START

Title: OFFICIAL GAZETTE OF THE UNITED STATES PATENT AND TRADEMARK
OFFICE. PATENTS.

Volume: 1216

Issues: 3 - 4
PATENT: 5,836,015 - 5,842,226

Date: NOVEMBER 17 - NOVEMBER 24, 1998

UMI Number: 10426.00

Note:

REEL NO: 22

UMI
300 North Zeeb Road
Ann Arbor, MI 48103

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THE PAPER AND INK USED IN THE ORIGINAL
PUBLICATION MAY AFFECT THE QUALITY OF
THE MICROFORM EDITION.

VOL

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NO

17

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U.S.
DEPARTMENT
OF COMMERCE

Patent
and
Trademark
Office

Vol. 1216 Number 3

OFFICIAL GAZETTE
of the UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

November 17, 1998

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE
November 17, 1998 Volume 1216 Number 3

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1214 O.G. 47, on September 15, 1998.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was increased, effective January 1, 1998, and was announced in the *Official Gazette* at 1205 O.G. 3, on December 2, 1997.

International fees were changed, effective on May 1, 1997, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1197 O.G. 69, on April 22, 1997. The basic fee and the designation fee were further changed effective January 1, 1998 and were announced in the *Official Gazette* at 1205 O.G. 3, on December 2, 1997.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective October 1, 1998, and were announced in the *Official Gazette* at 1213 O.G. 153, on August 18, 1998.

The schedule of PCT fees (in U.S. dollars), effective October 1, 1998, is as follows:

International Application (PCT Chapter I) fees:	
Transmittal fee	240.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
— No corresponding prior U.S. national application filed under 35 U.S.C. 111(a)	700.00
— Corresponding prior U.S. national application filed under 35 U.S.C. 111(a and filing fee under 37 CFR 1.16(a) paid)	450.00
— Supplemental search fee, per additional invention (payable only upon invitation)	210.00
European Patent Office as ISA	1250.00
International fees	
Basic fee	455.00
Basic supplemental fee (for each page over 30)	10.00
Designation fee per country or region	
— For the first 11 national or regional offices designated	105.00
— For each designation in excess of 11 offices	No Charge
Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5)	
— Designation fee	105.00
— Confirmation fee	52.50
International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination:	
Handling fee	162.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
— USPTO was ISA in PCT Chapter I	490.00
— Additional examination fee, per additional invention (payable only upon invitation)	140.00
— USPTO was not ISA in PCT Chapter I	750.00
— Additional examination fee, per additional invention (payable only upon invitation)	270.00

U.S. National Stage Fees	Small Entity	Regular
Basic National fee		
USPTO was IPEA		
— All claims presented satisfied provisions of PCT Article 33(2) to (4)	*	*
— All claims presented did not satisfy provisions of PCT Article 33(2) to (4)	*	*
USPTO was ISA but not IPEA	*	*
USPTO was neither ISA nor IPEA		
— Search report has not been prepared by the European Patent Office or the Japanese Patent Office	*	*
— Search report has been prepared by the European Patent Office or the Japanese Patent Office	*	*
Other National fees		
— For each independent claim in excess of 3	*	*
— For each claim in excess of 20.	*	*
— For each application containing a multiple dependent claim	*	*
— Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(l)	65.00	130.00
— Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(l)	130.00	130.00

* No fees are indicated because as of the date this notice was prepared these fee amounts were uncertain. Current fee amounts may be obtained from the Patent and Trademark Office's Web site (www.uspto.gov) or by contacting the PTO General Information Services Division at (703) 308-4357 or (800) 786-9199.

Sep. 16, 1998

BRUCE A. LEHMAN
Assistant Secretary of Commerce and
Commissioner of Patents and Trademarks

Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the

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maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on November 14, 1995 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,465,423 through 5,467,477
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on November 21, 1991 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,063,613 through 5,065,456
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on November 10, 1987 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,704,742 through 4,706,300
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1997, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) ....*
By other than a small entity ....*

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) ....*
By other than a small entity ....*

(g) For maintaining an original or reissue patent, except a design or plant patent, based on applications filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) ....*
By other than a small entity ....*

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable $700.00
(2) unintentional $1,640.00

* No fees are indicated because as of the date this notice was prepared these fee amounts were uncertain. Current fee amounts may be obtained from the Patent and Trademark Office's Web site (www.uspto.gov) or by contacting the PTO General Information Services Division at (703) 308-4357 or (800) 786-9199.

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED ON September 9, 1998
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Application Number	Issue Date
4,610,037	06/704,905	09/09/86
4,610,040	06/708,821	09/09/86
4,610,042	06/683,605	09/09/86
4,610,046	06/691,921	09/09/86
4,610,051	06/758,492	09/09/86
4,610,052	06/740,385	09/09/86
4,610,057	06/680,848	09/09/86
4,610,060	06/800,255	09/09/86
4,610,082	06/799,891	09/09/86
4,610,088	06/738,733	09/09/86
4,610,090	06/656,649	09/09/86
4,610,091	06/804,336	09/09/86
4,610,096	06/647,106	09/09/86
4,610,123	06/658,103	09/09/86
4,610,124	06/639,319	09/09/86
4,610,127	06/767,675	09/09/86
4,610,142	06/662,875	09/09/86
4,610,143	06/682,877	09/09/86
4,610,154	06/696,380	09/09/86
4,610,159	06/685,992	09/09/86
4,610,160	06/776,724	09/09/86
4,610,162	06/749,233	09/09/86
4,610,164	06/742,188	09/09/86
4,610,170	06/667,819	09/09/86
4,610,171	06/727,727	09/09/86
4,610,172	06/439,038	09/09/86
4,610,174	06/643,229	09/09/86
4,610,176	06/510,941	09/09/86
4,610,193	06/545,567	09/09/86
4,610,194	06/707,351	09/09/86
4,610,203	06/657,289	09/09/86
4,610,204	06/624,214	09/09/86
4,610,206	06/597,901	09/09/86
4,610,207	06/675,817	09/09/86
4,610,210	06/758,656	09/09/86
4,610,220	06/730,389	09/09/86
4,610,221	06/747,574	09/09/86
4,610,222	06/633,445	09/09/86
4,610,228	06/762,108	09/09/86
4,610,236	06/612,858	09/09/86
4,610,241	06/627,423	09/09/86
4,610,242	06/601,456	09/09/86
4,610,244	06/786,692	09/09/86
4,610,261	06/522,216	09/09/86
4,610,262	06/761,726	09/09/86

Patent Number	Application Number	Issue Date
4,610,267	06/411,298	09/09/86
4,610,275	06/794,517	09/09/86
4,610,281	06/664,345	09/09/86
4,610,284	06/668,763	09/09/86
4,610,287	06/758,168	09/09/86
4,610,288	06/653,493	09/09/86
4,610,300	06/651,278	09/09/86
4,610,313	06/739,884	09/09/86
4,610,314	06/692,938	09/09/86
4,610,315	06/712,642	09/09/86
4,610,327	06/636,249	09/09/86
4,610,331	06/548,009	09/09/86
4,610,332	06/764,966	09/09/86
4,610,340	06/547,315	09/09/86
4,610,356	06/656,014	09/09/86
4,610,361	06/666,019	09/09/86
4,610,368	06/771,001	09/09/86
4,610,370	06/814,686	09/09/86
4,610,394	06/245,396	09/09/86
4,610,403	06/575,442	09/09/86
4,610,411	06/756,120	09/09/86
4,610,412	06/642,681	09/09/86
4,610,415	06/506,901	09/09/86
4,610,419	06/774,582	09/09/86
4,610,423	06/708,579	09/09/86
4,610,424	06/674,834	09/09/86
4,610,428	06/793,020	09/09/86
4,610,431	06/712,993	09/09/86
4,610,446	06/685,782	09/09/86
4,610,449	06/769,456	09/09/86
4,610,455	06/658,190	09/09/86
4,610,460	06/602,161	09/09/86
4,610,461	06/745,530	09/09/86
4,610,465	06/543,518	09/09/86
4,610,468	06/640,740	09/09/86
4,610,469	06/575,325	09/09/86
4,610,470	06/638,067	09/09/86
4,610,471	06/792,445	09/09/86
4,610,477	06/735,445	09/09/86
4,610,486	06/716,856	09/09/86
4,610,493	06/822,916	09/09/86
4,610,503	06/642,526	09/09/86
4,610,506	06/568,725	09/09/86
4,610,547	06/752,851	09/09/86
4,610,571	06/787,060	09/09/86
4,610,579	06/732,124	09/09/86
4,610,593	06/610,360	09/09/86
4,610,599	06/528,871	09/09/86
4,610,602	06/746,556	09/09/86
4,610,609	06/618,597	09/09/86
4,610,627	06/677,861	09/09/86
4,610,632	06/610,123	09/09/86
4,610,655	06/613,035	09/09/86
4,610,660	06/683,054	09/09/86
4,610,663	06/683,052	09/09/86
4,610,664	06/639,076	09/09/86
4,610,667	06/689,909	09/09/86
4,610,674	06/770,720	09/09/86
4,610,675	06/756,554	09/09/86
4,610,676	06/611,423	09/09/86
4,610,677	06/779,628	09/09/86
4,610,678	06/529,900	09/09/86
4,610,684	06/623,065	09/09/86
4,610,685	06/774,111	09/09/86
4,610,697	06/683,460	09/09/86
4,610,699	06/688,654	09/09/86
4,610,700	06/657,594	09/09/86
4,610,702	06/694,453	09/09/86
4,610,703	06/824,610	09/09/86
4,610,705	06/668,716	09/09/86
4,610,707	06/772,977	09/09/86
4,610,709	06/694,284	09/09/86
4,610,711	06/656,292	09/09/86
4,610,714	06/668,036	09/09/86
4,610,719	06/779,311	09/09/86
4,610,721	06/696,980	09/09/86
4,610,722	06/696,977	09/09/86
4,610,732	06/714,398	09/09/86
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4,610,748	06/679,898	09/09/86
4,610,754	06/617,059	09/09/86
4,610,760	06/643,925	09/09/86
4,610,769	06/658,725	09/09/86
4,610,774	06/797,993	09/09/86
4,610,778	06/741,023	09/09/86
4,610,797	06/737,314	09/09/86
4,610,802	06/660,385	09/09/86
4,610,812	06/784,059	09/09/86
4,610,814	06/616,944	09/09/86
4,610,816	06/621,021	09/09/86
4,610,817	06/513,023	09/09/86
4,610,831	06/597,231	09/09/86
4,610,841	06/582,519	09/09/86
4,610,854	06/437,709	09/09/86
4,610,868	06/591,576	09/09/86
4,610,870	06/658,005	09/09/86
4,610,878	06/504,986	09/09/86
4,610,888	06/735,443	09/09/86
4,610,891	06/802,201	09/09/86
4,610,893	06/683,463	09/09/86
4,610,898	06/714,043	09/09/86
4,610,905	06/553,215	09/09/86
4,610,908	06/730,256	09/09/86
4,610,917	06/794,300	09/09/86
4,610,919	06/744,773	09/09/86
4,610,922	06/809,523	09/09/86
4,610,927	06/647,636	09/09/86
4,610,930	06/714,068	09/09/86
4,610,936	06/672,509	09/09/86
4,610,937	06/555,711	09/09/86
4,610,947	06/716,447	09/09/86
4,610,949	06/697,569	09/09/86
4,610,953	06/614,908	09/09/86
4,610,955	06/813,189	09/09/86
4,610,958	06/678,333	09/09/86
4,610,963	06/678,767	09/09/86
4,610,974	06/725,440	09/09/86
4,611,001	06/731,730	09/09/86
4,611,002	06/618,720	09/09/86
4,611,005	06/736,628	09/09/86
4,611,006	06/749,912	09/09/86
4,611,007	06/725,976	09/09/86
4,611,010	06/732,276	09/09/86
4,611,012	06/724,487	09/09/86
4,611,015	06/681,348	09/09/86
4,611,027	06/676,154	09/09/86
4,611,030	06/715,477	09/09/86
4,611,036	06/679,648	09/09/86
4,611,040	06/741,376	09/09/86
4,611,044	06/737,984	09/09/86
4,611,048	06/784,362	09/09/86
4,611,050	06/713,282	09/09/86
4,611,057	06/598,969	09/09/86
4,611,060	06/784,402	09/09/86
4,611,062	06/790,224	09/09/86
4,611,064	06/788,575	09/09/86
4,611,065	06/695,146	09/09/86
4,611,069	06/624,307	09/09/86
4,611,070	06/336,703	09/09/86
4,611,074	06/672,831	09/09/86
4,611,089	06/619,052	09/09/86
4,611,100	06/664,240	09/09/86
4,611,108	06/531,346	09/09/86
4,611,113	06/695,221	09/09/86
4,611,114	06/785,087	09/09/86
4,611,121	06/601,410	09/09/86
4,611,125	06/575,410	09/09/86
4,611,126	06/657,557	09/09/86
4,611,131	06/528,372	09/09/86
4,611,149	06/669,206	09/09/86
4,611,150	06/641,309	09/09/86
4,611,153	06/528,288	09/09/86
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4,611,167	06/711,717	09/09/86
4,611,168	06/533,902	09/09/86
4,611,191	06/731,268	09/09/86
4,611,194	06/766,371	09/09/86
4,611,196	06/720,946	09/09/86
4,611,198	06/777,770	09/09/86
4,611,201	06/766,266	09/09/86
4,611,202	06/543,108	09/09/86
4,611,203	06/591,099	09/09/86
4,611,204	06/668,341	09/09/86
4,611,206	06/418,268	09/09/86
4,611,207	06/547,591	09/09/86
4,611,213	06/619,089	09/09/86
4,611,229	06/505,518	09/09/86
4,611,230	06/683,125	09/09/86
4,611,234	06/562,462	09/09/86
4,611,242	06/607,988	09/09/86
4,611,248	06/758,564	09/09/86
4,611,253	06/625,141	09/09/86
4,611,272	06/463,469	09/09/86
4,611,274	06/518,450	09/09/86
4,611,277	06/533,064	09/09/86
4,611,279	06/485,085	09/09/86
4,611,283	06/335,951	09/09/86
4,611,284	06/531,209	09/09/86
4,611,316	06/561,654	09/09/86
4,611,317	06/561,653	09/09/86
4,611,324	06/669,279	09/09/86
4,611,325	06/685,198	09/09/86
4,611,337	06/527,470	09/09/86
4,611,341	06/577,074	09/09/86
4,611,346	06/537,279	09/09/86

PATENTS WHICH EXPIRED ON September 4. 1998 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Application Number	Issue Date
4,953,232	07/361,642	09/04/90
4,953,235	07/205,360	09/04/90
4,953,239	07/216,151	09/04/90
4,953,241	07/292,395	09/04/90
4,953,245	07/446,079	09/04/90
4,953,253	07/373,068	09/04/90
4,953,255	07/324,443	09/04/90
4,953,256	07/306,733	09/04/90
4,953,258	07/377,327	09/04/90
4,953,264	07/209,016	09/04/90
4,953,265	07/317,299	09/04/90
4,953,271	07/410,311	09/04/90
4,953,272	07/333,125	09/04/90
4,953,273	07/356,518	09/04/90
4,953,281	07/354,455	09/04/90
4,953,282	07/371,142	09/04/90
4,953,290	07/385,012	09/04/90
4,953,292	07/412,340	09/04/90
4,953,293	07/354,385	09/04/90
4,953,295	07/479,490	09/04/90
4,953,298	07/315,153	09/04/90
4,953,301	07/456,510	09/04/90
4,953,302	07/414,378	09/04/90
4,953,306	07/183,828	09/04/90
4,953,307	07/347,176	09/04/90
4,953,315	07/290,425	09/04/90
4,953,316	07/412,193	09/04/90
4,953,317	07/376,833	09/04/90
4,953,319	07/385,218	09/04/90
4,953,324	07/330,828	09/04/90
4,953,330	07/216,496	09/04/90
4,953,337	07/130,015	09/04/90
4,953,351	07/270,087	09/04/90
4,953,353	07/397,211	09/04/90
4,953,354	07/269,639	09/04/90
4,953,356	07/345,917	09/04/90
4,953,359	07/338,606	09/04/90
4,953,368	07/156,789	09/04/90
4,953,372	07/247,675	09/04/90
4,953,375	07/480,858	09/04/90
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4,953,390	07/351,215	09/04/90
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4,953,397	07/384,638	09/04/90
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4,954,222	07/273,261	09/04/90
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4,954,255	07/326,222	09/04/90
4,954,258	07/269,642	09/04/90
4,954,259	07/148,498	09/04/90
4,954,262	07/429,379	09/04/90

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Patent Number	Application Number	Issue Date
4,954,270	07/316,379	09/04/90
4,954,277	07/401,373	09/04/90
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4,954,303	07/308,720	09/04/90
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4,954,312	07/285,056	09/04/90
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4,954,956	07/131,405	09/04/90
4,954,973	07/174,762	09/04/90
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4,954,981	07/245,908	09/04/90
4,954,985	07/192,016	09/04/90
4,954,995	07/350,437	09/04/90
4,955,002	07/387,713	09/04/90
4,955,003	06/617,282	09/04/90
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4,955,020	07/374,086	09/04/90
4,955,023	07/164,021	09/04/90

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4,955,037	07/300,116	09/04/90
4,955,060	07/069,310	09/04/90
4,955,071	07/339,459	09/04/90
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4,955,078	07/249,635	09/04/90
4,955,085	07/164,933	09/04/90

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5,343,563	08/139,766	09/06/94
5,343,565	07/809,284	09/06/94
5,343,567	08/018,057	09/06/94
5,343,569	08/096,902	09/06/94
5,343,572	08/090,336	09/06/94
5,343,574	07/941,442	09/06/94
5,343,577	07/905,679	09/06/94
5,343,578	08/082,780	09/06/94
5,343,582	08/125,172	09/06/94
5,343,585	07/924,756	09/06/94
5,343,588	08/133,285	09/06/94
5,343,591	07/927,958	09/06/94
5,343,599	07/963,428	09/06/94
5,343,608	08/098,575	09/06/94
5,343,612	08/119,724	09/06/94
5,343,614	07/920,301	09/06/94
5,343,620	08/046,452	09/06/94
5,343,625	07/981,505	09/06/94
5,343,627	08/065,067	09/06/94
5,343,634	08/156,303	09/06/94
5,343,636	08/042,655	09/06/94
5,343,642	08/074,970	09/06/94
5,343,643	07/867,215	09/06/94
5,343,649	08/118,348	09/06/94
5,343,654	08/181,007	09/06/94
5,343,660	07/905,362	09/06/94
5,343,662	07/968,355	09/06/94
5,343,663	07/879,569	09/06/94
5,343,668	08/076,078	09/06/94
5,343,672	07/985,040	09/06/94
5,343,675	07/721,298	09/06/94
5,343,679	08/159,514	09/06/94
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5,344,171	08/001,130	09/06/94
5,344,172	08/014,265	09/06/94
5,344,179	07/980,532	09/06/94
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5,344,206	08/124,597	09/06/94
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5,344,214	07/986,485	09/06/94
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5,344,217	07/935,589	09/06/94
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5,344,633	08/075,926	09/06/94
5,344,639	07/719,715	09/06/94
5,344,642	08/027,291	09/06/94
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5,344,663	07/821,735	09/06/94
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5,344,767	07/905,561	09/06/94
5,344,795	07/949,189	09/06/94
5,344,798	07/928,593	09/06/94
5,344,804	07/915,600	09/06/94
5,344,814	08/067,316	09/06/94
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5,344,842	08/066,815	09/06/94
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5,344,936	08/027,552	09/06/94
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5,345,237	08/077,932	09/06/94
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5,345,348	07/723,439	09/06/94
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4,557,009	06/653,689	09/21/84	12/10/85	09/14/98
4,800,233	07/081,267	08/03/87	01/24/89	09/16/98
4,815,545	06/849,707	04/09/86	03/28/89	09/16/98
4,897,139	07/219,786	07/18/88	01/30/90	09/16/98
4,897,868	07/224,118	07/25/88	01/30/90	09/16/98
4,910,660	07/121,095	11/16/87	03/20/90	09/16/98
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5,117,561	07/636,688	01/02/91	06/02/92	09/14/98
5,118,052	07/115,333	11/02/87	06/02/92	09/16/98
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5,177,226	07/712,098	06/07/91	01/05/93	09/17/98
5,257,575	07/821,757	01/15/92	11/02/93	09/16/98
5,267,420	07/862,420	04/02/92	12/07/93	09/16/98
5,274,688	07/863,807	04/07/92	12/28/93	09/16/98
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Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

4,805,135, Re. S.N. 09/009,859, Jan. 21, 1998, Cl. 364/900, IMAGE COMMUNICATION APPARATUS HAVING A FUNCTION FOR DIVIDING AND OUTPUTTING AN IMAGE, Hiroshi Ochi, Owner of Record: *Nippon Telegraph and Telephone Corp., Tokyo, Japan,* Attorney or Agent: Abigail F. Cousins, Ex. Gp.: 2307

5,155,249, Re. S.N. 09/104,559, Jun. 25, 1998, Cl. 556/419, BENZOIC ACID DERIVATIVES AND PROCESS FOR PREPARING THE SAME, Koichi Shudo, Owner of Record: *Inventor,* Attorney or Agent: Gordon W. Hueschen, Ex. Gp.: 1204

5,286,037, Re. S.N. 08/962,971, Oct. 27, 1997, Cl. 473/460, ELECTRONIC HAND HELD LOGIC GAME, Nabil N. Ghaly, Owner of Record: *Inventor,* Attorney or Agent: Jay A. Bondell, Ex. Gp.: 3304

5,464,863, Re. S.N. 09/100,241, Jun. 19, 1998, Cl. 514/443, N-HETEROARYL-N′-PHENYLUREA DERIVATIVES, THEIR PRODUCTION AND USE, Masashi Nagamine, et. al., Owner of Record: *Nihon Nohyaku Co., Ltd., Tokyo, Japan,* Attorney or Agent: Paul E. White Jr., Ex. Gp.: 1616

5,495,670, Re. S.N. 09/035,379, Mar. 5, 1998, Cl. 030/162, UTILITY KNIFE, Charles E. Quinn, Owner of Record: *Fiskars Inc., Madison, Wis.,* Attorney or Agent: Keith D. Lindenbaum, Ex. Gp.: 3724

5,524,439, Re. S.N. 09/096,226, Jun. 11, 1998, Cl. 062/, VARIABLE TEMPERATURE SEAT CLIMATE CONTROL SYSTEM, David F. Gallup, et. al., Owner of Record: *Amerigon Inc., Burbank, Calif.,* Attorney or Agent: Lowell Anderson, Ex. Gp.: 3404

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5,533,543, Re. S.N. 09/112,187, Jul. 9, 1998, Cl. 251/359, POPPET SEAT FOR AIR REGULATING DEVICES, Roberto Semcia, Owner of Record: *Johnson WorldWide Associates, Inc., Sturtevant, Wis.*, Attorney or Agent: Todd A. Rathe, Ex. Gp.: 3753

5,534,970, Re. S.N. 09/112,380, Jul. 9, 1998, Cl. 355/053, SCANNING EXPOSURE APPARATUS, Toshiharu Nakashima, Owner of Record: *Inventor,* Attorney or Agent: Mitchell W. Shapiro, Ex. Gp.: 2851

5,536,061, Re. S.N. 09/115,863, Jul. 15, 1998, Cl. 296/155, AUTOMOTIVE VEHICLE BODY WITH POWERED SLIDING SIDE DOOR, Thomas N. Moore, et. al., Owner of Record: *Chrysler Corp., Auburn Hills, Mich.*, Attorney or Agent: Stephen T. Olson, Ex. Gp.: 3612

5,555,656, Re. S.N. 09/156,049, Sep. 17, 1998, Cl. 040/411.000, STRUCTURE OF CRYSTAL BALL PROVIDING DYNAMIC PHENOMENON IN THE BASE, Jian H. Liu, Owner of Record: *Inventor,* Attorney or Agent: Harold L. Novick, Ex. Gp.: 3509

5,557,844, Re. S.N. 09/159,360, Sep. 23, 1998, Cl. 29/852, METHOD OF PREPARING A PRINTED CIRCUIT BOARD, Anilkumar C. Bhatt, et. al., Owner of Record: *IBM Corp., Armonk, N.Y.*, Attorney or Agent: Lawrence R. Fraley, Ex. Gp.: 3206

5,561,585, Re. S.N. 09/165,285, Oct. 1, 1998, Cl. 361/234, ELECTROSTATIC CHUCK WITH REFERENCE ELECTRODE, Michael Scott Barnes, et. al., Owner of Record: *International Business Machines Corp., Armonk, N.Y.*, Attorney or Agent: Eric W. Petraske, Ex. Gp.: 2836

5,584,849, Re. S.N. 09/154,583, Sep. 17, 1998, Cl. 606/185, RETRACTABLE SAFETY PENETRATING INSTRUMENT WITH SAFETY SHIELD AND MULTIPLE TRIGGERING AND/OR MOVING COMPONENTS, InBae Yoon, Owner of Record: *Inventor,* Attorney or Agent: Jason M. Shapiro, Ex. Gp.: 3731

5,620,546, Re. S.N. 09/163,995, Sep. 30, 1998, Cl. 156/219, METHOD OF MAKING A FLOOR MAT HAVING A CHANNEL, Harold Reuben (Deceased), Owner of Record: *The Akro Corp., Canton, Ohio,* Attorney or Agent: David D. Beatty, Ex. Gp.: 1732

5,622,593, Re. S.N. 09/165,545, Oct. 2, 1998, Cl. 156/345, PLASMA PROCESSING APPARATUS AND METHOD, Masashi Arasawa, et. al., Owner of Record: *Tokyo Electron Ltd., Tokyo, Japan,* Attorney or Agent: Gregory J. Maier, Ex. Gp.: 1763

5,642,535, Re. S.N. 09/156,991, Sep. 18, 1998, Cl. 004/559, SEATING AND KNEELING APPLIANCE, Deidre M. Frawley, et. al., Owner of Record: *Inventor,* Attorney or Agent: John R. Flanagan, Ex. Gp.: 3751

5,681,486, Re. S.N. 09/154,926, Sep. 16, 1998, Cl. 216/67, PLASMA DESCALING OF TITANIUM AND TITANIUM ALLOYS, Herbert S. Goode, Jr., et. al., Owner of Record: *Roger D. Wylie,* Attorney or Agent: Roger D. Wylie, Ex. Gp.: 1741

5,689,891, Re. S.N. 09/164,985, Oct. 1, 1998, Cl. 030/394, CLUTCH MECHANISM FOR RECIPROCATING SAWS, Thomas R. Bednar, et. al., Owner of Record: *Milwaukee Electric Tool Corp., Brookfield, Wis.*, Attorney or Agent: Kevin P. Morgan, Ex. Gp.: 3725

5,694,682, Re. S.N. 09/158,475, Sep. 22, 1998, Cl. 029/888.023, METHOD OF MANUFACTURING VALVE SYSTEM FOR CAPACITY CONTROL OF A SCREW COMPRESSOR, Jan A. Zuercher, et. al., Owner of Record: *Coltec Industries Inc., New York, N.Y.*, Attorney or Agent: James W. Jakobsen, Ex. Gp.: 3726

5,709,255, Re. S.N. 09/161,696, Aug. 26, 1998, Cl. 144/220, CHIPPER WITH DETACHABLE FACING KNIVES, William C. Toogood, Owner of Record: *Key Knife Inc., Portland, Oreg.*, Attorney or Agent: Stephen F. Gass, Ex. Gp.: 3725

5,775,934, Re. S.N. 09/160,455, Sep. 24, 1998, Cl. 439/427, COAXIAL CABLE CONNECTOR, Dale C. McCarthy, Owner of Record: *Centerpin Technology Inc., Gulf Freeze, Fla.*, Attorney or Agent: William M. Hobby III, Ex. Gp.: 2833

Requests for Reexaminations Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

5,110,952, Re. S.N. 90/005,108, Sep. 16, 1998, Cl. 549/226, METHOD OF PRODUCING 3-DIBUTYLAMINO 6-METHYL-7-ANILINOFLUORAN, Hiroaki Harada, et. al., Owner of Record: *Yamamoto Chemicals, Inc., Osaka, Japan,* Attorney or Agent: Wenderoth Lind and Ponack, Washington, D.C., Ex. Gp.: 1612, Requester: Owner

5,471,533, Re. S.N. 90/005,105, Sep. 10, 1998, Cl. 380/051, RECORD WITH ENCODED DATA, Ynjiun P. Wang, et. al., Owner of Record: *Symbol Technologies, Inc., Holtsville, N.Y.*, Attorney or Agent: Finnegan Henderson Farabow Garrett and Dunner, Washington, D.C., Ex. Gp.: 2766, Requester: Owner

5,620,335, Re. S.N. 90/005,109, Sep. 17, 1998, Cl. 439/491, BOOT WITH ICON HOLDER, John A. Siemon, Owner of Record: *The Siemon Co., Watertown, Conn.*, Attorney or Agent: David A. Fox, Fishman Dionne Cantor and Colburn, Windsor, Conn., Ex. Gp.: 2833, Requester: Owner

5,667,146, Re. S.N. 90/005,107, Sep. 14, 1998, Cl. 239/587.1, HIGH-PRESSURE, FLEXIBLE, SELF-SUPPORTIVE, PIPING ASSEMBLY FOR USE WITH A DIFFUSER/NOZZLE, Ralph Pimental, et. al., Owner of Record: *Inventors,* Attorney or Agent: None, Ex. Gp.: 3752, Requester: Robert J. Pugh, Allegheny Teledyne Inc., Pittsburgh, Pa.

5,677,516, Re. S.N. 90/005,108, Sep. 10, 1998, Cl. 177/052, ARTICLE WEIGHING AND SORTING APPARATUS WITH IMPROVED WEIGH CUP, William H. Leverett, Owner of Record: *Durland-Wayland, Inc., LaGrange, Ga.*, Attorney or Agent: Roger T. Frost, Jones and Askew, Atlanta, Ga., Ex. Gp.: 2859, Requester: Ross F. Hunt, Jr., Larson and Taylor, Alexandria, Va.

Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED
September 28, 1998
DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date
119,952	71/105,289	12/25/1917
119,953	71/105,290	12/25/1917
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352,946	71/360,088	12/21/1937
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352,968	71/393,582	12/21/1937
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352,995	71/394,965	12/21/1937
352,996	71/395,169	12/21/1937
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Notice Regarding Technical Center Box Issue Fee Mailings

The Office will begin mailing address labels with the PTOL-85, "Notice of Allowance and Issue Fee Due" for patent applications allowed in all Technology Centers. These address labels should be used to ensure proper routing of post-allowance correspondence. This directive supersedes the "Special Boxes for Patent Mail" instruction. Any Notice of Allowance and Issue Fee Due received without the accompanying address labels should continue to be addressed to Box Issue Fee.

March 11, 1998

NICHOLAS P. GODICI
Deputy Assistant Commissioner
for Patents (Acting)

DEPARTMENT OF COMMERCE

Patent and Trademark Office

[Docket No. 980326078-8078-01]

Request for Comments on Proposed Internet Usage Policy

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Notice and request for public comments.

SUMMARY: The Patent and Trademark Office (PTO) requests comments on a proposed Internet usage policy. The policy is intended to provide guidance to PTO employees regarding the use of the Internet for official PTO business. The policy is to cover (1) communications with applicants via Internet electronic mail (e-mail) and (2) using the Internet to search for information concerning patent applications and elements appearing in trademark applications.

DATES: Written comments on the proposed Internet usage policy will be accepted by the PTO until December 28, 1998.

ADDRESSES: Written comments should be addressed to the attention of Magdalen Greenlief, Office of the Deputy Assistant Commissioner for Patent Policy and Projects. Comments submitted by mail should be sent to: Box Comments - Patents, Assistant Commissioner for Patents, Washington, D.C. 2023 1. Comments may also be submitted by facsimile transmission to (703) 305-8825 or by electronic mail through the Internet to "magdalen.greenlief@uspto.gov".

Written comments will be available for public inspection in Suite 910 of Crystal Park 2, 2121 Crystal Drive, Arlington, Virginia. In addition, comments provided in machine-readable format will be available through the PTO's Website at http://www.uspto.gov.

FOR FURTHER INFORMATION CONTACT: Magdalen Greenlief, by mail to her attention addressed to Box Comments-Patents, Assistant Commissioner for Patents, Washington, D.C. 20231; by telephone at (703) 305-8813; by facsimile transmission to (703) 305-8825; or by electronic mail through the Internet to "magdalen.greenlief@uspto.gov".

SUPPLEMENTARY INFORMATION: The Commissioner of Patents and Trademarks issued a Notice entitled "Interim Internet Usage Policy" in the Official Gazette of the United States Patent and Trademark Office (O.G.) on February 25, 1997 at 1195 O.G. 89. The Notice set forth interim guidelines for PTO employees regarding the use of the Internet to conduct official PTO business. The Notice also stated that the guidelines are interim since the public has not had an opportunity to comment on them and that the PTO will publish a Notice in the Federal Register and the Official Gazette requesting comments from the public on the use of the Internet in the PTO's patent and trademark examination process. Pursuant to the February 25, 1997 O.G. Notice, the following proposed Internet Usage Policy is being published for public comment.

The Internet offers a highly effective means of identifing, locating, and retrieving scientific and technical information and

also provides a means for the applicant to communicate with PTO employees via advanced electronic mail. Communications via Internet e-mail are at the discretion of the applicant. In view of the fact that all communications and data transmitted from or to applicant by the Internet may be neither encrypted nor secure, applicants who wish to communicate with the PTO on an unsecure medium such as Internet e-mail do so at their own risk. If an applicant wishes the PTO to communicate with the applicant on the unsecure medium, the applicant may authorize the PTO to do so by submitting a written authorization. Where the Internet is used to search patent applications, PTO employees must restrict their search operations to determining the general state of the art. The purpose of the Internet usage policy is to provide guidelines for PTO employees for using the Internet to conduct official PTO business.

(A) Regarding communications between PTO employees and applicant by electronic mail, the PTO is particularly interested in comments relating to the following:

(1) Regarding communication with the Patent Organization, where a written authorization by the applicant has been given. Patent Article 5 of the proposed Internet usage policy limits the use of the Internet e-mail for communications other than those under 35 U.S.C. 132 or which othenvise require a signature. Should such limitations be imposed? If so, what other types of correspondence should not be communicated via Internet e-mail?

(2) What type of confirmation, if any, from the PTO would you like to see regarding whether the e-mail with attachments has been received and is readable?

(3) Regarding communication with the Patent Organization, the "Interim Internet Usage Policy" published on February 25, 1997 at 1195 O.G. 89 indicated that an express waiver under 35 U.S.C. 122 by the applicant is required before Internet e-mail may be used by PTO employees to conduct official PTO business where sensitive data will be exchanged or where there exists a possibility that sensitive data could be identified.

The reference to a waiver of 35 U.S.C. 122 has been deleted from the proposed Internet usage policy because it appears to be unnecessary. Are there any problems with the elimination of the waiver?

(4) Patent Article 7 and Trademark .Article 8 of the proposed Internet usage policy permits PTO employees to respond to applicant's e-mail correspondence by other appropriate means such as telephone or by facsimile transmission. Would you prefer to have PTO employees respond via Internet e-mail or is the other appropriate means noted above acceptable?

(5) How likely would you utilize the Internet e-mail to conduct interviews under the conditions set forth in Patent Article 8 and Trademark Article 9 of the proposed Internet usage policy?

(6) In view of the fact that all communications and data transmitted from or to the applicant by the Internet may be neither encrypted nor secure, how likely and how often and for what purpose would you utilize the Internet e-mail to communicate with PTO employees regarding a particular application?

(7) Should digital signatures, digital certificates, public key/private key encryption and key recovery be used for Internet e-mail? If so, what software(s) should PTO use?

(B) The PTO is also interested in comments regarding searching and retrieving scientific and technical information in patent applications via the Internet, particularly comments relating to searching and retrieving scientific and technical information in patent applications which the PTO must maintain in confidence pursuant to 35 U.S.C. 122.

Please submit separate comments concerning patent provisions and trademark provisions. Although comments may be submitted by mail or facsimile transmission, the Office prefers to receive comments via the Internet. Where comments are submitted by mail, the Office would prefer that the comments be submitted on a DOS formatted 3.5" disk accompanied by a paper copy of the comments.

Written comments should include the following information:

— Name and affiliation of the individual responding;

— An indication of whether the comments offered represent views of the respondent's organization or are the respondent's personal views; and

— If applicable, information on the respondent's organization, including the type of organization (e.g., business,-trade group, university, nonprofit organization).

I. PROPOSED PATENT INTERNET USAGE POLICY

Introduction:

The Internet and its offspring, the World Wide Web (WWW), offer the PTO opportunities to (1) enhance operations by enabling Patent Examiners to locate and retrieve new sources of scientific and technical information, (2) communicate more effectively with our customers via advanced electronic mail (e-mail) and file transfer functions, and (3) more easily publish information of interest to the intellectual property community and the general public. This new technology offers low-cost, high speed, and direct communications capabilities upon which the PTO wishes to capitalize.

The organizations reporting to the Assistant Commissioner for Patents have special legal requirements that must be satisfied as part of the PTO's goal to make effective use of the Internet. Because security issues concerning transmission and capture of search requests by unauthorized individuals have not yet been resolved, Patent Examiners are to exercise good judgment and restrict their searches to nonspecific patent application uses.

Purpose:

To establish a policy for use of the Internet by the Patent Examining Corps and other organizations within the PTO;

To address use of the Internet to conduct interview-like communications and other forms of formal and informal communications;

To publish guidelines for locating, retrieving, citing, and properly documenting scientific and technical information sources on the Internet;

To inform the public how the PTO intends to use the Internet; and

To establish a flexible Internet policy framework which can be modified, enhanced, and corrected as the PTO, the public, and customers learn to use, and subsequently integrate, new and emerging Internet technology into existing business infrastructures and everyday activities to improve the patent application, the examining, and granting functions.

Article 1. Applicability

This policy applies to members of the Patent Organization within the PTO, including contractors and consultants working with, or conducting activities in support of, the Patent Organization.

Article 2. Scope

This policy applies to activities associated with, or directly related to, use of the Internet via PTO-provided network connections, facilities, and services. This includes, but is not limited to, PTONet connections, Office of Chief Information Officer (OCIO)-provided PCs and workstations, and Internet provider services. This policy also applies to use of other non-PTO Internet access facilities and equipment that are used to conduct non-patent application specific work.

Article 3. Conformance with existing, PTO-wide, Internet use policy

This Internet Usage Policy supersedes the Interim Internet Usage Policy published in the Official Gazette on February

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1997. The policy outlined in this document augments the existing PTO Internet Acceptable Use Policy as set forth in the Office Automation Services Guide. As such, this policy is an extension of current PTO office-wide Internet policy.

Article 4. Confidentiality of Proprietary Information

If security and confidentiality cannot be attained for a specific use, transaction, or activity, then that specific use, transaction, or activity shall **NOT** be undertaken/conducted.

All use of the Internet by Patent Organization employees, contractors, and consultants shall be conducted in a manner that ensures compliance with confidentiality requirements in statutes, including 35 U.S.C. 122, and regulations. Where a written authorization is given by the applicant for the PTO to communicate with the applicant via Internet e-mail, communications via Internet e-mail may be used.

Backup, archiving, and recovery of information sent or received via the Internet is the responsibility of individual users. The OCIO does not, and will not, as a normal practice, provide backup and recovery services for information produced, retrieved, stored, or transmitted to/from the Internet.

Article 5. Communications via the Internet and Authorization

Communications via Internet e-mail are at the discretion of the applicant.

Without a written authorization by applicant in place, the PTO will not respond via Internet e-mail to any Internet correspondence which contains information subject to the confidentiality requirement as set forth in 35 U.S.C. 122. A paper copy of such correspondence will be placed in the appropriate patent application.

The following is a sample authorization form which may be used by applicant: "Recognizing that Internet communications are not secure, I hereby authorize the PTO to communicate with me concerning any subject matter of this application by electronic mail. I understand that a copy of these communications will be made of record in the application file."

A written authorization may be withdrawn by filing a signed paper clearly identifying the original authorization. The following is a sample form which may be used by applicant to withdraw the authorization:

"The authorization given on ________, to the PTO to communicate with me via the Internet is hereby withdrawn. I understand that the withdrawal is effective when approved rather than when received."

Where a written authorization is given by the applicant, communications via Internet e-mail, other than those under 35 U.S.C. 132 or which otherwise require a signature, may be used. In such case, a printed copy of the Internet e-mail communications **MUST** be given a paper number, entered into the Patent Application Location and Monitoring System (PALM) and entered in the patent application file. A reply to an Office action may **NOT** be communicated by applicant to the PTO via Internet e-mail. If such a reply is submitted by applicant via Internet e-mail, a paper copy will be placed in the appropriate patent application file with an indication that the reply is NOT ENTERED.

PTO employees are **NOT** permitted to initiate communications with applicant via Internet e-mail unless there is a written authorization of record in the patent application by the applicant.

All reissue applications are open to public inspection under 37 CFR 1.11(a) and all papers relating to a reexamination proceeding which have been entered of record in the patent or reexamination file are open to public inspection under 37 CFR 1.11(d). PTO employees are **NOT** permitted to initiate communications with applicant in a reissue application or a patentee of a reexamination proceeding via Internet e-mail unless written authorization is given by the applicant or patentee.

Article 6. Authentication of Sender by a Patent Organization Recipient

The misrepresentation of a sender's identity (i.e., spoofing) is a known risk when using electronic communications. Therefore, Patent Organization users have an obligation to be aware of this risk and conduct their Internet activities in compliance with established procedures.

Internet e-mail must be initiated by a registered practitioner, or an applicant in a *pro se* application, and sufficient information must be provided to show representative capacity in compliance with 37 CFR 1.34. Examples of such information include the attorney registration number, attorney docket number, and patent application number.

Article 7. Use of Electronic Mail Services

Once e-mail correspondence has been received from the applicant, as set forth in Patent Article 4, such correspondence must be responded to appropriately. The Patent Examiner may respond to an applicant's e-mail correspondence by telephone, fax, or other appropriate means.

Article 8. Interviews

Internet e-mail shall **NOT** be used to conduct an exchange or communications similar to those exchanged during telephone or personal interviews unless a written authorization has been given under Patent Article 5 to use Internet e-mail. In such cases, a paper copy of the Internet e-mail contents **MUST** be made and placed in the patent application file as required by the Federal Records Act in the same manner as an Examiner Interview Summary Form is entered.

Article 9. Internet Searching

The ultimate responsibility for formulating individual search strategies lies with individual Patent Examiners, Scientific and Technical Information Center (STIC) staff, and anyone charged with protecting proprietary application data. When the Internet is used to search, browse, or retrieve information relating to a patent application, other than a reissue application or reexamination proceeding, Patent Organization users **MUST** restrict search queries to the general state of the art. Internet search, browse, or retrieval activities that could disclose proprietary information directed to a specific application, other than a reissue application or reexamination proceeding, are **NOT** permitted.

This policy also applies to use of the Internet as a communications medium for connecting to commercial database providers.

Article 10. Documenting Search Strategies

All Patent Organization users of the Internet for patent application searches shall document their search strategies in accordance with established practices and procedures as set forth in MPEP 719.05 subsection (B)(6).

Article 11. Citations

All Patent Organization users of the Internet for patent application searches shall record their fields of search and search results in accordance with established practices and procedures as set forth in MPEP 719.05 subsection (B)(6).

Subparagraph A.

Internet document citations should include information which is normally included for reference documents (*i.e.*, Form PTO-892). In addition, any information which would aid a future searcher in locating the document should be included in the citation. Guidelines for citing electronic information can be found as an attachment to this policy.

Subparagraph B.

When a document found on the Internet is not the original publication, then the Patent Examiner or STIC staff shall pursue the acquisition of a copy of the originally published document or an original of the document or Web object in question for all references cited. Note: scanned images are considered to

be a copy of the original publication. Electronic-only documents are original publications.

Article 12. Professional Development

The Internet is recognized as a tool for professional development. It may be useful for keeping informed of technological and legal developments in all art areas. For example, use of the Internet for keeping abreast of conferences, seminars, and for receiving mail from appropriate list servers is acceptable.

Article 13. Policy Guidance and Clarifications

Within the Patent Organization, any questions regarding Internet usage policy should be directed to the user's immediate supervisor. Non-PTO personnel should direct their questions to the Office of the Deputy Assistant Commissioner for Patent Policy and Projects.

II. PROPOSED TRADEMARK INTERNET USAGE POLICY

Introduction:

The Internet and its offspring, the World Wide Web (WWW), offer the PTO opportunities to (1) enhance customer services by enabling attorney advisors (Trademarks) and other Trademark employees to locate and retrieve new sources of legal, scientific, commercial and technical information, (2) communicate more effectively with customers via electronic mail (e-mail) and file transfer functions, and (3) more easily publish information of interest to the intellectual property community and the general public.

This new technology offers low-cost, high speed, direct communication capabilities that the PTO wishes to leverage to the advantage of its customers. The organizations reporting to the Assistant Commissioner for Trademarks have special legal requirements that must be satisfied as part of the PTO's goal to make effective use of the Internet and electronic commerce.

Purpose:

To establish a policy for use of the Internet by organizations reporting to the Assistant Commissioner for Trademarks, including: the Office of the Assistant Commissioner for Trademarks, the Trademark Examining Operation, Trademark Services, Trademark Program Control and the Trademark Assistance Center;

To address use of the Internet to conduct interview-like communications, and other forms of formal and informal communications;

To publish guidelines for locating, retrieving, citing, and properly documenting scientific, commercial and technical information sources on the Internet;

To inform the public how the PTO intends to use the Internet; and

To establish a flexible Internet policy framework which can be modified, enhanced, and corrected as the PTO, the public, and customers learn to use, and subsequently integrate, new and emerging Internet technology into existing business infrastructures and everyday activities to improve the trademark application, examination, and registration business processes.

Article 1. Applicability

This policy applies to members of the Trademark Organization reporting to the Assistant Commissioner for Trademarks within the PTO, including contractors and consultants working with, or conducting activities in support of, the Trademark Organization. It does not apply to members of the Trademark Trial and Appeal Board or contractors and consultants working with, or conducting activities in support of, the Trademark Trial and Appeal Board.

Article 2. Scope

This policy applies to activities associated with, or directly related to, use of the Internet via PTO-provided network connections, facilities, and services. This includes, but is not limited to, PTONet connections, Office of Chief information Officer (OCIO)-provided PCs and workstations, and Internet provider services. This policy also applies to use of other non-PTO Internet access facilities and equipment that are used to conduct non-trademark application specific work.

Article 3. Conformance with existing, PTO-wide, Internet use policy

This Internet Usage Policy supersedes the Interim Internet Usage Policy published in the Official Gazette in February 1997. The policy outlined in this document augments the existing PTO Internet Acceptable Use Policy as set forth in the Office Automation Services Guide. As such, this policy is an extension of current PTO office-wide Internet policy.

Article 4. Correspondence acceptable via the Internet

Internet e-mail may be used to reply or respond to an examining attorney's Office Action, to reply or respond to a petitions attorney's 30-day letter, to reply or respond to a Post Registration Office Action, as well as to conduct informal communications regarding a particular application or registration with the appropriate Trademark Organization employee. If e-mail communication is initiated by the applicant or applicant's attorney, Office Actions, Priority Actions, Examiner's Amendments, petitions attorney's 30-day letters, and Post Registration Office Actions may be sent to the applicant via Internet e-mail or by telephone, fax, or other appropriate means. Readable attachments to Internet e-mail for such purposes as the submission of evidence, specimens, affidavits and declarations will be accepted.

Article 5. Communications not acceptable via the Internet

Internet e-mail or other Internet communications may **NOT** be used to file Trademark Applications, Amendments to Allege Use, Statements of Use, Requests for Extension of Time to File a Statement of Use, Section 8 affidavits, Section 9 affidavits, or Section 15 affidavits until such time as the PTO publishes electronic forms for these filings and they are made available on the Internet by the PTO. Internet e-mail may be used to submit specimens of use, but the Office will determine acceptability of the specimen(s) and if the specimens are found not to meet the standards for specimens of use, additional specimens will be required. Certified copies of foreign certificates will **NOT** be accepted via Internet e-mail. Internet e-mail may **NOT** be used for any correspondence with the Trademark Trial and Appeal Board.

Article 6. Initiating Internet Communications

Internet communications will **NOT** be initiated by the Trademark Organization unless it is authorized to do so by the applicant or by the applicant's attorney. Authorization for members of the Trademark Organization to communicate with applicant or applicant's attorney via Internet e-mail may be given by so indicating in the application submitted to the PTO or in any official written communication with the Trademark Organization. The authorization must include the Internet e-mail address to which all Internet e-mail is to be sent, Internet communications may also be initiated and authorized by applicant or applicant's attorney by telephone or by responding to an Office Action or other official communication via an Internet e-mail address indicated on the official correspondence.

Article 7. Waivers and Authentication

Applicants and their attorneys understand that the misrepresentation of a sender's identity is a known risk when using electronic communications. Therefore, Trademark Organization users have an obligation to be aware of this risk and conduct their Internet activities in compliance with established procedures.

Internet e-mail must be initiated and authorized by a practitioner, or the applicant in a *pro se* application. Sufficient information must be provided to show representative capacity in compliance with 37 CFR 2.17 and 10.14. In trademark cases, examples of such information would include signing a paper

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in practice before the PTO in a trademark case, attorney docket number, and trademark application serial number or registration number.

The Assistant Commissioner for Trademarks will waive 37 CFR 10.18 to the extent that it requires an original signature personally signed by a trademark practitioner in permanent ink on any correspondence filed with the PTO. Receipt of an Internet e-mail communication by the Trademark Organization from the address of applicant or applicant's attorney containing the /s/ notation in lieu of signature and which references a Trademark application serial number will be understood to constitute a certificate that:

1. the correspondence has been read by the applicant or practitioner;

2. the filing of the correspondence is authorized;

3. to the best of the applicant's or practitioner's knowledge, information, and belief, there is good ground to support the correspondence, including any allegations of improper conduct contained or alleged therein; and

4. the correspondence is not interposed for delay.

Applicants requesting to correspond with the Trademark Organization via the Internet should recognize that Internet communications might not be secure, and should understand that a copy of any and all communications received via the Internet will be placed in the file wrapper and become a permanent part of the record.

Article 8. Office Procedures

When authorized to do so, the Trademark Organization will send Office Actions and other official correspondence to the Internet e-mail address indicated by the applicant or applicant's attorney. A signed, paper copy of the outgoing correspondence will be associated with the trademark application file wrapper.

When communications are received by an examining attorney, or other appropriate Trademark Organization employee, the attorney or employee will immediately reply to the communication acknowledging receipt of the communication. The date the communication was received by the Trademark Organization that appears in the heading of the communication will constitute the receipt date within the PTO for purposes of time-sensitive communications unless that date is a Saturday, Sunday, or Federal holiday within the District of Columbia, in which case the receipt date will be the next succeeding day which is not a Saturday, Sunday, or Federal holiday within the District of Columbia. A paper copy of all Internet e-mail communications, including a copy of any and all attachments, will be associated with the trademark application file wrapper. A paper copy of any informal communications regarding a particular trademark application or registration will be associated with the file wrapper and become a part of the record.

Article 9. Remedies

When an application is held abandoned because a timely Internet e-mail communication was sent to and received by the Trademark Organization but was not timely associated with the application file wrapper, the abandoned application may be reinstated by the Trademark Organization. There is no fee for a request to reinstate such an application.

When an application is held abandoned because a timely Internet e-mail communication was sent to, but apparently not received by the Trademark Organization, applicant or applicant's attorney may petition the Commissioner to revive the abandoned application pursuant to 37 CFR 2.66 and TMEP §§ 1112.05(a), (b). In determining whether or not an Internet response was timely filed, the Commissioner may accept a copy of a signed certificate of transmission meeting the requirements of 37 CFR 1.8, a copy of the previously transmitted correspondence, and a statement attesting to the personal knowledge of timely transmission of the response. 37 CFR 1.8(b)(1), (2), and (3).

In all situations, the applicant or the applicant's attorney should promptly notify the Office after becoming aware that the application was abandoned because a communication was not timely associated with the file wrapper or was not received by the Office.

Article 10. Use of Electronic Mail Services

Once e-mail correspondence has been received from an applicant, as set forth in Trademark Article 6, such correspondence must be responded to appropriately. The Trademark Organization employee may respond to an applicant's Internet e-mail correspondence by telephone, fax, or other appropriate means.

Article 11. Interviews

Internet e-mail may be used to conduct an exchange of communications similar to those exchanged during telephone or personal interviews. In such cases, a paper copy of the Internet e-mail contents **MUST** be made and placed in the trademark application file wrapper.

Article 12. Documenting Search Strategies

All Trademark Organization users of the Internet for trademark application research shall document their search strategies in accordance with established practices and procedures as set forth in TMEP § 1106.07(a).

Subparagraph A.

Any information, which would aid a future searcher in locating the document retrieved through Internet research, should be included in the citation. Guidelines for citing electronic information can be found as an attachment to this policy.

Subparagraph B.

When a document found on the Internet is not the original publication, then the Trademark Examining Attorney or Trademark Library staff shall pursue the acquisition of a copy of the originally published document or an original of the document or Web object in question for all references cited. Note: scanned images are considered to be a copy of the original publication. Electronic-only documents are original publications.

Article 13. Professional Development

The Internet is recognized as a tool for professional development. It may be useful for keeping informed of technological and legal developments. For example, use of the Internet for keeping abreast of conferences, seminars, and for receiving mail from appropriate list servers is acceptable.

Article 14. Policy Guidance and Clarifications

Within the Trademark Organization, any questions regarding the Internet usage policy should be directed to the user's immediate supervisor. Non-PTO personnel should direct their questions to the Office of the Assistant Commissioner for Trademarks.

Attachment

Guidelines for Citing Electronic Resources

The International Organization for Standardization (ISO) has created a standardized method for citing electronic resources. The formats are set forth in document ISO 690-2, which was published on November 15, 1997. The formats in ISO 690-2 are consistent with those proposed by the PTO in the fall of 1996.

ISO 690-2 references several ISO standards relating to documentation of publications. These are namely ISO 4:1984 *Documentation - Rules for the abbreviation of title words and titles of publications;* ISO 639:1988 *Code for the representation of names of languages;* ISO 690:1987 *Documentation - Bibliographic references - content, form, and structure* (the parent standard of 690-2); ISO 832:1994 *Information and documentation - bibliographic description and references - Rules for the abbreviation of typical words;* ISO 2108:1992 *Information and documentation - International standard book numbering (ISBN);* ISO 3297:1986 *Documentation - International standard serial numbering (ISSN);* ISO 5127-1:1983 *Documentation and information - Vocabulary - Part 1: Basic concepts;* ISO 8601:1988 *Date elements and interchange formats - Information interchange - Representation of dates and times;* ISO/TR 9544:1988 *Information processing - computer-assisted publishing - Vocabulary;* and ISO/IEC DIS 11179-3 *Information technology - Coordination of data element standardization.*

Elements of a Bibliographic Citation

The typical elements of a bibliographic citation are:

a. Author(s) — individual and corporate

b. Title

Titles fall into two general categories:

- Those that denote the source work (monograph, journal, conference, anthology/compilation, etc.)
- Those that describe the paper, chapter, or portion of work

c. Publication Date

d. Publisher

e. Report number/Series Number/Other identifying number

f. Editor(s)

g. Page numbers

h. Volume number

i. Issue number

j. Edition

A single print resource may not have all of the elements listed above; however, they will possess those which are appropriate to the work. In the case of monographs the volume and/or issue number may not be essential; as with journals the element for edition will be nonexistent. Therefore, it can be noted that even in traditional print publications the format of citations will vary with the resource being cited.

The same can be said for the realm of electronic publications. Electronic documents with originally published print equivalents will have most traditional bibliographic elements. Those that have no print equivalents will most likely not have traditional elements, even though they may look like and seem to possess many qualities of print publications.

Elements of Electronic Resource Citations

What makes the electronic resource different from the print resource? Initially it is safe to state that basic elements of a print citation are also applicable to the electronic form. These basic elements will include a title (even in the case of electronic mail in which the subject line can become the title element), originator (author), publisher, and publication date (although with electronic publications this element often raises problems for those verifying the document). Characteristics which are inherent to print publications but may not be to the electronic form include volumes, issues, and page numbers. The electronic resource will have elements in addition to the print resource. These elements include:

a. Type of Media

CD-ROM or other optical storage media

Diskette or other magnetic storage media

Online, including the Internet

b. Availability

The information required to retrieve the resource. In the case of online Internet resources this would include address-type information, along with directories, file names, etc.

c. Date(s)

- Posted/Publication
The publication date is the date the author/originator affixes to the document. If that is not present, the date the system administrator or webmaster placed the document on the online system can be substituted.

- Accessed on
The date the user found and read the document. They may also have downloaded the document for personal use. This date will provide future readers with documentation as to what version/edition the document was on when it was accessed. If a document was altered subsequently there will not be confusion as to which document the user is referring to.

Proposed Formats

When an examiner retrieves a document from an electronic source, he/she will determine if it is useful and will cite it if appropriate. Assuming the examiner has located all pertinent bibliographic elements for a citation, the next task will be to format the citation.

Punctuation is an interesting problem for electronic documents. Traditionally, academics and library scientists have used punctuation as a means for separating bibliographic elements in a citation. In the case of retrieving electronic documents, punctuation becomes part of the citation. When expressing URLs, directories, filenames, etc., punctuation marks are required to create an accurate citation. Therefore, limit the amount of punctuation in the citation in order to avoid confusion.

Due to the ease and potential frequency of updates of electronic documents, ISO 690-2 recommends the use of month, date, year, and time of day on all date citations. There is no stated preference for dates using standard abbreviated months (Jan., Feb., Mar.) or complete numeric transcription (using standard format of year-month-date).

Additionally, standard abbreviations for journal titles, countries, provinces, etc. should be applied to electronic citations.

The following formats are proposals for how an examiner might cite an electronic document. However, all possible citation iterations are not included; this is a sampling.

CD-ROM, Diskette, Commercial Database

Author. (publication date). Title. *Source* ("source" defined as the entire work, i.e. journal title). [Type of Medium], volume (issue), paging. Available:
sample:
Smith, Joe. (January 1999). How to do an online search. *Database.* **[CD-ROM]**, 17(2), 1-2. **Available: UMI. File: General Periodicals Index.**

FTP

Author. (publication date). Title. *Source.* [Type of Medium], volume (issue), paging. Available: Accessed on:
sample:
Smith, Joe. (January 1999). How to do an online search. *Database.* **[Online]**, 17(2), 1-2. **Available FTP: ftp.database.edu Directory: pubs/journals/database.online/vol17 File: 002dbs.txt Accessed on: February 1, 1999.**

E-mail, Listservs, Usenet

Author. <author e-mail address> (publication/posted date). Title. *Source* (or *Subject Line* replaces title/source). [Type of Medium], volume (issue), paging. Available: (either list the listserv address or fill this position with "personal e-mail") Accessed on (or received on):
sample:
Smith, Joe. **<jsmith@database. org>** (January 1999). How to do an online search. Database. [Online], 17(2), 1-2. **Available: personal e-mail. Received on: February 1, 1999.**
OR
Smith, Joe. <jsmith@database.org> Here's some search

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advice. [Online] **Available: PACS-L@UHUPVM1.uh.edu Accessed on: February 1, 1999.**

Gopher

Author. (publication date). Title. *Source.* [Type of Medium] volume (issue), paging. Available: Accessed on:
sample:
Smith, Joe. (January 1999). How to do an online search. *Database.* [Online] 17(2), 1-2. **Available Gopher: meckler.dbs.org/Database/pubs/journals/vol17/Howsearch Accessed on: February 1, 1999.**

Web Site

Author. (publication date). Title. *Source.* [Type of Medium] volume (issue), paging. Available: Last update: Accessed on:
sample:
Smith, Joe. (January 1999). How to do an online search. *Database* [Online] 17(2), 1-2.
Available Web Site:
www/meckler.database.org/Database/pbs/journals/vol17/ 002dbs.txt
Last update: January 1999 Accessed on: February 1, 1999.

Examiners are encouraged to speak to a PTO librarian or technical information specialist when they find that crucial elements to the citation are lacking in their records. The information specialist will work with the examiner to verify dates, authors, and other elements as needed.

Oct. 20, 1998
BRUCE A. LEHMAN
Assistant Secretary of Commerce and
Commissioner of Patents and Trademarks

Disclaimers

4,976,690—Ronald J. Solar, Minnetonka; and Jonathan Kagan, Minneapolis, both of Minn. VARIABLE STIFFNESS ANGIOPLASTY CATHETER. Patent dated Dec. 11, 1990. Disclaimer filed Oct. 7, 1998, by the assignee, SciMed Life Systems, Inc.

Hereby enters this disclaimer to claims 3 and 6 of said patent.

5,735,528—Roy C. A. Olsson, Fågelmar, Sweden. SELF-LUBRICATING PACKING PIECE. Patent dated Apr. 7, 1998. Disclaimer filed Oct. 2, 1998, by the assignee, Lycab AB.

Hereby enters this disclaimer to claims 8-14 of said patent.

5,736,398—Troy A. Giambernardi, San Antonio; and Robert J. Klebe, Helotes, both of Texas. GAS PERMEABLE POUCHES FOR GROWING CULTURES. Patent dated Apr. 7, 1998. Disclaimer filed May 14, 1998, by the assignee, Board of Regents, The University of Texas System.

Hereby enters this disclaimer to claim 15 of said patent.

5,747,941—Peter W. Shackle, Arlington Heights; and Randy G. Russell, Glen Ellyn, both or Ill.; Kent E. Crouse, Haltom City, Tex.; and Ronald J. Bezdon, Schaumburg, Ill. ELECTRONIC BALLAST THAT MONITORS DIRECT CURRENT THROUGH LAMP FILAMENTS. Patent dated May 5, 1998. Disclaimer filed Oct. 1, 1998, by the assignee, Energy Savings, Inc.

Hereby enters this disclaimer to claims 1, 2, 3, 4, and 5 of said patent.

5,764,524—Claes Georg Andersson, Fremont; Bradley R. Lewis, Gilroy; and Charles N. Villa, San Jose, all of Calif. METHOD AND APPARATUS FOR DETECTION OF MISSING PULSES FROM A REPETITIVE PULSE TRAIN. Patent dated Jun. 9, 1998. Disclaimer filed Aug. 31, 1998, by the assignee, Snap-On Technologies, Inc.

Hereby enters this disclaimer to claim 3 of said patent.

5,769,868—Paul G. Yock, Menlo Park, Calif. ANGIOPLASTY APPARATUS FACILITATING RAPID EXCHANGES. Patent dated Jun. 23, 1998. Disclaimer filed Sep. 2, 1998, by the inventor.

Hereby enters this disclaimer to claims 6-11 of said patent.

Disclaimer and Dedication

D372,821—Waterson Chen, Taichung City, Taiwan. CHAIR SUPPORT CONNECTOR FOR A ROCKING CHAIR. Patent dated Aug. 20, 1996. Disclaimer and Dedication filed Jan. 8, 1997, by the inventor.

Hereby disclaims and dedicates to the Public the entire term of said patent.

Certificates of Correction for November 17, 1998

D. 389,181
D. 391,353
D. 395,082
D. 396,880
D. 396,969
4,592,028
4,649,872
4,855,066
4,938,733
5,264,578
5,325,349
5,336,849
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Summary of Final Decisions Issued by the Trademark Trial and Appeal Board

September 28 - October 2, 1998

Date Issued	Type of Case(1)	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Citable as Precedent of TTAB
9-28	EX EX EX	74/265,139 74/802,305 75/975,964	DJS Associates, Inc.	genericness	Refusal Affirmed		"FORENSIC ENGINEERING SERVICES" [accident investigations and expert witnesses on highway, traffic and transportation safety], "FORENSIC ENGINEERING SERVICES" [highway safety testing and consultation; traffic and transportation engineering services] and "FORENSIC ENGINEERING SERVICES" [providing seminars and lectures in the field of highway, traffic and transportation safety]		No
9-29	EX	74/716,137	Unisys Corp.	2(e)(1)	Refusal Affirmed		"SERVER/CLIENT" [installation of computer software, namely, a series of object-oriented software development tools used to build programs, run and manage networks; computer software consultation and computer programming for others of a series of object-oriented software development tools used to build programs, run and manage networks]		No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (SJ)=SUMMARY JUDGMENT; (R)=REQ. FOR RECONSIDERATION; (MD)=MOTION TO DISMISS; (MR)=MOTION TO REOPEN

Date Issued	Type of Case(1)	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Citable as Precedent of TTAB
9-29	EX	75/045,478	Rykoff-Sexton, Inc.	2(d)	Refusal Affirmed as to all cited registrations except that for the mark "GIOVANNI'S" for flavoring syrups, etc.		"GIOVANNI" [cheese; meats, namely, beef patties, beef wafer steaks, ham, meatballs, pepperoni, salami, sausage, sliced steak, and steak chips; processed peppers, namely, green pepper strips, roasted peppers and pepper strips in brine; shortening and processed tomatoes, namely, canned whole tomatoes and crushed tomatoes in heavy puree; coffee, namely, espresso; doughball; mayonnaise; pasta, namely, elbows, fettucine, lasagna, linguini, noodles, spaghetti and wagon wheels; pizza sauce; spices, namely, basil leaves, bay leaf, black pepper, processed garlic, MSG, oregano leaf, parsley flakes and red cayenne pepper; vinegar]	"GIOVANNI'S" [flavoring syrups, namely, almond gourmet syrup, chocolate syrup, Irish Cream syrup, Jamaican rum gourmet syrup and hazelnut gourmet syrup for sale in the restaurant supply industry]; "GIOVANNI'S" [bakery products, namely, bread]; "GIOVANNI'S" [meat; restaurant services]; "GIOVANNI'S" (and design) [restaurant services]	No
9-29	OPP (SJ)	102,651	Corporate Document Services, Inc. v. I.C.E.D. Management, Inc.	2(d) [priority]	Opposition Dismissed [applicant's motion for summary judgment granted]	"THE COPY CLUB" [various services related to document processing, copying, etc.]	"COPY CLUB" [various services related to document processing and handling]		Yes

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (SJ)=SUMMARY JUDGMENT; (R)=REQ. FOR RECONSIDERATION; (MD)=MOTION TO DISMISS; (MR)=MOTION TO REOPEN

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Date Issued	Type of Case$^{(1)}$	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Citable as Precedent of TTAB
9-29	EX	74/672,042	Open Software Associates, Inc.	2(e)(1)	Refusal Affirmed		"OPENMESSAGE" [feature of a computer program for use in developing applications programs which provides for the sending and receiving of data records over a network]		No
9-29	EX	75/048,341	Worldwide Financial Services, Inc.	2(d)	Refusal Reversed		"WORLDWIDE SAYS YE$$, WHEN THE BANK SAYS NO" [mortgage and home equity loan services, mortgage brokerage services, first and second mortgage lending, equity financing, mortgage banking and real estate brokerage services]	"WHEN YOUR BANK SAYS NO, CHAMPION SAYS YES" [mortgage and home equity loan services]	No
9-29	EX	75/173,118	Monarch Business Forms	2(d)	Refusal Affirmed		"MONARCH" [house mark for business forms]	"MONARCH" [loose-leaf structures, namely, ring binders and report covers]	No
9-29	EX	74/735,420	Kohl's Department Stores, Inc.	2(d)	Refusal Affirmed		"M SPORT" (and "M" design) [men's, women's, and children's athletic wear and sportswear, namely, knit tops, knit shorts, knit pants, fleece tops, fleece shorts, fleece pants, jogging suits, socks and shoes]	"M.M. SPORT" [clothing, namely, men's, women's, and children's tops, bottoms, jackets, dresses, shirts, sweatshirts, sweatpants and vests]	No
9-29	EX	74/675,265	Wanted Shoes, Inc.	2(d)	Refusal Affirmed		"WANTED" [footwear]	"WANTED" [foundation garments, particularly, brassieres]	No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (SJ)=SUMMARY JUDGMENT; (R)=REQ. FOR RECONSIDERATION; (MD)=MOTION TO DISMISS; (MR)=MOTION TO REOPEN

Date Issued	Type of Case$^{(1)}$	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Citable as Precedent of TTAB
9-29	EX	75/051,067	KKH Corp.	2(d)	Refusal Affirmed		"CHAIR BUDDIES" [children's cushion seats in the form of stuffed fanciful figures of animals, birds or fish for use inside homes and other structures and in cars]	"CHAIR BUDDY IN A BAG" [folding beach chair furniture]	No
9-29	EX	75/027,858	J. Paul Martha	Section 6 disclaimer requirement (of words "INTERNATIONAL BASKETBALL LEAGUE")	Refusal Affirmed		"IBL INTERNATIONAL BASKETBALL LEAGUE" [entertainment services, namely, organizing and conducting basketball competitions and exhibitions]		No
9-29	EX	75/123,945	Rack Room Shoes, Inc.	2(d)	Refusal Affirmed		"SAHARA" [shoes]	"SAHARA CLUB" (and design) [wearing apparel for men, women, children, and infants, including pants, shirts, sport jackets, suits, sweaters, dresses, skirts, blazers, neckwear, hats, belts, etc.]	No
9-29	EX	75/009,259	Big Entertainment, Inc.	2(d)	Refusal Affirmed		"ACORNA" [various items of clothing, including sneakers, shoes, socks, etc.]	"ACORN" (and design) [footwear made at least in part of leather or sheepskin, namely, boots, shoes, and slippers]	No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (SJ)=SUMMARY JUDGMENT; (R)=REQ. FOR RECONSIDERATION; (MD)=MOTION TO DISMISS; (MR)=MOTION TO REOPEN

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Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Citable as Precedent of TTAB
9-29	OPP	97,562	Rexall Sundown, Inc. v. Sukrol Laboratories, Inc.	2(d)	Opposition Sustained	"IN-VIGOR-OL" [homeopathic drug/tonic]	"VIGOROL" [high potency vitamins for human consumption]		No
9-30	EX	74/620,872	Bedford Industries, Inc.	whether the configuration of goods applicant seeks to register as a trademark is inherently distinctive	Refusal Affirmed		configuration consisting of "transverse parallel ridges and valleys on one side of the web of material extending between the thickened embedded-wire edges of tie ribbons" [plastic double wire tie ribbon with or without an adhesive coating on one side]		No
9-30	EX	75/064,093	Lifelines Technology, Inc.	whether the matter applicant seeks to register functions as a trademark for its goods	Refusal Affirmed		ring design [time-temperature sensitive labels that monitor the condition of thermally sensitive products]		No
9-30	OPP	96,993	TGC Int'l., Inc. v. Novus Marketing, Inc.	2(d)	Oppositon Dismissed	"NOVUS" [insurance claim administration, repair of windshields, polymerizable material for glass repair, plastic polish and windshield repair kits; advertising and marketing services rendered to opposer's franchisees]	"NOVUS MARKETING, INC." [direct response advertising services for others, namely, placing advertisements in print media; list brokerage; list management; and bartering the goods and services of others]		No

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[1] EX–EX PARTE APPEAL; OPP–OPPOSITION; CANC–CANCELLATION; CU–CONCURRENT USE; (SJ)–SUMMARY JUDGMENT; (R)–REQ. FOR RECONSIDERATION; (MD)–MOTION TO DISMISS; (MR)–MOTION TO REOPEN

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	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Center for International Trade Development	(405) 744-7086
Oregon	Portland: Paul L. Boley Law Library, Lewis & Clark College	(503) 768-6786
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Puerto Rico	Mayaquez General Library, University of Puerto Rico	(787) 832-4040 Ext. 3459
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Clemson University Libraries	(864) 656-3024
South Dakota	Rapid City: Devereaux Library, South Dakota School of Mines and Technology	(605) 394-1275
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8877
	Nashville: Stevenson Science Library, Vanderbilt University	(615) 322-2717
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 495-4500
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-3826
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
	Lubbock: Texas Tech University	(806) 742-2282
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Vermont	Burlington: Bailey/Howe Library, University of Vermont	(802) 656-2542
Virginia	Richmond: James Branch Cabell Library, Virginia Commonwealth University	(804) 828-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
West Virginia	Morgantown: Evansdale Library, West Virginia University	(304) 293-2510 Ext. 113
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 286-3051
Wyoming	Casper: Natrona County Public Library	(307) 237-4935

PATENT TECHNOLOGY CENTERS

BRUCE A. LEHMAN, Commissioner
Q. TODD DICKINSON, Assistant Commissioner for Patents
NICHOLAS P. GODICI, (Acting) Deputy Assistant Commissioner for Patents
STEPHEN G. KUNIN, Deputy Assistant Commissioner for Patent Policy

TECHNOLOGY CENTERS		DIRECTORS	Telephone & FAX Numbers Area Code 703	New Case Date*
1600	**BIOTECHNOLOGY, ORGANIC CHEMISTRY & DESIGNS**			
1610	Organic chemistry, bio-affecting & body treating composition	John E. Kittle	308-0193 308-7922	02/15/97
2900	Designs			12/05/93
1620	Immunology & plants	Mary C. Lee	308-2359	04/17/97
1640	Combinatorial, linker & non-heterocyclic chemistry		308-8494	10/04/96
1630	Recombinant molecular & micro-biology, multicellular organism	John J. Doll	308-1123 305-7230	11/20/96
1650	Non-recombinant molecular & micro-biology, non-immuno proteins & peptides			01/19/98
1700	**CHEMICAL AND MATERIAL ENGINEERING**			
1710	Synthetic resins	Theodore Morris	308-1495	03/20/97
1770	Stock materials & miscellaneous articles		305-3599	01/13/97
1720	Fluid separation & agitation, metal foundry, welding, plastic molding apparatus, fuels & related compositions	Richard V. Fisher	308-1193 305-3599	01/26/97
1730	Glass & paper making, tobacco, non-metallic molding, adhesive bonding, tires & coating apparatus			01/12/97
1740	Metallurgy, electrochemistry, cleaning, disinfecting, sterilizing, analytical chemistry & wave energy			12/13/96
1750	Chemical products & processes, solar cells & sputtering apparatuses	Esther M. Kepplinger	308-1495 305-3935	12/16/96
1760	Food technology, petroleum processing, coating & etching			05/30/96
2700	**COMMUNICATIONS AND INFORMATION PROCESSING**			
2710	Television	James L. Dwyer (Acting)	305-4800	08/28/96
2740	Audio, radio, telephone & speech processing		308-5401	10/12/96
2720	Image & Fax	Jin F. Ng	305-4800	10/13/96
2730	General communications & digital communication systems		305-5401	09/16/96
2750	Storage processing, multiple computers, & multiple process coordinating	Robert E. Garrett	305-0286 308-2177	07/03/96
2760	Specialized data processing	Joseph J. Rolla	305-9700 308-5355	07/03/96
2770	Computer graphics & data bases	Gerald Goldberg	305-9700 308-5355	06/26/96

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	TECHNOLOGY CENTERS	DIRECTORS	Telephone & FAX Numbers Area Code 703	New Case Date*
2780	Processors, control systems, input/ output	Joseph J. Rolla	305-9700 308-5355	07/28/96
2800	**PHYSICS, OPTICS, SYSTEMS COMPONENTS & ELECTRICAL ENGINEERING**			
2810	Semiconductors, electrical circuits, static memory, digital logic	Rolf G. Hille	306-3421 308-7725	06/04/96
2820	Semiconductors & electrical circuits			03/06/97
2830	Power generation & distribution music, electrical components & control circuits	Stewart J. Levy	308-0658 308-7722	12/23/96
2850	Photocopying, recorders, printing, measuring & testing	Margaret A. Focarino	306-3421 308-7725	08/10/96
2870	Liquid crystals, optical elements, optical systems, fiber optics, lasers, electric lamps, registers, optics, measuring & radiant energy	Janice A. Howell	308-0530 305-3594	09/06/96
3600	**TRANSPORTATION, CONSTRUCTION, AGRICULTURE & NATIONAL SECURITY**			
3610	Surface transportation & material handling	Richard A. Bertsch	308-1134 308-2177	09/05/96
3620	Static structures, closures, machine elements & power transmissions, civil engineering, connections, hardware & furniture	Al Lawrence Smith	308-1020 305-3597	02/20/97
3630	Supports & sign exhibiting			06/12/97
3640	Aeronautics, agriculture, earth moving/working, petroleum & mining, plant & animal husbandry, butchering, optics, radio wave & acoustic wave communication, data processing for vehicles, weaponry, nuclear systems & national security	John F. Terapane, Jr.	306-4180 306-4195	11/12/95
3700	**MECHANICAL ENGINEERING, MANUFACTURING AND PRODUCTS**			
3710	Amusement and education devices	Ethel Rollins-Cross	308-1078 305-3579	10/19/96
3720	Packages, containers, manufacturing devices & processes, machine tools & hand tools			12/05/96
3730	Medical instruments, diagnostic equipment, treatment devices, surgery & surgical supplies	John J. Love	308-0873 305-3139	11/12/96
3740	Thermal & combustion technology, motive and fluid power systems, textile manufacturing & apparel	Donald G. Kelly	308-0975 308-7763	11/02/96
3750	Fluid handling & dispensing			11/07/96

TRADEMARK OPERATION

Bruce A. Lehman, Commissioner
Philip G. Hampton, II, Assistant Commissioner
Robert M. Anderson, Deputy Assistant Commissioner
David E. Bucher, Director, Trademark Examining Office
Condition of Trademark Applications as of October 1, 1998

Law Office	Oldest Date	
	New*	Amendment Filed
Law Office 101—Jerry Price, Managing Attorney, (703) 308–9101—North Tower, 10th Floor Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	04/20/98	07/07/98
Law Office 102—Thomas Shaw, Managing Attorney, (703) 308–9102—South Tower, 5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/25/98	05/13/98
Law Office 103—Michael A. Szoke, Managing Attorney, (703) 308–9103—North Tower, 4th Floor, Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	01/09/98	05/29/98
Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308–9104—South Tower, 6th Floor, Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	12/15/97	08/10/98
Law Office 105—Thomas Howell, Managing Attorney, (703) 308–9105—South Tower, 6th Floor, Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/20/98	05/26/98
Law Office 106—Mary Sparrow, Managing Attorney, (703) 308–9106—South Tower, 7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	04/09/98	06/08/98
Law Office 107—Thomas Lamone, Managing Attorney, (703) 308–9107—South Tower, 7th Floor, Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/28/98	08/18/98
Law Office 108—David Shallant, Managing Attorney, (703) 308–9108—South Tower, 8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services–Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	12/15/97	07/13/98
Law Office 109—Ronald Sussman, Managing Attorney, (703) 308–9109—South Tower, 8th Floor, Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	01/09/98	08/02/98
Law Office 112—Janice O'Lear, Managing Attorney, (703) 308–9112—North Tower, 4th Floor, Scientific Equipment & Furniture—Int. Classes 9,20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/25/98	07/16/98
Law Office 113—Meryl Hershkowitz, Managing Attorney, (703) 308–9113—North Tower, 4th Floor, Scientific Equipment & Furniture—Int. Classes 9,20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	01/09/98	05/29/98
**Collective Marks—Class 200 **Certification Marks—Classes A & B		
Office of Trademark Services—Terron Sims, Director, (703) 308-9100 Trademark Assistance Center—(703) 308-9000 Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188 Intent-To-Use—(ITU)—(703) 308-9500 Post Registration Section—(703) 308-9500		
Affidavits Under Sections 8 & 15 (All Classes)	07/13/98	—0—
Renewals (All Classes)	08/01/98	—0—
Section 12(c) Publications (All Classes)	08/14/98	—0—

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1. ** Assigned to all Law Office

2. Applicants with inquiries concerning the status of their applications and a touch telephone should call (703) 305-8747 from 6:30 a.m. to Midnight EST, Monday through Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquiries concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

3. * These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.

REEXAMINATIONS

NOVEMBER 17, 1998

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 5,541,054 (3671st)

SPECTRAL SENSITIZING DYES FOR PHOTOTHERMOGRAPHIC ELEMENTS

James R. Miller, Hudson, Wis.; Brian C. Willett, Grant Township, Washington County, Minn.; Doreen C. Lynch, Afton, Minn., and Becky J. Kummeth, Lake Elmo, Minn., assignors to Imation Corp., Saint Paul, Minn.

Reexamination Request No. 90/004,636, May 15, 1997.

Reexamination Certificate for Patent 5,541,054, issued Jul. 30, 1996, Ser. No. 425,860, Apr. 20, 1995.

Int. Cl.^{6} G03C *1/498; 1/20*

U.S. Cl. 430—572

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

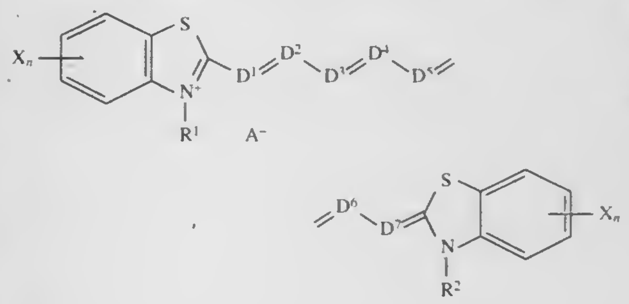
The patentability of claims **1–30** is confirmed.

Claim **31** is determined to be patentable as amended.

Claims **32–36**, dependent on an amended claim, are determined to be patentable.

22. A heat developable, photothermographic element comprising a support bearing at least one photosensitive, image-forming layer comprising:

(a) a photosensitive silver halide;
(b) a non-photosensitive, reducible silver source;
(c) a reducing agent for silver ions;
(d) a binder; and
(e) a spectrally sensitizing amount of a compound having the central nucleus:

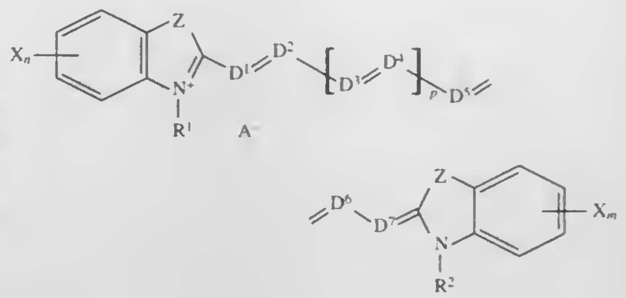


wherein:

X is independently a thioalkyl group of from 1 to 20 carbon atoms;
D^1 to D^7 each independently represents a methine group and adjacent methine groups selected from D^2, D^3, D^4, D^5 and D^6 may form cyclic groups;
n is independently 0, 1 or 2 with the total of all n's being at least 1;
R^1 and R^2 represent an alkyl group of from 1 to 20 carbon atoms other than carboxy-substituted alkyl; and
A^- is an anion.

31. A heat developable, photothermographic element comprising a support bearing at least one photosensitive, image-forming layer comprising:

(a) a photosensitive silver halide;
(b) a non-photosensitive, reducible silver source;
(c) a reducing agent for silver ions;
(d) a binder; and
(e) a spectrally sensitizing amount of a compound having the central nucleus:



wherein:

Z is S[, O, Se or N–R^3];
R^1 and R^2 represent an alkyl group of from 1 to 20 carbon atoms other than carboxysubstituted alkyl;
R^3 is H or alkyl group;
X and Y are thioalkyl groups of from 1 to 20 carbon atoms;
n=0 to 4;
m=0 to 4;
the sum of m plus n is at least 1;
D^1 to D^7 each independently represents a methine group and adjacent methine groups selected from D^2, D^3, D^4, D^5 and D^6 may form cyclic groups;
p=0 or 1; and
A^- is an anion.

B1 5,598,759 (3672nd)

FOOD SLICING RACK DEVICES

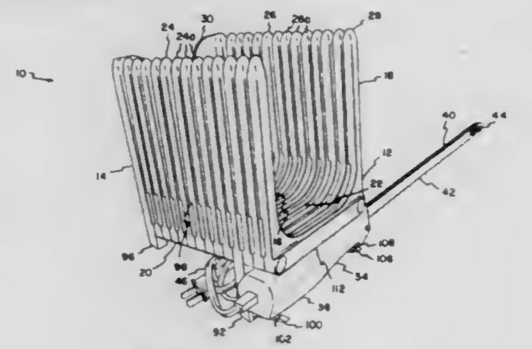
Bradley D. Sie, Mondovi; Jeffry A. Madson, and Maryjo R. Cohen, both of Eau Claire, all of Wis., assignors to National Presto Industries, Inc., Eau Claire, Wis.

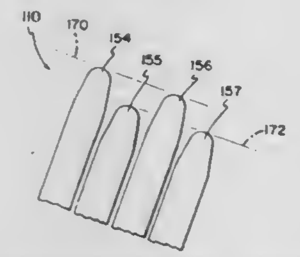
Reexamination Request No. 90/004,814, Oct. 27, 1997.

Reexamination Certificate for Patent 5,598,759, issued Feb. 4, 1997, Ser. No. 241,623, May 12, 1994.

Int. Cl.^{6} B26D *1/10*

U.S. Cl. 83—762





AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1** and **18** is confirmed.

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Claims **14** and **15** are cancelled.

Claims **2** and **16** are determined to be patentable as amended.

Claims **3–13** and **17**, dependent on an amended claim, are determined to be patentable.

New claims **19** and **20** are added and determined to be patentable.

2. A food slicing rack device comprising:

a base with a top surface; and

two rows of spaced apart fingers defining knife guide slots extending from the base, the two rows of fingers spaced from each other to receive a food item for slicing on the top surface between the two rows of fingers, the fingers of one row being aligned with the fingers of the other row to define guide pairs, each guide pair comprising one finger from each row, with guide pairs being disposed on opposite sides of each knife guide slot, each finger of each guide pair being provided with a visual indicator different from a visual indicator of an adjacent guide pair, each finger of each guide pair having the same visual indicator;

wherein the fingers are spaced apart a sufficient distance to permit electric knife blades of an electric knife to pass within the space between adjacent fingers;

wherein at least a portion of the space between the fingers is sufficiently large to permit electric knife blades and an electric knife blade rivet of the electric knife to pass within the portion.

B1 5,664,725 (3673rd)

MAILING FORM

Gerard F. Walz, Fallbrook, Calif., assignor to Walz Postal Solutions, Inc., Fallbrook, Calif.

Reexamination Request No. 90/004,940, Mar. 13, 1998.

Reexamination Certificate for Patent 5,664,725, issued Sep. 9, 1997, Ser. No. 610,497, Mar. 4, 1996.

Continuation-in-part of Ser. No. 227,513, Apr. 14, 1994, Pat. No. 5,501,393.

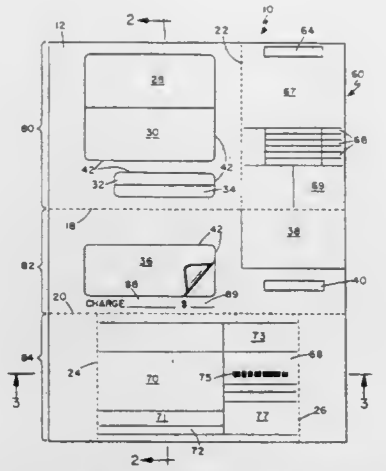
Int. Cl.⁶ B65D *27/06*

U.S. Cl. 229—92

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentablility of claims **1–22** is confirmed.

1. A mailing form, comprising:



first and second superimposed sheets, each sheet having an inner face facing the other sheet and an outer face;

the first sheet having a plurality of detachable areas which are detachable from the remainder of the first sheet, each detachable area having an adhesive backing facing said second sheet;

the first and second sheets being permanently secured together over predetermined, adhered areas of said form;

the second sheet having predetermined, non-adhered areas on its inner face which are aligned with the detachable areas of the first sheet, the non-adhered areas being covered with a non-adhesive coating on the inner face facing said first sheet;

at least one portion of said form including one of said adhered areas being detachable from the remainder of the form to provide a predetermined mailing form part, each of the sheets having predetermined printed indicia on its outer face in said one adhered portion;

the inner face of the first sheet being coated with a layer of adhesive material for securing the first sheet to the second sheet, the adhesive layer in said detachable areas comprising said adhesive backing; and

the form having at least one tear line for detaching said one portion of the form from the remainder of the form, said portion including a pair of second tear lines extending perpendicular to said one tear line for detaching a part of said mailing form part from the remainder of said portion, and side strips on opposite sides of said portion outside said tear lines, the inner face of said second sheet being coated with non-adhesive material in said side strips.

REISSUES

NOVEMBER 17, 1998

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 35,957

Patent Not Issued For This Number

Re. 35,958

METHOD OF FORMING PHOSPHATE COATING ON ZINC

Kenneth J. Hacias, Sterling Heights, Mich., assignor to Henkel Corporation, Plymouth Meeting, Pa.

Original No. 4,595,424, dated Jun. 17, 1986, Ser. No. 769,433, Aug. 26, 1985. Continuation of Ser. No. 209,113, Jun. 17, 1988, abandoned. Application for reissue Nov. 23, 1994, Ser. No. 344,839

Int. Cl.⁶ C23C *22/12;22/18*

U.S. Cl. 148—262 **50 Claims**

16. A process for suppressing white specking when phosphate-coating a zinc surface, comprising:

contacting the zinc surface with an aqueous, acidic solution containing:

(a) about 0.5 to about 4 percent phosphate ion;

(b) an ion selected from the group consisting of zinc ions, manganese ions, and mixtures thereof;

(c) about 0.01 to about 1 percent complex fluoride ions; and

(d) chloride ions;

wherein the weight:weight ratio of complex fluoride ions:chloride ions in the solution is measured and maintained during coating at a value of about 8:1 or greater by adjusting the amount of complex fluoride ion in the composition thereby suppressing the white specking.

Re. 35,959

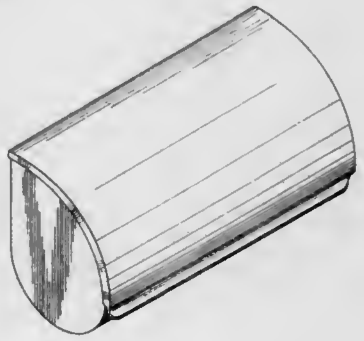
MAIL BOX

Tucker Willis, and James Cinquemani, Jr., both of Dallas, Tex., assignors to Chaenomeles, Inc, Dallas, Tex.

Original No. D. 354,829, dated Jan. 24, 1995, Ser. No. 14,054, Nov. 4, 1993. Application for reissue Dec. 15, 1995, Ser. No. 49,241

Loc (6) Cl. 99 *00*

U.S. Cl. D99—33



Re. 35,960

METHOD AND APPARATUS FOR AUTOMATICALLY ASSEMBLING SIDE GEARS, PINIONS AND PINION SHAFT WITHIN DIFFERENTIAL CASE

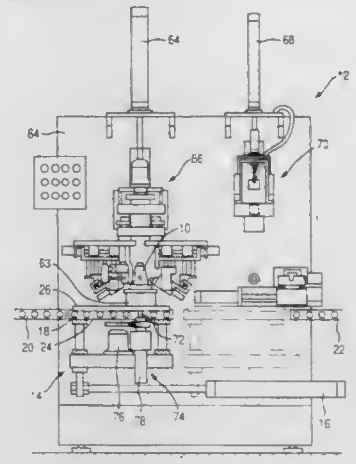
Manabu Ichiki; Masatoshi Kanazawa, and Tsutomu Ishikawa, all of Tokyo, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Original No. 5,400,506, dated Mar. 28, 1995, Ser. No. 155,552, Nov. 22, 1993. Application for reissue Nov. 7, 1996, Ser. No. 744,448

Claims priority, application Japan, Nov. 25, 1992, 4-337980

Int. Cl.⁶ B21D *53/28*

U.S. Cl. 29—893.1 **38 Claims**



34. A method of assembling a differential gear device including a differential case with a chamber formed therein, and components which are accommodated in said chamber and which include a pair of opposed differential side gears, a pair of opposed differential pinions interposed between and meshing with said side gears, and a differential pinion shaft for rotatably supporting said pinions, said differential case being adapted to be disposed in a differential assembly, rotatably with a ring gear about a first axis, said side gears being rotatable about said first axis, while said differential pinions being rotatable about a second axis perpendicular to said first axis, said case having a pair of openings which communicate with said chamber and are open to an external space outside said case and which are opposed to each other in a direction perpendicular to said second axis, in a plane parallel to said second axis and perpendicular to said first axis, said method comprising the steps of:

effecting meshing engagement of said differential pinions with said differential side gears disposed within said chamber of said differential case;

holding said differential pinions with holders, and causing relative rotation of said holders and said differential pinions relative to said differential case about said first axis and toward a predetermined position at which said pinion shaft can be inserted through said case and said pinions;

positioning said differential pinions at the predetermined position; and

inserting said pinion shaft through said case and said pinions at said predetermined position.

36. An apparatus for assembling a differential gear device including a differential case with a chamber formed therein, and components which are accommodated in said chamber and which include a pair of opposed differential side gears, a pair of opposed differential pinions interposed between and meshing with said side gears, and a differential pinion shaft for rotatable supporting said pinions, said differential case being adapted to be disposed in a differential assembly, rotatably with a ring gear about a first axis, said side gears being rotatable about said first axis, while said differential pinions being rotatable about a second axis perpen-

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dicular to said first axis, said case having a pair of openings which communicate with said chamber and are open to an external space outside said case and which are opposed to each other in a direction perpendicular to said second axis, in a plane parallel to said second axis and perpendicular to said first axis, said apparatus comprising:

a gear meshing device for effecting meshing engagement of said differential pinions with said differential side gears disposed within said chamber of said differential case;

an actuator for rotating said differential pinions and said differential case relative to each other about said first axis after said meshing engagement of said pinions with said side gears, until said pinions are brought to a predetermined position at which said pinion shaft can be inserted through said case and said pinions; and

a shaft inserting device for inserting said pinion shaft through said case and said pinions.

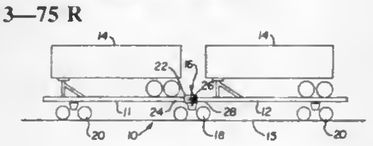
Re. 35,961
ARTICULATED RAIL CAR CONNECTOR

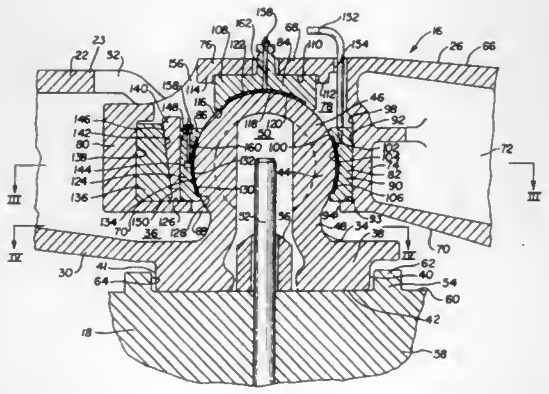
Donald Wiebe, Sewickley, Pa., assignor to Hansen Inc., Pittsburgh, Pa.

Original No. 5,520,295, dated May 28, 1996, Ser. No. 276,415, Jul. 18, 1994. Application for reissue Aug. 4, 1997, Ser. No. 905,576

Int. Cl.⁶ B61G *7/00*

U.S. Cl. 213—75 R **24 Claims**





1. In a rail car assembly having a wheeled truck with wheels which are engagable with a railway [truck] *track* for rolling movement thereon, and a pair of rail car platforms having adjacent ends thereof supported in common by the truck, a connector apparatus that is cooperable with such a truck and such adjacent platform ends to transmit loads between the pair of platforms while maintaining flexible support of the adjacent platform ends with respect to each other and with respect to the truck, said connector apparatus comprising:

a first connector portion rigidly affixed to one of such adjacent platform ends;

a second connector portion rigidly affixed to the other of such adjacent platform ends;

one of said first and second connector portions including center plate bearing means adapted for cooperation with a bearing portion of such a truck to provide vertical and lateral support of said one of said connector portions with respect to such a truck;

said one of said connector portions further including a first bearing means having convex spherical bearing surface means, and said other of said connector portions including a second bearing means having concave spherical bearing surface means;

said first and second bearing means being mutually cooperable to provide load bearing support of said connector portions with respect to one another; and

at least one of said concave and convex spherical bearing surface means being a discontinuous spherical bearing surface means comprised of a plurality of truncated spherical bearing surface elements which are engagable with the other of said concave and convex spherical bearing surface means to provide substantially all required load bearing support of said connector portions with respect to one another.

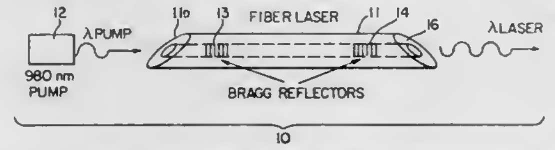
Re. 35,962
SINGLE LONGITUDINAL MODE PUMPED OPTICAL WAVEGUIDE LASER ARRANGEMENT

Gary A. Ball, Simsbury, and William H. Glenn, Vernon, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Original No. 5,305,335, dated Apr. 19, 1994, Ser. No. 17,069, Feb. 12, 1993. Continuation-in-part of Ser. No. 13,117, Feb. 1, 1993, Pat. No. 5,317,576, which is a continuation-in-part of Ser. No. 732,552, Jul. 19, 1991, abandoned, which is a continuation-in-part of Ser. No. 457,118, Dec. 26, 1989, abandoned. Application for reissue Aug. 5, 1996, Ser. No. 693,689

Int. Cl.⁶ H01S *3/30*

U.S. Cl. 372—6 **2 Claims**



1. In an optical waveguide laser arrangement including a solid optical waveguide having a gain portion that extends along an axis between two axially spaced reflectors disposed along the optical waveguide, said gain portion being of an excitable material which emits stimulated light upon excitation by pumping light, means for launching the pumping light into the optical waveguide for axial propagation along the optical waveguide, the two reflectors axially delimiting said gain portion thereby forming a laser resonator in said gain portion, the improvement wherein at least one of the reflectors is constituted by a Bragg grating consisting of a plurality of axially consecutive periodic perturbations in the refractive index of the optical waveguide, said Bragg grating reflecting the stimulated light with a reflectivity profile this is a maximum at a central wavelength corresponding to a central longitudinal mode of the laser resonator, said reflectivity profile decreasing for longitudinal modes adjacent to said central longitudinal mode of the laser resonator, and wherein the axial length of the laser resonator, the reflectivity of the one Bragg grating, and the gain of the excitable material are such that lasting occurs only at said central longitudinal mode of the laser resonator.

Re. 35,963
AUTOMATIC FOCUSING CAMERA

Yoshihiro Fujita, Tokyo; Kazuhiro Akiyama, and Miharu Takahashi, both of Saitama, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Original No. 4,831,404, dated May 16, 1989, Ser. No. 163,472, Mar. 4, 1988. Application for reissue Feb. 25, 1997, Ser. No. 805,551

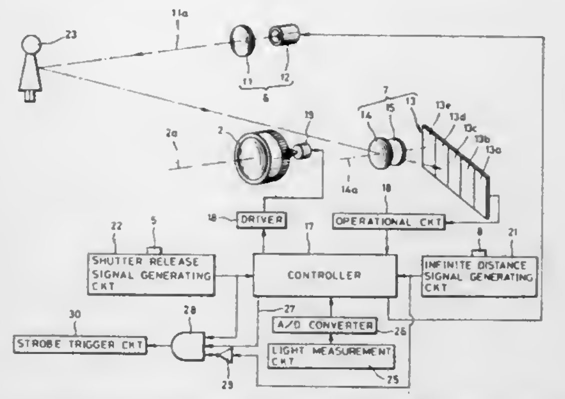
Claims priority, application Japan, Mar. 4, 1987, 62-49482

Int. Cl.⁶ G03B *3/00;15/03*

U.S. Cl. 396—61 **8 Claims**

1. An automatic focusing camera comprising: distance detecting means for detecting the distance of a subject to be photographed and providing a distance signal;

first lens positioning means for positioning an objective lens to a finite suitable focusing position according to said distance signal, *within a range from a close focusing position in which*



said objective lens focuses at a predetermined closest distance to a far focusing position in which said objective lens focuses at a predetermined far distance and covers infinity by a depth of field of said objective lens;

second lens positioning means for positioning said objective lens at a focusing position suitable for infinity independently from said distance signal, *in which said objective lens focuses at a distance farther than said predetermined far distance, said second lens positioning means being operable under the condition that infinity is covered by the depth of field of the objective lens in the far focusing position*; and

externally operable means for actuating said second lens positioning means to position said objective lens only at said focusing position suitable for infinity.

Re. 35,964
RUMINANT ANIMAL FEED SUPPLEMENT

Fred H. Wellons, Greensboro, N.C., assignor to CBP Resources, Inc., Greensboro, N.C.

Original No. 5,206,041, dated Apr. 27, 1993, Ser. No. 944,037, Sep. 11, 1992. Continuation of Ser. No. 470,391, Jan. 24, 1990, abandoned, which is a continuation of Ser. No. 272,095, Nov. 16, 1988, Pat. No. 4,919,940. Application for reissue Sep. 1, 1994, Ser. No. 299,695

Int. Cl.⁶ A23K *1/00*

U.S. Cl. 426—2 **4 Claims**

1. A process for supplying fatty acids containing at least 10 carbon atoms to ruminant animals while protecting the microorganisms in the animal's rumen from attack by the fatty acids comprising feeding highly saturated fatty acids to said animals in the form of triglycerides along with the dry matter content of said animal feed, said dry matter content including at least one vegetable material edible by ruminant animals selected from the group including legume hay, grass hay, corn silage, grass silage, legume silage, corn grain, oats, barley, distillers grain, brewers grain, soya bean meal, and cotton seed meal, said triglycerides being present in an amount effective to protect the microorganisms in the animals' rumen from attack by the fatty acids, wherein the iodine value of said triglycerides is in the range of 5 to 25.

4. The process according to claim 1, wherein said saturated fatty acids are selected from the group consisting of [natural fats and oils, including] tallow, lard, and grease.

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PLANT PATENTS

GRANTED NOVEMBER 17, 1998

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

10,684

Patent Not Issued For This Number

10,685

MINIATURE ROSE PLANT NAMED 'RUIROSORA'

Antonius A. Pouw, De Kwakel, Netherlands, assignor to DeRuiter's Nieuwe Rozen B.V., De Kwakel, Netherlands

Filed Jul. 3, 1997, Ser. No. 887,986

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—7.1 **1 Claim**

1. A new and distinct miniature rose plant named 'Ruirosora', as illustrated and described.

10,686

STRAWBERRY PLANT NAMED 'PS-1269'

Stephen M. Ackerman, Salinas; Michael D. Nelson, and Steven D. Nelson, both of Watsonville, all of Calif., assignors to Plant Sciences, Inc., and Berry R & D, Inc., both of Watsonville, Calif.

Filed Jun. 9, 1997, Ser. No. 871,778

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—48 **1 Claim**

1. A new and distinct strawberry variety designated 'PS-1269', as herein described and illustrated.

10,687

AZALEA PLANT NAMED 'CONLEL'

Robert Edward Lee, 52063 Ridge Crest Rd., Independence, La. 70443, assignor to Robert Edward Lee, and Plant Development Services Inc., both of Loxley, Ala.

Filed Aug. 27, 1997, Ser. No. 917,832

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—56 **1 Claim**

1. A new and unique variety of azalea plant named 'Conlel' as herein shown and described.

10,688

AZALEA PLANT NAMED 'CONLEJ'

Robert Edward Lee, 52063 Ridge Crest Rd., Independence, La. 70443, assignor to Robert Edward Lee, and Plant Development Services Inc., both of Loxley, Ala.

Filed Aug. 27, 1997, Ser. No. 917,839

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—55 **1 Claim**

1. A new and unique variety of azalea plant named 'Conlej' as herein shown and described.

10,689

AZALEA PLANT NAMED 'CONLEM'

Robert Edward Lee, 52063 Ridge Crest Rd., Independence, La. 70443, assignor to Robert Edward Lee, and Plant Development Services Inc., both of Loxley, Ala.

Filed Aug. 27, 1997, Ser. No. 917,831

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—57 **1 Claim**

1. A new and unique variety of azalea plant named 'Conlem' as herein shown and described.

10,690

HELIOPSIS PLANT NAMED 'LORAINE SUNSHINE'

Brent Jeffry Hanson, 502 N. Stevens St., Rhinelander, Wis. 54501

Filed Jul. 25, 1997, Ser. No. 910,472

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—68.1 **1 Claim**

1. A new and distinct cultivar of Heliopsis plant named 'Loraine Sunshine', as illustrated and described.

10,691

CHRYSANTHEMUM PLANT NAMED 'BRONZE CANTATA'

Cornelis P. Vandenberg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Jan. 21, 1997, Ser. No. 786,416

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—82.2 **1 Claim**

1. A new and distinct Chrysanthemum plant named 'Bronze Cantata', as described and illustrated.

10,692

ASIATIC HYBRID LILY PLANT NAMED 'PRIMA DONNA'

Ria Mak-Leek, 5595 Halls Ferry Rd., Independence, Oreg. 97351

Filed Aug. 6, 1997, Ser. No. 908,132

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—87.4 **1 Claim**

1. A new and distinctive variety of Asiatic hybrid lily plant substantially as herein shown and described, characterized by its high resistance to disease; its vigorous growth and rapid natural propagation; the excellence of its flower form, size, and substance; its versatility both as a garden plant and as a cut-flower producer from pre-cooled bulbs forced under glass out of season; and in particular by its unique multiple flower coloration; yellow base, soft yellow and white center, and pink tips with dark spots at the base.

10,693

ASIATIC HYBRID LILY PLANT NAMED 'EUROGOLD'

Johan A. Mak, 5955 Halls Ferry Rd., Independence, Oreg. 97351

Filed Aug. 22, 1997, Ser. No. 918,651

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—87.4 **1 Claim**

1. A new and distinctive variety of Asiatic hybrid lily plant substantially as herein shown and described, characterized by its high resistance to disease; its tolerance of virus and botrytis blight, its vigorous growth and rapid natural propagation; the excellence of its flower form, size, and substance; its versatility both as a garden plant and as a cut-flower producer from pre-cooled bulbs forced under glass out of season; and in particular by its unique

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semi upright-facing spotless flowers with its clean and intense yellow coloration surrounding a small dark brown ray extending from the nectary furrows and its small orange flame when the flower ages, a combination unique among Asiatic hybrid lilies suited to forcing and to mass commercial cultivation.

10,694
ORIENTAL HYBRID LILY PLANT NAMED 'WILDCARD'

Johan A. Mak, 5595 Halls Ferry Rd., Independence, Oreg. 97351

Filed Aug. 27, 1997, Ser. No. 918,894

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—87.4 **1 Claim**

1. A new and distinctive variety of Oriental hybrid lily plant substantially as herein shown and described, characterized by its high resistance to disease; its vigorous growth and rapid natural propagation; the excellence of its flower form, size, and substance; its versatility both as a garden plant and as a cut-flower producer from pre-cooled bulbs forced under glass out of season; and in particular by its broad-tepalled white flowers with a soft yellow flame extending from the nectary furrows and its red purple tepal spottings at the base of each tepal, a combination unique among Oriental hybrid lilies suited to forcing and to mass commercial cultivation.

10,695
GERANIUM PRATENSE PLANT NAMED 'SUMMER SKIES'

Kevin Nicholson, Wisbech, England, assignor to Blooms of Bressingham Ltd., Norfolk, England

Filed Feb. 7, 1997, Ser. No. 799,002

Int. Cl.^{6} A01H *5/00*

U.S. Cl. Plt.—87.12 **1 Claim**

1. A new and distinct cultivar of *Geranium pratense* plant named 'Summer Skies' as illustrated and described.

PATENTS

GRANTED November 17, 1998

ERRATA

Patents

For CLASS	See PATENT NO.
037—186	5,836,089
056—012	5,836,142
073—290	5,836,192
030—276	5,836,227
138—112	5,836,367
246—122	5,836,529
606—159	5,836,868
095—014	5,837,027
148—022	5,837,066
106—010	5,837,078
426—611	5,837,300
427—150	5,837,348
438—439	5,837,378
424—465	5,837,379
430—285	5,837,586
562—571	5,837,872
548—544	5,837,877
558—315	5,837,878
257—083	5,838,174
332—109	5,838,210
702—130	5,838,590
369—275	5,838,666

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PATENTS

GRANTED NOVEMBER 17, 1998

GENERAL AND MECHANICAL

5,836,015

PANTS WITH HIP PROTECTORS

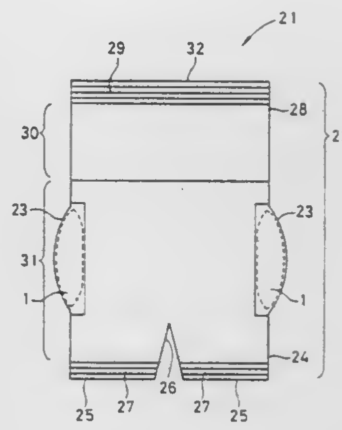
Johannes Nyvang Kristensen, Ikast, and Finn Kjærgaard, Viborg, both of Denmark, assignors to Txtex A/S, Ikast, Denmark

PCT No. PCT/DK95/00006, § 371 Date Jun. 12, 1997, § 102(e) Date Jun. 12, 1997, PCT Pub. No. WO96/20615, PCT Pub. Date Jul. 11, 1996

PCT Filed Jan. 5, 1995, Ser. No. 849,856

Int. Cl.^{6} A41D *13/00*

U.S. Cl. 2—23 **7 Claims**



1. Pants with hip protectors wherein said pants have a belly portion, a buttock portion and a crotch portion positioned between openings for both legs, wherein each of said hip protectors is flexible, each of said hip protectors is located in a pocket means on said pants at positions corresponding to the neck of the femur of each hip of said wearer when said pants are being worn, wherein each of said hip protectors is formed in an approximately domed shape so as to cover a portion corresponding to a neck of a wearer's femur, and wherein the hip protectors have flexibility with a flat compressive strength of (A) and lateral compressive strength of (B):

(A) a flat withstand load in 10 mm displacement of 196 to 980N (20 to 100 kgf),

(B) a lateral withstand load in 10 mm displacement of 49 to 294N (5 to 30 kgf).

5,836,016

METHOD AND SYSTEM FOR REDUCING DRAG ON THE MOVEMENT OF BLUFF BODIES THROUGH A FLUID MEDIUM AND INCREASING HEAT TRANSFER

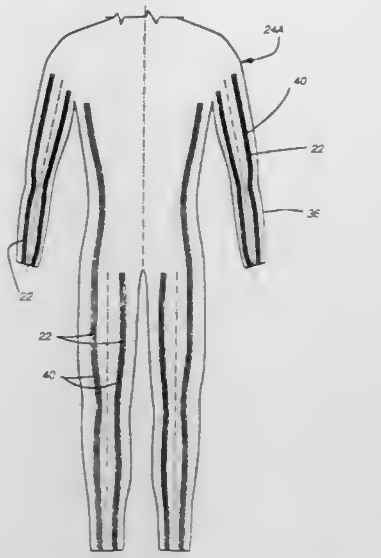
David L. Jacobs, 4825 Sixth St., Boulder, Colo. 80304; Eric L. Eagen, 7970 S. Cedar Cir., Littleton, Colo. 80120, and Jeffrey J. Rogers, 11236 W. Arbor Dr., Littleton, Colo. 80127

Filed Feb. 2, 1996, Ser. No. 580,121

Int. Cl.^{6} A41D *13/00*

U.S. Cl. 2—69 **43 Claims**

1. A system for reducing aerodynamic drag on a human body moving through a fluid medium along a line of movement, said body defining a stagnation line along a foremost substantially arcuate surface thereof in direct alignment with the line of movement, said system comprising at least one elongated protuberance fixed to the surface and extending substantially parallel to said stagnation line and being displaced from said stagnation line a predetermined distance, said protuberance being located along points of contact of tangent lines to said arcuate surface which tangent lines pass through the line of movement, and wherein the angle between said tangent line and said line of movement is in the range of 30° to 70°.



5,836,017

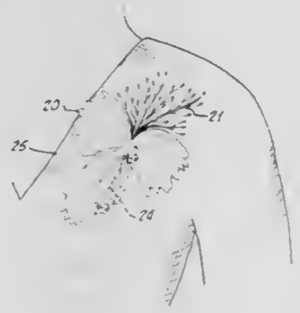
CORSAGE ASSEMBLY AND COMBINATION THEREOF WITH CLOTHING

Saburo Hironaga, 2910 W. Lingan La., Santa Ana, Calif. 92704, and Taylor Rudd, 17932 Scotia Cir., Huntington Beach, Calif. 92647

Filed Jan. 16, 1997, Ser. No. 784,710

Int. Cl.^{6} A41D *1/12;* **A45F** *5/08*

U.S. Cl. 2—69 **12 Claims**



1. A combination corsage-mounting device, corsage, and woman's outer garment, which comprises:

(a) a corsage-mounting device, said device including a small wire element having an elongate wire body and having wire legs extending from said body transverse to said body,
said wire legs having ends remote from said body, said ends of said wire legs being pointed,
said wire legs having end portions that include said ends,
said device also including buttons having holes therein to receive and hold said end portions of said legs,

(b) a corsage having stem means disposed parallel to and adjacent said body;

(c) means to secure said stem means to said body, and (d) a dress or other woman's outer garment formed of a fabric,
said fabric having an outer surface, said body, corsage, and securing means being on the exterior of said garment and adjacent said outer surface of said fabric,
said legs penetrating through said fabric in an inward direction.

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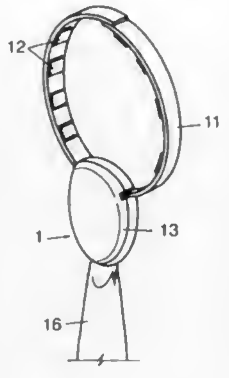
said buttons being on the interior of said garment and mounted on said end portions of said legs to cover said pointed ends and prevent said wire element from moving outwardly away from said fabric.

5,836,018
DETACHABLE NECKTIE WITH MAGNETIC FIELD GENERATING MEANS

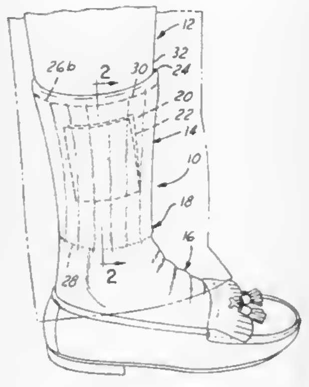
Ming Lee, No. 79, Wen Chou Street, Taipei City, Taiwan
Filed Nov. 12, 1997, Ser. No. 968,471
Int. Cl.⁶ A41D ***25/02;*** **A61N** ***2/08***
U.S. Cl. 2—144 **10 Claims**



1. A necktie comprising:
a neckband adapted for putting over the user's neck,
a plurality of magnetic elements fixedly mounted on said neckband at an inner side and equally spaced from one another;
a coupling box coupled to said neckband;
an apron unit; and
a connector adapted to connect said apron unit to said coupling box.

5,836,019
SOCK WITH HIDDEN POCKET

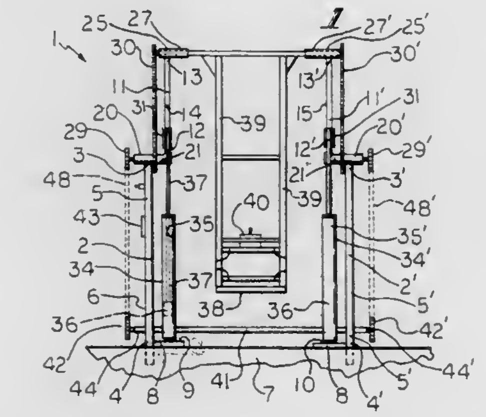
Marilyn E. McCafferty, 1400 Vernler, Grosse Pointe Woods, Mich. 48236
Filed Dec. 10, 1997, Ser. No. 988,464
Int. Cl.⁶ A41B ***11/00***
U.S. Cl. 2—239 **8 Claims**



1. A sock having a pocket comprising:
a sock body comprising:
a foot portion for receiving therein a foot of a person; and
a neck portion connected to said foot portion for engaging a calf of the person; and
an inner neck member coaxially disposed in relation to said neck portion, said inner neck member having a first end and an opposite second end, said inner neck member being connected to said sock body at an annular connection substantially adjacent said first end;
wherein a space between said neck portion and said inner neck member comprises an undivided annular pocket extending between said annular connection and said second end; and
wherein said neck portion terminates remote from said foot portion at an outer mouth; wherein said inner neck member extends a first distance between said annular connection and said second end, and wherein said neck portion extends a second distance between said annular connection and said outer mouth, wherein said second distance exceeds said first distance.

5,836,020
NON ELECTRICAL INDEPENDENT LIFTS

Edward J. Morris, Bay City, Mich., assignor to Morris Independent Lift, Bay City, Mich.
Filed Jun. 16, 1995, Ser. No. 440,516
Int. Cl.⁶ E04H ***4/06***
U.S. Cl. 4—496 **1 Claim**

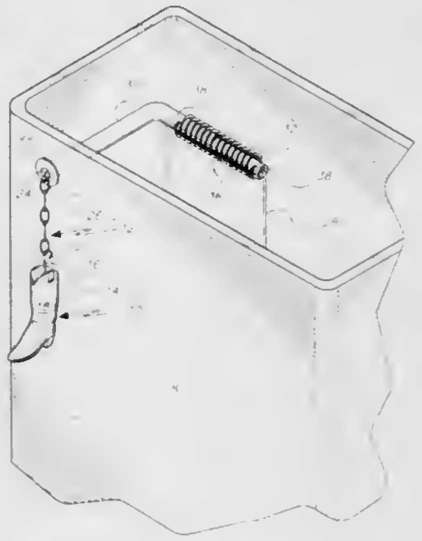


1. An independent lift comprising:
two spaced apart, vertical posts, each vertical post having a top end and a bottom end, and a front and a back, each vertical post being capable of being secured by the bottom end to a solid substrate, each said vertical post having a plate rigidly affixed to the bottom end, each said plate having a top surface, each said plate having a connector means detachedly fixed to the top surface;
two independent lifting arms, each said lifting arm having a near end and a distal end, a midpoint, and a back surface, each said lifting arm being attached to a first rotatable shaft at its near end, each said first rotatable shaft having an outer end and an inner end, and being supported on each of the outer and inner ends, by a bearing situated in a first bearing housing said shaft being supported by a respective bearing within each first bearing housing;
each first bearing housing being attached to the top respectively, of each vertical post;
each said first bearing housing having fixedly mounted near each near end, of each first rotatable shaft a non-rotating sprocket and fixed to each distal end, of each first rotatable shaft a middle sprocket, each middle sprocket being rotatable simultaneously with each respective, first rotatable shaft;
each said lifting arm being secured near the distal end to a second bearing housing;
a lifting bar common to both lifting arms being rotatably secured in each of the second bearing housings and being supported by a bearing within the second bearing housing;
said lifting bar extending through the bearing housings to provide a support for upper rotating sprockets rigidly affixed to the lifting bar at the support;
said non-rotating sprockets and said upper rotating sprockets being connected by a non-moving chain;

each said lifting arm having a rigid brace with a near end and a distal end fixedly attached at its near end to the back surface of the lifting arm at or near the midpoint of the lifting arm;
two essentially identical hydraulic assemblies, having a fixed end and a shaft end, said hydraulic assemblies having a housing, a movable piston therein and a piston shaft attached to the piston, each said hydraulic assembly respectively, mounted on the top surface of the bottom plate by the connector means, each piston shaft pivotally attached to the distal end of the rigid brace on each of the respective lifting arms;
the lifting bar having a lifting chair rigidly attached to it by chair support shafts; said chair being provided with a control for the control of the pistons in the hydraulic assemblies;
each said vertical post having a lower bearing housing fixedly attached near the bottom end of the vertical post and containing therein a bearing;
said independent lift having a lower rotating bar common to the vertical posts, said lower rotating bar extending from one vertical post to the other vertical post and through the lower bearing housings and being supported by the bearings located therein;
a set of lower sprockets being detachedly fixed to each end of the lower rotating bar and capable of being rotated simultaneously with the rotation of the lower rotating bar;
each respective lower sprocket being connected to a respective middle sprocket by a movable chain;
said independent lift being adapted to a means to power the piston in each piston assembly;
one of the vertical posts having attached on its back, a manifold to accommodate the power means.

5,836,021
NOVELTY TOILET PULL CHAIN AND TANK VALVE ACTUATOR

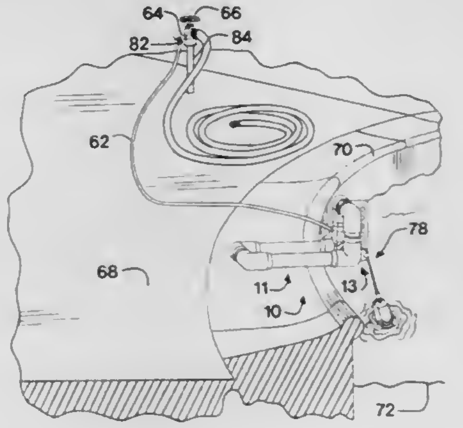
Gary L. Davidson, and Sherri L. Davidson, both of Rte. 1, Box 95A, Dewey, Okla. 74029
Filed Mar. 24, 1997, Ser. No. 822,491
Int. Cl.⁶ E03D ***5/09***
U.S. Cl. 004—411 **3 Claims**



1. A novelty toilet pull chain and tank valve actuator for mounting on and within a toilet tank and operatively interconnected with the tank valve in the toilet tank, said pull chain and tank valve actuator comprising:
a handle having a predetermined size, configuration and decoration representing a preselected theme;
a chain-and-line means interconnecting a toilet tank valve and said handle, said chain-and-line means including a chain segment attached to said handle and a line segment attached to the toilet tank valve, said chain segment extending from said handle outside of the toilet tank through an opening in a wall of the toilet tank to a location interior of the toilet tank, and having an inner end within the toilet tank, said line segment provided with a loop at one end for connection to said inner end of the chain segment and attached to the toilet tank valve at a second end;
a tube guide mounted within the toilet tank and extending from said opening to a position substantially over the tank valve, said chain segment inner end and said loop being located within said tube guide, said tube guide including:
an inner tube; and
an outer tube having a first end mounted at said opening and a second end within which said inner tube is slidably interfitted;
spring means urging said inner and outer tubes apart, whereby upon initiation of a toilet flushing action by pulling on said handle, said spring means are compressed, and then expand to assist in the closing of the tank valve when flushing is complete; and
readily detachable means interconnecting said chain segment and said handle, whereby said handle may be readily exchanged for another handle which is shaped and decorated to represent an additional theme.

5,836,022
AUTOMATIC LIQUID LEVEL CONTROL APPARATUS

Douglas Robert Busenga, 3730 Gaviota Ave., Long Beach, Calif. 90807
Filed Dec. 16, 1997, Ser. No. 991,450
Int. Cl.⁶ E04H ***4/00***
U.S. Cl. 4—508 **15 Claims**



1. An apparatus for maintaining liquid in a reservoir at predetermined levels comprising:
a source of liquid under pressure:
a spigot having an inlet opening and an outlet opening wherein said inlet opening is connected to said source of liquid under pressure;
a supply valve mounted in said spigot and operated to permit flow from said spigot inlet to said spigot outlet;
a control valve assembly for maintaining a selected level of liquid in said reservoir and including a control valve moveable between open and closed positions, and a float buoyantly supported on the surface of said liquid in said reservoir and coupled to said control valve of said control valve assembly to move said control valve between said open and said closed positions responsive to liquid level in said reservoir, whereby a drop in liquid level in said reservoir lowers the vertical elevation of said float, thereby opening said control valve and a rise in liquid level in said reservoir elevates the vertical level of said float, thereby closing said control valve;
conduit means connected between said supply valve and said control valve assembly for conveying liquid from said source of liquid to said control valve assembly;
a ballast container in which a ballast material is located and which rests upon a reservoir deck adjacent to said reservoir:

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a stanchion secured to said ballast container and including means for mounting said control valve assembly at a selected position from among a plurality of vertically separated positions thereon; and
a clamp for securing said control valve assembly at said selected position vertically and pivotably on said stanchion;
said ballast container is comprised of a plurality of hollow, elongated horizontal and vertical members and means for joining said elongated horizontal and vertical members together.

5,836,023

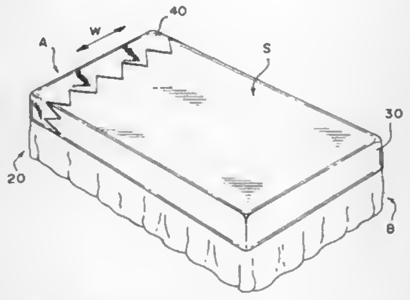
DECORATIVE TRIM STRIP FOR COMFORTERS, QUILTS, AND THE LIKE

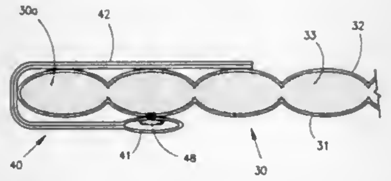
Lou Ann Elizabeth Stone Munson, 7015 Leebrad St., Springfield, Va. 22151

Filed Jan. 23, 1997, Ser. No. 792,850

Int. Cl.^{6} A47G *9/00*

U.S. Cl. 5—482 **21 Claims**





1. A bedclothing arrangement, comprising:
a bed covering sized to cover a standard-sized bed, the bed covering having a length, adapted to extend from a head portion to a foot portion of the bed, and a width;
a decorative trim strip made with flexible fabric, the decorative trim strip having a width and a length, wherein the width of the trim strip is greater than the length of the trim strip, and the length of the trim strip is less than the length of the bed covering; and
fastening means for removably fastening the decorative trim strip to the bed covering in such a manner that the width of the decorative trim strip extends in a widthwise direction across the width of the bed covering;
wherein the bed covering comprises a bottom panel adapted to be positioned face down on a bed, a top panel, and filler material disposed between the bottom panel and the top panel,
wherein the fastening means comprise complementary fastener structures provided respectively at the bottom panel of the bed covering and on a first portion of the decorative trim strip,
wherein the decorative trim strip is sized and configured and the fastening means are positioned and arranged in such a manner that, when the decorative trim strip is fastened to the bed covering by the fastening means, a second portion of the decorative trim strip is capable of being extended beyond an edge of the bed covering and manipulated over the edge of the bed covering to thereby overlie a corresponding portion of the top panel of the bed covering,
wherein the second portion of the decorative trim strip comprises a decorative, non-linearly patterned edge portion which extends in a widthwise direction of the decorative trim strip,
wherein the flexible fabric which comprises the decorative trim strip is doubled over at the first portion of the decorative trim strip so as to loop back upon itself and thereby define front and back fabric layers, the front and back fabric layers being stitched together along a stitching line which extends in the widthwise direction of the decorative trim strip, the stitching line forming a base of the first portion of the decorative trim strip, and
wherein the second portion of the decorative trim strip is comprised of a portion the front fabric layer which extends from below the stitching line to the non-linearly patterned edge portion and a portion of the back fabric layer which extends from below the stitching line to the non-linearly patterned edge portion.

5,836,024

SUPPORT DEVICE

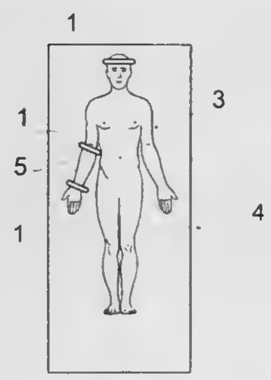
Janet Uglehus, 68 Achille Rd., Grimsby DN34 5RB; Russell Birchall, Liverpool, and Christopher Hawes, Cheshire, all of United Kingdom, assignors to Janet Uglehus, Grimsby, United Kingdom

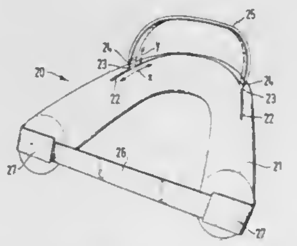
Filed Jan. 23, 1997, Ser. No. 788,853

Claims priority, application United Kingdom, Jan. 24, 1996, 9601380

Int. Cl.^{6} A47G *9/00*

U.S. Cl. 5—636 **19 Claims**





1. A device for supporting a person's head above a resting surface while permitting movement of said head comprising:
a ring member securable to said head and having a support portion along an inner surface extending around at least the back and sides of said head, said support portion shaped and dimensioned to lift said head clear of said resting surface when said outer surface rests upon said resting surface, said support portion being U-shaped and having two ends and a connecting means joining said ends; and
a slider strap near the closed portion of said U-shape to adjust the position of said support portion on said person's head.

5,836,025

GEL CONTAINING POSITIONING CUSHION FOR INFIRM PATIENTS

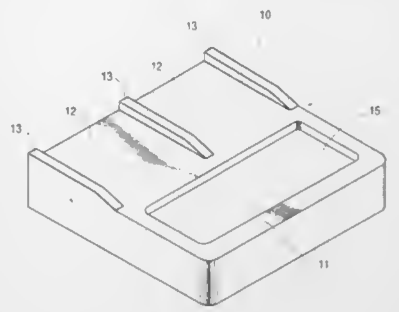
George W. Poncy, Sr., 5380 North Ocean Blvd., Apt. 12-J, Singer Island, Fla. 33404

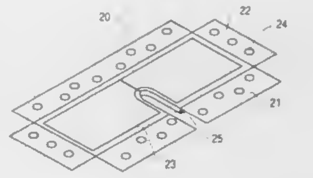
Filed Feb. 10, 1997, Ser. No. 798,044

Int. Cl.^{6} A47C *27/18;7/02*

U.S. Cl. 5—654 **10 Claims**

1. A positioning cushion to support a sitting patient, comprising:





a rigid saddle base comprising a front portion defining thigh supporting front surfaces, and a rear portion defining a trough adjacent to said front surfaces;
a gel bladder, said gel bladder positioned in said trough; and
a resilient foam top cover mounted over said saddle base and said gel bladder, said gel bladder further comprising a recessed portion, said recessed portion positioned in said gel bladder to receive a sitting person's coccyx said trough having sufficient size so that said gel bladder in said trough will allow the buttocks of a sitting person to sink to a position lower than the upper thighs of such person supported on said thigh supporting front surfaces.

5,836,026

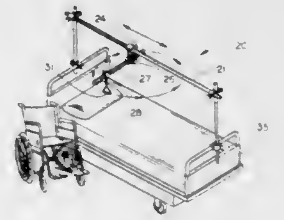
ORTHOPEDIC TRAPEZE WITH SELF-LOCKING ROTATABLE MECHANISM

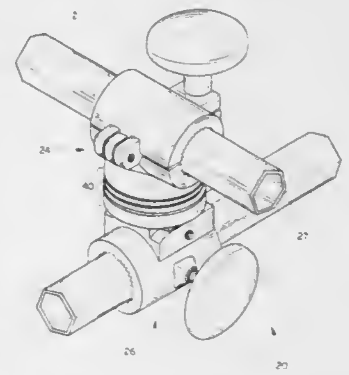
Michael C. Reed, 207 Arbor Ct., Omaha, Nebr. 68108

Filed May 22, 1997, Ser. No. 827,990

Int. Cl.^{6} A47C *31/00*

U.S. Cl. 5—662 **19 Claims**





1. An orthopedic trapeze for a hospital bed with respect to which an overhead frame bar is positioned, including:
an upper base assembly capable of travel along the overhead frame bar;
a lower base assembly;
support means for rotatably supporting said lower base assembly for rotation with respect to said upper base assembly, said support means allowing rotation in a horizontal plane;
a trapeze bar supported to said lower base assembly;
a trapeze assembly including a handle attached to said trapeze bar;
engaging means for fixing said trapeze bar at a selectable horizontal position in relation to said lower base assembly for positioning of said handle;
pivot means for pivotally attaching said lower base assembly to said support means, said pivot means depending from said support means and allowing pivotal movement in a vertical plane;
clutch means for engaging said lower base assembly against said upper base assembly to prevent rotation, said rotation pin passing through a center hole, said clutch means being activated in response to an external force on said trapeze assembly and said trapeze bar, said external force causing said trapeze bar and said lower base assembly to pivot, causing the clutch means to be moved upward and become engaged with said upper base assembly; and
biasing means between said clutch means and said lower base assembly for counteracting a gravitational force from said trapeze bar and said trapeze assembly, said biasing means preventing said trapeze bar from pushing said clutch means upward to contact said upper base assembly, thereby disengaging said clutch means when said external force is absent from said trapeze bar and said trapeze assembly.

5,836,027

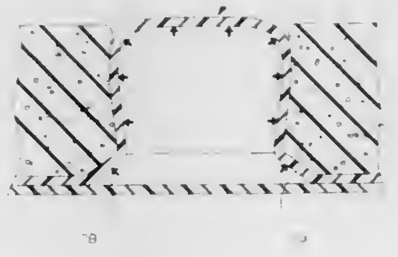
INTEGRATED MATRIX BEDDING SYSTEM

Robert D. Leventhal, 2548 Micheltorena, Los Angeles, Calif. 90039, and Paul B. Thomas, 1257 W. O'Farrell St., San Pedro, Calif. 90731

Filed Apr. 25, 1997, Ser. No. 837,871

Int. Cl.^{6} A47C *27/18*

U.S. Cl. 5—706 **22 Claims**



1. A mattress, comprising:
a. an airtight and fluid-tight structure having a flexible top layer and a flexible bottom layer affixed to the flexible top layer to form a plurality of spaced apart vertical adjustable cylindrical shaped glands, each cylindrical shaped glands being compressible and expandable and having a widened open wedge shaped proximal end integrally formed with the top layer and a narrow closed distal end, the plurality of vertical adjustable cylindrical shaped glands arranged in a matrix;

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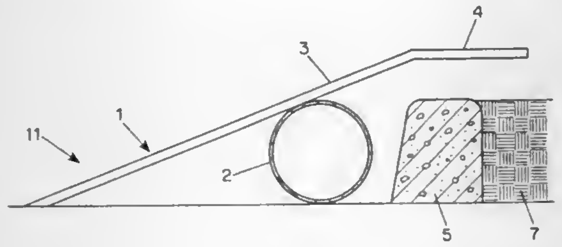
- b. a plurality of connecting tubes integrally formed with said top layer of said airtight and fluid-tight structure, each connecting tube respectively interconnected to two adjacent cylindrical shaped glands;
- c. means for supplying air under pressure to inflate said plurality of adjustable cylindrical shaped glands to a desired stiffness, such that the air is respectively transferrable from said plurality of cylindrical shaped glands by said plurality of connecting tubes;
- d. a foam structure having a plurality of vertical interior cavities arranged in a matrix, each interior cavity respectively receiving one of said plurality of adjustable cylindrical shaped glands such that each of said plurality of adjustable cylindrical shaped glands is supported by the foam structure for preventing lateral movements of said plurality of adjustable cylindrical shaped glands, where the foam structure abuts against each wedge proximal end of each of said plurality of adjustable cylindrical shaped glands for providing a lifting effect to lift said foam structure to a height relative to an adjusted pressure; and
- e. whereby said mattress has the ability to adjust the relative pressure over a large range to suit the various shapes and masses of resting bodies.

5,836,028
CURB-CROSSING APPARATUS
Gunner Petersen, 6 Sweet Way, Poughquag, N.Y. 12570
Filed Sep. 30, 1996, Ser. No. 724,066
Int. Cl.^{6} E01D *15/12*
U.S. Cl. 14—2.4 **45 Claims**



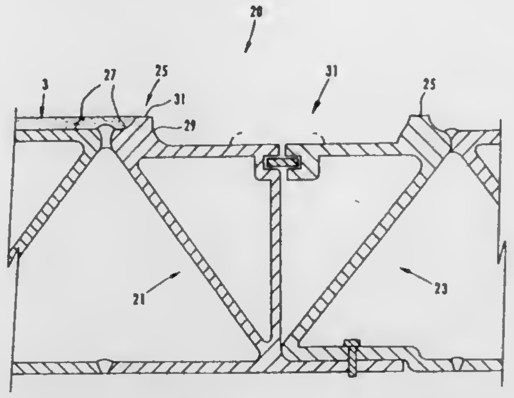
1. A portable curb crossing apparatus for preventing damage to a curb and equipment upon the equipment's traveling between a street and an elevated subgrade, the apparatus comprising:

a ramp member having a lower section and an upper section angled from the lower section toward the subgrade and having an upper section end distal from the lower section; and

a tubular pivot member transversely affixed to the lower section of the ramp and resting, during use, on a surface of the street, the pivot member having a transverse cross-section of a size such that the upper section end is at a height higher than the elevation of the subgrade;

wherein the curb crossing apparatus pivots about the pivot member between a first position in which the lower portion of the ramp member makes contact with the street and a second position in which the upper portion of the ramp member rests upon the elevated subgrade, as the equipment traverses the curb crossing apparatus.

5,836,029
METHOD OF PREPARING AN ALUMINUM BRIDGE DECK AND AN ALUMINUM BRIDGE DECK CONFIGURATION FOR RECEIVING A WEARING SURFACE
Douglas W. Garber, Midlothian; John R. Weir, and Bruce Robbins, both of Richmond, all of Va., assignors to Reynolds Metals Company, Richmond, Va.
Filed Oct. 22, 1996, Ser. No. 734,832
Int. Cl.^{6} E01D *21/00;19/12*
U.S. Cl. 14—77.1 **7 Claims**

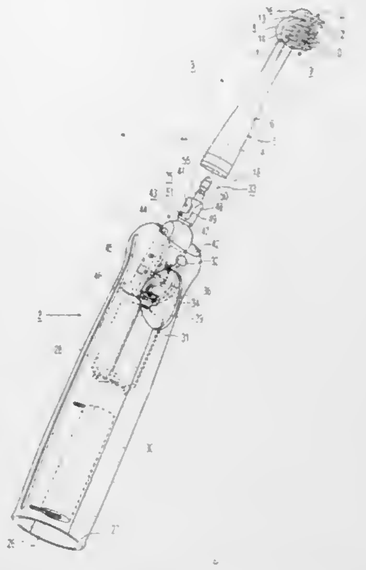


5. A method of forming an aluminum alloy bridge deck joint extrusion for use in an aluminum alloy bridge deck comprising:

extruding a length of an aluminum alloy, the extruded length having one of an isotropic or an orthotropic cross section and first and second upper surfaces; and

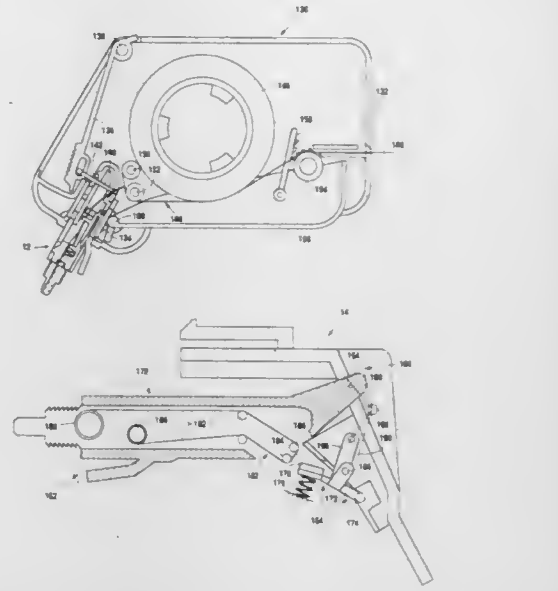
forming a raised portion separating said first and second upper surfaces, said raised portion running in a longitudinal direction of the extruded length and acting as a dam so that polymer concrete applied to said second upper surface as part of a joint between adjacent aluminum alloy bridge deck segments is separated from polymer concrete previously applied to said first upper surface of said extruded length.

5,836,030
DENTAL CLEANING DEVICE AND ATTACHMENT FOR SUCH A DEVICE
Hendrik P. Hazeu, Krumpendorf; Erich Krammer, Klagenfurt, and Arno Wolfger, Grafenstein, all of Austria, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Dec. 23, 1996, Ser. No. 774,586
Claims priority, application Austria, Dec. 28, 1995, 2112/95
Int. Cl.^{6} A61C *17/34;* **A46B** *13/02*
U.S. Cl. 15—22.1 **16 Claims**



1. A dental cleaning device comprising a grip member to be held in a hand, said grip member containing a motor for driving drive means, and comprising an elongate extension member which extending along a longitudinal axis projecting from the grip member in a direction of the longitudinal axis, said grip member further comprising a brush holder arranged on the elongate extension member adjacent a free end of the elongate extension member, said brush holder carrying bristles projecting therefrom transversely to the longitudinal axis, said brush holder being pivotable about a pivotal axis extending transversely to the longitudinal axis, substantially in the direction of the bristles and substantially central to said brush holder, said brush holder being drivable by the motor via the drive means for reciprocation with respect to the pivotal axis along a circular arcuate path, and said grip member further comprising, near the brush holder, an interdental brush holder arranged on the elongate extension member adjacent the free end of the elongate extension member, said interdental brush holder carrying interdental bristles projecting therefrom transversely to the longitudinal axis and disposed adjacent the bristles on the brush holder, said interdental brush holder being coupled to a drive member of the drive means, said drive member being pivotable about a further pivotal axis, and is drivable by the motor via the drive means for reciprocation with respect to the further pivotal axis along a circular arc-shaped path, characterized in that the further pivotal axis, about which the drive member is pivotable, also extends transversely to the longitudinal axis of the elongate extension member and is remote from the interdental brush holder, and the free ends of the interdental bristles projecting from the interdental brush holder as well as the free ends of the bristles projecting from the brush holder perform a movement whose main component is oriented parallel to a plane which extends perpendicularly to the pivotal axis of the brush holder, the movement of said drive member along said circular arc-shaped path causing said interdental brush holder and the free ends of the interdental bristles to perform a reciprocatory movement substantially parallel to a longitudinal direction of interdental spaces between teeth in a user's mouth.

5,836,031
FIBER OPTIC CABLE CLEANER
Larry R. Cox, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Jun. 7, 1996, Ser. No. 660,644
Int. Cl.^{6} A47L *25/00*
U.S. Cl. 15—104.002 **12 Claims**



1. A device for cleaning the tip of a bare optical fiber retained in a connector, the device comprising:

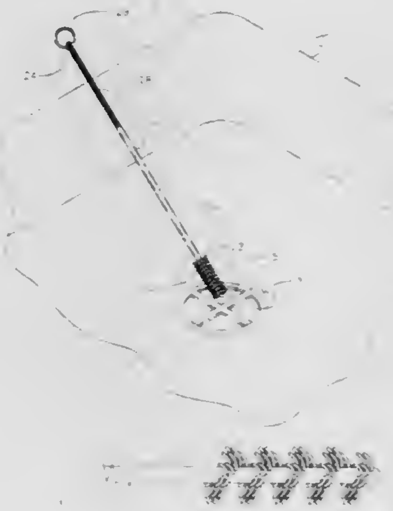
a tool body;

means for releasably attaching said tool body to the connector;

cleaning media located in said tool body; and

means for urging the tip of the optical fiber from said connector and into contact with said cleaning media when said tool body is attached to the connector.

5,836,032
APPARATUS FOR REMOVING HAIR FROM A DRAIN
Leslie H. Hondo, 230 Alu Rd., Wailuku, Maui, Hi. 96793
Filed Sep. 30, 1997, Ser. No. 941,875
Int. Cl.^{6} B08B *9/02*
U.S. Cl. 15—104.32 **9 Claims**



1. An apparatus for removing hair and other debris from a drain, comprising:

an elongate shaft having a longitudinal axis, a proximal end, and a distal end, said shaft proximal end being for insertion into a drain; and

pick up means for picking up hair and dirt, said pick up means being provided at proximal end of said shaft;

wherein said pick up means includes a plurality of rows of hooking members, the rows being helically configured around the longitudinal axis.

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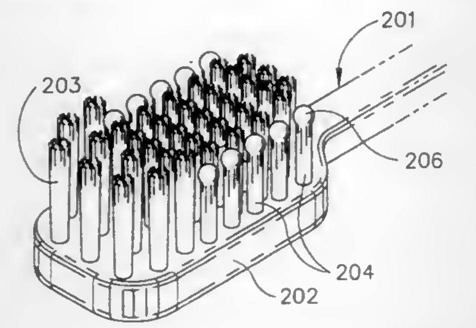
5,836,033
TOOTHBRUSH FOR BRUSHING TEETH AND MASSAGING GUMS

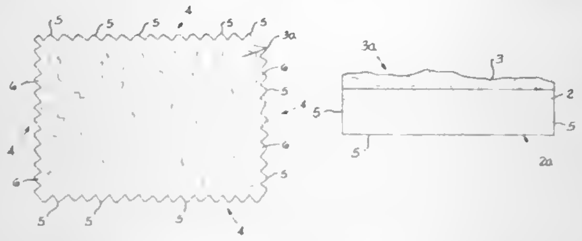
Harald Berge, Sokolovskà 61, 186 06 Praha 8, Czech Rep.
PCT No. PCT/NO94/00142, § 371 Date Jun. 17, 1996, § 102(e) Date Jun. 17, 1996, PCT Pub. No. WO95/07036, PCT Pub. Date Mar. 16, 1995
PCT Filed Aug. 29, 1994, Ser. No. 612,954
Claims priority, application Norway, Sep. 10, 1993, 933240
Int. Cl.⁶ A46B *9/04*
U.S. Cl. 15—110 **9 Claims**



1. An improvement in a toothbrush comprising a substantially planar head and a handle, especially for combining brushing of the teeth and massage of the gums, and comprising a plurality of toothbrush bristles one end of which is attached to the head of said toothbrush and the other end of which extends freely from the head of said toothbrush, said toothbrush bristles of ordinary cleaning function being arranged in combination with other bristles effecting massage functions, characterized in that the improvement resides in that the toothbrush head comprises an inner area having substantially vertically arranged individual bristles effecting cleansing function, and that said toothbrush head also comprises integrally therewith at least one outer group of substantially vertically arranged individual bristles of length lower than said cleansing bristles, said outer bristles having a rounded portion associated therewith for massage function.

5,836,034
COMBINED SOFT/ABRASIVE CLEANING SPONGE WIDTH PROJECTING PEAKS WITH ROUNDED TIPS

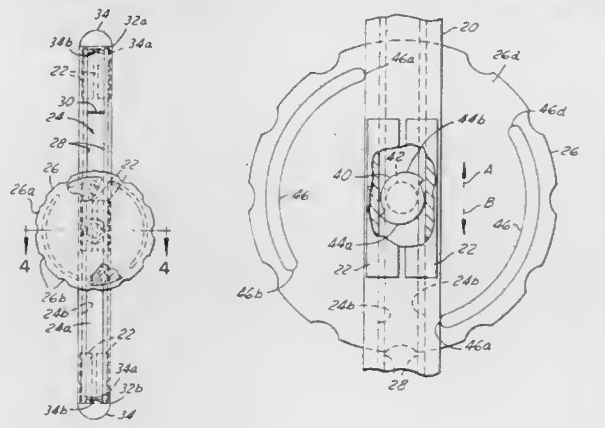
Jesus Javier Galvan Garza, Platon #799 Col. Contry La Silla, Guadalupe N.L., Mexico, 67170
Filed Mar. 21, 1997, Ser. No. 828,288
Int. Cl.⁶ A47L *13/10;13/12*
U.S. Cl. 15—118 **6 Claims**



1. A cleaning sponge for cleaning the surfaces of dishes, bathrooms and tile, comprising in combination:
- a single integral flexible and spongy body formed as a flexible planar sheet material of predetermined geometrical shape presenting opposed planar cleaning surfaces for wiping surfaces of the dishes, bathrooms and tile, said opposed cleaning surfaces having two diverse cleaning characteristics, namely: (a) an abrasive surface structure with sufficient roughness to dislodge dirt and grime encrusted upon said surfaces of the dishes, bathrooms and tile, and (b) a soft surface structure able to softly clean delicate surfaces, wherein said body further comprises a plurality of side-by-side salients extending about peripheral edges of said body bearing said opposed cleaning surfaces in a pattern retaining the opposed cleaning surfaces thereupon and exposing the salients to penetrate and scrub corners and irregularly shaped surfaces of said dishes, bathroom and tile with said abrasive surface structure to dislodge said dirt and grime therefrom.

5,836,035
ADJUSTABLE SHOWER BACK CLEANER

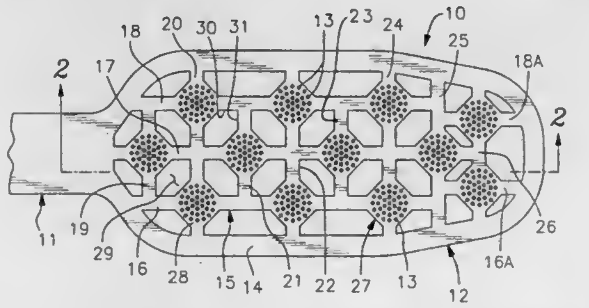
Donald C. McElfish, 4718 Gerald, Warren, Mich. 48092, and Anthony S. Schwartz, 1203 Ski Park Dr., West Branch, Mich. 48661
Filed Jan. 16, 1997, Ser. No. 784,458
Int. Cl.⁶ A46B *15/00*
U.S. Cl. 15—160 **19 Claims**



1. A shower back cleaner for being connected with a shower wall comprising:
- an elongated mounting rail, said mounting rail having a rear side and an opposite front side;
- mounting member means for attaching said rear side of said mounting rail to a shower wall;
- a base having a front face and an opposite rear face;
- cleaning member means connected with said front face of said base for abuttably cleaning a showering person; and
- cam means responsive to rotation of said base in relation to said mounting rail for slidingly connecting said rear face of said base to said mounting rail, wherein rotation of said base to an adjustment position results in said cam means permitting free sliding movement of said base in relation to said mounting rail, and wherein rotation of said base to an affixment position results in said cam means affixing said base in slidingly frozen relation to said mounting rail.

5,836,036
SELF CLEANING TOOTHBRUSH

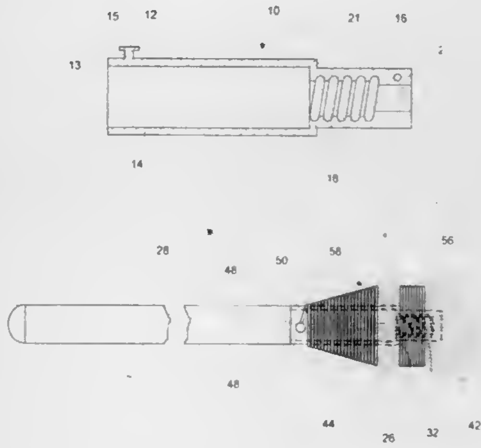
Brian Ivory, 38 S. Meridian Rd., Youngstown, Ohio 44509
Filed Jun. 20, 1997, Ser. No. 880,139
Int. Cl.⁶ A46B *9/04*
U.S. Cl. 15—167.1 **9 Claims**



1. A toothbrush having a handle portion and a brush head portion, said brush head portion comprising:
- a plurality of longitudinally and transversely spaced intersecting support rails, said support rails are of a known transverse dimension intersecting support rails define bristle mounting areas of a greater transverse dimension than that of said support rails said bristle mounting areas are in staggered relation to one another, a plurality of toothbrush bristles extending from said respective mounting areas and said handle portion extending from said brush head portion.

5,836,037
PLASTIC SLEEVE FOR WIRE WOUND BROOM

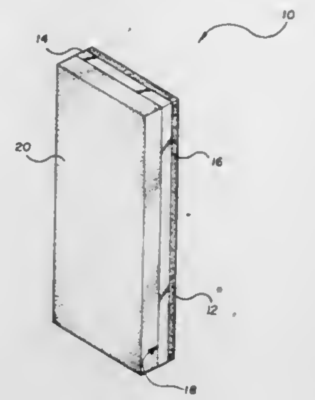
Jon Monahan, Arcola, Ill., assignor to The Thomas Monahan Co., Arcola, Ill.
Filed May 21, 1996, Ser. No. 651,844
Int. Cl.⁶ A46B *3/08;3/16*
U.S. Cl. 15—189 **9 Claims**



1. A broom corn fiber type broom, which includes:
- a broom head having a generally cylindrical plastic sleeve having a first end which defines an open surface extending axially therethrough and a second end which defines axially therethrough a forward threaded open surface in communication with the open surface of the first end, a plurality of broom corn fibers having a portion thereof laterally extending along an outer surface of said sleeve, and means connected to said sleeve for binding said portion of said broom corn fibers to said sleeve; and
- a handle having an outer diameter less than a diameter of said open surface of said first end of said sleeve and having an end having an outer diameter less than a diameter of said threaded surface of said second end of said sleeve and threaded in a complimentary manner to be received therein, and wherein said handle is threadably connected to said broom head.

5,836,038
MAGNETIC MOUNT DRY ERASER

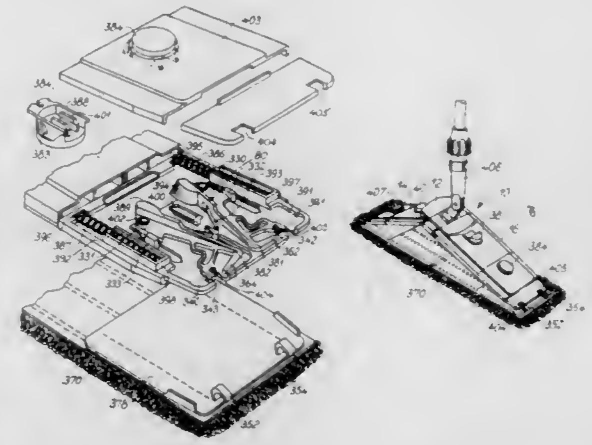
Kelly R. Thorp, 1708 Cougar Ave., Norfolk, Va. 23518
Filed Oct. 17, 1997, Ser. No. 953,405
Int. Cl.⁶ A47L *13/16;* **A47G** *29/00*
U.S. Cl. 15—209.1 **7 Claims**



1. An eraser comprising:
- a substantially thin rigid support member including top and bottom planar surfaces;
- a magnetic attraction means disposed on the top surface of said support member for securing said eraser to a metallic surface, said magnetic attraction means being coextensive with said top surface; and
- erasure means disposed on the bottom surface of said support member for removing markings of a predetermined origin, said erasure means being coextensive with said bottom surface.

5,836,039
COLLAPSIBLE MOP PAD HOLDER

Alf Rimer, Herley, Denmark, assignor to DIT International HQ A/S, Lynge, Denmark
PCT No. PCT/DK93/00360, § 371 Date Jun. 28, 1995, § 102(e) Date Jun. 28, 1995, PCT Pub. No. WO94/09692, PCT Pub. Date May 11, 1994
PCT Filed Nov. 5, 1993, Ser. No. 432,149
Claims priority, application Denmark, Nov. 5, 1992, 1349/92
Int. Cl.⁶ A47L *13/10;13/16;13/255*
U.S. Cl. 15—228 **53 Claims**



1. A collapsible map pad holder (**10**) comprising
- a body member (**12**),
- at least first and second wing parts (**14**, **16**) each pivotally connected to the body member (**12**) so as to be pivotable between an operative position in which the body member (**12**) and the wing parts (**14**, **16**) define a surface for supporting a mop pad, and an inoperative position in which each of the wing parts (**14**, **16**) depends from the body member (**12**),
- first and second locking means (**18**, **20**) for locking the first and second wing parts (**14**, **16**), respectively is relation to the body member (**12**) in the operative positions of the wing parts,
- a pair of first latch members, each of said first and second locking means (**18**, **20**) comprising a respective one of said first latch members (**22**, **23**), each of said first latch members being moveable between a locking position, in which it is in locking engagement with the respective wing part (**14**, **16**) in its operative position, and a releasing position,
- a locking element (**24**; **24***a*, **24***b*) having the first latch members (**22**, **23**) arranged thereon being movably mounted on the body member (**12**) so as to be movable in relation thereto.

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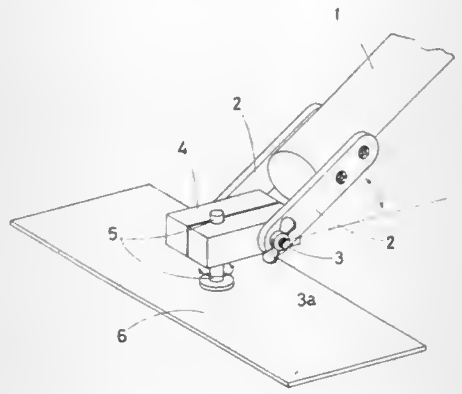
first actuating means (**30**) for moving the locking element so as to move the first latch members (**22**, **23**) between their locking and releasing positions,
activating means selected from the group consisting of:
  second latch members (**22**, **23**) for locking each of the first and second wing parts (**14**, **16**) in an intermediate position between the operative position and the inoperative position of the respective wing part (**14**, **16**), and a second actuating means (**30**) adapted to move only one of said first latch members (**22**, **23**) to its releasing position when actuated.

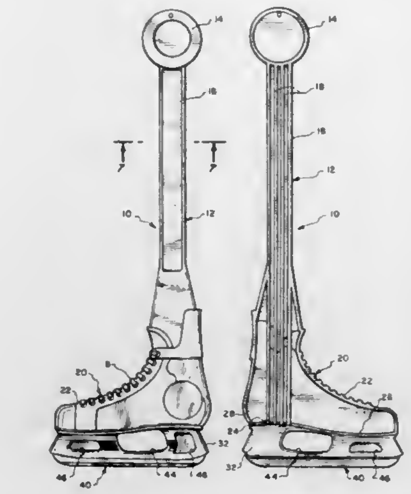
5,836,040
TOOL FOR APPLYING VARNISH, GLUE OR ANY OTHER MATERIAL REQUIRING SMOOTHING
Ezio Giacomelli, Via Omero, 19, Civitanova Marche, Italy
Filed Oct. 4, 1996, Ser. No. 725,994
Int. Cl.^{6} B25G *1/06*
U.S. Cl. 15—235.8 **13 Claims**



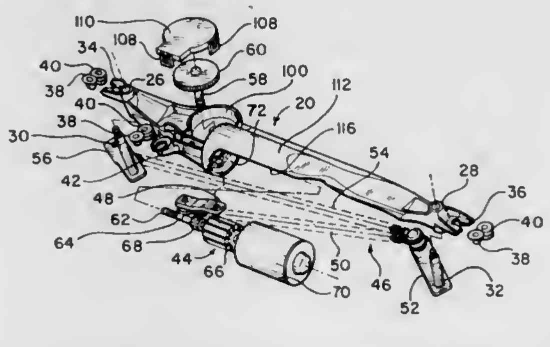
1. A tool for smoothing varnish, glue, or other fluid material, comprising:
- a handle;
- a support block pivotally coupled with said handle, said support block defining a projecting pin hole;
- locking means for locking said handle at an angle with respect to said support block; and
- a spatula having a projecting pin extending therefrom, said projecting pin being rotatably received in said projecting pin through hole such that said spatula pivots about a pivot axis defined by said projecting pin.

5,836,041
ICE SCRAPER
Arthur S. Kleinpell, II, 2565 Kent Ridge Ct., Bloomfield Township, Mich. 48301, and Lori Wachler, 26524 Hendrie Blvd., Huntington Woods, Mich. 48070
Filed Apr. 21, 1997, Ser. No. 840,973
Int. Cl.^{6} B60S *1/04;* **A47L** *1/06*
U.S. Cl. 15—236.02 **8 Claims**

1. In an ice scraper, the combination of: an elongated hollow handle having upper and lower extremities and providing an elongated channel; a hollow representational image on the lower extremity of said handle, said image having upper and lower extremities; reinforcing means located inside said channel and said image extending from the upper extremity of said handle through said hollow image to the lower extremity of said image to reinforce said image, said reinforcing means including a plurality of elongated ribs located in said channel in side-by-side relationship; and a scraper blade on the lower extremity of said image.

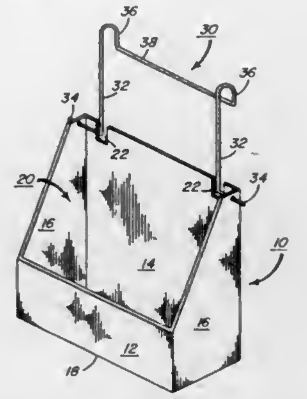


5,836,042
MODULAR WINDSHIELD WIPER DRIVE SUPPORT FRAME
Gregory Allen Funk, Franklin; Michael Charles Nazione, Columbia, and Franz Buechele, Lawrenceburg, all of Tenn., assignors to ACD Tridon Inc., Burlington, Canada
Filed Mar. 19, 1996, Ser. No. 617,445
Int. Cl.^{6} B60S *1/06*
U.S. Cl. 15—250.3 **4 Claims**



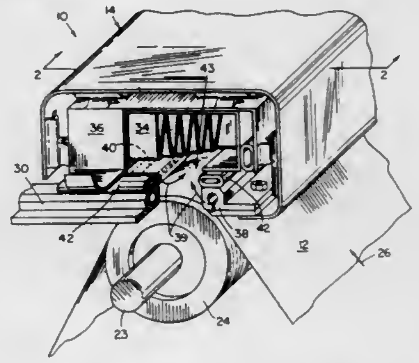
1. A modular support frame for a windshield wiper drive, the support frame comprising:
- a unitary body having integrally formed mounting brackets for securing the frame to a vehicle body;
- at least one integrally formed pivot boss for receiving a pivot drive shaft rotatable in said boss and driven to reciprocate a windshield wiper,
- and an integrated motor carrier supporting a motor drive adapted to drive a motor shaft defining a longitudinal axis and coupled to a crank arm forming part of a linkage adapted to rotate said pivot drive shaft, said motor carrier having an integrally formed end plate transverse to said longitudinal axis and apertured for receiving the motor shaft therethrough and an integrally formed splash cover extending from said end plate in a longitudinal direction parallel to said longitudinal axis so as to partly cover a housing for the motor drive, the splash cover being adapted to shield the motor drive from weather and defining a longitudinally-extending opening adapted to axially receive the motor drive for assembly into said support frame.

5,836,043
VERSATILE PAINT TRAY
Steven C. Rovas, 31 Greenleaf Meadows, Rochester, N.Y. 14612
Filed Aug. 18, 1997, Ser. No. 912,735
Int. Cl.^{6} B44D *3/12*
U.S. Cl. 15—257.06 **2 Claims**



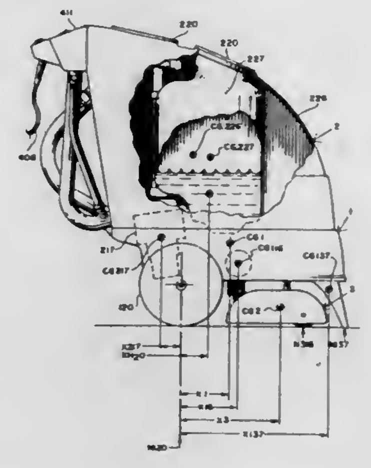
1. A paint tray including a bottom, front wall, back wall, and sidewalls forming an open vessel, and further including:
- a mounting bracket operatively connected to said side walls of said tray;
- said mounting bracket having parallel legs, each said leg including a foot at one end and a hook at the other end;
- said feet extending outward of said legs and pivotally connected to the tops of opposite sidewalls of said tray for pivotal movement of said bracket from a storage position within said tray to an operating position behind said tray; and
- a crossbar connecting said other ends of said legs;
- said hooks being adapted to engage the top step of a step ladder with said legs overlying said top step, permitting said tray to hang from said top step in a substantially vertical attitude.

5,836,044
SURFACE CLEANER AND COLLECTOR SYSTEM
Chandler G. Sinnett, Falmouth, and Marshall Edward Hall, Windham, both of Mass., assignors to Chapman Corporation, Portland, Mass.
Filed May 26, 1995, Ser. No. 451,529
Int. Cl.^{6} B08B *5/02*
U.S. Cl. 15—309.1 **34 Claims**



1. A surface cleaner and collector system comprising:
- a chamber having an opening for receiving a surface to be cleaned;
- a pressurized air delivery system proximate said surface for establishing an air flow for loosening and entraining contaminants on said surface;
- a collector for trapping said entrained contaminants and passing the air flow, the entrained contaminants directed to said collector preventing their escape from said system;
- a sealing system for sealing said collector with respect to said chamber; and
- a delivery system for transporting the surface through the opening in said chamber.

5,836,045
VACUUM CLEANER METHOD
Philip M. Anthony, Chicago; James C. Hand, Glen Ellyn, and David Pacchini, Chicago, all of Ill., assignors to Breuer Electric Mfg. Co., Chicago, Ill.
Division of Ser. No. 606,432, Feb. 23, 1996, Pat. No. 5,659,918. This application May 27, 1997, Ser. No. 863,808
Int. Cl.^{6} A47L *11/30*
U.S. Cl. 15—320 **2 Claims**



1. The method of forming a carpet cleaner having a tank assembly, including an outer reservoir tank, and an inner flexible bladder, means for rollingly supporting the carpet cleaner, and a brush assembly secured to the housing for driving an agitator, which agitator is in operative contact with the carpet,
- the step of proportioning the tank and the cleaning fluid container and precisely positioning the tank and container with respect to each other so that the combined center of gravity of the fresh solution and soiled solution migrate forwardly toward the nozzle as the solution is depleted from the cleaner,
- whereby a relatively constant loading is placed upon the agitator, and a relatively constant loading upon the vacuum nozzle, all to the end that there is a consistency in carpet cleansing throughout the entire cycle form the beginning when the cleaning fluid container has an initial amount of fluid, until the end of the cycle when the cleaning fluid container is substantially exhausted of its cleaning fluid.

5,836,046
PORTABLE WATER EXTRACTION CLEANER
Eric C. Huffman, Lowell; Robert C. Coon, Holland, and Douglas J. Medema, Belding, all of Mich., assignors to Bissell Inc., Grand Rapids, Mich.
Filed Jun. 27, 1997, Ser. No. 884,453
Int. Cl.^{6} A47L *11/34*
U.S. Cl. 15—321 **13 Claims**

1. In a fluid extraction cleaning apparatus comprising a fluid delivery system for delivering clean solution to a surface to be cleaned, a fluid extraction system for extracting dirty solution and air from such a surface, and a housing supporting the delivery system and the extraction system, the improvement wherein the housing defines a recess for receiving a pair of tanks therein, the housing having a stop spaced from an inner surface of the recess, the stop being engageable by lower end portions of the tanks and formed and disposed to hold the tanks in engagement with the inner surface of the recess, whereby each of the tanks may be mounted on the housing by inserting the tank into the recess

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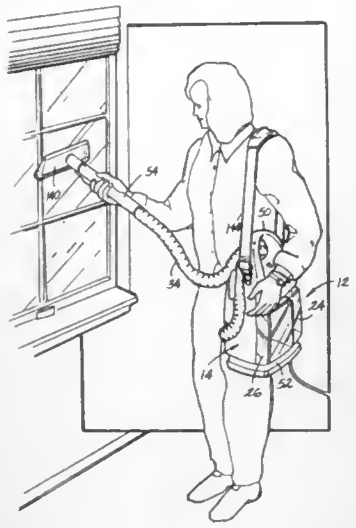


beyond the stop, the delivery system including an inlet on the housing disposed to receive clean solution from one of the tanks when said one tank is received in the recess, the extraction system including an outlet on the housing disposed to deliver dirty solution and air to the other of the tanks when said other tank is received in the recess.

5,836,047
VACUUM CLEANER FOR BOTH UPRIGHT AND CANISTER MODES

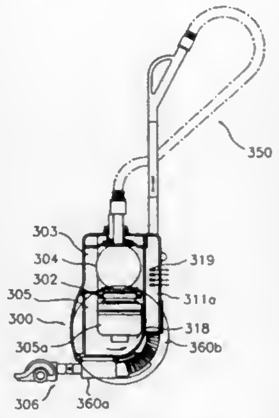
Jin Bang Lee; Byung Cheol Choi, both of Incheon; Seon Kyu Kim; Yeong Je Jeon, both of Seoul; Seon Young Hong, Kyeongki-Do, and Nam Ho Lee, Seoul, all of Rep. of Korea, assignors to Daewoo Electronics Co., Inc., Seoul, Rep. of Korea

Continuation-in-part of Ser. No. 310,983, Sep. 23, 1994, abandoned. This application Feb. 4, 1997, Ser. No. 795,186

Claims priority, application Rep. of Korea, Jan. 20, 1994, 94-1043; Feb. 24, 1994, 94-3391

Int. Cl.⁶ A47L ***5/36***

U.S. Cl. 15—328 **10 Claims**



1. A vacuum cleaner for both upright and canister modes, comprising:

a cleaner body section having a first recess in which a first connector section is placed, which is formed at a first side of the cleaner body section which is defined as a bottom side thereof, and a second recess in which a second connector section is placed, which is formed at second side of the cleaner body section which is defined as a rear side thereof, wherein the first and second sides form a right angle, and a couple of fitting portions are provided at the first side adjacent to the second side, the first and second fitting portions are spaced at a predetermined distance from each other and each has first and second slots, respectively;

first and second main wheels which are rotatable mounted parallel to the surface confined by each edge of the first side and the second side, respectively, and first and second auxiliary wheels which are rotatable mounted under the second side;

a brush section being in contact with a place to be cleaned and providing an air passageway therein for the dirt-bearing air;

the first connector section having first and second protrusions which protrude in opposite directions to insert into the first and second slots, respectively, and the first connector section detachably connected to the brush section, and for providing an air passageway for the dirt-bearing air to enter from the brush section, wherein the first and second protrusions are slidably mounted in the first and second slots, respectively, while the first recess receives the first connector section to be slid along the first and second protrusions;

the second connector section fixedly inserted in the second recess and connected to the first connector section, and for providing an air passageway for the dirt-bearing air; and

a suction pipe section having a detachably connected end to the cleaner body and another free end;

wherein, in an upright mode, the brush section is connected to the first connector section, and the second connector section is connected to the free end of the suction pipe section, and tilt of the cleaner body which is placed on the first connector section and moves by the first and second main wheels is adjusted by the suction pipe section, whereas in a canister mode, the brush section is connected to the free end of the suction pipe section, and the second side of the cleaner body faces the ground, and the first and second main wheels and the first and second auxiliary wheels are utilized to move the cleaner body having the first connector section and the second connector section mounted thereon.

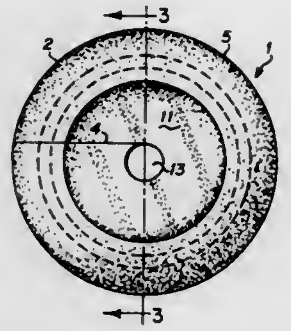
5,836,048
UNIVERSAL FIRE BARRIER GROMMET

John Alfred Rossman, Lakewood, and Jayant Dahyabhai Patel, Lake Forest, both of Calif., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Aug. 9, 1996, Ser. No. 694,876

Int. Cl.⁶ B65D ***53/06***

U.S. Cl. 16—2.2 **7 Claims**



1. A fire-resistant grommet for mounting into a hole in a panel, said grommet comprising:

a body portion defining a central passage therethrough and defining a pair of opposed outer surfaces extending radially outward from the central passage to define at least in part a pair of flanges, said body portion formed from a molded elastomeric material for resiliently engaging the edge of the hole in the panel between the flanges; and

a fire-resistant fibrous mat integrated with the body portion on at least one of the outer surfaces, the fibrous mat being embedded in the outer surface of the body portion before the elastomeric material has fully cured such that portions of the elastomeric material extend into the spaces between the fibers of the fire-resistant mat to securely integrate the mat to the body portion when the elastomeric material is fully cured.

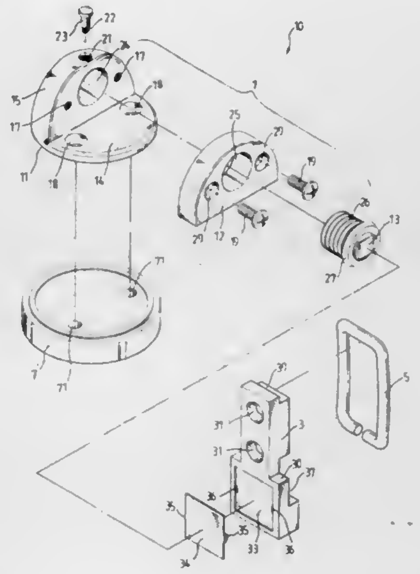
5,836,049
DOOR STOP

Mao Sung Chiang, No. 76, Hsin-1 Road, Sec. 2, Taipei, Taiwan

Filed Sep. 19, 1997, Ser. No. 934,325

Int. Cl.⁶ E05F ***5/02***

U.S. Cl. 16—82 **7 Claims**



1. A door stop comprising:

a holder unit adapted to be fixedly fastened to a floor, said holder unit comprising a mounting base, a cushion block, a socket, a T-rod and a magnet, said mounting base comprising a horizontal flat bottom block adapted to be fixedly fastened to the floor by screws and a vertical stop block raised from a stop side of said horizontal flat bottom block, said vertical stop block having a horizontal socket hole, said T-rod being fastened to a top side of said vertical stop block, said cushion block being fixedly fastened to a front side of said vertical stop block of said mounting base and having a through hole disposed in alignment with the socket hole of said vertical stop block of said mounting base, said socket being tightly fitted into the through hole of said cushion block and the socket hole of said vertical stop block of said mounting base, said magnet being fixedly mounted within said socket and having a front end exposed outside said cushion block;

a strap, adapted to be fixedly fastened to a door, said strap being secured to said magnet of said holder unit by a magnetic force of attraction to hold the door in an open position when the door is opened, said strap comprising a narrow upper part, a broad lower part, two shoulders bilaterally defined between said narrow upper part and said broad lower part, a transverse locating groove at a top side of said narrow upper part, a front recess at a front side of said broad lower part, and an iron plate fixedly fastened to said front recess in a flush manner and adapted to act with the magnet of said holder unit;

a retainer loop coupled to the narrow upper part of said strap by a slip joint and set between a vertical position hung on the transverse locating groove of said strap and a horizontal position supported on the shoulders of said strap, said retainer loop being hung on the T-rod of said holder unit when it is set in the horizontal position and the door is opened and retained in the open position.

5,836,050
APPARATUS FOR CONTROLLING THE OPENING MOVEMENT OF A VEHICLE DOOR

Werner Rumez, Geisbergweg 9, D-75417 Muehlacker, and Siegfried Sumser, Im unteren Kienle 9, D-70184 Stuttgart, both of Germany

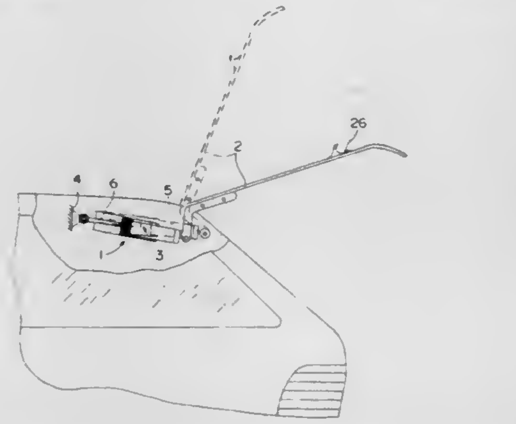
PCT No. PCT/DE95/01689, § 371 Date Aug. 25, 1996, § 102(e) Date Aug. 25, 1996, PCT Pub. No. WO96/17182, PCT Pub. Date Jun. 6, 1996

PCT Filed Nov. 30, 1995, Ser. No. 619,664

Claims priority, application Germany, Nov. 30, 1994, 44 42 547.3

Int. Cl.⁶ E05F ***3/00***

U.S. Cl. 16—84 **17 Claims**



1. An apparatus for controlling the opening movement of a door hinged to the body of a vehicle, comprising:

first and second elongate members adapted to be respectively pivotally connected to the door and the body and telescopingly movable relative to each other between a first length at which the door is closely adjacent to the body and a second length at which the door is pivoted away from the body to a maximum;

means on the exterior of one of the first and second elongate members for generating friction;

means on the interior of the other of the first and second elongate members for engaging the friction generating means before the first and second elongate members reach the second length thereby limiting opening movement of the door to less than the maximum.

5,836,051
TROLLEY HANDLE UNIT

Robert Myers, Uplands, Kemnal Road, Chislehurst BR7 6LT Kent, England

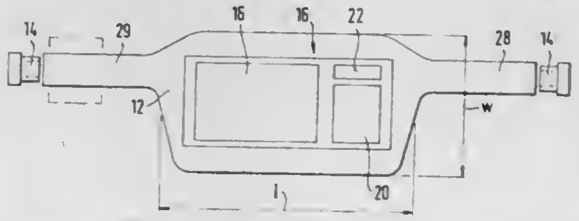
PCT No. PCT/GB95/02380, § 371 Date Apr. 4, 1997, § 102(e) Date Apr. 4, 1997, PCT Pub. No. WO96/11130, PCT Pub. Date Apr. 18, 1996

PCT Filed Sep. 10, 1995, Ser. No. 817,075

Claims priority, application United Kingdom, Oct. 7, 1994, 9420301; Mar. 31, 1995, 9506618

Int. Cl.⁶ A47B ***95/02***

U.S. Cl. 16—111 R **12 Claims**



1. A handle unit for a trolley, comprising: a housing having a front face, a rear face and opposite sides, the front face of the housing including central, generally flat, panel for providing infor-

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mation to a user, a hand gripping portion provided on each of the opposite sides of the housing and formed integrally therewith; the housing being configured to project rearwardly of the panel to the rear face thereof, and a bar-code reader mounted within the housing.

5,836,052

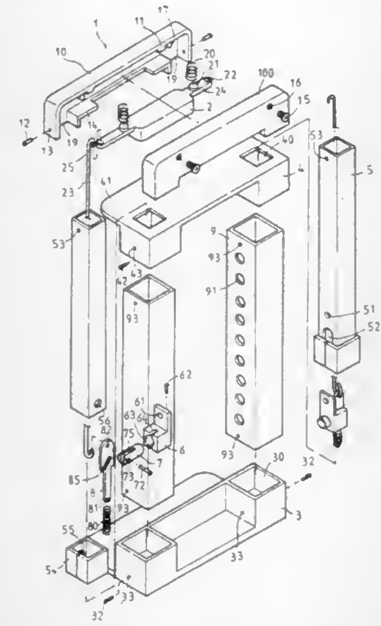
POSITIONING DEVICE FOR A RETRACTABLE HANDLE

Cheng-Tsan Chou, 27, Lane 280, Chung Zhen Road, Sa Lu, Taichung Shien, Taiwan

Filed Sep. 30, 1996, Ser. No. 723,786

Int. Cl.⁶ A47B *95/02;* B25G *1/04*

U.S. Cl. 16—115 **20 Claims**



1. A retractable handle comprising, in combination: first and second outer pipes, with each of the outer pipes including a plurality of holes; first and second inner pipes inserted in the first and second outer pipes, respectively, with each of the first and second inner pipes including an upper portion and a lower portion; a grip fastened to the upper portions of each of the first and second inner pipes; a positioning device disposed in the power portion of each of the first and second inner pipes, with each positioning device comprising, in combination: a fixed seat disposed in the inner pipe, a tenon slideable in the fixed seat and insertable in one of the plurality of holes of the corresponding outer pipe, a slide plate slideable in the fixed seat, with the slide plate including a slant slot, and a pin extending from the tenon and into the slant slot for sliding the tenon in the fixed seat with movement of the slide plate; and means for sliding the slide plate in the fixed seat.

5,836,053

CABLE TIE

Paul A. Davignon, Uxbridge, Mass.; Richard M. Bastien, Cumberland, R.I., and James C. Benoit, Needham, Mass., assignors to Avery Dennison Corporation, Pasadena, Calif.

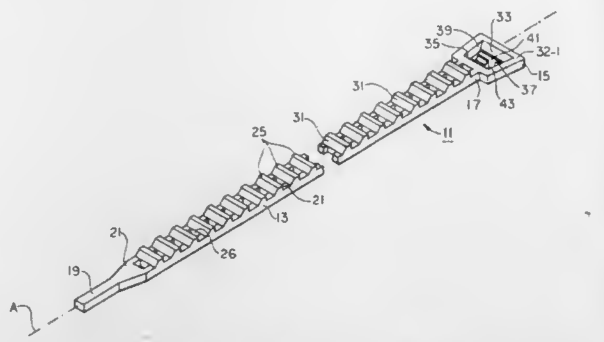
Filed Oct. 1, 1996, Ser. No. 722,409

Int. Cl.⁶ F16L *3/08;* E05B *75/00*

U.S. Cl. 24—16 PB **10 Claims**

1. A one piece cable tie for forming a plurality of objects such as cables into a bundle, said cable tie comprising:

(a). an elongated flexible strap having a top planar surface, a bottom planar surface, a first end and a second end, said strap having a plurality of raised cross-members spaced along its length which define therebetween a plurality of openings, each opening having a bottom edge,



(b). a locking head integrally formed to the first end of said strap, said locking head having a top surface and a bottom surface and including an inner end wall, an outer end wall and a pair of sidewalls which together define a strap accepting channel, and

(c). a holding tab disposed within said locking head, said holding tab projecting out from one of said end walls into said strap accepting channel for cooperation with one of said openings in said strap,

(d). said other end wall being generally in the shape of an angled locking face for cooperation with one of said raised cross-members, said angled locking face extending from one sidewall to the other sidewall and inwardly and downwardly from the top surface of said locking head,

(e). whereby after the second end of said strap has been inserted through said strap accepting channel and drawn tight around a bundle and the insertion force is thereafter relaxed, the stored pressure of the bundle by virtue of its configuration pivots said strap causing one of the raised cross-members to abut against the angled locking face to lock the strap in place and causing the holding tab to engage one of said openings in the strap to oppose deliberate release of the cross-member from the locking face.

5,836,054

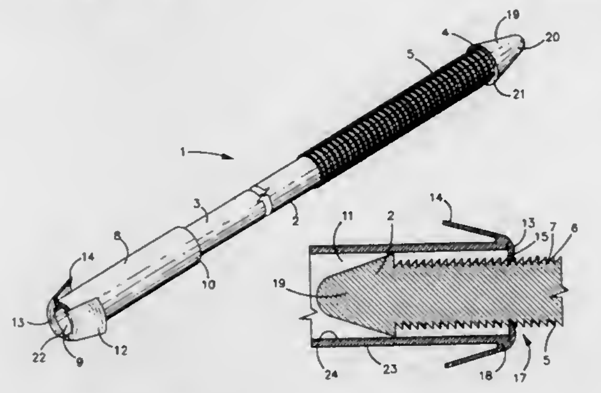
CYLINDRICAL CABLE TIE

Gary E. Alexander, Baton Rouge, La., assignor to Medisys Technologies, Inc., Baton Rouge, La.

Filed Oct. 8, 1996, Ser. No. 727,272

Int. Cl.⁶ B65D *63/10*

U.S. Cl. 24—16 PB **70 Claims**



1. A cable tie comprising:

a flexible elongated body member having a head end and a tail end;

a plurality of teeth positioned on said body member;

a receiving head having a mouth end, a seat end fixably attached to said head end of said body member, and a chamber wall extending from said seat end to said mouth end, said chamber wall having interior surfaces, said mouth end, said seat end, and said interior surfaces of said chamber wall defining a receiving chamber, said mouth end containing a mouth opening, said mouth opening providing passage into said receiving chamber, said mouth opening and said receiving chamber sized to receive said tail end of said body member; and

at least one locking arm having a lip end and a control end, said locking arm having a pivot point between said lip end and said control end, said locking arm positioned on said receiving head, said arm configured to engage said teeth when said body member is inserted into said receiving chamber.

5,836,055

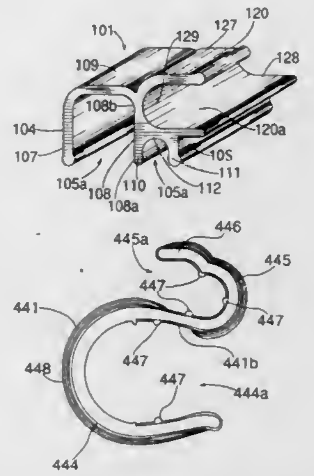
COSMETIC ACCESSORY CLIP

Gary Cooper, 104 W. 70th St., Apt. 3D, New York, N.Y. 10023

Filed Nov. 19, 1997, Ser. No. 972,981

Int. Cl.⁶ A44B *21/00*

U.S. Cl. 24—339 **10 Claims**



1. A lipstick cosmetic accessory clasp for axially extending cosmetic accessories, such as a lipstick barrel and lip liner pencil, said clasp comprising in combination:

an first larger arcuate-shaped open clip having attached at a closed portion thereof a smaller arcuate-shaped open clip adjacent to said larger open clip,

a cosmetic barrel being insertable and engagable by a spring action of said larger arcuate-shaped open clip and further,

a cosmetic pencil being insertable and engagable by a spring action of said smaller arcuate-shaped open clip adjacent to said larger arcuate-shaped open clip,

said larger arcuate-shaped open clip comprising an arcuate portion of a circle adjacent to a oppositely extending smaller arcuate portion, wherein said larger arcuate-shaped open clip and said smaller arcuate-shaped open clip together form an "S" with a larger bottom portion than a smaller top portion,

said smaller arcuate-shaped open clip being interconnected to said larger arcuate-shaped open clip in such a manner that the sense of curvature of said larger arcuate shaped open clip is opposite to that of said adjacent smaller arcuate shaped open clip, resulting in a serpentine-shaped cosmetic accessory clasp,

said smaller arcuate shaped open clip being joined tangentially to said larger arcuate shaped open clip at a point where said sense of curvature of said smaller arcuate-shaped open clip changes to said opposite sense of curvature of said larger arcuate-shaped open clip, and,

an open end of said smaller arcuate-shaped open clip extending in a direction 180° opposite to the direction of an open end of said larger arcuate-shaped open clip.

5,836,056

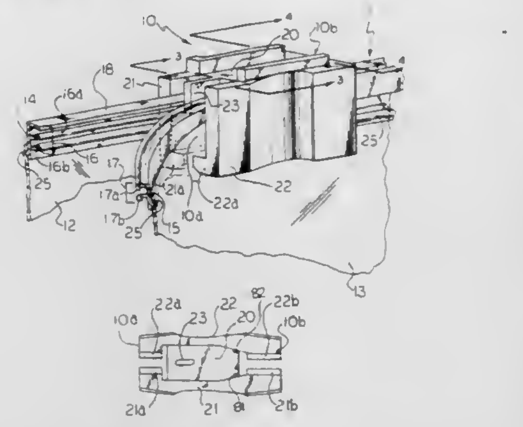
RECLOSABLE FASTENER ASSEMBLY

Jose Porchia, Midland; Brian C. Dais, Sanford; Kenneth A. Toney, and Judi R. Welsh, both of Midland, all of Mich., assignors to S. C. Johnson Home Storage Inc., Racine, Wis.

Continuation-In-part of Ser. No. 711,643, Sep. 10, 1996. This application Apr. 25, 1997, Ser. No. 846,082

Int. Cl.⁶ A44B *19/00*

U.S. Cl. 24—400 **12 Claims**



1. A reclosable fastener assembly comprising:

a) a first fastener strip having an inner surface and an outer surface, the first fastener strip having at least an uppermost closure element and a bottommost closure element positioned along the length of the inner surface;

b) a second fastener strip having an inner surface and an outer surface, the second fastener strip having at least an uppermost closure element and a bottommost closure element positioned along the length of the inner surface, the closure elements along the second fastener strip being adapted to engage with the closure elements along the first fastener strip, thereby interlocking the second fastener strip with the first fastener strip; and

c) a slider for moving between a closed position and an open position along the fastening strips in straddling relation, the slider having a top and side walls depending from opposite sides of the top for receiving the fastener strips therebetween, the side walls extending downward from the top to a point below the uppermost closure elements, so that at least a portion of the fastener strips are held between the side walls, the side walls extending from a separating end of the slider to a pinching end, the slider including pinching means proximate to the pinching end, the pinching means being adapted to press the first and second fastener strips into an interlocked relationship as the slider is moved toward the closed position, the slider having a separating leg depending from the top between the first and second side walls at the separating end of the slider, the separating leg penetrating at least one of the uppermost closure elements of the first or second fastener strips, but not the bottommost closure elements.

5,836,057

ZIPPER FOR PLASTIC BAGS

Daniel Machfud, 8, Yoel St., Sharia, Petach Tikva, Israel

PCT No. PCT/EP96/02357, § 371 Date Jan. 30, 1998, § 102(e) Date Jan. 30, 1998, PCT Pub. No. WO96/38006, PCT Pub. Date Dec. 5, 1996

PCT Filed May 31, 1996, Ser. No. 973,313

Claims priority, application Israel, Jun. 1, 1995, 113982

Int. Cl.⁶ A44B *21/00;* B65D *33/00*

U.S. Cl. 24—400 **6 Claims**

1. A zip for plastic bags comprising

for packaging at least one strip of flexible material (2) which is stuck to the opening of the bag to provide a tight seal under the zip.

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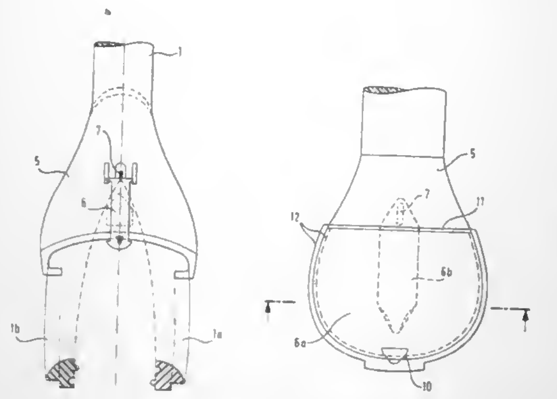


two strips of semi-rigid material (**1***a*, **1***b*) which have at least one tongue (**3**) and groove (**4**) so that the tongue (**3**) of one semi-rigid strip (**1***a*, **1***b*) can be inserted into the groove (**4**) of the other semi-rigid strip (**1***a*, **1***b*), thereby latching the semi-rigid strips (**1***a*, **1***b*) one to another,

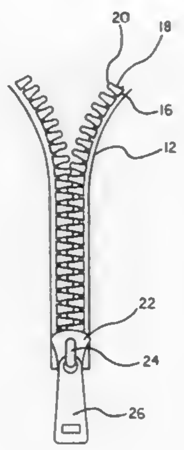
a clasp (**5**) that grasps these strips (**1***a*, **1***b*) in joining or separating manner as it slides along the strips (**1***a*, **1***b*),

a tab (**6**) with a sharp protrusion for opening the bag which is attached to the clasp (**5**), characterized in that

said tab is attached to the clasp along the length by a hinge (**11**) so that the sharp protrusion (**7**) on tip of the tab (**6**) is thrust downwards into the flexible strip (**2**) or bag when the tab is grasped and lifted and that the bag or flexible strip (**2**) are torn when the clasp is moved.

5,836,058
SAFETY RELEASE ZIPPER

Edward J. Cullum, 23 Azalea Ct., Plainview, N.Y. 11803
Filed Jun. 9, 1997, Ser. No. 871,251
Int. Cl.^{6} A44B *19/00*
U.S. Cl. 24—401 **1 Claim**



1. A safety release zipper for allowing separation due to pressures placed on a garment comprising, in combination:

two opposing side portions securable to two opposing sides of a garment to be closed together;

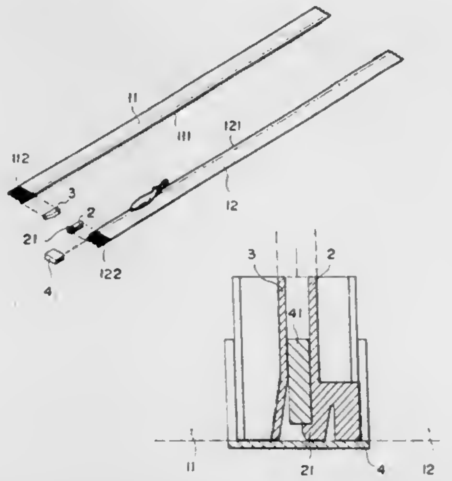
two lengths of interlocking teeth secured to and extending inwardly from the two opposing side portions, the teeth having a triangular configuration including a base portion, angled side portions of a predetermined angle and an apex portion, the apex portion being blunted to preclude cutting, the angled side portions of each of the teeth being substantially linear and without indentations, the linear side portions of the teeth functioning to enable the two length of interlocking teeth to be manually pulled apart;

a sliding channel having an interior block slidably coupling with the two lengths of interlocking teeth, the sliding channel sliding along the lengths of interlocking teeth to facilitate the engagement and disengagement thereof;

a pivotal handle coupled with the sliding channel.

5,836,059
INVISIBLE ZIPPER WITH OPEN-END

Roger C. Y. Chung, Hsin-Chuan, Taiwan, assignor to Keen Ching Industrial Co., Ltd., Taipei Hsien, Taiwan
Filed Jul. 16, 1997, Ser. No. 895,037
Int. Cl.^{6} A44B *19/00*
U.S. Cl. 24—432 **1 Claim**



1. An open end invisible zipper comprising:

a) first and second chain tapes each having chain teeth engageable with chain teeth of the other chain tape and a rubberized fabric end portion;

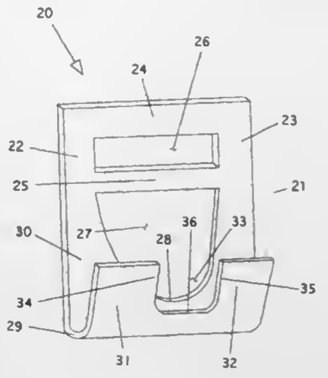
b) a tape hook member fixedly attached to the rubberized fabric end portion of the first chain tape, the tape hook member having an end and a side portion, a notch extending inwardly from the end and a hook extending outwardly from the side portion whereby the notch enables resilient displacement of the hook relative to the tape hook member;

c) an inserting pin fixedly attached to the rubberized fabric end portion of the second chain tape; and,

d) a box having a hollow rectangular configuration with an end wall and a partition wall within the hollow box spaced from the end wall whereby insertion of the tape hook member into the box on a first side of the partition wall causes the hook to engage the partition wall such that the end of the tape hook member is in contact with the end wall of the box to immovably attach the box to the first chain tape.

5,836,060
TRUCK STRAP FASTENER ADAPTED FOR EITHER HOOK OR FLAT IRON ATTACHMENT

Grant Profit, 113 Quigley Dr., Cochrane AB, Canada, T0L 0W4
Filed Jan. 23, 1997, Ser. No. 787,530
Int. Cl.^{6} A44B *13/00*
U.S. Cl. 24—698.2 **1 Claim**



1. A fastener for connecting a tie-down strap to a trailer, comprising:

(A) a body, defining a first hook opening and a strap opening, the body comprising:

(a) generally parallel left and right side elements a spaced distance apart, defining the first hook opening centrally located between the left and right side elements;

(b) an upper cross member, connecting the left and right side elements;

(c) a lower cross member, parallel to the upper cross member, connecting the left and right side elements, whereby the straps opening is a single elongate horizontally oriented strap opening defined within the body, and is bounded by the upper and lower cross members and by the left and right side elements and whereby the strap opening is adapted for attachment to the tie-down strap; and

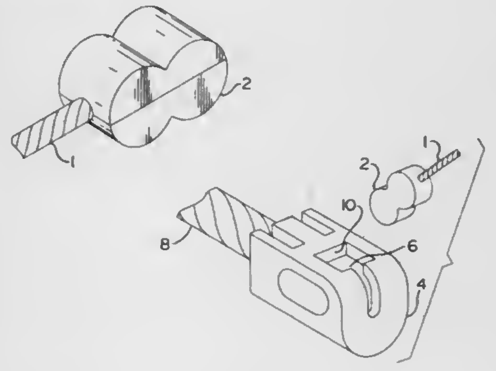
(d) a hook support rim adjacent to the first hook opening;

B) a curved base, attached to the body, defining a hook support edge; and

C) a pair of prongs, extending from the curved base, the pair of prongs and the hook support edge defining a second hook opening, wherein the first and second hook openings are in alignment, together defining a hook receiving passage in a medial location within the fastener, and wherein the pair of prongs together with the body defining a flat iron receiving channel, the pair of prongs comprising generally straight left prong and right prongs.

5,836,061
CABLE END ANCHORING NIPPLE AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Gilbert Castillo, Dublin, and Masahiro Izumi, Westerville, both of Ohio, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 12, 1997, Ser. No. 900,375
Int. Cl.^{6} F16G *11/00*
U.S. Cl. 24—702 **19 Claims**



1. An anchoring structure for a cable end, comprising:

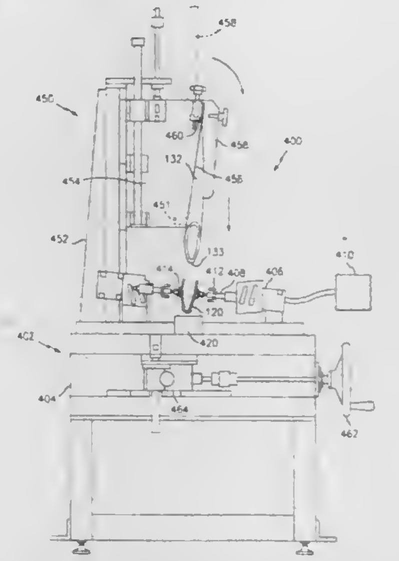
a securing body having a recess defined therein and having an opening defined through an outer surface thereof and extending into said recess;

an anchoring nipple for being fixed to the cable end and fitted into the recess of the securing body through said opening; and

said nipple comprising a unitary member with substantially cylindrical half portions joined abuttingly side-by-side such that the unitary member is substantially 8-shaped when viewed toward ends of said substantially cylindrical half portions.

5,836,062
APPARATUS FOR ASSEMBLING A HELICOPTER MAIN ROTOR BLADE SUBASSEMBLY

Kevin P. Leahy, Naugatuck; Corey D. Jones, Prospect, and David A. Kovalsky, Huntington, all of Conn., assignors to Sikorsky Aircraft Corporation
Filed Apr. 16, 1997, Ser. No. 843,527
Int. Cl.^{6} B23P *15/00*
U.S. Cl. 29—23.51 **9 Claims**



1. An apparatus for assembling a helicopter main rotor blade subassembly which includes a lower airfoil skin, a core, an upper airfoil skin, and a spar assembly having a tip end and a root end, said apparatus comprising:

(a) a lower assembly comprising

a base having a contoured upper airfoil nest, said contoured upper airfoil nest having a root end and a tip end,

first and second guide ramps disposed proximal to said contoured upper airfoil nest, said first guide ramp being disposed proximal to said root end, and at said second guide ramp being disposed proximal to said tip end, and

a plurality of leading-edge pusher cams disposed proximal to said contoured upper airfoil nest;

(b) an upper assembly configured for mating with said lower assembly comprising a support structure and a flexible impervious membrane supported by said support structure; and

(c) said flexible impervious membrane and said contoured upper airfoil nest defining a molding cavity therebetween upon mating of said upper assembly to said lower assembly.

5,836,063
METHOD FOR PRODUCING CAPACITIVE CERAMIC ABSOLUTE PRESSURE SENSORS SORTED IN ZERO-POINT LONG-TERM STABILITY DEFECT CLASSES

Frank Hegner, and Lukas Klausmann, both of Lörrach, Germany, assighors to ENVEC Mess- und Regeltechnik Gmbh + Co., Weil am Rhein, Germany
Filed Mar. 5, 1997, Ser. No. 811,708
Claims priority, application European Pat. Off., Mar. 23, 1996, 96104655
Int. Cl.^{6} H01G *7/00*
U.S. Cl. 29—25.42 **8 Claims**

1. A method for producing capacitive alumina-ceramic absolute pressure sensors sorted in high-precision zero-point long-term stability defect classes which comprises the following steps:

forming a disk-shaped substrate having an annular first electrode near the edge of the substrate and a circular second electrode near the center of the substrate, the first electrode being electrically insulated from the second electrode,

forming a diaphragm having a third electrode;

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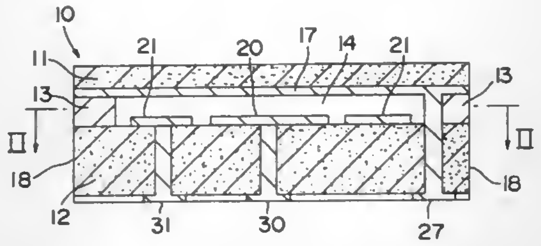


forming an absolute pressure sensor by tightly joining the outer edge of the substrate to the outer edge of the diaphragm using an active brazing ring, a chamber being formed between the substrate and the diaphragm, the first electrode facing the third electrode making a virtually pressure independent reference capacitance, and the second electrode facing the third electrode making a pressure-dependent capacitance;

determining a measured-value span for the absolute pressure sensor;

determining a first zero value for the absolute pressure sensor in a first condition having a first gas at a first temperature and under a near-vacuum pressure using a high-precision capacitance zero-point measuring device having a guaranteed zero-point measuring error;

storing the absolute pressure sensor in a second condition having at least one of a second gas, a second temperature and a second pressure, the second gas having a lower molecular weight than the first gas, the second temperature being greater than normal room temperature, the second pressure being greater than normal atmospheric pressure;

after the storing step, determining a second zero value for the absolute pressure sensor in the first condition using the high-precision capacitance zero-point measuring device;

calculating a pressure sensor ratio by dividing the difference between the first zero value and the second zero value by the measured-value span of the absolute pressure sensor;

calculating a reference ratio by dividing the guaranteed zero-point measuring error of the high-precision capacitance zero-point measuring device by the measured-value span of the absolute pressure sensor;

selecting a minimum value which is greater than the reference ratio;

comparing the pressure sensor ratio to the minimum value; and

classifying the absolute pressure sensor into the high-precision zero-point long-term stability defect classes based on the comparison between the pressure sensor ratio and the minimum value.

5,836,064
MACHINING CENTER

Hans-Henning Winkler, Tuttlingen, and Karl Deufel, Kolbingen, both of Germany, assignors to Chiron-Werke GmbH & Co. KG, Tuttlingen, Germany

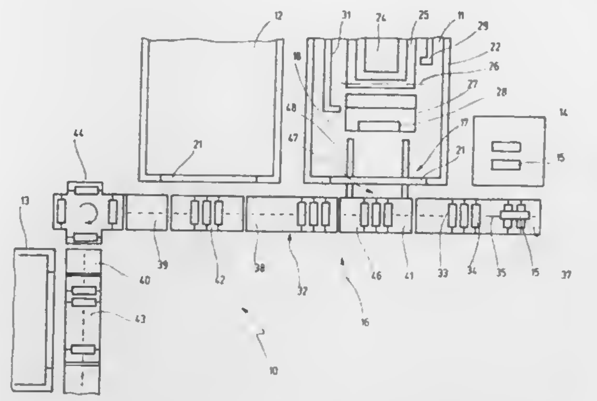
Filed Feb. 21, 1997, Ser. No. 804,308

Claims priority, application Germany, Mar. 1, 1996, 196 07 782.6

Int. Cl.⁶ B23Q *7/00*

U.S. Cl. 29—33 P **17 Claims**

1. A machining center comprising: a plurality of machine tools arranged along a track, each machine tool having a working space and a receptacle arranged within said working space for receiving workpieces to be machined, said working space being accessible through a loading opening for exchanging workpieces and closed off by an operator door, and a loading system for transporting said workpieces between individual ones of said machine tools, said loading system comprising a transport track, arranged on the machine tools, for manually moving the workpieces from one machine tool to the next, wherein at least some of the machine tools perform different machining operations in succession on the same workpiece, and wherein the transport track has stationary sections which in each case connect two adjacent machine tool to one another, as well as displaceable sections that are arranged, transversely displaceably, in front of an operator door in such a way that they can be slid through the loading opening into the workspace.



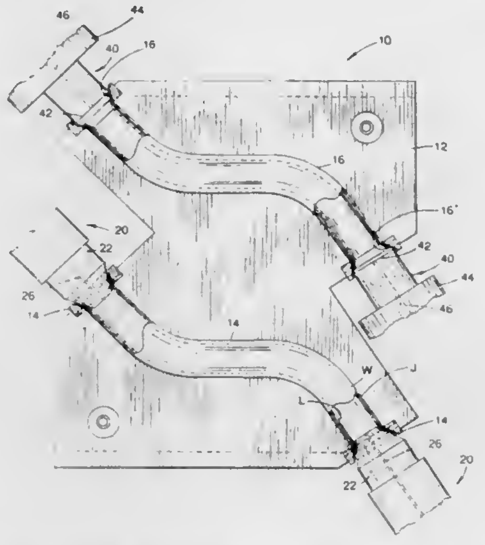
5,836,065
EXTENDED JACKET END, DOUBLE EXPANSION HYDROFORMING

James R. Dehlinger, Ada; Roger A. Crawford, Muskegon; Wallace J. Poole, Fremont; Robert A. Shaffer, Comstock Park, and Donald R. VandePolder, Grand Rapids, all of Mich., assignors to Benteler Automotive Corporation, Grand Rapids, Mich.

Division of Ser. No. 522,172, Aug. 31, 1995, Pat. No. 5,673,470. This application Sep. 26, 1996, Ser. No. 721,548

Int. Cl.⁶ B23P *23/00;* **B21D** *26/02*

U.S. Cl. 29—33 T **3 Claims**



1. Hydroforming apparatus for forming a dual wall air gap conduit having an inner wall liner and an outer wall jacket, said liner and jacket having adjacent ends with at least one jacket end extending axially beyond the adjacent liner end, said apparatus comprising:

a mold defining a first cavity having ends, at least one end of which has an outwardly flared outer support;

a pair of end closures adjacent said first cavity ends, at least the one end closure adjacent said flared outer support being configurated to cooperate with said flared outer support to squeeze and seal said adjacent ends of said liner and jacket during hydroforming;

a first hydroforming inlet orifice in said at least one end closure to said mold first cavity for entry of and pressurization of hydroforming fluid into a liner of a workpiece for expansion of both the liner and jacket;

a mold defining a second mold cavity having ends, at least one end of which has an outwardly flared anvil;

a second pair of end closures adjacent said second cavity ends, at least one of said second pair of end closures and said flared anvil being dimensioned and configured to be cooperative for squeezing and sealing the flared end of just said workpiece jacket and not said liner, thereby forming a sealing shoulder having a diameter radially and axially offset from the adjacent liner end;

a second hydroforming orifice in said at least one end closure to said mold second cavity for entry of and pressurization of hydroforming fluid into said liner and between said liner and said jacket for expansion of said jacket and not said liner.

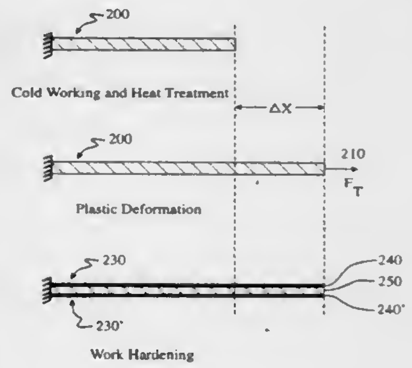
5,836,066
PROCESS FOR THE PRODUCTION OF TWO-WAY SHAPE MEMORY ALLOYS

Richard B. Ingram, Aurora, N.Y., assignor to Innovative Dynamics, Inc., Ithaca, N.Y.

Filed Jul. 22, 1996, Ser. No. 681,028

Int. Cl.⁶ B21C *37/00*

U.S. Cl. 29—90.7 **30 Claims**



1. A method for producing a two-way shape memory alloy element comprising the steps of:

treating a shape memory alloy element to exhibit a one-way memory effect, thereby creating a one-way shape memory alloy element having limits in its ability to recover from a deformed shaped if heated above its transformation temperature;

deforming said one-way shape memory alloy element substantially to the limits of its ability to recover its shape; and

subsequent to said deforming step. work hardening a portion of said deformed one-way shape memory alloy element, thereby converting a region of said work hardened portion into an elastic region which counteracts the one-way shape memory effect and creating a two-way shape memory alloy element.

5,836,067
TOOL FOR REMOVING HUB ASSEMBLIES FROM OUTBOARD STERN DRIVE ENGINES

Walter D. Cochran, 5449 Frazier Rd., Buford, Ga. 30518

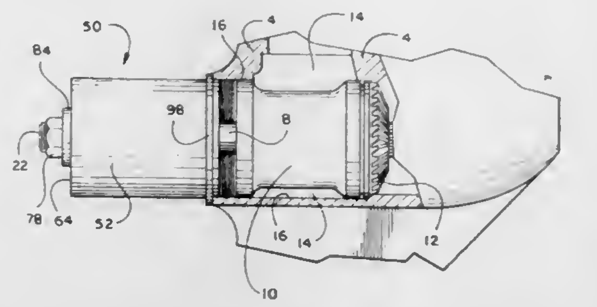
Filed Aug. 22, 1996, Ser. No. 701,474

Int. Cl.⁶ B23P *19/04*

U.S. Cl. 29—263 **15 Claims**

1. A tool for removing a hub assembly from a chamber in a gear housing portion of an outboard engine, comprising:

a body having a first end, a second end, a cavity disposed between the first and second ends and a body outer surface, the first end having a first end surface to engage a bearing carrier of the hub assembly, the second end having a face, the face having a bore in general axial alignment with the cavity;



an annular flange mounted to the body outer surface proximate the first end for seated engagement over an existing annular opening from the chamber;

shaft engagement means congruent with the bore for engaging and preventing rotational movement of a shaft of the hub assembly that extends through both the opening and the bore and protrudes beyond the face; and

a nut to simultaneously engage the face and a threaded end of the shaft to impart longitudinal outward movement of the hub assembly as the nut is appropriately rotated about the shaft until the bearing carrier engages the first end surface.

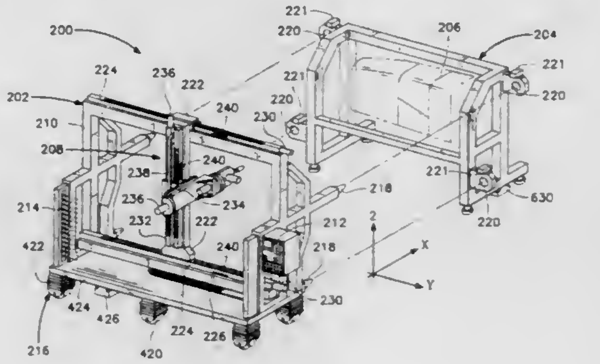
5,836,068
MOBILE GANTRY TOOL AND METHOD

Nicholas George Bullen, Oxnard, and Frank R. Chang, Cerritos, both of Calif., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Apr. 14, 1997, Ser. No. 834,148

Int. Cl.⁶ B23Q *39/00;* **B23P** *23/06*

U.S. Cl. 29—430 **33 Claims**



1. A mobile tool positioning system, comprising:

at least one support assembly located adjacent a workpiece, said at least one support assembly including at least one engager;

a mobile multi-axis numerical controlled robotic tool having at least one proximity sensor removably engaged to said at least one engager, wherein said mobile tool is detachably coupled to said at least one support assembly and transportable between at least one support assembly and another support assembly with another workpiece for performing tooling operations on each respective workpiece; and

a multi-movement control device coupled to said mobile tool;

wherein at least one of the support assembly and the mobile tool includes a self leveler.

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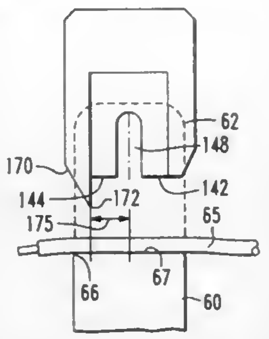
5,836,069
IMPACT TOOL HEAD HAVING CUTTING KNIFE INTEGRALLY MOLDED WITH WIRE-INSERTION BLADE

Michael M. Fallandy, Ventura, and Edward J. Zoiss, Moorpark, both of Calif., assignors to Harris Corporation, Melbourne, Fla.
Filed Jan. 29, 1996, Ser. No. 754,021
Int. Cl.^{6} B23P *23/00*
U.S. Cl. 29—566.4 **13 Claims**

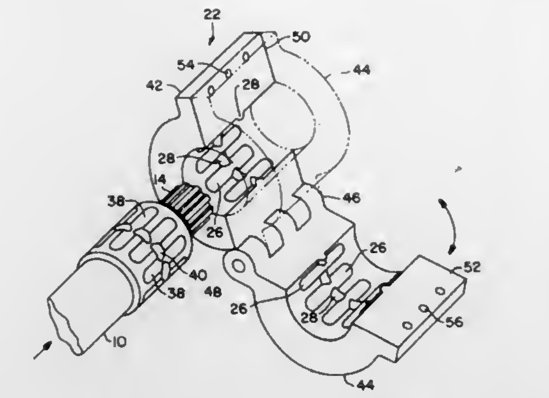


1. A wire-insertion and cutting head for a craftsperson's impact tool comprising a plurality of unitary wire-insertion and cutting blade elements installed in a support member, each unitary wire-insertion and cutting blade element having both a wire-insertion blade and a cutting knife edge formed in a single continuous element, thereby preventing play between the insertion blade and the knife edge, and wherein said wire-insertion blade has first and second tines which are solid with and adjoin said cutting knife edge and have thickness less than the thickness of said cutting knife edge.

5. A wire-insertion and cutting head for a craftsperson's impact tool comprising a plurality of unitary wire-insertion and cutting blade elements installed in a support member, each unitary wire-insertion and cutting blade element having both a wire-insertion blade and a cutting knife edge formed in a single continuous element, thereby preventing play between the insertion blade and the knife edge, and wherein said wire-insertion blade has first and second tines which are solid with and adjoin said cutting knife edge and have thickness less than the thickness of said cutting knife edge, and wherein said unitary wire-insertion and cutting blade element comprises a generally U-shaped outer cutting blade portion surrounding a reduced thickness interior wire-insertion blade portion, said generally U-shaped outer cutting blade portion having a first leg portion, which adjoins a first blade tine of said wire-insertion blade portion and terminates at a generally planar end face, coplanar with an end face of a second blade tine, said first and second blade tines being spaced apart from one another by a slot therebetween, and a second leg portion adjoining said second blade tine, and protruding beyond said planar end faces of said tines in the form of a tapered cutting surface portion, that terminates at a knife-edge.

5,836,070
METHOD AND FORMING DIE FOR FABRICATING TORQUE JOINTS

Aldo Arena, Smithtown, N.Y., assignor to Northrop Grumman Corporation, Los Angeles, Calif.
Continuation-in-part of Ser. No. 226,720, Apr. 12, 1994, abandoned. This application May 29, 1996, Ser. No. 655,063
Int. Cl.^{6} B21D *39/00;28/18*
U.S. Cl. 29—523 **24 Claims**



7. A method of fabricating a torque joint between two tubular members having one end of one tubular member inserted into an end of the other tubular member to provide an overlapping region between the tubular members; comprising the steps of:

(a) encompassing the overlapping region of said tubular members with an annular die having an inner cylindrical surface facing the outer surface of said overlapping region, said annular die comprising a plurality of mating die sections hingedly interconnected to enable insertion of said tubular members and extraction thereof in the open position of said die sections, said inner surface of said annular die having a plurality of circumferentially spaced axially extending recesses and at least one radial recess extending radially outwardly so as to enable said inner surface to contact the outer circumferential surface of said tubular members;

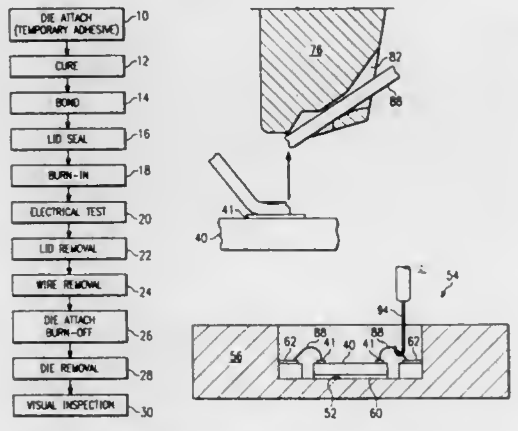
(b) inserting an electrical coil member which is connected to a source of electrical energy into said tubular members so as to extend into said overlapping region within the confines of said annular die;

(c) applying an electrical current to said coil member by said source of electrical energy so as to impart an electromagnetic force to the interior of said tubular members in said overlapping region by said coil member to generate a deformation force expanding said tubular members radially outwardly within said overlapping region so as to impress said pattern of recesses on said inner die surface onto said tubular members to produce a corresponding pattern of axial and radial outwardly expanded grooves therein forming said torque joint; and

(d) opening the hingedly interconnected mating die sections upon completion of the formation of said grooves so as to facilitate extraction of said torque joint from said annular die.

5,836,071
METHOD TO PRODUCE KNOWN GOOD DIE USING TEMPORARY WIRE BOND, DIE ATTACH AND PACKAGING

Robert J. Falcone, Odessa, and Stephen R. Martin, Midland, both of Tex., assignors to Texas Instrument Incorporated, Dallas, Tex.
Filed Dec. 26, 1996, Ser. No. 777,844
Int. Cl.^{6} H05K *13/00;* **G01R** *31/02*
U.S. Cl. 29—593 **11 Claims**



1. A method for temporarily packaging a semiconductor die, comprising the steps of:

attaching the semiconductor die to a die support in a package housing with an adhesive;

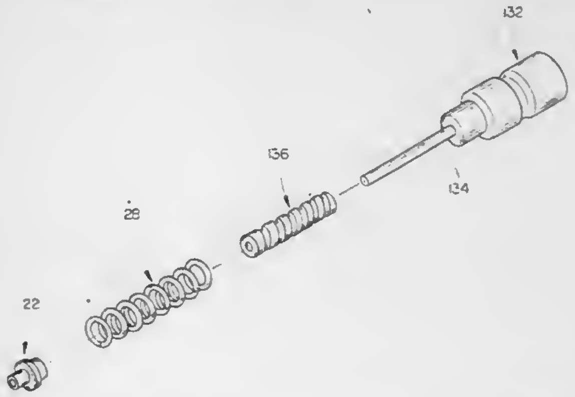
forming an electrical connection between at least one conductor within the package housing and a corresponding bond pad on the die by attaching a wire to the at least conductor and the corresponding bond pad;

breaking the electrical connection between the at least one conductor within the package housing and the corresponding bond pad by disconnecting the wire from the bond pad;

exposing the adhesive to heat to volatilize the adhesive sufficiently to permit the die to be picked up from the die support.

5,836,072
METHOD OF ASSEMBLING AN ANTENNA AND OVER-MOLDING THE SAME WITH A THERMOPLASTIC MATERIAL

Jonathan Lee Sullivan, 3733 "C" St., Lincoln, Nebr. 68510; Douglas McKeown, 2021 S. 35th St., Lincoln, Nebr. 68506; Glen A. Wilcox, Box 129, Ceresco, Nebr. 68017, and William P. Hayes, Lot S-1145 Woodcliff, Fremont, Nebr. 68025
Filed Jul. 27, 1995, Ser. No. 508,176
Int. Cl.^{6} H01P *11/00*
U.S. Cl. 29—600 **5 Claims**



1. The method of assembling an antenna and over-molding the same with a thermoplastic material, comprising the steps of:

providing an elongated metal rod, metal fitting and elongated helical metal spring;

said metal rod having first and second ends;

said helical spring having first and second ends;

securing the said metal fitting to said first end of said metal rod;

securing said first end of said spring to said metal fitting to create a first sub-assembly;

placing said first sub-assembly into a first injection molding tool, said first injection molding tool having a first elongated cavity for receiving said metal rod therein and a second cavity for receiving said spring;

introducing a flowable thermoplastic material into said first and second cavities of said first injection molding tool to cover substantially all of said metal rod, to cover said metal fitting, and to cover the exterior of said spring except for said second end thereof;

centering said metal rod in said first elongated cavity during the injection of said thermoplastic material therein;

centering said helical spring in said second cavity during the injection of said thermoplastic material therein;

maintaining the spring pitch distance of said spring during the injection of said thermoplastic material into said second cavity;

allowing the thermoplastic material to cure for a predetermined length of time;

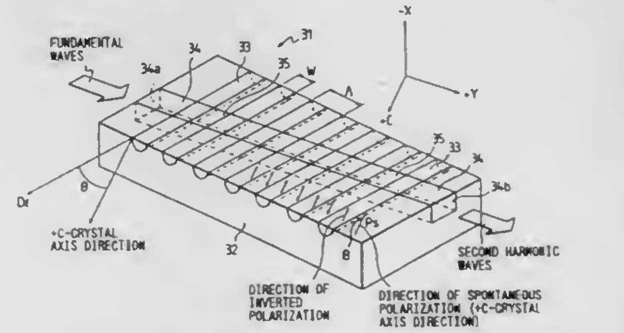
removing the over-molded first sub-assembly from said first injection molding tool;

placing said over-molded first sub-assembly into a second injection molding tool, said second injection molding tool having a first cavity formed therein for receiving the over-molded metal rod, a second cavity formed therein for receiving said over-molded spring, and a third cavity located at said second end of said spring;

and introducing a flowable thermoplastic material into said third cavity to fill the interior of said over-molded spring and to create an end cap for the antenna.

5,836,073
METHOD OF MAKING OPTICAL WAVELENGTH CONVERTING DEVICE

Kiminori Mizuuchi; Kazuhisa Yamamoto, and Hisanao Sato, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Division of Ser. No. 387,057, Feb. 10, 1995, which is a continuation of Ser. No. 132,295, Oct. 6, 1993, abandoned. This application Oct. 25, 1995, Ser. No. 548,035
Claims priority, application Japan, Oct. 7, 1992, 4-268388; Jan. 22, 1993, 5-8961
Int. Cl.^{6} H01P *11/00*
U.S. Cl. 29—600 **15 Claims**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FUNDAMENTAL WAVES
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SECOND HARMONIC WAVES
DIRECTION OF INVERTED POLARIZATION
DIRECTION OF SPONTANEOUS POLARIZATION (+C-CRYSTAL AXIS DIRECTION)

1. A manufacturing method of an optical wavelength converting device, comprising the steps of:

preparing a ferroelectric substrate having an upper surface of which a normal line is inclined to a C-crystal axis toward an X–Y crystalline plane defined as (001) crystalline plane in Miller indices, spontaneous polarization of the ferroelectric substrate being directed toward a +C-crystal axis direction:

arranging first masks on the upper surface of the ferroelectric substrate at regular intervals;

immersing the ferroelectric substrate with the first masks in a phosphoric acid solution to exchange positive ions of the ferroelectric substrate not covered with the first masks for H^+ ions of the phosphoric acid solution, a plurality of proton exchange regions arranged at the regular intervals being formed in an upper region of the ferroelectric substrate not covered with the first masks;

thermally processing the ferroelectric substrate and the proton exchange regions to diffuse the H^+ ions densified in the proton exchange regions into the ferroelectric substrate at a first diffusion speed and diffuse heavy ions of the ferroelectric substrate into the proton exchange regions at a second diffusion speed lower than the first diffusion speed, the proton exchange regions being charged with negative electricity, the ferroelectric substrate surrounding the proton exchange regions being charged with positive electricity, and an electric field having a component directed in a –C-crystal axis direction being induced because of a difference in electricity between the proton exchange regions and the ferroelectric substrate to form inverted-polarization kernels having inverted polarization directed in the –C-crystal axis direction in boundary regions between the proton exchange regions and the ferroelectric substrate;

continuing to thermally process the ferroelectric substrate and the proton exchange regions to grow the inverted-polarization kernels, the proton exchange regions and the ferroelectric substrate positioned under the proton exchange regions being changed to a plurality of inverted-polarization regions arranged at the regular intervals of which inverted polariza-

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tion is directed in the –C-crystal axis direction opposite to the C-crystal axis direction; and

forming an optical waveguide which crosses alternate rows of the inverted-polarization layers and the ferroelectric substrate positioned between the inverted-polarization layers, fundamental waves transmitting through the alternate rows of the optical waveguide being converted into second harmonic waves, and a refractive index of the optical waveguide being higher than that of the ferroelectric substrate to confine the fundamental and second harmonic waves in the optical waveguide.

5,836,074

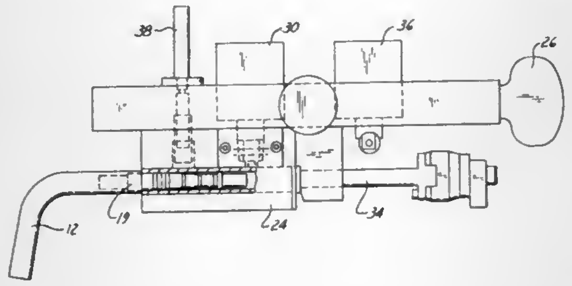
APPARATUS FOR INSERTING A VALVE INTO AN ORIFICE TUBE

Robert John Hutter, Plymouth; Mike Heinonen, Brighton, and Atul Natverial Sheth, Novi, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 3, 1997, Ser. No. 808,774

Int. Cl.^{6} B23P *19/04;21/00*

U.S. Cl. 29—714 **1 Claim**



1. An evaporator orifice tube check valve inserting tool, comprising:

a housing including means for receiving an evaporator orifice tube, said means comprising an evaporator orifice tube receiving channel;

an evaporator orifice tube detecting sensor for determining when the evaporator orifice tube is received in the evaporator orifice tube receiving channel;

a holding member disposed on said housing for releasably engaging the evaporator orifice tube when the evaporator orifice tube is seated in said evaporator orifice tube channel;

an evaporator orifice tube check valve press pin for inserting said evaporator orifice tube check valve into said evaporator orifice tube to a predetermined location, said press pin comprising a pneumatically activated cylinder operative to engage said evaporator orifice tube check valve and insert the evaporator orifice tube check valve into the evaporator orifice tube a predetermined distance;

evaporator orifice tube check valve location means for determining the location of the evaporator orifice tube check valve within the evaporator orifice tube, said means comprising a pressure responsive switch for measuring the amount of pressure applied against said press pin;

a limit switch disposed on said housing for limiting the travel of said pneumatically activated cylinder into said evaporator orifice tube;

an evaporator orifice tube marker disposed in said evaporator orifice tube channel of said housing for marking the evaporator orifice tube only if the evaporator orifice tube check valve is at said predetermined location; and

an evaporator orifice tube check valve signal generating device for signaling an operator when an evaporator orifice tube check valve is improperly located within said evaporator orifice tube.

5,836,075

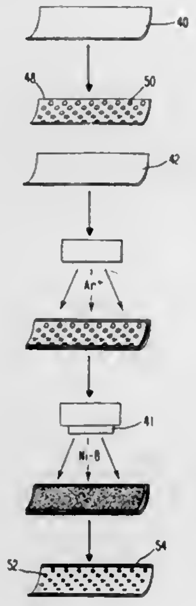
PROCESS FOR FORMING COMBUSTION TURBINE COMPONENTS BY TRANSIENT LIQUID PHASE BONDING

Thomas John Fitzgerald, Longwood, and Thomas Walter Zagar, Winter Springs, both of Fla., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 31, 1996, Ser. No. 775,822

Int. Cl.^{6} B23P *15/00*

U.S. Cl. 29—889.2 **17 Claims**



1. A process for constructing a component of a combustion turbine from a plurality of component sub-structures, each said sub-structure comprising a substrate material, and each said sub-structure having at least one mating surface, said process comprising the steps of:

(a) machining said mating surface of each said sub-structure to remove oxide therefrom;

(b) masking the mating surface of the sub-structure assembly to define an area of desired contact between sub-structures;

(c) applying a layer of bond material on said defined area of said mating surface of at least one of said sub-structures by sputter deposition, said bond material having a melting point depressant therein having a melting point temperature;

(d) assembling each said sub-structure to form said component by positioning opposing mating surfaces of each said sub-structure into contact with each other with said layer of bond material disposed between the opposing mating surfaces; and

(e) exposing the sub-structure assembly to an environment having a temperature higher than said melting point temperature, whereby said melting point depressant diffuses into said substrate material of said sub-structure assembly and said bond material solidifies to form a bond between opposing mating surfaces of said sub-structure assembly.

5,836,076

ALIGNING SYSTEM AND MACHINE FOR A DOUBLE ENVELOPING SPEED REDUCER

Oprea Duta, Clayton, and Randy R. Prom, St. Charles, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

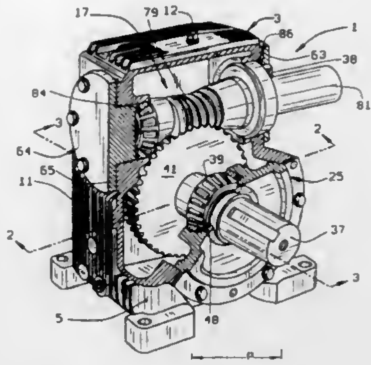
Filed Nov. 7, 1996, Ser. No. 745,173

Int. Cl.^{6} B23Q *17/00;* **G01M** *13/02;* **F16H** *57/02*

U.S. Cl. 29—893.1 **14 Claims**

1. A method of assembling a double enveloping speed reducer assembly; the speed reducer assembly including:

a housing having a front wall, a back wall, side walls, a top and a bottom; said walls, top and bottom defining a chamber;



a worm gear bracket on one of said housing walls, said worm gear bracket defining a first worm gear bearing shoulder; a second worm gear bearing shoulder on an opposite wall of said housing from said first worm gear bearing shoulder;

a worm bracket on another of said housing walls, said worm bracket defining a first worm bearing shoulder; a second worm bearing shoulder being positioned on an opposite wall of said housing from said first worm bearing shoulder;

a worm gear assembly received in said chamber, said worm gear assembly having a worm gear shaft, a worm gear on said worm gear shaft to rotate with said worm gear shaft, and worm gear bearing assemblies through which said worm gear shaft is rotatably journaled; said worm gear bearing assemblies being received in said worm gear bearing shoulders, said worm gear including a worm gear plate and gear teeth formed at a radial edge of said plate, said teeth having a curvature perpendicular to a plane of said gear plate;

a worm assembly received in said chamber, said worm assembly including a worm shaft, an enveloping worm spiral on said shaft, and worm bearing assemblies in which said worm shaft is rotatably journaled, said worm bearing assemblies being received in said worm bearing shoulders; said worm spiral defining a curvature parallel to the axis of said worm shaft; and

a worm gear shim assembly including a first shim and a second shim associated with said worm gear assembly to position said worm gear in said chamber and a worm shim assembly including a third shim associated with said worm assembly to position said worm in said chamber such that centers of curvature of said worm and worm gear are aligned with each other;

said method including predetermining the thickness of said worm shim assembly and said worm gear shim assembly necessary to align centers of curvature of said worm spiral and worm gear when said worm assembly and worm gear assembly are placed in said housing; placing said shim assemblies adjacent surfaces of said housing; mounting said worm gear assembly and said worm gear bracket to said housing; and mounting said worm assembly and said worm bracket to said housing.

5,836,077

METHOD FOR FORMING GROOVES

Motonori Usui, Shimosuwa-machi, and Tetsuya Matsuda, Nagano, both of Japan, assignors to Sankyo Seiki Mfg. Co., Ltd., Nagano-ken, Japan

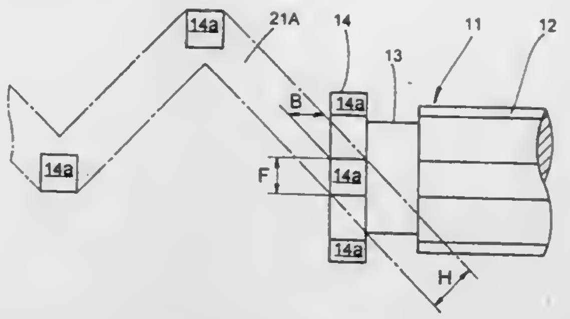
Filed May 5, 1997, Ser. No. 850,964

Claims priority, application Japan, May 21, 1996, 8-149846

Int. Cl.^{6} B23C *3/28;* **F16C** *33/00*

U.S. Cl. 29—898.02 **4 Claims**

1. In a method for forming hydrodynamic pressure-generating grooves, in which a machining portion held by a tool holder is inserted into a circular work-hole, a bearing surface of a bearing member, to form hydrodynamic pressure-generating grooves on the inner surface of said work-hole by relatively and simultaneously moving machining tip portions provided on said machin-



ing portion in the axial and circumferential directions in said work-hole, the improvement comprising the steps of:

providing said machining tip portion with an axial cutting edge, formed in parallel with said axial direction, and a circumferential cutting edge, formed along said circumferential direction; and

moving said machining tip portion relatively and simultaneously in the axial and circumferential directions in said work-hole so that a single hydrodynamic pressure-generating groove can be formed by both said axial cutting edge and said circumferential cutting edge which are formed on one machining tip portion.

5,836,078

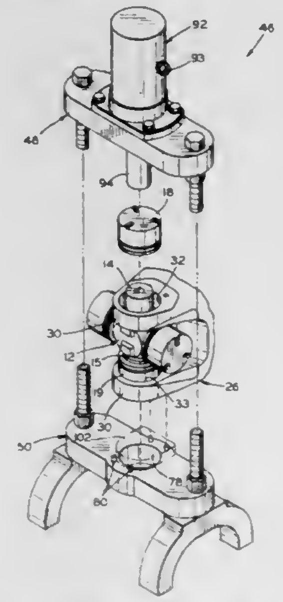
APPARATUS FOR REMOVING OR MOUNTING A BEARING CUP

Albert Aiken, and Johnny N. Smith, both of Toledo, Ohio, assignors to Dana Corporation, Toledo, Ohio

Filed Dec. 26, 1995, Ser. No. 578,275

Int. Cl.^{6} B23P *11/00*

U.S. Cl. 29—898.07 **7 Claims**



1. A method for installing a bearing cup on a universal joint including a cross having first and second trunnions and a yoke having first and second openings formed therethrough, said method comprising the steps of:

(a) providing an apparatus including a base, a support disposed at a distance from the base, and a ram carried on the support and selectively movable toward the base;

(b) positioning the bearing cup adjacent to the base;

(c) positioning the cross such that the second trunnion is aligned with the bearing cup;

(d) positioning the yoke such that the first and second openings are respectively disposed about the first and second trunnions; and

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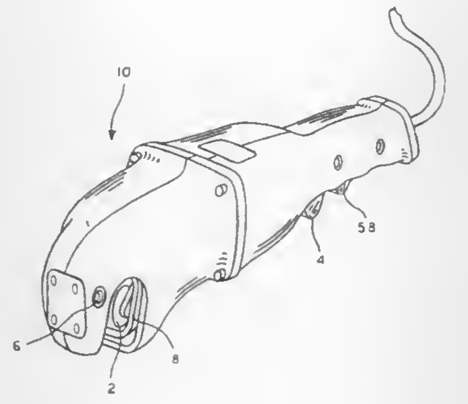
(e) moving the ram into engagement with the yoke so as to move the yoke relative to the base such that the bearing cup is moved into the first opening and about the second trunnion.

5,836,079
PIPE CUTTING TOOL

Michael E. Cronin, 7134 Antioch Rd., Middlegrove, N.Y. 12850, and Frank L. Tavolacci, 100 Myrtle Ave., Hawthorne, N.Y. 10532

Filed Jun. 3, 1996, Ser. No. 655,692
Int. Cl.^{6} B23D *21/08*
U.S. Cl. 30—101 **22 Claims**



1. A pipe cutting device incorporating a C-shaped body rotatably mounted within a main housing, said C-shaped body incorporating within its opening a plurality of pipe support rollers positioned opposing a cutting tool suitably mounted to a self feeding and retracting mechanism operable by a rotational movement of said C-shaped body, with respect to said main housing and about a central axis comprising:

(a) within said C-shaped body two aligned members of said mechanism positioned in tandem, with one or more of said members spirally configured at one end, and the second member attached to the cutting tool suitably positioned on an axis perpendicular to said central axis, so that as one of said members rotates about its axis the second member, attached to said cutting tool, will be advanced radially inward to said central axis thereby advancing the cutting tool into the wall of a pipe;

(b) ratchet teeth on the periphery of said spirally configured member adapted to engage a pawl suitably mounted so as to limit its rotation to one direction and to operatively engage said spirally configured member with a second pawl to rotationally drive said spirally configured member responsive to the rotational movement of said C-shaped body, said second pawl attaching to a longitudinal member positioned perpendicularly to said central axis, protruding from said C-shaped body and operatively following profile of a cam track fixed within said main housing;

(c) means to retract said cutting tool, after said pipe has been cut off, said means being operable after one complete revolution of said spirally configured member whereby as the peak end of said spiral continues to rotate past the peak end of said member attached to said cutting tool said members will be contracted by a biasing means and concurrently said cutting tool will operatively be released to its retracted position;

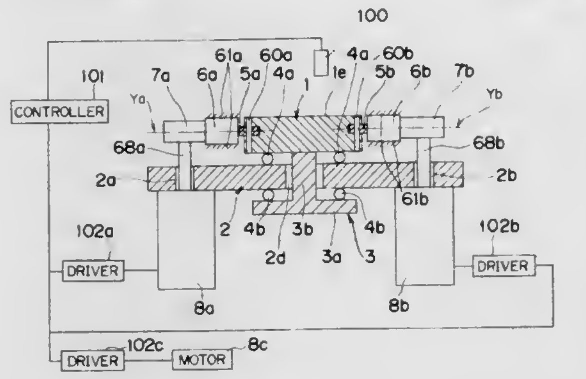
(d) static adjustment means for one or more pipe backup rollers mounted in a slidable member within a passageway located on an axis perpendicular to said central axis, thus enabling said pipe backup support rollers to accommodate a plurality of diametrical pipe sizes, said adjustment means incorporating a pivotally adjustable, predetermined off-set body having a plurality of rotatable support flats joined to a suitable hex socket;

(e) means operatively attached to said main housing for static traversing of said cutting tool so that said tool is traversed from its fully retracted position to the wall of the pipe to be cut.

5,836,080
POSITIONING TABLE

Noriyuki Inagaki, Osaka, and Toru Hattori, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-Fu, Japan

Filed Jan. 3, 1996, Ser. No. 582,314
Claims priority, application Japan, Jan. 12, 1995, 7-003480
Int. Cl.^{6} B23Q *1/25*
U.S. Cl. 33—1 M **20 Claims**



1. A positioning table comprising:

a table member having a load plane;

a supporting device for movably supporting the table member within one plane parallel to the load plane;

first, second, and third slide blocks located around the table member in a freely movable fashion toward and away from the table member, the first and second slide blocks being movable in first and second directions parallel to each other, and the third slide block being movable in a third direction perpendicular to said first and second directions;

first, second, and third rollers projecting from a peripheral edge of the table member and being rotatable about axes perpendicular to said one plane, the first, second, and third slide blocks being pressed into contact with first sides of the corresponding first, second, and third rollers; and

first, second, and third rotary cams abutting against the corresponding first, second, and third slide blocks at sides thereof opposite to said first sides thereof;

wherein the supporting device comprises: a base plate for supporting the table member having the load plane on its upper surface, a regulating device integrally fixed to a lower surface of the table member through the base plate and having a regulating plate facing the base plate at a lower end thereof, and balls interposed between the table member and the base plate and between the base plate and the regulating plate, wherein the base plate is held between the table member and the regulating plate via the balls.

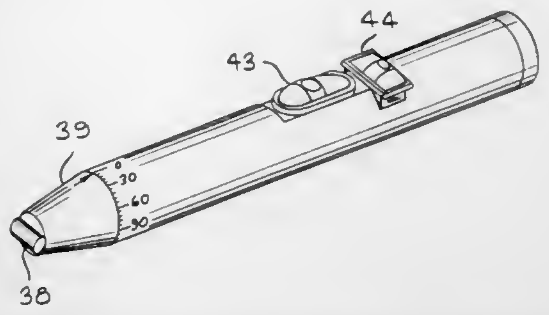
5,836,081
LIGHT BEAM LEVELING MEANS AND METHOD

Steven J. Orosz, Jr., Oregon, Ohio, assignor to Charles F. Schroeder, Toledo, Ohio

Filed May 29, 1996, Ser. No. 654,884
Int. Cl.^{6} F21V *8/00*
U.S. Cl. 33—290 **11 Claims**

1. A portable laser unit for use in aligning spaced points comprising,

a pen-light sized laser and leveling means directly associated therewith for providing a reference for horizontal orientation of the beam projected therefrom,

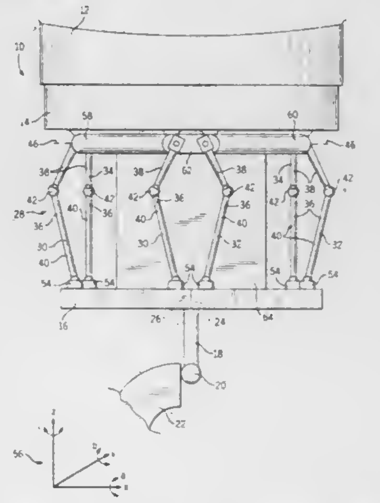


a transparent bar positioned for transmission of the beam of said laser therethrough to convert said beam to a line of light on surfaces to which it is projected.

5,836,082
THREE-AXIS PROBE

Paul C. Sheldon, Mequon, Wis., assignor to Sheldon/Van Someren Inc., Wauwatosa, Wis.

Filed Sep. 27, 1996, Ser. No. 722,364
Int. Cl.^{6} G01B *5/008;5/016*
U.S. Cl. 33—556 **19 Claims**



1. A probe structure for use on a coordinate positioning machine having a moveable arm, the probe structure being designed to restrict unwanted rotational motion of a stylus, comprising:

a base structure configured to permit mounting of the probe to the moveable arm;

a stylus supporting member; and

a linkage assembly comprising a plurality of linkages, each linkage having a pair of parallel, articulated legs connected between the base structure and the stylus supporting member, wherein each articulated leg includes a first end adapted to permit pivotable motion with a single degree of freedom and a second end adapted to permit pivotable motion with at least two degrees of freedom.

5,836,083
REMOTE ELASTIC CENTER MACHINE

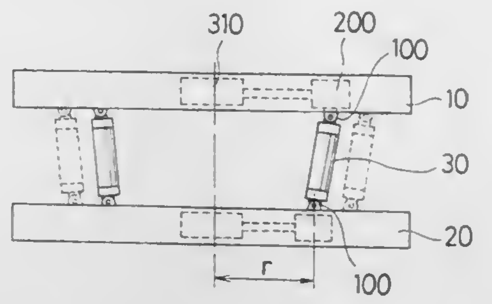
Joo Sangwan, Shochiku-so 1F Room 5 8-36, Ishibashi 4-chome, Ikeda-shi, Osaka 563, Japan

PCT No. PCT/JP95/01638, § 371 Date Apr. 18, 1996, § 102(e) Date Apr. 18, 1996, PCT Pub. No. WO96/05947, PCT Pub. Date Feb. 29, 1996

PCT Filed Aug. 18, 1995, Ser. No. 633,784

Claims priority, application Rep. of Korea, Aug. 19, 1994, 1994 20470

Int. Cl.^{6} G01B *5/25*
U.S. Cl. 33—644 **10 Claims**

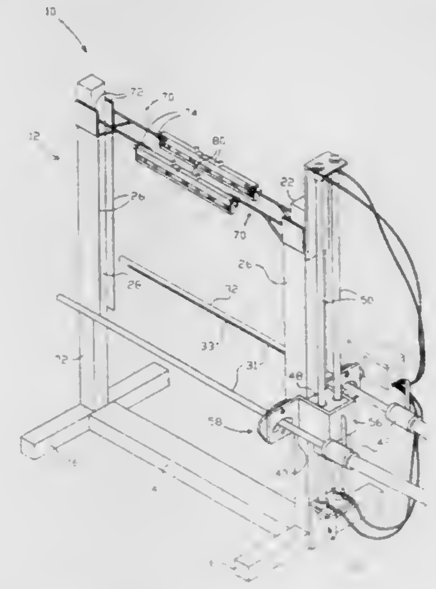


1. A remote compliance center device comprising: an upper structure; a lower structure; a plurality of elastic elements disposed between said upper and lower structures; at least one of upper and lower portions of said respective elastic elements are moveable radially, simultaneously by substantially the same distance in radial directions by mechanical means in at least one of said upper and lower structures to change a position of a compliance center which exists in a central axial direction of said remote compliance center device and to change a stiffness between said upper and lower structures; said mechanical means is a driving which includes: a driving bevel gear which rotates at the center of the remote compliance center device; a plurality of driven bevel gears which are interlocked with said driving bevel gear, each of said driven bevel gears coupled with a corresponding bolt shaft which is screwed into a corresponding slider; and where said plurality of sliders are each pivotably connected to a respective elastic element.

5,836,084
STENCIL DRYER

Robert Jackson, Meridian, and Wallace E. Croghan, Jr., Boise, both of Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 4, 1996, Ser. No. 610,316
Int. Cl.^{6} F26B *25/00*
U.S. Cl. 34—107 **20 Claims**



1. A stencil dryer, comprising:

a. a holder means for holding the stencil;

b. a discharge means for discharging air against a stencil positioned in the holder means; and

c. a driver means operatively coupled to the discharge means for moving the discharge means along substantially the full extent of the stencil.

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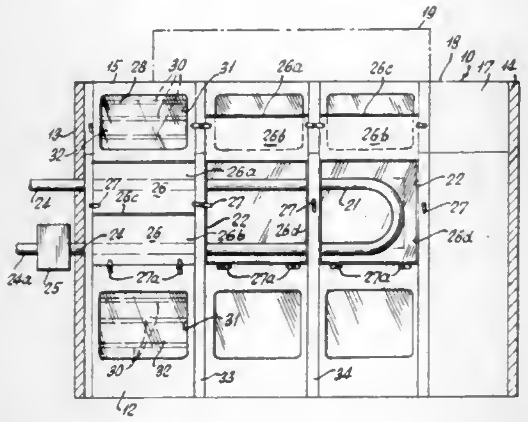
5,836,085
PAINT-SPRAYING AND CURING BOOTH WITH FIRED RADIANT HEATERS

Joshua S. Ben-Ezra, Box 185A Fawn Hill Rd., Tuxedo Park, N.Y. 10987

Filed Jul. 10, 1997, Ser. No. 891,338

Int. Cl.^{6} F26B *3/34*

U.S. Cl. 34—270 **4 Claims**



1. In a paint spraying and paint curing booth comprising a closed ventilated chamber adapted for containment of a vehicle or other article to be painted and provided with an externally mounted radiant heater in an externally closed reflective housing open to said chamber, the improvement comprising at least one panel adapted to form a vapor tight seal between said housing and said chamber in closed position during paint spraying operations, and means for maintaining said panel in open position to provide unobstructed flow of radiant energy from said heat source to said chamber during paint curing operations.

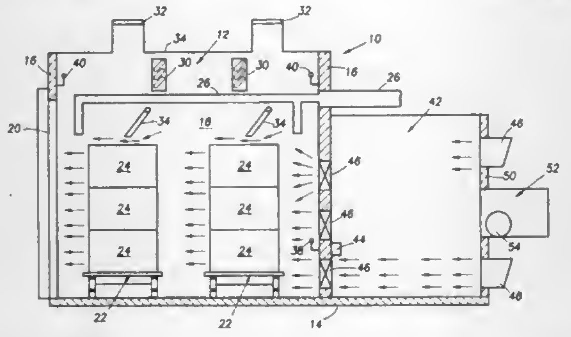
5,836,086
PROCESS FOR ACCELERATED DRYING OF GREEN WOOD

Danny J. Elder, Rt. 5, 110B, Kirbyville, Tex. 75956

Continuation-in-part of Ser. No. 859,848, May 21, 1997. This application Jul. 1, 1997, Ser. No. 886,497

Int. Cl.^{6} F26B *7/00*

U.S. Cl. 34—396 **38 Claims**



35. A process of conditioning wood comprising the following steps:

applying a controlled heating fluid at a temperature between about 120° F. and 190° F. to the wood in a confined zone for a predetermined period of time sufficient to provide a generally uniform heating of the wood, the heating fluid having predetermined moisture content sufficient to maintain substantially the moisture content of wood;

applying a cooling fluid after heating of the wood for substantially surrounding the wood, the cooling fluid having a temperature and humidity substantially less than the temperature and moisture content of the heated wood; and

maintaining the application of the cooling fluid to the wood for a predetermined time period.

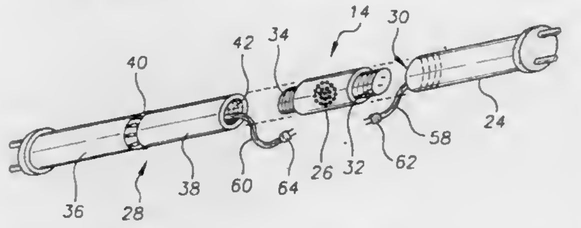
5,836,087
FOOTWEAR DRYER SUPPORT ROD

James E. Wilson, and Barbara M. Wilson, both of 2083 S. Melanie Dr., Homosassa, Fla. 34448

Filed Jun. 17, 1997, Ser. No. 877,156

Int. Cl.^{6} F26B *13/10*

U.S. Cl. 34—528 **20 Claims**



1. A footwear dryer support rod comprising:

an interconnectable rod assembly including a fixed length rod section, a circuit housing rod section, and a telescoping rod section;

an alarm circuit housed within said circuit housing rod section including a detecting circuit and an alarm device circuit, said alarm device circuit including an electrically driven audible output device;

a first moisture probe pair extending outwardly from a first end of said fixed length rod section; and

a second moisture probe pair extending outwardly from a second end of said telescoping rod section.

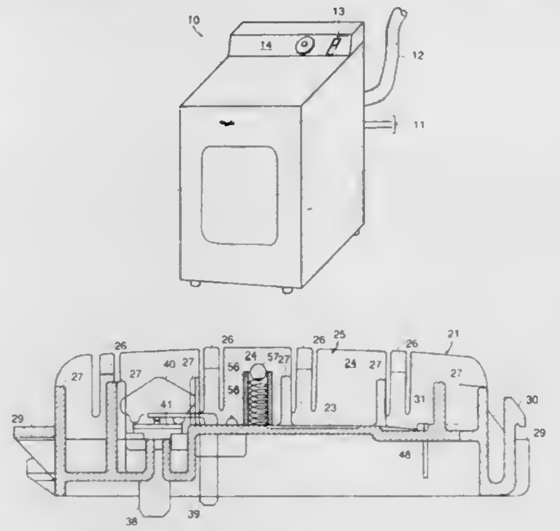
5,836,088
MACHINE CONTROLLING ELECTRICAL CIRCUITRY FOR A CLOTHES DRYER

Charles A. Barney, P.O. Box 114, Stow, Mass. 01775, and James M. Carroll, Jr., 6 Hunting St., Wellesley, Mass. 02181

Filed May 28, 1997, Ser. No. 864,763

Int. Cl.^{6} F26B *13/10*

U.S. Cl. 34—534 **3 Claims**



3. For mounting on a control panel having a generally planar front surface, a machine controlling electrical circuitry comprising a base and an operating lid,

said base including attaching structure for attaching to a generally planar control panel

said base including lid constraining structure and said lid including contrary mating structure, said lid constraining structure and said constraint mating structure engaging to constrain motion of the lid relative to the base to motion with one degree of freedom approximately parallel to a generally planar front surface of a control panel to which the machine is attached by said attaching structure,

said base including range limiting structure and said operating lid including interfering structure, said range limiting structure and said interfering structure impacting at two positions of the operating lid to limit motion of said operating lid to a range of positions,

said machine further comprising an electrical component which assumes different states depending on an actuating mechanical force applied thereto, said electrical component being affixed to said base in an orientation such that the direction of said actuating mechanical force is perpendicular to a generally planar front surface of a panel to which the machine is attached by said attaching structure,

said operating lid having a protrusion extending rearward which engages with said electrical component and applies an actuating force thereto, such force varying with position of said operating lid within said range of motion,

said operating lid including a handle structure shaped to receive forces to move said lid through said range from a hand of an operator.

5,836,089
EXCAVATING EQUIPMENT FITTED WITH SURFACE CLAMPS

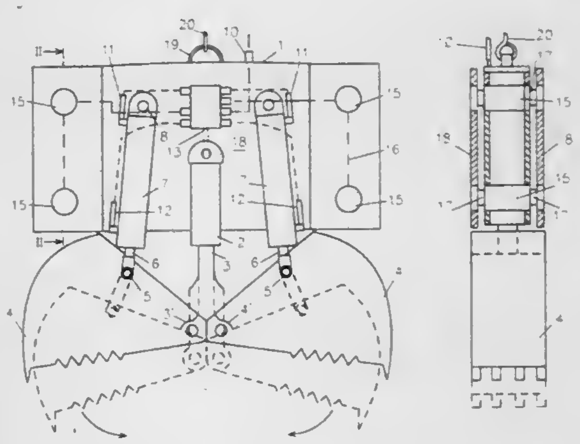
Yitshaq Lipsker, 24 Trumpeldor St., Ramat Hasharon 47264, Israel

Continuation-in-part of Ser. No. 507,259, Aug. 18, 1995, abandoned. This application Oct. 11, 1996, Ser. No. 728,940

Claims priority, application Israel, Feb. 22, 1993, 104820

Int. Cl.^{6} B66C *3/02*

U.S. Cl. 37—186 **17 Claims**



1. Excavating equipment comprising a rigid support structure; surface clamping means articulately mounted on said support structure; excavating means downstream of said surface clamping means in a direction of excavation; said surface clamping means being substantially as wide as said excavating means; urging means for urging the excavation means in the direction of excavation and during excavating; said urging means being connected at one end thereof to the support structure and at an opposed end thereof to said excavating means, power means coupled to said excavating means for operating same and for operating said urging means, said power means being also coupled to said surface clamping means for laterally displacing said clamping means against rigid supporting surfaces so as to consolidate the surfaces to generate a counter-reaction to forces generated by operation of said excavating means; and equipment displacing means coupled to said support structure for displacing said equipment into and out of an excavation.

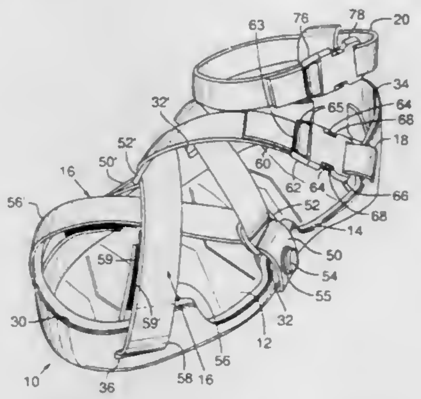
5,836,090
NON-SLIP SANDAL WITH WHOLLY REPLACEABLE PARTS

Douglas N. Smith, Grants Pass, Oreg., assignor to Korkers, Inc., Grants Pass, Oreg.

Filed Nov. 12, 1996, Ser. No. 754,191

Int. Cl.^{6} A43B *3/12;5/00*

U.S. Cl. 36—7.6 **19 Claims**



1. A non-slip sandal for attaching over a shoe having a sole, said sandal comprising:

a soleplate sized to accommodate said sole of said shoe, said soleplate having an upper surface and a bottom surface, said bottom surface having a plurality of threaded nuts molded therein, the soleplate also having forward and rear ends;

at least one upstanding member attached to said soleplate for locating said shoe on said soleplate, the upstanding member being semi-rigid and positioned for preventing the shoe from moving laterally off the forward and rear ends of the soleplate;

means for fastening said soleplate to said shoe comprising a forward strap assembly, said forward strap assembly including two ends that are releasably attached to said upstanding member; and

a rear strap attached to said upstanding member and extending forwardly from said rear end of said soleplate for connecting with said forward strap assembly to secure said sandal on said shoe; and

a plurality of slip-resistant studs, each stud having a threaded shaft protruding therefrom for threading into said nuts in said bottom surface of said soleplate, said studs being removable from said nuts so as to allow replacement of any one of said studs.

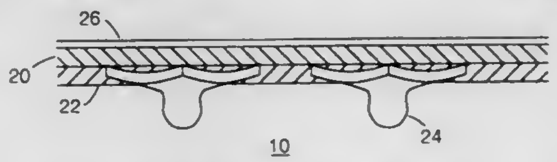
5,836,091
TRACTION ENHANCING ARTICLES OF MANUFACTURE

Michael H. Cook, 224 Farewell, Fairbanks, Ala. 99701

Continuation-in-part of Ser. No. 707,000, Sep. 4, 1996, abandoned. This application Oct. 22, 1997, Ser. No. 956,493

Int. Cl.^{6} A43C *15/00;* **B60C** *11/00;* **A63C** *11/00*

U.S. Cl. 36—59 R **5 Claims**



1. A traction enhancing article of manufacture comprising:

a flexible base, said base having an adhesive layer formed on a first side, said adhesive layer having a plurality of cleats securely embedded therein, said cleats having a polygonal shaped base and a protruding tip, said polygonal shaped base having a generally convex shape and downwardly extending corners with arcuate sides extending between said corners;

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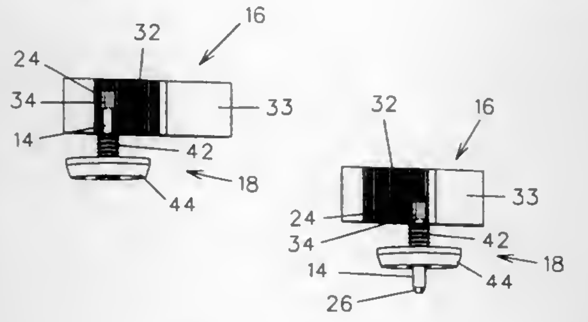
a second layer, said second layer having a plurality of apertures formed therein, the spacing of said apertures corresponding to the spacing of said cleats, the second layer being adhered to said base with said cleats protruding through said apertures;
said polygonal base extending beneath and covered by said second layer.

5,836,092
SPORTS SHOE WITH RETRACTABLE SPIKES

James R. Yarnell, 335 Royal Burgess Dr., Campobello, S.C. 29322

Filed Oct. 16, 1996, Ser. No. 732,635
Int. Cl.^{6} A43C *15/14*
U.S. Cl. 36—61 5 Claims

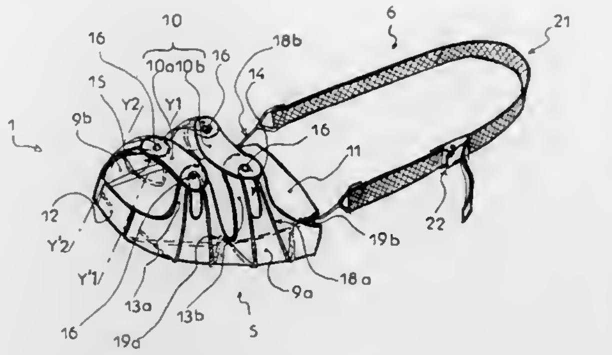


1. A sports shoe having a sole, comprising:
a plurality of spikes mounted in apertures in said sole for movement between a first position extending beyond said sole apertures and a second position retracted within said sole apertures;
a pinion mounted at an end of each of said spikes for engagement with a rack;
said rack slidably mounted in said sole in first and second opposed directions, said rack having a plurality of rack gears thereon for engagement with a corresponding pinion, a movement of said rack in said first direction rotating each said pinion and spike attached thereto in a first direction for said extension of each said spike beyond said sole to said first position, movement of said rack in said second direction rotating each said pinion and spike attached thereto in a second direction for retraction of each said spike within said sole to said second position;
release means for disengaging said pinions from said rack, whereby to allow for removal of said spikes from said sole apertures;
said release means including a plurality of threaded members extending into said sole apertures, each said spike being releasably engageable with a corresponding threaded member.

5,836,093
BINDING FOR RETAINING A SHOE OR BOOT TO A SNOW SHOE

Philippe Gallay, Le Nojak, 74220 La Clusaz, France
Filed Jan. 24, 1997, Ser. No. 788,022
Claims priority, application France, Jan. 26, 1996, 96 01200; Jul. 3, 1996, 96 08558
Int. Cl.^{6} A43B *5/04*
U.S. Cl. 36—125 11 Claims

1. A binding for retaining a boot or shoe which has a toe and a heel on a snow shoe, the binding comprising:
a front retention means for defining a cavity with a rearward opening, the cavity dimensioned for receiving the toe, the front retention means including:
a lower surface,
at least two lateral side walls extending upward from the lower surface,

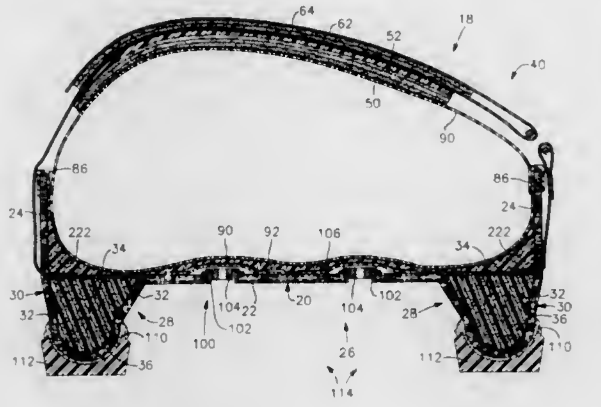


an upper connection means for connecting upper ends of the side walls, and,
a front stop wall, the side walls being articulately connected to the front stop wall for articulation relative to generally vertical axes;
a rear retention means extending rearward from the front retention means for retaining the heel; and,
a contracting means for contracting the cavity defined by the front retention means, the contracting means being connected with the rear retention means such that retaining the heel causes the contracting means to contract the front retaining means around the toe.

3. The binding as set forth in claim 1 wherein the upper connection means includes:
a member connected between the side walls in a sliding relationship with at least one of the side walls.

5,836,094
BICYCLE SHOE INCLUDING UNIT BODY

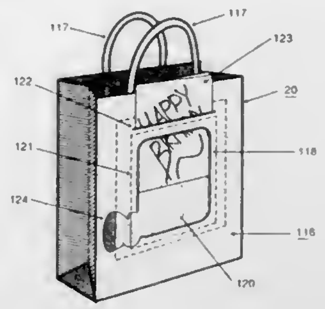
Nicholas H. Figel, Rte. 1, Box 186, Highlands, N.C. 28741
Filed Jun. 2, 1997, Ser. No. 867,371
Int. Cl.^{6} A43B *5/00;5/14*
U.S. Cl. 36—131 15 Claims



1. A cycling shoe comprising:
a rigid unit body including
a sole portion having an intermediate region and a perimeter region, with an integral downwardly-extending ridge structure extending along and defining a substantial portion of said perimeter region, and
an integral upwardly-extending sidewall terminating said sole portion perimeter region and forming a portion of a shoe upper; said unit body sole portion intermediate region including a cleat attachment device; and
further shoe upper components attached to said upwardly-extending sidewall.

5,836,095
DECORATIVE, VISUALLY STIMULATING DISPLAY AND ARTICLE HOLDING SYSTEM

Christopher S. Crowell, 80 Plains Rd., Essex, Conn. 06426
Division of Ser. No. 342,256, Nov. 18, 1994, Pat. No. 5,613,312. This application Mar. 20, 1997, Ser. No. 821,106
Int. Cl.^{6} G09F *3/10*
U.S. Cl. 40—299 9 Claims



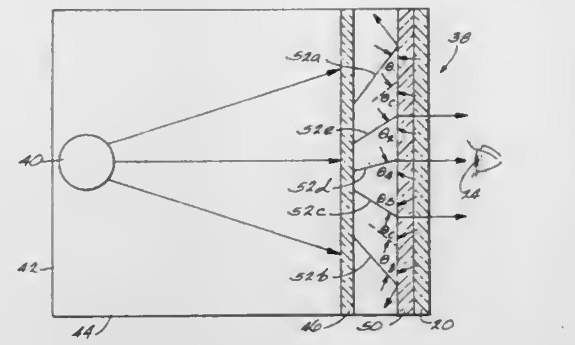
1. A decorative, visually stimulating display and holding system constructed for holding any desired object or gift and being used as a combined display item and greeting card holder, said display and holding system comprising

A. a first and a second panel
  a. positioned in juxtaposed, spaced relationship with each other,
  b. comprising substantially the same overall dimensions, and
  c. said first panel incorporating a cut-out zone formed therein dimensioned for cooperating with a greeting card;
B. a first side panel and a second side panel, each
  a. being in juxtaposed, spaced relationship with each other,
  b. comprising substantially the same overall size and shape,
  c. interconnected with and extending between the first panel and the second panel, and
  d. incorporating fold lines therein for enabling the display and holding system to be easily folded for storage,
C. a bottom panel extending between and being connected with the first and second panel within the first and second side panels, thereby establishing and defining an internal retaining zone within which the desired item or gift can be stored;
D. a first greeting card member movably positionable in juxtaposed, spaced relationship with the cut-out zone of the first panel, and
E. a second card retaining and holding member cooperatively associated with the first panel for enabling said greeting card member to be securely retained in juxtaposed, spaced, relationship with the cut-out zone formed on said first panel; whereby a combined gift retaining and greeting card holding system is achieved which enables any desired greeting card member to be retained and displayed.

5,836,096
APPARATUS FOR ILLUMINATING MEDICAL DIAGNOSTIC IMAGING FILM WITH ENHANCED VIEWABILITY

William R. Brauer, 2420 Pasadena Blvd., Wauwatosa, Wis. 53226
Filed Mar. 4, 1996, Ser. No. 610,218
Int. Cl.^{6} G02B *27/02*
U.S. Cl. 40—361 7 Claims

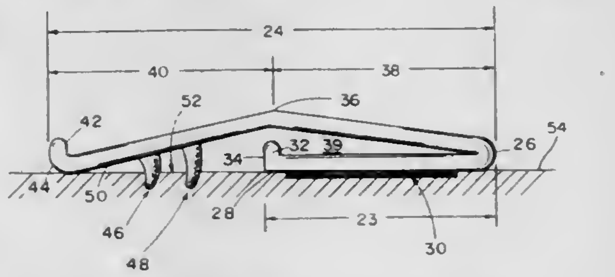
1. Illuminating apparatus comprising:
a medical diagnostic imaging film supported in a specified plane;
means for projecting light comprising first and second portions toward said supported imaging film, said projected light having a first solid angle, said first and second portions including light rays directed at angles relative to said specified plane which are greater than, and less than, a critical angle, respectively; and



light directing film means positioned between said light projecting means and said imaging film for refracting said first portion of projected light so that respective rays of said first portion are converged to lie within a second solid angle which is substantially less than said first solid angle, for directing said refracted first portion to illuminate said imaging film, and for selectively reflecting said second portion of projected light so that said reflected second portion does not illuminate said imaging film.

5,836,097
UNIVERSAL SHELF DIVIDER, LABEL AND SIGN HOLDER SYSTEM

Kirk Lewis, Lee's Summit, Mo.; John Gebka; Michael Brinkman, both of Coral Springs, Fla., and Neil Speed, Nottingham, United Kingdom, assignors to FEMC Ltd., Ft. Lauderdale, Fla.
Filed Apr. 10, 1996, Ser. No. 630,833
Int. Cl.^{6} G09F *3/20*
U.S. Cl. 40—658 12 Claims



1. An elongated universal support element comprising:
a mounting portion and a cover portion each of which has an inner and an outer surface and spaced inner and outer longitudinally extending edges, the spacing between said inner and outer edges of said mounting portion being the width of said mounting portion, the spacing between said inner and outer edges of said cover portion being the width of said cover portion,
said mounting portion and said cover portion being integrally connected to each other along their respective inner edges with their outer edges extending freely,
the width of said cover portion being greater than the width of said mounting portion, whereby said cover portion includes a first part which is connected to, and overlies, said mounting portion with the inner surfaces of said mounting portion and said cover portion facing each other to together define a generally V-shaped channel member, and a second part which extends beyond said outer edge of said mounting portion,
said mounting portion being adapted to be affixed to a mounting surface with its outer surface juxtaposed thereto,
a finger member having a base portion carried by said inner surface of said second part of said cover portion adjacent said outer edge thereof, said finger member having a flexible terminal portion, said finger member having a height between said base portion and said flexible terminal portion greater

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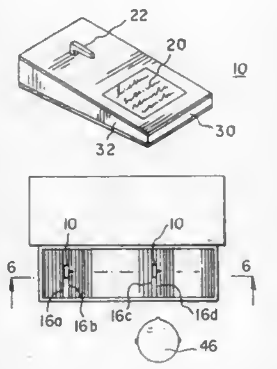
than the distance between said base portion and a plane which is an extension of said outer surface of said mounting portion, whereby said terminal portion of said finger member is adapted to flex when it engages a mounting surface to which said outer surface of said mounting portion is affixed to thereby removably capture portions of an item to be supported by said support element between the mounting surface and said finger member carried by said second part of said cover member,

further including an upwardly extending flange carried by said outer edge of said mounting portion to act as a stop for portions of an item engaged between said second part of said cover portion and the mounting surface.

5,836,098
FILE POSITION LOCATION DEVICE AND METHOD RELATED THERETO

Joseph T. Carney, 111 Hayes Ave., Charleston, W. Va. 25314
Filed Jan. 31, 1997, Ser. No. 791,214
Int. Cl.⁶ G09F *3/16*

U.S. Cl. 40—666 **4 Claims**



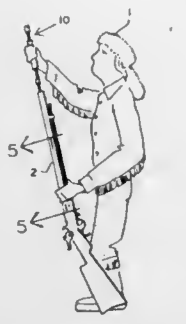
1. A method for locating the position of a file, said method comprising:
(a) storing files in a file storage cabinet having a file drawer and having a metal surface,
(b) providing a file position location device comprising (i) a magnetic substrate, and (ii) a foam wedge adhered to said substrate;
(c) magnetically attaching said device to said cabinet by placing said magnetic substrate into contact with said metal surface,
(d) opening said drawer,
(e) removing a file from said drawer, said file having had a position between two non-removed files,
(f) placing said device in said position between said two non-removed files, wherein said wedge of said device comprises a compressible, elastomeric polymeric foam for permitting compression of said wedge by forces applied by said non-removed files;
(g) closing said drawer,
(h) opening said drawer to replace said file in the position of said device.

5,836,099
ROD ASSEMBLY AND METHOD

Chriss L. Pace, 842 S. Tamela Dr., and Curtis B. Guillory, 910 S. Tamela Dr., both of Lake Charles, La. 70605
Filed Jun. 5, 1997, Ser. No. 869,664
Int. Cl.⁶ F41A *29/02*

U.S. Cl. 42—95 **7 Claims**

1. A rod assembly for utilization in a muzzle loading firearm comprising, in combination,
an accessory rod threaded at each end,
an accessory coupler for threadedly engaging the accessory rod,

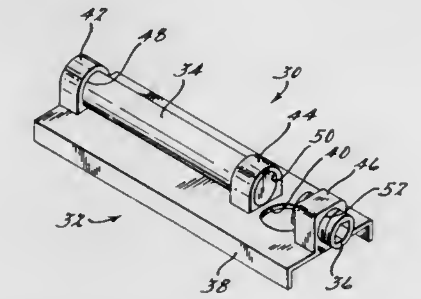


an extension coupler for securement to the accessory rod having means for threadedly engaging an accessory rod coupler,
a coupler to secure the extension rod to a slide rod,
and a slider adjustably secured to the slide rod and slidable axially along the slide rod for impacting the rod assembly by dropping the same onto the coupler securing the slide rod to the balance of the rod assembly.

5,836,100
FIBER OPTIC SIGHT

Gerald E. Stover, Lapeer, Mich., assignor to Williams Gun Sight Co., Davison, Mich.
Filed Jul. 10, 1996, Ser. No. 677,520
Int. Cl.⁶ F41G *1/34*

U.S. Cl. 42—103 **13 Claims**



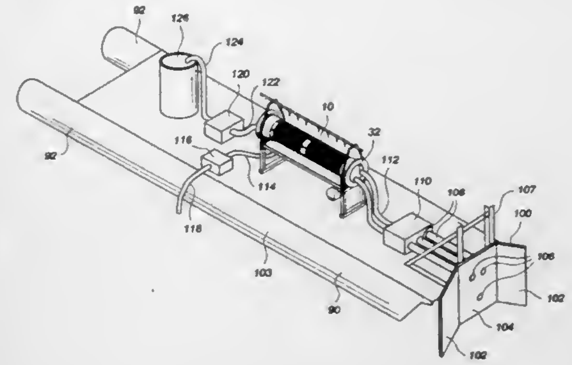
1. A sighting device for a weapon having a barrel assembly which includes a front bead sight threadingly received within a threaded bore extending into said barrel assembly, said sighting device comprising:
a generally U-shaped frame defining a hole for securing said sighting device to said barrel assembly and a pair of legs for guiding and positioning said frame on said barrel assembly;
a fiber optic element;
means for securing said fiber optic element to said frame, said securing means extending from said frame and positioned to substantially surround a portion of the periphery of said fiber optic element to secure said fiber optic element to said frame and a portion of said fiber optic element uncovered by said securing means enabling enhanced absorption of light by said fiber optic element; and
means for securing said sighting device to said barrel assembly, said securing means utilizing said hole for securing said sighting device to said barrel assembly.

5,836,101
BRINE SHRIMP SEPARATION APPARATUS AND METHODS

Charles Tze-An Tuan, 2929 S. 450 East, Bountiful, Utah 84010
Filed Oct. 29, 1996, Ser. No. 740,431
Int. Cl.⁶ A01K *79/00*

U.S. Cl. 43—4.5 **7 Claims**

1. A method of separating shrimp eggs from a slurry formed of shrimp eggs, shrimp and water, said method comprising:

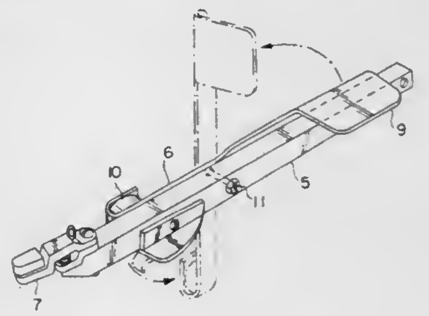


providing a containment vessel having a perforated sidewall;
placing said slurry in said containment vessel; and
rotating said containment vessel collecting shrimp eggs which have passed through said perforated sidewall.

5,836,102
REMOTE CONTROLLED FISHING AID WITH SIGNALLING CAPABILITY

Chase Revel, 2533 N. Carson St., #1647, Carson City, Nev. 89706
Filed Aug. 5, 1996, Ser. No. 691,827
Int. Cl.⁶ A01K *97/12;* **A01M** *31/06*

U.S. Cl. 43—17 **22 Claims**



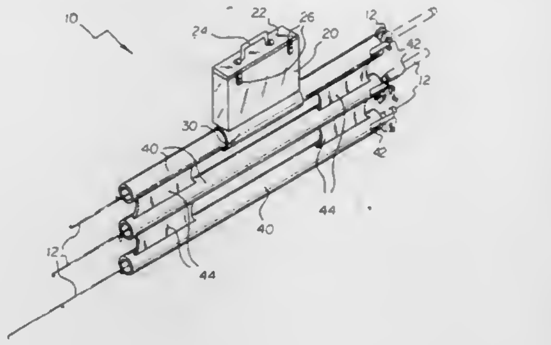
1. A fishing line transport device comprising:
a buoyant body;
propulsion means for propelling said buoyant body in water, said propulsion means having a power source and a drive mechanism;
a radio system for remotely controlling the movement of said buoyant body;
fishing line holding means for releasably holding the fishing line;
a boom mounted to extend rearwardly from said buoyant body for supporting said fishing line holding means remotely from said drive mechanism; and
a signalling device mounted on said boom and pivotable into an upright position.

5,836,103
FISHING ROD AND TACKLE CARRIER SYSTEM

Randy K. Taylor, 414 Lake Placid Dr., Bonaire, Ga. 31005
Filed Dec. 16, 1996, Ser. No. 767,142
Int. Cl.⁶ A01K *97/08; 97/04*

U.S. Cl. 43—26 **6 Claims**

1. The fishing rod and tackle carrier system comprising:
a tackle box having a bottom exterior surface;
a cuff bracket having an open end;
said cuff bracket secured to said bottom exterior surface with said open end projecting away from said bottom exterior surface;

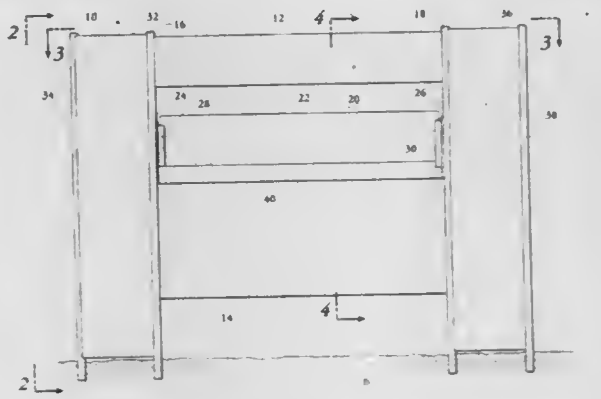


a first plurality of tubes coupled to one another thereby forming a substantially vertical structure, where at least one of said tubes removably secures within said cuff bracket to secure said first plurality of tubes to said tackle box and where each of said first plurality of tubes removably receive a fishing rod;
a second plurality of tubes coupled to one another forming a substantially vertical structure; and
a joinder cuff removably secured to said second plurality of tubes and removably secured to said first plurality of tubes, thereby providing an increased number of said tubes for a greater number of said fishing rods.

5,836,104
FLYING INSECT TRAP

Alan L. Epps, Rte. 1, Box 209, McAlester, Okla. 74501
Filed Dec. 30, 1996, Ser. No. 773,925
Int. Cl.⁶ A01M *1/10*

U.S. Cl. 43—122 **17 Claims**



1. A passive, environmentally friendly apparatus for exterminating flying insects, comprising:
(a) a transparent deflector for deflecting the flying insects;
(b) a trap for receiving deflected insects;
(c) a plurality of opaque targets positioned about said deflector and trap so as to direct the flying insects into said deflector, whereby they are deflected into said trap and exterminated, at least one of said targets being in a vertical plane above or below said deflector and trap and at least one other of said targets extending laterally away from said deflector and trap.

5,836,105
NURSERY POT STABILIZING DEVICE

Ronald E. Loosen, Temecula, Calif., assignor to Amaroo Enterprises, Inc., Temecula, Calif.
Filed May 9, 1997, Ser. No. 853,832
Int. Cl.⁶ A47G *7/00*

U.S. Cl. 47—39 **13 Claims**

1. A nursery pot stabilizing device, comprising:

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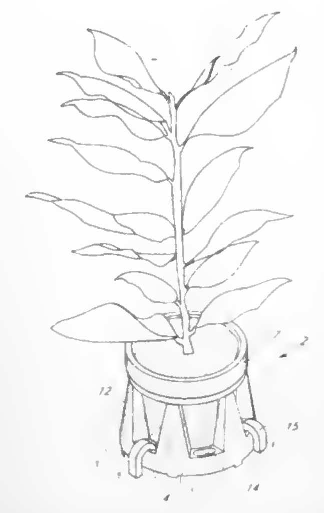
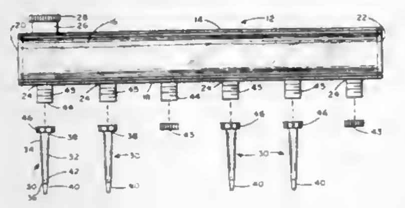
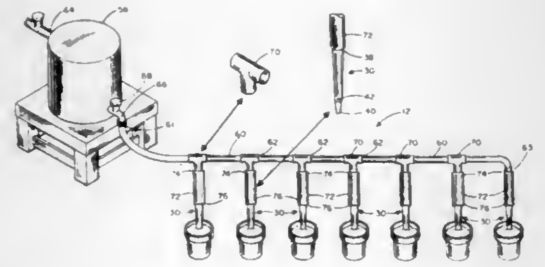


- a circular base having an upper surface, a lower surface, an outer periphery and a central platform for receiving a nursery pot, said central platform having a plurality of openings therein;
- a plurality of vertical supports attached to and extending upwardly from the upper surface of said base, said vertical supports and said base together forming a receptacle sized to receive and hold a nursery pot; and
- a plurality of openings along the outer periphery and on the upper surface of said base between said vertical supports.

5,836,106
PLANT WATERING CONTROL DEVICE

Timothy Scott Alex, 62 Woodvale Ave., Greenville, S.C. 29605
Continuation-in-part of Ser. No. 243,826, May 17, 1994, abandoned. This application Jan. 31, 1997, Ser. No. 792,636
Int. Cl.⁶ A01G *27/00*
U.S. Cl. 47—48.5 **21 Claims**



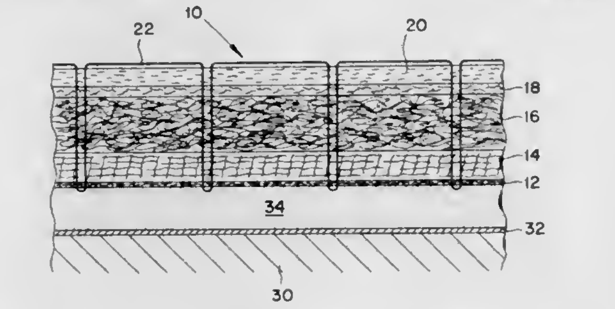


1. A self-regulating plant watering system for automatic, controlled delivery of liquids to the root systems of plants and for promoting water conservation, said system comprising:

- a. an elongated chamber having a pre-determined length and including an upper portion, a lower portion, opposite ends and a plurality of openings positioned at spaced intervals along the length of the lower portion of said chamber;
- b. an entrance having a closeable means for receiving liquid into the chamber and sealing said entrance;
- c. a plurality of hollow, elongated watering devices, each device having an open top end, a closed, tapered bottom end and at least one through hole near the bottom end for allowing a controlled release of liquid from the device into the soil;
- d. means for attaching said top ends to said openings for attaching said watering devices to said chamber and forming an airtight connection between each device and the chamber; and
- e. wherein said chamber and attached watering devices define an enclosed apparatus, whereby said chamber and devices are filled with water and a partial vacuum is created within said apparatus.

5,836,107
MULTI-LAYERED VEGETATION ELEMENT

Wolfgang Behrens, Trespenmoor 25, D-27243, Gross Ippener, Germany
PCT No. PCT/DE96/01114, § 371 Date Jan. 24, 1997, § 102(e) Date Jan. 24, 1997, PCT Pub. No. WO97/01687, PCT Pub. Date Jan. 16, 1997
PCT Filed Jun. 18, 1996, Ser. No. 776,245
Claims priority, application Germany, Jun. 28, 1995, 195 23 406.5
Int. Cl.⁶ A01C *1/04*
U.S. Cl. 47—56 **19 Claims**

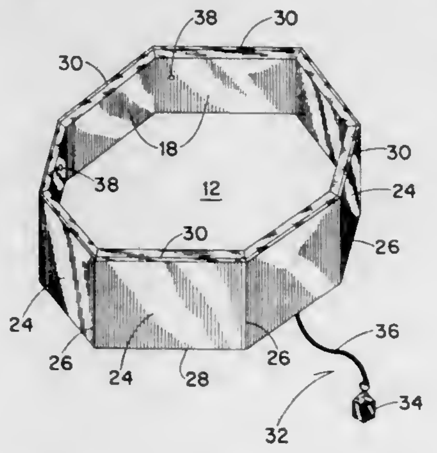


1. A rollable multi-layered vegetation element (**10**) for the greening of artificial level expanses with the individual layers being mechanically interconnected, comprising the following design of the individual layers, from bottom to top:

- a porous fibrous web (**12**) as the lowest layer,
- a lower layer (**14**) made from cocos,
- a mineral wool layer (**16**) made from mineral wool,
- a vegetation layer comprising seeds and living plant matter (**18**),
- an upper retaining layer (**20**) as a protective layer.

5,836,108
FLOATING PLANTER BOX

David W. Scheuer, W 1854 Hwy. M., Rib Lake, Wis. 54470
Filed Apr. 28, 1997, Ser. No. 845,871
Int. Cl.⁶ A01G *31/02;7/00*
U.S. Cl. 47—65 **18 Claims**

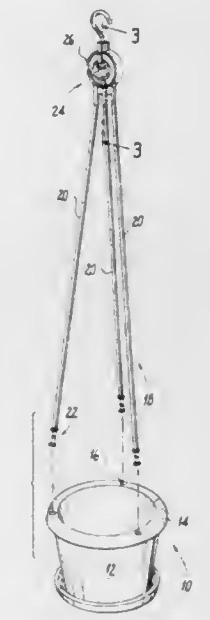


1. A floating planter box comprising:

- a) a generally regular polyhedral planar base member of selected thickness with top and bottom surfaces and an outer edge, said base member composed of a rigid synthetic foam polymer resin less dense than water and essentially impervious to water;
- b) a pair of generally regular polyhedral planar frame members of selected thickness conforming to the outer edge of and framing said generally regular polyhedral base member, said frame members being no larger than said base member, a first frame member positioned on the top surface of said base member and a second frame member positioned on the bottom surface of said base member, said pair of planar frame members of equal thickness and of combined thickness about equal to said selected thickness of said base member;
- c) a plurality of generally rectangular planar side members oriented perpendicular to, and completely surrounding said planar base member, said side members each positioned in close contact with adjacent said members and securely attached to both of said pair of frame members securing said base member between said pair of frame members, said side members extending a selected distance below said bottom surface of said base member and a selected distance above said top surface of said base member, said side members and base member top surface forming a contained volume there upon, adapted to contain soil or growth material with plants therein, said planter box displacing sufficient water to float said box plus soil and plants therein, when placed in a body of water.

5,836,109
HANGING FLOWER PLANTER

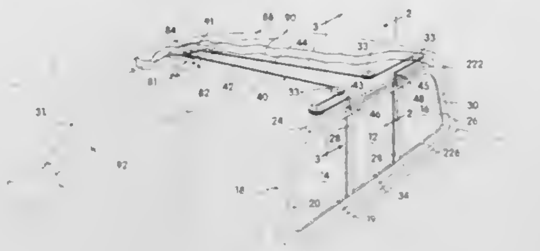
Joseph Kunz, Kearny, N.J., and Morris Moskowitz, Monsey, N.Y., assignors to Missry Associates, Inc., Dunellen, N.J.
Filed Nov. 8, 1996, Ser. No. 745,772
Int. Cl.⁶ A01G *9/02;* **A47G** *7/02*
U.S. Cl. 47—67 **13 Claims**



1. A hanging flower planter comprising a bowl shaped container having a rim about its upper edge, a suspension assembly having a plurality of elongated elements attached at one end to the rim of the container and at their other end to a hook by which said planter may be hung, the other ends of said elongated elements being integrally secured to a common hub, and means for attaching said hub to said hook for free relative rotation of each of said hub and hook so that said container and hook are independently rotatable.

5,836,110
REMOTE MANUAL ANTI-BACKDRIVE SYSTEM FOR MODULAR REAR-MOUNTED WINDOW ASSEMBLY

Dennis J. Buening, Northville, Mich., assignor to Excel Industries, Inc., Elkhart, Ind.
Continuation-in-part of Ser. No. 624,130, Mar. 29, 1996. This application Sep. 27, 1996, Ser. No. 726,055
Int. Cl.⁶ E05F *11/06*
U.S. Cl. 49—360 **24 Claims**

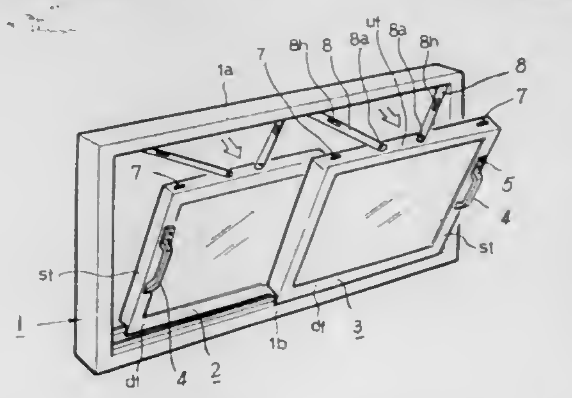


1. A modular window assembly vertically mounted in a motor vehicle body having a windshield and a roof, enclosing a passenger compartment, the modular window assembly comprising, in combination:

- a circumferential rear-mounted frame member mounted in a window recess in the vehicle body rearward of a driver's seat;
- a slider subassembly comprising a sliding pane mounted in the rear-mounted frame member to slide laterally back and forth between an open position and a closed position; and
- a drive subassembly to move the slider subassembly laterally back and forth between its open and closed positions, the drive subassembly comprising:
  - a manually-operable drive unit secured to the roof of the vehicle remote from the rear-mounted frame member; and
  - an anti-backdrive subassembly for substantially preventing movement of the slider subassembly between its open and closed positions by forces other than operation of the manually-operable drive unit.

5,836,111
OPENING-CLOSING DEVICE FOR WINDOWS

Dong H. Tak, Seoul, Rep. of Korea, assignor to Fine Industries, Inc., Chungcheongbuk-do, Rep. of Korea
Filed Apr. 16, 1996, Ser. No. 633,026
Int. Cl.⁶ E05D *13/00*
U.S. Cl. 49—425 **12 Claims**



1. Windows having an opening and closing device comprising:

- guide rails formed on a top segment of an outer frame;
- a pair of links for connecting an upper frame of each of said windows to each of said guide rails, said links being slidable along said guide rails;

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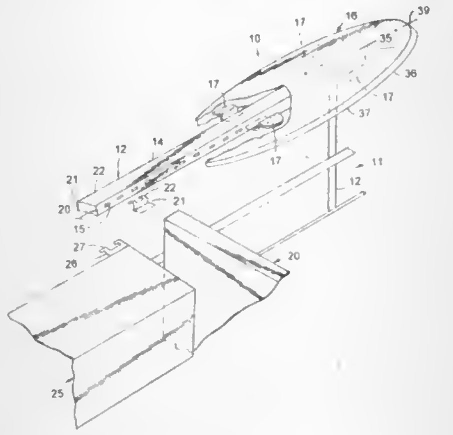
a pair of sliding rails formed on a bottom segment of said outer frame; and
a sliding roller mechanism installed between each of said sliding rails and a lower frame of each of said windows,
whereby said windows are provided with two functions, a tilt opening function and a slide opening function, said two functions being selectively used, wherein said links are respectively provided with a locking hole.

5,836,112
PARTITION SYSTEM INCLUDING TRANSACTION TOP

Michelle L. Lindale, Muskegon, Mich., and Kurt P. Dammermann, San Francisco, Calif., assignors to Steelcase Inc., Grand Rapids, Mich.

Filed May 9, 1997, Ser. No. 853,889
Int. Cl.^{6} E04B *2/74;2/82*
U.S. Cl. 52—36.4 **18 Claims**



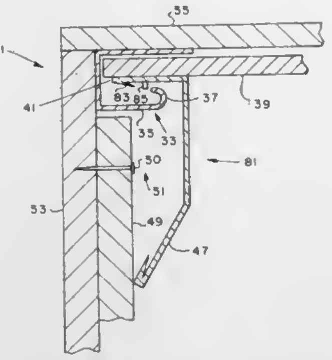
1. An apparatus comprising:
a partition including a frame;
a transaction top positioned above the frame; and
brackets attaching the transaction top to the frame, the frame including a top horizontal frame member with opposing apertured sides defining a plurality of attachment sites configured to receive the brackets in a plurality of horizontally spaced locations, the brackets being engaged with the frame in selected ones of the attachment sites.

5,836,113
SYSTEM AND METHOD OF SECURING AND FINISHING EXTERIOR SIDING PANELS

Douglass Bachman, 1305 Thunderbrook Dr., Desoto, Tex. 75115, assignor to Douglass Bachman, Desoto, and Lynn Nickols, Grand Prairie, both of Tex.

Continuation-in-part of Ser. No. 846,138, Apr. 25, 1997. This application Jun. 27, 1997, Ser. No. 884,182
Int. Cl.^{6} E04B *7/00*
U.S. Cl. 52—94 **19 Claims**

1. A system for finishing and securing an exterior siding top panel, said system comprising:
a wall to which said siding top panel is attached;
an orthogonal surface, said wall meeting said orthogonal surface at a right-angle corner at a top end of said wall;
a siding panel covering said orthogonal surface;
a J-channel bracket mounted on said orthogonal surface at said corner for holding an end of said siding panel covering said orthogonal surface, said J-channel bracket having a J-channel clip with a hook at an end projecting outward from a side facing said siding panel covering said orthogonal surface;
a snap-in trim piece holding a top end of said siding panel, said snap-in trim piece having a plurality of crimps running along a top surface of said snap-in trim piece; and

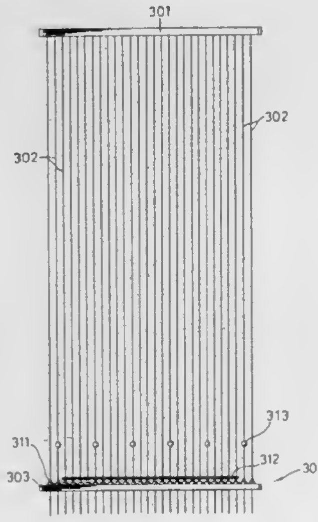


means for interlocking said J-channel bracket and said snap-in trim piece to finish and secure said siding top panel to said wall, said means for interlocking located on a side of said J-channel bracket facing said siding panel covering said orthogonal surface and formed by inserting said plurality of crimps between said siding panel covering said orthogonal surface and said hook in said J-channel clip;
whereby said plurality of crimps and said hook are held in place by said siding panel covering said orthogonal surface.

5,836,114
APPARATUS FOR INHIBITIVELY PREVENTING BIRDS FROM CROWDING

Tadao Ohba, Saitama-Ken, Japan, assignor to Ohba Building Maintenance Co., Ltd., Japan

Division of Ser. No. 263,132, Jun. 21, 1994, Pat. No. 5,649,394. This application Nov. 30, 1995, Ser. No. 565,391
Int. Cl.^{6} A01M *29/00*
U.S. Cl. 52—101 **5 Claims**



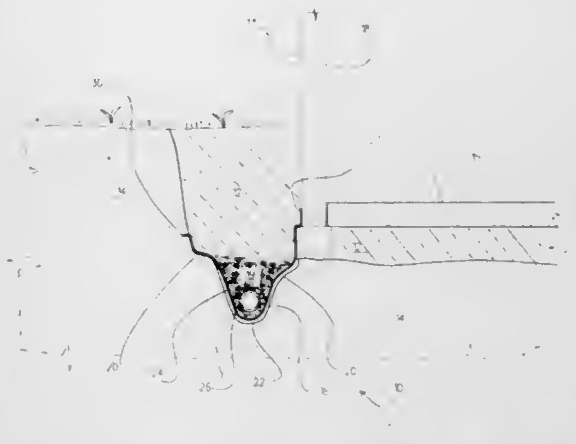
1. An apparatus for inhibitively preventing birds from crowding at the upper part of a building, comprising;
a first base member adapted to be secured to the upper end of an opening portion located above the upper part of said building, said first base member extending along the upper end of said opening portion in the horizontal direction,
a plurality of wires suspended from said first base member in the equally spaced relationship as seen in the horizontal direction,
a second base member detachably secured to said plurality of wires at the lower end parts of the wires to serve also as a weight for said apparatus, said second base member extending in parallel with said first base member in the horizontal direction,
a plurality of magnetic members disposed at the lower end parts of said wires above said second base member in the spaced relationship as seen in the horizontal direction, and

a wire connecting/disconnecting mechanism for connecting said wires to said second base member and disconnecting from the second base member.

5,836,115
FOUNDATION WATERPROOFING AND DRAINAGE SYSTEM

Randy K. Clay, 9720 Hudson Ct., Thornton, Colo. 80229, and William H. Grisinger, III, 9535 West 54th Pl., Arvada, Colo. 80002

Filed Dec. 9, 1996, Ser. No. 762,398
Int. Cl.^{6} E02D *19/00;31/00*
U.S. Cl. 52—169.5 **13 Claims**



5. A method for preventing the accumulation of water below a grade level of a perimeter area about a building foundation and soil surrounding the building, the building foundation being on disturbed soil surrounded by undisturbed soil and extending to a depth below the grade level, the method comprising:
providing a trench about the foundation. the trench beginning at the grade level and being at least as deep as the disturbed soil about the foundation and having sides, at least one side being bounded by undisturbed soil, and a bottom;
providing an impermeable liner;
providing a substantially rigid edge section;
covering the trench with the impermeable liner;
driving the substantially rigid edge section together with the impermeable liner into undisturbed soil at the side of the trench below the grade level; and
filling the impermeable liner in the trench with fill material, so that water filtering through the disturbed soil about the building foundation will reach undisturbed soil and flow over the undisturbed soil and over the edge section together with the impermeable liner and into the lined trench.

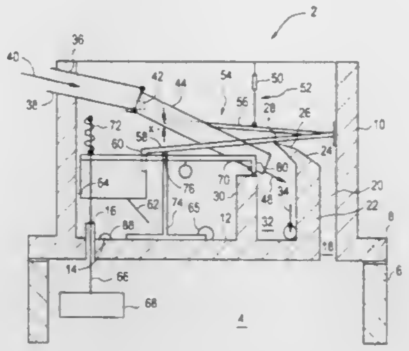
5,836,116
TANK SYSTEM

Roland Widmann, Bussenstrasse 40, D-88525, Dürmentingen, Germany

PCT No. PCT/DE94/00920, § 371 Date Jun. 6, 1996, § 102(e) Date Jun. 6, 1996, PCT Pub. No. WO96/05379, PCT Pub. Date Feb. 22, 1996

PCT Filed Aug. 10, 1994, Ser. No. 615,195
Int. Cl.^{6} E03B *11/00*
U.S. Cl. 52—169.7 **19 Claims**

1. Tank system comprising:
a tank;
a run-off for contaminated water;
a rainwater intake means;
a delivery element in flow communication with the rainwater intake means and defining therewith a direction of water flow, the delivery element being movable between a first position in flow communication with the tank and a second position in flow communication with the run-off;

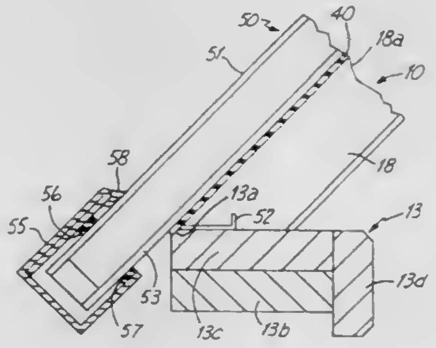


a sampling conduit having an inlet end in flow communication with the delivery element and arranged at a shallow angle to the direction of flow, for diverting a portion of water flowing therethrough;
a water collecting container in flow communication with the sampling conduit, and including an outlet; and
director means for moving the delivery element between the first and second positions depending on an amount of water in the water collecting container.

5,836,117
BUILDING EXTENSION

Flint Scott Johnson, 645 5th Ave. South, South St. Paul, Minn. 55075

Filed Jul. 28, 1995, Ser. No. 508,439
Int. Cl.^{6} E06B *1/38*
U.S. Cl. 52—201 **19 Claims**



1. An outdoor building extension forming an enclosure comprising:
a top support member having a top external surface;
a bottom support member having a top external surface;
an intermediate support member, said intermediate support member extending from said top support member to said bottom support member and having a top external surface with said top external surfaces forming a an external frame for supporting one side of a panel external to said frame to enable a panel to be removed or replaced by lifting the panel off the external surfaces;
a layer of double-sided foam tape extending along said top surfaces, said layer of double-sided foam tape having a first adhesive on one side for securing said double-sided foam tape to said top surfaces and a second adhesive on the other side; a plurality of see-through panels located on said frame with said panels secured to said frame, with said panels secured to said foam tape by said second adhesive, said double-sided foam tape having sufficient resiliency to permit slight relative displacement between said plurality of said panels and said

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frame while maintaining the integrity of the plurality of panels external to said frame.

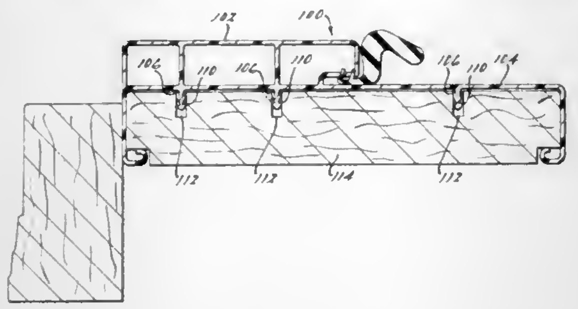
5,836,118

DOOR JAMB SYSTEM WITH PROTECTIVE STOP AND JAMB CLADDING

James D. Thornton, St. Charles, Ill.; Philip A. Wortman, Prineville, Oreg., and Larry J. Schlicht, New Albany, Ill., assignors to The Standard Products Company, Cleveland, Ohio

Filed Aug. 20, 1996, Ser. No. 700,005
Int. Cl.^{6} E06B *1/04*

U.S. Cl. 52—204.1 **20 Claims**



1. A door jamb system for a door frame having a door hingedly attached thereto, comprising:

A plurality of door jamb substrate members including first and second vertical members and a head member, each of said vertical members having end faces, an outer surface and an inner surface, said head member having a first end affixed to a top edge of said first vertical member, a second end affixed to a top edge of said second vertical member and an inner surface, said inner surfaces of said first and second vertical members and said head member defining a door passageway, said first and second vertical members and said head member further defining slotted receptacles in predetermined locations along said inner surfaces;

a door stop having an outer surface abutting said inner surfaces of said plurality of door jamb substrate members, and a stop face for abutting the door when the door is closed within said door passageway, said door stop outer surface including fingers extending therefrom that mechanically interlock with a first plurality of said slotted receptacles to secure said stop to said door jamb substrate members; and

a jamb cladding that is permanently and directly affixed to said door jamb substrate members for covering exposed portions of said door jamb substrate members not covered by said stop, said jamb cladding including fingers extending therefrom for providing a mechanical interlock with a second plurality of said slotted receptacles to increase structural integrity of said plurality of door jamb substrate members and to protect said plurality of door jamb substrate members from exposure to outdoor weather conditions.

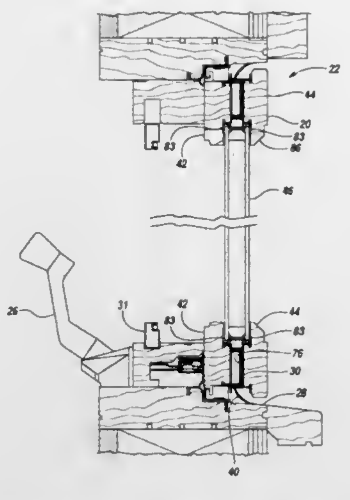
5,836,119

WINDOW SASH

Brian A. Emmanuel, Merrill, Wis., assignor to Lincoln Wood Products, Inc., Merrill, Wis.

Filed Jan. 23, 1997, Ser. No. 788,864
Int. Cl.^{6} E06B *3/988*

U.S. Cl. 52—204.71 **22 Claims**



1. A window sash comprising:

four inner sash members connected to form a rectangular inner sash and defining an inside glass opening, wherein each inner sash member is a plastic extrusion and each inner sash member has a rectangular box-type center section defined by an exterior wall which is spaced generally parallel from an interior wall by an outside wall which faces away from the glass opening, and an inside wall which faces toward the glass opening, and two interior barbs extend from each sash member interior wall to define an interior channel, and two exterior barbs extend from each sash member exterior wall to define an exterior channel;

interior trim strips each having a first surface which extends substantially adjacent to the interior wall of the inner sash member, each interior trim strip being connected in a positive fit in one of said interior channels;

exterior trim strips each having a first surface which extends substantially adjacent to the exterior wall of the inner sash member, each exterior trim strip being connected in a positive fit in one of said exterior channels; and

at least one glass pane positioned between the interior trim strips and the exterior trim strips.

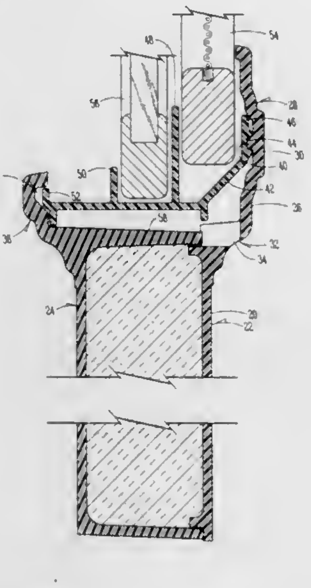
5,836,120

DOOR HAVING INTEGRALLY FORMED WEEP HOLE FOR DRAINAGE

Marc M. DeBower, Pleasant Hill, Iowa, assignor to Emco Enterprises Inc., Des Moines, Iowa

Filed Jun. 25, 1997, Ser. No. 882,181
Int. Cl.^{6} E06B *7/14*

U.S. Cl. 52—209 **20 Claims**



1. A door, comprising:

a body having an aperture therethrough for receiving at least one window element;

the body including substantially parallel and spaced apart exterior and interior panels joined together to define the aperture;

the exterior panel having an integrally formed weep hole extending therethrough which intersects the aperture and thereby puts the aperture in fluid communication with a generally vertical exterior surface of the exterior panel so as to allow moisture to drain from the aperture.

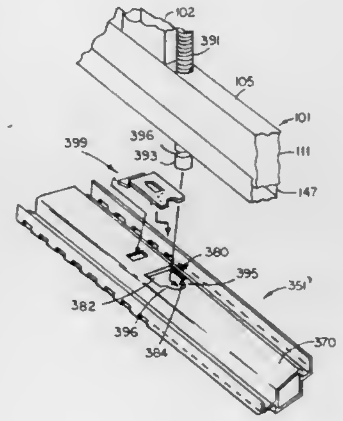
5,836,121

CONNECTION SYSTEM FOR CONNECTING PARTITION AND FLOOR CHANNEL

William K. Hofman, Ada, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.

Filed Jul. 26, 1996, Ser. No. 686,701
Int. Cl.^{6} E04B *2/74*

U.S. Cl. 52—241 **16 Claims**



1. A partition construction comprising:

a partition frame including a pair of leveling members located along a bottom of the partition frame, the leveling members each including downwardly disposed end sections having an interlock recess therein; and

a floor channel defining a floor-engaging wall and a secondary wall spaced above the floor-engaging wall, the secondary wall including key hole apertures each having a large end and a small end, the large end being adapted to vertically receive the end section of an associated one of the leveling members and further the small end being adapted to horizontally receive the end section of the associated one leveling member, the secondary wall including marginal material around the small end of the key hole apertures for interlockingly engaging the interlock recess to capture the associated one leveling member therein.

5,836,122

PAPERBEAD FOR PROTECTING DRYWALL CORNERS

George Rennich; Roy Schouten, both of Edmonton, and Florent Gilmore, Sherwood Park, all of Canada, assignors to British Steel Canada Inc., Canada

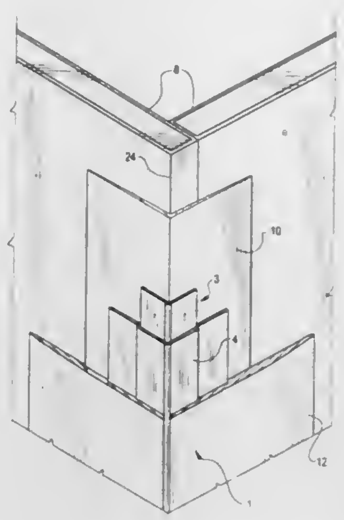
Continuation of Ser. No. 389,817, Feb. 14, 1995, Pat. No. 5,613,335. This application Mar. 18, 1997, Ser. No. 820,647
Int. Cl.^{6} E04B *1/38*

U.S. Cl. 52—254 **20 Claims**

1. A drywall paperbead comprising:

an elongated core having an outer surface; and

a paper strip bonded to said outer surface of said core, said paper strip comprising a stock paper impregnated with a strengthening compound to a relatively uniform concentration throughout its thickness so that said paper strip has a high wet strength and is made resistant to scuffing and abrasion throughout its thickness.



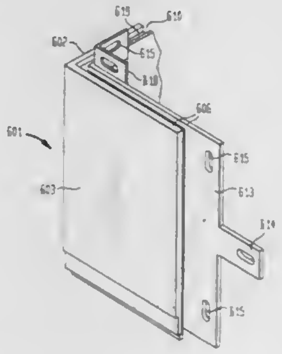
5,836,123

VINYL-SIDING CORNER BLOCK

Francesco Gulino, 1714 Whitpain Hills, Blue Bell, Pa. 19422

Filed May 24, 1996, Ser. No. 653,450
Int. Cl.^{6} E04F *13/00*

U.S. Cl. 52—288.1 **6 Claims**



1. A vinyl-siding corner block comprising an angled element for use in the building of houses, said angled element comprising:

a sheet of material, said sheet being disposed as a first wing and a second wing, said wings being set at an angle to one another;

said wings each having an exterior surface and an interior surface,

said exterior surface having a raised portion and a recessed portion,

said sheet having an upper edge, a lower edge, and two distal edges,

said upper edge and said distal edges having a groove therein, said groove being continuous around said upper edge and said distal edges,

said lower edge having a ridge thereon,

said distal edges having flanges thereon, said flanges being co-planar with said internal surface,

said distal edges having tongues extended therefrom, said tongues being co-planar with said internal surface and extending sufficiently so as to permit attachment of said vinyl-siding corner block to structural elements of a building, by means of said tongues,

said flanges and said tongues being provided with slotted perforations through which attachment means may be passed when attaching said vinyl-siding corner block to a building.

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said wings having an integrally formed L-shaped attachment flange positioned at a junction of said wings and extending from said upper edge of said vinyl-siding corner block,

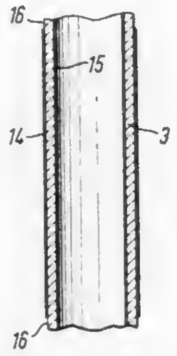
whereby a first vinyl-siding corner block can be attached to a building by said flanges and said tongues,

second, and subsequent, vinyl-siding corner blocks can be positioned above said first vinyl-siding corner block, said ridge of said lower edge of each subsequent vinyl-siding corner block being interactively positioned in said groove of said upper edge of a previously applied vinyl-siding corner block,

said second, and subsequent vinyl-siding corner blocks are attached to a building by said flanges or said tongues, and conventional siding applied to said building is interactively positionable in said grooves in said distal edges.

5,836,124
FOUNDATION TUBE FOR USE AS A FOUNDATION FOR MASTS, POSTS, PILLARS, ETC.

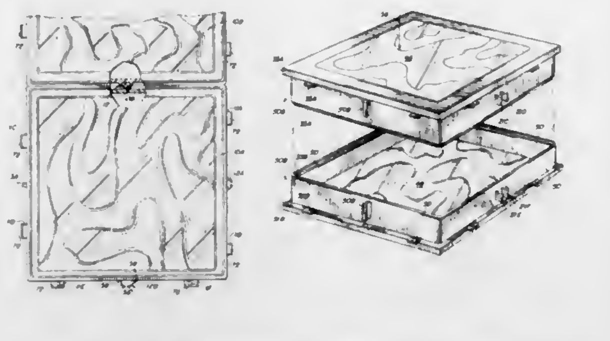
Nils Aspehaug, Billingstad, and Frode Inge Volle, Nesøya, both of Norway, assignors to Kvaerner Eureka a.s., Lier, Norway
PCT No. PCT/NO95/00055, § 371 Date Sep. 12, 1996, § 102(e) Date Sep. 12, 1996, PCT Pub. No. WO95/25213, PCT Pub. Date Sep. 21, 1995
PCT Filed Mar. 13, 1995, Ser. No. 704,512
Claims priority, application Norway, Mar. 14, 1994, 940911
Int. Cl.⁶ E02D *27/32*
U.S. Cl. 52—297 **4 Claims**



1. A foundation tube (**3**) for use as foundation for masts, posts, pillars, etc., wherein perforations or holes (**4**) are provided for casting mixture (**8**) in the space between the tube (**3**) and the surrounding material (**1**), characterized in that the tube (**3**) is coated internally and externally along its entire length with an electrically insulating, covering coating (**14**, **15**), especially of thermoplastic, that in addition to a covering coating (**14**, **15**) both internally and externally, an electrically insulating coating is applied, and that lower part (**16**) of the tube (**3**) internally and externally is given a rough surface, which provides a secure attachment to the casting mixture (**8**), and a roughness-forming coating is provided on the outside, especially at the lower part (**16**) of the tube (**3**), wherein the electrically insulating coating (**14**) is removed in a top part and the bottom part (**16**) of the tube (**3**).

5,836,125
INTERLOCKING TRANSLUCENT BLOCKS

Samuel R. Regina, 5450 E. Capri, Mesa, Ariz. 85206
Filed Jul. 29, 1996, Ser. No. 687,978
Int. Cl.⁶ E04C *1/00;* **E04B** *2/00*
U.S. Cl. 52—306 **19 Claims**



1. An interlockable building block comprising:

a. a block including spaced apart front and rear surfaces having a perimeter edge and at least three sidewalls spanning the distance between the front and rear surfaces, the front and rear surfaces being dimensioned such that the perimeter edge extends outward from the block sidewalls and defines a protruding ledge;

b. a block fastening system including

  i. a male coupling element positioned on one of the sidewalls and having a male interlocking element with a defined maximum width and a pedestal element having a first end and a spaced apart second end supporting the male interlocking element at a fixed distance from the block sidewall, the pedestal element having a width less than the maximum width of the male interlocking element to provide a reduced width capture zone located in proximity to the male interlocking element; and

  ii. a female receptacle positioned on a different one of the sidewalls and including first and second female interlocking elements and first and second laterally deflectable female pedestal elements laterally spaced apart along the length of the sidewall, each pedestal element having a first end coupled to the sidewall and an elevated second end, the second ends of the female pedestal elements supporting the first and second female interlocking elements at a fixed distance above the block sidewall with a lateral spacing less than the maximum width of the male interlocking element, the female receptacle configured to define a male coupling element engagement chamber below the spaced apart second ends of the female pedestal elements whereby the female receptacle laterally deflects around and captures a mateable male coupling element to provide a snap together interlocking coupling with the mateable male coupling element.

5,836,126
MODULAR CONCRETE FORM SYSTEM AND METHOD FOR CONSTRUCTING CONCRETE WALLS

Thomas E. Harkenrider, Carlsbad; Scott D. Pinkerton, Bonita; Robert W. Buck, Lake Forest, and Jeffrey L. Hanson, Chino, all of Calif., assignors to The Salk Institute of Biological Studies, La Jolla, Calif.
PCT No. PCT/US94/13490, § 371 Date Nov. 24, 1995, § 102(e) Date Nov. 24, 1995, PCT Pub. No. WO95/14837, PCT Pub. Date Jun. 1, 1995
Continuation-in-part of Ser. No. 156,271, Nov. 22, 1993, Pat. No. 5,537,797. This PCT application Nov. 22, 1994, Ser. No. 459,461
Int. Cl.⁶ E04B *5/00*
U.S. Cl. 52—410 **19 Claims**

1. A modular form unit for architectural concrete walls, comprising:

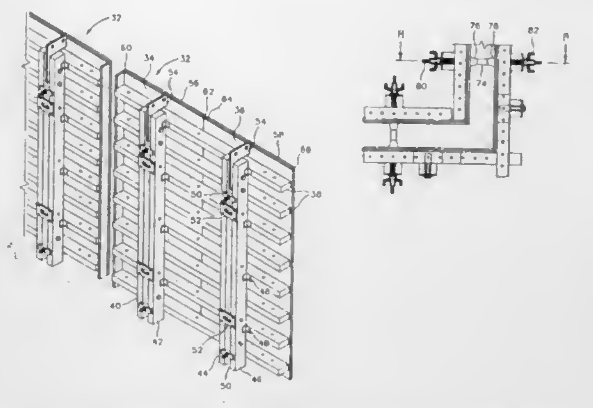
a generally rectangular support frame of multiple parallel base beams normally disposed horizontally;

a pair of closely spaced backing beams normally disposed vertically and secured to a back of said base beams;

a backing sheet secured to a front of said base beams;

a facing sheet overlying and secured to said backing sheet, said facing sheet is a laminate of plywood and a plastic sheet, the plastic sheet having a thickness of about one tenth of an inch;

a plurality of tie holes extending through said facing sheet;

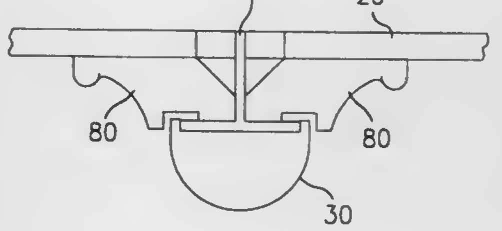


a seal tube assembly for positioning between a pair of opposed form units aligned with opposing tie holes; and

a high tensile tie rod for each tie hole.

5,836,127
SYSTEM AND METHOD FOR INSTALLING CEILING PANELS

Delbert M. Clark, and Jerry L. Trunkenbolz, both of 12704 E. Nora Ave., Spokane, Wash. 99216
Filed Jul. 11, 1997, Ser. No. 891,473
Int. Cl.⁶ E04B *9/06*
U.S. Cl. 52—506.07 **14 Claims**



1. A ceiling system including:

a plurality of downwardly hanging T-Bars forming a T-Bar grid system, each of said T-Bars having an upper surface and an exposed lower surface and adapted to support at least one ceiling panel;

a plurality of ceiling panels supported by said T-Bars;

a plurality of grid covers releasably secured to and covering the exposed lower surfaces of said T-Bars, and

a plurality of pieces of molding which are each mounted between said grid covers and said ceiling panels, wherein each of said pieces of moulding are supported by the upper surface of said T-Bar and said ceiling panels.

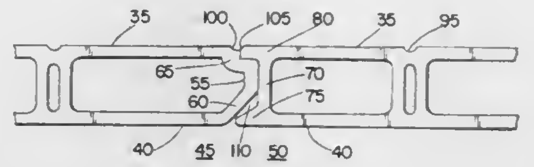
5,836,128
DECK PLANK

A. Anthony Groh, Columbus, and Philip H. Stobart, Worthington, both of Ohio, assignors to Crane Plastics Company Limited Partnership, Columbus, Ohio
Filed Nov. 21, 1996, Ser. No. 752,813
Int. Cl.⁶ E04C *3/00*
U.S. Cl. 52—580 **55 Claims**

1. A deck plank comprising:

a generally rectangular plank having a horizontal top and bottom,

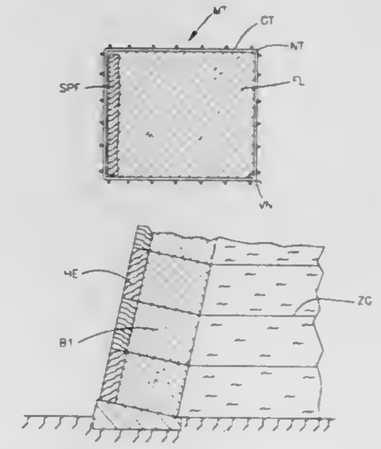
a first edge attached to the top and the bottom forming a tongue, the tongue having a substantially vertical portion and an angled portion of a first angle,



and a second edge opposite the first edge and attached to the top and the bottom forming a groove, the groove having a substantially vertical portion and an angled portion of a second angle, the tongue adapted to fit with a groove of an adjacent plank, the first angle being sufficiently different from the second angle such that the tongue and the groove are adapted to maintain a space between the angled portion of the tongue and the angled portion of the groove of the adjacent plank when the substantially vertical portion of the tongue is placed adjacent to the substantially vertical portion of the groove of the adjacent plank.

5,836,129
CONSTRUCTION ELEMENT, IN PARTICULAR SUPPORTING OR SOUND INSULATING CONSTRUCTION ELEMENT CAPABLE OF BEING PLANTED, SET OF CONSTRUCTION ELEMENTS AND PROCESS FOR PRODUCING THE SAME

Felix Paul Jaecklin, Geissbergstrasse, CH-5400 Ennetbaden, Switzerland
PCT No. PCT/EP94/02907, § 371 Date Oct. 6, 1995, § 102(e) Date Oct. 6, 1995, PCT Pub. No. WO95/06783, PCT Pub. Date Mar. 9, 1995
PCT Filed Sep. 1, 1994, Ser. No. 428,250
Claims priority, application Germany, Sep. 1, 1993, 43 29 370.0
Int. Cl.⁶ E02D *5/00;17/20*
U.S. Cl. 52—612 **13 Claims**



1. A building element for a structure such as a greenable supporting or sound-proofing structure, said building element comprising an at least partly permeable casing part and a filling which comprises block-like or granular or pourable or porous material, characterized by:

said casing part (**100**) having the form of a non-buckling hollow body which is at least partly rigid in respect of bending forces, in particular in respect of compression forces acting in a casing plane, and which in a bond with said filling forms a premanufactured and substantially self-supporting building element;

said casing part comprising at least one generally flat wall (**110**), in particular at least one side wall which extends in a direction vertically or transverse to the horizontal when said building element is installed, which wall is shortenable, without buckling, in said direction vertically or transverse to the horizontal.

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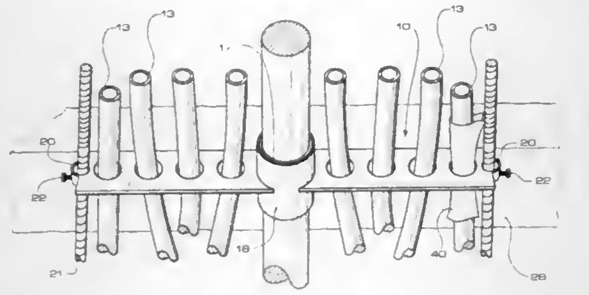
5,836,130
WATER LINE GUIDING AND HOLDING DEVICE

Arnold E. Unruh, 1586 W, 1510 North, St. George, Utah 84770; Wade M. Ebling, 1017 Beecher Ave., Brigham City, Utah 84302; R. Dale Hubbard, 435 E. Washington, Ramona, Calif. 92065, and Lincoln Powers, 626 N. 2040 East Cir., St. George, Utah 84770

Filed Feb. 14, 1997, Ser. No. 800,408
Int. Cl.^{6} E04C *2/52*
U.S. Cl. 52—698 4 Claims

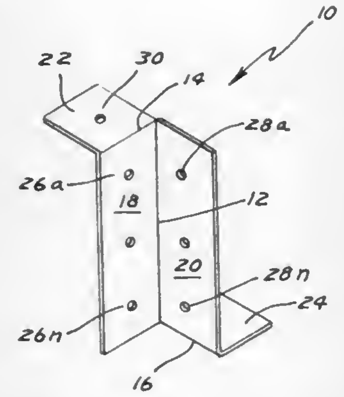


1. A device for holding end portions of water lines in separated positions, while said lines are placed for subsequent coverage by a concrete slab floor during construction of a building, said device comprising:
- an elongate member having means spaced apart therealong for holding said end portions generally fixed in separated positions;
- means for securing the elongate member in fixed position holding said end portions, wherein:
  - the elongate member is a plate member carrying edges and disposed generally in a horizontal plane and having spaced apart holes therealong, said holes each being sized to accept a water line end portion therethrough and wherein the securing means comprises:
    - a separated cylindrical shell member sized to fit about a vent pipe placed for incorporation into the building being constructed; and
    - a cylindrical shell integral with the plate member and sized to fit about the separate cylindrical shell about the vent pipe.

5,836,131
JOIST HANGER

Ernest S. Viola, Huntington, and Raymond C. Frobosilo, Lido Beach, both of N.Y., assignors to Super Stud Building Products, Astoria, N.Y.

Filed Dec. 22, 1994, Ser. No. 361,690
Int. Cl.^{6} E04B *1/38;* **E04C** *5/00*
U.S. Cl. 52—702 14 Claims

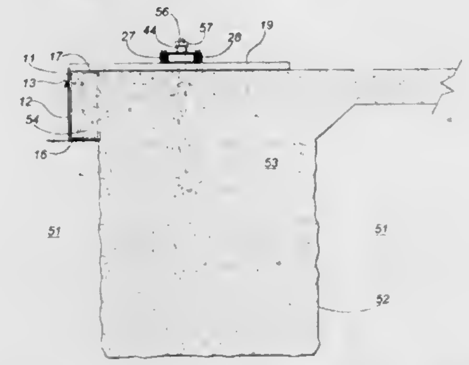


11. A joist hanger comprising:
- a. two planar members at a substantially right angle;
- b. opposing tab members extending at a substantially right angle for an opposing end of each of said planar members; and,
- c. a hole in each of said planar members and each of said tab members.

5,836,132
ANCHOR TEMPLATE

Kirby Weathersby, Covington, Ga., assignor to E-Z Anchor Bolt Template, Inc., Covington, Ga.

Filed Jan. 30, 1997, Ser. No. 791,284
Int. Cl.^{6} E04B *1/38*
U.S. Cl. 52—702 4 Claims



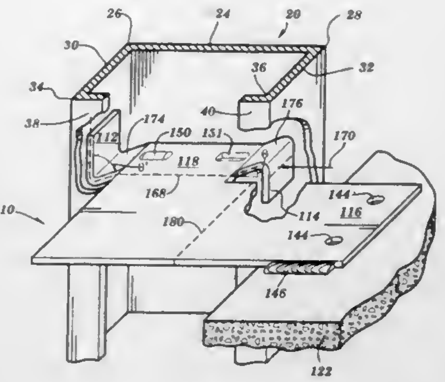
1. A reusable anchor bolt template adapted to be fastened to a form element having top and bottom ends, wherein said template comprises:
- (a) a form plate adapted to engage the top end of the form element;
- (b) a first primary support element attached in cantilever fashion to said form plate;
- (c) a second primary support element arranged parallel to said fist primary support element and attached in cantilever fashion to said form plate;
- (d) a securing strap adjustably connected to said form plate and engaging the bottom end of the form element for releasably securing the form plate to the form element;
- (e) a primary support member attached in cantilever fashion to said form plate, said member extending over a poured concrete material; and
- (f) a means for suspending said anchor bolts below a level of poured concrete, said means secured to said primary support member, said suspending means including a secondary support element adjustably attached to said primary support member, and at least one support plate adjustably attached to said secondary support element, said support plate defining an opening through which an anchor bolt can pass.

5,836,133
VERTICAL MOVEMENT CLIP FOR ATTACHING A BUILDING MEMBER TO A BEAM HAVING A CHANNEL THEREIN

Mark Bergeron, Clifton Park, and Lawrence C. Dippold, Rexford, both of N.Y., assignors to B & D Industries, Inc., Albany, N.Y.

Continuation-in-part of Ser. No. 497,385, Jun. 30, 1995, Pat. No. 5,640,823. This application Jun. 13, 1997, Ser. No. 874,806
Int. Cl.^{6} E04B *2/00*
U.S. Cl. 52—715 14 Claims

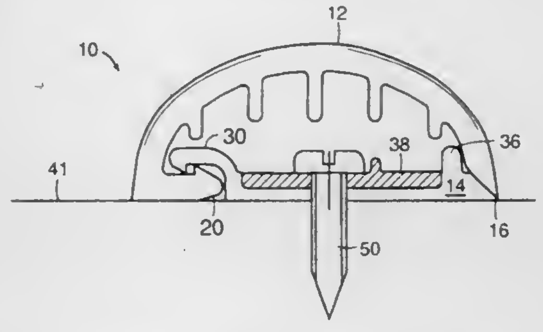
1. A clip comprising:
- a) a base plate having a first side and a second opposite side, a first edge, a second edge opposite the first edge, and a third edge adjacent to the first and second edges, wherein the first, second and third edges are adjacent to the first and second sides;
- b) a first arm, extending from the first edge of said base plate, said first arm having a first portion angularly offset to extend between 0 to 180 degrees with respect to the first side of said base plate and a second portion angularly offset to extend between 180 to 360 degrees with respect to the first side of said base plate;
- c) a second arm, extending from the second edge of said base plate, and extending in an opposite direction with respect to said first and second portions of said first arm; and
- d) a flange extending from the third edge of said base plate and being coplanar with said base plate.



5,836,134
PROTECTIVE BUMPER RAILING

Heraldo Couto, Lowell, and Leonard J. Lapenta, Melrose, both of Mass., assignors to Boston Metal Products Corp., Medford, Mass.

Filed Feb. 21, 1995, Ser. No. 395,362
Int. Cl.^{6} E04F *19/02*
U.S. Cl. 52—718.02 22 Claims

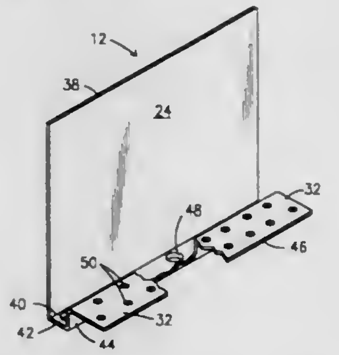


11. A unitary protective bumper rail for protecting a substrate, said rail comprising:
- a longitudinally-extending mounting member having:
  - a first portion with a mounting surface for flush attachment to said substrate, and
  - a longitudinally-extending insert against a surface of said first portion facing away from said substrate, said insert being made of a material having a greater impact resistance than the material of said mounting surface;
- a resilient, longitudinally-extending protective strip; and
- a hinged connector attached to said mounting member and said protective strip along a pair of adjacent longitudinally-extending sides thereof for permitting pivotal movement of said protective strip relative to said mounting member between a first position in which said protective strip overlies said mounting member, and a second position in which said protective strip is pivoted away from said mounting member, one of said mounting member and said protective strip including a latch mounted along the longitudinally-extending side thereof opposite the side thereof that is hingedly connected to the other of said protective strip and said mounting member, and the other of said protective strip and mounted member including a connector mounted along the longitudinally-extending side thereof opposite the side thereof that is hingedly connected to the other of said mounting member and protective strip,
- said latch and said connector being arranged to engage each other when said protective strip and said mounting member are in said first position in which the protective strip and mounting member define a space therebetween, the insert having one surface in contact with the first portion and another surface facing the protective strip across the space,
- the protective strip including a resilient sealing rib extending along a longitudinally-extending side of said rail near said hinged connector, said rib contacting said mounting member when said protective strip and said mounting member are in said first position.

5,836,135
DRAINAGE TRACK

Joseph R. Hagan, 1391 Pinellas Rd., Belleair, Fla. 34616; Kim DeVormer, 3133 Honeywood La., Apt. C, Roanoke, Va. 24014, and Fred Hansen, 6005 NW. 100 Way, Parkland, Fla. 33076-2579

Filed Jan. 31, 1997, Ser. No. 792,597
Int. Cl.^{6} E04F *17/00;* **E04B** *2/00*
U.S. Cl. 52—730.1 6 Claims



1. A drainage track of the type primarily intended for use with exterior insulation and finish systems, said drainage track comprising: a flashing leg comprising a top edge and a bottom edge; a first structural web joined to said flashing leg and extending in angular relation from said flashing leg bottom edge; a second structural web joined to said first web and extending in angular relation to said first web toward said top edge; and an horizontal leg joined to said second web and extending in angular relation to said second web, said horizontal leg comprising a distal edge opposite said second web and said horizontal leg further comprising a plurality of finish apertures formed therein; and said first web comprising a plurality of drain apertures formed therein.

5,836,136
SEAL INTEGRITY MONITORING AND ADAPTIVE CONTROL METHOD AND APPARATUS

Gary G. Highberger, Atlanta, Ga., assignor to Kliklok Corporation, Decatur, Ga.

Filed Mar. 18, 1997, Ser. No. 819,895
Int. Cl.^{6} B65B *51/30;57/02*
U.S. Cl. 53—75 15 Claims

1. A method for sealing and monitoring the integrity of a seal in packaging film during forming by opposed sealing jaws during packaging of loose, free flowing product or the like, and for adaptive control thereof, comprising the steps of:
- monitoring a pressure being exerted between said sealing jaws when said sealing jaws reach a closed position and a seal is formed;

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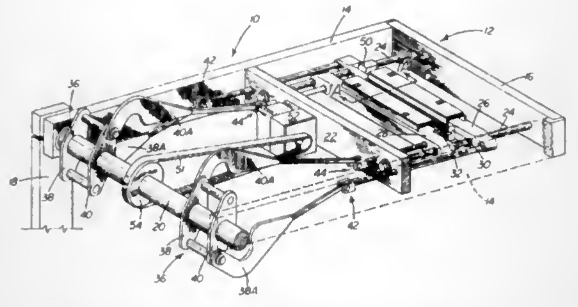


analyzing said pressure to evaluate the seal integrity;

providing a good seal signal to a controller when the pressure is less than a design threshold;

providing a marginal seal signal to said controller when the pressure is within a first range above the design threshold but indicative of an acceptable seal; and

providing a reject seal signal to said controller when the pressure is within a second range above said first range and indicative of an unacceptable seal; and

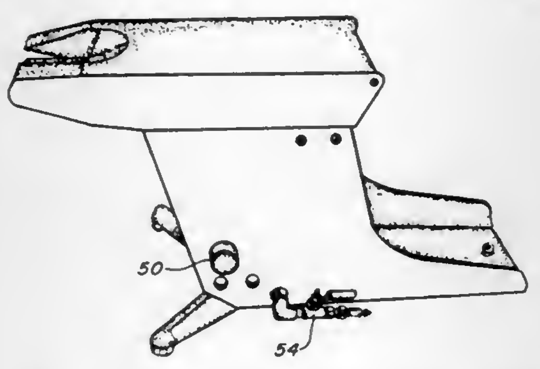
generating a control signal by said controller to provide adaptive control of said packaging,

whereby the packaging speed and efficiency can be maximized independent of ambient conditions and product variations.

5,836,137
TYING APPARATUS

Luis C. Contreras, 1701 Steinbeck St., Placentia, Calif. 92670, and Roger S. Kincel, 4928 Loma Laguna Dr., Carlsbad, Calif. 92008

Filed Sep. 22, 1997, Ser. No. 934,919
Int. Cl.^{6} B65B *51/08*
U.S. Cl. 53—138.8 **18 Claims**



1. In an apparatus for tying articles with tie material capable of being twisted to form tie having a rotatable cutting means, a twisting head, means for storing a continuous length of tie material, means for feeding a preselected length of the tie material adjacent to, said head into an essentially U-shaped configuration to be operated on by said head, wherein the improvement comprises:

an intermittent rotatable pneumatic drive connected to said feeding means and said twisting head for operating same to cause the preselected length of tie material to be severed from its continuous length and to be simultaneously twisted upon itself and thereby tied about an article during the rotation of said head, said pneumatic drive having,

a pneumatic rotary actuator with means to provide an angular rotational movement of 360 degrees, completing a full revolution,

a pilot operated control valve in pneumatic communication with said rotary actuator for driving the actuator in clockwise operational direction and a counterclockwise reset direction,

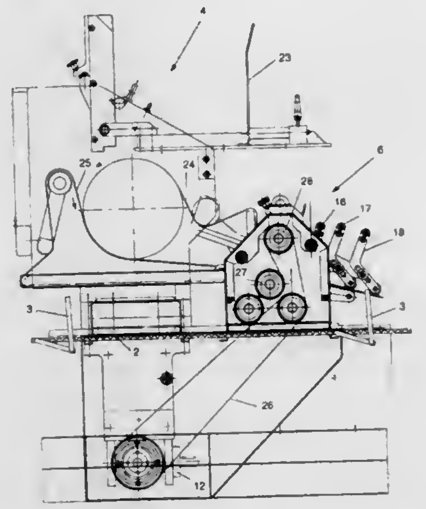
single revolution operational programming means in pneumatic communication with said control valve, actuating the control valve to rotate the actuator a single revolution when mechanically triggered by said twisting head and feeding means by supplying and releasing pneumatic pilot pressure to said control valve, and

reset valve means in pneumatic communication with said control valve when manually energized initiating and completing a single revolution of said actuator, thereby bypassing said single revolution operational programming means.

5,836,138
APPARATUS FOR ASSEMBLING AND PACKAGING MAIL ITEMS

Johan Hendriks, Hoorn, Netherlands, assignor to Buhrs Zaanhdam B.V., Zaandam, Netherlands

Filed May 6, 1997, Ser. No. 852,451
Claims priority, application Netherlands, May 6, 1996, 1003045
Int. Cl.^{6} B65B *11/20;35/24*
U.S. Cl. 53—206 **7 Claims**

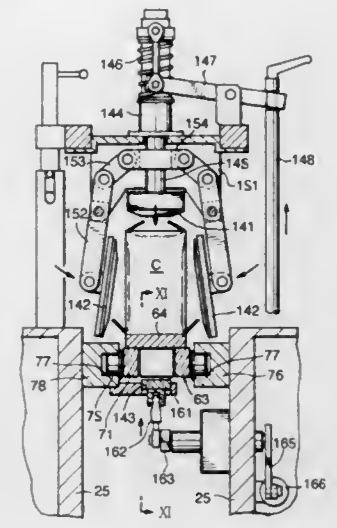


1. An apparatus for assembling and packaging mail items, wherein the mail items are assembled from documents in a mail item assembly path and thereafter are placed on a web in a packaging path, which web is folded around the mail item placed thereon and is closed in order to form a mailable postal package, the apparatus comprising, in the mail item assembly path, a transport track (**1**) which includes an endless conveyor (**2**) with mail item forwarding projections (**3**) and a conveyor drive, as well as at least one feeding device (**4**) with a feeding device drive, which feeding device (**4**) is arranged above and in-line with the transport track (**1**) for feeding documents, the feeding device (**4**) comprising a feeding device delivery gap (**5**) located a distance above a transport surface formed by the transport track (**1**), the apparatus further comprising a document guiding device (**6**) arranged downstream of the feeding device delivery gap (**5**), which document guiding device (**6**) comprises a first endless conveyor (**7**) and a second endless conveyor (**8**), each having a portion of a transport part in mutual abutment and thus forming a document guiding path (**9**) bounded by a document guiding path infeed gap (**10**) and a document guiding path delivery gap (**11**), while a drive (**12**) of the first and the second endless conveyor (**7**, **8**) is independent of the feeding device drive, and in operation the transport speeds of the first and the second conveyor (**7** and **8**, respectively) are equal to each other.

5,836,139
EAR BONDING DEVICE FOR USE IN PACKAGING MACHINES

Kiyomi Yoshida; Kei Ueta, and Michio Ueda, all of Itano-gun, Japan, assignors to Shikoku Kakoki Co., Ltd., Tokushima, Japan

Filed Jul. 14, 1997, Ser. No. 892,536
Claims priority, application Japan, Jul. 15, 1996, 8-185203
Int. Cl.^{6} B65B *51/14;61/24*
U.S. Cl. 53—387.3 **4 Claims**



1. An ear bonding device for use in packaging machines comprising a container transport conveyor having a plurality of holders for holding a container having upper and lower ears as supported on each pair of adjacent holders, the conveyor being intermittently drivable so as to halt containers held by the holders one after another at a pressure-bonding station; an upper ear pressing member disposed above a path of transport of containers at the pressure-bonding station and movable upward and downward; a pair of lower ear pressing members arranged at opposite sides of the transport path respectively and movable toward and away from each other; and a support member for receiving pressure of the upper ear pressing member and the lower ear pressing members acting on the holder for pressure bonding.

5,836,140
WRAPPING A LOAD WHILE CONTROLLING WRAP TENSION

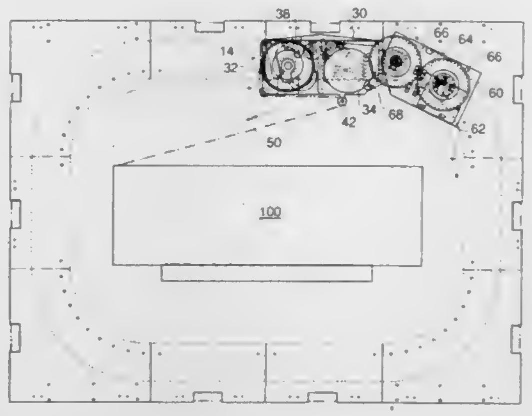
Patrick R. Lancaster, III, Louisville, Ky., assignor to Lantech, Inc., Louisville, Ky.

Filed Nov. 13, 1996, Ser. No. 746,545
Int. Cl.^{6} B65B *13/02*
U.S. Cl. 53—399 **52 Claims**

1. A method for automatically wrapping packaging material around a load having corners and for which demand for packaging material decreases as the packaging material approaches contact with a corner and increases after the packaging material intercepts a corner comprising:

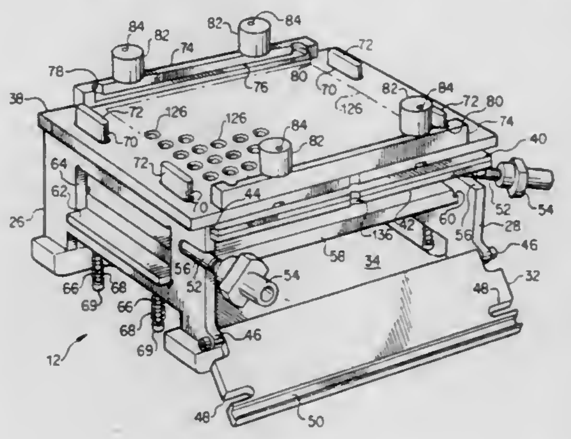
providing relative rotation between a load having corners and a packaging material dispenser to wrap the packaging material around the load;

automatically varying the tension on the packaging material around the time the packaging material intercepts a corner of the load to apply substantially the highest tension during wrapping to the packaging material near each corner of the load, locking in substantially the highest tension on the packaging material during wrapping as each corner intercepts the packaging material.



5,836,141
CAPSULA HANDLING SYSTEM

James A. Sundberg, Apple Valley, Calif., assignor to Professional Compounding Centers of America, Inc., Houston, Tex.
Continuation of Ser. No. 841,475, Feb. 26, 1992, Pat. No. 5,321,932. This application Mar. 14, 1994, Ser. No. 209,260
Int. Cl.^{6} B65B *43/40*
U.S. Cl. 53—468 **23 Claims**



1. A method of handling capsules, said method comprising the steps of:

providing a loader component and an opener/encapsulater component;

providing first capsules and second capsules, wherein said second capsules are larger than said first capsules;

providing two first capsule receiving plates for holding said first capsules within said opener/encapsulater component, and providing two second capsule receiving plates for holding said second capsules within said opener/encapsulater component;

simultaneously positioning and orienting said first capsules within said opener/encapsulater component, said step of simultaneously positioning and orienting said first capsules within said opener/encapsulater component being performed by said loader component;

removing said first capsule receiving plates from said opener/encapsulater component;

positioning said second capsule receiving plates within said opener/encapsulater component; and

simultaneously positioning and orienting said second capsules within said opener/encapsulater component, said step of simultaneously positioning and orienting said second capsules within said opener/encapsulater component being performed by said loader component.

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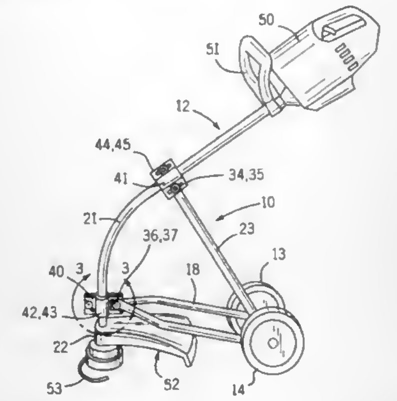
5,836,142

WHEEL ATTACHMENT CONNECTABLE TO WEED TRIMMERS AND THE LIKE

Eugene E. Maxwell, 4711—104th St., Kenosha, Wis. 53142-5612

Filed Dec. 4, 1996, Ser. No. 760,188
Int. Cl.⁶ A01D *75/10*
U.S. Cl. 56—12.1 **19 Claims**



1. A wheel attachment connectable to a handheld device having a shaft with an operating unit at an operating end and a handle at a handle end, comprising:

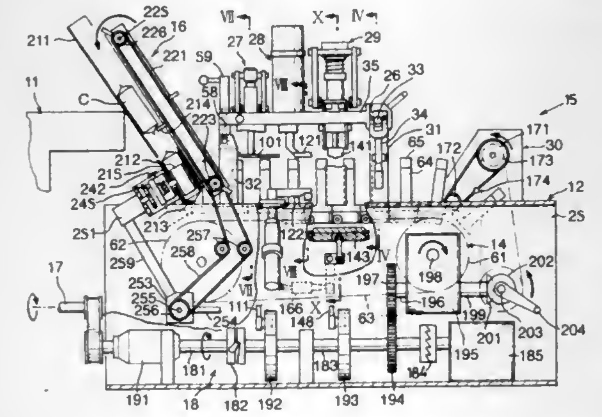
an axle having two ends;
a pair of wheels attached to the ends of the axle;
a first frame having a first end and a second end, the first end attached to the axle and the second end attached to the shaft of the handheld device;
a second frame having a first end and a second end, the first end attached to the axle and the second end attached to the shaft at a point above the attached location of the second end of the first frame; and
wherein the first frame and second frame are A-shaped such that both frames have a single point of contact with the shaft of the device and multiple points of contact with the axle.

5,836,143

DRIVE DEVICE FOR USE IN PACKAGING MACHINES

Kiyomi Yoshida; Seiji Sato, and Hiroyuki Matsuda, all of Tokushima, Japan, assignors to Shikoku Kakoki Co., Ltd., Tokushima, Japan

Filed Jul. 14, 1997, Ser. No. 892,064
Claims priority, application Japan, Jul. 15, 1996, 8-185214
Int. Cl.⁶ B65B *61/24;9/20*
U.S. Cl. 53—551 **5 Claims**



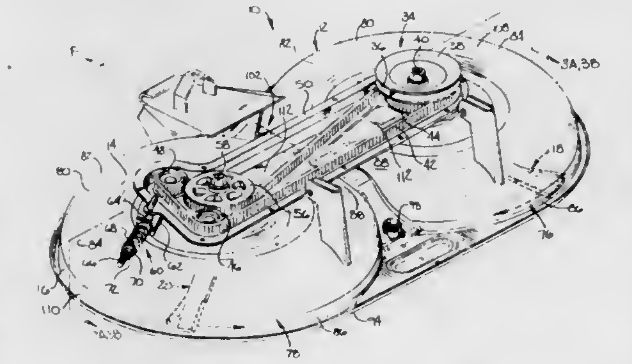
1. In a packaging machine comprising a device for forming incomplete containers by forming a web into a tube, filling contents into the tube, thereafter transporting the tube by a length corresponding to one container at a time, and sealing and cutting the tube transversely thereof every time the tube is transported; a container conveyor for receiving the incomplete containers from the device and transporting the containers; and a complete container forming device for mating each incomplete container into a complete rectangular parallelepipedal container during transport on the conveyor, a drive device comprising a main shaft coupled to the incomplete container forming device so as to transmit power thereto, and a transmission shaft having one end connected to the main shaft by a main clutch and the other end coupled to a motor by a secondary clutch, the transmission shaft being coupled to the conveyor so as to transmit power thereto.

5,836,144

MOUNTING PLATE FOR MOWER DECK

Gary David Hohnl, Slinger, and Dean William Benter, Horicon, both of Wis., assignors to Deere & Company, Moline, Ill.

Filed Jan. 24, 1997, Ser. No. 788,972
Int. Cl.⁶ A01D *34/82*
U.S. Cl. 56—320.1 **11 Claims**



1. A mechanism having a multiple spindle mower deck within which a plurality of mower blades rotate for mowing grass, comprising:

spindle housings which rotatively support respective spindles to which the mower blades are fixed for rotation, said spindle housings being operatively rigidly fixed with the mower deck,
a belt drive mechanism for driving the spindles, including pulleys mounted to respective spindles and a belt which operatively engages said pulleys,
at least one idler pulley which engages the belt,
a mounting plate to which said at least one idler pulley is mounted, said mounting plate being positioned above the mower deck and is operatively fixed with the deck and spindle housings by way of attaching hardware that fix the spindle housings with the deck.

5,836,145

TIRE CORD HAVING A CORE AND SHEATH WITH IMPROVED RUBBER PENETRATION

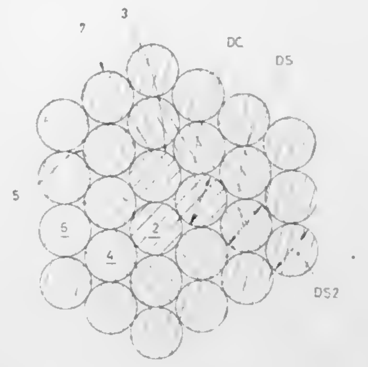
Masatsugu Kohno, Kobe, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo-ken, Japan

Filed Oct. 27, 1995, Ser. No. 549,314
Claims priority, application Japan, Oct. 28, 1994, 6-289199; Nov. 24, 1994, 6-315874
Int. Cl.⁶ D02G *3/36*
U.S. Cl. 57—213 **4 Claims**

1. A tire cord comprising a core, a first sheath and a second sheath surrounding the first sheath, wherein

the core consists of three steel filaments twisted together,
the first sheath consists of seven to nine steel filaments twisted around the core in the same direction as the core twist,
the twist pitch length of the first sheath is in the range of from 1.05 to 1.50 times the twist pitch length of the core,
the diameter of the core filaments is in the range of from 0.8 to 1.0 times the diameter of the first sheath filaments,

the second sheath consists of twelve to fifteen steel filaments twisted around the first sheath in the same direction as the core twist,
the twist pitch length of the second sheath is in the range of from 1.05 to 1.50 times the twist pitch length of the first sheath.

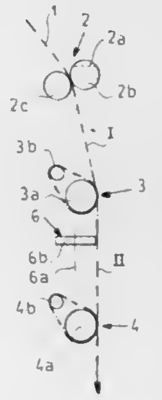


5,836,146

METHOD OF AND APPARATUS FOR PRODUCING THICK REGIONS IN A FILAMENT YARN

Günter König, Uhingen, Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach/Fils, Germany

Filed Sep. 25, 1997, Ser. No. 938,414
Claims priority, application Germany, Sep. 30, 1996, 196 40 405.3
Int. Cl.⁶ D01H *13/26*
U.S. Cl. 57—287 **14 Claims**



1. A method of producing thick regions along a filament yarn, comprising the steps of:

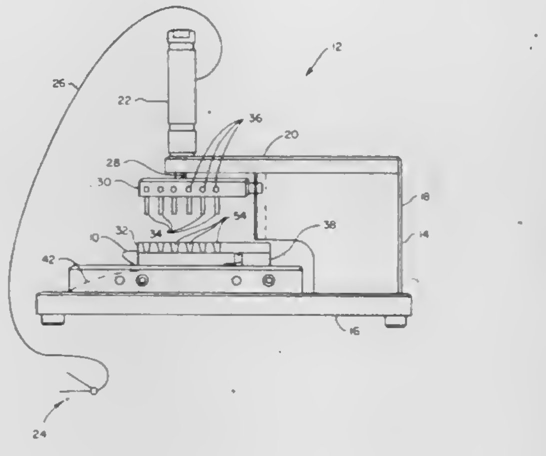
(a) displacing a filament which can be thinned by stretching and can be stretched upon heating along a path:
(b) stretching said filament at an upstream first zone along said path and, independently of stretch applied to said filament at said first zone, stretching said filament at a second zone of said path downstream of said first zone:
(c) forming said filament in said first zone with initial thick regions of first lengths spaced apart with first spacings along said filament; and
(d) at time-spaced intervals, heating portions of at least some of said initial thick regions along said second zone while said filament is stretched in said second zone to thin out heated portions of said initial thick regions and vary lengths and spacings of remaining thick regions along said filament, thereby generating a generally random distribution of thick regions along said filament with respect to lengths and spacings thereof.

5,836,147

APPARATUS AND METHOD FOR ASSEMBLING STAPLE DRIVERS IN A CARTRIDGE

Leonard H. Schnipke, Cloverdale, Ohio, assignor to Schnipke Family Partnership, Ottoville, Ohio

Division of Ser. No. 490,767, Jun. 15, 1995, Pat. No. 5,653,928. This application Apr. 3, 1997, Ser. No. 832,092
Int. Cl.⁶ B29C *37/02;65/00;* **B23Q** *3/00*
U.S. Cl. 59—71 **3 Claims**



1. Apparatus for assembling staple drivers in a cartridge to be used during surgery comprising,

said cartridge being an elongated generally rectangular shape, one of the sides of said rectangle including a channel extend longitudinally along said side; a plurality of pocket openings in said side, said pocket openings being linearly aligned generally parallel with said channel, said pocket openings being one end of a plurality of pockets extending completely through said cartridge from pocket entrances on the opposite side of said cartridge from said pocket openings, said pocket openings having a geometric shape;
a bracket having a trough configured to receive said cartridge only by linear insertion with said pocket opening facing away from overlying plungers,
a guide fixture mounted between said plungers and said cartridge including guide passages converging toward said pocket entrances; said passages being formed to receive a plurality of tree mounted staple drivers of a size and geometric shape generally corresponding to the size and geometric shape of said pocket openings; said tree being formed with a plurality of branches and with a staple driver on one end of each branch, said staple drivers being linearly aligned;
said guide passages converging to a size and geometric shape generally corresponding to the size and geometric shape of said staple drivers, whereby the narrowest parts of said guide passages are a snug fit for said staple drivers and thereby said narrowest parts are structurally configured to prevent misalignment of said staple drivers as said staple drivers are separated from the branches of said tree;
said overlying plungers including blades aligned with said guide passages and pockets mounted on a plate,
said plate being mounted to reciprocate with respect to said bracket whereby said blades engage said staple drivers after said staple drivers are separated from said tree and push said staple drivers into said pockets.

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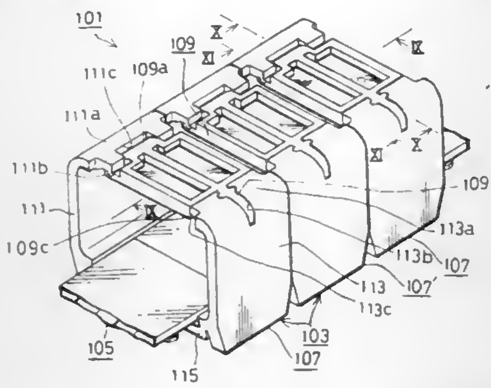
5,836,148
CABLE CHAIN

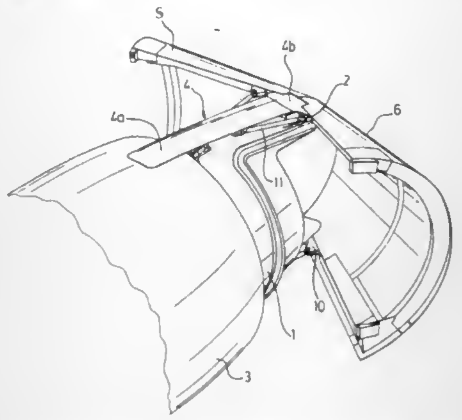
Hitoshi Fukao, Komaki, Japan, assignor to Kunimorikagaku Ltd., Aichi-ken, Japan
Filed Aug. 5, 1996, Ser. No. 692,383
Claims priority, application Japan, Feb. 6, 1996, 8-045423; Apr. 5, 1996, 8-110456
Int. Cl.^{6} F16G *13/02*
U.S. Cl. 59—78.1 **12 Claims**



1. A cable chain having a number of chain unit members made of synthetic resin, each of said chain unit members comprising:
- a supporting plate for connecting together a pair of side plates opposite each other at an appointed interval at ends of said supporting plate at a lower portion of the side plates;
- a covering member made of synthetic resin for covering an upper opening of the respective chain unit members;
- a hinge member made of synthetic resin having an integral hinge property, said hinge member being molded in advance to be a plate-like member having an engaging portion to be engaged in an attaching hole secured at the respective supporting plates of adjacent chain unit members.

5,836,149
THRUST REVERSER PROVIDED WITH AT LEAST ONE SWING DOOR AND CONSTRUCTED TO PERMIT A BEARING SURFACE OF REDUCED THICKNESS OF THE TRAILING EDGE, FOR A JET ENGINE, NOTABLY THAT OF AN AIRCRAFT, AND A JET ENGINE EQUIPPED WITH THIS THRUST REVERSER

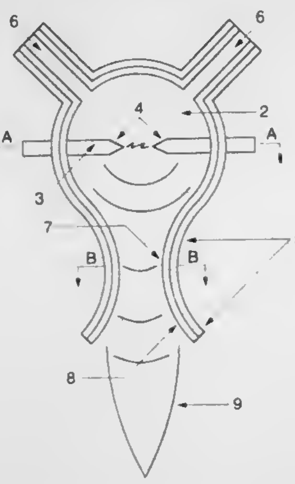
Guy Servanty, Leguevin, France, assignor to Conception Aeronautique Du Sud-Ouest, Blagnac, France
Continuation of Ser. No. 409,001, Mar. 23, 1995, abandoned. This application May 27, 1997, Ser. No. 863,722
Claims priority, application France, Mar. 28, 1994, 94.03920
Int. Cl.^{6} F02K *1/60;1/11*
U.S. Cl. 60—226.2 **7 Claims**



1. A thrust reverser for a jet engine, notably that of an aircraft, comprising a pipe extended by flanges, and a fairing covering the pipe and the flanges, said thrust reverser having:
- at least one door having outer and inner surfaces and provided with a rear end face having a trailing edge extending along a plane which is oblique with respect to the longitudinal axis of this door, each of said doors being disposed in line with the pipe and borne by connecting pieces pivoting about transverse pivots fixed to the flanges, towards the rear end of the latter,
- pivoting means for each door, arranged so as to cause it to pivot about the axis of said pivots between two extreme positions:
  - a folded position in which each door lies in line with the pipe so as to have, on the outer surface of the door, the same profile as the fairing, and to form on the inner surface of the door, with the flanges, an extension of the pipe,
  - a deployed position in which each door is disposed in such a way that its rear face is substantially parallel to the longitudinal axis of the engine,
  - wherein each connecting piece being integral with said door and including a connecting arm fixed to the flange, each connection piece includes a structural joint offset towards the front relative to a transverse plane passing through the fronts of the pivots of the doors and orthogonal to the longitudinal axis of the door,
- the fairing extends as far as the rear end of the flanges and is connected to the flanges to obtain a bearing plate of minimal thickness when the doors are in their deployed position, said fairing and each door being arranged, on the one hand, so as to cover completely the flanges in the folded position of the said door, and, on the other hand, to enable each door to be brought into its deployed position completely clearing the space between the internal flange and the external fairing without any interference between said fairing and door.

5,836,150
MICRO THRUST AND HEAT GENERATOR

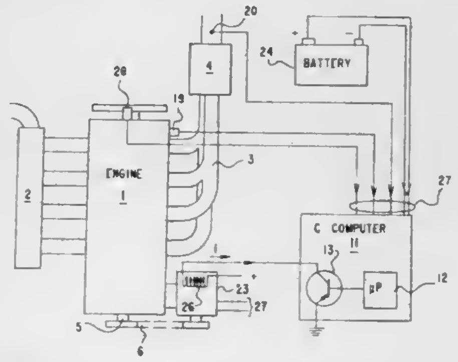
Ernest J. Garcia, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed May 31, 1995, Ser. No. 456,993
Int. Cl.^{6} F02K *9/08*
U.S. Cl. 60—256 **23 Claims**



1. A micro thrust and heat generator developed using a polysilicon surface micromachining batch-fabricated technique comprising:
- a substrate base comprising at least single crystal silicon material;
- an ignition chamber formed on said substrate base;
- a delivery means formed on said substrate base for providing a fuel source to said ignition chamber;
- an ignition means formed on said substrate base for igniting a fuel source within said ignition chamber; and
- a convergent-divergent nozzle formed on said substrate base and extending outward from said ignition chamber for receiving a high-flow gas stream generated from said ignition means within said ignition chamber.

5,836,151
METHOD AND DEVICE FOR REDUCING HARMFUL GAS EMISSIONS FROM A MOTOR VEHICLE INTERNAL COMBUSTION ENGINE

Alain Antranik Atanasyan, Tournefeuille; Alain Michel Aubourg, Toulouse, and Alain Joseph Perez, Fonsorbes, all of France, assignors to Siemens Automotive S.A., Toulouse Cedex, France
PCT No. PCT/EP94/00105, § 371 Date Jul. 27, 1995, § 102(e) Date Jul. 27, 1995, PCT Pub. No. WO94/17296, PCT Pub. Date Aug. 4, 1994
PCT Filed Jan. 17, 1994, Ser. No. 495,569
Claims priority, application France, Jan. 29, 1993, 93 00960
Int. Cl.^{6} F01N *3/20*
U.S. Cl. 60—274 **13 Claims**

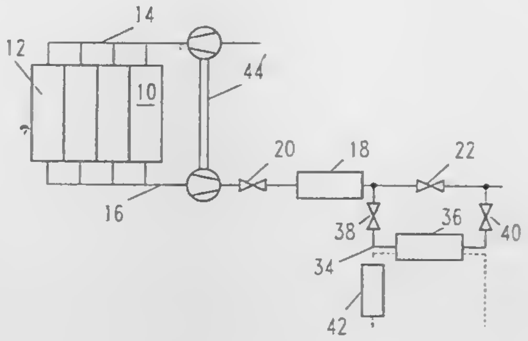


1. A method for reducing harmful gas emissions of an internal combustion engine propelling a motor vehicle, wherein the internal combustion engine powers at least one auxiliary unit by supplying mechanical energy thereto, the method which comprises:
- during a warm-up phase of the internal combustion engine,
- modifying a given operating condition of an auxiliary unit powered by the internal combustion engine and reducing a mechanical power absorbed by the auxiliary unit as compared with a mechanical power absorbed during a normal operation thereof.

5,836,152
PROCESS FOR REDUCING THE EXHAUST GAS EMISSIONS OF AN INTERNAL COMBUSTION ENGINE FOR MOTOR VEHICLES WITH CATALYTIC CONVERTER

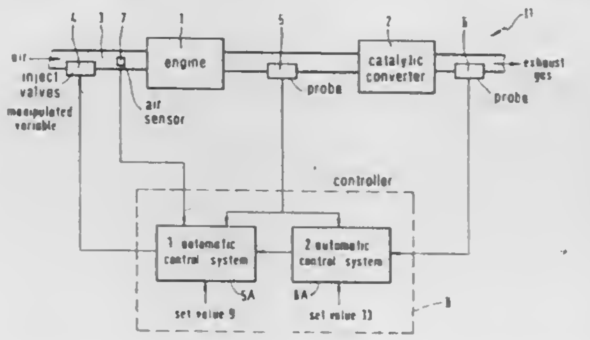
Oskar Schatz, Gauting, Germany, assignor to Schatz Thermo Gastech GmbH, Erling-Andechs, Germany
PCT No. PCT/EP96/00091, § 371 Date Sep. 10, 1996, § 102(e) Date Sep. 10, 1996, PCT Pub. No. WO96/21803, PCT Pub. Date Jul. 18, 1996
PCT Filed Jan. 10, 1996, Ser. No. 704,564
Claims priority, application Germany, Jan. 10, 1995, 195 00 472.8
Int. Cl.^{6} F01N *5/02*
U.S. Cl. 60—274 **37 Claims**

1. A method for reducing exhaust gas emissions of an internal combustion engine for an automotive vehicle, said combustion engine including an exhaust gas outlet, an exhaust gas conduit and an exhaust gas catalytic converter, which method is characterized by providing, at least at cold start, a ram pressure condition in said exhaust gas conduit to generate a pressure increase of more than 0.5 bar at the exhaust gas outlet of the engine, and by additionally loading the engine at rapid load and speed changes and by controlling said ram pressure condition such that ram pressure is relatively high when said combustion engine is under low load conditions, and ram pressure is relatively low when said combustion engine is under heavy load conditions.



5,836,153
METHOD FOR CONTROLLING THE FUEL-AIR RATIO OF AN INTERNAL COMBUSTION ENGINE

Ulrich Staufenberg, Diethardt, and Peter Olejnik, Bad Soden, both of Germany, assignors to VDO Adolf Schindling AG, Frankfurt, Germany
Filed Dec. 5, 1996, Ser. No. 762,120
Claims priority, application Germany, Dec. 7, 1995, 195 45 694.7
Int. Cl.^{6} F02D *41/14*
U.S. Cl. 60—274 **7 Claims**



1. A method for controlling the fuel-air ratio of an internal combustion engine in which the output signal of a first lambda probe, which is arranged in front of a catalytic converter in the exhaust pipe of the internal combustion engine, is fed to a controller, and the controller gives off a setting variable for the fuel-air ratio, there being another signal which is obtained from the output signal of a second lambda probe arranged behind the catalytic converter and which is fed to the controller, the method comprising steps of:
- obtaining a hold time from the output signal of the second lambda probe depending on the point in time of a reversal of the output signal of the first lambda probe:
- employing the hold time for offsetting, in time, the output signal of the controller;
- producing a count of reversals of the output signal of the first lambda probe;
- incrementing a value of the count in at least one of a positive sense and a negative sense according to a comparison of the output signal of the second lambda probe with a reference signal; and
- in said obtaining step, employing the count for obtaining the hold time.

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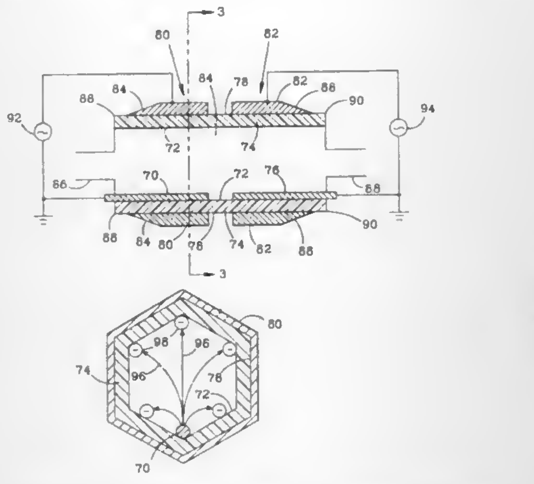
5,836,154
MULTI-STATE GASEOUS POLLUTANT DESTRUCTION APPARATUS AND METHOD

Weldon S. Williamson, Malibu; Franklin A. Dolezal, Reseda; David B. Cohn, Torrance, and John H. S. Wang, Rancho Palos Verdes, all of Calif., assignors to Raytheon Company, El Segundo, Calif.

Filed Aug. 19, 1996, Ser. No. 689,998
Int. Cl.^{6} F01N *3/00*
U.S. Cl. 60—275 **32 Claims**



1. A corona discharge pollutant destruction apparatus, comprising:

a pollutant generator capable of generating an exhaust gas including multiple types of pollutants;

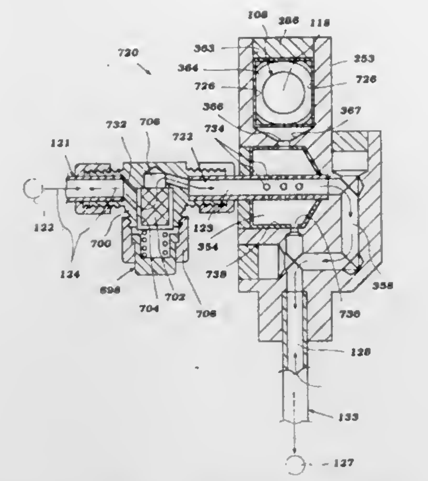
a plurality of corona discharge reactors positioned to receive said exhaust gas in series and to treat said pollutants, wherein said plurality of corona discharge reactors comprise at least one oxidation reactor and at least one reduction reactor, said oxidation reactors connected to oxidize relatively high energy level pollutants, and said reduction reactors connected to reduce relatively low energy level pollutants and wherein said oxidation reactors and said reduction reactors are connected alternately in series, each reduction reactor positioned to treat said low energy level pollutants subsequent to treatment of said high energy level pollutants by a preceding oxidation reactor; and

a power source connected to supply different ones of said reactors with different levels of electrical power to generate corona discharges in said reactors for treating different respective pollutants in said exhaust gas.

5,836,155
SENSOR ARRANGEMENT FOR ENGINE CONTROL SYSTEM

Masahiko Katoh, Iwata, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jun. 7, 1995, Ser. No. 476,361
Claims priority, application Japan, May 6, 1994, 6-117645; Jun. 8, 1994, 6-151521; Jun. 8, 1994, 6-151522; Jun. 30, 1994, 6-172625; Jul. 13, 1994, 6-185418; Jul. 13, 1994, 6-185419; Jul. 18, 1994, 6-165453; Sep. 2, 1994, 6-209785; Nov. 9, 1994, 6-275121; Nov. 10, 1994, 6-303216; Nov. 10, 1994, 6-303217
Int. Cl.^{6} F01N *3/22;* G01N *27/46*
U.S. Cl. 60—276 **94 Claims**

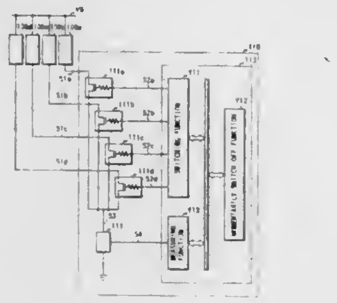


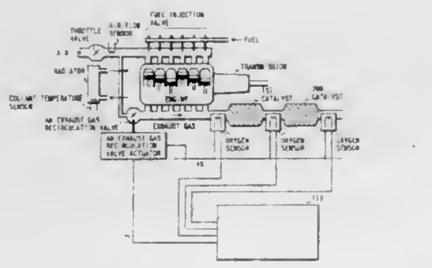
1. A control system for a 2-cycle, crankcase compression, internal combustion engine having a combustion chamber that varies in volume cyclically during engine operation, an exhaust system for receiving exhaust gases from said combustion chamber during a cycle of engine operation, a fuel supply system for supplying fuel to said engine for combustion in said combustion chamber, an accumulator chamber for providing a volume in which exhaust gases from said combustion chamber may accumulate and communicating with said combustion chamber for at least a portion of the engine operating cycle, a sensor in said accumulator chamber for providing a control signal for control of said fuel supply system, and protecting means for preventing oil and said exhaust gases from contaminating said sensor comprising coating the inner surface of said accumulator chamber with a catalytic material.

5,836,156
DRIVING DEVICE OF SENSORS AND ACTUATORS

Mitsuru Watabe, Urizura-machi, and Hideaki Ishikawa, Mito, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 18, 1995, Ser. No. 529,492
Claims priority, application Japan, Sep. 16, 1994, 6-221390
Int. Cl.^{6} F01N *3/00*
U.S. Cl. 60—276 **8 Claims**





1. A device for driving a plurality of at least one of sensors and actuators, comprising:

measuring means for measuring electric current flowing through said plurality of at least one of sensors and actuators;

switching means for selectively energizing said plurality of at least one of sensors and actuators; and

a control unit for controlling said switching means to cause said measuring means to measure separately electric current flowing through each of said plurality of at least one of sensors and actuators separately by switching on and off the electric current in said plurality of at least one of sensors and actuators.

wherein said sensors are air-fuel ratio sensors disposed on both sides of a catalyst or catalysts in an exhaust channel of an engine, and said actuators are exhaust recirculation valve actuators.

2. Device for driving sensors which are substantially continuously energized while said device is active, said device comprising:

measuring means for measuring an electric current flowing through said sensors;

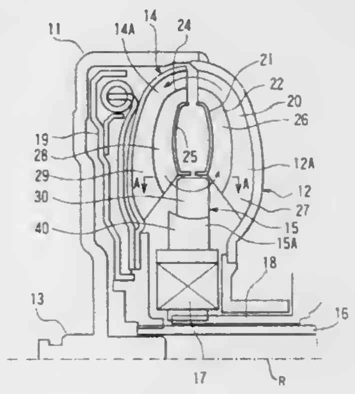
switching means for selectively enabling and interrupting an electric current flow in said sensors; and

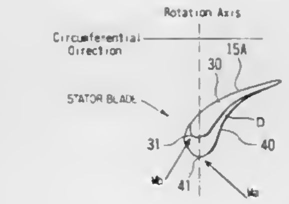
a control unit for controlling said switching means periodically to interrupt current flow in all of said sensors other than a selected sensor whose current is to be measured.

5,836,157
TORQUE CONVERTER FOR MOTOR VEHICLE

Hideaki Kosuge, Fuji, Japan, assignor to Jatco Corporation, Japan

Filed Dec. 4, 1997, Ser. No. 985,340
Claims priority, application Japan, Dec. 5, 1996, 8-340549
Int. Cl.^{6} F16D *33/00*
U.S. Cl. 60—362 **9 Claims**





1. A torque converter for a motor vehicle, comprising an impeller, a turbine, and a stator, for forming a circulation path of an oil and transmitting a rotary torque, each of said impeller, said turbine and said stator having a plurality of blades;

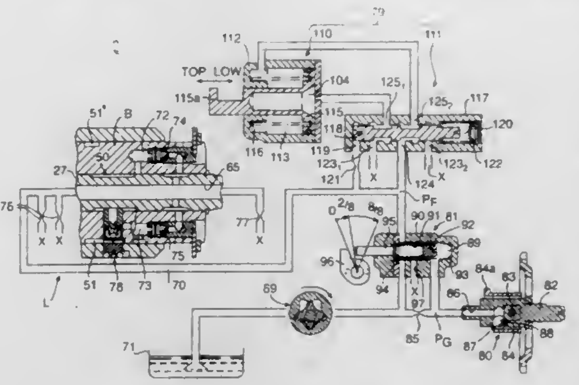
wherein each of said plurality of blades of said stator is divided into a radially inner half portion and a radially outer half portion in a radial direction of the circulation path; and

wherein said radially inner half portion has a front edge that is set back from a front edge of said radially outer half portion, and is inclined with respect to a direction of a rotation axis of the torque converter by a larger angle than said radially outer half portion.

5,836,158
AUTOMATIC CLUTCH DEVICE FOR HYDROSTATIC CONTINUOUSLY VARIABLE TRANSMISSION

Yoshihiro Nakajima, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 9, 1996, Ser. No. 727,927
Claims priority, application Japan, Oct. 9, 1995, 7-261682
Int. Cl.^{6} F16D *31/02*
U.S. Cl. 60—436 **22 Claims**



1. An automatic clutch device for a hydrostatic continuously variable transmission in which a hydraulic pump and a hydraulic motor are in communication with each other through a low pressure oil passage and a high pressure oil passage, and an oil supply passage connected to an oil supply pump is connected to said low pressure oil passage and said high pressure oil passage through a first check valve and a second check valve, respectively, said automatic clutch device, comprising:

a clutch valve operatively positioned for communicating oil from said high pressure oil passage and at least one of said low pressure oil passage and a discharge port connected to an oil reservoir, for switching a valve position between a valve opening position in which said high pressure oil passage and at least one of said low pressure oil passage and said discharge port connected to said oil reservoir are communicated to each other and a valve closing position in which they are cut-off from each other, said clutch valve being applied with an oil pressure of said low pressure oil passage for biasing said clutch valve in the valve closing direction; and

an oil pressure governor for linearly increasing the oil pressure of said low pressure oil passage applied to said clutch valve with an input rotational speed of said hydraulic pump, said oil pressure governor being in communication with said clutch valve.

5,836,159
MECHANISM OF RETURNING TO NEUTRAL FOR AXLE DRIVING APPARATUS

Hiroaki Shimizu, and Ryota Ohashi, both of Amagasaki, Japan, assignors to Kanzaki Kokyukoki Mfg. Co., Ltd., Japan

Filed Jun. 11, 1997, Ser. No. 872,672
Claims priority, application Japan, Jun. 26, 1996, 8-166225
Int. Cl.^{6} F16D *39/00*
U.S. Cl. 60—487 **3 Claims**

1. A hydrostatic transmission comprising:

a hydraulic pump and a hydraulic motor fluidly connected with each other through a closed fluid circuit for circulating operating oil between said hydraulic pump and said hydraulic motor;

a movable swash plate for changing a quantity of oil discharged by said hydraulic pump;

a control arm engaging with said movable swash plate;

a biasing means provided for returning said movable swash plate which has been slantingly rotated to a neutral position when an operating force is released therefrom;

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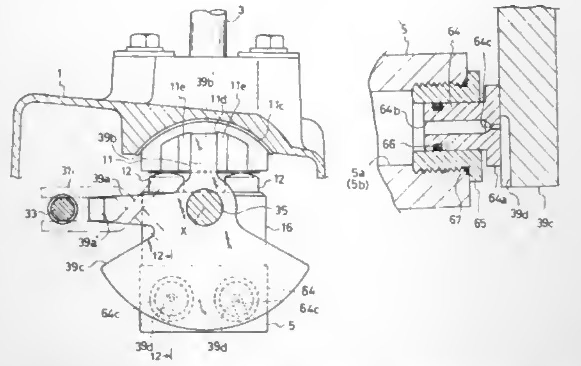
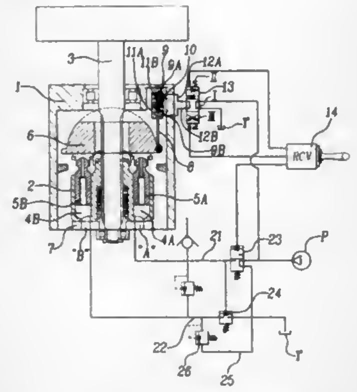


- a center section, disposed in a housing, in which said closed fluid circuit is disposed; and
- a piston disposed within said center section, wherein said piston is slid out of said center section by the pressure of operating oil in said closed fluid circuit and presses against said control arm when said movable swash plate is slantingly rotated out of the neutral position.

5,836,160
HYDRAULIC SYSTEM FOR DRIVING AXIAL PISTON TYPE HYDRAULIC MOTOR

Sung Kyo Chang, Changwon, Rep. of Korea, assignor to Samsung Heavy Industries Co., Ltd., Rep. of Korea
Filed Dec. 10, 1996, Ser. No. 762,917
Int. Cl.⁶ F16D *39/00*
U.S. Cl. 60—489 **3 Claims**

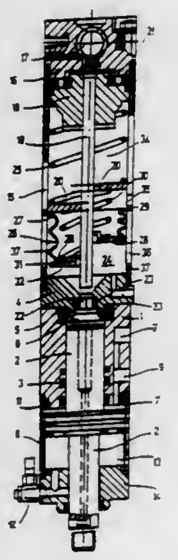


1. A hydraulic system for driving an axial piston type hydraulic motor having a swash plate pivotably rotatable relative to a shaft, a cylinder block coupled to the shaft, and a plurality of reciprocating pistons being disposed in the cylinder block and further coupled to the swash plate, the hydraulic system comprising:

- a cylinder;
- a swash plate piston received within said cylinder, said swash plate piston dividing said cylinder into a first chamber and a second chamber;
- a rod connecting said swash plate piston and the swash plate;
- a pair of springs disposed within each chamber, said springs exerting biasing forces on said swash plate piston;
- a first fluid passage connected to said first chamber;
- a second fluid passage connected to said second chamber;
- a piston control valve for selectively connecting said first and second fluid passages to a hydraulic pump and a tank or, alternatively, connecting said first fluid passage to said second fluid passage;
- an inlet passage provided between an inlet port of the hydraulic motor and said hydraulic pump;
- an outlet passage provided between an outlet port of the hydraulic motor and said tank;
- a main control valve provided within said inlet passage for selectively opening said inlet passage in response to a predetermined signal; and
- a remote control valve outputting a predetermined signal to said piston control valve and said main control valve.

5,836,161
HYDRAULIC PRESSURE BOOSTER

Viktor Malina, Kissleg, Germany, assignor to Tox Pressotechnik GmbH, Weingarten, Germany
PCT No. PCT/DE95/01795, § 371 Date Sep. 19, 1997, § 102(e) Date Sep. 19, 1997, PCT Pub. No. WO96/18825, PCT Pub. Date Jun. 20, 1996
PCT Filed Dec. 14, 1995, Ser. No. 849,828
Claims priority, application Germany, Dec. 16, 1994, 44 45 011.7
Int. Cl.⁶ F15B *7/00;* **B60T** *13/58*
U.S. Cl. 60—560 **22 Claims**

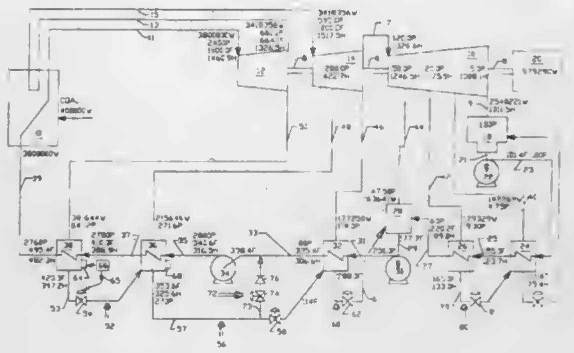


1. A hydraulic pressure booster comprising,

- a fluid-filled working chamber (**6**, **106**) for alternating pressures of a low reservoir pressure and a high working pressure,
- a fluid-filled reservoir chamber (**24**, **124**), which is under reservoir pressure is hydraulically connected to the working chamber (**6**, **106**) and has a movable dividing wall (**26**, **126**),
- a working piston (**2**, **102**) that functions in the working chamber (**6**, **106**) and whose stroke can be transmitted outside the pressure booster,
- an externally actuatable pneumatic plunger (**19**, **119**) for driving a piston (**18**, **118**) of the working piston (**2**, **102**) dips into the working chamber (**6**, **106**) and
- with a control point in a connection (**22**, **122**, **41**, **39**) between the working chamber (**6**, **106**) and the reservoir chamber (**24**, **124**), which connection can be closed by a control device in order to produce the high working pressure in the working chamber (**6**, **106**) after the dipping of the plunger (**19**, **119**),
- the movable dividing wall (**26**, **126**, **426**) is clamped in a stationary manner at least at one of its end regions (**29**, **129**, **429**), and
- the dividing wall (**26**) is embodied as a membrane (**27**, **127**, **427**) that is comprised of elastic material and defines the reservoir chamber (**24**, **124**, **424**).

5,836,162
FEEDWATER HEATER DRAIN RECYCLE SYSTEM

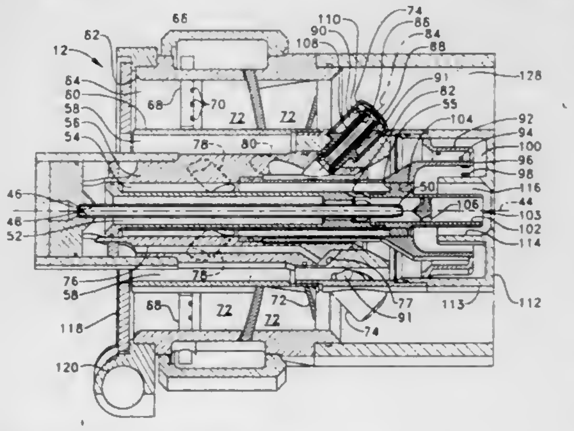
Christopher J. Haynes, Portsmouth, R.I., assignor to Power Software Associates, Inc., Portsmouth, R.I.
Filed Aug. 8, 1996, Ser. No. 693,994
Int. Cl.⁶ F01K *7/22*
U.S. Cl. 60—663 **5 Claims**



1. In a steam power plant including a boiler, a steam turbine, a plurality of feedwater heaters interconnected by feedwater piping, and a feedwater pump, with said feedwater pump located downstream of a closed feedwater heater, with one or more closed feedwater heaters downstream of said feedwater pump, and with the feedwater heater immediately upstream of the feedwater pump serving as a receiving vessel for condensate draining from the feedwater heater immediately downstream of the feedwater pump through drain piping, the improvement comprising a connection, consisting of piping and valves, between the feedwater heater immediately downstream of the feedwater pump and the feedwater piping that connects the feedwater pump and the feedwater heater immediately upstream, allowing the draining condensate to flow into said feedwater piping without the assistance of a pump.

5,836,163
LIQUID PILOT FUEL INJECTION METHOD AND APPARATUS FOR A GAS TURBINE ENGINE DUAL FUEL INJECTOR

John F. Lockyer, and Gareth W. Oskam, both of San Diego, Calif., assignors to Solar Turbines Incorporated, San Diego, Calif.
Filed Nov. 13, 1996, Ser. No. 748,309
Int. Cl.⁶ F02G *1/00*
U.S. Cl. 60—737 **3 Claims**

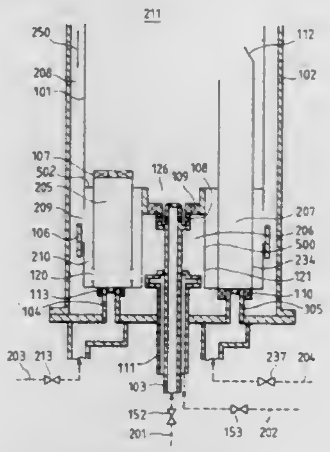


1. A fuel injector comprising:

- a liquid pilot fuel feed line having a liquid pilot fuel feed line inlet and a liquid pilot fuel feed line outlet;
- a pilot fuel-air mixing passage having an interior surface and a downstream end;
- a conically-shaped pintle swirler for driving liquid pilot fuel outwardly to flow along the interior surface of the pilot fuel-air mixing passage to create a cylindrically-shaped film of liquid pilot fuel downstream of the downstream end of the pilot fuel-air mixing passage;
- a source of air in fluid communication with the pilot fuel-air mixing passage; and
- a secondary source of air in fluid communication with the downstream end of the pilot fuel-air mixing passage.

5,836,164
GAS TURBINE COMBUSTOR

Satoshi Tsukahara, Hitachi; Shohei Yoshida, Hitachioota; Masahiko Yamagishi, Hitachi; Kazumi Iwai, Mito; Hiromi Koizumi, Hitachi, and Yoichi Yoshinaga, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jan. 29, 1996, Ser. No. 593,087
Claims priority, application Japan, Jan. 30, 1995, 7-012304
Int. Cl.⁶ F02C *1/00*
U.S. Cl. 60—733 **12 Claims**



1. A gas turbine combustor comprising:

- a diffusion combustor arranged at an axis portion of a combustion chamber for injecting fuel and effecting diffusion combustion;
- a plurality of first premixing combustors arranged at an outer periphery of said diffusion combustor for injecting a mixture of air and fuel and effecting premixed combustion each of said plurality of first premixing combustors being formed so that a mixture outlet end thereof projects more downstream than a fuel outlet end of said diffusion combustor;
- a plurality of second premixing combustors each formed so that a mixture outlet thereof projects more downstream than the mixture outlet end of said each first premixing combustor;
- wherein said first premixing combustors and said second premixing combustors are arranged alternately at the outer periphery of said diffusion combustor; and
- wherein a swirler is provided on said each first premixing combustor in the vicinity of the mixture outlet end thereof for imparting swirling motion to the mixture.

5,836,165
ADAPTIVE FEEDFORWARD VIBRATION CONTROL SYSTEM AND METHOD

Shaun L. Champion, Hermosa Beach; Yeong-Wei A. Wu, Rancho Palos Verde, and Michael H. Kieffer, Redondo Beach, all of Calif., assignors to Hughes Electronics, Los Angeles, Calif.
Filed Oct. 30, 1996, Ser. No. 739,634
Int. Cl.⁶ F01B *29/08;* **F25B** *9/00*
U.S. Cl. 62—6 **34 Claims**

1. An adaptive feedforward control system for reducing vibrations generated by opposite reciprocating pistons, said control system comprising:

- a plurality of signal generators connected to generate piston drive signals;

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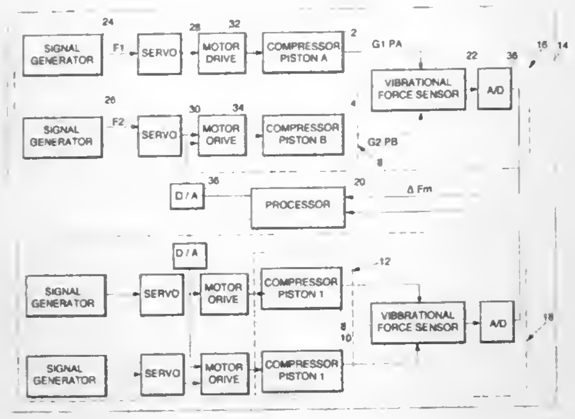


- a plurality of servos connected to control piston motor drives in response to the respective drive signals;
- a vibration sensor connected to sense vibrations caused by said pistons at a location spaced from said pistons; and
- a processor connected to provide fundamental frequency correction signals to adjust said piston motor drives in response to the fundamental frequency component of said sensed vibrations so as to reduce said vibrations.

5,836,166
COOLING APPARATUS

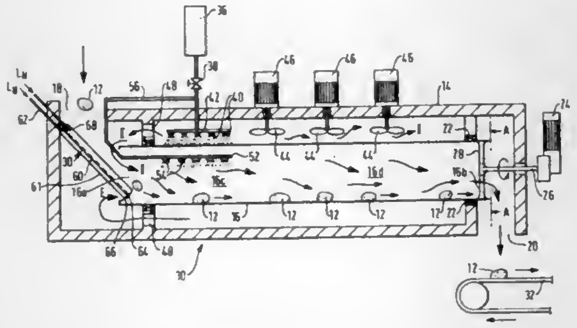
David G. Wardle, Bridgewater, N.J., assignor to The BOC Group plc, Windlesham, England

Filed May 28, 1997, Ser. No. 864,608

Claims priority, application United Kingdom, Jun. 10, 1996, 96 12041

Int. Cl.⁶ F25D *13/06*

U.S. Cl. 62—63 15 Claims



1. A method of chilling products comprising passing said products through a rotatable tube having a first upstream portion and a second downstream portion, the product being chilled in both of said portions, the method including the step of contacting the outer surface of the upstream portion of the tube with a liquid cryogenic medium thereby causing sufficient heat transfer between the outer and inner surfaces thereof so that the rate of heat loss from any of said products which become deposited on the inner surface of said upstream portion is such that the resultant thermal contraction causes any bond between the product and the tube to be broken, thereby permitting said products to be transported for further chilling in said second downstream portion of the tube.

5,836,167
METHOD AND APPARATUS FOR FREEZING LARGE PIPE

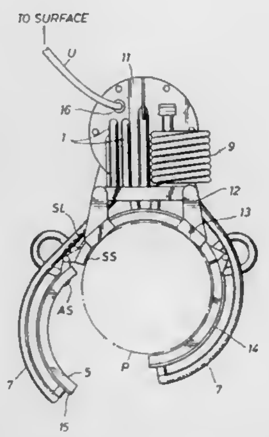
Stuart D. Clouston, Aberdeen, and Paul S. Goodwin, Aberdeenshire, both of Scotland, assignors to Nowsco Well Service Ltd., Calgary, Canada

PCT No. PCT/US95/11879, § 371 Date May 8, 1996, § 102(e) Date May 8, 1996, PCT Pub. No. WO97/11326, PCT Pub. Date Mar. 27, 1997

PCT Filed Sep. 18, 1995, Ser. No. 646,372

Int. Cl.⁶ F25D *3/00*

U.S. Cl. 62—66 41 Claims



14. Apparatus for freezing a subsea large pipe plug, comprising:
- a jacket adapted to encircle a section of large diameter pipe;
- a recycling refrigeration unit having said jacket connected as an evaporation chamber;
- a subsea submersible housing enclosing at least a portion of said refrigeration unit; and
- wherein said refrigeration unit includes a heat exchanger in cooling contact with said submersible housing atmosphere.

5,836,168
AUTOMATIC ICE PRODUCTION APPARATUS

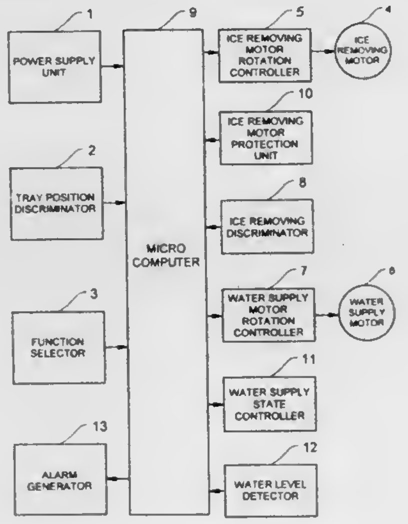
Kun Bin Lee, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Oct. 7, 1996, Ser. No. 726,791

Claims priority, application Rep. of Korea, Dec. 8, 1995, 1995-47714

Int. Cl.⁶ F25C *5/06*

U.S. Cl. 62—129 18 Claims


1
POWER SUPPLY UNIT
2
TRAY POSITION DISCRIMINATOR
3
FUNCTION SELECTOR
13
ALARM GENERATOR
9
MICRO COMPUTER
5
ICE REMOVING MOTOR ROTATION CONTROLLER
4
ICE REMOVING MOTOR
10
ICE REMOVING MOTOR PROTECTION UNIT
8
ICE REMOVING DISCRIMINATOR
7
WATER SUPPLY MOTOR ROTATION CONTROLLER
6
WATER SUPPLY MOTOR
11
WATER SUPPLY STATE CONTROLLER
12
WATER LEVEL DETECTOR

1. An automatic ice production apparatus comprising:
- an ice removing motor for turning a tray in a one of a normal and a reverse direction to perform an ice removing operation;
- a water supply motor for pumping water from a water supply tank to refill said tray following ice removal;
- a tray position discriminator for discriminating a rotation position of said tray;
- a function selector for allowing a user to select various functions of said automatic ice production apparatus;
- a dispenser for supplying drinking water to the user;
- an ice removing discriminator for checking an ice producing state;
- ice removing motor rotation control means connected to said ice removing motor for controlling a rotating operation of said ice removing motor;
- water supply motor rotation control means connected to said water supply motor for controlling a rotation operation of said water supply motor;
- water supply state control means connected to said water supply motor for controlling an amount of water pumped by said water supply motor to said automatic ice production apparatus and said dispenser;
- water level detection means connected to said water supply state control means for detecting a level of water in a water supply tank;
- alarm generation means connected to said water supply state control means for generating an alarm in response to the water level detected by said water level detection means; and
- system control means for controlling the entire operation of said automatic ice production apparatus.

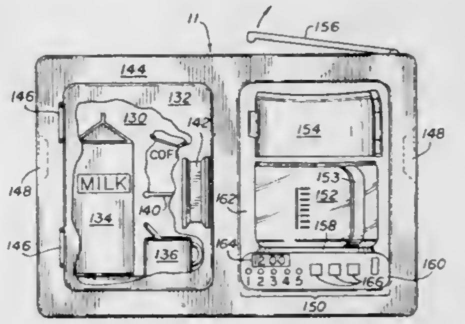
5,836,169
COFFEE BREWER INCLUDING REFRIGERATED STORAGE RECEPTACLE

Todd E. Marlette, 2111 Jefferson Davis Hwy. Suite 211 South, Arlington, Va. 22202-3116

Filed Jan. 29, 1997, Ser. No. 790,102

Int. Cl.⁶ F25D *15/00*

U.S. Cl. 62—331 20 Claims



1. An article of manufacture comprising:
- a brewing device for brewing coffee or related beverages;
- a refrigerated receptacle having a frontwardly openable door;
- a molded case permanently connecting the brewer to the refrigerated receptacle, said molded case defining a void below said brewing device which is so configured and arranged to removably receive a coffee pot; and
- a heating element permanently connected to said molded case about a bottom portion of the void to support and warm the coffee pot.

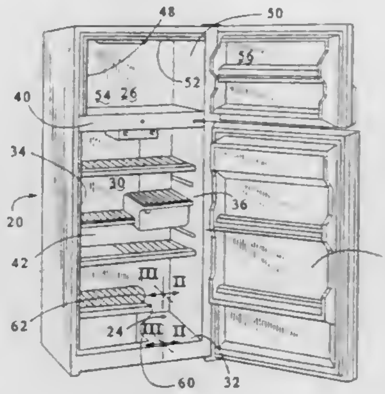
5,836,170
VACUUM RELEASE VALVE TUBE ASSEMBLY

Travis M. Perkins, Evansville; Brian P. Kelley, Newburgh, and Armon A. Adler, Haubstadt, all of Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed May 29, 1997, Ser. No. 865,315

Int. Cl.⁶ F26B *41/04*

U.S. Cl. 62—409 10 Claims



9. A vacuum release valve for refrigerated compartment comprising:
- a tube means sized and arranged to penetrate through a liner of said compartment, said tube means having opposite open ends with a channel communicating therebetween, and said tube means comprising a straight tube having an annular flange surrounding said straight tube adjacent said first open end, and a raised collar substantially surrounding said straight tube on a side of said flange opposite first open end, said raised collar arranged to grip a liner of said compartment to said flange when said valve is installed;
- a closure means for covering a first of said open ends of said tube means that is open to an interior of said compartment, said closure means normally closed against said open end and openable when said pressure inside said compartment is less than surrounding ambient pressure outside said compartment.

5,836,171

Patent Not Issued For This Number

5,836,172
PROCESS FOR THE PURIFICATION OF A CRYOGENIC FLUID BY FILTRATION AND/OR ADSORPTION

Daniel Gary, Montigny-le-Bretonneux; René Lardeau, Saulx-les-Chartreux; Philippe Fraysse, Fontenay-Aux-Roses, and Frédéric Castellanet, Le Pecq, all of France, assignors to L'Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation des Procedes Georges Claude, Paris Cedex, France

Division of Ser. No. 790,362, Jan. 28, 1997. This application Nov. 28, 1997, Ser. No. 967,582

Claims priority, application France, Dec. 24, 1996, 96 15972

Int. Cl.⁶ F25J *3/08*

U.S. Cl. 62—608 11 Claims

1. Process for the purification of hydrogen or deuterium in liquid, diphasic, gaseous or supercritical phase by removal of its carbon dioxide and water impurities, and at least one other of its impurities selected from the group consisting of neon, nitrogen, carbon monoxide, oxygen, argon, krypton, xenon, and hydrocarbons, the process comprising the steps of:
- filtering at least one impurity in solid state;
- adsorbing at least one impurity in liquid or gaseous state; and

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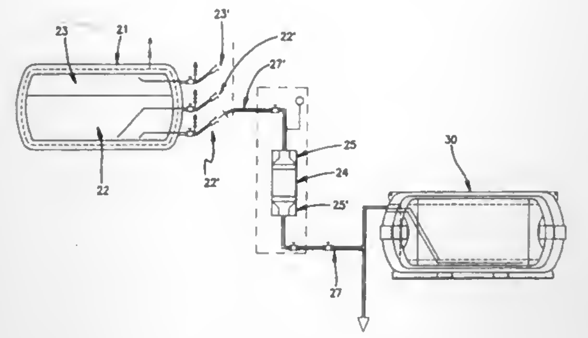
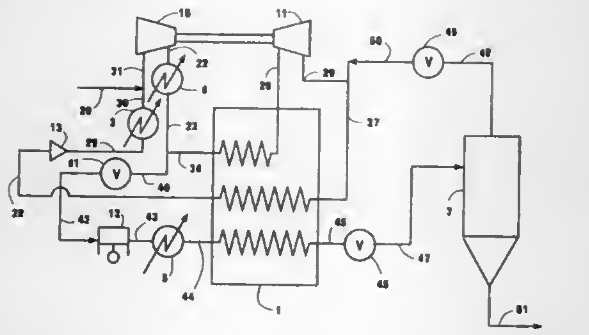


recovering at least a portion of purified hydrogen or deuterium, said purified hydrogen or deuterium containing no more than 1 ppb of said impurities.

5,836,173
SYSTEM FOR PRODUCING CRYOGENIC LIQUID

Nancy Jean Lynch, North Tonawanda; Dante Patrick Bonaquist, Grand Island, and Paul Arthur Henry, Williamsville, all of N.Y., assignors to Praxair Technology, Inc., Danbury, Conn.

Filed May 1, 1997, Ser. No. 850,098
Int. Cl.⁶ F25J *3/00*
U.S. Cl. 62—613 **10 Claims**



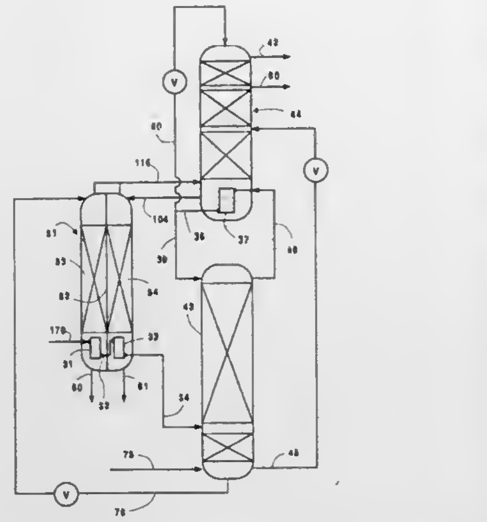
1. A method for producing cryogenic liquid comprising:
(A) compressing refrigerant gas to a first pressure;
(B) adding feed gas to the compressed refrigerant gas to produce a working gas mixture;
(C) compressing the working gas mixture to a second pressure which exceeds the first pressure to produce elevated pressure working gas mixture;
(D) turboexpanding a first portion of the elevated pressure working gas mixture to produce cold refrigerant gas;
(E) further compressing a second portion of the elevated pressure working gas mixture to a supercritical pressure to produce supercritical fluid; and
(F) cooling the supercritical fluid by indirect heat exchange with the cold refrigerant gas and producing cryogenic liquid.

5,836,174
CRYOGENIC RECTIFICATION SYSTEM FOR PRODUCING MULTI-PURITY OXYGEN

John Fredric Billingham, Tonawanda; Michael James Lockett, and Dante Patrick Bonaquist, both of Grand Island, all of N.Y., assignors to Praxair Technology, Inc., Danbury, Conn.

Filed May 30, 1997, Ser. No. 866,263
Int. Cl.⁶ F25J *3/02*
U.S. Cl. 62—643 **10 Claims**

1. A method for producing high purity oxygen and low purity oxygen comprising:

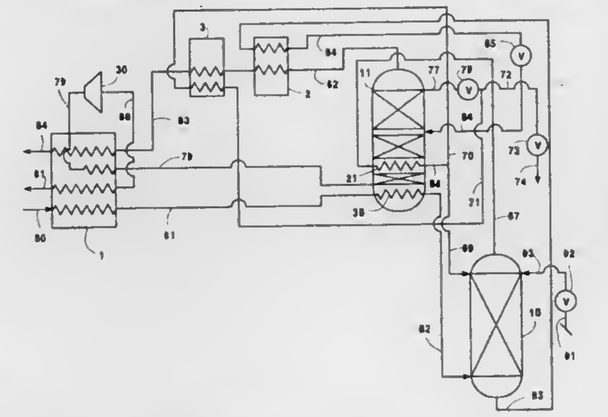


(A) condensing feed air and passing the resulting feed air into a higher pressure column;
(B) separating the feed air within the higher pressure column by cryogenic rectification into oxygen-enriched liquid and nitrogen-enriched vapor;
(C) passing oxygen-enriched liquid from the higher pressure column into a lower pressure column and producing nitrogen-rich vapor and oxygen-richer liquid in the lower pressure column;
(D) passing oxygen-containing liquid into a side column having a first product portion and a second product portion separated by a longitudinally oriented partition, processing the oxygen-containing liquid in each of the first product portion and the second product portion of the side column by cryogenic rectification and producing high purity oxygen in the first product portion and low purity oxygen in the second product portion;
(E) reboiling the first product portion by a first portion of the said condensing feed air and reboiling the second product portion by a second portion of said condensing feed air; and
(F) recovering high purity oxygen from the first product portion and recovering low purity oxygen from the second product portion.

5,836,175
DUAL COLUMN CRYOGENIC RECTIFICATION SYSTEM FOR PRODUCING NITROGEN

Dante Patrick Bonaquist, Grand Island, N.Y., assignor to Praxair Technology, Inc., Danbury, Conn.

Filed Aug. 29, 1997, Ser. No. 920,861
Int. Cl.⁶ F25J *3/00*
U.S. Cl. 62—652 **10 Claims**



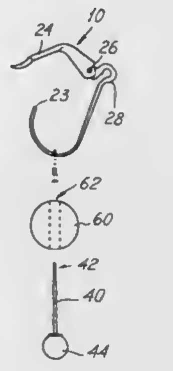
1. A method for producing nitrogen comprising:

(A) passing feed air into a first column and separating feed air within the first column by cryogenic rectification into oxygen-enriched bottom liquid and nitrogen-enriched top vapor;
(B) passing oxygen-enriched bottom liquid from the first column into a second column and producing oxygen-rich bottom liquid and nitrogen-rich top vapor by cryogenic rectification within the second column;
(C) vaporizing at least some of the oxygen-rich bottom liquid to produce oxygen-rich vapor;
(D) condensing nitrogen-enriched top vapor by indirect heat exchange with fluid from above the bottom of the second column;
(E) turboexpanding a portion of the oxygen-rich vapor; and
(F) recovering nitrogen-rich top vapor as product nitrogen.

5,836,176
EARRING ASSEMBLY WITH REMOVABLE ORNAMENTS

Joseph Lichtenstein, and Israel Lichtenstein, both of Brooklyn, N.Y., assignors to Hazel Jewelry Co., Brooklyn, N.Y.

Filed May 16, 1997, Ser. No. 857,292
Int. Cl.⁶ A44C *7/00*
U.S. Cl. 63—13 **23 Claims**



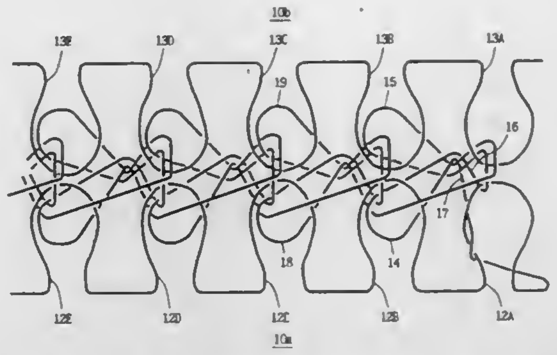
1. An earring assembly with selectively removable ornaments, comprising:
an earlobe securing assembly;
a pin having a loop at a first end thereof for receiving therethrough a part of said earlobe securing assembly, said pin being selectively slidable around said part of said earlobe securing assembly for selective removability of said pin from said earlobe securing assembly, and a stop at a second end thereof; and
at least one ornamental member having at least one opening extending therethrough for receipt of said loop end of said pin, said at least one opening of said at least one ornamental member being smaller then said stop.

5,836,177
BINDING-OFF METHOD, BOUND KNITTED FABRIC, AND CAD APPARATUS THEREFOR

Masao Okuno, Wakayama, Japan, and Michael Caird, Troon, Scotland, assignors to Shima Seiki Manufacturing Ltd., Wakayama, Japan

Filed Dec. 30, 1996, Ser. No. 774,786
Claims priority, application Japan, Dec. 28, 1995, 7-344229
Int. Cl.⁶ D04B *1/24;7/10*
U.S. Cl. 66—64 **4 Claims**

1. A binding-off method, said method comprising the steps of:
providing a flat knitting machine for binding two knitted fabrics, having at least a pair of needle beds comprising a front needle bed and a rear needle bed, each of said front and rear needle beds having a plurality of needles, wherein a space between said pair of needle beds forms a trick gap, at least one of said front and rear needle beds being slidable to the right and to

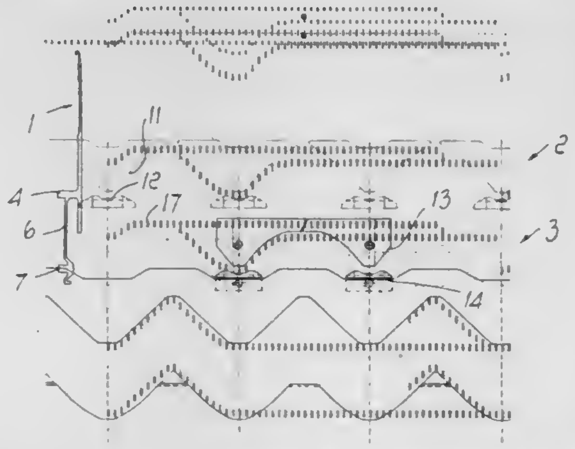


the left, said flat knitting machine having a yarn feeder for feeding yarn to at least one needle of the plurality of needles of the needle beds, wherein each knitted fabric is provided with a large number of stitches, each of said stitches consisting of a loop and prolongations on both sides thereof; said method further comprising the steps of
a. forming new stitches in succession to stitches of the respective two knitted fabrics, said two knitted fabrics comprising a front fabric and a rear fabric;
b. transferring said new stitches to opposing needle beds to make the prolongations of said new stitches cross each other;
c. overlapping said new stitches with interior stitches of said two knitted fabrics; and
repeating steps a, b, and c from one side end of each of the two knitted fabrics toward interior portions thereof.

5,836,178
MODIFIED NEEDLE WITH ASSOCIATED ACTUATION ELEMENTS FOR KNITTING THE HEEL IN CIRCULAR STOCKING MACHINES

Jan Ando', Scandicci, Italy, assignor to Matec S.r.l., Scandicci, Italy

Filed Jun. 2, 1997, Ser. No. 868,207
Claims priority, application Italy, Aug. 1, 1996, BO96A0421
Int. Cl.⁶ D04B *35/02*
U.S. Cl. 66—123 **3 Claims**



1. In a circular knitting machine with a needle cylinder, a needle selection combination comprising a modified needle with associated actuation elements for knitting sock and stocking heels and toes, the needle comprising: a first selection needle heel; an elastic extension extending from said first selection needle heel; and a second selection needle heel attached at said elastic extension; said actuation elements comprising first actuation elements and second actuation elements for actuating respectively said first and second needle heels, said first and second actuation elements being distributed independently of one another along two corresponding annular bands of the circular knitting machine cylinder, said bands being arranged at different levels.

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5,836,179
MANUFACTURE OF KNITTED BRIEF BLANKS

Antonie Hendrick van Laar, Edificio Navegador Lote 2-6B, Avenida 25, Portugal

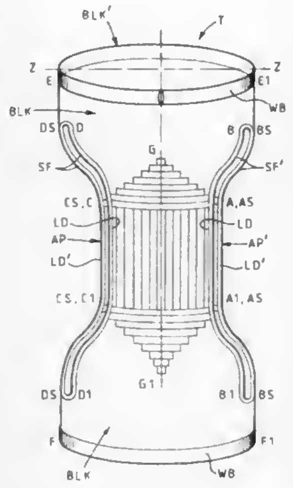
PCT No. PCT/GB94/01938, § 371 Date Aug. 8, 1996, § 102(e) Date Aug. 8, 1996, PCT Pub. No. WO95/07381, PCT Pub. Date Mar. 16, 1995

PCT Filed Sep. 7, 1994, Ser. No. 615,325

Claims priority, application United Kingdom, Sep. 8, 1993, 9318617

Int. Cl.⁶ D04B *1/24*

U.S. Cl. 66—171 **10 Claims**



1. A method of forming a plurality of brief blanks on a circular knitting machine having needle selection and stitch length control, the method comprising the steps of:
- forming a tube of brief blanks in a side-by-side relationship;
- forming apertures at positions between the brief blanks as leg openings by taking needles out of action to cause the needles to be inoperative;
- cutting and trapping yarn feed to the inoperative needles; and
- slitting the tube walewise at positions between the blanks to provide a plurality of separate brief blanks for brief manufacture.

5,836,180
AUTOMATIC WASHER AND DISPENSER CUP THEREFOR

Irene M. Herman-Latack, Baroda, Mich.; Nyik Siong Wong, and Gregory J. McPherson, both of Singapore, Singapore, assignors to Whirlpool Corporation, Benton Harbor, Mich.

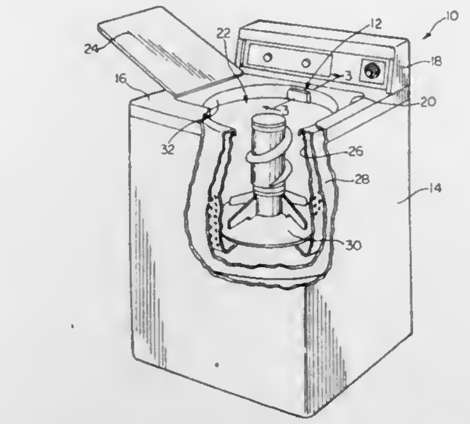
Filed Apr. 4, 1997, Ser. No. 832,994

Claims priority, application Singapore, Nov. 23, 1996, 9611409-5

Int. Cl.⁶ D06F *39/02*

U.S. Cl. 68—17 R **13 Claims**

1. An automatic washer comprising:
- a cabinet having a wash treatment zone for receiving a clothes load for washing;
- a water inlet for providing water to the wash treatment zone; and
- a wash additive dispenser assembly comprising a cover having a removable cup assembly forming a reservoir for holding a wash additive and being moveable between a load position and a use position, wherein when the cup assembly is in the load position, the cup assembly can be removed from the cover and used as a scoop to measure a quantity of additive and returned to the dispenser assembly loaded with a wash additive, and when the cup assembly is in the use position, the reservoir is aligned with the water inlet so that during the addition of water at least the reservoir portion of the cup assembly is washed by such water.



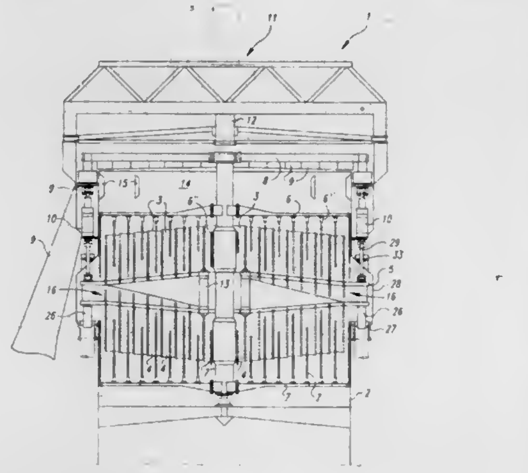
5,836,181
DIFFUSER

Lennart Jonsson, and Björn Karlsson, both of Karlstad, Sweden, assignors to Kvaerner Pulping AB, Karlstad, Sweden

Continuation-in-part of Ser. No. 228,668, Apr. 18, 1994, abandoned. This application May 16, 1996, Ser. No. 649,845

Int. Cl.⁶ D21D *5/02*

U.S. Cl. 68—181 R **22 Claims**



1. A diffuser, comprising:
- a container through which cellulose pulp is arranged to be transported, the cellulose pulp including filtrate, the container having a filtrate outlet for directing the filtrate away from the container;
- a pulp outlet connected to the container for directing a portion of the pulp away from the container;
- a nozzle arm positioned in the container, the nozzle arm having nozzles for delivering a fluid to the cellulose pulp;
- a scraper arm having a scraper movable relative to the container to direct the portion of the pulp to the pulp outlet;
- a screen arm in the container and a plurality of screens disposed on and connected to the screen arm, the screen arm and the screens being movable vertically as a unit within the container, the screens being concentrically disposed about a central axis in the container, the screen arm being coupled to the screens for withdrawal of the filtrate, the screen arm having an outer end; and
- a vertically directed withdrawal pipe rigidly and non-pivotally attached to the outer end of the screen arm, the withdrawal pipe being slidably controlled relative to the container, the withdrawal pipe telescopically extending into the filtrate outlet and being a rigid structure connected in sealing arrangement to the filtrate outlet during vertical movement of the screen arm to substantially resist rotational forces exerted on the screen arm by the cellulose pulp relative to the container.

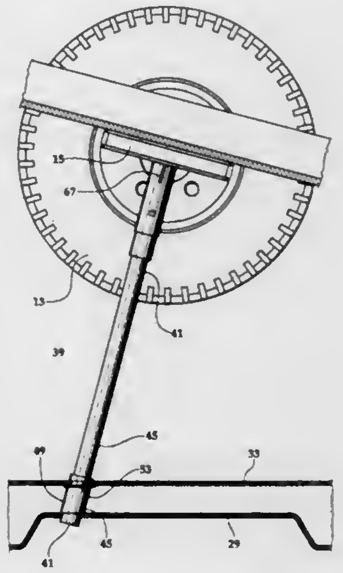
5,836,182
SPARE TIRE LOCKING DEVICE

Gerald R. Schotthoefer, Dallas, Tex., assignor to Adell Corporation, Sunnyvale, Tex.

Filed Jul. 18, 1997, Ser. No. 896,820

Int. Cl.⁶ B62D *43/04;* **E05B** *65/12*

U.S. Cl. 70—259 **5 Claims**



1. A device for locking a spare tire mounted on a hoist having a hoist shaft, wherein the device comprises:
- a rear bumper having a vertical portion with a hole providing access to the hoist shaft, a horizontal portion attached to the vertical portion and extending forward, and a lip extending downward from the horizontal portion, wherein the lip of the bumper has a arcuate notch aligned with the hole in the vertical portion of the bumper and the hoist shaft;
- a winch tube cover, having a forward end and a rearward end;
- a forward connector attached to the forward end of the winch tube cover and adapted to cover one end of the hoist shaft, and having an open bore to provide access to the hoist shaft;
- a rear connector attached to the rearward end of the winch tube cover and adapted to extend through the opening in the rear bumper, and having an open bore to provide access to the hoist shaft; and
- a lock for temporary attachment to the rear connector to prevent access to the hoist shaft through the rear connector.

5,836,183
SECURITY DEVICE FOR LAPTOP COMPUTERS

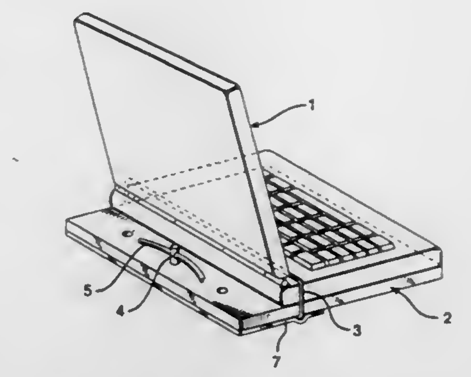
Jay S. Derman, Redondo Beach, Calif., assignor to ACCO Brands, Inc., Lincolnshire, Ill.

Filed Apr. 23, 1997, Ser. No. 842,475

Int. Cl.⁶ E05B *69/00*

U.S. Cl. 70—58 **8 Claims**

1. A device for securing a laptop computer from theft, the laptop computer having a keyboard portion with a monitor portion hinged at an angle thereto when said laptop computer is in operation, comprising:
- a base member, having a generally planar top surface and dimensioned to support the keyboard portion of the laptop computer on said top surface, said base member being made of a rigid material;
- means for retaining the laptop computer to the top surface of said base member when said laptop computer is opened for operation; and
- means for preventing removal of the laptop computer from said base member when retained, and securing said laptop computer from theft.



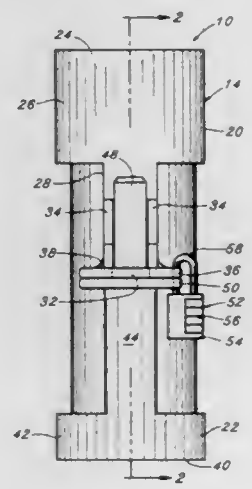
5,836,184
SAFETY GUARD FOR AEROSOLS

Paul E. Brown, 135 Bantam Lake Rd., Bantam, Conn. 06750

Filed Jun. 2, 1997, Ser. No. 866,975

Int. Cl.⁶ F16K *35/00*

U.S. Cl. 70—178 **5 Claims**



1. A dispenser assembly comprising in combination
- a. a pressurized aerosol container defined by a closed cylindrical can having a sidewall, an upper end and a lower end and a valved outlet at said upper end, and
- b. a safety guard comprising a pair of opposed cups receiving the opposite ends of the container respectively, each cup having an integral arm extending toward the opposite cup, the arms lying side-by-side for a portion of the arms, each arm having a flange perpendicular to the arm, one of the flanges formed with an opening receiving a portion of the other arm, the flanges engaging each other and being formed with aligned apertures adapted to receive a shackle of a padlock.

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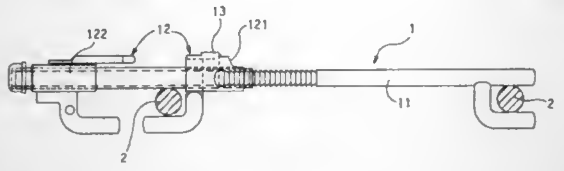
5,836,185
TELESCOPING VEHICLE ANTI-THEFT DEVICE SEPARATELY SIMULTANEOUSLY LOCKING TO THE VEHICLE'S STEERING WHEEL AT EACH OF TWO LOCATIONS

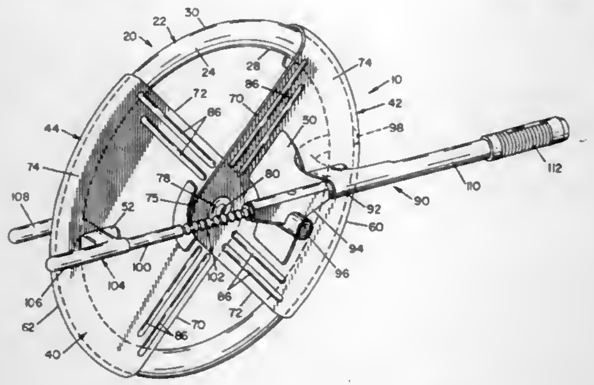
Renato M. Openiano, 934 Fuchsia La., San Diego, Calif. 92154
Continuation of Ser. No. 647,242, May 9, 1996, abandoned, which is a continuation-in-part of Ser. No. 514,238, Aug. 11, 1995, Pat. No. 5,636,538. This application Jul. 21, 1997, Ser. No. 897,811
Int. Cl.^{6} B60R *25/02*
U.S. Cl. 70—209 **6 Claims**



6. A method of mounting a steering wheel security device comprising:
- placing first and second telescoping parts over an arcuate rim portion of steering wheel;
- telescoping together along an axis the first and second telescoping parts until they capture the first arcuate rim portion of the steering wheel between them;
- extending along the axis a third telescoping part from the first and the second telescoping parts, jointly, until this third telescoping part engages the steering wheel rim at a second arcuate rim portion opposite the first arcuate rim portion; and
- locking with a lock (i) the first telescoping part to the second telescoping part so that they capture the first arcuate rim portion of the steering wheel between them, and also (ii) the third telescoping part in extension from the first and the second telescoping parts, jointly, so that the third telescoping part engages the steering wheel rim at the second arcuate rim portion;
- wherein all the telescoping is along the one axis.

5,836,186
STEERING WHEEL PROTECTION DEVICE

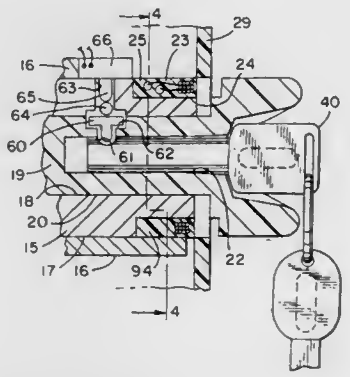
James E. Winner, Jr., Hollywood Beach, Fla., assignor to Winner International Royalty Corporation, Sharon, Pa.
Continuation of Ser. No. 783,435, Jan. 16, 1997, Pat. No. 5,735,149, which is a continuation of Ser. No. 541,463, Oct. 10, 1995, Pat. No. 5,755,123. This application Sep. 12, 1997, Ser. No. 928,998
Int. Cl.^{6} B60R *25/02*
U.S. Cl. 70—209 **45 Claims**



1. A vehicle security device adapted to limit access to a steering wheel which steering wheel includes a rim having a front face, a back face, an inner edge, and an outer edge, said security device comprising a cut resistant face plate lying in a plate plane, said face plate including at least two plate sections and a plate connector adapted to connect said plate sections together, said plate connector allowing independent rotation of each of said plate sections in said plate plane between a collapsed and a completely open position said at least two plate sections connected together to at least partially overlap in said closed position, at least two of said plate sections including an opening positioned inwardly from a peripheral edge of said plate section and spaced on said plate section to be in a nonoverlapping relationship with an adjacent plate section when said plate sections are in a completely open position, at least one of said plate sections including two legs wherein each leg has a first end and a second end and an outer peripheral edge extending between said first end of each leg, said two legs forming an angle of less than 180°.

5,836,187
TUMBERLESS AUTOMOBILE IGNITION LOCK

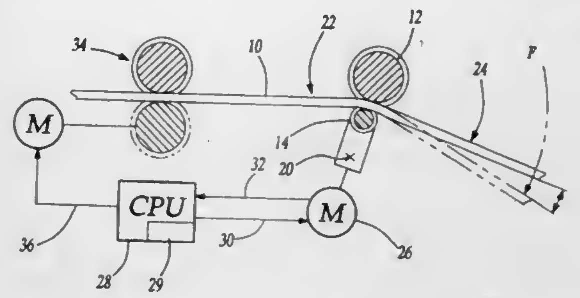
David C. Janssen, Whitefish Bay, and Larry R. Grimmer, Sussex, both of Wis., assignors to STRATTEC Security Corporation, Milwaukee, Wis.
Continuation of Ser. No. 253,774, Jun. 3, 1994, abandoned. This application Sep. 27, 1996, Ser. No. 721,942
Int. Cl.^{6} E05B *49/00*
U.S. Cl. 70—252 **2 Claims**



1. A lock system comprising:
- a lock assembly including
- a stationary sleeve, the sleeve having a radial recess therein;
- a lock cylinder mounted within the sleeve for rotation between first and second positions, the lock cylinder having a keyway;
- a key adapted to be inserted into the keyway and then turned to rotate the lock cylinder between the first and second positions;
- a blocking structure including a cylinder lock member and a ball bearing located in the recess in the sleeve with one end of the cylinder lock member extending into the keyway, the cylinder lock member being adapted to be moved radially relative to the lock cylinder and the sleeve in response to the insertion of the key into the keyway, permitting rotation of the lock cylinder by the key,
- the cylinder lock member engaging the inner surface of the sleeve when the lock cylinder is in a position other than the first position to prevent the removal of the key from the keyway; and
- a key minder for sensing the presence of a key in the keyway, the key minder including a switch and a movable plunger for actuating the switch, the plunger extending within the radial recess in axial alignment with the cylinder lock member and being biased to a non-actuating position, the plunger being moved by the blocking structure to an actuating position in response to movement of the blocking structure upon insertion of the key into the keyway; and
- an interlock circuit including
- a transponder mounted on the key, the transponder being enabled when the lock cylinder is rotated to the second position for generating a coded signal; and
- a reader responsive to the coded signal for controlling a control circuit.

5,836,188
METHOD AND APPARATUS FOR BENDING AN ELONGATED MEMBER TO A TARGET ANGLE

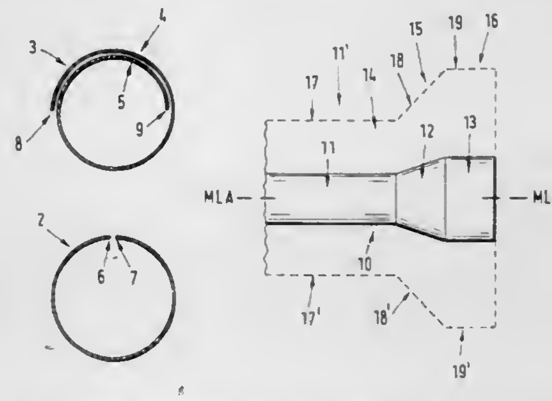
Clark D. Mahan, Cadillac; Ralph E. Westerburg, Reed City, and Alan W. Bass, LeRoy, all of Mich., assignors to Pilot Industries, Inc., Dexter, Mich.
Filed Apr. 9, 1997, Ser. No. 826,898
Int. Cl.^{6} B21B *37/00*
U.S. Cl. 72—21.4 **12 Claims**



7. A machine for forming a bend at a target angle between adjacent sections of an elongated member comprising:
- a) means for bending said elongated member at an intersection of said adjacent sections to an angle equal to said target angle plus a predetermined increment,
- b) means for thereafter returning said adjacent sections of said elongated member to said target angle,
- c) with said adjacent sections of said elongated member at said target angle means for inputting a value representative of the force necessary to maintain said adjacent sections at said target angle,
- d) means for comparing said inputted value with a threshold value,
- e) means for increasing said predetermined increment whenever said inputted value exceeds said threshold value and thereafter iteratively reactuating said bending means, said returning means, said inputting means and said comparing means until said inputted value is less than said threshold value.

5,836,189
METHOD OF MANUFACTURING A PIPE HAVING SECTIONS WITH DIFFERENT CROSS-SECTIONAL CONFIGURATIONS

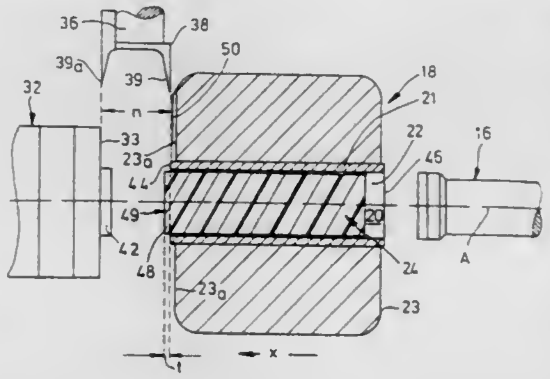
Wolfgang Streubel, Detmold, and Udo Klasfauseweh, Gütersloh, both of Germany, assignors to Benteler AG, Paderborn, Germany
Filed Feb. 6, 1997, Ser. No. 795,574
Claims priority, application Germany, Feb. 7, 1996, 196 04 368.9
Int. Cl.^{6} B21D *39/02*
U.S. Cl. 72—51 **5 Claims**



1. A method of manufacturing a pipe having sections with different cross-sectional configurations, the method comprising:
- (a) making available a sheet bar having a rectangular base portion and at least one formation section integrally connected to the base portion, wherein the at least one formation section is configured differently from the base portion;
- (b) deforming the base portion into the shape of a pipe and deforming the formation section into a shape with partially overlapping portions;
- (c) deforming the sheet bar to a final shape of the pipe; and
- (d) joining together abutting edges of the base portion and the at least one formation section; further comprising using a sheet bar having a formation section of trapezoidal configuration at an end of the sheet bar and a symmetrical configuration with respect to a center longitudinal axis, whereby the pipe manufactured from the sheet bar has a truncated cone-shaped cross-sectional expansion on at least one end thereof.

5,836,190
PROCESS FOR EXTRUDING A SECTION OR THE LIKE FROM AN INGOT AND A DEVICE THAT PURPOSE

Diethelm Wömpner, Bodman-Ludwigshafen; Adolf Ames, Hilzingen-Duchtlingen; Ulf Hodel, Engen, and Gregor Rotzinger, Singen-Friedingen, all of Germany, assignors to Alusuisse Technology & Management Ltd., Switzerland
Filed Jan. 6, 1997, Ser. No. 778,951
Claims priority, application Germany, Feb. 5, 1996, 196 03 853.7
Int. Cl.^{6} B21C *23/00*
U.S. Cl. 72—255 **16 Claims**



5. Device for extruding a section or the like body from an ingot having a free front end, which comprises: a container having a downstream container end and a bore therein with an upstream bore entrance, wherein the free front end of the ingot is introduced into the bore entrance and exits at the container end; a die downstream of the container having a shape-giving opening therein, with the container end facing the die opening, wherein the free front end of the ingot extends out of the container end before entering the die opening to a decree amounting to the width of a collar; an extrusion stem for feeding the ingot in the direction of extrusion (x) into the shape-giving opening in said die for the purpose of extrusion; a shearing tool provided after the end of the container facing the die; and a movable shearing blade means arranged over the container end operative to shear off a slice of the free front end of the ingot before said ingot is introduced into said die opening.

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5,836,191
CONTINUOUS EXTRUSION APPARATUS

Anthony Thomas Wright, Ashford, England, assignor to BWE Limited, Ashford, England

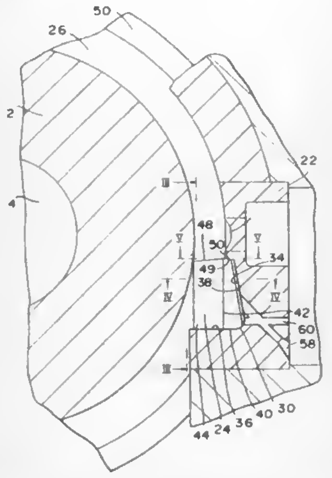
PCT No. PCT/GB96/00647, § 371 Date Nov. 18, 1996, § 102(e) Date Nov. 18, 1996, PCT Pub. No. WO96/29161, PCT Pub. Date Sep. 26, 1996

PCT Filed Mar. 15, 1996, Ser. No. 737,614

Claims priority, application United Kingdom, Mar. 17, 1995, 9505379

Int. Cl.^{6} B21C *23/00*

U.S. Cl. 72—262 **6 Claims**



1. A continuous extrusion apparatus, comprising:
- a) a rotatable wheel having an axis, a circumferential groove and a cylindrical surface;
- b) an arcuate tooling bounding a radially outer portion of said groove;
- c) said tooling having a die top with an exit aperture and a wedge-shaped recess having a complementary seating face;
- d) said tooling having an abutment body with a spine providing an abutment face, a first and second shoulder flanking said spine adjacent said abutment face and being operatively adapted to co-act with said cylindrical surface, and a seating face being remote from said abutment face and being operatively adapted to co-act with said complementary seating face;
- e) said abutment body being operatively adapted to register with said wheel and being disposed within said wedge-shaped recess on a plane parallel to and displaced from an axial plane containing said wheel axis; and,
- f) said abutment body being urged into said wedge-shaped recess by component forces arising at said abutment face from the displacement of a feed material from said circumferential groove to said exit aperture upon rotation of said wheel.

5,836,192
DEVICE FOR MONITORING A PREDETERMINED LEVEL OF A LIQUID IN A CONTAINER

Igor Getman; Sergej Lopatin, both of Lörrach, and Roland Müller, Steinen, all of Germany, assignors to Endress + Hauser GmbII + Co., Maulburg, Germany

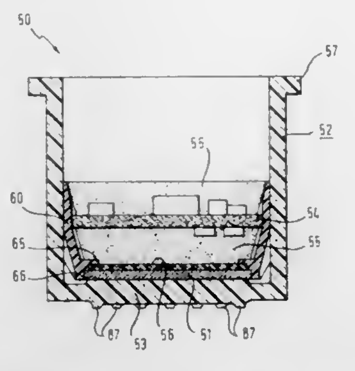
Filed Oct. 16, 1996, Ser. No. 733,099

Claims priority, application Germany, Oct. 17, 1995, 195 38 678.7

Int. Cl.^{6} G01F *23/28*

U.S. Cl. 73—290 V **6 Claims**

1. A device for monitoring a predetermined level of a liquid in a container comprising an ultrasonic transducer fitted on the outer surface of the container wall at a measurement point situated at the height of the level to be monitored and containing a piezoelectric element arranged in a transducer housing, said piezoelectric element generates, when excited by an alternating voltage pulse having a given transmission frequency, an ultrasonic transmission pulse which is transferred via a diaphragm to the container wall and converts ultrasonic vibrations transferred from the container wall to the ultrasonic transducer into electrical reception signals, said piezoelectric element consisting of a porous piezoelectric ceramic having a type 3—3 connectivity, said transducer housing being at least partially filled with a potting compound, an acoustical insulating member being positioned on the side of the piezoelectric element facing away from said diaphragm providing acoustical insulation between said piezoelectric element and said potting compound and preventing contact between said piezoelectric element and said potting compound.



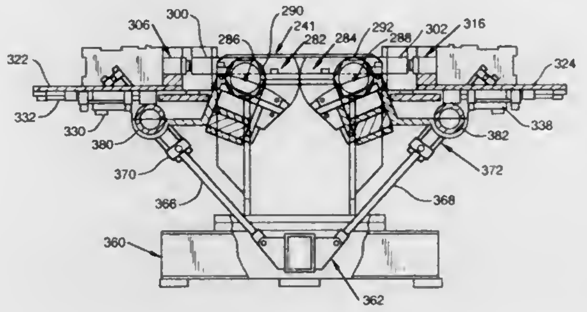
5,836,193
APPARATUS FOR FORMING ELONGATED METAL ARTICLES AND RELATED METHOD

Daniel E. Hunter, Export; Lawrence W. Cisko, Harrison City; Jeffrey M. Shoup, Delmont; Blair T. Allison, Cheswick; Daniel Bergstrom, Sarver; Peter J. Coppola, Cecil, all of Pa.; Walter R. Reichelt, Jr., Bloomfield Hills, Mich., and William A. Graham, McDonald, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Nov. 27, 1996, Ser. No. 753,614

Int. Cl.^{6} B21D *11/02*

U.S. Cl. 72—298 **25 Claims**



1. Apparatus for forming an elongated tubular metal workpiece comprising
- a pair of rotatable cooperating die members supported for rotation in opposite directions,
- gripping means for gripping end portions of said tubular workpiece adjacent to said die members,
- said gripping means having means for inserting a portion thereof axially into the end portions of said tubular workpiece prior to said forming and maintaining said inserted position during said forming, and
- means for effecting simultaneous rotation of said die members after said tubular workpiece is gripped by said gripping means.

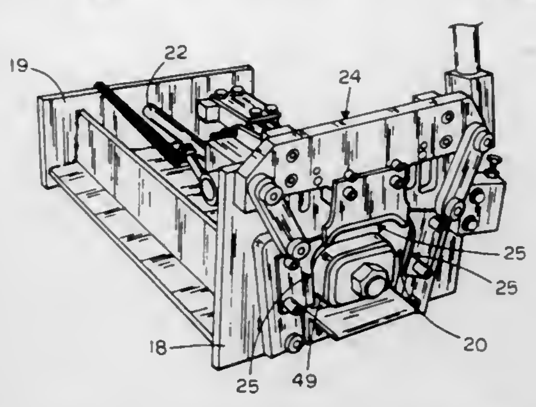
5,836,194
PORTABLE TUBE-BENDING MACHINE

Jean-Pierre Micouleau, Beautiran, France, and Gerald Sauder, St. Louis, Mo., assignors to Grover Machine Co., St. Louis, Mo.

Filed Oct. 30, 1995, Ser. No. 549,980

Int. Cl.^{6} B21D *9/04*

U.S. Cl. 72—307 **16 Claims**



1. A portable tube-bending machine for receiving a length of tubular material and repeatedly crimping the length of tubular material to form an elbow, comprising a framework means, a carriage means movably mounted to the framework means and adapted to engage the length of tubular material and induce lengthwise movement relative to the framework means along an axis the length of the tubular material, a set of rollers mounted to the carriage means, an operating shaft means mounted to the framework means and operatively connected to a toggle means and the carriage means, whereby to sequentially actuate the toggle means and advance the carriage means, a die means movably mounted to the toggle means and adapted to crimp the length of tubular material, the die means includes inner and outer die elements, the outer die elements are carried by the toggle means, a rack and pinion means operatively connecting the operating shaft means and the toggle means, a ratchet drive means operatively connecting the operating shaft means and the carriage means, and a ratchet drive-release means mounted to the framework means.

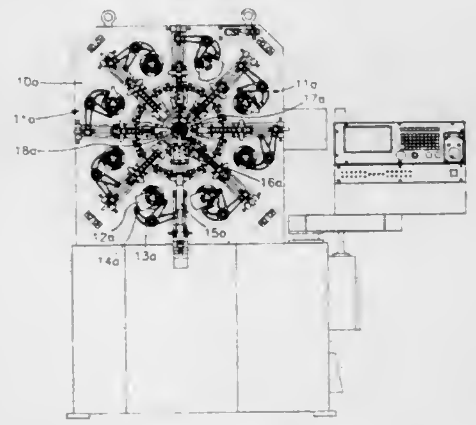
5,836,195
AUTOMATIC CUTTER ROTATING MECHANISM FOR WIRE FORMING MACHINE

David Wu, 1F, No. 68, Lane 280, Sec.6, Min Chuan E. Rd., Nei Hu, Talpel, Taiwan

Filed Jul. 22, 1997, Ser. No. 898,151

Int. Cl.^{6} B21F *1/00; 11/00*

U.S. Cl. 72—338 **3 Claims**



1. An adjustable wire forming system comprising:
- (a) a machine body;
- (b) an automatically driven rotating spindle coupled to said machine body for the axial advancement of a wire workpiece therethrough;
- (c) a rotating unit coupled to said machine body in angularly displaceable manner about said rotating spindle;
- (d) means coupled to said rotating unit for driving said angular displacement thereof; and,
- (e) a plurality of forming assemblies disposed about said rotating spindle, each of said forming assemblies including:
  - (1) a cam unit coupled in angularly displaceable manner to said machine body, said cam unit having a cam groove formed therein;
  - (2) a cutter unit displaceably coupled to said rotating unit and having formed thereon a roller member, said cutter unit having extending therefrom a workpiece engagement member;
  - (3) a transmission unit coupled to said cam unit for imparting to said cutter unit, responsive to said cam unit angular displacement, a radial displacement relative to said rotating spindle, said transmission unit having formed therein an arcuate groove extending a predetermined angular distance about said rotating spindle for adjustably receiving said cutter unit roller member, said transmission unit having formed thereon a cam roller member for engaging said cam groove of said cam unit; and,
  - (4) means coupled to said cam unit for automatically driving said angular displacement thereof;

whereby said cutter unit is adjustable in angular orientation relative to said rotating spindle.

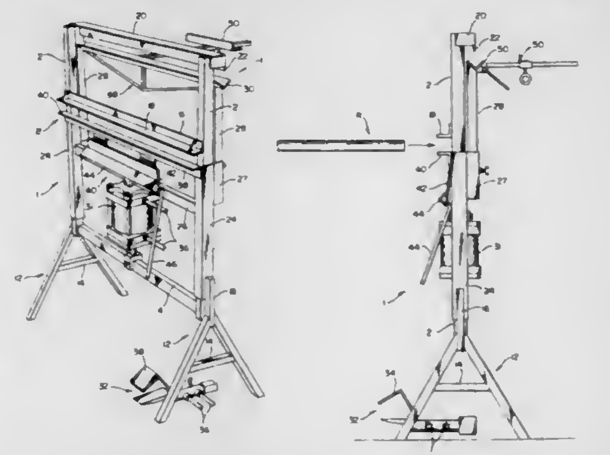
5,836,196
DEVICE FOR FORMING ROOFING TILES

Lance D. Smith, P.O. Box 53, Monroe, Wash. 98272

Filed Mar. 5, 1997, Ser. No. 811,835

Int. Cl.^{6} B21D *9/05;* **B21J** *13/02*

U.S. Cl. 72—384 **2 Claims**



1. A portable machine including at least two discrete work stations for performing a plurality of operations upon a sheet of preformed roofing without the necessity of altering the machine, comprising:
- a generally vertical rectangular main frame supported by stabilizing feet, including at least one fixed horizontal member extending between the sides of the main frame and located intermediate the ends thereof;
- a vertically reciprocal rectangular working element captured within the main frame;
- means to selectively reciprocate the working element;
- a first work station comprising flattening means cooperating with a fixed horizontal member of the main frame and a horizontal member of the working element to flatten a defined strip of the preformed roofing when the two members reciprocate together; and

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a second work station vertically spaced from the first work station comprising bending means cooperating with a fixed horizontal member of the main frame, said bending means secured to the working element and reciprocating therewith, enabling an operator to bend a portion of the roofing, whereby a worker may perform substantially all of the operations necessary for installing preformed sheet roofing on the machine.

5,836,197

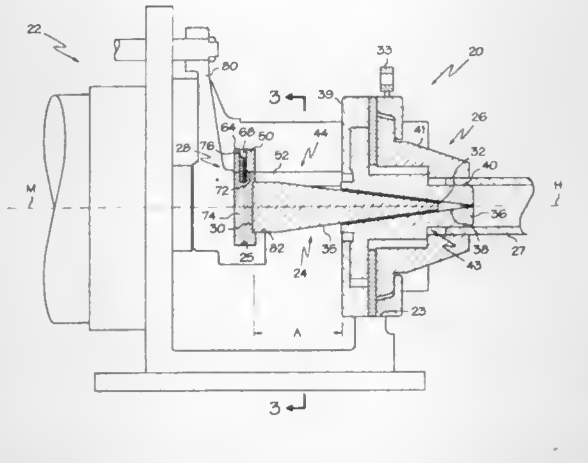
INTEGRAL MACHINE TOOL ASSEMBLIES

Ralph E. McKee, Wilmington, and James M. Burnett, Mason, both of Ohio, assignors to McKee Machine Tool Corp., Wilmington, Ohio

Filed Dec. 16, 1996, Ser. No. 767,528

Int. Cl.^{6} B21D *41/02;41/04*

U.S. Cl. 72—402 **23 Claims**



1. An improved machine tool assembly for use in a machine for working a work piece, comprising:

a first body having a longitudinal axis, said first body being movable in a direction along its longitudinal axis;

a second body for engaging said first body during use to deform a work piece, said second body having a longitudinal axis, said longitudinal axes of said bodies being substantially coaxial;

an interconnecting structure joining said bodies in an effectively integral manner, at least one of said first body, said second body and said interconnecting structure being adapted to engage a machine in use;

each of said bodies having an angular position about its respective longitudinal axis and said interconnecting structure having an angular alignment member for maintaining said angular positions of said bodies relative to each other;

said interconnecting structure and said bodies being adapted to be simultaneously separated as a unit from the machine; and

wherein said body is adapted to be stationary along its longitudinal axis during use.

5,836,198

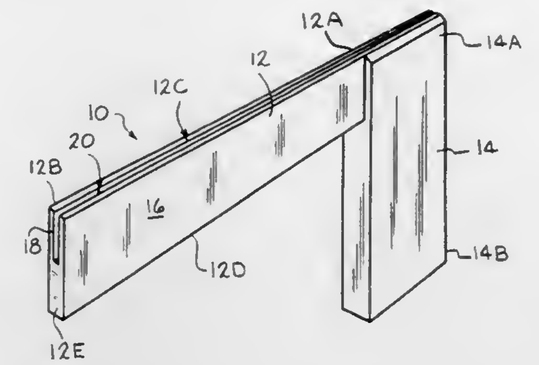
COMBINATION SQUARE AND BENDING TOOL

Brian L. Guilford, 13045 Dow Rd., Sunfield, Mich. 48890

Filed Jan. 2, 1998, Ser. No. 2,508

Int. Cl.^{6} B21D *5/16*

U.S. Cl. 72—458 **12 Claims**



12. A method for bending sheet metal, which comprises:

(a) a first leg having opposed ends; a second leg having opposed ends forming a longitudinal axis of the second leg and mounted at one end on one end of the first leg such that the first leg and second leg form a 90° angle with both the first leg and second leg in one plane; the second leg having a slot extending parallel to the longitudinal axis of the second leg to allow for insertion of the sheet metal for bending the sheet metal;

(b) inserting an edge of the sheet metal to be bent into the slot; and

(c) grasping the tool by the first leg and rotating the first leg in a direction such as to bend the sheet metal in the direction.

5,836,199

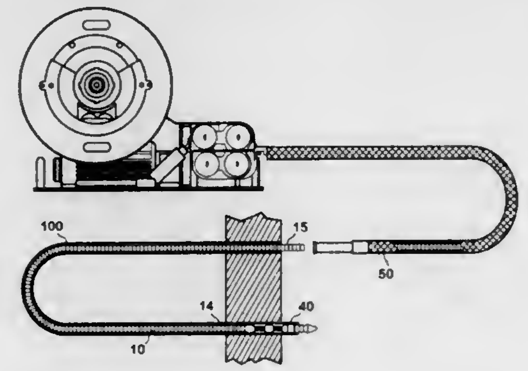
BEADED SHAFT ASSEMBLY

Christopher R. Loud, Issaquah, Wash., assignor to Zetec, Inc, Issaquah, Wash.

Filed Dec. 4, 1996, Ser. No. 759,408

Int. Cl.^{6} B21D *9/03*

U.S. Cl. 72—466 **15 Claims**



1. A flexible shaft with distal and proximal ends comprising,

a self-supporting chain of adjoining beads with first and second bead ends in line with the chain, each end with a transverse contact face, the beads disposed in longitudinal adjacency on a chain axis, the contact faces of adjacent beads matching, and having a longitudinal bore which collectively form a duct along a chain axis

means for maintaining the beads together swivelly in face to face contact comprising at least one elastic band within the duct attached to and stretched between beads, compressing the beads together,

and in which a first band attaches between a first pair of beads and a second band attaches between a second pair of beads and overlaps the first band.

5,836,200

CELL FOR MEASURING ACOUSTICAL PROPERTIES OF FLUID SAMPLES UNDER HIGH PRESSURE

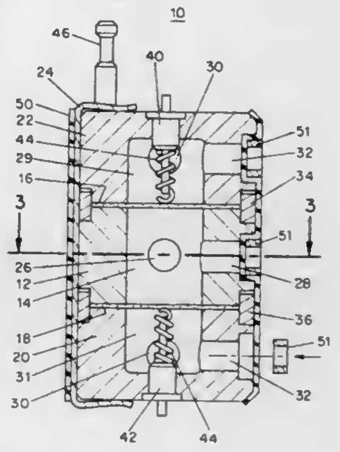
Vladimir Belonenko; Eugenij Bünau, both of Moscow, Russian Federation; Tigran Chalikian, Piscataway, N.J.; Theodor Funck, Göttingen, Germany; Vijcheslav Nikolashev, Moscow, and Armen Sarvazyan, Pushchino, both of Russian Federation, assignors to UHP Corp., Portola Valley, Calif.

PCT No. PCT/EP93/02113, § 371 Date Aug. 7, 1996, § 102(e) Date Aug. 7, 1996, PCT Pub. No. WO95/04929, PCT Pub. Date Feb. 16, 1995

PCT Filed Aug. 9, 1993, Ser. No. 586,925

Int. Cl.^{6} C01N *29/02;* **G01H** *5/00*

U.S. Cl. 73—61.79 **16 Claims**



1. A cell for measuring the acoustical properties of a fluid sample, said cell comprising:

a main cell having

(a) a cell body having first and second flat cell ends opposite each other,

(b) first and second cell openings in said first and second flat cell ends, respectively,

(c) a fluid sample cavity in said cell body for receiving the fluid sample, said fluid sample cavity being in communication with said first and second cell openings, and

(d) a fluid sample channel connecting said fluid sample cavity and the outer surface of said cell body;

first and second electro-acoustical transducer wafers disposed on said first and second flat cell ends, respectively, each of said first and second electro-acoustical transducer wafers having an inner surface facing inwardly toward said fluid sample cavity and an outer surface facing outwardly away from said fluid sample cavity;

first and second inner electrodes disposed on the inner surfaces of said first and second electro-acoustical transducer wafers, respectively;

first and second outer electrodes disposed on the outer surfaces of said first and second electro-acoustical transducer wafers, respectively;

a first end piece having

(a) a first end-piece body with two ends,

(b) a first end-piece end-wall at one end of said end-piece body,

(c) a first flat end-piece face at the other end of said end-piece body, said first flat end-piece face being placed in contact with the outer surface of said first electro-acoustical transducer wafer,

(d) a first end-piece opening in said first flat end-piece face, said first end-piece opening being approximately the size of and being aligned with said first cell opening,

(e) a first compensation fluid cavity for receiving a compensation fluid, said first compensation fluid cavity being in communication with said first end-piece opening, and

(f) a first compensation fluid channel connecting said first compensation fluid cavity and the outer surface of said first end-piece body;

a second end piece having

(a) a second end-piece body with two ends,

(b) a second end-piece end-wall at one end of said end-piece body,

(c) a second flat end-piece face at the other end of said end-piece body, said second flat end-piece face being placed in contact with the outer surface of said second electro-acoustical transducer wafer,

(d) a second end-piece opening in said second flat end-piece face, said second end-piece opening being approximately the size of and being aligned with said second cell opening,

(e) a second compensation fluid cavity for receiving a compensation fluid, said second compensation fluid cavity being in communication with said second end-piece opening, and

(f) a second compensation fluid channel connecting said second compensation fluid cavity and the outer surface of said second end-piece body;

first and second terminals mounted in said first and second end pieces, respectively, said first and second terminals electrically coupled to said first and second outer electrodes, respectively;

means for applying pressure to said first and second end pieces to bias them towards each other; and

one or more elastic sleeves tightly enclosing said cell body and said first and second end-piece bodies.

5,836,201

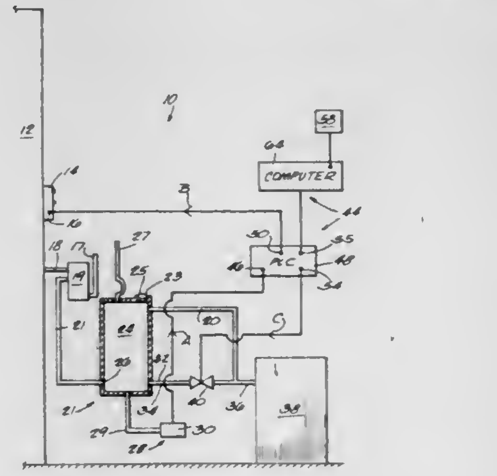
METHODS AND APPARATUS FOR MEASURING THE FLOW RATE OF SOLVENT RECOVERY IN SOLVENT RECOVERY DRYERS.

Jodell L. Drew, West Allis; David L. Foshey, Muskego, both of Wis., and Michael D. Johnson, Golden Valley, Minn., assignors to Industrial Towel & Uniform, Inc., New Berlin, Wis.

Filed Apr. 30, 1997, Ser. No. 847,162

Int. Cl.^{6} G01F *23/00;* **D06F** *33/00*

U.S. Cl. 73—291 **21 Claims**



1. A solvent recovery apparatus comprising:

a solvent recovery dryer for removing solvent from articles being processed, the solvent recovery dryer having a liquid outlet;

a container having an inlet, wherein said inlet is in fluid communication with the liquid outlet for receiving liquid from the solvent recovery dryer;

a sensor for producing a signal indicating the level of liquid in the container; and

a computer system in operable communication with said sensor and said dryer, the computer system including means for receiving the signal from the sensor to determine the level of liquid in the container and means for computing the flow rate of liquid flowing through the liquid outlet of the solvent recovery dryer by determining the level of liquid in the container from the solvent recovery dryer at timed intervals.

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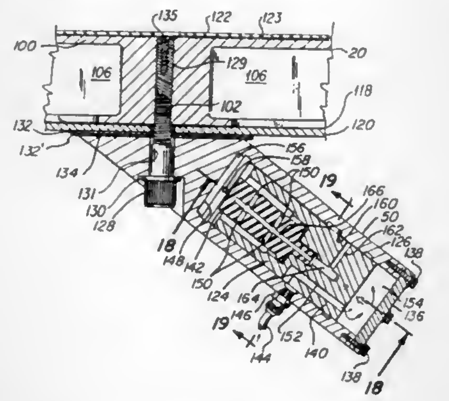
5,836,202
EXCITER MOUNTING FOR RANDOM VIBRATION GENERATING TABLE

Gregg K. Hobbs, Westminister, Colo., assignor to Qualmark Corporation, Denver, Colo.

Continuation of Ser. No. 474,454, Jun. 7, 1995, abandoned, which is a continuation-in-part of Ser. No. 344,544, Nov. 22, 1994, Pat. No. 5,589,637, Division of Ser. No. 950,631, Aug. 27, 1992, Pat. No. 5,365,788, which is a continuation-in-part of Ser. No. 487,757, Mar. 1, 1990, abandoned. This application May 19, 1997, Ser. No. 858,124

Int. Cl.^{6} G01M *7/06*

U.S. Cl. 73—665 **11 Claims**



1. Vibration screening apparatus for imparting multimodal and multi-axial vibrations to a device to be screened, comprising:

- a mounting table with a core structure that has multiple, undamped, dispersion paths, which are capable of dispersing unidirectional stress wave excitations from impact forces imparted to the mounting table into multimodal and multi-axial vibrations that are substantially incoherent relative to one another;
- an impact actuator that has an ability to impart impact forces unidirectionally along an axis, said impact actuator being connected to said mounting table in a rigid manner that accommodates no relative movement between said impact actuator and said core structure and in an orientation such that said axis intersects said rigid core structure at an angle between said axis and said mounting table in a range between twenty degrees (20°) and forty degrees (40°); and
- mounting means on said mounting table for mounting said device securely on said mounting table in substantially immoveable relation to said core structure.

5,836,203
MAGNETICALLY EXCITED FLEXURAL PLATE WAVE APPARATUS

Stephen J. Martin; Michael A. Butler, both of Albuquerque; Gregory C. Frye, Cedar Crest, and James H. Smith, Albuquerque, all of N. Mex., assignors to Sandia Corporation, Albuquerque, N. Mex.

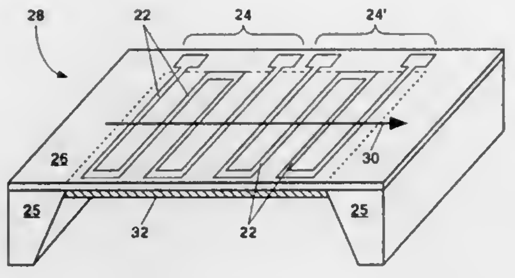
Filed Oct. 21, 1996, Ser. No. 734,290

Int. Cl.^{6} G01H *3/06*

U.S. Cl. 73—579 **16 Claims**

1. A flexural plate wave apparatus comprising:

- a meandering conductor upon a non-piezoelectric membrane further comprising silicon nitride or polysilicon;
- a static magnetic field orthogonal to the conductor and aligned in-plane with the membrane; and



- means for energizing the conductor with an electrical current and thereby exciting flexural plate waves in the membrane.

5,836,204
VIBRATION GENERATOR AND MACHINE WITH SUCH A GENERATOR

Valdemar Skak, Fåborg, Denmark, assignor to Aktieselskabet Valdemar Skak Dansk Svingningsteknik, Denmark

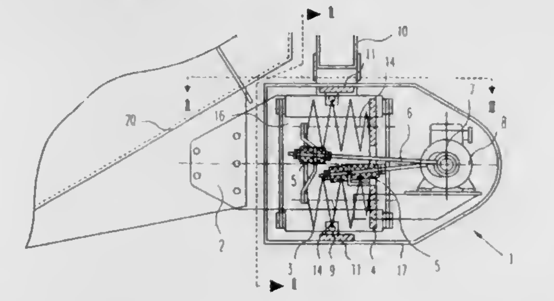
PCT No. PCT/DK95/00361, § 371 Date Mar. 19, 1997, § 102(e) Date Mar. 19, 1997, PCT Pub. No. WO96/09126, PCT Pub. Date Mar. 28, 1996

PCT Filed Sep. 8, 1995, Ser. No. 817,013

Claims priority, application Denmark, Sep. 19, 1994, 1076/94; Feb. 22, 1995, 0192/95

Int. Cl.^{6} B06B *1/14;* **B65G** *27/32*

U.S. Cl. 74—61 **10 Claims**



1. Balanced vibration generator (**1**) for resonance-amplified operation of a machine or equipment and comprising at least one set of counter-oscillating masses (**4**, **16**, **20**) suspended in a spring system (**3**), where the spring system includes resonance springs in the form of helical springs (**3**) which essentially also support the masses, also comprising a balanced drive system (**6**, **7**, **8**) built into the generator, and where the vibration generator is suspended from securing elements (**10**, **11**) which are in engagement with the resonance springs (**3**) around their elastic center-point, characterized in that the resonance springs are mounted in the securing elements (**9**, **28**) which are in fixed connection with a base or a support in such a manner that the springs, by being turned around their longitudinal axes (**14**), can change the relationship between the lengths of the springs from the securing element and to the counter-oscillating masses.

5,836,205
LINEAR ACTUATOR MECHANISM

Steven M. Meyer, 1164 S. Valentine Way, Lakewood, Colo. 80228, assignor to Steven M. Meyer, Lakewood, Colo.

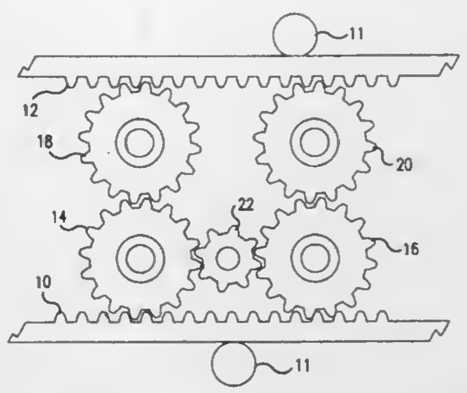
Filed Feb. 13, 1997, Ser. No. 800,300

Int. Cl.^{6} F16H *19/04*

U.S. Cl. 74—89.17 **18 Claims**

1. A linear actuator comprising in combination:

- a first gear rack;
- a second gear rack fixed with respect to said first gear rack and parallel to said first gear rack;



- wherein said gear racks face each other in opposition to each other;
- a pair of first drive gears in meshing engagement with said first gear rack;
- a pinion gear in contact with each of said first drive gears;
- a pair of second drive gears, each in meshing engagement with said second gear rack; and
- each of said second drive gears in meshing engagement with one of said first drive gears.

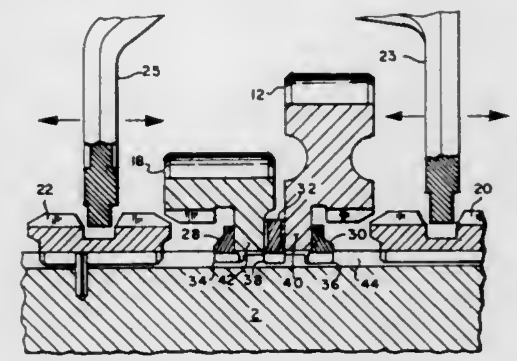
5,836,206
VEHICLE TRANSMISSION AND THRUST WASHER THEREFOR

Robert Craft, Ceresco, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 12, 1996, Ser. No. 730,950

Int. Cl.^{6} F16H *3/097;57/04*

U.S. Cl. 74—333 **5 Claims**



1. A change gear transmission (**100**) of the type having a mainshaft (**2**) journaled for rotation about a central rotational axis and having a plurality of splines (**44**) extending axially along the outer surface thereof in substantially equal spaced relationship to each other, at least two floating mainshaft gears (**12**, **18**) encircling the mainshaft in axially spaced-apart relationship to each other and having respective thrust surfaces (**47**, **49**) facing towards each other in substantial transverse relationship to the mainshaft central rotational axis, clutch means (**20**, **22**) selectively operable to clutchingly engage the mainshaft gears to the mainshaft one at a time, a transverse annular groove (**38**) disposed in the mainshaft between the mainshaft gear thrust surfaces, and an improved thrust washer (**32**) disposed in the groove and extending therefrom radially outwardly between the mainshaft gear thrust surfaces and operative to transmit axial thrust to the mainshaft imparted to the mainshaft gears by the clutch means, wherein the improvement is characterized by said thrust washer including a plurality of depressions on opposite sides thereof that are not in registration with each other and are adapted to enable lubricant (**9**) to move radially outwardly from between the mainshaft gear thrust surfaces and the thrust washer surface so as to diminish accumulation of lubricant therebetween.

5,836,207
RATIO SELECTOR MECHANISMS

John Spooner; Mark Stanley Willows, both of Kenilworth, and David Anthony Harries, Welford on Avon, all of Great Britain, assignors to Kongsberg Techmatic UK Limited, Leamington SPA, England

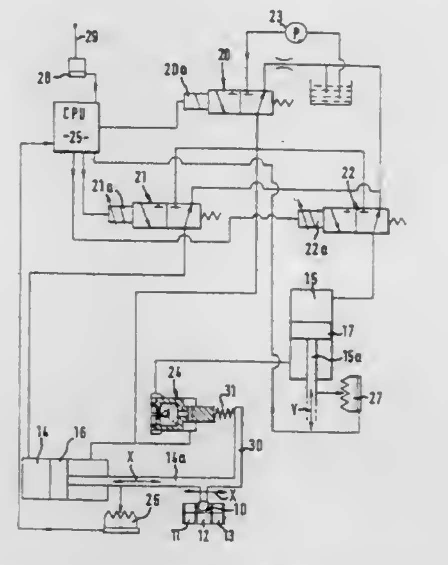
PCT No. PCT/GB96/01732, § 371 Date Mar. 17, 1997, § 102(e) Date Mar. 17, 1997, PCT Pub. No. WO97/05410, PCT Pub. Date Feb. 13, 1997

PCT Filed Jul. 19, 1996, Ser. No. 809,997

Claims priority, application United Kingdom, Jul. 26, 1995, 9515333; Feb. 10, 1996, 9602734

Int. Cl.^{6} F16H *61/28*

U.S. Cl. 74—335 **11 Claims**



1. A ratio selector mechanism for the selection of the operative ratio in a associated synchromesh vehicle transmission in which fluid pressure operated actuating means operates synchromesh units, the mechanism including a first fluid pressure operated actuator which moves a selector member in a first direction to engage one of a number of ratio shift rails, a second fluid pressure operated actuator which moves the selector member in a second direction to longitudinally displace the engaged shift rail to engage an associated selected ratio, and a valve member which acts against a bias force which is varied in dependence on the position of the first actuator to control the level of pressure supplied to the second actuator.

5,836,208
APPARATUS FOR CONVERTING A ROTATIONAL MOVEMENT INTO AN AXIAL MOVEMENT

Johannes Dietrich, Gilching, and Bernd Gombert, Grafrath, both of Germany, assignors to Deutsche Forschungsanstalt für Luft-und Raumfahrt e.V., Köln, Germany

Filed Oct. 30, 1996, Ser. No. 741,042

Claims priority, application Germany, Oct. 31, 1995, 195 40 634.6

Int. Cl.^{6} F16H *25/22*

U.S. Cl. 74—424.8 C **13 Claims**

1. Apparatus for converting a rotational movement into an axial movement or vice versa, the apparatus comprising a spindle rod (**1**) having a single lead thread (**10**), a spindle nut (**3'**) that encompasses the rod, and a plurality of rolling or roller bodies (**2'**) disposed between the spindle nut and the spindle rod, each of said plurality of rolling or roller bodies (**2'**) having grooved profiles (**21'**) that match the thread (**10**) of the spindle rod (**1**), wherein the rolling or roller bodies (**2'**) are rotatably engaged on the spindle rod and are seated between the spindle rod and a plurality of guide rings (**5**) and bearings (**6**) engaged adjacent to the guide rings (**5**) within the spindle nut (**3'**), each of said plurality of rolling or roller

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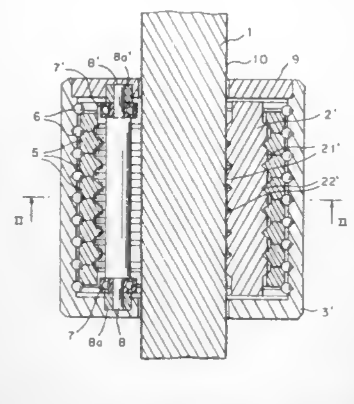


bodies (**2'**) being fixedly spaced relative to the spindle nut (**3'**) and one another as effected by spacing means in a form of ball or roller bearings (**7**, **7'**) rotatably fixed to the spindle nut and spaced apart from the thread of the spindle rod, so that an axial reception of force and torque by the spindle nut (**3'**) is transmitted through the rolling and roller bodies (**2'**), the guide rings (**5**) and the bearings (**6**), and, through the rolling or roller bodies (**2'**), the guide rings (**5**) and the bearings (**6**), a rotational movement of the spindle rod (**1**) is converted into an axial movement of the spindle nut (**3'**), or vice versa, that is free from pitch errors.

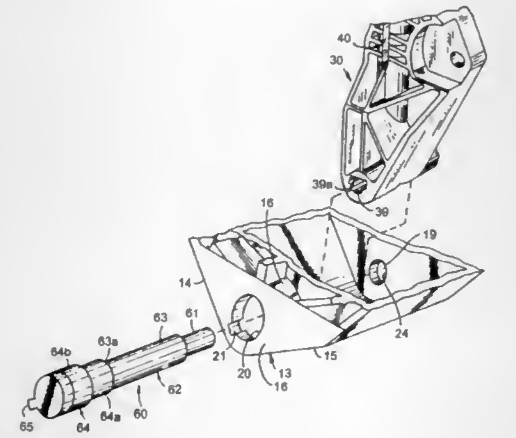
5,836,209
SHIFTER WITH PIVOT PIN HAVING RETENTION TAB

Scott M. Ebenstein, Rockford, Mich., assignor to Grand Haven Stamped Products Division of JSJ Corporation, Grand Haven, Mich.

Filed Dec. 30, 1996, Ser. No. 777,527

Int. Cl.⁶ F16H *59/04*

U.S. Cl. 74—473.21 **14 Claims**



1. A shifter for a vehicle comprising:
- a base for attachment to a vehicle, the base including spaced, aligned sockets;
- a pivot member;
- said aligned sockets having aligned first openings for pivotally receiving said pivot member;
- a shift lever assembly having a portion located between said sockets and having a second opening for receiving said pivot member whereby said shift lever assembly is pivotable between said sockets with said pivot member about an axis of rotation between an assembly-permitting angular position and a plurality of gear positions;
- said pivot member includes a tab at one end thereof extending radially from said pivot member;
- said base including a flange having an outer surface and an inner surface located laterally outwardly of one of said sockets and having a third opening configured to receive said pivot member and tab when said shift lever assembly is in an assembly-permitting angular position; and
- at least a portion of the inner surface of said flange being spaced from said one of said sockets to permit said pivot member with said tab to pivot with said shift lever assembly to said gear positions behind the inner surface of said flange to thereby prevent said pivot member from being withdrawn from said aligned sockets when said shift lever assembly is in any one of said gear positions.

5,836,210
ARM BEARING FOR AN AWNING

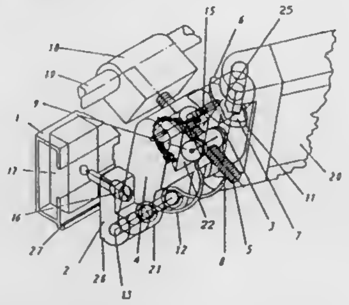
Viktor Lohausen, 74199 Oberheinriet, Germany, assignor to Technolizenz Establishment, Triesen, Liechtenstein

Filed Nov. 28, 1995, Ser. No. 605,229

Claims priority, application Switzerland, May 28, 1993, 01611/93

Int. Cl.⁶ G05G *11/00*

U.S. Cl. 74—483 K **14 Claims**



1. An arm bearing for an awning, comprising:
- at least one support block (**2**),
- at least one bearing block (**4**) arranged to swivel about a first rotation axle (**13**) into a drop-out position,
- an arm (**20**) rotatable about a second rotation axle (**14**) transversely to said first rotation axle (**13**),
- a threaded coupling rod (**5**) coupling said support block (**2**) and said bearing block (**4**) for tilting movement of said bearing block (**4**),
- an adjusting nut (**9**) coupled to said threaded coupling rod (**5**) for limiting said tilting movement of said bearing block (**4**) within variable limits,
- at least one lock (**15**) coupled to said arm (**20**) and displaceable transversely to said threaded coupling rod (**5**) for locking engagement with said adjusting nut (**9**),
- said adjusting nut (**9**) having at least one recess (**3**) or projection (**23**) arranged approximately radially with respect to said threaded coupling rod (**5**) for locking engagement with said lock (**15**), and
- an eccentric cam (**6**) rigidly connected to said arm (**20**) for positively controlling displacement of said lock (**15**).

5,836,211
TILT STEERING MECHANISM

William J. Ross, Sarasota; Andrew K. Stiteler, Bradenton, and Jerald G. Wagner, Venice, all of Fla., assignors to IMO Industries, Inc., Sarasota, Fla.

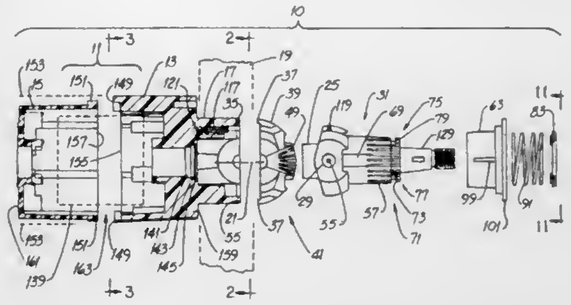
Filed Feb. 12, 1997, Ser. No. 798,832

Int. Cl.⁶ B62D *1/18*

U.S. Cl. 74—493 **32 Claims**

1. A tilt steering mechanism including:
- a housing having a tower extending along a tower axis;
- a locking apparatus fixed with respect to the tower and having a first locking member thereon;
- a trunnion swivel bar extending along a swivel axis and mounted for pivoting movement with respect to the tower and the locking apparatus; and
- a locking device mounted on the swivel bar for movement along the swivel axis, the locking device including a second locking member for selectively engaging the first locking member, thereby permitting the angle between the tower axis and the swivel axis to be adjusted;

and wherein:
- the swivel bar includes a pair of trunnion pins; and
- the pins are retained between the tower and the locking apparatus for pivoting movement with respect thereto.



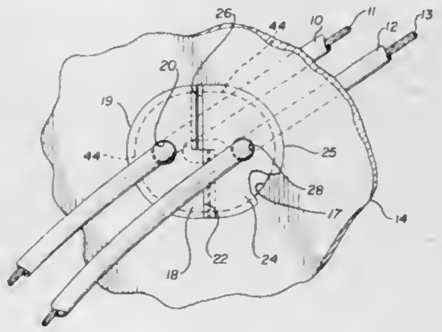
5,836,212
INTERLOCKING GROMMET WITH GROSS HOLE AND METHOD OF ASSEMBLY

Wayne Bates, Grand Blanc, Mich., assignor to Teleflex, Inc., Plymouth Meeting, Pa.

Filed May 21, 1997, Ser. No. 859,969

Int. Cl.⁶ F16C *1/10*

U.S. Cl. 74—502.6 **7 Claims**



1. A motion transmitting remote control assembly comprising:
- a conduit (**10**);
- a flexible core element (**11**) movably supported by said conduit (**10**);
- a first grommet sector (**18**) having a hole (**20**);
- said conduit (**10**) extending through said hole (**20**) for supporting said conduit (**10**) in an aperture (**17**) in a wall (**14**);
- said first grommet sector (**18**) having a periphery (**19**) for engaging and retaining the grommet sector (**18**) in the aperture (**17**) in the wall (**14**);
- said first grommet sector (**18**) having a straight edge (**22**) extending across said first grommet sector (**18**) between extremities of said periphery (**19**) thereof; and
- a second grommet sector (**24**, **30**) having a periphery (**25**, **37**) for engaging and retaining the second grommet sector (**24**) in the aperture (**17**) and a straight edge (**26**, **36**) in mechanical interlocking engagement with said edge (**22**) of said first grommet sector (**18**), whereby the entire periphery of the engaged first and second grommet sectors may be disposed in the aperture (**17**) in a wall (**14**).

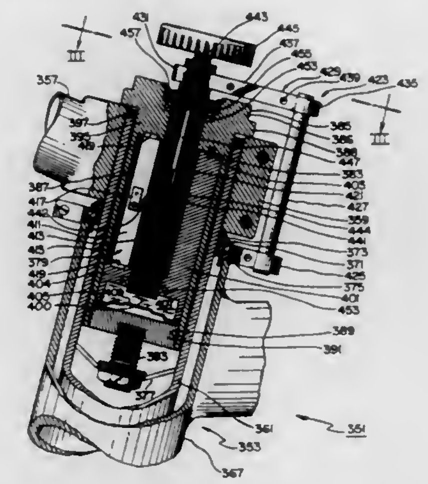
5,836,213
STEERING DAMPER IN AND FOR VEHICLES

Timothy C. Hopey, 4300 Rosanna Dr., Allison Park, Pa. 15101

Continuation-in-part of Ser. No. 176,659, Jan. 3, 1994, Pat. No. 5,492,033. This application Feb. 23, 1995, Ser. No. 392,516

Int. Cl.⁶ B62K *21/12*

U.S. Cl. 74—551.2 **18 Claims**



1. A vehicle having a frame including a head tube, rotatable handlebars connected to said frame, steerable wheel means, a steer-tube connected to said steerable wheel means, rotatable within said head tube to seer said steerable wheel means, means, connecting said handlebars to said steer-tube for rotating said steer-tube and through said steer-tube said steerable wheel means for steering said steerable wheel means by rotation of said handlebars, a steering damper within said steer-tube, said steering damper having a container for damping fluid, vane means in said container, means, cooperative with said vane means, for producing damping by said fluid on rotation of said container from a center relative to said vane means, and means connecting said handlebars to said container cooperative to rotate said container together with said steer-tube and said steerable wheel means synchronously with said handlebars relative to said vane means to damp the displacement from center of said handlebars by action of said means cooperative with said vane means.

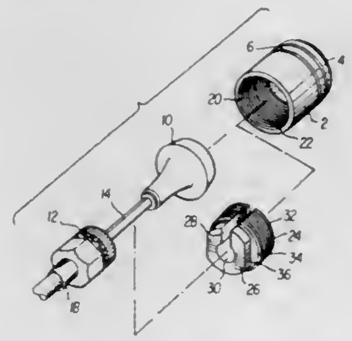
5,836,214
CHOKE PULL-KNOB COVER

Kenneth Marquis, 139 Henry St., Shavertown, Pa. 18708

Filed Nov. 1, 1996, Ser. No. 743,004

Int. Cl.⁶ G05G *1/02*

U.S. Cl. 74—558.5 **11 Claims**



1. A cover assembly which covers a knob which is slidably mounted on a vehicle via a slide member, which comprises:
- a substantially inflexible housing having a closed end cover and an open end such that a chamber is formed in said housing, said knob being positioned in said chamber;

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a substantially inflexible collar which is securable to the housing and has a radially extending slot formed therein which radially extends from a longitudinally extending aperture in the collar to permit passage therethrough of the slide member of the knob, said collar having a substantially planar end wall portion, a substantial portion of which directly engages with a surface portion of the knob and which extends substantially to a midportion of the housing in a longitudinal direction thereof;
an engaging member engaged with at least one of the collar and the housing for securing the collar to the housing such that the knob is positioned in the chamber of the housing; and
at least one groove member formed in an outer circumferential surface of the housing, said groove member assisting an operator in pulling the housing towards the operator for providing choking of a carburetor of the vehicle, said groove member surrounding said outer circumferential surface of the housing.

5,836,215
LAMINAR CAM ARRANGEMENT

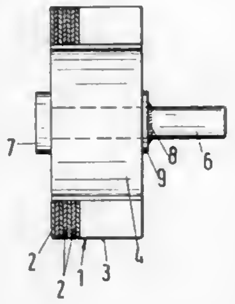
Alfred Beier, Brunswick; Dietrich Distler, Wolfsburg; Helmut Wittke, Didderse, and Christian Nesselrath, Eversen, all of Germany, assignors to Volkswagen AG, Wolfsburg, Germany

Filed Jul. 8, 1994, Ser. No. 272,782

Claims priority, application Germany, Jul. 8, 1993, 43 22 776.7

Int. Cl.^{6} F16H *53/00*

U.S. Cl. 74—567 **4 Claims**



1. A cam arrangement having a cam profile surface comprising a plurality of punched layers of flat sheet stock assembled in aligned and laterally adjacent relation and providing a camshaft opening, and fastening means for joining the layers together at a location outside the cam profile surface wherein the fastening means comprises at least one weld joint adjacent to the camshaft opening.

5,836,216
FLYWHEEL OR INERTIAL MASS DEVICE FOR A MOTOR VEHICLE, THE FLYWHEEL HAVING INDENTATIONS AS TOOTHING OF A PLANETARY GEAR TRAIN

Jörg Sudau, Niederwerrn; Bernhard Schierling, Kürnach, and Hilmar Göbel, Grafenrheinfeld, all of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Germany

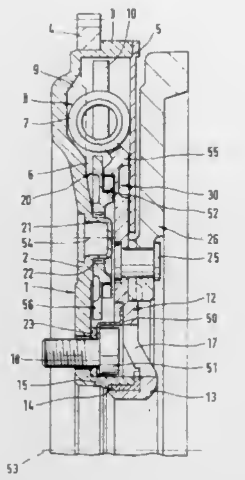
Filed Mar. 7, 1997, Ser. No. 812,589

Claims priority, application Germany, Mar. 8, 1996, 196 09 043.1

Int. Cl.^{6} F16F *15/30*

U.S. Cl. 74—574 **17 Claims**

1. A two part flywheel for an internal combustion engine of a motor vehicle for transmitting mechanical rotary power from the internal combustion engine to a transmission, said flywheel comprising:
a first inertial mass;
a second inertial mass;



said first and second inertial masses being rotatable with respect to one another;
said second inertial mass comprising a hub disc;
said hub disc having an axis of rotation;
a planetary gear system for transmission of torque;
said planetary gear system consisting solely of:
a planet wheel;
a plurality of projections disposed on said hub disc;
said plurality of projections being disposed a predetermined distance from said axis of rotation of said hub disc; and
said plurality of projections being disposed to form a ring gear;
said planet wheel being rotatably connected to said first inertial mass;
said planet wheel being disposed to engage said projections of said hub disc to transmit torque between said first and second inertial masses;
said hub disc having a first side and a second side facing away from one another, both of said first and second sides being transverse to said axis of rotation;
said first side of said hub disc being disposed adjacent said planet wheel;
said plurality of projections being disposed on said first side of said hub disc;
said plurality of projections being disposed at predetermined circumferential distances from one another;
said hub disc comprising a plurality of indentations;
said plurality of indentations being disposed on said second side of said hub disc;
each of said plurality of indentations being disposed at a position corresponding to one of said plurality of projections on said first side of said hub disc; and
said indentations and projections having been formed by at least one of pressing and stamping said second side of said hub disc toward said first inertial mass.

7. A two part flywheel for an internal combustion engine of a motor vehicle for transmitting mechanical rotary power from the internal combustion engine to a transmission, said flywheel comprising:
a first inertial mass;
a second inertial mass;
said first and second inertial masses being rotatable with respect to one another;
said second inertial mass comprising a hub disc;
said hub disc having an axis of rotation;
a planetary gear system for transmission of torque;
said planetary gear system comprising:
at least one planet wheel;
a plurality of projections disposed on said hub disc;
said plurality of projections being disposed a predetermined distance from said axis of rotation of said hub disc; and
said plurality of projections being disposed to form a ring gear;
said at least one planet wheel being rotatably connected to said first inertial mass;

said at least one planet wheel being disposed to engage said projections of said hub disc to transmit torque between said first and second inertial masses;
said hub disc having a first side and a second side facing away from one another, both of said first and second sides being transverse to said axis of rotation;
said first side of said hub disc being disposed adjacent said at least one planet wheel;
said plurality of projections being disposed on said first side of said hub disc;
said plurality of projections being disposed at predetermined circumferential distances from one another;
said hub disc comprising a plurality of indentations;
said plurality of indentations being disposed on said second side of said hub disc;
each of said plurality of indentations being disposed at a position corresponding to one of said plurality of projections on said first side of said hub disc; and
said indentations and projections having been formed by at least one of pressing and stamping said second side of said hub disc toward said first inertial mass.

5,836,217
TORSIONAL VIBRATION DAMPER

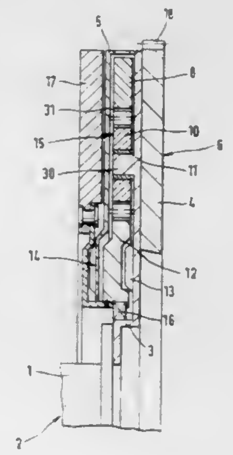
Jörg Sudau, Niederwerrn, and Bernhard Schierling, Kürnach, both of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Germany

Filed Jul. 9, 1997, Ser. No. 890,170

Claims priority, application Germany, Jul. 10, 1996, 196 27 764.7

Int. Cl.^{6} F16F *15/10;15/22;* G05G *1/00*

U.S. Cl. 74—574 **8 Claims**



1. A torsional vibration damper, comprising:
at least one inertia mass;
an absorption mass;
connecting elements arranged rotatably to connect the absorption mass to the inertia mass;
a balancing weight associated with the absorption mass; and
a movement-transmitting transmission configured to connect the balancing weight to the absorption mass and to the inertia mass.

5,836,218
CRANKSHAFT FOR COOLING PISTONS

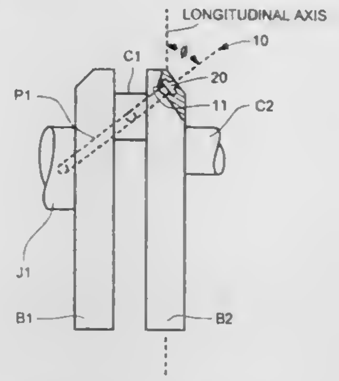
Hyun-Gi Lee, Kyungsangnam-do, Rep. of Korea, assignor to Hyundai Motor Company, Ltd., Seoul, Rep. of Korea

Filed Dec. 20, 1996, Ser. No. 771,422

Claims priority, application Rep. of Korea, Dec. 20, 1995, 1995 52774

Int. Cl.^{6} F16C *3/04;11/00*

U.S. Cl. 74—605 **6 Claims**



1. A crankshaft system comprising:
a plurality of crank pins connected together by a plurality of balance weights;
journal means rotatably supporting said crank pins and said balance weights;
oil passage means for providing passages in said crank pins, said balance weights, and said journal means, whereby each balance weight has at least one oil passage means disposed therein; and
oil hole means being disposed in said balance weights and said crank pins for providing an equal distribution of oil, said oil hole means further comprises oil lets for providing high-velocity streams of oil to further widen said distribution of oil.

5,836,219
GEAR-CASE ARRANGEMENT FOR A MOTOR-GEAR DRIVE UNIT, IN PARTICULAR FOR AUTOMOBILE WINDOW LIFTERS OR THE LIKE

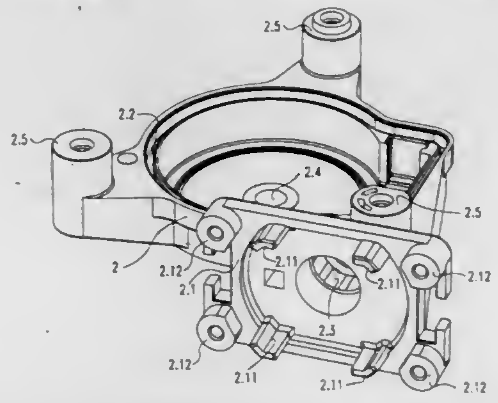
Peter Klingler, Neubrunn, and Thomas Luckas, Kuermach, both of Germany, assignors to Siemens Aktiengesellshcaft, Munich, Germany

Filed Aug. 23, 1996, Ser. No. 701,951

Claims priority, application Germany, Aug. 25, 1995, 295 13 701 U

Int. Cl.^{6} F16H *57/02*

U.S. Cl. 74—606 R **19 Claims**



1. A motor-gear drive unit, comprising:
a gear case; and
a gear case cover for closing said gear case in a moisture-tight manner.

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wherein said gear case cover is fashioned to connect to said gear case nonpositively by means of a press-fit, clamp-fastening closure provided by a peripheral web inserted into a peripheral channel-shaped groove, said peripheral web and said peripheral channel-shaped groove being provided, respectively, on one and the other of said gear case and said gear case cover, and

wherein said peripheral web bears on a side wall of said peripheral channel-shaped groove via a scraping rib.

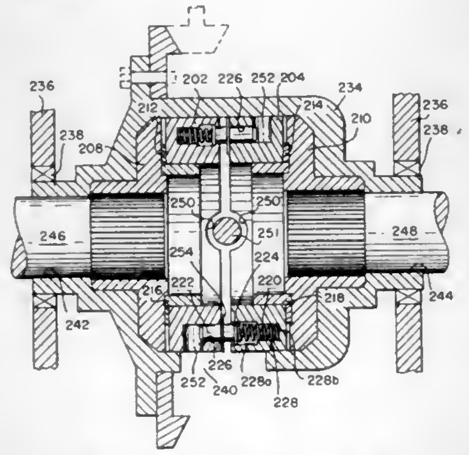
5,836,220
LOCKING DIFFERENTIAL WITH PIN ACCESS WINDOW

Paul J. Valente, Berkley, Mich., assignor to Tractech Inc., Warren, Mich.

Continuation-in-part of Ser. No. 754,170, Nov. 25, 1996, Pat. No. 5,715,733. This application Apr. 17, 1997, Ser. No. 842,824

Int. Cl.^{6} F16H *48/12*

U.S. Cl. 74—650 **9 Claims**



1. A locking differential for driving a pair of collinearly-arranged axially-spaced output shafts the adjacent ends of which extend through aligned shaft openings contained in the opposed walls of a hollow differential casing, said casing containing an access opening affording access to the casing chamber, comprising:

(a) a pair of annular collinearly-arranged axially-spaced clutch members adapted for insertion within the casing chamber via the casing access opening to axially spaced positions between, and collinearly aligned relative to the axis of, the casing shaft openings, respectively, the adjacent faces of said clutch members containing at least one pair of diametrically arranged drive grooves, at least one pin bore, and at least one oversized spring bore, and further wherein each said clutch member contains in its outer periphery a radially inwardly directed pin access opening communicating with each pin bore;

(b) a pair of generally annular side gears collinearly arranged with, and on opposite sides of said clutch members, said side gears being internally splined for non-rotatable connection with the output shafts, respectively, said side gears and said clutch members having adjacent faces provided with cooperating clutch teeth, respectively, said clutch members being axially displaceable inwardly and outwardly toward disengaged and engaged positions relative to said side gears, respectively;

(c) a diametrically extending drive rod arranged between said clutch members and extending within said drive grooves, respectively, the remote ends of said drive rod extending radially outwardly beyond said clutch members for connection with said differential casing, the width of said drive grooves being greater than the diameter of said drive rod and said drive grooves having a cross-sectional configuration such as to cause disengagement of the clutch member associated with an output shaft that overruns the other output shaft beyond a given amount, thereby to disengage the overrunning shaft from the associated clutch member;

(d) spring means arranged in each said oversized spring bore for urging said clutch members outwardly axially apart toward said engaged position;

(e) locking means for limiting the extent of angular rotational displacement of said clutch members relative to each other, said locking means including a plurality of locking pins each having a first end slidably mounted in a corresponding pin bore, each said locking pin being axially slidably displaceable between a retracted inoperable position wherein said locking pin is contained generally within said pin bore with said first end opposite said pin access opening, and an extended operable position wherein said locking pin is axially displaced to extend at its other end partially within a corresponding aligned spring bore contained in the opposing face of the other clutch member, thereby to compress the associated spring means arranged therein, whereby upon the insertion of the tip of a screwdriver into said pin access opening, said pin may be displaced from said retracted inoperable position to said extended operable position; and

(f) clip means for maintaining said locking pin in said extended operable position.

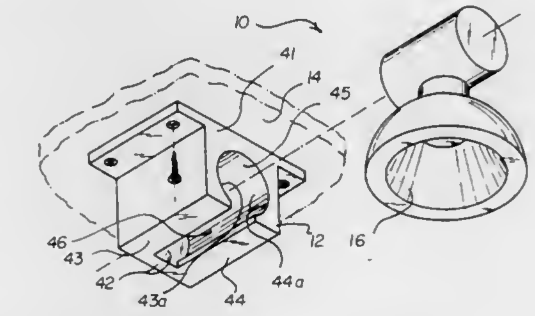
5,836,221
PILL BOTTLE CAP REMOVAL DEVICE

Jeff Hystead, 6697 Barrisdale Dr., Mississauga, Ontario, Canada, L5N 2H5

Filed Apr. 17, 1997, Ser. No. 842,913

Int. Cl.^{6} B67B *7/18*

U.S. Cl. 81—3.25 **9 Claims**



3. A pill bottle cap removal device comprising:

a base having a first side adapted for mounting to a support surface, said base having a protrusion extending away from said first side, said protrusion structured to have a cylindrical bore adapted for positioning substantially parallel to the support surface, said protrusion having a distal surface structured to have a slot extending between said distal surface and said bore such that said slot provides an opening into said bore;

a tool having a cylindrical handle grippable by a hand of a user, a receiving member and a stem coupling said handle to said receiving member;

wherein said cylindrical handle is insertable into said bore and wherein said stem is passable through said slot such that said tool is matably received by said base whereby said tool is prevented from rotating about a longitudinal axis of the tool with respect to the support surface when the tool is inserted into the base; and

wherein said receiving member has engaging surfaces which converge toward each other for receiving and engaging a range of sizes of pill bottle caps.

5,836,222
SHINGLE REMOVING TOOL

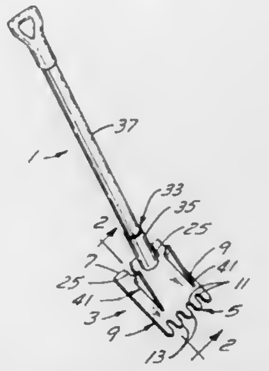
William Harpell, 2380 Findlay Road, Jocyeville, Ontario, Canada, K0H 1Y0

Filed Oct. 9, 1996, Ser. No. 728,162

Claims priority, application Canada, Oct. 12, 1995, 2160399

Int. Cl.^{6} E04D *15/02*

U.S. Cl. 81—45 **7 Claims**



1. A shingle removing tool having a flat blade with a generally main quadratic area having a front edge and a back edge and parallel side edges joining the front and back edges; the blade being made from a sheet of uniform thickness; the front edge having a plurality of spaced-apart slots extending inwardly from the front edge of the blade; the back edge having at least two spaced-apart slots extending inwardly from the back edge of the blade; the slots sized to readily receive the shanks of roofing nails but not to pass the heads of the nails; the slots on the front edge forming fingers with parallel sides; the fingers being tapered in width at their front ends to enlarge the mouths of the slots to a funnel shape; the sides of the fingers defining the slot, that extend rearwardly from the front ends, being substantially longer than the front ends of the fingers to locate the closed ends of the slots some distance from the front edge of the blade whereby when a nail in a roof is located at the closed end of a slot and the tool is pivoted up about its front edge on the roof, the nail is easily levered out of the roof.

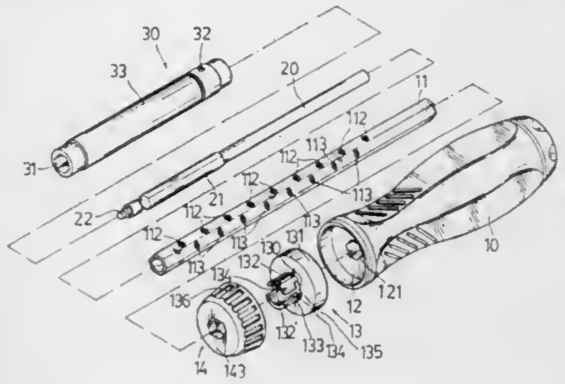
5,836,223
LENGTH-ADJUSTABLE SCREWDRIVER

Ching-Chou Lin, No. 33-12, Lane 320, Sec. 1, Sha-Tien Rd., Ta-Tu Hsiang, Taichung Hsien, Taiwan

Filed Jun. 25, 1997, Ser. No. 882,145

Int. Cl.^{6} B25B *13/48*

U.S. Cl. 81—436 **2 Claims**



1. A length-adjustable screwdriver comprising:

a handle having a recessed circular front hole at a front end thereof, and a polygonal center hole longitudinally disposed at the center of said recessed circular front hole;

a collar block mounted within the recessed circular front hole of said handle, said collar block having a circular base fit into the recessed front hole of said handle, a center through hole through the center of said circular base in alignment with the polygonal center hole of said handle, a tubular upright flange raised from one side of said circular base around the center through hole of said circular base, two transverse slots bilaterally disposed at the connecting area between said circular base and said upright flange, two longitudinal openings respectively and perpendicularly extended from said transverse slots, a springy strip raised from said circular base at an outer side of said upright flange facing a gap at said upright flange and having a top end terminating in a semicircular retainer head;

a polygonal tube inserted through the center through hole of said collar block into the polygonal center hole of said handle, having an inside annular flange, and two longitudinal rows of locating holes, alternatively arranged at two adjacent side walls thereof;

a chuck mounted on the front end of said handle and turned between a first position in which the retainer head of said spring strip is forced into engagement with one locating hole of said polygonal tube to secure it in place, and a second position in which the retainer head of said springy strip is released from said polygonal tube, permitting said polygonal tube to be moved in the polygonal center hole of said handle, said chuck comprising a center through hole through which said polygonal tube passes, a longitudinal groove longitudinally disposed inside its center through hole and adapted for receiving said springy strip, and two inward guide rods bilaterally and inwardly raised from the periphery of its center through hole and respectively inserted through the longitudinal openings of said collar block into the transverse slots thereof;

a shaft inserted into said polygonal tube, having one end terminating in a polygonal rod section stopped at the inside annular flange of said polygonal tube, and a magnet at the end of said polygonal rod section; and

a sleeve sleeved onto said polygonal tube, said sleeve having a polygonal center through hole fitting the outer diameter of said polygonal tube, and a spring-supported ball adapted to engage one locating hole of said polygonal tube.

5,836,224
METHOD AND APPARATUS FOR WORKING ON SHEET MATERIAL

Heinz Joseph Gerber, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., Tolland, Conn.

Filed Dec. 27, 1995, Ser. No. 579,336

Int. Cl.^{6} B26D *7/14;* **D06H** *7/00*

U.S. Cl. 83—22 **6 Claims**

1. A method of working on sheet material comprising:

providing a support surface for supporting at least one layer of limp sheet material in a spread condition;

placing a work tool in working relationship with the material in a work operation while the material is spread on the support surface;

identifying present working condition parameters which include type of sheet material, depth of sheet material or number of plies of sheet material;

inputting the present working condition parameters into a control system which includes a look-up table storing a plurality of predetermined pressure level values and associated working condition parameters, each value representing a suitable level of pressure for securely holding sheet material to the support surface under the associated working condition parameters;.

matching the present working condition parameters with stored working condition parameters to select a pressure level value which represents a suitable level of pressure for the present working condition parameters;

retrieving the selected pressure level value, and

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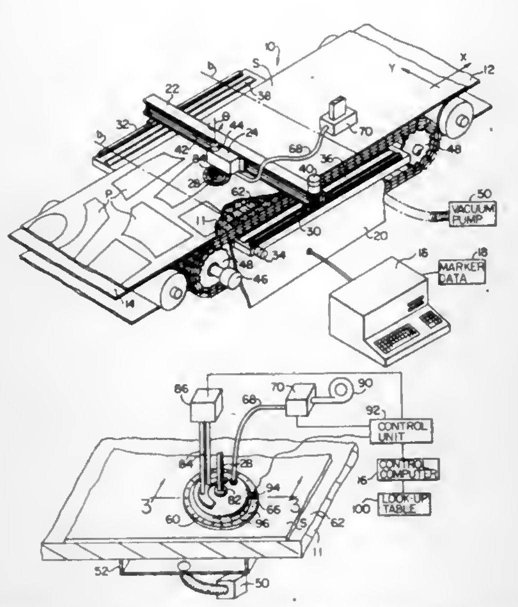


discharging a pressurized gas at the selected level of pressure against the sheet material for securely holding the sheet material to the support surface.

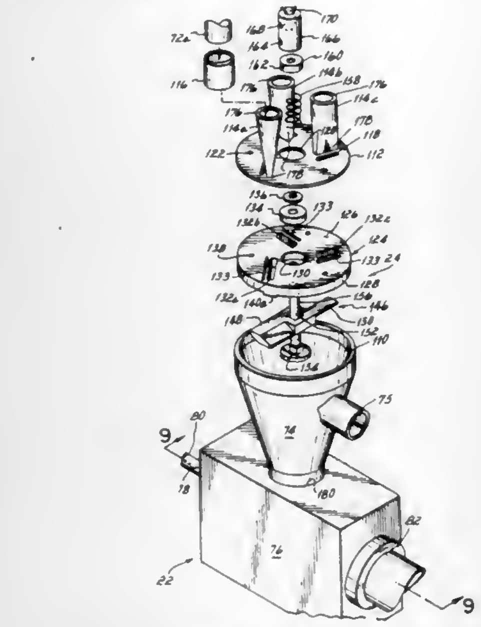
5,836,225
METHOD AND APPARATUS FOR PROCESSING CHOPPED FIBERS FROM CONTINUOUS TOWS

Julius J. Molnar, Amherst; Gregory Alaimo, Avon Lake, both of Ohio, and John M. Raterman, Lawrenceville, Ga., assignors to Nordson Corporation, Westlake, Ohio

Division of Ser. No. 801,907, Dec. 3, 1991, Pat. No. 5,450,777. This application Jun. 15, 1995, Ser. No. 490,547

Int. Cl.^{6} D01G *1/04;* **B26D** *1/28*

U.S. Cl. 83—100 **15 Claims**



1. A cutter plate adapted for use in a cutter mechanism which forms chopped fibers from continuous tows comprising:
- a circular plate having first and second surfaces;
- said circular plate being formed with at least two ribs extending outwardly from said second surface thereof;
- said circular plate being formed with tow slot means, each extending from said first surface thereof through one of said ribs, said tow slot means each forming a straight shear edge along one of said ribs;
- said tow slot means being disposed about an axis through said plate such that said shear edges are disposed about said axis and extend in a direction other than radially with respect thereto;
- each said tow slot means for receiving and confining a plurality of fibers in one of said tows uniformly across said shear edges for shearing;
- one of said tows slot means each being adapted to receive a tow which passes therethrough and protrudes beyond said ribs extending from said second surface of said circular plate in position with respect to said straight shear edge of said ribs so that a cutter blade having a cutting edge parallel to said shear edges when shearing said fibers, can cut the tow against said shear edge to form chopped fibers.

5,836,226
APPARATUS FOR PROGRESSIVELY FEEDING AND MACHINING SHEET MATERIAL

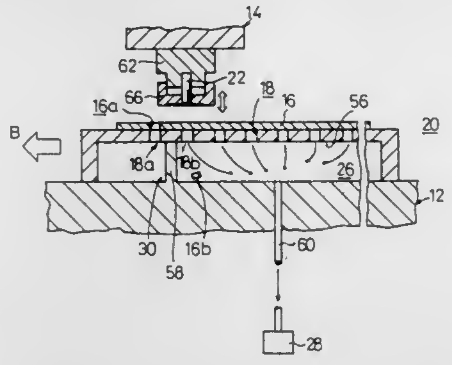
Hiroyuki Tsuji, Nagoya; Kazumasa Kitamura, Ichinomiya, and Motoo Noritake, Nagoya, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Dec. 20, 1996, Ser. No. 772,119

Claims priority, application Japan, Dec. 25, 1995, 7-337425; Dec. 18, 1996, 8-338796; Dec. 18, 1996, 8-338800

Int. Cl.^{6} B26D *7/06*

U.S. Cl. 83—129 **21 Claims**



1. An apparatus for progressively feeding and machining a sheet material, comprising:
- a die for placing a sheet material thereon, said die having a machining pattern for machining the sheet material;
- a machining head movable toward and away from said die and having a plurality of punches for machining the sheet material in coaction with said die in a predetermined number of machining cycles according to said machining pattern;
- a feed mechanism for moving said die, with the sheet material placed thereon, and said punches relatively to each other to align a machining position on the sheet material with said punches each time the sheet material is machined by said die and said punches;
- a suction chamber communicating with said machining pattern; and
- closure means for isolating a machined region of the machining pattern from said suction chamber to maintain said suction chamber under a vacuum when said suction chamber is evacuated;
- said closure means comprising at least one partition wall extending across said die in a direction substantially transverse to a direction of movement of said die, said partition wall being in sliding contact with an underside of said die.

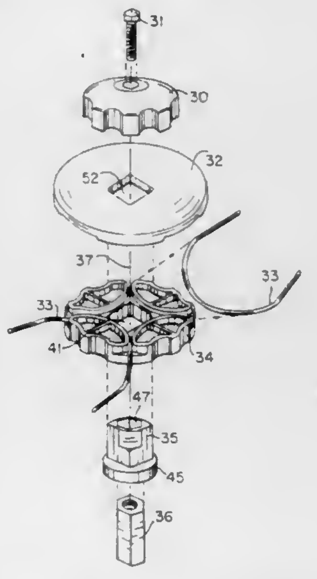
5,836,227
WEED CUTTER HEAD

John M. Dees, Jr., 7153 Hanson Dr. N., Jacksonville, Fla. 32210, and Earl O. Highsmith, Rte. 24, Box 459, Baldwin, Fla. 32234

Continuation-in-part of Ser. No. 414,091, Mar. 31, 1995, abandoned. This application Dec. 13, 1996, Ser. No. 766,507

Int. Cl.^{6} B26B *27/00*

U.S. Cl. 30—276 **8 Claims**



1. A weed cutting head attachable to a portable weed cutting machine wherein said head comprises the combination of the following components in the order given from a lower ground level to an upper attachment to said machine: a knob bolt, a knob, a tension plate, at least one length of a flexible monofilament cutting line, a line holding plate, an arbor, an internally threaded elongated hexagonal nut, and at least one length of a flexible monofilament cutting line; said knob being a thick circular disc having a central bore with a hexagonal counterbore adapted to seat a hexagonal head on said knob bolt; said tension plate being a thin circular disc having a lower smooth planar face, an upper ridged face, and a central axial first square passageway, said upper face containing a plurality of raised radial serrated narrow ridges and a plurality of raised perimetric serrated narrow ridges around said first square passageway; said line holding plate being a thick circular disc having a planar upper surface, a channeled lower surface, and a central axial second square passageway said lower surface having a plurality of radial serrated narrow channels and a plurality of perimetric serrated narrow channels around said second square passageway, said channels and said ridges being alignêd and fitting together in a male-female coupling; with said cutting line clamped therebetween and with the free ends thereof extending outwardly of said line holding plate; said arbor being a central axial pin having a square body fitting snugly into said first and second square passageways, having a central hexagonal axial bore functioning as a snugly fitting seat for said hexagonal nut, and having a laterally extending flange at the upper end of said arbor; said hexagonal nut being totally enclosed in said hexagonal bore.

5,836,228
APPARATUS FOR CUTTING SHEET MATERIAL

Duncan Richard Guthrie, Cambridge; David William Smith, Cambridgeshire, and John David Wood, Cambridge, all of Great Britain, assignors to Shaikh Ghaleb Mohammad Yassin Alhamad, Riyadh, Saudi Arabia

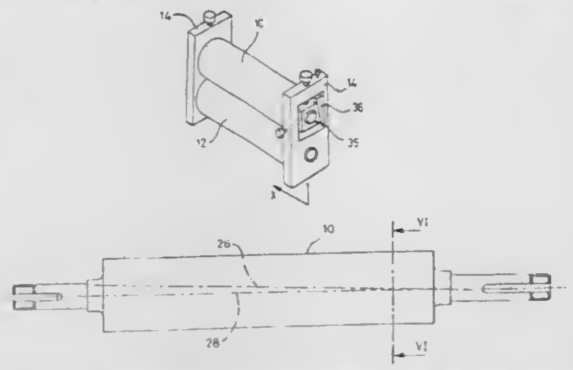
PCT No. PCT/GB95/00670, § 371 Date Nov. 14, 1996, § 102(e) Date Nov. 14, 1996, PCT Pub. No. WO95/26838, PCT Pub. Date Oct. 12, 1995

PCT Filed Mar. 27, 1995, Ser. No. 714,100

Claims priority, application United Kingdom, Mar. 31, 1994, 9406581

Int. Cl.^{6} B26D *1/147*

U.S. Cl. 83—342 **6 Claims**



1. An apparatus for cutting sheet material, the apparatus comprising two generally cylindrical rotary members characterized by a driving member (**10**) and a driven member (**12**), each member having on the periphery thereof a plurality of ribs (**18**), (**30**) at a predetermined pitch and helix angle, the pitch of the ribs (**18**) on the driving member (**10**) being smaller than the pitch on the ribs (**30**) on the driven member (**12**) and the helix angle of the ribs (**18**) on the driving member (**10**) being of opposite direction to, and of smaller magnitude than, the helix angle of the ribs (**30**) on the driven member (**12**), the said ribs (**18**) on the driving member (**10**) being operable to engage and drive the ribs (**30**) on the driven member (**12**) and the ribs (**18**), (**30**) being operable to cooperate in cutting the sheet material (**16**) with a shearing action.

5,836,229
GLASS SCRIBING DISC

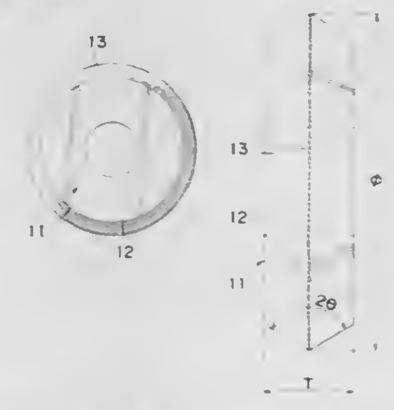
Haruo Wakayama, and Yasuhiro Chiyo, both of Settsu, Japan, assignors to Mitsuboshi Diamond Industrial Co., ltd., Osaka, Japan

Continuation of Ser. No. 611,192, Mar. 5, 1996, abandoned. This application Jun. 18, 1997, Ser. No. 877,808

Claims priority, application Japan, Nov. 6, 1995, 7-287175

Int. Cl.^{6} B26D *3/08;* **C03B** *33/027*

U.S. Cl. 83—886 **36 Claims**



7. A glass scribing disc for forming a scribed line on a brittle plate by generating vertical cracks due to brittle fracture thereof, said glass scribing disc comprising:

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- a peripheral portion defined by first and second circumferentially extending beveled surfaces that converge radially outwardly and that define therebetween an obtuse angle, that intersect at a circumferential line extending along a radially outermost portion of said disc and that form a circumferentially extending ridge;
- said ridge including circumferentially alternately arranged first portions and second portions;
- each said first portion including a radial protrusion defined by said first and second beveled surfaces and having an arc-shaped cutting edge extending along said circumferential line; and
- each said second portion comprising a recess extending radially inwardly from said circumferential line to a depth of from 2 to 20 μm.

5,836,230

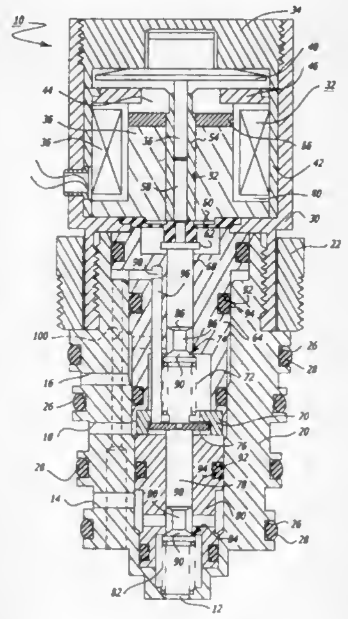
HIGH SPEED 2-WAY CONTROL VALVE

Oded E. Sturman, One Innovation Way, Woodland Park, Colo. 80863, assignor to Oded E. Sturman, Woodland Park, Colo.

Filed Aug. 27, 1996, Ser. No. 703,524

Int. Cl.^{6} F15B *13/04*

U.S. Cl. 91—455 **14 Claims**



1. A valve that directs the flow of a fluid having a fluid pressure, comprising:
- a housing having an inlet port, a first cylinder port, a second cylinder port and a reservoir port;
- valve means within said housing for allowing fluid communication between said first cylinder port and said inlet port, and between said reservoir port and said second cylinder port when said valve means is moved from a first position to a second position;
- a pin that is in fluid communication with said inlet port and coupled to said valve means such that a first fluid force acts on said pin and is an only force transmitted through said pin to said valve means; wherein there is a second fluid force acting on said valve means, such that the first and second fluid forces are equal and opposite; and,
- a solenoid operatively connected to said valve means to move said valve means between said first and second positions, said solenoid having a magnet to hold said valve means in said second position.

5,836,231

RADIAL-PISTON HYDRAULIC MOTOR AND METHOD FOR REGULATION OF A RADIAL-PISTON HYDRAULIC MOTOR

Mauno Leinonen, Jyväskylä, Finland, assignor to Valmet Voimansiirto Oy, Jyväskylä, Finland

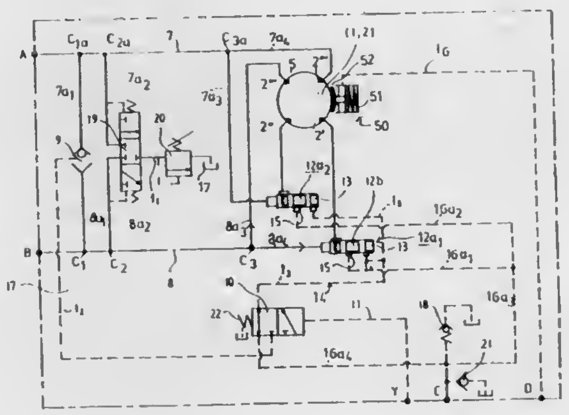
PCT No. PCT/FI95/00256, § 371 Date May 23, 1996, § 102(e) Date May 23, 1996, PCT Pub. No. WO95/31641, PCT Pub. Date Nov. 23, 1995

PCT Filed May 16, 1995, Ser. No. 586,914

Claims priority, application Finland, May 18, 1994, 942304

Int. Cl.^{6} F01B *1/06*

U.S. Cl. 91—491 **12 Claims**



1. A radial-piston hydraulic motor, comprising
- a central shaft;
- at least one cylinder group, each of said at least one cylinder group comprising
  - a cylinder frame including a plurality of radially oriented recesses and arranged in a stationary position in connection with said shaft;
  - a box frame rotatably mounted to said cylinder frame,
  - a cam ring having an inner, wave-shaped face arranged in connection with said box frame,
  - piston mechanisms having a piston and a press wheel and arranged in said recesses in said cylinder frame such that a piston space is defined between said cylinder frame and each of said pistons, and
  - conduit means for passing hydraulic fluid into said piston spaces such that said pistons are pressable against said wave-shaped face of said cam ring to cause said cam ring to revolve in relation to said at least one cylinder group;
- a distributor valve connected to said box frame for controlling flow of the hydraulic fluid to and from said piston spaces via said conduit means in order to selectively displace at least some of said pistons in a power stage outward against said cam ring causing said cam ring to rotate while enabling other of said pistons in a return stage to be displaced inward,
- a set of ducts arranged in said cylinder frame for passing the hydraulic fluid to said distributor valve,
- a closing valve arranged in said cylinder frame and interposed between said distributor valve and at least one of said piston spaces, said closing valve including a movable spindle structured and arranged to control the flow of hydraulic fluid to said at least one piston space independent of the flow of hydraulic fluid to other of said piston spaces, and

- connecting means for fluidly connecting said distributor valve to said closing valve such the hydraulic fluid flows from said distributor valve through said closing valve to said at least one piston space.

5,836,232

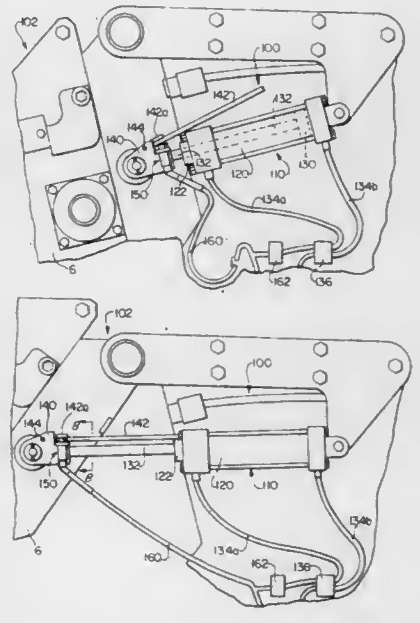
CYLINDER SAFETY LOCK

Reid W. Williams, Mesa, Ariz., assignor to Continental Eagle Corporation, Prattsville, Ala.

Filed Nov. 12, 1996, Ser. No. 747,288

Int. Cl.^{6} F15B *15/26;* E05F *3/12;* E05C *17/00*

U.S. Cl. 92—14 **10 Claims**



1. An arrangement for a safety lock for a cylinder-and-piston mechanism that is used to move an article between first and second positions, the cylinder-and-piston mechanism including an article-moving cylinder, an article-moving piston movable in the article-moving cylinder, and an article-moving piston rod having a first end attached to the article-moving piston and a second end attached to the movable article and being movable between fully retracted and fully extended positions corresponding to the first and second positions of the article, the arrangement comprising:

- a) a locking bar having a pivot end proximate the attachment between the article-moving piston rod and the movable article and a non-pivot end opposite the pivot end, said locking bar being pivotable between a lowered and fully raised position and having a plurality of partially raised positions between its lowered and fully raised positions, said locking bar being positioned to rest on the article-moving cylinder when the article-moving piston rod is fully retracted into the article-moving cylinder and the article is in its first position and being dimensioned to drop off the article-moving cylinder into its lowered position and lock against the end of the article-moving cylinder when the article-moving piston rod is fully extended and the article is in its second position; and
- b) means for automatically moving said locking bar from its lowered position to its fully raised position with its non-pivot end above the article-moving cylinder to enable the article to be moved from its second position to its first position, wherein said moving means includes:
  - 1) a locking bar cylinder positioned proximate said pivot end of said locking bar:
  - 2) a locking bar piston movable in said locking bar cylinder; and
  - 3) a locking bar piston rod having a first end attached to said locking bar piston and a second end positioned to engage said locking bar proximate said pivot end and to pivot the locking bar into its raised position above the article-moving cylinder.

5,836,233

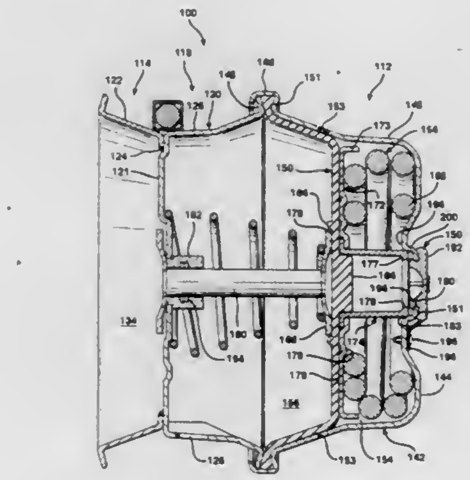
SPRING BRAKE WITH SEALABLE BREATHER HOLES

Donald Rumsey, 400 3rd. Road North, Nampa. Id. 83687

Filed Mar. 7, 1997, Ser. No. 813,351

Int. Cl.^{6} F16D *65/24;* F01B *7/00*

U.S. Cl. 92—63 **17 Claims**



1. A pneumatic automotive vehicle spring brake having a longitudinal alignment comprising:
- a spring chamber head having a transverse end wall and a surrounding side wall that extends longitudinally from said transverse end wall and which includes a flared portion that flares outwardly at an angle of about eighteen degrees relative to said longitudinal alignment of said spring brake, and said flared portion has at least one vent opening therethrough.
- an adapter head joined to said spring chamber head to form a hollow enclosure therebetween and said transverse end wall of said spring chamber head is located remote from said adapter head,
- a spring brake diaphragm having a periphery clamped between said spring brake head and said adapter head so that said diaphragm divides said hollow enclosure into a spring chamber and a pressure chamber and said diaphragm is longitudinally deflectable between a position closest to said transverse end wall of said spring chamber head and a position furthest from said transverse end wall, and
- a power spring compressed within said spring chamber so as to bear against said transverse end wall and said diaphragm, and wherein said diaphragm is deflectable by pressure applied within said pressure chamber so as to further compress said power spring and concurrently contact said surrounding side wall of said spring chamber head to thereby seal said at least one vent opening therethrough, only as said diaphragm approaches said position closest to said transverse end wall of said spring chamber head, and wherein said diaphragm is deflectable by said power spring when pressure in said pressure chamber is relieved to thereby unseal said at least one vent opening as soon as said diaphragm is deflected from said position closest to said transverse end wall.

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5,836,234

SINGLE CAM RECIPROCATING LINKED PISTON TYPE ENGINE

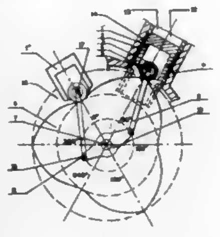
Feichang Chen; Zhigeng Xi, both of Guagao Road, Guangmang Bridge, Pudong, Shanghai 201208, P.R., and Lei Chen, Shanghai Jiao Tong University, Shanghai 200030, P.R., all of Canada

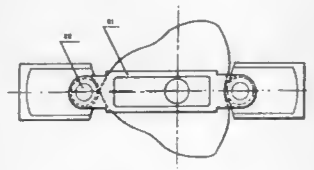
PCT No. PCT/CN94/00003, § 371 Date Feb. 13, 1997, § 102(e) Date Feb. 13, 1997, PCT Pub. No. WO95/18915, PCT Pub. Date Jul. 13, 1995

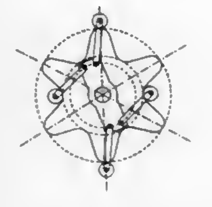
PCT Filed Jan. 1, 1994, Ser. No. 676,175

Int. Cl.^{6} F01B *1/00*

U.S. Cl. 92—72 **6 Claims**







1. A single cam, reciprocating linked piston type engine, comprising:

at least one cam mounted on a main shaft defining a main shaft axis, said cam having a circumferentially continuous, curved outer surface including at least two apexes and at least two nadirs, said apexes being spaced from said nadirs so as to form a first included angle between each adjacent said apex and said nadir;

at least two pistons mounted for reciprocating movement within respective cylinders, each said cylinder defining a central axis that extends through said main shaft axis, and said cylinders being spaced apart so as to form a second included angle between the central axes thereof, said first included angle being equal to said second included angle, and each of said two pistons including a piston skirt at a lower end thereof and a roller pin hole and an opening formed in the piston skirt;

a swing link mounted at a middle point thereof on the main shaft for pivoting movement about a swing link axis coincident with the main shaft axis, said swing link including opposite ends and at least one swing link pin hole formed in each end, said swing link pin holes being symmetric about the swing link axis;

at least two connecting rods connecting the swing link to the two pistons, each said connecting rod having first and second ends with a connecting rod pin hole at each end, said connecting rods being connected at the first ends to the ends of the swing link by swing-link pins extending through the swing link pin holes; and

at least two roller pair subassemblies connecting the second ends of the connecting rods to the pistons, each roller pair subassembly including a roller pin, a roller, and needles disposed between the roller pin and roller, the roller pin being fitted in the piston skirt opening of a respective one of the piston skirts and extending through the connecting rod pin hole at the second end of the connecting rod and the roller pin hole in the respective piston, and the roller being fitted in the respective piston skirt opening and engaged against the outer surface of the cam so as to be tangent therewith.

5,836,235

PISTON FOR HYDRAULIC ACTUATING CYLINDERS

Eckhart Rüdiger, Ebern, and Herbert Sauer, Pfarrweisach, both of Germany, assignors to Fahrzeugtechnik Ebern GmbH, Germany

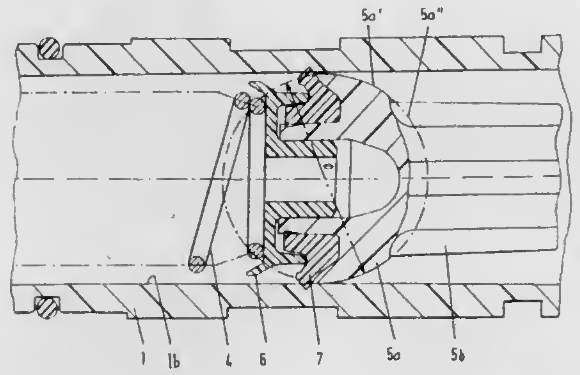
Continuation of Ser. No. 306,344, Sep. 15, 1994, abandoned.

This application Mar. 27, 1997, Ser. No. 825,195

Claims priority, application Germany, Sep. 15, 1993, 43 31 241.1

Int. Cl.^{6} F16J *1/02;9/00*

U.S. Cl. 92—178 **9 Claims**



1. A hydraulic actuating cylinder assembly, comprising:

a cylinder housing having an inner wall defining a cylinder; and

a piston in said cylinder housing, said piston comprising:

a piston portion having a peripheral seat, a peripheral packing received in said peripheral seat for forming a hydraulic seal with said inner wall of said cylinder housing, wherein said peripheral seat has an unobstructed opening facing away from said piston rod portion so as to be able to receive said packing in an axial direction toward said piston rod portion;

a piston rod portion arranged for connecting the piston portion to further equipment outside the cylinder;

the piston portion becoming narrower from said peripheral seat to said piston rod portion for permitting the piston to have both movement along the cylinder and tilting movement within the cylinder while maintaining the hydraulic seal, wherein the piston portion linearly contacts the inner wall of the cylinder; and

wherein the piston portion and piston rod portion together comprise a single unitary part

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5,836,236

COFFEE BREWER AND HOT WATER DISPENSER

Patrick J. Rolfes, 431 Morning Canyon Rd., Corona Del Mar, Calif. 92704, and Paul E. Rolfes, 88 Ocean Vista, Newport Beach, Calif. 92660

Filed Mar. 3, 1997, Ser. No. 810,708

Int. Cl.^{6} A47J *31/40*

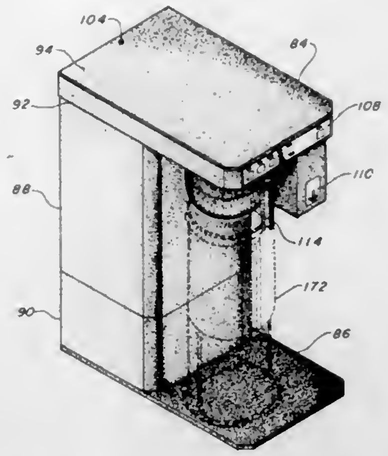
U.S. Cl. 99—290 **19 Claims**

1. A coffee brewer and hot water dispenser apparatus including attached city water and electrical power comprising;

a brew water tank receiving and storing water from an external source,

a brew pre-heater in mechanical and fluid communication with said brew water tank for heating and maintaining brew water temperature therein using heat produced by electrical energy,

a brew boiler in fluid communication with said brew water tank for boiling pre-heated water from the brew tank for coffee brewing using heat produced by electrical power,



a circular spray head for receiving boiling water from said brew boiler and distributing boiling water evenly over coffee grounds in a uniform parametric manner,

a hot water tank receiving and storing water from an external source,

a hot water heater in mechanical and fluid communication with said hot water tank for heating and maintaining water temperature therein using heat produced by electrical power,

hot water dispensing means fluidly connected to said hot water tank for supplying heated water to an external container for food and beverages, and

an electronic controller interconnected with an indicating control panel defining means to regulate both brew water and hot water fill, level, temperature and dispensing, also process indicating and selection means, permitting a user to select on/off function, half and full pot brew levels, view brewing progress intervals, viewing when it is safe to remove coffee containing brew cone, viewing heater malfunction and initiate hot water dispensing.

5,836,237

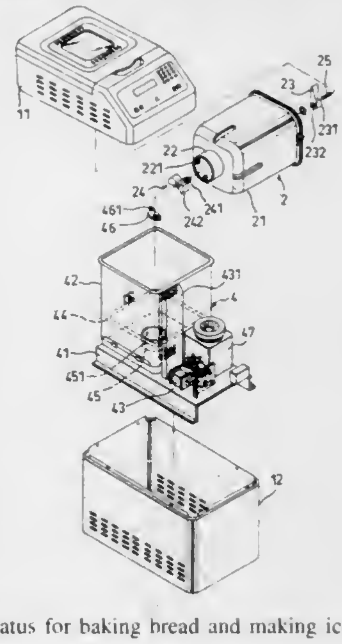
APPARATUS FOR BAKING BREAD AND MAKING ICE CREAM

Hanh Chiang, No. 162, Chung-Chen S. Rd., Hsia-Jen Hsiang, Tainan Hsien, Taiwan

Filed Jan. 12, 1998, Ser. No. 5,783

Int. Cl.^{6} A21B *1/00;* **A21D** *8/00;* **A23G** *9/00;* **A47J** *27/00*

U.S. Cl. 99—348 **12 Claims**



1. An apparatus for baking bread and making ice cream, comprising:

a housing unit including a lower housing and an upper housing which is mounted detachably on said lower housing, said upper housing being formed with an upper opening and being provided with a removable cover for covering said upper opening;

a bread baking assembly mounted detachably into said housing unit and including:

a vertical baking barrel having a bottom surface,

a vertical, hollow small outer cylinder fixed to said bottom surface of said baking barrel, said small outer cylinder being made of plastic and having an open lower end and an inner circumferential surface which is formed with a plurality of tongues,

a bread stirrer having a fixed rotating shaft which is mounted rotatably in said baking barrel, and

a small driving member having a fixed horizontal rod portion and coupled with said rotating shaft of said bread stirrer in such a manner that said rotating shaft of said bread stirrer can rotate synchronously with said small driving member;

an ice-cream making assembly mounted detachably into said housing unit and including:

a horizontal supporting disk having a bottom surface;

a vertical, hollow large outer cylinder fixed to said bottom surface of said supporting disk, said large outer cylinder being made of plastic and having an open lower end and an inner circumferential surface which is formed with a plurality of tongues,

a freezing barrel mounted rotatably on said supporting disk and having a hollow surrounding wall body which includes a cylindrical inner wall, a cylindrical outer wall surrounding said inner wall, and a refrigerant contained in said wall body between said inner and outer walls,

an ice-cream stirrer mounted rotatably in said freezing barrel,

a locking member locking said ice-cream stirrer relative to said housing unit when said ice-cream making assembly is mounted in position with respect to said housing unit, and

a large driving member having a fixed horizontal rod portion and coupled with said freezing barrel in such a manner that said freezing barrel can rotate synchronously with said large driving member; and

a base assembly including:

a base positioned within said lower housing,

a barrel-receiving container fixed on said base,

an air blowing unit disposed on said base to blow air into said container,

a motor installed on said base,

an electrical heating member disposed on a lower portion of said container,

a vertical, hollow inner cylinder fixed in said container and having an outer circumferential surface formed with a plurality of grooves which can engage respectively and fittingly said tongues of said bread baking assembly when said bread baking assembly is placed into said housing unit via said upper end opening of said upper housing upon removal of said cover from said upper end opening and which can engage respectively and fittingly said tongues of said ice-cream making assembly when said ice-cream making assembly is placed into said housing unit via said upper end opening upon removal of said cover from said upper end opening, and

a motor-driven member mounted rotatably in said container and having a fixed vertical push arm unit, said motor being capable of being energized to rotate said push arm unit of said motor-driven member about a vertical axis so as to contact and rotate synchronously said horizontal rod portion of said small driving member with said push arm unit when said tongues of said bread baking assembly are engaged within said grooves of said base assembly, thereby rotating said bread stirrer in said baking barrel, and so as to contact and rotate synchronously said horizontal rod portion of said large driving member with said push arm unit when said tongues of said ice-cream making assembly are engaged within said grooves of said base assembly, thereby rotating said freezing barrel in said housing unit.

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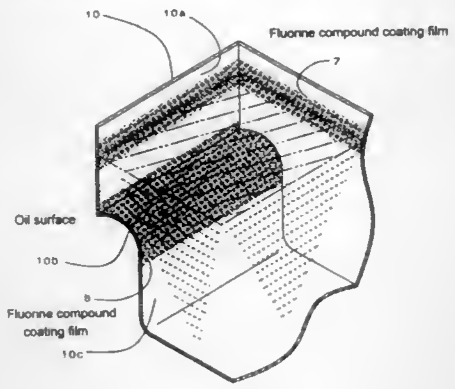
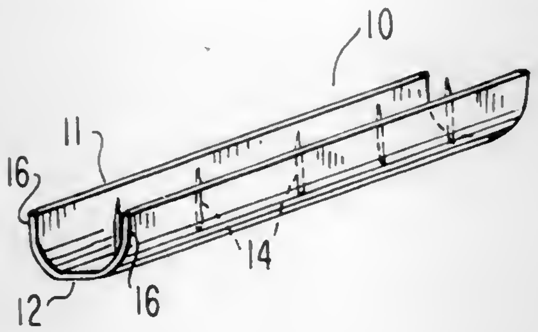
5,836,238
DEEP-FRYING APPARATUS
Toshihiro Kobayashi, Nagoya, Japan, assignor to Paloma Industries, Ltd., Aichi, Japan
Filed Jul. 9, 1997, Ser. No. 890,168
Claims priority, application Japan, Aug. 9, 1996, 8-227855
Int. Cl.^{6} A47J *37/12*
U.S. Cl. 99—403 **3 Claims**


10
10a
Fluorine compound coating film
7
Oil surface
10b
9
Fluorine compound coating film
10c

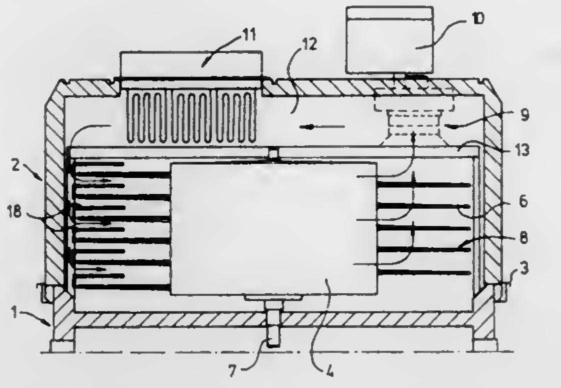
1. A deep-frying apparatus, comprising:
an oil tank having interior surfaces for holding cooking oil in which food is immersed for cooking;
heating means positioned outside of said oil tank; and
said interior surfaces at substantially vertical walls of said oil tank and near the cooking oil surface of said oil tank being coated with a fluorine compound.

5,836,239
UTENSIL FOR BAKING POTATOES
Julie Shapiro, 100 Schoharie Dr., Jericho, N.Y. 11753
Filed Feb. 10, 1997, Ser. No. 798,360
Int. Cl.^{6} A47J *37/10*
U.S. Cl. 99—421 V **14 Claims**



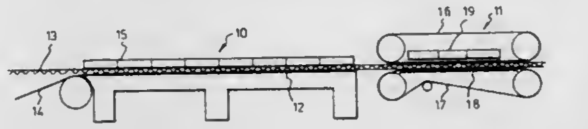
1. A utensil for baking potatoes, comprising:
at least one member including a bottom wall and a plurality of upwardly extending side walls, said bottom and side walls defining a partially enclosed cooking space between them, and
at least one spike member for supporting the baking potatoes having a first end and a second end, said first end being fixed to said bottom wall and said second end extending through said cooking space between said side walls wherein said side walls extend upwardly from said bottom wall at least substantially the height of said at least one spike member.

5,836,240
OVEN WITH HOT AIR GUIDE
Hendrikus Antonius Jacobus Kuenen, Overloon, Netherlands, assignor to Koppens B.V., Bakel, Netherlands
Filed May 2, 1997, Ser. No. 850,514
Claims priority, application Netherlands, May 3, 1996, 1003027
Int. Cl.^{6} A47J *37/00;* **A21B** *1/00;* **F27B** *9/00;* **F24C** *15/32*
U.S. Cl. 99—443 C **9 Claims**



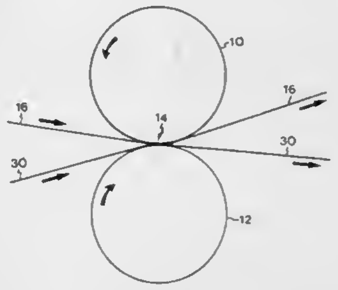
1. In an oven for preparing food products, comprising:
a housing;
a conveyor belt for supporting food products, said conveyor belt structured and arranged to move through the housing in a helical path;
heating means for generating a stream of hot air through the housing for heating food products arranged on the belt;
booster means for drawing air in the housing and conveying said air to the heating means;
the improvement wherein guide means are operatively arranged in the housing for guiding the stream of hot air over the belt in such a way that the products are heated uniformly in a transverse direction of the belt.

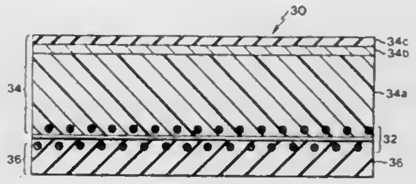
5,836,241
HEAT TRANSFER SYSTEM
Peter Horton, Agawam, Mass., assignor to SCM Container Machinery Limited, Overpool, England
Filed Mar. 5, 1996, Ser. No. 612,070
Int. Cl.^{6} B30B *5/02;15/34*
U.S. Cl. 100—311 **3 Claims**



1. A heat transfer system in which a continuous web of material is carried past a hot plate surface with one face of the moving web in contact therewith, there being means applying a load on the opposite face of the web to maintain said contact between the web and the hot plate surface, and conveying means for transporting the web past the hot plate surface; characterized in that the load applying means is in direct contact with the web as it travels past the hot plate surface, said load applying means comprising a series of fluid-filled vessels adapted to apply a substantially constant load upon the web thus holding it down firmly against the hot plate surface irrespective of any undulation thereof, and further characterized in that the conveying means is disposed entirely beyond the hot plate surface in the direction of conveyance of the web.

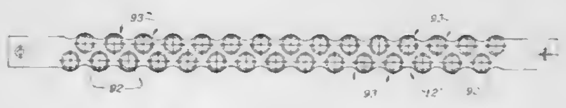
5,836,242
CALENDERING SYSTEM INCLUDING A BELT HAVING AN ADAPTABLE WEB-CONTACTING SURFACE
Bo-Christer Aberg, Halmstad, Sweden, assignor to Albany Nordiskafilt AB, Halmstad, Sweden
PCT No. PCT/SE95/00597, § 371 Date Dec. 9, 1996, § 102(e) Date Dec. 9, 1996, PCT Pub. No. WO95/34715, PCT Pub. Date Dec. 12, 1995
PCT Filed May 26, 1996, Ser. No. 750,411
Claims priority, application Sweden, Jun. 15, 1994, 9402094
Int. Cl.^{6} D21G *1/00;* **B30B** *3/04*
U.S. Cl. 100—327 **18 Claims**





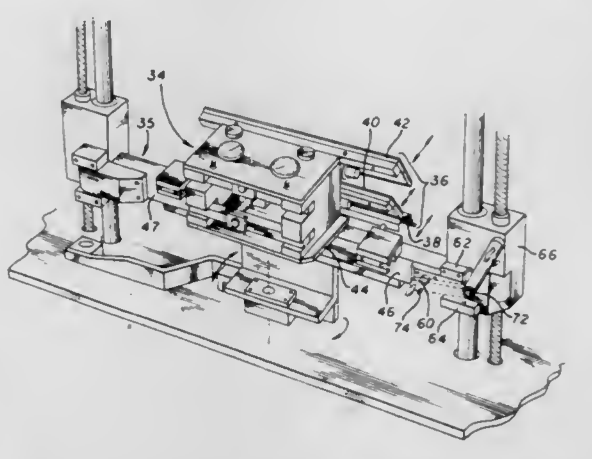
1. A calendering system in a papermaking or board manufacturing process, said system comprising at least one press nip (**14**) and an endless calender belt (**30**) comprising a core (**32**) and a compressible, elastic material bonded to the core (**32**), said calender belt (**30**) having a web side (**34**) which contacts a paper or paperboard web (**16**) being calendered in said at least one press nip (**14**) and a press side (**36**) on the opposite side of said core (**32**) from said web side (**34**), characterized in that the calender belt (**30**) in its thickness direction has a first hardness on the web side (**34**), and a higher hardness, as compared with said first hardness, on the press side (**36**), said first hardness being so chosen that the surface (**38**) of the web side (**34**) of the calender belt (**30**) can adapt its shape in the press nip (**14**) to unevennesses in the surface (**20**) of a web (**16**).

5,836,243
CARRIER BAR HAVING CONTOURED POCKETS AND/OR SCALLOPED EDGES FOR CONVEYING PELLET SHAPED ARTICLES
E. Michael Ackley, 1273 N. Church St., Morrestown, N.J. 08057
Division of Ser. No. 819,725, Mar. 17, 1997, Pat. No. 5,768,996, which is a continuation of Ser. No. 472,968, Jun. 7, 1995, Pat. No. 5,655,453, Continuation-in-part of Ser. No. 37,719, Mar. 25, 1993, Pat. No. 5,433,146, which is a continuation-in-part of Ser. No. 690,067, Apr. 23, 1991, abandoned, which is a continuation of Ser. No. 404,216, Sep. 7, 1989, abandoned, which is a continuation-in-part of Ser. No. 229,763, Aug. 5, 1988, Pat. No. 4,905,589, which is a continuation-in-part of Ser. No. 11,790, Feb. 6, 1987, abandoned. This application Sep. 29, 1997, Ser. No. 939,553
Int. Cl.^{6} B41F *17/00*
U.S. Cl. 101—44 **22 Claims**



1. A carrier bar assembly comprising:
at least first and second adjacent carrier bars, each of the first and second carrier bars including an upper surface including at least one scalloped edge, the scalloped edge of the first carrier bar being cooperable with the scalloped edge of the second carrier bar to form a substantially continuous surface;
a plurality of pockets formed in said upper surface, each of said pockets being configured to receive a pellet shaped article; and
a surface provided for each of said pockets, said surface positioning each said pellet shaped article to a reference position within each of said pockets.

5,836,244
ROTATION SYSTEM FOR CIRCUIT BOARD SCREENER
John V. Cronin, Newport Beach; Tan Y. Ly, and Peter R. Rose, both of Santa Ana, all of Calif., assignors to Circuit Automation, Irvine, Calif.
Filed Nov. 5, 1996, Ser. No. 743,873
Int. Cl.^{6} B41F *17/00*
U.S. Cl. 101—123 **7 Claims**



1. In a vertical screening apparatus for simultaneously screening each side of a board with inking material in which two vertically oriented chases are mounted in opposing spaced relationship with respect to each other and an ink reservoir is disposed along the base of each of said chases, and which opposing first and second print heads are verticaly reciprocated through flood and print sequences on opposite sides of the chases, the improvement comprising a rotational assembly with means for rotating said first print head away from said chases, wherein said rotational assembly further comprises means for rotating said ink reservoir away from said chases while maintaining vertical alignment with said first print head, said first print head comprising a flood blade and print squeegee.

5,836,245
DRIVE FOR A MULTI-COLOR WEB-FED ROTARY PRINTING PRESS
Claus August Bolza-Schünemann, Würzburg, Germany, assignor to Koenig & Bauer-Albert Aktiengesellschaft, Wurzburg, Germany
PCT No. PCT/DE93/00525, § 371 Date Dec. 19, 1994, § 102(e) Date Dec. 19, 1994, PCT Pub. No. WO94/00297, PCT Pub. Date Jan. 6, 1994
PCT Filed Jun. 18, 1993, Ser. No. 356,227
Claims priority, application Germany, Jun. 19, 1992, 42 19 969.7
Int. Cl.^{6} B41F *5/08;5/12;5/16*
U.S. Cl. 101—181 **1 Claim**

1. A drive for a multi-color web-fed rotary printing press comprising:

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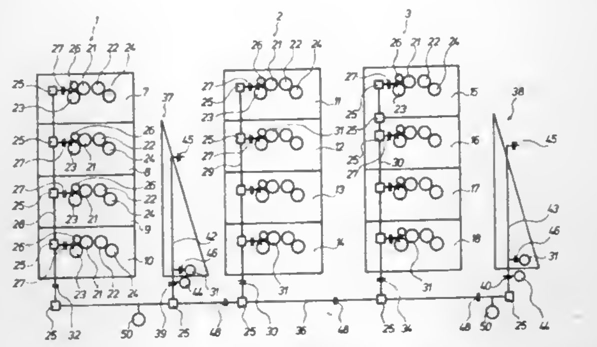
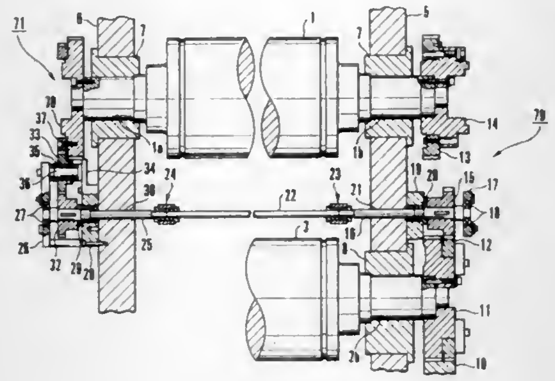


- a plurality of printing groups with each of said printing groups having at least two individual printing units disposed one above the other;
- an individual printing unit drive motor for each one of said individual printing units in each one of said plurality of printing groups;
- at least first and second folding units, each having a separate folding unit drive motor;
- a separate upright shaft positioned adjacent each one of said plurality of printing groups and each of said at least first and second folding units, each said upright shaft having an upright shaft clutch;
- a separate coupling clutch and bevel gear connecting each individual printing unit in each one of said plurality of printing groups to said separate upright shaft associated with said one of said plurality of printing groups; and
- a main synchronizing drive shaft extending longitudinally and being connected to each one of said upright shafts for said plurality of printing groups and said at least first and second folding units through said shaft clutches, each of said individual printing unit drive motors being separately disconnectable from its associated one of said upright shafts, each said individual printing unit drive motor having an output sufficient to operate another one of said printing units in the one of said printing groups in which it is located upon failure of another one of said individual printing unit drive motors in the one of said printing groups in which said individual printing units are located.

5,836,246
PRINTING PRESS

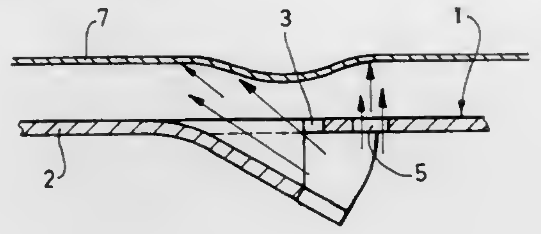
Nobuaki Saito, and Hiroyuki Sugiyama, both of Ibaragi, Japan, assignors to Komori Corporation, Tokyo, Japan
Filed Aug. 12, 1997, Ser. No. 909,607
Claims priority, application Japan, Aug. 13, 1996, 8-213551
Int. Cl.^{6} B41F *5/00*
U.S. Cl. 101—216 **4 Claims**



1. A printing press comprising:
- a plurality of cylinders arranged in parallel to each other in an axial direction and including a first cylinder;
- a main drive system constituted by a plurality of drive gears and a drive unit that drive said plurality of cylinders by transmitting rotation of said drive unit.
- an auxiliary drive system connected to said main drive system and having at least one drive gear that drives said first cylinder by transmitting rotation of said main drive system thereto, said auxiliary drive system is arranged on a side opposite to said main drive system through said plurality of cylinders;
- a rotation transmitting mechanism arranged in parallel to said plurality of cylinders to transmit rotation of said main drive system to said auxiliary drive system, said rotation transmitting mechanism comprises a second cylinder among said plurality of cylinders, and
- braking force applying means for applying a braking force to said first cylinder through said auxiliary drive system in a direction opposite to that of rotation of said main drive system, said braking force applying means comprises a torsion bar arranged on a rotation transmitting line of said auxiliary drive system in a direction perpendicular to said plurality of cylinders, to connect a rotation transmitting line of said main drive system and a rotation transmitting line of said first cylinder while applying torsion thereto in a rotating direction.

5,836,247
CONTACT-FREE SHEET GUIDANCE DEVICE IN A SHEET-FED PRINTING PRESS

Günter Stephan, Wiesloch-Baiertal, and Peter Thoma, Mannheim, both of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Germany
Filed Sep. 3, 1997, Ser. No. 922,423
Claims priority, application Germany, Sep. 3, 1996, 296 15 295.1; May 22, 1997, 197 21 390.1
Int. Cl.^{6} B41F *1/28*
U.S. Cl. 101—420 **4 Claims**

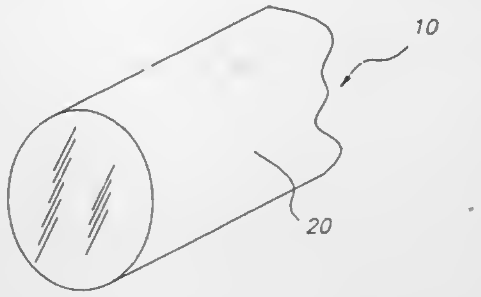


1. A contact-free sheet guidance device in a sheet-fed printing press, having a sheet guiding surface, comprising at least one blast air nozzle formed in the sheet guiding surface and having a cross section directed obliquely downwardly with respect to the sheet guiding surface, the sheet guiding surface being formed with an opening for an air outlet directed substantially vertically at a sheet being fed in the sheet travel direction, said air outlet opening being disposed upstream of the blast air nozzle in the sheet travel direction and being smaller in cross section than the cross section of said blast air nozzle.

5,836,248
ZIRCONIA-ALUMINA COMPOSITE CERAMIC LITHOGRAPHIC PRINTING MEMBER

Gregory S. Jarrold, Henrietta; Dilip K. Chatterjee, and Syamal K. Ghosh, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed May 1, 1997, Ser. No. 850,315
Int. Cl.^{6} B41N *1/14*
U.S. Cl. 101—453 **17 Claims**

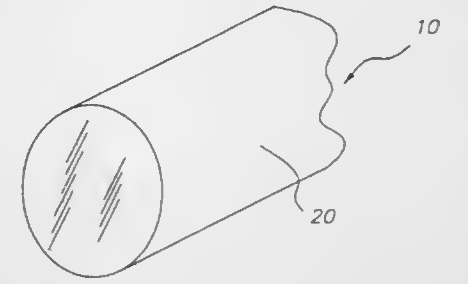
1. A lithographic printing member having a printing surface composed of a ceramic that is a composite of: (1) a zirconia alloy,



and (2) alumina, said composite ceramic having a density of from about 5.0 to 6.05 g/cm^3 and from about 0.1 to about 50%, by weight being composed of alumina, wherein said zirconia alloy is from about 80 to 100% in the tetragonal form.

5,836,249
LASER ABLATION IMAGING OF ZIRCONIA-ALUMINA COMPOSITE CERAMIC PRINTING MEMBER

Dilip K. Chatterjee, and Syamal K. Ghosh, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed May 1, 1997, Ser. No. 848,332
Int. Cl.^{6} B41C *1/10*
U.S. Cl. 101—467 **19 Claims**

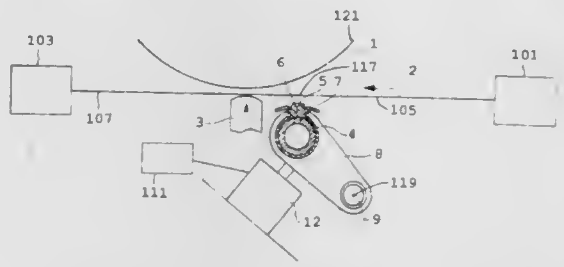


1. A method of imaging comprising the steps of:
- A) providing a lithographic printing member having a lithographic printing surface composed of a ceramic that is a composite of: (1) a zirconia alloy, and (2) alumina, said composite ceramic having a density of from about 5.0 to about 6.05 g/cm^3, and from about 0.1 to about 50%, by weight being comprised of alumina, and
- B) providing an image on said printing surface by imagewise exposing said printing surface to electromagnetic radiation provided by a laser under the following conditions:
  - an average power level of from about 0.1 to about 50 watts,
  - a peak power of from about 6,000 to about 100,000 watts (in Q-switched mode),
  - a pulse rate up to 50 kHz,
  - an average pulse width of from about 50 to about 300 nsec, and
  - a scan velocity of up to about 3 m/sec,

so as to ablate the zirconia alloy in the exposed areas of said printing surface, and to transform said printing surface from a hydrophilic to an oleophilic state or from an oleophilic to a hydrophilic state in said exposed areas of said printing surface, thereby creating said lithographic printing surface having both image areas and non-image areas.

5,836,250
DEVICE AND METHOD TO CLEAN CYLINDER SURFACES IN ROTARY PRINTING PRESSES

Joachim Herrmann, Mannheim; Kurt Lötsch, Wiesenbach; Ralf Degner, Heidelberg, and Hendrik Stemmler, Wiesloch, all of Germany, assignors to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Germany
Filed May 9, 1997, Ser. No. 854,233
Claims priority, application Germany, May 11, 1996, 196 19 143.2
Int. Cl.^{6} B41F *35/00*
U.S. Cl. 101—483 **15 Claims**



1. A cleaning apparatus to clean a cylinder of a rotary printing press, said apparatus comprising:
- a cleaning cloth:
- an arrangement to move the cleaning cloth across the cylinder of the rotary printing press;
- said arrangement to move the cleaning cloth comprising an upstream portion being configured and disposed to supply cleaning cloth to the cylinder of the rotary printing press, and a downstream portion being configured and disposed to receive cleaning cloth from the cylinder of the rotary printing press;
- an applicator, and means to selectively actuate said applicator to move the cleaning cloth into and out of contact with the cylinder of the rotary printing press;
- a feed to feed cleaning fluid to a cleaning cloth;
- said feed being disposed between said applicator and said upstream portion of said arrangement;
- said feed comprising a wick;
- said wick being configured and disposed to absorb and retain cleaning fluid;
- a body including said wick, said body being movably mounted to selectively contact said wick with the upstream portion of said cleaning cloth to accurately control the quantity of cleaning fluid to be transferred to said cleaning cloth.

5,836,251
ROLL ON—ROLL OFF BIMODAL TERMINAL SYSTEM

Richard C. Hathaway, Greenville; Mearl K. Bridges, New Madison; John M. Barr, Lewisburg, and Donald R. Klein, Greenville, all of Ohio, assignors to Kaci Terminal System Ltd., Greenville, Ohio
Filed Mar. 17, 1997, Ser. No. 819,548
Int. Cl.^{6} B61J *1/00*
U.S. Cl. 104—27 **22 Claims**

1. A system for loading and unloading highway vehicles onto railroad vehicles, said system comprising
- (a) a plurality of pivotally connected railroad vehicles, each of said plurality of pivotally connected railroad vehicles having a deck for highway vehicles, said deck extending from a central portion of said railroad vehicle to at least one first end of said railroad vehicle;
- (b) a terminal, said terminal having:
  - (i) at least one stationary railroad track portion
  - (ii) a plurality of moveable railroad track segments;
  - (iii) means connected to said moveable railroad track segments for positioning said moveable railroad track segments in a first configuration and in a second configuration,

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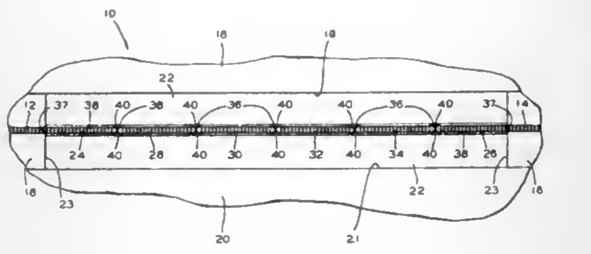
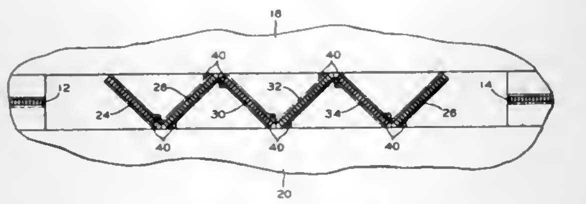




said first configuration being an aligned configuration wherein said moveable railroad track segments are aligned in a line so that said plurality of pivotally connected railroad vehicles can be rolled from said at least one stationary track portion onto said moveable railroad track segments said second configuration being a zig-zag configuration such that a first end of each of said pivotally connected railroad vehicles is adjacent a first terminal surface on which highway vehicles may move, so that highway vehicles can be moved onto said railroad vehicles from said first terminal surface, and so that such highway vehicles can be moved from said railroad vehicles onto said first terminal surface.

5,836,252
RAIL BRAKE ELEMENT

Reinhard Roick, Burks Falls, Canada, assignor to A. Rawie GmbH & Co., Osnabruck, Germany

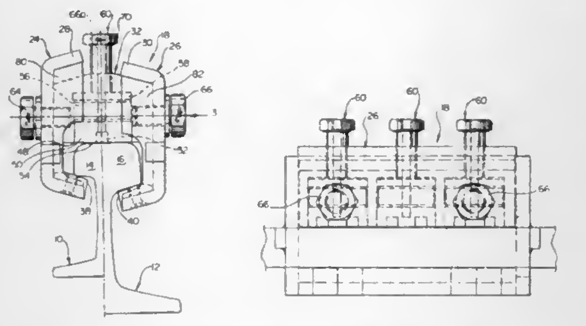
PCT No. PCT/EP96/00321, § 371 Date Feb. 24, 1998, § 102(e) Date Feb. 24, 1998, PCT Pub. No. WO96/26855, PCT Pub. Date Sep. 6, 1996

PCT Filed Jan. 26, 1996, Ser. No. 860,318

Claims priority, application Germany, Feb. 28, 1995, 195 07 000.3

Int. Cl.^{6} B61K *7/00*

U.S. Cl. 104—259 **5 Claims**



1. A rail brake element, for use in rail brake buffer blocks, comprising a pair of clamping plates extending about a rail head from each side, which clamping plates include at its portion below the rail head a brake lining portion of suitable rigid friction material for engagement with the rail head, a retaining element disposed between the clamping plates and connected to the latter by at least one bolt, which retaining element has at its lower side facing the rail head a plurality of spaced recesses each receiving a spring assembly which is biased by a bolt in the retaining element for urging an element of friction material against the upper face of the rail head so as to exert a tension force upon the clamping plates, characterized in that the retaining element is a lining ledge (**32**) receiving in said spaced recesses (**54**) cylindrical pads (**50**) of friction material, and in that the clamping bolt (**60**) is hollow and an indicator of rod (**66***a*) extends through the clamping bolt (**60**) to the pad (**50**).

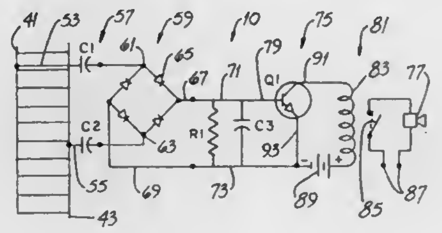
5,836,253
NOISE-POWERED ELECTRICAL ACCESSORY CIRCUIT FOR MODEL RAILROAD

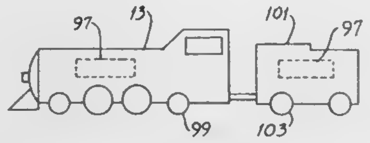
William B. Kunka, 2022 Michigan Blvd., Racine, Wis. 53402

Filed Jun. 9, 1997, Ser. No. 871,456

Int. Cl.^{6} B60L *1/00*

U.S. Cl. 104—296 **13 Claims**





1. In an electrical circuit for a model railroad and including (a) a DC variable-voltage power source having a pair of output terminals connected to respective rails of a model railroad track, and (b) a capacitor and a normally-closed switch connected in series across the output terminals, the improvement comprising an accessory circuit having first and second input lines, each connected to a separate one of the respective rails, the accessory circuit including:

an AC-pass filter at the input lines;

a rectifier section coupled to the AC-pass filter;

a relay circuit coupled to the rectifier section, the relay circuit including an electrical contact switched between a first state and a second state; and

an electrically-powered accessory coupled to the contact and energized when the contact switches from the first state to the second state.

5,836,254
PALLET AND METHOD FOR THE MANUFACTURING OF THE PALLET

Sixten Johansson, Eskilstuna, Sweden, assignor to OLV Pallen Aktiebolag, Fellingsbro, Sweden

PCT No. PCT/SE95/01089, § 371 Date Apr. 11, 1997, § 102(e) Date Apr. 11, 1997, PCT Pub. No. WO96/11852, PCT Pub. Date Apr. 25, 1996

PCT Filed Sep. 25, 1995, Ser. No. 817,088

Claims priority, application Sweden, Oct. 17, 1994, 9403530

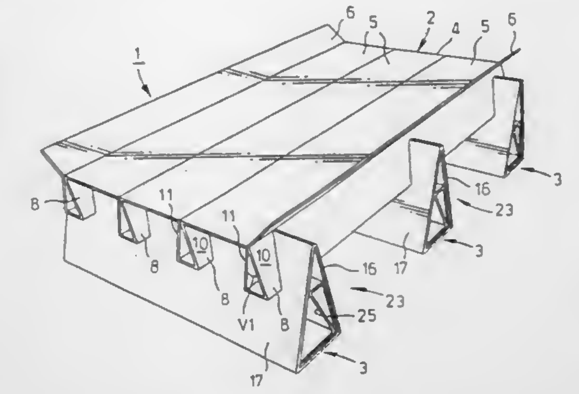
Int. Cl.^{6} B65D *19/00*

U.S. Cl. 108—51.3 **27 Claims**

1. A pallet, comprising:

a plurality of parallel base beams;

a deck joined to the plurality of parallel base beams, said deck comprising a web or sheet of material, said web or sheet of material being folded to form a deck surface with a plurality of parallel panels adjoining each other and a plurality of parallel projections on an underside thereof, and wherein each base beam of the plurality of parallel base beams extends upward to contact the underside of the parallel panels, and including at least one through-recess having a shape which corresponds to a cross-section of a corresponding one of said plurality of parallel projections, wherein the corresponding parallel projection engages the at least one recess thereby forming the pallet with a plurality of spaces to accommodate lifting forks between the plurality of parallel base beams, wherein lower surfaces of the plurality of parallel projections forms lifting surfaces for the lifting forks.



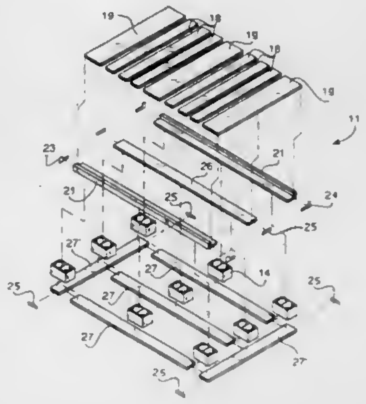
5,836,255
PALLET FOR ERECTED AND COLLAPSIBLE CONTAINER/PALLET SYSTEM

Mark O. Uitz, 1050 Crest View Dr. Suite C15, Mountain View, Calif. 94040

Filed Apr. 8, 1996, Ser. No. 631,633

Int. Cl.^{6} B65D *19/00*

U.S. Cl. 108—57.25 **11 Claims**



1. A rugged but lightweight pallet having a construction provided by differing parts creatable from common plastic stock, comprising as discrete sections:

A) a top deck section defining a pallet surface for interacting with goods to be transported, said pallet surface including both a plurality of cross bars and a pair of edge boards each of said edge boards closing one end of said cross bars;

B) a bottom deck section for engaging a supporting surface; and

C) a plurality of spacer blocks extending from and secured between said top and bottom deck sections, spacing said deck sections apart to define channels therebetween for receipt of pallet pick-up tines:

wherein said spacer blocks are formed from a common piece of plastic stock and said spacer block stock is extruded with a generally hollow interior but with strengthening webbing to support the walls of the block, and each of said spacer blocks is oriented relative to the top and bottom decks so that the latter close those opposed ends of the block at which said hollow interior and webbing are exposed; and

wherein said spacer block stock is generally rectangular in cross-section with two pair of opposed exterior walls, and said webbing within said stock and, hence, within each of said spacer blocks includes an internal cross wall extending between opposed exterior walls of said stock and a pair of opposed chevrons respectively connecting the center of the other opposed walls to a portion of the first opposed walls supported by said interior cross wall.

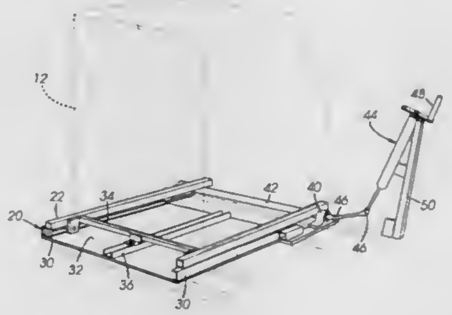
5,836,256
APPARATUS FOR MOVING AUTOMATIC TELLER MACHINES BETWEEN RETRACTED AND EXTENDED POSITIONS

Kenneth G. Senterfeit, Sr., West Columbia, S.C., assignor to Concept Unlimited Inc, Gaston, S.C.

Filed Jul. 2, 1997, Ser. No. 887,012

Int. Cl.^{6} G07G *5/00*

U.S. Cl. 109—24.1 **20 Claims**



1. Apparatus for moving an automatic teller machine between a retracted position and an extended position, said apparatus comprising:

a frame having a front end and a back end;

bearings attached to said front end of said frame;

a shaft rotatable in said bearings;

a carriage carried by said frame, said carriage having a front end and back end, said carriage adapted to carry said teller machine, said carriage riding in direct engagement with said shaft between a retracted position wherein said front end of said carriage is substantially coextensive with said front end of said frame, and an extended position wherein said front end of said carriage is cantilevered beyond said front end of said frame;

means carried by said frame for securing said back end of said carriage to said frame when said carriage moves between said retracted and said extended positions, said securing means cooperating with said shaft to cantilever said front end of said carriage beyond said front end of said frame, said carriage being substantially supported by said shaft when said front end is cantilevered; and

means for rotating said shaft so that said carriage moves between said retracted position and said extended position.

5,836,257
CIRCULATING FLUIDIZED BED FURNACE/REACTOR WITH AN INTEGRAL SECONDARY AIR PLENUM

Felix Belin, Brecksville, and David J. Walker, Wadsworth, both of Ohio, assignors to McDermott Technology, Inc., New Orleans, La.

Filed Dec. 3, 1996, Ser. No. 759,885

Int. Cl.^{6} F23G *5/00*

U.S. Cl. 110—245 **9 Claims**

1. A circulating fluidized bed reactor, comprising:

a furnace reactor enclosure at least partially defined by a front wall and a rear wall spaced away from the front wall, and a bottom wall connected between the front and rear walls:

means for supplying primary air through the bottom wall for fluidizing a circulating bed in the furnace reactor enclosure;

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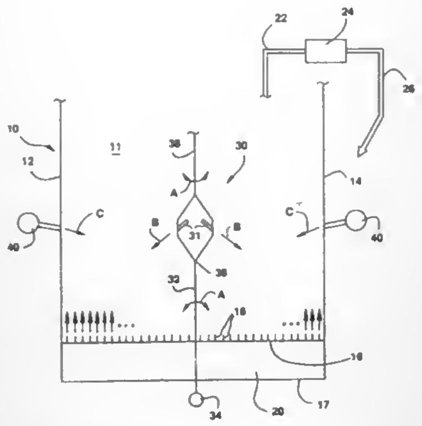


means for recirculating the bed from a top of the furnace reactor enclosure back to a lower portion thereof; and

waterwall means for defining at least one integral secondary air plenum in the furnace reactor enclosure for supplying secondary air into the fluidized bed, above the bottom wall, without physically separating a lower or an upper portion of the furnace reactor enclosure into portions, said waterwall means extending substantially vertically in the furnace reactor enclosure and having a plurality of openings therethrough to allow for good communication of gases and solids therethrough from one side of the waterwall means to the other between front and rear portions of the furnace reactor enclosure at both the upper and lower portions thereof.

5,836,258
METHOD AND APPARATUS FOR INCINERATING WASTE MATERIAL USING OXYGEN INJECTION

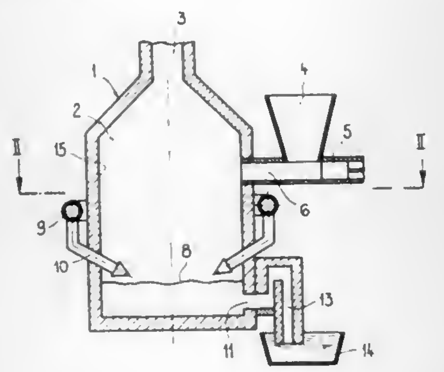
Hans Ruegg, Wohlen, and Thomas Ungricht, Zurich, both of Switzerland, assignors to Von Roll Umwelttechnik AG, Zurich, Switzerland

Filed Oct. 19, 1995, Ser. No. 545,278

Claims priority, application Switzerland, Oct. 20, 1994, 03 153/94

Int. Cl.^{6} F23G *5/00*

U.S. Cl. 110—346 **16 Claims**



1. A method for incinerating loose refuse waste material in which incombustible constituents of the refuse waste material are drawn off as a melt comprising:

providing a furnace chamber;

introducing loose refuse waste material into the furnace chamber to form a layer of loose refuse waste material; and

introducing oxygen toward the layer of refuse waste material at a speed of at least the speed of sound to burn combustible constituents of the refuse waste material such that burning of said combustible constituents provides a melting heat to melt remaining constituents of the refuse waste material.

5,836,259
EMBROIDERY SEWING MACHINE

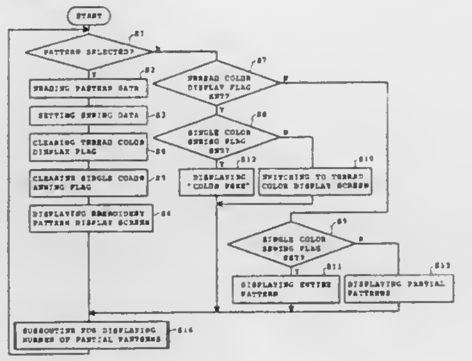
Takafumi Tanaka, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

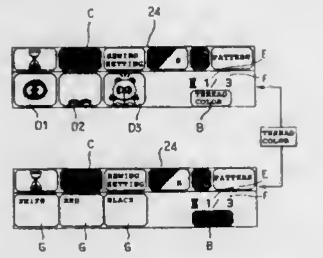
Filed Nov. 17, 1997, Ser. No. 972,048

Claims priority, application Japan, Nov. 19, 1996, 8-308510

Int. Cl.^{6} D05B *21/00*

U.S. Cl. 112—102.5 **17 Claims**


START
PATTERN SELECTED?
READING PATTERN DATA
SETTING SEWING DATA
CLEARING THREAD COLOR DISPLAY FLAG
CLEARING SINGLE COLOR SEWING FLAG
DISPLAYING EMBROIDERY PATTERN DISPLAY SCREEN
THREAD COLOR DISPLAY FLAG SET?
SINGLE COLOR SEWING FLAG SET?
DISPLAYING "COLOR FREE"
SWITCHING TO THREAD COLOR DISPLAY SCREEN
SINGLE COLOR SEWING FLAG SET?
DISPLAYING ENTIRE PATTERN
DISPLAYING PARTIAL PATTERN
SUBROUTINE FOR DISPLAYING NUMBER OF PARTIAL PATTERNS
S1
S2
S3
S4
S5
S6
S7
S8
S11
S12
S13
S14
S15
S16



1. An embroidery sewing machine comprising:

an embroidery forming apparatus for forming an embroidery on a workpiece cloth based on pattern data including data of different partial patterns obtained by dividing an embroidery pattern into one or more different partial patterns and data of thread colors representing colors of embroidery threads corresponding to the respective partial patterns;

a machine main body;

a display device provided on the machine main body;

display control means for controlling the display device so that the display device separately displays an embroidery pattern display screen for displaying each partial pattern and a thread color display screen for displaying a thread color corresponding to each partial pattern, based on the pattern data; and

display switching operation means operated for switching the display on the display device between the embroidery pattern display screen and the thread color display screen.

5,836,260
NEEDLE BAR STOPPER FOR USE IN A SEWING MACHINE

Yasuhiko Kawaguchi, Kaizu-gun; Akio Takahashi, Hashima-gun; Masaki Shimizu, Toyoake, and Minoru Sakanobe, Komaki, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jul. 24, 1997, Ser. No. 899,791

Claims priority, application Japan, Nov. 20, 1996, 8-309572

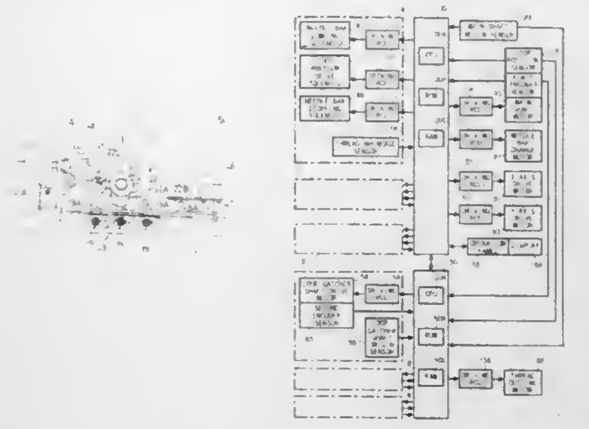
Int. Cl.^{6} D05B *69/18*

U.S. Cl. 112—277 **18 Claims**

1. A needle bar stopper for use in a sewing machine having a main shaft and a needle bar which moves vertically upon reception of a driving force from the main shaft, the needle bar stopper for stopping the needle bar comprising:

a transmission prohibiting unit which prohibits transmission of the driving force from the main shaft to the needle bar; and

a braking unit which applies a braking force to the needle bar when transmission of the driving force from the main shaft to the needle bar is prohibited, wherein the needle bar stopper further comprises a moving direction detector which detects the needle bar moving direction, and the braking unit is controlled to operate based on a result of detection by the moving direction detector.



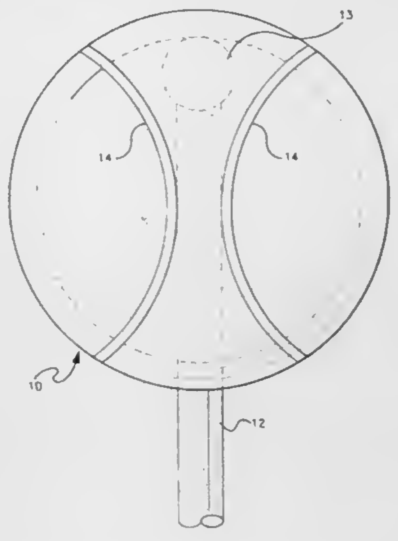
5,836,261
VEHICLE ANTENNA TOPPER

Dolores M. Sutton, 334 Laurentian Pl., Elmira, N.Y. 14904-2807

Filed Aug. 11, 1997, Ser. No. 907,644

Int. Cl.^{6} G09F *17/00*

U.S. Cl. 116—209 **3 Claims**



1. A vehicle antenna topper for engaging an end of a vehicle antenna terminating in a ball, the vehicle antenna topper comprising:

an ornamental element having a hollow interior and having an opening for retaining the antenna, said opening having a plurality of radiating slits extending therearound, and

at least two opposing arcuate support members, each opposing arcuate support member having side surfaces located between opposite end surfaces, each end surface secured to said interior of said ornamental element, said at least two support members defining a passage aligned with said opening in said ornamental element, and said at least two arcuate support members being resiliently biased for engaging the antenna.

5,836,262
ANIMAL EXCRETION TREATING MATERIAL AND METHOD OF MANUFACTURING SAME

Yoichi Yasukawa, Tokyo, Japan, assignor to Y. Yasukawa, Tokyo, Japan

PCT No. PCT/JP95/02165, § 371 Date Aug. 13, 1997, § 102(e) Date Aug. 13, 1997, PCT Pub. No. WO97/14299, PCT Pub. Date Apr. 24, 1997

PCT Filed Oct. 20, 1995, Ser. No. 849,910

Int. Cl.^{6} A01K *1/015*

U.S. Cl. 119—173 **4 Claims**

1. An animal excretion treating material which is a granulated product of a mixture comprising 49 to 59% by weight of a powdered natural organic substance having a particle size of 60 mesh or less, 20 to 30% by weight of powdered bentonite having a particle size of 200 mesh or less, 6 to 16% by weight of a powdered highly water-absorbable resin, and 5 to 15% by weight of a powdered binder, said granulated product having a bulk density of 0.25 to 0.5 g/cm^3 and a water-absorbing ability of 1.3 to 3 times its own weight.

5,836,263
CLUMPING ANIMAL LITTER

G. Robert Goss, Quincy, and D. Cristina Frugoli, Mundelein, both of Ill., assignors to Oil-Dri Corporation of America, Chicago, Ill.

Filed Aug. 19, 1997, Ser. No. 917,048

Int. Cl.^{6} A01K *1/015*

U.S. Cl. 119—173 **14 Claims**

1. A clumping animal litter comprising:

a particulate, non-swelling clay material;

a swelling clay; and

starch;

said litter containing on a total litter weight basis, the swelling clay in an amount of at least about 30% by weight and starch in an amount in the range of about 0.5 to about 6% by weight.

5,836,264
APPARATUS FOR USE IN DETERMINING EXCITANTS, ATTRACTANTS, STIMULANTS AND INCITANTS FOR MEMBERS OF THE PENAEUS GENUS OF THE CLASS CRUSTACEA

Alan Owen Pittet, Keyport, N.J.; Phillip G. Lee, Galveston, Tex., and Jennifer C. Ellis, Tacoma, Wash., assignors to International Flavors & Fragrances Inc., New York, N.Y., and Board of Regents, The University of Texas System, Austin, Tex.

Division of Ser. No. 413,440, Mar. 30, 1995, Pat. No. 5,579,723, which is a continuation-in-part of Ser. No. 279,187, Jul. 22, 1994, Pat. No. 5,474,030. This application Mar. 26, 1996, Ser. No. 622,581

Int. Cl.^{6} A01K *61/00;63/00*

U.S. Cl. 119—207 **2 Claims**

1. Apparatus for determining whether a given substance at a given aqueous concentration attracts, incites, stimulates and/or excites a member of the Penaeus genus of the Class Crustacea comprising first apparatus means comprising:

(a) static holding tank means for containing (i) a volume of water and (ii) at least one live member of the Penaeus genus of the Class Crustacea within said volume of water;

(b) pump-injected test solution feeding means for pumping aqueous solutions at variable or constant flow rates of test material into said static holding tank;

(c) visible light generating and guidance means for guiding visible wavelength light of variable or constant intensity into said volume of water in said static holding tank means;

(d) first variable power source means for engaging the visible light generating means;

(e) second variable power source means for engaging the pump generated feeding means; and

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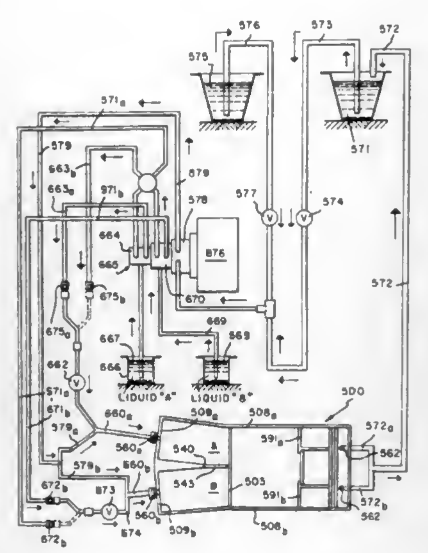


- (f) variable focus/focal length video camera or camcorder recording means for recording the movements of one or more appendages and/or the lateral direction or velocity of one or more members of the Penaeus genus of the Class Crustacea when the pump-injected feeding means is engaged and when the visible light generating means is engaged;

whereby the video camera or camcorder recording means records the nature of the motion of the appendages of said member of the Penaeus genus of the Class Crustacea towards the substance fed by said pump generated feeding means into said holding tank;

taken in combination with second apparatus means comprising:

- (a) a flow-through tank means for containing (i) a moving volume of water entering via an inlet and exiting via an exit orifice and (ii) at least one live member of the Penaeus genus of the Class Crustacea within said flow-through tank means;
- (b) pump-injected test solution feeding means for pumping aqueous solutions at variable or constant flow rates of test material into said flow-through holding tank means ahead of said entry orifice;
- (c) visible light generating and guiding means for guiding visible wavelength light of variable or constant intensity into the inner part of said flow-through tank means;
- (d) a first variable power source for engaging the visible light generating means;
- (e) a second variable power source for engaging the pump generated feeding means; and
- (f) variable focus/focal length video camera or camcorder recording means for recording the movements of one or more appendages and/or the lateral direction or velocity of the member of the Penaeus genus of the Class Crustacea when the visible light generating means and the pump-injected feeding means are engaged;

whereby the appendage movements and/or forward motion of the member of the Penaeus genus of the Class Crustacea within the flow-through holding tank means causes an excitatory or attracting or inciting or stimulating mechanism for said member of the Penaeus genus of the Class Crustacea.

5,836,265
REEF BALL

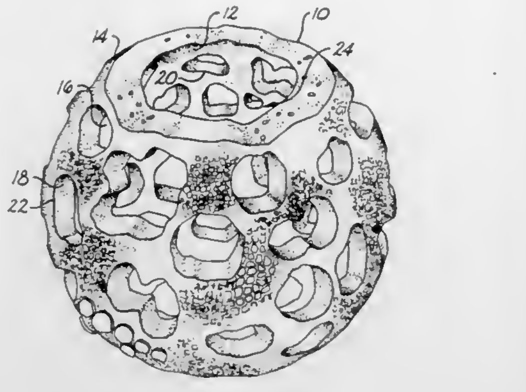
Todd Ryan Barber, 7085 Chappell Cir., Doraville, Ga. 30360, and Gerald L. Barber, 410 Hudson Rd., Greenville, S.C. 29615

Continuation of Ser. No. 264,040, Jun. 22, 1994, Pat. No. 5,564,369. This application Oct. 10, 1996, Ser. No. 749,761

Int. Cl.⁶ A01K *61/00*

U.S. Cl. 119—221 **1 Claim**

1. An artificial reef structure for promoting the growth of marine life on the surfaces thereof while submerged in a body of water comprising:



- a concrete shell defined by a wall extending about an inner cavity and having an exterior and interior surface;
- holes provided in said wall for providing ingress and egress of fish into the interior of said structure;
- said holes having an inlet and an outlet and a concave radially extending surface defined between said inlet and outlet of said holes; and
- a textured cementitious surface carried on at least one of said surfaces of said wall for supporting marine growth on the surface of said wall.

5,836,266
APPARATUS FOR CONNECTING SHELLFISH TO CULTURE ROPE

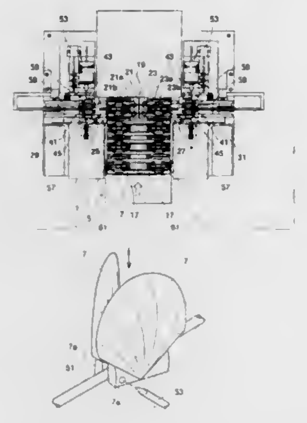
Kohei Watanabe, Hakodate, Japan, assignor to Kabushiki Kaisha Towa Denki Seisakusho, Hokkaido, Japan

Filed Nov. 14, 1997, Ser. No. 970,939

Claims priority, application Japan, Nov. 20, 1996, 8-323330

Int. Cl.⁶ A01K *61/00*

U.S. Cl. 119—234 **12 Claims**



1. An apparatus for connecting shellfish to a culture rope comprising a shellfish transfer unit that transfers shellfish in a predetermined direction, shellfish being transferred, two by two, in parallel upstanding orientation with their ear end portions down; stopper means for stopping, at a predetermined stop position, the shellfish transferred by said shellfish transfer unit; a rope supplying unit that supplies a culture rope to a space between ear end portions of two shellfish in the stop position; an ear spacer arranged between and contacting with the ear end portions of two shellfish in the stop position; a pair of shellfish supporting pads cooperating with said ear spacer to support therebetween two shellfish in the stop position; a piercing unit that pierces, in series, the ear end portions of two shellfish held in the stop position and the culture rope supplied between the ear end portions by said rope supplying unit; and a pin inserting unit that inserts a connecting pin into holes pierced by said piercing unit in the ear end portions and the culture rope to connect the two shellfish to the culture rope.

5,836,267
ANTI-PECKING DEVICE

Brian Kenneth MacGregor Eadie, and Peter Scott Eadie, both of Renfrewshire, United Kingdom, assignors to Martin Edgar, Selkirk, United Kingdom

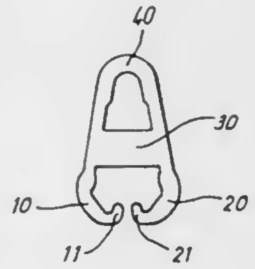
PCT No. PCT/GB95/01684, § 371 Date Apr. 25, 1997, § 102(e) Date Apr. 25, 1997, PCT Pub. No. WO96/02131, PCT Pub. Date Jul. 17, 1995

PCT Filed Jul. 17, 1995, Ser. No. 765,799

Claims priority, application United Kingdom, Jul. 15, 1994, 9414389

Int. Cl.⁶ A01K *45/00*

U.S. Cl. 119—715 **17 Claims**



1. An anti-pecking device for fitting to a beak of a bird, comprising first and second limb members each having an end portion adapted to be located in a nostril of the bird, at least one bit member coupled to at least one of said limb members and adapted to be positioned between the jaws or mandibles of the bird and at least one guard member coupled to at least one of said limb members adapted to extend outwardly from the jaws or mandible of the, and wherein said limb members, bit member and at least one guard member all extend in substantially a single plane, and said limb members extend in a forward direction from said end portions such that, in use of the device, with said end portions located in the nostrils of the bird, said limb members are located one on either side of the beak of the bird and said bit member interconnects said limb members, extending between upper and lower portions of said beak.

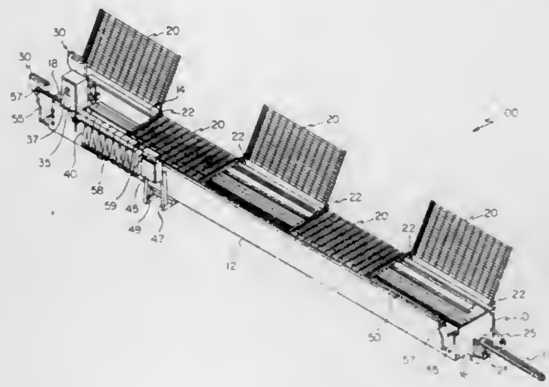
5,836,268
SOOTBLOWER WITH TRAVELLING LIMIT SWITCH

H. Davis Wall, Chattanooga, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jan. 2, 1997, Ser. No. 775,930

Int. Cl.⁶ F22B *37/52*

U.S. Cl. 122—392 **23 Claims**



1. A retractable sootblower, having a movable carriage and lance tube assembly for cleaning inside surfaces of a boiler, comprising:

- a stationary starter switch for initiating operation of the sootblower;
- a power cable disposed between the movable assembly and the starter switch and configured to transmit electrical current from the starter switch to the moveable assembly;
- a limit switch mounted to and moveable with the moveable assembly; and
- a stationary switch control device disposed proximate the boiler and configured to cooperate with said limit switch so as to reverse a direction of movement of the moveable assembly during sootblower operation by reversing the direction of the current to the movable assembly.

5,836,269
COOLANT CIRCUIT OF AN INTERNAL-COMBUSTION ENGINE

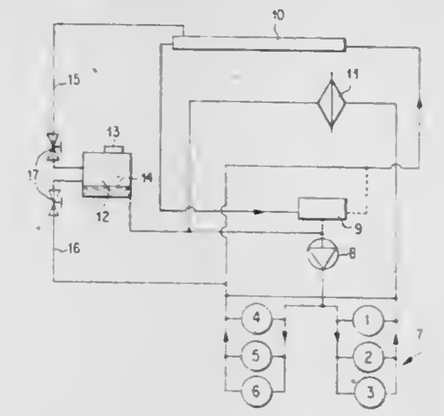
Klaus Schneider, Tiefenbronn, Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Weissach, Germany

Filed Feb. 7, 1997, Ser. No. 797,268

Claims priority, application Germany, Feb. 29, 1996, 196 07 638.2

Int. Cl.⁶ F01P *7/14*

U.S. Cl. 123—41.1 **18 Claims**



1. Coolant circuit of an internal-combustion engine comprising:

- hollow spaces in a casing of this internal-combustion engine through which a coolant flows,
- a coolant pump for pumping coolant through the hollow spaces,
- a main coolant circuit and a short coolant circuit,
- a thermostatic valve for switch-over between the main coolant circuit and the short circuit,
- a radiator disposed in the main coolant circuit,
- an expansion tank having a pressure control valve, and
- at least one vent line leading into the expansion tank,
- wherein a stop valve is arranged in the at least one vent line for selectively blocking a connection to the expansion tank in both flow directions of coolant flow through said connection and the stop valve is in communication with coolant in the expansion tank and operated by pressure changes resulting from variations in the operating temperature of the coolant.

5,836,270
ROTATING APPARATUS AND HEATING APPARATUS FOR VEHICLE

Shiniji Aoki, Kariya; Hikaru Sugi, Nagoya; Hajime Ito, Kariya, and Toshio Morikawa, Toyota, all of Japan, assignors to Denso Corporation, Kariya, Japan

Filed Jul. 1, 1997, Ser. No. 886,667

Claims priority, application Japan, Jul. 2, 1996, 8-172605

Int. Cl.⁶ F01P *3/12*; B60H *1/00*

U.S. Cl. 123—41.31 **17 Claims**

1. A rotating apparatus for a vehicle having a driving source unit and a passenger compartment, comprising:

- a heat-generating unit using a shearing force, said heat-generating unit including a rotor which rotates when a driving

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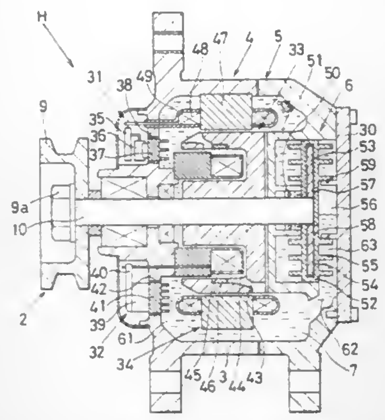


force of said driving source unit is applied thereto and a heat-generating chamber for sealing therein viscous fluid which generates heat for heating said passenger compartment when a shearing force generated by a rotational force of said rotor is applied to said viscous fluid;

a rotating unit having a rotating body which is disposed coaxially with said rotor of said heat-generating unit and rotates when a driving force of said driving source unit is applied thereto. said rotating unit generating heat for heating said passenger compartment due to said rotation of said rotating body; and

a driving force transmission unit having a common driving shaft for transmitting the driving force of said driving source unit to said rotor and said rotating body.

5,836,271
WATER PUMP

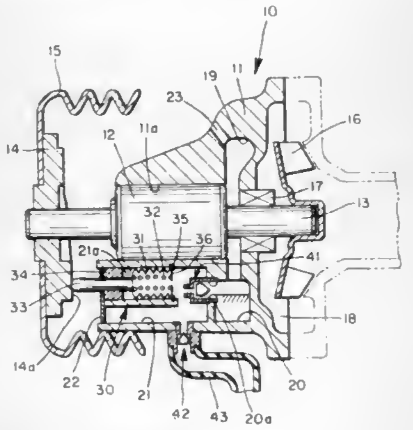
Norio Sasaki, Nishikamo; Mitsutoshi Hagiwara, Anjyo; Yasuo Ozawa, Kariya, and Itsuro Hashiguchi, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi-pref., Japan

Filed Sep. 25, 1996, Ser. No. 720,147

Claims priority, application Japan, Sep. 29, 1995, 7-253851

Int. Cl.^{6} F01P *5/10*

U.S. Cl. 123—41.44 **6 Claims**



1. A water pump comprising:

a housing defining a working chamber;

a rotary shaft freely rotatably supported in the housing via a bearing;

an impeller fixedly secured to one end of said rotary shaft and accommodated in said working chamber;

a seal member provided between said impeller and said bearing, within said housing and around said rotary shaft. said housing having further defined therein a space between said bearing and said seal member;

pressure-feed means for forcibly feeding coolant that has leaked into said space into a radiator reservoir tank; and

drive means for rotating said rotary shaft to circulate the coolant.

5,836,272
CYLINDER HEAD OF ENGINE

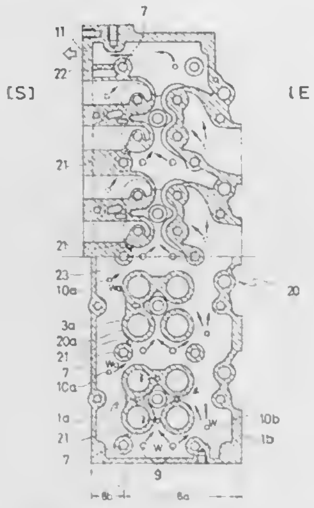
Noriyuki Sakurai, Fujisawa, Japan, assignor to Isuzu Motors Ltd., Tokyo, Japan

Filed Jul. 17, 1995, Ser. No. 501,281 .

Claims priority, application Japan, Jul. 19, 1994, 6-167037

Int. Cl.^{6} F01P *3/02*

U.S. Cl. 123—41.82 R **7 Claims**



1. A cylinder head of an engine having a cylinder block with a cylinder block cooling water jacket. the cylinder head extending in a longitudinal direction and having an outer periphery defined by side walls, comprising:

a cylinder head cooling water jacket provided along an upper wall of the cylinder head. said cylinder head cooling water jacket comprising first and second portions with the first portion having valve port groups therein, each valve port group comprising an intake valve port and an exhaust valve port with the valve port groups being spaced in the longitudinal direction of the cylinder head, the second portion being bounded by the first portion and one of the side walls, the second portion having a downstream end and having first cooling water ports therein with the first cooling water ports communicating with the cylinder block cooling water jacket such that water flows from the first cooling water ports toward the downstream end of the second portion;

second cooling water ports formed in the vicinity of respective valve port groups in the first portion;

a drain port opening to the downstream end of the second portion; and

a partition provided in the vicinity of but upstream from the drain port. the partition projecting from the side wall bounding the second portion. towards the first portion whereby cooling water flowing in the second portion is caused to flow toward the first portion.

5,836,273
RECIPROCATING MACHINE

Kelvin John Hair, Auckland, New Zealand, assignor to Qintessential Concepts Limited, Parnell, New Zealand

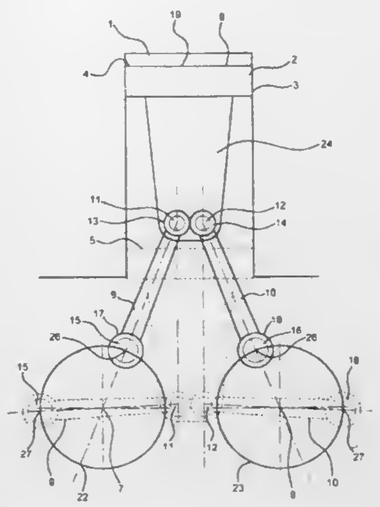
PCT No. PCT/NZ95/00118, § 371 Date Jul. 11, 1997, § 102(e) Date Jul. 11, 1997, PCT Pub. No. WO96/15355, PCT Pub. Date May 23, 1996

PCT Filed Nov. 14, 1995, Ser. No. 836,570

Claims priority, application New Zealand, Nov. 14, 1994, 264915

Int. Cl.^{6} F01B *9/02;* **F02B** *75/32*

U.S. Cl. 123—52.4 **14 Claims**



1. A reciprocating machine including a cyclical kinematic chain in which power is transferred between translational and rotational motion, said kinematic chain including a translational means cyclically reciprocatable along a line of motion through a first stroke between a first position and a second position and through a second stroke from said second position back to said first position, said kinematic chain having rotational means in the form of a pair of crank shafts having axes substantially symmetrically disposed on opposite sides of and normal to said line of motion of said translational means, said translational means having a pair of pivotal connecting means the axes of which are parallel and said axes in motion follow paths parallel to said line of motion, said crank shafts each having a crank pin the axis of which follows an orbital path of predetermined diameter in motion, a pair of connecting rods, each having a first end and a second end, the first end of each connecting rod being connected by said pivotal connecting means through attaching means to said translational means such that said connecting rods never achieve a parallel state, axes of said pivotal connecting means being disposed between said translational means and a line between the axes of said crank shafts and said second end of each of said connecting rods being rotationally connected to respective said crank pins, the distance between said crank shafts axes, the length of said connecting rods, the positioning of said pivotal connecting means in relation to said translational means and said predetermined diameter of said orbital paths and the construction and arrangement being such that in motion the ratio of the length of each of said strokes to the predetermined diameter is at least 1.1 to 1.

5,836,274
MULTI VALVE ENGINE WITH VARIABLE VALVE OPERATION

Tetsushi Saito; Hiroyuki Tsuzuku, and Naoki Tsuchida, all of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

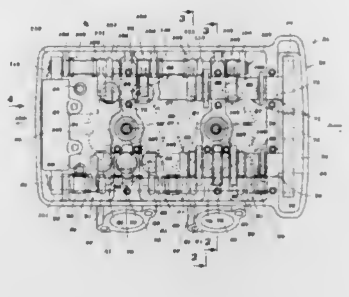
Filed Apr. 10, 1996, Ser. No. 630,280

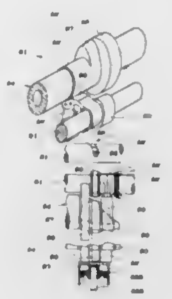
Claims priority, application Japan, Apr. 12, 1995, 7-086782; Jun. 22, 1995, 7-156037

Int. Cl.^{6} F01L *1/12;13/00*

U.S. Cl. 123—90.16 **14 Claims**

1. A valve operating mechanism for a reciprocating machine comprised of a chamber of volume that varies cyclically with operation of said machine, intake valve means for admitting a charge to said chamber. exhaust valve means for discharging a charge from said chamber. actuating means for operating said valve means in time relationship. at least one of said valve means being comprised of at least three poppet valves. said actuating means comprising a single camshaft for operating each of said three poppet valves, and means for selectively controlling the opening of two of said three poppet valves by said cam shaft differently from each other and differently from the opening of the remaining of said three poppet valves.





5,836,275
VALVE TIMING CONTROL DEVICE

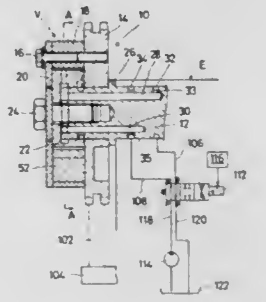
Atsushi Sato, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi-pref., Japan

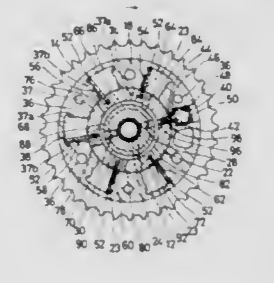
Filed May 15, 1997, Ser. No. 856,979

Claims priority, application Japan, May 15, 1996, 8-120307

Int. Cl.^{6} F01L *1/344;13/00*

U.S. Cl. 123—90.17 **5 Claims**





1. A valve timing control device comprising:

a rotor fixed on a cam shaft of an engine;

a housing member rotatably mounted on the cam shaft so as to surround the rotor;

a plurality of chambers defined between the housing member and the rotor and having a pair of circumferentially opposed walls, respectively;

a plurality of vanes provided on the rotor and extended outwardly therefrom in a radial direction into the chambers so as to divide the chambers into a first pressure chamber and a second pressure chamber, respectively;

a fluid supplying means for supplying fluid under pressure to at least a selected one of the first pressure chambers and the second pressure chambers;

a locking means for connecting the housing member and the rotor, the locking means including a pin which is able to connect the housing member and the rotor;

a canceling means for canceling the locking means, before at least one of the first pressure chamber and the second pressure chamber, which is disposed neighboring the pin, is filled with fluid under pressure by the fluid supplying means.

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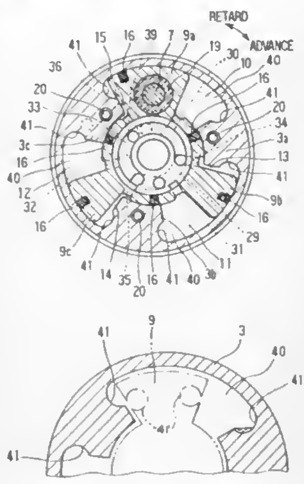
5,836,276
ROTATIONAL PHASE ADJUSTING APPARATUS HAVING FLUID RESERVOIR

Kazutoshi Iwasaki, Nagoya; Michio Adachi, Obu; Masayasu Ushida, Okazaki, and Yoshio Matsumoto, Inabe-gun, all of Japan, assignors to Denso Corporation, Kariya, Japan
Filed Aug. 8, 1997, Ser. No. 907,483
Claims priority, application Japan, Aug. 9, 1996, 8-211431
Int. Cl.⁶ F01L *1/344*
U.S. Cl. 123—90.17 13 Claims



1. A rotational phase adjusting apparatus for adjusting a rotational phase between a driving shaft and a driven shaft, the apparatus comprising:

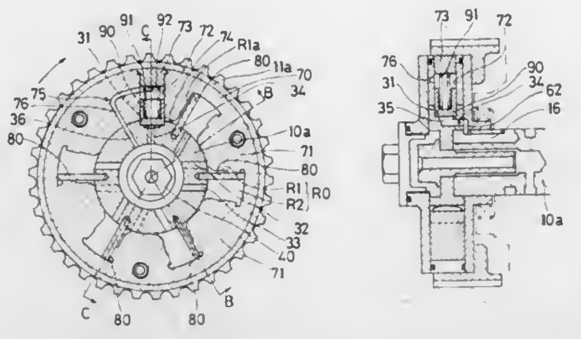
- a housing disposed in a driving force transmitting system which transmits a driving force from the driving shaft to the driven shaft and rotatable with one of the driving shaft and the driven shaft, said housing having therein an accommodating chamber extending in a predetermined circumferential length;
- a vane rotatable with e other of the driving shaft and the driven shaft and accommodated in the accommodating chamber relatively rotatable with respect to the housing in response to an operating fluid supplied to the accommodating chamber; and
- a fluid reservoir provided in a recess on a circumferential end wall of at least one of the housing and the vane, the recess having a configuration to assist in retaining a part of the operating fluid therein when the cylindrical housing and the vane unit are at all possible resting positions during an engine stop.

5,836,277
VALVE TIMING CONTROL DEVICE

Naoki Kira, Anjo; Katsuhiko Eguchi, Kariya; Kazumi Ogawa, and Motoo Nakamura, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan
Filed Dec. 23, 1997, Ser. No. 996,520
Claims priority, applicatinn Japan, Dec. 24, 1996, 8-344122; Feb. 26, 1997, 9-042741; Oct. 30, 1997, 9-298786
Int. Cl.⁶ F01L *1/34*
U.S. Cl. 123—90.17 6 Claims

1. A valve timing control device comprising:

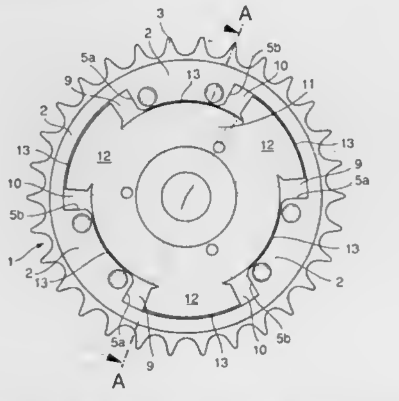
- a rotation shaft for opening and closing a valve;
- a rotation transmitting member rotatably mounted on the rotation shaft;
- a vane connected to one of the rotation shaft and the rotation transmitting member;
- a chamber defined between the rotation shaft and the rotation transmitting member and divided into a first pressure chamber and a second pressure chamber by the vane being extended into the chamber;
- a first fluid passage in fluid communication with the first pressure chamber for supplying and discharging the fluid therein and therefrom, respectively;



- a second fluid passage in fluid communication with the second pressure chamber for supplying and discharging the fluid therein and therefrom;
- a retracting hole formed on one of the rotation shaft and the rotation transmitting member;
- a locking pin slidably fitted in the retracting hole and urged toward the other of the rotation shaft and the rotation transmitting member;
- a receiving hole formed on the other of the rotation shaft and the rotation transmitting member and in which a part of the locking pin is fitted when the relative phase between the rotation shaft and the rotation transmitting member is in a predetermined phase; and
- a third fluid passage in fluid communication with the receiving hole only when the relative phase between the rotation shaft and the rotation transmitting member is in the predetermined phase.

5,836,278
DEVICE FOR VARYING THE VALVE CONTROL TIMING OF AN INTERNAL COMBUSTION ENGINE, ESPECIALLY CAMSHAFT SETTING MECHANISM ACCORDING TO THE VANE CELL PRINCIPLE

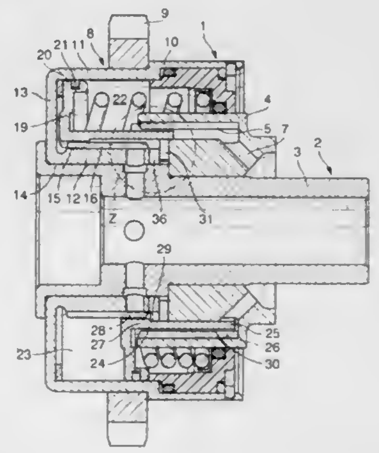
Martin Scheidt, Adelsdorf, Germany, assignor to Ina Walzlager Schaeffler OHG, Herzogenaurach, Germany
Filed Jan. 15, 1998, Ser. No. 7,354
Claims priority, application Germany, Mar. 4, 1997, 197 08 661.1
Int. Cl.⁶ F01L *1/344*
U.S. Cl. 123—90.17 2 Claims



1. A device for varying valve control timing of an internal combustion engine, comprising a camshaft setting mechanism having a drive gear (**1**) constructed as an outer rotor, which is adapted to be joined with a crankshaft of the internal combustion engine through at least one of a toothed belt and a control chain, the outer rotor including a hollow space (**8**) formed by a circumferential wall (**2**) and two lateral walls (**6**, **7**), gearing (**3**) being located on an exterior of the circumferential wall (**2**), and at least one working chamber (**4**) being defined by boundary walls (**5***a*, **5***b*) located in an interior of the circumferential wall (**2**) that are directed toward a central longitudinal axis of the drive gear (**1**), an impeller (**11**) constructed as an internal rotor having at least one radial vane (**12**) which is located in the hollow space (**8**) of the drive gear (**1**) which is adapted to be fixedly connected to and rotate with a camshaft (**14**) of the internal combustion engine, the at least one vane (**12**) subdivides the at least one working chamber (**4**) into two pressure areas (**9**, **10**) in each working chamber, such that at least one of a relative rotation and a continuous hydraulic clamping of the camshaft (**14**) relative to the crankshaft is obtained by at least one of electively time delayed and simultaneous action of pressurized oil in the two pressure areas (**9**, **10**), the impeller (**11**) being constructed of a material having a higher thermal expansion coefficient than a material of the drive gear (**1**), such that the pressure areas (**9**, **10**) in the hollow space (**8**) of the drive gear (**1**) are adapted to be sealed off against leakage by expansion of the impeller (**11**) during operation of the engine.

5,836,279
DEVICE FOR VARYING THE OPENING AND CLOSING TIMES OF GAS EXCHANGE VALVES OF AN INTERNAL COMBUSTION ENGINE

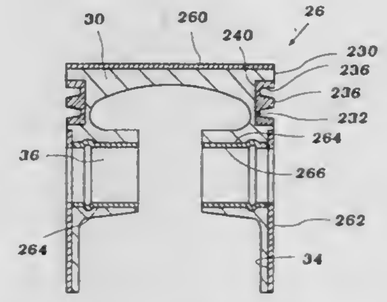
Andreas Strauss, Herzogenaurach, Germany, assignor to INA Walzlager Schaeffler oHG, Germany
Filed Mar. 30, 1998, Ser. No. 50,403
Claims priority, applicatinn Germany, May 21, 1997, 197 21 209.3
Int. Cl.⁶ F01L *1/344*
U.S. Cl. 123—90.17 4 Claims



1. A device for varying the opening and closing times of gas exchange valves of an internal combustion engine, comprising a driven unit (**2**) rotationally fixed to an intake or exhaust camshaft and constituted by a hub (**3**) comprising a helical gearing (**5**), said device further comprising a drive unit (**8**) which is in driving relationship with a crankshaft through a traction element and is mounted for rotation on the driven unit (**2**), said drive unit (**8**) comprising a drive pinion (**9**) having a housing (**10**) rotationally fixed thereon and a second helical gearing (**16**), the device also comprising an adjusting piston (**19**) which is axially displaceable by a hydraulic pressure medium between two end positions within the housing (**10**) and which axially delimits two pressure chambers (**22**, **23**) which can be connected alternately or simultaneously to a pressure medium feed duct (**7**, **18**) and a pressure medium drain duct, said adjusting piston (**19**) being made in one piece with a hollow cylindrical sliding sleeve (**24**) having a first helical gear section (**26**) and, axially spaced therefrom, an oppositely oriented, second helical gear section (**28**), the first helical gear section (**26**) cooperating with the complementary helical gearing (**5**) on the driven unit (**2**) and the second helical gear section (**28**) cooperating with the complementary helical gearing (**16**) on the drive unit (**8**), the two pressure chambers (**22**, **23**) being sealed from each other by a piston sealing ring (**21**) on an end face (**20**) of the adjusting piston (**19**) and by a first sealing disc (**31**) which surrounds the hub (**3**) of the driven unit (**2**) while being arranged between opposing end faces (**6**, **17**) of the driven unit (**2**) and the drive unit (**8**), an outer periphery (**33**) of the first sealing disc (**31**) bearing against an inner periphery (**29**) of the sliding sleeve (**24**), characterized in that a second sealing disc (**36**) surrounding the hub (**3**) of the driven unit (**2**) is arranged next to the first sealing disc (**31**) between the end faces (**6**, **17**) of the driven unit (**2**) and the drive unit (**8**), an inner peripheral clearance of said second sealing disc (**36**) to the hub (**3**) is smaller than a mounting clearance of the drive unit (**8**) to the hub (**3**) of the driven unit (**2**), and pressure medium leakages between the pressure chambers (**22**, **23**) of the device (**1**) through an inner peripheral clearance of the first sealing disc (**31**) are sealed by the second sealing disc (**36**).

5,836,280
LUBRICATION SYSTEM FOR TWO CYCLE ENGINE

Kazuo Miyazawa, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan
Filed Nov. 22, 1995, Ser. No. 562,159
Claims priority, application Japan, Nov. 24, 1994, 6-289772
Int. Cl.⁶ F02F *3/10;3/12*
U.S. Cl. 123—193.4 9 Claims



1. An internal combustion engine comprising a cylinder block and head assembly, said cylinder block and head assembly including a plurality of cylinders, a lubrication system for delivering oil to said cylinders, a piston disposed in each of said cylinders so as to reciprocate in an axial direction of said cylinders, each of said pistons including a cylindrical piston head provided at an upper end of said piston, a piston skirt integrally connected to said piston body and a piston pin boss, at least one piston ring groove provided in said piston head, a piston ring fitted in said at least one piston ring groove, said piston ring including an inner and outer sliding surface and an upper and lower surface, said piston pin boss forming a piston pin hole adapted to receive a piston pin, a molybdenum disulfide plating arrangement on at least said piston pin hole of said piston so as to enhance lubricity of said piston, the upper surface of said piston head facing a combustion chamber formed by said cylinder block and head assembly being formed with a nickel plating, and a tin plating on the portion of said piston skirt facing the cylinder being tin plated.

5,836,281
APPARATUS FOR OPTIMIZING THE INTERCONNECTION PATHS OF ELONGATE CONDUITS

Denis Godeau, Joudry, and Anthony Garcia, Villemandeur, both of France, assignors to Hutchinson, Paris, France
Filed Aug. 19, 1996, Ser. No. 699,226
Claims priority, application France, Sep. 15, 1995, 95 10829
Int. Cl.⁶ F02F *7/00*
U.S. Cl. 123—195 A 11 Claims

8. An interconnection cradle for a motor vehicle engine, comprising:

- an elongate support member adapted to be attached to the motor vehicle engine, said elongate support member comprising a first branch of length substantially equal to the width of an engine, a second branch parallel to said first branch, and a third branch orthogonal to said first and second branches and having two ends, said first branch attached to one end and said second branch attached to the other end.

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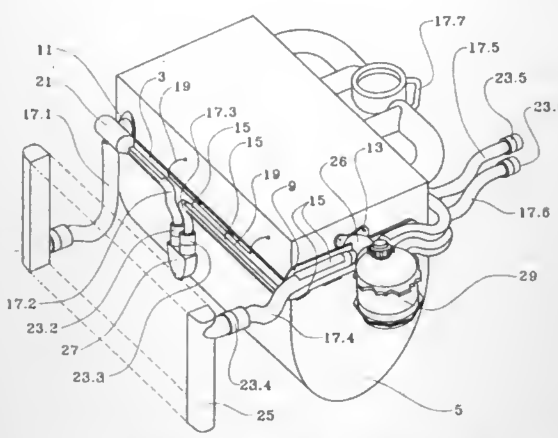


- a first fixing plate carrying said first branch for affixing the interconnection cradle to the engine,
- a second fixing plate carrying said third branch for affixing the interconnection cradle to the engine,
- a plurality of releasable conduit connectors carried by said first branch for affixing elongate conduits to the interconnection cradle,
- a plurality of releasable conduit connectors carried by said second branch for affixing elongate conduits to the interconnection cradle, and
- a plurality of releasable conduit connectors carried by said third branch for affixing elongate conduits to the interconnection cradle.

5,836,282

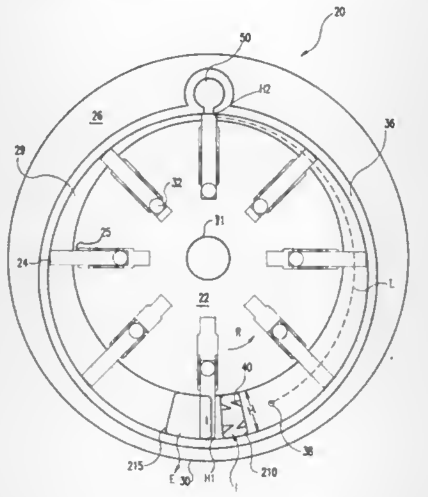
METHOD OF REDUCING POLLUTION EMISSIONS IN A TWO-STROKE SLIDING VANE INTERNAL COMBUSTION ENGINE

Brian D. Mallen, Charlottesville, Va., assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 27, 1996, Ser. No. 774,275

Int. Cl.⁶ F02B *53/02*

U.S. Cl. 123—219 **35 Claims**



1. A method for reducing exhaust pollution emissions in a two-stroke sliding vane internal combustion engine, having vanes that slide with at least one of a radial and axial component of vane motion, the method comprising the steps of:

- inducting fresh air into a vane cell;
- injecting fuel into the vane cell at an ultra-lean equivalence ratio less than 0.65 and at a location such that a circumferential distance at mid-cell-height from injection to a stator site at the onset of combustion is at least about 4 times a vane cell height at intake;
- compressing the ultra-lean fuel-air combination while mixing to a dimensionless concentration fluctuation fraction of less than 0.25;
- combusting the ultra-lean, mixed fuel-air combination;
- scavenging the combusted fuel-air combination after an expansion cycle.

5,836,283

DISC-TYPE ROTARY ENGINE

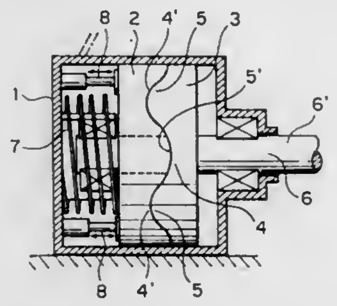
Yukio Kajino, 3279-6, Ooaza Yokoze, Yokoze-machi, Chichibu-gun, Saitama-ken, Japan

Filed Sep. 29, 1997, Ser. No. 942,696

Claims priority, application Japan, Nov. 19, 1996, 8-323413

Int. Cl.⁶ F02B *53/00*

U.S. Cl. 123—230 **2 Claims**



1. A disc-type rotary engine comprising:

- an engine casing having a cylindrical inner circumferential wall;
- a non-rotary disc in which an undulatory concave/convex surface in a stream line shape having at least two radial concave portions and two radial convex portions alternately is formed on one end and which is fitted to the inner circumferential wall of the casing coaxially and air-tightly;
- a rotary disc in which a radial concave/convex surface of the same shape as that of the undulatory concave/convex surface of the non-rotary disc is formed on one end, and which is fitted to the inner circumferential wall of the casing airtightly and rotatably such that the convex portions of the concave/convex surface are in a sliding contact with the undulatory concave/convex surface of the non-rotary disc;
- a rotary power shaft which rotates interlocking with the rotary disc and which is protruded at one end to the outside of the casing;
- a resilient means for resiliently engaging the non-rotary disc which is made slidable reciprocally in the axial direction along with the rotation of the rotary disc to the concave/convex surface of the mating rotary disc;
- a fuel supply channel in communication with a vicinity of a slope of a first concave portion formed on the non-rotary disc at which a convex portion of the rotary disc gets into sliding engagement with said concave portion;
- an exhaust port in communication with a vicinity of a slope of a second concave portion formed on the non-rotary disc at which the convex portion of the rotary disc gets out of sliding engagement with said concave portion,
- a gas reservoir combustion chamber opened to a vicinity of a slope of a second concave portion formed on the non-rotary disc at which the convex portion of the rotary disc gets into sliding engagement with said concave portion, with an ignition plug being disposed at the inside of said reservoir; and
- a compression communication channel for communicating from a vicinity of a slope of the first concave portion formed on the non-rotary disc at which the convex portion of the rotary disc gets into sliding engagement with said concave portion to the gas reservoir fuel chamber by way of a check valve.

5,836,284

INTAKE SYSTEM CONSTRUCTION FOR INTERNAL COMBUSTION ENGINE AND MANUFACTURING PROCESS OF INTAKE PASSAGE SECTION OF INTERNAL COMBUSTION ENGINE

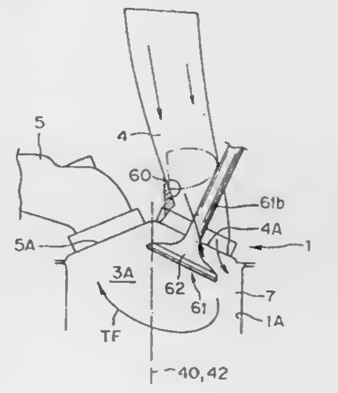
Hideyuki Oda, Kyoto; Takashi Kawabe, Funai-gun; Nobuaki Murakami; Katsunori Ueda, both of Kyoto; Satoshi Yoshikawa, Otsu; Kenji Goto, Kyoto; Tomohiro Ohashi, Okazaki; Eiichi Hiruma, Kawasaki; Jyun Takemura, Toyota; Shigeo Yamamoto, Obu, and Kazuyoshi Nakane, Okazaki, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 15, 1996, Ser. No. 648,357

Claims priority, application Japan, May 15, 1995, 7-116159; Sep. 11, 1995, 7-233130

Int. Cl.⁶ F02B *31/04*

U.S. Cl. 123—308 **6 Claims**



1. An intake system construction for an internal combustion engine, comprising:

- a combustion chamber formed with upper and lower extremities thereof defined by a lower wall of a cylinder head and a top wall of a piston fittedly inserted in a cylinder;
- an intake open end formed in said lower wall of said cylinder head in opposition to said combustion chamber on one side of a reference plane which contains a central axis of said cylinder, said intake open end being opened or closed by an intake valve;
- an exhaust open end formed in said lower wall of said cylinder head in opposition to said combustion chamber on an opposite side of said reference plane, said exhaust open end being opened or closed by an exhaust valve;
- an intake port formed in communication with said combustion chamber via said intake open end and extending upwardly from said intake open end so that a vertical swirl of inducted air is formed in said combustion chamber, said intake port being formed wider in one of halves thereof located adjacent said reference plane than in the other half thereof located remote from said reference plane, whereby a central axis of an inducted air flow in said intake port is off-centered toward said reference plane; and
- an exhaust port communicating with said combustion chamber via said exhaust open end so that combustion gas is discharged from said combustion chamber:
- said intake port is provided at a lower extremity thereof in said one of halves thereof located adjacent to said reference plane with a guide portion for guiding an inducted air flow in said intake port toward an inner peripheral surface of a side wall of said cylinder in said combustion chamber.

5,836,285

DEVICE FOR CONTROLLING KNOCKING IN AN INTERNAL COMBUSTION ENGINE

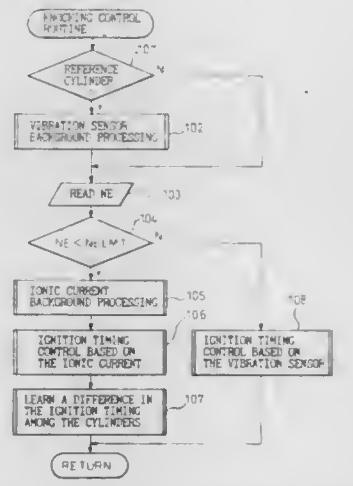
Keiichiro Aoki; Kazuhisa Mogi; Koichi Nakata, all of Susono; Yasuo Ito, Nagoya, and Youichi Kurebayashi, Toyohashi, all of Japan, assignors to Toyota Jidosha Kabushiki, Aichi, Japan

Filed Sep. 18, 1997, Ser. No. 933,320

Claims priority, application Japan, Sep. 19, 1996, 8-247962; Jul. 18, 1997, 9-194488

Int. Cl.⁶ F02P *5/152*

U.S. Cl. 123—418 **6 Claims**


KNOCKING CONTROL ROUTINE
101
REFERENCE CYLINDER
N
Y
VIBRATION SENSOR BACKGROUND PROCESSING
102
READ NE
103
104
NE < NE LMT
N
Y
IONIC CURRENT BACKGROUND PROCESSING
105
106
108
IGNITION TIMING CONTROL BASED ON THE IONIC CURRENT
IGNITION TIMING CONTROL BASED ON THE VIBRATION SENSOR
LEARN A DIFFERENCE IN THE IGNITION TIMING AMONG THE CYLINDERS
107
RETURN

1. A device for controlling knocking of an internal combustion engine, comprising:

- a first occurrence-of-knocking discrimination means which applies a voltage across a pair of electrodes installed in a combustion chamber of the internal combustion engine, detects an ionic current flowing between said pair of electrodes through ions generated when a gas mixture in the combustion chamber burns, and discriminates whether the knocking is occurring or not based upon the ionic current that is detected;
- a second occurrence-of-knocking discrimination means which detects vibration of the cylinder block by using a vibration sensor installed in the cylinder block of the internal combustion engine, and discriminates whether the knocking is occurring or not based upon the vibration of the cylinder block that is detected; and
- an ignition timing control means which controls the ignition timing of the internal combustion engine based upon the result of discrimination of either said first occurrence-of-knocking discrimination means or said second occurrence-of-knocking discrimination means depending upon the operation region of the internal combustion engine.

5,836,286

ADJUSTABLE ECCENTRIC FUEL COUPLING

Robert C. Timmer, Grandville, and Robert D. Straub, Lowell, both of Mich., assignors to Diesel Technology Company, Wyoming, Mich.

Filed Apr. 24, 1997, Ser. No. 840,653

Int. Cl.⁶ F02M *61/14*

U.S. Cl. 123—470 **10 Claims**

1. An adjustable eccentric fuel coupling device for use with an internal combustion engine including a cylinder head (**12**) having defined therein a cylinder head recess (**14**) intersected by a fuel supply passage (**16**), the coupling device comprising:

- an eccentric (**18**) having first and second ends (**24**, **26**) and having contiguous first and second right circularly cylindrical portions (**20**, **22**) respectively disposed proximate the first and second ends (**24**, **26**), each portion having a central axis (A, B), the central axes being parallel but laterally spaced apart,

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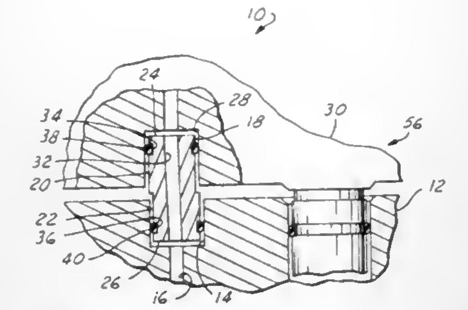


the first right circularly cylindrical portion of the eccentric being sealingly insertable into a recess (**28**) of a fuel unit injector (**30**), the second right circularly cylindrical portion of the eccentric being sealingly insertable into the recess in the cylinder head, the eccentric being relatively free to float longitudinally within the recess of the fuel unit injector and the recess in the cylinder head, the eccentric also being rotatable to obtain an alignment of the first right circularly cylindrical portion with the recess in the fuel unit injector and of the second right circularly cylindrical portion with the recess in the cylinder head, thereby compensating for a substantial amount of dimension tolerance accumulation, and

the eccentric also having defined therein a fuel passage (**32**) extending between a pair of orifices centrally disposed at each end of the eccentric to provide an unobstructed fuel course between the recess in the cylinder head and the recess in the fuel unit injector.

5,836,287

SYSTEM AND METHOD FOR CONTROLLING AIR-FUEL RATIO IN INTERNAL COMBUSTION ENGINE

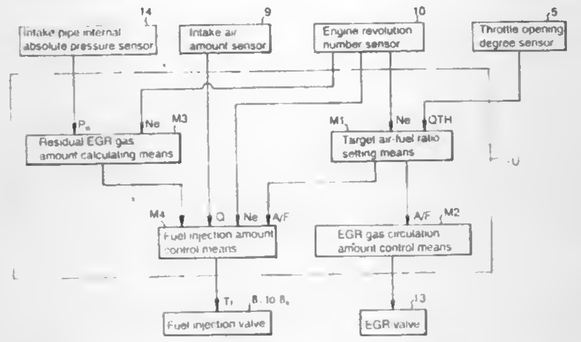
Toru Yano; Eisuke Kimura; Masanori Hayashi; Yusuke Tatara; Toshio Yokoyama, and Kenichiro Kinoshita, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 424,880, Apr. 10, 1995. This application Aug. 18, 1997, Ser. No. 912,441

Claims priority, application Japan, Apr. 8, 1994, 6-71128; Apr. 13, 1994, 6-74768; Apr. 26, 1994, 6-88341

Int. Cl.^{6} F02D *43/00*

U.S. Cl. 123—478 **4 Claims**


14
9
10
5
Intake pipe internal absolute pressure sensor
Intake air amount sensor
Engine revolution number sensor
Throttle opening degree sensor
P
Ne
M3
M1
Ne
θTH
Residual EGR gas amount calculating means
Target air-fuel ratio setting means
M4
Q
Ne
A/F
A/F
M2
Fuel injection amount control means
EGR gas circulation amount control means
T
8 to 8
13
Fuel injection valve
EGR valve

1. An air-fuel control system in an internal combustion engine, comprising a fuel injection valve provided at each of plural cylinders, an EGR gas circulation amount control means for controlling an amount of EGR gas circulated from an exhaust passage to an intake passage, a target air-fuel ratio setting means for setting a target air-fuel ratio based on an operational state of the internal combustion engine, and a fuel injection amount control means for controlling an amount of fuel injected by each said fuel injection valve based on the target air-fuel ratio, in which when said target air-fuel ratio setting means has switched the target air-fuel ratio, said fuel injection amount control means sequentially decreases said amounts of fuel injected with predetermined intervals for each said fuel injection valve, said air-fuel control system further including a residual EGR gas amount calculating means for calculating an amount of EGR gas remaining in the intake system, whereby when said target air-fuel ratio setting means has switched the target air-fuel ratio, said EGR gas circulation amount control means decreases an amount of EGR gas circulated, and said fuel injection amount control means starts said decreasing of the amount of fuel injected after said decreasing of said residual EGR gas amount calculated by said residual EGR gas amount calculating means is reduced to at least a predetermined value.

5,836,288

METHOD AND APPARATUS FOR CONTROLLING FUEL INJECTION IN A MULTICYLINDER INTERNAL COMBUSTION ENGINE

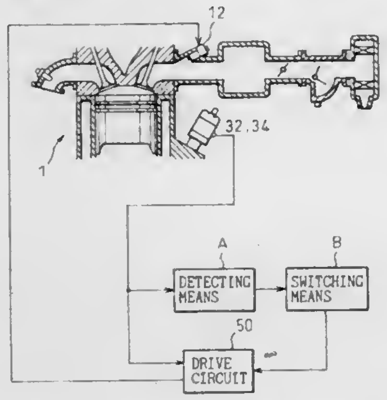
Norihisa Nakagawa, Numazu, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi-ken, Japan

Filed Jul. 16, 1997, Ser. No. 895,178

Claims priority, application Japan, Jul. 18, 1996, 8-189439

Int. Cl.^{6} F02D *41/06*

U.S. Cl. 123—491 **6 Claims**



1. An apparatus for controlling fuel injection in a multicylinder internal combustion engine that controls the opening of fuel injection valves for a period of time on the basis of a cranking amount determined corresponding to engine conditions at the start of the engine and a post-cranking amount determined corresponding to engine conditions after the engine has been started, comprising:

means for detecting that the cranking amount has been injected once to each cylinder;

means for switching the fuel injection amount from the cranking amount to the post-cranking amount after the detecting means has detected that the cranking amount has been injected once to each cylinder regardless of an engine rotational speed.

5,836,289

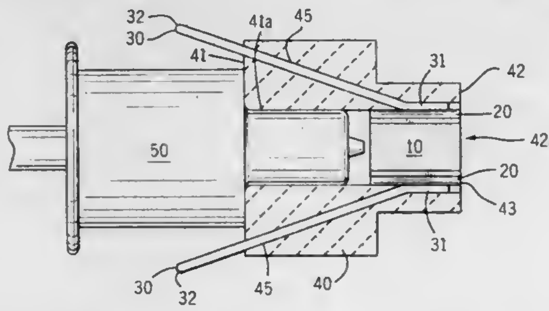
POROUS ELEMENT FUEL VAPORIZER

Robert H. Thring, Devine, Tex., assignor to Southwest Research Institute, San Antonio, Tex.

Filed Jun. 10, 1997, Ser. No. 872,252

Int. Cl.^{6} F02M *31/00*

U.S. Cl. 123—549 **9 Claims**



1. An apparatus for heating and vaporizing fuel spray released from the spray nozzle of a fuel injector comprising:

a porous element situated downstream of said fuel injector for receiving, heating and vaporizing fuel spray from said feel injector;

a device for heating said porous element:

a holder having a first receptive end for permanently axially positioning said porous element and a second receptive end for permanently axially positioning said spray nozzle upstream of said porous element and having;

a cylindrical fuel air mixing chamber in an open space in said holder between said porous element and said spray nozzle:

a circumferential air manifold radially circumscribing said mixing chamber; and

an air inlet for supplying air radially into said manifold and said mixing chamber, wherein said holder is heat resistant and is constructed of a non-electrically conductive material.

5,836,290

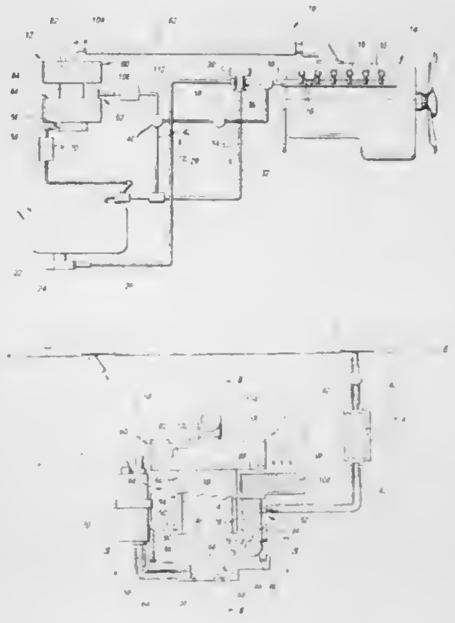
APPARATUS AND METHOD FOR GASIFYING VOLATILE LIQUID FUELS

Jack J. Gilbert, Alphretta, Ga., assignor to The Gasifier Corporation, Shelby Township, Mich.

Continuation of Ser. No. 506,322, Jul. 24, 1995, abandoned. This application Jan. 29, 1996, Ser. No. 594,684

Int. Cl.^{6} F02M *17/02*

U.S. Cl. 123—522 **26 Claims**



1. Apparatus for gasifying volatile liquid fuels for combustion, comprising:

a housing having a generally round mixing chamber including lower and upper extremities:

a housing inlet for introducing dried air and a volatile liquid fuel into the mixing chamber for circular flow for mixing with each other:

a liquid outlet in the housing at the lower extremity of the mixing chamber for removing liquid fuel that flows downwardly from the mixing circular flow of the air and the fuel: and

a gas outlet in the housing at the upper extremity of the mixing chamber and through which a gas mixture of air and fuel is delivered for combustion.

5,836,291

EVAPORATED FUEL PROCESSING APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

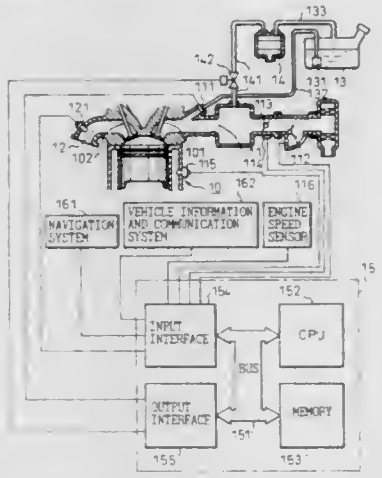
Yukio Kinugasa, Susono; Takaaki Itou, Misima; Yoshihiko Hyodo, Susono; Toru Kidokoro, Hadano, and Naoya Takagi, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed May 22, 1997, Ser. No. 862,042

Claims priority, application Japan, May 30, 1996, 8-136946

Int. Cl.^{6} F02D *41/04;41/14*

U.S. Cl. 123—679 **22 Claims**



1. An evaporated fuel processing apparatus for an internal combustion engine of a vehicle, comprising:

a purge pipe for leading fuel vapor generated from a fuel tank to an intake pipe;

a purge valve provided in the purge pipe for controlling an amount of fuel vapor to be purged into the intake pipe:

a running condition detecting means for detecting a future running condition of the engine based on information corresponding to a route over which the vehicle will be running:

an amount predicting means for predicting an amount of fuel vapor evaporated from the fuel tank in accordance with the future running condition detected by the running condition detecting means: and

a valve opening controlling means for controlling a future valve opening of the purge valve in accordance with the amount of fuel vapor predicted by the amount predicting means.

5,836,292

HEATER CONTROLLER FOR AN AIR-FUEL RATIO SENSOR

Keiichiro Aoki, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Oct. 25, 1996, Ser. No. 736,675

Claims priority, application Japan, Dec. 14, 1995, 7-325977

Int. Cl.^{6} F02D *41/00;* **F02M** *23/00;25/00*

U.S. Cl. 123—697 **20 Claims**

1. A heater controller for controlling electric power supplied to a heater for heating an air-fuel ratio sensor which detects an air-fuel ratio of an internal combustion engine, comprising:

an engine condition detecting means for detecting an operating condition of the internal combustion engine:

a basic electric power determining means for determining a basic electric power supplied for heating the sensor in accordance with the engine operating condition detected by said engine condition detecting means:

a fuel-cut state detecting means for detecting whether or not the engine is operating under a fuel-cut state:

an index calculating means for calculating an index which denotes a temperature fall in an atmosphere around the sensor when it is determined that the engine is operating under the fuel-cut state by said fuel-cut state detecting means:

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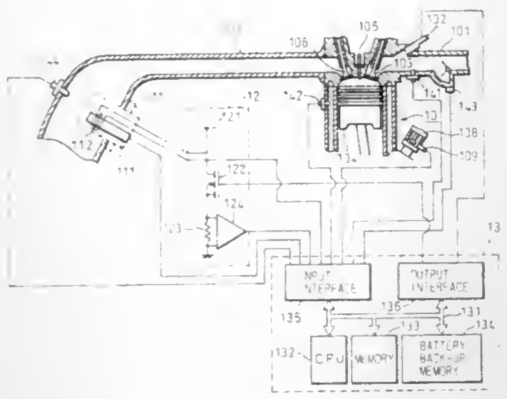


an auxiliary electric power determining means for determining an auxiliary electric power in accordance with the index calculated by said index calculating means when it is determined that the engine has returned from the fuel-cut state by said fuel-cut state detecting means; and

an electric power supplying means for supplying an electric power which is a sum of the basic electric power determined by said basic electric power determining means and the auxiliary electric power determined by said auxiliary electric power determining means.

5,836,293

EVAPORATED FUEL TREATMENT DEVICE OF AN ENGINE

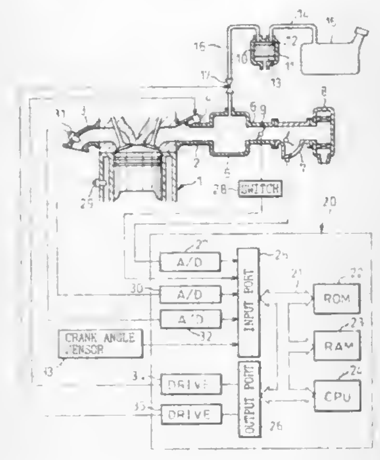
Akinnri Osanai, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Aug. 13, 1997, Ser. No. 910,245

Claims priority, application Japan, Aug. 13, 1996, 8-213850

Int. Cl.^{6} F02D *41/00*

U.S. Cl. 123—698 17 Claims



1. An evaporated fuel treatment device for an engine provided with an intake passage, comprising:

a purge control valve for controlling an amount of purge of fuel vapor to be purged to the intake passage;

purge control means for restarting the purge of the fuel vapor after the purge of the fuel vapor is stopped once during engine operation; and

restart purge rate setting means for restarting the purge action by the purge rate just before the purge action was stopped when a load of the engine at the time of the restart of the purge action is higher than a predetermined set load and restarting the purge action by a purge rate below the predetermined purge rate when the load of the engine at the time of the restart of the purge action is lower than the predetermined set load.

5,836,294

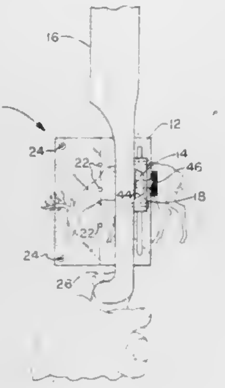
BOW SIGHT

James E. Merritt, 5217 Rule Rd., Bellville, Ohio 44813, assignor to James E. Merritt; Larry J. Caudill, and Dwight W. Etzwiler, all of Bellville, Ohio

Filed May 14, 1997, Ser. No. 856,295

Int. Cl.^{6} F41G *1/467*

U.S. Cl. 124—87 26 Claims



1. A bow sight comprising:

a support;

a first substantially transparent sight plate carried by said support; and

a first sight dot carried by said sight plate said sight dot being surrounded by unpatterned substantially transparent sight plate material that is unobstructed thereby forming an unobstructed viewing area through said sight plate around said sight dot.

5,836,295

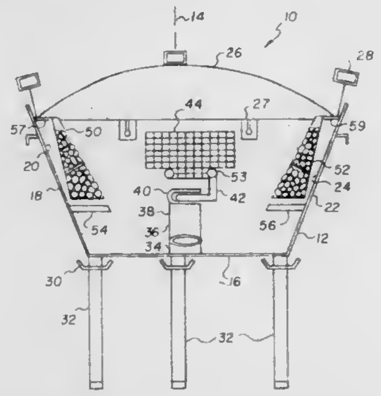
OUTDOOR GRILL WITH REMOVABLE COMPONENTS

Abdul-Razzak Faraj, P.O. Box 566068, Atlanta, Ga. 31156

Filed Oct. 14, 1997, Ser. No. 950,339

Int. Cl.^{6} A47J *37/00*

U.S. Cl. 126—25 R 17 Claims



1. An outdoor grill, comprising:

a housing having a central axis, a bottom, a first sidewall connected along a bottom edge of said first sidewall to said bottom on one side of said central axis and defining a first sidewall mounting site, and a second sidewall connected along a bottom edge of said second sidewall to said bottom on the other side of said central axis and defining a second sidewall mounting site;

a first coupling member fastened to said bottom of said housing;

a second coupling member having one end connected to said first coupling member and a distal end extending upward between said first and second sidewall mounting sites;

a first firebox mounted along said first sidewall at said first sidewall mounting site;

a second firebox mounted along said second sidewall at said second sidewall mounting site;

a cooking rack having a bottom portion and a cooking area and being positioned between said first and second sidewall mounting sites and;

mounting means for mounting said cooking rack on said distal end of said second coupling member, said mounting means including a hinge attached to said bottom portion of said cooking rack, said cooking rack being movable between a cooking position at which said cooking rack is pivoted about said hinge to extend substantially about said hinge and a storage position at which said cooking rack is pivoted about said hinge to extend substantially below said hinge.

5,836,296

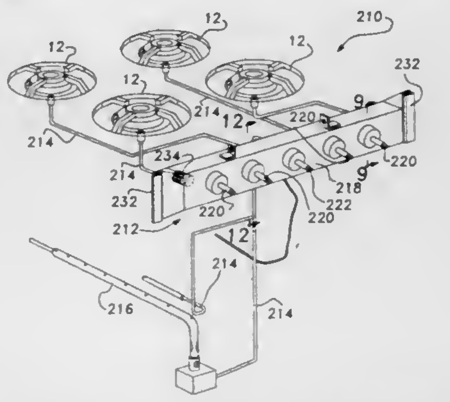
MANIFOLD WITH INTEGRAL BURNER CONTROL AND OVEN CONTROL

William L. Hillis, Lawrenceburg; Garry Wayne Woods, Heiskell; Gary E. Berry, La Follette, and William J. Ferlin, Franklin, all of Tenn., assignors to Lincoln Brass Works, Inc., Nashville, Tenn.

Filed Sep. 24, 1996, Ser. No. 710,965

Int. Cl.^{6} F24C *3/00*

U.S. Cl. 126—39 G 27 Claims



1. A gas distribution system for a gas cooking appliance having a plurality of burners, said gas distribution system comprising:

a tubular manifold mounted to said appliance, said manifold defining a gas input chamber;

first gas supply means for supplying gas to said gas input chamber;

second gas supply means for supplying gas from said gas input chamber to each of said burners; and

a valve assembly disposed within said gas input chamber and one of said burners for regulating the flow of gas between said gas input chamber and said burner, said valve assembly including a front cover, a back cover, a valve disc and a seal disposed between said back cover and said valve disc, said valve disc being rotatably supported with respect to said back cover to regulate the flow of gas between said gas input chamber and said burner in relation to its rotational position.

5,836,297

COOKING EXHAUST APPARATUS AND METHOD OF INSTALLING THE APPARATUS

Tomeji Kawasaki, 30-12, Hibaru 7-chome, Minami-ku, Fukuoka-shi, Fukuoka, Japan

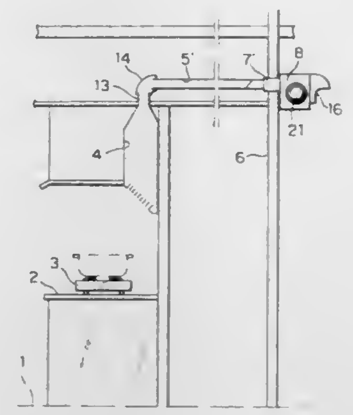
Continuation of Ser. No. 466,764, Jun. 6, 1995, abandoned. This application Oct. 30, 1997, Ser. No. 960,708

Claims priority, application Japan, Dec. 9, 1994, 6-306629; Mar. 13, 1995, 7-052603

Int. Cl.^{6} F23L *3/00*

U.S. Cl. 126—299 D 13 Claims

1. A cooking exhaust apparatus for use in a cookroom defined by a floor, a ceiling and a side wall, said apparatus comprising:



a smoke collecting hood provided above a heating unit;

piping located in the ceiling, said piping having two ends through one of which it communicates with said smoke collecting hood;

a hollow member having a first wall portion connected to the other end of said piping, said hollow member being attached to the side wall of said cookroom;

an exhaust blower having a drawing port connected to a second wall portion of said hollow member separate and spaced from said first wall portion to which said piping is connected, said exhaust blower having an exhaust port discharging outside of said cookroom;

said hollow member having an inside dimension substantially larger than an inside diameter of said drawing port and substantially larger than an inside diameter of said piping; and

said exhaust blower being operative to suck air through said drawing port thereof to cause a negative pressure in said hollow member, by which air in said piping is caused to flow into said hollow member against flow resistance of said piping, said exhaust blower drawing air through said hollow member providing a strong low-noise exhaust from said smoke collecting hood.

5,836,298

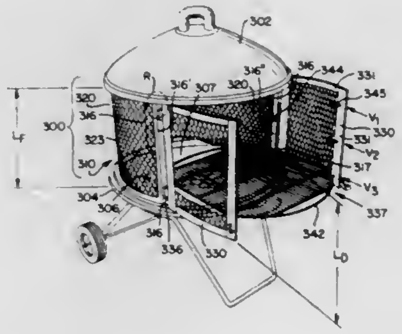
PORTABLE OUTDOOR FIREPLACE AND FIRE SCREEN ASSEMBLY THEREOF

Jeff Grady, Naperville, Ill., assignor to Fleming Sales Company, Lombard, Ill.

Continuation-in-part of Ser. No. 564,379, Nov. 24, 1995, Pat. No. 5,598,834. This application Oct. 9, 1996, Ser. No. 728,545

Int. Cl.^{6} F24B *1/182*

U.S. Cl. 126—506 21 Claims



1. A portable fireplace, comprising:

a base member for supporting and burning the combustible material therein, a fire screen assembly supported by the base

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member, the fire screen assembly defining a generally cylindrical burning chamber containing said combustible material within said base member, a cover member supported by said fire screen assembly and providing a cover for the burning chamber, said fire screen assembly including first and second fire screen panels which provide a protective screen around said combustible material, said fire screen assembly further including a frame including a pair of opposing ring members interconnected by vertical columns which cooperate together with said first and second fire screen panels to define the enclosure, the frame ring members defining a circular perimeter of said enclosure, two of said frame columns being spaced apart from each other along said enclosure perimeter, said two frame columns defining an entrance of said enclosure, and said entrance including means for holding a cooking grill insertable horizontally into said frame, and supporting the cooking grill in said frame in a horizontal orientation with respect to said base member, said cooking grill support means including pairs of corresponding support members disposed on said entrance frame columns.

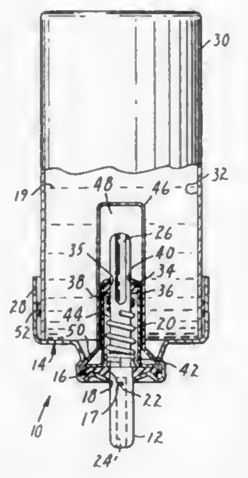
5,836,299
SEALS FOR USE IN AN AEROSOL DELIVERY DEVICE

Oh-Seung Kwon, Woodbury, Minn., assignor to Minnesota Mining & Manufacturing Co., St. Paul, Minn.

Continuation of Ser. No. 92,001, Jul. 15, 1993, abandoned. This application Feb. 28, 1995, Ser. No. 397,546

Int. Cl.^{6} B65D *83/14*

U.S. Cl. 128—200.23 **8 Claims**



1. A device for delivering an aerosol, comprising: a valve stem, a diaphragm comprising an ethylene-propylene-diene rubber free of silicone adhesive agents and having walls defining a diaphragm aperture, and a casing member having walls defining a formulation chamber and a casing aperture, wherein the valve stem passes through the diaphragm aperture and the casing aperture and is in slidable sealing engagement with the diaphragm aperture, and wherein the diaphragm is in sealing engagement with the casing member, the device having contained in the formulation chamber thereof a medicinal aerosol formulation wherein the medicinal aerosol formulation comprises 1,1,1,2-tetrafluoroethane or 1,1,1,2,3,3,3-heptafluoropropane.

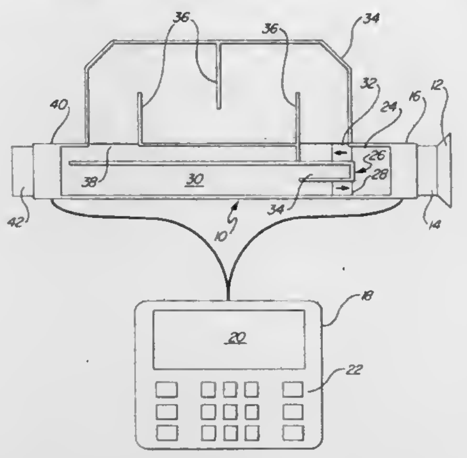
5,836,300
METABOLIC GAS EXCHANGE AND NONINVASIVE CARDIAC OUTPUT MONITOR

James R. Mault, 5804 Renee Dr., Durham, N.C. 27705

Filed Mar. 11, 1997, Ser. No. 814,677

Int. Cl.^{6} A61M *16/00*

U.S. Cl. 128—204.23 **5 Claims**



1. A respiratory gas analyzer for measuring the metabolic activity or cardiac output of a subject, comprising:

a respiratory connector operative to be supported in contact with a subject so as to pass inhaled and exhaled gasses as the subject breathes;

means for connecting to a source of respiratory gasses;

a bi-directional flow meter adapted to generate electrical signals as a function of the volume of gasses which pass through it in either direction;

a pass-through carbon dioxide scrubber operative to absorb carbon dioxide from gasses which pass through it;

a capnometer;

a valve shiftable between a first configuration and a second configuration;

conduits interconnecting said respiratory connector, said means for connecting to a source of respiratory gasses, said scrubber, said flow meter, said capnometer and said valve;

computer means for receiving the outputs of the flow meter and the capnometer;

means for controlling the position of the valve;

said computer being connected to said means for controlling the valving so as to interconnect the components in either a first configuration in which, upon inhalation by a subject substantially the entire inhaled volume is passed from the source of respiratory gasses, through the flow meter to the subject and upon exhalation by a subject substantially all of the exhaled gasses are passed through the flow meter in a direction opposite to the inhaled gasses, or a second configuration in which upon inhalation by a subject only a fraction of the inhaled gasses are passed through the flow meter from the source of respiratory gasses, with the balance constituting previously exhaled gasses stored in said conduits, and upon exhalation by a subject only a fraction of the exhaled gasses are passed through the flow meter in a direction opposite to the inhaled gasses, the balance being stored in said conduits, whereby the computer may calculate the cardiac output of a subject based on the difference between the carbon dioxide content of the exhaled gasses between the time the valve is in the first configuration and the time the valve is in the second configuration and the difference in the end-tidal carbon dioxide content of the exhaled breath between the times the valves are in the first configuration and the valves are in the second configuration; and means operative at such time as said valve is in said first configuration, whereby upon exhalation by a subject, the exhaled gasses are passed first through the scrubber, then through the flow meter in a direction opposite to the inhaled gasses, whereby the computer may generate a signal proportional to the integral of the difference between the inhaled and exhaled gas volumes over a period of time to calculate a subject's metabolic rate.

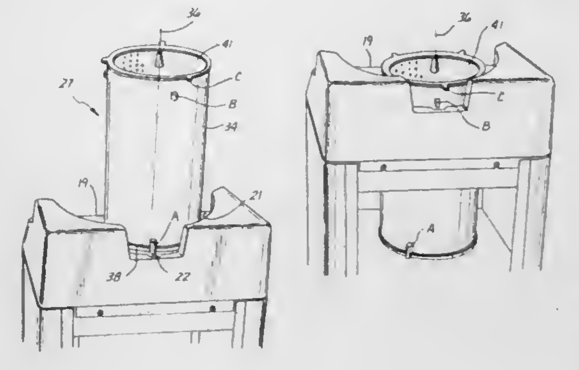
5,836,301
SURGICAL SMOKE EVACUATOR FILTER MOUNTING STRUCTURE

Steven E. Holian, Moreno Valley Ranch; Donald R. Reiterman, Hemet; Richard J. Greff, Yorba Linda, and Ronald E. Thomas, Alta Loma, all of Calif., assignors to Stackhouse, Inc., Palm Springs, Calif.

Continuation of Ser. No. 960,934, Oct. 14, 1992, Pat. No. 5,456,248. This application May 12, 1995, Ser. No. 439,991

Int. Cl.^{6} A62B *7/10;19/00;23/02*

U.S. Cl. 128—205.12 **19 Claims**



1. A surgical smoke evacuator, comprising:

a housing;

means for defining an airflow channel through the housing;

at least one filter having an inlet end, an outlet end, and a longitudinal axis extending between the inlet end and the outlet end, the filter being sized and configured for placement in an operative position along the air flow channel;

portions of the housing defining a filter cavity disposed to receive the filter in the operative position along the air flow channel, the filter cavity having an inlet side and an outlet side longitudinally spaced from the inlet side; and

filter alignment means disposed between the filter and the housing for guiding the filter relative to the housing along a predetermined circuitous path extending between the inlet side and the outlet side during loading and unloading of the filter in the evacuator, the circuitous path including at least one axial portion requiring the filter to be moved axially relative to the housing, and at least one angular portion requiring the filter to be moved angularly about the longitudinal axis of the filter relative to the housing.

5,836,302
BREATH MONITOR WITH AUDIBLE SIGNAL CORRELATED TO INCREMENTAL PRESSURE CHANGE

James R. Homuth, DeForest, and Kevin G. Tissot, Brooklyn, both of Wis., assignors to Ohmeda Inc., Liberty Corner, N.J.

Filed Jul. 10, 1997, Ser. No. 889,911

Int. Cl.^{6} A62B *9/00;7/00;* G10K *9/00;* G01L *7/00*

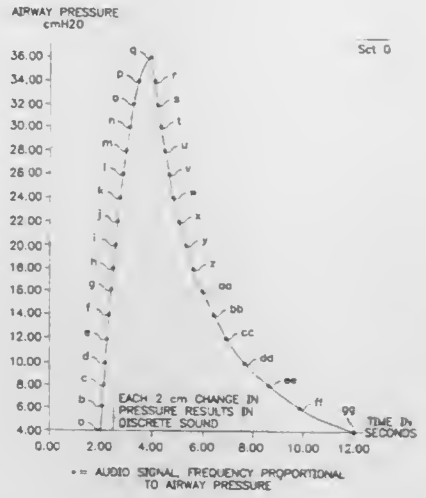
U.S. Cl. 128—205.23 **13 Claims**

7. A method of providing an audible waveform in a ventilator system providing a breath cycle to a patient of varying pressure comprising the steps of:

(a) providing a breath of varying pressure to a patient;

(b) sensing and monitoring the pressure of the breath provided to a patient,

(c) determining predetermined incremental changes in the pressure of the breath sensed and monitored in step (b),



(d) providing an audible sound of predetermined frequency at each predetermined incremental change in pressure determined in step (c).

5,836,303
RESPIRATOR APPARATUS

Wendell Hurst, Franklin; William J. Nielsen, Troy; Robert C. Metzger, East Lansing, and Frederick D. Walker, Middleton, all of Mich., assignors to Thermal Air Products, Inc., East Lansing, Mich.

Filed Sep. 17, 1996, Ser. No. 719,295

Int. Cl.^{6} A62B *7/10*

U.S. Cl. 128—206.24 **9 Claims**

1. A respirator apparatus that covers facial features of a wearer during engagement, the apparatus comprising:

(a) a mask having a cheek engaging portion, a nose-bridge engaging portion, and a chin engaging portion, the mask having an opening disposed therein, the mask generally matching facial contours of the wearer and providing a seal during engagement, the mask including an inner layer and an outer layer, the inner layer and the outer layer being made of a cross-linked polyethylene material having memory for maintaining a last customized shape;

(b) a mesh material disposed across the opening of the mask, the opening including an air inlet enabling air to be inhaled during engagement to pass therethrough, and an air outlet enabling air to be exhaled during engagement to pass therethrough; and

(c) a lip disposed across the cheek engaging portion and the nose-bridge engaging portion of the mask, the lip generally matching the contour of the cheek and nose-bridge structure of the wearer, the lip providing a seal during engagement, the lip being made of a cross-linked polyethylene material having memory for maintaining a last customized shape, the lip

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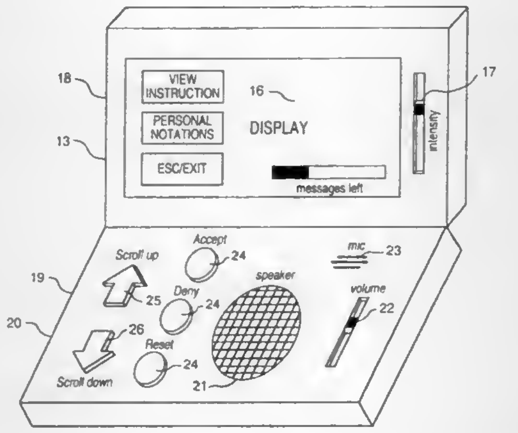
preventing moist air of near body temperature that is exhaled during engagement from escaping in an upward direction through the cheek and nose-bridge portions of the mask.

5,836,304
COMPUTER SYSTEM FOR COGNITIVE REHABILITATION

Frederick J. Kellinger, 109 Priscilla Dr., Sewickley, Pa. 15143, and Marvin A. Schilder, 25 Hemlock Dr., Beaver Falls, Pa. 15010

Filed Aug. 20, 1996, Ser. No. 700,312
Int. Cl.⁶ A61B *5/00*
U.S. Cl. 128—630 **26 Claims**



1. A portable programmable data processor for mobile use by a cognitive deficient patent for administering rehabilitation therapy, said portable processor comprising:
- means for programming said portable processor from a therapist computer data processor for storing prescribed patient activity information for a patient;
- means for communicating the stored activity information on a scheduled basis to a patient for patent response;
- means for recording and storing patient response information input by a patient in response to the communicated activity information; and
- means for downloading said stored response information from said portable processor to a therapist computer data processor for analysis;
- said means for communicating including a continuously activatable signal alarm capable of providing at least one patient alarm selected from the group consisting of tactile, visual and audio alarms.

5,836,305

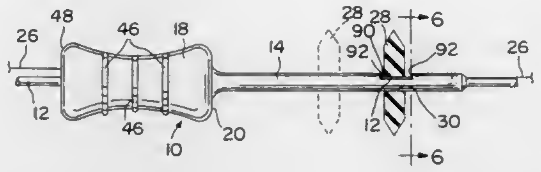
Patent Not Issued For This Number

5,836,306
EXCHANGE ACCESSORY FOR USE WITH A MONORAIL CATHETER

Patrick J. Duane; Thomas K. Fitzmaurice; James Paul Gilson, and Ronan Micheál Thornton, all of Galway, Ireland, assignors to Bard Connaught, Dublin, Ireland

Filed Dec. 23, 1994, Ser. No. 363,514
Int. Cl.⁶ A61B *5/00*
U.S. Cl. 128—772 **15 Claims**

1. In combination with a catheter, an exchange accessory for insertion into a connector of the type including a sealing member which selectively closes the connector, comprising:

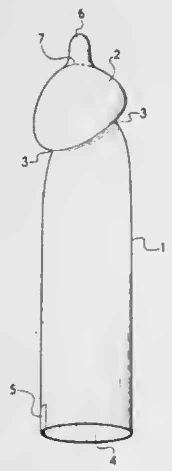


- a hollow, elongated sleeve having proximal and distal ends, the sleeve being adapted to be slidingly received within the connector and to slidingly receive the catheter,
- the sleeve having an enlarged head, and
- the sleeve further having an aperture disposed through the elongated sleeve between the proximal and distal ends, the aperture permitting selective direct engagement of the catheter and the sealing member when the sleeve is slidably positioned by the operator to align the aperture and the sealing member to thereby prevent longitudinal movement between the sleeve and catheter.

5,836,307
CONTRACEPTIVE SHEATH

Thomas Scholl, 14, Quai Kleber, F-67000 Strassbourg, France
PCT No. PCT/DE93/01214, § 371 Date Sep. 20, 1995, § 102(e) Date Sep. 20, 1995, PCT Pub. No. WO94/13231, PCT Pub. Date Jun. 23, 1994

PCT Filed Dec. 17, 1993, Ser. No. 481,427
Int. Cl.⁶ A61F *5/44*
U.S. Cl. 128—844 **12 Claims**

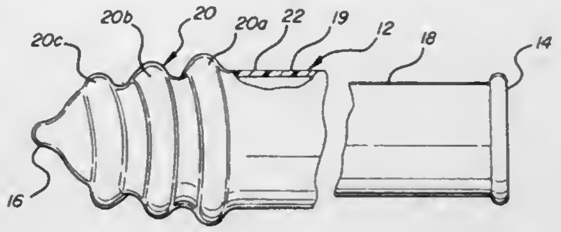


9. Prophylactic comprising
- a cylindrical, elongated, thin-walled sheath of elastic material having a closed end and an open end, said sheath being divided into two sections, which are a front section and a rear section with a border between said sections; said border being a constriction shape adjusted to the shape of a glans of a male penis, said border having a wall thickness being greater than wall thickness of the front section and the rear section;
- said border constriction shape having an enveloping curve which is a constant curve;
- said constriction shape being a reinforcement of the elastic material and being of the same material as the front section and the rear section so that the surface of the sheath extends smoothly on an inside surface and an outside surface at a transition from the front section to the rear section;
- said front section having a larger diameter than the rear section; and
- said prophylactic has a marking visible in a rolled-up condition in order to orient a user regarding the position of the constriction shape.

5,836,308
SPRING ACTION MALE CONDOM

Ravikumar Alla; Madhusudhan Alla; Raghunatha Alla, and Alla V. K. Reddy, all of 9 Webster Ct., Plainsboro, N.J. 08536

Filed Nov. 21, 1997, Ser. No. 975,619
Int. Cl.⁶ A61F *6/04*
U.S. Cl. 128—844 **6 Claims**

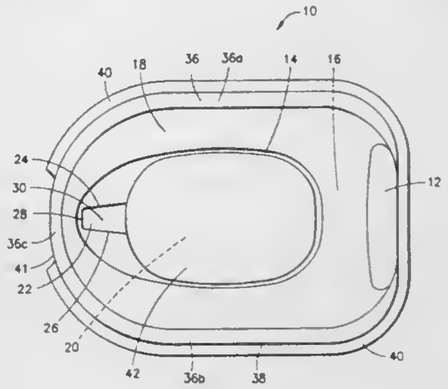


1. A method for manufacturing a male condom comprising the steps of providing a mold having an elongated cylindrical portion and an outer surface on one end thereof defining a convolution thereon defining a spring formation; dipping said mold into a liquid elastomeric material to form a thin elastic membrane having a first spring action and forming a pouch with an open end and a closed end with a tubular wall formed therebetween and including a convolution shaped in the form of the convolution on said mold and formed integrally of said tubular wall adjacent said closed end that will produce spring movement independently of the elasticity of the elastomeric material.

5,836,309
BLOOD AND OTHER BODY FLUID CONTAINMENT TRAY

Nicholas J. Webb, 5370 Basel Dr., Wrightwood, Calif. 92397

Filed Jan. 22, 1997, Ser. No. 787,381
Int. Cl.⁶ A61G *15/00*
U.S. Cl. 128—845 **20 Claims**

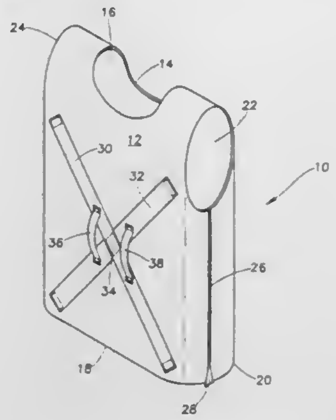


1. A containment tray, comprising:
- a) an upper rim having an opening defining an entrance portion; and
- b) an interior surface, sloping downward from said upper rim to form a cradle, and curving upward between said cradle and said entrance portion to form a support portion, said cradle having a floor surface and a drain portion, said drain portion adapted to receive a drain, and said floor surface sloping downward from said support portion to said drain portion.

5,836,310
PATIENT SUPPORTING GATE VEST

Ramona M. Winters, and Dorothy F. Hyde, both of 2730 Highway 73 South, Nekoosa, Wis. 54457

Filed Jul. 1, 1997, Ser. No. 886,500
Int. Cl.⁶ A61G *15/00*
U.S. Cl. 128—845 **8 Claims**

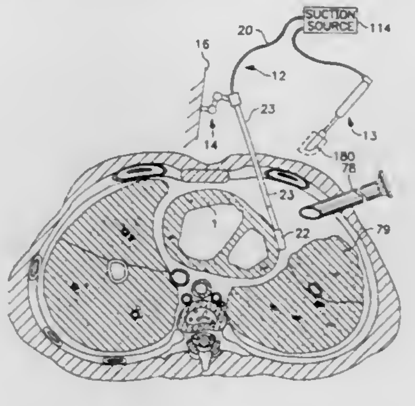


1. A single piece upper body garment having a centrally located aperture for receiving the head of the wearer, and aligned, opposed recessed areas for accepting the arms of the wearer;
- means for releasibly joining the edges along each of two sides for forming a vest like garment, having a front panel and a back panel;
- a first back panel reinforcing strip extending diagonally across the surface of the panel;
- a second back panel reinforcing strip extending diagonally across the surface of the panel transversely intersecting the first reinforcing strip;
- a pair of parallel, space apart handles attached to the first and second reinforcing strips and affording a means for stabilizing or supporting a person wearing the garment, from behind.

5,836,311
METHOD AND APPARATUS FOR TEMPORARILY IMMOBILIZING A LOCAL AREA OF TISSUE

Cornelius Borst, and Hendrious J. Mansvelt Beck, both of Bilthoven, Netherlands, assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Sep. 20, 1995, Ser. No. 531,363
Int. Cl.⁶ A61B *1/00*
U.S. Cl. 128—897 **4 Claims**



1. A method of performing open or closed chest cardiac surgery comprising:
- accessing a surface of the heart;
- positioning a first member having a first suction port on the surface of the heart;
- coupling a suction source to the suction port of the first member;

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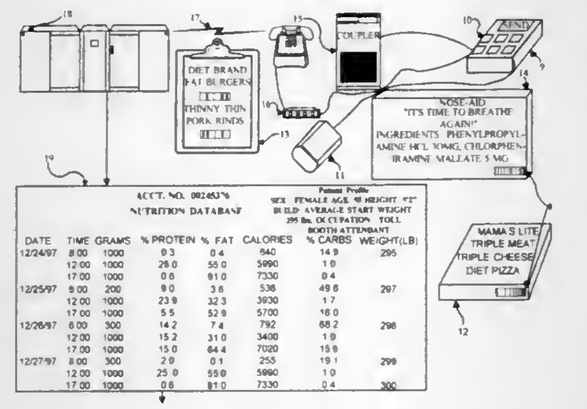
creating a suction with the suction source, the created suction then communicated to the first suction port;
grasping the surface of the heart with the suction in the first suction port; and
fixing the first member to a stationary object and performing a cardiac surgical procedure;.

5,836,312
COMPUTER-ASSISTED SYSTEM AND METHOD FOR ADJUDGING THE EFFECT OF CONSUMABLE INTAKES ON PHYSIOLOGICAL PARAMETERS

Steven Jerome Moore, 9 Sonoma Rd., Cortlandt Manor, N.Y. 10566

Filed Jan. 2, 1996, Ser. No. 581,889
Int. Cl.^{6} D61B *19/00*

U.S. Cl. 128—897 **10 Claims**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COUPLER
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SEND
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DIET BRAND FAT BURGERS
THINNY THIN PORK RINDS
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11
NOSE-AID "IT'S TIME TO BREATHE AGAIN!" INGREDIENTS PHENYLPROPYLAMINE HCL 10MG, CHLORPHENIRAMINE MALEATE 5 MG
19
ACCT. NO. 00245376
NUTRITION DATABASE
Patient Profile
SEX FEMALE AGE 40 HEIGHT 5'2" BUILD AVERAGE START WEIGHT 295 lbs. OCCUPATION TOLL BOOTH ATTENDANT
MAMA'S LITE TRIPLE MEAT TRIPLE CHEESE DIET PIZZA
12

DATE	TIME	GRAMS	% PROTEIN	% FAT	CALORIES	% CARBS	WEIGHT(LB)
12/24/97	8:00	1000	0.3	0.4	840	14.9	295
	12:00	1000	25.0	55.0	5990	1.0	
	17:00	1000	0.6	91.0	7330	0.4	
12/25/97	9:00	200	9.0	3.6	536	49.6	297
	12:00	1000	23.9	32.3	3930	1.7	
	17:00	1000	5.5	52.9	5700	16.0	
12/26/97	8:00	300	14.2	7.4	792	68.2	298
	12:00	1000	15.2	31.0	3400	1.0	
	17:00	1000	15.0	64.4	7020	15.9	
12/27/97	8:00	300	2.0	0.1	255	19.1	299
	12:00	1000	25.0	55.0	5990	1.0	
	17:00	1000	0.6	81.0	7330	0.4	300

1. A method for adjudging the effect of consumptions over a period of time on one or more physiological parameters comprising:
marking consumables with consumable identifiers to identify the consumable;
correlating said consumable identifiers with data pertaining to the contents of said consumables by data processing means;
storing said consumable identifiers coupled with the data pertaining to the contents of said consumables in a first data storage unit;
inputting said consumable identifiers into a second data storage unit upon consumption of said consumables and along with the amount of consumable consumed and the time of consumption;
transmitting the information stored in said second data storage unit to a central processing unit electronically coupled to said first data storage unit;
computationally co-processing the information stored in said first data storage unit with said information stored in said second data storage unit;
computationally resolving physiological algorithms relating one or more physiological parameters to said computationally co-processed information utilizing said computationally co-processed information;
providing a read-out of the effect of consumptions over a period on time on physiological parameters based on said computational resolution of said physiological algorithms.

5,836,313
METHODS FOR MAKING COMPOSITE HYDROGELS FOR CORNEAL PROSTHESES

Edward Perez, Cambridge; David Miller, Brookline, and Edward W. Merrill, Belmont, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.
Continuation-in-part of Ser. No. 384,378, Feb. 3, 1995, which is a continuation of Ser. No. 14,812, Feb. 8, 1993, abandoned. This application Apr. 14, 1995, Ser. No. 422,149
Int. Cl.^{6} A61B *19/00;* **A61F** *2/14*

U.S. Cl. 128—898 **9 Claims**

1. A method for making an implantable composite keratoprosthesis comprising
placing corneal tissue in a mold having a corneal implant shape,
placing in contact with the corneal tissue a biocompatible hydrogel between approximately 50 and 100 microns in thickness,
placing between the corneal tissue and hydrogel a polymerizable polymeric solution, and
polymerizing the polymeric solution to chemically bond the hydrogel to the corneal tissue to form a keratoprosthesis, wherein upon implantation the corneal tissue abuts epithelial cells surrounding the keratoprosthesis.

5,836,314
SURGICAL TREATMENT OF STRESS URINARY INCONTINENCE

Theodore V. Benderev, San Juan Capistrano; Neil H. Naves, and Mark J. Legome, both of Mission Viejo, all of Calif., assignors to Boston Scientific Technology, Inc., Maple Grove, Minn.
Continuation of Ser. No. 42,739, Apr. 5, 1993, Pat. No. 5,611,515, which is a continuation-in-part of Ser. No. 862,847, Apr. 3, 1992, abandoned, which is a continuation-in-part of Ser. No. 801,747, Dec. 3, 1991, abandoned. This application Jun. 6, 1996, Ser. No. 659,759
Int. Cl.^{6} A61B *19/00*

U.S. Cl. 128—898 **34 Claims**

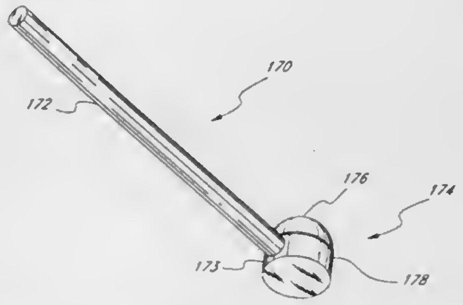
1. A method of suspending a bladder neck, comprising the steps of:
(a) securing a first suture to a first bone anchor;
(b) positioning said first anchor in a bone without exposing the bone by way of an open surgical procedure;

(c) securing said first suture to tissue generally adjacent to the bladder neck; and
(d) suspending the bladder neck with said first suture.

5,836,315
METHOD OF TENSIONING A SUSPENDED TISSUE MASS

Theodore V. Benderev, San Juan Capistrano; Neil H. Naves, and Mark J. Legome, both of Mission Viejo, all of Calif., assignors to Boston Scientific Technology, Inc., Maple Grove, Minn.
Continuation of Ser. No. 243,503, May 16, 1994, Pat. No. 5,582,188, which is a division of Ser. No. 42,739, Apr. 5, 1993, Pat. No. 5,611,515, which is a continuation-in-part of Ser. No. 862,847, Apr. 3, 1992, abandoned, which is a continuation-in-part of Ser. No. 801,747, Dec. 3, 1991, abandoned. This application Aug. 27, 1996, Ser. No. 703,900
Int. Cl.^{6} A61B *19/00*

U.S. Cl. 128—898 **22 Claims**



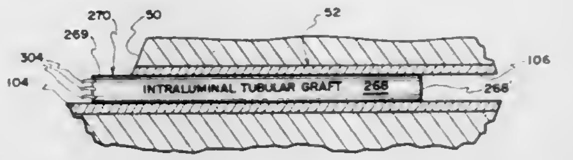
1. A method of suspending a first tissue mass from a second tissue mass with a preselected tension, comprising the steps of:
providing a suture, said suture having at least a first portion, a second portion, and a third portion, the first portion of said suture being between the second and third portions of said suture;
positioning the first portion of said suture around the first tissue mass;
securing at least one of the second and third portions of said suture to the second tissue mass;
positioning a suture tensioner having a preselected cross-sectional area between said suture and either of the first or second tissue masses;
tying the second and third portions of said suture; and thereafter removing the suture tensioner to produce an amount of slack in said suture corresponding to the cross-sectional area of the suture tensioner.

5,836,316
METHOD OF RESTORING REDUCED OR ABSENT BLOOD FLOW CAPACITY

Mark Plaia, Tigard; Vincent A. Reger, Portland, and Gregory N. Nordgren, Wilsonville, all of Oreg., assignors to EndoVascular Instruments, Inc., Vancouver, Wash.
Continuation of Ser. No. 402,795, Mar. 13, 1995, Pat. No. 5,622,188, which is a division of Ser. No. 73,002, Jun. 7, 1993, Pat. No. 5,571,169. This application Oct. 15, 1996, Ser. No. 730,420
Int. Cl.^{6} A61F *2/06;* **A61M** *29/00*

U.S. Cl. 128—898 **15 Claims**

1. A continuous, multiple procedure method of treating an artery, comprising the steps of:
providing a small arteriotomy into the artery;
removing plaque from within a segment of an artery through the small arteriotomy at least in part by performing an endarterectomy using an atherotome;

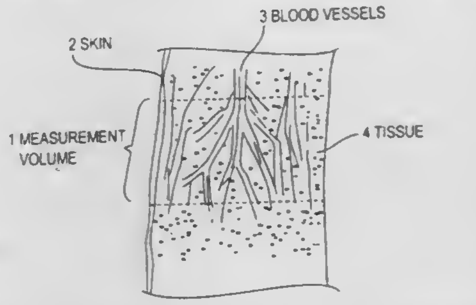


removing the atherotome from the artery through the arteriotomy;
placing an essentially non-disintegrating vascular graft and a graft grasping instrument through the arteriotomy and displacing the graft and the grasping instrument along the artery to a location within and as an internal lining for the artery at least co-extensive with the segment;
removing the grasping instrument from the artery through arteriotomy;
adhering the vascular graft within said artery at said location.

5,836,317
TRANSCUTANEOUS NON-BLOODY DETERMINATION OF THE CONCENTRATION OF SUBSTANCES IN THE BLOOD

Hermann Kunst, Treuenbrietzener Strasse 20, Berlin D-13439, Germany
PCT No. PCT/DE95/00664, § 371 Date Jan. 17, 1997, § 102(e) Date Jan. 17, 1997, PCT Pub. No. WO95/31928, PCT Pub. Date Nov. 30, 1995
PCT Filed May 19, 1995, Ser. No. 737,585
Claims priority, application Germany, May 20, 1994, 44 17 849.2
Int. Cl.^{6} A61B *19/00*

U.S. Cl. 128—898 **20 Claims**



1. A method for transcutaneous and non-bloody in vivo determination of an analyte in blood, comprising:
(a) spectroscopically generating at least one first signal corresponding to at least one analyte quantity in a region of a body and at least one second signal corresponding to at least one water quantity in the region of the body;
(b) determining the at least one analyte quantity based on the at least one first signal and determining the at least one water quantity based on the at least one second signal;
(c) calculating a concentration of the analyte in water by forming a ratio of a value related to the at least one analyte quantity and a value related to the at least one water quantity; and
(d) calculating a concentration of the analyte in blood based on the ratio.

5,836,318
PIERCING DEVICE FOR CIGARS

James C. Adams, 845 S. Winton Rd., Rochester, N.Y. 14618
Filed Jan. 6, 1998, Ser. No. 3,431
Int. Cl.^{6} A24F *13/24;* **A24C** *1/38;5/60*

U.S. Cl. 131—253 **6 Claims**

1. A cigar piercing device which includes an outer housing and a moveable top receiving and indexing station for positioning the tip

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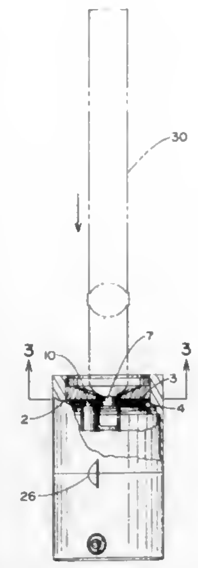
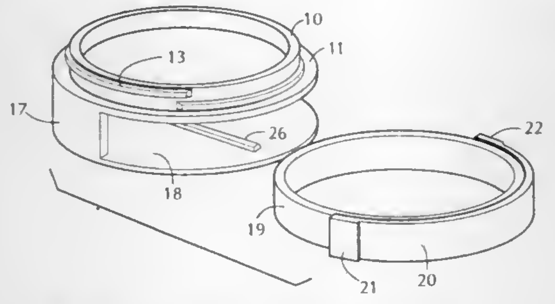


of a cigar, said indexing station is adapted to automatically activate a rotating piercing tool in response to the downward movement of the indexing station by downward pressure being placed against the station by the tip of the cigar.

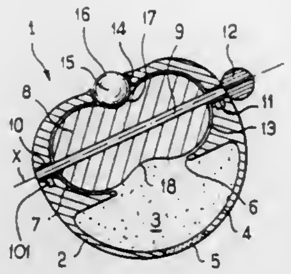
5,836,319
TAR-LIKE COSMETIC COMPACT HAVING A CYLINDRICAL PULL-OUT DRAWER
Carl M. Lombardi, 424 W. Neck Rd., Lloyd Harbor, N.Y. 11743
Filed Feb. 5, 1997, Ser. No. 795,426
Int. Cl.^{6} A45D *33/20*
U.S. Cl. 132—287 **7 Claims**



1. A jar-like travel cosmetic compact comprising:
- A. an upper section having an open top cylindrical shell accommodating a cosmetic, and a screw-on circular lid to enclose the shell;
- B. a lower section integral with the upper section and defining a cylindrical chamber having a semi-circular opening to admit a cylindrical pull-out drawer; and
- C. a cylindrical pull-out drawer containing a mirror affixed to a bottom of said drawer and an applicator for the cosmetic insertable through said opening into said chamber.

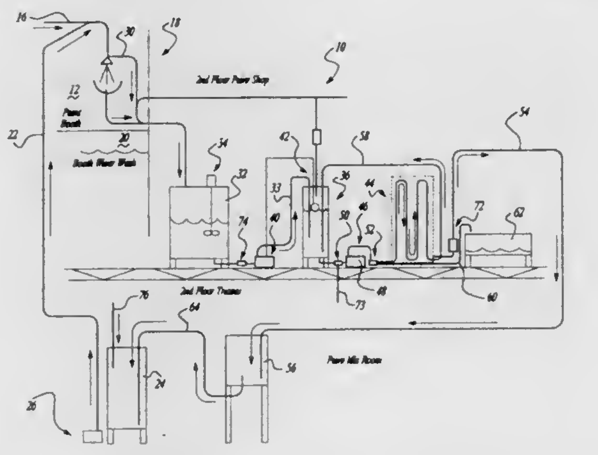
5,836,320
DEVICE FOR PACKAGING AND APPLYING A COSMETIC
Jean-Louis Gueret, Paris, France, assignor to L'Oreal, Paris, France
Filed May 13, 1996, Ser. No. 644,296
Claims priority, application France, May 16, 1995, 95 05771
Int. Cl.^{6} A45D *40/26*
U.S. Cl. 132—317 **15 Claims**

1. A device for packaging and applying a cosmetic, the device comprising a housing suitable for containing said cosmetic, an



applicator element for applying said cosmetic, and transfer means for feeding the applicator element with cosmetic taken from inside the housing, said transfer means including a coating roller rotatably mounted inside the housing, said roller having a region of its surface that is in contact with the applicator element and that is exerting contact pressure thereon, and a region of its surface that is in contact with the cosmetic contained in the housing, rotation of the roller conveying a coating of cosmetic between said regions for transfer to the applicator element because of said contact pressure, wherein the coating roller is secured to drive means accessible to the user outside the housing.

5,836,321
PROCESS OF RECYCLING A WATER LADEN SOLVENT WHICH WAS USED TO PURGE A POINT SUPPLY LINE OF A PAINT SPRAYER
Donald E. Kaneski, Fenton, and David R. Powell, Kirkwood, both of Mo., assignors to Chrysler Corporation, Auburn Hills, Mich.
Filed Apr. 7, 1997, Ser. No. 835,369
Int. Cl.^{6} B08B *7/04*
U.S. Cl. 134—10 **3 Claims**



1. A method of recycling a water ladened solvent used for purging a paint supply line of a paint sprayer, comprising the steps of:

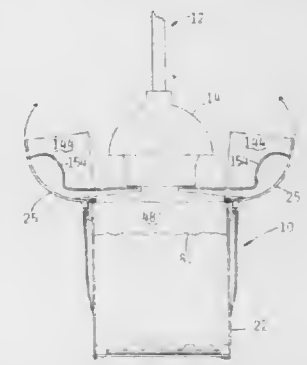
purging a paint supply line with water ladened solvent;
collecting purged material including a mixture of water ladened solvent and paint;
agitating said purged material within a vessel for preventing settlement of paint within said vessel;
filtering said purged material for separating said water ladened solvent and said paint;
collecting said water ladened solvent separated from said purged material; and
purging said paint supply line using water ladened solvent separated from said purged material.

3. A method of recycling a water ladened solvent used for purging a paint supply line of a paint sprayer, comprising the steps of:

(a) purging a paint supply line with water ladened solvent;

(b) collecting purged material including a mixture of water ladened solvent and paint in a vessel;
(c) filtering said purged material for separating said water ladened solvent from said purged material;
(d) recycling remaining purged material from said filtering step to said vessel;
(e) repeating steps (c) and (d) until a desired amount of water ladened solvent is removed from said purged material;
(f) collecting said water ladened solvent separated from said purged material; and
(g) purging said paint supply line using water ladened solvent separated from said purged material.

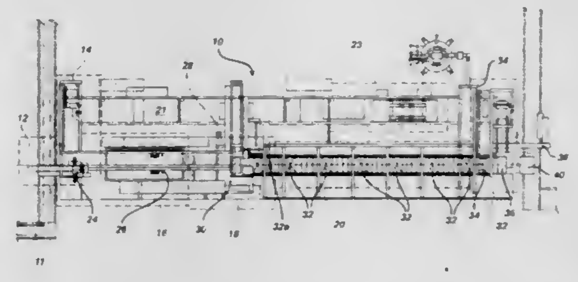
5,836,322
STORAGE AND CLEANING UNIT FOR A TOILET PLUNGER
Nancy G. Borger, and Gary A. Borger, both of 5001 Packer Dr., Wausau, Wis. 54401
Filed May 7, 1997, Ser. No. 852,805
Int. Cl.^{6} B08B *7/00;* B65D *83/00*
U.S. Cl. 134—42 **22 Claims**



21. A method for opening and closing a toilet plunger storing and cleaning device, using a toilet plunger having a handle with opposed end, and a cup disposed at one end thereof and having a sidewall terminating in a cup end wall,

said method comprising the steps of:
(a) opening a device having (i) an open-topped container having an interior, (ii) a lid thereto having two lid-halves and a hole therethrough, (iii) a hinge mechanism connecting each said lid-half to said container, and (iv) an internal closure mechanism disposed within said lid and adjacent said hole; said hole penetrating said two lid-halves; each said lid-half having an interior surface, an exterior surface, and a tab extending from said exterior surface; said internal closure mechanism having a curved portion for engaging the side wall of the cup of the toilet plunger and a linear portion for engaging the end wall of the cup of the toilet plunger; by depressing each said tab of said lid-halves causing each said lid-halves to pivot about said hinge mechanism to open and expose said interior of said container;
(b) lowering the toilet plunger into said interior of said container;
(c) engaging the end wall of the cup of the toilet plunger against said linear portion, causing said lid-halves to pivot shut to close said device;
(d) resting the end wall of the cup of the toilet plunger in said container and enclosing both the cup of the toilet plunger and a portion of the handle of the toilet plunger and wherein a remainder of the handle protrudes through said hole in said lid;
(e) grasping the handle and pulling the handle toward said lid-halves; and
(f) engaging the side wall of the cup of the toilet plunger against said curved portion, causing said lid-halves to pivot open to open said device.

5,836,323
AUTOMATED METHOD AND APPARATUS FOR HYDRATING SOFT CONTACT LENSES
Darren Scott Keene; Timothy Patrick Newton; Daniel Tsu-Fang Wang; David Dolan, all of Jacksonville, Fla.; Kiyoshi Imai, Urawa; Katsuaki Yoshida, Honzyo, both of Japan; Svend Christensen, Allinge, Denmark; Finn Thrige Andersen, Vedback, Denmark; Ture Kindt-Larsen, Holte, Denmark; Kaj Bjerre, Vallensback Strand, Denmark; Junichi Fukuchi, Toyko, Japan; David Byram, Bunnell, and Gary Hall, Jacksonville, both of Fla., assignors to Johnson & Johnson Vision Products, Inc., Jacksonville, Fla.
Continuation-in-part of Ser. No. 432,935, May 1, 1995, Pat. No. 5,640,980, which is a continuation-in-part of Ser. No. 258,556, Jun. 10, 1994, Pat. No. 5,476,111. This application May 7, 1996, Ser. No. 643,965
Int. Cl.^{6} B08B *3/04*
U.S. Cl. 134—58 R **41 Claims**



1. An automated apparatus for hydrating a molded hydrophilic contact lens, said automated apparatus comprising:
(a) a first robotic assembly for removing a plurality of contact lens molds from a carrier, each mold having a contact lens therein, and assembling said molds with a mold carrier and a plurality of lens transfer means to form a first hydration carrier;
(b) a second robotic assembly for immersing said first hydration carrier in a hydration bath to hydrate the lens and release said lens from said mold, and to allow said lens to transfer from said mold to said lens transfer means; said second robotic assembly removing said first hydration carrier from said bath after a predetermined time;
(c) a transport for transporting said first hydration carrier through said hydration bath;
(d) a third robotic assembly for removing said molds from said lens transfer means and transporting said lens transfer means and said lenses to a subsequent processing station.

5,836,324
VENT SEAL ARRANGEMENT
Thomas M. Johnson, and Brian L. Ness, both of Jackson, Tenn., assignors to Maytag Corporation, Newton, Iowa
Filed Jul. 21, 1997, Ser. No. 897,818
Int. Cl.^{6} A47L *15/48*
U.S. Cl. 134—58 D **20 Claims**

1. A vent seal for selectively sealing a vent outlet opening extending through a door of a dishwasher, comprising:
an elongated flexible strip adapted to mount adjacent to and generally registered with the vent outlet opening, the strip normally being disengaged from the vent outlet opening such that the vent outlet opening is open; and

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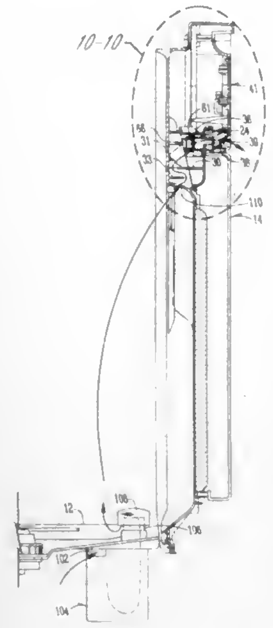
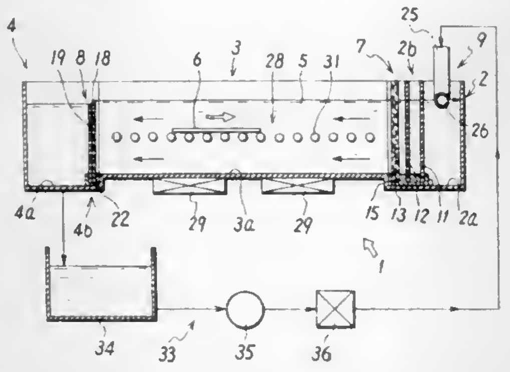


the strip being deflectable so as to sealingly engage and thereby close the vent outlet opening.

5,836,325
RUNNING WATER TYPE WASHING MACHINE

Shigeo Akanuma, and Masashi Fujii, both of Ayase, Japan, assignors to Speedfam Clean System Co., Ltd., Ayase, Japan
Filed Sep. 16, 1996, Ser. No. 714,382
Claims priority, application Japan, Feb. 20, 1996, 8-056977
Int. Cl.^{6} B08B *3/04*
U.S. Cl. 134—183 **5 Claims**

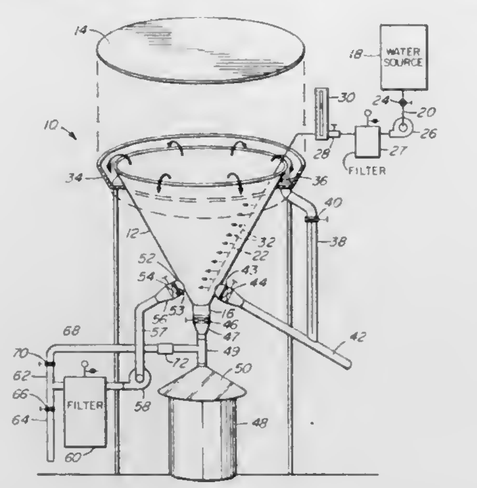


1. A running water type washing machine with a washing vessel defining a flow passage of a wash liquid from a liquid feed section to a liquid discharge section via an intermediate washing section for washing work in submerged state under streams of said wash liquid from said liquid feed section, and upstream and downstream flow regulation means located across the flow passage in said liquid feed and liquid discharge sections, respectively, for regulating the flow of said wash liquid, characterized in that:

said downstream flow regulation means is constituted by a pair of first and second regulator plates containing plural water passage apertures of identical constructions with an adjustable open area, said regulator plates being located across said flow passage in an overlapped state and adjustably relative to the other in the vertical direction.

5,836,326
BEAD CLEANSING SYSTEM

Guy William Inkster, Vernon, Canada, assignor to Clearly Canadian Beverage Corporation, Vancouver, Canada
Filed May 8, 1997, Ser. No. 853,327
Int. Cl.^{6} B08B *3/04*
U.S. Cl. 134—198 **6 Claims**

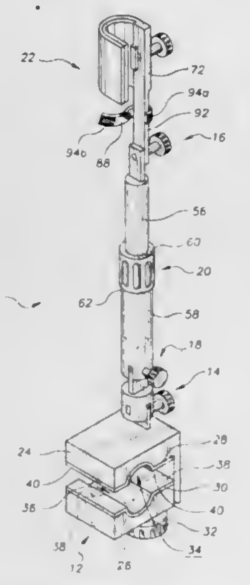


1. Apparatus for cleaning a suspension of fragile beads having a high water content suspended in a preservative, comprising:

a cleansing vat for holding a quantity of said suspension, said vat having a top portion and said top portion having discharge means;
flow nozzles in the cleansing vat to induce turbulence in said vat whereby to clean the beads and to cause flawed beads to rise to the top of the suspension and to be discharged by said discharge means;
means for removing the preservative from said vat and cleaning said preservative;
means for combining the contents of said vat and said cleaned preservative.

5,836,327
UMBRELLA HOLDER

Gary A. Davis, 203 London La., Glenn Heights, Tex. 75154
Filed Aug. 5, 1997, Ser. No. 906,577
Int. Cl.^{6} A45B *3/00*
U.S. Cl. 135—16 **18 Claims**

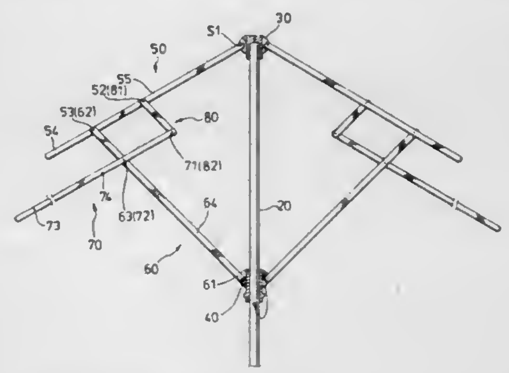


1. A umbrella holder comprising:
a clamp mechanism;

a right/left angular adjustment mechanism;
a forward/rearward angular adjustment mechanism;
a length adjustment mechanism; and
an umbrella shaft and handle securing mechanism;
said clamp mechanism including an upper and lower jaw member, an upper and lower resilient clamp pad, and a clamp screw mechanism, each said upper and lower jaw member being provided with a clamp channel that is covered with said upper or lower resilient clamp pad, respectively;
said left/right and forward/rearward angular adjustment mechanisms each including a fork member pivotally mounted on a central pivot member that includes a screw mechanism that can be tightened to secure said fork member and said central pivot member together at a desired angle;
said length adjustment mechanism including a telescoping assembly including a rod member slidably disposed within a tubular member, and a compression fitting fitted about said tubular member to compress said tubular member about said rod member and hold said rod member in fixed relationship to said tubular member;
said umbrella shaft and handle securing mechanism including a shaft channel clamp and a handle strap assembly positioned below said shaft channel clamp, said shaft channel clamp including a channel member having an elongated channel that is covered with resilient padding and sized to receive therein a portion of a shaft of an umbrella and a compression member, rotatably connected to a shaft clamp screw mechanism, positioned within said elongated channel, rotation of said clamp screw mechanism causing said compression member to move against an opposed sidewall that partially defines said elongated channel.

5,836,328
GARDEN UMBRELLA WITH UPPER AND LOWER SUPPORT RIBS

Henry Lee, 10F-1, No. 303, Sec. 3, Chung-Hsiao E. Rd., Taipei City, Taiwan
Filed Mar. 25, 1998, Ser. No. 47,668
Int. Cl.^{6} A45B *19/12*
U.S. Cl. 135—25.2 **5 Claims**



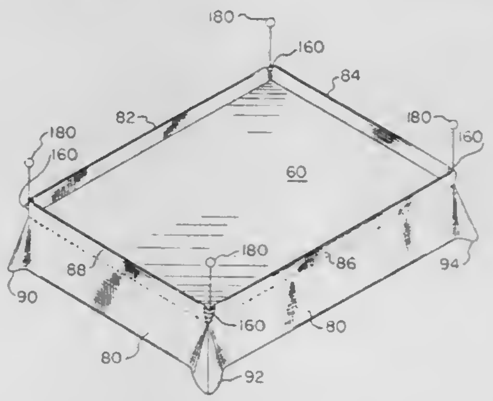
1. A garden umbrella comprising:
an upright pole having a top end which is provided with a rib holder;
a plurality of upper support ribs, each of which has a first proximate end pivotally attached to said rib holder, a first distal end, and a first intermediate portion between said first proximate end and said first distal end;
a runner slidably sleeved on said pole;
a plurality of stretchers, each of which has a second proximate end pivotally attached to said runner, a second distal end pivotally attached to said first intermediate portion adjacent to said first distal end of the corresponding one of said first support ribs, and a second intermediate portion between said second proximate end and said second distal end;
a plurality of lower support ribs, each of which has a third proximate end relative to said rib holder, a third distal end, and a third intermediate portion between said third proximate end and said third distal end, said third intermediate portion being pivotally attached to said second intermediate portion of the corresponding one of said stretchers; and
a plurality of connecting rods, each of which has an upper end pivotally attached to said first intermediate portion of the corresponding one of said upper support ribs adjacent to said first proximate end, and a lower end pivotally attached to said third proximate end of the corresponding one of said lower support ribs.

5,836,329

Patent Not Issued For This Number

5,836,330
SUSPENDED OVERHEAD CANOPY ASSEMBLY AND METHOD THEREFORE

Linsey Franklin, 1340 Marshall St., Boulder, Colo. 80302
Filed Nov. 2, 1995, Ser. No. 552,137
Int. Cl.^{6} E04H *15/04*
U.S. Cl. 135—90 **6 Claims**



1. A ceiling suspended canopy comprising:
a fabric canopy cover having two ends and two sides, each end and side having pockets on the top side of said canopy cover;
a plurality of suspension frame members adjustable in length for insertion into said pockets;
connection members for joining said suspension frame members together to form a suspension frame; and
suspension means for suspending said suspension frame members and said canopy cover frame from a ceiling.

5,836,331
VENTILATING DEVICE

Bengt Grahn, Abmorvägen 47, S-930 86 Moskosel, Sweden
PCT No. PCT/SE92/00208, § 371 Date Dec. 30, 1994, § 102(e) Date Dec. 30, 1994, PCT Pub. No. WO92/18728, PCT Pub. Date Oct. 29, 1992
PCT Filed Apr. 2, 1992, Ser. No. 129,043
Claims priority, application Sweden, Apr. 9, 1991, 9101048
Int. Cl.^{6} E04H *15/16*
U.S. Cl. 135—94 **13 Claims**

1. A tent having a tent cloth (**4**) and a framework forming a roof top (**8**) having an apex, and a place for an open fire (**6**) under said roof top, the tent cloth (**4**) having an upper boundary (**12**) at a distance below the apex of said roof top, so that an opening (**9**) for discharging flue gases (**7**) coming from a fire is formed at the roof top, said roof top of the tent being substantially cone-shaped, the tent comprising a flue gas fly (**13**) of flexible cloth arranged in the flue gas opening, said flue gas fly arranged, in a first position substantially closing the flue gas opening, to have a shape of an

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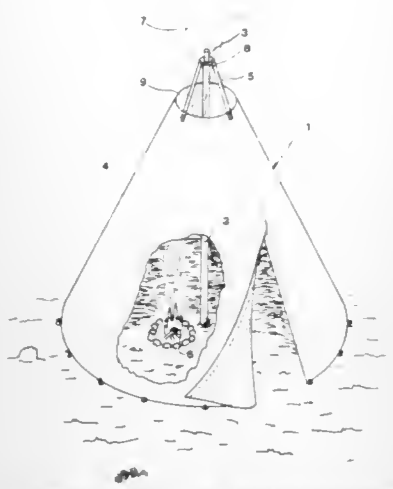
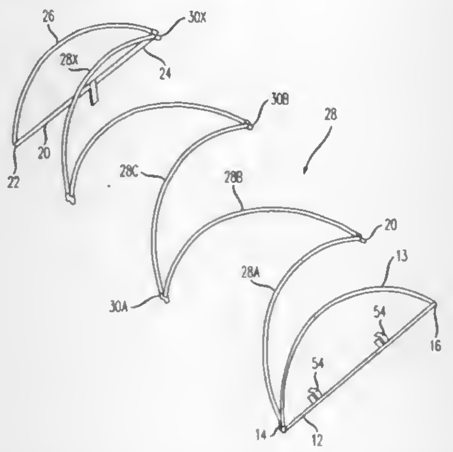


unbroken cone having a lower edge and a top having an apex, the apex of the flue gas fly being arranged at the apex of the roof top and supported by said framework, characterized in that the tent having means (**16**, **17**, **19**) for regulating the closing degree of the flue fly (**13**), said means comprising at least one traction transmitting element (**16**) connected to the lower edge of the flue gas fly cone and having a part extending upwardly to a region of the top of said cone and then extending downwardly, said traction elements being arranged so that pulling downwardly on the part extending downwardly from the top of the cone pulls the lower edge of the cone upwardly so as to set at least a part of the flue gas opening (**9**) free from the flue gas fly (**13**).

5,836,332
SHOPPING CART CANOPY

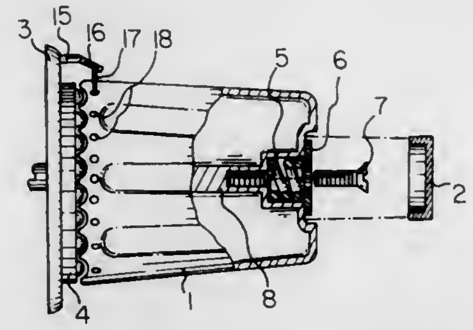
James Mick, 713 Bismarck St., Toms River, N.J. 08757
Filed Sep. 8, 1997, Ser. No. 925,057
Int. Cl.⁶ E04H *15/36*
U.S. Cl. 135—124 **5 Claims**



1. A shopping cart canopy comprising:
a frame said frame having a first transverse member having a first end and a second end and having a first fixed arc member secured to said first end and said second end;
a second transverse member having a first end and a second end and having a second fixed arc member secured to said first end and said second end;
a plurality of resilient, flexible arc members disposed between said first transverse member and said second transverse member, and said flexible resilient arc members coupled at the ends thereof in staggered formation, one end of one of said plurality of said resilient flexible arc members secured to one of said ends of said first transverse member and one of said ends of one of said plurality of resilient flexible arc members secured to one of said ends of said second transverse member;
a cover supported by said first fixed arc member, said second fixed arc member, and said flexible resilient arc members disposed therebetween, said first fixed arc member, said second fixed arc member and said flexible resilient arc members being secured within seams of said cover, said first transverse member and said first fixed arc member and said second transverse member and said second fixed arc member moveable in parallel relationship to each other so as to collapse said shopping cart canopy or extend said shopping cart canopy over a shopping cart.

5,836,333
CLICKER FAUCET

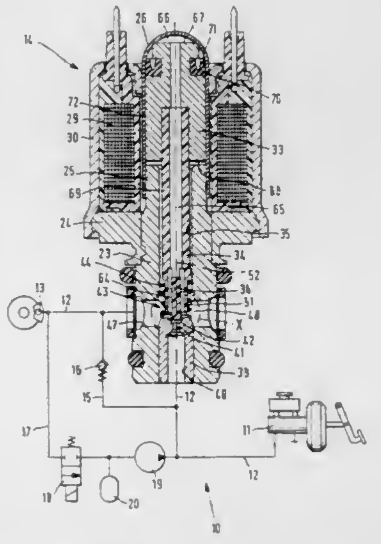
Kenneth B. Haynes, 5215 3rd Ave., W., Bradenton, Fla. 34209
Filed Sep. 27, 1996, Ser. No. 720,404
Int. Cl.⁶ F16K *37/00*
U.S. Cl. 137—1 **15 Claims**



12. A method for controlling the water temperature and flow rate of water exiting from faucets and shower heads and for blocking inadvertent rotation of the faucet handle connected to said faucets and shower heads which is used for adjustment of said exiting water, said method comprising the steps of
providing an essentially planar clicker mechanism having a perimeter surface with uniformly spaced and configured protrusions thereon, a handle having a lower surface configuration complementing said non-flat perimeter surface, a hinge, a cover plate, a plate, a post, and a water control valve;
forming a hole centrally in said cover plate;
placing the valve stem of said water control valve through said hole so that said cover plate is axially aligned with said valve stem;
connecting one end of said hinge to said cover plate in a position adjacent to the outside perimeter of said cover plate;
connecting the other end of said hinge to one of the opposite ends of said plate;
connecting the other of said opposite ends of said plate to one end of said post;
positioning said clicker mechanism against said cover plate so that said protrusions face away from said cover plate;
connecting said handle to said valve stem so that said lower surface configuration of said handle interacts with said protrusions of said clicker mechanism to produce audible and tactile clicking sensations when said handle is rotated and which also allows one pre-established incremental increase and decrease of water flow into said faucet and shower head for each one of said clicking sensations produced; and
also connecting said handle so that the distal end of said post can be rotated into one of many indentations in the outside surface of said handle to block inadvertent rotation of said handle once a desired water temperature setting is achieved.

5,836,334
ELECTROMAGNETICALLY ACTUATED VALVE FOR SLIP-CONTROLLED HYDRAULIC BRAKE SYSTEMS IN MOTOR VEHICLES

Norbert Mittwollen, Markgroeningen; Wolfgang Maisch, Schwieberdingen; Martin Oehler, Leingarten; Guenther Hohl, and Hans-Peter Huebner, both of Stuttgart, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany
PCT No. PCT/DE95/00437, § 371 Date Jan. 27, 1997, § 102(e) Date Jan. 27, 1997, PCT Pub. No. WO95/28305, PCT Pub. Date Oct. 26, 1995
PCT Filed Mar. 30, 1995, Ser. No. 722,198
Claims priority, application Germany, Apr. 13, 1994, 44 12 648.4
Int. Cl.⁶ F16K *31/06;* **B60T** *8/36*
U.S. Cl. 137—1 **9 Claims**

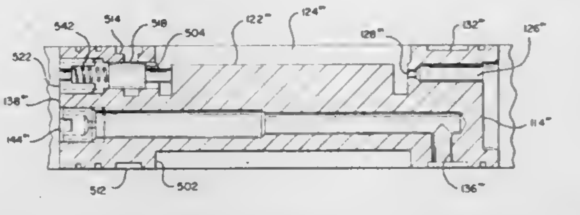


9. A method for switching an electromagnetically actuated valve (**14**) in a slip-controlled hydraulic brake system (**10**) of a motor vehicle which comprises disposing the valve between a master cylinder (**11**) and a wheel brake cylinder (**13**) in a brake line (**12**), and upon slip control for brake pressure reduction in the wheel brake cylinder (**13**) moving the valve into a closing position by applying current to a magnet coil (**29**) which applies a magnetic force on an armature, while in the currentless state, the valve can be moved into its open position for brake pressure buildup, moving the valve (**14**) out of its closing position into a further-reduced, partly closed position by applying a modified, movable current to a magnet coil (**29**) with a current of low constant height or with a medium-frequency or high-frequency pulsed current that is lower than a current for closing the valve (**14**), and simultaneously applying a hydraulic force onto the armature, whereby the magnetic force and the hydraulic force act counter to a spring force of a restoring spring (**44**).

5,836,335
PROPORTIONAL PRESSURE CONTROL VALVE

Louis C. Harms, Evanston, and Zilek Liberfarb, Morton Grove, both of Ill., assignors to Fluid Power Industries, Inc., Lincolnshire, Ill.
Continuation of Ser. No. 426,647, Apr. 21, 1995, abandoned, which is a continuation of Ser. No. 34,188, Mar. 22, 1993, abandoned, which is a continuation of Ser. No. 747,131, Aug. 19, 1991, abandoned. This application Feb. 8, 1996, Ser. No. 598,285
Int. Cl.⁶ F15B *13/043*
U.S. Cl. 137—14 **9 Claims**

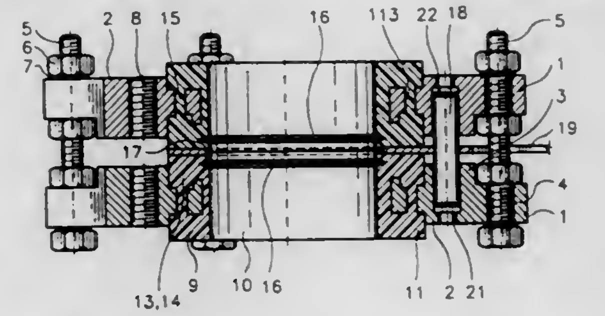
7. A method for operating a proportional pressure control cartridge valve comprising the steps of:



supplying pressurized hydraulic fluid to a pump formed through a wall of a hollow cage;
supplying a flow of hydraulic fluid from the pump port to an electromagnetically operated pilot valve through a pilot valve supply passage formed in a spool;
supplying a regulated control pressure of fluid to a control pressure chamber within the cage which control pressure is regulated by an electrical control signal applied to the electromagnetically operated pilot valve proportional pressure control valve, the control pressure chamber including a control pressure surface located on the spool, the spool fitting snugly within the hollow cage and being moveable therein, said control pressure applied to the control pressure surface urging the spool to move relative to the cage to a position in which the spool allows a flow of hydraulic fluid to pass between the pump port in the wall of the cage to a clutch port also formed through the wall of the cage while simultaneously obstructing any flow of hydraulic fluid between the clutch port and a tank port also formed through the wall of the cage;
supplying a feedback pressure of fluid from the clutch port to a feedback pressure chamber within the cage, the feedback pressure chamber including a feedback pressure surface on the spool, said feedback pressure applied to the feedback pressure surface urging the spool to move relative to the cage to a position in which the spool obstructs any flow of hydraulic fluid between the pump port and the clutch port while simultaneously allowing a flow of hydraulic fluid to pass between the clutch port and the tank port;
restraining the rate at which fluid may flow between the clutch port in the cage and the feedback pressure chamber; and
relieving any abnormally high pressure that occurs in the clutch port in response to a difference in hydraulic fluid pressure between the clutch port and the control pressure chamber.

5,836,336
CUT-OFF DIAPHRAGM GATE VALVE

Henryk Warzecha, ul. 1-szego Maja 88, 32-332 Bukowno, Poland
Filed Jun. 19, 1997, Ser. No. 879,001
Int. Cl.⁶ F16R *1/18*
U.S. Cl. 137—15 **16 Claims**



16. A method of producing a cut-off gate valve comprising the steps:
forming a first annular member having an inner part and having an outer part together with first attachment means disposed in the first outer part of the first annular member;
casting a first annular gasket having a first outer part, a first inner cylindrical surface with a first inner end and a first outer end, wherein the first inner part of the first annular member is

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embedded in the first outer part of the first annular gasket together with a first sealing lip disposed at the first inner end of the of the first annular gasket;

forming a second annular member having a second inner part and having a second outer part together with second attachment means disposed in the second outer part of the second annular member;

casting a second annular gasket having a second outer part, a second inner cylindrical surface with a second inner end and a second outer end, wherein the second inner part of the second annular member is embedded in the second outer part of the second annular gasket together with a second sealing lip disposed at the second inner end of the of the second annular gasket;

placing a diaphragm, having a hinge opening disposed surrounding the hinge pin, and disposed between the first inner end of the first annular gasket and the second inner end of the second annular gasket, and having a cylindrical opening disposed such that in a first position of the diaphragm the cylindrical opening is aligned with the first sealing lip and with the second sealing lip so as to allow a flow through a circular opening defined by the first sealing lip and the second sealing lip and such that in a second position of the diaphragm a solid plate is disposed between the first sealing lip and the second sealing lip such as to prevent a flow through a circular obstruction formed by the diaphragm between the first sealing lip and the second sealing lip;

attaching a fixed hinge pin between the first annular member and the second annular member and aligning in parallel to a common axis of the first annular gasket and of the second annular gasket;

holding the first annular member together at a defined distance relative to the second annular member with joining means attached to the first attachment means and to the second attachment means such that the first sealing lip engages the second sealing lip in an open position of the valve such that a flow can pass through an interior open space of the first annular gasket and through an interior open space of the second annular gasket.

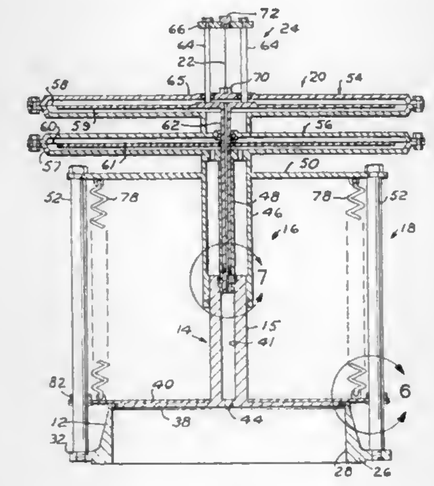
5,836,337
LARGE DIAMETER LOW PRESSURE RELIEF VALVE

Julian S. Taylor, 8300 SW. 8th St., Oklahoma City, Okla. 73128

Filed Nov. 17, 1997, Ser. No. 971,910

Int. Cl.^{6} F16K *17/14*

U.S. Cl. 137—70 **4 Claims**



1. A low pressure relief valve, comprising:

a valve body adapted to be connected with a fluid containing member,

said body having a fluid passageway and a valve seat in the passageway communicating with fluid in said member;

a valve having a tubular stem sealing with the seat and normally closing the passageway;

posts on said valve body supporting a valve guide plate in spaced relation with respect to said valve;

spring means interposed between said valve guide plate and said valve for biasing said valve toward a passageway open position;

coaxial sleeve means axially extending though and supported by said guide plate for telescopically receiving and entering said valve stem;

superposed diaphragm housing means axially supported by said sleeve means opposite the valve;

diaphragm means dividing each diaphragm housing to form upper and lower compartments on respective sides of the diaphragm means and including a tubular diaphragm stem extending from the uppermost diaphragm means into said valve stem for providing fluid communication between said fluid containing member and the respective said upper diaphragm compartment;

pin cage means including standards slidably projecting through the top surface of the uppermost diaphragm housing and secured to the uppermost diaphragm means opposite the valve and supporting a collapsible pin interposed between the pin cage means and the surface of the adjacent diaphragm housing;

latch means in the valve stem engaging the sleeve means for maintaining the valve seated;

whereby fluid pressure exceeding a predetermined value in the diaphragm housing opposite the valve moves the diaphragm means toward the valve simultaneously collapsing the collapsible pin and releasing the latch means allowing said spring means to unseat the valve and open the passageway.

5,836,338
THERMAL SAFETY DEVICE FOR AUTOMATICALLY SEALING CONDUITS

Klaus Schulze, Gernrode, Germany, assignor to Mertik Maxitrol GmbH & Co., KG, Germany

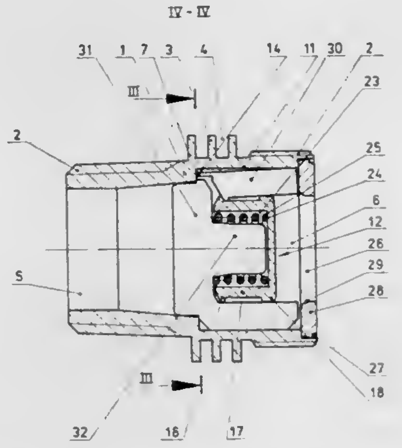
PCT No. PCT/EP95/02175, § 371 Date Dec. 20, 1996, § 102(e) Date Dec. 20, 1996, PCT Pub. No. WO96/00357, PCT Pub. Date Jan. 4, 1996

PCT Filed Jun. 7, 1995, Ser. No. 765,376

Claims priority, application Germany, Jun. 24, 1994, 44 22 241.6

Int. Cl.^{6} F16K *17/14*

U.S. Cl. 137—75 **14 Claims**



1. A thermal safety device for automatically sealing fluid conduits in response to excessive temperatures comprising:

a housing having a fluid towpath therethrough and a seat at one end thereof, a closure member movably disposed within said housing, said closure member including a notch in a sidewall portion thereof,

a biasing spring within said housing, said biasing spring being operative to urge said closure member into sealing engagement with said seat,

a generally U-shaped component pivotably disposed within said fluid flowpath in said housing so as to have a minimal interference with said fluid flow, said component including a portion received within said notch on said closure member whereby said component is operative to retain said closure member in spaced relationship to said seat,

a meltable body disposed on an inner sidewall of said housing, said meltable body being operative to retain said portion of said component within said notch, said meltable body melting when said housing is subjected to an excessive temperature thereby allowing said portion to pivot out of said notch and said closure member to move into engagement with said seat to close off said fluid flowpath.

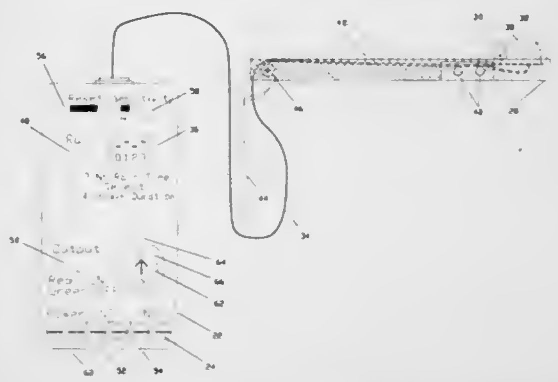
5,836,339
RAINDROP COUNTER AND CONTROL SYSTEM FOR IRRIGATION SYSTEMS

David L. Klever, 2400 Lakeview Ave. #1, Richmond, Va. 23220, and M. Thomas Craigo, 8753 Signal Hill Rd. #4, Manassas, Va. 20110

Filed Dec. 31, 1996, Ser. No. 774,407

Int. Cl.^{6} F16K *31/02*

U.S. Cl. 137—78.2 **3 Claims**



1. A raindrop counter and control system for overriding a plurality of automated devices requiring the ability to detect the presence, subsequent absence, and duration of precipitation, which comprises:

(a) An outdoor rain sensor containing a single pair of opposing mounted Infrared (IR) emitter and detector connected to a separate control unit via a multi-conductor cable such that the emitter receives power from the control unit via a conductor, and a separate conductor connected to the collector of the IR detector sends a signal back to the control unit,

(b) a separately mounted control unit connected to said outdoor probe which supplies a current limited voltage through resistor **R4** to the IR emitter which produces a beam of IR light which will be detected by the IR detector thus creating a control voltage on the collector pin of the detector which is connected, via a conductor within the multi-conductor cable, to the input pin of comparator **U1***a* through capacitor **C6**.

(1) the control signal also being tied to resistor **R1**, the opposite end of resistor **R1** being tied to the reference input of comparator **U1***a*, which is then held steady by capacitor **C2**, whereby, any quick positive change in the input voltage of comparator **U1***a* will be detected resulting in a logic-low pulse on the output of the comparator.

(2) the offset voltage between the input pin and reference pin of comparator **U1***a* being selectable via the switched resistor network of resistors **R2** and **R3** allowing selectable levels of sensitivity.

(3) the output of comparator **U1***a* being tied to the trigger pin of timer **U2***a*, where a logic-low pulse will trigger the timer and supply a logic-high pulse to the output of timer **U2***a* for approximately 100 mS, the duration being determined by the time constant set by resistor **R11** and capacitor **C4**.

(4) the output of timer **U2***a* being tied to the set pin of DFF **U3***a*, where a logic-high pulse will result in a logic-high being applied to the Q output of DFF **U3***a* causing timer **U2***b* to begin a timing cycle of approximately 60 seconds, determined by the time constant of resistors **R8**, **R9**, and capacitor **C3**.

(5) the output of timer **U2***b* is tied to the input pins of an inverter created with NAND gate **U7***a*, where a logic-high will apply a logic-low to the output of the inverter removing the reset signal applied to counter **U4***a*, thus enabling the counter.

(6) the output of timer **U2***a* is also tied to the clock pin of counter **U4***a*, which, once enabled by the removal of the reset signal from inverter **U7***a*, will begin counting the number of raindrops.

(c) contain an electronic control circuit having the means to use the number of counted raindrops to detect the presence of precipitation, the subsequent absence of precipitation, determine the duration of detected precipitation.

(d) contain circuitry to provide visual display of both the active or passive status of the unit and the detection of individual raindrops, and allow selection of the output mode of the unit, either logic-level, normally open (N.O.), or normally closed (N.C.).

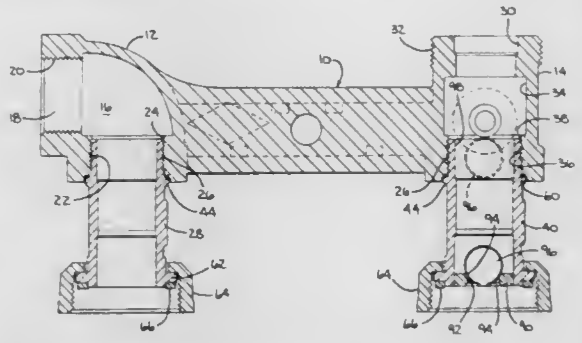
5,836,340
AUXILIARY GAS CONNECTION FOR METER SETS

Joseph L. Daghe, Dubuque, Iowa, and John Eckel, Hazel Green, Wis., assignors to A. Y. McDonald Mfg. Co., Dubuque, Iowa

Filed Jan. 19, 1996, Ser. No. 588,206

Int. Cl.^{6} F16K *43/00*

U.S. Cl. 137—112 **13 Claims**



1. A meter bar assembly comprising:

an elongated casting;

spaced, threaded inlet and outlet ports in said casting;

two spaced, threaded swivel receiving ports in said casting and opening to a common side of said casting, one connected to said inlet port and the other connected to said outlet port;

a shoulder in each of said swivel receiving ports;

an auxiliary port in said casting and in fluid communication with said outlet port;

a cylindrical tube in said auxiliary port and extending into said casting to provide a mechanical barrier between said outlet port and said other swivel port, said barrier allowing fluid to pass from said other swivel port to said outlet port;

a closure for said tube;

a first valve seat within said tube;

a first spherical valve member within said tube;

a pin extending across said tube in spaced relation to said first valve seat for confining said first valve member within said tube in a position to open and close against said first valve seat;

a pair of swivel tubes, one threaded in each swivel port, each swivel tube including a stop surface abutted against the shoulder of the associated swivel port;

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the swivel tube in said another swivel port, at its end remote from said another swivel port, including an interior passage of relatively precise dimensions;

a second valve seat in said interior passage;

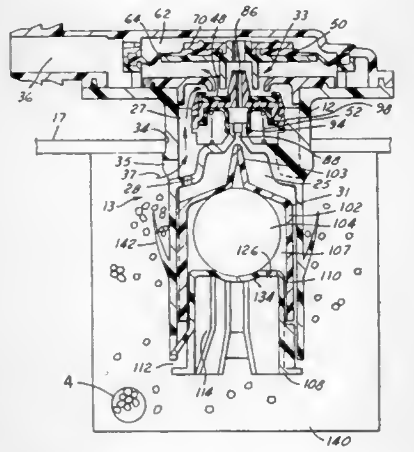
a second spherical valve member in said swivel tube in said another swivel port and positioned to open or close against said second valve seat, said second valve member being retained in said swivel tube in said another swivel port by said cylindrical tube and said second valve seat; and

swivel nuts, one on each of said swivel tubes.

5,836,341
FUEL TANK VAPOR CONTROL APPARATUS

Douglas William Ayers, Milan; Mark Nulman, West Bloomfield, and George Francis Stringfellow, Dearborn Heights, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 31, 1997, Ser. No. 829,664
Int. Cl.^{6} F16K *24/04*
U.S. Cl. 137—202 **4 Claims**



1. A fuel tank vapor control apparatus for controlling the flow of liquid and vapor through an aperture in a fuel tank, the fuel tank vapor control apparatus comprising:

a vent housing mounted in the aperture and formed to include a vent inlet and a vent outlet, the vent housing defining a vent path for communicating vapor from the fuel tank between said vent inlet and said vent outlet;

a valve movable in said vent housing between a blocking position blocking flow of liquid and vapor from the fuel tank between said vent inlet and said vent outlet along said vent path and a venting position allowing flow of vapor between the fuel tank and said vent outlet along said vent path; and

a greater than 90% open cell foam member having a volume substantially less than the volume of the fuel tank and being attached to said vent inlet between the fuel tank and said vent path, said foam member allowing vapor to flow in said vent path and blocking liquid flow in said vent path.

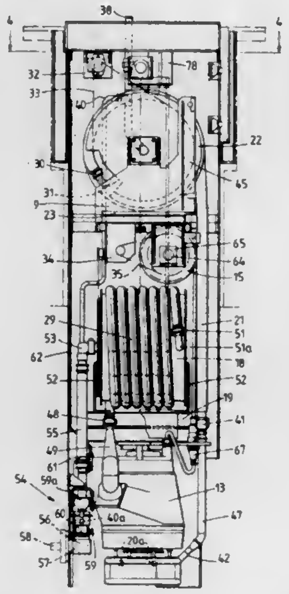
5,836,342

Patent Not Issued For This Number

5,836,343
PUMPS AND PUMP HANDLING APPARATUS

James Jones, Warrington, England, assignor to British Nuclear Fuels PLC, Risley, England

Continuation of Ser. No. 15,871, Feb. 10, 1993, abandoned, which is a continuation of Ser. No. 638,132, Dec. 24, 1990, abandoned, which is a continuation of Ser. No. 282,063, Dec. 9, 1988. This application May 3, 1995, Ser. No. 433,806
Claims priority, application United Kingdom, Dec. 17, 1987, 8729481
Int. Cl.^{6} B65H *75/34*
U.S. Cl. 137—355.26 **6 Claims**

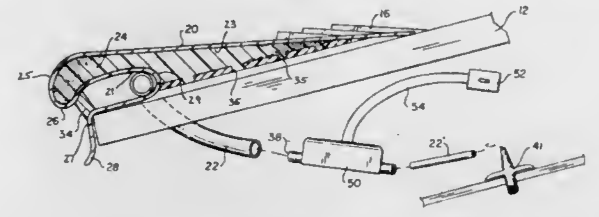


1. Handling apparatus for a pump, said apparatus comprising a first drum associated with a first hose for supplying fluid to the pump, a first motor for rotating the first drum to wind the first hose onto the first drum, a second drum associated with a second hose for discharge of fluid medium by the pump, a second motor for rotating the second drum to wind the second hose onto the second drum, a third drum associated with electric cable for the pump, and a third motor for rotating the third drum to wind the cable onto the third drum, and controlling means being operative to control the first, second and third motors in a predetermined varying manner in dependence on the varying but currently unwound amount of the respective hose or cable to avoid slack in the first and second hoses and the cable during winding rotation of the first drum, the second and the third drum.

5,836,344
SYSTEM FOR PREVENTING AND MELTING ICE DAMS

Andrew Hovi, Sr., 10 Valley View Rd., Danville, Pa. 17821

Filed Dec. 10, 1996, Ser. No. 762,718
Int. Cl.^{6} F16K *5/00*
U.S. Cl. 137—357 **20 Claims**



1. A system for preventing the formation of ice dams and the buildup of ice and snow along the roof edge of a building of the type having a warm fluid source, the system comprising:

a plurality of edge members securable along the edge of the roof of the building, each of said edge members being formed of a heat conductive material and each of said edge member having a shape defining an elongate channel that opens downwardly while said edge member is secured to the roof of the building;

a fluid conducting member positioned in said channel of each said edge member, said fluid conducting member having a plurality of ports for expelling the fluid conducted therein;

first support means on each said edge member for supporting each said edge member under weight of the snow and ice; and

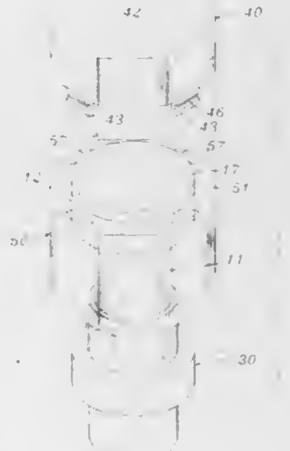
fluid transfer means, communicating between the warm fluid source and each said fluid conducting member, for transferring the warm fluid from the warm fluid source to each said fluid conducting member;

wherein said ports of each said fluid conducting member expel the warm fluid into said channel, warming each said edge member to cause the ice dams and the snow and ice buildup thereon to melt, whereby the resulting water runoff flows off each said edge member.

5,836,345
VACUUM BREAKER VENT VALVE PACKAGING AND INSTALLATION SYSTEM

Kurt S. B. Ericson, Schilde, Belgium, assignor to Studor Trading Ltd., Dunedin, Fla.

Division of Ser. No. 609,712, Mar. 1, 1996, Pat. No. 5,725,099. This application Jan. 16, 1998, Ser. No. 7,919
Int. Cl.^{6} B65D *51/16*
U.S. Cl. 137—382 **9 Claims**

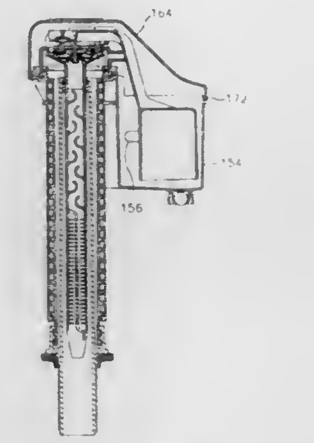


1. In a vacuum breaker vent valve having a valve cap integrally connected to a hollow stem connectable through a coupler to a vent pipe and a valve opening adapted to fluidly connect said stem to ambient air, the improvement comprising first and second half protective housing mountable over said valve cap and hollow stem in surrounding relation thereto, said first half protective housing having a bottom opening permitting ambient air to enter said valve opening, said second half mounted over the first housing half and the valve cap protruding through a top opening in the first housing half, the first housing half engaging multiple dimples on an annular side surface of the valve cap to prevent the valve cap from being pushed through the top opening.

5,836,346
PILOT OPERATED DIAPHRAGM FILL VALVE

David Nichols-Roy, Escondido, Calif., assignor to Hunter Plumbing Products

Division of Ser. No. 720,636, Oct. 2, 1996, Pat. No. 5,715,859. This application Oct. 28, 1997, Ser. No. 959,187
Int. Cl.^{6} F16K *31/26;31/36*
U.S. Cl. 137—414 **22 Claims**



1. A pilot operated diaphragm fill valve for controlling water level in a storage tank, comprising:

an elongated outer tubular riser and valve housing having an upper end and a lower end, a radial flange at said upper end;

an elongated inner riser and supply tube having an upper end and a lower end, concentrically disposed in said outer riser tube and having a main valve seat at said upper end, said inner supply tube being adapted for connection to a source of water;

a valve housing cap having means for detachable connection to said upper end of said tubular valve housing, and an annular recess in said housing cap, said valve housing cap includes a vacuum port in a top thereof;

a main diaphragm valve mounted in said annular recess in said valve housing cap and engageable with said valve seat for controlling flow of water into said valve housing from said supply tube said main diaphragm valve includes a radially extending thin peripheral lip engaging with said vacuum port as a vacuum break valve;

a pressure control chamber in said housing cap between said main diaphragm valve and said housing cap;

a pin extending through said diaphragm and having a groove therein for communicating said control chamber with said inlet tube;

a vent valve port having a valve seat in said housing cap for venting said pressure chamber,

a float having a float arm pivotally mounted on said cap; and

a vent valve member mounted on one end of said float arm for engaging said vent valve seat for selectively closing said vent port.

5,836,347
FLUID PRESSURE SUPPLY SYSTEM

David Anthony Harries, Welford on Avon, Great Britain, assignor to Kongsberg Techmatic UK Limited, Leamington Spa, England

Filed Mar. 27, 1996, Ser. No. 634,155
Int. Cl.^{6} F16K *31/12*
U.S. Cl. 137—487.5 **10 Claims**

1. A vehicle fluid pressure supply system characterised by comprising a fluid pressure supply pump connected via solenoid-operated flow control valve means with a plurality of separate fluid pressure operated circuits each operating separate functions of the vehicle, means for detecting the current operative state and the fluid pressure supply status of each circuit, and electrical control

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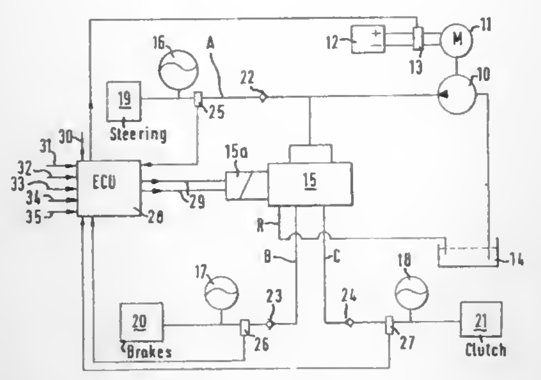
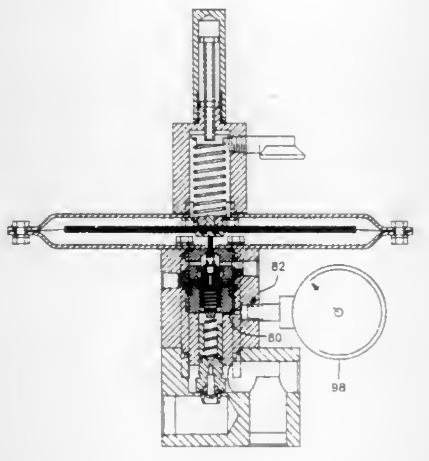


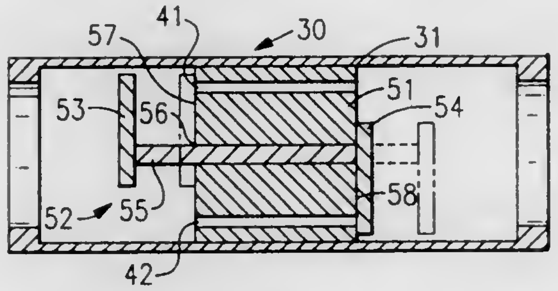
means which receives signals from the detecting means and operates the control valve means to direct available pump flow to the appropriate circuit to maintain each circuit at least at a minimum pressure level required to operate the associated function.

5,836,348
PILOT CONTROLLED BLANKETING VALVE
Paul R. Ostand, Sissonville, W. Va., assignor to Appalachian Controls Environmental, South Charleston, W. Va.
Filed Dec. 28, 1995, Ser. No. 580,333
Int. Cl.^{6} F16K *17/10;37/00*
U.S. Cl. 137—489 **6 Claims**



1. A blanketing valve for allowing transfer of gas to a tank having a liquid contained therein, said blanketing valve comprising:
- a housing including a pilot valve, a main valve and an actuator,
- an inlet gas line to said housing for receipt of inlet gas, said inlet gas line being connected to said pilot valve and said main valve,
- a pilot intake chamber within which said pilot valve is movable, said pilot intake chamber being in communication with a source of inlet gas through said inlet gas line for passage of inlet gas to the tank upon movement of said pilot valve,
- a piston chamber formed by said housing including a piston of said main valve for controlled movement of said piston upon movement of said pilot valve,
- a passageway extending between said pilot intake chamber and said piston chamber for transfer of gas between said pilot intake chamber and said piston chamber upon movement of at least one of said pilot valve and said main valve,
- a diagnostic port in communication with said passageway, and
- a pressure gauge connected to said diagnostic port, said pressure gauge measuring pressure in said passageway for comparing the measured pressure against a pressure in said inlet gas line to determine if an equilibrium condition is present, if said pilot valve is open, or if both said pilot valve and said main valve are open.

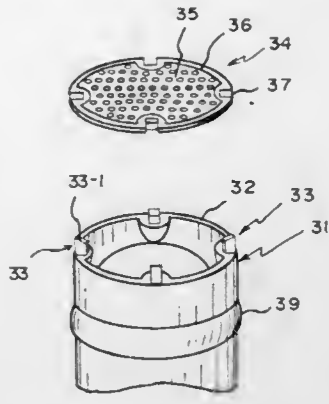
5,836,349
BIDIRECTIONAL FLOW CONTROL DEVICE
Kevin A. Kimberly, Marietta, and John M. Palmer, Cicero, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.
Filed Dec. 30, 1996, Ser. No. 775,468
Int. Cl.^{6} F16K *17/26*
U.S. Cl. 137—493.8 **3 Claims**



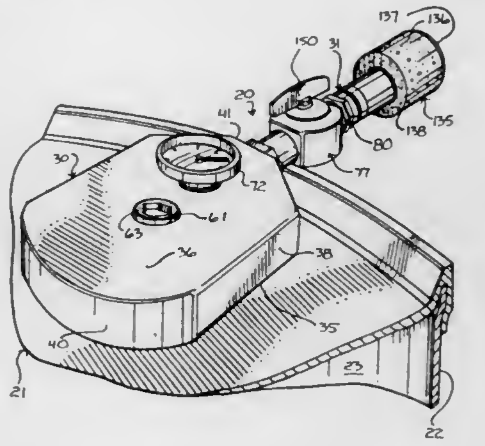
1. A device for controlling the flow of a fluid in a conduit in a first and second direction comprising:
- a shell defining a fluid flow passageway in flow communication with the conduit;
- a single metering body fixedly positioned within the fluid flow passageway. the body having a first metering orifice and a second metering orifice axially extending therethrough in communication with the fluid flow passageway and having a mounting hole passing therethrough;
- valve means for selectively allowing flow communication through the first metering orifice in a first direction while sealing off flow communication through the second metering orifice or through the second metering orifice in a second direction while sealing off flow communication through the first metering orifice, said valve means having a rod slidably positioned within and extending through the mounting hole and a pair of pistons secured on either end of the rod with a first of the pistons operatively associated with the first metering orifice and a second of the pistons operatively associated with the second metering orifice;
- said valve means operative directly in response to fluid flow. whereby said valve means establishes communication through the appropriate metering orifice according to the direction of the fluid flow.

5,836,350
ELECTROMAGNETIC VALVE
Yoshikazu Sakaguchi, Anjo; Takenori Kano, Toyota; Koichi Ichigo, Hekinan; Takeshi Nasu, Nishio, and Takuji Akiyama, Anjo, all of Japan, assignors to Aisin Aw Co., Ltd., Japan
Filed Aug. 2, 1996, Ser. No. 691,648
Claims priority, application Japan, Aug. 4, 1995, 7-199781
Int. Cl.^{6} F16K *35/00*
U.S. Cl. 137—550 **10 Claims**

1. An electromagnetic valve comprising:
- a hydraulic circuit coupling having an input port with a cylindrical interior surface and a circumferential groove in said cylindrical interior surface; and
- a planar strainer mounted within said input port and including:
  - a filter portion in the form of a planar sheet having a plurality of pores extending therethrough; and
  - a retainer with an outer circumference having a plurality of projections extending therefrom, said projections being coplanar with said filter portion and press-fit within said circumferential groove, whereby said strainer is held fixed within said input port.

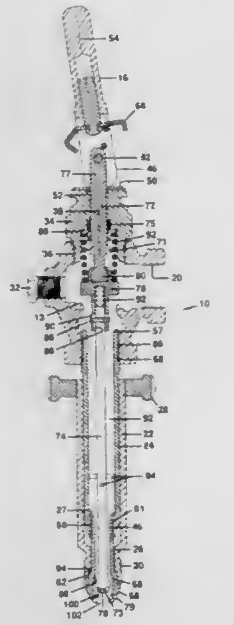


5,836,351
VENT DEVICE
William D. Underwood, III, 3761 W. Monte Cristo, Phoenix, Ariz. 85023
Filed Mar. 20, 1997, Ser. No. 822,269
Int. Cl.^{6} F16K *24/00*
U.S. Cl. 137—587 **32 Claims**



1. In combination with a container of a type including a shell enclosing a space and a bunghole formed through the shell to access the space, a vent for conducting gas from the atmosphere to the space, said vent comprising:
- a manifold including an inlet, an outlet detachably engagable to the bunghole in gas communication, and a channel interconnecting said inlet and said outlet in gas communication;
- a breather intake assembly including,
  - an inlet element having a continuous sidewall with an open inlet end, an open outlet end, a bore extending therethrough from said open inlet end to said open outlet end for facilitating the passage of gas from said open inlet end to said open outlet end, said bore including a first bore section in gas communication with said open inlet end, a second bore section in gas communication with said first bore section and said open outlet end, and a seat located intermediate said first bore section and said second bore section, and
  - a valve assembly carried by said second bore section and movable between a normal closed position for inhibiting gas from passing from said first bore section to said second bore section, and an open position for allowing gas to pass from said first bore section to said second bore section;
- connector means for interconnecting said open outlet end of said breather intake assembly to said inlet of said manifold in gas communication;
- said valve assembly movable from the closed position to the open position when sub-atmospheric pressure is present within the space of the container.

5,836,352
ENVIRONMENTAL FILL VALVE
Spencer M. Nimberger, Houston, Tex., assignor to PGI International, Ltd., Houston, Tex.
Filed Jun. 6, 1996, Ser. No. 659,263
Int. Cl.^{6} F16K *55/18;31/44*
U.S. Cl. 137—614.19 **20 Claims**



1. A method of manufacturing a fill valve for controlling the flow of propane from a fill line to a control valve having an internal thread and an internal seat, the method comprising:
- forming a valve body having a propane inlet for fluid interconnection with the fill line;
- interconnecting an elongate sleeve with the valve body;
- forming a discharge housing with a discharge end having an external thread for threaded interconnection with the internal thread in the control valve;
- rotatably positioning the discharge housing about the elongate sleeve;
- securing a nose tip to a lower end of the elongate sleeve;
- forming a nose tip with an exterior surface and annular nose tip seal thereon for sealing engagement with the internal seat in the control valve and a fill valve seat defining a portion of a flow passageway through the nose tip;
- securing the nose tip to a lower end of the elongate sleeve;
- extending a valve stem through the valve body and the elongate sleeve, the valve stem being axially moveable with respect to the valve body between an opened and a closed position;
- positioning a lower stem portion of the valve stem within the nose tip, the lower stem portion having a nominal lower valve stem diameter;
- biasing the valve stem to the closed position;
- connecting a handle to the valve stem for axially moving the valve stem between an opened and a closed position; and
- positioning a fill valve seal one the lower stem portion of the valve stem for selective engagement and disengagement with the fill valve seat to close and open the fill valve, respectively, the fill valve seal having a nominal seal diameter at least as large as the nominal lower valve stem diameter.

6. A fill valve for controlling the flow of propane from a fill line in fluid communication with a propane storage vessel to a control valve in fluid communication with a propane use tank, the control valve having a control valve stem and a handle for engaging and

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disengaging the control valve stem with a control valve seat, and the control valve having an internal thread and an internal seat, the fill valve comprising:

a valve body having a propane inlet for fluid interconnection with the fill line;

an elongate sleeve interconnected with the valve body;

a discharge housing surrounding the elongate sleeve, the discharge housing including a discharge end having an external thread for threaded interconnection with the internal thread in the control valve;

a nose tip secured to a lower end of the elongate sleeve, the nose tip having an exterior surface with an annular nose tip seal thereon for sealing engagement with the internal seat in the control valve and a fill valve seat defining a portion of a flow passageway through the nose tip;

a valve stem extending through the valve body and the elongate sleeve, the valve stem being axially moveable with respect to the valve body between an opened and closed position, the valve stem having a lower stem portion positioned within the nose tip, the lower stem portion having a nominal lower valve stem diameter;

a handle for moving the valve stem between an opened and a closed position; and

a fill valve seal carried on the lower stem portion of the valve stem for selective engagement and disengagement with the fill valve seat to close and open the fill valve, respectively, the fill valve seal having a nominal seal diameter at least as large as the nominal lower valve stem diameter.

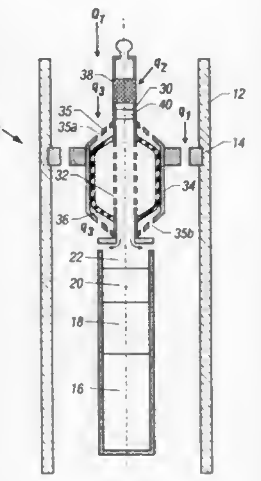
5,836,353
VALVE ASSEMBLY FOR BOREHOLE TELEMETRY IN DRILLING FLUID

Donald H. Van Steenwyk, San Marino, Calif., assignor to Scientific Drilling International, Inc., Houston, Tex.

Filed Sep. 11, 1996, Ser. No. 712,275

Int. Cl.^{6} G01V *1/52*

U.S. Cl. 137—624.15 **14 Claims**



9. Apparatus for generating pressure pulses in a fluid flowing in a tubular, comprising:

means for attaching the apparatus to an inside wall location in a tubular;

means for restricting flow in the tubular at the inside wall location;

a tube concentric within the means for restricting flow, the tube sized to conduct a selected portion of the fluid stream, the tube having a wall extending from upstream of a means for restricting flow to downstream of the means for restricting flow, the wall of the tube having a perforation in a selected segment of the tube, the segment being covered by a membrane capable of radial outward movement so as to form a bladder;

a cylinder outside and concentric to the tube and forming an annulus between the tube and the cylinder, the cylinder having a wall and closed ends so as to form a vessel, the wall of the cylinder having a perforation in a selected segment of the wall;

a free piston in the annulus, the piston being capable of slidable movement along the annulus and being disposed between the perforation in the wall of the tube and the perforation in the wall of the cylinder and separating a fluid in the annulus from the fluid stream;

a membrane capable of radial outward movement so as to form a bladder, the membrane being outside the cylinder and disposed so as to cover the perforation in the wall of the cylinder;

a pilot valve, the pilot valve being disposed in the conduit downstream of the perforation and operably connected to a driver, the driver being electrically driven and adapted to move the pilot valve toward an open and a closed position in response to a signal from a downhole instrument;

a frame, the frame being disposed around the membrane and having an opening upstream of the means for restricting flow and an opening downstream of the means for restricting flow, such that flow through the frame is reduced when the membrane is moved radially outward; and

a source of electrical energy.

5,836,354
HYDRAULIC PRESSURE CONTROLLER AND RESERVOIR WATER-PROOFING STRUCTURE

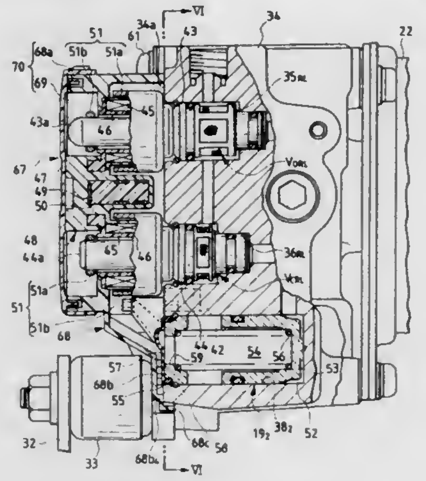
Tsutomu Amano; Naotoshi Tamai; Takashi Aoki, and Takaomi Shirase, all of Nagano, Japan, assignors to Nissin Nogyo Co., Ltd., Nagano, Japan

Filed Oct. 22, 1996, Ser. No. 731,913

Claims priority, application Japan, Oct. 23, 1995, 7-274580; Oct. 23, 1995, 7-274581

Int. Cl.^{6} F16K *11/02;* **B60T** *8/32*

U.S. Cl. 137—884 **6 Claims**



1. A hydraulic pressure controller comprising:

a base;

an electromagnetic valve mounted on the base and including a guide cylinder protruding from the base, a coil unit having a bobbin surrounding the guide cylinder and a coil wound on the bobbin, and a magnetic path forming frame connecting magnetically a first end and a second end of the guide cylinder;

a reservoir and a damper arranged with the electromagnetic valve on the base; and

a cover covering the electromagnetic valve, the reservoir and the damper, and including a frame coupled to the base, the frame surrounding the electromagnetic valve, and a skirt portion formed integrally with the frame, the skirt portion covering the reservoir and the damper.

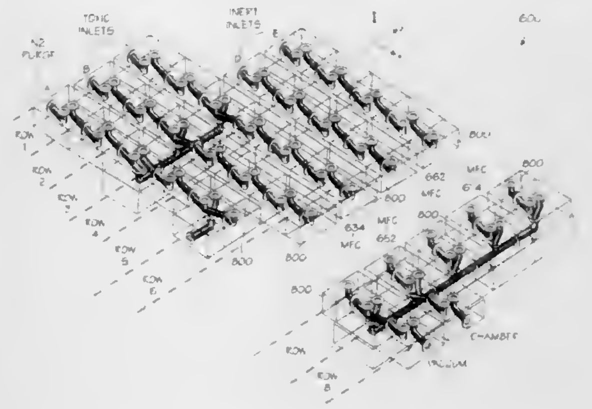
5,836,355
BUILDING BLOCKS FOR INTEGRATED GAS PANEL

Jeffrey R. Markulec, San Jose; Dennis G. Rex, Sunnyvale; Richard E. Schuster, Milpitas, and Brent D. Elliot, Cupertino, all of Calif., assignors to Insync Systems, Inc., Milpitas, Calif.

Filed Dec. 3, 1996, Ser. No. 760,150

Int. Cl.^{6} F16K *11/00*

U.S. Cl. 137—884 **25 Claims**



10. A gas panel comprising a plurality of interconnected blocks comprising:

a first block comprising:

a first face;

a second face adjacent to said first face;

a third face opposite said second face;

a fourth face opposite said first face;

a first port and a second port formed in said first face, said first port and said second port having a first position relationship;

a third port formed in said second face;

a fourth port formed in said third face;

a first passage coupling said first port to said third port; and

a second passage coupling said second port to said fourth port;

a second block comprising:

a first face;

a second face adjacent to said first face;

a third face opposite said second face;

a fourth face opposite said first face;

a first port and a second port formed in said first face, said first port and said second port having said first positional relationship;

a third port formed in said second face;

a fourth port formed in said third face;

a fifth port formed in said fourth face;

a first passage coupling said first port to said third port; and

a second passage coupling said second port, said fourth port, and said fifth port;

a third block comprising:

a first face;

a second face adjacent to said first face;

a third face opposite said second face;

a fourth face opposite said first face;

a first port and a second port formed in said first face, said first port and said second port having said first positional relationship;

a third port formed in said second face;

a fourth port formed in said third face;

a fifth port formed in said fourth face;

a first passage coupling said first port, said fourth port, and said third port; and

a second passage coupling said second port and said fifth port;

a fourth block comprising:

a first face;

a second face adjacent to said first face;

a third face opposite said second face;

a fourth face opposite said first face;

a first port and a second port formed in said first face, said first port and said second port having said first positional relationship;

a third port formed in said second face;

a fourth port formed in said fourth face;

a first passage coupling said first port, and said third port; and

a second passage coupling said second port to said fourth port.

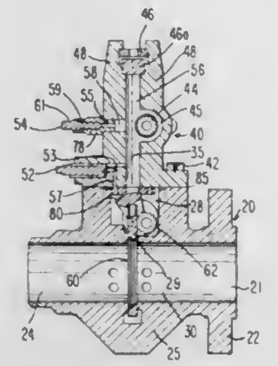
5,836,356
DUAL CHAMBER ORIFICE FITTING

Ashvin D. Desai, Lumberton, N.C., assignor to Mueller Steam Specialty, a Divison of Core Industries, Inc., St. Pauls, N.C.

Filed Mar. 12, 1996, Ser. No. 614,081

Int. Cl.^{6} F15D *1/02*

U.S. Cl. 138—44 **20 Claims**



1. A dual chamber orifice fitting, comprising:

a first chamber maintained in fluid communication with a pipeline, a fluid flowing in said pipeline passing through said first chamber;

a second chamber selectively maintained in fluid communication with said first chamber;

a sealing member formed as an eccentric plug member selectively rotatable from a first position wherein said sealing member seals said first chamber from said second chamber, and a second position wherein said sealing member permits said first chamber to be placed in fluid communication with said second chamber, said eccentric plug member travelling along an eccentric path between the first and second positions.

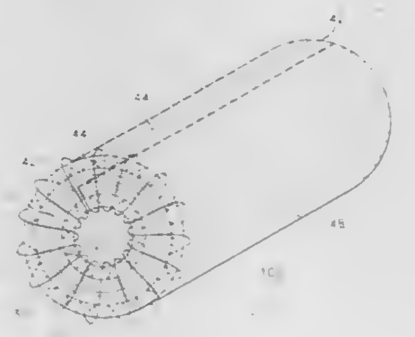
5,836,357
PRESSURE-EXPANDABLE CONDUIT LINER

Mark Kittson, Niagara Falls, and Steve Kulawic, Jordan Station, both of Canada, assignors to Bay Mills Ltd., Ontario, Canada

Filed Oct. 26, 1995, Ser. No. 548,375

Int. Cl.^{6} F16L *55/18;9/14*

U.S. Cl. 138—98 **10 Claims**



1. A pressure-expandable conduit liner, comprising:

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a first flexible fabric layer mechanically bonded to a glass-containing layer and folded to form a tubular laminate; said laminate being penetrable by a resinous liquid capable of setting to form a substantially continuous matrix within said laminate following expansion of said laminate within a conduit,

wherein the fabric layer includes an inner fabric layer and an outer fabric layer, the inner and outer fabric layers being laterally offset from one another in a step configuration, so that, when the liner is folded to form a tubular laminate, the tubular laminate has first and second longitudinal seam portions which are not in radial alignment along said tubular laminate.

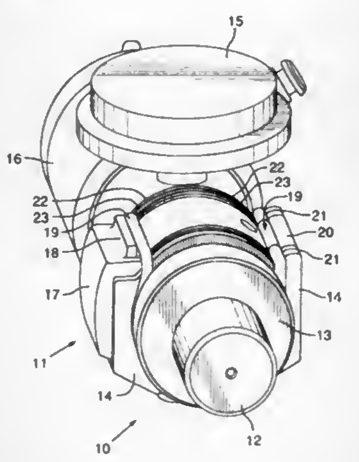
5,836,358
FILL PORT COVERS

Gary N. Byrd, Donahue, Iowa, and Dale L. Selhost, Moline, Ill., assignors to Litton Systems, Inc., Davenport, Iowa

Filed Jul. 23, 1997, Ser. No. 898,759

Int. Cl.^{6} B65B *1/04*

U.S. Cl. 141—18 **20 Claims**



1. A cover for a fill port in a housing of a pressurized vessel, comprising a pressurized vessel having a housing, a cover plate capable of sliding from a first position to a second position and at least one flexible elongated curved member located in a circular groove in said housing, said elongated curved member having opposed ends each of which may be attached to the cover plate.

5,836,359
LIQUID DOSAGE DISPENSERS

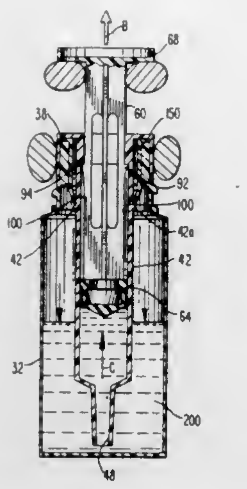
David Seidler, Forest Hills, N.Y., assignor to Concept Workshop Worldwide, LLC, New York, N.Y.

Filed Jun. 27, 1996, Ser. No. 671,549

Int. Cl.^{6} B67D *5/00*

U.S. Cl. 141—23 **19 Claims**

1. A liquid dosage dispenser comprising a bottle for containing a liquid, said bottle having an open neck, a dispenser apparatus removably supported on said neck having a housing extending into said bottle and a plunger device extending into said housing for longitudinal movement therein, said housing having an opening through which liquid in said bottle can be drawn into said housing, one of said housing and plunger device including stop means of predetermined configuration for stopping, longitudinal movement of said plunger device and the other of said housing and plunger device including follower means for contacting said stop means, said plunger device being rotatable with respect to said housing to align said follower means with a desired portion of said stop means, said follower means and stop means, when aligned, allowing said plunger device to be moved longitudinally along said housing until said follower means contacts said stop means to draw a predetermined amount of liquid through said opening into said housing, said dispenser apparatus being removable from said bottle to permit said predetermined amount of drawn liquid to be dispensed through said opening, said stop means including a plurality of keyways of different lengths and said follower means including a projection for riding in said keyways when selectively aligned therewith.



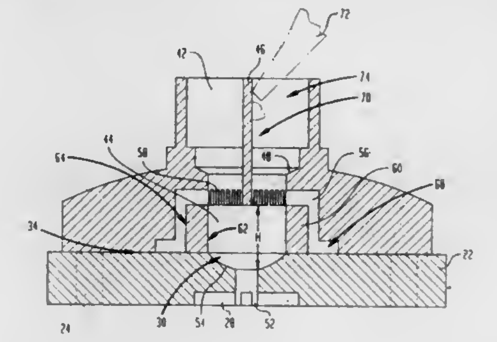
5,836,360
VOLUME CONTROLLED RECEPTACLE

Michael Gavin, Warren, N.J., and James A. Mawhirt, Brooklyn, N.Y., assignors to International Technidyne Corporation, Edison, N.J.

Filed Mar. 25, 1997, Ser. No. 823,973

Int. Cl.^{6} B65B *1/04;3/04*

U.S. Cl. 141—126 **23 Claims**



1. A volume-control receptacle for receiving a specific volume of fluid comprising:
- a receptacle base having an upper inlet and a cup-like bore in communication with the upper inlet, the cup-like bore defining a reservoir with a bottom; and
- a plurality of capillaries connected to the cup-like bore and opening at a specific height above the bottom of the reservoir for draining excess fluid from the receptacle to achieve a specific volume of fluid in the reservoir, the volume of fluid being determined by the height of the plurality of capillaries relative to the bottom of the reservoir.

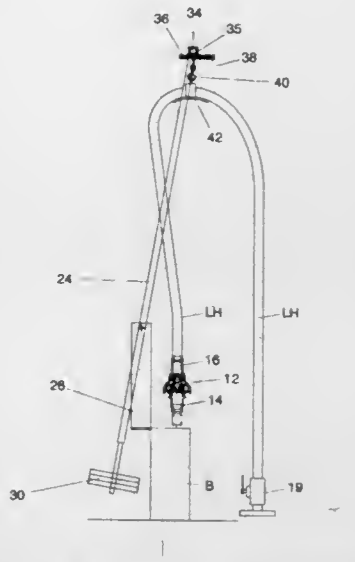
5,836,361
RELEASABLE FLUID HOSE LOADING ARM SYSTEM

Sandor Koncsek, Houston, Tex., assignor to PGI International, Inc., Houston, Tex.

Filed Jul. 29, 1997, Ser. No. 903,033

Int. Cl.^{6} B67C *3/00*

U.S. Cl. 141—279 **20 Claims**



11. A system for fluidly interconnecting a bulkhead to a portable transport using a flexible fill hose, comprising:
- a coupling for structurally and fluidly interconnecting the bulkhead with the flexible hose;
- an elongate arm pivotally mounted with respect to the bulkhead;
- a biasing member for biasing the arm in the generally vertical position;
- a support plate secured to an upper end of the arm;
- a release disk normally supported by the support plate;
- a hose support supported from the release disk for supporting the flexible hose; and
- a plurality of retaining members for normally interconnecting the support plate and the release disk, such that the release disk is normally supported by the support plate at the upper end of the elongate arm, and during a pull-away the release disk structurally separates from the support plate.

5,836,362
MULTIPLE ADSORBENT LOADING METHOD AND APPARATUS FOR A RADIAL FLOW VESSEL

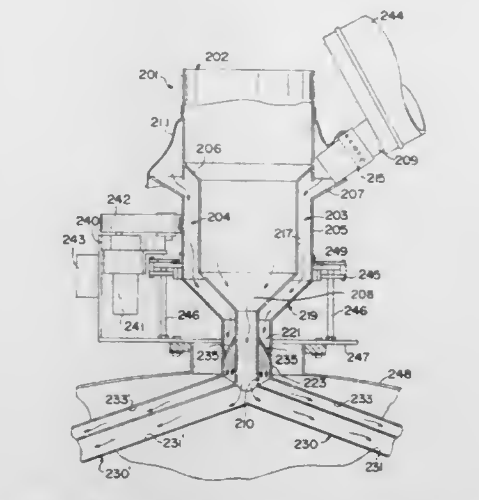
Mark William Ackley, East Aurora; Jeffert John Nowobilski, Orchard Park; James Smolarek, Boston, and James Stanley Schneider, Akron, all of N.Y., assignors to Praxair Technology, Inc., Danbury, Conn.

Filed Jul. 15, 1997, Ser. No. 892,888

Int. Cl.^{6} B65G *65/32*

U.S. Cl. 141—286 **11 Claims**

1. A particle loader assembly for loading particles into a vessel to form a particle bed comprising inner and outer radially disposed concentric layers of particles said inner layer containing at least one type of particle of different granulometry or composition or both granulometry and composition from a type of particle contained in said outer layer, the assembly comprising:
- first feed hopper means for supplying particles for the inner layer;
- second feed hopper means for supplying particles for the outer layer;
- at least one rotary arm having a first end proximal to said feed hopper and a second end distal to said hopper and comprising:
  - (i) a first chute conduit in particle flow communication with said first feed hopper and adapted for dispensing at an uniform flow rate particles supplied by said first feed hopper and forming said inner layer upon rotation of said at least one arm; and
  - (ii) a second chute conduit in particle flow communication with said second feed hopper and adapted at the distal end thereof for dispensing at said uniform flow rate particles supplied by said second feed hopper and forming said inner layer upon rotation of said rotary at least one rotary arm whereby said inner and outer layers contact one another at an interface;
- drive means for rotating said hopper means and said at least one rotary arm, the rotation of the hopper means facilitating the uniform distribution of particles within said flow of particles through said assembly;
- control means for controlling the feed and rotation rate of said assembly.



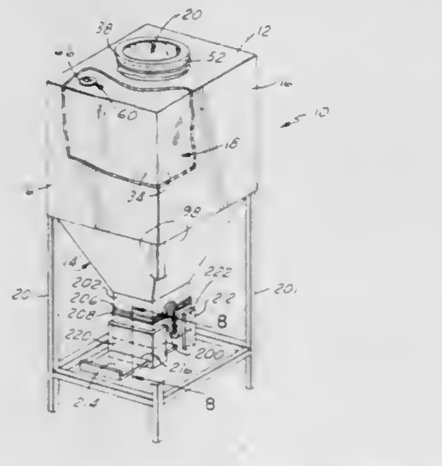
5,836,363
TANK LINER

Lee LaFleur, Manistee, Mich., assignor to Custom Packaging Systems, Inc., Manistee, Mich.

Continuation-in-part of Ser. No. 701,863, Aug. 23, 1996. This application May 5, 1997, Ser. No. 850,294

Int. Cl.^{6} B65B *1/04*

U.S. Cl. 141—314 **20 Claims**



1. For use within a bulk container having a substantially rigid top container wall, bottom container wall and side container walls and a filler opening in said top container wall, a collapsible container liner comprising,
- a collapsible bag of a flexible material having a liner top, a liner bottom, and liner sides which correspond to said container walls within said bulk container and a first opening in said liner top disposed generally coaxially with said filler opening.

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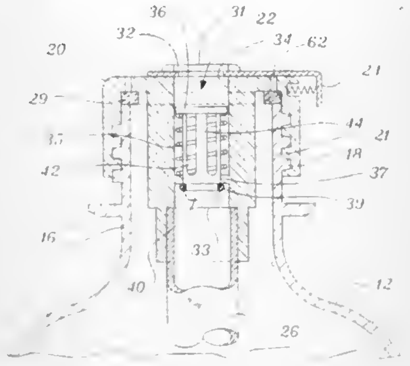
a seal between said top container wall and said liner top around the periphery of said filler opening and said first opening for sealing off the space between said liner and said container,
a second opening in said liner top spaced from said first opening,
an evacuation outlet sealably attached to said liner top around the periphery of said second opening for evacuating said space through said second opening, and
a cap removably and sealably received in said outlet.

5,836,364
REFILLABLE PRESSURIZED BEVERAGE CONTAINER

John W. Burton, 4 Woodland Dr., Pittsburgh, Pa. 15228
Filed Dec. 29, 1995, Ser. No. 580,814
Int. Cl.^{6} B65B *1/04;3/00;* **B67C** *3/00*
U.S. Cl. 141—348 **16 Claims**

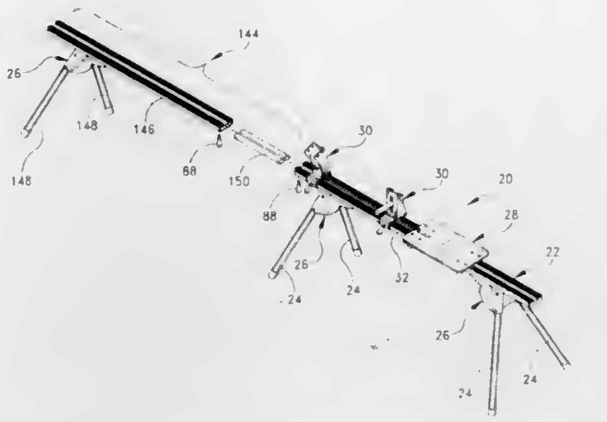


1. A refillable container comprised of:
a. a bottle having an externally threaded neck and mouth at a distal end of the neck and constructed to be capable of holding fluids above atmospheric pressure;
b. a threaded cap threaded onto the neck, the threaded cap having:
  i. a top;
  ii. at least one valve in the top having a single resealable passageway for filling, pressurizing and emptying the container, the at least one valve being capable of being opened by a probe which engages the valve and pushes into the cap. the valve being closed when not acted upon by the probe, and
  iii. a plurality of vent holes positioned in the top so as to be adjacent the mouth of the bottle when the cap is placed thereon; and
c. a releasable sealing ring sized and positioned between the mouth and the cap so as to close the vent holes when the cap is fully threaded onto the neck and allow gas within the container to escape through the vent holes when the cap is loose.

5,836,365
PORTABLE WORK BENCH HAVING MULTIPLE ACCESSORIES

Thomas E. Derecktor, Fall River, Mass., assignor to TracRac, Inc., Fall River, Mass.
Filed Jun. 19, 1997, Ser. No. 878,972
Int. Cl.^{6} B25H *1/00*
U.S. Cl. 144—287 **18 Claims**

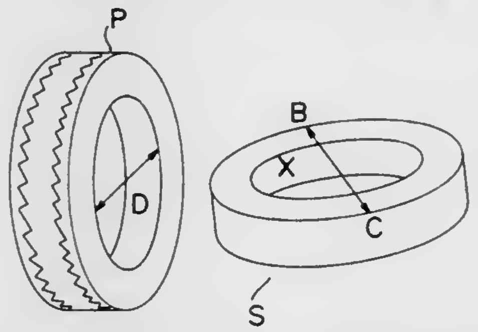
1. A portable work bench comprising:
a track having a structural body;
support means for supporting the track in an elevated position above a surface; and
a dual purpose accessory releasably attachable to the track, said dual purpose accessory comprising
  a body,
  mounting means for slidably mounting the body on the track so that the body is movable along the length of the track,



  locking means for locking the body at a desired position along the length of the track, and
  a member having attaching means for attaching the member to the body of the accessory in a first position in which the member supports an item placed therein and for attaching the member to the body in a second position in which the member engages the item.

5,836,366
METHOD OF FITTING AN ASSEMBLY FORMED OF A TIRE AND OF A TREAD STRIP SUPPORT

Olivier Muhlhoff, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin-Michelin & Cie, Clermont-Ferrand, France
PCT No. PCT/EP95/01954, § 371 Date Dec. 5, 1996, § 102(e) Date Dec. 5, 1996, PCT Pub. No. WO95/33628, PCT Pub. Date Dec. 14, 1995
PCT Filed May 23, 1995, Ser. No. 750,303
Claims priority, application France, Jun. 9, 1994, 94 07164
Int. Cl.^{6} B60B *21/00*
U.S. Cl. 152—379.3 **11 Claims**

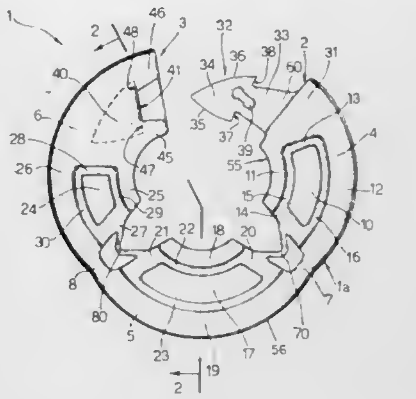


1. A method of fitting a tire and a tread support ring on a one-piece wheel rim comprising a first wheel rim seating surface, a second wheel rim seating surface, a tread support ring bearing surface connected axially on the inside of the first wheel rim seating surface and a small hump at the outer end of the first wheel rim seating surface, at least the first wheel rim seating surface tapering outwardly and the second wheel rim seating surface having its axially inner end on a circle of a diameter greater than the diameter of the circle on which the axially inner end of the first wheel rim surface is located, the tire comprising a first bead (2') and a second bead (2") which will surface is located, the tire comprising a first bead (2') and a second bead (2") which will be fitted respectively on the first wheel rim seating surface and the second wheel rim seating surface, the method comprising:
  in a first stage. inserting the support ring into the tire,
  placing the second bead (2") onto the wheel rim from the side opposite to the second wheel rim seating surface and moving it over the bearing surface using positioning means.

  fitting the first bead on the first wheel rim seating surface, the first bead engaging the support ring to seat it on the bearing surface,
  and then completing the fitting of the second bead on the second wheel rim seating surface.

5,836,367
SPACER WASHER

Rocco Calabrese, Turin, Italy, assignor to ITW-Fastex Italia S.p.A, Italy
Filed Oct. 3, 1997, Ser. No. 943,178
Claims priority, application Italy, Oct. 4, 1996, TO96A0811
Int. Cl.^{6} F16L *9/18*
U.S. Cl. 138—112 **14 Claims**

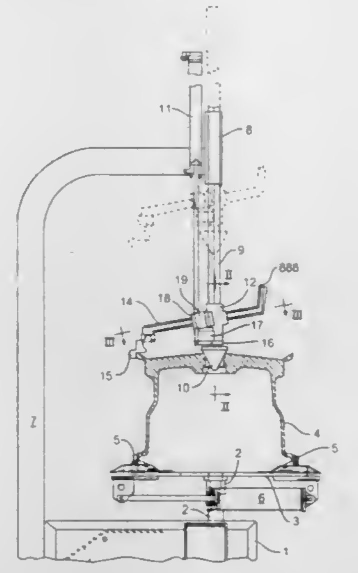


1. A spacer washer for a pipe. comprising:
a one-piece, expansible and contractible annular element which defines an interior space for accommodating a pipe and which comprises at least one hinge portion and a radially-split portion defining opposite circumferential ends which face each other and which are separable from each other so as to permit insertion of a pipe into said interior space; and
mutually cooperating snap-engaging fastening means, located upon said opposite circumferential ends of said annular element, for fixedly connecting together said opposite circumferential ends of said annular element when said fastening means are fastened together so as to define an inner ring for encircling a pipe when a pipe is inserted into said interior space and for integral connection to an outer supporting ring by a plurality of radial ribs;
wherein said spacer washer is fabricated from a single material having a Shore A hardness value greater than 80.

5,836,368
MACHINE FOR MOUNTING AND REMOVING TIRES ONTO AND FROM RESPECTIVE WHEEL RIMS

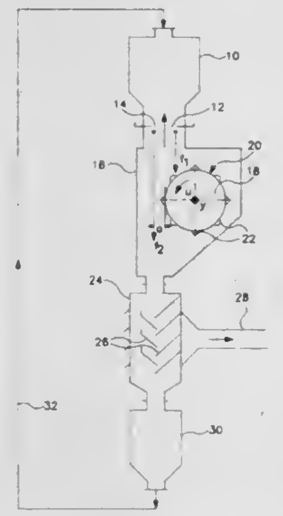
Remo Corghi, Correggio, Italy, assignor to Corghi - S.P.A., Strada Statle, Italy
Filed Apr. 16, 1997, Ser. No. 842,788
Claims priority, application Italy, May 3, 1996, RE96A0028
Int. Cl.^{6} B60C *25/135*
U.S. Cl. 157—1.24 **6 Claims**

1. A machine for removing and mounting tires from and onto respective wheel rims comprising:
  a base;
  a rotary platform supported for rotation on the base;
  a column extending vertically upwards from the base to a side of the platform; and
  first and second mutually slidable elements supported on the column, the second mutually slidable element having a first portion for supporting thereon a tool for operating on a tire bead and a second portion for securing to a center of the wheel rim.



5,836,369
PROCESS FOR RECLAIMING USED FOUNDRY SAND

Christian Renner, Beringen, and Jovo Laskovic, Schaffhausen, both of Switzerland, assignors to Georg Fischer Disa AG, Switzerland
Filed Oct. 2, 1996, Ser. No. 725,126
Claims priority, application Switzerland, Oct. 4, 1995, 02798/95
Int. Cl.^{6} B22C *5/00*
U.S. Cl. 164—5 **6 Claims**



1. A process for treating used foundry sand comprising sand grains having binders and additives adhering thereto comprising the steps of:
  providing a batch of used foundry sand in a container;
  gravity feeding a first and a second substantially parallel streams of used foundry sand from the container;
  accelerating and diverting the used foundry sand from the first stream into the second stream wherein the used foundry sand in the first stream impacts the used foundry sand in the second stream and is decelerated whereby adhering binders and additives are abraded off and any sharp edges of the sand grains are rounded.

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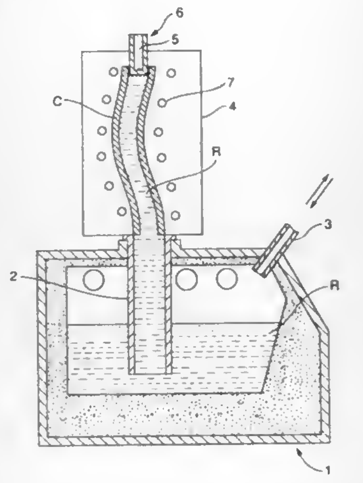
5,836,370
METHOD OF MANUFACTURING LOW-MELTING POINT METAL CORES

Eiji Naruse, Toyokawa, Japan, assignor to Sintokogio, Ltd., Nagoya, Japan
Filed Jul. 24, 1996, Ser. No. 687,163
Claims priority, application Japan, Jul. 28, 1995, 7-212559
Int. Cl.^{6} B22D *18/04;23/00*
U.S. Cl. 164—77 **2 Claims**

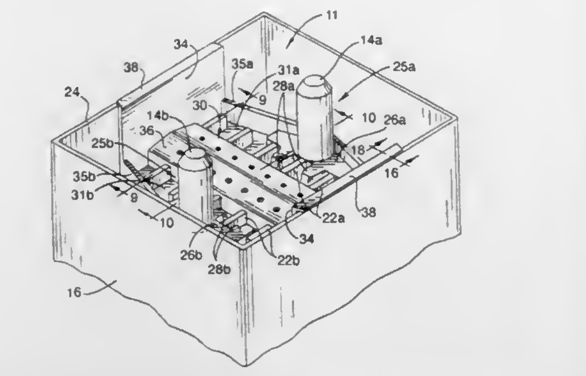


1. A method of manufacturing a low-melting point metal core having a central through hole, wherein molten metal held in a low-pressure casting machine equipped with a stalk tube and a holding furnace is fed into a cavity of a mold disposed above the stalk tube, by applying a pressurized gas to the molten metal in the holding furnace, the method comprising the steps of:
- fitting a loose piece in the mold so as to protrude into the cavity in a position for forming an entrance portion of the central through hole of the core to be cast, the loose piece having a built-in heater for generating a temperature higher than the melting point of the core metal,
- feeding and filling the molten metal into the cavity by applying the pressurized gas to the furnace while the loose piece is being heated to said temperature higher than the melting point of the core metal by actuating the heater, and
- depressurizing the furnace after the cavity has been held in a filled state for a given time, when the cast molten metal at the peripheral part of the cavity has solidified and at the same time the molten metal at the central part of the cavity is still unsolidified, and removing the loose piece from the mold while said molten metal at the central part of the cavity is still unsolidified so as to have the pressure inside the furnace return to atmospheric pressure, and so as to have the unsolidified molten metal fall freely by its own weight into the furnace via the stalk tube thereby forming the central through hole.

5,836,371
METHOD AND APPARATUS FOR ATTACHING TERMINAL POST STRAPS TO A BATTERY PLATE GROUP

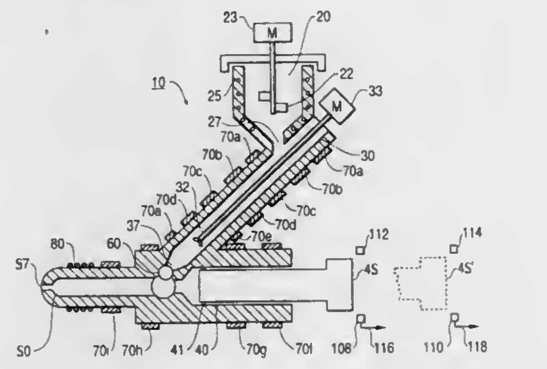
William H. Kump, West St. Paul; David L. Lund, Minneapolis, both of Minn., and Charles J. DiMarco, Kansas City, Mo., assignors to GNB Technologies, Inc., St. Paul, Minn.
Filed Dec. 30, 1996, Ser. No. 774,769
Int. Cl.^{6} B22D *23/06;19/00;* **H01M** *6/00*
U.S. Cl. 164—80 **23 Claims**

1. A method of making a lead acid storage battery comprising the steps of assembling a plate group consisting of a plurality of positive and negative plates each having a respective plate lug with the plate lugs of the positive plates disposed in one row and the plate lugs of the negative plates disposed in a second row, positioning the plate group in an open top container, positioning a mold made of non-inductive material over said plate group with the lugs of said plates extending through said mold, positioning a pair of pre-formed terminal posts on said mold with a strap portion of each post adjacent plate lugs of a respective one of said rows, and melting and fusing said plate lugs and portions of said terminal post straps to form interconnections above said mold between the positive plates and one of said terminal posts and between the negative plates and the other of said terminal posts.



5,836,372
METHOD AND APPARATUS FOR MANUFACTURING LIGHT METAL ALLOY

Kaname Kono, Tokyo, Japan, assignor to Takata Corporation, Tokyo, Japan
Continuation of Ser. No. 522,586, Sep. 1, 1995, abandoned. This application Jun. 12, 1997, Ser. No. 873,922
Int. Cl.^{6} B22D *17/00;17/10*
U.S. Cl. 164—113 **10 Claims**



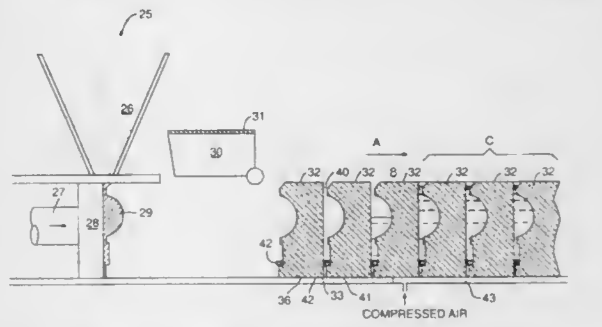
1. A method of injection molding a metal alloy comprising the steps of:
- (a) providing said metal alloy in a liquid state to a temperature-controlled barrel;
- (b) displacing said metal alloy along the temperature-controlled barrel by gravity to convert said metal alloy from the liquid state to a thixotropic state;
- (c) retracting a piston, which is housed separately from the barrel, to produce suction pressure in a chamber and drawing into the chamber said metal alloy in the thixotropic state with the suction pressure produced by the retraction of the piston; and
- (d) advancing said piston to inject said metal alloy in the thixotropic state from said chamber into a mold.

4. An injection molding system for producing a metal alloy, comprising:
- an accumulation chamber which stores therein the metal alloy in a thixotropic state, said chamber having a first port, a second port through which the metal alloy in the thixotropic state is injected, and a third port, the first port being located between the second and third ports;

- a barrel which feeds said accumulation chamber through the first port with the metal alloy in the thixotropic state, said barrel positioned to gravity feed said metal alloy to said accumulation chamber;
- a piston-cylinder assembly having a piston and a cylinder, the cylinder housing the piston and being connected to the third port, wherein movement of said piston outwardly from said cylinder produces suction pressure in the accumulation chamber for drawing said metal alloy in the thixotropic state into said accumulation chamber from said barrel, and movement of said piston inwardly into said cylinder produces pressure for injecting said metal alloy in the thixotropic state from said accumulation chamber into a mold; and
- a valve disposed between said barrel and said accumulation chamber, said valve selectively opening and closing said first port in response to one of (a) a pressure differential between said accumulation chamber and said barrel caused by movement of said piston, and (b) movement of said piston.

5,836,373
STRING MOULD PLANT INCLUDING ARRANGEMENT FOR PREVENTING SHRINKAGE VOIDS IN METAL CASTINGS

Preben N. Hansen, Ålsgårde; Steen Pedersen, Ballerup; Niels W. Rasmussen, Frederiksberg; Vagn Mogensen, Gentofte, and Emil Jespersen, Glostrup, all of Denmark, assignors to Georg Fischer Disa A/S, Herlev, Denmark
PCT No. PCT/DK94/00221, § 371 Date Jun. 13, 1996, § 102(e) Date Jun. 13, 1996, PCT Pub. No. WO95/18689, PCT Pub. Date Jul. 13, 1995
PCT Filed Jun. 7, 1994, Ser. No. 663,253
Claims priority, application Denmark, Jan. 3, 1994, 0016/94
Int. Cl.^{6} B22C *9/08;* **B22D** *27/09;47/02*
U.S. Cl. 164—167 **13 Claims**

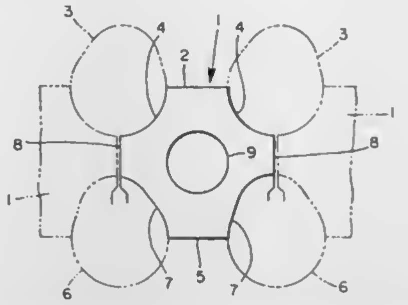


1. A string moulding plant comprising a string of sand moulds comprising a plurality of individual mould assemblies, means for moulding sand to produce the moulds of said string of sand moulds, a pouring device for sequentially pouring metal into individual mould assemblies as said mould assemblies are advanced past the pouring device, each of said mould assemblies comprising first and second mutually abutting moulds, at least one mould cavity, an ingate connected to the at least one mould cavity, and an internal after-feeding reservoir disposed below said at least one mould cavity and connected to said at least one mould cavity, and said plant further comprising a source of pressurized gas connected to said after-feeding reservoir.

5,836,374
CHILL PLATE AND STACKED MOLD

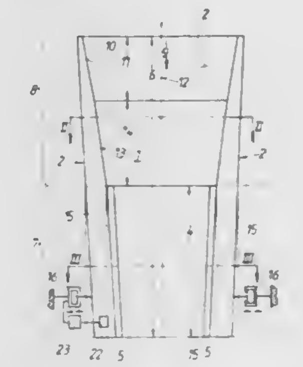
Sumitoshi Mai, Kashiwazaki, Japan, assignor to Kabushiki Kaisha Riken, Tokyo, and Riken Castec Corporation, Kashiwazaki, both of Japan
Filed Jan. 8, 1997, Ser. No. 778,218
Claims priority, application Japan, Mar. 13, 1996, 8-083035
Int. Cl.^{6} B22C *9/20;* **B22D** *15/00*
U.S. Cl. 164—322 **16 Claims**

1. A chill plate, comprising:
- a plurality of outer side surfaces;
- a plurality of cavities, each cavity disposed on a periphery of said chill plate between adjacent outer side surfaces of said plurality of outer side surfaces, and each said cavity having a shape which corresponds to a shape of a part to be chilled; and
- a through hole disposed substantially in a center of said chill plate, said through hole for receiving a shaft therein.



5,836,375
CONTINUOUS CASTING MOLD

Heinrich Thöne, Losenstein, and Franz Wimmer, Riedau, both of Austria, assignors to Voest-Alpine Industrieanlagenbau GmbH, Linz, Austria
Filed Oct. 10, 1995, Ser. No. 541,303
Claims priority, application Austria, Oct. 11, 1994, 1917/94
Int. Cl.^{6} B22D *11/16;11/10*
U.S. Cl. 164—452 **22 Claims**



1. A continuous casting mold arrangement for casting a strand including a billet or bloom, said arrangement comprising:
- a continuous casting mold having a mold length and side walls defining an open-ended mold cavity, said mold cavity having a pour-in section at one end of said mold cavity and a ran-out section arranged to follow said pour-in section in the running direction of said strand, at least two oppositely arranged side walls of said mold being rigidly fixed relative to each other about said pour-in section of said mold cavity, each of said at least two oppositely arranged side walls having a conicity decreasing in the running direction of said strand, and having a side wall section in said run-out section of said mold cavity, said side wall sections being constructed so as to be movable relative to said strand and each side wall section being arranged at a smaller conicity than the smallest conicity of each of said at least two oppositely arranged side walls of said pour-in section of said mold cavity; and
- pressing means being provided to press said side wall sections toward said strand.

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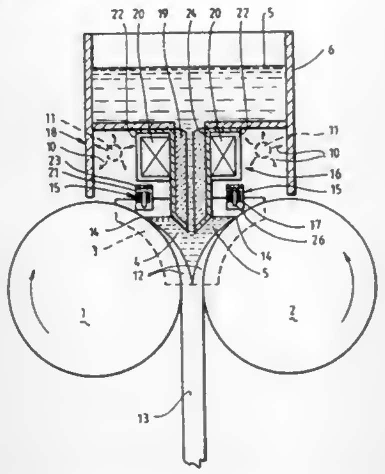
5,836,376
METHOD AND APPARATUS FOR GIVING VIBRATION TO MOLTEN METAL IN TWIN ROLL CONTINUOUS CASTING MACHINE

Kunio Matsui, Yokohama; Atsushi Hirata, Hiratsuka, and Akihiko Kimatsuka, Chigasaki, all of Japan, assignors to Ishikawajima-Harima Heavy Industries Co. Ltd., Tokyo, Japan, and BHP Steel (JLA) PTY. Ltd., Mebourne, Australia
Filed Jul. 15, 1996, Ser. No. 679,569
Claims priority, application Australia, Jul. 19, 1995, PN4260
Int. Cl.^{6} B22D *27/02;11/06*
U.S. Cl. 164—466 **13 Claims**



1. A method of continuously casting metal strip comprising:

introducing molten metal into a nip between a pair of parallel casting rolls via metal delivery means disposed above the nip to create a casting pool of molten metal supported on casting surfaces of the rolls immediately above the nip;

counter-rotating the casting rolls to deliver a solidified metal strip downwardly from the nip; and

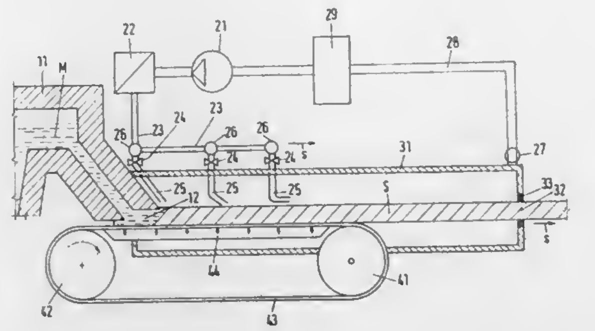
applying simultaneously a DC magnetic field and an AC magnetic field to edge margins of the molten metal of the casting pool extending along a meniscus defined by the molten metal of the pool and the casting surfaces of the rolls to induce high frequency relative vibratory movement between the molten metal of the casting pool and the casting surfaces of the rolls along the meniscus.

5,836,377
PROCESS AND DEVICE FOR COOLING MOLTEN STEEL

Wolfgang Reichelt; Ulrich Urlau, both of Moers; Paul Freier, and Karl-Heinz Spitzer, both of Clausthal-Zellerfeld, all of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Germany
PCT No. PCT/DE95/00196, § 371 Date Oct. 3, 1996, § 102(e) Date Oct. 3, 1996, PCT Pub. No. WO95/23661, PCT Pub. Date Sep. 8, 1995
PCT Filed Feb. 10, 1995, Ser. No. 702,503
Claims priority, application Germany, Mar. 4, 1994, 44 07 873.0
Int. Cl.^{6} B22D *11/124;11/06*
U.S. Cl. 164—486 **17 Claims**

1. A process for cooling molten steel, in which at least a portion of a melt emerging from a metal nozzle of a metallurgical vessel is solidified by contacting a cooling surface, said process comprising the following steps:

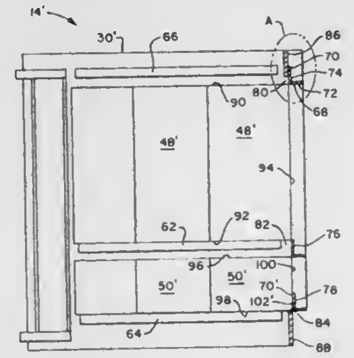
blowing a gas through a gas nozzle onto a surface of a freely accessible molten steel strand having a predetermined cross-section as it emerges from the metal nozzle, wherein the gas nozzle is oriented at an angle of between 0° and 45° relative to a plane defined by the strand and the directed gas is of a quantity and speed so as to impact upon the surface of the strand and reduce the cross-section of the strand;



forming a reducing atmosphere on the surface of the strand; and exposing the strand to the reducing atmosphere at least until solidification is complete.

5,836,378
AIR PREHEATER ADJUSTABLE BASKET SEALING SYSTEM

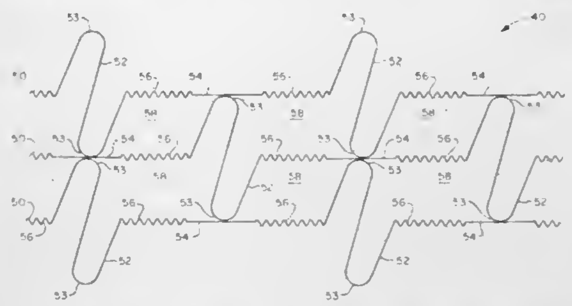
Mark E. Brophy, Wellsville, N.Y., and Harlan E Finnemore, Pocatello, Id., assignors to ABB Air Preheater, Inc., Wellsville, N.Y.
Filed Jun. 14, 1996, Ser. No. 665,077
Int. Cl.^{6} F23L *15/02*
U.S. Cl. 165—9 **19 Claims**



1. A sealing system for use in a rotary regenerative air preheater including a rotor having a cold-end, a hot-end, upper and lower rotor shell portions, a plurality of circumferentially spaced radially extending diaphragms forming compartments in the rotor, a plurality of heat exchange baskets disposed in the compartments wherein one of the heat exchange baskets in each compartment defines a hot-end outboard basket and one of the heat exchange baskets in each compartment defines a cold-end outboard basket, the hot-end and cold-end outboard baskets each having upper, lower and outboard surfaces, the upper surface of the hot-end outboard basket and the upper shell portion defining a first gap therebetween, the lower surface of the hot-end outboard basket and the upper surface of the cold-end outboard basket defining a second gap therebetween, and the lower surface of the cold-end outboard basket and the lower rotor shell segment defining a third gap therebetween, the sealing system comprising a first sealing member disposed adjacent the outboard surface of the hot-end outboard basket for sealing the first gap, a second sealing member disposed adjacent the outboard surfaces of the hot-end and cold-end baskets for sealing the second gap, and a third sealing member disposed adjacent the outboard surface of the cold-end basket for sealing the third gap, wherein the second sealing member is mounted to the outboard surface of one of the hot-end outboard basket and the cold-end outboard basket.

5,836,379
AIR PREHEATER HEAT TRANSFER SURFACE

Wayne S. Counterman, Wellsville, N.Y., assignor to ABB Air Preheater, Inc., Wellsville, N.Y.
Filed Nov. 22, 1996, Ser. No. 755,484
Int. Cl.^{6} F28D *7/02*
U.S. Cl. 165—10 **9 Claims**



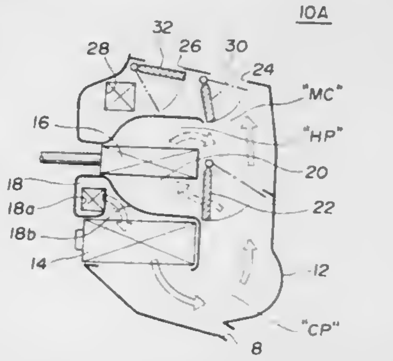
1. A heat transfer element for a rotary regenerative preheater comprising:

a first heat transfer plate defining a plurality of generally equidistantly laterally spaced apart, parallel straight notches, each of said notches comprising adjacent double ridges extending transversely from opposite sides of said first heat transfer plate, and undulations extending between said notches;

a second heat transfer plate adjacent said first heat transfer plate, and defining a plurality of generally equidistantly laterally spaced apart, parallel straight flat sections and undulations extending between said flat sections, said flat sections being spaced apart a distance generally equal to the lateral spacing of said notches, said notches of said first heat transfer plate being in contact with said flat sections of said second heat transfer plate to thereby define channels therebetween.

5,836,380
HEATER/COOLER UNIT OF AUTOMOTIVE AIR CONDITIONING DEVICE

Norimitsu Takesita; Masahiro Sano, both of Sano; Yasuko Arakawa, Fujioka, and Kazue Ayabe, Iwafune, all of Japan, assignors to Calsonic Corporation, Tokyo, Japan
Filed Sep. 27, 1996, Ser. No. 720,329
Claims priority, application Japan, Oct. 2, 1995, 7-254905; Oct. 2, 1995, 7-254906
Int. Cl.^{6} F25B *29/00*
U.S. Cl. 165—43 **11 Claims**



1. A heater/cooler unit of an automotive air conditioning device, comprising:

a casing having air inlet and outlet openings formed therein, said air outlet opening being the opening through which conditioned air to be blown to a passenger room passes;

means defining in said casing an air mixing chamber located just upstream of said air outlet opening;

means defining in said casing a first air flow passage which extends from said air inlet opening to said air mixing chamber;

means defining in said casing a second air flow passage which extends from a downstream part of said first air flow passage to said air mixing chamber;

means defining in said casing a third air flow passage which extends downstream from said air mixing chamber;

an evaporator installed in an upstream part of said first air flow passage for cooling air passing therethrough;

a heater core installed in said second air flow passage for warming air passing therethrough;

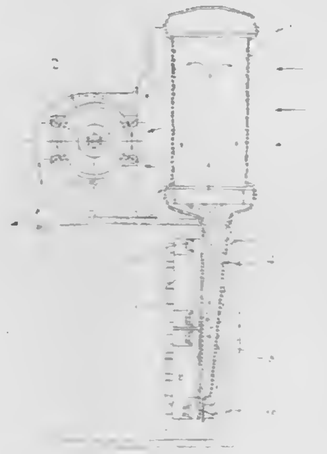
a mix door arranged to control the proportion between the amount of air directly led to the mixing chamber from said first air flow passage and the amount of air directed to said second air flow passage from said first air flow passage; and

a ventilation door arranged to control the proportion between the amount of air directed from said air mixing chamber to said air outlet opening and the amount of air directed from said air mixing chamber toward said third air passage,

wherein said evaporator and said heater core are arranged generally in parallel with each other and arranged to define therebetween an upstream portion of said first air flow passage containing air that has not yet passed through the evaporator and an upstream portion of said second air flow passage.

5,836,381
COOLING APPARATUS USING BOILING AND CONDENSING REFRIGERANT

Hiroyuki Osakabe, Chita-gun; Takashi Furukawa, Nagoya; Kiyoshi Kawaguchi, Toyota; Masahiko Suzuki, Hoi-gun, and Manji Suzuki, Chiryu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
Continuation of Ser. No. 504,025, Jul. 19, 1995. This application Sep. 11, 1997, Ser. No. 927,176
Claims priority, application Japan, Jul. 19, 1994, 6-167024; Jul. 19, 1994, 6-167025; Jul. 19, 1994, 6-167026; Jan. 13, 1995, 7-003646
Int. Cl.^{6} F28D *15/00*
U.S. Cl. 165—104.21 **22 Claims**



1. A cooling apparatus using boiling and condensing refrigerant for cooling heating elements generating heat, comprising:

a refrigerant tank formed by joining a plurality of thin plate materials together defining a chamber, refrigerant being sealed in said chamber, each of said plurality of thin plates having a joining portion, said joining portion having at least a through hole, the heating elements being constructed and arranged to be disposed on said thin plate material such that the heating elements may contact the chamber to transfer heat thereto, the refrigerant adsorbing heat generated from the heating elements and being gasified;

a structural member constructed and arranged to cover the heating elements, wherein the refrigerant tank is fixed between the heating elements and the structural member;

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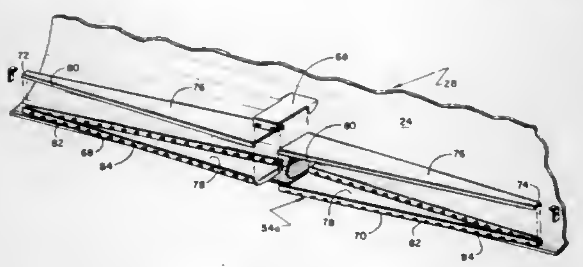
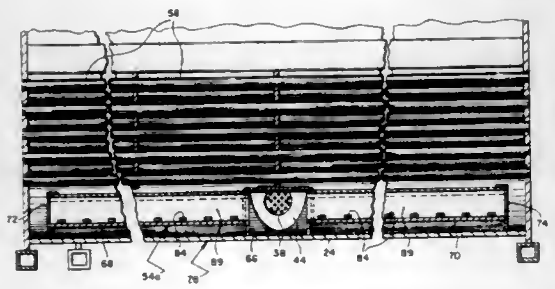
- a radiation part of tubular shape mounted on said refrigerant tank with one opening completely closed and the other opening communicated with said refrigerant tank for cooling and liquefying the gasified and elevated refrigerant and returning the liquefied refrigerant into said refrigerant tank;
- a fastening member for fastening each said heating element and the structural member through said through hole at said joining portion, wherein said plurality of thin plate materials are disposed to oppose mutually, and a part of opposing thin plate materials are completely adhered and bonded together at said joining portion, and said joining portion is formed at one of a part which is recessed and a part which is protruded of said thin plate material.

5,836,382
EVAPORATOR REFRIGERANT DISTRIBUTOR

Steve S. Dingle, and Jon P. Hartfield, both of La Crosse, Wis., assignors to American Standard Inc., Piscataway, N.J.
Continuation of Ser. No. 684,611, Jul. 19, 1996, abandoned. This application Nov. 26, 1997, Ser. No. 978,782
Int. Cl.^{6} F28D *7/00*
U.S. Cl. 165—160 **10 Claims**

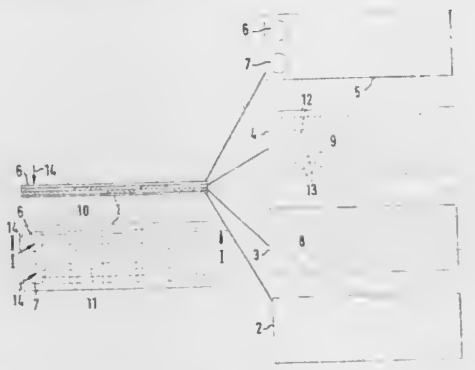




1. A refrigerant evaporator for use in a liquid chiller comprising:
- a shell, two-phase but primarily liquid refrigerant flowing into said shell when said chiller is in operation;
- a plurality of tubes horizontally disposed in said shell and running generally longitudinally thereof: and
- a refrigerant distributor, said distributor being positioned generally below said tubes and having an inlet for receiving said two-phase but primarily liquid refrigerant into said shell, said distributor having a first and a second branch, each of said branches defining a refrigerant flow passage and being disposed above and spaced apart from the bottom of said shell, said inlet being disposed between said first and said second branches, the cross section of said flow passages generally decreasing in a direction away from said inlet, each of said branches being of two-piece construction, a first piece of said first branch and a first piece of said second branch each being a cover portion and a second piece of said first branch and a second piece of said second branch each being a trough portion, each of said branches defining a plurality of orifices communicating between a refrigerant branch flow passage and the interior of said shell, said orifices being generally equally spaced along each of said branches.

5,836,383
HEAT TRANSFER DEVICE OF A PLATE SANDWICH STRUCTURE

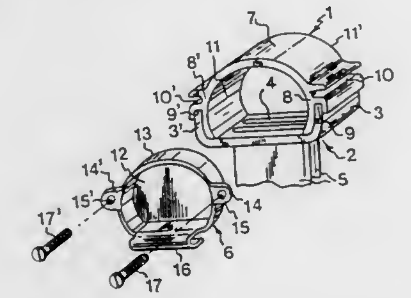
Eberhard Zwittig, Hochdorf, Germany, assignor to Behr GmbH & Co., Stuttgart, Germany
Filed Aug. 1, 1996, Ser. No. 690,868
Claims priority, application Germany, Aug. 1, 1995, 195 28 116.0
Int. Cl.^{6} F28D *9/00*
U.S. Cl. 165—167 **15 Claims**



1. A heat transfer device, comprising:
- a sandwich structure constructed of several plates and/or plate sections arranged one above another, at least one of which is provided with flow-duct-forming breakthroughs, the sandwich structure comprising:
- at least two flow-duct-covering plates and/or plate sections and one flow duct plate unit arranged in-between which is formed of one or more superimposed flow duct plates and/or plate sections each provided with flow duct breakthroughs,
- wherein one or more distinct, separate flow paths, each of which extend continuously between an inflow point and an outflow point, are formed by the flow duct breakthroughs in one flow duct plate and/or plate section or by mutually overlapping flow duct breakthroughs of several adjoining flow duct plates and/or plate sections, said flow paths extending predominantly in parallel to the plate plane between the inflow point and the outflow point.

5,836,384
HEAT EXCHANGE TANK FOR ASSEMBLY IN A HEAT EXCHANGER AND METHOD OF PRODUCING IT

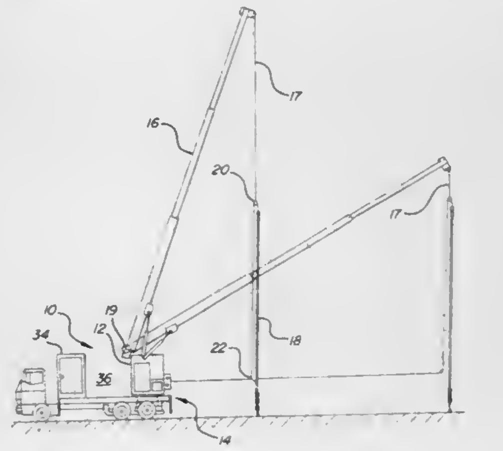
Björn Wijkstrom, and Hans Svensson, both of Asarum, Sweden, assignors to Valeo Engine Cooling Aktiebolag, Solvesborg, Sweden
Filed Jan. 23, 1996, Ser. No. 589,955
Claims priority, application Sweden, Jan. 25, 1995, 9500249
Int. Cl.^{6} F28F *9/02*
U.S. Cl. 165—173 **11 Claims**



11. A method of producing a heat exchanger tank to be mounted in a heat exchanger, comprising the steps of assembling an elongate casing of essentially U-shaped cross-section and a connecting plate so as to form a tubular tank section having two end openings, and fixing an end piece at the respective end opening, wherein the respective end piece is positioned at the casing by inserting at least one fixing means through a recess formed in the end piece and fixing it in a receiving means formed on the casing, the respective end piece is positioned at the connecting plate by an engagement means so as to produce clamping forces holding together the respective end pieces and the connecting plate, the casing, the connecting plate and the end pieces are thereafter connected by brazing.

5,836,385
APPARATUS FOR DEPLOYING WIRELINE

Sietse Jelle Koopmans, Hoogeind 29A, 2321, Meer, Belgium
PCT No. PCT/GB95/03050, § 371 Date Jun. 27, 1997, § 102(e) Date Jun. 27, 1997, PCT Pub. No. WO96/21081, PCT Pub. Date Jul. 11, 1996
PCT Filed Dec. 29, 1995, Ser. No. 860,501
Claims priority, application United Kingdom, Dec. 29, 1994, 9426323
Int. Cl.^{6} E21B *19/08*
U.S. Cl. 166—77.1 **9 Claims**

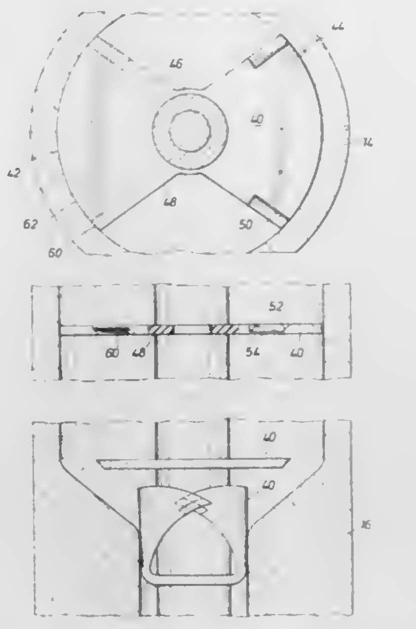


1. Apparatus for use in deploying slickline, wireline and the like comprising: a portable bed; a mounting table rotatable on the bed about a vertical axis; winch apparatus including a winch drum for carrying a coil of line; and an arm movable from a transport position to a raised position for supporting a pressure lubricator and associated pulleys, the winch drum and the arm being aligned and mounted on the table.

5,836,386
WIPING ELEMENT FOR A DRILL PIPE ID WIPING DEVICE

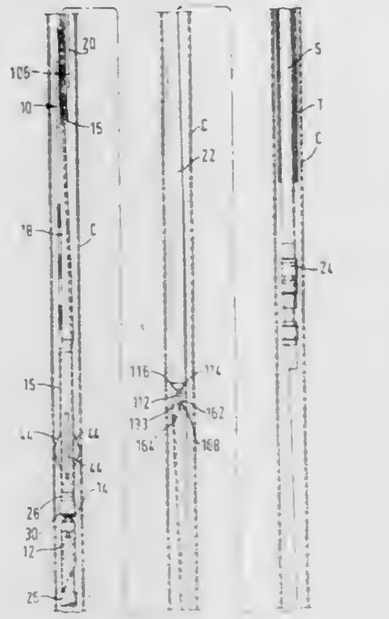
Archie Haggard, 2922 Teague, Houston, Tex. 77080
Filed Aug. 13, 1996, Ser. No. 696,123
Int. Cl.^{6} E21B *37/04*
U.S. Cl. 166—177.3 **15 Claims**

1. An improved wiper element for a pipe ID wiper comprising a resilient wiping element mounting on a pipe wiper mandrel and further having oppositely disposed petals to enable wiping within a large pipe, and wherein the opposing petals are defined by a transverse edge extending outwardly along said petals, and wherein said edges define a corner at the outer periphery of said petals, and further comprising a chamfered face at said corners to thereby enable said corners to overlap when brought into an abutting relationship.



5,836,387
SYSTEM FOR SECURING AN ITEM IN A TUBULAR CHANNEL IN A WELLBORE

Thurman B. Carter, Pearland, Tex., assignor to Weatherford/Lamb, Inc., Houston, Tex.
Division of Ser. No. 673,791, Jun. 27, 1996, abandoned, which is a division of Ser. No. 414,201, Mar. 31, 1995, Pat. No. 5,531,271, which is a continuation-in-part of Ser. No. 300,917, Sep. 6, 1994, Pat. No. 5,425,417, which is a continuation-in-part of Ser. No. 225,384, Apr. 4, 1994, Pat. No. 5,409,060, which is a continuation-in-part of Ser. No. 119,813, Sep. 10, 1993, Pat. No. 5,452,759, which is a continuation-in-part of Ser. No. 210,697, Mar. 18, 1994, Pat. No. 5,429,187. This application Aug. 13, 1997, Ser. No. 910,735
Int. Cl.^{6} E21B *23/01*
U.S. Cl. 166—217 **5 Claims**



1. A system for securing an item in a tubular channel in a wellbore, the system comprising

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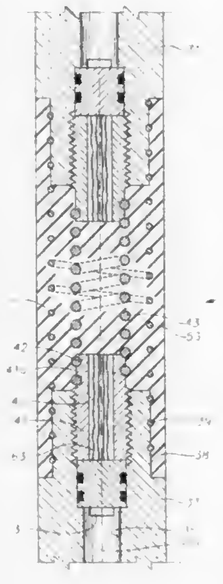
a lower body member,
an upper body member,
interconnecting means for movably interconnecting the lower body member and the upper body member so that upon application of a downward force on the upper body member the upper body member moves downwardly in the tubular channel effecting sideways movement of the lower body member so the lower body member contacts an interior surface of the tubular channel thereby wedging the lower body member and the upper body member in the tubular channel,
the interconnecting means comprising
  a connecting bar disposed partially in a first connecting bar groove in the lower body member and partially in a second connecting bar groove in the upper body member, and
  the connecting bar grooves and the connecting bar configured so that the connecting bar is movably held in the connecting bar grooves, and
at least one pawl member having opposed pawl member ends and movably mounted on the connecting bar, and movable in response to an upward force on the upper body member so that one of the opposed pawl member ends contacts the lower body member and the other pawl member end contacts the upper body member forcing the two body members apart.

5,836,388
FLEXIBLE JOINT FOR DOWNHOLE TOOLS

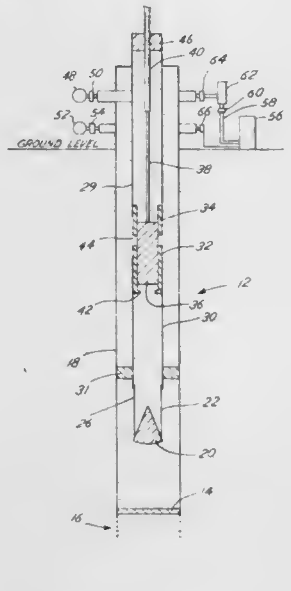
Borislav J. Tchakarov, Houston, Tex., assignor to Computalog Limited, Calgary, Canada
Filed Jul. 16, 1997, Ser. No. 893,330
Int. Cl.^{6} E21B *17/20*
U.S. Cl. 166—242.6 **15 Claims**



1. A flexible joint for joining a pair of downhole tool modules, the flexible joint comprising:
  a pair of subs wherein each sub is adapted to connect to one of the modules;
  a coiled inner spring connected between the subs, the inner spring being wound in a first direction; and
  a coiled outer spring surrounding the inner spring, connected between the subs, and being wound in a direction opposite to the first direction.

5,836,389
APPARATUS AND METHOD FOR INCREASING PRODUCTION RATES OF IMMOVABLE AND UNSWEPT OIL THROUGH THE USE OF WEAK ELASTIC WAVES

Dennis Wagner, and Reed Juett, both of Arlington Heights, Ill., assignors to Wave Energy Resources, Arlington Heights, Ill.
Filed Dec. 9, 1996, Ser. No. 762,068
Int. Cl.^{6} E21B *43/25*
U.S. Cl. 166—249 **9 Claims**

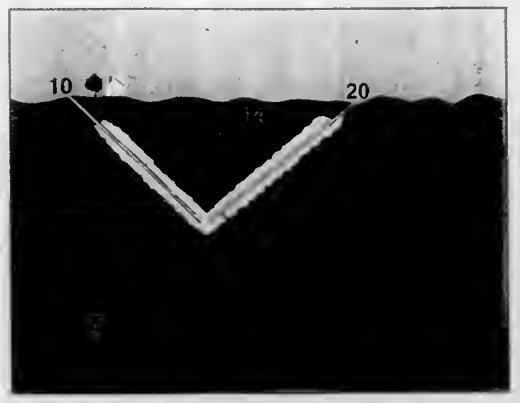


1. A method for increasing oil production in an oil field comprising the steps of:
  (a) generating an impulse wave within a well that has down-hole tubing, said impulse wave traveling through at least a portion of said down-hole tubing;
  (b) at least partially deflecting said impulse wave with a deflector and thus causing at least one elastic wave to be formed and propagated into an area surrounding the well;
  (c) allowing at least a portion of said at least one elastic wave to travel down-hole past said deflector; and
  (d) preventing at least a percentage of said portion of said at least one elastic wave from deflecting back up-hole into the down-hole tubing,
whereby oil production in the oil field is increased.

5,836,390
METHOD FOR FORMATION OF SUBSURFACE BARRIERS USING VISCOUS COLLOIDS

John A. Apps, Lafayette; Peter Persoff, Piedmont; George Moridis, Oakland, and Karsten Pruess, Berkeley, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.
Filed Nov. 7, 1996, Ser. No. 745,089
Int. Cl.^{6} E21B *33/13*
U.S. Cl. 166—281 **19 Claims**

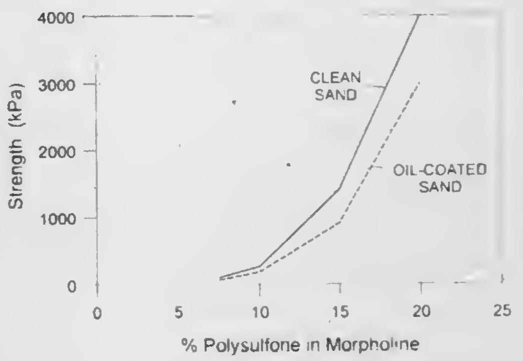
1. A method for formation of subsurface barriers comprising steps:
  (a) emplacing into a subsurface a grout comprising a viscous colloid selected from the group consisting of a colloidal silica, modified colloidal silica, polysiloxane and polybutene; and



  (b) solidifying said colloid in place.

5,836,391
WELLBORE SAND CONTROL METHOD

Ralph G. Jonasson; Kevin Rispler, both of Edmonton, and Ernest H. Perkins, Sherwood Park, all of Canada, assignors to Alberta Oil Sands Technology & Research Authority, Edmonton, Canada
Continuation-in-part of Ser. No. 506,169, Jul. 25, 1995, abandoned. This application Jul. 16, 1996, Ser. No. 680,829
Int. Cl.^{6} F21B *33/138*
U.S. Cl. 166—295 **2 Claims**



1. A process for consolidating the near-bore region of an unconsolidated subterranean reservoir containing reservoir fluid and being formed by discrete sand or gravel particles having communicating fluid flow channels extending therebetween to provide fluid flow permeability, comprising:
  (a) emplacing a liquid slug of a first solution in the near-bore region, said solution comprising a linear polymer dissolved in a good solvent for the polymer;
  (b) then Injecting a liquid slug of a poor solvent for the polymer, said poor solvent being miscible in the good solvent, into the near-bore region to contact the first slug and precipitate linear polymer to consolidate the particles of the near-bore region while retaining sufficient residual permeability to enable production of the reservoir fluid:
the solvents and polymer having been selected on the following basis:
  (i) the good solvent being substantially non-reactive with the polymer,
  (ii) the polymer being non-miscible with water and with petroleum and substantially non-reactive with the reservoir solids and fluids,
  (iii) the combination of solvents and polymer used being operative to form a three-dimensional network of interconnected strands in a sand sample, said strands extending through fluid flow channels in the sample.

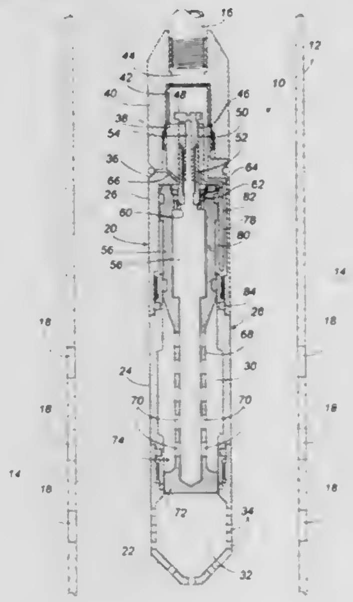
5,836,392
OIL AND GAS FIELD CHEMICALS

Phillip Lance Urlwin-Smith, Ascot, United Kingdom, assignor to Halliburton Energy Services, Inc., Duncan, Okla.
PCT No. PCT/GB95/03019, § 371 Date Aug. 5, 1997, § 102(e) Date Aug. 5, 1997, PCT Pub. No. WO96/19636, PCT Pub. Date Jun. 27, 1996
PCT Filed Dec. 22, 1995, Ser. No. 849,904
Claims priority, application United Kingdom, Dec. 22, 1994, 9426025
Int. Cl.^{6} F21B *33/13*
U.S. Cl. 166—295 **18 Claims**

1. A method for conformance control of a reservoir comprising:
injecting into a zone of the reservoir an aqueous solution of a co-polar comprising at least one ethylenically unsaturated polar monomer and at least one copolymerizable ethylenically unsaturated ester formed from a hydroxy compound of the formula ROH wherein R is an alkyl group of 4–30 carbons, alkenyl group of 4–20 carbons, cycloalkyl group of 5–8 carbons, aryl group of 6–20 carbons or such groups, substituted with from 1 to 3 hydroxyl, ether or thio ether groups or a heterocyclic or heterocyclic alkylene group of from 3–8 carbons and at least one heteroatom selected from oxygen, nitrogen and sulfur and an alkenoic or aralkenoic carboxylic acid having from 4–20 carbons or sulfonic or phosphoric acid having from 2–20 carbons together with a crosslinking agent comprising a multi-valent metal ion capable of crosslinking an acrylic acid polymer to form a viscous gel;
allowing the solution to flow through at least a portion of a high permeability region within said zone wherein it is heated to a temperature of at least about 20° C. while maintained at a pH above about 6.5 whereupon crosslinking occurs to form a substantially non-flowable gel within said high permeability region which reduces the permeability of said region in said zone.

5,836,393
PULSE GENERATOR FOR OIL WELL AND METHOD OF STIMULATING THE FLOW OF LIQUID

Howard E. Johnson, 3765 Bozeman Lake Rd., Kennesaw, Ga. 30144
Filed Mar. 19, 1997, Ser. No. 820,536
Int. Cl.^{6} E21B *43/26*
U.S. Cl. 166—308 **6 Claims**



2. A method of stimulating the flow of liquid through subterranean earth formations to a wellbore in the earth comprising the steps of:

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determining the level of liquid in the wellbore;

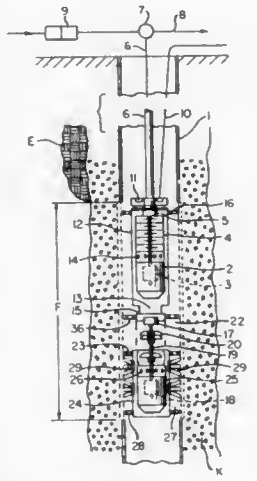
estimating the pressure at which most of the subterranean earth formation about the wellbore will fracture;

inserting a gas expulsion tool into a well casing which extends into the wellbore to the depth below the level of the liquid in the wellbore and to the depth of the earth formation to be stimulated;

expelling a surge of compressed gas from the gas expulsion tool in the well casing and through openings in the well casing and out beyond the wellbore at the depth of the earth formation to be stimulated at a pressure exceeding 50% of the estimated formation fracturing pressure.

5,836,394
WELL REGENERATION APPARATUS

Karl-Heinz Blank, Mühlenstr. 2A, D-50259 Pulheim, Germany
Filed Jul. 3, 1997, Ser. No. 887,619
Claims priority, application WIPO, Jul. 7, 1996, PCT/DE96/01215; Germany, Feb. 28, 1997, 197 08 140.1
Int. Cl.^{6} E21B *37/08*
U.S. Cl. 166—312 **16 Claims**



1. A well regeneration apparatus, including means for mechanically cleaning a well casing, comprising:

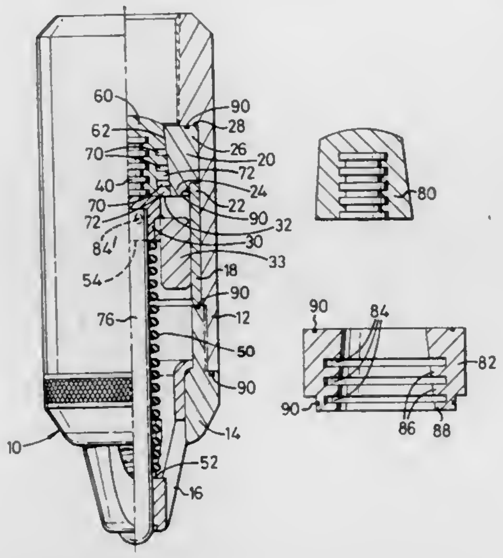
a scrubber pump associated with said means for mechanically cleaning a well casing for washing and scrubbing a filter pipe portion of said well casing, and a gravel bed that surrounds said well casing, by means of a fluid;

a feed pump adapted to be disposed above said scrubber pump, wherein a pressure side of said feed pump is connected to a riser that leads out of said well, and wherein a pump chamber of said scrubber pump communicates with a suction side of said feed pump; and

a further chamber disposed in the vicinity of said scrubber pump and serving to accommodate said means for mechanically cleaning a well casing, wherein said pump chamber of said scrubber pump is disposed above said further chamber and serves to accommodate components of said scrubber pump that convey fluid outwardly into said gravel bed, in particular such that fluid passes out of said gravel bed, via said lower further chamber into said upper pump chamber, and from the latter into said gravel bed.

5,836,395
VALVE FOR WELLBORE USE

Peter Budde, Vlaardigen, Netherlands, assignor to Weatherford/Lamb, Inc., Houston, Tex.
Continuation-in-part of Ser. No. 639,886, Apr. 29, 1996, Pat. No. 5,680,902, which is a continuation-in-part of Ser. No. 519,503, Aug. 25, 1995, Pat. No. 5,511,618, which is a continuation of Ser. No. 283,404, Aug. 1, 1994, Pat. No. 5,450,903. This application Jun. 4, 1997, Ser. No. 868,511
Int. Cl.^{6} E21B *33/04*
U.S. Cl. 166—321 **17 Claims**



1. A valve comprising

a body through which fluid is flowable,

a valve seat connected in and to the body and through which fluid is flowable,

a valve member positioned adjacent the valve seat and selectively movable to seat against the valve to close the valve to fluid flow and selectively movable away from the seat to open the valve to fluid flow, and

a plurality of spaced apart recesses on the valve member for hoiding debris and thereby preventing the debris from inhibiting valve closure.

5,836,396
METHOD OF OPERATING A DOWNHOLE CLUTCH ASSEMBLY

Dwayne S. Norman, 1327 Norfolk Drive, N.W., Calgary, Alberta, Canada, T2K 5L5
Division of Ser. No. 580,125, Dec. 28, 1995, Pat. No. 5,732,777. This application Dec. 31, 1997, Ser. No. 2,079
Claims priority, application Canada, Nov. 28, 1995, 2163946
Int. Cl.^{6} E21B *23/00*
U.S. Cl. 166—376 **8 Claims**

1. A method of rotatably connecting the downhole end of a tubing string to a tubing anchor in a well bore, comprising the steps of:

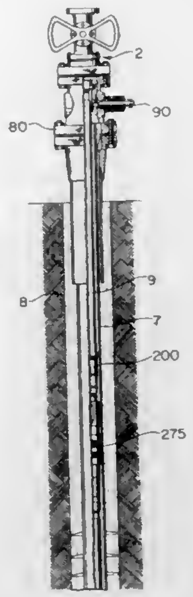
connecting the downhole end of said tubing string to a first tubular sub;

connecting said tubing anchor to a second tubular sub;

providing an initial connection between said first and second tubular subs preventing both relative rotation and axial separation therebetween;

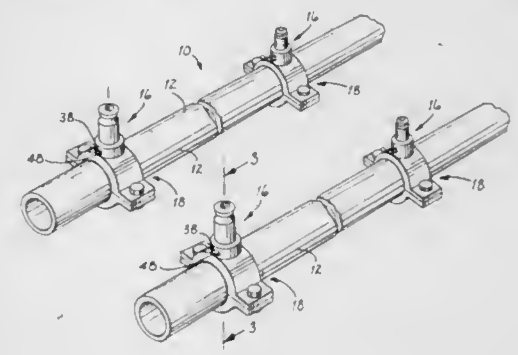
fixing said tubing anchor in place in said well bore by means of torque transmitted through tubing string and said first and second tubular subs to said tubing anchor; and

rupturing said initial connection between said first and second tubular subs by means of tension applied to said first tubular sub, whereupon said first and second tubular subs may be axially separated by a predetermined amount so that one can rotate relative to the other and so that said tubing string is then rotatable relative to said tubing anchor.



5,836,397
HEAD-LOCK FIRE SPRINKLER SYSTEM

Darin I. Craig, 60 Caesar Pl., and Rick S. Foster, 263 Pacific, both of Lake Havasu City, Ariz. 86406
Filed Nov. 18, 1996, Ser. No. 746,807
Int. Cl.^{6} A62C *35/58*
U.S. Cl. 169—5 **1 Claim**



1. A fire sprinkler system comprising, in combination:

a plurality of water conduits having passages through walls thereof at predetermined points;

a plurality of sprinkler assembly receivers each mounted in each one of said conduits enclosing said passages; and

a multiplicity of sprinkler assemblies removably attached to said plurality of sprinkler assembly receivers for creating a spray or mist of water when the fire sprinkler system is activated;

each one of said plurality of sprinkler assembly receivers being so constructed and configured as to form an interior passage provided by a cylindrical wall in fluid communication with a respective said passage;

each said cylindrical wall having formed therein at least one bayonet-type fastener slot having an entry portion generally parallel to an axis of the cylindrical wall thereof and a locking portion generally perpendicular to the axis of the cylindrical wall thereof;

each one of said multiplicity of sprinkler assemblies comprising:

a cylindrical insert having a water passage axially formed therethrough in fluid communication with said respective passage;

valve means for closing said water passage to flow;

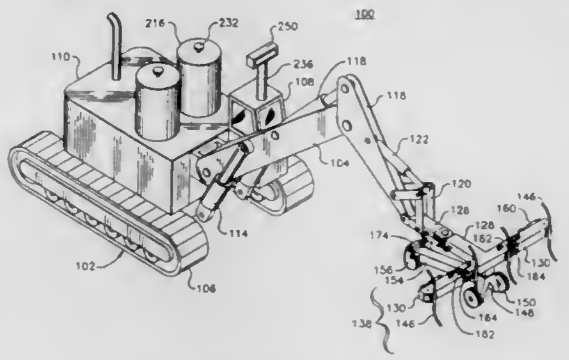
means for forming a water spray or mist when the fire sprinkler system is activated;

fusible link means for opening the water passage to flow when the fusible link means is heated to a predetermined temperature; and

at least one bayonet pin extending from the cylindrical insert capable of being received in said bayonet-type fastener slot in each said cylindrical wall for selectively locking each one of said sprinkler assemblies in an associated said receiver and, respectively, for permitting removal of each said sprinkler assembly from said associated receiver.

5,836,398
VEHICLE MOUNTED FIRE FIGHTING SYSTEM

Richard W. White, San Diego, Calif., assignor to FAV, Inc., San Diego, Calif.
Continuation-in-part of Ser. No. 308,981, Sep. 20, 1994. This application Aug. 5, 1996, Ser. No. 695,219
Int. Cl.^{6} A62C *27/00*
U.S. Cl. 169—24 **18 Claims**



1. A fire fighting assembly, comprising:

a forward assembly mountable on a land-based vehicle forwardly movable over terrain and extendable therefrom in a forward direction of movement of said vehicle;

at least one rotary power drive, each said rotary power drive having a rotatable shaft, each shaft having an axis of rotation parellel to said terrain and parellel to said forward direction of movement, each said rotary power drive mounted to said forward assembly such that said rotatable shaft extends away from said forward assembly and said vehicle in said forward direction; and

a plurality of elongated members, each said elongated member having a hub, said hub being attached to said rotatable shaft wherein rotating said rotatable shaft causes said hub to rotate, said elongated member having a radius of rotation extendable to said terrain whereby a portion of an elongated member strikes said terrain to sweep debris while said vehicle moves over said terrain.

5,836,399
SPRAYER WHEEL SHIELD

Marvin Anthony Maiwald, and Scott Charles Steege, both of Ankeny, Iowa, assignors to Deere & Company, Moline, Ill.
Filed Aug. 27, 1996, Ser. No. 703,587
Int. Cl.^{6} B62D *25/16*
U.S. Cl. 172—509 **20 Claims**

1. In an agricultural vehicle having a frame supported for movement over ground in a forward direction and in a rearward direction by a plurality of wheels, the wheels connected to wheel support structure and including wheel hubs, the wheels adapted for positioning between rows of crop, attachable and removable shield structure for protecting the crop from one of the wheels when attached, comprising:

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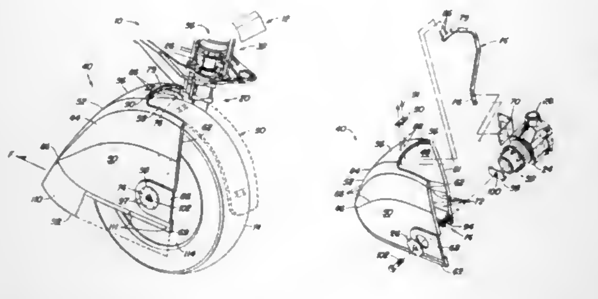


a plastic wheel shield having a body with a lower, forward nose portion and inside and outside sidewalls extending in the rearward direction from the nose portion, and a top wall connected to the sidewalls;

a support and aligning member connected to the wheel support structure and extending upwardly therefrom to an uppermost shield receiving member, the support and aligning member and the wheel shield including mating structure for at least temporarily supporting substantially the entire weight of the wheel shield independently of separate fasteners during attaching of the shield structure; and

bracket structure connected to the wheel support and alignable with a preselected location on one of the sidewalls when the wheel shield is supported on the support and aligning member, and bolt structure connected between the bracket structure and the preselected location and supporting the wheel shield from the wheel support structure.

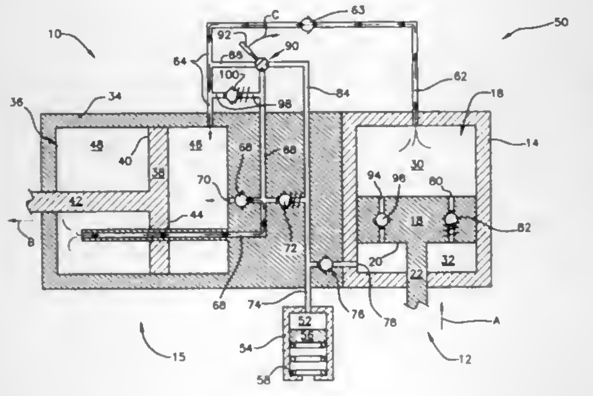
5,836,400
THREE SPEED CIRCUIT FOR HYDRAULIC TOOL

Myron D. Tupper, 12550 SE. 242nd Ave., Boring, Oreg. 97090, and William Gallentine, 615 Country Club Rd., Hood River, Oreg. 97031

Filed Nov. 18, 1997, Ser. No. 972,767

Int. Cl.^{6} B25F *5/00;* F15B *15/18*

U.S. Cl. 173—11 **11 Claims**



1. A hydraulic device having a mechanical input and a mechanical output, comprising:

a pump having a housing including a pump bore and a pump piston disposed to move linearly within said pump bore and to develop pressure on fluid occupying said pump;

a ram having a ram housing including a ram bore and a ram piston disposed to move within said ram bore; and

fluid circuitry communicating between said pump bore and said ram bore such that fluid pressure developed within said pump is imposed on said ram piston, said fluid circuitry disposed to move said ram piston selectively at three speeds with corresponding magnitudes of force relative to a single speed of said pump piston.

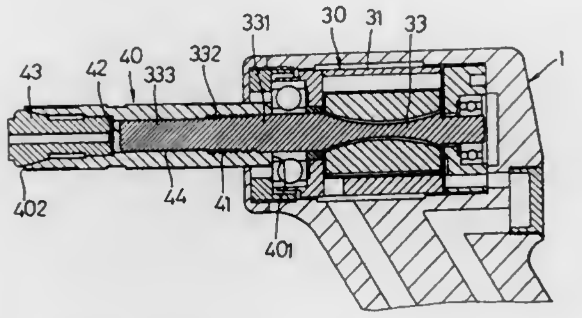
5,836,401
DRIVING MECHANISM FOR A PNEUMATIC TOOL

Wang Lin Hsiu-Tsu, Taichung Hsien, Taiwan, assignor to Shiuh Horng Air Tool Corp., Taiwan

Filed May 29, 1997, Ser. No. 864,809

Int. Cl.^{6} B25D *15/00*

U.S. Cl. 173—93 **3 Claims**



1. A driving mechanism for a pneumatic tool, comprising:

a motor having a body portion and a rotor shaft mounted rotatably to said body portion, said rotor shaft having an engaging section which extends beyond said body portion, said engaging section of said rotor shaft having an externally threaded portion adjacent to said body portion and a non-threaded portion which is connected to and which extends away from said externally threaded portion; and

an elongated connector having first and second ends and an axial hole extending from said first end thereof, said axial hole having an internally threaded section formed adjacent to said first end of said connector and a non-threaded section which is connected to said internally threaded section and which extends away from said first end of said connector toward said second end of said connector, said externally threaded portion of said rotor shaft engaging threadedly said internally threaded section of said connector, said non-threaded portion of said rotor shaft engaging fittingly said non-threaded section of said connector, whereby that said connector is rotatable coaxially and stably with said rotor shaft when said motor is actuated.

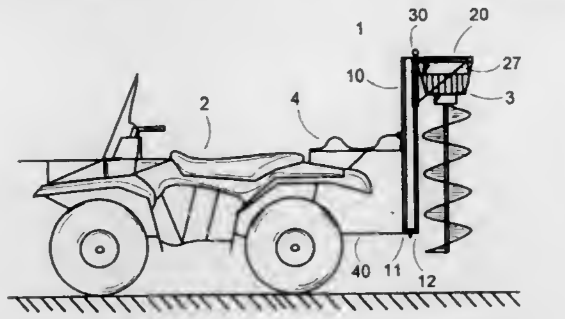
5,836,402
AUGER-HOLDER

Wayne Jones, 456 E. Pond Rd., Nobleboro, Me. 04555

Filed Aug. 3, 1995, Ser. No. 511,067

Int. Cl.^{6} F21C *11/02*

U.S. Cl. 173—185 **13 Claims**



1. An auger-holder for removably securing a portable auger to a vehicle, said auger-holder comprising:

a) a primary frame;

b) attachment means for securing said primary frame to said vehicle; and

c) a secondary frame adjustably engageable with said primary frame such that a position of said secondary frame may be adjusted with respect to a fixed position of said primary frame, wherein said secondary frame is designed to receive a portable auger, and wherein said secondary frame may be of adjustable width to accept auger handles of differing dimensions.

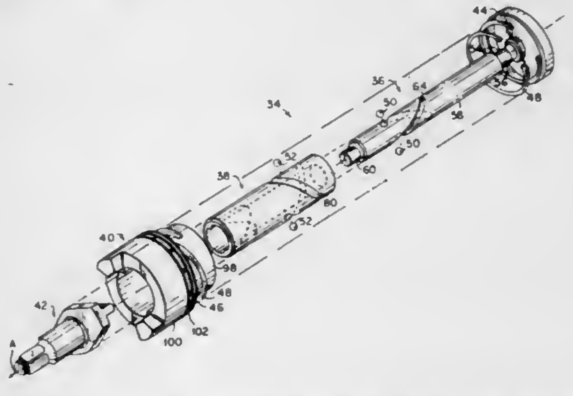
5,836,403
REVERSIBLE HIGH IMPACT MECHANISM

Gordon A. Putney, Lake Geneva, and Dean J. Iwinski, Muskego, both of Wis., assignors to Snap-on Technologies, Inc., Lincolnshire, Ill.

Filed Oct. 31, 1996, Ser. No. 741,666

Int. Cl.^{6} B25D *15/00*

U.S. Cl. 173—205 **14 Claims**



1. A reversible rotary impact mechanism for applying intermittent torque impulses to a load, the mechanism comprising:

a shaft rotatable about an axis and adapted to be coupled to a motive source;

a rotatable anvil for coupling to the load and having an anvil ear;

an axially and rotatably moveable tubular hammer substantially coaxial with the shaft and having a hammer ear engageable with the anvil ear;

a rotatable tubular drive coupling member having inner and outer cylindrical surfaces substantially coaxial with the shaft;

a first helical cam structure coupling the shaft to only the inner surface of the drive coupling member;

a second helical cam structure coupling the hammer to only the outer surface of the drive coupling member; and

a bias member resiliently biasing the hammer axially toward the anvil to engage the hammer ear with the anvil ear.

whereby when the shaft is rotated in a first direction and torque exerted by the anvil ear on the hammer ear exceeds a given threshold, the first helical cam structure responds to rotation of the shaft to move the drive coupling member axially away from the anvil to disengage the hammer ear from the anvil ear, and when the shaft is rotated in a second direction and torque exerted by the anvil ear on the hammer ear exceeds a given threshold, the second cam structure responds to rotation of the shaft to move the hammer relative to the drive coupling member axially away from the anvil to disengage the hammer ear from the anvil ear.

5,836,404
DRILL BITS WITH ENHANCED HYDRAULIC FLOW CHARACTERISTICS

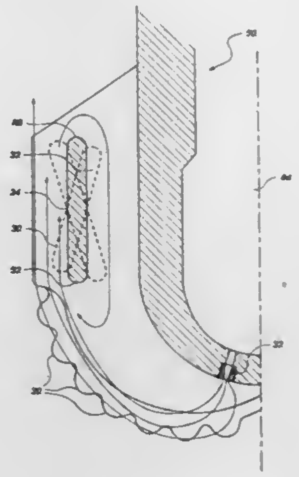
William R. Trujillo, South Salt Lake, Utah; Sean K. Berzas, The Woodlands, Tex.; Craig H. Cooley, Bountiful, and Wayne R. Hansen, Centerville, both of Utah, assignors to Baker Hughes Incorporated, Houston, Tex.

Division of Ser. No. 631,448, Apr. 12, 1996. This application Sep. 10, 1997, Ser. No. 927,058

Int. Cl.^{6} E21B *7/00;10/60*

U.S. Cl. 175—57 **12 Claims**

1. A method of stabilizing drilling fluid flow within channels of a drilling structure, comprising:



establishing upward fluid flow in at least one substantially longitudinally extending channel of said drilling structure; and

recirculating at least a portion of said upward fluid flow from said at least one channel through an associated recirculation channel at least partially physically partitioned therefrom.

5,836,405
FASTENING APPARATUS FOR AND METHOD OF SETTING FASTENING ELEMENTS

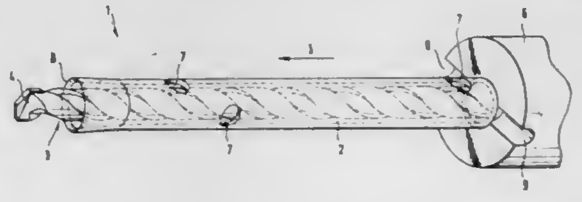
Hans Gschwend, Schweiz, Switzerland, and Martin Noser, Vaduz, Liechtenstein, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed May 23, 1997, Ser. No. 862,529

Claims priority, application Germany, May 24, 1996, 196 20 955.2

Int. Cl.^{6} E21B *7/00;* F16B *13/04*

U.S. Cl. 175—57 **12 Claims**



9. Method of anchoring a fastening element in a borehole formed in a receiving material by drilling an axially extending borehole in the receiving material and anchoring the fastening element in the borehole comprising the steps of inserting an axially extending drilling tool (3, 23) having an outside diameter through an axially extending bore in a fastening element (2, 12, 22) having an outside diameter where the bore has a diameter greater than the outside diameter of the drilling tool, rotating the drilling tool by means of a drilling device and forming a borehole with a smaller diameter than the outside diameter of the fastening element and maintaining said fastening element separate from the rotation of the drilling tool, while rotating the drilling tool directing axially directed hammer-like blows against the fastening element and driving the fastening element into anchored engagement with the borehole formed by the drilling tool.

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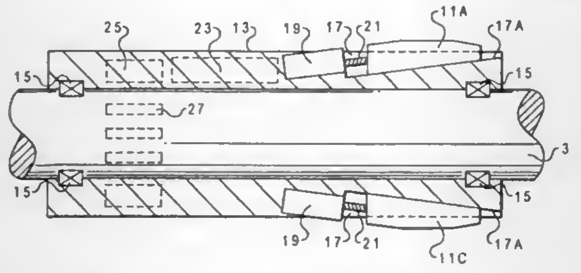
5,836,406
ADJUSTABLE STABILIZER FOR DIRECTIONAL DRILLING

Frank J. Schuh, Plano, Tex., assignor to Telejet Technologies, Inc., Dallas, Tex.

Continuation of Ser. No. 757,139, Dec. 3, 1996, abandoned, which is a continuation of Ser. No. 446,006, May 19, 1995, abandoned. This application Jun. 26, 1997, Ser. No. 882,798

Int. Cl.^{6} E21B *7/04*

U.S. Cl. 175—61 **17 Claims**



1. An improved assembly for steering a rotating drillstring in a borehole, the assembly comprising:
  a stabilizer sub for attachment into a drillstring;
  a stabilizer body rotatably carried by the stabilizer sub, wherein the stabilizer body remains substantially stationary relative to the borehole as the drillstring rotates;
  at least one stabilizer blade carried by the stabilizer body, the stabilizer blade being radially extendable from the stabilizer body and into engagement with the sidewall of the borehole;
  a yielding member coupled to each stabilizer blade for moving the stabilizer blade relative to the stabilizer body, the yielding member being constructed to yield in response to a selected axial load, to allow the stabilizer blade to collapse to minimal radial extension; and
  a non-hydraulic motor associated with the stabilizer blade assembly and carried by the stabilizer body for selective extension of the stabilizer blade.

5,836,407
ARTICULATED TOOL FOR DRILLING OIL, GAS GEOTHERMAL WELLS

André Leroy, 64 chaussée du Roi Baudoin, Saint Symphorien, Belgium

PCT No. PCT/FR95/00779, § 371 Date Mar. 21, 1997, § 102(e) Date Mar. 21, 1997, PCT Pub. No. WO95/34741, PCT Pub. Date Dec. 21, 1995

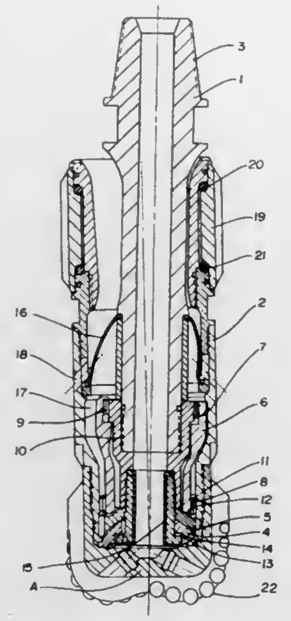
PCT Filed Jun. 14, 1995, Ser. No. 750,467

Claims priority, application France, Jun. 15, 1994, 94 07551

Int. Cl.^{6} E21B *4/00;17/04*

U.S. Cl. 175—101 **5 Claims**

1. A tool for drilling oil, gas or geothermal wells, driven in rotation by a driving element which also transmits to it a forward thrust, constituted by two main components, one of which is a hollow shaft joined by one of its ends to the driving element, and the other of which is a blind tubular body, here called the tool body, the closed end of which externally carries the cutting edges and the open end of which allows the passage of the hollow shaft, in which the two main components are spherically connected, characterized:
  in that the hollow shaft transmits the drilling torque to the tool body through a transmission system called a variable configuration transmission system comprising, between the hollow shaft and the tool body, an intermediate element connected to each of the main components,
  in that a ball joint which embodies the spherical connection is located at the very bottom of the blind part of the tool body,
  in that the tool body carries a stabilizer located at its other end, at a distance from the center of the ball joint on the order of at least 2.5 times the external diameter of the tool body,
  in that the variable configuration transmission system is separate from the ball joint and located on the same side of this ball joint as the stabilizer and
  in that this system uses, to transmit the drilling torque, the intermediate element and wherein the intermediate element surrounds the hollow shaft.



5,836,408
ROTARY PERCUSSION BLOW ASSISTED DRILL

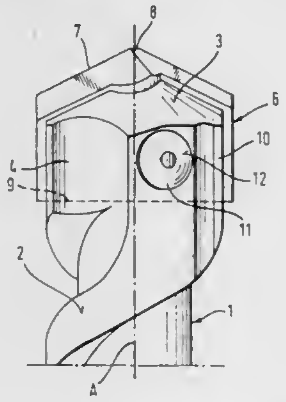
Werner Kleine, Achim; Axel Neukirchen, Drensteinfurt, and Werner Bongers, München, all of Germany, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Dec. 9, 1996, Ser. No. 762,182

Claims priority, application Germany, Dec. 7, 1995, 195 45 646.7

Int. Cl.^{6} E21B *10/44*

U.S. Cl. 175—293 **15 Claims**



1. A rotary percussion blow assisted drill comprising an axially extending shank (**1**) having an axis of rotation (A) with a cutting head end face (**3**) and an axially extending outside surface (**2**) with at least one main helically extending conveying groove in said outside surface for the removal of drill material from said cutting head end, a cutting plate (**6**) with hard metal cutting edges (**7**) having an axial extension fitted into a cutting head end region (**10**) of said shank (**1**) extending inwardly from said cutting head end face, said cutting plate (**6**) projects axially outwardly from said cutting head end (**3**) and radially outwardly by a dimension (s) from said outside surface (**2**), at least one pin-shaped guide element (**11, 21, 31**) having a central axis (L) extending substantially perpendicularly to the axis of rotation (A) of said shank and embedded in said cutting head end region (**10**) within a range of the axial extension of said cutting plate inwardly from said cutting head end face, said guide element (**11, 21, 31**) being spaced circumferentially from said cutting plate and having a non-cutting free end face (**12**) spaced radially outwardly by a dimension (r) from said outside surface (**2**), and the dimension (r) being less than the outward dimension (s) of said cutting plate (**6**).

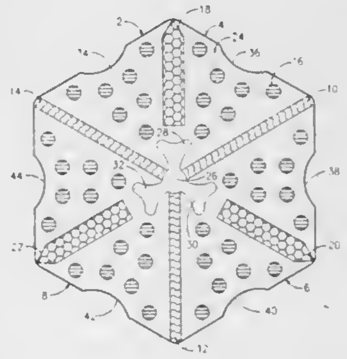
5,836,409
MONOLITHIC SELF SHARPENING ROTARY DRILL BIT HAVING TUNGSTEN CARBIDE RODS CAST IN STEEL ALLOYS

William Banning Vail, III, 3123 198th Pl. SE., Bothell, Wash. 98012

Continuation of Ser. No. 664,791, Jun. 17, 1996, Pat. No. 5,615,747, which is a continuation-in-part of Ser. No. 301,683, Sep. 7, 1994, abandoned. This application Mar. 31, 1997, Ser. No. 825,575

Int. Cl.^{6} E21B *10/46*

U.S. Cl. 175—379 **3 Claims**



1. A monolithic long lasting rotary drill bit assembly for attachment to a rotary drill string for drilling a relatively constant diameter borehole into a geological formation comprising:
  at least one tungsten carbide rod cast into a relatively soft steel alloy matrix material to make at least a portion of the body of a drill bit,
  whereby said body of the drill bit has a top end, a bottom end, and a lateral extent,
  said top end of the drill bit being attached to said rotary drill string,
  said bottom end of the drill bit being in contact with the bottom of the borehole during rotary drilling, and
  a portion of said lateral extent of the body of the drill bit being in contact with a part of the wall of the borehole during rotary drilling,
  whereby during rotary drilling, the bottom end of the drill bit undergoes wear that progressively exposes new portions of the tungsten carbide rod whereby said rod has a length exceeding three times its diameter and whereby said rod wears and undergoes breakage as the relatively soft steel matrix material located at the bottom end of the drill bit erodes during rotary drilling operations thereby making the drill bit that self sharpens on the bottom of the drill bit during drilling operations;
  means to compensate for the lateral wear of the drill bit during drilling operations to make a drill bit that drills a relatively constant diameter borehole as the drill bit undergoes said lateral wear,
  whereby said means to compensate for the lateral wear of the drill bit is a self-actuating means that is actuated by any lateral bit wear;
  at least one watercourse that conducts mud from the drill string to the borehole being drilled through at least one opening in the drill bit;
  thereby providing a long lasting drill bit that self sharpens on the bottom end of the drill bit during drilling operations and that compensates for lateral wear of the drill bit to produce a relatively constant diameter borehole.

5,836,410
PERCUSSIVE BLOW ASSISTED ROTARY DRILL

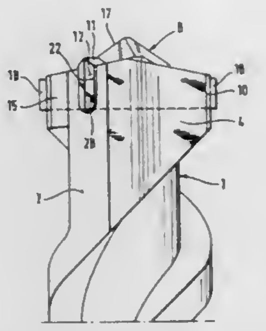
Werner Kleine, Achim, Germany, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Dec. 9, 1996, Ser. No. 762,173

Claims priority, application Germany, Dec. 7, 1995, 195 45 648.3

Int. Cl.^{6} C21B *10/36*

U.S. Cl. 175—415 **10 Claims**



1. A percussive blow assisted rotary drill comprising an axially-extending shank (**1**) having a leading end face (**3**) and an axially extending outside surface with at least one helically extending drilled material removal groove (**4, 5**), said shank having a rotational direction (R) about the axis thereof and an axially extending leading end region (**10**) with a main hard metal cutting plate (**6**) and a pair of auxiliary hard metal cutting plates (**11**) fixed therein and said main cutting plates and auxiliary cutting plates extending axially outwardly from said leading end face and radially outwardly from said outside surface, each of said auxiliary cutting plates located on an opposite side of said main cutting plate from the other said auxiliary cutting plate, said main cutting plate (**6**) disposed relative to said auxiliary cutting plates in an X-shaped pattern, said auxiliary cutting plate extending at least one of axially outwardly from and radially outwardly from said main cutting plate, in the X-shaped pattern each said auxiliary cutting plate (**11**) forming an acute angle with said main cutting plate lagging the auxiliary cutting plate in the rotational direction (R) and forming an obtuse angle with said main cutting plate leading the auxiliary cutting plate in the rotational direction, and said at least one main removal groove (**4, 5**) being located ahead in the rotational direction of at least one of said auxiliary cutting plates in the region of one of the obtuse angles between one of said auxiliary cutting plates and said main cutting plate.

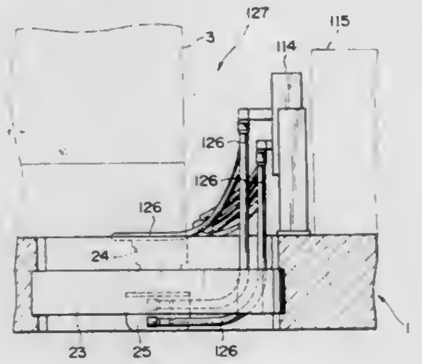
5,836,411
HYDRAULIC WORKING MACHINE

Eiji Maeba, Hiroshima, and Hidetoshi Suzuki, Ogaki, both of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed May 14, 1996, Ser. No. 645,714

Int. Cl.^{6} E02F *9/00*

U.S. Cl. 180—6.58 **6 Claims**



1. A hydraulic working machine comprising:
an undercarriage;

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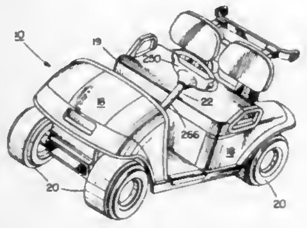
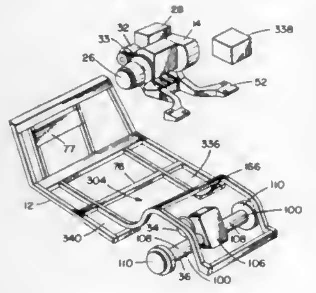
- a revolving upper structure rotatably mounted on said undercarriage, wherein said upper structure is configured to rotate about a swivel axis;
- a cab provided on an upper surface of said revolving upper structure substantially over said axis, such that said cab faces a forward direction;
- an internal combustion engine disposed in said revolving upper structure;
- a hydraulic oil tank and a fuel tank for said internal combustion engine disposed on said upper surface of said revolving upper structure and alongside said cab defining a first upwardly open space; and
- a directional control valve disposed on said upper surface of said revolving upper structure at a position within said first space and spaced radially from said swivel axis and cab to define at least a second space between said cab and said control valve;
- wherein said hydraulic oil tank is disposed adjacent said directional control valve and wherein said hydraulic oil tank is aligned substantially with a line extending radially from the swivel axis, through said direction control valve.

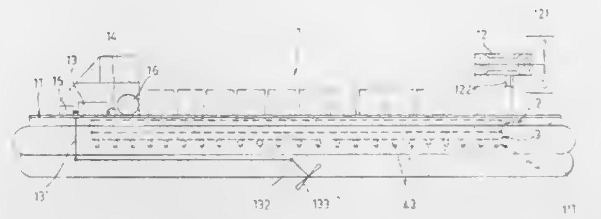
5,836,412
METHOD OF ASSEMBLING A GOLF CAR
Thomas W. Lyles, Martinez; Robert A. Courtwright, Evans; Daniel C. Allen, Martinez, and Edgar Grigsby, Jr., Augusta, all of Ga., assignors to Textron, Inc., Providence, R.I.
Filed Nov. 22, 1993, Ser. No. 156,811
Int. Cl.^{6} B21D *39/00*
U.S. Cl. 180—65.1 **7 Claims**





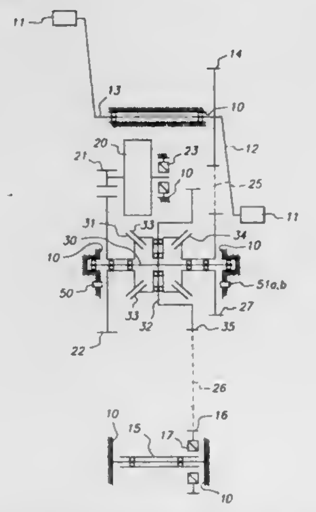
1. A method of assembling a golf car comprising steps of:
- providing a golf car chassis having a general block shaped drive system receiving area;
- selecting a type of drive system from a group of drive system types consisting of an electric motor drive system and an internal combustion engine drive system; and
- connecting a drive system of the selected type of drive system to the chassis in the drive system receiving area.

5,836,413
HOVERCRAFT CAPABLE OF STORING ENERGY AND AIR-CUSHION PRODUCING METHOD THEREFOR
Pen-Chang Liao, No. 6, Lane 255, Min-Sheng-1 Rd., Hsin-Hsing Dist., Kaohsiung City, Taiwan
Filed Jan. 7, 1997, Ser. No. 779,508
Int. Cl.^{6} B60V *1/02*
U.S. Cl. 180—116 **12 Claims**



1. A hovercraft including a boat hull, a gas turbine engine unit installed on the boat hull, an air-cushion generating device disposed on the boat hull, and a propeller device drivable by the gas turbine engine unit, the hull having a skirt at a bottom thereof, the gas turbine engine unit being provided with an exhaust duct unit, wherein the improvements comprise:
- the hull further including an energy storing unit and a heat exchange device which are disposed thereon, said energy storing unit including a plurality of energy storing containers attached to said hull, said heat exchange device having an output pipe which has an outlet end that is coupled and communicated with the air-cushion generating device, each of said containers being adapted to receive therein a low-temperature, high-pressure gas which flows into said heat exchange device, said gas turbine engine unit being capable of operating and discharging a high-temperature exhaust therefrom which flows into said heat exchange device so as to exchange heat with the low-temperature, high-pressure gas coming from said containers, thus increasing volume of said gas and decreasing pressure of said gas, whereby said air-cushion generating device can produce continuously a downward gas flow so as to form within said skirt an air cushion for supporting the hull.

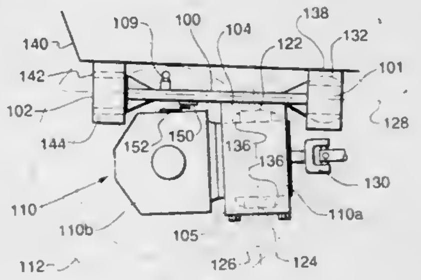
5,836,414
MANPOWER-ASSISTING POWER APPARATUS
Takeshi Seto, and Hiroshi Miyazawa, both of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan
Filed Feb. 21, 1996, Ser. No. 604,270
Claims priority, application Japan, Feb. 21, 1995, 7-032708; Jan. 10, 1996, 8-002694
Int. Cl.^{6} B62K *11/00*
U.S. Cl. 180—207 **4 Claims**



1. A manpower-assisting power apparatus for proportionally combining human-developed power with machine power, comprising:
- a motor;
- a manpower driven member;
- a differential gear mechanism including manpower rotation and motor rotation inputs connected to said manpower driven member and said motor, respectively;
- a rotational speed detector in communication with the manpower rotation and motor rotation inputs of said differential gear mechanism for respectively detecting rotational speeds applied to said manpower rotation and motor rotation inputs;

- a signal comparator in communication with said rotational speed detector for comparing the detected rotational speeds;
- a controller in communication with said signal comparator and the motor for controlling the speed of the motor such that the ratio of the respective detected rotational speeds remains constant; and
- a direction-of-rotation detection mechanism in communication with said manpower rotation input of said differential gear mechanism and said controller for detecting a current direction of manpower rotation.

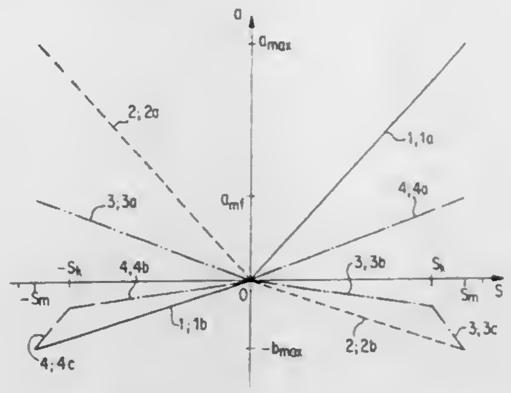
5,836,415
COMPOUND STEERING MECHANISM
Richard Barrowman, Hutton Brentwood, Great Britain, assignor to New Holland North America, Inc., New Holland, Pa.
Filed Jan. 7, 1997, Ser. No. 779,069
Claims priority, application United Kingdom, Jan. 20, 1996, 9601164
Int. Cl.^{6} B60K *17/30*
U.S. Cl. 180—266 **8 Claims**



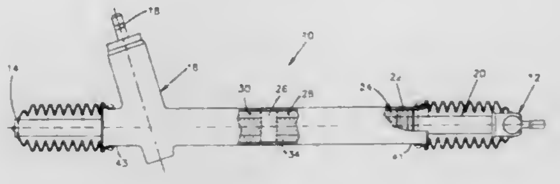
1. In a compound steering mechanism for a vehicle having a vehicle body, said compound steering mechanism including a steering axle, steerable wheels contacting the ground to support the vehicle for mobile movement over the ground and being mounted on the lateral ends of the axle for pivoting movement relative to the axle, and means for mounting the axle to the vehicle body for pivoting movement relative to the vehicle body about two orthogonal axes, the first said axis being generally vertical and offset from a line of contact between the steerable wheels and the ground and the second said axis extending generally fore-aft of the vehicle body, the improvement comprising:
- said means for mounting the steering axle on the vehicle body including a skate forming an intermediate member mounted on the vehicle body for pivoting about the said fore-aft axis, said skate having means for supporting the steering axle in a manner to allow pivoting of said steering axle about said first axis.

5,836,416
SETTING-ELEMENT CONTROL ARRANGEMENT AND METHOD FOR MOTOR VEHICLE LONGITUDINAL SPEED AND/OR THE STEERING ANGLE
Manfred Müller, Nürnberg; Werner Reichelt, Esslingen; Peter Frank, Stuttgart, and Johannes Clauss, Bietigheim-Bissingen, all of Germany, assignors to Mercedes-Benz AG, Germany
Filed Jan. 3, 1997, Ser. No. 774,723
Claims priority, application Germany, Jan. 4, 1996, 196 001 40.4
Int. Cl.^{6} B60K *26/00*
U.S. Cl. 180—333 **21 Claims**

1. Setting element arrangement for controlling longitudinal speed a motor vehicle, comprising
- a user-actuable setting element which, during forward motion of the vehicle, effects a change of the longitudinal speed in a first change direction when actuated in a first longitudinal-speed actuation direction, and effects a change of the longitudinal speed in a second change direction opposite to the first actuation direction when actuated in a second longitudinal-speed actuation direction opposite to the first; and
- means for inverting assignment of the two change directions of the longitudinal speed to the respective first and second longitudinal-speed actuation directions of the setting element during reverse motion of the vehicle, in relation to the assignment during the forward motion.



5,836,417
POWER STEERING FLUID
Jon W. Martin, Los Alamitos, Calif., assignor to TRW Inc., Lyndhurst, Ohio
Filed Jan. 2, 1996, Ser. No. 581,775
Int. Cl.^{6} B62D *5/06*
U.S. Cl. 180—417 **17 Claims**



1. A fluid power vehicle steering gear comprising:
- a tubular housing;
- a fluid disposed within said tubular housing; and
- a member movable relative to said housing in response to a change in the fluid pressure in said housing;
- said fluid comprising a mixture of a base oil and a grease, the weight of the grease in said fluid being about 0.1% to about 8% of the weight of the base oil in said fluid.

5,836,418
ELECTRONIC CONTROLLED POWER STEERING APPARATUS
Younggah Kim, Kyungsangnam-do, Rep. of Korea, assignor to Hyundai Motor Company, Seoul, Rep. of Korea
Continuation-in-part of Ser. No. 405,180, Mar. 16, 1995, abandoned. This application Aug. 23, 1996, Ser. No. 702,115
Claims priority, application Rep. of Korea, Mar. 16, 1994, 94-5242
Int. Cl.^{6} B62D *5/00*
U.S. Cl. 180—422 **15 Claims**

1. An electronic controlled power steering apparatus, comprising:
- a power supply section for supplying power to said power steering apparatus;

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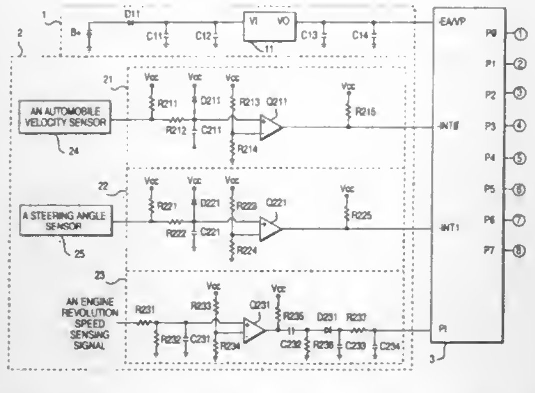


automobile velocity sensing means for sensing a velocity of an automobile and converting the sensed velocity into electrical velocity signals;

steering angle sensing means for sensing a steering angle of a steering and converting the sensed steering angle into electrical angle signals;

engine revolution speed sensing means for sensing a revolution speed of the engine and converting the sensed revolution speed into electrical revolution signals; and

a micro-controller receiving said electrical velocity signal, said electrical angle signals and said electrical revolution signal, said micro-controller including

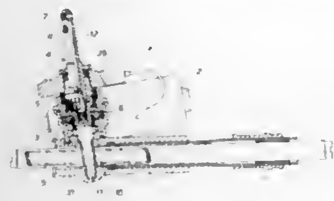
determining means for determining whether said electrical velocity signals appropriately correspond to said electrical revolution signals,

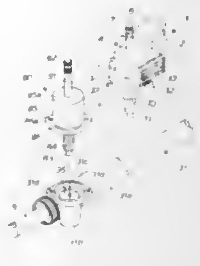
means for outputting data control signals corresponding to an optimum power steering hydraulic pressure in accordance with the electrical velocity signals the electrical angle signals when said determining means determines that said electrical velocity signals and said electrical revolution signals correspond appropriately, and

means for outputting data control signals corresponding to a predetermined constant power steering hydraulic pressure when said determining means determines that said electrical velocity signals and said electrical revolution signals do not correspond appropriately, thereby maintaining a constant steering angle force with a constant power steering hydraulic pressure.

5,836,419
RACK AND PINION ELECTRIC POWER STEERING SYSTEM WITH UNITIZED CONSTRUCTION FOR REMOVABLE MOUNTING

Yasuo Shimizu, and Katsuji Watanabe, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki, Kaisha, Japan
Filed Dec. 20, 1995, Ser. No. 580,072
Claims priority, application Japan, Dec. 21, 1994, 6-318637
Int. Cl.^{6} B62D *5/04*
U.S. Cl. 180—443 **23 Claims**





1. An electric power steering system comprising:

a rack-and-pinion steering mechanism having a pinion shaft and a rack shaft, the pinion shaft having an input shaft for connection to a steering shaft and an output shaft connected to the input shaft for angular displacement relative thereto, the output shaft having a pinion in mating engagement with the rack shaft;

a rack shaft case, the rack shaft being disposed in the rack shaft case for axial displacement therein;

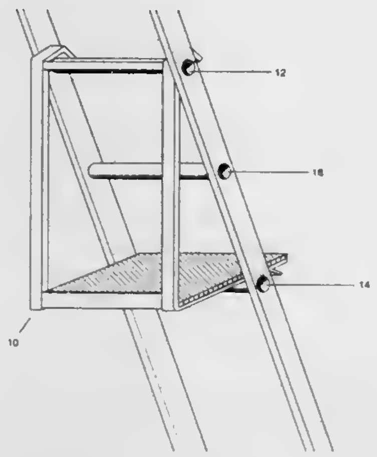
a torque sensor for detecting a steering torque of the rack-and-pinion steering mechanism; and

an electric motor for outputting, in response to the steering torque detected by the torque sensor, a steering assist force to the pinion shaft to power-assist the movement of steered wheels via the rack-and-pinion steering mechanism;

wherein the pinion shaft, the torque sensor and the electric motor define components integrated into a single unit for removable connection to and disconnection from the rack shaft and the rack shaft case as a single unit without independent connection and disconnection of any one of the components.

5,836,420
LADDER PLATFORM DEVICE

Raymond L. Marky, Jr., 316 Garner Ct., Tallahassee, Fla. 32301
Continuation of Ser. No. 342,915, Nov. 21, 1994, abandoned. This application Jan. 8, 1997, Ser. No. 780,710
Int. Cl.^{6} E06C *7/16*
U.S. Cl. 182—121 **14 Claims**



1. A portable attachment for use with a ladder comprising:

a frame having an upper area, a middle area, and a lower area;

said upper area includes a hook-like attachment means that is adapted for engaging a front surface and an upper surface of an upper rung and extends outwardly from a back surface of said ladder and said lower area include a stop that is adapted for engaging a front surface of a lower rung of said ladder to provide for a middle rung to be located between said upper rung and said lower rung when said attachment is in use;

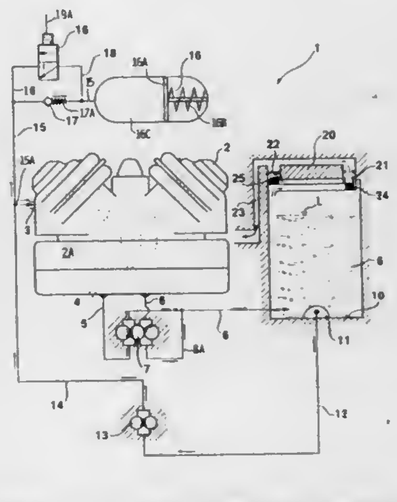
a platform is securely attached to said lower area of said frame for receiving feet of a user, said platform extends rearwardly from said lower rung;

said middle area attaches said upper area to said lower area and said middle area of said frame is permanently at a right angle with respect to said platform; and

said hook-like attachment includes an upward wall that is attached to said middle area of said frame at a first obtuse angle and a downward wall that is attached to said upward wall at a right angle, and said stop is at a second obtuse angle with respect to said platform, and said first obtuse angle is equal to said second obtuse angle.

5,836,421
LUBRICATING SYSTEM FOR INTERNAL COMBUSTION ENGINES

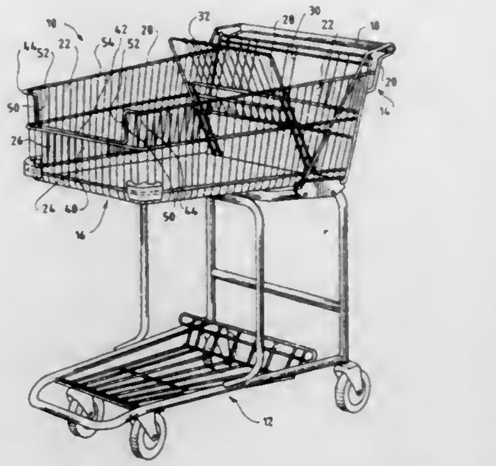
Werner Leicht, Stetten, Germany, assignor to MTU Motoren- und Turbinen Union Friedrichshafen GmbH, Friedrichshafen, Germany
Filed Aug. 7, 1996, Ser. No. 693,751
Claims priority, application Germany, Aug. 12, 1995, 195 29 733.4
Int. Cl.^{6} F01M *1/20; 11/06*
U.S. Cl. 184—6.2 **6 Claims**



1. A lubricating system for an internal combustion engine (**2**), comprising a lubricant supply container (**9**) having an inlet port (**8**) and a suction port (**11**), a return line (**5**, **6**) connecting said engine (**2**) to said inlet port (**8**) of said supply container (**9**), a first pump (**7**) in said return line for transporting lubricant from said engine (**2**) to said supply container (**9**), a supply line (**12**, **14**) connecting said suction port (**11**) to said engine (**2**), a second pump (**13**) in said supply line (**12**, **14**) for transporting lubricant from said suction port (**11**) to said engine (**2**), an accumulator (**16**), an accumulator line (**15**) connecting said accumulator (**16**) to said engine (**2**) and to said supply line (**14**) so that under normal operating conditions said second pump (**13**) keeps lubricant circulating and said accumulator (**16**) pressurized, a parallel connection comprising a non-return valve (**17**) for charging said accumulator and a controllable first valve (**19**) connecting said accumulator (**16**) to said accumulator line (**15**), a sensor (S) for sensing a pressure drop signifying an inadequate lubricant supply to said engine under operating conditions other than normal for controlling said controllable valve (**19**) to open for feeding lubricant from said accumulator (**16**) to said engine (**2**) under said other than normal operating conditions, said supply container (**9**) further comprising at least one venting and air admission port and at least one controllable second valve (**24** or **25**) in said at least one venting and air admission port for keeping said port open under said normal operating conditions and for closing said port under said other than normal operating conditions, whereby said engine is lubricated even in an upside-down position by said accumulator (**16**).

5,836,422
SHOPPING CART HAVING FRONT BASKET WALL WITH LOWERED UPPER EDGE AND COMBINATION WITH CHECKOUT STAND

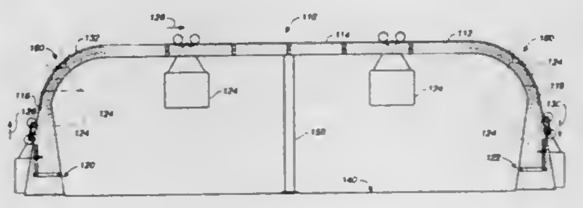
Jack W. Hurst, Wagoner, Okla., assignor to Unarco LLC, Atlanta, Ga.
Filed Jun. 4, 1996, Ser. No. 658,203
Int. Cl.^{6} A47B *46/00*
U.S. Cl. 186—63 **9 Claims**



6. A combination comprising a checkout stand supported by a floor, the checkout stand having a working surface at a specific elevation above the floor, and a shopping cart comprising a wheeled chassis standing on the floor, a handle structure, and a basket mounted to the wheeled chassis and to the handle structure so as to extend frontwardly from the handle structure, the basket having side, bottom, and front walls, which are fixed to one another, each of the side and front walls having an upper edge, the bottom wall being lower than the elevation of the working surface of the checkout stand, the front wall having a central region, the central region having an upper edge spaced at least several inches below the upper edges of the side walls and located approximately at the elevation of the working surface of the checkout stand, the front wall being spaced frontwardly of the handle structure and having two side regions, the central region between the side regions, each of the side regions having a stepped edge between the upper edge of one of the side walls and the upper edge of the central region of the front panel, the front wall defining an open region between the stepped edges of the side regions, above the upper edge of the central region, the open region at all times being free of any structure of the shopping cart.

5,836,423
PEOPLE MOVER SYSTEM

Jan K. Kunczynski, 1862 Jan Dr., Glenbrook, Nev. 89413
Filed Nov. 4, 1996, Ser. No. 742,653
Int. Cl.^{6} B66B *9/06*
U.S. Cl. 187—245 **100 Claims**



27. A people mover system comprising:

a guideway extending along a transit path;

a passenger car;

a drive assembly having an endless traction belt mounted for movement along the guideway and formed to accelerate the passenger car to a speed substantially in excess of a walking speed;

an attachment assembly securing the passenger car to the traction belt for propulsion of the passenger car along the guideway by the traction belt;

the guideway having a near vertical section proximate an end thereof formed for guided vertical movement of the passenger car to a vertical position proximate the end permitting the passenger car to pass beyond an obstacle proximate the end, the guideway having a horizontally extending section with a length sufficient for the passenger car to reach a speed substantially in excess of a walking speed, and the vertical section and the horizontally extending section being con-

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nected by a transition section for continuous smooth guided movement of the passenger car between the vertical section and the horizontally extending section; and

the attachment assembly being formed to permit the passenger car to remain in a relatively level orientation as the passenger car is propelled along the guideway.

5,836,424

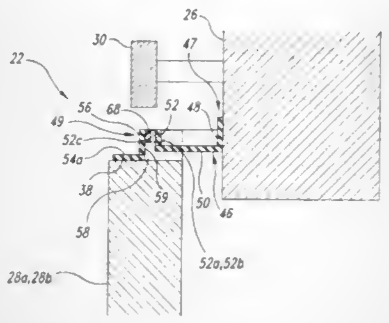
MULTIPLE LEVEL BUILDING WITH ELEVATOR HOISTWAY SEAL STRUCTURE

Thomas H. Allen, 1995 Rnanoke, Boise, Id. 83712

Continuation-in-part of Ser. No. 423,958, Apr. 18, 1995, abandoned. This application Oct. 18, 1996, Ser. No. 732,129

Int. Cl.^{6} B66B *13/06*

U.S. Cl. 187—333 **10 Claims**



6. A hoistway door seal structure for limiting the flow of fluid into or out of a hoistway to restrict the passage of smoke and water into or out of the hoistway in the event of a fire, comprising:

a wall structure having an opening therein defining a hoistway entrance having a headwall, a pair of lateral jambs and a sill;

a pair of opposing hoistway doors sized to substantially cover the hoistway entrance when in a fully closed position and to allow access to the hoistway through the hoistway entrance when in a fully open position, each of the hoistway doors having a lateral portion, a meeting edge, a top portion, and a bottom portion;

a door support rail positioned in a generally horizontal orientation and connected to the wall structure, the door support rail having a roller support surface;

at least one door support truck connected to each door, each door support truck having a support roller engaging the roller support surface of the support rail to support a respective one of the opposing hoistway doors while permitting substantially planar movement of the respective one of the hoistway doors in a substantially lateral direction between the fully open position and the fully closed position, wherein when in the fully closed position the hoistway doors are spaced from the sill to define sill spaces, spaced from the headwall to define transverse spaces, and spaced from the lateral jambs to define lateral spaces, and the meeting edges of the hoistway doors are spaced from each other to define a meeting edge space;

an elongated lateral extension extending from a lateral portion of each hoistway door toward the wall structure;

lateral seals extending from the wall structure toward the hoistway doors in an overlapping relationship with a respective one of the lateral extensions extending from the hoistway doors to sealably engage the respective one of the lateral extensions to seal the lateral spaces when the hoistway doors are in the fully closed position;

an elongated seal connected to the meeting edge of one of the hoistway doors, the elongated seal being sized to sealably engage the meeting edge of the other doors when the hoistway doors are in the fully closed position to seal the meeting edge space;

elongated transverse extensions extending from the top portion of each hoistway door toward the wall structure, each of the transverse extensions having first and second ends and a sealing surface extending therebetween, the first end being spaced a first distance from the headwall and the second end being spaced a second distance from the headwall that is different than the first distance so the sealing surface is at an angle relative to the headwall;

elongated transverse mating structure extending from the headwall toward the transverse extensions, each of the transverse mating structures having a seal mating surface substantially parallel to the sealing surface of a respective transverse extension; and

an elongated seal connected to the one of the seal mating surface and the sealing surface, the roller support surface of the door support rail having guide portions to guide the hoistway doors to move along a path of movement in a selected direction relative to the transverse mating structures between a partially closed position and the fully closed position as the hoistway doors are moved into and out of the fully closed position, the seal being in sealable engagement with the sealing surface of the transverse extension and the seal mating surface of the transverse mating structure to seal the transverse spaces when the hoistway doors are moved into the fully closed position, and the sealing surface of the transverse extensions being spaced apart from the seal mating surface of the transverse mating structure with the seal being out of engagement with the other one of the seal mating surface and the sealing surface when the hoistway doors are moved into the partially closed position.

5,836,425

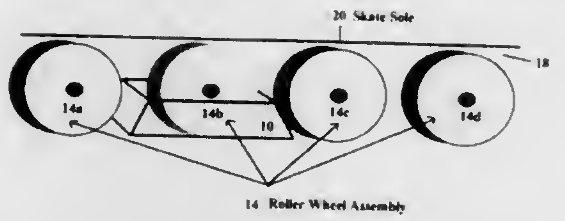
NON-SKID WHEEL CHOCK FOR IN LINE ROLLER BLADE SKATES

Thomas Robert Ahlstrom, 19542 E. Parker Sq. Dr., Parker, Colo. 80134

Filed Jul. 23, 1996, Ser. No. 685,291

Int. Cl.^{6} B60T *1/00;* A63C *1/02;* A43B *21/36*

U.S. Cl. 188—412 **3 Claims**



1. A flexible immobilizing chock for temporary attachment on a wheel of an in-line roller skate, said chock comprising:

(a) a molded block having two side walls and two end walls and a cavity for receiving said wheel of said in-line skate;

(b) said cavity of said chock having the size and shape of approximately half the circumference of one of the skates wheels, said cavity further comprising at least one lip formed on at least one of the internal walls of said cavity, said lip adapted to secure said chock to a wheel of an in-line roller skate;

(c) said chock being of one piece and formed of flexible material and is of such a size and construction that it may be stored in the pocket of the skate user.

5,836,426

ROLL BRAKE

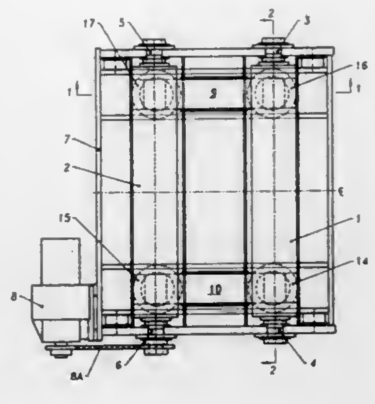
Dennis P. Chadwick, Napanee, Canada, assignor to Chadwick Engineering Limited, Kingston, Canada

Filed Jan. 7, 1997, Ser. No. 779,435

Int. Cl.^{6} B60T *1/00*

U.S. Cl. 188—29 **7 Claims**

1. A roll brake assembly for selectively locking a pair of axially rotatable parallel roll members, mounted in a frame, so as to prevent relative opposite rotational movement therebetween comprising: at least one planar member extending under said parallel roll members perpendicular to the longitudinal axes thereof and intermediate said roll members and said frame, and actuating means intermediate said planar member and said frame to selectively raise said planar member into locking engagement with said parallel roll members so as to prevent said relative opposite rotational movement therebetween and lower said planar member out of contact with said parallel roll members so as to allow rotation thereof.



5,836,427

MOUNTING CONSTRUCTION OF DISC BRAKE ASSEMBLY

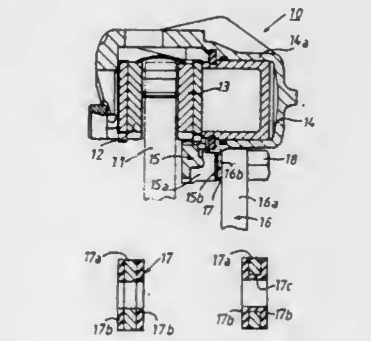
Tatsuyuki Nakajima, and Toshitaka Suga, both of Nagoya, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 26, 1997, Ser. No. 806,677

Claims priority, application Japan, Feb. 27, 1996, 8-040057

Int. Cl.^{6} F16D *65/14;* F16F *2/00*

U.S. Cl. 188—73.46 **20 Claims**



1. A mounting construction of a disc brake assembly in which the disc brake assembly includes a mounting bracket formed with an attachment face which faces a corresponding attachment face of a stationary support bracket and fixed to the stationary support bracket by way of a fastening bolt, the mounting construction comprising

a damping element disposed between the attachment faces of said mounting bracket and said stationary support bracket to reduce brake squeal caused by compound vibration acting on said mounting bracket.

5,836,428

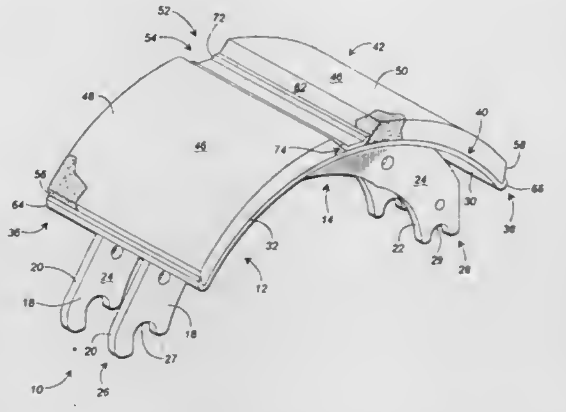
BRAKE SHOE ASSEMBLY HAVING BRAKE LINING RETAINER MEMBERS

Gordon Young, Brantford, Canada, assignor to Rome Tool & Die Co., Rome, Ga.

Filed Apr. 28, 1997, Ser. No. 847,818

Int. Cl.^{6} F16D *69/04*

U.S. Cl. 188—250 G **5 Claims**



1. A method of forming a brake shoe assembly, the brake shoe assembly including an arcuate web and an arcuate brake shoe table mounted to said web, said brake shoe table having an outer attachment surface, a medial portion, and two distal ends, the brake shoe assembly further including two brake shoe lining plates, each of said brake shoe lining plates having a distal edge and a medial edge, the method comprising the steps of:

bending each of said distal ends of said brake shoe table upwardly to form distal flanges extending outwardly from said outer attachment surface;

applying a bonding material to said outer attachment surface of said brake shoe table;

placing said brake shoe lining plates on top of said outer attachment surface of said brake shoe table with said distal edge of each of said brake shoe lining plates in flush abutment with said respective distal flanges of said brake shoe table, said bonding material spread evenly between said brake shoe lining plates and said outer attachment surface to avoid the presence of air pockets therebetween; and

attaching a wedge member to said medial portion of said brake shoe table in abutment with said medial edge of each of said brake shoe lining plates, said wedge member urging each of said brake shoe lining plates outwardly into said distal flanges such that each of said brake shoe lining plates is securely retained on said outer attachment surface between said wedge member and said distal flanges in compression.

5,836,429

BRAKE SHOW PIN AND PREASSEMBLED SPRING AND CUP ASSEMBLY

James T. McGuire, and Curtis Freeberg, both of Byron, Ill., assignors to Textron, Inc., Providence, R.I.

Filed Jan. 22, 1996, Ser. No. 589,376

Int. Cl.^{6} F16D *51/00*

U.S. Cl. 188—340 **26 Claims**

1. A spring and cup assembly for use in a brake assembly, comprising: a cup, a spring having first and second ends, said cup being preassembled with and engaged against said first end of said spring, and structure for initially retaining said spring in a compressed condition with said cup prior to engagement of and actual

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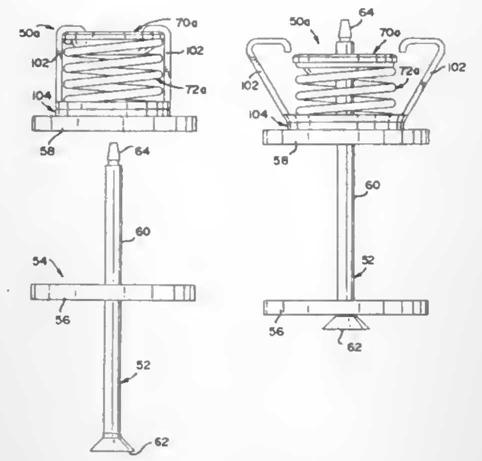


installation of said spring and cup assembly with the brake assembly to define a preassembled, preloaded spring and cup assembly.

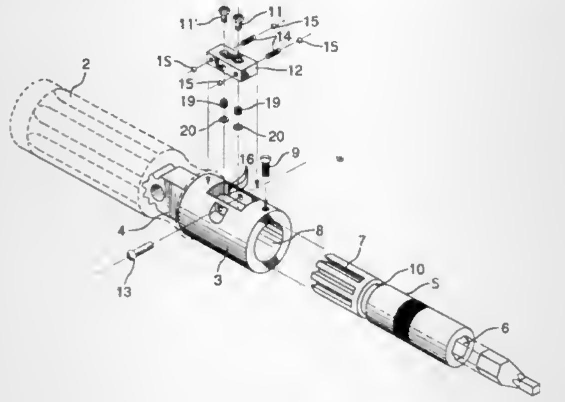
5,836,430
RATCHET MECHANISM FOR SCREWDRIVERS AND THE LIKE

Kailash C. Vasudeva, Waterloo, Canada, assignor to Maxtech, Inc., Roseville, Mich.

Filed Jan. 13, 1997, Ser. No. 782,814

Int. Cl.^{6} B25B *15/04;* F16D *41/08*

U.S. Cl. 192—43.2 **12 Claims**



1. A ratchet mechanism, comprising:
a body having a generally cylindrical axial opening in a distal end thereof;
an output shaft having a splined portion secured rotatably within said opening, said splined portion having a plurality of axial splines;
two pins mounted on a rocker for radial movement through a wall of said body into and out of said splines, said pins being configured such that one pin permits rotation of the splined portion in a first direction and prevents rotation in the opposite direction, and the other pin permits rotation in the opposite direction and prevents rotation in the first direction;
said rocker being pivotally mounted to pivot between two extreme positions about a lateral axis, in which positions one or the other of the pins extends fully into the splines, and said rocker being positioned at least partially within said wall of said body so as to restrict any rotation about the axis of said body.

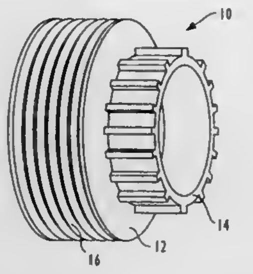
5,836,431
TRANSMISSION CLUTCH HOUSING FORMED FROM A SINGLE PIECE OF METAL AND METHOD FOR MAKING THE SAME

Fred G. Jaekel, Richmond Hill, Canada, assignor to Cosma International Inc., Ontario, Canada

Division of Ser. No. 699,345, Aug. 19, 1996. This application Oct. 6, 1997, Ser. No. 944,825

Int. Cl.^{6} F16H *55/44*

U.S. Cl. 192—70.2 **8 Claims**



1. A rotational motion transmitting member constructed and arranged to rotate about an axis of rotation for selectively transmitting a rotational motion from a driving rotational member to a driven rotational member in conjunction with a clutch plate assembly including a plurality of parallel annular clutch plates constructed and arranged for axial movement with respect to one another between a relative slipping relationship and an engaged relationship, the plurality of parallel annular clutch plates including a driven set of clutch plates and a driving set of clutch plates, said rotational motion transmitting member comprising:
a central web structure extending radially from said axis of rotation;
a splined clutch plate engaging structure extending axially from said central web structure constructed and arranged to engage a periphery of a one of the driving set of clutch plates and the driven set of clutch plates so as to transmit rotary motion between the one set of clutch plates and said rotational motion transmitting member; and
a rotational member coupling structure extending axially from said central web structure constructed and arranged to be operatively associated with a one of the driving rotational member and the driven rotational member so as to transmit rotary motion between the one rotational member and said rotational motion transmitting member, said rotational member coupling structure comprising a poly-V-groove pulley constructed and arranged to receive a poly-V-shaped belt operatively coupled with the one rotational member.
said central web structure, said splined clutch plate engaging structure, and said rotational member coupling structure all being integrally formed from a single piece of sheet metal material.

5,836,432
FRICTION CLUTCH WITH A CAPTIVE PRE-LOAD SPRING AND A CAPTIVE PRE-LOAD SPRING FOR A FRICTION CLUTCH

Ulrich Husse, Schweinfurt; Karl Müller, Kronungen, and Herbert Berwind, Schonungen, all of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Germany

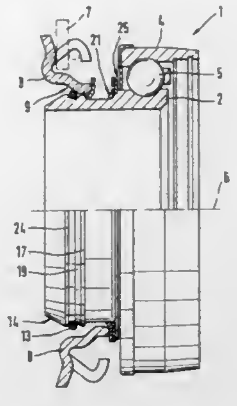
Filed Dec. 23, 1996, Ser. No. 771,865

Claims priority, application Germany, Dec. 27, 1995, 195 48 859.8

Int. Cl.^{6} F16D *23/14*

U.S. Cl. 192—70.13 **18 Claims**

18. A bearing for actuating and deactuating an apparatus having a biasing device, said bearing comprising:
a first end and a second end;
a longitudinal axis being disposed to join said first end and said second end;



said first end comprising a substantially ring-shaped portion;
said substantially ring-shaped portion being configured to be disposed adjacent a biasing device;
said substantially ring-shaped portion being configured to be disposed adjacent a connecting element, which connecting element is configured to connect said substantially ring-shaped portion with a biasing device;
said substantially ring-shaped portion comprising an outer surface facing away from the longitudinal axis;
said outer surface comprising a first annular groove and a second annular groove disposed adjacent to one another;
a substantially ring-shaped element disposed in said first annular groove;
a spring device disposed at least in part in said second annular groove;
said spring device being configured to apply an axial bias to a connecting element;
said substantially ring-shaped element being configured and disposed to be held between a portion of a connecting element and at least a portion of said first annular groove upon connection of said bearing to a biasing device;
said spring device comprising at least one washer having an undulating shape;
said outer surface of said substantially ring-shaped portion comprising a web portion;
said web portion being disposed between said first annular groove and said second annular groove;
said web portion having an outside diameter dimension;
said at least one washer having a first inside diameter dimension upon being disposed at least in part in said second annular groove;
said at least one washer being configured to permit axial compression of said at least one washer upon assembly of said clutch assembly;
said at least one washer having a second inside diameter dimension in said compressed state;
said first inside diameter dimension of said at least one washer being smaller than said outside diameter dimension of said web portion; and
said second inside diameter dimension of said at least one washer being larger than said outside diameter of said web portion, to permit assembly of said bearing.

5,836,433
WEAR COMPENSATING FRICTION CLUTCH

Hiroshi Uehara, Osaka, Japan, assignor to Exedy Corporation, Japan

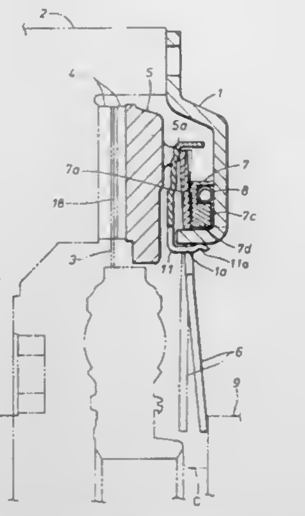
Filed Apr. 11, 1997, Ser. No. 834,058

Claims priority, application Japan, Apr. 23, 1996, 8-126508

Int. Cl.^{6} F16D *13/75*

U.S. Cl. 192—70.25 **4 Claims**

1. A friction clutch, comprising:
a clutch cover attached to a flywheel, said clutch cover having an inner periphery provided with a cylindrical wall coaxial with said flywheel;



a diaphragm spring accommodated in a space defined between said flywheel and said clutch cover, and consisting of an annular dish spring which has an outer peripheral part abutting a part of a pressure plate placed between said diaphragm spring and said flywheel, and an inner peripheral part adapted to be actuated by a release assembly;
a diaphragm spring support assembly provided on said clutch cover for supporting a point of said diaphragm spring adjacent to said outer peripheral part of said diaphragm spring from a side facing away from said pressure plate;
a wear compensating means which urges a support point of said diaphragm spring support assembly abutting said diaphragm spring toward said pressure plate;
a wear detecting member having an annular member provided with a friction tongue piece frictionally engaging said cylindrical wall of said clutch cover to thereby restrict a movement of said support point of said diaphragm spring support assembly toward said pressure plate;
a return spring which urges said pressure plate away from said flywheel; and
a clutch disk interposed between said pressure plate and said flywheel so as to be selectively engaged therebetween;
wherein said diaphragm spring is provided with a negative spring property region which provides a spring force required for engaging said clutch disk between said pressure plate and said flywheel, said spring force provided by said diaphragm spring progressively diminishing with an increase in a clutch release stroke to a level smaller than a spring force provided by said return spring, and said frictional force being greater than a normal spring force applied by said diaphragm spring but smaller than a level of said spring force which will be reached when a wear of said clutch disk has progressed and an operating point of said diaphragm spring has shifted to a point of a higher spring load in said negative spring properly region.

5,836,434
CABLE-TYPE CLUTCH DEVICE

Hideo Sawazaki, Hamamatsu, Japan, assignor to Suzuki Motor Corporation, Shizuoka-ken, Japan

Filed Mar. 7, 1997, Ser. No. 813,641

Claims priority, application Japan, Mar. 28, 1996, 8-099178

Int. Cl.^{6} B60K *23/02*

U.S. Cl. 192—99 S **6 Claims**

1. A cable-type clutch device comprising:
a clutch housing having opposite face portions for mounting to an engine and transmission respectively, said clutch housing having a central portion for mounting an input shaft and flywheel to rotate about an axis extending between the opposite face portions, said clutch housing having an upper and a lower portion;

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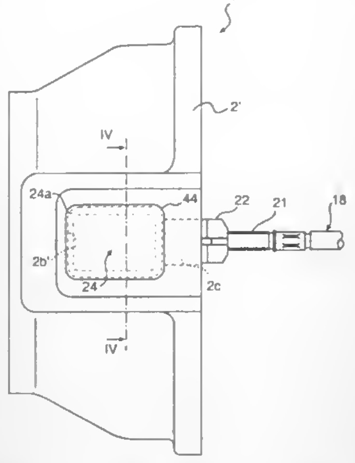


a cable attaching device, including an outer cable mounted to the housing adjacent one of the opposite faces at a housing bulging portion extending below the lower portion of the housing, and an inner cable within the outer cable;

said housing bulging portion having a bottom below the inner cable, the bottom having an opening;

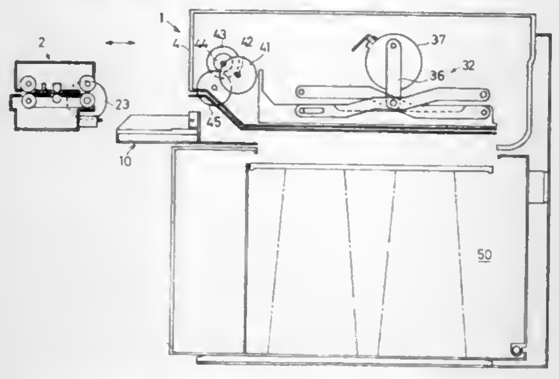
a removable cap mounted at the bottom of the bulging portion and covering the opening; and

a clutch release fork having a top end pivotally mounted within the upper portion of the housing and having a lower end extending beyond the lower portion of the housing and connected to the inner cable within the bulging portion of the housing;

the housing bulging portion having a width greater than a width of the clutch release fork, and smaller than a width of the housing lower portion.

5,836,435
BILL HANDLING APPARATUS

Masanobu Fujita, and Noriyuki Kanno, both of Kanagawa, Japan, assignors to Japan Cash Machine Co., Ltd., Japan
PCT No. PCT/JP96/00562, § 371 Date Mar. 31, 1997, § 102(e) Date Mar. 31, 1997, PCT Pub. No. WO96/27860, PCT Pub. Date Sep. 12, 1996
PCT Filed Mar. 7, 1996, Ser. No. 732,212
Claims priority, application Japan, Mar. 7, 1995, 7-047651
Int. Cl.^{6} G07F *7/04*
U.S. Cl. 194—206 **6 Claims**



1. In a bill handling apparatus including validator means for validating a bill inserted into said apparatus; stacker means for storing a bill in response to an output from said validator means when the bill is considered genuine by said validator means; and a frame for supporting said stacker means, said validator means including conveyor means for transporting the bill along a passageway, and sensor means disposed adjacent to said passageway, the improvement comprising:

coupling means provided between said validator means and frame for detachably supporting said validator means on said frame in the condition of alignment of said passageway of said validator means with a passageway of said stacker means;

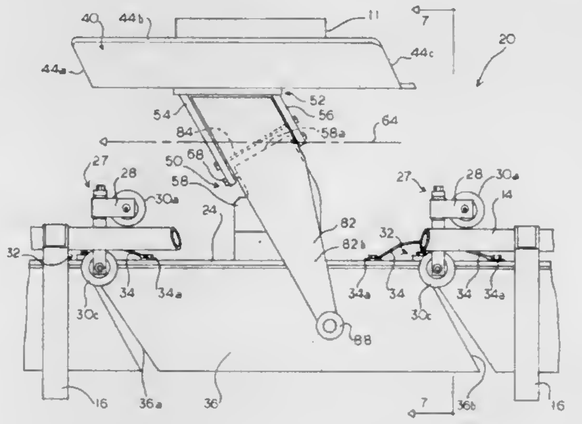
connector means which comprises a plug and a jack, one of which is attached to a rear end of said validator means for electrical connection with said validator sensor, and the other is attached to a front end of said frame; and

power transmission means which comprises a drive gear rotatably supported on said frame, and a follower gear rotatably mounted on said validator means and disposed on the same plane of said drive gear;

attachment of said validator means to said frame through said connector means, causes said follower gear of said validator means to automatically come into engagement with said drive gear of said frame, and simultaneously to automatically engage said plug and jack of said connector means with each other, whereby said conveyer means in said validator means can be driven by a motor provided outside said validator means and in said frame, and also sensor means in said validator means can forward its output to a validator control means provided outside said validator means and in said frame through said connector means.

5,836,436
TILTING CART FOR A PACKAGE SORTING CONVEYOR

J. David Fortenbery, Charlotte, and David Patrick Erceq, Concord, both of N.C., assignors to Mantissa Corporation, Charlotte, N.C.
Filed Apr. 15, 1996, Ser. No. 632,012
Int. Cl.^{6} B65G *47/46*
U.S. Cl. 198—370.03 **94 Claims**



1. A conveyor cart for a sorting conveyor for transporting objects and unloading objects at one or more unloading stations adjacent the conveyor, said sorting conveyor including: a conveyor track; a train of said tilting conveyor carts connected end-to-end; and a linear induction motor power source for moving said conveyor carts on said conveyor track, each of said tilting conveyor carts comprising:

(a) a trailer frame base, including: (i) a roller structure for engaging said conveyor track, (ii) a vertically oriented metal fin responsive to said linear induction motor power source, and (iii) a hitch mechanism for connecting each tilting conveyor cart to an adjacent conveyor cart, wherein said linear induction motor and said metal fin are both vertically oriented beneath said trailer frame base and wherein said metal fin is generally parallelogram-shaped with rearwardly angled front and rear edges;

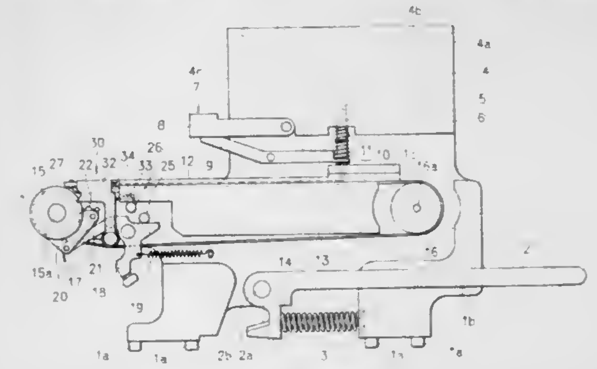
(b) a carrying tray for holding the objects;

(c) a tiltable support apparatus for supporting said carrying tray above said trailer frame base and for allowing tilting of said carrying tray towards at least one side of the conveyor to unload objects into unloading stations on at least one side of the conveyor; and

wherein said linear induction motor power source includes at least two vertically oriented out-of-phase electromagnets mounted in fixed positions relative to said vertically oriented metal fin.

5,836,437
APPARATUS FOR SUPPLYING CHIP PARTS AND A METHOD FOR SAME

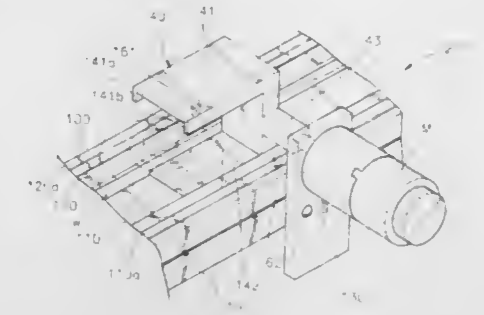
Koji Saito; Kikuji Fukai, and Taro Yasuda, all of Tokyo, Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 444,107, May 18, 1995, Pat. No. 5,636,725. This application Mar. 21, 1997, Ser. No. 821,939
Claims priority, application Japan, May 18, 1994, 6-104108
Int. Cl.^{6} B65G *47/44*
U.S. Cl. 198—396 **9 Claims**

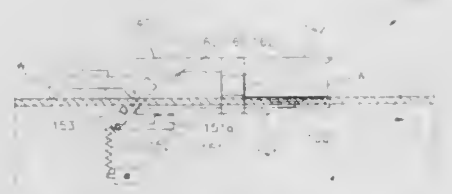


1. A chip part supplying apparatus comprising a hopper for storing chip parts in random directions, a discharge channel, the hopper and discharge channel being arranged so chip parts stored in said hopper can be moved to the discharge channel in a prescribed orderly direction, a conveying belt positioned below an exit of said discharge channel, a belt driving mechanism for driving said belt in a prescribed direction, a chip part guide for organizing chip parts discharged onto said belt, said chip parts discharged onto said belt through the exit of said discharge channel being organized on the said belt by the chip part guide into an orderly directed line before being transferred to a succeeding process, a force applying device coupled with the chip parts on said belt for establishing space between the forefront chip part and the next chip part on said belt.

5,836,438
DEVICE FOR AUTOMATICALLY TURNING OVER WORK PIECES

Jong-Kun Jung, Seoul, Rep. of Korea, assignor to Daewoo Electronics, Co., Ltd., Rep. of Korea
Filed May 17, 1996, Ser. No. 649,155
Claims priority, application Rep. of Korea, May 18, 1995, 1995-12343
Int. Cl.^{6} B65G *47/24*
U.S. Cl. 198—402 **6 Claims**





1. A device for turning over work pieces comprising:

a base;

a pair of transfer means for transferring the work pieces in an automated manufacturing line in a transfer direction, with the work pieces being kept on upper surfaces thereof, the pair of transfer means mounted on the base in a parallel relationship with each other and separated by a gap therebetween;

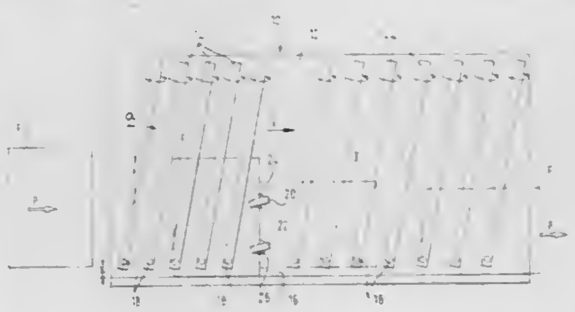
a receiving holder including a substantially U-shaped receiver and joined to a connection having a rotation axis horizontally extending at a right angle with respect to the transfer direction of the transfer means, the receiving holder being located between the pair of transfer means, the receiving holder being rotatable between a first position, wherein the work piece is inserted into the U-shaped receiver and a second position, wherein the work piece is discharged therefrom;

a holder control means for rotating the receiving holder to the second position, when the work piece is inserted into the U-shaped receiver and for reversely rotating the receiving holder to the first position, when the work piece is discharged from the U-shaped receiver; and

a stopper means for preventing the subsequent work piece from being advanced by the transfer means while the receiving holder stays in other positions except the first position, the stopper means having a lever member pivotably attached to the base, a stopping lug formed at an end of the lever member and a spring, the lever member being biased by the spring so that the stopping lug protrudes over the transfer means to thereby prevent the work piece placed on the transferring means from advancing while the receiving holder stays in other position except the first position, and the lever member being depressed by a bottom of the U-shaped receiver so that the stopping lug is forced below the transfer means when the receiving holder stays in the first position.

5,836,439
DEVICE FOR THE ROTATION OF SHEETS ON A ROLLER CONVEYOR

Luc Coyette, Cortil Noirmont, Belgium, assignor to C. P. Bourg S.A., Belgium
Filed Mar. 11, 1997, Ser. No. 815,065
Claims priority, application France, Mar. 13, 1996, 96 03164
Int. Cl.^{6} B65G *47/24*
U.S. Cl. 198—415 **13 Claims**



2. A device for rotating sheets on a sheet conveyor, said conveyor comprising a plurality of rotating cylinders defining a transport plane (P) and a lateral guide rail which extends in a longitudinal direction of said conveyor, and further comprising a pair of

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rollers entrained in rotation at mutually different speeds and spaced apart from each other and from said guide rail transversely to said longitudinal direction, each of said rollers having an axis inclined with respect to a direction normal to said longitudinal direction by a determined angle which is greater for one of said rollers which is closer to said guide rail and has a lower speed of rotation, and each of said rollers having a periphery opposed to an associated rotary support element substantially in said transport plane, wherein said rollers have rotation axes inclined in a sense so that sheets passing between said rollers and said rotary support element tend to retract from said guide rail.

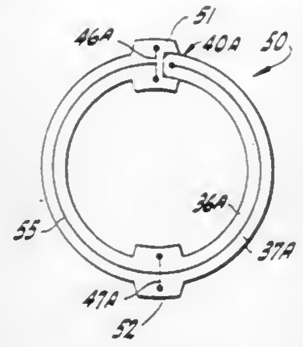
5,836,440
HIGH SPEED TUBULAR BELT CONVEYOR AND SYSTEM AND METHOD FOR MAKING

Alex Mindich, 8339 N. Christiana, Skokie, Ill. 60076

Continuation of Ser. No. 584,985, Jan. 11, 1996, abandoned, which is a continuation of Ser. No. 324,133, Oct. 17, 1994, abandoned, which is a continuation of Ser. No. 195,596, Feb. 14, 1994, abandoned, which is a continuation of Ser. No. 737,586, Jul. 25, 1991, abandoned, which is a continuation of Ser. No. 610,458, Nov. 8, 1990, abandoned, which is a continuation of Ser. No. 239,528, Aug. 31, 1988, abandoned, which is a continuation of Ser. No. 799,928, Nov. 20, 1985, Pat. No. 4,823,941. This application Jan. 10, 1997, Ser. No. 782,553

Int. Cl.^{6} B65G *15/08;15/30;15/34;23/04*

U.S. Cl. 198—819 **7 Claims**



1. A method of forming a prestressed normally closed tubular conveyor belt, comprising the steps of:
  providing a first elongated layer of elastic material having a predetermined width;
  stretching a second, relatively narrow elongated layer of elastic material to substantially the width of said first layer by applying, tensile force transverse to the length of said second layer;
  aligning said two layers,
  joining said layers together while maintaining tension on said second layer, whereby upon releasing the applied tension after said joining, the joined layers maintains the first layer in tension along its width and the second layer in compression along its width sufficient so that the resulting bending moment transversely bends the joined layers along its width to a normally closed tubular configuration having a tubular angle >=360°.

5,836,441
CIRCUIT BREAKER ACCESSORY MODULE ACTUATORS

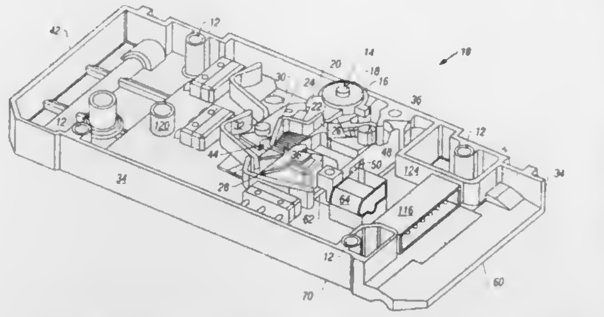
Jerry Lynn Scheel, and Randy Luther Siebels, both of Cedar Rapids, Iowa, assignors to Square D Company, Palatine, Ill.

Filed Apr. 9, 1996, Ser. No. 629,668

Int. Cl.^{6} H01H *73/12*

U.S. Cl. 200—17 R **10 Claims**

1. An accessory module for a circuit breaker comprising:
a switch;



a dummy handle for indicating a status of the circuit breaker wherein a switch handle of the circuit breaker connects to the dummy handle and the movement of the switch handle is imitated by the dummy handle;
an actuator including;
  first and second ends; and
  an integral pivot which snaps in place into the accessory module wherein the actuator moves about the integral pivot in response to movement of the dummy handle causing the switch to send a signal indicative of the status of the circuit breaker; and
wherein the accessory module is external to the circuit breaker.

5,836,442
DOOR SWITCH FOR VEHICLES

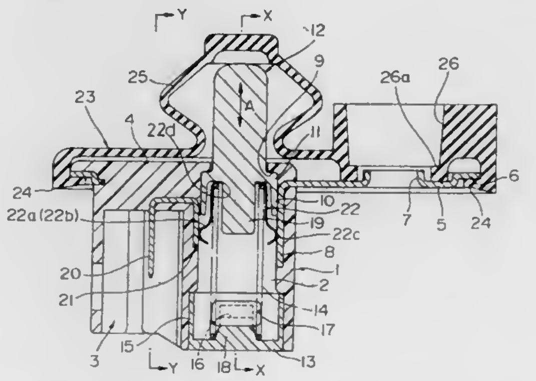
Mineo Hirano, Tokyo, Japan, assignor to Niles Parts Co., Ltd., Japan

Filed Jan. 31, 1997, Ser. No. 791,740

Claims priority, application Japan, Feb. 16, 1996, 8-054098

Int. Cl.^{6} H01H *1/00*

U.S. Cl. 200—284 **11 Claims**



7. A door switch for a vehicle, comprising:
a switch slider having a push rod projecting outward therefrom;
a switch case having a switch slide chamber. said switch slider being slidably receive in said switch slide chamber for movement along a first axis;
a movable electrode mounted on said switch slider movable in a direction same as that of said switch slider for selectively engaging at least one fixed electrode;
and integrally formed male connector recessed portion provided at a location adjacent laterally to said switch slide chamber relative to said first axis, such that said male connector recessed portion is arranged beside said switch slide chamber;
said at least one fixed electrode comprising a first fixed electrode having a first end exposed on an inner wall surface of said switch slide chamber and a second end projected into said male connector recessed portion adjacent to said switch slide chamber; and
a metal plate bracket in a flange portion of said switch case, wherein a first part of said metal plate bracket extends along an inner wall surface of the switch slide chamber of said switch case to provide a second fixed electrode and a second part of said metal plate bracket extends away from said first part in a direction generally perpendicular to said first axis. said second part having an opening therein for receiving a mounting screw and an exposed surface for electrically grounding said second fixed electrode to a body of the vehicle.

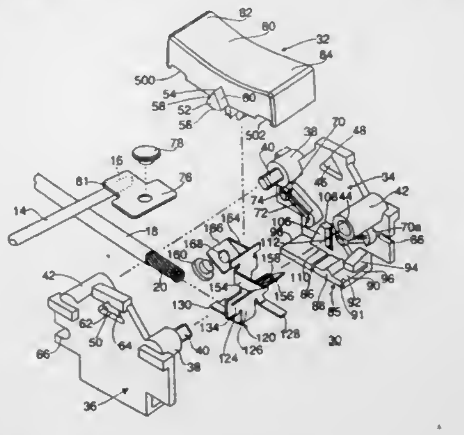
5,836,443
ELECTRICAL ROCKER SWITCH

Paul Gernhardt, Chesapeake, Va.; Serge Krzyzanowski, Flushing, and Frantz Germain, Rosedale, both of N.Y., assignors to Leviton Manufacturing Co., Inc., Little Neck, N.Y.

Continuation-in-part of Ser. No. 647,092, May 9, 1996, Pat. No. 5,647,479, which is a continuation of Ser. No. 233,581, Apr. 26, 1994, Pat. No. 5,570,778. This application Jan. 10, 1997, Ser. No. 779,748

Int. Cl.^{6} H01H *21/24*

U.S. Cl. 200—557 **10 Claims**



4. An electrical rocker switch comprising:
(a) a housing;
(b) a rocker having a generally arcuate outer face extending from a first end to a second end: said rocker being pivotally supported in said housing at a first pivot point and being pivotally movable with limited angular movement between first and second rest positions;
(c) a boss carried by said rocker and extending downwardly therefrom into said housing;
(d) a spring member having a first free end extending from said boss to a support member in said housing, said spring member being aligned with a vertical centerline of said housing; said spring member having a central portion pivotable about a second pivot point; said first free end of said spring member engaging said boss and retaining said rocker in a selected of said first and secong rest position;
(e) a fixed contact mounted upon said housing; said fixed contact adapted to be connected to a first line of a first electrical circuit;
(f) a movable contact mounted upon a contact arm connected to and transverse to said spring member; said movable contact moves into mechanical and electrical contact with said fixed contact and moves away from mechanical and electrical contact with said fixed contact as said spring member central portion pivots about said second pivot point in response to the movement of said rocker between said first and second rest positions;
(g) means to connect said spring member to a line of an electrical circuit to complete a first electrical circuit when said movable and fixed contacts are engaged and interrupt said first electrical circuit when said movable and fixed contacts are not engaged;
(h) said support member extends transverse to said vertical center line of said housing and has a support surface and a slot through said support member aligned with said vertical center line;
(i) said spring member further comprising a lower portion and a second free end portion;
(j) said spring member being anchored to said housing by placement of said lower portion of said spring member in said slot through said support member; and
(k) said second free end portion of said spring means is trifucated to form two spring legs and an electrical contact leg.

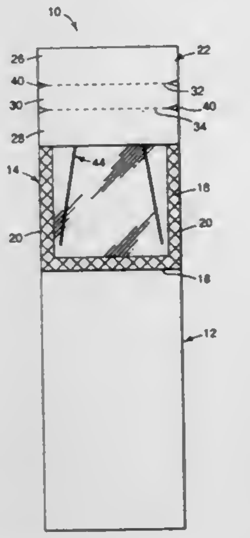
5,836,444
POUCH FOR ORTHODONTIC APPLIANCE

Kenneth E. Hoevel, Monrovia; Bruce E. Chester, Irvine, both of Calif., and Gregory D. Crowe, Louisville, Ky., assignors to Minnesota Mining & Manufacturing Co., St. Paul, Minn.

Division of Ser. No. 501,186, Jul. 11, 1995, Pat. No. 5,655,653. This application Apr. 21, 1997, Ser. No. 840,952

Int. Cl.^{6} A61B *19/02;* **B65D** *65/36*

U.S. Cl. 206—63.5 **8 Claims**



1. A pouch comprising:
a first sheet made of a flexible material and having at least one printable surface for printing text; and
a second sheet extending over said first sheet and defining a product-receiving receptacle therebetween, said second sheet being made of a clear plastic material, said second sheet being fixed to said first sheet at least partially along a path circumscribing said receptacle, said first sheet extending beyond said second sheet a sufficient distance to permit an additional area for printing text,
wherein said first sheet includes a folded-over portion, wherein said folded-over portion is fixed to said second sheet, wherein said folded-over portion includes a first section fixed to said second sheet, a second section repositionably fixed to said second sheet and a third section located between said first section and said second section, and wherein said folded-over portion also includes a first line of weakness extending between said first section and said third section and a second line of weakness extending between said second section and said third section, said first line of weakness and said second line of weakness enabling said third section to be torn away from said first section and said second section before said pouch is opened, whereby a tamper evident indicator is provided.

7. A pouch comprising:
a first sheet made of a flexible material and having at least one printable surface for printing text;
a second sheet extending over said first sheet and defining a product-receiving receptacle therebetween, said second sheet being made of a clear plastic material, said second sheet being fixed to said first sheet at least partially long a path circumscribing said receptacle, said first sheet extending beyond said

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said second sheet a sufficient distance to permit an additional area for printing text; and

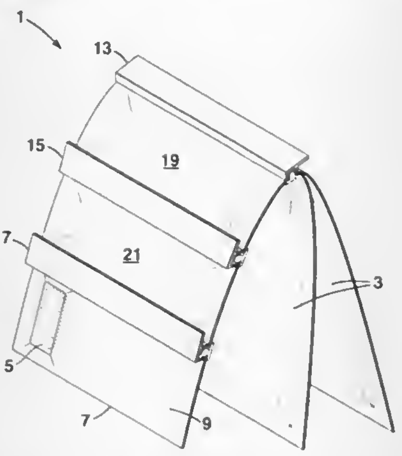
an orthodontic archwire received in said receptacle between said first sheet and said second sheet, said archwire being generally U-shaped and having a first leg, a second leg spaced from said first leg and a middle portion interconnecting said first leg and said second leg and wherein said first sheet and said second sheet each include a line of weakness extending across said first leg and said second leg such that when said first sheet and said second sheet are torn along said lines of weakness, said middle portion of said archwire is exposed for grasping while a portion of said first leg and said second leg of said archwire remains between said first sheet and said second sheet and whereby the space between said first leg and said second leg provides a location for grasping said article within the confines of said archwire without pressing directly on said archwire.

5,836,445
POUCH
Richard B. Provonchee, Cushing, Me., assignor to FMC Corporation, Philadelphia, Pa.

Filed Jul. 23, 1996, Ser. No. 685,228

Int. Cl.⁶ B65D *25/08*

U.S. Cl. 206—221 **19 Claims**



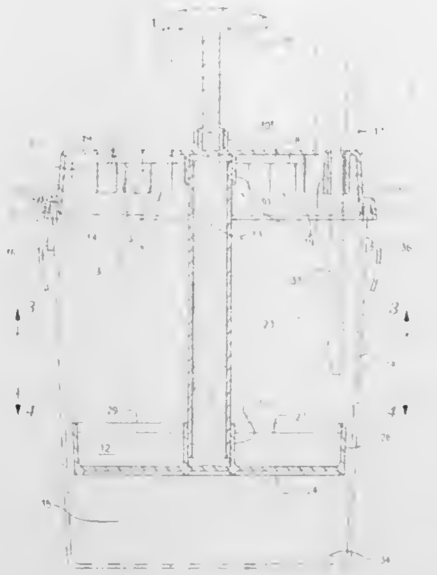
1. A flexible water and air impermeable pouch including a filter compartment and a filter immovably disposed therein, with an area on one side thereof exposed to the interior of the pouch, the filter compartment is adapted to have an opening formed in an area adjacent a portion of the filter contiguous with the exterior of the pouch, and the filter is adapted to filter fluid exiting the pouch through the opening.

5,836,446
TOOL CADDY
Laurence T. Varnom, Jacksonville, Fla., assignor to Bowvar Industries, Inc., Ocala, Fla.

Filed May 6, 1996, Ser. No. 643,374

Int. Cl.⁶ B65D *85/00*

U.S. Cl. 206—373 **20 Claims**



1. A tool holding device adapted to be inserted into and carried by a bucket: comprising an upper horizontal flat plate spaced above and rigidly joined to a lower horizontal dish, a short generally vertical wall extending downwardly from and around the outer perimeter of said plate, said plate extending radially outwardly, said vertical wall adjacent its lower extremity having a shoulder formed therein to overlie and be supported on a rim of a bucket with an outer extremity of said vertical wall locatable outwardly of a rim of a bucket, said vertical wall being spaced outwardly of said dish said plate including a plurality of passageways for receiving and holding vertically therein hand tools with a lower part of tools hanging below said plate and handles of tools above said plate, a centrally located handle connected to said plate and extending upwardly therefrom for lifting said tool holding device vertically into and out of a bucket, said lower horizontal dish including a shallow open container with an upturned outer edge and a substantially flat bottom supportable on a horizontal surface when removed from a bucket, said outer edge when said shoulder overlies a rim of a bucket being spaced from a bucket wall with said bottom of said container being spaced above a bottom of a bucket, said plate and said dish being rigidly joined together by a vertical spacer connector means to dispose said dish below lower parts of tools hanging below said plate.

11. A tool holder insertable into an open top bucket comprising a flat horizontal upper plate, a lower horizontal dish spaced remotely from said plate, said plate having a perimeter greater than an open top of a bucket, a short generally vertical wall attached to said perimeter of said plate and having an outer extremity adapted to be located outwardly of a rim of a bucket, said plate having a plurality of tool receiving passageways extending substantially vertically through said plate, a flange extending outwardly of said short wall and being in general alignment with said plate, said flange being adapted to rest on and be supported by an upper edge of a bucket, said passageways including a plurality of circular holes adjacent and inwardly of said perimeter of said plate to receive single part tools therein and a tubular guide attached to and depending downwardly from said hole and terminating remotely from said dish, and a plurality of elongated slot shaped holes to receive dual part tools therein, said dish including a shallow open top container having an upturned perimeter wall and a plurality of radial walls to divide said container into a plurality of generally wedge-shaped compartments, and an elongated spaced vertical connector respectively rigidly joined at one end to said plate and at its other end to said dish.

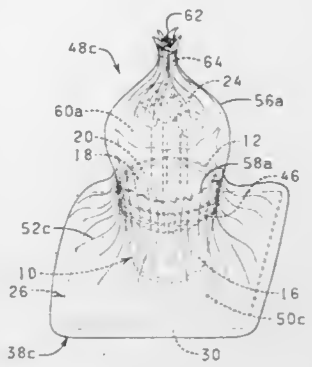
5,836,447
PACKAGING ASSEMBLY FOR SHIPPING A CONTAINER AND METHOD FOR USING SAME
Pedro F. Garcia, Atlanta, Ga., and Donald E. Weder, Highland, Ill., assignors to Southpac Trust International, Inc.

Continuation-in-part of Ser. No. 242,485, May 13, 1994, Pat. No. 5,564,567, which is a continuation-in-part of Ser. No. 202,058, Feb. 25, 1994, Pat. No. 5,411,137, which is a continuation of Ser. No. 93,109, Jul. 16, 1993, Pat. No. 5,311,992. This application Oct. 15, 1996, Ser. No. 730,552

Int. Cl.⁶ B65D *85/52*

U.S. Cl. 206—423 **36 Claims**

1. A packaging assembly, comprising:



a container having an upper end, a lower ends and an outer surface and a floral grouping disposed therein;

a support member having an upper support surface, a lower surface, and a periphery, the lower end of the container disposed on the upper support surface of the support member in a non-connected relationship with respect to the support member and with the container oriented in a substantially upright position; and

a sheet of material wrapped and secured about the support member and the container and the floral grouping such that the support member, the container, and the floral grouping are enclosed within and covered by the sheet of material and the container is supported in its upright position by the combination of the sheet of material and the support member so as to prevent the container and the floral grouping from toppling during transport.

14. A method of packaging a floral grouping disposed in a container for transport, the method comprising the steps of:

providing a support member having an upper support surface, a lower surface, and a periphery;

disposing the lower end of the container on the upper support surface of the support member so that the container is in a non-connected relationship with respect to the support member and oriented in a substantially upright position;

wrapping a sheet of material about the support member, the container, and the floral grouping; and

securing the sheet of material about the support member, the container, and the floral grouping such that the floral grouping is enclosed within and covered by the sheet of material and the container is supported in its upright position by the combination of the sheet of material and the support member so as to prevent the container and the floral grouping from toppling during transport.

19. A packaging assembly, comprising:

a container having an upper end, a lower end, and an outer surface and a floral grouping disposed therein:

a support member having an upper support surface, a lower surface, and a periphery, the lower end of the container bondingly connected to the upper support surface of the support member such that the container is oriented in a substantially upright position; and

a sheet of material wrapped and secured about the support member and the container and the floral grouping such that the support member, the container, and the floral grouping are enclosed within and covered by the sheet of material and the container is supported in its upright position so as to prevent the container and the floral grouping from toppling during transport.

32. A method of packaging a floral grouping disposed in a container for transport, the method comprising the steps of:

providing a support member having an upper support surface, a lower surface, and a periphery;

bondingly connecting the lower end of the container on the upper support surface of the support member such that the container is oriented in a substantially upright position;

wrapping a sheet of material about the support member, the container, and the floral grouping; and

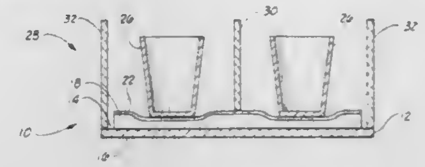
securing the sheet of material about the support member, the container, and the floral grouping such that the floral grouping is enclosed within and covered by the sheet of material and the container is supported in its upright position so as to prevent the container and the floral grouping from toppling during transport.

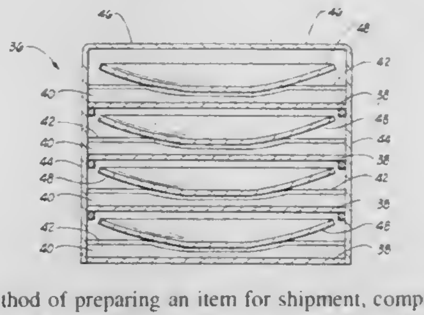
5,836,448
SHIPPING DEVICE WITH BONDABLE FOAM LAYER
Donald E. Weder, Highland, Ill., assignor to Southpac Trust International, Inc.

Filed Feb. 5, 1997, Ser. No. 796,489

Int. Cl.⁶ B65D *85/50;85/52*

U.S. Cl. 206—423 **36 Claims**





1. A method of preparing an item for shipment, comprising:

providing a shipping device comprising a rigid support surface at least a portion of which has a deformable foam layer disposed thereupon and connected thereto, the deformable foam layer having an upper bonding surface comprising a connecting bonding material; and

securing at least one item to the shipping device by placing the item upon the foam layer of the shipping device and bondingly connecting the item to the foam layer via the connecting bonding material wherein a portion of the foam layer adjacent the item is deformed in response to pressure exerted on the foam layer by the item wherein the foam layer conforms to a portion of the item such that the item is secured for shipment.

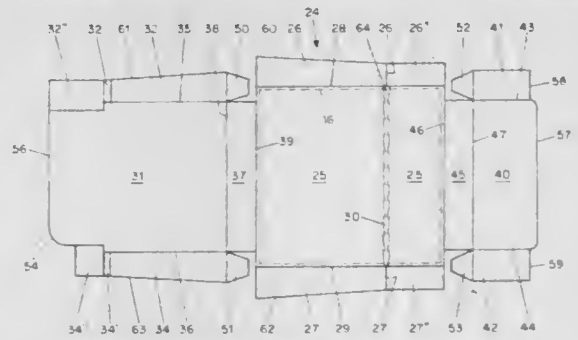
5,836,449
RECLOSABLE PHOTOGRAPHIC SHEET PACKAGE
Dirk Peeters, Mortsel, Belgium, assignor to Agfa-Gevaert, Mortsel, Belgium

Filed Jan. 21, 1997, Ser. No. 786,795

Claims priority, application European Pat. Off., Feb. 22, 1996, 96200455

Int. Cl.⁶ B65D *85/48*

U.S. Cl. 206—455 **10 Claims**



1. A reclosable photographic sheet package comprising:

a stack of photographic sheets and

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- a rectangular telescope-type carton made from one cardboard blank and having (i) a base with a neck extension and (ii) a cover telescoping over said neck extension,
- said neck extension of the base having a rear wall and two side walls only and being open at a front side so as to afford easy access to the sheets for removal of sheets from the carton.

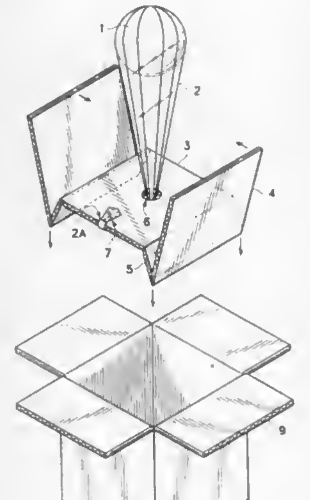
5,836,450
PACKAGING DEVICE USING MEMBRANE, PLATFORM, AND APERTURE AS A MEANS OF RESTRAINT

Juanita A. Gonzales, 490 Cambridge Ave., Palo Alto, Calif. 94306

Continuation of Ser. No. 482,290, Jun. 7, 1995, abandoned. This application May 14, 1997, Ser. No. 856,891

Int. Cl.^{6} B65D *85/30*

U.S. Cl. 206—462 **7 Claims**



1. A package assembly for protecting an object from damage due to rough handling of the package, comprising:
- a carton having a bottom and sidewalls extending upwardly from that bottom,
- a load bearing platform positioned within said carton at a distance above the bottom of said carton and comprising at least one edge, first and second surfaces, and at least one aperture through that load bearing platform,
- a flexible membrane having portions of said flexible membrane tightly envelopable about said object, and having free ends fastened to said load bearing platform,
- wherein said object may be held against the first surface of said load bearing platform by said flexible membrane, other portions of said flexible membrane extending through said at least one aperture and along the second surface of said load bearing platform, and wherein said free ends of said flexible membrane being fastened to said load bearing platform hold said object against said first surface of said load bearing platform, thereby preventing said object from moving in relation to said load bearing platform and protecting said object from damage.

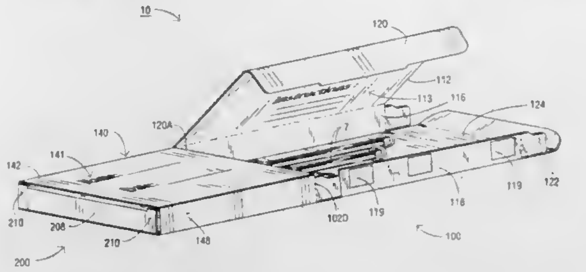
5,836,451
CARTON HAVING TRAY AND RETURN CARTON

Rodney D. Dixon, Burlington, N.C., assignor to Mebane Packaging Corporation, Mebane, N.C.

Filed Sep. 11, 1997, Ser. No. 927,825

Int. Cl.^{6} B65D *69/00*

U.S. Cl. 206—569 **18 Claims**



1. A package for containing both longer and shorter components and being transformable into a secondary package for carrying the shorter components, said package comprising:
- a) a unitary, tubular base carton having first and second ends and a first length extending between said first and second ends;
- b) a tear line formed in said base carton between said first and second ends and defining a tubular sub-carton and a remainder portion, said sub-carton having a second length extending between said first end of said base carton and said tear line, said second length being less than said first length; and
- c) a tray disposed in said sub-carton, said tray having first and second ends and a third length extending between said first and second ends of said tray, said third length being less than said first length of said base carton.

5,836,452

Patent Not Issued For This Number

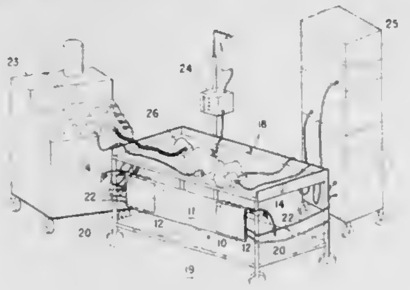
5,836,453
CABLE POUCH HAVING MEDICAL APPLICATIONS

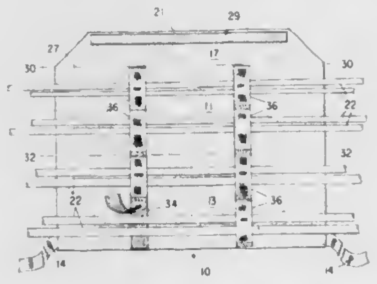
Jazmin V. Herrera, 9300 Raintree Rd., Burke, Va. 22015

Filed Apr. 25, 1997, Ser. No. 845,420

Int. Cl.^{6} B65D *85/00*

U.S. Cl. 206—702 **5 Claims**





1. A cable pouch having medical applications comprising:

- a piece of flexible sheet material having integrally connected sections, each of said sections having an interior surface and an exterior, said sections comprising:
  - a first substantially rectangular section having a first long edge and a second long edge;
  - a second substantially rectangular section having a first long edge and a second long edge with opposite ends; and
  - a flap having a first edge and a second edge, said first edge being parallel to said second edge, said first edge of the flap being integrally attached to said first long edge of said first rectangular section to define a first fold line and said first long edge of said second rectangular section being integrally attached to said second long edge of said first rectangular section to define a second fold line;
  - a pair of ties attached at the opposite ends of said second long edge of said second rectangular section for securing said pouch above a floor to a patient carrier;
  - an assembly of interlocking bands and straps for securing a plurality of cables against said interior surface, said assembly of interlocking bands and straps vertically extending across the interior surface of said first rectangular section and said second rectangular section;
- fastening means for removably securing said flap to said second rectangular section to enclose a plurality of cables within said pouch when said flap and said second rectangular section are inwardly folded along said first fold line and said second fold line, respectively; and
- a plurality of pockets on the exterior surface of said first rectangular section for securely containing a plurality of cable plugs.

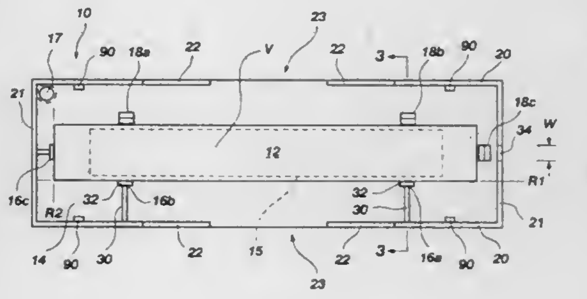
5,836,454
LEAD FRAME CASING

Sven Evers, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Jan. 17, 1996, Ser. No. 587,641

Int. Cl.^{6} B65D *85/62*

U.S. Cl. 206—723 **19 Claims**



1. An apparatus for storing a stack of lead frame strips comprising:
- a casing including a base for supporting the lead frame strip stack and a plurality of walls extending upwardly from said base and defining a top opening into said casing;
- at least one reference guide member disposed within said plurality of side walls and coupled to said base for providing at least one reference plane against which the stacked lead frame strips may be aligned;
- at least one resilient guide member coupled to said base and spaced from said at least one reference guide member;
- a lid adapted for substantially covering said casing; and
- at least one actuating member coupled to said lid for moving at least a portion of said at least one resilient guide member toward said at least one reference guide member to substantially align stacked lead frame strips disposed within said casing against said reference plane and substantially immobilize said stacked lead frame strips within said casing.

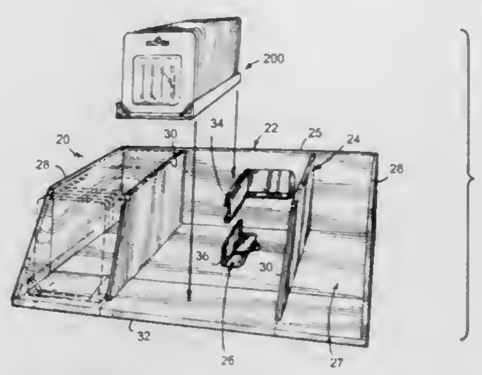
5,836,455
FLOOR DISPLAY ASSEMBLY

Wilton M. Connor, Charlotte, N.C.; Gregory R. Buchanan, Rock Hill, and Daniel E. Hagood, Clover, both of S.C., assignors to Eveready Battery Company, Inc., St. Louis, Mo.

Filed Aug. 30, 1996, Ser. No. 705,595

Int. Cl.^{6} B65D *5/50*

U.S. Cl. 206—757 **20 Claims**



1. A display stand tray for displaying product for sale, said display stand tray comprising:
- a bottom support panel to support the product for sale;
- a pair of upstanding end walls and a back wall, said walls integral with said bottom support panel, for retaining the product therein; and
- at least one divider tab, integral to and die-cut from said back wall, said tab being alternatively repositionable between a first non-engageable position flush with said back wall and a second engaging position wherein said divider tab lies in a vertical plane substantially parallel to said end walls and positioned for separating rows of product on display.

5,836,456
DISCRETE MATERIAL WASHING APPARATUS

Thomas James Lappin, and Robert Leslie Pickering, both of Armagh, United Kingdom, assignors to Rapid International Limited, Tandragee, County Armagh, United Kingdom

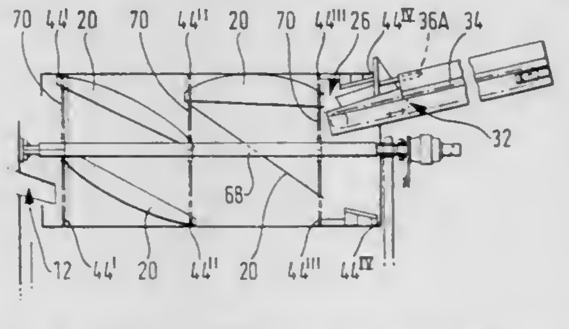
PCT No. PCT/GB94/02491, § 371 Date May 13, 1996, § 102(e) Date May 13, 1996, PCT Pub. No. WO95/13140, PCT Pub. Date May 18, 1995

PCT Filed Nov. 11, 1994, Ser. No. 646,316

Claims priority, application United Kingdom, Nov. 11, 1993, 9323331

Int. Cl.^{6} B07B *1/22*

U.S. Cl. 209—246 **23 Claims**



1. A discrete material washing apparatus comprising
- a structure mounting an elongate trough which has an inlet and an outlet,
- a dished tray mounted on the structure and shaped to feed into the inlet of the trough, the tray being to receive disposal of a cementitious mixture therein,
- a cylindrical screen having a net surface, the screen extending substantially along the length of the trough and adapted for rotation,

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water spray means being provided to play on any mixture disposed onto the tray and passed through the inlet into the interior of the screen for size classification with smaller particles able to pass through the mesh of the screen surface into the trough and larger particles remaining in the screen,
first means to remove the smaller particles from the trough,
second means to remove the larger particles from the interior of the screen through the outlet of the trough,
weir means in at least one longitudinal side for removal of the cementitious water from the trough,
gate means provided for operation to close off the inlet of the trough, the gate means being operable responsive to a pressure monitoring device surveying throughput of mixture into the screen, the device measuring the pressure on the screen above a preset level over which the gate is activated by extending a ram to push the gate downwards to close of the inlet, and
power means to rotate the screen and operate the first and second removal means.

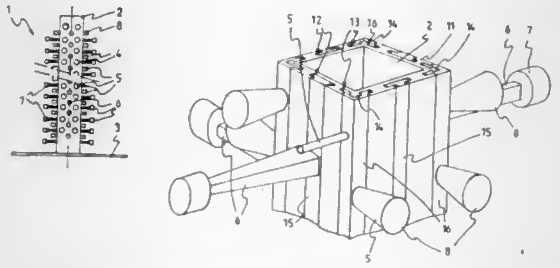
5,836,457

Patent Not Issued For This Number

5,836,458

METHOD FOR MANUFACTURING A DEVICE IN WHICH DISH-SHAPED CONTAINERS CAN BE PLACED AND A DEVICE IN WHICH DISH-SHAPED CONTAINERS CAN BE PLACED

Arnoldus Theodorus Bernardus Maria Nales, Vollenhadsweg 2, 7396 B.W., Terwolde, Netherlands
Filed Mar. 4, 1997, Ser. No. 793,732
Claims priority, application Netherlands, Oct. 18, 1994, 9401715
Int. Cl.^{6} A47F *5/00*
U.S. Cl. 211—41.2 7 Claims

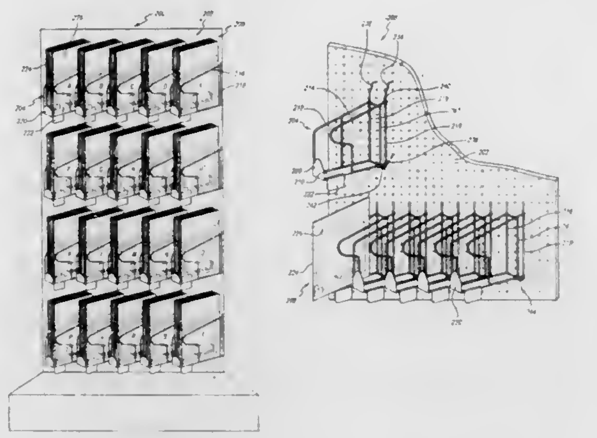


1. A method for manufacturing a device in which dish-shaped containers can be placed and supported at a desired mutual distance above one another, the method including the steps of:
(a) fabricating a column having a plurality of side faces defining corners therebetween, each corner being formed at a specific angle, at least one side face having defined therein at least one vertically disposed nonreleasing slit;
(b) fabricating a plurality of strips at least a portion of each of which is slidably insertable within at least one of the nonreleasing slits, each of the plurality of strips having a plurality of pin-shaped projections extending in the same direction therefrom and being integrally formed therewith; and
(c) inserting the plurality of strips into the plurality of nonreleasing slits.

5,836,459

COMPACT, HIGH VISIBILITY DISPLAY RACK AND CONFIGURATION

Joseph F. Nezwek, Redondo Beach, and James R. Plumb, Altadena, both of Calif., assignors to Avery Dennison Corporation, Pasadena, Calif.
Filed May 2, 1996, Ser. No. 641,878
Int. Cl.^{6} A47F *5/00*
U.S. Cl. 211—50 17 Claims

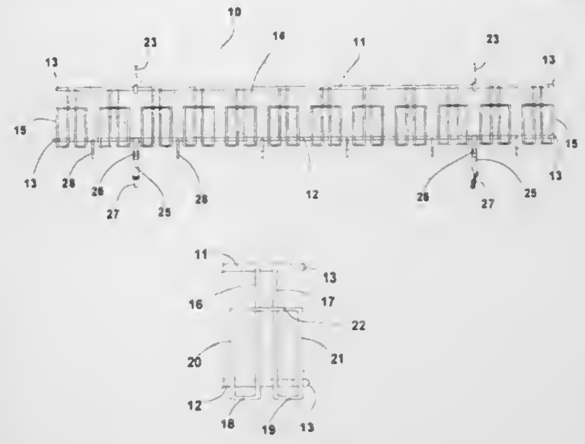


1. A high visibility storage rack assembly, comprising:
an open wire storage construction for receiving and storing at least one thin sheet type product package having a front face side, an obverse face side, a front edge side, and a rear edge side, for receiving thereon eye-catching designs for attracting attention to the product package;
said open wire storage construction including an open front edge side for helping to minimize the weight of the storage rack assembly and for providing user access to the thin sheet type product package to facilitate its removal;
said open wire storage construction further including a base structure for supporting from below the thin sheet type product package, a first side member connected to said base structure and extending substantially perpendicularly therefrom for helping to support the thin sheet type product package from its obverse face side, a second side member extending in a substantially parallel plane to said first side member for helping to support the thin sheet type product package from its front face side without substantially obstructing the eye catching design thereon, and a rear edge side member connected between said first and second side members for helping to support the thin sheet product package from its rear edge side;
a support surface mounting arrangement connected to said open wire storage construction for supporting it removably from a supporting surface so that said first side member, said second side member and said rear edge side member are all disposed at substantially acute angles relative to said supporting surface;
said support surface mounting arrangement including a pair of spaced apart vertical support members each connected to said open wire storage construction for helping to support it removably from said supporting surface; and
at least one restraining member connected to said open wire storage construction for helping to prevent the thin sheet type product package from slipping out of a storage area defined by a space bounded by the rear edge side member, the first side member and the second side member of the open wire storage construction.

5,836,460

PORTABLE SPORTS BOTTLE RACK

Joe Dan Brown, 2332 State Hwy. 43-E, Henderson, Tex. 75652, and Clifford J. Adams, 3400 Varsity Dr., Tyler, Tex. 75701
Filed Jan. 31, 1997, Ser. No. 792,637
Int. Cl.^{6} A47F *5/00*
U.S. Cl. 211—74 20 Claims

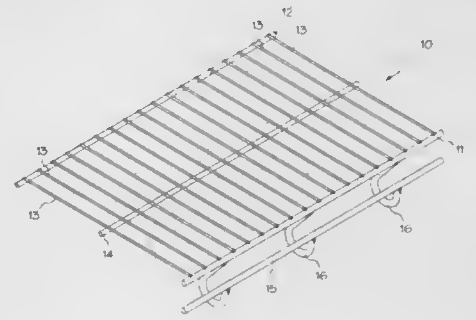


1. A portable bottle rack, comprising
an elongate base assembly having an upper edge and a lower edge;
first attachment means for releasably connecting said upper edge of said base assembly to a supporting structure;
second, flexible, attachment means for releasably connecting said lower edge of said base assembly to a supporting structure; and
a plurality of bottle holders disposed on said base assembly and interconnected thereto, each of said bottle holders having an open top to receive a bottle therethrough, bottom support means to support a bottle thereon, and lateral support means to laterally retain a bottle placed in said bottle holder.

5,836,461

WIRE SHELF

Elmer J. Kokenge; William Carlson; Stephen R. Egolf, and John D. Kokenge, all of Cincinnati, Ohio, assignors to Schulte Corporation, Cincinnati, Ohio
Filed Jan. 10, 1997, Ser. No. 781,477
Int. Cl.^{6} A47F *5/00*
U.S. Cl. 211—153 24 Claims

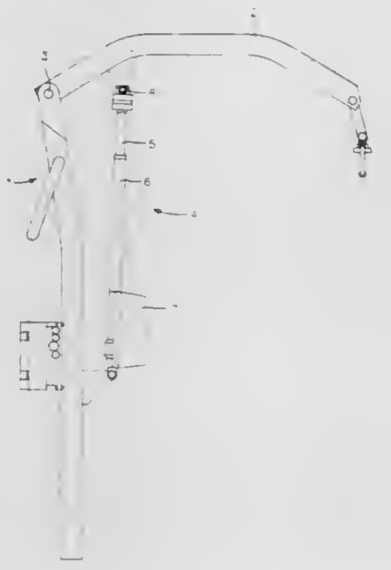


1. A wire shelf having a hanger rod which permits uninterrupted hanger travel along its length, said shelf comprising:
(a) a plurality of parallel, transversely-extending rod members, each having a rear end and a forward end, said transversely-extending rod members providing a support surface and said forward end of said members positioned at a forward edge of said shelf;
(b) a longitudinally-extending rear support rod secured to the rear end of each of said transversely-extending rod members;
(c) a longitudinally-extending front support rod secured to the forward end of each of said transversely-extending rod members;
(d) at least one longitudinally-extending intermediate support rod positioned parallel to said front and rear support rods, and secured to said transversely-extending rod members;
(e) a plurality of support hooks shaped from a wire rod, said support hooks secured to one of said front support rod and said at least one intermediate support rod, each of said support hooks having an end surface, an outer surface and a lower end, said end surface secured directly to the outer circumference of one of said front support rod and said at least one intermediate support rod; and
(f) a hanger rod secured to said support hooks at or adjacent to said lower end of the support hooks;
wherein said support hooks are configured so as to position said hanger rod beneath the plane of said support surface, and such that the hook portion of a clothes hanger may be slid along the length of said hanger rod without obstruction from said support hooks.

5,836,462

ADJUSTING MEANS

Gunnar Liljedahl, Pellvagen 4, Luleå, Sweden, S-975 93
PCT No. PCT/SE95/01201, § 371 Date Apr. 8, 1997, § 102(e) Date Apr. 8, 1997, PCT Pub. No. WO96/13456, PCT Pub. Date May 9, 1996
PCT Filed Oct. 16, 1995, Ser. No. 817,022
Claims priority, application Sweden, Oct. 31, 1994, 9403720
Int. Cl.^{6} B60P *1/10*
U.S. Cl. 212—260 3 Claims



1. An adjusting means for a hoisting crane, said adjusting means comprising
a hoisting spindle in the form of a screw traveling axially within a cylinder by means of a relative movement between said screw and a cooperating driven groove meshing rotating means,
said screw having a free end connected to a lifting arm of the hoisting crane by means of a connector, said connector being stiff in an axial direction of the work spindle and including two parts in the form of two concentric, in relation to each other, rotatable bodies, one being non-rotatably attached to a

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free end of said screw, the second being non-rotatably attached to said lifting arm of the hoisting crane,

said rotatable bodies each having a sliding face, said sliding faces being opposed to each other perpendicular to the axis of the work spindle,

said sliding faces being pressed to contact each other by means of a holding means so that a friction resistance is established against relative turning of said bodies about an axis, which is concentric with the work spindle, said friction being great enough to prevent the rotation of said screw when said groove meshing rotating means moves around said screw but is less than friction caused by hand rotation of said screw if said groove meshing rotating means should not be operable.

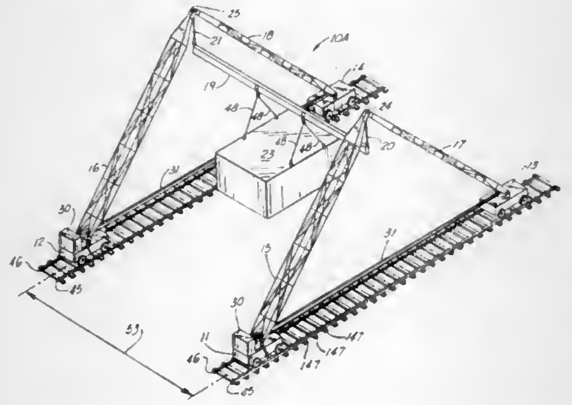
5,836,463
POWERED LIFTING APPARATUS USING MULTIPLE BOOMS

Jon E. Khachaturian, 5827 Rhodes Ave., New Orleans, La. 70131

Filed Dec. 9, 1996, Ser. No. 780,846

Int. Cl.⁶ B66C *23/50*

U.S. Cl. 212—270 **34 Claims**



1. A method for lifting a multi-ton package comprising the steps of:

- a) continuously supporting a first pair of booms from a first pair of carriage, where the lower end of a first boom is pinned to a first carriage and the lower end portion of a second boom is pinned to second carriage;
- b) continuously supporting a second pair of booms from a second pair of carriages, wherein the lower end portion of a third boom is pinned to a third carriage and the lower end portion of a fourth boom is pinned to fourth carriage;
- c) pinning the upper end portion of the first and second booms together to form a pinned connection;
- d) pinning the upper end portion of the third and fourth booms together to form a pinned connection;
- e) suspending a lifting beam with cable rigging from the pinned connections of the respective pairs of booms;
- f) positioning of the beam near the package;
- g) attaching the package to the beam with rigging;
- h) lifting the package with rigging that depends from the lifting beam by tightening a first cable that links the first and second carriages and a second cable that links the third and fourth carriages, thus increasing the angle of inclination of the booms and raising the apex of each of the paired booms; and
- i) wherein in steps "f" and "h" the lifting beam can be positioned in a generally horizontal position.

5,836,464
CLOSURE FOR BEVERAGE CONTAINER

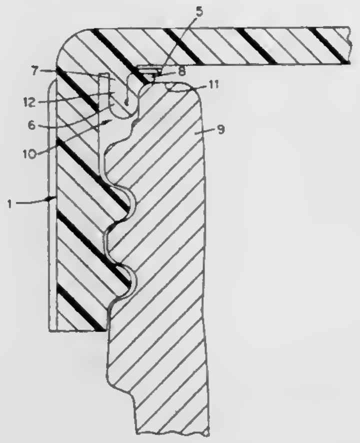
Rodney M. Druitt, North Luffenham, United Kingdom, assignor to Closures and Packaging Services Limited, Guernsey, United Kingdom

Continuation of Ser. No. 718,022, Sep. 23, 1996, abandoned, which is a continuation of Ser. No. 490,020, Jun. 12, 1995, abandoned, which is a continuation of Ser. No. 181,668, Apr. 21, 1994, Pat. No. 5,638,972, which is a continuation of Ser. No. 623,911, Mar. 14, 1991, Pat. No. 5,423,444. This application Jul. 23, 1997, Ser. No. 899,285

Claims priority, application Australia, Jun. 17, 1988, PI/8846

Int. Cl.⁶ B65D *53/00*

U.S. Cl. 214—344 **4 Claims**



1. A closure suitable for mounting onto a container, said closure being molded from a plastic resilient material and comprising a top portion and a skirt portion extending from the top portion said top portion and skirt portion defining a cavity, characterized in that an annular sealing rib projects downwardly into the cavity defined by the top portion and the skirt portion, said rib including a first portion having a substantially cylindrical inner surface, the first portion extending away from the top portion and lying radially inward of the skirt, and a second, frusto-conical portion contiguous with the end of the first portion distal to the top portion and extending radially inward to terminate in a circular free edge, the first portion having an internal diameter relative to the external diameter of the neck of the container to which the closure is to be attached such that during engagement of the closure with the neck, the second, frusto-conical portion will be engaged by the free end of the neck and folded back against the substantially cylindrical inner surface of the first portion of the rib to form a seal between at least an outer surface of the neck of the container and the closure.

5,836,465
CHILD-RESISTANT CLOSURE ASSEMBLIES

Roger M. King, Latimer, United Kingdom, assignor to Beeson and Sons Limited, Rickmansworth, United Kingdom

Continuation of Ser. No. 463,216, Jun. 5, 1995, Pat. No. 5,638,969. This application Nov. 4, 1996, Ser. No. 743,519

Claims priority, application United Kingdom, Apr. 18, 1996, 9507892

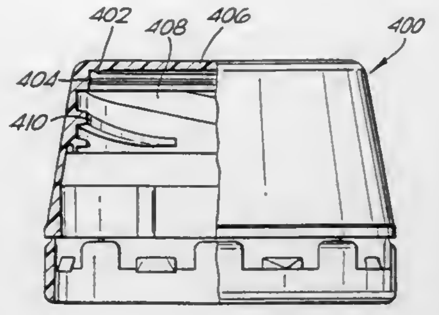
Int. Cl.⁶ B65D *55/02*

U.S. Cl. 215—216 **16 Claims**

1. A child-resistant container and closure assembly comprising:

a container neck comprising a first screw thread comprising first thread portions projecting from the neck and two first locking elements located below said first screw thread on opposite sides of the container neck,

a closure for the container neck comprising a resiliently deformable skirt a second screw thread complementary to the first screw thread and comprising second thread portions projecting inwardly from the skirt, and two second locking elements on opposite sides of the resiliently deformable skirt;



wherein the first and second locking elements mutually engage in ratchet fashion when the closure is screwed onto a fully engaged position on the container neck and subsequently block unscrewing of the closure unless a radial pressure is applied to the skirt at positions spaced from the locking elements to deform the skirt to release the locking elements; and

wherein the first and second threads are two-start, substantially continuous steeply pitched threads, wherein the closure can be moved from a substantially fully disengaged position to a substantially fully engaged position on the neck by through a single smooth rotation through about 90° or less and wherein said first thread portions are spaced around said neck sufficiently closely to block non-rotational axial movement of said first thread portions past said second thread portions.

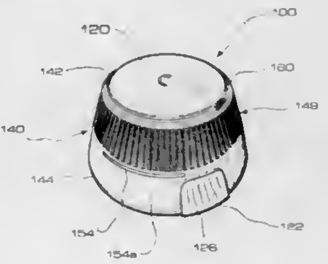
5,836,466
SAFETY CLOSURE AND CONTAINER ASSEMBLY

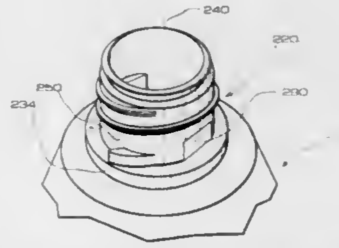
Marc A. Briere, Newburgh; Christopher B. Clodfelter, Evansville, and William D. Sprick, Evansville, all of Ind., assignors to Rexam Plastics, Inc., Evansville, Ind.

Filed May 22, 1997, Ser. No. 861,793

Int. Cl.⁶ B65D *55/02*

U.S. Cl. 215—216 **29 Claims**





1. A safety closure and container assembly, comprising:

a safety closure having

- (a) a top wall having a lower surface and an outer perimeter,
- (b) an annular skirt having an inner annular surface, said inner annular surface having an internal thread,
- (c) at least locking lug,
- (d) at least one oversized squeeze pad disposed on an outer surface of said annular skirt at a lower end thereof, said squeeze pad being offset from said locking lug by about 90°, said squeeze pad having a thickness greater than a wall thickness of said annular skirt in a region adjacent said squeeze pad, said squeeze pad thickness being continuously greater than said annular skirt wall thickness at all locations thereon, wherein said squeeze pad stiffens the annular side wall near said region adjacent thereto, and,
- (e) at least one annular slot disposed in a central region of said annular skirt, said slot being unsymmetrically located about said annular skirt between said locking lug and said squeeze pad; and

a container having a neck portion, at least one locking tab projecting outwardly from an outer surface of said neck portion, at least one flattened surface disposed on an outer surface of said neck portion, and an external thread provided on said outer surface sized to engage said internal thread of said safety closure, said flattened surface being offset from said locking tabs by about 90°.

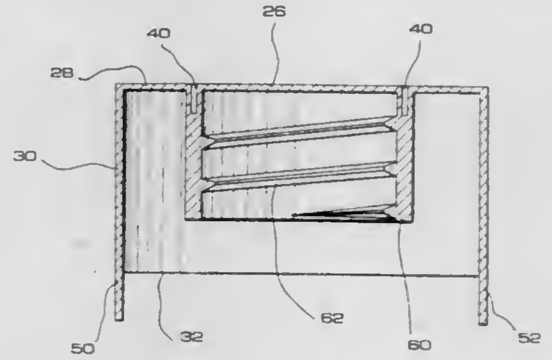
5,836,467
DOUBLE-SHELL CLOSURE HAVING AN ARCUATE GROOVE

Gary V. Montgomery, Evansville, Ind., assignor to Rexam Plastics Inc., Evansville, Ind.

Filed May 22, 1997, Ser. No. 862,077

Int. Cl.⁶ B65D *55/02*

U.S. Cl. 215—216 **6 Claims**



1. A closure, comprising:

a top wall having an outer diameter;

an outer shell depending downwardly from a lower surface of said top wall;

an inner shell depending downwardly from said lower surface and disposed concentrically with and spaced inwardly from said outer shell; and,

an arcuate groove disposed in an upper surface of said top wall depending downwardly towards said inner shell.

5,836,468
PLASTIC SNAP CLOSURE WITH ANTI-TAMPER STRIP AND METHOD OF ITS MANUFACTURE

Udo Bösl, Eimeldingen, Germany, and Kelvin Pitman, Bubendorf, Switzerland, assignors to Crown Cork AG, Reinach, Switzerland

PCT No. PCT/CH95/00248, § 371 Date Jun. 14, 1996, § 102(e) Date Jun. 14, 1996, PCT Pub. No. WO96/14252, PCT Pub. Date May 17, 1996

PCT Filed Oct. 23, 1995, Ser. No. 663,067

Claims priority, application Switzerland, Nov. 2, 1994, 3273/94

Int. Cl.⁶ B65D *39/00*

U.S. Cl. 215—253 **20 Claims**

1. Plastic snap closure for containers with a substantially cylindrical mouth area, with a cap base (1) and a cap wall (2) abutting onto said cap base, said cap wall having a circumference, an inside surface, an outside surface, and a lower edge (14), protruding snapping means (3) being arranged along the circumference on the inside surface of said cap wall, said snapping means being able to snap over a bead (5) on the container mouth, said snapping means

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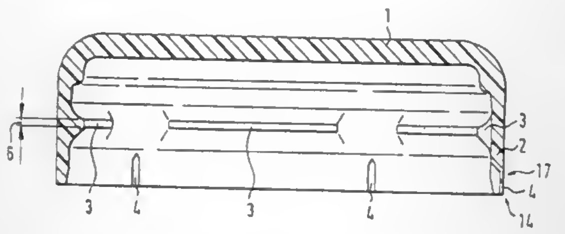
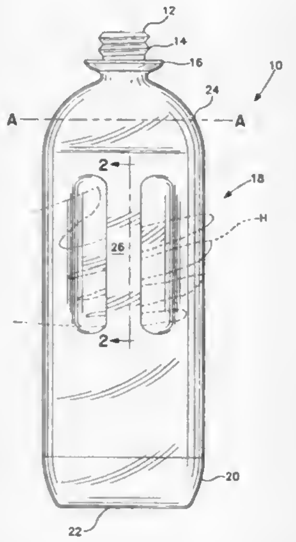


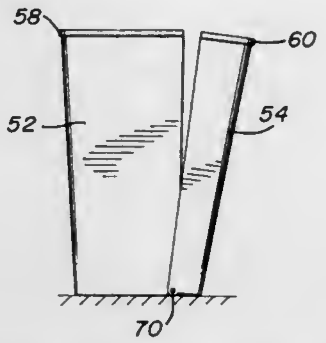
having a radial thickness wherein the radial thickness of said snapping means reaches a maximum (**7**) within an annular snap-on area (**6**) of the cap wall, and vertical weakened zones (**4**) are formed as depressions on the cap wall and are arranged beneath the snap-on area (**6**) in order to break when a bottle opener is applied to a lower edge of the cap wall.

5,836,469
BOTTLE WITH GRIPPING SUPPORT
Stanton Zebrowski, 61-73 Seaview Ave., Stamford, Conn. 06902
Filed Jan. 24, 1996, Ser. No. 599,490
Int. Cl.^{6} B65D *1/40;23/10*
U.S. Cl. 215—384 **6 Claims**



1. A beverage bottle formed of light weight, blow molded plastic, the bottle having a thin generally cylindrical main body wall (**18**), a tapered bottom wall portion (**20**), a base (**22**), a tapered upper body portion (**24**) and a neck (**14**) for receiving a closure cap all integrated into a unitary bottle, the main body wall normally deforming upon application of hand pressure normal for gripping the cylindrical main body wall when pouring out the contents of the bottle, a gripping support (**26**) molded into the cylindrical wall, the gripping support defined by a closed portion (**26***a*) of the main body wall occupying up to two-thirds of the height of the main body wall, the gripping support having an inner surface, a passage (**28**) molded into the cylindrical wall and defined by the inner surface (**26***b*) of the gripping support and a concave section (**18***b*) of the bottle wall, the concave section (**18***b*) of the bottle wall passing from one side (**18***c*) of the bottle wall to the other **18***d*, the passage extending from said one side (**18***c*) of the bottle to said other (**18***d*), the passage being of sufficient width to accommodate an adult hand, the bottle with gripping support and passage being of integral construction, whereby the bottle is held without deformation for pouring out its contents by inserting a hand through the passage with fingers gripping the main body wall and the inner surface of the gripping support bearing against the back of the hand.

5,836,470
TRASH RECEPTACLE WITH EXPANDABLE RIM
Michael L. Neelly, 49 Briggsboro La., Fairport, N.Y. 14450; Raymond Flo, Canandaigua, N.Y.; Kathryn E. Alexander, and Bill Russell Alexander, both of Columbus, Ohio, assignors to Michael L. Neelly, Fairport, N.Y.
Filed Mar. 10, 1997, Ser. No. 814,086
Int. Cl.^{6} B65D *1/06*
U.S. Cl. 220—4.22 **14 Claims**

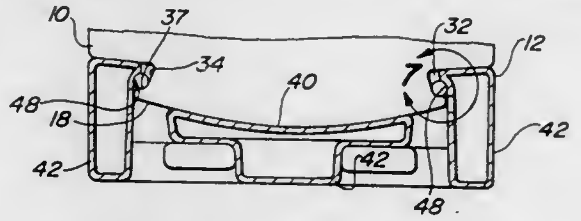


1. A trash receptacle having an upper periphery defining an open end, the receptacle comprising:
(a) a main body, the main body having a base and a side, the side including an upper periphery which comprises a portion of the upper periphery of the receptacle;
(b) a secondary body pivotally attached to and biased away from the main body, the secondary body having a bottom and a second side, the secondary side including an upper periphery which when combined with the upper periphery of the main body forms the upper periphery of the receptacle;
(c) the bottom having a first level spaced a first distance from the upper periphery of the secondary body and a second level, parallel to the first level and spaced a second distance, greater than the first distance, from the upper periphery of the secondary body, the secondary body hinged to the main body adjacent the second level.

5,836,471

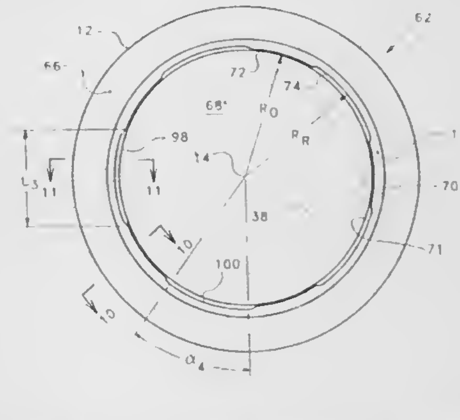
Patent Not Issued For This Number

5,836,472
ALL POLY CONTAINER WITH SEPARABLE TANK AND PALLET MEMBERS
Elaine K. Vavra, Crete, and Dwight E. Nichols, Beatrice, both of Nebr., assignors to Hoover Group, Inc., Alpharetta, Ga.
Filed Oct. 24, 1996, Ser. No. 736,510
Int. Cl.^{6} B65D *21/00*
U.S. Cl. 220—571 **9 Claims**



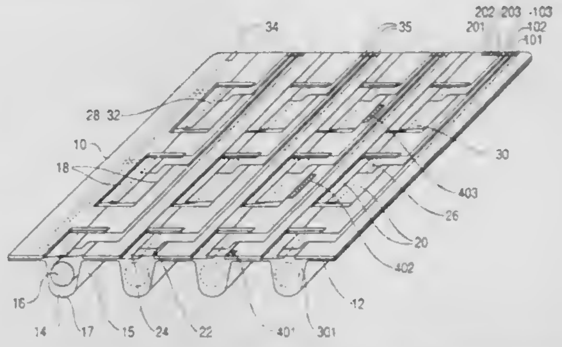
8. A container for bulk liquids comprising:
a tank member, said tank member having a top wall, a bottom wall and side walls, said tank member having a fill port, said tank member having recessed areas on said side walls, said recessed areas having side walls recessed from said tank member side walls, said recessed area side walls having lifting surfaces extending outwardly in opposite directions, said recessed area having a sump and a discharge port located in one of said side walls;
a pallet, said pallet having side walls, said pallet having an upper surface, said tank member removably mounted on said upper surface with said recessed area fitting inside of said pallet, said pallet being shaped to interfit with said tank member, said pallet having a drain valley located beneath said sump, said pallet having downwardly facing surfaces, said downwardly facing surfaces being substantially vertically aligned with said lifting surfaces, said pallet having means forming holes located on said side walls;
a pair of elongated structural members, said structural members being shaped to fit through said holes, said structural members passing through said holes on said side walls, said structural members passing between said downwardly facing surfaces and said lifting surfaces, said structural members being in engagement with said surfaces so as to attach said tank member to said pallet; and maintain said tank member and said pallet in a connected together relationship.

5,836,473
BEVERAGE CONTAINER WITH INCREASED BOTTOM STRENGTH
K. Reed Jentzsch, Arvada; Otis H. Willoughby, Boulder, and Gary A. Baldwin, Louisville, all of Colo., assignors to Ball Corporation, Broomfield, Colo.
Continuation of Ser. No. 31,059, Mar. 2, 1993, abandoned, which is a continuation of Ser. No. 600,942, Oct. 22, 1990, abandoned, which is a continuation-in-part of Ser. No. 505,618, Apr. 6, 1990, abandoned. This application Aug. 29, 1994, Ser. No. 298,351
Int. Cl.^{6} B65D *7/00*
U.S. Cl. 220—606 **51 Claims**



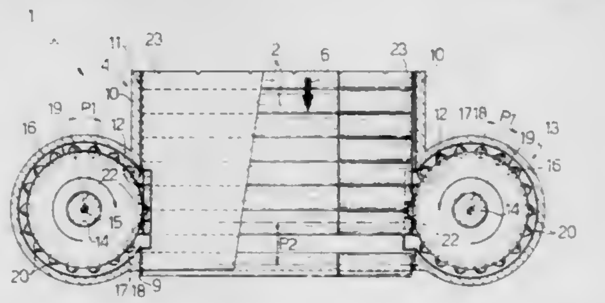
1. A drawn and ironed container, comprising:
a substantially cylindrical sidewall disposed about a vertical axis; and
a bottom attached to said sidewall and comprising:
  an exteriorly convexly-shaped annular support comprising an annular supporting surface, wherein a radially innermost annular part of said annular support defines a first diameter;
  a center panel; and
  a panel positioning portion positioned between said supporting surface and said center panel and comprising annular second and third parts, said second part being positioned above said annular support and generally extending outwardly relative to said vertical axis from a lower end of said second part to an upper end of said second part, said third part being positioned above said second part and generally extending inwardly relative to said vertical axis from a lower end of said third part to an upper end of said third part, said lower end of said third part having a second diameter greater than said first diameter of said radially innermost part of said annular support and said upper end of said third part having a third diameter less than said first diameter of said radially innermost part of said annular support, wherein there is a discontinuity between said upper end of said third part and said center panel.

5,836,474
STORAGE MEANS SPECIALLY INTENDED FOR MEDICAMENTS
Göran Wessberg, Upsala, Sweden, assignor to NovaTelligence AB, Ronneby, Sweden
PCT No. PCT/SE94/01137, § 371 Date May 24, 1996, § 102(e) Date May 24, 1996, PCT Pub. No. WO95/14456, PCT Pub. Date Jun. 1, 1995
PCT Filed Nov. 28, 1994, Ser. No. 649,711
Claims priority, application Sweden, Nov. 26, 1993, 9303919
Int. Cl.^{6} G07F *11/66*
U.S. Cl. 221—25 **10 Claims**



1. A medicament storage device which includes a storage plate for at least one quantity, for instance a medication dosage stored in a storage space, characterized in that the opening of the storage space has a closure means which includes one long and one short mutually opposite resiliently mounted or elastic flap which overlap one another, wherein the flap overlap regions are provided with indicating means which indicate the direction of the latest passage through said opening, and/or detection means which produce a signal when passage occurs through the opening and indicates the direction of said passage.

5,836,475
DEVICE FOR THE ORDERLY SUPPLY OF ELONGATED ARTICLES, IN PARTICULAR TOBACCO PRODUCTS
Fulvio Boldrini, Ferrara, Italy, assignor to G.D Socitea' Per Azioni, Bologna, Italy
Filed Feb. 6, 1997, Ser. No. 797,469
Claims priority, application Italy, Feb. 7, 1996, BO96A0054
Int. Cl.^{6} B65G *59/00*
U.S. Cl. 221—131 **16 Claims**



1. A device for the orderly supply of elongated articles, the device comprising at least one channel presenting a bottom opening and a longitudinal axis; and the channel being defined by two lateral walls parallel to said longitudinal axis and separated by a distance substantially equal to a thickness of the articles, so as to permit a respective column of articles to travel, with their respec-

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tive axes crosswise to said axis, along the channel to said bottom opening; characterized by comprising an ordering device located outside said channel and upstream from said bottom opening along said axis, and which in turn comprises at least two engaging elements movable successively along respective given portions of respective end edges of at least one of said two lateral walls, and cooperating with respective ends of said articles to accompany the articles along a substantially central portion of said given portion, and to feed the articles in orderly manner to said bottom opening.

5,836,476

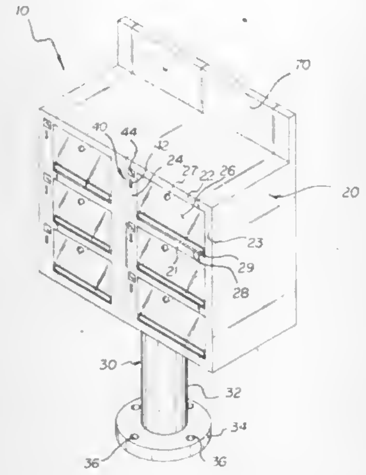
MOTORIZED NEWSPAPER DISPENSING SYSTEM

Emmanuel Ampofo, P.O. Box 874, Boston, Mass. 02123-0874

Filed Nov. 6, 1996, Ser. No. 744,940

Int. Cl.⁶ G07F *11/00*

U.S. Cl. 221—131 **7 Claims**



1. A newspaper dispensing system, comprising:
a housing structure formed to store printed literature;
a support means secured to the bottom side of the housing structure elevating the housing structure to a level comfortable for an average height person;
a coin receiving means secured to the front left side of the housing structure receiving coins deposited from purchasers;
a dispensing means secured within the lower portion of the housing structure substantially horizontal;
a sign stand secured to the rear top portion of the housing structure supporting advertising material; and
wherein the housing structure includes:
  a bottom member horizontally positioned with respect to ground;
  a left side member secured orthogonally to the left edge of the bottom member;
  a right side member secured orthogonally to the edge of the bottom member opposite of the left side member;
  a top member secured at one end to the left side member opposite of the bottom member and projecting horizontally to the bottom member where the top member is secured to the right side member opposite of the bottom member forming a rectangular tube which is sized to store printed literature;
  a rear member enclosing the rear end of the rectangular tube;
  a transparent refilling door secured to the end of the rectangular tube opposite of the rear member, where the transparent refilling door includes a dispensing slot in the lower portion allowing the printed literature to project through;
  a handle secured to the exterior surface of the transparent refilling door; and
  a dispensing door formed to the shape of the dispensing slot and pivotally attached on an elongated edge to the top edge of the dispensing slot rotatably enclosing the dispensing slot while allowing interior printed literature to engage the dispensing door rotating the dispensing door outward away from the rear member allowing dispensing of the printed literature.

5,836,477

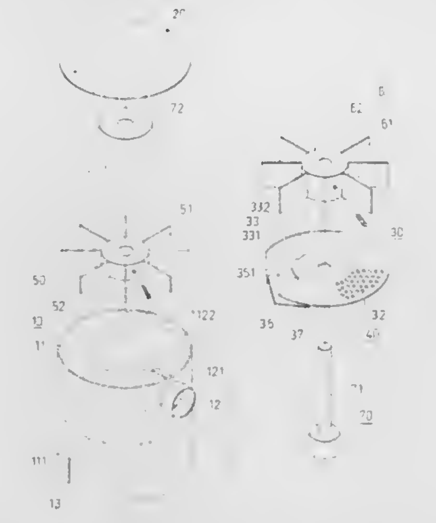
BALL FEEDING DEVICE OF A BALL WASHING MACHINE

Ding-Tsai Yeh, 364, Pon-Yi Road, Tai-Ping, Taichung, Taiwan

Filed May 21, 1997, Ser. No. 861,054

Int. Cl.⁶ A24F *27/14*

U.S. Cl. 221—135 **12 Claims**



1. A ball feeding device of a ball washing machine, said ball feeding device comprising:
  a cylindrical housing of a hollow construction and provided in a midsegment of a hollow interior thereof with an intermediate plate having a center hole and a first cut in a periphery thereof, said intermediate plate further having a plurality of first pores contiguous to said first cut, said cylindrical housing further provided with a ball admitting hole corresponding in location to said first pores and having a tubular portion extending in a direction away from said cylindrical housing, said ball admitting hole provided with a ball stopping plate located over a junction between said first cut and said first pores;
  an upper plate fastened hermetically with a top end of said cylindrical housing such that said upper plate and said intermediate plate form therebetween a first receiving cell;
  a lower plate fastened in the hollow interior of a bottom segment of said cylindrical housing such that said lower plate and said intermediate plate form therebetween a second receiving cell, said lower plate provided with a plurality of second pores corresponding in location to said first cut and said first pores of said intermediate plate, said lower plate further provided with a second cut such that the distance between an inner edge of said second cut and an outer edge of said second cut is greater than the outer diameter of a ball, and that said second cut is aligned with a ball feeding port of the ball washing machine, said lower plate further provided at the center thereof with a through hole;
  a suction apparatus fastened with the underside of said lower plate such that said suction apparatus is corresponding in location to said second pores;
  a first lobed wheel located in said first receiving cell and composed of a plurality of first lobes, and first ball cells formed between two adjoining first lobes;
  a second lobed wheel located in said second receiving cell and composed of a plurality of second lobes, and second ball cells formed between two adjoining second lobes; and
  a driving apparatus fastened with the underside of said lower plate and provided with a shaft on which said first lobed wheel and said second lobed wheel are rotatably mounted, said shaft provided at one end thereof with a cylindrical member fastened therewith.

5,836,478

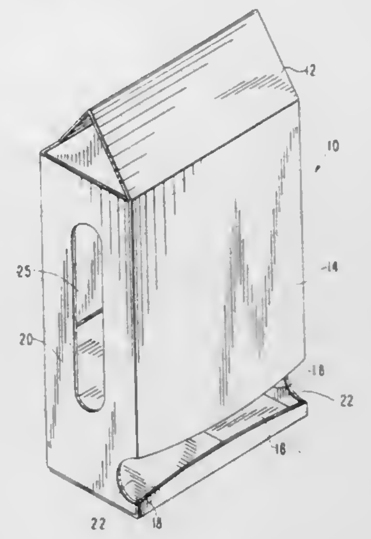
BATTERY DISPENSER

James Weiss, Clemston, Fla., assignor to Atico International USA, Inc., Ft. Lauderdale, Fla.

Filed Feb. 28, 1997, Ser. No. 807,419

Int. Cl.⁶ B65D *5/72*

U.S. Cl. 221—309 **5 Claims**



1. A battery-filled container, comprising:
a plurality of batteries; and
a box containing the batteries in a stacked manner, the box having a top edge, a face, and sidewalls adjacent opposite sides of the face, the face having two edges each convexly curved and extending between the sidewalls and defining an aperture between the two edges, the sidewalls each having a recess adjacent to and in spatial communication with the aperture, the aperture defining a spacing between a portion of the two edges that is smaller in dimension than a diameter of any one of the batteries contained within the container, the face flexing in response to a concentration of manual forces being applied to one of the two edges so as to in effect widen the aperture to permit the batteries to emerge through the aperture one at a time.

5,836,479

RECHARGEABLE CONTAINERS AND DISPENSERS

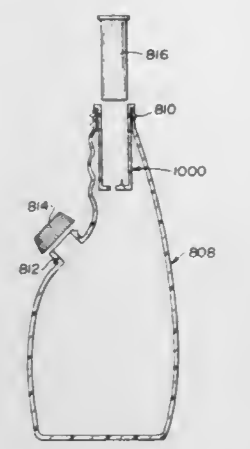
William L Klima, Stafford, Va., and Walter F. Klima, Jr., Travelers Rest, S.C., assignors to Sprayex L.L.C., Stafford, Va.

Continuation-in-part of Ser. No. 852,736, May 7, 1997, Ser. No. 808,575, Feb. 28, 1997, Ser. No. 694,386, Aug. 8, 1996, Ser. No. 507,691, Jul. 25, 1995, abandoned, Ser. No. 485,254, Jun. 7, 1995, and Ser. No. 279,978, Jul. 25, 1994, Pat. No. 5,529,216. This application Jul. 21, 1997, Ser. No. 897,838

Int. Cl.⁶ B67D *5/00*

U.S. Cl. 222—83.5 **41 Claims**

1. A rechargeable liquid dispensing apparatus, comprising:
a bottle having at least one neck portion;
a cartridge receiver disposed in said neck portion, said cartridge receiver, including, an upper outwardly extending flange portion, a bottom wall portion having a through hole extending therethrough, and a bayonet extending upwardly from said bottom wall portion;



a cartridge configured to be removably inserted within said cartridge receiver, said cartridge containing one or more separate charges of concentrated product, said cartridge, including, an upper outwardly extending flange, an upper wall portion, a lower wall portion, at least one of said upper wall portion and said lower wall portion being configured to be frangible by said bayonet of said cartridge receiver when said cartridge is inserted into said cartridge receiver; and
a closure connected to said neck portion to seal said bottle.

5,836,480

STACKABLE HOPPER BOTTOM FOR STORAGE BIN

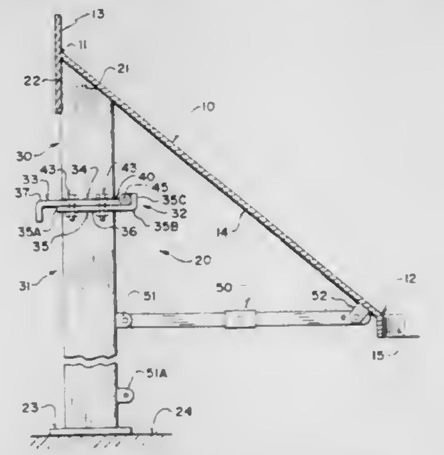
Richard E. Epp, and Dwayne S. Epp, both of Box 64, Fiske, Canada

Filed Mar. 25, 1997, Ser. No. 824,240

Claims priority, application Canada, Nov. 4, 1996, 2189476

Int. Cl.⁶ B67D *5/60*

U.S. Cl. 222—143 **11 Claims**



1. A hopper bottom for a storage bin comprising:
a generally conical hopper bottom wall having an outer edge and extending therefrom downwardly and inwardly toward a central base;
a discharge opening at the central base having a closure member for opening and closing the discharge opening whereby material stored in the bin can be discharged by gravity;
and a plurality of legs arranged at spaced positions around the hopper bottom wall for supporting the hopper bottom wall and the central base at a height spaced upwardly from a horizontal support surface;
each leg comprising a stub portion attached to the hopper bottom wall and extending downwardly therefrom and a lower main portion connected by a hinge to a bottom end of the stub portion for pivotal movement relative about a horizontal axis thereto between a first erected vertical position, in which the stub portion and the main portion lie along a common line,

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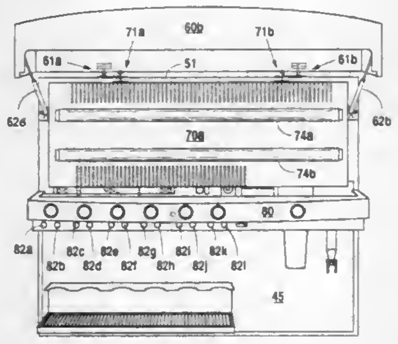
and a second folded position, in which the main portion extends from the bottom end of the stub portion inwardly and downwardly generally along an underside of the hopper bottom wall such that the hopper bottom can be stacked on top of a similar hopper bottom for transportation with the main portions of the legs folded between the underside of the hopper bottom wall and an upper side of the hopper bottom wall of the similar hopper bottom.

5,836,481
DISPENSER HOUSING

Darwin L. Strohmeyer, Spring Branch, and John T. Hawkins, Jr., Adkins, both of Tex., assignors to Lancer Partnership, Ltd., San Antonio, Tex.

Filed Apr. 29, 1996, Ser. No. 638,835
Int. Cl.⁶ B67D *5/06*
U.S. Cl. 222—182 **12 Claims**



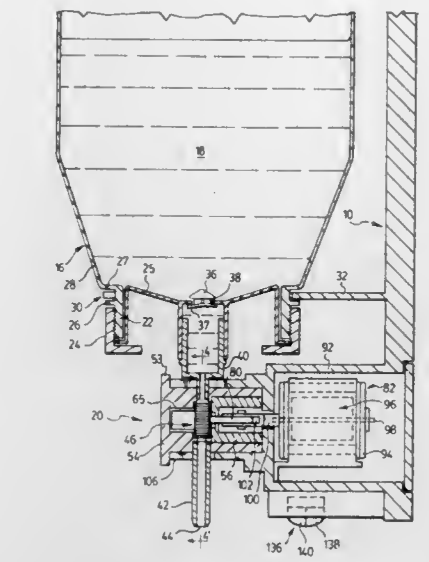
1. A dispenser housing, comprising:
- an enclosure for receiving a dispenser therein, wherein said enclosure includes an opening that permits access to the dispenser;
- a first access member secured to said enclosure, wherein said first access member is pivotally movable along a first direction between a first position covering a portion of the opening of said enclosure and a second position that provides access to the dispenser through a first portion of the opening of said enclosure; and
- a valve casing secured to said enclosure, wherein said valve casing is pivotally movable along a second direction opposite to the first direction between a first position covering a portion of the opening of said enclosure and a second position that provides access to the dispenser through a second portion of the opening of said enclosure.

5,836,482
AUTOMATED FLUID DISPENSER

Hermann Ophardt, Lindenau 27, D-47661 Issum, Germany, and Heiner Ophardt, 3931 Vineland Crescent, Vineland, Ontario, Canada

Filed Apr. 4, 1997, Ser. No. 833,263
Int. Cl.⁶ B65D *88/54*
U.S. Cl. 222—325 **20 Claims**

1. A device for dispensing a fluid comprising:
- a housing;
- a removable, replaceable unit removably mounted to the housing;
- the unit including: a container for fluid to be dispensed; and a pump activable to dispense fluid from the container;
- the pump having a rotatable input member extending therefrom: the pump operative to dispense fluid from the container by rotation of the input member,
- the housing comprising:
  - a motor with a rotatable output member; and
  - a motor control mechanism for controlling operation of the motor;



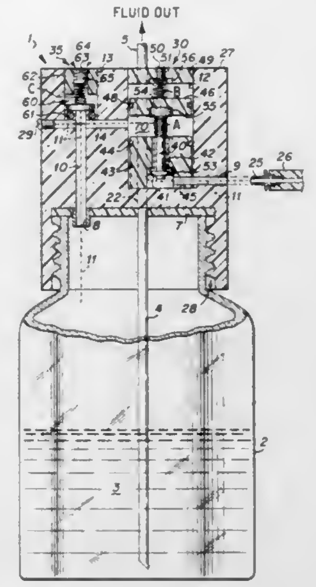
- the motor output member removably coupled to the input member of the pump for rotation of the pump on operation of the motor,
- the motor comprising an electric direct current motor with a rotor journalled for rotation about an axle relative a stator fixed to the housing,
- a coaxial extension of the axle comprising the motor output member;
- the pump removably coupling with the motor by sliding of the pump relative the housing parallel the axle of the motor,
- the container removably coupling with the housing for support of the container by the housing by sliding of the container relative the housing parallel the axle of the motor such that by sliding of the unit relative the housing the container is coupled to the housing and simultaneously the pump is coupled to the motor.

5,836,483
SELF-REGULATING FLUID DISPENSING CAP WITH SAFETY PRESSURE RELIEF VALVE FOR DENTAL/ MEDICAL UNIT FLUID BOTTLES

Jimmy D. Disel, San Jose, Calif., assignor to Aerotech Dental Systems, Inc., San Jose, Calif.

Filed Feb. 5, 1997, Ser. No. 795,218
Int. Cl.⁶ B65D *83/14*
U.S. Cl. 222—396 **10 Claims**

1. A cap for a water line treatment system comprising in operative combination:
- (a) a generally cylindrical cap body having a recess in one end and threads in said recess for receiving engaging a fluid bottle for supply of fluid to said water line;
- (b) said cap including a regulator valve and a relief valve disposed in bores therein;
- (c) said cap including a high pressure air inlet bore to said regulator valve and a low pressure bore leading from said regulator valve into communication with a headspace volume in said bottle; and

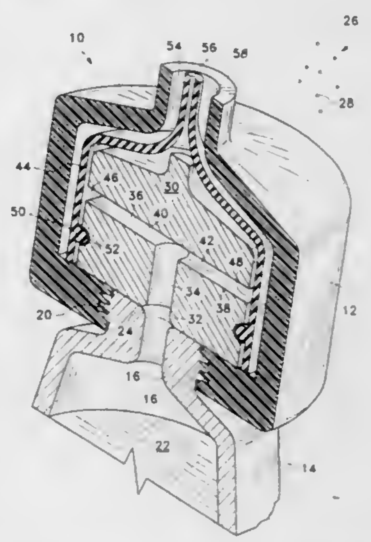


- (d) said relief valve is located in said cap in communication with said low pressure bore, said relief valve includes means for preventing overpressure build-up in said bottle.

5,836,484
CONTAMINATION-SAFE MULTIPLE-DOSE DISPENSING CARTRIDGE FOR FLOWABLE MATERIALS

Bernard R. Gerber, 583 Mello La., Santa Cruz, Calif. 95062-2707

Filed Oct. 3, 1996, Ser. No. 724,975
Int. Cl.⁶ B65D *5/72*
U.S. Cl. 222—494 **39 Claims**

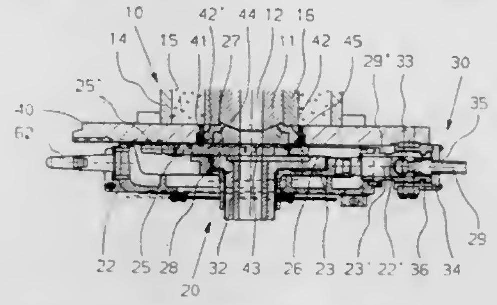


1. A dispensing cartridge for dispensing a flowable material from a container of the type which does not produce an internal vacuum when said flowable material is dispensed, and for preventing external contaminants from entering said container, said dispensing cartridge comprising:
- a) a housing;
- b) an attaching means for attaching said housing to a delivery port of said container in an air-tight manner;
- c) a delivery block located inside said housing and having:
  - 1) an input port for receiving said flowable material exiting said container through said delivery port;
  - 2) an internal channel commencing at said input port and terminating in at least one output port;
- d) a flexible sheath for enveloping said delivery block such that a portion of said flexible sheath covers said at least one output port thereby producing at least one sleeve valve permitting only the outflow of said flowable material from said at least one output port;
- e) an outlet valve formed by an end of said flexible sheath downstream of said at least one sleeve valve, said outlet valve permitting only the outflow of said flowable material therethrough; and
- f) a dispensing port in said housing for dispensing said flowable material exiting through said outlet valve.

5,836,485
SLIDING GATE VALVE ASSEMBLY FOR A VESSEL CONTAINING MOLTEN METAL

Werner Plattner, Hünenberg, and Walter Toaldo, Zug, both of Switzerland, assignors to Stopinc AG, Baar, Switzerland

Filed Jul. 17, 1997, Ser. No. 895,807
Claims priority, application Switzerland, Jul. 18, 1996, 1996 1808/96
Int. Cl.⁶ B22D *41/08*
U.S. Cl. 222—600 **34 Claims**



1. A sliding gate valve arrangement, comprising:
- a molten metal vessel having an outlet and guide tracks secured to said vessel extending transverse to said outlet;
- a housing frame slidably mountable on said guide tracks, said housing frame having a refractory base plate and a slider unit therein and a plurality of spring elements, said slider unit comprising a refractory sliding plate, and said refractory sliding plate being sealingly pressable into engagement with said refractory base plate by said spring elements;
- a drive element connectable with said slider unit for moving said slider unit back and forth;
- wherein said guide tracks have a predetermined length such that said housing frame, when disposed on said guide tracks, is slidable over a predetermined distance between a first position in which said housing frame positions said refractory base plate and said slider unit below said outlet of said molten metal vessel and a second position in which said housing frame is released from said guide tracks and said molten metal vessel;
- a coupling on said housing frame; and
- a manipulator connectable with said coupling of said housing frame for moving said housing frame on said guide tracks between said first position and said second position for removing and installing said housing frame on said vessel.

5,836,486
HANGER BAR

Yasuhiro Ohsugi, Hiroshima, Japan, assignor to NKG Co., Ltd., Hiroshima, Japan

Filed Feb. 5, 1997, Ser. No. 794,428
Claims priority, application Japan, Feb. 15, 1996, 8-028101; Nov. 6, 1996, 8-294249
U.S. Cl. 223—85 **6 Claims**

1. An hanger bar, comprising:

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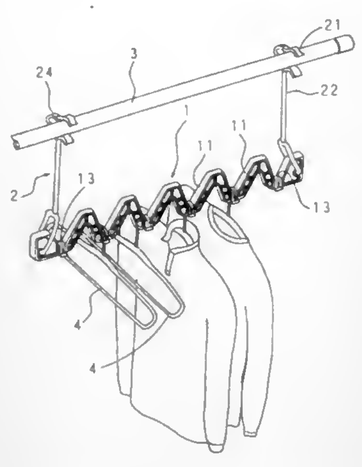
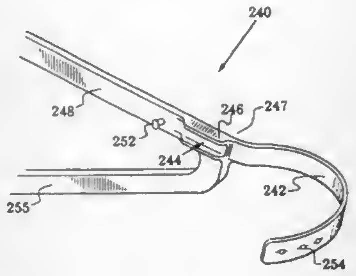


an elongated hanging member provided with a plurality of first recesses for catching hangers, the first recesses being aligned along the length of the hanging member so as to have openings facing in an upward direction, each first recess having on the bottom thereof an upwardly directed engaging portion having an arcuate top portion which conforms substantially in cross-sectional shape to the shape of the hook portion of a garment hanger, the cross-section being taken in a plane perpendicular to the length of the hanging member; and

suspending members, for supporting the hanging member, set on both ends of the hanging member aligned with the direction of the first recesses.

5,836,487
GARMENT HANGER

Peter Ar-Fu Lam, 20104 Wayne Ave., Torrance, Calif. 90503
Continuation-in-part of Ser. No. 247,318, May 23, 1994, abandoned. This application Aug. 27, 1996, Ser. No. 703,903
Int. Cl.^{6} A47G *25/40;25/14*
U.S. Cl. 223—94 **34 Claims**



1. An adjustable width garment hanger, comprising:

a suspension member;

first and second elongate arms extending in opposite lateral directions from said suspension member thereby defining a garment supporting width;

each of said first and second arms including a proximal portion having a proximal end located proximate to said suspension member and a remote end located remote from said suspension member, said proximal portions are supported relative to one another at an obtuse angle therebetween; and

each of said first and second arms further including a distal portion having a proximal end located proximate to the corresponding remote end of said proximal portion and extends proximately along the axis of its respective proximal portion towards a distal end remote from said proximal portion; wherein

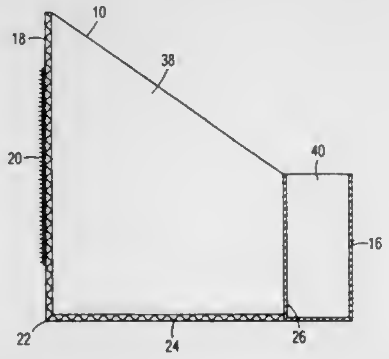
each of said distal portions is configured to be readily physically distorted at multiple points along its axis for varying its lateral extension from its respective proximal portion to adjust said garment supporting width;

the span between the remote ends of said proximal portions defines proximately the minimum shoulder width of garment to be supported and the maximum span between the remote ends of said distal portions defines proximately the maximum shoulder width of garment to be supported; and

each said proximal portion is stronger relative than the corresponding distal portion of the garment hanger.

5,836,488
MAIL CARRYING AND ORGANIZING DEVICE

Paul Timothy Priestley, 1466 Woodview Rd., Yardley, Pa. 19067
Filed Sep. 24, 1996, Ser. No. 719,406
Int. Cl.^{6} A45F *5/00*
U.S. Cl. 224—222 **2 Claims**



1. A bag structure for carrying mail, the structure adapted to be worn on a person's inner forearm between the elbow and the hand, the structure comprising:

a divided container having a front wall, a back wall, at least one dividing wall spaced from said front and back wall and located therebetween, opposing end walls, and a floor wherein said container includes an open top defined by respective top edges of said front wall, said back wall, said end walls, and said at least one dividing wall;

an armband adapted to be releasably connected about the forearm of a person, wherein said armband has a length which is less than a length of said back wall; and

an armband attachment means connected to said back wall of said container for providing a removable connection between said container and said armband such that a longitudinal axis of said armband is substantially parallel to said top edge of said back wall, said armband comprising an armband pad and two straps coupled to said pad, said two straps adapted to be wrapped and secured around the forearm of a person, wherein:

a) said front wall is formed from a clear plastic material;

b) said at least one divider having a color which differs from a remaining portion of said structure;

c) said back wall is formed from corrugated cardboard which is laminated with one of vinyl and canvas material and which is creased at a point to form an angle having substantially facing sides with one side thereof forming said back wall and another side forming said floor;

d) said end walls are connected to said back wall and said floor;

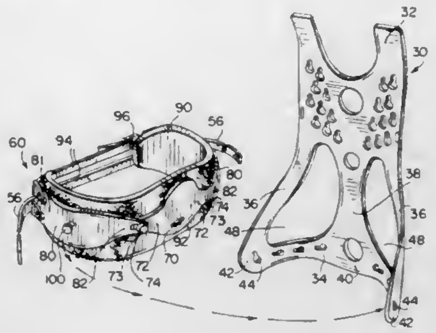
e) each of said end walls being formed of canvas;

f) said attachment means comprising one of a hook-and-loop fastener; and

g) said armband pad being formed of corrugated cardboard laminated with one of plastic and canvas material, said armband pad having the other of said hook-and-loop fastener such that it may detachably connect to said attachment means, said two straps each having opposing end portions having attachment means thereon cooperable with each other for securing said straps to the forearm of a person.

5,836,489
BELT ASSEMBLY FOR A LOAD CARRYING SYSTEM

Thomas R. Swetish, Racine, Wis., assignor to Johnson Worldwide Associates, Inc., Sturtevant, Wis.
Filed Dec. 9, 1996, Ser. No. 762,569
Int. Cl.^{6} A45F *3/08*
U.S. Cl. 224—262 **31 Claims**



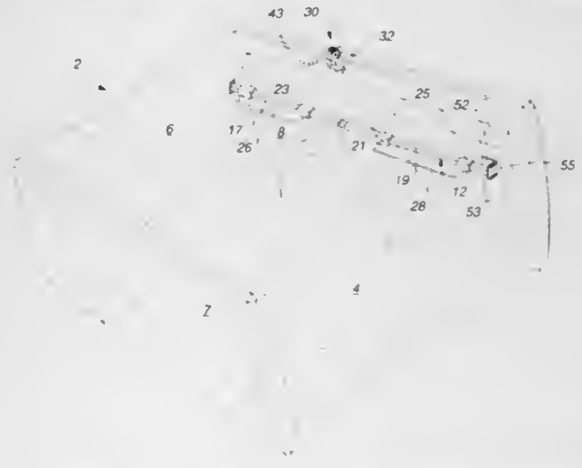
1. A belt assembly for a load carrying system including a load support structure configured to support a load on a user's back, the belt assembly comprising:

a rear panel having two ends and being configured to cover a lumbar region of the user, the rear panel having a length that extends generally in a first plane; and

a pair of lateral panels adapted to be coupled to the load carrying system, each lateral panel configured to be pivotally connected at a first location, substantially rearward of the user's hips, to each respective end of the rear panel and configured to be wrapped around a hip of a user, the lateral panels being configured to distribute the load on the user's back to the user's hips and having free ends coupled to one another, each lateral panel being rotatable about an axis substantially oblique to the plane in which the length of the rear panel extends.

5,836,490
TRUCK BED BICYCLE RACK

Brent A. Price, 1211 Bonfoy Ave., Colorado Springs, Colo. 80909
Filed Jun. 5, 1997, Ser. No. 869,827
Int. Cl.^{6} B60R *9/00*
U.S. Cl. 224—403 **3 Claims**



1. A bicycle rack adapted to be installed in a truck bed defined by at least a floor, an upstanding forward wall and one upstanding sidewall, comprising,

an elongated rod having forward and rearward ends,

means for detachably securing the forward end of the rod to the forward wall of the bed,

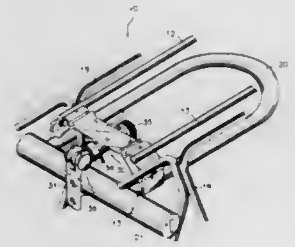
means for detachably securing the rearward end of the rod to the sidewall of the bed,

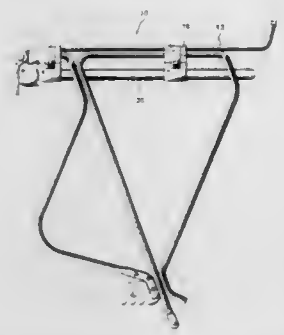
a pair of spaced apart bails carried by the rod and extending laterally of the rod; and

fastening means adapted to be clamped to the sidewall for attachment to the bicycle.

5,836,491
LOCK SECURING DEVICE FOR A BICYCLE

Louis Chuang, 7F-8, No. 20, Ta Lon Road, Taichung, Taiwan
Filed Sep. 25, 1997, Ser. No. 937,503
Int. Cl.^{6} B62J *7/04;11/00*
U.S. Cl. 224—456 **3 Claims**





1. A lock securing device for a bicycle, comprising:

a frame being able to be disposed to a rack of said bicycle and having a tubular member disposed to an underside thereof, said frame having two hook portions respectively disposed to two ends thereof;

a quick-release means having a handle which has two lugs extending from one of two ends thereof and each of said lugs has an eccentric hole defined therethrough so as to form a protrusion portion, a curved tongue extending laterally from said handle and near the other end of said handle, an activating rod having a first end thereof pivotally connected between said two lugs and a second end thereof with an outer threaded periphery which movably inserted through said tubular member, an engaging member movably mounted to said activating rod and having a curved surface for receiving said protrusion portions of said lugs, and

an adjusting member threadedly engaged with said outer threaded periphery of said activating rod which is inserted through said tubular member.

5,836,492
TIRE MOUNTABLE FOLDING CARRIER

Richard A. Allen; Alexander R. Allen, and Christopher B. Allen, all of Concord, Mass., assignors to R. A. Allen Company, Inc., Lincoln, Mass.
Filed Oct. 24, 1996, Ser. No. 740,133
Int. Cl.^{6} B60R *9/10*
U.S. Cl. 224—493 **16 Claims**

1. A folding carrier mountable on a motor vehicle having an externally mounted spare tire, said carrier comprising:

a frame;

a first carrying arm and a second carrying arm, each said first and second carrying arm pivotally connected to said frame,

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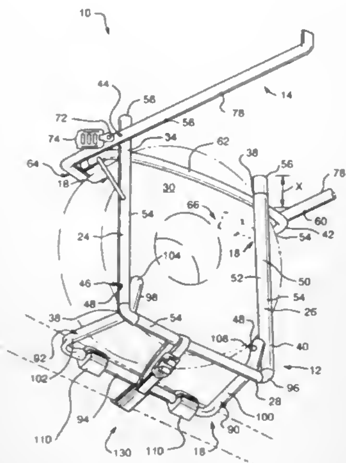


each said first and second carrying arm movable about an axis between an operative extended position and a stored collapsed position at said pivotal connection, said axes being co-axial, each of said first and second carrying arms having a first end and a second end;

- a first foot extending inwardly from said first carrying arm adjacent said first end thereof and a second foot extending inwardly from said second carrying arm adjacent said first end thereof, said first and second inwardly extending feet configured to engage an inner sidewall of a spare tire mounted on the outside of the motor vehicle when said first and second carrying arms are in their operative extended positions;
- a connecting means extending between and connecting said first carrying arm to said second carrying arm, said first and second carrying arms and said connecting means having a substantially H-shaped configuration, said connecting means configured to engage the spare tire mounted on the outside of the motor vehicle, said connecting means having a pair of ends, one end of said connecting means being connected to said first carrying arm at a position adjacent said pivotal connection of said first carrying arm to said frame, the other of said ends of said connecting means being connected to said second carrying arm at a position adjacent said pivotal connection of said second carrying arm to said frame, said connecting means being configured so as to secure said first and second carrying arms spaced in substantially parallel disposition relative to one another, said feet and a portion of said carrying arms and said connecting means defining a substantially C-shaped opening that is configured to fit over the spare tire mounted on the outside of the motor vehicle; and
- a supporting member pivotally mounted to said frame and constrained for limited rotational movement relative thereto between an extended operative position and a collapsed stored position, said supporting member configured to contact the motor vehicle when said supporting member is in its operative position and the spare tire is positioned in said substantially C-shaped opening.

5,836,493
VEHICULAR MOUNT FOR CARGO CARRIER

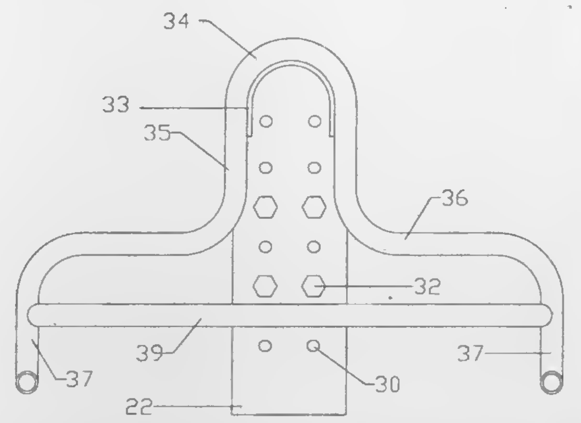
Michael P. Grunsted, 1555 Deerfield Dr., Oshkosh, Wis. 54904; Peter M. Schingen, and Paul R. Walker, both of Winnebago County, Wis., assignors to Michael P. Grunsted, Oshkosh, Wis.

Filed Feb. 21, 1997, Ser. No. 801,849
Int. Cl.^{6} B60R *9/06*

U.S. Cl. 224—519 **14 Claims**

1. A mount for a cargo carrier on a vehicle having a standard receiver hitch, comprising:

- (a) a hitch connecting means adapted for connecting with the receiver hitch;



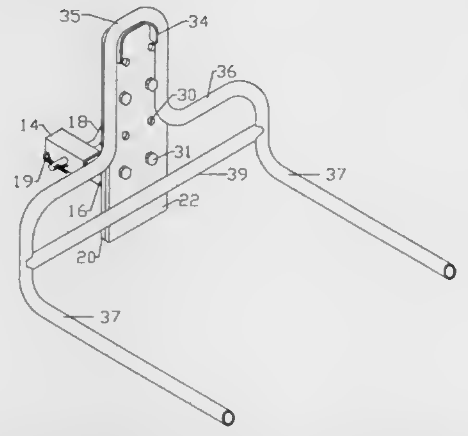
- (b) a first plate vertically disposed and affixed to said hitch connecting means, said first plate having a substantially planar surface disposed outwardly from said hitch connecting means;
- (c) a second plate vertically disposed and mounted rearwardly to said first plate, said second plate having a substantially planar surface, said planar surfaces of said first and second plates being adjoined in contacting relationship along a major portion of each of said surfaces, and
- (d) means attached to said second plate adaptable for supporting a cargo carrier.

5,836,494
VEHICULAR CARGO CARRIER ASSEMBLY

Michael P. Grunsted, 1555 Deerfield Dr., Oshkosh, Wis. 54904; Peter M. Schingen, and Paul R. Walker, both of Winnebago County, Wis., assignors to Michael P. Grunsted, Oshkosh, Wis.

Filed Feb. 21, 1997, Ser. No. 801,848
Int. Cl.^{6} B60R *9/06*

U.S. Cl. 224—521 **21 Claims**



1. A carrier assembly for a vehicle having a standard receiver hitch, comprising:

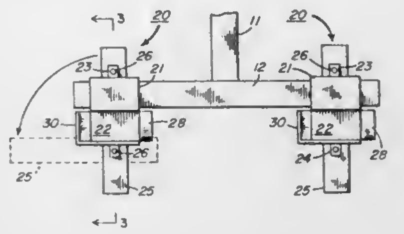
- (a) a hitch connecting means for connecting with said receiver hitch and projecting outwardly therefrom;
- (b) a plate member having opposed first and second facings and secured at one facing thereof to said hitch connecting means, said plate member being disposed outwardly from and transversely to said hitch connecting means;
- (c) a retaining means affixed to the opposite facing of said plate member; and
- (d) a generally horizontally disposed platform comprising spaced, parallel tubular members depending from said retaining means.

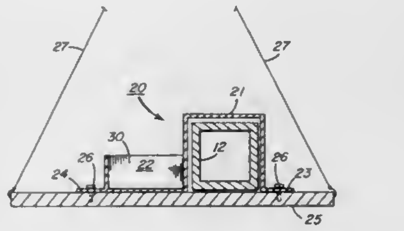
5,836,495
AUTOMATIVE VEHICLE LIFT MECHANISM ADAPTED FOR TWO-WHEELED VEHICLES

James D. Wilkinson, 5439 Ontario Center Rd., Ontario, N.Y. 14519

Filed Jun. 2, 1997, Ser. No. 867,591
Int. Cl.^{6} B60R *9/10*

U.S. Cl. 224—537 **2 Claims**





1. A wheel pad for removable placement on the crossbar of a wheel lift mechanism, said wheel pad including:

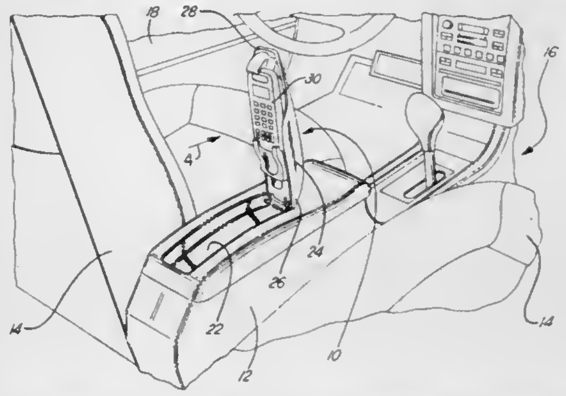
- an inverted crossbar channel for placement over said crossbar, and an upright wheel channel parallel with said crossbar channel;
- a lock bar adapted for removable placement under said crossbar to alternatively secure said wheel pad to said crossbar and release said wheel pad from said crossbar;
- a front flange forward of said crossbar channel and a rear flange rearward of said wheel channel for releasable bolted connection to said lock bar to permit horizontal pivotal movement of said lock bar between locked and unlocked positions thereof.

5,836,496
VEHICLE CELLULAR PHONE PRESENTATION DEVICE

David Hastings Levin, Novi; Jonathan Paul Grasso, Utica, and Licheng Tseng, Novi, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jun. 6, 1997, Ser. No. 870,464
Int. Cl.^{6} B60R *11/00*

U.S. Cl. 224—553 **10 Claims**



1. A phone presentation device for holding and displaying a portable telephone handset within an automotive vehicle, the presentation device comprising:

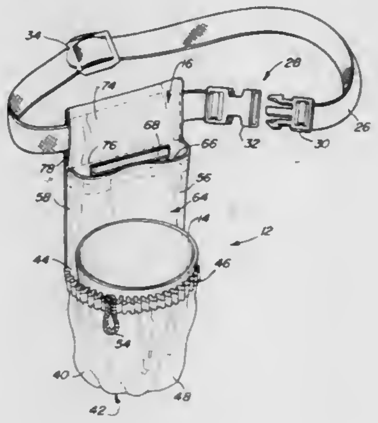
- a housing;
- an adjustable cradle attached to an inner surface of the housing and having:
  - an elongate base member with a handset receiving section;
  - a fixed grip mounted on a first end of the base member;
  - an adjustable grip mounted on a second end of the base member for movement between a first position biasing the handset longitudinally toward the fixed grip and a second position in which the handset may be released from the fixed grip; and
  - bias means for biasing the adjustable grip between the first and second positions;
- means for mounting the housing to a trim piece in the vehicle for movement between a stowed position in which the cradle and handset is hidden from view within the trim piece and a deployed position in which the handset is presented for use; and
- wherein the means for mounting comprises a generally U-shaped pivot member attached within the housing and having a pair of connectors adapted to be attached to the trim piece.

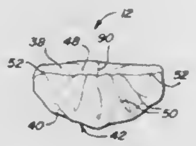
5,836,497
POUCH FOR A CASINO BUCKET AND METHOD OF MAKING SAME

Barbara F. Pelish, 25791 Cunningham, Warren, Mich. 48091-1485

Filed Aug. 16, 1996, Ser. No. 689,987
Int. Cl.^{6} A45F *3/02;* **B65D** *30/10*

U.S. Cl. 224—677 **22 Claims**





1. A pouch to be secured to a user and for carrying various items, said pouch comprising:

- a back panel;
- a lower pocket formed by the back panel and a lower pocket panel, said lower pocket including an open upper portion and a substantially flat closed base portion combining to define a cup-like shape configured to accept and hold a cylindrical-shaped bucket, said closed base portion being formed by a combination of a portion of the back panel and a portion of the lower pocket panel, wherein the part of the closed base portion formed by the portion of the back panel includes at least one sewn back panel dart and the part of the closed base portion formed by the portion of the lower pocket panel includes at least one sewn lower pocket panel dart, and wherein the at least one back panel dart is formed by gathering a dart portion of the back panel and stitching the gathered dart portion of the back panel and the at least one lower pocket panel dart is formed by gathering a dart portion of the lower pocket panel and stitching the gathered dart portion of the lower pocket panel, said lower pocket panel being stitched

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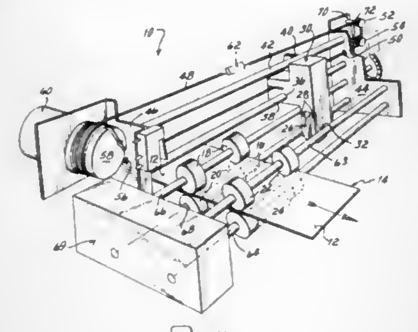
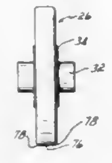
to the back panel on an inside of the lower pocket so that the stitching is not visible from an outside of the lower pocket; and

an upper pocket defined by the back panel and an upper pocket panel, said upper pocket being positioned above the lower pocket and allowing access into the upper pocket when the bucket is in the lower pocket.

5,836,498
LOTTERY TICKET DISPENSER

Edmund F. Turek, Cincinnati, Ohio, assignor to Interlott Technologies, Inc., Cincinnati, Ohio
Filed Apr. 10, 1996, Ser. No. 628,994
Int. Cl.^{6} B26F *3/02;* **B65H** *35/10*
U.S. Cl. 225—1 **20 Claims**

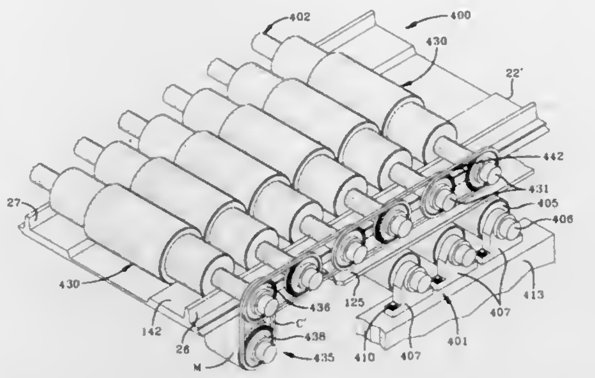




9. A method of separating individual generally planar articles joined together along a line of weakness comprising the steps of:
- feeding a plurality of said articles connected together along a path, said feeding being accomplished with at least one feed roller rotating about a roller axis;
- moving a burster to intersect the path; and
- bursting said line of weakness with the burster contacting said articles proximate said line of weakness, said burster having a cylindrical contact surface which contacts said articles and thereby bursts said line of weakness and separates said pair of adjacent articles, said burster being rotated about a burster axis generally perpendicular to said roller axis during said bursting.

5,836,499
CONVEYOR APPARATUS FOR THE TRANSPORT OF DOOR PANELS

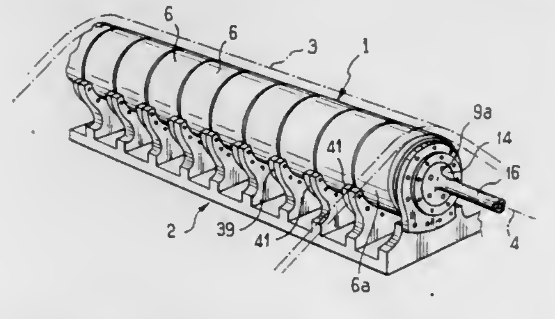
Willis J. Mullet, Pensacola Beach; Albert W. Mitchell, Pace, both of Fla.; Thomas B. Bennett, III, Wooster, Ohio, and William S. Wilson, Pace, Fla., assignors to Wayne-Dalton Corp., Mt. Hope, Ohio
Continuation-in-part of Ser. No. 260,108, Jun. 15, 1994, Pat. No. 5,522,446. This application Jan. 30, 1995, Ser. No. 380,084
Int. Cl.^{6} B65H *20/00*
U.S. Cl. 226—168 **18 Claims**



1. Conveyor apparatus for the continuos production of foam-cored door panel material having a planar skin on one side and a skin on the other side thereof having a pair of spaced co-planar skin surface joined by an offset skin surface comprising, first conveyor means having a first panel-engaging surface lying in a panel for engaging the planar skin on one side of the panel material, means for driving said first conveyor means at a selected speed, second conveyor means having second and third panel-engaging surfaces for engaging the spaced skin surfaces and the offset skin surface, respectively, on the other side of the panel material, and means for driving at least one of said second and third panel-engaging surfaces of said second selected means at substantially the same speed as said selected speed of said first conveyor means.

5,836,500
GUIDING DEVICE USING A NON-BENDING SEGMENTED ROTARY ROLL

Bernard Jourde, Elbeuf, France, assignor to Asselin, Elbeuf, France
Filed Feb. 26, 1997, Ser. No. 805,629
Claims priority, application France, Feb. 27, 1996, 96 02378
Int. Cl.^{6} B65H *20/00:57/14;* **F16C** *13/00*
U.S. Cl. 226—189 **18 Claims**

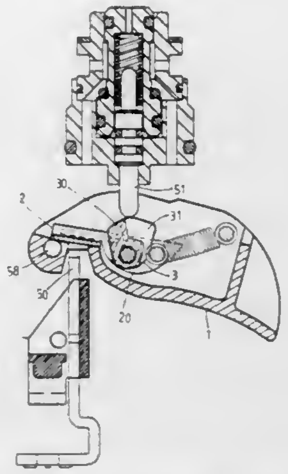


1. A guiding device using a rotary roll. comprising:
- a frame;
- a roll having an axis and two axial ends, and comprising an axial succession of at least two roll segments, each having two opposing axial ends and being rigidly connected to each other;
- an axial gap defined between said two opposing axial ends of said at least two successive segments, at least one of the opposing ends being tubular;
- an annular recess which is formed to extend within said at least one tubular opposing end and opens radially outwardly to be in communication with said axial gap, said recess having a cylindrical inner wall;
- a bearing having an inner ring mounted around said cylindrical inner wall of said recess, an outer ring and a support plate, said outer ring being supported, at least indirectly, by said frame by way of said support plate which extends radially outwardly through said gap;

wherein said bearing is axially longer than said axial gap and projects axially into said tubular opposing end.

5,836,501
SAFETY TRIGGER MECHANISM FOR STAPLER

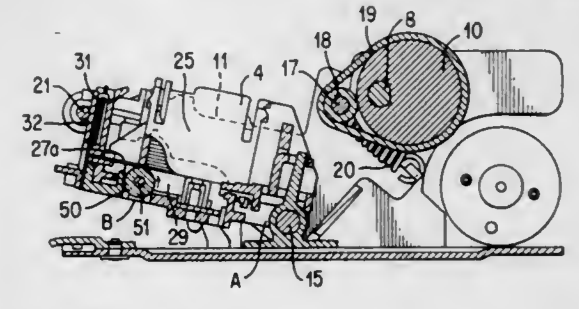
Mei-Ling Lai, Taichung, Taiwan, assignor to Basso Industry Corp., Taichung, Taiwan
Filed Jun. 23, 1997, Ser. No. 880,552
Int. Cl.^{6} B25C *1/04*
U.S. Cl. 227—8 **3 Claims**



1. A safety trigger mechanism for a stapler, the stapler including a switch button, said safety trigger mechanism comprising:
- a trigger body for pivotally coupling to the stapler at a pivot shaft and for allowing said trigger body to be rotated about said pivot shaft, said trigger body including an opening,
- a frame including a middle portion pivotally coupled to said trigger body at a pivot axle for allowing said frame to be rotated about said pivot axle, said frame including a first end aligned with said opening of said trigger body,
- a block secured on said frame and including a recess for receiving the switch button of the stapler and for preventing the block from being actuated by the switch button, and
- means for biasing said first end of said frame to engage with said trigger body.

5,836,502
MOTOR DRIVEN STAPLER

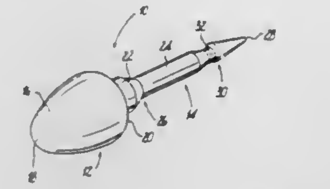
Toshiyuki Kanai, and Toru Yoshie, both of Tokyo, Japan, assignors to Max Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 462,023, Jun. 5, 1995, abandoned, which is a continuation of Ser. No. 87,872, Jul. 9, 1993, Pat. No. 5,474,222. This application Feb. 10, 1997, Ser. No. 796,444
Claims priority, application Japan, Jul. 10, 1992, P.HEI.4-207384; Jul. 10, 1992, P.HEI.4-207385; Jul. 10, 1992, P.HEI.4-207386; Aug. 4, 1992, U.M.HEI4-60281; Aug. 4, 1992, U.M.HEI4-60282; Aug. 4, 1992, U.M.HEI4-60283
Int. Cl.^{6} B25C *5/16*
U.S. Cl. 227—131 **5 Claims**

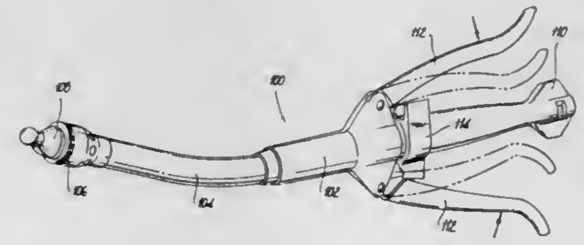


1. A stapler comprising:
- a staple cartridge for receiving a plurality of sheets of staples wherein each sheet comprises four sides. a top portion. and a bottom portion:
- a magazine movable between a first and second position and capable of receiving said staple cartridge:
- a first feeding unit slidably mounted within said magazine and including a supporting position immovably disposed at a position behind the magazine. the first feeding unit comprising a spring member which moves said first feeding unit to engage with at least one of said sides of lowermost sheet of said sheets of staples in response to movement of said magazine from said first position to said second position so that said lowermost sheet is moved relative to others of said sheets of staples and thereby positioned to enable staples within said lowermost sheet to be formed and said first feeding unit engages said at least one of said side for the duration of said engagement with said lowermost sheet of staples: and
- a second feeding unit for forming at least one staple and feeding said at least one staple into an article to be stapled when said magazine is moved from said second position to said first position.

5,836,503
INSERTION DEVICE FOR SURGICAL APPARATUS

Karl H. Ehrenfels, Ridgefield, Conn., and Robert H. Schnut, Carmel, N.Y., assignors to United States Surgical Corporation, Norwalk, Conn.
Filed Apr. 22, 1996, Ser. No. 636,104
Int. Cl.^{6} A61B *17/68*
U.S. Cl. 227—175.1 **23 Claims**





1. An insertion device for use with a surgical tissue fastening apparatus comprising:
- a) a shaft configured for engagement with a surgical tissue fastening apparatus; and
- b) a head on a distal end of the shaft, the head having an atraumatic distal surface and an anvilless proximal surface.

5,836,504
METHOD AND APPARATUS FOR SOLDERING INSPECTION OF A SURFACE MOUNTED CIRCUIT BOARD

Shiro Koike; Yasuo Morita; Yasunori Kakebayashi; Eiji Yoshida; Taro Nishijima, and Yoshikazu Mori, all of Takasago, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan
PCT No. PCT/JP95/01569, § 371 Date Feb. 28, 1997, § 102(e) Date Feb. 28, 1997, PCT Pub. No. WO96/05714, PCT Pub. Date Feb. 22, 1996
PCT Filed Aug. 8, 1995, Ser. No. 776,651
Claims priority, application Japan, Aug. 8, 1994, 6-186002; Aug. 9, 1994, 6-187075
Int. Cl.^{6} G01B *15/06;23/04;* **B23K** *31/12*
U.S. Cl. 228—103 **20 Claims**

1. An apparatus for inspecting soldering conditions from a transmission image applying radiating X-rays, comprising
- a response adjustment means wherein a response of said transmission image is adjusted so as to make its response charac-

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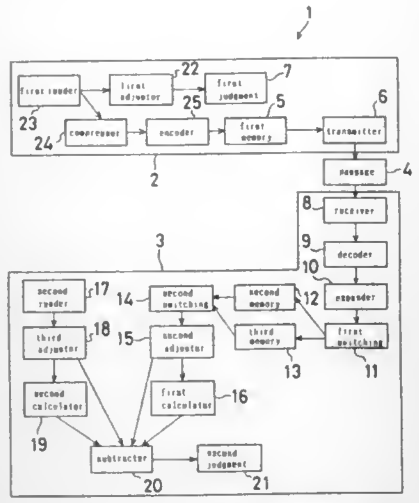


teristic into uniform in a referred spatial frequency range on the basis of a response characteristic to a spatial frequency concerning an image radiographic system and an image processing system at the time of reading the transmission image and

a soldering inspection means for inspecting soldering conditions using said transmission image of which response is adjusted.

5,836,505
JOINING BY BRAZING OF CERAMIC MATERIALS CONTAINING SILICON CARBIDE

Gilles Chaumat, Claix, and Gisèle Coing-Boyat, Sassenage, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 7, 1997, Ser. No. 852,375

Claims priority, application France, May 7, 1996, 96 05708

Int. Cl.⁶ B23K *35/30;103/16*

U.S. Cl. 228—121 **13 Claims**

1. Joining of ceramic elements comprising SiC, by means of a brazed joint, characterized in that the brazed joint is formed of a braze alloy of Si and Rh, resistant to fluorine at temperatures of over 50° C.

5,836,506
SPUTTER TARGET/BACKING PLATE ASSEMBLY AND METHOD OF MAKING SAME

Thomas J. Hunt, Peekskill, and Paul S. Gilman, Suffern, both of N.Y., assignors to Sony Corporation, Tokyo, Japan, and Materials Research Corporation, Orangeburg, N.Y.

Filed Apr. 21, 1995, Ser. No. 426,246

Int. Cl.⁶ B21D *39/00*

U.S. Cl. 228—172 **27 Claims**

1. A method of forming a bonded sputter target/backing plate assembly comprising a sputter target having a bonding surface, and an underlying backing plate having a bonding surface, comprising the steps of:

providing a self-supporting sputter target having a bonding surface, and a backing plate having a bonding surface;

treating one of said bonding surfaces with a treatment selected from the group consisting of:

(i) roughening at least a portion of one of said bonding surfaces so as to produce a roughened portion having a surface roughness (R_a) of at least about 120 micro-inches; and

(ii) drilling a plurality of holes in one of said bonding surfaces;

orienting said sputter target and backing plate to form an assembly having an interface defined by said bonding surfaces;

subjecting said assembly to a controlled atmosphere;

heating said assembly; and

pressing said assembly so as to bond said bonding surfaces.

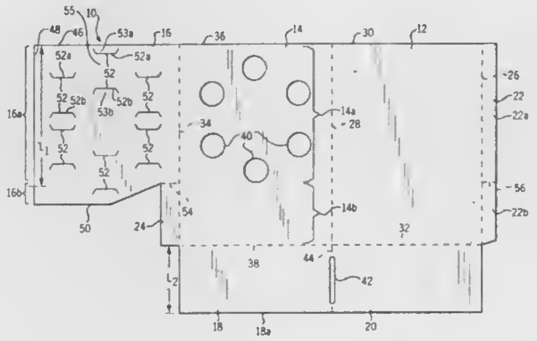
5,836,507
DISPLAY FOLDER

David C. Mueller, 1727 E. Midway Rd. #6, and Daniel R. Coots, 2503 S. Greenview St., both of Appleton, Wis. 54915

Filed Feb. 14, 1997, Ser. No. 801,054

Int. Cl.⁶ B65D *27/08*

U.S. Cl. 229—67.1 **3 Claims**



1. A display folder, comprising:

a first panel having lateral edges and upper and lower edges;

a second panel integrally attached at a fold line to an edge of the first panel, the secured panel having lateral edges, upper and lower edges, and also at least one aperture;

a pocket panel integrally attached at a fold line to a lower edge of the second panel; and

a backing panel integrally attached at a fold line to an edge of the second panel, the backing panel having at least one securer for retaining at least one displayable item on the backing panel as the backing panel is folded and unfolded relative to the second panel, the backing panel also having a securing tab along one edge;

wherein the backing panel can hold a displayable item adjacent the aperture with the item being observable through the aperture, and the pocket panel or a connection to the second panel can removably maintain the backing panel in this position by contact with the securing tab.

5,836,508
PRE-WRAPPED GIFT BOX

Tommy R. Savage, 14100 Montfort Dr. #2248, Dallas, Tex. 75240

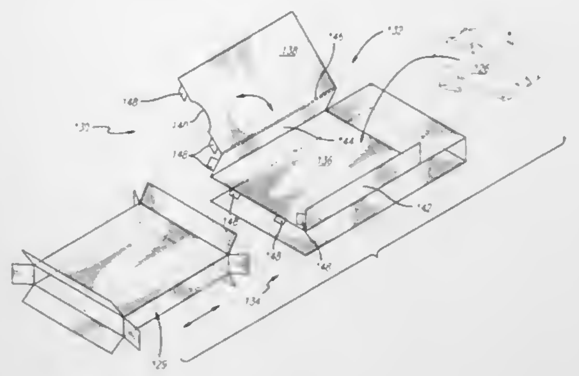
PCT No. PCT/US95/06238, § 371 Date Jan. 3, 1997, § 102(e) Date Jan. 3, 1997, PCT Pub. No. WO95/31328, PCT Pub. Date Nov. 23, 1995

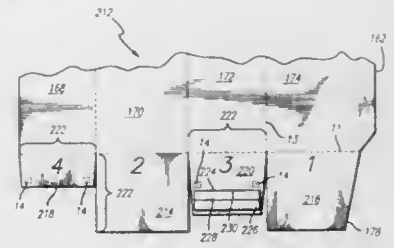
PCT Filed May 15, 1995, Ser. No. 737,256

Int. Cl.⁶ B65D *5/42;* **B65B** *43/08*

U.S. Cl. 229—103.3 **27 Claims**

1. A pre-wrapped box, comprising:





a flattened tube (**35**) of box material including a pair of opposed short (**218**) and long (**220**) flaps (**218**) foldable to seal an open end of the tube when erected;

decorative paper (**3**) secured to the outer surface of the tube along portions of the first pair of flaps, said paper extending no further about half way across the open end;

a first adhesive strip portion (**225**) positioned on a portion of the long flap extending beyond the decorative paper for securing the short flap to the long flap to seal the open end, thereby forming a pair of unsecured paper flaps (**232**, **234**); and

a second adhesive strip portion (**228**) positioned on a portion of the long flap remaining exposed after the short flap has been secured to the long flap for securing the pair of paper flaps to complete the wrapping of the box end.

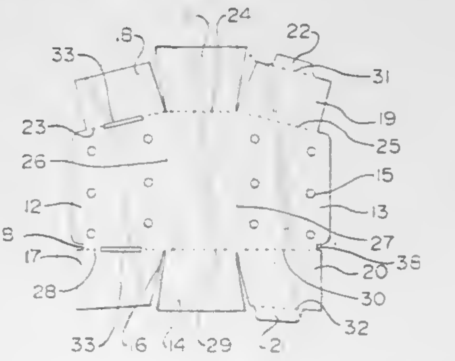
5,836,509
STORAGE AND DISPLAY BOX

Bruno Van Loo, Hillegom, Netherlands, assignor to Simple Pleasures Flowerbulbs & Perennials, Inc., Babylon, N.Y.

Filed Sep. 30, 1997, Ser. No. 940,483

Int. Cl.⁶ B65D *5/00*

U.S. Cl. 229—112 **9 Claims**



1. A storage box having a bottom, two sides, a front, a back and a top and formed from a single folded sheet having two surfaces, comprising:

a bottom panel having two side edges, a front edge and a rear edge;

two side panels, each being integrally formed with a side edge of said bottom panel and having a free end, each side panel having a sloped front edge and a straight back edge such that said free ends are narrower than said side edges of said bottom panel;

a front panel integrally formed with said front edge of said bottom panel, said front panel having a free end that is wider than said front edge of said bottom panel;

a rear panel integrally formed with said rear edge of said bottom panel, said rear panel having a free end that is wider than said rear edge of said bottom panel;

a plurality of flaps, each having a free end and being integrally formed with the front and back edges of each of said side panels; and

means for securing the box in an assembled state,

such that the box can be assembled by folding said front panel, rear panel, and side panels perpendicular to said bottom panel, folding said flaps on one side panel over said front and rear panels, folding said flaps on the other side panel over said flaps on said one side panel, and securing the box in an assembled state, wherein the box is narrower at the bottom than at the top and wherein the front of the box is angled rearward from vertical.

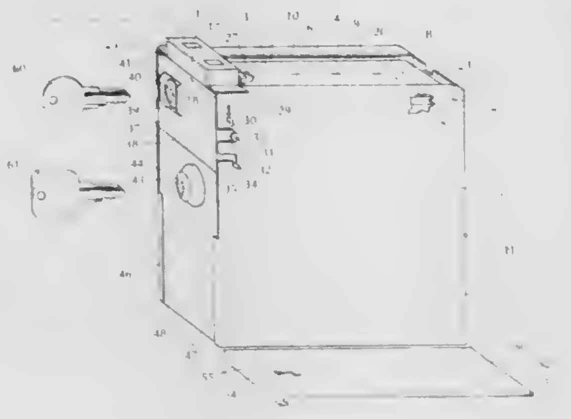
5,836,510
LOCKING REMOVABLE BILL STACKING CASSETTE WITH MOVING RAILS

Roger Kirchner, 205 Oneota Rd., Highland Lakes, N.J. 07422

Filed Sep. 5, 1995, Ser. No. 523,408

Int. Cl.⁶ G07B *15/00*

U.S. Cl. 232—15 **10 Claims**



1. A removable bill stacking cassette for use with and attachment to a currency validator equipped with a plunger for introducing bills into the bill stacking cassette's housing, comprising:

a) a bill stacking housing with an open end for receiving bills introduced into the housing chamber by the plunger;

b) a slideplate for enclosing the open end of the housing;

c) a locking means which allows the slideplate to cover the open end of the housing when the locking means is in an unlocked position;

d) an attaching means which allows the cassette to be removed from the currency validator when the slideplate is positioned to cover the open end of the chamber; and

e) movable rails which 1) lie below the slideplate path such that the slideplate path is between the movable rails and open end of the housing; 2) lie above the billstack; and 3) move when the slideplate is inserted into the slideplate path so that the billstack is offset below the inserted slideplate.

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5,836,511
SOLAR HOT WATER HEATING SYSTEM

Malcolm Gilmour, Bayswater, Australia, assignor to Sola-Kleen Pty., Ltd., Baywater, Australia

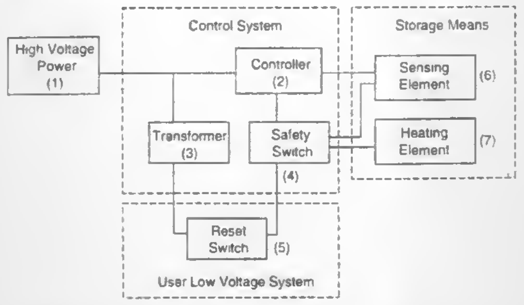
PCT No. PCT/AU95/00198, § 371 Date Oct. 8, 1996, § 102(e) Date Oct. 8, 1996, PCT Pub. No. WO95/27874, PCT Pub. Date Oct. 19, 1995

PCT Filed Apr. 7, 1995, Ser. No. 718,531

Claims priority, application Australia, Apr. 8, 1996, PM4933

Int. Cl.^{6} F24D *19/10*

U.S. Cl. 236—21 R **17 Claims**



1. A liquid temperature regulation system comprising:

a controller means being adapted to control operation of a temperature regulation means; a sensing means to detect the liquid temperature; a safety means to enable said temperature regulation means to be disabled; and

a reset means connectable to a power source via a transforming means adapted to lower the voltage level of said power source to a level safe for use by a user; said reset means being operable to reset said safety means to enable said controller means to again operate said temperature regulation means.

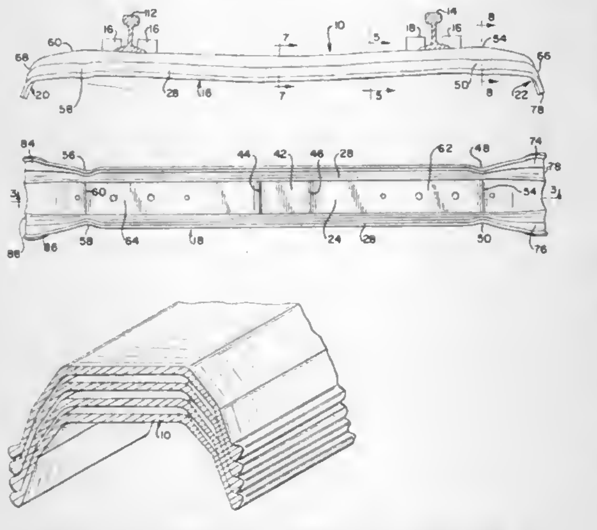
5,836,512
UNITARY STEEL RAILROAD TIE

Alan Briggs, North Barrington, Ill., assignor to Tie & Track Systems, Inc., Lemont, Ill.

Filed Jan. 29, 1997, Ser. No. 790,166

Int. Cl.^{6} E01B *3/00*

U.S. Cl. 238—60 **20 Claims**



1. A unitary steel railroad tie positionable in ballast for use in a railway track system comprising: an elongated channel body having a web and a pair of sidewalls formed integral with opposite edges of the web, said channel body having a pair of opposed ends, an integral rail seat adjacent to each of the opposed ends of said channel body, each rail seat being formed on the web and being adapted for connecting a rail to the web, an indentation in each sidewall adjacent to each end of the body, the indentations at each end being opposed to each other forming an interior reduced section between the sidewalls at each end of the body to restrict movement of ballast toward the respective end along the length of the body between the sidewalls, an apex in the web and directly above each interior reduced section, each apex being substantially the same height as the other apex and being the high points of the web, and a flared spade formed integral with each end of the body, each of said spades extending downward from the web below the sidewalls.

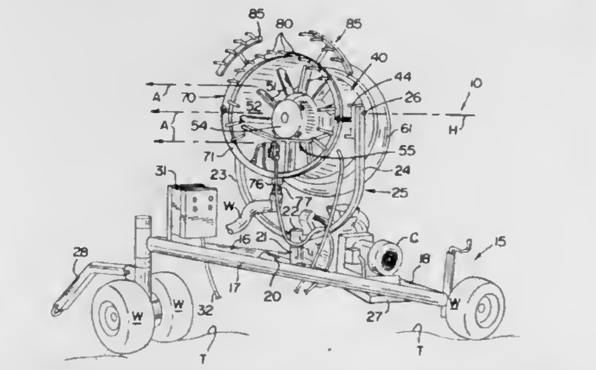
5,836,513
APPARATUS FOR AND METHOD OF MAKING SNOW

Warren C. Smith, Marquette, Mich.; William T. Bright, Summersville, W. Va.; Brian L. Johnson, Summersville, W. Va.; Edward James King, Summersville, W. Va., and Vincent L. Ramik, Annandale, Va., assignors to Lake Effect Technologies, Inc., Summersville, W. Va.

Filed Mar. 20, 1996, Ser. No. 618,770

Int. Cl.^{6} F25C *3/04*

U.S. Cl. 239—2.2 **30 Claims**



21. Apparatus for making snow comprising means for defining a housing, means for generating an air current relative to said housing, means for defining a water manifold, said water manifold including means for spraying water from said water manifold toward the generated air current whereby the water and air admix and form snow under first ambient conditions, said water manifold means including a plurality of first and second orifices of different sizes disposed in alternating relationship along said water manifold, and valve means for substantially simultaneously opening the first plurality of orifices and closing the second plurality of orifices in respective first and second positions thereby accommodating at least two different ambient conditions to optimize snow making.

5,836,514
SNOWMAKING GUN

Louis Handfield, 5-95 Sault-au-Matelot, Quebec City QC, Canada, G1K3Y9

PCT No. PCT/CA95/00090, § 371 Date Aug. 8, 1996, § 102(e) Date Aug. 8, 1996, PCT Pub. No. WO95/23320, PCT Pub. Date Aug. 31, 1995

PCT Filed Feb. 22, 1995, Ser. No. 687,606

Claims priority, application Canada, Feb. 24, 1994, 2116368

Int. Cl.^{6} F25C *3/04*

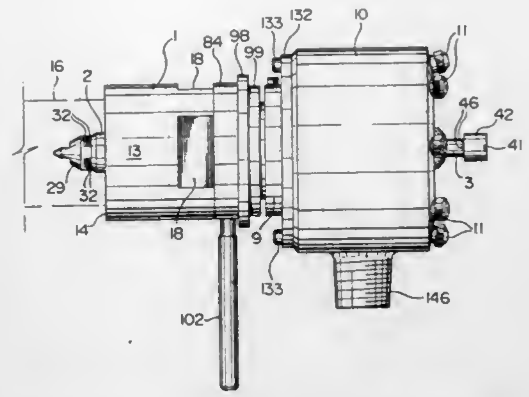
U.S. Cl. 239—14.2 **13 Claims**

1. A snowmaking gun comprising:

(a) casing means including

- (i) outer shell means (**10**),
- (ii) inner shell means (**9**) defining an air chamber (**145**) and nozzle means (**11**) for discharging air from said air chamber (**145**) in an outer annular stream of air;

(b) water tube means (**5**) extending substantially entirely through said inner shell means (**9**) for receiving water from a source of water under pressure, said water tube means (**5**) having an outlet end (**78**) for discharging the water from the gun; characterized by



(c) valve means (**71**,**78**) at said outlet end (**78**) of said water tube means (**5**) for controlling the volume of water discharged from said water tube means (**5**), and for shaping the water into a primary thin, annular film of water which then turns into an intermediate annular stream of small water droplets for discharge into the center of an outer annular stream of air exiting said nozzle means (**11**) for mixing with said outer annular stream of air downstream of the discharge end of the gun for producing snow, temperature permitting; and

(d) resonator means (**3**,**4**) extending through said water tube means (**5**) for receiving moist air from a source thereof under pressure, and for producing a central stream of fine ice particles which act as nuclei for promoting the production of snow.

5,836,515
HIGH EFFICIENCY SPRAYING DEVICE, IN PARTICULAR FOR SPRAYING WATER IN THE FORM OF MICRO-DROPLETS

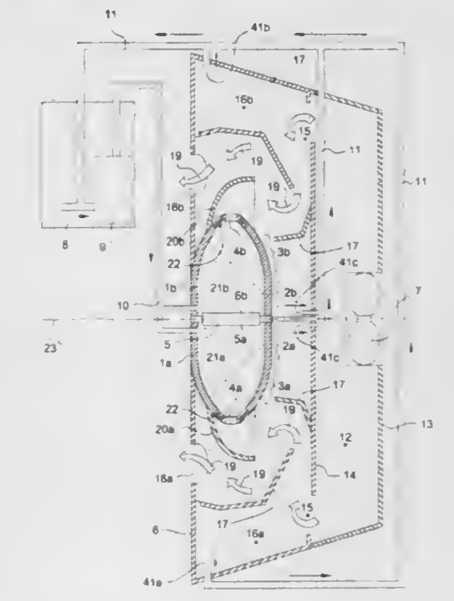
Georges Fonzes, Antibes; Michel Gschwind, Grasse; Jean Lauretti, Le Cannet; Gil Ching, Cagnes sur Mer; Daniel Guyomar, Nice, and Jean-Denis Sauzade, Grasse, all of France, assignors to IMRA Europe SA, Valbonne, France

Filed Jan. 2, 1997, Ser. No. 778,362

Claims priority, application France, Jan. 4, 1996, 96 00048

Int. Cl.^{6} B05B *1/08;1/24*

U.S. Cl. 239—102.2 **11 Claims**



1. A liquid spraying device including an elongate first vessel closed at one of its ends by a first free face of a piezoelectric transducer capable of emitting waves into a liquid filling the vessel, and open at its end remote from the piezoelectric transducer, wherein the piezoelectric transducer includes a second free face opposite its first free face, and wherein an elongate second vessel is disposed symmetrically to the first vessel relative to the piezoelectric transducer, the second vessel being closed at one of its ends by said second free face of the piezoelectric transducer, which is thus also capable of emitting waves into a liquid filling the second vessel, the second vessel being open at its end remote from the piezoelectric transducer.

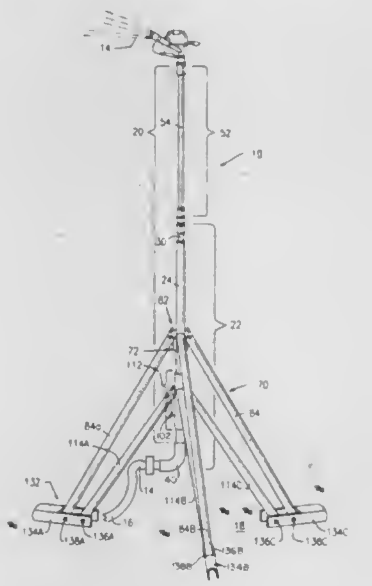
5,836,516
FOLDABLE, PORTABLE SPRINKLER SYSTEM

Lynn F. Van Epps, and James L. Van Epps, II, both of Portage, Wis., assignors to Freeland Industries, Inc., Portage, Wis.

Filed Dec. 24, 1996, Ser. No. 772,809

Int. Cl.^{6} B05B *15/06;* **A62C** *13/76*

U.S. Cl. 239—280.5 **4 Claims**



1. A portable sprinkler system, comprising:

a) A central column assembly including a lower section, an upper section removably connected to said lower section, and a sprinkler head removably connected to said upper section;

b) said lower section includes an outer tube formed of galvanized steel, an inner tube formed of plastic for supplying water to said upper section, and hose connection means at said lower end for receiving a hose for supplying water to said inner tube;

c) said upper section being formed of plastic and being removably connected to said inner tube of said lower section to form a rotatable column, said upper section including means for removably connecting said sprinkler head thereto so that said rotatable column and said sprinkler head are rotatable as a unit relative to said outer tube in response to reaction forces produced by said sprinkler head;

d) said outer tube at the lower end thereof having three connection flanges formed of galvanized steel extending outwardly from said outer tube;

e) first, second, and third leg members formed of galvanized steel tubing each having an open seam and being pivotally connected at their upper ends to receive said three connection flanges on said outer tube in each of said open seams, respectively;

f) first, second, and third horizontally disposed feet members for engaging the ground to support said sprinkler system being connected to the lower ends of said first, second, and third leg members, respectively;

g) said lower section including a second outer tube formed of galvanized steel and being slidably disposed on said inner

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tube, said second outer tube having three connection flanges formed of galvanized steel extending outwardly from said second outer tube;

h) fourth, fifth, and sixth leg members formed of galvanized steel tubing each having an open seam and being pivotally connected at their upper ends to receive said three connection flanges on said second outer tube in each of said open seams, respectively;

i) said first, second, and third feet members being connected to the lower ends of said fourth, fifth, and sixth leg members, respectively; and

j) said first to sixth leg members being movable between a first position parallel to said central column assembly when said sprinkler system is not in use and a second position diagonally disposed relative to said central column assembly when said sprinkler system is in use to support said central column assembly in a vertical position.

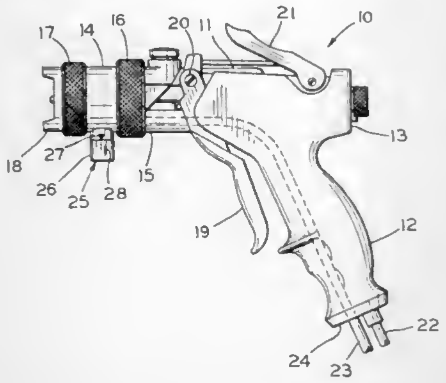
5,836,517
SPRAY GUN WITH FLUID VALVE

Marvin D. Burns, Millbury, Ohio; Mark E. Charpie, Lambertville, and Thomas E. Grime, Temperance, both of Mich., assignors to Ransburg Corporation, Indianapolis, Ind.

Filed Jan. 3, 1995, Ser. No. 367,837

Int. Cl.^{6} B05B *1/28*

U.S. Cl. 239—290 **6 Claims**



1. A spray head for a spray gun having passages in a spray gun body for delivering fluid and pressurized air to said spray head, said spray head being adapted to be detachably mounted on the spray gun body, said spray head having a fluid discharge orifice, a fluid inlet passage adapted to receive fluid from a passage in the spray gun body and to deliver such fluid to said fluid discharge orifice and a valve surface adapted for cooperating with trigger operated valve needle to form a trigger operated valve for initiating and terminating the discharge of fluid from said fluid discharge orifice, and wherein said spray head is characterized by a valve mounted in said spray head upstream from said valve surface to limit flow of fluid to said fluid discharge orifice when the trigger operated valve is open.

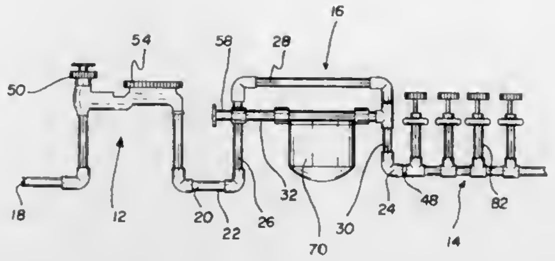
5,836,518
FERTILIZER SPRINKLER SYSTEM

Shelby D. Jester, 2553 Studebaker Rd., Long Beach, Calif. 90815

Filed Mar. 19, 1997, Ser. No. 820,990

Int. Cl.^{6} B01F *1/00*

U.S. Cl. 239—310 **8 Claims**



1. A fertilizer sprinkler system for distributing fertilizer mixed with water over a lawn and plants comprising, in combination:

a pipe system adapted for flow of liquid therethrough, the pipe system comprised of an inboard portion, a outboard portion and an intermediate portion, the inboard portion coupled to a main water line, the intermediate portion being defined by a first vertical member, a horizontal member and a second vertical member, the intermediate portion further having a lower horizontal member having a first end in fluid communication with the first vertical member and a second end in fluid communication with the second vertical member, the lower horizontal member having an intermediate segment having an integral lid extending downwardly therefrom, the lid having an inlet port and an outlet port therethrough;

a fertilizer container removably coupling with the lid of the pipe system;

a plurality of outlet valves positioned within the outboard portion of the pipe system, the plurality of outlet valves adapted for coupling with sprinklers;

a dividing wall secured to and extending downwardly from the lid of the pipe system, the dividing wall positioned within the fertilizer container when coupled to the lid.

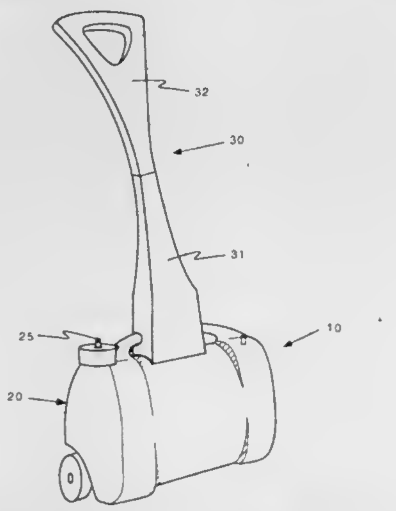
5,836,519
PORTABLE WHEELED SPRAYING APPARATUS HAVING AN ADJUSTABLE HANDLE

Robert S. Brown, 513 Colt Dr., Loveland, Colo. 80537

Filed Oct. 3, 1996, Ser. No. 726,324

Int. Cl.^{6} A61M *11/02*

U.S. Cl. 239—373 **1 Claim**



1. A portable wheeled spraying apparatus comprising:

(a) a liquid storage container having substantially a vertical elliptical shaped cross-section center that extends horizontally,

(b) generally elliptical shaped end caps integrally attached to said liquid storage container center whereby rigidity and a low center of gravity for stored liquid is provided,

(c) a means for providing pressurized air into said liquid storage container and providing a liquid Inlet into said liquid storage container,

(d) a liquid outlet fitting on said liquid storage container,

(e) a handle centrally located on top of said container, an extension having two curved pieces forming an arc, adjustably joined to an extension middle whereby the extension end position is lowered or raised and,

(f) wheels horizontally mounted near bottom of said liquid storage container.

5,836,520
APPARATUS FOR DISPENSING FLUID IN AN ARRAY PATTERN

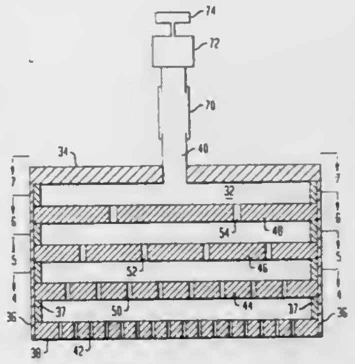
Sarvotham M. Bhandarkar; Kishore Kumar Chakravorty; Tai Chong Chai, and Jian Hua Wu, all of Singapore, Singapore, assignors to Institute of Microelectronics, Singapore, Singapore

Filed Jan. 4, 1996, Ser. No. 582,746

Claims priority, application Singapore, Oct. 28, 1995, 9501664-8

Int. Cl.^{6} B05B *1/14*

U.S. Cl. 239—553.5 **14 Claims**



1. A dispenser comprising:

a chamber enclosed by an upper wall and a lower wall, said upper wall oriented parallel to said lower wall,

said upper wall having a vertically bored inlet port and said lower wall having a plurality of vertically bored outlet ports for providing access to said chamber, said outlet ports geometrically arranged in a first array pattern characterized by rows and columns of bores,

a plurality of baffle plates interposed between said upper wall and said lower wall, said baffle plates spatially separated from each other and oriented parallel to and spatially separated from said upper and lower walls, and

said baffle plates having a plurality of vertically bored holes for providing access between said inlet port and said outlet ports, wherein said plurality of vertically bored holes of immediately adjacent baffle plates are vertically non-overlapping such that each one of said plurality of vertically bored holes modifies a path of fluid flow,

whereby said dispenser is effective in providing homogeneous flow of fluid through said outlet ports.

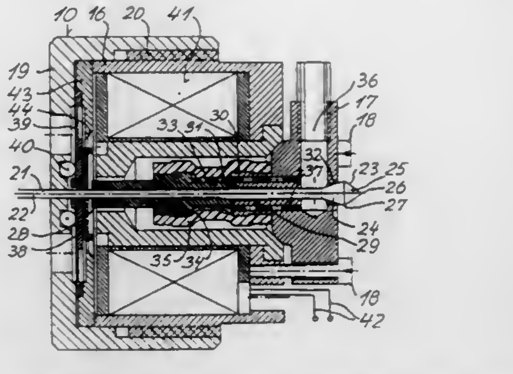
5,836,521
VALVE DEVICE WITH IMPACT MEMBER AND SOLENOID FOR ATOMIZING A LIQUID

Karl Holm, Brovst, and Knut Meyer, Rungsted Kyst, both of Denmark, assignors to Dysekompagniet I/S, Virum, Denmark

Continuation of Ser. No. 341,561, Mar. 9, 1995, abandoned. This application Jul. 23, 1997, Ser. No. 898,901

Int. Cl.^{6} B05B *1/30*

U.S. Cl. 239—584 **71 Claims**



35. A valve device for atomizing a liquid into drops, said valve comprising

a housing defining an annular valve seat therein by a sharp edge having an axial width smaller than 0.2 mm,

a valve member having an annular surface part diverging in a direction downstream of the valve seat, the valve member being movable in relation to the housing between an open position in which an annular nozzle opening is defined between the annular, diverging surface part and the valve seat, and a closed position in which the diverging surface part is in sealing engagement with the valve seat, the valve member further defining a converging surface part extending downstream from the diverging surface part, an annular, sharp edge being defined between the diverging and converging surface parts,

means for supplying pressurized liquid to be atomized to the nozzle opening,

electromagnetic means for moving the valve member between its open and closed positions,

control means for controlling the operation of the electromagnetic means so as to control the movement of the valve member.

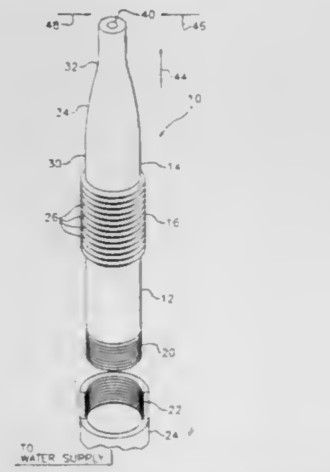
5,836,522
WATER NOZZLE APPARATUS

Michael Gunter Przystawik, Cape Coral, Fla., assignor to Waltzing Waters, Inc., Cape Coral, Fla.

Filed Mar. 14, 1997, Ser. No. 818,327

Int. Cl.^{6} B05B *15/08*

U.S. Cl. 239—588 **9 Claims**



1. In a water display fountain, which fountain includes a pressurized water supply and a water supply line connected to the water supply, the improvement consisting of an adjustable water nozzle apparatus, said apparatus comprising:

a cylindrically tubular, unthreaded first conduit portion communicably interengaged with the water supply line;

a generally tubular second conduit portion having a discharge outlet; and

a generally tubular, longitudinally flexible bellows portion that communicably interconnects said first and second conduit portions, said bellows portion including a selected material and a longitudinal series of circumferential ribs, which ribs are of a selected number and spacing, such that a force of at least 205 inch pounds is required to flex said bellows portion and angularly adjust said second conduit portion relative to

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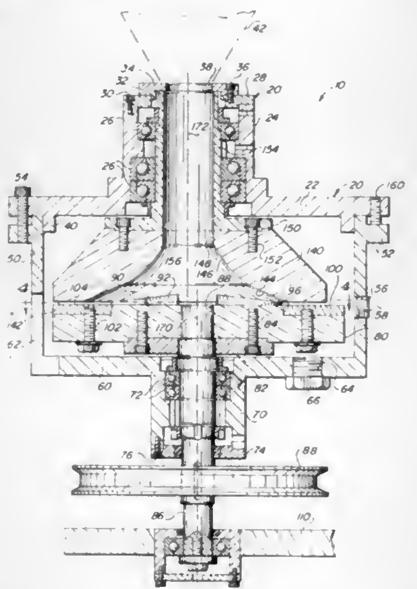
said first conduit portion, said bellows portion being sufficiently rigid to hold said second conduit portion in an angularly selected orientation relative to said first conduit portion such that water is directed through said nozzle apparatus and discharged from said outlet in a selected direction;
said second conduit portion including a relatively wide diameter cylindrical connector segment that is attached and located immediately adjacent to said bellows portion, a relatively narrow diameter cylindrical tip segment that includes a distal end of said second conduit portion and said discharge outlet, and a tapered transitional segment that interconnects said connector segment and said tip segment;
said first and second conduit portions and said bellows portion comprising a single unitary piece.

5,836,523
APPARATUS AND METHOD FOR REDUCING MATERIAL

Norman W. Johnson, P.O. Box 726, Gilbert, Ariz. 85299
Filed Mar. 10, 1997, Ser. No. 814,776
Int. Cl.^{6} B02C *19/00*
U.S. Cl. 241—5 **11 Claims**

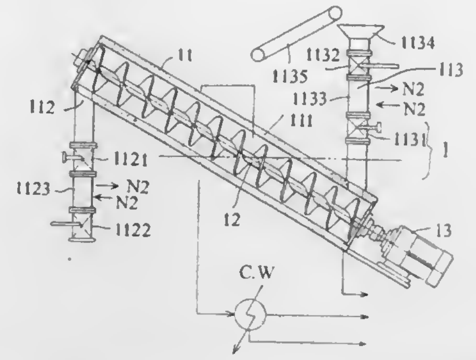


1. Apparatus for reducing material comprising in combination:
first rotor means for receiving material to be reduced, including a top surface and a generally horizontally disposed wear ring flush with the top surface;
means for rotating the first rotor at a relatively high speed to produce relatively high centrifugal force to sling outwardly the material disposed on the first rotor; and
second rotor means disposed above the first rotor means for rotating in response to the rotation of the first rotor means, and including a conical surface against which the material impinges and is reduced and a bottom surface parallel and adjacent to the wear ring.

5,836,524
LIQUEFACTION OF WASTES WITH PRODUCT OIL RECYCLING

Hong-Paul Wang, Tana, Taiwan, assignor to National Science Council, Taipei, Taiwan
Filed Oct. 1, 1996, Ser. No. 723,929
Int. Cl.^{6} B02C *19/12*
U.S. Cl. 241—23 **22 Claims**

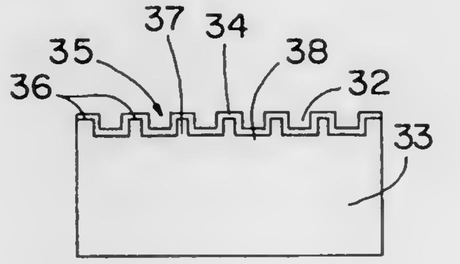
1. A resource recycling method of waste treatment of a feed with liquefaction and pyrolysis in an inclined liquefaction/pyrolysis zone, said zone having a liquefaction zone at a lower end and a pyrolysis zone at an upper end, said method comprising the steps of:



crushing the feed into small pieces having a size of about 5-10 cm,
feeding the crushed feed into said liquefaction zone,
introducing oil into said liquefaction zone,
liquefying the crushed feed with the oil at a temperature of 200°–400° C.,
moving the crushed feed upwardly into said pyrolisis zone, and
pyrolyzing an output from the liquefying step at a temperature of 300°–500° C. in said pyrolysis zone.

5,836,525
LINING FOR A REFINER

Yves Garnier, Grenoble, and Guy Caucal, Montchaboud, both of France, assignors to A.R.T.E. Parc Equation, Gieres, France
PCT No. PCT/FR95/00452, § 371 Date Jan. 31, 1997, § 102(e) Date Jan. 31, 1997, PCT Pub. No. WO95/27822, PCT Pub. Date Oct. 19, 1995
PCT Filed Apr. 7, 1995, Ser. No. 721,992
Claims priority, application France, Apr. 8, 1994, 94 04667
Int. Cl.^{6} B02C *7/12*
U.S. Cl. 241—28 **19 Claims**



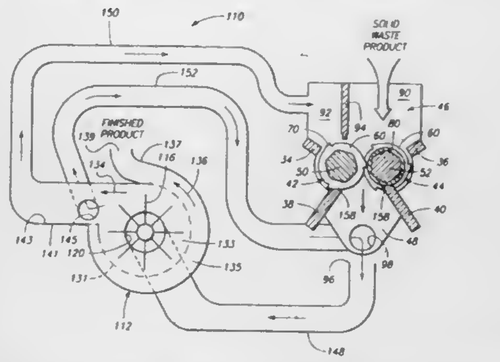
1. A pulp refiner filling, comprising a face (**16**) for securing to a refiner and a working face (**17, 22**) comprising an active surface and including at least one core (**15, 28, 33, 50, 51**) made of rigid material covered by a coating made of a wear-resistant material in such a way that at least the active surface (**18**) of the filling is comprised of all or a portion of the external surface of said coating (**19, 20, 25**), characterized in that said coating (**19, 20, 25**) is porous and is comprised of an overlay of thin layers or lamellae (**21**), characterized in that the thickness of said thin layers or lamellae (**21**) is between 0.003 and 0.100 mm.

5,836,526

Patent Not Issued For This Number

5,836,527
APPARATUS FOR COMMINUTING SOLID WASTE MATERIALS

Jere F. Irwin, and Gerald M. Corbin, both of Yakima, Wash., assignors to Irwin Research & Development, Yakima, Wash.
PCT No. PCT/US94/06412, § 371 Date Nov. 26, 1996, § 102(e) Date Nov. 26, 1996, PCT Pub. No. WO95/33566, PCT Pub. Date Dec. 14, 1995
PCT Filed Jun. 6, 1994, Ser. No. 290,719
Int. Cl.^{6} B02C *4/08;18/14*
U.S. Cl. 241—49 **17 Claims**

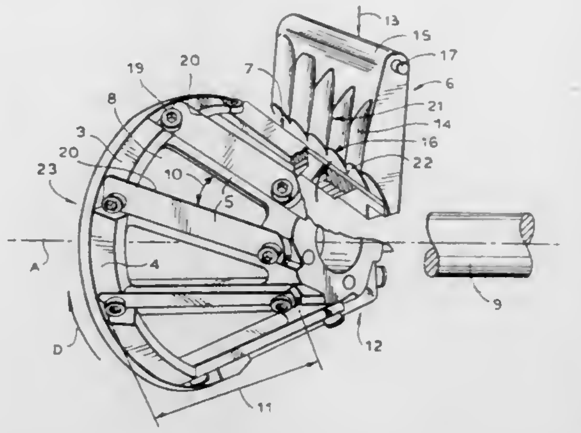


1. An improved apparatus for comminuting solid waste material into small pieces having a size less that a predetermined size, comprising:
a frame having an enclosure with an entrance for initially receiving the solid waste material;
a set of overlapping scissor rolls rotatably mounted within the enclosure for shearing the waste material into subdivided pieces when the material passes between the scissor rolls;
said enclosure having, (1) a shear intake manifold communicating with the entrance for receiving the solid waste material upstream of the scissor rolls and directing the waste material to the scissor rolls, and (2) a shear outtake manifold downstream of the scissor rolls for receiving the subdivided waste material pieces from the scissor rolls after the material has passed between the scissor rolls;
a separator screen mounted on the frame downstream of the scissor rolls having a plurality of apertures corresponding to the predetermined size for permitting small subdivided pieces having a size less than the predetermined size to pass therethrough while preventing large subdivided pieces having a size greater than the predetermined size from passing therethrough; and
a pneumatic conveyer mounted on the frame communicating with the shear outtake manifold, the screen, and the shear intake manifold for generating an airstream of sufficient velocity to (1) remove the subdivided pieces from the shear outtake manifold, (2) entrain the subdivided pieces in the airstream, (3) impinge the subdivided pieces against the screen to direct the small subdivided pieces through the screen, and (4) carrying the large subdivided pieces away from the screen and into the shear intake manifold to recycle the large subdivided pieces through the scissor rolls to further reduce the size of the large subdivided pieces.

5,836,528
CHIPPER

Günter Hilgarth, Leutershausen, Germany, assignor to Steinmax Werkzeuge GmbH, Ansbach, Germany
Filed Nov. 1, 1996, Ser. No. 742,375
Claims priority, application Germany, Mar. 27, 1996, 196 12 024.1
Int. Cl.^{6} B02C *18/16*
U.S. Ct. 241—93 **18 Claims**

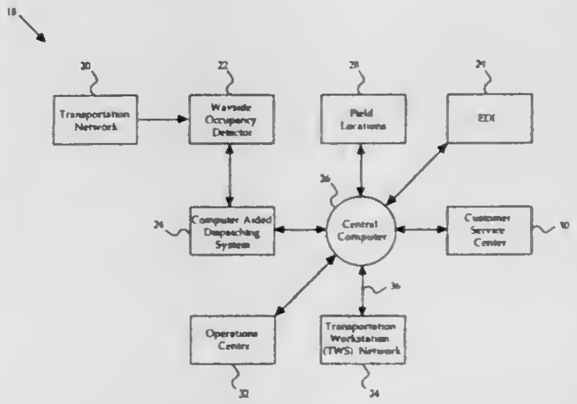
1. A chipper comprising:
a housing formed with an intake defining a feed direction;
a hollow drum rotatable in the housing in a rotational sense about an axis transverse to the feed direction and formed with a plurality of angularly spaced, radially throughgoing, and axially elongated windows;



a respective blade fixed to the drum immediately down-stream in the sense from each window, the blades having edges defining on rotation of the drum an orbit;
a breaker plate secured in the housing, defining with the orbit a gap narrowing in the rotational sense, and formed with a plurality of wedges extending generally in the direction and secantally of the drum, having sharp edges extending in the feed direction, directed generally radially at the drum, and spaced radially from the drum; and
means for rotating the drum in the sense and thereby pressing material fed in the direction into the housing against the wedges to split the material with the wedges, then draw it into the gap, and then comminute it with the blades.

5,836,529
OBJECT BASED RAILROAD TRANSPORTATION NETWORK MANAGEMENT SYSTEM AND METHOD

Marshall A. Gibbs, Jacksonville, Fla., assignor to CSX Technology, Inc., Jacksonville, Fla.
Filed Oct. 31, 1995, Ser. No. 550,881
Int. Cl.^{6} B61L *23/22*
U.S. Cl. 246—122 R **19 Claims**



1. A computer-implemented method for management of an object-based railroad transportation network, comprising the steps of:
collecting a set of real-time identification, position, interconnection and display characteristics for mobile transports and fixed transports within the transportation network; and
generating a map characterizing relationships between the transports based on said characteristics;
wherein the step of collecting comprises the steps of
detecting one of the mobile transports passing by a wayside occupancy detector and responsively generating a unique transport detector signal;

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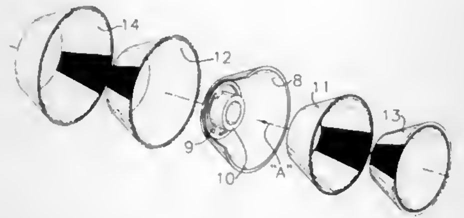
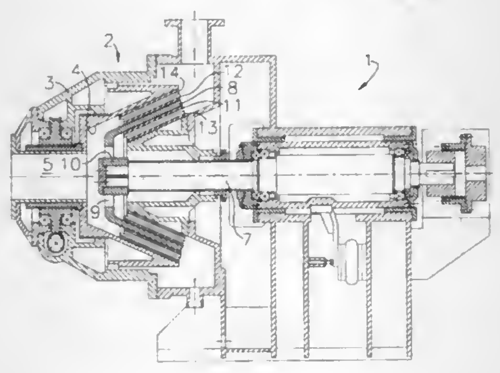
translating the unique transport detector signal into a mobile transport latitude/longitude coordinate; and
accepting entry of a fixed transport latitude/longitude coordinate corresponding to the location of one of the fixed transports; and
wherein the step of generating a map comprises the steps of
positioning a mobile transport icon on one of the maps at the mobile transport latitude/longitude coordinate; and
positioning a fixed transport icon on one of the maps at the fixed transport latitude/longitude coordinate.

5,836,530
PAPER MANUFACTURE CONICAL-TYPE PULP REFINERS IMPROVEMENTS

Milton Pilão, São Paulo, Brazil, assignor to Pilao S/A Maquinas e Equipamentos, Brazil
Filed Jan. 29, 1997, Ser. No. 794,239
Claims priority, application Brazil, Jan. 29, 1996, 9600509-2
Int. Cl.^{6} B02C *7/12*
U.S. Cl. 241—261.1 **10 Claims**

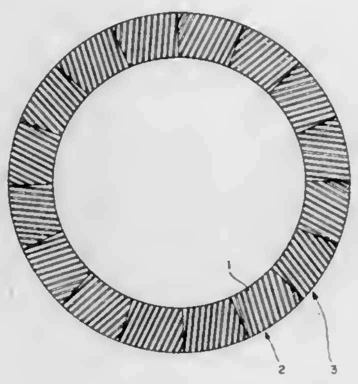


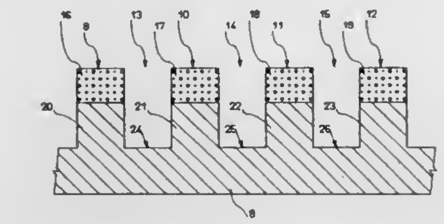


7. A paper manufacturing conical-type pulp refiner comprising:
a support structure (**1**) supporting a horizontally disposed framework (**2**);
a front lid (**3**) connected to the framework defining a refining chamber (**4**) having a conical shape with an axial entrance (**5**) centered on the front lid for entrance of material to be refined;
a radial side exit attached to the refining chamber for refined material;
a first conical stator positioned in the refining chamber;
a second conical stator positioned in the refining chamber within the first stator; and
a rotor positioned between the first and second stators having a separate outer refining cone positioned on an outer surface of the rotor and a separate inner refining cone positioned on an inner surface of the rotor, and a spoked entrance hub to distribute the material to be refined towards the inner and outer refining cones.

5,836,531
PAPER PULP DEFIBERING OR REFINING PLATE AND METHOD OF MANUFACTURING IT

Guy Maybon, Saint Jorioz, France, assignor to Technogenia S.A., Saint Jorioz, France
Division of Ser. No. 266,716, Jun. 28, 1994, Pat. No. 5,580,472. This application Jun. 5, 1996, Ser. No. 659,160
Claims priority, application France, Jul. 13, 1993, 93 08791
Int. Cl.^{6} B02C *7/12*
U.S. Cl. 241—296 **6 Claims**

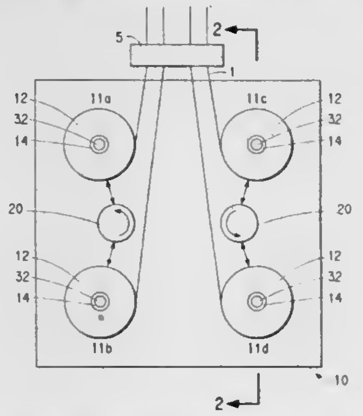




1. Paper pulp defibering or refining plate comprising a comminuting surface having a large number of ridges separated by grooves, wherein:
the plate body is made of a first material adapted to provide the general mechanical strength of the plate in use, and
only the upper part of the ridges is a layer of a composite second material comprising a hard abrasion resistant material powder bound in a brazing metal alloy which is brazed to said hard abrasion resistant material powder.

5,836,532
SYSTEM AND METHOD FOR ON-LINE MISSING/ GAINED FILAMENT DETECTION

Dewey Edwin Thompson, Signal Mountain, Tenn., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Dec. 5, 1996, Ser. No. 760,977
Int. Cl.^{6} B65H *54/02;63/02;* **G06G** *7/64*
U.S. Cl. 242—35.5 R **23 Claims**

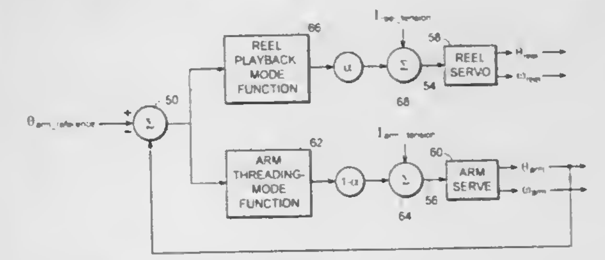


1. A method for using a microprocessor to monitor linear density, on-line, of at least one yarn package formed through winding of multifilamentary yarns during a wind cycle on a first winding position at a winding apparatus, said apparatus capable of winding a plurality of said at least one yarn package simultaneously at a plurality of winding positions, the first winding position being one of said winding positions, said method comprising the steps of:
inputting predetermined process parameters, including a tolerance range and at least one diameter range:
inputting rotation speed of each said at least one yarn package:
deriving a time interval required to wind said at least one yarn package through said at least one diameter range for each said at least one yarn package;
calculating a denier value for said at least one yarn package through one of said at least one diameter range using said corresponding rotation speed, said corresponding time interval and said predetermined process parameters;
determining whether said calculated denier value is within said tolerance range for said at least one yarn package through one of said at least one diameter range; and
repetitively performing for a remainder of said at least one diameter range throughout said wind cycle, said steps of inputting rotation speed, deriving a time interval, calculating a denier value, and determining whether said calculated denier value is within said tolerance range.

10. An apparatus for determining linear density, on-line, of at least one yarn package formed on a winding apparatus through winding of multifilamentary yarns from a spinning position, comprising:
a microprocessor based device;
a yarn package diameter measurement device for measuring diameter of each said at least one yarn package;
a rotational speed sensor for sensing rotational speed of each said at least one yarn package, said sensor for providing a sensed speed signal; and
a timer for measuring time required to traverse a region defined by a start and end diameter measured by said yarn package diameter measurement device, said timer for providing a timing signal corresponding to said measured time,
wherein said speed signal and said timing signal are adapted to be provided to said microprocessor based device for on-line, real-time calculation and monitoring of said linear density of said at least one yarn package, said calculation and said monitoring being on-line and real-time with respect to the spinning position.

5,836,533
HYBRID ARM-POSITION/TAPE-TENSION SERVOCONTROL SYSTEM

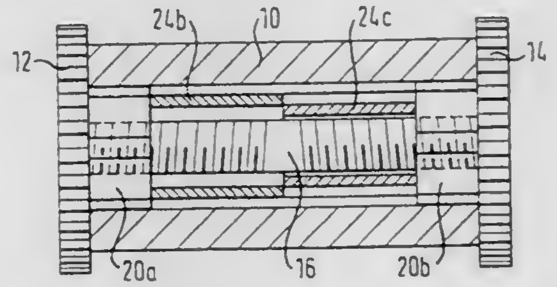
Kurt F. Hallamasek, Oakland, Calif., assignor to Ampex Corporation, Redwood City, Calif.
Filed Oct. 31, 1996, Ser. No. 740,674
Int. Cl.^{6} G11B *15/43*
U.S. Cl. 243—334.6 **5 Claims**



1. A cassette recorder comprising:
A) a tension-arm servomechanism including a tension arm adapted for training of a tape thereabout, the tension-arm servomechanism being responsive to tension-arm drive signals to apply torque in accordance therewith to the tension arm, which is movable between first and second tension-arm positions and imparts tension to the tape trained-thereabout;
B) a reel servomechanism including a tape reel, adapted for training of a tape thereabout, to which the reel servomechanism applies torque in accordance with tension-arm drive signals applied thereto;
C) a tension-arm control circuit, responsive to the actual tension-arm position and to a tension-arm-position command signal representing a desired tension-arm position, that generates and applies to the tension-arm servomechanism tension-arm drive signals in accordance with a tension-arm control function that includes a contribution equal to the product of a tension-arm scheduling coefficient and a constituent tension-arm control function of the difference between the actual tension-arm position and the desired tension-arm position, the tension-arm scheduling coefficient being a function of tension-arm position that assumes a first, relatively high tension-arm scheduling-coefficient value when the tension arm is in the first tension-arm position, that assumes a second, relatively low tension-arm scheduling-coefficient value when the tension arm is in the second tension-arm position, and that generally decreases through a range of values between the first and second tension-arm scheduling-coefficient values when the tension arm moves toward the second tension-arm position through a range of tension-arm positions between the first tension-arm position and the second tension-arm position; and
D) a reel control circuit, responsive to the actual tension-arm position and to a tension-arm-position command signal representing a desired tension-arm position, that generates and applies to the reel servomechanism reel drive signals in accordance with a reel control function that includes a contribution equal to the product of a reel scheduling coefficient and a constituent reel control function of the difference between the actual tension-arm position and the desired tension-arm position, the reel scheduling coefficient being a function of tension-arm position that assumes a first, relatively low reel scheduling-coefficient value when the tension arm is in the first tension arm position, that assumes a second, relatively high reel scheduling-coefficient value when the tension arm is in the second tension-arm position, and that generally increases through a range of values between the first and second reel scheduling-coefficient values when the tension arm moves toward the second tension-arm position through a range of tension-arm positions between the first tension-arm position and the second tension-arm position.

5,836,534
FORCE LIMITING DEVICE IN A SAFETY BELT RETRACTOR

Klaus Böhmler, Schwäbisch Gemünd, Germany, assignor to TRW Occupant Restraint Systems GmbH, Alfdorf, Germany
Filed Aug. 23, 1996, Ser. No. 702,837
Claims priority, applicatinn Germany, Aug. 30, 1995, 295 13 942.0
Int. Cl.^{6} B60R *22/28*
U.S. Cl. 242—379.1 **6 Claims**



1. A force limiting device for use in a safety belt retractor, said retractor having a hollow belt spool, a shaft axially extending through said belt spool, a pair of ratchet wheels each connected to one axial end of said shaft, at least one internally threaded nut member coaxially accommodated within and connected to said

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hollow belt spool for joint rotation and relative axial displacement, said shaft being externally threaded and engaged with said nut member, and a pair of energy dissipating sleeve members of a plastically deformable material being coaxially engaged about said shaft in axial abutment against each other, said nut member, upon relative rotation with respect to said shaft, forcingly and telescopically driving one of said sleeve members into the other of said sleeve members.

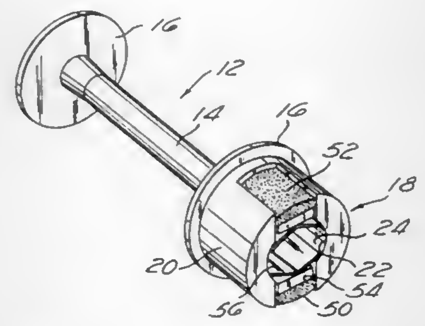
5,836,535
TOWED VEHICLE DEPLOYMENT APPARATUS INCORPORATING MECHANICAL BRAKE

Roger D. Brum, Irvine, Calif., assignor to Southwest Aerospace Corporation, Tustin, Calif.

Continuation of Ser. No. 213,908, Mar. 14, 1994, abandoned. This application Dec. 27, 1996, Ser. No. 773,918

Int. Cl.⁶ B65H *75/30*

U.S. Cl. 242—381.5 **8 Claims**



1. A towed vehicle deployment apparatus comprising:

a rotatable spool comprising a rotor portion having a cylindrical outer surface, an inner surface, a central compartment defined by said inner surface, and at least one opening extending radially from said outer surface to said central compartment;

a stationary brake drum defining a cylindrical inner surface, said spool being rotatably connected to said brake drum in a manner wherein said rotor portion resides within said brake drum; and

a brake assembly comprising at least one brake element disposed within said central compartment and said opening, said brake element being configured to permanently deform at a predetermined rotational speed of the spool and move radially outward within said opening upon yielding so as to contact the inner surface of the brake drum and apply a braking force to the spool.

5,836,536
CABLE STORAGE ASSEMBLY

Roland L. Bodden, 3324 Cavendish Pl., Harvey, La. 70058

Filed Jul. 2, 1997, Ser. No. 887,058

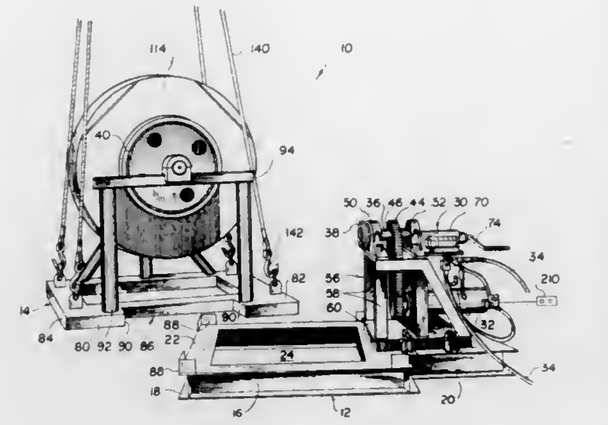
Int. Cl.⁶ B65H *75/34;75/30*

U.S. Cl. 242—390.5 **19 Claims**

1. A cable storage assembly comprising:

a stationary portion carrying a motor means for producing a rotational force; having a supporting frame a

a removable portion having a supporting frame detachably engageable with said stationary portion, said removable portion comprising a spool with a spool shaft for receiving a length of cable wound thereon, a means carried by said spool for receiving rotational force produced by said motor means to facilitate winding of the cable on said spool; and



a means for retaining said spool shaft stationary during rotation of said spool.

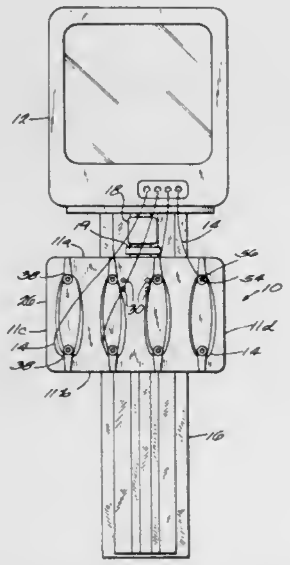
5,836,537
MEDICAL CORD CONTROL AND STORAGE APPARATUS

Bruce A. Glass, 74 Eastwood Dr., Deerfield, Ill. 60015

Filed Jul. 3, 1997, Ser. Nn. 888,032

Int. Cl.⁶ B65H *75/44*

U.S. Cl. 242—400.1 **11 Claims**



1. In a medical room having a headwall system or a bracket for mounting a monitor, a medical cord storage apparatus comprising:

a) a plate having opposed top and a bottom edges and opposed left and right edges,

b) means for attaching said plate to said headwall system or said bracket,

c) at least one pair of opposed hooks with one of said pair adjacent said top or left edge and the other of said pair adjacent said bottom or right edge, each of said hooks including a stem having a longitudinal center line, a proximal end contacting said plate, and an opposite distal end and an arm extending at a right angle to said stem at said distal end, and,

d) at least one of said pair of hooks also comprising means for locking said hook in a position in which said arm is pointed away from said other of said pair of hooks, and means for releasably allowing said arm to rotate about said stem longitudinal center line.

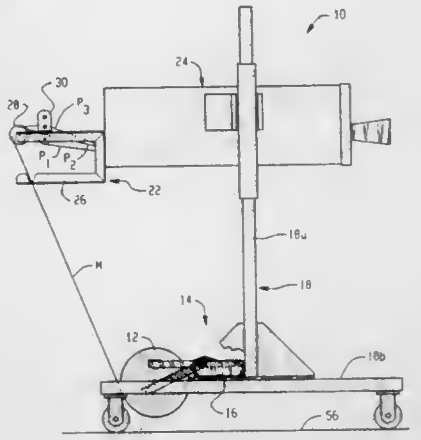
5,836,538
CUSHIONING CONVERSION SYSTEM WITH STOCK ROLL LIFTER

Michael J. Lencoski, Claridon Township, and Alvin Wells, Madison, both of Ohio, assignors to Ranpak Corp., Concord Township, Ohio

Continuation of Ser. No. 730,001, Oct. 11, 1996. This application Dec. 20, 1996, Ser. No. 771,044

Int. Cl.⁶ B65H *19/12*

U.S. Cl. 242—559.1 **17 Claims**



1. A cushioning conversion system for producing a cushioning product from sheet stock material supplied as a stock roll, comprising a conversion assembly which converts the sheet stock material into the cushioning product and a stock roil support assembly;

the stock roil support assembly comprising a mount, a pair of laterally spaced apart roll lifter arms mounted to said mount for movement between a loading position and an elevated operating position, a pedal connected to a linkage assembly for movement between a raised position and a depressed position;

said linkage assembly connected to said roll lifter arms and said pedal such that movement of said pedal between said raised position and said depressed position effects movement of the roll lifter arms between said loading position and said elevated operating position;

each of said roll lifter arms including a plurality of recesses linearly disposed along a top surface of the roll lifter arm and upwardly opening when the roll lifter arm is in the loading position, each of the recesses in one of the roll lifter arms being aligned with a respective one of the recesses in the other of the roll lifter arms thereby providing aligned pairs of recesses for receiving ends of a roll holder used to rotatably support the stock roll whereby rolls of different diameters may each be accommodated by a respective pair of said aligned pairs of recesses.

5,836,539
INLET GUIDE MECHANISM FOR WIRE FEEDER

Daniel N. Grimm, Mentor, Ohio, and Brian L. Verrilli, Carlsbad, Calif., assignors to The Lincoln Electric Company, Cleveland, Ohio

Filed Aug. 11, 1997, Ser. No. 907,973

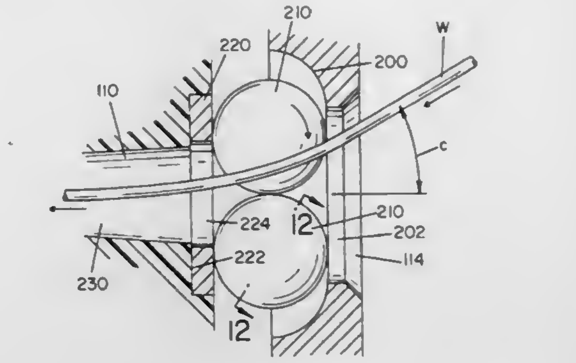
Int. Cl.⁶ B65H *23/00;57/00*

U.S. Cl. 242—615.3 **22 Claims**

21. A method for guiding a wire from a wire spool to a wire feeder of an arc welder, said method comprises the steps of:

(a) directing said wire through a wire passageway having an entrance end;

(b) providing said entrance end of said passageway with a plurality of closely spaced spherical balls surrounding said passageway and supported for annular rotation circumferentially around said entrance end of said passageway; and,



(c) allowing said wire to engage at least one of said balls as it enters said passageway.

5,836,540
PROJECTILE HAVING AN APPARATUS FOR FLIGHT-PATH CORRECTION

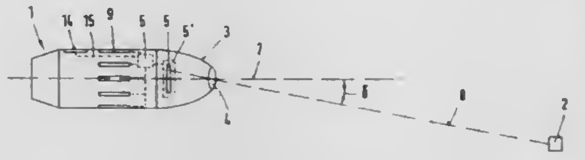
Rudolf Romer, Kaarst, and Gerd Wollmann, Oberhausen, both of Germany, assignors to Rheinmetall W & M GmbH, Unterluss, Germany

Filed Mar. 24, 1995, Ser. No. 477,121

Claims priority, application Germany, Mar. 25, 1994, 44 10 326.3

Int. Cl.⁶ F41G *7/00*

U.S. Cl. 244—3.16 **2 Claims**



1. A projectile having a longitudinal axis and a substantially pointed front end, at least one flight correction charge disposed on the projectile for effecting a correction of the flight path of the projectile by a predetermined angle (δ_0) when ignited, a sensor disposed in said front end of said projectile for detecting a respective target and for measuring an angle (δ) between the longitudinal axis of the projectile and a line connecting the projectile and the target, and electronics, responsive to an output from said sensor, for causing ignition of said flight correction charge when said angle (δ) measured by said sensor is identical in magnitude to a flight path correction of said predetermined angle (δ_0) caused by the respective flight correction charge.

5,836,541
EASILY-CONVERTIBLE FIXED-WING ROADABLE AIRCRAFT

Roger N. C. Pham, 625 Veranda Ct., #1140, Grand Prairie, Tex. 75050

Continuation-in-part of Ser. No. 811,503, Mar. 5, 1997. This application May 21, 1997, Ser. No. 859,732

Int. Cl.⁶ B64C *37/00*

U.S. Cl. 244—2 **18 Claims**

1. In a roadable flying vehicle designed to operate effectively both in the air and in the roadway, said vehicle having a center of gravity, a longitudinal axis, a fuselage with a cabin for housing an operator, a width, a top, a front end, and a rear end, the combination comprising:

front ground supporting means disposed at the front end of the vehicle, comprising of at least one steerable front wheel,

rear ground supporting means mounted behind the center of gravity, comprising a pair of rear wheels.

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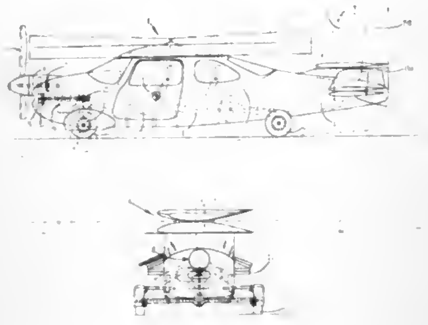


- a vertical stabilizer means and a horizontal stabilizer means located at the rear end of the fuselage,
- an air propulsion means for propelling said vehicle while flying in the air,
- a wing comprising of a center panel and two outer panels foldably attached to said center panel by a wing folding mechanism allowing said outer panels to overlap on top of said center panel in a folded position, and allowing said outer panels to extend laterally from said center panel in an extended position, and,
- said wing is rotatably mounted on top of said fuselage on a wing pivot mechanism whereby said wing is horizontally rotatable between a flight position with the wing span approximately orthogonal to the fuselage's longitudinal axis and a roadable position with the wing span approximately parallel to the longitudinal axis of the fuselage, thereby allowing the vehicle to have a maximum width within legal limit for use in the roadway.

5,836,542
FLYING CRAFT AND A THRUSTER ENGINE SUITABLE FOR USE IN SUCH A CRAFT

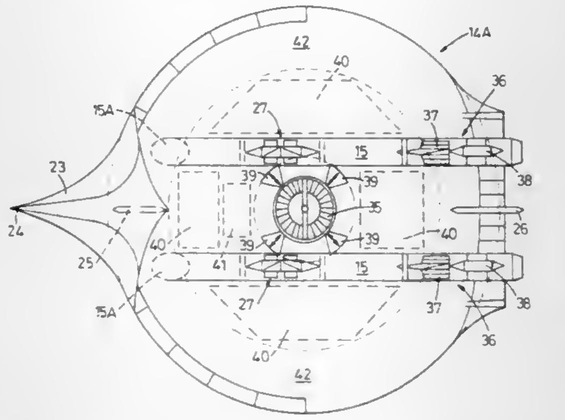
David Johnston Burns, Broomhall Castle, Menstrie, Clackmannanshire, FK11 7EA, Great Britain

Filed Apr. 28, 1995, Ser. No. 430,721

Claims priority, application United Kingdom, Apr. 28, 1994, 9408394

Int. Cl.⁶ B64C *39/06*

U.S. Cl. 244—12.2 **6 Claims**



6. A flying craft comprising:

- a generally dished form body providing a lift characteristic, and having a front end and a rear end, said body further having a domed shaped upper surface and a lower surface, said domed shaped upper surface having a front part and an air inlet located in said front part of said domed upper surface;
- vertically disposed first engine means located substantially at the center of said dish shaped body for providing a vertical thrust for vertically propelling said flying craft to an elevated position; and
- second engine means for providing propulsion power which is only sufficient to cause a forward motion of the flying craft with a slight descending path from an elevated position attained by means of the first engine means, said second engine means comprising electrically powered propulsion means for providing a horizontal thrust for propelling said flying craft in a forward direction from said elevated position, said electrically powered propulsion means comprising propulsion turbines, electrical drive means for driving said propulsion turbines, and air ductings located on either side of said first engine means and extending within said body from said air inlet to said rear end of said body, each of said ductings housing a said propulsion turbine whereby propulsion air is supplied to said propulsion turbine through the ducting.

5,836,543
DISCUS-SHAPED AERODYNE VEHICLE FOR EXTREMELY HIGH VELOCITIES

Klaus Kunkel, Herhartstrasse 6A, D-40882, Ratingen, and Peter Plichta, Düsseldorf, both of Germany, assignors to Klaus Kunkel, Ratingen, Germany

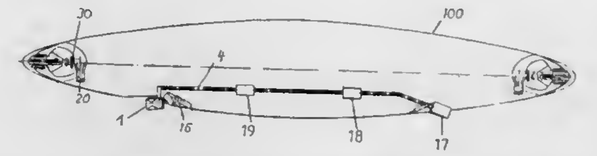
PCT No. PCT/DE95/01430, § 371 Date Aug. 1, 1996, § 102(e) Date Aug. 1, 1996, PCT Pub. No. WO96/14504, PCT Pub. Date May 17, 1996

PCT Filed Oct. 16, 1995, Ser. No. 666,581

Claims priority, application Germany, Nov. 2, 1994, 44 39 073.4

Int. Cl.⁶ B64C *15/12;30/00*

U.S. Cl. 244—12.2 **14 Claims**



1. A discus-shaped aerodyne for extremely high velocities and extreme altitudes comprising:

- a discus-shaped outer casing configured to generate buoyancy upon horizontal travel through a gas atmosphere;
- a jet arrangement disposed along a peripheral area of the casing for the generation of lift;
- at least one rocket drive on said casing for reaction of silicon hydride compounds for the generation of horizontal movement of the aerodyne and including a nitrogen burner in which the silicon hydride compounds are burned with atmospheric nitrogen at increased temperatures in the presence of atmospheric oxygen as an oxidizing agent for hydrogen of the silicon hydride compounds; and
- means for feeding said silicon hydride compounds and atmospheric air to said burner.

5,836,544
EMERGENCY SOFT-LANDING SYSTEM FOR ROTOR-TYPE AIRCRAFT

Dino M. Gentile, 10001 Limerick Ave, Chatsworth, Calif. 91311

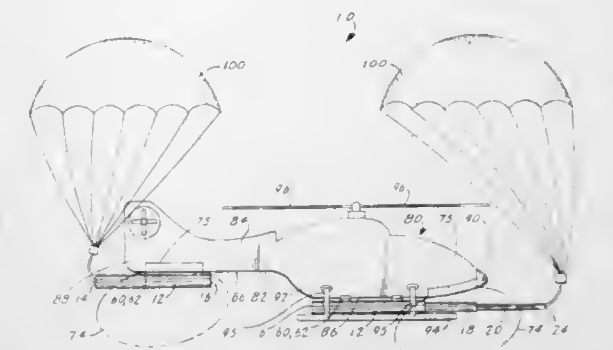
Filed May 13, 1996, Ser. No. 645,283

Int. Cl.⁶ B64D *25/00*

U.S. Cl. 244—17.17 **5 Claims**

1. An emergency soft-landing system for rotor-type aircraft said system comprising:

- a) at least one parachute-containing structure having at least one parachute deployment end, which extends longitudinally, and is laterally centered and attached to the lower surface of the helicopter fuselage, between said pair of landing gear, wherein the parachute deployment end extends beyond the helicopter's front end and the circumferential arc produced by the helicopter's rotor blades,
- b) means for attaching said parachute-containing structure to a structural member of a rotor-type aircraft, that is comprised of a helicopter having a fuselage with an upper surface, a lower surface, a rear end, a front end, sides and a pair of landing gear that extend downward from each side of the fuselage's lower surface and,
- c) means for deploying at least one fast-deployment parachute from the parachute deployment end during an emergency landing situation.



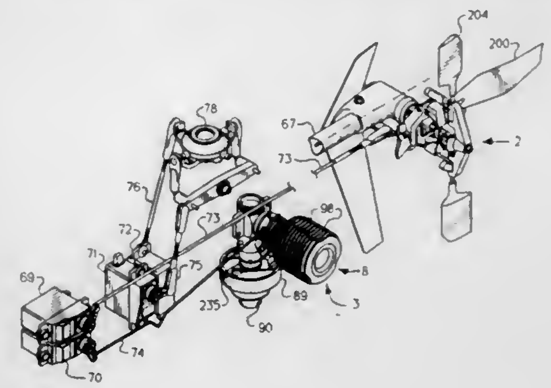
5,836,545
ROTARY WING MODEL AIRCRAFT

Paul E. Arlton, 1132 Anthrop Dr., West Lafayette, Ind. 47906; David J. Arlton, West Lafayette, and Paul Klusman, Lafayette, both of Ind., assignors to Paul E. Arlton, West Lafayette, Ind.

Continuation of Ser. No. 292,718, Aug. 18, 1994, Pat. No. 5,609,312, which is a continuation-in-part of Ser. No. 233,159, Apr. 25, 1994, Pat. No. 5,628,620, said Ser. No. 728,929 is a continuation of Ser. No. 292,719, Aug. 18, 1994, Pat. No. 5,597,138. This application Oct. 11, 1996, Ser. No. 728,929

Int. Cl.⁶ B64C *27/00;* **B64D** *35/02*

U.S. Cl. 244—60 **50 Claims**



1. A system for controlling the flight performance of a radio-controlled model helicopter having a power plant configured to produce power, a main rotor, and a tail rotor, wherein the main rotor is supported for rotation about a main rotor axis of rotation and driven by the power plant at a main rotor speed and the tail rotor is supported for rotation about a tail rotor axis of rotation and driven by the power plant, the system comprising

- a power plant cooling system for cooling the power plant, the power plant cooling system consuming less than about five percent of the power produced by the power plant and
- means for allocating the power produced by the power plant so that power produced by the power plant is distributed among the power plant cooling system, main rotor, and tail rotor, wherein [the power plant cooling system consumes less than about five percent of the power produced by the power plant and] the tail rotor is rotated by the power plant at a tail rotor speed of less than about three times the main rotor speed at which the main rotor is rotated by the power plant so that the tail rotor consumes a minimum amount of power produced by the power plant.

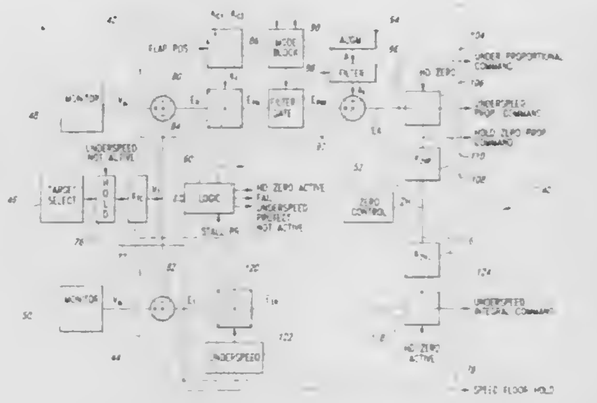
5,836,546
AUTOPILOT/FLIGHT DIRECTOR UNDERSPEED PROTECTION SYSTEM

Mark E. Gast, Seabrook, Tex., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 441,468, May 15, 1995. This application Jan. 10, 1997, Ser. No. 782,507

Int. Cl.⁶ B64C *13/16;13/08;* **G05D** *01/00;01/08*

U.S. Cl. 244—76 B **17 Claims**



1. An apparatus for producing an underspeed override signal in an aircraft having an autopilot, comprising:

- a flight speed monitor configured to monitor a flight speed of the aircraft and to produce an electrical signal corresponding to the monitored flight speed;
- a first minimum maneuver speed selector producing an electrical signal corresponding to a first minimum maneuver speed;
- a second minimum maneuver speed selector producing an electrical signal corresponding to a second minimum maneuver speed;
- a target speed signal generator coupled to receive the electrical signal corresponding to the first minimum maneuver speed and the electrical signal corresponding to the second minimum maneuver speed, the target speed signal generator producing a target signal, the target signal corresponding to the greater of the first minimum maneuver speed and second minimum maneuver speed; and
- an error signal generator having a first input coupled to receive the electrical signal from the flight speed monitor and a second input coupled to receive the target signal from the target speed signal generator, the error signal generator producing the override signal corresponding to the difference between the target speed and the monitored flight speed in response to the target signal and the electrical signal from the flight speed monitor, the error signal generator having an output coupled to provide the override signal to the autopilot.

5,836,547
ATTENUATED SEAT BACK ASSEMBLY FOR AN AIRCRAFT PASSENGER SEAT

Roger Koch, Miami Shores; Ronald Grilliot, Plantation, and Mark Larson, Pembroke Pines, all of Fla., assignors to Aircraft Modular Products, Inc., Miami, Fla.

Filed Apr. 8, 1996, Ser. No. 630,009

Int. Cl.⁶ B60N *2/42;* **B60R** *21/055;* **B64D** *25/04;25/00*

U.S. Cl. 244—122 R **19 Claims**

1. An attenuated aircraft seat back assembly for an aircraft passenger seat of the type which includes a seat back having a seat back frame with a front side and a rear side, said attenuated assembly comprising:

- a mount assembly, said mount assembly including an interior engagement segment and an exterior engagement segment,
- said interior engagement segment of said mount assembly being structured to be secured at the rear side of the seat back frame,

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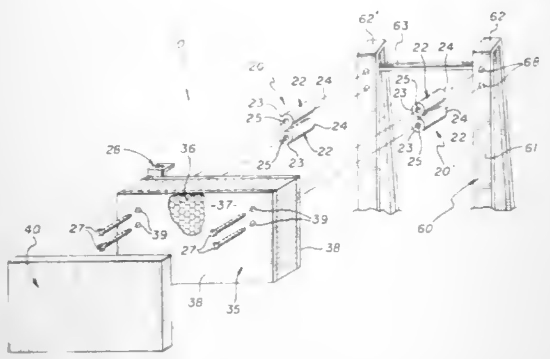


thereby maintaining said exterior engagement segment of said mount assembly spaced apart a predetermined distance from the seat back frame,

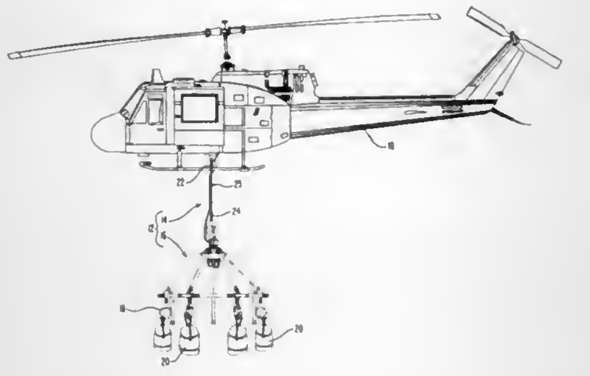
an impact absorbent, generally rigid material panel, said rigid material panel being structured to be fixedly secured at said exterior engagement segment of said mount assembly so as to be disposed in generally parallel, spaced apart relation to the seat back frame,

said rigid material panel being generally thin so as to minimize an overall thickness of the seat back, and

said rigid material panel being structured to substantially resist a direct impact thereto, while still yielding sufficiently so that an object impacting said panel will have a generally acceptable Head Injury Criteria (HIC) value of 1000 or less.

5,836,548
CARGO MANAGEMENT SYSTEMS

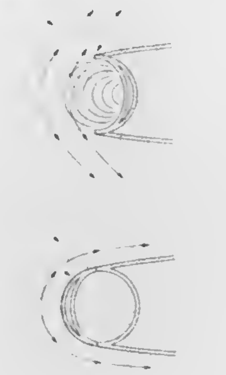
Phillip Dietz, Sandy, and Donald P. Cox, Orem, both of Utah, assignors to Skyhook Technologies, Inc., Orem, Utah
Continuation-in-part of Ser. No. 384,414, Feb. 6, 1995, Pat. No. 5,593,113. This application Aug. 7, 1996, Ser. No. 689,302
Int. Cl.⁶ B64D *1/08*
U.S. Cl. 244—137.1 **31 Claims**



1. An airframe for selectively attaching and selectively releasing multiple payloads suspended by a cable from an aircraft, the airframe comprising:
  (a) a loading frame;
  (b) attachment means for connecting the loading frame to the cable;
  (c) swivel means for enabling the loading frame to freely rotate relative to the attachment means;
  (d) a plurality of payload hooks attached to the loading frame; and
  (e) means for transferring electrical signals between a loading frame and the attachment means when the loading frame freely rotates relative to the attachment means.

5,836,549
AIRFOIL LEADING EDGE WITH CAVITY

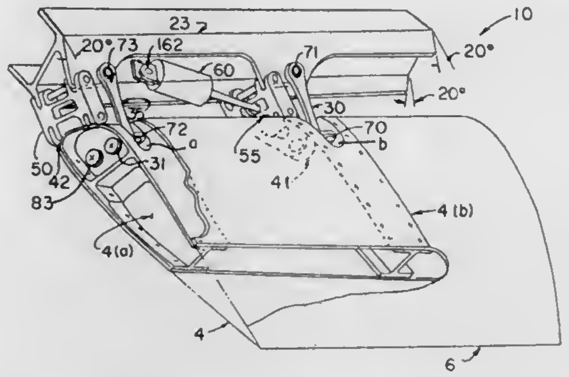
Boyd B. Bushman, Lewisville, Tex., assignor to Lockheed Martin Corporation, Fort Worth, Tex.
Filed Jan. 10, 1997, Ser. No. 781,237
Int. Cl.⁶ B64C *3/16;3/36;11/18*
U.S. Cl. 244—203 **18 Claims**



1. An airfoil for an aircraft, comprising in combination:
a leading portion;
an unobstructed cavity formed in the leading portion and extending substantially the length of the airfoil, the cavity defining two parallel leading edges separated by the cavity, the cavity having a closed base and creating a shock wave forward of the leading portion while the airfoil is in supersonic airflow to retard temperature increase of the leading portion.

5,836,550
MECHANISM FOR STREAMWISE FOWLER DEPLOYMENT OF THE WING TRAILING OR LEADING EDGE

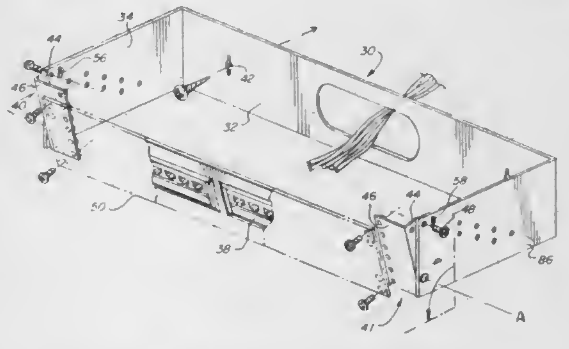
Carlos A. Paez, Creve Coeur, Mo., assignor to Boeing Company, St. Louis, Mo.
Filed Nov. 27, 1996, Ser. No. 757,145
Int. Cl.⁶ B64C *9/04;9/28;13/28*
U.S. Cl. 244—214 **5 Claims**



1. A mechanism for deploying a flap, comprising
a. a spar of a wing;
b. a flap connected to said spar by
  1. two swivel links, each being hingedly connected at one end to said spar and at an opposite end to a respective one of two flap support fittings, each said flap support fitting being pivotally hinged to the flap; and
  2. two slaving mechanisms, each corresponding to a single swivel link and being rotationally connected to the spar at one end by a spherical bearing and to the flap at an opposite end by being engaged in a slotted slaving bolt; and
c. a linear flap actuator connected to the spar at one end and to one of the two swivel links at the other end for pivoting the one link, causing pivoting of the other link, pivoting of the two flap support fittings and rotation of the two slaving mechanisms, for moving the flap in a streamwise Fowler motion in a single action.

5,836,551
BOTTOM PIVOT WALLMOUNT BRACKET AND WIRE MANAGEMENT SYSTEM

Stephen Orlando, Longboat Key, Fla., assignor to Ortronics Corporation, Pawcatuck, Conn.
Filed Jul. 26, 1996, Ser. No. 686,750
Int. Cl.⁶ F16L *3/00*
U.S. Cl. 248—49 **2 Claims**



1. A stand-off wire management bracket comprising:
a back panel having a longitudinal axis:
two side panels extending from said back panel, said side panels each having inside surfaces and having an upper stop and a lower stop extending from said inside surfaces:
two attachment brackets, with each attachment bracket having a first section and a second section substantially perpendicular to said first section, said first sections being pivotally connected to said inside surfaces of said side panels at lower corners of the side panels furthest from the back panel such that said attachment brackets rotate about an axis substantially parallel said longitudinal axis of said back panel;
said attachment brackets having open and closed positions, portions of said second sections of said attachment brackets being substantially parallel said back panel when said attachment brackets are closed, and portions of said second sections of said attachment brackets being substantially perpendicular said back panel when said attachment brackets are fully open;
said upper stops being positioned to contact said first sections of said attachment brackets when said attachment brackets are closed, and said lower stops being positioned to contact said first sections of said attachment brackets when said attachment brackets are fully opened; and
means to secure said attachment brackets to said side panels in said closed position, said securing means being removable.

5,836,552
MUSICAL INSTRUMENT STAND

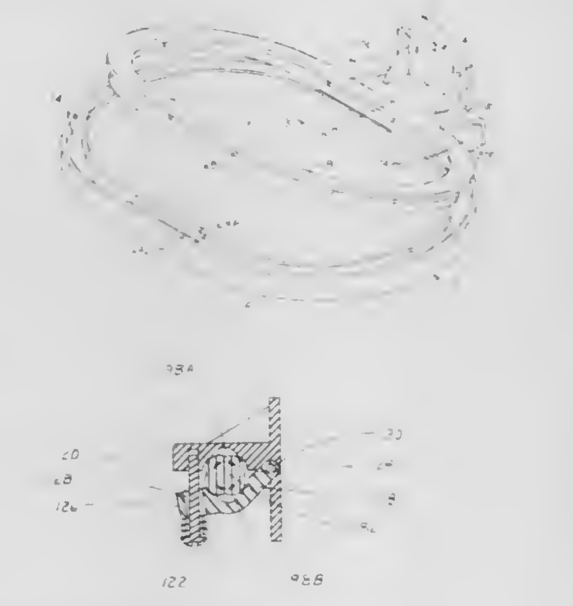
Ming-Ti Yu, 122-5, Jun Liao Road, Feng Yuan, Taichung Shien, Taiwan
Filed Dec. 28, 1997, Ser. No. 998,570
Int. Cl.⁶ F16M *11/38*
U.S. Cl. 248—166 **4 Claims**

1. A musical instrument stand comprising:
a first hollow plate, a second hollow plate, a first base rod, a second base rod, an adjustment knob, a balance seat, an annular cushion, a screw rod, and a swivel knob,
a lug disposed on the first base rod,
the lug having a round hole and an oblong hole,
the balance seat having a lateral post, a channel receiving the lug, a groove receiving a lower end of the first hollow plate, a first through aperture matching the oblong hole, and a second through aperture matching the round hole,

a positioning bolt passing through the first through aperture and the oblong hole to fasten the adjustment knob and the balance seat together,
a screw passing through the second through aperture and the round hole to fasten the lug and the balance seat together,
the second hollow plate disposed on the second base rod,
a first undulated bracket disposed on the first hollow plate,
a second undulated bracket disposed on the second hollow plate,
the first hollow plate having an upper lobe end,
the upper lobe end having a slot and a through hole,
the second hollow plate having an upper disk end,
the upper disk end having a center hole and a periphery flange,
the upper disk end inserted in the slot,
a screw rod having a head portion and a threaded portion inserted through the through hole, the center hole, and the swivel knob.

5,836,553
FOLDING BAG HOLDER

Steven W. Bergaila, 187 A Arlene Ct., Wheeling, Ill. 60090
Filed Feb. 8, 1996, Ser. No. 598,498
Int. Cl.⁶ B65B *67/04*
U.S. Cl. 248—99 **1 Claim**



1. I claim a pliable bag holder comprising:

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(A) a generally oblong annular bag support ring, comprising a central bag receiving area and an upwardly facing open channel extending uninterruptedly around the bag support ring periphery;
(B) a generally oblong lock ring, comprising a size and shape corresponding and complementary to that of said bag support ring, allowing said lock ring to engage the support ring;
(C) a bag gripping labyrinth like passageway, formed by the cooperating complementary shapes of said support ring and said lock ring;
(D) said bag support ring further comprising means for retaining said lock ring in a locked position when the lock ring is engaged and cooperating with the support ring;
(E) said lock ring further comprising cooperating means for allowing said support ring to retain the lock ring in the locked position when both support ring and lock ring are engaged and cooperating with each other;
(F) a pliable bag with a continuous sidewall and a closed end, and an open end comprising a mouth extending around the perimeter of said pliable bag, said open end being inserted upwardly through said central bag receiving area of said bag support ring, then turned outwards across said open channel, then reverted downwards around the periphery of the support ring so as to have a portion of the sidewall of said pliable bag spanning said open channel and thereby confining a portion of the bag sidewall in said labyrinth like passageway as the lock ring engages the support ring;
(G) means for flexibly attaching to and positioning said lock ring in proximity to said bag support ring in order to best facilitate the installation of the pliable bag into said bag holder;
(H) a—first—support arm, attached to and extending outwardly from the bag support ring periphery;
(I) a second support arm, extending coplanarly with said first—support—arm, the second arm being parallel to and located a predetermined distance from the first arm;
(J) an elongated index cam with appropriate cross sectional shape comprised of a plurality of lobes, so as to allow for a predetermined number of horizontal, vertical, and angled indexed holding positions of bag holder and bag, said elongated index cam having one end attached to the first support arm and a second end attached to the second support arm thereby spanning normally between the support arms and coplanarly with said bag support ring;
(K) a fixed elongated cam receiving clamp, comprising an elongated cam receiving channel having a cross sectional shape and size complementary to and mating with a portion of said elongated index cam;
(L) a pivoting elongated cam receiving clamp, comprising an elongated cam receiving channel having a cross sectional shape and size complementary to and mating with a portion of said elongated index cam, the pivoting clamp being attached to the fixed elongated cam receiving clamp via a pivot, said pivot being located so as to align the fixed clamp with said pivoting clamp so that both of the elongated cam receiving channels cooperate to grip around said elongated index cam with both channels simultaneously receiving and mating with said elongated index cam;
(M) means for variably and flexibly tensioning the pivoting clamp against the fixed clamp causing a clamping force to be exerted by both clamps against and around said elongated cam, as the cam index is rotated relative to the fixed clamp and pivoting clamp, said lobes of said elongated index cam rotate alternately in and then out of phase with respect to the mating receiving channels, as said elongated index cam lobes rotate out of phase with said cam receiving channels, the pivoting clamp pivots to a more open position thereby causing an increased tension in said flexible tensioning means, said increased tension thereby effecting a larger breakout force necessary to rotate the cam along with said pliable bag holder from one indexed position to another;
(N) a mounting plate both of attached to the elongated cam clamps, having slots or holes to allow for common fasteners to be utilized to attach the folding bag holder and bag assembly to a suitable surface.

5,836,554

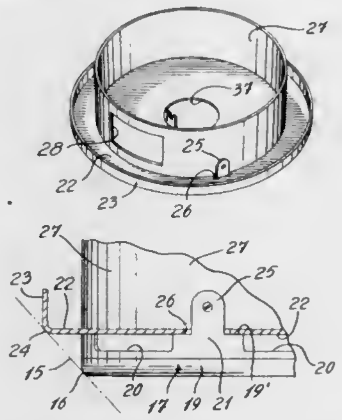
SUPPORT BASE FOR GAS WATER HEATERS

Claude Lesage, Pointe-Claire, Canada, assignor to Giant Factories Inc., Montreal, Canada

Filed Jun. 21, 1996, Ser. No. 667,474

Int. Cl.^{6} A47G *23/02*

U.S. Cl. 248—152 **8 Claims**



1. A support base for a gas-fired water heater tank, said base comprising a circular bottom dish having a flat bottom support wall and a tank supporting circumferential flange wall, a circumferential rounded edge between said bottom wall and circumferential flange wall, air passage means disposed spaced apart about said circumferential flange wall, a circular housing-support bottom wall secured on top of said circumferential flange wall and having further air passage means formed therein for admitting air to a burner chamber formed thereover by a circumferential sleeve secured and supported thereon and through said air passage means of said circumferential flange wall, said air passage means disposed about said circumferential flange wall being closely spaced to said circular housing-support bottom wall to cause a cooling circumferential air convection stream to cool said housing support-bottom wall, said circular housing-support bottom wall being adapted to secure said water heater tank thereto with said housing-support bottom wall spaced above a floor surface by said circular bottom dish, said circular bottom dish with said air passage means and said housing-support bottom wall providing a heat shield for said floor surface said air passage means creating said air convection stream to also prevent heat loss through said support base, said circular bottom dish permitting sliding and rolling displacement of said water heater tank on said floor surface without damage to said floor surface.

5,836,555

INDUSTRIAL CHAIR

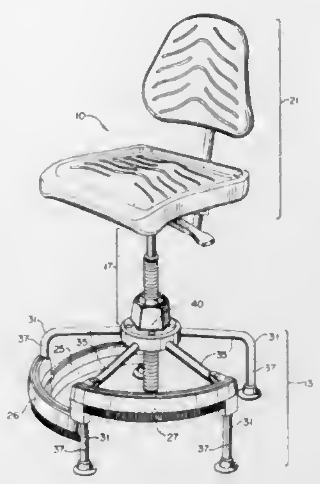
Thomas Lee Ellsworth, Shorewood; Alwin J. Stahel, and Peter Robert Fervoy, both of St. Paul, all of Minn., assignors to Safco Products Company, New Hope, Minn.

Filed Jun. 7, 1996, Ser. No. 664,243

Int. Cl.^{6} F16M *11/00*

U.S. Cl. 248—161 **20 Claims**

1. A mechanism for adjusting the position of a support column in relation to a fixed platform, comprising:
a) a support column having an exterior surface with a plurality of engaging means arranged along the length of the column for selectively engaging portions of a coupling:
b) a coupling shaped for selectively engaging the support column and positioning the support column relative to a fixed platform, the coupling having an inner surface shaped for contacting the support column engaging means in a substantially matched shape friction fit, the coupling further having adjustable circumference means for permitting selection between locking engagement and relative movement between the support column and the coupling;
c) retaining means for operably retaining the coupling in fixed relation to the support column: and



d) a fixed platform attached to the retaining means.

5,836,556

HOUSING HAVING ADJUSTABLE SUPPORT LEGS FOR LEVELING THE HOUSING

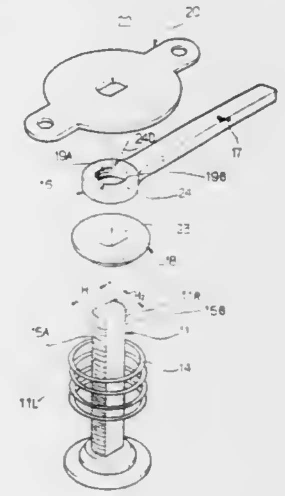
Ho Young Kim, Kyungki-Do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

Filed Feb. 2, 1996, Ser. No. 597,459

Claims priority, application Rep. of Korea, Feb. 4, 1995, 1995 1694

Int. Cl.^{6} F16M *11/24*

U.S. Cl. 248—188.4 **2 Claims**



1. A washing machine comprising a housing in combination with apparatus for enabling the housing to be made level, the housing carrying a guide member having a non-circular guide hole fixed against movement relative to the housing, the apparatus comprising:
a plurality of adjustment legs for supporting the housing on a support surface, each adjustment leg including an upper portion extending through a respective one of said guide holes: each adjustment leg including externally threaded structures spaced circumferentially apart by flats, whereby each adjustment leg is of non-circular cross section corresponding in shape to the respective said guide hole and is thereby prevented from rotating relative to the housing by the respective said guide hole;
a plurality of fixing members mounted on respective adjustment legs with the housing resting on the fixing members, each fixing member including a guide hole through which a respective adjustment leg extends, each fixing member being rotatable relative to its respective adjustment leg about an axis of the adjustment leg, the guide hole of each fixing member including circumferentially spaced internally threaded structures engageable with the externally threaded structures in one rotational position of the fixing member for preventing movement of the fixing member and housing relative to the adjustment leg along the leg axis, the internally threaded structures being disengageable from the externally threaded structures in another rotational position of the fixing member to permit the fixing member and housing to move relative to the adjustment leg along the axis of the adjustment leg; and
a plurality of coil compression springs mounted on respective adjustment legs for biasing a respective fixing member upwardly.

5,836,557

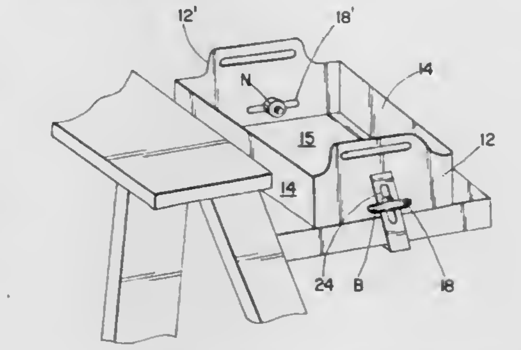
DETACHABLE UTILITY TRAY FOR STEP LADDER

Harold David Bailey, 407 Ross St., and Keith Alan Bailey, 408 Eastline Dr., both of Middletown, Ohio 45044

Filed Feb. 19, 1997, Ser. No. 801,023

Int. Cl.^{6} E06C *7/14*

U.S. Cl. 248—210 **6 Claims**



1. A utility tray assembly capable of being mounted on a support member of a ladder, such as a shelf or step, comprising:
a tray including parallel side walls, parallel end walls disposed normal to said side walls, and a bottom defining a plane and disposed normal to said side walls and said end walls, each of said end walls having a first slot therein extending in a direction parallel to the plane of said tray bottom, said tray bottom having an undersurface:
a strap having a body portion and opposing end portions situated along a longitudinal axis, each of said end portions including a slot therein extending in a direction parallel with said longitudinal axis of said strap, and
a fastener associated with each of said end walls and insertable through said slots in said end walls and said strap for securing said end portions of said strap to said tray end walls in such a manner that the support member of said ladder is captured between the body portion of said strap and said undersurface of said tray bottom.

5,836,558

ADJUSTABLE SIGN MOUNTING BRACKETS

Jack H. Kulp, San Juan Capistrano, Calif., and John D. McKenney, Arroyo Seco, N. Mex., assignors to Traffix Devices, San Clemente, Calif.

Continuation of Ser. No. 291,121, Aug. 16, 1994, Pat. No. 5,624,092. This application Aug. 16, 1996, Ser. No. 696,568

Int. Cl.^{6} A47B *96/06*

U.S. Cl. 248—218.4 **25 Claims**

1. An adjustable bracket for mounting a display sign on a post, said bracket being adapted for removable installation on said post and comprising:
a first surface adapted to abut said post along a first line of contact:

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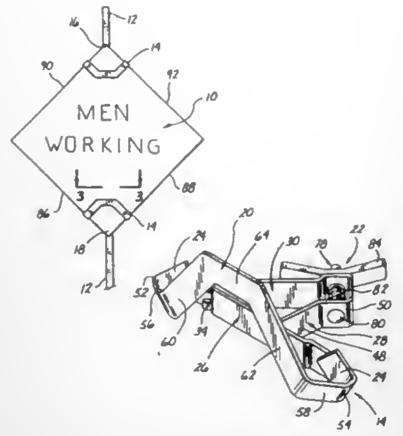
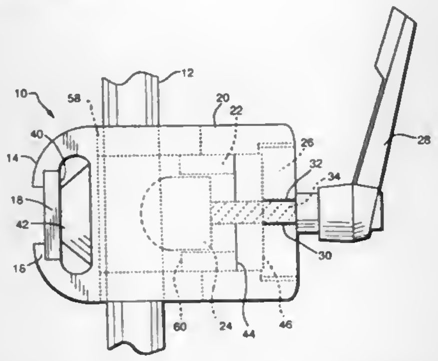


a second surface joined to said first surface which is adapted to abut said post along a second line of contact; and

a clamping plate comprising a substantially planar third surface having a first end which is attached to one of said first and second surfaces and a second end which is adjustable attached to the other of said first and second surfaces using an adjustable fastener, wherein the clamping plate is adapted to translate through a range of positions when said bracket is installed on said post, from a position wherein it does not contact said post, to a position wherein it firmly abuts said post along a third line of contact which lies at an acute angle with respect to each of said first and second lines of contact, the clamping plate having no other post contacting surface, so that the clamping plate is adapted to contact said post only along said third line of contact;

such that when said third surface does not contact the post or only loosely abuts the post along said third line of contact, the bracket may be moved vertically along the post or removed therefrom, and when said adjustable fastener is adjusted to cause the third surface to more firmly abut the post, the bracket is fixed at a predetermined vertical location thereon.

5,836,559
CLAMP FOR SECURING A POLE TO A STATIONARY OBJECT
Samuel Ronci, 416 Mittersill Rd., Franconia, N.H. 03580
Filed May 23, 1997, Ser. No. 862,975
Int. Cl.⁶ A47B ***96/06***
U.S. Cl. 248—230.3 **23 Claims**



1. A clamp for securing a pole to a stationary object, said clamp comprising:

a body, said body having a body pole bore formed therein for receiving said pole;

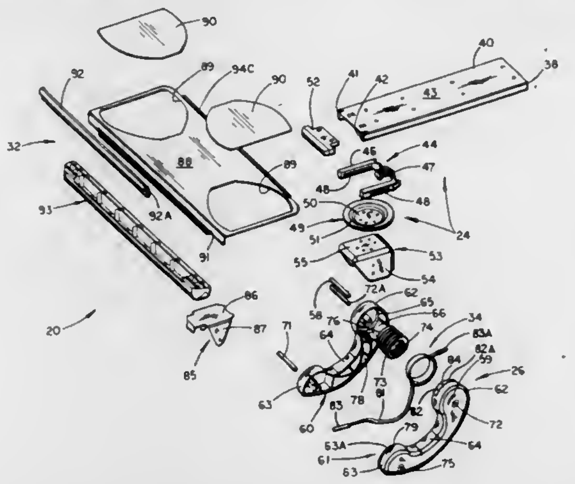
a plunger disposed in said body and being movable in said body, said plunger having a plunger pole bore formed therein for receiving said pole and a slot formed therein for allowing expansion of said plunger upon urging of said pole against a surface of said plunger pole bore;

a piston disposed in said plunger, said piston having a first and a second end and being movable in said plunger, said first end of said piston having a pole contacting surface; and

a shaft secured to said second end of said piston for causing movement of said piston within said plunger upon rotation of said shaft,

wherein said piston moves within said plunger upon rotation of said shaft for forcing said pole contacting surface against said pole and thereby urging said pole against said surface of said plunger pole bore to cause expansion of said plunger within said body.

5,836,560
ARTICULATED KEYBOARD SHELF
Jonathan Ira Kaplan, Palo Alto; David John Law, Burlingame; Kevin Scott Nason, Mountain View, all of Calif., and David K. Jones, Grand Rapids, Mich., assignors to Steelcase Inc., Grand Rapids, Mich.
Filed Nov. 22, 1995, Ser. No. 561,667
Int. Cl.⁶ E04G ***3/00***
U.S. Cl. 248—286.1 **39 Claims**



1. An adjustable support, comprising:

a mounting bracket adapted for attachment to a support surface;

a platform having a forward portion and a rearward portion thereof disposed generally opposite said forward portion;

a support arm having a first end thereof pivotally connected with said mounting bracket, and a second end thereof pivotally connected with said platform;

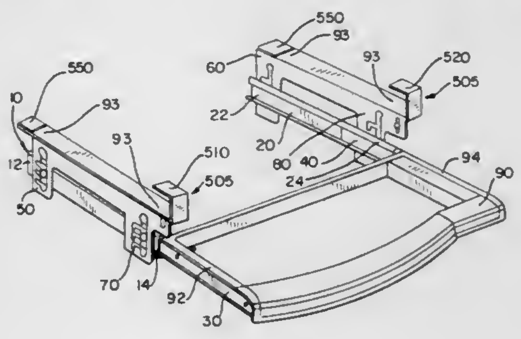
a lock drum fixedly mounted on said support arm; and

an elongate, flexible brake element wrapped around at least a portion of said lock drum, and having a first end thereof connected with said mounting bracket, and a second end thereof connected with said platform, whereby the moment of said platform and any device thereon tenses said brake element on said lock drum and locks said platform in its selected vertical position, and rotation of said platform about a pivotal coupling with the second end of the support arm releases said brake element on said lock drum and permits said platform to be adjusted to alternate vertical positions.

5,836,561
ANGLE-ADJUSTABLE CYMBAL HOLDER
Tsun-Chi Liao, Taichung, Taiwan, assignor to Hwa Shin Musical Instrument Co., Ltd., Taichung, Taiwan
Filed Jul. 28, 1997, Ser. No. 901,414
Int. Cl.⁶ E04G ***3/00***
U.S. Cl. 248—291.1 **4 Claims**

1. A cymbal holder assembly comprising a holder base adapted to hold a cymbal, a mounting base fastened to said holder base by a screw and a wing nut, and a constraint device mounted within said holder base and said mounting base and adapted to prohibit said holder base and said mounting base from a relative rotary motion, said constraint device comprising a flat friction rod holder block having a center through hole through which said screw passes and two sets of recessed holes at two opposite sides thereof, a first set of embossed friction rods and a second set of embossed friction rods respectively mounted in said recessed holes of said flat friction rod holder block, a first friction plate mounted within said holder base around said screw and prohibited from a rotary motion relative to said holder base and disposed in contact with said first set of embossed friction rods, and a second friction plate mounted within said mounting base and prohibited from a rotary motion relative to said mounting base and disposed in contact with said second set of embossed friction rods.

5,836,562
MOUNTING DEVICE FOR AN APPARATUS FOR SUPPORTING A KEYBOARD
Howard L. Danzyger, Aurora; James F. Caruso, Evanston; David C. Brown, Chicago; Michael C. Thuma, Des Plaines, and Michael J. Anguiano, Addison, all of Ill., assignors to Fellowes Manufacturing Company, Itasca, Ill.
Continuation-in-part of Ser. No. 699,900, Aug. 16, 1996. This application Apr. 29, 1997, Ser. No. 840,396
Int. Cl.⁶ A47F ***1/10***
U.S. Cl. 248—295.11 **20 Claims**

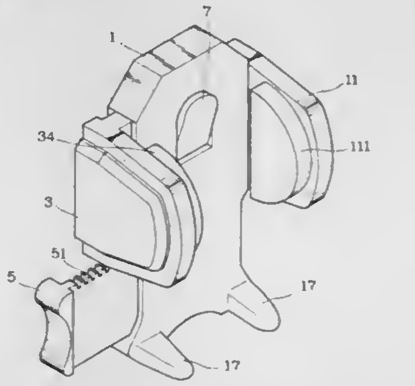


1. In combination with a support apparatus having a first mounting bracket with a first attachment plate, a second mounting bracket with a second attachment plate, and a first work surface slidably connected to the first and second mounting brackets, a mounting device for removably attaching the support apparatus to a second work surface, the mounting device comprising:

a first clamp and a second clamp, each clamp having a first wall, a second wall, and a third wall; and

wherein the first attachment plate is positioned between the first and third walls of the first clamp, and the second attachment plate is positioned between the first and third walls of the second clamp.

5,836,563
MOBILE PHONE HOLDER
Tao Hsin-Yung, 5Fl,No. 2, JienKang Rd., ChunghHo City, Taipei Hsien, Taiwan
Filed Sep. 12, 1997, Ser. No. 928,700
Int. Cl.⁶ A47G ***1/10***
U.S. Cl. 248—316.4 **2 Claims**



1. A mobile phone holder, comprising:

a frame having a clamp arm on a lateral side, two slots on another lateral side, two spaced feet at a bottom end and an opening at an upper portion; adjacent two lateral sides of the opening in the rear surface of the frame is two spaced pivot seats, nearby the clamp arm in the rear surface of the frame having a first stud;

a cover fastenable with the frame having a second stud located thereon;

a clamp slidable in the first slot having a first gear rack on a bottom edge thereof and a third stud in a rear surface thereof,

an elastic member engageable respectively at two ends with the first and the third studs;

a push button slidable in the second slot having a second gear rack on a top edge;

a gear located in the middle of rear surface of the frame between the two slots engageable respectively at a top with the first gear rack and at a bottom with the second gear rack;

a toggle member pivotally moveable in the opening of the frame having a rear recess adjacent a sideward projection, a horizontal shaft engageable with the pivot seats and a protrusive block at a bottom below the shaft; and

a spring engageable at two ends with the recess and the second stud for moving the toggle slantly outside the opening of the frame when external force is absent.

5,836,564
FAIL SAFE HOLD OPEN TELESCOPING ROD
John A. Duran, Glendodra, Calif., assignor to Avibank Mfg., Inc, Burbank, Calif.
Filed May 23, 1996, Ser. No. 652,100
Int. Cl.⁶ A47F ***5/01***
U.S. Cl. 248—354.5 **12 Claims**

1. A fail safe hold open rod comprising:

at least a pair of telescoping tubes, one of said tubes being disposed inside of the other and movable from a fully retracted position to a fully extending position; and

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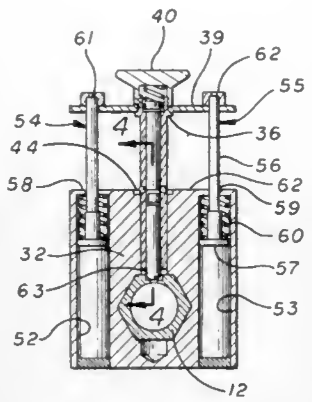
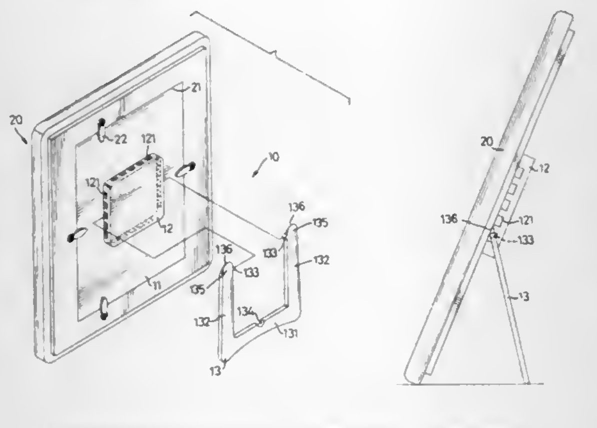


locking means associated with said tubes normally spring biased into a position locking one of said tubes with respect to the other, said locking means further including hold open means for holding said locking means away from locking engagement with said tubes during extension of one tube with respect to the other, said locking means including a first pair of vertically aligned holes in said tubes, said locking means further including a locking pin movable from a first position into said aligned holes to a second position out of engagement with said aligned holes, said locking means also including biasing means associated with said pin normally biasing said pin toward said holes, said locking means further including a housing mounted to one of said tubes, said pin being centrally mounted in said housing, and biasing means disposed on each side of said pin and coupled thereto normally biasing said pin toward said holes, said hold open means including a groove about the periphery of said pin, at least one ball member disposed in said groove, said pin being reciprocal within a sleeve and movable therewith, said sleeve having at least one opening through which said ball extends when said locking means is in a locking position with respect to said tubes, said housing having an upper end and a cavity therein at the upper end thereof surrounding said sleeve, said ball being adapted to enter said cavity when said pin is moved out of engagement with said holes preventing said sleeve from moving toward said holes.

5,836,565

SUPPORTING DEVICE FOR A PICTURE FRAME

Yao-ming Chang, No. 40, Lane 40, Sec. 3, Chungyang N, Rd., Peitou Dist., Taipei, Taiwan
Filed Jan. 27, 1997, Ser. No. 789,655
Int. Cl.^{6} A47G *1/24*
U.S. Cl. 248—456 **11 Claims**



1. A supporting device for a picture frame, comprising:

a mount adapted to be securely attached to a picture frame back, the mount having one or more pairs of opposite sides defined on a periphery thereof;

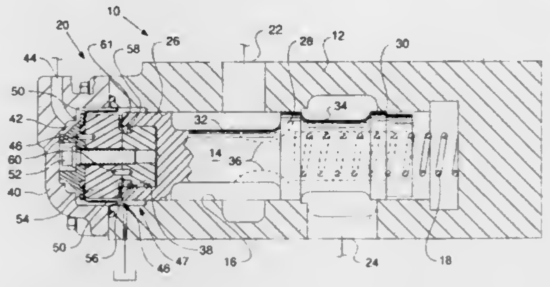
a support piece having a pair of legs and an intermediate beam interconnecting the pair of legs, each leg having a terminal portion; and

means for selectably attaching each of the pair of legs onto a corresponding one of a selected pair of opposite sides of the mount to maintain the support piece at a predetermined inclination with respect to the mount, wherein the means for attaching comprises one or more holes in each of the one or more opposite sides of the mount and a respective tab on each leg selectively engageable into a respective hole of a corresponding one of each pair of opposite sides, and further wherein the tab of each leg has a substantially rectangular cross-section, each hole on each side of the mount is substantially rectangular, an end of the terminal portion of each leg abuts a surface of the picture frame back and an edge of the tab of each leg abuts a wall surface of the rectangular hole when the support piece is at the predetermined inclination.

5,836,566

CONNECTOR MECHANISM FOR A VALVE SPOOL AND A DIAPHRAGM

David E. Bullard, Washington; Gregory A. Menke, East Peoria; James G. Starling, Pekin, and Daniel J. Whiting, Bloomington, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.
Filed Aug. 22, 1997, Ser. No. 920,262
Int. Cl.^{6} F16K *31/145*
U.S. Cl. 251—61.2 **7 Claims**



1. A connector mechanism adapted to permit relative rotation between a spool of an air actuated valve and a diaphragm of an air actuating mechanism, the air actuated valve having a housing, a spool slideably disposed in a bore defined in the housing, and first and second spaced apart ports connected to the bore, the air actuating mechanism having a housing connected to the housing of the air actuated valve, a actuator member connected to the spool at one end thereof, an air chamber, and a diaphragm connected between one of the housings and the actuator member, the connector mechanism comprising:

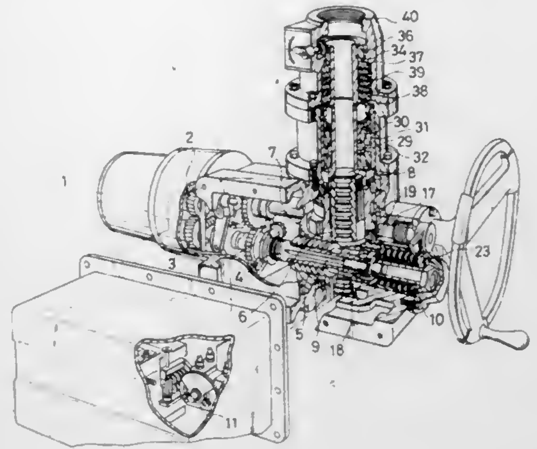
a connector member firmly connected to the actuator member and the diaphragm at one end thereof and connected at the other end thereof to one end of the spool to permit relative rotation between the connector member and the spool.

5,836,567

APPARATUS FOR CONTINUOUS DETECTION OF LOAD IN AN ELECTRIC VALVE ACTUATOR

Susumu Watanabe, Hiratsuka, Japan, assignor to Nippon Gear Co.,Ltd., Japan
PCT No. PCT/JP93/01704, § 371 Date Apr. 30, 1996, § 102(e) Date Apr. 30, 1996, PCT Pub. No. WO95/14186, PCT Pub. Date May 26, 1995
PCT Filed Nov. 19, 1993, Ser. No. 637,702
Int. Cl.^{6} F16K *31/05*
U.S. Cl. 251—129.12 **7 Claims**

1. An apparatus for continuous detection of load in an electric valve actuator in which a worm shaft which is rotated by a motor is engaged in a tubular worm axially slidable, but not to rotatable,



a valve element being so that the worm shaft may rotate together with and slide axially in the tubular worm, thereby opening and closing a valve, comprising:

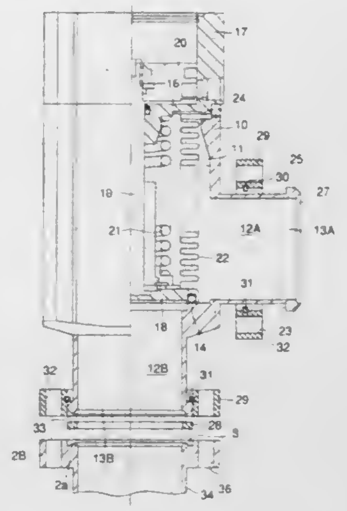
a pressure receiving portion provided perpendicular to an axis of said tubular worm to receive thrust based on axial movement of said tubular worm, and

a strain gauge mounted on the pressure receiving portion so that torque of said motor may be detected by resistance variation of the strain gauge depending on deformation of the pressure receiving portion.

5,836,568

HIGH-VACUUM VALVE

Tsuneo Ishigaki, and Keiichi Shibuya, both of Yawara-mura, Japan, assignors to SMC Corporation, Japan
Filed Jun. 6, 1997, Ser. No. 870,795
Claims priority, application Japan, Jun. 14, 1996, 8-174418
Int. Cl.^{6} F16K *17/36*
U.S. Cl. 251—148 **2 Claims**



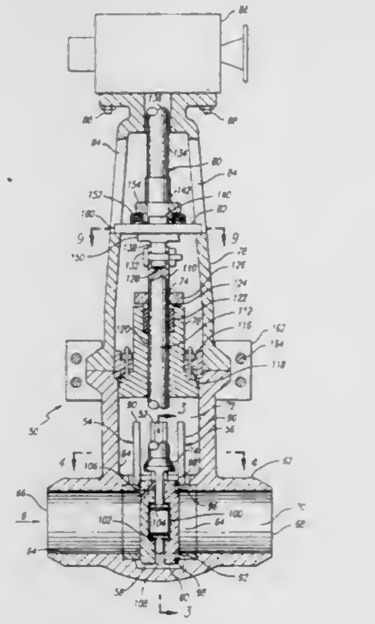
1. In a high-vacuum valve of the type wherein a plurality of ports are communicated with a valve chamber in a valve body through respective tubular portions, and a valve seat is formed in a flow path connecting said valve chamber and one of said tubular portions, and wherein said flow path is closed by bringing a valve element into contact with said valve seat, and said flow path is opened by separating said valve element from said valve seat,

the improvement wherein an annular space for interposing a metallic annular gasket is formed at an end portion of a tubular portion of an aluminum alloy that forms a port, and a seal portion is formed on an inner wall that forms said annular space, and wherein said seal portion or a whole of said valve body is subjected to an oxalic acid anodic oxidation coating treatment, thereby enhancing compression strength of said seal portion and preventing said seal portion from being damaged, deformed and sticking to said metallic annular gasket.

5,836,569

GUIDED GATE VALVE

David A. Wurangian, Granada Hills, Calif., assignor to Flowserve Management Company, Irving, Tex.
Division of Ser. No. 420,231, Apr. 11, 1995, Pat. No. 5,704,594. This application Aug. 8, 1997, Ser. No. 908,904
Int. Cl.^{6} F16K *3/18*
U.S. Cl. 251—327 **19 Claims**



1. A gate valve comprising:

a valve body having an interior surface defining an interior chamber with an upstream opening, a downstream opening and an internal passage therebetween;

an upstream valve seat mounted to the valve body and defining an opening in the passage between the upstream opening and the downstream opening;

a downstream valve seat mounted to the valve body and defining an opening in the passage between the upstream opening and the downstream opening;

a guide rail mounted to the valve body between the upstream valve seat and the downstream valve seat; and

a first gate and a second gate each having a sealing surface, the gates mounted movably within the interior chamber of the valve body with their sealing surfaces in parallel, each gate movable between an open position wherein fluid communicates between the upstream opening and the downstream opening, and a closed position wherein the sealing surface of each gate is positioned adjacent the opening of its respective valve seat to prevent fluid communication between the upstream opening and the downstream opening of the passage,

wherein the first gate is located longitudinally between the upstream valve seat and the guide rail and guided by at least one of the upstream valve seat and the guide rail as the first gate moves between the open and closed positions, and

the second gate is located longitudinally between the guide rail and the downstream valve seat and guided by at least one of the downstream valve seat and the guide rail as the second gate moves between the open and closed positions.

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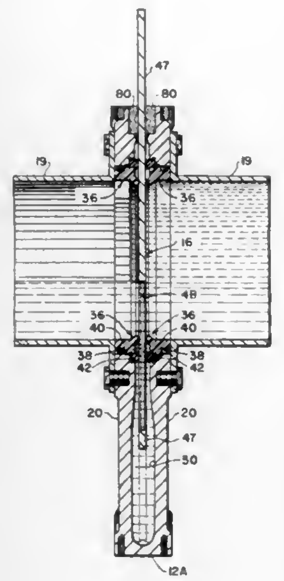
5,836,570
GATE VALVE SEAT

Robert Blenkush, St. Cloud; David Thomas, St. Joseph, and Richard Reugemer, St. Cloud, all of Minn., assignors to General Signal Corporation, Stamford, Conn.

Filed Sep. 25, 1996, Ser. No. 710,993

Int. Cl.⁶ F16K *3/03*

U.S. Cl. 251—328 7 Claims



2. A gate valve comprising:
a valve housing having high pressure and low pressure sides, and having first and second housing walls secured together in face to face relationship with an aperture extending through each housing wall in alignment about a central axis so as to define a chamber, including a gap, therebetween; said first housing wall being on the high pressure side of the valve housing, and said second housing wall being on the low pressure side;
a sealing ring formed of an elastomeric material and having a valve seat extendable into the gap a predetermined distance, the sealing ring extending axially and lining the aperture of the first housing wall;
a gate plate, having opposite sides, disposed within the chamber and formed with an imperforate section and an apertured section in sliding contact with said valve seat and reciprocable between an open position wherein the apertured section is located between the wall apertures to provide a port for fluid flow, and a closed position wherein the imperforate section is located between the wall aperture to prevent fluid flow through the port; said port having a high pressure portion and a low pressure portion corresponding with the respective sides of the valve housing;
a guide ring of load bearing material on each side of the gate plate for absorbing the compressive load resulting from the difference in pressure between the opposite sides of the gate, said guide rings extending axially and lining the respective wall apertures, said guide rings having an inner periphery greater than the inner periphery of said sealing ring, said guide rings projecting axially oppositely within the chamber to compressively engage said gate plate;
first cavity defined between an inner portion of said sealing ring which is radially outwardly of the valve seat and the imperforate section of said gate plate;
a second cavity extending below said guide rings; and
means for venting the fluid pressure existing in said first cavity to the low pressure portion of the port including means for establishing fluid communication between said first cavity and said second cavity.

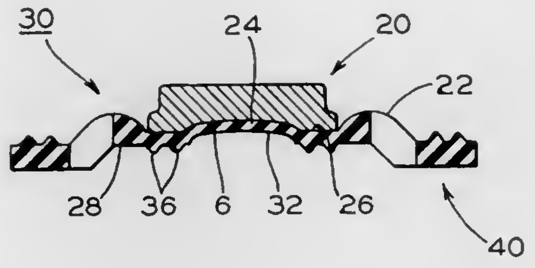
5,836,571
DISC DIAPHRAGM FOR AN INTERGRATED COCK VALVE

Lawrence R. Streitman, Pittsburgh; Lawrence M. Kushnir, Jr., Huntingdon, and Ronald M. Markos, Harrison City, all of Pa., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Jul. 18, 1997, Ser. No. 896,464

Int. Cl.⁶ F16K *31/126*

U.S. Cl. 251—331 20 Claims



1. A combination disc diaphragm assembly for use in a preselected valve assembly, said combination disc diaphragm assembly comprising:
- (a) a disc portion having a first configuration, said disc portion including:
  - (i) a generally round center portion having a first predetermined diameter and a first predetermined thickness,
  - (ii) a generally round outer portion formed as a protrusion and extending outwardly from an outer periphery of said generally round center portion adjacent a bottom surface thereof, said generally round outer portion having a second predetermined diameter which is greater than said first predetermined diameter of said generally round center portion and a second predetermined thickness, and
  - (iii) a domed shaped cavity formed in said bottom surface of said generally round center portion and substantially in a center thereof, said domed shaped cavity having a first radius; and
- (b) a generally round diaphragm member having a second configuration, said diaphragm member including:
  - (i) a convex portion formed in a center portion of said diaphragm member,
  - (ii) a first side having a dome shaped projection disposed as part of said convex portion of said diaphragm member, said domed shaped projection having a second radius, said first side of said diaphragm member having a generally flat surface adjacent an outer periphery of said convex portion, and
  - (iii) a second side having a dome shaped cavity disposed as part of said convex portion of said diaphragm member, said domed shaped cavity having a third radius; and
- (c) means connected to each of said bottom surface of said generally round center portion and a surface of said cavity formed in said generally round center portion and a bottom surface of said generally round outer portion of said disc portion and a surface of said dome shaped projection disposed as part of said convex portion of said first side of said diaphragm member and said generally flat surface adjacent said outer periphery of said convex portion for bonding said convex portion of said first side of said diaphragm member to said bottom portion of said disc portion of said combination disc diaphragm assembly.

5,836,572
METHOD FOR CONSTRUCTING AN OUTDOOR STRUCTURE SUCH AS A GATE POST, GATE WING, OR FENCE

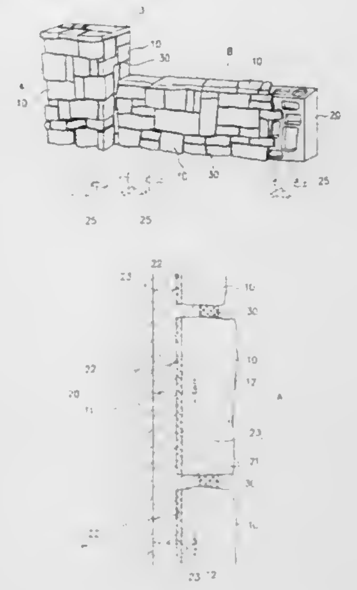
Shigeyuki Sugiyama, Nigano-Ken, Japan, assignor to Toyo Exterior Co., Ltd., Tokyo, Japan

Division of Ser. No. 579,874, Dec. 28, 1995, Pat. No. 5,713,561. This application Mar. 31, 1997, Ser. No. 829,638

Claims priority, application Japan, Dec. 30, 1994, 6-339570

Int. Cl.⁶ E04H *17/14*

U.S. Cl. 256—19 1 Claim



1. A method for producing a structure comprising the steps of:
molding a plurality of artificial stones in different shapes;
indicating a mark on each of the artificial stones;
making a substrate of an elastic foamed plastic material,
. said substrate having a surface and being provided on its surface with a plurality of artificial stone receiving recesses and a plurality of ribs protruding from the substrate surface, said recesses being defined and bordered by said protruding ribs in conformity with the respective different shapes of the artificial stones, each of the ribs having a height smaller than a thickness of the artificial stone it borders;
indicating a mark on each of the artificial stone receiving recesses;
conforming the artificial stones with the the artificial stone receiving recesses by checking the respective marks indicated on the artificial stones and the artificial stone receiving recesses;
inserting the artificial stones in the corresponding recesses for a provisional fixation;
forming a joint by embedding a joint material in a gap defined between respective pairs of adjacent artificial stones, the joint material supported by the ribs acting as a joint base;
adhesively fixing the artificial stones inserted into the recesses.

5,836,573
CLAMPING DEVICE

Takehiko Hayashi, Toyota; Takaaki Hayashi, Kariya; Sentarou Sugita, Nagoya, and Takeshi Nishikayama, Kariya, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

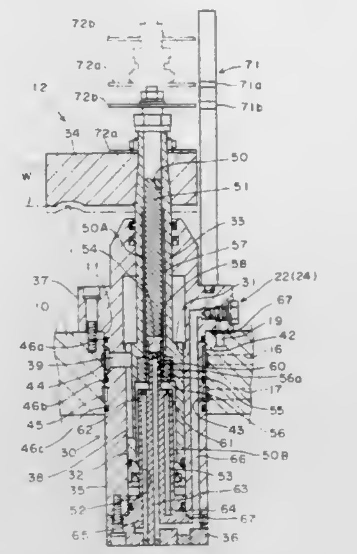
Filed Dec. 24, 1996, Ser. No. 773,309

Claims prinrity, application Japan, Dec. 26, 1995, 7-339450

Int. Cl.⁶ B23Q *3/00*

U.S. Cl. 269—20 8 Claims

1. A clamping system for clamping a workpiece, comprising:
a fixture base having at least one installing hole;



a clamping device inserted in each said at least one installing hole,
clamping fluid supplying passages formed in the fixture base for supplying clamping fluid, one end of each of said clamping fluid supplying passages being connected to each said at least one installing hole;
detection fluid supplying passages formed in the fixture base for supplying detection fluid;
a clamping in member;
a cylinder unit formed in said clamping member configured to move said clamping member in directions for clamping and unclamping the workpiece;
a piston movable in said cylinder unit so as to define two fluid chambers for moving said piston;
a detection u nit in said clamping device for detecting operation conditions of the clamping member, said detection unit includes detection fluid passages formed in said clamping device, a plurality of nozzles in said cylinder unit which are to be opened and closed by movements of said piston, and pressure switches for detecting a pressure of the detection fluid in said detection fluid supplying passages formed in said fixture base, wherein one end of each of said detection fluid supplying passages is connected to each of said at least one installing hole, wherein one end of each of said detection fluid passages is connected to one of said nozzles, and wherein other end of each of said detection fluid passages is communicated with said detection fluid supplying passages formed in the fixture base when said clamping device is installed in a respective installing hole; and
clamping fluid passages formed in said clamping device, wherein one end of each of said clamping fluid passages is connected to one of said fluid chambers, and wherein other end of each of said clamping fluid passages is communicated with said clamping fluid supplying passages formed in the fixture base when said clamping device is installed in a respective installing hole.

5,836,574
CLAMPING DEVICE OF MACHINE TOOL

Sung-Bu Park, #401, 101dong Pungrim Apt., 13, Kwankyo-Dong, Nam-Ku, Incheon, Rep. of Korea

Filed Apr. 2, 1997, Ser. No. 832,022

Claims priority, application Rep. of Korea, Apr. 4, 1996, 1996-7172; Aug. 11, 1996, 1996-38987; Japan, Apr. 2, 1997, 1997-1620; Rep. of Korea, Apr. 2, 1997, 1997-1619

Int. Cl.⁶ B23Q *3/00*

U.S. Cl. 269—93 8 Claims

1. A clamping device of machine tool for holding down a workpiece placed on a table of a machine tool, said clamping device comprising:

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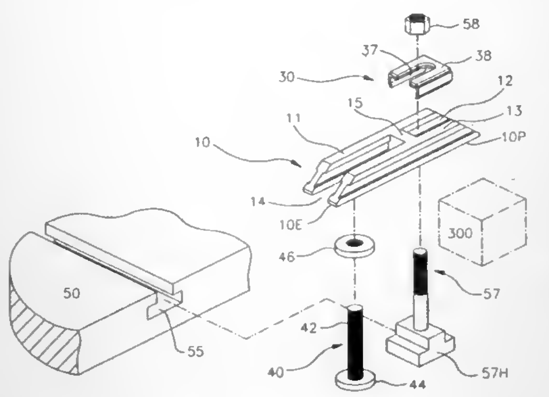
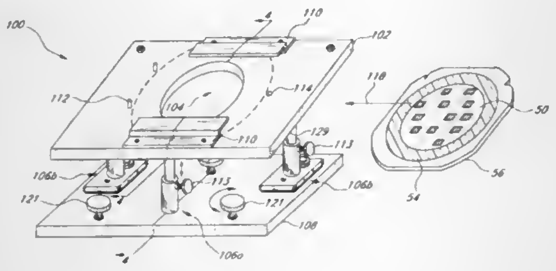


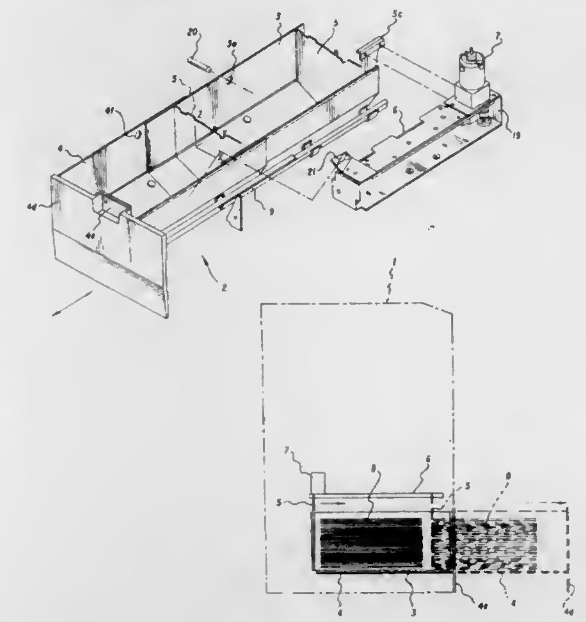
- a fastening bolt, of which a head portion is inserted in a groove formed in said table, and of which an upright extending free end is threadedly coupled to a fastening nut;
- a clamping member having a pair of bodies longitudinally extended, and a reinforcer disposed between said bodies with a space though which said fastening bolt passes, and said bodies having a longitudinal groove along a side wall, respectively; and
- a washer member disposed on said bodies and having a slot at the center portion of said washer member for receiving said fastening bolt, said fastening nut disposed on said washer member, and said washer member slidingly moving in the longitudinal direction of said bodies with a guidance of said groove of said clamping member.

5,836,575
WAFER MANUAL HANDPICK STATION
Keith Robinson, Caldwell, and Robert Villa, Boise, both of Id., assignors to Micron Electronics, Inc., Nampa, Id.
Filed Oct. 30, 1996, Ser. No. 741,043
Int. Cl.^{6} B65G *47/00*
U.S. Cl. 269—317 **15 Claims**



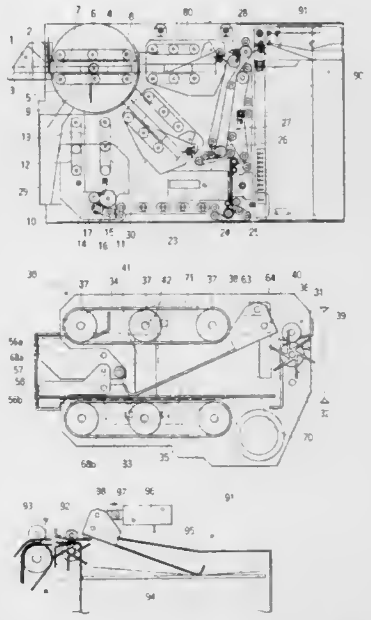
1. A wafer stand, comprising:
- a pedestal;
- a top plate having a substantially planar upper surface and an aperture extending through its thickness;
- a plurality of supports each having a first end and a second end, said supports interposed between said pedestal and said top plate, said supports further having an adjustable telescoping portion and an articulated joint at both first and second ends; and
- a positioning mechanism for maintaining a wafer in proximity to said top plate and in relative alignment with said aperture.

5,836,576
APPARATUS FOR REMOVING COPIES AND/OR DOCUMENTS FROM A MACHINE
Felix Ebner; Ulrich Fischer; Gerhard Glemser; Peter Herbster; Juergen Ries, and Helmut Stohrer, all of Stuttgart, Germany, assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Oct. 8, 1996, Ser. No. 731,037
Claims priority, application Germany, Oct. 13, 1995, 195 38 065.7
Int. Cl.^{6} B65H *31/30*
U.S. Cl. 270—58.02 **11 Claims**



1. Apparatus for removing copies and/or documents from a machine and in particular machine for collating and folding and/or binding into documents copies received from a copier, the said apparatus having a catch and removal tray which is movable drawer fashion from a first position inside the machine in which it acts as a catch tray for copies or documents to a second position in which it extends outwards from the machine thus allowing the copies and/or documents to be removed characterized in that:
- said catch and removal tray (**2**) can be extended telescopically outwards from said machine (**1**) and has a fixed (**3**) and a movable (**4**) tray section;
- said fixed section of the tray (**3**) is located inside said machine (**1**) and acts as a catch tray for copies and/or documents (**8**) placed more or less flat on top of one another;
- said movable section of the tray (**4**) acts as a removal tray for the copies and/or documents (**8**) when drawn outwards from said machine (**1**) to its extended position;
- in lateral cross-section, at right angles to the direction of movement of the movable section of said tray (**4**), said two sections of said tray (**3**; **4**) are essentially identical being "U" shaped with an open top and each having an essentially horizontal bottom panel (**3***a*, **4***a*) and vertical side panels (**3***b*, **3***c*; **4***b*, **4***c*) running parallel to the direction of movement of said movable section of the tray (**4**);
- said movable section of the tray (**4**) runs parallel to and slides underneath said fixed section of the tray (**3**) thus enveloping it, and;
- a sliding panel (**5**) which is movable in the same direction as the direction of movement of said extending section of said tray (**4**) extends downwards into said fixed section of the tray (**3**) and can be moved from an initial backward position outside said storage area of the tray to a forward position (**8**) in said tray into the movable, extended section of said tray (**4**).

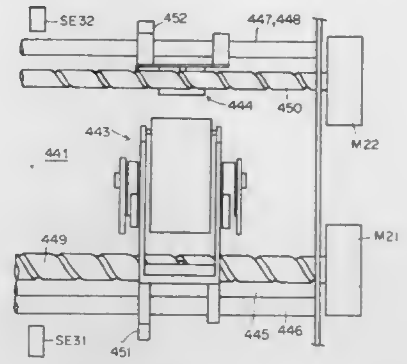
5,836,577
BILL HANDLING MACHINE
Junichi Arikawa, Kawaguchi; Yoshiyuki Katoh, Tokyo; Toru Inage, Kasukabe; Wataru Iida, Matsudo, and Hideo Atsumi, Sayama, all of Japan, assignors to Laurel Bank Machines Co., Ltd., Tokyo, Japan
Filed Feb. 4, 1997, Ser. No. 795,386
Claims priority, application Japan, Feb. 29, 1996, 8-043527; Dec. 10, 1996, 8-329788
Int. Cl.^{6} G07F *7/04*
U.S. Cl. 270—58.04 **27 Claims**



1. A bill handling machine provided with a bill stacking device comprising a bill press member whose leading end portion is swingably supported and which is adapted to guide bills downwardly, bill press member driving means for pressing the leading end portion of the bill press member downwardly, sensor means for detecting rear end portions of bills to be stacked, and control means for actuating, based on a detection signal, the bill press member driving means when a predetermined time period has passed after the sensor means detected the rear end portion of the bill.

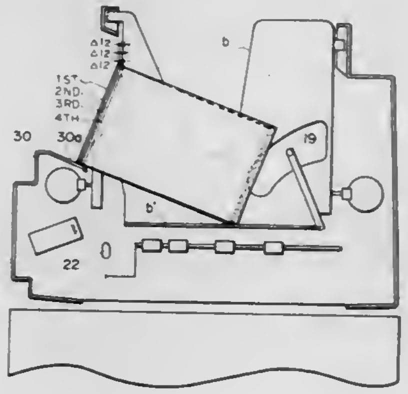
5,836,578
FINISHING APPARATUS PROVIDED WITH STAPLING FUNCTION
Ryo Hirano, Toyohashi; Yuji Taguchi, Itami, and Shinji Wakamatsu, Toyokawa, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan
Filed Mar. 21, 1997, Ser. No. 821,444
Claims priority, application Japan, Mar. 22, 1996, 8-066143; Mar. 22, 1996, 8-066144
Int. Cl.^{6} B65H *39/02*
U.S. Cl. 270—58.11 **24 Claims**

1. A finisher which staples a set of sheets discharged from an image forming apparatus comprising:
- sheet stacking means which receives and stacks sheets discharged from the image forming apparatus;
- a staple head which drives staples into the stacked set of sheets;
- a staple anvil which receives and bends staples driven from the staple head;
- first moving means which moves the staple head in a first direction;
- second moving means which moves the staple anvil in a second direction;
- the first and second directions are substantially parallel to each other; and



- the first moving means and the second moving means move the staple head and the staple anvil independently.

5,836,579
SHEET POST-PROCESSING APPARATUS WITH STACK INCLINING MEANS
Kenichi Hayashi, Tokyo; Yoshifumi Takehara, Yokohama, and Katsuhito Kato, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 662,181, Jun. 12, 1996, abandoned, which is a continuation of Ser. No. 120,345, Sep. 14, 1993, abandoned. This application Aug. 12, 1997, Ser. No. 909,630
Claims priority, application Japan, Sep. 17, 1992, 4-248006
Int. Cl.^{6} B65H *39/11*; **G03G** *15/001*
U.S. Cl. 270—58.16 **41 Claims**



1. A sheet post-processing apparatus comprising:
- a plurality of sheet receiving trays vertically arranged with space between adjacent ones for accommodating sheets;
- sheet discharging means for discharging sheets to said plurality of sheet receiving trays;
- a passage for permitting the sheet to be taken out from a front side in an inclined direction; and
- sheet inclining means for inclining the sheets on said sheet receiving tray to facilitate taking-out of the sheets from the passage, said sheet inclining means extending in a direction of arrangement of said plurality of trays to incline all of said sheets in said plurality of trays together.

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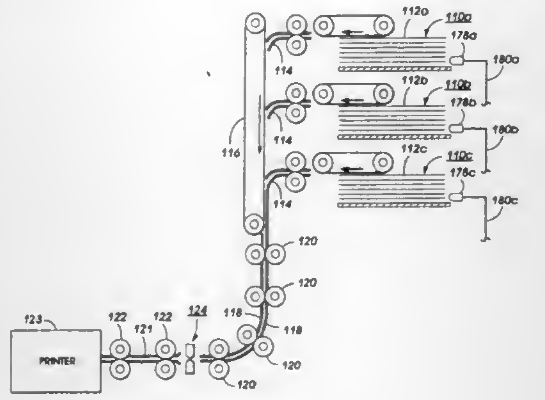
5,836,580
SINGLE TRAY AND MULTI TRAY MISFEED DETECTOR WITH VOLTAGE RESPONSE ADJUSTMENT

Paul Hansen, Westminster, and Sheldon F. Raizes, Rancho Palos Verdes, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 13, 1997, Ser. No. 782,323
Int. Cl.^{6} B65H *3/44*
U.S. Cl. 271—9.13 **3 Claims**

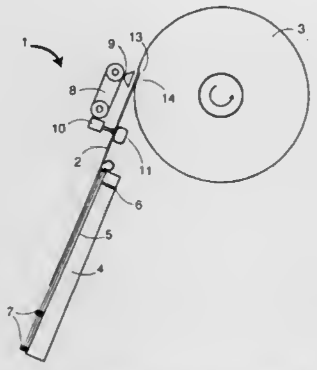


1. In a sheet transport system comprising:
a. a first tray for supporting a stack of sheets,
b. a second tray for supporting a stack of sheets,
c. a sensor located to sense a thickness or paper weight value of each sheet discharged from each of said trays,
d. said sensor comprising an emitter and a phototransistor being so constructed and arranged to receive sheets therebetween,
e. said emitter emitting light rays towards said phototransistor,
f. said sensor having voltage response in accordance with the amount of light sensed by said phototransistor,
g. condition changing means operably connected to said sensor for changing the conditions of voltage response of said sensor,
h. said conditions of voltage response being at least one condition for sensing sheets of a first given range of sheet thickness or paper weight value and a second condition for sensing sheets of a second given range of sheets that are thicker or heavier value than said first given range,
i. said sensor having a voltage response when in said one condition that is higher for a sheet of a given thickness or paper weight value than the voltage response for a sheet of the same given thickness or paper weight value when said sensor is in said second condition,
j. means for storing in memory a thickness or paper weight value sensed by said sensor of a given sheet from each of said trays,
k. said condition changing means for said sensor being responsive to a signal indicating a thickness or paperweight value of a sheet to be received by said sensor to set the condition of voltage response for said sensor in accordance with the given range of thickness or paper weight value corresponding to the thickness or paper weight value of the remaining sheets to be received from said trays,
l. means for comparing the thickness or paper weight value sensed by said sensor of each of the remaining sheets from said first tray with the thickness or paper weight value in memory sensed by said sensor of the given sheet from said first tray, when said sensor was in the same voltage response condition corresponding to the given range of thickness or paper weight value for sensing the remaining sheets of said first tray, and generating a signal indicating a misfeed if the values differ by a predetermined amount, and
m. means for comparing the thickness or paper weight value sensed by said sensor of each of the remaining sheets from said second tray with the thickness or paper weight value in memory sensed by said sensor of the given sheet from said second tray, when said sensor was in the same voltage response condition corresponding to the given range of thickness or paper weight value for sensing the remaining sheets of said second tray, and generating a signal indicating a misfeed if the values differ by a predetermined amount.

5,836,581
DEVICE AND METHOD FOR LOADING A SHEET-LIKE MEDIUM

Marc Vernackt, Overmere, Belgium, assignor to Barco Graphics N.V., Ghent, Belgium

Filed Oct. 11, 1996, Ser. No. 729,391
Int. Cl.^{6} B65H *5/08*
U.S. Cl. 271—11 **13 Claims**



1. A loading device for loading a sheet-like medium on a drum, the loading device comprising:
a) means for supplying a vacuum to the interior of said drum;
b) a material supply device able to contain at least one sheet-like medium;
c) a mechanical device which picks up said sheet-like medium from the material supply device, transports said sheet-like medium to said drum, and releases said sheet-like medium; and
d) take-over means which engages the sheet-like medium at exactly one point approximately in the center of said sheet-like medium prior to the mechanical device releasing the sheet-like medium, wherein the takeover means allows the sheet-like medium to relax to a substantially tension-free state substantially onto the drum after the mechanical device releases the sheet-like medium; said means for supplying a vacuum supplying a vacuum to the interior of said drum after said take-over means engages the sheet-like medium.

5,836,582
SHEET FEEDING DEVICE WITH AIR INJECTORS FOR SEPARATING SHEETS

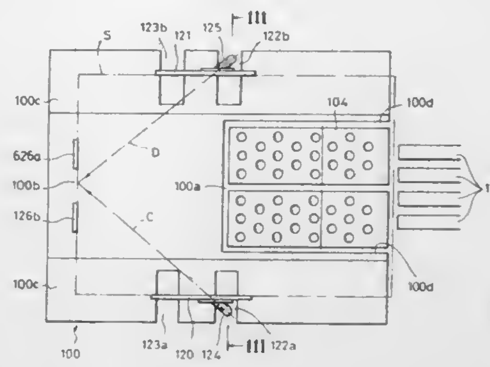
Hiroshi Ogawa, Yokohama; Michiro Koike, Kawasaki, and Yoshimitsu Nakane, Chigasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 412,317, Mar. 29, 1995, abandoned. This application Aug. 28, 1997, Ser. No. 919,350

Claims priority, application Japan, Apr. 4, 1994, 6-089101; Jul. 29, 1994, 6-197478

Int. Cl.^{6} B65H *5/08*
U.S. Cl. 271—12 **14 Claims**

1. A sheet feeding device comprising:
sheet supporting means for supporting sheets;
sheet feeding means for feeding the sheets supported by said sheet supporting means, said sheet feeding means including attraction means for attracting a sheet to said sheet feeding means by air suction; and
air injection means for injecting air toward edges of the sheets for separating, one by one, the sheets supported by said sheet supporting means,
wherein said air injection means comprises first air injection means for injecting air toward leading ends of the sheets supported by said sheet supporting means, and second air injection means disposed at a position on a side of the sheets supported by said sheet supporting means for injecting air from the side position toward a side edge of the sheets supported by said sheet supporting means, said second air injection means directing air toward the trailing ends of the sheet supported by said sheet supporting means, and
wherein said sheet supporting means is configured for supporting sheets of plural sizes; and further comprises control means for controlling said first and second air injection means to both inject air when sheets of a size greater than a predetermined size are loaded on said sheet supporting means, and only said first air injection means to inject air when sheets of a size smaller than the predetermined size are loaded.



5,836,583
DETECTION SYSTEM FOR DETECTING A POSITION OF A BALL ON A ROULETTE WHEEL

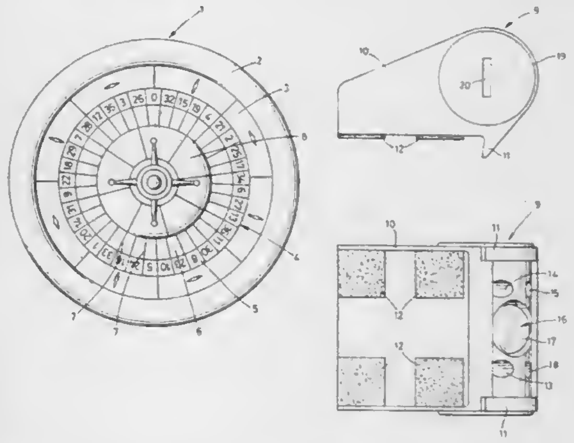
Paul Towers, Preston, United Kingdom, assignor to Technical Casino Services Ltd.

PCT No. PCT/GB95/00933, § 371 Date Oct. 24, 1996, § 102(e) Date Oct. 24, 1996, PCT Pub. No. WO95/28996, PCT Pub. Date Nov. 2, 1995

PCT Filed Apr. 25, 1995, Ser. No. 737,304

Claims priority, application United Kingdom, Apr. 26, 1994, 9408252

Int. Cl.^{6} A63F *5/02*
U.S. Cl. 273—142 B **16 Claims**

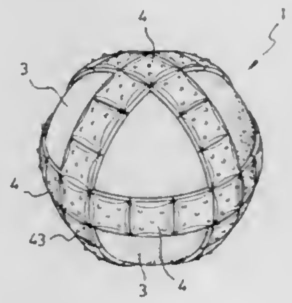


6. A roulette wheel comprising:
a static outer portion within which is mounted a rotatable cylinder with an outer numbers ring and a ring of pockets: and
a detection means mounted on the outer portion for detecting a location of a roulette ball in relation to the wheel, said detection means comprising:
  a light source operative to emit visible light which is directed at the numbers ring and the ring of pockets, said light source having at least one specific wavelength which is modulated and predetermined dependent on a relative chrominance of the rotatable cylinder and the ball:
  a sensor means operative to receive light reflected by the rotatable cylinder and the ball located thereon, said sensor means for detecting at least one modulated wavelength similar to said at least one specific wavelength emitted by the light source; and
means for analyzing the reflected light to determine a position of the rotatable cylinder and the location of the ball in relation thereto.

5,836,584
SPHERICAL PUZZLE TOY

Tsun Ding Chen, P.O. Box 82-144, Taipei, Taiwan

Filed Jul. 8, 1997, Ser. No. 889,843
Int. Cl.^{6} A63F *9/08*
U.S. Cl. 273—153 S **1 Claim**



1. A spherical puzzle toy comprising:
a spherical base formed of two semi-spherical shells and having a plurality of mounting holes spaced around the periphery, said semi-spherical shells being turned on an axis relative to each other, said semi-spherical shells including a first semi-spherical shell having a sleeve on the inside at the center, and a second semi-spherical shell having a split rod fitted into said sleeve, said sleeve having an inside annular groove around the inside wall, said split rod having a tapered head revolvably retained in said annular groove, said semi-spherical shells having raised portions and recessed portions alternatively engaged to keep tracks intersected:
a plurality of partition panels having a respective hooked coupling portion respectively hooked in each mounting hole, said partition panels defining a plurality of intersected tracks around the periphery of said spherical base: and
a plurality of slides moved in said intersected tracks and having raised portions at the top, which rub the user's palms when the user turns said semi-spherical shells with the hands:
wherein said intersected tracks are switched to one another to change the combination of said slides when said semi-spherical shells are turned relative to each other.

5,836,585
BOARD GAME WITH PLAYING CARD HOLDER

Robert LaCivita, Phoenix, Ariz., assignor to N-Fuego, LLC, Phoenix, Ariz.

Filed Mar. 6, 1997, Ser. No. 812,238
Int. Cl.^{6} A63F *3/00*
U.S. Cl. 273—287 **3 Claims**

1. A board game including in combination:
a main flat board member having at least two opposing player positions on an upper surface thereof with a predetermined number of card positions at each of said player positions:
card holder devices at each of said player positions comprising a plurality of rectangular raised areas corresponding to each of said predetermined number of card positions in a predetermined arrangement on said upper surface of said flat board member;
a plurality of separate removable individual containers, each for containing a card therein and each having a rectangular recess

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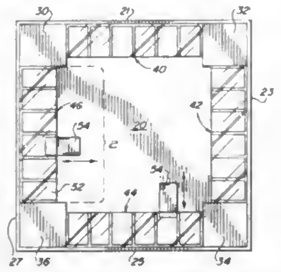
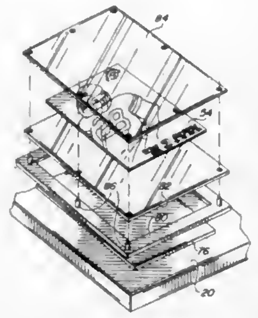
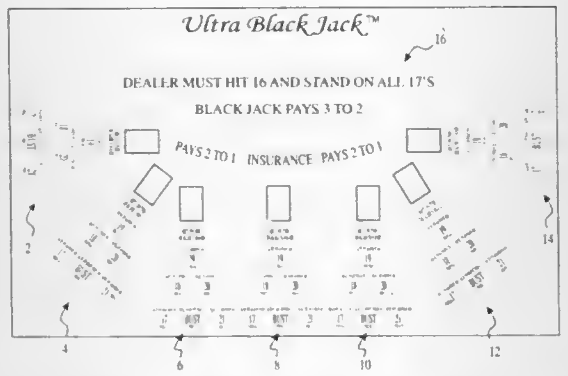




therein corresponding to said rectangular raised areas for location thereon, for aligning and removably displaying a predetermined number of flat rectangular cards in a predetermined arrangement at each of said player positions; and

wherein each of said containers is transparent at least on one surface thereof to permit viewing of a card contained therein.

5,836,586
METHOD OF PLAYING A MODIFIED TWENTY-ONE CARD GAME
Howard M. Marks, Westport, Conn., and Anthony M. Singer, Brooklyn, N.Y., assignors to PTT, LLC, Westport, Conn.
Filed May 20, 1997, Ser. No. 859,394
Int. Cl.^{6} A63F *1/00*
U.S. Cl. 273—292 **28 Claims**


Ultra Black Jack™
16
DEALER MUST HIT 16 AND STAND ON ALL 17'S
BLACK JACK PAYS 3 TO 2
PAYS 2 TO 1 INSURANCE PAYS 2 TO 1
BUST
BUST
2
4
6
8
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12
14

15. A method of playing a modified twenty-one card game between at least one player and a dealer with a deck of fifty-two playing cards, and a table layout having a playing surface with a plurality of player positions, one for each player, with at least one of a common and a plurality of individual dealer bet areas on each of said player positions, each of said player positions including distinguishable dealer bet areas representing all potential final dealer hand counts, comprising the steps of:

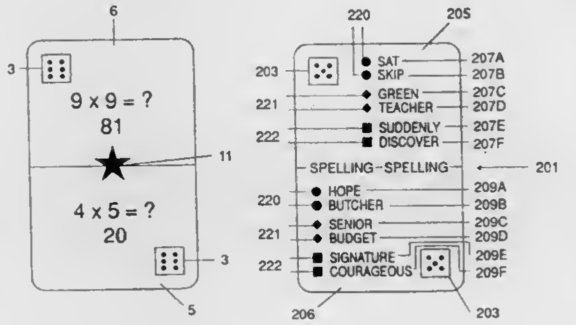
(a) each player selecting a number of said dealer bet areas, and placing wagers on the dealer bet areas selected, said number of wagers allowed to be placed ranging from placing one wager on one of said dealer bet areas, up to placing a plurality of wagers, on at least two and up to all of said dealer bet areas representing all potential final dealer hand counts;

(b) initially dealing a hand of two cards to at least the dealer to form the dealer hand, dealing additional cards to the dealer to receive more cards according to standard predetermined rules of twenty-one;

(c) determining the final dealer hand count by following the standard predetermined rules; and

(d) comparing the final dealer hand count to the dealer bet areas wherein said wagers were placed in placing step (a), and awarding the player responsive to the wagers and a coincidence between the final dealer hand count and the dealer bet areas.

5,836,587
PLAYING CARDS FOR AN EDUCATIONAL GAME
Harry Frederick Druce, 3 Roundwood Lane, Harpenden Hertfordshire AL5 3BW, and John Michael Druce, 33 Glen Trool Village, Newton Stewart Wigtownshire DG8 6TO, both of Great Britain
Continuation of Ser. No. 244,392, Sep. 27, 1994, Pat. No. 5,551,700. This application Jun. 14, 1996, Ser. No. 664,178
Claims priority, application United Kingdom, Oct. 14, 1992, 9221535; Sep. 20, 1993, 9319387
Int. Cl.^{6} A63F *1/00*
U.S. Cl. 273—296 **21 Claims**



17. A pack of playing cards for an educational game, comprising:

a) a number of sets of cards exactly equal to the number of faces on a die, each card having a front and rear face;

b) each rear face being identical to each other;

c) each card having disposed on said front face at least one question and answer;

d) each card having disposed thereon a depiction of at least one die-face on said front face; and

e) each card of each set having disposed thereon the depiction of the same die-face, the die-face being different in each set, and there being equal numbers of cards in each set.

5,836,588
INTERACTIVE WALL ART
Joanne Gerson, 7714 Stonehenge Dr., Cincinnati, Ohio 45242
Filed Apr. 10, 1996, Ser. No. 630,269
Int. Cl.^{6} A63B *67/00*
U.S. Cl. 273—348.4 **13 Claims**

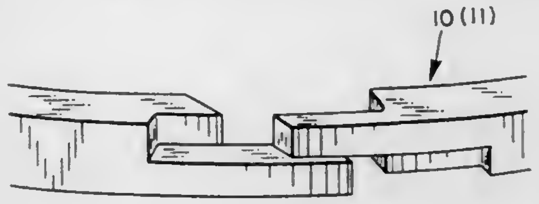
1. A game, comprising:

a projectile having an outside surface, the outside surface being covered with first attachment means; and

a repositionable, mural-like flexible sheet, wherein the sheet has a front surface and a back surface, the front surface illustrating a scene, at least a portion of the front surface being covered with a second attachment means that matingly corresponds to the first attachment means, and the back surface having adhesive material thereon, such that the sheet may be removably adhered to a wall without additional fasteners and

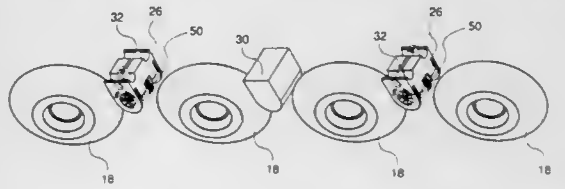
without damaging the wall, and wherein the adhesive material allows for reapplication of the sheet after removal.

5,836,589
SLIDING MEMBER FOR USE WITH LIGHTWEIGHT METAL
Tatsuei Sakata, Kashiwazaki, Japan, assignor to Kabushiki Kaisha Riken, Tokyo, Japan
Filed Jul. 30, 1997, Ser. No. 903,495
Claims priority, application Japan, Aug. 12, 1996, 8-227332
Int. Cl.^{6} F16J *9/28*
U.S. Cl. 277—407 **5 Claims**



1. A sliding member for sliding contact with a lightweight metal alloy, comprising polyetheretherketone resin and a binder having 15~20 percent by weight of amorphous alumina powder 3~8 percent by weight of graphite powder, and 6~9 percent by weight of carbon powder.

5,836,590
METHOD AND APPARATUS FOR SLOWING OR STOPPING A ROLLER SKATE
David N. Mitchell, Englewood; Gregory C. Sturgeon, Brighton, and James R. Leto, Jr., Denver, all of Colo., assignors to Out of Line Sports, Inc., Englewood, Colo.
Filed Feb. 18, 1997, Ser. No. 801,858
Int. Cl.^{6} A63C *17/14*
U.S. Cl. 280—11.2 **26 Claims**

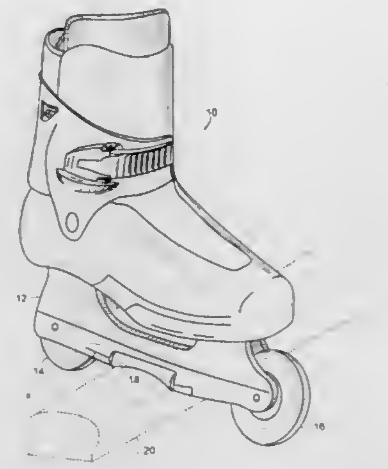


1. A braking system for a roller skate having a plurality of wheels, the system comprising:

at least one braking surface spaced-apart from the wheels; and

means between the braking surface and at least one of the wheels for slowing or stopping the wheel such that heat generated when slowing or stopping the wheel is created at the braking surface and is substantially prevented from reaching the wheel.

5,836,591
IN-LINE WHEELED SKATE FOR EXTREME SKATING
John A. Roderick, Scituate, and David R. Willis, Wakefield, both of R.I., assignors to Mearthane Products Corporation
Filed Oct. 11, 1996, Ser. No. 731,249
Int. Cl.^{6} A63C *17/06*
U.S. Cl. 280—11.22 **4 Claims**



1. An in-line wheeled skate comprising

an elongated frame extending in a longitudinal direction of travel of the skate;

a pair of longitudinally spaced wheels positioned in-line along the frame, each wheel being mounted to the frame for rotation about a fixed axis of rotation extending perpendicular to the longitudinal direction of said frame, the pair of wheels adapted to roll in the longitudinal direction of the frame upon a ground plane defined by lowermost portions of the wheels; and

an elongated roller positioned between said pair of wheels, the roller being mounted to said frame for rotation about a single axis extending in the longitudinal direction of the frame, the rotational axis of the roller being disposed between left and right longitudinal side planes defined by left and right lateral sides of said pair of wheels, the roller having an outer engagement surface configured for rolling contact with an elongated supporting surface extending transversely between the pair of wheels for permitting the skate to travel in a direction extending perpendicular to the longitudinal direction of said frame, a lowermost portion of the outer engagement surface of the roller being positioned vertically higher than the ground plane of the wheels.

5,836,592
STRUCTURE FOR IN-LINE ROLLER SKATES
Sheng-Hsiung Chang, No.510, Sec.5, Chung-Shin Road, San-Chung, Taipei, Taiwan
Filed Jan. 17, 1997, Ser. No. 784,993
Int. Cl.^{6} A63C *1/22;1/26*
U.S. Cl. 280—11.26 **1 Claim**

1. An improved structure of an in-line roller skate, comprised of members of a wheel seat, a skate quarter, a skate toe and a positioning sheet, wherein:

said wheel seat and said skate quarter are integrally formed, a front end of said wheel seat is provided on lateral sides thereof with a woven belt, while a receiving seat is provided on the front end of said skate quarter, said receiving seat is provided with a slide groove which is provided at an appropriate location thereon with a screw hole;

said skate toe is an arciform hood, a guide plate is provided on a rear bottom thereof, said guide plate is provided with an elongated slot which is engraved on a rear portion thereof with marks spaced by a suitable distance, said marks are

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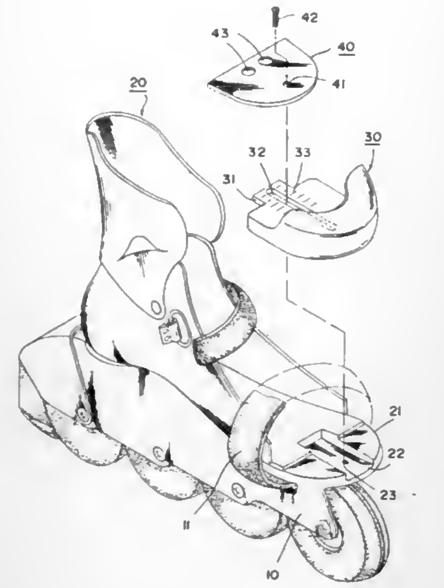


indicated with numbers of sizes in the U.S. system as well as in the British system, respectively on the two sides of said elongated slot;

said positioning sheet is semi-round and is provided with a screw hole with a screw which extends therethrough said positioning sheet is provided with two round viewing holes behind said screw hole;

said skate toe is placed on said receiving seat of said skate quarter while said guide plate on a bottom of said skate toe is engaged in said slide groove of said seat, said positioning sheet is press lapped on an inner surface of said skate toe, said screw extends through said screw hole-on said positioning sheet and said elongated slot of said skate toe, and is screwed into said screw hole in said slide groove of said seat, so that said skate toe and positioning sheet are locked on said skate quarter, said two viewing holes on said positioning sheet are aligned with said marks on said guide plate; when said skate toe is adjusted, as said screw on said positioning sheet is first loosened said skate toe moves outwardly, and is viewable through viewing holes to find a suitable size mark, then upon tightening said screw again, micro-adjustment is completed; the woven belt on a lateral side of the front end of said wheel seat covers a gap induced between said skate quarter and said skate toe.

5,836,593
EQUIPMENT MOVER PAD

Vernon James Skinner, 18 Oakhill, Hollesley, Woodbridge, Suffolk, United Kingdom

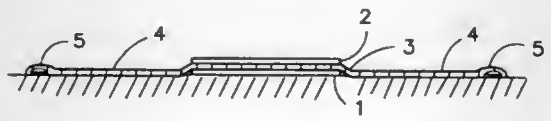
PCT No. PCT/GB92/01911, § 371 Date May 14, 1996, § 102(e) Date May 14, 1996, PCT Pub. No. WO93/08105, PCT Pub. Date Apr. 29, 1993

PCT Filed Oct. 16, 1992, Ser. No. 211,556

Claims priority, application United Kingdom, Oct. 18, 1991, 9122150

Int. Cl.^{6} B62B *15/00*

U.S. Cl. 280—19 **5 Claims**



1. A device for pulling heavy equipment across a supporting surface comprising:

a composite pad of generally rectangular shape having longitudinally extending and transversely extending edges,

said composite pad including a lower, flexible sheet of plastic and an upper backing of rubber,

said plastic sheet having a smooth lower surface for engaging said support surface,

said rubber backing having a ribbed upper surface for engaging said equipment,

said composite pad being coilable into a compact helical configuration about said transversely extending edges, and

a pair of straps attached to said composite pad and extending longitudinally beyond at least one transversely extending edge of said composite pad.

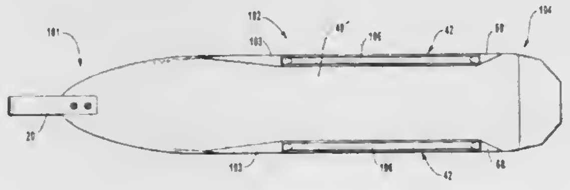
5,836,594
SNOWMOBILE SKI

Verlin M. Simmons, Providence, Utah, assignor to Simmons, Inc., Provident, Utah

Continuation-in-part of Ser. No. 88,411, Jul. 1, 1993, Pat. No. 5,360,220, which is a continuation-in-part of Ser. No. 988,231, Dec. 9, 1992, abandoned. This application Mar. 15, 1994, Ser. No. 213,950

Int. Cl.^{6} B62B *17/00*

U.S. Cl. 280—28 **20 Claims**



1. A snowmobile ski, comprising:

a base extending in a longitudinal direction and having a bottom for moving over snow, the base also extending in a lateral direction between a first edge and a second edge thereof and having a top adapted to be connected to a snowmobile;

a first side portion extending in the longitudinal direction and extending downward from the first edge;

a second side portion extending in the longitudinal direction and extending downward from the second edge;

a first guide rod disposed on a bottom of the first side portion; and

a second guide rod disposed on a bottom of the second side portion.

5,836,595
COMBINATION STEPLADDER/HANDTRUCK APPARATUS

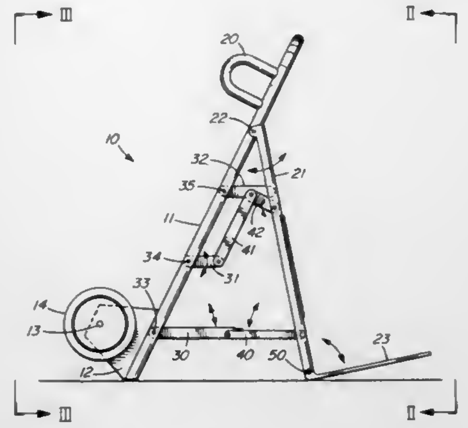
John Nigel Brice, 13431 - 25th Avenue, Surrey, British Columbia, Canada, V4A 1Y8

Filed Mar. 21, 1997, Ser. No. 823,285

Int. Cl.^{6} B62B *1/02*

U.S. Cl. 280—30 **5 Claims**

1. A handtruck/stepladder combination comprising a first frame, wheels attached to said first frame at a position adjacent the lowermost position of said first frame, handles attached to said first frame near the uppermost location of said first frame, a second frame pivotally connected to said first frame at a position adjacent said handles and defining a stepladder in a first position when said second frame extends outwardly from said first frame and defining a handtruck when said second frame extends inwardly and is adjacent too said first frame, a support plate pivotally connected to said second frame at a position adjacent the lowermost position of said second frame, at least two steps pivotally connected to said first and second frames and extending therebetween when said second frame is in said first position and being substantially



parallel to said first frame when said second frame is in said second position.

5,836,596
SHOPPING CART

Rudolf Wanzl, Leipheim, Germany, assignor to Wanzl GmbH & Co., Leipheim, Germany

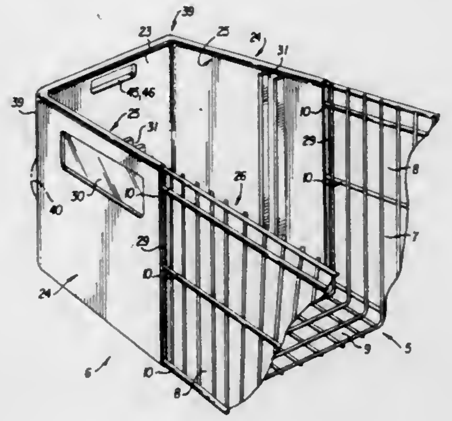
PCT No. PCT/DE94/00337, § 371 Date Oct. 11, 1994, § 102(e) Date Oct. 11, 1994, PCT Pub. No. WO94/22705, PCT Pub. Date Oct. 13, 1994

PCT Filed Mar. 24, 1994, Ser. No. 290,876

Claims priority, application Germany, Apr. 7, 1993, 93 05 333.9; Jul. 9, 1993, 93 10 234.8; Dec. 22, 1993, 93 19 720.9

Int. Cl.^{6} B62B *11/00*

U.S. Cl. 280—33.991 **14 Claims**



1. A shopping cart comprising a chassis, a means to push said cart, a container to accommodate goods carried by the chassis, the chassis and the container being designed in such a way that shopping carts of the same kind can be pushed into one another in order to save space;

the container being composed of

(a) a carrying section which is attached to the chassis and which has a bottom, two side walls, an open front end and a back wall and

(b) a front extension which has a bottom, two side walls, a front wall and an open back end;

said front extension being rigidly connected to and carried by the carrying section in a manner to prevent relative motion between the carrying section and the front extension and to form with the carrying section a common space; said front extension being located to face said back wall; said front extension being made of plastic and comprised of at least one device for promoting, supporting or influencing the shopping process.

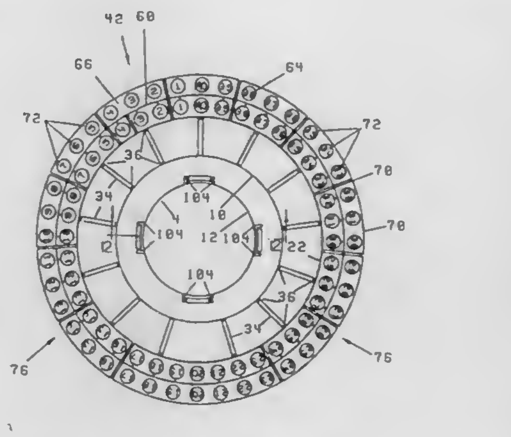
5,836,597
DEVICE AND METHOD FOR ADJUSTING CAMBER AND/OR TOE

Richard D. Schlosser, Loveland; Gabriel Dragnea, and Robert M. Allman, both of Longmont, all of Colo., assignors to Specialty Products, Inc., Longmount, Colo.

Continuation of Ser. No. 54,411, Apr. 28, 1993, Pat. No. 5,622,378, Continuation-in-part of Ser. No. 911,464, Jul. 10, 1992, abandoned. This application Mar. 21, 1997, Ser. No. 822,221

Int. Cl.^{6} B62D *17/00*

U.S. Cl. 280—86.753 **4 Claims**



1. A shim assembly for correcting misalignment of a vehicle wheel spindle extending from a mounting plate attached to a vehicle the shim assembly comprising:

a first tapered shim element having opposed, non-parallel tapered surfaces;

a second tapered shim element having opposed, non-parallel tapered surfaces, at least a portion of one of the tapered surfaces of the first tapered shim element and at least a portion of one of the tapered surfaces of the second tapered shim element being adjacent to and in contact with each other;

said first tapered shim element being rotatably connected to said second tapered shim element; and

wherein said first and second tapered shim elements are connected by apparatus comprising:

an arcuate lip defined in one of said first and second shim elements;

at least two circumferentially spaced apart connectors projecting axially outwardly from the other of said first and second shim elements;

each of said at least two circumferentially spaced apart connectors having an arcuate groove formed therein; and

at least a portion of said arcuate lip being located in each of said arcuate grooves of said at least two circumferentially spaced apart connectors at all rotational positions of said first and second shim elements to secure said first and second shim elements together as a rotationally adjustable shim assembly.

5,836,598
APPARATUS FOR VEHICLE SUSPENSION STABILIZATION SYSTEM AND METHOD THEREOF

Eric G. Parker, Chicago, and Robert K. Dutzi, Buffalo Grove, both of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed Feb. 11, 1997, Ser. No. 798,875

Int. Cl.^{6} B60G *3/02*

U.S. Cl. 280—93.51 **11 Claims**

1. A stabilization member useable for coupling first and second pivotal suspension components in a vehicle suspension stabilization system, the stabilization member comprising:

a resilient dampening member;

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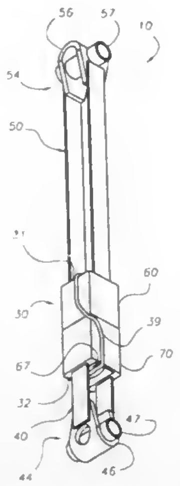


a first tension member having a substantially U-shaped closed first end portion coupled to the resilient dampening member and a second end portion coupleable to one of the first and second pivotal suspension components;

a second tensioning member having a substantially U-shaped closed first end portion coupled to the resilient dampening member and a second end portion coupleable to the other of the first and second pivotal suspension components;

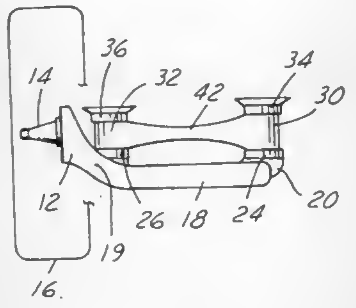
the substantially U-shaped closed first end portion of the first tension member linked with the substantially U-shaped closed first end portion of the second tension member, and the resilient dampening member retained in a cavity between the substantially U-shaped closed first end portion of the first tension member and the substantially U-shaped closed first end portion of the second tension member,

whereby tension on the first and second tension members is at least partially absorbable by compression of the resilient dampening member.

5,836,599

INDEPENDENT SUSPENSION APPARATUS FOR A WHEELED VEHICLE

Alexander Rein de Vlugt, Commerce TWP, Mich., assignor to Ford Global Technologies, Inc., Dearborn, Mich.
Filed Jan. 21, 1997, Ser. No. 787,508
Int. Cl.^{6} B60G *7/00*
U.S. Cl. 280—124.128 **15 Claims**



1. A rear suspension apparatus for a motor vehicle having a longitudinal axis (LV) and a vehicle structure, said rear suspension apparatus comprising:

a control arm having a rearward end for supporting a rotatable wheel and tire assembly, and inboard and outboard ends disposed forwardly alone the longitudinal axis (LV) from said rearward end;

lower joint means to for pivotally attaching said inboard and outboard ends of said control arm;

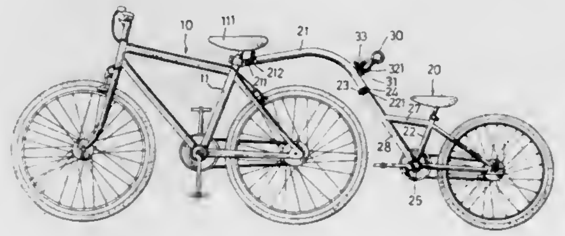
upper joint means for pivotally attaching to said vehicle structure; and

link means for pivotally interconnecting said lower and upper joint means, whereby said control arm transfers loads through said lower joint means into said link means and from said link means into said upper joint means to the vehicle structure.

5,836,600

TANDEM BICYCLE WITH DETACHABLE AND FOLDABLE REAR BICYCLE FRAME

Ping-Jan Chiu, No. 1146, Chung-Shan Rd., Ta-Chia Chen, Taichung Hsien, Taiwan
Filed Jan. 30, 1997, Ser. No. 792,432
Int. Cl.^{6} B62K *27/00*
U.S. Cl. 280—231 **2 Claims**



1. A tandem bicycle, comprising:

a front bicycle frame having a front seat tube for mounting a seat;

a rear bicycle seat frame having a rear seat tube, a top tube extending forwardly from said rear seat tube, a down tube extending upwardly and forwardly from said rear seat tube;

a connecting member interconnecting said front seat tube and said down tube, said connecting member being detachable from said front seat tube and being foldable over said down tube; and

a handle assembly detachably mounted to said connecting member,

wherein said handle assembly includes a hollow handle support which projects upward from said connecting member and which has two opposing walls formed with engaging holes respectively, a handle bar which has a sleeve projecting downward therefrom to be sleeved on said handle support and which has slots for alignment with said engaging holes, and a U-shaped resilient dog member which is disposed in said handle support and which has two engaging ends biased to project into said engaging holes and said slots.

5,836,601

COLLAPSIBLE GOLF BAG CART WITH SEAT

Walter T. Nelson, Ada, Mich., assignor to Pingree Products Ltd., Ada, Mich.
Filed Jul. 23, 1996, Ser. No. 686,121
Int. Cl.^{6} B62B *1/12*
U.S. Cl. 280—645 **14 Claims**

1. A collapsible golf club bag cart movable between collapsed and uncollapsed configurations, said cart comprising:

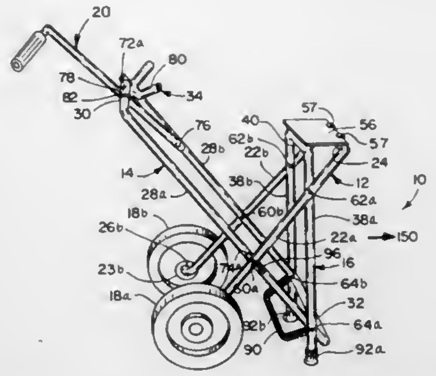
a wheel support frame;

a bag support frame having dual spaced apart side members for seating a golf club bag therebetween, said bag support frame being pivotally secured to said wheel support frame at a first joint;

a seat support frame pivotally secured to said wheel support frame at a second joint and to said bag support frame at a third joint;

a seat hingedly connected to at least one of said wheel support frame and said seat support frame;

a pair of wheels secured to said wheel support frame; and

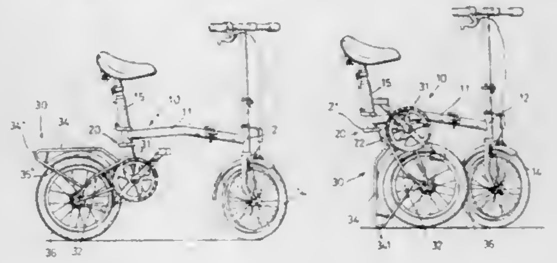


an offset hinge located at one of said joints, said offset hinge having a first end portion secured to one of said frames, a second end portion secured to another of said frames, and a center portion extending between and linearly offsetting said first and second end portions, whereby said offset hinge swings to allow the cart to move between the collapsed and uncollapsed configurations.

5,836,602

COLLAPSIBLE BICYCLE

Ping-Tien Wang, 15th Fl., No. 135, Ching Tung St., Tainan Hsien, Taiwan
Filed Aug. 12, 1997, Ser. No. 909,961
Int. Cl.^{6} B62K *15/00*
U.S. Cl. 280—287 **3 Claims**



1. A collapsible bicycle comprising:

a body frame (**10**) including a first end portion and a second end portion, a front wheel (**14**) rotatably mounted on said first end portion of said body frame (**10**), and a seat tube (**15**) fixedly mounted on said second end portion of said body frame (**10**);

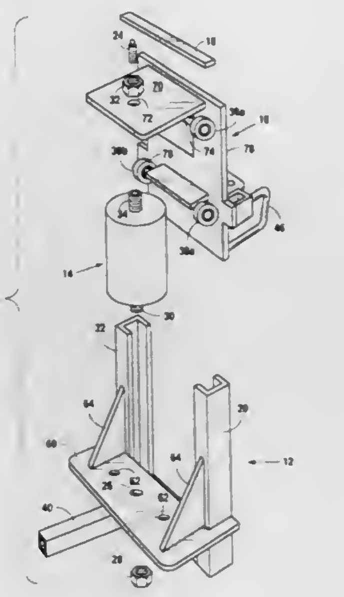
a rear frame (**30**) including an upright tube (**31**) disposed beneath said seat tube (**15**), a pair of seat stays (**32**) each extending from said upright tube (**31**), a rear wheel (**36**) rotatably mounted between said pair of seat stays (**32**), and a pair of supporting brackets (**34**) each having a first end portion fixedly mounted on a corresponding one of said pair of seat stays (**32**) and a second end portion (**341**) located at a position flush with said rear wheel (**36**); and

a pivot mechanism (**20**) pivotally connected between said seat tube (**15**) and said upright tube (**31**) such that said upright tube (**31**) can be pivoted relative to said seat tube (**15**), thereby pivoting said rear frame (**30**) toward said front wheel (**14**) of said body frame (**10**) to a position where said second end portion (**341**) of each of said two supporting brackets (**34**) together with said rear wheel (**36**) can be supported on the ground synchronously.

5,836,603

SHOCK ABSORBING TRAILER HITCH

Jeff Logan, P.O. Box 1035, Wewoka, Okla. 74884, and John Turner, Rt. 2 Box 130-A3, Seminole, Okla. 74868
Filed Apr. 3, 1997, Ser. No. 829,999
Int. Cl.^{6} B60D *13/00*
U.S. Cl. 280—483 **6 Claims**



1. A trailer hitch assembly for attachment to a vehicle and a trailer for towing said trailer comprising:

a fixed support member attachable to said vehicle, said support member further comprising a plurality of spaced apart, generally parallel guide tracks;

a floating hitch member attachable to said trailer, said hitch member further comprising a plurality of spaced apart, generally parallel, rotatable rollers;

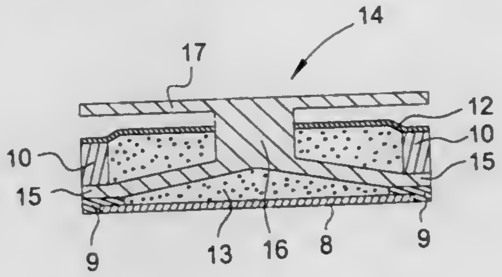
a variable pressure air shock absorber assembly attached at a first end to said fixed support member and at a second end to said floating hitch member;

said rollers engaging with said tracks when said vehicle is attached to said trailer.

5,836,604

BOARD FOR GLIDING ON SNOW, INCLUDING A DEVICE FOR MOUNTING A BOOT BINDING

Yves Piegay, Meyrieu les Etangs, France, assignor to Skis Rossignol, S.A., Voiron, France
Filed May 21, 1996, Ser. No. 651,146
Claims priority, application France, May 22, 1995, 95 06336
Int. Cl.^{6} A63C *5/00*
U.S. Cl. 280—607 **24 Claims**



1. A board for gliding on snow, comprising:

a lower assembly comprising a sole bordered by edges;

an upper assembly comprising at least one filler core, a reinforcing element, and an outer casing made of at least one part; and

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a device, located in a central support region of the board, for mounting a boot binding, wherein said device comprises:

at least two lower elements located inside and on each side of the board, that bear on said edges of said lower assembly,

at least one upper element located above said outer casing of said upper assembly or level with the top of said outer casing, said at least one upper element defining a platform for mounting said binding, and

at least one connecting element between each of said lower and upper elements, at least a portion of said at least one connecting element being located inside the board and passing through the top of said upper assembly.

5,836,605

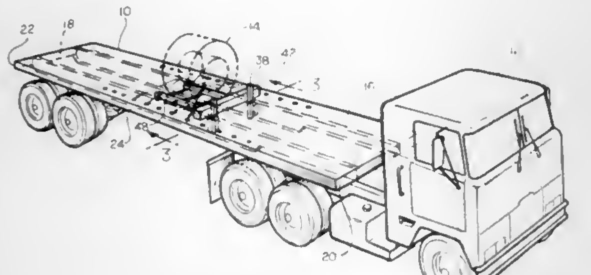
TRAILER AND APPARATUS FOR RESTRAINING COIL STOCK

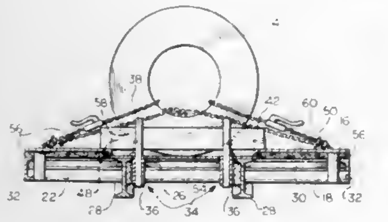
Donald Keith Bowling, 8050 Wayne Rd., Wayne, Ohio 43466

Continuation of Ser. No. 266,009, Jun. 27, 1994, abandoned. This application Mar. 21, 1996, Ser. No. 619,152

Int. Cl.^{6} B60P *9/00*

U.S. Cl. 280—789 **11 Claims**





1. A trailer for transporting a round coil stock, the trailer comprising:

a platform having a front, a rear and opposed sides;

a frame including at least two longitudinal parallel beams interconnected by a plurality of cross beams, said frame fastened to said platform and cooperatively supported by axles, wheels and suspension equipment;

at least two brackets spaced from said opposed sides of said platform and attached along the length of said parallel beams, each bracket of said at least two brackets spaced an equal distance from the front of said trailer and including a support member having an opening;

at least two removable posts, each removable post inserted in said opening of each support member;

a removable cross piece block disposed between said at least two removable posts and the coil stock, said cross piece block extending across said at least two removable posts;

a recess disposed within a central surface area of said platform and having elevated opposed sides; and

at least two blocks, each block having a complimentary round edge capable of receiving a rounded side of the coil stock, each block disposed within said recess between one of said elevated sides of said recess and the coil stock,

wherein said cross piece block, said at least two removable posts and said at least two brackets cooperatively prevent forward movement of the coil stock on the trailer, and

wherein said recess and said at least two blocks cooperatively prevent lateral movement of the coil stock on the trailer.

5,836,606

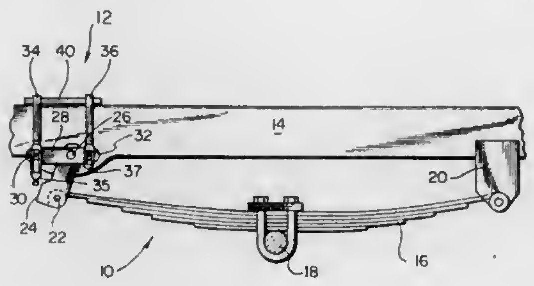
PAYLOAD DEPENDENT STABILIZER SYSTEM

Louis M. Spoto, Sleepy Hollow, and Kenneth H. Dorman, Carol Stream, both of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Division of Ser. No. 689,936, Oct. 2, 1996. This application Jul. 18, 1997, Ser. No. 896,445

Int. Cl.^{6} B60G *11/02*

U.S. Cl. 280—718 **21 Claims**



1. An improved shackle for a stabilizer system for an automotive vehicle, comprising:

an elongate body having first and second pivot means defined within first and second opposite ends thereof for pivotal connection to a vehicle frame member and a vehicle leaf spring, respectively; and

an elongate arm rigidly connected to said elongate body at a connection point and extending transversely thereof.

5,836,607

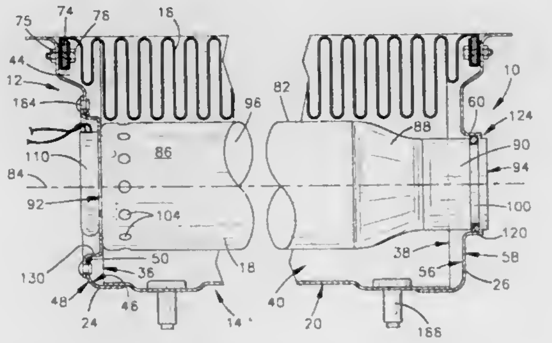
GAS GENERATOR ATTACHMENT MEANS FOR A VEHICLE SAFETY APPARATUS

John P. Wallner, Rochester, Mich., assignor to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Mar. 5, 1996, Ser. No. 611,374

Int. Cl.^{6} B60R *21/20*

U.S. Cl. 280—728.2 **5 Claims**



1. An apparatus for helping to protect an occupant of a vehicle during a vehicle collision above a predetermined threshold, said apparatus comprising:

a reaction canister;

an inflatable vehicle occupant protection device located in said reaction canister;

an inflator for supplying inflation fluid to inflate said inflatable vehicle occupant protection device;

said reaction canister having a main body portion, a first end wall and a second end wall opposing said first end wall, said first and second end walls being fixed to said main body portion and defining a chamber, said first end wall having an inner surface and an outer surface, said first end wall further having a first opening therein having a first diameter, said second end wall also having an inner surface and an outer surface;

said inflator having a cylindrical body portion having a first end terminating in a first end wall and a second end opposite said first end, said cylindrical body portion having a second diameter smaller than said first diameter, said inflator being axially insertable, through said first opening, into said chamber;

a flange member fixed to said first end wall of said inflator;

means for clamping said flange member against said outer surface of said first end wall; and

means for supporting said inflator on said second end wall;

said means for supporting said inflator on said second end wall comprising a plurality of screws, each of said plurality of screws being insertable (i) through one of a plurality of openings in said second end wall and (ii) into one of a plurality of threaded openings in said second end of said inflator, each of said screws, when inserted through one of said plurality of openings and into one of said plurality of threaded openings being secured to said inflator for supporting said inflator on said second end wall;

said outer surface of said first end wall comprising a tapered rim portion defining said first opening, and said means for clamping said flange member against said outer surface of said first end wall comprising said screws, which when secured to said inflator, urge portions of said flange member into said tapered rim portion and clamp said flange member against said outer surface of said first end wall.

5,836,608

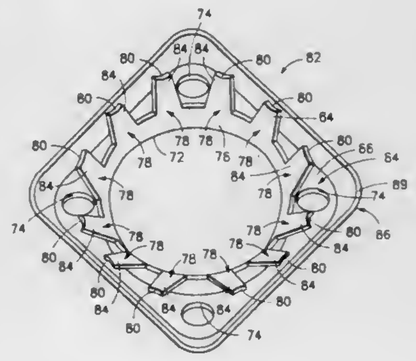
AIRBAG DEFLECTION MOUNT

Quin Soderquist, South Weber, and Richard W. Carr, Brigham City, both of Utah, assignors to Morton International, Inc., Chicago, Ill.

Filed Dec. 11, 1996, Ser. No. 763,478

Int. Cl.^{6} B60R *21/26*

U.S. Cl. 280—728.2 **20 Claims**



11. An airbag module comprising:

A) an inflator having a sidewall defining a plurality of spaced-apart inflation ports;

B) a module baseplate surrounding the inflator sidewall below the plurality of inflation ports;

C) an airbag cushion including a throat surrounding the inflator sidewall and having a collar received on the module baseplate so that inflation gas exiting the inflation ports will inflate the airbag cushion; and

D) an airbag deflection mount including,

a retainer ring received over the collar of the airbag cushion and fastened to the module baseplate with the collar of the airbag cushion clamped therebetween, and

a plurality of circumferentially spaced-apart deflectors extending upwardly from the retainer ring to distal ends between the plurality of inflation ports and a top of the inflator sidewall, the plurality of spaced-apart deflectors positioned between the inflator sidewall and the throat of the airbag cushion to deflect a substantial portion of hot inflation gas and solid particles exiting the plurality of inflation ports of the inflator axially away from the throat of the airbag cushion while a lesser portion of the inflation gas passes radially past the spaced-apart deflectors to radially enter the airbag.

5,836,609

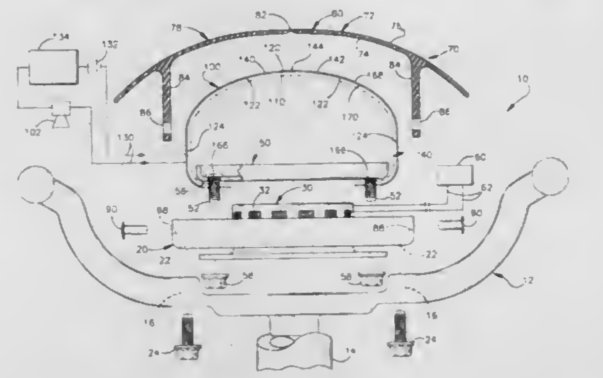
HORN SWITCH FOR AIR BAG MODULE

Daniel E. Coleman, Mesa, Ariz., assignor to TRW Inc., Lyndhurst, Ohio

Filed Mar. 4, 1997, Ser. No. 811,313

Int. Cl.^{6} B60R *21/20*

U.S. Cl. 280—728.3 **6 Claims**



1. A vehicle occupant safety apparatus for mounting on a portion of a vehicle, said apparatus comprising:

an inflatable vehicle occupant protection device having a deflated condition and an inflated condition;

an inflator actuatable to supply inflation fluid to inflate said inflatable device from the deflated condition to the inflated condition;

support means for supporting said inflator and said inflatable device on the vehicle portion;

a cover having a closed condition when said inflatable device is in the deflated condition, said cover being movable from the closed condition to an open condition upon inflation of said inflatable device; and

a wrap within said cover for maintaining said inflatable device in the deflated condition prior to actuation of said inflator;

said wrap including means operable to actuate an electrically actuatable device of the vehicle, said wrap and said means operable to actuate an electrically actuatable device comprising a flexible, electrically insulating sheet material with a layer of electrically conductive, variable resistance material adhered onto said flexible sheet material and whose electrical conductivity varies when deformed;

a retaining ring; and

fasteners which extend from said retaining ring through openings in said occupant protection device and said flexible sheet material.

5,836,610

MULTIPLE LEVEL FLUID FUELED AIRBAG INFLATOR

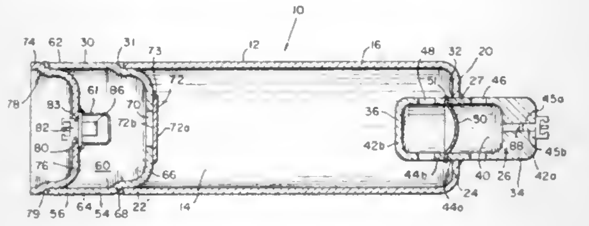
Karl K. Rink, Liberty; David J. Green, Brigham City; Walter A. Moore, and Glen S. Beus, both of Ogden, all of Utah, assignors to Morton International, Inc., Chicago, Ill.

Continuation of Ser. No. 437,911, May 10, 1995, abandoned, which is a continuation-in-part of Ser. No. 339,603, Nov. 15, 1994, Pat. No. 5,531,473, which is a continuation-in-part of Ser. No. 252,036, May 31, 1994, Pat. No. 5,470,104. This application Jul. 1, 1997, Ser. No. 886,778

Int. Cl.^{6} B60R *21/26*

U.S. Cl. 280—736 **14 Claims**

1. In an air bag system for a motor vehicle, the system comprising at least one air bag module containing at least one inflatable air bag and sensor means for sensing at least one air bag system



operating condition selected from the group of ambient temperature, occupant presence, seat belt usage and deceleration of the motor vehicle, the improvement comprising:

a multiple level air bag inflator coupled to the at least one air bag module, said multiple level air bag inflator adapted to produce and release, to the air bag, inflation gas at multiple inflation levels, said multiple level air bag inflator containing at least one fluid fuel and at least one oxidant and comprising:
a first chamber containing a supply of pressurized stored gas, said first chamber including at least one gas exit port and having sealing means normally closing the at least one gas exit port;
opening means to open the at least one gas exit port whereby at least a portion of the contents of said first chamber are expelled from said first chamber;
directing means for directing the expelled contents of said first chamber to the air bag;
a second chamber containing the at least one fluid fuel stored separately from the at least one oxidant wherein, upon actuation, the at least one fluid fuel and the at least one oxidant are contacted and burned to produce combustion products including hot combustion gas, said second chamber including at least one gas exit opening and having sealing means normally closing the at least one gas exit opening, the second chamber sealing means having a first surface adjacent said first chamber and a second surface adjacent said second chamber such that upon opening of the second chamber sealing means said second chamber is in fluid communication with said first chamber, the second chamber sealing means adapted to open when the difference in pressure at the first and the second surfaces becomes sufficiently large, whereby at least a portion of the contents of said second chamber are passed into said first chamber; and
initiator means for initiating the burning of the at least one fluid fuel and the at least one oxidant in said second chamber;
wherein, upon receipt by the module of a first level output from the sensor means, the gas released from said multiple level air bag inflator is free of combustion products and
wherein, upon receipt by the module of a third level output from the sensor means, the gas released from said multiple level air bag inflator comprises at least a portion of the stored gas and at least a portion of the combustion products produced by burning the at least one fluid fuel and the at least one oxidant in said second chamber.

5,836,611

INFLATABLE RESTRAINT DEVICE AND METHOD OF MANUFACTURING SAME

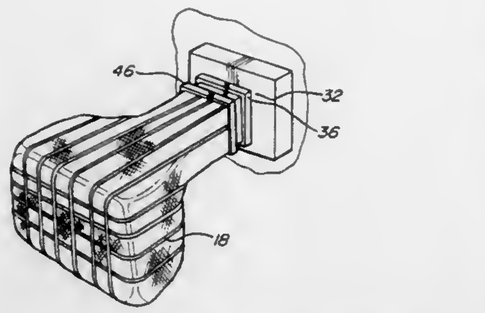
Edward B. Palm, 1710 Shore Club Dr., St. Clair Shores, Mich. 48080

Continuation of Ser. No. 236,964, May 2, 1994, Pat. No. 5,501,259. This application Dec. 1, 1995, Ser. No. 565,875

Int. Cl.^{6} B60R *21/16*

U.S. Cl. 280—743.1 **12 Claims**

1. A three dimensional air bag comprising:
a first layer of material; and
a plurality of discrete load carrying fibers disposed on said first layer of material in a pre-specified configuration, said pre-specified configuration corresponding with a pattern defining high and low stress areas of said first layer of material when said air bag is deployed such that a higher concentration of said discrete load carrying fibers are present in said high stress areas of said first layer of material for reinforcing said high stress areas of said first layer of material and more discrete fibers being present in said high stress areas of said first layer of material and more discrete fibers being present in said high stress areas than in said low stress areas of said first layer of material.



5,836,612

PASSENGER SIDE GAS BAG

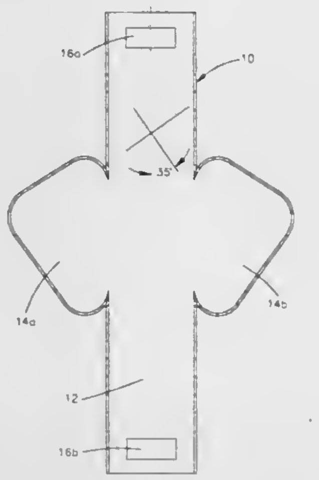
Norbert Lang, Leinzell, Germany, assignor to TRW Occupant Restraint Systems GmbH, Alfdorf, Germany

Filed Jul. 1, 1996, Ser. No. 673,101

Claims priority, application Germany, Jul. 3, 1995, 295 10 775 U

Int. Cl.^{6} B60R *21/16*

U.S. Cl. 280—743.1 **3 Claims**



1. A passenger side gas bag comprising an envelope part and two lateral parts connected therewith, said envelope part and said lateral parts being formed from an integral blank of flat textile fabric, said blank having an elongated middle section, corresponding to said envelope part, and two flaps corresponding to said lateral parts and joined to a middle portion of said elongated middle section, each flap being sewn along an edge to an adjacent edge of said middle section, said flaps of said blank generally possessing the configuration of a right angled triangle with rounded apices, and said elongated middle section having rectilinear edges which extend parallel to each other.

5,836,613

CAR BODY STRUCTURE

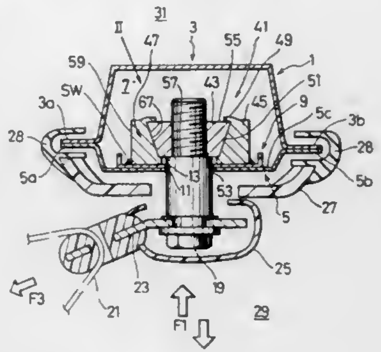
Kenichi Saito, and Tetsuo Maki, both of Kanagawa-ken, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 29, 1997, Ser. No. 788,500

Claims priority, application Japan, Jan. 29, 1996, 8-013109

Int. Cl.^{6} B60R *22/00*

U.S. Cl. 280—808 **7 Claims**



1. A car body structure comprising:
a pillar panel including an outer panel and an inner panel;
a nut member arranged in a hollow portion between the outer panel and the inner panel; and
a bolt fixed to said nut member, for supporting a seat belt anchor plate;
wherein said nut member includes a nut main body to which said bolt is fixed, and a nut holder supported on said pillar panel, for holding said nut main body,
said nut holder has a holder portion formed to support a tensile load applied to said nut main body, and
at least one of said nut main body and said nut holder has an engaging portion for holding said nut main body in said holder portion and for supporting said nut main body until a compressive load applied to said nut main body is increased to a predetermined value.

5,836,614

BOOK WITH VARIOUS SECTIONS

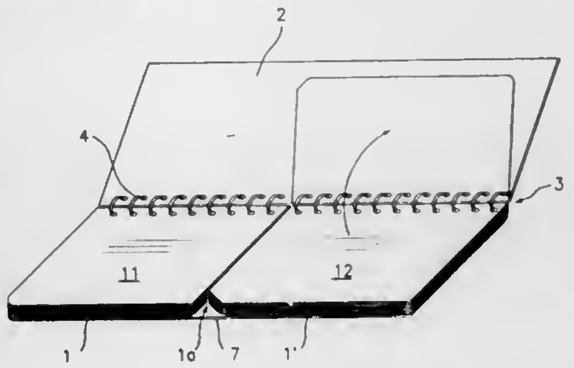
Nam Kyo Park, Raseong Vilra Gadong 201, 1045-25, Bisan3-Dong Dongan-Gu, Anyang-si, Kyeongki-do, Rep. of Korea

Filed Mar. 14, 1997, Ser. No. 815,044

Claims priority, application Rep. of Korea, Nov. 4, 1996, 1996 38212

Int. Cl.^{6} B42D *15/00*

U.S. Cl. 281—16 **8 Claims**



1. A book with various sections comprising:
a plurality of book sections each comprising of a plurality of stacked sheets, each book section carrying different contents from each other, and each sheet having a corner portion cut off to facilitate turning with fingers, one of the book sections containing a first set of information comprising at least one of text to be studied and question materials to be solved, and the other one of the book sections contains a second set of information comprising at least one of hints, explanations of the question material, reference matters and correct answers, the first and second book sections being arranged parallel to one another on a same plane so that a sheet of the one of the book sections carrying the first information can be viewed simultaneously with a sheet of the other book section carrying the second information;
at least one front cover for respectively covering and protecting front surfaces of the book sections;
a base cover for supporting the book sections and covering and protecting rear surfaces of the book sections; and
a binder that hingedly secures one side edge of one book section to one side edge of the at least one front cover and one side edge of the base cover, and one side edge of the other book section to another side edge of the base cover, the binder including a member made of a coil spring.

5,836,615

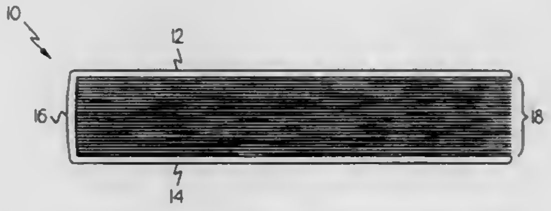
BOOK CONSTRUCTION WITH RELEASABLE ADHESIVE

Michael Elliot, deceased, late of New York, N.Y.; by Michaele Elliot, executor, 60 E. 96th St., New York, N.Y. 10128, and by Peter Elliot, executor, 866 River Rd., Piermont, N.Y. 10968

Filed May 10, 1995, Ser. No. 435,402

Int. Cl.^{6} B42D *1/00*

U.S. Cl. 281—21.1 **4 Claims**



1. A book containing currency comprising a front cover and a back cover each of which is attached to a backing, said backing having a binder and having an inherently tacky adhesive which is embedded in said binder and protrudes therefrom, said tacky adhesive comprising a copolymer of an alkyl acrylate ester and an ionic monomer or maleic anhydride, and a plurality of sheets of currency releasably secured to said inherently tacky adhesive of said backing between said front cover and said back cover, said plurality of sheets of currency being secured to said backing along one edge of each said sheet of currency, each said sheet of currency being removable from and resecurable to the said adhesive on said backing so as to allow said sheet of currency to be removed and subsequently resecured a plurality of times.

5,836,616

TALKING BUSINESS CARD

David S. Cooper, 627 Sharon Ct., Woodbridge, N.J. 07095

Filed Apr. 8, 1997, Ser. No. 833,693

Int. Cl.^{6} B42D *15/00*

U.S. Cl. 283—56 **14 Claims**

1. A self-contained, electronic message-emitting device in the form of a talking business card for providing a recorded message, comprising:
a) a card holding member including a base member and opposite side wall members thereon which form a first receiving channel on one side and a second receiving channel on the opposite side for slidably receiving therein the opposite edges of a business card;
b) said base member including a compartment for receiving an electronic message emitting assembly; and
c) said electronic message emitting assembly including an electronic voice microchip for recording a message or sound, a

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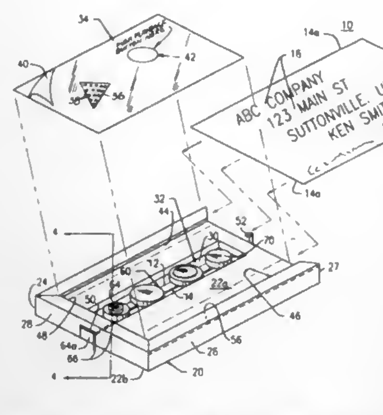


record button to initiate and activate said voice microchip to record said message or sound, a play back button to play back said message or sound for audio listening by the user, and a power source component for energizing said voice microchip.

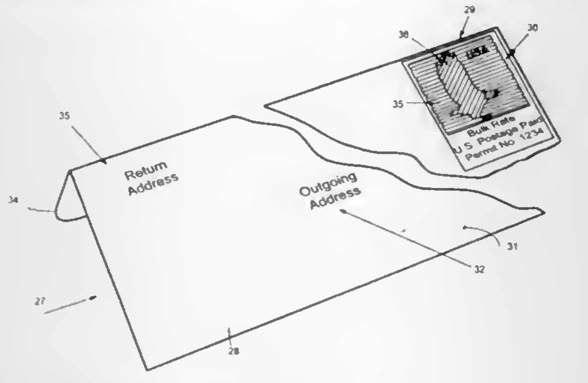
5,836,617
PRINTED LABELS FOR POSTAL INDICIA

James S. Beaudoin, Little Saumico, Wis., and Edward E. Roske, Waukesan, Ill., assignors to Moore Business Forms, Inc., Grand Island, N.Y.

Division of Ser. No. 566,690, Dec. 4, 1995. This application Sep. 29, 1997, Ser. No. 939,884

Int. Cl.⁶ B42D *15/00*

U.S. Cl. 283—67 **19 Claims**



1. A mailing piece comprising:

an envelope or postcard having an addressable face with an upper right corner; and

a label having a first face with permanent pressure sensitive adhesive, and an imaged second face, said imaged second face including as indicia: "POSTAGE PAID", an indication of rate, and an indication of permit authorization; and said imaged second face including decorative graphics having one or more colors immediately adjacent or underlying said indicia; and

said label first face adhered to said envelope or postcard at said upper right corner thereof by said permanent adhesive.

5,836,618
STRETCHABLE THERMOPLASTIC LABELS FOR CRYOGENIC STORAGE CONTAINERS

Daniel Perlman, Arlington, Mass., assignor to Brandeis University, Waltham, Mass.

Filed Nov. 6, 1996, Ser. No. 746,053

Int. Cl.⁶ B42D *15/00*

U.S. Cl. 283—70 **12 Claims**

1. A method for specimen identification, employing marking or printing of a label for placing on a cryogenic storage vial or other container which must withstand exposure to cryogenic storage conditions, said method comprising the steps of:

(a) providing a sized portion of a pressure-sensitive adhesive label comprising a waterproof non-polyvinyl thermoplastic facestock material with a markable waterproof upper surface and a waterproof adhesive-coated lower surface, wherein said facestock material is capable of being stretched at room temperature at least 10% in the machine direction and at least 10% in the transverse direction without breaking, whereby said facestock and said adhesive can remain united and bonded to said container during and after said exposure to said cryogenic storage conditions;

(b) marking or printing upon said upper surface to identify said container and any material within said container, wherein said marking or printing can resist ice and moisture which condenses upon said container when it is removed from said cryogenic storage conditions; and

(c) attaching said sized portion of said label to said container;

wherein said cryogenic storage conditions comprise exposure to a temperature of about −80° C. or lower.

5,836,619
MANUALLY-SEVERABLE COUPLING DEVICE, AND MEDICAL INFUSION ASSEMBLY INCLUDING SAME

Eli Shemesh, Ashdod, and Ellen Tobe, Tel Aviv, both of Israel, assignors to Migada, Inc., Englewood Cliffs, N.J.

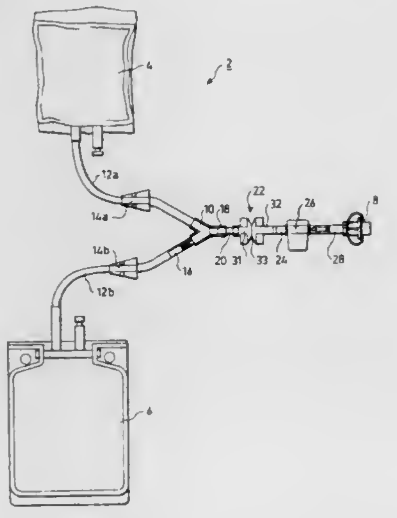
PCT No. PCT/US94/12439, § 371 Date Jul. 22, 1996, § 102(e) Date Jul. 22, 1996, PCT Pub. No. WO95/12780, PCT Pub. Date May 11, 1995

PCT Filed Oct. 28, 1994, Ser. No. 637,771

Claims priority, application Israel, Nov. 5, 1993, 107509

Int. Cl.⁶ F16L *37/28;* **A61M** *1/28*

U.S. Cl. 285—4 **8 Claims**



1. A medical infusion assembly particularly useful for peritoneal dialysis, comprising:

a first tube for connection to an infusion liquid bag for supplying an infusion liquid to a subject;

a second tube for connection to the subject to receive the infusion liquid; and

a manually-severable coupling device which couples said first and second tubes, comprising:

a flexible plastic member having a passageway therethrough and formed with tubular end sections at its opposite ends for receiving the tubes to be coupled;

an annular groove formed in said flexible plastic member intermediate its tubular end sections defining a flexible, weakened annular web, said weakened annular web capable of being severed by rotating one of said tubular end sections with respect to the other;

and a finger gripping formation integrally formed in each of said tubular end sections on opposite sides of said weakened annular web, grippable by a user to rotate said tubular end sections with respect to each other to sever them from each other along said weakened annular web,

wherein said first tube includes one branch connectable to said infusion liquid bag, a second branch connectable to a liquid drainage bag for draining a liquid, and a clamp in each of said branches which selectively opens either of said first or second branches while the other is closed, wherein said first tube is connected to said first and second branches by a Y-connector and wherein at least one of the branches of the first tube includes a breakaway cannula.

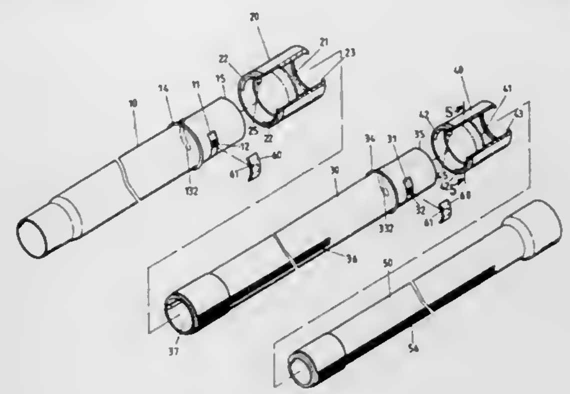
5,836,620
TELESCOPIC EXTENSION WAND FOR VACUUM CLEANER

Chieh-Chun Wang, and Chia-Ming Lin, both of Taichung, Taiwan, assignors to Kinergy Industrial Co., Ltd., Taichung, Taiwan

Filed Sep. 10, 1996, Ser. No. 711,590

Int. Cl.⁶ A47L *9/24;* **F16L** *27/12*

U.S. Cl. 285—7 **3 Claims**



1. A telescopic extension wand for a vacuum cleaner comprising:

a) an outer tube including an outer wall provided with a pair of retaining rings, an L-shaped guide slot and an elongate slot, an opening formed in the elongate slot, a retaining plate received within the elongate slot and having a plurality of first retaining teeth disposable through the opening;

b) an inner tube telescopically received within the outer tube, the inner tube including an outer wall provided with a series of second retaining teeth, the first and second retaining teeth being complementary to and selectively engageable with each other for securing the inner tube in a telescopically extended position relative to the outer tube; and

c) a sleeve received over the outer tube, the sleeve including a pair of stopping rings engaged with the retaining rings of the outer tube for limiting the sleeve to only rotational movement with respect to the outer tube, an inclined tab engaging the retaining plate and urging same inwardly to engage the first retaining teeth with the second retaining teeth in one rotational position of the sleeve and disengaging the first retaining teeth from the second retaining teeth in a second rotational position of the sleeve, and a projecting boss disposed within the L-shaped slot for sliding movement therein during rotation of the sleeve.

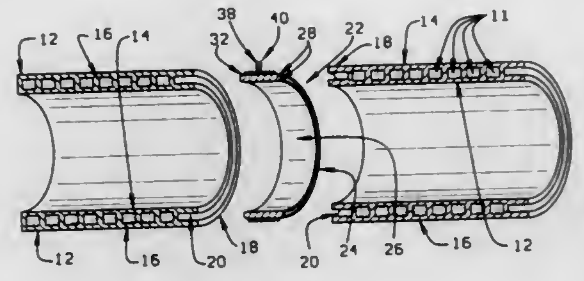
5,836,621
METHOD OF AND JOINT FOR ELECTROFUSION COUPLING OF THERMOPLASTIC PIPES

Steve Campbell, 4501 Lindell, Unit 11D/E, St. Louis, Mo. 63108

Division of Ser. No. 654,104, May 28, 1996. This application Oct. 29, 1997, Ser. No. 960,004

Int. Cl.⁶ F16L *13/00*

U.S. Cl. 285—21.2 **17 Claims**



1. An electrofusion weld assembly for uniting a pair of substantially identical profile wall thermoplastic pipes, each of the pipes having an outer wall, an inner wall, an end wall, a helical rib located generally between the inner wall and the outer wall and joining the inner wall to the outer wall, and a recessed channel in the end wall for receiving a coupler therein, said weld assembly comprising:

a coupler uniting the end walls of the profile wall pipes and positioned within the channels, the coupler having an exterior surface adjacent the outer walls of the profile wall pipes and an interior surface adjacent the inner walls of the profile wall pipes; and

an electrical resistance element sufficiently close to both the coupler and the profile wall pipe walls to cause the profile wall pipes to fuse to the coupler on energization of the electrical resistance element thereby forming a pipe joint having a substantially constant inner diameter and a substantially constant outer diameter.

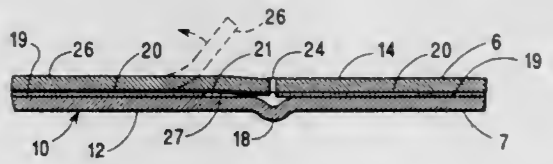
5,836,622
SINGLE SIDE IMAGED POST CARD ASSEMBLY

Warren M. Fabel, Delray Beach, Fla., assignor to Laser Substrates, Inc., Boca Raton, Fla.

Filed Apr. 20, 1993, Ser. No. 49,946

Int. Cl.⁶ B42D *15/02*

U.S. Cl. 283—62 **19 Claims**



1. An assembly adapted to being folded to form a folded document with images on both sides thereof, following a single pass of said assembly through an image forming device which places an image only on one side of said assembly, said assembly comprising:

a front sheet including an image receiving surface, and an adhesive coated surface;

a back sheet having an outward facing surface, an interior surface, and a first tear line between said interior and outward facing surfaces said interior surface being affixed to said adhesive coated surface of said front sheet such that a permanent bond is formed on one side of said tear line and a

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releasable bond is formed on the other side of said tear line, a release material being affixed on said interior surface of said back sheet on said other side of said tear line; and

a fold line on said front sheet aligned with said tear line when said front sheet and back sheet are affixed, all images formed by said image forming device occurring on said image receiving surface and on both sides of said fold lines

said folded document being formed by removing a portion of said back sheet on said other side of said tear line, thereby exposing said adhesive coated surface of said front sheet and leaving a remaining portion of said back sheet, and folding said front sheet about said fold line so that said exposed adhesive coated surface contacts said remaining portion of said back sheet.

5,836,623

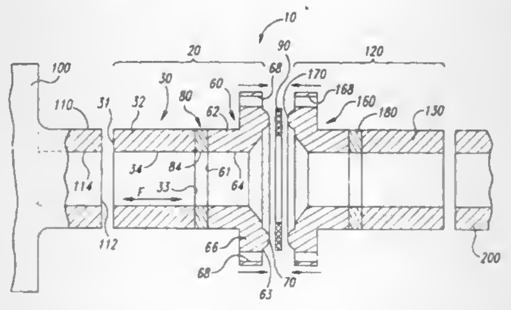
CONNECTOR SYSTEM FOR USE IN ULTRA-HIGH VACUUM SYSTEMS

Richard D. Bothell, and Jed Bothell, both of 2760 Washington St., Port Townsend, Wash. 98368

Filed Sep. 20, 1996, Ser. No. 717,132

Int. Cl.⁶ F16L *55/00*

U.S. Cl. 285—148.9 **11 Claims**



1. A connector for use in an ultra-high vacuum system, comprising:

a metal conduit section comprised of aluminum having a first hardness and a first temper, the conduit section having a first end, a second end, and a flow path between the first and second ends;

a metal fitting member having, a second hardness greater than the first hardness of the conduit section, the fitting member having a rear face proximate to the second end of the conduit section and an opening aligned with the flow path of the conduit section; and

a metallic reaction-inhibiting barrier positioned between the conduit section and the fitting member and sealingly attached to the fitting member and the conduit section, the reaction-inhibiting barrier having an aperture aligned with the flow path of the conduit section and the opening of the fitting member, the reaction-inhibiting barrier being comprised of a layer of niobium and layer of aluminum having a second temper bonded to the layer of niobium, the second temper of the layer of aluminum being less than the first temper of the aluminum conduit section, and the niobium/aluminum reaction-inhibiting. barrier inhibiting metallic interaction between the conduit section and the fitting member under ultra-high vacuum and temperature cycling conditions.

5,836,624

METAL PART INCLUDING A SPHERICAL WALL ELEMENT, AND AN EXHAUST BALL-COUPLING INCLUDING SUCH A PART

Louis Brandener, Poissy, France, assignor to Financiere de Segur, Paris, France

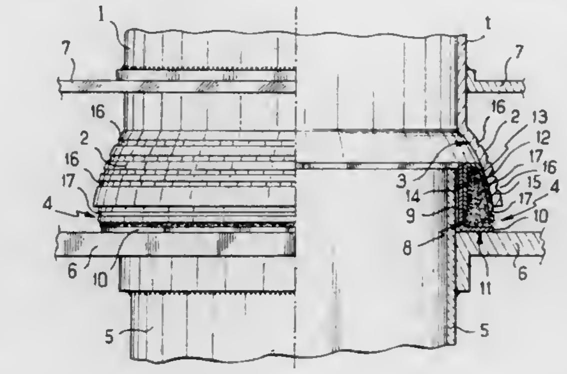
PCT No. PCT/FR94/00760, § 371 Date Dec. 20, 1995, § 102(e) Date Dec. 20, 1995, PCT Pub. No. WO95/00792, PCT Pub. Date Jan. 5, 1995

PCT Filed Jun. 23, 1994, Ser. No. 564,224

Claims priority, application France, Jun. 25, 1993, 93 07758

Int. Cl.⁶ F16L *27/04*

U.S. Cl. 285—261 **4 Claims**



1. An exhaust ball-coupling comprising a first length of metal tube having an end provided with a spherical wall element that has a concave spherical inside surface, and a second length of tube carrying an annular exhaust gasket having a convex spherical outside surface in contact with the concave inside surface of the first length of tube, said first and second lengths of tube being provided with flanges interconnected by link members urging said flanges towards each other, wherein the spherical wall element of the first length of tube is provided with a series of work-hardened annular strips spaced apart and extending substantially coaxially.

5,836,625

BOLT HOUSING, ASSEMBLY, AND FITTED PANEL

Anthony Wilfred Kibble, 15 Carnoustie Close, Bloxwich, West Midlands, United Kingdom, WS3 3UH

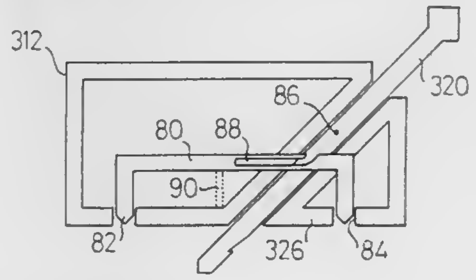
PCT No. PCT/GB94/02001, § 371 Date Mar. 8, 1996, § 102(e) Date Mar. 8, 1996, PCT Pub. No. WO95/08040, PCT Pub. Date Mar. 23, 1995

PCT Filed Sep. 14, 1994, Ser. No. 596,354

Claims priority, application United Kingdom, Sep. 16, 1993, 9319207; May 9, 1994, 9409053

Int. Cl.⁶ E05C *1/04*

U.S. Cl. 292—145 **14 Claims**



1. A bolt assembly which includes

(i) a first bolt housing, a bolt having a bolt tip, a first bolt guide carried by the first bolt housing, the bolt having a longitudinal axis and being mounted for longitudinal sliding movement in a direction constrained by and relative to the first bolt guide, the first bolt housing having a surface beyond which the bolt tip can project while said bolt is constrained by said first bolt guide, the first bolt guide being at an acute angle to said surface,

(ii) a first bolt tip channel for receiving the first bolt tip alignable with the first bolt guide, the bolt tip being movable into and out of the first bolt tip channel only when said first bolt guide and first bolt tip channel are aligned,

(iii) a second housing comprising the first bolt tip channel,

(iv) supplementary holding means mounted to the first bolt housing for restraining movement of the first bolt guide relative to the first bolt tip channel parallel to said surface when the bolt tip is received in the first bolt tip channel,

wherein said supplementary holding means is external to both the first bolt housing and the second housing when the assembly is in a closed condition and the supplemental holding means being movable relative to the first bolt housing, said first bolt housing being adapted for fitment to a panel.

5,836,626

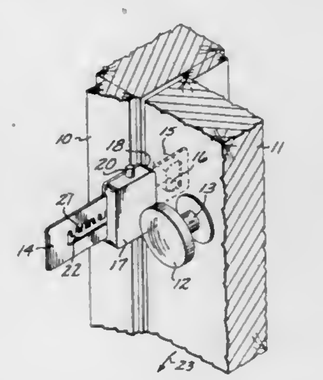
LOCKING DOOR LATCH

Thomas A. Coy, 621 Allen Ave., Glendale, Calif. 91201

Filed Apr. 29, 1996, Ser. No. 638,653

Int. Cl.⁶ E05C *19/18*

U.S. Cl. 292—292 **12 Claims**



1. A locking door latch device for insertion between the free edge of a door to engage a horizontally-disposed retractable door bolt, to be received in a bolt hole formed in a mating door frame or jamb, and comprising:

an elongated, planar latch plate including at least one vertically-elongated bolt pass-through hole, said bolt pass-through hole having opposed straight vertical edges and curved top and bottom ends configured to be complementally received around said retractable bolt, said latch plate also including an internal longitudinal slot formed with two opposing longitudinal edges, one such edge being linear and the opposite being configured with a plurality of lateral notches spaced at selected intervals;

at least one arcuate flange segment projecting laterally from at least one of said ends of said at least one bolt pass-through hole and extending lengthwise on said latch plate to terminate in forward and rearward ends, said arcuate flange segment configured to complementally engage said bolt and be received in said bolt hole;

an abutment housing movably carried on said latch plate, and formed with an abutment side, said housing being shiftable to an abutting position disposing said abutment side for engagement with said door adjacent to said free edge;

a retainer plunger carried on said abutment housing selectively projectable from said abutment housing and having at least one retaining pin operative to, when said plunger is projected, engage a selected one of said plurality of notches; and

a spring in said abutment housing biasing said plunger to said projected position.

5,836,627

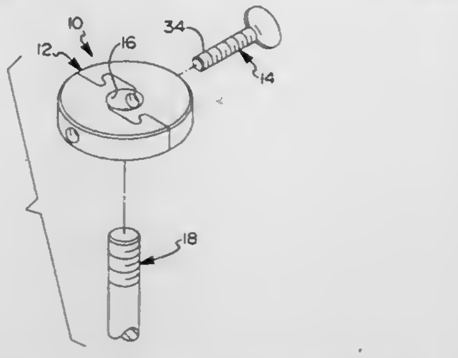
HOUSING AND SECURING DEVICE

Stephen A. Nemeckay, Detroit, Mich., assignor to Dexter Automatic Products Company, Dexter, Mich., a part interest

Continuation of Ser. No. 312,816, Sep. 27, 1994, Pat. No. 5,538,299. This application Jul. 23, 1996, Ser. No. 685,441

Int. Cl.⁶ E05C *17/02*

U.S. Cl. 292—305 **9 Claims**



1. A locking device for removably mounting onto an item, the locking device comprising:

(a) first and second opposedly-arranged, interdigitating body portions, each of the first and second body portions having a male pedestal portions a male foot portion, a U-shaped recess, and an inner surface, wherein each inner surface defines a first female portion for axially slidably receiving the male foot portion of each opposite body portion in an interdigitating relationship and each U-shaped recess of each body portion defines a second female portion for axially slidably receiving the male pedestal portion of each opposite body portion in an interdigitating relationship, the body portions having means for preventing radial disengagement by the interdigitation of the two body portions, the body portions each having a relief area which, upon interdigitation of the body portions, cooperate to define an aperture for axially slidably receiving an item to be locked;

(b) a first bore extending radially through one of the body portions and into the aperture, the bore extending through the inner surface of the body portion and through the interdigitated foot of the other body portion, thereby defining a notch in the foot portion of the other body portion, and

wherein the body portions are adapted to be aligned coaxially with the item.

5,836,628

DOORJAMB REINFORCING DEVICE

Ronald A. Beier, 6641 Laurel Rd., Oklahoma City, Okla. 73162

Filed Dec. 11, 1996, Ser. No. 764,678

Int. Cl.⁶ E05B *17/00*

U.S. Cl. 292—346 **11 Claims**

1. A doorjamb in combination with a device for reinforcing the doorjamb, the doorjamb having an exterior side, an interior side, an inner edge, and an outer edge, the exterior side having a stop rail against which a door engages when the door is in a closed position, the inner edge of the doorjamb opposing the outer edge and being adjacent to the door as the door is moved to the closed position, the doorjamb having a bolt receiving hole extending through the doorjamb from the exterior side to the interior side proximate the inner edge for receiving a retractable bolt of the door, the device comprising:

a rigid plate member having a flange formed along one side thereof and a bolt receiving opening formed proximate an opposite side thereof, the plate member mounted to the interior side of the doorjamb with the bolt receiving opening substantially aligned with the bolt receiving hole of the doorjamb and the flange extending over a substantial portion of the outer edge of the doorjamb in contact with the outer edge of the doorjamb such that application of a force on the door in

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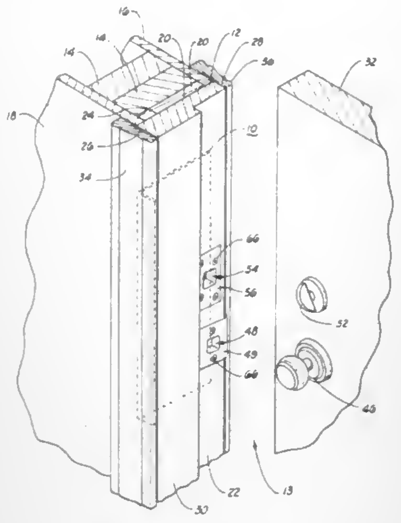
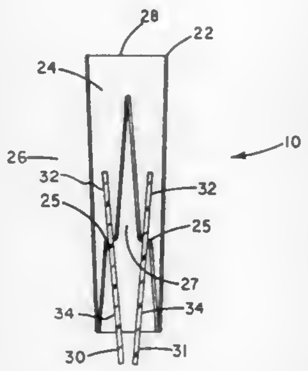


the direction of the inner edge of the doorjamb when the bolt of the door is extended through the bolt receiving opening of the plate member causes the force to be distributed over a substantial portion of the outer edge of the doorjamb.

5,836,629

DISPOSABLE ANIMAL WASTE RECEPTACLE

Stephen John Hobart, 17 Park Drive, Wickford Essex, United Kingdom, SS12 9DJ
Filed Sep. 18, 1997, Ser. No. 933,163
Int. Cl.^{6} A01K *29/00;* **E01H** *1/12*
U.S. Cl. 294—1.3 11 Claims



1. A disposable animal waste receptacle for picking up animal waste from a surface and containing the waste for disposal comprising:

a bag having a wall defining an interior for receiving the hands of a user, said wall having an exterior;

a pair of scooping members for scooping up animal waste off of a surface;

each of said scooping members being mounted to said bag, each of said scooping members extending through the wall of said bag such that an interior portion of said scooping member extends into the interior of said bag and an exterior portion of said scooping member extends out of the exterior of said bag, the interior portion of each of said scooping members being manipulatable by one of said hands grasping the interior portion of said scooping member to effect a scooping of animal waste onto said scooping member;

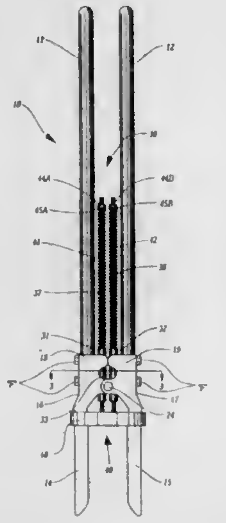
wherein the wall of said bag has an outer surface forming an inverted exterior pocket on the exterior of said bag, said exterior pocket being positioned between the scooping members for receiving animal waste scooped by said scooping members;

wherein the wall of said bag is invertible such that the exterior pocket of the outer surface of the bag is moved into an interior position simultaneous with said scooping members and any animal waste scooped onto said scooping members into said bag for disposal without further handling of said scooping members.

5,836,630

POSTHOLE DIGGER AND CLEANING ATTACHMENT

Ronald Glenn Putnam, Jr., 15031 Beatties Ford Rd., Huntersville, N.C. 28078
Continuation-in-part of Ser. No. 613,840, Mar. 11, 1996, Pat. No. 5,685,587. This application Nov. 10, 1997, Ser. No. 966,625
Int. Cl.^{6} A01B *1/18*
U.S. Cl. 294—50.5 19 Claims



1. In a posthole digger comprising first and second spaced-apart and substantially upright handles, each handle having a free end thereof and a proximal end thereof, pivot means for pivotably attaching the handles together, and first and second cooperating scoops extending from respective proximal ends of the handles, the scoops being moveable between a generally open position for penetrating the ground surface, and a generally closed position for excavating, the improvement comprising a cleaning attachment for removing accumulated earthen matter from the first and second scoops when in the open position, said cleaning attachment comprising:

(a) a stationary hollow sleeve attached adjacent the proximal ends of the handles;

(b) an elongate slide rod received within the sleeve and extending between the handles for sliding vertical movement relative thereto;

(c) an inner scraper attached to an end of said slide rod and positioned between the first and second scoops for reciprocating vertical movement along the length of the scoops when in the open position;

(d) biasing means engaging the slide rod for normally urging the inner scraper upwardly into a storage position adjacent a top end of the scoops;

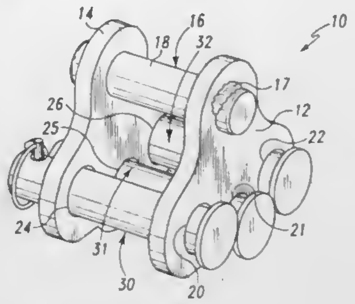
(e) a foot extension secured to said inner scraper for being depressed by the foot of a user against the force of said biasing means to move said inner scraper downwardly along the length of said scoops from the top end thereof to a bottom end thereof; and

(f) an outer scraper secured to said foot extension and residing in closely-spaced relation to an outside surface of the scoops, said outer scraper being movable in unison with said inner scraper to clean away accumulated earthen matter from inside and outside surfaces of the scoops in the open position.

5,836,631

LOAD LEVELING SLING RIGGING APPARATUS

Kenneth A. Coe, Lebanon, Ind., assignor to American Steel Investment Corporation, Fort Wayne, Ind.
Filed May 9, 1997, Ser. No. 853,510
Int. Cl.^{6} B66C *1/12*
U.S. Cl. 294—74 16 Claims



1. A sling rigging apparatus comprising:

a first body member;

a second body member operatively connected with said first body member;

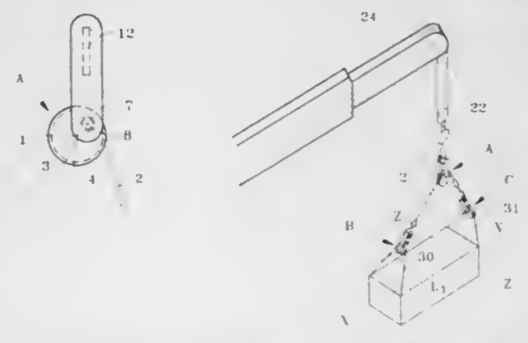
a suspension member on which an upward force may be applied to lift the first and second body members, said suspension member attached to at least one of said first and second body members; and

a plurality of pins extending in a longitudinal direction to span a space between portions of said first and second body members, said plurality of pins comprising a first pin, a second pin, and a third pin, each of said plurality of pins including an exterior periphery, said pins being spaced from each other in a direction transverse to said longitudinal direction and arranged to define a multi-curved pathway along which a sling is positionable for frictional engagement with at least parts of the exterior peripheries of said plurality of pins, wherein said first pin and said third pin are disposed on opposite sides of said second pin, wherein said suspension member is disposed above said first and third pins, wherein said second pin is disposed below said first and third pins, and wherein each pin comprises a onepiece construction in the spanned space between portions of said first and second body members.

5,836,632

LOAD BALANCING LIFTING APPARATUS

Juan Rogelio Pompa, Houston, Tex., assignor to Jerry M. Ball, So. Houston, Tex.
Filed Jul. 29, 1997, Ser. No. 902,256
Int. Cl.^{6} B66C *1/12;* **B66D** *3/04*
U.S. Cl. 294—82.12 8 Claims

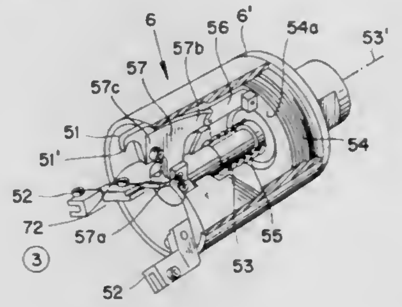


1. Apparatus for balancing and lifting a load supported from opposite ends of a first cable or chain, said apparatus comprising a first sheave engageable by said cable or chain and through which extends a pin member, the opposite ends of said pin member being supported by structural members which may be attached to a source of power for lifting said load; said apparatus being characterized in that the central axis of said pin member is radially offset from the center of said first sheave and in that first and second ends of said first cable or chain are connected to first and second support assemblies, each of which also includes a sheave through which is inserted a pin member the central axis of which is radially offset from the center of its corresponding sheave, each of said sheaves of said first and second support assemblies being engageable with a center portion of second and third cable or chains, respectively.

5,836,633

GRIPPING ARRANGEMENT

Bo Karl Ragnar Svensson, Nybrogatan 75 114 40, Stockholm, Sweden
PCT No. PCT/SE95/01193, § 371 Date Mar. 19, 1997, § 102(e) Date Mar. 19, 1997, PCT Pub. No. WO96/12582, PCT Pub. Date May 3, 1996
PCT Filed Oct. 16, 1995, Ser. No. 817,041
Claims priority, application Sweden, Oct. 21, 1994, 94 03607
Int. Cl.^{6} B25J *15/08*
U.S. Cl. 294—88 26 Claims



1. An arrangement which grips and holds or releases material with the aid of a number of movable gripping devices and which includes a central, axially extending main part which is adapted to support a piston-cylinder device which can move reciprocatingly in relation to said main part, wherein the axial movement of said piston-cylinder device can be translated to radial movement of said gripping devices through the medium of a lever means, and wherein the lever means is pivotal in relation to said main part and has a part which is intended for coaction with the piston-cylinder device and a part, which is intended for coaction with the gripping device and which includes a first supportive surface and a first through-penetrating hole, and where said gripping device includes a second supportive surface and a second through-penetrating hole, characterized in, that the gripping device includes a tapered portion which forms, among other things, said second supportive surface and a first abutment surface, that said two supportive surfaces can face towards one another and perpendicularly related to a plane, which is adapted to coincide with a centre line of said main part, that said first supportive surface is parallel related to said plane, that said part includes a second abutment surface, which can face said first abutment surface, that said two abutment surfaces are adapted to abut and support one another, that said first hole is positioned through said second abutment surface, that said second hole is positioned through said first abutment surface, that when the supportive surfaces support and abut one another the centre lines of said two holes are coordinated, and that a connecting and holding element is fixed to but readily removable from said gripping device part and is intended to coact with said two holes simultaneously.

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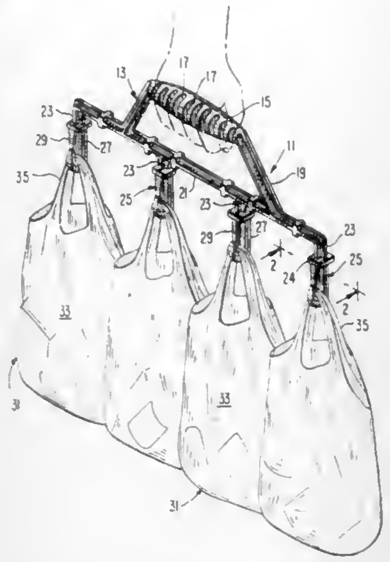
5,836,634
BAG HANGER UNIT

Jack Finkelman, 26-10 Union St. Apt 5B, Flushing, N.Y. 11354
Filed Dec. 11, 1997, Ser. No. 989,110
Int. Cl.^{6} B65D *33/06*
U.S. Cl. 294—159 **6 Claims**



1. A hanger unit for carrying a plurality of bags, each having one extending handle, the hanger unit comprising:

an extending support bar with a first end and a second opposite end and having a plurality of rigid struts fixedly depending downwardly therefrom and spaced substantially equidistant one from the other with one of said struts depending substantially from said first end of said support bar, and a second of said struts depending substantially from said second end of said support bar;

a handle comprising a grip substantially centrally disposed above said support bar and under which at least some of said plurality of struts fixedly depend from said support bar, said grip having first and second ends from which first and second arms extend oppositely downward toward and are fixed to said support bar at locations therealong away from said support bar ends; and

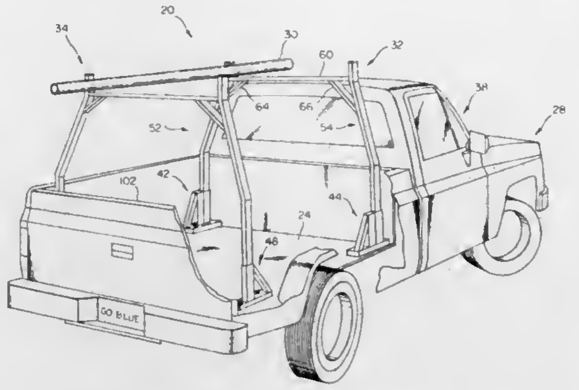
a plurality of self-closing clip elements corresponding in number to said plurality of struts, wherein each of said clip elements is connected to and non-movably hangs from its corresponding strut.

5,836,635
KNOCKDOWN TRUCK RACK APPARATUS AND METHOD

John R. Dorman, 15908 18th Ave. Ct. East, Tacoma, Wash. 98445-3343
Filed May 31, 1996, Ser. No. 656,578
Int. Cl.^{6} B60F *3/00*
U.S. Cl. 296—3 **3 Claims**

3. In a truck of the type having a flat cargo bed that extends rearward from a passenger cab, a knockdown truck rack adapted for attachment to the cargo bed for elevated support of materials and construction equipment, above the cargo bed, the knockdown truck rack comprising:

a front support frame that is movable from a stored position where the space above the cargo bed of the truck is substantially unobstructed, to a vertical set position over the truck cargo bed for supporting equipment in an elevated position adjacent the passenger cab of the truck, said front support frame having a pair of laterally spaced, left and right, vertically oriented side-posts, and an elevated horizontal cross rail disposed therebetween, wherein each side-post is attached to opposite ends of the cross rail;



an independent, rearwardly disposed, aft support frame that is movable from a stored position where the space above the cargo bed of the truck is substantially unobstructed, to a vertical set position over the truck cargo bed for supporting equipment in an elevated position, said aft support frame having a pair of laterally spaced, left and right, vertically oriented side-posts, and an elevated horizontal cross rail disposed therebetween, wherein each side-post is attached to opposite ends of the cross rail;

a pair of laterally spaced, left and right front socket assemblies for attachment to the cargo bed of a truck adjacent the passenger cab, said front socket assemblies being disposed to receive corresponding said left and right side-posts of the front support frame to rigidly maintain the front support frame in the vertical set position;

a pair of laterally spaced, left and right aft socket assemblies for attachment to the cargo bed of a truck, said aft socket assemblies being disposed to receive corresponding said left and right side-posts of the aft support frame to rigidly maintain the aft support frame in the vertical set position;

each said front and aft socket assemblies further comprising a base plate for mounting to the cargo bed of the truck, and a tubular socket sleeve defining a receiving socket of the size and shape to receive therein the corresponding side-post of the corresponding support frame, each socket sleeve being fixed to the corresponding base plate, and extending vertically therefrom; and

each front socket assembly further comprising an additional adjacently disposed parallel socket sleeve for receiving the side-post of an aft support frame, said adjacent parallel socket sleeves being connected, each to the other, wherein the aft support frame is movable to a vertical set position adjacent the front support frame.

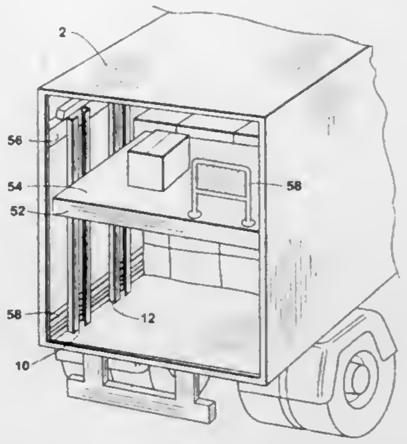
5,836,636
GOODS STORAGE

William Mark Adams, Sutton Lodge, 33 Town Street, Sutton-cum-Lound, Retford, England
PCT No. PCT/GB93/01515, § 371 Date Jan. 17, 1995, § 102(e) Date Jan. 17, 1995, PCT Pub. No. WO94/02337, PCT Pub. Date Feb. 3, 1994
PCT Filed Jul. 19, 1993, Ser. No. 373,188
Claims priority, application United Kingdom, Jul. 18, 1992, 92154324
Int. Cl.^{6} B60P *3/05*
U.S. Cl. 296—24.1 **12 Claims**

1. A goods support system (**52**) for use in a goods storage area having a floor, a ceiling and at least a pair of sidewalls, which system comprises:

at least one base (**54**) mounted on a plurality of first guides (**10**, **12**, **14**, **16**) forming a first set of guides, said base movable along said first set of guides within the goods storage area;

a set of second guides wherein said base and said first guides are movable within the goods storage area in a perpendicular direction to the movement of said base along the first set of guides;

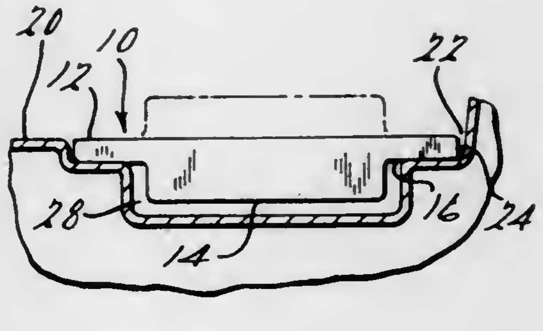


said first set and second set of guides mounted on or adjacent to said sidewalls, floor or ceiling; and

wherein one of the first or second sets of guides are mounted in a substantially vertical plane and the other set of guides is mounted in a substantially horizontal plane.

5,836,637
REVERSIBLE VEHICLE FLOOR PANEL

Ernest J. Laginess, Clarkston; Walter W. Frisbie, Lake Orion, and Allen G. Hicks, Allenton, all of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.
Filed Oct. 1, 1997, Ser. No. 941,819
Int. Cl.^{6} B62D *43/00*
U.S. Cl. 296—75 **4 Claims**



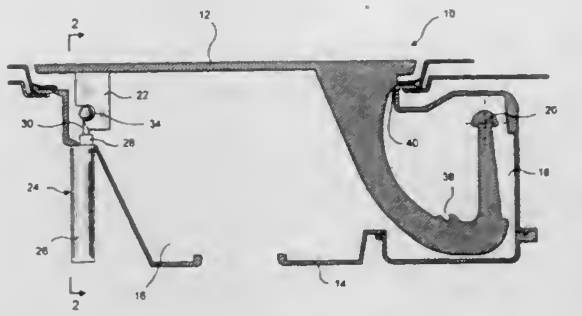
1. An assembly for adjusting the relative interior floor height of a portion of a passenger vehicle passenger interior, comprising:

a reversible floor panel assembly having a first planar panel on one side and a second planar panel,on an opposite side of said floor panel assembly, said first and second planar panels being spaced generally vertically apart from one another, the area of said first planar panel being greater than the area of said second planar panel to form a flange along at least one edge of said floor panel assembly, said flange being substantially coplanar with said first planar panel, and the vertical thickness of said first planar panel and said flange being substantially equal to one another, said floor panel assembly having at least one generally vertical wall interconnecting said first and second planar panels adjacent said flange; and

a floor of said passenger vehicle passenger interior having a cavity formed therein for receiving said second planar panel and said vertical wall of said reversible floor panel assembly when said reversible floor panel assembly is placed over said cavity with said first planar panel facing upwardly, said floor further having a recess formed therein generally adjacent said cavity for receiving said flange when said floor panel assembly is placed over said cavity with said first planar panel facing upwardly and for receiving said flange when said floor panel assembly is reversed with said first planar panel facing downwardly, and the vertical depth of said recess being approximately equal to the thickness of said first planar panel and said flange.

5,836,638
FUEL DOOR ASSEMBLY

Brian D. Slocum, Manhattan, Ill., assignor to Illinois Tool Works Inc., Glenview, Ill.
Filed Dec. 9, 1996, Ser. No. 762,097
Int. Cl.^{6} B60J *9/00;* **E05C** *19/16*
U.S. Cl. 296—97.22 **3 Claims**



1. A fuel door assembly comprising:

a housing, said housing having an open main compartment including an opening to which a tube leading to a fuel tank may be attached;

a door, said door covering said main compartment when in a closed condition and being hingedly connected to said housing, said door including a latch by which it is maintained in said closed condition covering said main compartment; and

a push-push lock attached to said main compartment, said push-push lock being reciprocatingly operable between a first fixed position and a second fixed position and being engagable with said latch, said door being locked in a fully closed condition upon said main compartment when said push-push lock is in said first fixed position and partially opened with respect thereto when said push-push lock is in said second fixed position.

5,836,639
MOTOR-VEHICLE SLIDING-DOOR SYSTEM WITH ELECTRONIC CONTROLLER

Frank Kleefeldt, Heiligenhaus; Damien Labonde, Essen; Johannes-Theodor Menke, Velbert; Stefan Armbruster, Heiligenhaus, and Thomas Schönenberg, Leverkusen, all of Germany, assignors to Kiekert AG, Heiligenhaus, Germany
Filed Apr. 2, 1997, Ser. No. 831,974
Claims priority, application Germany, Apr. 2, 1996, 196 13 114.6; Apr. 2, 1996, 196 13 116.2; Jun. 1, 1996, 296 09 770 U; Jan. 25, 1997, 197 02 698.2; Feb. 19, 1997, 197 06 393.4
Int. Cl.^{6} B60J *5/06*
U.S. Cl. 296—155 **8 Claims**

1. A motor vehicle comprising:

a body;

a door movable on the body between a closed position and an open position;

an electric power source mounted in the body;

a latch having

interengageable parts on the vehicle body and on the door engageable in a latched position to retain the door in the closed position, and

an electrical actuator energizable to put the latch in an unlatched position;

means including a drive on the body connected to the door and energizable from the source for moving the door between the open and closed positions;

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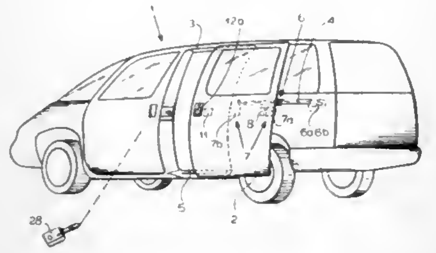
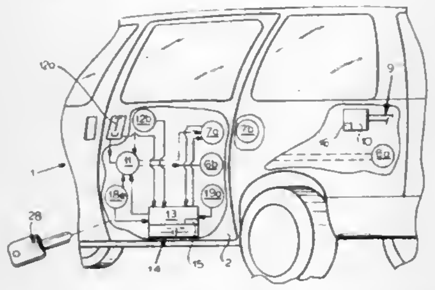
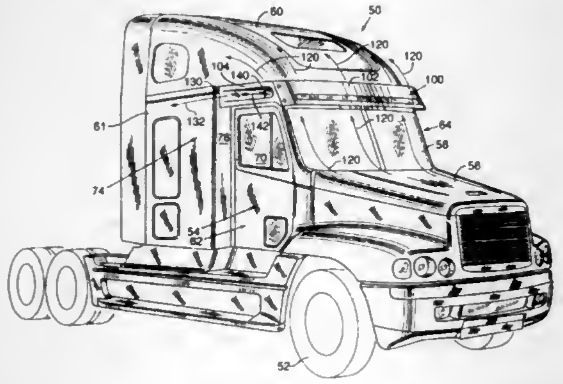




a battery in the door separate from the body-mounted power source;
electronic control means in the door powered by the battery and including
  a controller connected to the latch actuator for operating same to unlatch the door and
  a transmitter for transmitting a signal indicating the position of the door and of the latch; and
electronic control means in the body including
  a receiver for receiving the signal from the transmitter in the door, and
  a controller connected to the drive and to the body power source for operating the drive in accordance with the signal received by the body receiver.

5,836,640
VEHICLE WITH EXTERIOR SUN VISOR AND SUN VISOR CONSTRUCTION

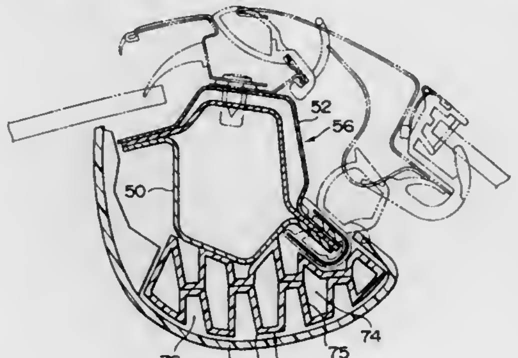
Mark S. Hurayt, Aloha; Christopher Jory, Portland, and Hans-Peter Bock, Hillsboro, all of Oreg., assignors to Freightliner Corporation, Portland, Oreg.
Filed Jul. 3, 1996, Ser. No. 674,838
Int. Cl.⁶ B62D *35/00*
U.S. Cl. 296—180.2 **36 Claims**



1. A vehicle with a sun visor for a vehicle having a windshield and side doors, the sun visor comprising:
an elongated first side visor portion extending across a first door in a position above the first door, a front visor portion extending across the front of the vehicle and above the windshield, and an elongated second side visor portion extending across a second door in a position above the second door, the second door being at the side of the vehicle opposite to the side of the vehicle having a first door;
a plurality of mounts coupling the first and second side visor portions and front visor portion in an offset position from the vehicle so as to provide a path for air to flow upwardly along the windshield and between the vehicle and the front visor portion, a path for air to flow between the first side visor portion and the vehicle and a path for air to flow between the second side visor portion and the vehicle.

5,836,641
STRUCTURE OF ABSORBING IMPACT ENERGY USING INTERIOR MATERIAL OF AUTOMOBILE

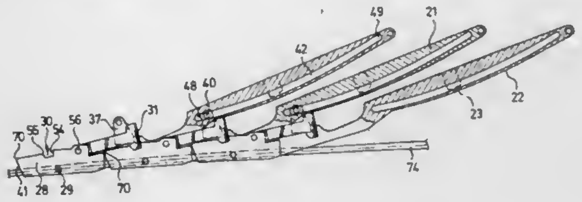
Tatsuya Sugamoto, Toyota; Suga Hitoshi, Nagoya; Masaya Kubo, and Yuzuru Imoto, both of Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan
Division of Ser. No. 742,702, Nov. 5, 1996, Pat. No. 5,660,426, which is a continuation of Ser. No. 393,310, Feb. 22, 1995, abandoned. This application Apr. 17, 1997, Ser. No. 840,854
Claims priority, application Japan, Feb. 22, 1994, 6-46605; Aug. 29, 1994, 6-226014; Jan. 19, 1995, 7-23307
Int. Cl.⁶ B60R *21/04*
U.S. Cl. 296—189 **8 Claims**



1. A structure for absorbing impact energy using a non-metallic interior material arranged on an inside of an inner panel of a structural member of a vehicle body, the structural member being provided with the inner panel and an outer panel and having two flange joint portions formed by joining respective flanges of the inner panel and the outer panel together in an overlapped state, said structural member being formed to have a closed structure in cross section taken along an imaginary plane, comprising:
an energy absorbing space composed of a first space defined by said interior material and an edge of at least one of said flange joint portions in a direction of extension of said one flange joint portion in said imaginary plane and a second space defined by said interior material and said inner panel, other than said at least one flange joint portion; and
a non-metallic energy absorber having a first energy absorber portion disposed in said first space and a second energy absorber portion disposed in the second space,
wherein said first energy absorber portion is provided with a hollow portion defined by two wall portions in said imaginary plane respectively facing to said edge of said at least one of said flange joint portions and to said interior material.

5,836,642
VEHICLE ROOF WITH A SERIES OF RAISABLE COVER STRIPS

Wolfram Salz, Ditzingen-Hirschlanden, Germany, assignor to Webasto Karosseriesysteme GmbH, Stockdorf, Germany
Filed Nov. 18, 1996, Ser. No. 751,682
Claims priority, application Germany, Nov. 17, 1995, 195 42 884.6
Int. Cl.⁶ B60J *7/047*
U.S. Cl. 296—216.02 **18 Claims**

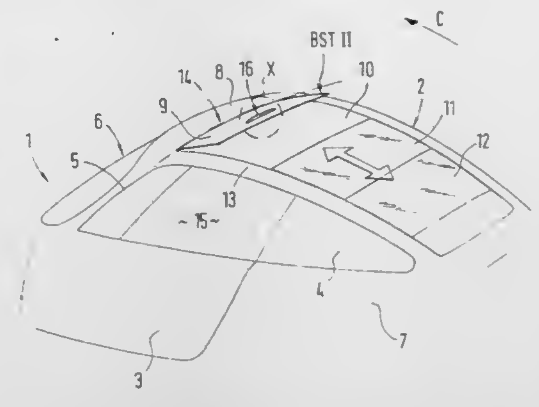


1. Vehicle roof with a series of elongated cover strips for selectively closing and at least partial exposing a roof opening in a fixed roof surface of a vehicle, the cover strips bordering one another in a closed position in a manner forming an essentially planar. integrated system of cover strips, each cover strip having a swingable attachment element on each of opposite narrow ends thereof, means for guiding each of the attachment elements along a guideway attached to the roof, means for coupling adjacent attachment elements for joint movement in opening and closing directions as long as neither of the adjacent attachment elements is in a fully swung-out position, and means for disengaging said coupling means as each of the adjacent attachment elements reaches a fully swung-out position in a manner enabling relative movement with respect to one another as a respective, not yet fully swung-out, one of the adjacent attachment elements is being swung out, a locking element being provided for locking each attachment element in a fully swung-out position under the influence of an opening movement of the respective adjacent attachment element, means for automatically releasing each said locking element in response to a closing motion of the respective adjacent attachment element, and a guide element for moving an end cover strip along a fixed translational path with respect to the fixed roof surface; wherein said guide element is connected to the fixed roof surface and to the end cover strip in a manner enabling the end cover strip to be automatically displaceable relative to the guide element between the closed position and the fully swung-out position; wherein the end cover strip is connected to the guide element by an engagement part which is joined to the guide element and engages a crank slot which is formed in the attachment element for the end cover strip.

5,836,643
VEHICLE ROOF

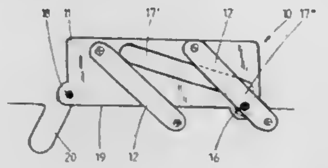
Michael Preiss, Vaihingen, Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Weissach, Germany
Continuation of Ser. No. 620,542, Mar. 25, 1996, abandoned. This application Oct. 15, 1997, Ser. No. 951,167
Claims priority, application Germany, Mar. 24, 1995, 195 10 822.1
Int. Cl.⁶ B60J *7/22*
U.S. Cl. 296—217 **23 Claims**

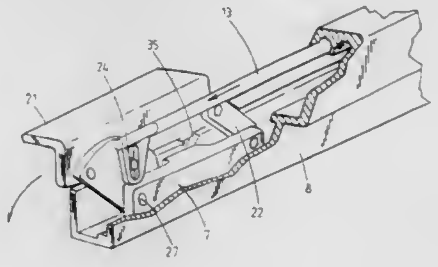
1. Vehicle roof assembly comprising:
a first roof section made of glass disposed adjacent a vehicle windshield frame, said first roof section being selectively movable between a lower position approximately flush with adjacent vehicle exterior surfaces and an upper wind deflecting position,
a roof opening disposed rearwardly of said first roof section,
and an air baffle immovably disposed on an exterior side of said first roof section to extend away from the exterior side, said air baffle extending laterally over only a portion of the width of the first roof section and being located at a position spaced between and spaced from front and rear edges of the first roof section, said air baffle serving to minimize air booming in a passenger compartment when said roof opening is open during forward driving of a vehicle with said roof assembly.



5,836,644
OPENING ROOF FOR A VEHICLE

Robert Smith, Wolverhampton, United Kingdom, assignor to Inalfa Industries B.V., Netherlands
Filed Oct. 24, 1996, Ser. No. 735,918
Claims priority, application Netherlands, Oct. 25, 1995, 1001499; Mar. 22, 1996, 1002685
Int. Cl.⁶ B60J *7/06*
U.S. Cl. 296—219 **12 Claims**





1. An opening roof for a vehicle having an opening in a fixed roof. the opening roof comprising:
a frame mountable around the opening;
a flexible cover for selectively closing or exposing the opening;
a cover plate fixed to a side of the cover and guided at its lateral ends through glide shoes in guide rails extending along either side of the opening in a longitudinal direction of the frame;
a drive member coupled to the cover plate; and
a displacement mechanism between the cover plate and one of the glide shoes and operably connected to the drive member for displacing the cover plate in a forward and downward direction relative to the glide shoes during the final closing movement, the displacement mechanism comprising a four-bar mechanism formed as a deformable parallelogram and having parallel bars pivotally fixed at opposite ends to the glide shoe and the cover plate.

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5,836,645
LOUNGER-TYPE MASSAGE MACHINE

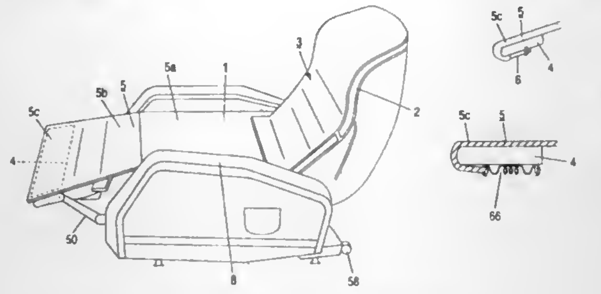
Hironobu Sakaue; Ryuji Yamada; Haruo Sugai; Akihide Sugawa; Masamichi Miyaguchi; Masatoshi Dairin; Makoto Fukutani; Fumihiro Nishio, and Hiroyuki Hojyo, all of Osaka, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Nov. 21, 1996, Ser. No. 752,561

Claims priority, application Japan, Nov. 24, 1995, 7-305912

Int. Cl.^{6} A47C *1/02*

U.S. Cl. 297—68 **14 Claims**



1. A lounger-type massage machine comprising:
a seat;
a back support operative to be reclined relative to said seat;
a leg rest movable between a retracted position where said leg rest is retracted to a position below said seat and an extended position where said leg rest is extended outwardly in front of said seat;
a continuous sheet extended to cover said seat and said leg rest; and
looseness prevention means having elastic members for elastically pulling an end of said sheet so as to prevent the loosening of said sheet in both said retracted position and said extended position of said leg rest.

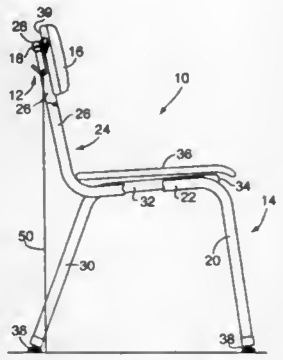
5,836,646
CLASSROOM CHAIR HAVING BOOKBAG HOOK

Ali R. Salehi, Wilbraham, Mass., and David P. Williams, Milford, Conn., assignors to Columbia Manufacturing, Inc., Westfield, Mass.

Filed May 14, 1997, Ser. No. 855,937

Int. Cl.^{6} A47C *7/62*

U.S. Cl. 297—188.04 **14 Claims**



7. In a classroom chair including a tubular chair frame having a backrest supporting portion, a backrest, and attaching means for securing the backrest to said backrest supporting portion, the improvement comprising; a bookbag hook defined by an axially elongated bent rod having generally eyelet shaped end portions, each of said eyelet shaped end portions having an aperture therethrough, said backrest supporting portion having spaced apart indentations therein, each one of said eyelet shaped end portions received within and generally complimenting an associated one of said indentations, said attaching means including a pair of threaded fasteners, each one of said fasteners passing through said backrest supporting portion and through an associated one of said apertures and threadably engaging said backrest, said fasteners cooperating with said backrest supporting portion and said backrest to secure said backrest to said backrest supporting portion and to secure said bookbag hook to said chair in depending relation to said chair frame with said eyelet shaped end portions of said bookbag hook disposed between said backrest supporting portion and said backrest.

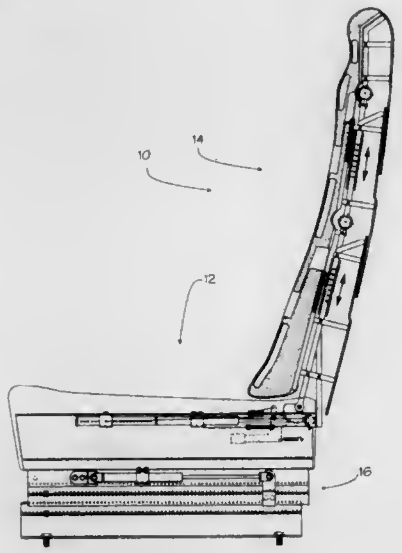
5,836,647
VEHICLE SEAT WITH SHOCK ABSORPTION

Ben Turman, 4318 Date Ave., La Mesa, Calif. 91941

Filed May 20, 1997, Ser. No. 859,190

Int. Cl.^{6} B60N *2/42;* B60R *21/00*

U.S. Cl. 297—216.1 **20 Claims**



1. A vehicle seat comprising:
a seat base;
a seat back;
track means coacting with said seat base for movably supporting the seat within the vehicle;
first energy absorbing means in coacting relation between said seat base and said track means;
means on said base for supporting said seat back;
energy absorbing means coacting between said supporting means and said seat base, and
wherein shear means affixes said seat base to said track means whereby, on impact with the rear of the vehicle, said shear means shears thereby enabling relative movement between said seat base and said track means under damped control of said first energy absorbing means.

5,836,648
VEHICLE SEAT WITH MULTIFUNCTION BACKREST

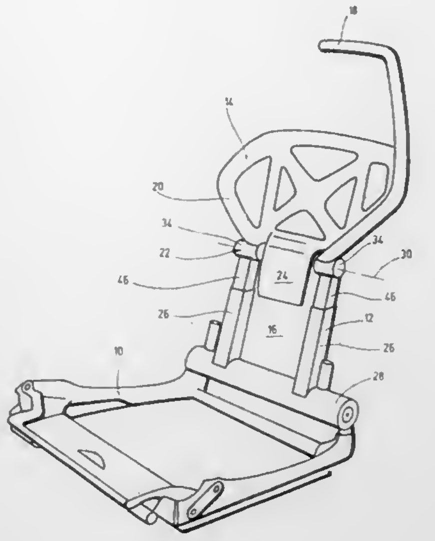
Kurt Karschin, Kirchheim/Teck, and Rene Heller, Mengen-Rulfingen, both of Germany, assignors to Recaro GmbH & Co., Kirchheim/Teck, Germany

Filed Oct. 31, 1997, Ser. No. 962,063

Claims priority, application Germany, Oct. 31, 1996, 196 43 977.9

Int. Cl.^{6} B60N *2/42*

U.S. Cl. 297—216.14 **11 Claims**



1. A vehicle seat, comprising:
a seat part;
a backrest having a top backrest part and a bottom backrest part, said backrest parts being pivotably connected;
an adjustment means for varying inclination of said backrest relative to said seat part; and
a clamping device, coupled to said backrest parts, providing a clamping force for restraining relative pivoting of said backrest parts during normal vehicle operating conditions and for allowing said top backrest part to pivot relative to said bottom backrest part to intercept a seat occupant in response to an actuating force from the seat occupant overcoming said clamping force and causing pivoting of said top backrest part during crash conditions, said clamping device including a horizontal pivot axle pivotably coupled to said top backrest part by a slip clutch, said slip clutch being adjustable to vary said clamping force and being adjusted to a threshold value for said actuation force associated with crash conditions, said actuation force overcoming said clamping force of said slip clutch and causing forward pivoting of said top backrest part about said pivot axle, said clamping device also including an adjustment device for selectively positioning said top backrest part in a desired angular position relative to said bottom backrest part within a predetermined range.

5,836,649
SAFETY CHAIR FOR CHILDREN

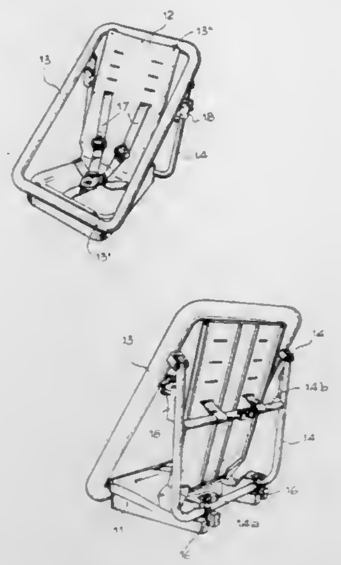
Lućiano Bonetti, Telgate, Italy, assignor to Foppa Pedretti S.p.A., Grumello del Monte, Italy

Filed Apr. 29, 1997, Ser. No. 840,371

Int. Cl.^{6} A47D *1/10;* B60N *2/28*

U.S. Cl. 297—256.1 **8 Claims**

1. A safety chair for children designed to be applied to a seat in a vehicle, the safety chair comprising:
an upholstered supporting structure including
a seat and a base support, supporting said seat;
a back and a back support which extends from said base support for supporting said back;
an oblique frame which connects a front of said base support to a top of said back support; and
an auxiliary frame which connects said oblique frame to a back of said base support, said auxiliary frame being designed to be fastened to said base support so as to maintain said back support upright when the chair is positioned ready for use and being unfastenable to permit overturning of the back support substantially in line with the base support, said oblique frame being jointed to a front of said base support and may be overturned thereon, wherein said back support is pivoted, at said top, on said oblique frame whereas a lower part of said back support is free and slides on said base support and wherein said auxiliary frame is pivoted on said oblique frame and removably fastened in holes provided in said back of said base support.



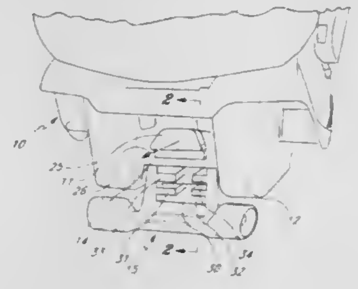
5,836,650
CAR SEAT WITH HEIGHT ADJUSTMENT MECHANISM

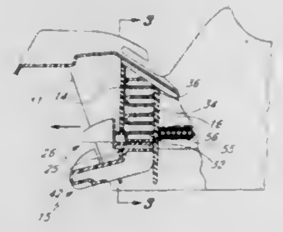
Robert John Warner, Jr., Stow, and Michael Carnahan, Bedford, both of Ohio, assignors to Century Products Company, Macedonia, Ohio

Filed Jun. 13, 1997, Ser. No. 874,311

Int. Cl.^{6} B60N *2/26;* A47D *1/10*

U.S. Cl. 297—256.11 **18 Claims**





1. A car seat for installation on a seat cushion of a vehicle, via a seat belt associated with said vehicle, the car seat comprising a main body defining a seating area, a seat base supporting the main body, a vertically movable support member for engagement with a portion of said seat base at at least two locations to permit vertical adjustment of said portion of said seat base relative to said vehicle seat cushion, the support member providing support between said seat base and said vehicle seat cushion, and means for releasably securing said support member to said portion of said seat base

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5,836,651
ADJUSTABLE CROSS-DIVIDED BACKREST FOR VEHICLE SEAT

Ferenc Szerdahelyi, Coburg, and Eberhard Pleiss, Untersiemau, both of Germany, assignors to Brose Fahrzeugteile GmbH & Co. KG, Coburg, Coburg, Germany

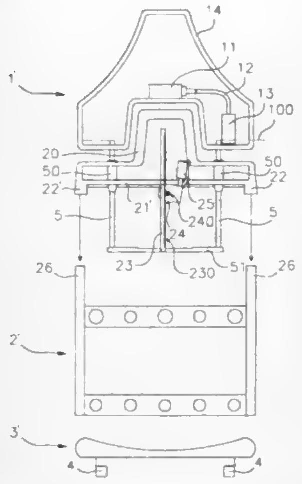
PCT No. PCT/DE96/00554, § 371 Date Sep. 30, 1997, § 102(e) Date Sep. 30, 1997, PCT Pub. No. WO96/30228, PCT Pub. Date Oct. 3, 1996

PCT Filed Mar. 25, 1996, Ser. No. 930,737

Claims priority, application Germany, Mar. 31, 1995, 195 12 012.4

Int. Cl.^{6} A47C *7/36*

U.S. Cl. 297—410 8 Claims



1. An adjustable cross-divided backrest for a vehicle seat, comprising a lower backrest part including a projection and which is adapted to be mounted for swivel movement on a lower seat frame of such vehicle seat in an axis running across the travel direction of such vehicle seat;

an upper backrest part including a head rest and a shoulder support integrated in one piece and which has in a central portion, a downwardly open recess,

wherein the upper backrest part is fixed to the lower backrest part and is adapted to,

swivel and be vertically adjusted relative to the lower backrest part, and

wherein the projection of the lower backrest part substantially fills out the recess of the upper backrest part when the upper backrest part is located in a lowermost adjustment position.

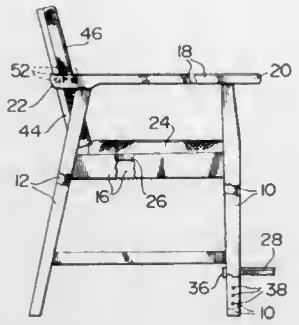
5,836,652
INVALID CHAIR WITH PIVOTAL FOOT REST

Michael S. Wexler, and Darrel Bonnet, both of Ottawa, Canada, assignors to VMS Rehab Systems Inc., Ogdensburg, N.Y.

Filed Feb. 27, 1997, Ser. No. 805,663

Int. Cl.^{6} A47C *7/50*

U.S. Cl. 297—423.28 14 Claims



1. In a chair for invalids and patients include front and rear legs, including a seat connecting the legs, said seat including seating portion having a front edge located at a height above the knees of a typical adult, and a back rest and a foot rest, said foot rest being pivotable from a substantially-horizontal active position to a substantially-vertical stowed position, said foot rest, in its vertical stowed position lying within the confines of said legs of said chair, and in its horizontal active position extending forwardly of said chair, the improved foot rest comprising: a generally-rectangular foot rest member which extends between said front legs, said foot rest member including a front edge, a rear edge and two side edges which extend between said front edge and said rear edge, an abutment stop which is secured directly to the rear edge of said foot rest member, and which coincides with, and lies along, said rear edge and includes two lateral extensions, one of which extends beyond one side edge at said rear edge, the other of which extends beyond the other side edge, said abutment stop extending perpendicularly upwardly from said foot rest member at said rear edge, said extensions of said abutment stop being adapted to abut against an associated rear face of said front legs, thereby to limit downward pivoting movements of said foot rest member, two brackets, one of which is affixed to the underface of said foot rest member adjacent to one said side edge, the other of which is affixed to the underface of said foot rest member adjacent to the other said side edge, said brackets being at said rear edge, and pin means, which are located forwardly of said rear edge of said foot rest member, thereby connecting each bracket with an associated front leg, thereby to secure said foot rest member to said chair in a cantilevered manner to provide an automatic stop of said upward pivoting to said vertical stowed position, and to permit said pivoting between a positively-stopped horizontal active position and said automatically-stopped stowed position.

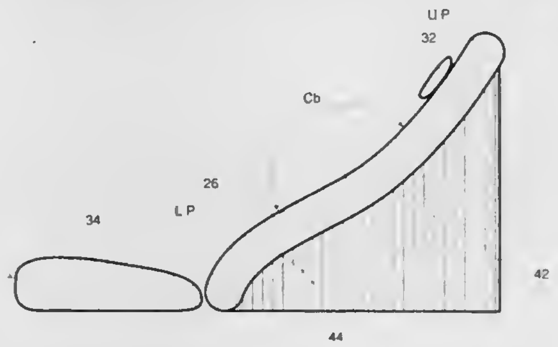
5,836,653
BACKRESTS/LEGLESS LEISURE CHAIRS MADE WITH A FOUNDATION

Walter J. Albecker, 838 S. May, Chicago, Ill. 60607

Continuation-in-part of Ser. No. 899,750, Jun. 17, 1992, Pat. No. 5,425,567, and Ser. No. 721,179, Jun. 26, 1991, abandoned. This application Jun. 19, 1995, Ser. No. 492,170

Int. Cl.^{6} A47C *20/00*

U.S. Cl. 297—452.31 21 Claims



1. A backrest/leisure chair comprising:

(a) a relatively firm generally wedge shaped foundation having a sloped face, a base, a back and two sides, the face being oriented at an acute angle from the base to define a generally wedge shape, the face further having an obtuse angle generally at its midpoint which orients an upper portion of the face at a higher angle than a lower portion;

(b) a softer top cushion having an upper and lower portion secured to the face; and

(c) a means for supporting occupant's lumbar region in a relatively natural lordotic curve comprising a generally convex semi-elliptically shaped elongated cylindrical generally firm lumbar support on the lower portion of the relatively firm foundation and extending substantially to a lower edge of said face, said firm lumbar support having a firmness sufficient to generally maintain its convex shape when pressure from a reclining occupant leaning against the foundation is applied.

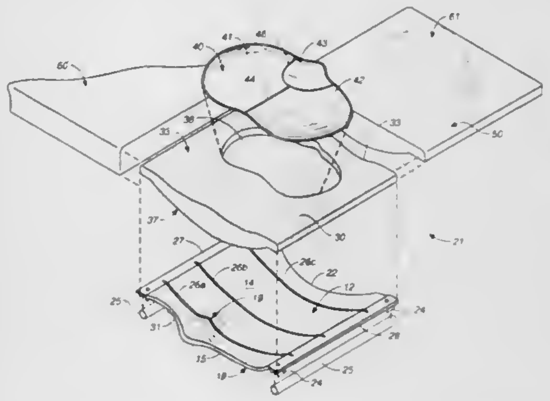
5,836,654
WHEELCHAIR SEAT ASSEMBLY WITH CONTOURED SEAT PAN AND CUSHION AND METHOD

Pamela C. DeBellis; Grant C. Denton, both of Boulder; John C. Dinsmoor, III, Westminister, and Richard R. Runkles, Longmont, all of Colo., assignors to Sunrise Medical HHG Inc., Longmont, Colo.

Division of Ser. No. 654,102, May 28, 1996. This application Aug. 20, 1997, Ser. No. 915,351

Int. Cl.^{6} A47C *27/18;27/14;7/02*

U.S. Cl. 297—452.41 38 Claims



1. The combination of a flexible pouch and elastomeric envelope for use in a wheelchair seating system comprising:

a) a flexible pouch having a flowable material contained therein,

b) an elastomeric envelope mounted around a cushion of said seating system, said flexible pouch being fixed directly to said elastomeric envelope at a plurality of spaced locations generally preventing relative movement between said flexible pouch and said envelope,

c) said flexible pouch being held in position on an area of said cushion by said envelope, and

d) said envelope and said flexible pouch having mutually engaged surfaces superimposed on said area of said cushion, said superimposed surfaces each having areas greater than said area of said cushion permitting localized relative displacement between said surfaces and permitting movement of said flexible pouch and said superimposed area of said envelope relative to said cushion.

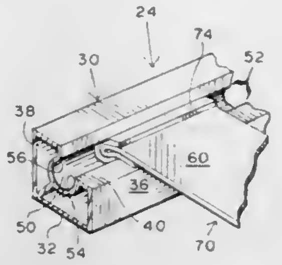
5,836,655
STRAP RETAINER ASSEMBLY AND METHOD

Steve Laufer, Miami, Fla., assignor to Miami Metal Products, Inc., Miami, Fla.

Continuation of Ser. No. 410,822, Mar. 27, 1995, abandoned. This application Jan. 23, 1997, Ser. No. 786,995

Int. Cl.^{6} A47C *7/02*

U.S. Cl. 297—452.63 8 Claims



1. A strap retainer assembly, comprising, in combination,

an anchor having a bottom section, a front section and a back section, and a cavity having a substantially uniform and lengthwise opening, and;

an insert comprising a strap of material having two opposed ends and at least one clip for an end where said end is retained by said clip, the entirety of said clip of said insert being introducible into the lengthwise opening of said cavity and rotatable relative to said cavity whereby said strap is not wrapped around said anchor.

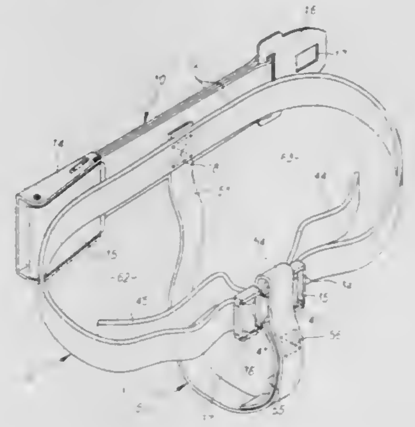
5,836,656
CHILD RESTRAINT

Ronald M. Baggott, 26771 Stafford, Mission Viejo, Calif. 92692

Filed Jun. 5, 1997, Ser. No. 869,726

Int. Cl.^{6} A47C *31/00*

U.S. Cl. 297—467 11 Claims



6. A child restraint for use with a lap-type seat belt having a first buckle assembly including a cooperating buckle and tongue which are releasable to disconnect the buckle, and for use for a child, having a torso, stomach, crotch and back, the child restraint comprising

a first short belt section affixed to a second buckle assembly of a design like the first buckle assembly and comprising a buckle for mating with the tongue of the first buckle assembly and a tongue for mating with the buckle of the first buckle assembly,

a second belt section forming a loop for encircling the torso of a child, the second belt section having a third buckle assembly at ends thereof, the third buckle assembly receiving at least a loop of the second belt section to allow the second belt section to be adjusted about the torso of a child,

a third belt section having a first end for extending from the third buckle assembly adjacent the location of a stomach area of a child, down under a crotch and back to a second end near the back of a child to be held in the second belt section, the second end of the third belt section and a central portion of the second belt section being securely fastened to the central section of the first belt section, and

the first end of the third belt section being formed into a loop for encircling a portion of the second belt section.

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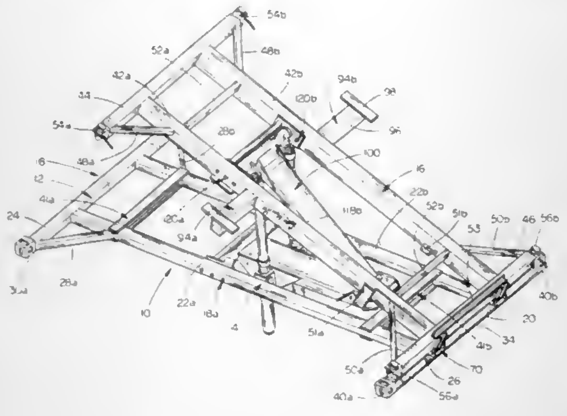
5,836,657
DETACHABLE STABILIZED INTERMODAL CONTAINER DUMPING APPARATUS

Jeffrey L. Tilley, Omaha, Nebr., and Ross F. Meyer, Mesa, Ariz., assignors to Omaha Standard, Inc., Council Bluffs, Iowa

Filed May 1, 1996, Ser. No. 641,700
Int. Cl.^{6} B60P *1/16;1/64*

U.S. Cl. 298—1 A **9 Claims**



1. A detachable stabilized intermodal container dumping apparatus for removable mounting on an internodal container transport vehicle. said apparatus comprising;

a container support frame including longitudinal and transverse frame axes, forward and rearward ends, a lower frame section and an upper frame section,

at least two upper frame container connection devices mounted on said upper frame section for removably mounting an intermodal container thereon;

said upper frame section including frame means operative to fixedly mount said upper frame container connection devices in spaced apart relation whereby said upper frame container connection devices are positioned to receive an intermodal container thereon;

at least two lower frame connection devices mounted on said lower frame section for removably and releasably mounting said container support frame on an intermodal container transport vehicle such that when said lower frame connection devices engage an intermodal container transport vehicle, said lower frame connection devices fixedly mount said lower frame section on the vehicle;

said lower frame section including frame means operative to fixedly mount said lower frame connection devices in spaced apart relation whereby said lower frame connection devices are positioned to fit onto an intermodal container transport vehicle;

said upper frame section hingedly connected to said lower frame section adjacent said rearward end of said container support frame along a hinge pivot axis extending generally perpendicular to said longitudinal axis of said container support frame whereby said upper frame section may pivot relative to said lower frame section; and

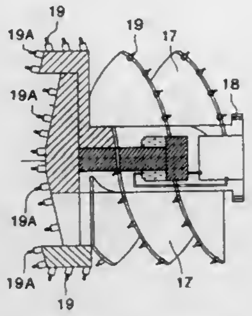
a hoist unit mounted on said container support frame forward of said hinge pivot axis, said hoist unit including a non-lifting stabilizing frame and at least one lifting device, said lifting device being pivotally attached at both upper and lower ends thereof to said non-lifting stabilizing frame, said stabilizing frame of said hoist unit connected at a respective connection point to each of said lower and upper frame sections forward of said hinge pivot axis such that upon engagement of said lifting device, said upper frame section is pivoted about said hinge pivot axis relative to said lower frame section. said lower end pivotal attachment of said lifting device being spaced from the connection point of the stabilizing frame to the lower frame section in the direction of the longitudinal axis of the container support frame.

5,836,658
METHOD AND APPARATUS FOR BORING AND SHEARING OF ROCKS

Dennis Mraz, 410 Jessop Avenue, Saskatoon, Saskatchewan, Canada, S7N 2S5

Filed Sep. 6, 1996, Ser. No. 709,941
Int. Cl.^{6} E21C *27/18*

U.S. Cl. 299—60 **10 Claims**



1. A method of cutting rock in a heading where, as a first step of each excavation cycle, boring a first and a second open surface to a predetermined depth in a face of the heading utilizing a single cutting means configured as a boring means and, as a second step of the excavation cycle, shearing the heading to the predetermined depth utilizing the single cutting means reconfigured as a shearing means.

5,836,659
ELELCTRONICALLY CONTROLLABLE BRAKE ACTUATION SYSTEM

Hans-Jorg Feigel, Rosbach; Ulrich Neumann, RoBdorf; Andreas Klein, Bad Homburg, and Lothar Schiel, Hofheim, all of Germany, assignors to ITT Manufacturing Enterprises Inc., Wilmington, Del.

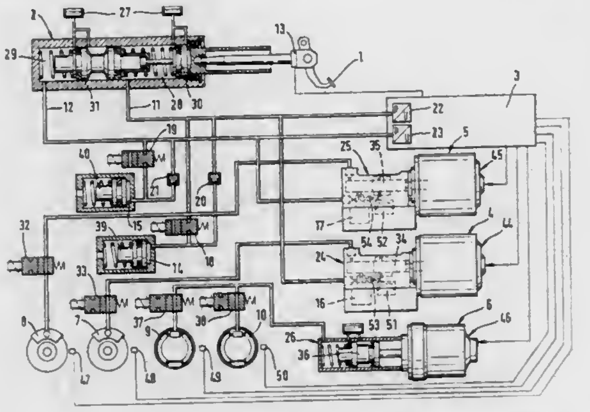
PCT No. PCT/EP95/02665, § 371 Date May 1, 1997, § 102(e) Date May 1, 1997, PCT Pub. No. WO96/03300, PCT Pub. Date Feb. 8, 1996

PCT Filed Jul. 8, 1995, Ser. No. 776,414

Claims priority, application Germany, Jul. 28, 1994, 44 26 682.0

Int. Cl.^{6} B60T *8/42*

U.S. Cl. 303—115.2 **8 Claims**



1. An electronically controllable brake actuation system for automotive vehicles, including a master brake cylinder operable by an actuating pedal, braking pressure generators actuatable by an electronic control unit and having pressure chambers which are connected to the wheel brakes of the vehicle, the braking pressure generators being connectable to the master brake cylinder by way of hydraulic connections closable by valve assemblies. at least one sensor device to identify the driver's wish for deceleration. and at least one simulator chamber which interacts with the master brake cylinder, characterized in that the valve assemblies are configured as solenoid valves which are actuatable by the electronic control unit with time delay after identification of the driver's wish for deceleration, and low-pressure accumulators are connected to the pressure chambers of the braking pressure generators to be connected to the wheel brakes in the release position of the braking pressure generators.

5,836,660
METHOD FOR DETERMINING A TRIGGERING THRESHOLD VALUE FOR AN AUTOMATIC BRAKE APPLICATION

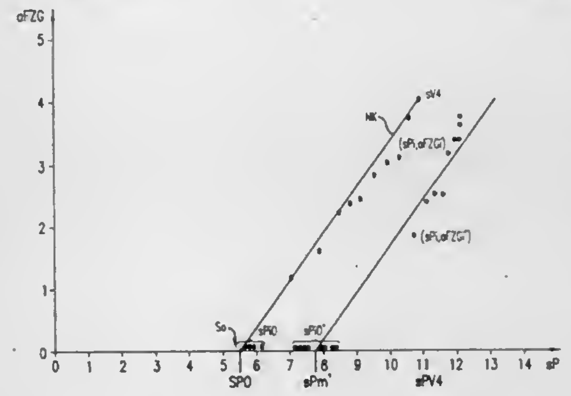
Franz Brugger, Winnenden; Bernd Knoff, Esslingen; Wolfgang Kiesewetter, Waiblingen; Albrecht Eckl, Stuttgart, and Manfred Steiner, Winnenden, all of Germany, assignors to Mercedes-Benz AG, Germany

Filed Oct. 30, 1996, Ser. No. 742,439

Claims priority, application Germany, Oct. 30, 1995, 195 40 397.5

Int. Cl.^{6} B60T *7/06*

U.S. Cl. 303—155 **8 Claims**



1. Method for determining a triggering threshold value for automatic brake application in an automatic braking system of the type in which, when an actuating speed of a brake pedal exceeds the triggering threshold value, a braking pressure greater than the braking pressure corresponding to the position of the brake pedal is developed, with the triggering threshold value being determined from a preset threshold value and a vehicle-specific correction factor, said method comprising the steps of:

storing a standard curve representing a relationship between vehicle deceleration and pedal travel, which standard curve includes a value sP0 for pedal travel at a vehicle deceleration of aFZG0=0 m/s^2;

determining pairs of values for pedal travel and corresponding vehicle deceleration several times during a brake application;

extrapolating a value sPi0 for pedal travel at a vehicle deceleration of 0 M/s^2 for each value pair of values, based on a curve analogous to the curve of the standard curve;

calculating a sliding average sPm from the values of sPi0 obtained;

determining a relative deviation ABW=sPm/sP0 from the value of sP0 as a vehicle-specific correction factor ABW; and

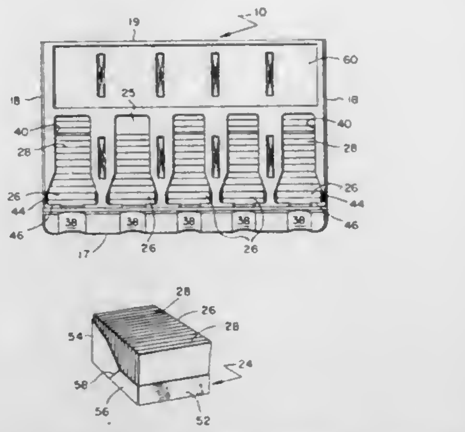
determining a triggering threshold value as a function of the product of preset threshold value VS and vehicle-specific correction factor ABW.

5,836,661
PACKAGE DISPENSER

Dennis L. Oldorf, Scottsdale, Ariz., assignor to Lil' Drug Store Products, Inc., Cedar Rapids, Iowa

Filed Sep. 23, 1996, Ser. No. 717,851
Int. Cl.^{6} A47F *1/08*

U.S. Cl. 312—42 **7 Claims**



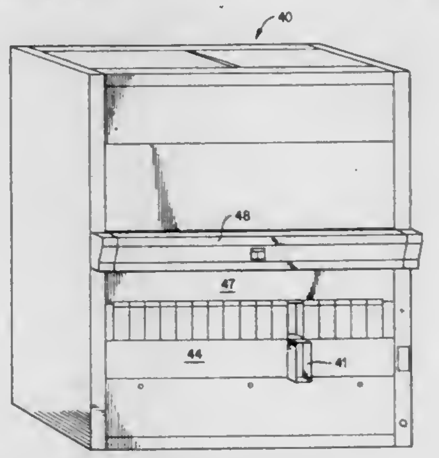
1. A dispenser for storing, displaying and manually dispensing individual box-shaped packages, said dispenser comprising: a housing having a generally vertically extending rear wall and a generally vertically extending front wall spaced from the rear wall to form an open space between the walls, dividers spaced apart between the front and rear walls to form within the open space of the dispenser one or more vertically-extending magazines each throughout its length being substantially uniform in width and uniform in depth and adapted to receive one or more box-shaped packages to be stored and dispensed, each magazine having an opening in the front wall that defines a dispensing opening at the lower end of the magazine, a support at the lower end of each magazine near the dispensing opening adapted to support a plurality of packages in a stacked relationship in a magazine, a lip extending across the lowest portion of the dispensing opening and having a top edge extending above the support, the width of the dispensing opening being greater than the width of a package to be contained in the magazine and the height of the dispensing opening above the top edge of the lip being greater than the height of a single package, a recess in the support and extending toward but not into the back wall to provide for manual lifting of a lowermost package resting on the support over the lip and through the dispensing opening, the front wall having an upper part above the dispensing opening and a lower part below the dispensing opening, and the lower part of the front wall having a recess beneath the recess in the support at the lower end of each magazine.

5,836,662
VERTICAL STACKING SYSTEM USING CONTROLLED ACCESS METHOD

Timothy J. Robey, Portland, Me., assignor to Bellhelmer Metallwerk GmbH, Germany

Division of Ser. No. 549,167, Oct. 27, 1995, abandoned. This application Sep. 16, 1997, Ser. No. 931,510
Int. Cl.^{6} A47B *49/00*

U.S. Cl. 312—268 **8 Claims**



1. A storage and retrieval system comprising a housing;

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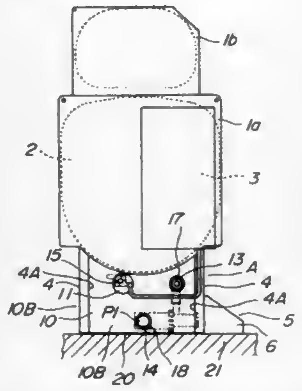
- a carousel having carriers with compartments arranged above one another and rotatable in a vertical direction within the housing so as to pass a vertically disposed access area on at least one of a front face and a rear face of the housing; and
- a plurality of doors being provided at the access area and being configured to be selectively operable individually and as groups to provide authorized access to at least one selected carrier compartment of selectively variable unobstructed width adjacent the access area by a system operator, wherein the doors are pivotable about a horizontal axis at one edge thereof to move from and to a fully closed position and a fully open position.

5,836,663
MOUNT BASES FOR AN ABSORPTION REFRIGERATOR

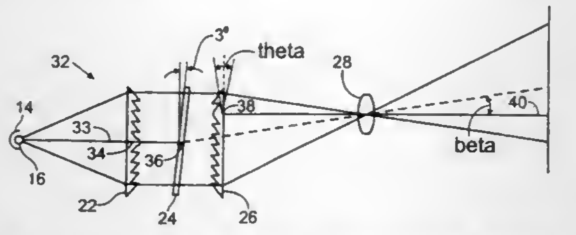
Masahiro Furukawa; Sumio Ikeda, and Hisao Miyazaki, all of Gunma-ken, Japan, assignors to Sanyo Electric Co., Ltd., Osaka-fu, Japan
Filed Oct. 22, 1996, Ser. No. 735,429
Claims priority, application Japan, Oct. 24, 1995, 7-275567
Int. Cl.^{6} F16M *11/22*
U.S. Cl. 312—351.5 **4 Claims**



1. A mount base for use with an absorption refrigerator to support a low-temperature and/or high-temperature cabinet of the absorption refrigerator, comprising: a plurality of pairs of U-shaped cross section legs spaced by a front to rear distance from each other and mounted to a lower side of said cabinet with the U-sections facing each other; and a plurality of coplanar link plates securely joined by butt welding to each free end of the U-sections so that opposing lateral sides of each pair of legs are continuous with each other, thus forming an inner space defined by four sides beneath the cabinet.

5,836,664
LCD PROJECTOR WITH SHIFT AND TILT FIELD LENS

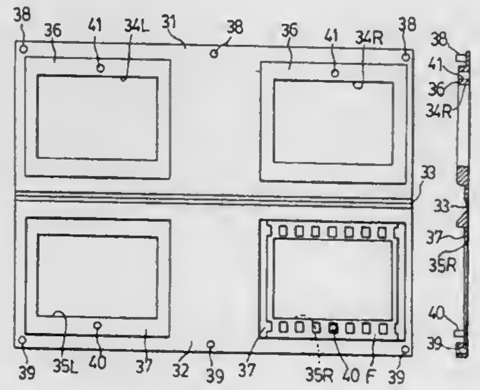
Arlie R. Conner, Tualatin, and David K. Booth, Tigard, both of Oreg., assignors to Lightware, Inc., Beaverton, Oreg.
Continuation of Ser. No. 559,594, Nov. 1, 1995, Pat. No. 5,622,417. This application Apr. 16, 1997, Ser. No. 843,580
Int. Cl.^{6} G03B *21/14*
U.S. Cl. 353—70 **17 Claims**



6. In a LCD projector having a light source that illuminates a LCD having an optical center substantially aligned with an illumination optical axis extending from the light source, the LCD panel providing display information that is projected toward a display screen to form a display image, the display image being projected at an elevation angle in an elevation direction toward the display screen, the improvement comprising:
- a field lens positioned to receive the display information from the LCD panel and form a display object corresponding to the display image, the field lens having an optical center offset from the optical center of the LCD panel in the elevation direction to define a projection optical axis that extends toward the display screen, the field lens being tilted about a tilt axis transverse to the projection optical axis and the elevation direction to cooperate with the offset of the field lens optical center to form an orthoscopic display image; and
- a field lens tilt mechanism for variably tilting the field lens about the tilt axis of the LCD projector.

5,836,665
STEREO-SLIDE MOUNT

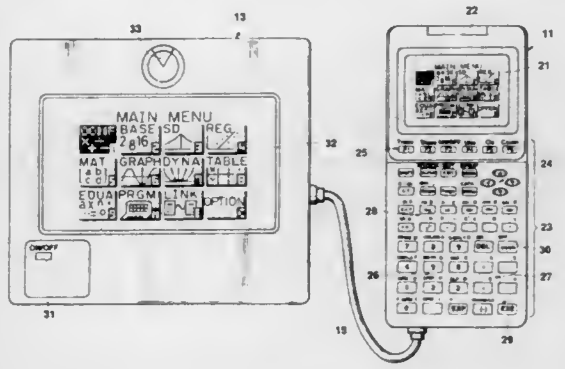
Minoru Inaba, No. 1116, Oaza Samukawa, Oyama-shi, Tochigi-ken, Japan
Filed Oct. 26, 1995, Ser. No. 548,586
Int. Cl.^{6} G03B *21/14*
U.S. Cl. 353—120 **7 Claims**



7. A stereo slide mount for holding a pair of stereo slide films each having a photographed screen region and perforations along two parallel edges comprising:
- a front-side mount frame having a first two windows formed in parallel;
- a protruding portion formed around each of the first two windows;
- a back-side mount frame having a second two windows formed in parallel, the second two windows corresponding to the first two windows in said front-side mount frame, and having a recess portion formed around each of the second two windows, said recess portion having a vertical size equal to that of one of the pair of slide films and a lateral size longer than that of one of the pair of slide films,
- one positioning pin for each of the second two windows placed within the recess portion along a lateral edge;
- a hole for each of the first two windows placed within the protruding portion sized to receive said one positioning pin;
- a hinge portion connecting said back-side mount frame to said front-side mount frame; and
- a plurality of joining pins and joining holes placed on said front-side mount frame and said back-side mount frame for holding said front-side mount frame and said back-side mount frame together;
- whereby when the pair of stereo slide films are placed within the slide mount there is no loss in screen area and a picture can be viewed maintaining an optimum solid effect which is nearly equal to a picture viewed through a view-finder at the time of taking a picture.

5,836,666
ELECTRONIC CALCULATING APPARATUS

Takaharu Aoyama, Koganei; Kazuhiko Arikawa, Fussa; Teiji Sindo, Hamura, and Mitsuru Okano, Fussa, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan
Filed Mar. 26, 1996, Ser. No. 622,652
Claims priority, application Japan, Mar. 31, 1995, 7-097651; Mar. 31, 1995, 7-097672
Int. Cl.^{6} G03B *21/14*
U.S. Cl. 353—122 **16 Claims**

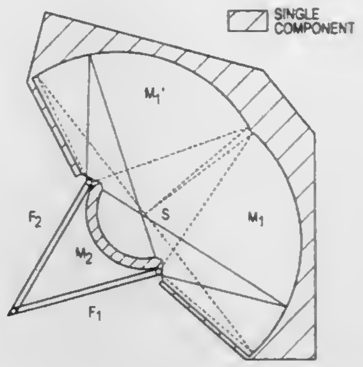


1. An electronic calculating apparatus comprising:
- an electronic calculator; and
- a display device,
- wherein:
- said electronic calculator comprises:
  - input means for inputting data;
  - sending means for sending data inputted by said input means using a radio frequency wave;
  - first processing means for performing an operation based on the data inputted by said input means; and
  - first display means for displaying a result of the operation performed by said first processing means, and wherein:
- said display device comprises:
  - receiving means for receiving data sent from said sending means of the electronic calculator;
  - second processing means for performing an operation which is substantially the same as the operation performed by said first processing means of the electronic calculator; and
  - second display means having a liquid crystal display unit of a transparent type, for displaying on the liquid crystal display unit of a transparent type a result of the operation performed by said second processing means.

5,836,667
CONCENTRATING AND COLLECTING OPTICAL SYSTEM USING CONCAVE TOROIDAL REFLECTORS

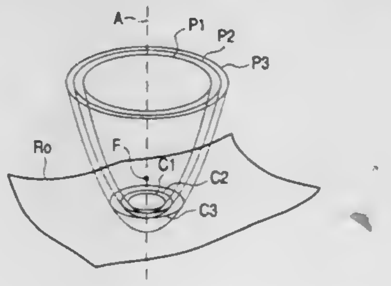
Glenn Baker; Karlheinz Strobl; Douglas Brenner, all of Los Angeles; Robert L. Piccioni, Thousand Oak; Robert Fischer, Westlake Village, all of Calif., and Michael Thomas, Brookline, Mass., assignors to Cogent Light Technologies, Inc., Santa Clarita, Calif.
Continuation of Ser. No. 924,198, Aug. 3, 1992, Pat. No. 5,430,634. This application Jun. 7, 1995, Ser. No. 488,188
Int. Cl.^{6} F21V *7/04*
U.S. Cl. 362—32 **51 Claims**

1. A system comprising:
- a source of highly divergent, broadband, incoherent electromagnetic radiation, said source having an extent;
- an electromagnetic radiation reflector having an axis and a substantially toroidal reflecting surface concave to said source, said toroidal reflecting surface having first and second radii of curvature in first and second orthogonal planes, respectively, with said first radius of curvature being greater than said second radius of curvature, said source being located near a center of curvature of said reflector but laterally offset from the axis of said reflector by a distance, the ratio of the square of said distance to said first radius of curvature being greater than said extent; and
- a fiber optic target positioned to collect electromagnetic radiation provided by said source and collected by and reflected from said reflector.



5,836,668
METHOD OF FORMING A REFLECTION SURFACE OF A REFLECTION MIRROR OF A VEHICLE LAMP

Masahito Ishikawa, and Masahiro Maeda, both of Shizuoka, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan
Filed Jul. 16, 1996, Ser. No. 682,920
Claims priority, application Japan, Jul. 17, 1995, 7-202906
Int. Cl.^{6} B60Q *1/04*
U.S. Cl. 362—61 **18 Claims**



13. A display method using a computer for defining a light reflective surface of a vehicle lamp and a display connected to the computer, comprising the steps of:
- forming a free curved surface of a shape providing an optically high efficiency;
- displaying a basic surface formed by adding restrictive conditions of the vehicle to said surface of the shape; and
- displaying the state of light incident on said basic surface, said light being emitted from a light source.

5,836,669
REMOTE ILLUMINATION AND LIGHT APPORTIONMENT IN APPLIANCES

Aharon Zeev Hed, Nashua, N.H., assignor to Troy Investments, Inc., Nashua, N.H.
Filed Jan. 17, 1996, Ser. No. 587,579
Int. Cl.^{6} F21V *33/00*
U.S. Cl. 362—92 **37 Claims**

1. An appliance comprising:
- an appliance housing defining an interior chamber at least partially closed by said housing;
- an electric power connection to said appliance for electrically energizing said appliance by supplying electrical energy thereto, said chamber having walls;

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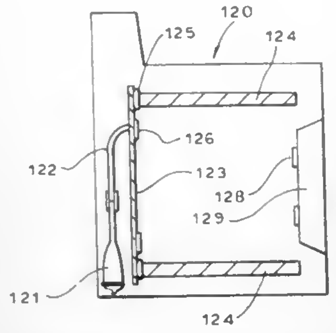
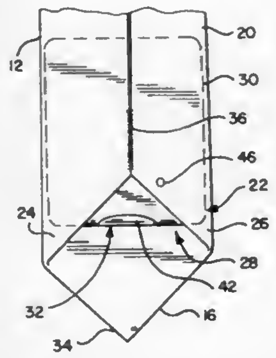


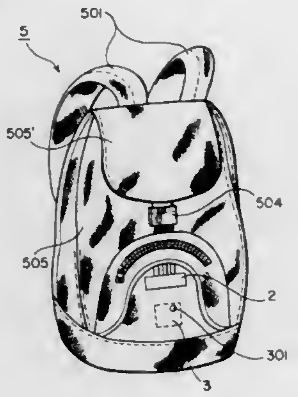
at least one lamp in said housing outside said chamber and supplied by said electric power connection with said electrical energy;
light-transmission means illuminated by said lamp and extending to at least one of said walls for delivering light to said chamber from said lamp; and
light-extraction means extending along at least one of said walls optically coupled to said light-transmission means and located in said chamber for emitting light transmitted to said light-extraction means in a direction generally transverse to a light-propagation direction therealong to illuminate said interior chamber.

5,836,670
NECKTIE WITH A FLAT FLASHLIGHT CONCEALED THEREIN
Warren E. Gilson, 601 N. Segoe, Unit 104, Madison, Wis. 53705
Filed Feb. 24, 1997, Ser. No. 803,863
Int. Cl.⁶ F21L *15/08;7/00*
U.S. Cl. 362—103 5 Claims



1. A necktie for illuminating an area adjacent a distal end portion of said necktie, said necktie having an inner space between a front ply and a rear ply and comprising:
a holding means formed in said inner space adjacent said distal end portion of said necktie, said holding means having an illumination opening; and
a generally flat flashlight capable of being activated to emit light therefrom and disposed in said holding means such that light emitted from said flashlight when said flashlight is activated projects through said illumination opening from said distal end portion of said necktie whereby an area adjacent said distal end portion of said necktie is illuminated.

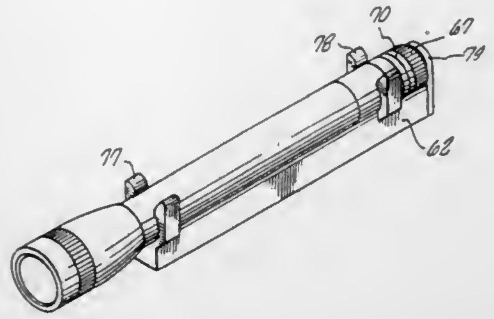
5,836,671
BACKPACK OR WAISTPACK E.L. LIGHTING ARRANGEMENT
Tseng Lu Chien, SP, No. 29, Alley 73, Lin-Shen Street, Shi-Chi Town, Taipei, Hseng, Taiwan
Continuation of Ser. No. 343,915, Nov. 17, 1994, abandoned. This application Mar. 11, 1996, Ser. No. 617,969
Int. Cl.⁶ F21L *15/08*
U.S. Cl. 362—84 7 Claims



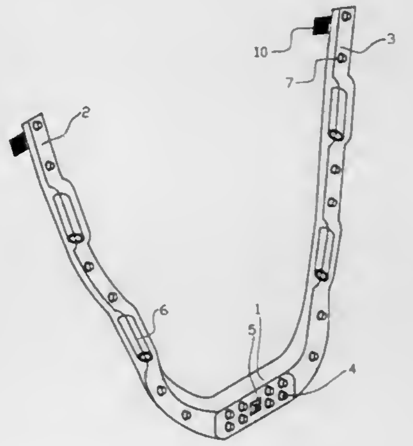
1. A bag carried by a user via a belt or strap, comprising:
a lighting arrangement made up of an electro-luminescent strip, a power supply, and circuit means for supplying power from the power supply to the electro-luminescent strip, said lighting arrangement being affixed to the bag,
wherein said power supply and circuit means are surrounded by a housing attached to the bag, said circuit means including at least one switch for turning the strip on and off,
wherein the strip is sealed within a flexible protective sleeve attached to the bag by means selected from the group consisting of glue, Velcro™, double-sided tape, and stitching so as to conform to a shape of the bag,
wherein the strap is a shoulder strap and the bag is a backpack, and
wherein the strip includes a pre-wired electro-luminescent light panel having multiple discrete light emitting segments arranged on said panel to shine through a transparent area of the flexible protective sleeve.

5,836,672
RECHARGEABLE MINIATURE FLASHLIGHT
Anthony Maglica, Ontario; Ralph Emsley Johnson, Los Alamitos, and Armis L. Lewis, Cucamonga, all of Calif., assignors to Mag Instrument, Inc., Ontario, Calif.
Division of Ser. No. 538,553, Oct. 3, 1995, Pat. No. 5,528,472, which is a division of Ser. No. 159,457, Nov. 30, 1993, Pat. No. 5,455,752, which is a division of Ser. No. 7,566, Jan. 22, 1993, Pat. No. 5,267,130, which is a division of Ser. No. 895,087, Jun. 8, 1992, Pat. No. 5,193,898, which is a division of Ser. No. 632,128, Dec. 19, 1990, Pat. No. 5,121,308, which is a division of Ser. No. 111,538, Oct. 23, 1987, Pat. No. 5,008,785. This application Jun. 18, 1996, Ser. No. 666,639
Int. Cl.⁶ F21L *7/00*
U.S. Cl. 362—183 4 Claims

1. A rechargeable flashlight system including a flashlight and recharger,
the flashlight comprising
a lamp bulb;
at least one battery;
a body having a cavity for retaining the at least one battery:
contacts for receiving the lamp bulb at a first end of said body;
a tailcap/switch assembly at a second end of said body for turning the lamp bulb on and off, the tailcap/switch assembly including a positive conductor and a negative conductor externally exposed for receiving charging current for battery charging, a tailcap having a switch knob with a bore, and a switch contact forming a hollow cylinder on at least a portion of the switch contact at one end of the switch contact, and having contact elements at the other end of the switch contact positioned to connect or disconnect electrically for turning the lamp bulb on or off, respectively, the switch contact extending from the bore toward the cavity; and
a spare lamp bulb held inwardly of the hollow cylinder by the switch contact;
the recharger comprising
a housing made of non-conductive material, having front tongs, rear tongs, and a foot wherein placement of the flashlight in the housing so that the tailcap of the flashlight is resting against the foot will position a first housing contact to electrically couple with the positive conductor and a second housing contact to electrically couple with the negative conductor, the housing being adapted to accommodate the flashlight;
an electrical circuit for regulation of constant charging current provided to the flashlight, the separate electrical contacts being positive and negative contacts for contacting with the positive and negative contacts for contacting with the positive conductor and the negative conductor of the flashlight.

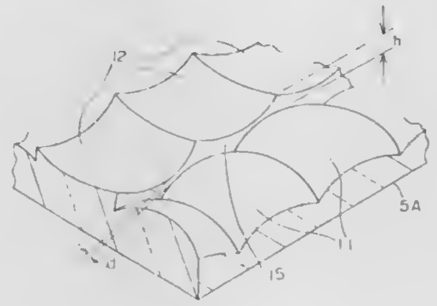


5,836,673
STRIP SPORT LIGHT
Robin Lo, 12309 Terrence Ave., Saratoga, Calif. 95070
Continuation-in-part of Ser. No. 289,657, Aug. 12, 1994, Pat. No. 5,667,294. This application Jan. 14, 1997, Ser. No. 783,497
Int. Cl.⁶ F21V *23/04*
U.S. Cl. 362—251 4 Claims



1. A safety strip sport light comprising:
an elongated housing formed from a single piece of flexible material that comprises a central body, a first side strip body, and a second side strip body;
said central body comprises an electrical control switch, at least one light source, and an electronic printed circuit board, and
said first side strip comprises a first end portion of said elongated body housing and said second side strip comprises a second end portion of said elongated body housing, each said side strip includes at least one electrical energy source, at least one light source, and an element of a fastening means; and wherein
said printed circuit board electrically connects said energy sources with said electrical control switch and said light sources on said central body and said side strip bodies such that said electrical control switch performs the following three functions:
(a) illumination—at least one of said light sources is turned on;
(b) blinking—multiple light sources flash on and off;
(C) shut off—all said light sources are turned off;
said side strips each contain an element of a hook-and-loop fastener, such that said side strips are detachably connected to each other, thereby facilitating the attachment of said strip sport light onto an object chosen by a user; and wherein
said electrical control switch is electrically connected to said light sources, said switch triggering an illuminating function and a blinking function wherein at least one of said light sources blinks on and off while said blinking function is activated.

5,836,674
LENS STRUCTURE FOR LAMPS
Norihiro Nishitani; Hirokazu Yanagihara, and Masamitsu Wada, all of Shizuoka, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan
Filed Mar. 13, 1996, Ser. No. 614,698
Claims priority, application Japan, Mar. 18, 1995, 7-086254
Int. Cl.⁶ F21V *5/00*
U.S. Cl. 362—336 12 Claims



1. An automotive lamp, comprising:
a lamp body having a front opening;
a lens coupled to said front opening of said lamp body;
a light source disposed within a lamp chamber defined by said lamp body and said lens; and
a plurality of first lens steps and a plurality of second lens steps formed on said lens, said plurality of first lens steps and said second plurality of second lens steps arranged in a first row of first lens steps and a second row of second lens steps, said first row adjacent to said second row in a horizontal direction thereof, each of said first lens steps being shifted from each adjacent one of said second lens steps by half a pitch in a vertical direction,
wherein said first lens steps comprise concave fish-eye lens steps and said second lens steps comprise convex fish-eye lens steps.

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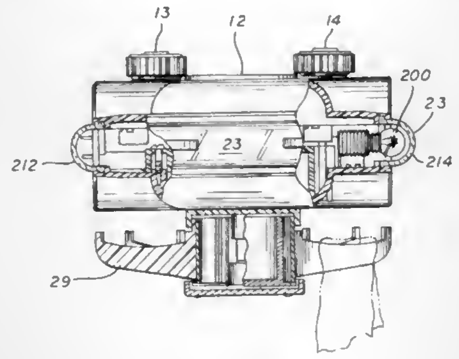
5,836,675
ILLUMINATED CLOSET ORGAINZER

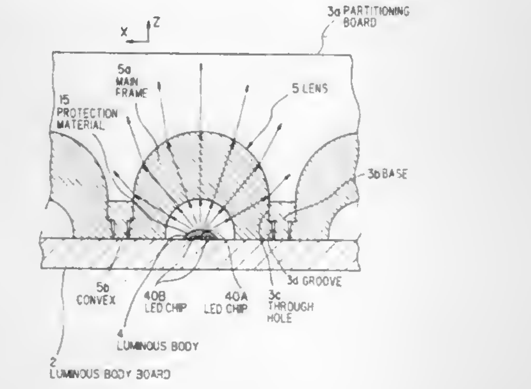
Cooper C. Woodring, Topeka, Kans., assignor to Barbara D. Arner, Oxnard, Calif.
Filed Feb. 25, 1998, Ser. No. 30,098
Int. Cl.^{6} F21V *33/00*
U.S. Cl. 362—234 **10 Claims**



1. A closet organizer comprising:
- an upper housing;
- a lower housing secured to the upper housing;
- a lighting compartment extending about the entire outer periphery of said organizer sandwiched between said upper and lower housing;
- A rotatable belt having a plurality of spaced tie and belt receiving hooks mounted to said lower housing;
- rotating means associated with said belt for selectively rotating the same;
- a plurality of spaced lights mounted in said organizer, at least one light associated with said lighting compartment, said lighting compartment being closed off by a translucent panel; and
- electronic means coupled to said lights and said rotating means for selectively lighting said lights and rotating said belt.

5,836,676
LIGHT EMITTING DISPLAY APPARATUS

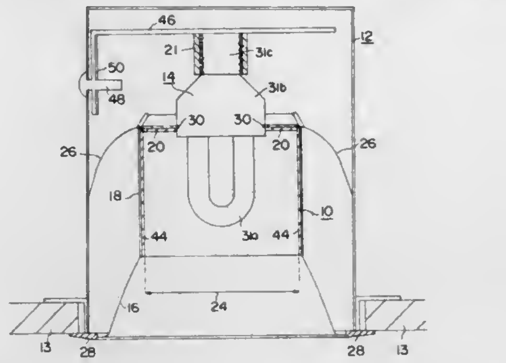
Akira Ando, and Mitsuji Sekine, both of Tokyo, Japan, assignors to Koha Co., Ltd., Tokyo, Japan
Filed Jan. 6, 1997, Ser. No. 779,202
Claims priority, application Japan, May 7, 1996, 8-112748; May 7, 1996, 8-112749
Int. Cl.^{6} F21V *5/00*
U.S. Cl. 362—244 **11 Claims**



4. A light emitting display apparatus, comprising:
- a plurality of pixels to display a predetermined image, each of said plurality of pixels being composed of red and green light emitting diodes and having no light emitting diode of a color other than red and green; and
- means for driving said red and green light emitting diodes to be turned on in accordance with predetermined light intensities, thereby representing various colors including a white color.

5,836,677
RETROFIT COMPACT FLUORESCENT LAMP

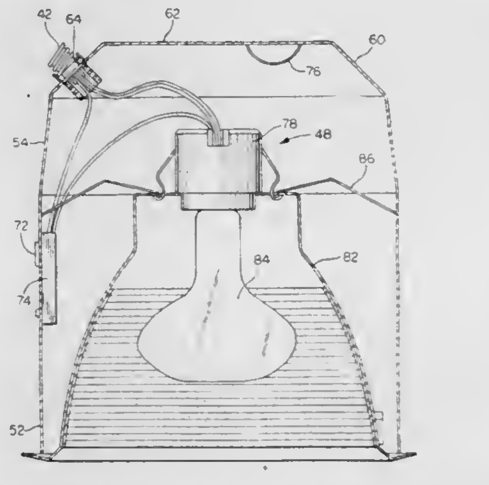
William T. Connors, Newark, Del.; Gordon L. McGregor, Landenberg, Pa., and Raymond B. Minor, Elkton, Md., assignors to W.L. Gore & Associates, Inc., Newark, Del.
Filed Feb. 5, 1997, Ser. No. 795,491
Int. Cl.^{6} F21V *7/22;17/06*
U.S. Cl. 362—304 **46 Claims**



1. A reflector unit adapted to be installed inside of an existing lamp fixture, the reflector unit comprising
- a reflective upper section;
- means for attaching the reflector unit inside of the lamp fixture;
- a reflective disk adapted to be attached to a lamp;
- the reflective disk having an outer diameter substantially matching an inner diameter of the upper section so as to allow the disk to mount within the upper section; and
- wherein the upper section comprises expanded polytetrafluoroethylene.

5,836,678
UNIVERSAL TYPE I.C./NON-TYPE I.C. RECESSED DOWNLIGHT HOUSING CAN ASSEMBLY AND METHOD FOR MARKING THE CAN ASSEMBLY

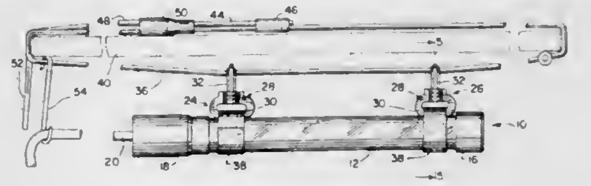
Philip Dean Wright, Waveland; Mark E. Jennings, and Bryan Scott Steele, both of Crawfordsville, all of Ind., assignors to NSI Enterprises, Inc., Atlanta, Ga.
Filed Jul. 26, 1996, Ser. No. 686,669
Int. Cl.^{6} F21S *1/02*
U.S. Cl. 362—364 **55 Claims**



1. A downlight fixture having a pan support, a junction box and a can mounting a first lamp having a first preferred wattage for an insulation contact installation, the can mounting a second lamp having a second preferred wattage for a non-insulation contact installation, the fixture being useable in both insulation contact installations and non-insulation contact installations when respectively employing the first and second lamps of said first and second preferred wattages, means carried by the can for operating the fixture in either an insulation contact installation or a non-insulation contact installation at said respective preferred wattages, said means comprising a thermal protection device mounted on a surface of the can for sensing the existence of a first temperature when the fixture is used in an insulation contact installation and a second temperature when the fixture is used in a non-insulation contact installation, the can being formed of a material and having a volume causing surfaces of the can to maintain a temperature not to exceed the first temperature in an insulation contact installation and not to exceed the second temperature in a non-insulation contact installation when in use with the respective lamps of the respective preferred wattages.

5,836.679
PORTABLE WORK LIGHT WITH ADAPTABLE SUPPORTING MECHANISM

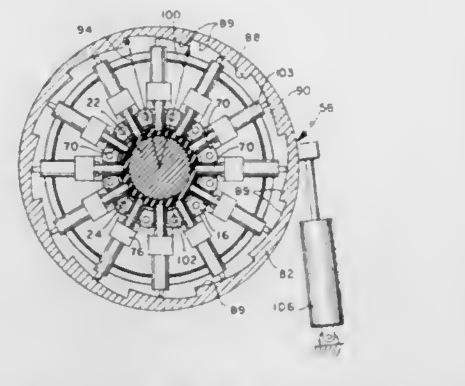
Thomas L. Klamm, 253 N. Wisconsin St., Racine, Wis. 53402
Filed Mar. 21, 1997, Ser. No. 828,210
Int. Cl.^{6} F21V *21/16*
U.S. Cl. 362—391 **10 Claims**



1. A portable work light comprising:
- a cord having a first end with a fixed loop formed thereat and a section of the cord passing through the fixed loop to form an adjustable loop of the cord;
- a tube having an aperture within which the cord is received with the tube able to slide along the cord, wherein the tube at a first position squeezes the fixed loop against the section of the cord thereby captivating the cord from moving through the fixed loop, and the tube at a second position along the cord allows the cord to move through the fixed loop; and
- a work light having a housing and a fastener for attaching the housing to the cord.

5,836,680
EXTRUDER WITH FEEDBACK LOOP CONTROL

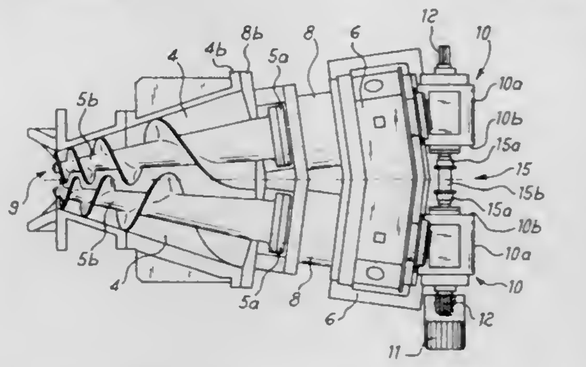
Mark Daniel Banas, Cuyahoga Falls; Gary Robert Burg, Canton; Malcolm George Marshall, Wadsworth; Thomas Alan Murray, Akron, and Bruce Joseph Turner, Wadsworth, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Mar. 26, 1996, Ser. No. 622,662
Int. Cl.^{6} B29C *47/00*
U.S. Cl. 366—80 **11 Claims**



1. An extruder for extruding an associated material comprising:
- an extruder housing having a feed section, a center section including a throttle section, and an outlet section;
- an extruder screw rotatably mounted in said extruder housing, said extruder screw having a core portion and a helical portion with said helical portion being helical about a longitudinal axis;
- a throttle surrounding a portion of said throttle section, said throttle having a plurality of pins extending radially into said housing about said longitudinal axis of said extruder screw, said pins being radially adjustable by a circular cam extending around said extruder housing, said cam having a center, an inner wall, and an outer wall, said inner wall having a plurality of cam surfaces for engagement by said pins, each of said cam surfaces having a radius from said center, said radius gradually decreasing from a maximum radius to a minimum radius, said pins having resilient means for urging said pins radially outward to contact said cam surfaces, said cam surfaces urging said pins radially inward into said throttle section when said cam is rotated in a first direction such that said pins are in contact with said cam surfaces at a smaller radius than before said cam is rotated to reduce the cross-sectional area of said throttle section, and said pins being movable radially outward from said throttle section by said resilient means when said cam is rotated in an opposite direction such that said pins are in contact with said cam surfaces at a greater radius than before said cam is rotated to increase the cross-sectional area of said throttle section; and,
- cam rotation means for rotating said cam.

5,836.681
MACHINE WITH TWO CONVERGING THREADED ROTORS FOR THE EXTRUSION OF PLASTOMERS ELASTOMERS AND THE LIKE

Mauro Matteo Giani, Guanzate, Italy, assignor to Pomini S.P.A., Castellanza, Italy
Filed Oct. 29, 1996, Ser. No. 741,381
Claims priority, application Italy, Nov. 21, 1995, MI95A2415
Int. Cl.^{6} B29B *7/22;* **B01F** *7/08*
U.S. Cl. 366—83 **9 Claims**



1. A double screw extruder, comprising:
- a support;
- a housing mounted on the support;
- a pair of rotors extending along respective rotor axes and housed in said housing, the rotor axes converging toward each other, each of the rotors having:
  - respective front shaft and rotor shaft removably attached to each other, the rotor shaft protruding beyond and terminating outside the housing,
  - respective centering means for aligning the respective shafts along the respective rotor axis, and
  - respective angular means for angularly positioning the respective shafts upon aligning, and

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- respective locking means for locking the front and rotor shafts upon angularly positioning the shafts;
- a casing mounted on said support and receiving said rotor shafts and connected with said housing;
- drive means on the casing for actuating said rotors and having a drive axis transverse to the rotor axes, said drive means including a pair of high-speed, spaced apart and coaxial driving shafts rotatable about the drive axis and each operatively connected with the respective rotor; and
- synchronizing means formed on a bottom of the casing for synchronizing rotation of said rotors and including:
  - coupling means for adjusting the phase difference between said driving shafts, and
  - a pair of reducers connecting each of the high-speed driving shafts with the respective rotor and comprising:
    - a respective reducer shaft extending along a shaft axis parallel to the respective rotor axis,
    - respective bevel gear means for coupling each of the high-speed shafts with the respective one of the reducer shafts, a respective pair of reducer and high-speed driving shafts forming therebetween a respective angle differing from 90°, and
    - respective cylindrical gear means each mounted rotatably fixedly on the respective reducer shaft and operatively connected with the respective rotor shaft.

5,836,682

APPARATUS FOR CONTINUOUS PROCESSING OF FLOWABLE MATERIALS

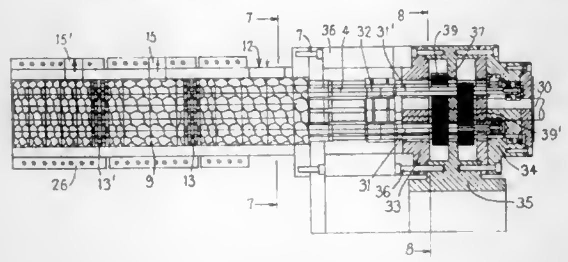
Josef Blach, Gartenstrasse 8, D-71732 Tamm, Germany

Filed Jan. 28, 1997, Ser. No. 789,291

Claims priority, application Germany, Feb. 6, 1996, 196 04 228.3; Jun. 5, 1996, 196 22 582.5

Int. Cl.^{6} B29B *7/48*

U.S. Cl. 366—84 **24 Claims**



1. An apparatus for continuous processing of pourable and flowable materials, comprising: a housing having a central axis and radially inner and outer sides defining a space therebetween; a plurality of elongate axis-parallel, rotatable shafts disposed at the same radial distance from the central axis along a circle in the space, the rotatable shafts being spaced at equal angles from an adjacent one of the shafts relative to the central axis, each of the plurality of shafts carrying a plurality of processing elements disposed axially one behind the other with which processing elements on adjacent shafts closely mesh, the housing having axis-parallel concave segments on the radially inner and outer sides, the concave segments receiving and guiding the shafts and processing elements; at least one material supply opening positioned at one end of the housing extending into the space; at least one material discharge opening at the other end of the housing extending from the space; and at least one radial opening positioned along the circle for passage of material from the radially outer side to the radially inner side of the space.

5,836,683

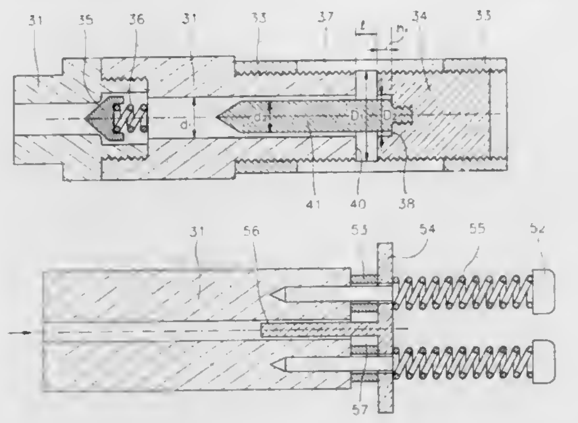
MIXING APPARATUS USING ACOUSTIC RESONANCE

Jong-Duck Moon, and Suk-Yoon Hong, both of Kyonggi-do, Rep. of Korea, assignors to Institute for Advanced Engineering, Seoul, Rep. of Korea

Filed Mar. 11, 1997, Ser. No. 815,362

Int. Cl.^{6} B01F *11/00*

U.S. Cl. 366—124 **11 Claims**



1. A mixing apparatus for mixing two fluids using acoustic resonance, comprising:

- a fluid influx tube for receiving a pressurized fluid, said fluid influx tube having an outlet through which the pressurized fluid is emitted;
- a fluid supplying means for supplying the pressurized fluid to said fluid influx tube;
- a reflective plate located a predetermined distance from the outlet of said fluid influx tube, said reflective plate dividing the pressurized fluid into a plurality of parts due to the pressure, said pressurized parts being discharged from the outlet into an external fluid, thereby mixing the pressurized fluid with the external fluid, said reflective plate having a reflective groove formed on a front side thereof facing toward said fluid influx tube;
- a pole-shaped column, protruding from said reflective plate and located at the outlet of said fluid influx tube, for forming said outlet into an annular opening so that the pressurized fluid is dispersed in an annular shape at the outlet of said fluid influx tube; and
- a means for connecting said fluid influx tube with said reflective plate, said connecting means having a hollow cylindrical shape and a plurality of fluid-emitting holes;
- wherein the fluid emitting from the outlet of said fluid influx tube generates an acoustic resonance when the pressurized fluid hits against the reflective plate.

5,836,684

PROCESSING TOOL FOR USE WITH A KITCHEN APPLIANCE FOR MIXING OR COMMINUTING FOOD MATERIALS

Vicente Safont, Montgat; Mariano Peñaranda, Barcelona; Alejandro Hernandez, Santa Oliva, all of Spain, and Jürgen Golob, Friedrichsdorf, Germany, assignors to Braun Aktiengesellschaft, Frankfurt, Germany

Filed Mar. 12, 1997, Ser. No. 820,447

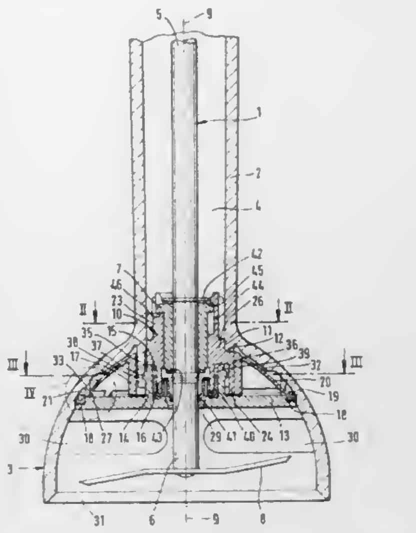
Claims priority, application Germany, Oct. 10, 1994, 44 36 092.4

Int. Cl.^{6} A47J *43/044;43/07*

U.S. Cl. 366—129 **12 Claims**

1. A processing tool for mixing or comminuting food materials comprising:

- a working shaft having an input end and an output end;
- a shaft housing which carries the input end and is adapted for coupling to a drive motor of a kitchen appliance;



- a flared bell-shaped housing attached to the shaft housing and positioned near the output end of the working shaft;
- a bearing sleeve carrying the output end of the working shaft;
- a cover plate separating an inner space defined by the bell-shaped housing from an inner space defined by the shaft housing, the cover plate having a bore through which the output end of the shaft extends outwardly;
- a work performing element secured to the output end; and
- a seal structure having an elastic sealing part supported by the shaft housing, and a circumferential sealing ring formed integrally with the elastic sealing part, wherein the bearing sleeve is inserted into the elastic sealing part, and the circumferential sealing ring is arranged between an outer circumferential area of the cover plate and the bell-shaped housing, with the elastic sealing part and the sealing ring of the seal structure operating to center the bearing sleeve elastically.

5,836,685

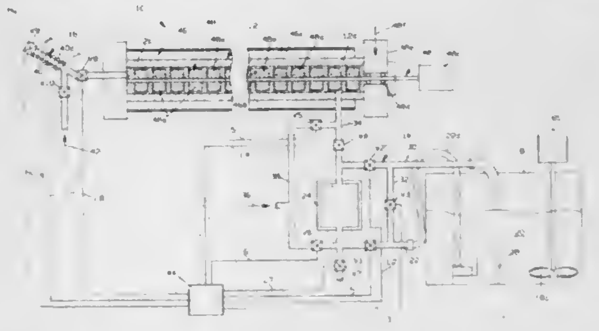
METHOD FOR CONTINUOUSLY TREATING PARTICULATE MATERIAL IN A SLURRY IN A HIGH TEMPERATURE AND HIGH PRESSURE CHAMBER EMPLOYING INTERMITTENT FEED

Raymond E. Lambert, Sr., P.O. Box 334, Cataumet, Mass. 02534-0334

Continuation of Ser. No. 627,689, Apr. 2, 1996, Pat. No. 5,628,561. This application Feb. 4, 1997, Ser. No. 801,507

Int. Cl.^{6} B01F *15/02*

U.S. Cl. 366—136 **1 Claim**



1. A method for intermittently feeding slurry into a high pressure, high temperature treatment chamber having an inlet end and an outlet end used to treat particulate material in the slurry in a continuous process in which a reservoir of slurry is maintained in a slurry container comprising the steps of forming a main slurry circulation loop having a slurry circulation conduit connected between the slurry container and a loading chamber through a first valve and a slurry return conduit connected between the loading chamber and the slurry container through a second valve, forming a by-pass circulation loop by connecting a by-pass conduit between the slurry circulation conduit and the slurry return conduit through a third valve, continuously pumping slurry from the reservoir through at least one of the main and by-pass circulation loops, connecting the loading chamber to the treatment chamber through a slurry inlet valve, providing a high pressure liquid source and connecting the high pressure liquid source to the treatment chamber and to the loading chamber through respective fifth and sixth valves, connecting the loading chamber to a drain through a seventh valve and performing operational cycles by sequentially opening and closing the valves a plurality of times per minute during the treatment of such particulate material.

5,836,686

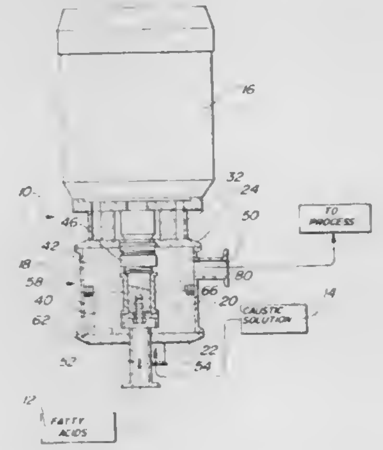
MULTI-CHAMBER HIGH PRESSURE DISPERSION APPARATUS

Ray Ogier, Ontario, Canada, assignor to Chem Financial, Inc., Canada

Continuation-in-part of Ser. No. 597,692, Feb. 6, 1996, Pat. No. 5,624,186. This application Feb. 6, 1997, Ser. No. 797,481

Int. Cl.^{6} B01F *15/02*

U.S. Cl. 366—176.1 **11 Claims**



1. A dispersion apparatus for mixing a plurality of materials, said apparatus comprising:

- a housing having a bottom chamber and an upper chamber;
- a motor mounted to said housing for turning a shaft extending into said housing;
- a chamber separator plate mounted to said housing to separate said upper chamber from said lower chamber, said chamber separator plate having an aperture for receiving said shaft therethrough and forming an annular passage therebetween;
- at least two kinetic baffles mounted within said lower chamber to form pressure zones;
- an inlet plate mounted to said housing and having a primary inlet and a secondary inlet for delivering said plurality of materials into said lower chamber;
- a pair of turbines mounted to said shaft, said first turbine disposed in said lower chamber and said second turbine disposed in said upper chamber; and
- a distribution ring mounted to an end of said shaft, said dispersion ring having a skirt having a plurality of paddles.

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5,836,687

ADJUSTABLE HEIGHT FOOD MIXER

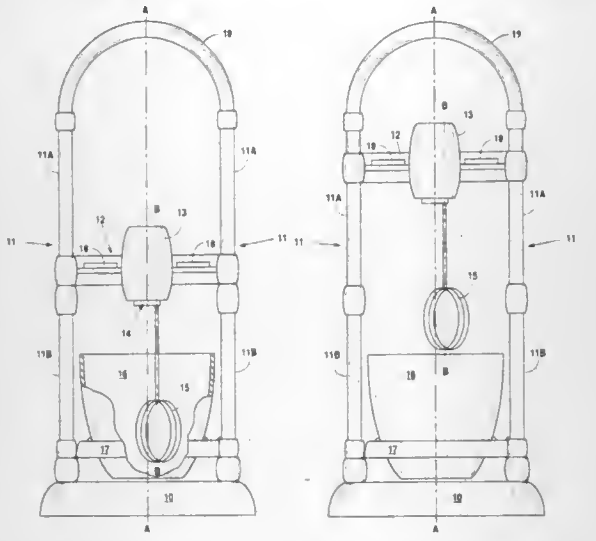
Fasih Uddin Khalid, 91A, Tsung Lan Shui, Clear Water Bay Road, Kowloon, Hong Kong

Filed May 13, 1997, Ser. No. 855,305

Claims priority, application United Kingdom, May 30, 1996, 9611307

Int. Cl.^{6} A47J *43/044*

U.S. Cl. 366—207 **1 Claim**



1. A domestic food mixer comprising: an electric motor with a rotor and an implement holder drivingly connected to said motor, a frame having a central base with at least two upstanding columns equidistant from a central axis of said mixer to slidingly support a bridge carrying a motor housing for said motor, said holder being mounted below said motor, said motor movable up and down between two operative positions and supported by sliding said bridge up and down said columns; an implement fitted to said holder, said motor arrangeable in a first operative position for mixing food in a bowl positioned on said base and in a second operative position to allow said bowl to be removed from beneath said implement, said motor mounted with said rotor on said central axis of said mixer, and a link member connected to said upstanding columns above said bridge forming a carrying handle for said mixer, said link member slidingly engaged with said columns and movable up and down said columns.

5,836,688

METHOD AND APPARATUS FOR PROCESSING MATERIALS

Karl Eping, Trier, Germany, assignor to Laeis Bucher GmbH, Trier, Germany

Continuation of Ser. No. 516,693, Aug. 18, 1995, abandoned. This application Jul. 30, 1997, Ser. No. 903,349

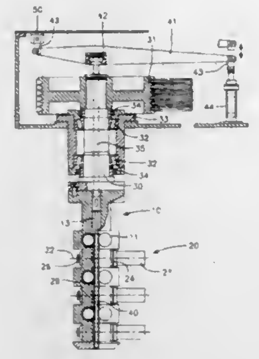
Claims priority, application Germany, Aug. 18, 1994, 4429244.9

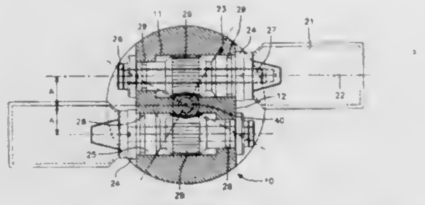
Int. Cl.^{6} B01F *7/18*

U.S. Cl. 366—285 **5 Claims**

1. An apparatus for processing at least one flowable material, said apparatus comprising:

- a vessel for accommodating said at least one flowable material; and
- a rotor having an arrangement of process implements extending out from the rotor, said rotor being rotatable in at least one rotational direction and immersible in said at least one flowable material so as to impel a boundary layer of said at least one flowable material in contact with said rotor;
- said arrangement of process implements including at least one process implement extending out from said rotor substantially perpendicularly with respect to a rotational axis of said rotor, said at east one process implement having a cross sectional profile defining a pitch with respect to a rotational plane of said at least one process implement and being mounted on said rotor in a rotatable manner with respect to an implement axis extending radially out from said rotor, and said rotor including a rotor shaft defined at the rotational axis of the rotor, said rotor shaft having an axially extending recess accommodating an actuating mechanism operable for adjusting said pitch of said at least one process implement to thereby modify axial accelerations imparted on said boundary layer by said rotor.





5,836,689

DEVICE FOR KNEADING HIGH-CONSISTENCY FIBER PULP

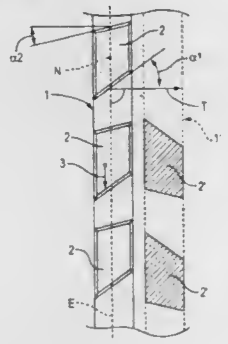
Ulrich Wieland, Berg, Germany, assignor to Voith Sulzer Stoffaufbereitung GmbH, Ravensburg, Germany

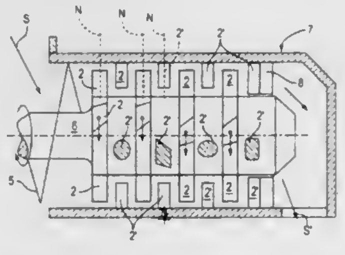
Filed May 9, 1997, Ser. No. 854,182

Claims priority, application Germany, May 10, 1996, 196 18 886.5

Int. Cl.^{6} B01F *7/04*

U.S. Cl. 366—303 **20 Claims**





1. A kneading device for high-consistency fiber pulp comprising:

- at least two substantially rotationally symmetrical and coaxial kneading machines, that are movable relative to each other, comprising a plurality of teeth in ring-shaped tooth rows forming a ring-shaped gap between the tooth rows and positioned relative to one another such that at least one tooth row of one of the at least two kneading machines reaches into the ring-shaped gaps of another of the at least two kneading machines;
- a face side of at least a portion of the teeth comprising an angled surface for diverting the fiber pulp in a transport direction, resulting from a throughput of a flow of the fiber pulp through the kneading device and from relative movement between the fiber pulp and the face side;
- at least a portion of the teeth comprising angled surfaces on a rear side;
- wherein an angle α1 of a slope on the face side differs from an angle α2 of the rear side by at least 5°, the angles α1 and α2 being defined between the respective face side and rear side relative to the pulp transport direction, and
- at least a portion of the teeth being mounted in a releasable fashion, so that a position of the face side and the rear side are exchangeable by rotating the teeth.

5,836,690

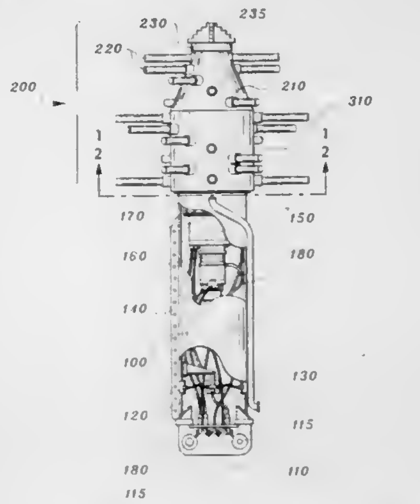
ROTATABLE MIXING HEAD HAVING SEALED BEARINGS

Steven W. Davis, Lancaster; Brian T. Gibbs, Hurst, and Frank Rosner, Roanoke, all of Tex., assignors to Ultimate Environmental Mixing, Inc., Lancaster, Tex.

Filed Dec. 17, 1997, Ser. No. 992,557

Int. Cl.^{6} B01F *7/18*

U.S. Cl. 366—325.2 **18 Claims**



1. A mixing head assembly attachable to a boom of an excavating machine, the mixing head assembly comprising:

- a. A torque tube having an axis, a first end and a second end. the torque tube further comprising:
  - i. A means for providing rotary power mounted within the torque tube adjacent to the first end of the torque tube; the means for providing rotary power axially aligned with the axis of the torqne tube;
  - ii. A mounting assembly attached to the second end of the torque tube for removably attaching the mixing head assembly to the boom of an excavating machine;
- b. a rotatable mixing head comprising:
  - i. a bearing housing attached to the first end of the torque tube; the bearing housing having a drive end and an impeller end;
  - ii. A casing enclosing the bearing housing and rotatable about the bearing housing; the casing defining a cavity about the bearing housing; the casing externally having a plurality of sockets for receiving a plurality of mixing arms;
  - iii. A drive shaft passing through the bearing housing; the drive shaft having a drive end and an impeller end; the drive end of the drive shaft engaging the means for providing rotary power; the impeller end of the drive shaft engaging the casing, so that the means for providing rotary power rotates the casing about the bearing housing; and,
  - iv. means for sealing the bearing housing from the external environment.

5,836,691

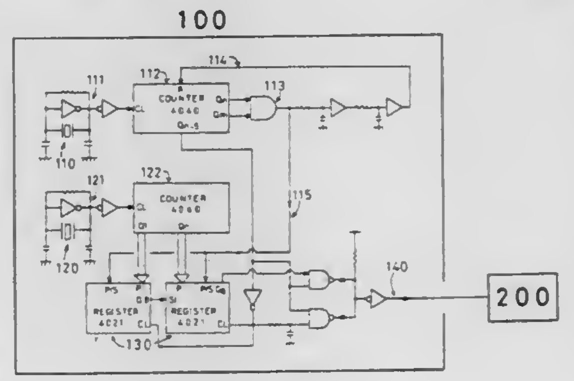
METHOD OF THERMOMETRY AND APPARATUS FOR THE THERMOMETRY

Tsuneo Yamauchi, Nagoya, Japan, assignor to Techno Togo Limited Company, Mino, Japan

Filed Jul. 17, 1996, Ser. No. 683,614

Int. Cl.^{6} G01K *11/26*

U.S. Cl. 374—117 **2 Claims**



1. An electric thermometer comprising in combination: a first crystal resonator having a large temperature coefficient; a first oscillator circuit for producing an oscillating output signal; a first counter connected to receive the first oscillating signal from the first oscillator circuit; a gate connected to receive the counter stage contents from the first counter for producing a reset signal of the first counter stage contents; a second crystal resonator as a standard resonator having a small temperature coefficient; a second oscillator circuit for producing a reference oscillating output signal; a second counter connected to receive the second oscillating signal from the second oscillator circuit; a parallel-in serial-out shift register connected to the second counter for storing the counter stage contents and also connected to the gate for receiving a latch signal; and

- a recording unit means for receiving the counter stage contents from the parallel-in serial-out shift register placed at a far distance, comprising in combination: a microcomputer for receiving serial digital data from the register and for converting the received counter stage contents to temperature; a ROM to store a function table of a relationship between the counter stage contents and temperature; a SRAM for storing the converted temperature; and a D/A converter for making an analog signal in response to the temperature.

5,836,692

DIFFERENTIAL RADIATION DETECTOR PROBE

Francesco Pompei, Boston, Mass., assignor to Exergen Corporation, Watertown, Mass.

Continuation of Ser. No. 219,985, Mar. 30, 1994, abandoned. This application Jun. 18, 1996, Ser. No. 665,593

Int. Cl.^{6} G01J *5/02;5/16*

U.S. Cl. 374—121 **7 Claims**

1. A temperature detecting assembly comprising:

- a probe housing which houses an infrared detector in a circuit without amplification:

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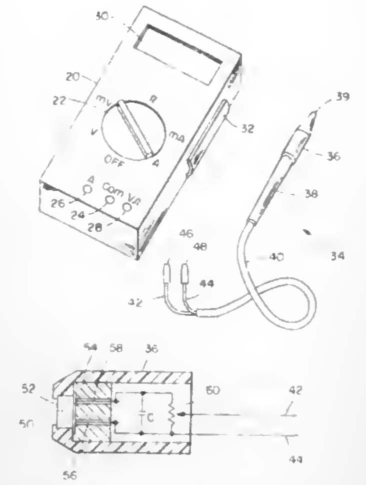


a hand-held electrical meter having no temperature scale or temperature specific input; and

leads coupled to the probe housing at one end and having connectors at an opposite end connected to socket connectors of the hand-held electrical meter, the socket connectors being designated for electrical parameter measurement;

the infrared detector output being calibrated to provide an electrical output which provides a direct reading of temperature degrees, by a factor of ten, on an electrical parameter scale of the meter.

5. A method of detecting temperature of a target surface comprising:

providing an infrared detector in a circuit without amplification in a probe, the probe having leads with standard connectors and an electrical output corresponding to a temperature of a surface viewed by the infrared detector, the infrared detector being calibrated to provide the electrical output such that it provides a direct reading of temperature degrees, by a factor of ten, on an electrical parameter scale of a meter having no temperature scale or temperature specific input;

plugging the standard connectors of the leads into a hand-held electrical meter; and

directing the infrared detector at the target surface to generate the electrical output between the leads and detecting the electrical output with the meter.

5,836,693

METHOD AND APPARATUS FOR MEASURING PRESSURE IN A PIPELINE WITHOUT TAPPING

Foster B. Stulen, Galena; Susan T. Brown, Dublin; Glenda S. Holderbaum, Hilliard; David B. Philips, Bexley, and Arthur C. Eberle, Upper Arlington, all of Ohio, assignors to Columbia Gas of Ohio,Inc., Columbus, Ohio

Division of Ser. No. 262,696, Jun. 20, 1994, Pat. No. 5,645,348. This application Feb. 23, 1996, Ser. No. 606,410

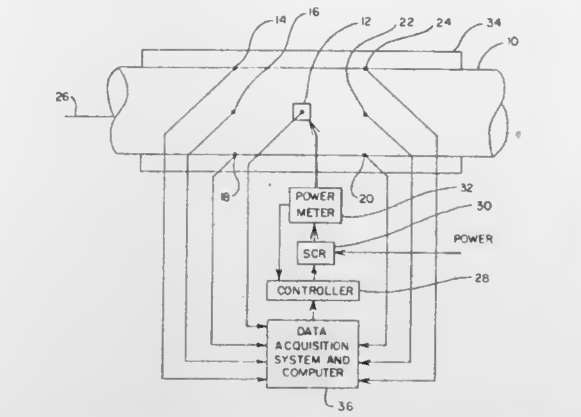
Int. Cl.^{6} G01N *25/00;13/02;1/68*

U.S. Cl. 374—45 **4 Claims**

1. In combination, a pipe of unknown volume partially encompassed by a housing.

said pipe containing an unknown fluid of unknown composition and unknown pressure, said fluid being selected from the group consisting of a flowing fluid and a static fluid, said fluid also being selected from the group consisting of a gaseous fluid and a liquid fluid,

the combination including (1) a heater attached to the external surface of the pipe within the housing, (2) a source of electrical energy connected to said heater through a controller for controlling the energy to said heater, (3) a plurality of temperature sensors attached to the surface of said pipe inside said housing, and (4) said sensors being connected to a screen of a data display system outside said housing for displaying temperatures from said sensors,



said plurality of temperature sensors including a first set of three temperature sensors on the pipe surface in a first direction transverse to the heater, and a second set of three temperature sensors on the pipe surface in a second direction transverse to the heater and opposite to the first direction, each set including one sensor on the top of the pipe, one sensor about half way down the side of the pipe, and one sensor on the bottom of the pipe.

5,836,694

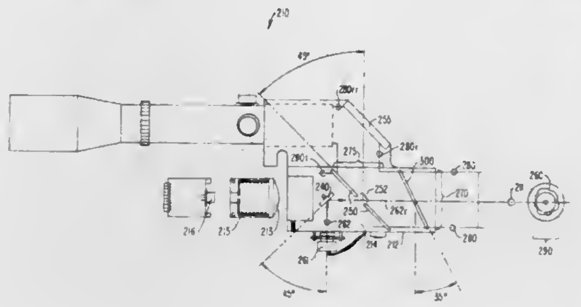
LASER AND SCOPE AIMING MECHANISM FOR A HAND-HELD TEMPERATURE MEASURING UNIT

Phan Nguyen, Pacifica, Calif., assignor to Raytek Subsidiary, Inc., Santa Cruz, Calif.

Filed Dec. 10, 1996, Ser. No. 761,337

Int. Cl.^{6} G01J *5/08;5/62*

U.S. Cl. 374—130 **12 Claims**



1. A temperature measuring device for measuring the temperature of a distant target area, the device comprising:

an infrared (IR) temperature sensor including an IR detector and a first focusing element for focusing IR radiation, wherein said first focusing element focuses incoming IR radiation emitted from the target onto said IR detector;

a scope including an eyepiece and a second focusing element for focusing visible radiation, wherein said second focusing element focuses incoming visible radiation reflected from the target onto said eyepiece;

a visible light source for emitting a visible beam of light, with said visible beam of light being incident upon the target;

a beamsplitter for transmitting a portion of said incoming IR radiation and reflecting a portion of said incoming visible radiation, with said transmitted IR portion being incident upon said IR detector, wherein said beamsplitter includes an opening; and

a first mirror element for directing said beam of visible light toward the target, wherein said beam of visible light is incident upon said first mirror element and wherein said first mirror element reflects said visible beam of light through said opening and toward the target

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5,836,695

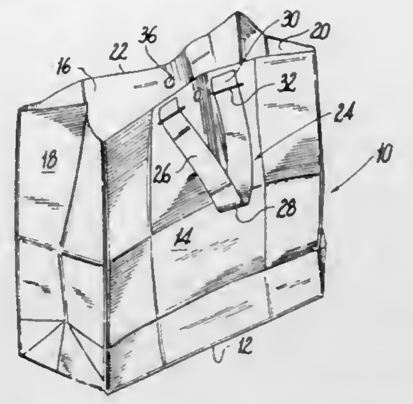
BAG WITH INVERTED LOOP HANDLE

Violet Hanson, 14 Fairway Dr., Old Bethpage, N.Y. 11804

Filed Oct. 31, 1996, Ser. No. 741,561

Int. Cl.^{6} B65D *33/10*

U.S. Cl. 383—14 **2 Claims**



1. In a plastic flat bottom bag having front, rear and side panels extending upwardly from the flat bottom, a handle for each of its front and rear panels, each said handle comprising a strip of plastic material lying flat against the outer surface of the respective panel with the ends of said strip forming a tab adjacent the upper edges of the respective panels and the main body of the strip directed downwardly toward the flat bottom, said tabs being heat welded directly to the outer surface of the panels along collinear lines so that in use the main body of the strip is folded over the attachment line, said attachment line extending beyond the edges of the strip to reinforce said panel.

5,836,696

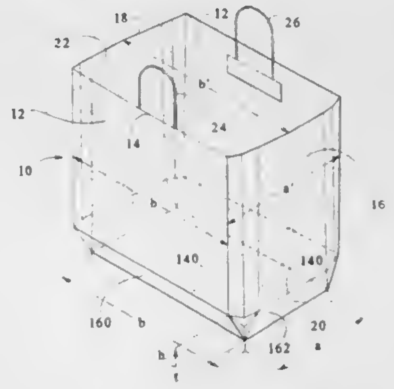
SACK HAVING OUTWARDLY EXPANDABLE WALLS

Mark L. Schnell, Kiel, Wis., assignor to H.G. Weber and Companu, Inc., Kiel, Wis.

Continuation-in-part of Ser. No. 653,503, May 2, 1996, abandoned. This application Oct. 8, 1997, Ser. No. 943,865

Int. Cl.^{6} B65D *30/20*

U.S. Cl. 383—120 **8 Claims**



1. A sack comprising:

a planar front wall having a bottom edge and a pair of side edges;

a planar rear wall having a bottom edge and a pair of side edges:

first and second side walls, each having a bottom edge and a pair of side edges

a V-shaped gusset connecting each side edge of said first and second side walls to each side edge of said front and rear walls;

a bottom having a width generally equal to a width of said front and rear walls and a depth generally equal to a width of said side walls; and

a connecting panel connecting each bottom edge of said front, rear and side walls to said bottom closing said rectangular configuration, said V-shaped gussets and said connecting panels allowing expansion of said sack above said bottom to a depth greater than a depth of said bottom.

5,836,697

OPENING DEVICE FOR FLEXIBLE CONTAINERS, CONTAINER PROVIDED WITH SUCH A DEVICE AND APPLICATION METHOD THEREOF

Emilio Tessera Chiesa, Leumann, Italy, assignor to Sales S.p.A., Turin, Italy

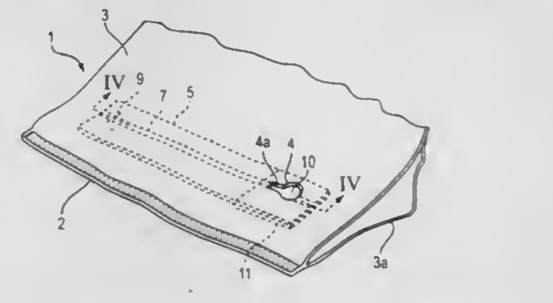
PCT No. PCT/EP95/01665, § 371 Date Jan. 9, 1997, § 102(e) Date Jan. 9, 1997, PCT Pub. No. WO95/30601, PCT Pub. Date Nov. 16, 1995

PCT Filed May 3, 1995, Ser. No. 737,063

Claims priority, application Italy, May 5, 1994, T094A0361

Int. Cl.^{6} B65D *33/00*

U.S. Cl. 383—205 **14 Claims**



1. An opening device for flexible sealed containers formed by a pair of walls sealed around respective peripheral edges, said opening device comprising a tape element adapted to be applied to the inner face of one of said container walls and incorporating along a substantially central area thereof, a longitudinal strip having a substantially initial portion defining a gripper tongue, wherein said gripper tongue is adapted to be pulled outwardly through an aperture in said one container wall so as to perform tear separation of said tape element by said longitudinal tear strip and to tear said one container wall, wherein said tape element is a label having an adhesive face adapted to be adhesively secured to said inner face of said one container wall and said gripper tongue of said longitudinal tear strip of said label is adapted to be located in an inner area of said one wall with respect to said sealed peripheral edges of the container walls, wherein the gripper tongue of the label is defined by a cut of the label, wherein the gripper tongue of the label is adapted to adhere to a tear wing of said wall of the container, which tear wing is delimited by a partial cut adapted to be separated, through non-pierced areas of said wall of the container, from said cut delimiting the gripper tongue of the label, wherein said longitudinal strip of the label is adapted to extend across said partial cut and wherein the adhesive face of the label has a non-adhesive portion adapted to be arranged in correspondence with at least one initial portion of the tear wing of said wall of the container.

5,836,698

APPARATUS AND METHOD FOR REMOVAL AND INSTALLATION OF A STRUT BEARING

Warner G. Richardson, Shorewood, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Sep. 9, 1997, Ser. No. 926,365

Int. Cl.^{6} F16C *29/02;43/02*

U.S. Cl. 384—29 **6 Claims**

1. A suspension strut having a cylindrical housing with a bore therein and a cylindrical rod reciprocating mounted within the bore of the strut housing, comprising:

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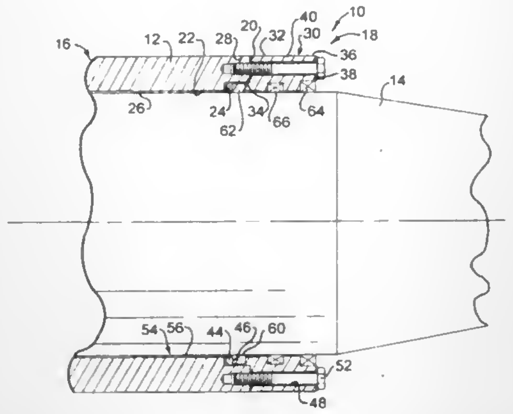


- a multi-piece bearing positioned within the bore between the cylindrical housing and the cylindrical rod, the multi-pieces form a circular bearing around the rod, each of the pieces have an end portion having a hole therethrough;
- a end cap removeably attached to the cylindrical housing around the rod, the end cap having a end portion positioned between the housing and the bearing and having a hole aligned with the hole in the bearing; and
- a key positioned in the hole of the bearing and the hole in the end cap for connecting the bearing to the end cap.

6. A method for installing and removing a bearing which is positioned between a cylindrical housing and a rod in a suspension strut, comprising the steps of:

- removing a bolt that extends through a mounting hole in a end cap and is threadably fastened into the housing for unfastening the end cap from the housing;
- rotating an elongated threaded rod into a threaded puller hole for removing the end cap and the bearing from the strut;
- disconnecting the bearing from the end cap for removal of the bearing;
- connecting the bearing to the end cap for installing the bearing;
- rotating the elongated rod into a threaded hole in the housing;
- rotating a nut onto the threaded rod to contact the end cap and moving the end cap and the bearing into position in the housing;
- removing the threaded rod from the threaded hole in the housing; and
- positioning the bolt in the mounting hole in the end cap and rotating the bolt into the threaded hole in the housing to fasten the end cap to the housing.

5,836,699
ROLL-FORMED BUSHING FOR SLIDING SURFACE BEARINGS

Karl Back, Dielheim; Karl Becker, St. Leon-Rot; Wolfgang Bickle, Reilingen, and Thomas Storch, Brühl, all of Germany, assignors to Kolbenschmidt Aktiengesellschaft, Neckarsulm, Germany

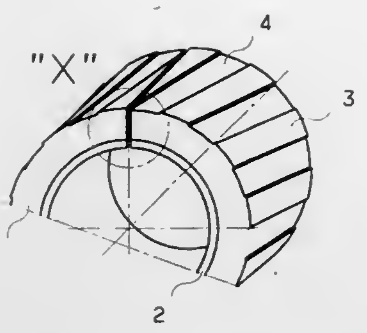
Filed Sep. 27, 1995, Ser. No. 534,359

Claims priority, application Germany, Sep. 30, 1994, 44 35 098.8

Int. Cl.^{6} F16C *33/10;35/02*

U.S. Cl. 384—276 **6 Claims**

1. A roll-formed bushing for sliding surface bearings, which bushing is made from a strip section comprising a maintenance-free or low-maintenance bearing material and which is circular in an installed state, which bushing comprises a butt joint which extends throughout the width of the bushing and is closed in an installed state, and in which bushing at least the outside peripheral surface has a profile which extends throughout the width of the said peripheral surface, characterized in that the profile consists of frustoconical elevations, which are arranged in parallel rows, which include an angle of 1° to 30° with the longitudinal axis of the bushing.



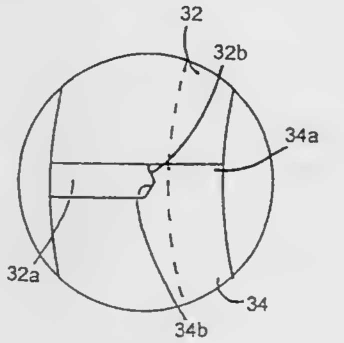
5,836,700
SPLIT BEARING SEAL

Robert C. Wilkie, Jr.; Robert M. Galewski, both of Virginia Beach, and George E. Slemp, Lanexa, all of Va., assignors to Cooper Split Roller Bearing Corporation, Virginia Beach, and Advex Corporation, Hampton, both of Va.

Filed Jun. 5, 1997, Ser. No. 869,452

Int. Cl.^{6} F16C *33/80*

U.S. Cl. 384—480 **10 Claims**



1. A bearing and seal ring assembly comprising:

- a bearing subassembly;
- a pair of seal rings astraddle said bearing subassembly;
- each of said seal rings comprising first and second semicircular metal ring segments, each said segment having first and second ends;
- said first end of said first segment having an interference interfit with said first end of said second segment, and said second end of said first segment having an interference fit with said second end of said second segment, to form said seal ring;
- said segments being separable or interconnectable by temporary deformation of said segments;
- said first and second ends of said first segment having radially convex surfaces and said first and second ends of said second segment having radially concave surfaces of matching configuration to said convex surfaces, to form said interference interfit.

5,836,701
MECHANICAL SPIN BEARINGS

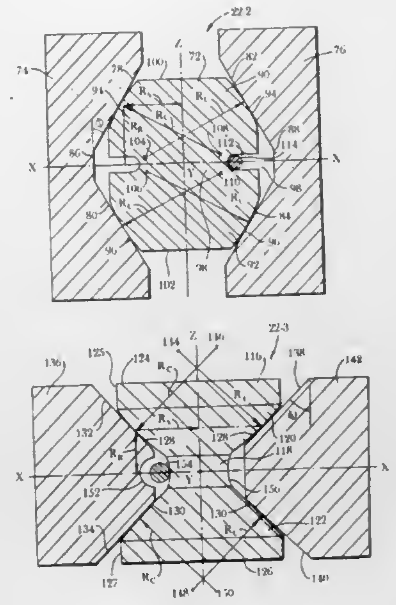
John M. Vranish, Crofton, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 23, 1997, Ser. No. 797,507

Int. Cl.^{6} F16C *33/36*

U.S. Cl. 384—565 **19 Claims**

1. A spin bearing assembly, comprising:



- first and second mutually opposing complementary bearing support members having mutually spaced apart bearing support surfaces wherein said first support member includes a carrier access slot for receiving a carrier spring member;
- a set of spin bearings located between said bearing support members
- such that each of said spin bearings is mutually separated and biased towards said second support member by said carrier spring; and wherein said spin bearings include a body having a pair of end faces,
- a central rotational axis passing through said end faces,
- a waist region substantially midway between said end faces and having a first thickness dimension, and
- first and second discrete side surface regions located between said waist region and said end faces and having a second thickness dimension different from said first thickness dimension of said waist region, said first and second side surface regions further having respective curvilinear contact surfaces adapted to provide a plurality of bearing contact points.

5,836,702
COMPOSITE BEARING HOUSING

Richard M. Whiddon, Simpsonville, and Theodore L. Hazlett, Taylors, both of S.C., assignors to Reliance Electric Industrial Company, Cleveland, Ohio

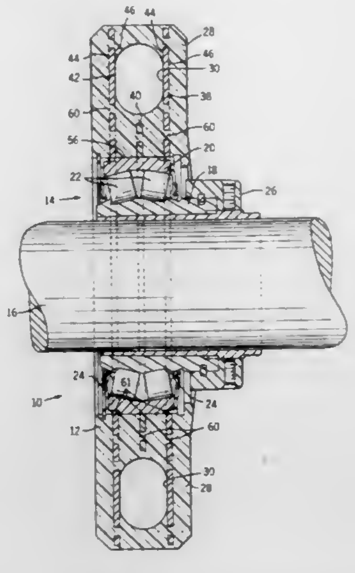
Filed Aug. 27, 1997, Ser. No. 921,921

Int. Cl.^{6} F16C *19/28*

U.S. Cl. 384—584 **13 Claims**

1. A housing for a bearing set, the housing comprising:

- a housing body formed of a moldable plastic material, the body including an aperture bounded by a bearing set support surface; and
- at least one substantially planar, edge loaded reinforcing member disposed at least partially within the body, the reinforcing member at least partially surrounding the aperture, wherein when the bearing housing is placed in service the reinforcing member carries tensile and compressive loading exerted in the bearing set.



5,836,703
PRINTER SYSTEM WITH AUTOMATIC INK RIBBON CASSETTE EXCHANGE FUNCTION

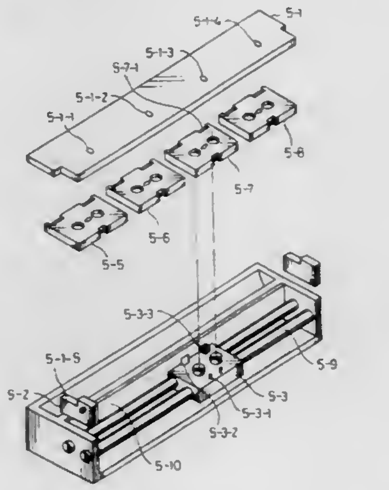
Tadashi Watanabe, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 469,457, Jun. 6, 1995, Pat. No. 5,720,562. This application Aug. 20, 1997, Ser. No. 915,411

Claims priority, application Japan, Sep. 1, 1994, 6-208905; Sep. 1, 1994, 6-208906; Sep. 22, 1994, 6-228526; Sep. 22, 1994, 6-228527

Int. Cl.^{6} B41J *33/36*

U.S. Cl. 400—208 **4 Claims**



1. A printer system with an automatic ink ribbon cassette exchange system, comprising:

- a carriage for holding thereon a single ink ribbon cassette;
- a stocker for storing therein plural ink ribbon cassettes;
- a changer for taking out an ink ribbon cassette held in a predetermined position of said stocker to be mounted on said carriage or taking out the ink ribbon cassette held on said carriage to be stored in a predetermined empty space in said stocker;
- stocker state detection means for detecting whether or not said stocker is set in a predetermined position for permitting a user to exchange one of the ink ribbon cassettes on said stocker; and

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control means for controlling operations of said carriage and said changer,
wherein when said stocker state detection means detects that said stocker is set in the predetermined position, said control means controls said changer so as not to take out one of the ink ribbon cassettes on said stocker nor install the ink ribbon cassette from said carriage in said stocker.

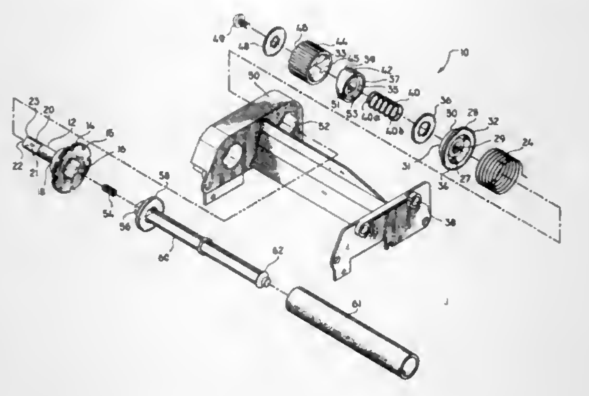
5,836,704
RIBBON TENSIONING ASSEMBLY

Ed Lau, Apopka; Mark Anthony Lombardo, Longwood, and Kenneth Colonel, Oviedo, all of Fla., assignors to Datamax Corporation, Orlando, Fla.

Filed Nov. 24, 1997, Ser. No. 977,261

Int. Cl.⁶ B41J *33/14*

U.S. Cl. 400—234 **10 Claims**



1. A ribbon tensioning assembly comprising:
a knob having a top wall, an internal raised portion attached to the top wall having a first helical camming surface and a second helical camming surface out of phase and disposed about a center point;
a compression helix having a first end portion forming a first helical camming surface and a second helical camming surface for engaging first and second helical camming surfaces of the knob;
a spring coupled to the compression helix at a second end portion of the compression helix;
a clutch connected to the spring, the spring for biasing the clutch;
a surface against which the clutch is biased for frictional engagement between the surface and the clutch;
a spindle, attached to a ribbon supply roll, for securing the knob, the compression helix, the spring and the clutch in relative position such that turning the spindle provides frictional resistance between the clutch and the surface for creating increased tension in a ribbon dispensed from the supply roll.

5,836,705
KEYBOARD ARRANGEMENT TO MAXIMIZE TYPING SPEED AND DATA ENTRY AND TO EASE TRANSITION FROM A QWERTY KEYBOARD

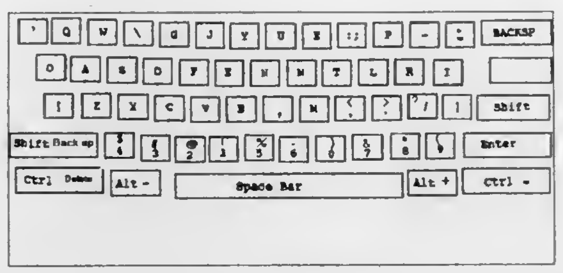
John I. M. Choate, c/o Rte. 1, Box 260H, Seminole, Okla. 74818-0065

Continuation-in-part of Ser. No. 273,205, Jul. 11, 1994, Pat. No. 5,498,088, which is a continuation-in-part of Ser. No. 918,767, Jul. 27, 1992, Pat. No. 5,352,050. This application Feb. 1, 1996, Ser. No. 595,491

Int. Cl.⁶ B41J *5/10*

U.S. Cl. 400—486 **13 Claims**

1. A keyboard having, a complete alphabet, punctuation, and numerals, in at least three rows of letters; and one or more rows of numerals, marks, symbols and punctuation; comprising:



a middle letter row having 11 or more keys and the key corresponding to the letter E; wherein at least two of the remaining keys, selected from the group consisting of the letters A, S, D, F, H and L, beginning with the second letter in the row have the same location relative to each other as in the middle row of the conventional QWERTY keyboard;
an upper letter row, adjacent to said middle row, having at least two keys corresponding to the letters selected from the group consisting of the letters Q, W, Y, U, or P, beginning with the second letter in the row have the same location relative to each other as in the upper letter row of the conventional QWERTY keyboard; and
a lower letter row, adjacent to said middle row, having at least two keys corresponding to the letters and punctuation selected from the group consisting of Z, X, C, V, B, M, the period, the comma, and the question mark, beginning with the second letter in the row have the same location relative to each other as in the lower letter row of the conventional QWERTY keyboard; and wherein at least seventeen of the letter and punctuation keys have the same location as on the QWERTY keyboard.

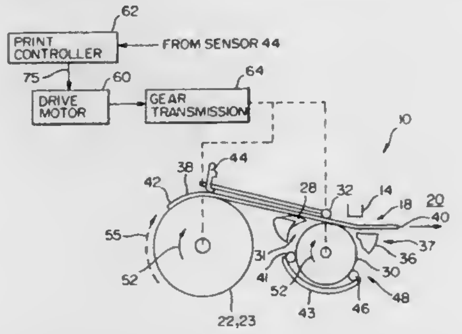
5,836,706
MEDIA HANDLING SYSTEM FOR DUPLEX PRINTING

Thomas W. Ruhe, LaCenter, Wash., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 8, 1997, Ser. No. 986,722

Int. Cl.⁶ B41J *13/02;* **B65H** *29/00*

U.S. Cl. 400—636 **14 Claims**



1. A media sheet handling system for moving a media sheet along a first path into a print zone for first side printing, for moving the media sheet along a second path for flipping the media sheet and for moving the flipped media sheet along the first path into the print zone for second side printing, the media sheet having a first edge and a second edge opposite the first edge, the system comprising:
a first roller, a second roller, a third roller, a refeed guide, an inner guide, a first signal, and a second signal;
the first path extending from the first roller to the second roller and into the print zone;
means for rotating the first roller and second roller in a common first direction for first side printing during which the first roller feeds the media sheet along the first path to the second roller and into the print zone, and the second roller receives a lead edge of the media sheet as the media sheet progresses along the first path, the first edge of the media sheet serving as the lead edge during first side printing;
means for discontinuing motion of said second roller in the first direction after printing on the first side is complete and while a portion of the media sheet remains in contact with the second roller;
the refeed guide being located along the first path between the first roller and the second roller and being mounted for movement between a first position and a second position, means biasing the refeed guide toward the first position, wherein in response to the media sheet passing over the refeed guide along the first path moves the refeed guide into the second position;
means responsive to the first signal for triggering the first roller and second roller to change direction to a common second direction while said portion of the media sheet remains in contact with the second roller to cause flipping of the media sheet, the second roller while rotating in the second direction moving the media sheet backward toward the refeed guide which is in the first position, the second edge of the media sheet being the lead edge during movement of the media sheet back toward the refeed guide,
means for maintaining the refeed guide in the first position blocking movement of the media sheet along the first path and directing movement of the media sheet toward the second path during flipping of the media sheet;
said third roller being located adjacent to the second roller and the inner feed guide, the third roller movable between a first position out of contact with the second roller and a second position in contact with the second roller;
wherein during movement of the media sheet along the second path, the second roller drives the media sheet along the inner guide between the third roller and the inner guide, the third roller being in the first position;
means for moving the third roller into the second position while the media sheet moves along the inner guide to drive the media sheet back along the inner guide toward and onto the first roller; and
wherein for second side printing, means responsive to the second signal triggers the first roller and second roller to change direction back to the common first direction for second side printing after the media sheet clears the inner guide, the first roller moves the media sheet along the first path for second side printing with the media sheet second edge as the lead edge.

5,836,707
SIDE KNOCK TYPE MECHANICAL PENCIL

Hidehei Kageyama; Tomiji Ueki, and Yoshihide Mitsuya, all of Kawagoe, Japan, assignors to Kotobuki & Co., Ltd., Kyoto, Japan

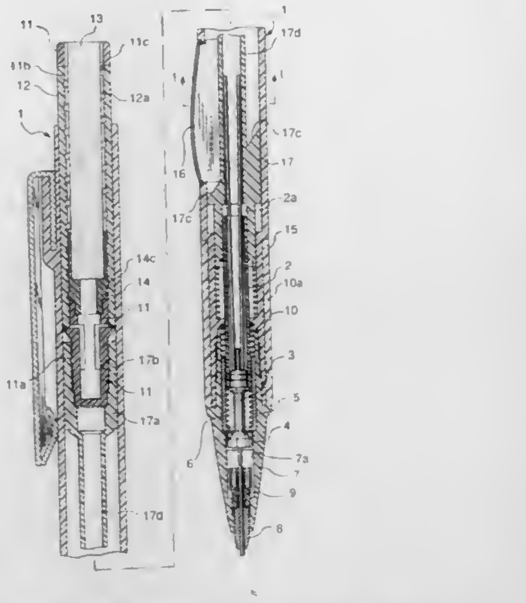
Division of Ser. No. 327,549, Oct. 24, 1994, abandoned. This application Dec. 31, 1996, Ser. No. 777,240

Claims priority, application Japan, Jul. 22, 1994, 5-191293; Sep. 27, 1994, 5-267965

Int. Cl.⁶ B43K *21/16*

U.S. Cl. 401—65 **12 Claims**

1. A side-knock mechanical pencil comprising:
a generally cylindrical shell extending from approximately the front end of the pencil to the rear end of the pencil;
a generally elongated slide member disposed within said shell, said slide member being axially movable within said shell, said slide member having a lead passageway extending through it and a slanted portion having a surface that is angled relative to a longitudinal axis of said slide member;
a chuck member connected to a front end of said slide member and configured and disposed to advance a pencil lead out of the front end of the pencil upon knocking operation;
a first biasing member disposed within said cylindrical shell to bias an assembly comprising said chuck member and said slide member backward;



a knock lever disposed within a side of said shell in position to abut said angled surface so that side-knock operation is effected when said knock lever is depressed;
a retaining sleeve disposed within said cylindrical shell axially behind said slide member, said retaining sleeve axially secured relative to said cylindrical shell;
a generally cylindrical end cap coaxially disposed within the rear end of the pencil behind said slide member, said end cap having a helical guide groove extending along an inner surface thereof;
a generally cylindrical guide cylinder coaxially disposed within and extending through said end cap, said guide cylinder having at least one slot extending axially along a side thereof, said end cap being axially fixed relative to said guide cylinder and free to rotate relative to said guide cylinder, a front end of said guide cylinder extending forward and received within the retaining sleeve, the front end of said guide cylinder being secured in releasable fashion within said retaining sleeve; and
a rod-like-article support member generally coaxially disposed within said guide cylinder with a lug extending through said slot and engaging said helical guide groove;
whereby rotating said end cap relative to said guide cylinder and within the rear end of said shell causes said rod-like-article support member to advance or retract within said guide cylinder, and said guide cylinder and said end cap can be removed, as a unit, from the rear end of said pencil by pulling the front end of said guide cylinder out of the retaining sleeve, thereby to load pencil lead within said pencil.

5,836,708
CARTRIDGE-TYPE FEEDING CASE FOR A SOLID OBJECT

Yoshikazu Tani, Tokyo, Japan, assignor to Tokiwa Corporation, Nakatsugawa, Japan

Continuation of Ser. No. 166,448, Dec. 13, 1993, abandoned. This application May 23, 1996, Ser. No. 652,119

Claims priority, application Japan, Sep. 8, 1993, 5-048888 U; Sep. 8, 1993, 5-048889 U

Int. Cl.⁶ A45D *40/06;40/12*

U.S. Cl. 401—70 **26 Claims**

25. A cartridge-type feeding case for feeding a solid object comprising a cartridge for projectably accommodating the solid object into an internal through hole thereof and a case body having an opening for removably and rotatably holding the cartridge, comprising:
an extruding rod incorporated in said case body for extruding the solid object when the cartridge is installed in said case body, said extruding rod being movable axially backward and for-

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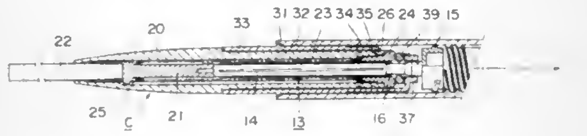
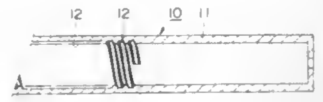
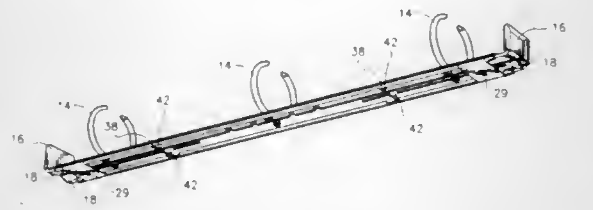




ward between a retracted position within said case body and an extended position extending outwardly of said case body;
converting means for converting rotation movement of said cartridge relative to said case body into an axial sliding movement of said extruding rod relative to said case body;
means for providing a resistance to said rotation, and
means for reducing said resistance when said extruding rod is moved to said extended position.

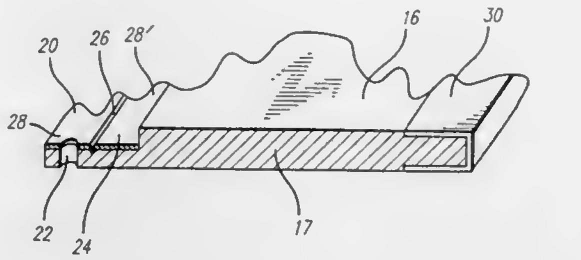
5,836,709
RING BINDER
Law Chun Cheung, Shatin, Hong Kong, assignor to Leco Stationery Manufacturing Company Limited, Hong Kong
Filed Jun. 6, 1996, Ser. No. 660,799
Claims priority, application United Kingdom, Jan. 24, 1996, 9601428; May 7, 1996, 9609458
Int. Cl.^{6} B42F *3/04*
U.S. Cl. 402—38 **38 Claims**



1. A ring binder adapted to be fixed to an article by at least one fixing means, the ring binder comprising support means for mounting a plurality of ring members thereon and controlling means for opening and closing the ring binder, characterized in that the support means comprises a pair of support members pivotally supported by holding means joining the outer edges of the pair of support members together, whereby the inner edges of the pair of support members move away from each other on pivoting, and the holding means cooperates with controlling means in order to support the support means.

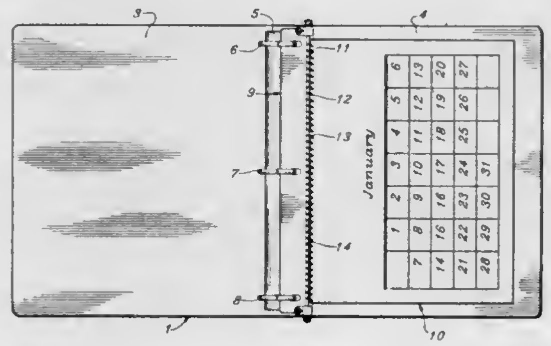
5,836,710
LASER/INKJET PRINTABLE SHEET ASSEMBLY AND PRINTING METHOD
Sonia Owen, Covina, Calif., assignor to Avery Dennison Corporation, Pasadena, Calif.
Division of Ser. No. 348,370, Dec. 1, 1994, Pat. No. 5,558,454. This application Aug. 5, 1996, Ser. No. 691,943
Int. Cl.^{6} B42D *15/00*
U.S. Cl. 402—79 **45 Claims**

1. An assembly which is folded over along one edge for feeding into a laser printer, inkjet printer, or photocopier, the assembly comprising:
a sheet having a binding edge and a binding edge region extending inwardly from said binding edge;
said sheet having a longitudinal folding line which is inset from and which runs substantially parallel to said binding edge;
said binding edge region having a folding portion defined on one side by said binding edge and on an opposite side by said folding line, and a non-folding portion; and
a binding edge reinforcement film which is adhered to at least a portion of said binding edge region;
wherein said folding portion of said binding edge region is folded over at said folding line to said non-folding portion of said sheet.



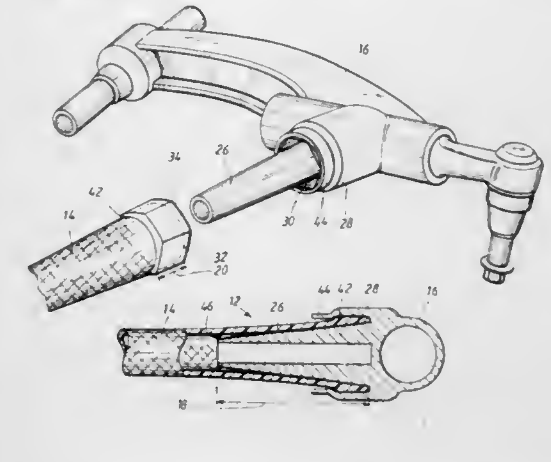
2. The assembly of claim 1 wherein said sheet includes a main body having an integral, outwardly-extending tab, and said assembly thereby defines a one-piece divider assembly.

5,836,711
RING NOTEBOOK ADAPTER
Richard M. Stewart, 731 Ojai Ave., Sun City Center, Fla. 33573
Filed Jul. 28, 1997, Ser. No. 901,759
Int. Cl.^{6} B42F *13/00*
U.S. Cl. 402—79 **8 Claims**



1. An adapter for holding a plurality of pages bound by coaxial elements of a binding member, within a notebook of the type having a spine and a plurality of spaced rings attached to the spine which may be opened and closed, the adapter comprising:
an elongated substantially flat carrier member having a length approximately the same as that of the spine and defining a plurality of holes along the carrier member spaced to correspond to the spacing of the rings of said notebook and arranged to receive the rings when they are opened and to hold the carrier member when the rings are closed,
an elongated rod member adapted to extend axially through coaxial elements of a binding member so as to hold a plurality of pages bound by coaxial elements and having opposite end portions extending beyond the coaxial elements,
first means supporting the end portions of the elongated rod member on respective opposite ends of the carrier member, and
second means for temporarily detaching at least one end portion of the elongated rod member from said first means to enable the elongated rod member to pass axially through the coaxial elements.

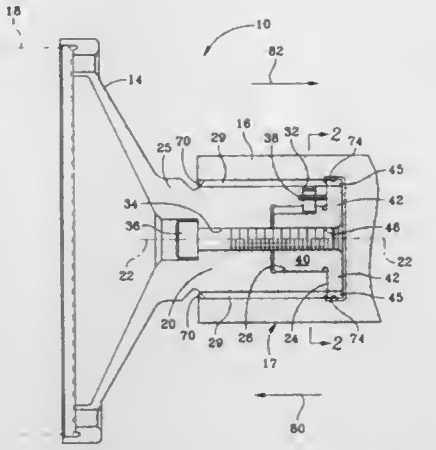
5,836,712
JOINT BETWEEN TWO COMPONENTS
Sigvard Zetterström, Hakenäset, Sweden, assignor to AB Volvo, Sweden
PCT No. PCT/SE95/01266, § 371 Date Apr. 22, 1997, § 102(e) Date Apr. 22, 1997, PCT Pub. No. WO96/12897, PCT Pub. Date May 2, 1996
PCT Filed Oct. 25, 1995, Ser. No. 817,664
Claims priority, application Sweden, Oct. 25, 1994, 9403659
Int. Cl.^{6} F16B *2/00*
U.S. Cl. 403—334 **12 Claims**



1. A joint between an at least hollow ended, generally cylindrical first component and a second component, said first component comprising
a first end portion terminating in a first free end region, a second end portion terminating in a second free end region, and a mid portion extending between said first and second end portions, said amid portion presenting a first predetermined external diameter and said first end portion presenting an external diameter which increases gradually from said first predetermined external diameter to a second predetermined external diameter at said first free end region, said first free end region presenting a free end from which at least one planar surface axially extends;
said second component comprising:
a generally ring-shaped socket presenting at least one substantially planar circumferentially and axially extending surface, and a tapered pin extending from within said ring-shaped socket,
wherein said first end portion of said first component is adapted to be pushed onto said tapered pin of said second component to a joined position such that, when approaching said joined position, said first component is constrained by said second component to be displaced in a substantially axial direction only and, when in said joined position said first free end region of said first component extends into said generally ring-shaped socket of said second component and said at least one planar surface extending axially from the free end of said first free end region of said first component abuts said at least one substantially planar circumferentially and axially extending surface of said second component.

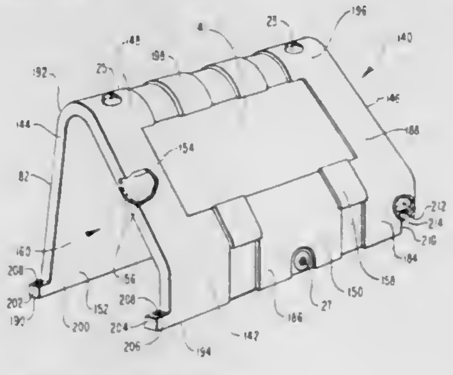
5,836,713
COUPLING MECHANISM FOR ESTABLISHING AN INVOLUTE SPLINE CONNECTION
Walter L. Brassert, Belmont, and Paul N. Dahlstrand, Andover, both of Mass., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.
Filed May 1, 1997, Ser. No. 848,931
Int. Cl.^{6} F16B *3/00*
U.S. Cl. 403—359 **7 Claims**

1. A mechanism for establishing an involute spline connection, said mechanism comprising:



A) a hub, said hub comprising an axis, a first hub end with a cavity formed at the first hub end, a second hub end, an outer periphery with a first involute spline defining alternating first peaks and first valleys spaced around the outer periphery of the hub, said hub also including a follower recess joining said outer periphery and said cavity;
B) a locking member adapted to be located substantially in said cavity, said locking member comprising: a first locking member end, a second locking member end, a lip at the locking member first end, said lip having an outer periphery with a second involute spline defining alternating second peaks and second valleys spaced around the outer periphery of said lip, said second involute spline adjacent said first involute spline when the locking member is located substantially in said cavity, said locking member also including a cam groove along the exterior of said locking member;
C) coupling means for coupling the locking member and hub, said hub movable axially when the locking member and hub are coupled and uncoupled by the coupling means: and
D) a follower adapted to be located in said follower recess, said follower adapted to engage said cam groove to cause the locking member to be moved to a locked position wherein each of the second peaks is adjacent a first valley when the hub is moved in a first axial direction, and to cause the locking member to be moved to an unlocked position wherein first and second peaks are aligned when the hub is moved in a second axial direction.

5,836,714
CONTROL BARRIER SYSTEMS
Marc E. Christensen, Salt Lake City, Utah, assignor to Off The Wall Production, Inc., Salt Lake City, Utah
Continuation-in-part of Ser. No. 533,758, Sep. 26, 1995, Pat. No. 5,611,641, which is a continuation-in-part of Ser. No. 278,495, Jul. 20, 1994, Pat. No. 5,452,963. This application Jun. 11, 1996, Ser. No. 661,445
Int. Cl.^{6} E01F *15/10*
U.S. Cl. 404—0.6 **41 Claims**



40. A control barrier comprising:

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(a) a housing having an exterior surface extending between opposing end walls and an interior surface defining an internal chamber, the exterior surface comprising:
  (i) an exposed top surface; and
  (ii) a covered bottom surface, the bottom surface being substantially U-shaped and defining a passageway extending between the opposing end walls; and
(b) means for filling the internal chamber with a ballast; and
(c) means for mechanically interconnecting adjacent barriers so that the strength of the connection increases as the barriers are filled with the ballast.

5,836,715

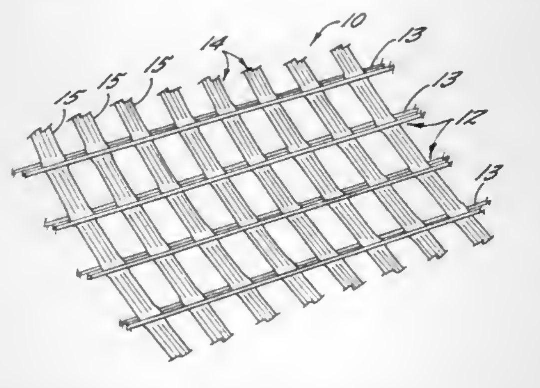
STRUCTURAL REINFORCEMENT MEMBER AND METHOD OF UTILIZING THE SAME TO REINFORCE A PRODUCT

James E. Hendrix, Pacolet; Gordon L. Brown Jr., and Mansfield H. Creech Jr., both of Anderson, all of S.C., assignors to Clark-Schwebel, Inc., Anderson, S.C.

Filed Nov. 19, 1995, Ser. No. 556,030

Int. Cl.^{6} E01C *11/16*

U.S. Cl. 404—134 **18 Claims**



12. A structural member adapted to reinforce a product and comprising
a gridwork comprising a set of warp strands and a set of weft strands disposed at substantially right angles to each other, with each of the strands comprising at least one continuous filament, with the gridwork being impregnated substantially throughout with a fully cured thermoset resin so as to interlock the strands at their crossover points and maintain the gridwork in a relatively rigid state, wherein the sets of strands are non-interlaced, wherein the set of warp strands includes a plurality of strands lying on one side of the set of weft strands and a plurality of strands lying on the other side of the set for weft strands, wherein at least some of the strands of each set are spaced apart so as to define an open structure, and wherein the set of warp strands is separated into groups each containing a plurality of contiguous strands, with at least one strand of each group lying on one side of the set of weft strands, and at least one other strand of each group lying on the other side of the set of weft strands in contiguous superimposed relationship with said at least one strand.

5,836,716

DRAINAGE PIPE

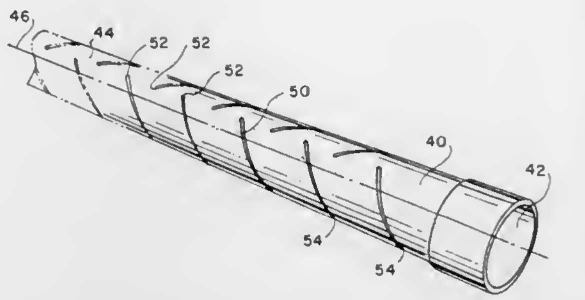
Wm. Ralph Johnson, 721 Michelle Pl., Coppell, Tex. 75019, and Raymond Johnson, III, 8865 FM 429, Kaufman, Tex. 75142

Filed Feb. 5, 1997, Ser. No. 795,988

Int. Cl.^{6} E02B *11/00*

U.S. Cl. 405—43 **5 Claims**

1. A subsurface drainage pipe, comprising:
a tubular main pipe body having inner and outer surfaces and a longitudinal central axis;



the inner and outer surfaces being circular in cross-section about the central axis;
walls defining a plurality of slot-shaped apertures through the inner and outer surfaces along the length of the main pipe body;
the slot-shaped apertures being about ⅛ inch wide;
the slot-shaped apertures being angled with respect to the central axis about 25 degrees;
the slot-shaped apertures having longitudinally-aligned first ends spaced along the main pipe body about 2.25 inches apart;
the slot-shaped apertures extending from the first ends to second ends located about 90 degrees around the main pipe body; and
the second ends being located alternately on opposite sides of the main pipe body, with the second ends on each of the opposite sides being longitudinally-aligned and spaced along the main pipe body about 4.5 inches apart.

5,836,717

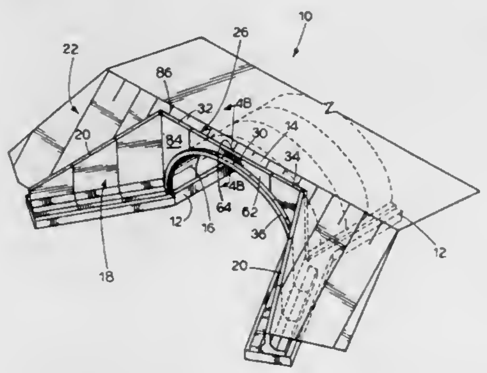
MULTI-SEGMENT SPANDREL WALL FOR OVERFILLED ARCH STRUCTURES

Joe Bernini, Binz, Switzerland, assignor to Bebo of America, Montgomery, Ala.

Filed Feb. 25, 1997, Ser. No. 806,113

Int. Cl.^{6} E01F *5/00*

U.S. Cl. 405—125 **29 Claims**



1. A combination of an arch element of an earth overfilled arch structure and a spandrel wall comprising:
A) an arch end element having an outer surface, two feet on the surface supporting said arch end element and an end edge extending from one foot to the other foot to have an overall length measured circumferentially around said arch end element end edge equal to the circumferential distance from one foot to the other, and a curb extending above said outer surface, said curb extending for more than one-half of said overall length;
B) a center segment resting on said arch end element and having a front surface abutting said curb;
C) a lateral segment which rests on said arch end element and has a front surface abutting said curb and an end edge abutting an end edge of said center segment;
D) the arch element providing vertical support for said segments with overfill and the curb providing all of the horizontal support for said center segment.

5,836,718

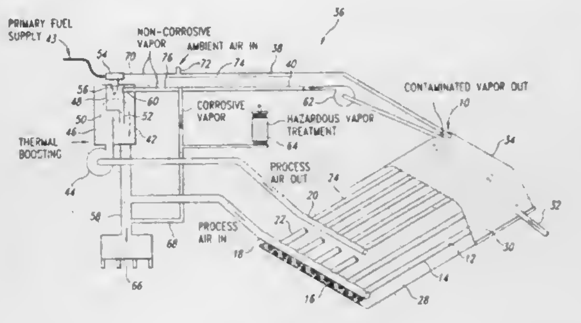
METHOD AND APPARATUS FOR EX SITU CLEANING OF CONTAMINATED SOIL

Philip A. Price, 32917 NE. 134th St., Duvall, Wash. 98019

Filed Jan. 13, 1997, Ser. No. 782,613

Int. Cl.^{6} A62D *3/00;* B09C *1/06*

U.S. Cl. 405—128 **6 Claims**



1. A method for ex situ cleaning of contaminated soil using a closed system of heat-conductive solid-walled pipes embedded in the contaminated soil, the pipes being in communication with a heat source that heats and circulates air throughout the system of pipes, the method comprising the steps of:
placing the contaminated soil in a heap on the pipes;
substantially enclosing the soil heap with a vapor barrier;
circulating heated air throughout the pipes to elevate the temperature of the surrounding soil to a temperature sufficient to cause vaporization of soil contaminates;
extracting the vapor containing the soil contaminants from the enclosed soil heap; and
treating the vapor containing the soil contaminants to remove the soil contaminants from the vapor.

5,836,719

PIPE LAYING VESSEL AND METHOD

Robert George Martin, Oldmeldrum; Donald Carmichael, and Stephen John Roberts, both of Aberdeen, all of United Kingdom, assignors to Coflexip Stena Offshore Limited, United Kingdom

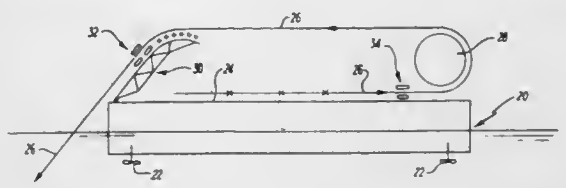
PCT No. PCT/GB95/00574, § 371 Date Nov. 26, 1996, § 102(e) Date Nov. 26, 1996, PCT Pub. No. WO95/25238, PCT Pub. Date Sep. 21, 1995

PCT Filed Mar. 16, 1995, Ser. No. 704,698

Claims priority, application United Kingdom, Mar. 16, 1994, 9405067; Jun. 10, 1994, 9411702

Int. Cl.^{6} F16L *1/00*

U.S. Cl. 405—166 **25 Claims**



1. A method of laying an underwater pipeline, comprising assembling pipe sections together along a substantially horizontal axis on the deck of a vessel to form a pipeline and laying the pipeline onto the sea bed as pipeline assembly progresses, bending the pipeline as it is laid from the vessel, wherein the bending of the pipeline includes diverting the pipeline upwardly along a substantially arcuate path and subsequently diverting the pipeline downwardly to a final launch angle and launching the pipeline from the vessel.

5,836,720

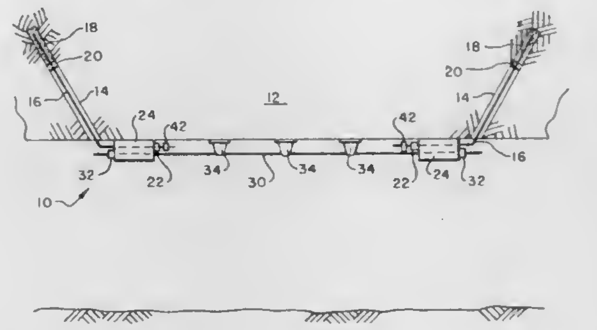
MINE ROOF SUPPORT SYSTEM

John C. Stankus, Canonsburg; John G. Oldsen, Butler, both of Pa., and Brian R. Castle, Rolla, Mo., assignors to Jennmar Corporation, Pittsburgh, Pa.

Filed Jun. 3, 1996, Ser. No. 659,040

Int. Cl.^{6} E21D *21/00*

U.S. Cl. 405—302.2 **3 Claims**



1. A cable mine roof supporting system comprising:
at least two boreholes spaced from each other;
at least one cable roof bolt secured in each said borehole, with a leading end of each said cable bolt secured within one said borehole and a trailing end extending out from said borehole;
at least one splice tube coupled to said trailing end of each said cable bolt, each said splice tube comprising an elongated conduit between a pair of spaced ends, said conduit adapted to receive at least a pair of cables therethrough;
a cable attachment on said trailing end of the said cable roof bolt at a position where said splice tube is positioned on said cable roof bolt between said cable attachment and said borehole, wherein said cable attachment has a diameter larger than the inner dimensions of said conduit of said splice tube and said cable attachment is adapted to abut against one end of said conduit of said splice tube, and wherein each said splice tube connects two of said cable bolts extending from two of said spaced boreholes; and
a plurality of roof support plates held against a mine roof by said cable bolts between said spaced boreholes, each said roof plate including:
  a load-bearing surface positioned adjacent the mine roof,
  a raised support member extending from said load-bearing surface, and
  a cable engaging member extending from said support member and adapted to secure said roof plate to one said cable bolt.

5,836,721

POWDER COATING APPARATUS

John S. Wallace, 977 Yarmouth Rd., Bloomfield, Mich. 48301

Division of Ser. No. 285,304, Aug. 3, 1994, Pat. No. 5,656,325. This application Aug. 30, 1996, Ser. No. 705,727

Int. Cl.^{6} B65G *53/40*

U.S. Cl. 406—75 **11 Claims**

1. An apparatus for directing powdered material toward a portion of a fastener to form a coating thereon comprising:
a vibratory feeder bowl having a side wall, a closed bottom, and a substantially open top;
a spiral track in said bowl that extends from the bottom of said bowl to the top of said bowl;
means for sensing an amount of said material in the bottom of said bowl that generates a signal when said material therein is

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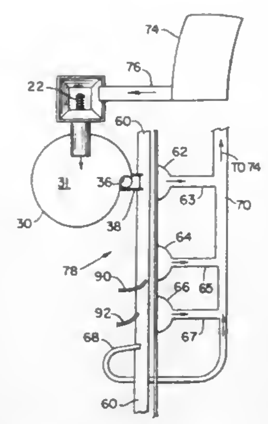


not at a preselected substantially constant level, said sensing means being out of contact with both said bowl and said material in said bottom of said bowl;

means responsive to said signal generated by said sensing means for adding additional said powdered material to said bottom of said bowl;

means for vibrating said bowl to urge the powdered material along said track at a selectively adjustable rate; and

means for exiting said powdered material from said bowl located near the top of said bowl.

5,836,722

SPRAYING METHOD AND DEVICE FOR COOLING A POWDERED COATING PRODUCT

Adrien Lacchia, Saint Martin le Vinoux, France, assignor to Sames S.A., Meylan, France

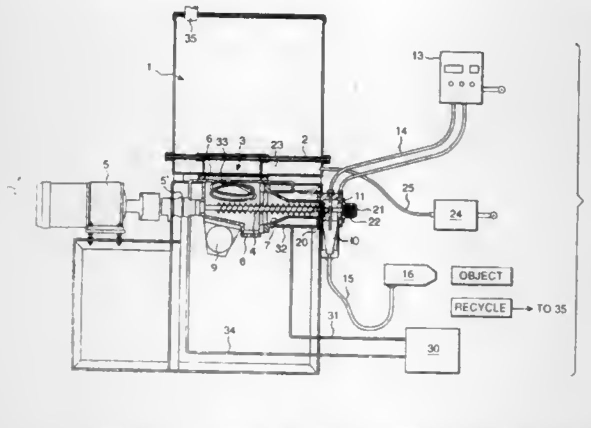
PCT No. PCT/FR94/00592, § 371 Date Nov. 21, 1995, § 102(e) Date Nov. 21, 1995, PCT Pub. No. WO94/27731, PCT Pub. Date Dec. 8, 1994

PCT Filed May 19, 1994, Ser. No. 553,440

Claims priority, application France, May 24, 1993, 93 06137

Int. Cl.⁶ B65G *53/48*

U.S. Cl. 406—122 **14 Claims**



1. A method for coating an object with a powdered coating product comprising: providing a mass of the powdered coating product in a product feeding device; cooling the powdered coating product within the product feeding device to a temperature which prevents deterioration of the powdered coating product; delivering the cooled powdered coating product to a sprayer; and spraying the powdered coating product onto the object by the sprayer.

5,836,723

MACHINING TOOL

Rainer Von Haas, Geesthacht, and Willi Jester, Herten, both of Germany, assignors to Widia GmbH, Essen, Germany

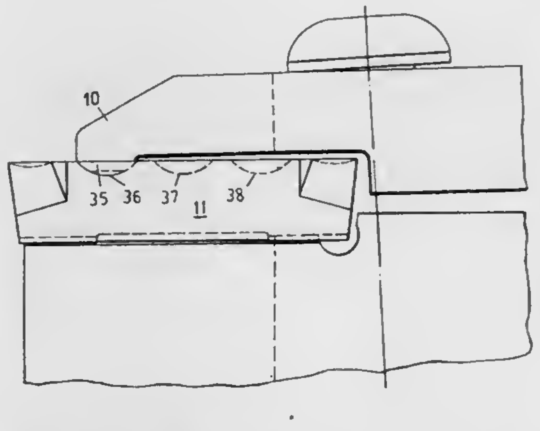
PCT No. PCT/DE95/00018, § 371 Date Oct. 25, 1996, § 102(e) Date Oct. 25, 1996, PCT Pub. No. WO95/29781, PCT Pub. Date Nov. 9, 1995

PCT Filed Jan. 7, 1995, Ser. No. 737,101

Claims priority, application Germany, May 3, 1994, 44 15 425.9

Int. Cl.⁶ B23B *27/16;29/04*

U.S. Cl. 407—107 **19 Claims**



1. A tool assembly comprising:

a tool holder having a holder support face;

a clamping dog having a dog surface spaced from and facing the holder support face;

a tool between the holder and the dog and having at least one end cutting edge, a face directly confronting the holder support face, and a surface directly confronting the dog surface, one of the surfaces being formed with at least one recess and the other surface being formed with at least one bump engageable in the recess; and

tightening means engaged between the holder and the dog for pressing the dog surface in a clamping direction generally perpendicular to the faces and surfaces toward the support surface and thereby clamping the tool between the dog and the support, the bump and recess being both substantially part-spherical, the bump having a larger radius of curvature than the recess and engaging the recess in all-around annular contact.

5,836,724

METAL CUTTING TOOL AND A REPLACEABLE SHIM FOR USE THEREWITH

Amir Satran, and Yaron Eizen, both of Kfar Vradim, Israel, assignors to Iscar Ltd., Migdal Tefen, Israel

Filed Jan. 31, 1997, Ser. No. 792,306

Claims priority, application Israel, Feb. 2, 1996, 117015

Int. Cl.⁶ B23B *27/16*

U.S. Cl. 407—104 **28 Claims**

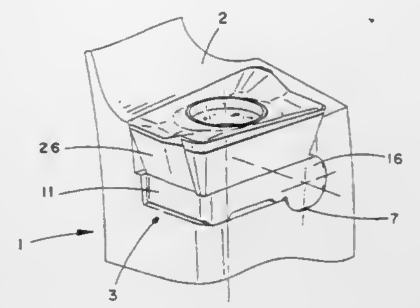
17. A shim comprising a body portion having upper and lower surfaces, and a rib member integrally formed with said body portion and projecting beyond said lower surface of said body portion,

said rib member having:

a longitudinal axis,

spaced apart, first and second peripheral portions located on a cylindrical envelope of diameter d_2 centered about said longitudinal axis, said first and second peripheral portions facing in substantially opposite directions, and

a first axially extending portion inset with respect to the cylindrical envelope and located between said first and second peripheral portions, said rib member having a thickness D_2 between said first axially extending portion and a substantially opposite second axially extending portion, wherein $d_2>D_2$.



5,836,725

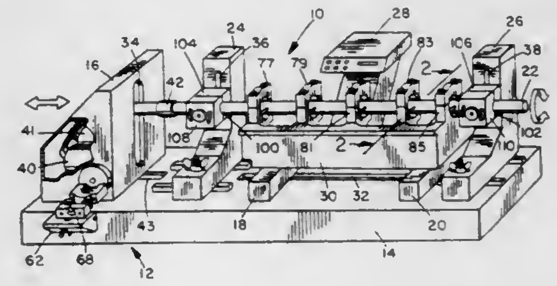
APPARATUS AND METHOD FOR BORING OVERHEAD CAM ENGINE CYLINDER HEADS

Brice Harmand, La Jolla, Calif., assignor to Harmand Family Limited Partnership, San Diego, Calif.

Division of Ser. No. 414,507, Mar. 31, 1995, Pat. No. 5,590,466, and a continuation-in-part of Ser. No. 301,244, Sep. 6, 1994, Pat. No. 5,655,278. This application Sep. 16, 1996, Ser. No. 714,660

Int. Cl.⁶ B23B *41/00*

U.S. Cl. 408—1 R **19 Claims**



17. A method for boring a plurality of cam shaft bearings in an overhead cam engine, the method comprising the steps of:

mounting a workpiece to a work surface;

supporting a boring bar on a pair of supports disposed adjacent said work surface, said boring bar having a plurality of locations for retaining a plurality of cutting bits at a depth, said locations having a staggered arrangement with respect to said axis of rotation,

adjusting said depth of each cutting bit of said plurality of cutting bits;

aligning said boring bar with respect to said cam shaft bearings;

providing a first drive means to said work surface and said boring bar, said first drive means for rotating said boring bar at a rotation speed;

providing a second drive means to said work surface and said boring bar, said second drive means for moving said boring bar in a direction along an axis of rotation at a feed rate;

rotating said boring bar at said rotation speed using said first drive means; and

moving said boring bar in a direction along said axis of rotation at said feed rate using said second drive means.

5,836,726

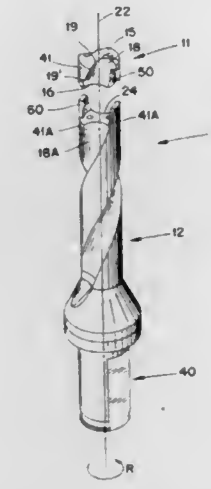
TWO-PIECE ROTARY METAL-CUTTING TOOL AND METHOD FOR INTERCONNECTING THE PIECES

Mattias Berglund, Njutånger; Fredrik Lundberg, Askersund, and Ingela Svensson, Linköping, all of Sweden, assignors to Seco Tools AB, Fagersta, Sweden

Filed Sep. 15, 1997, Ser. No. 929,462

Int. Cl.⁶ B23B *51/00*

U.S. Cl. 408—1 R **15 Claims**



15. A method for mounting a cutting portion to a tool body to form a metal-cutting rotary tool; the tool body including a shank portion; a front surface, and rear chip flutes formed in an outer surface of the tool body; the cutting portion including a support surface abutting the front surface, a cutting surface having cutting edges, and front chip flutes formed in an outer surface of the cutting portion; one of the tool body and cutting portion including longitudinal projections, and the other of the tool body and cutting portion including circumferential recesses, each recess communicating with a respective flute and extending less than 180 degrees; the method comprising the steps of:

A) converging the cutting portion and tool body longitudinally toward one another to bring the projections into respective ones of the flutes that communicate with the circumferential recesses; and

B) effecting relative rotation between the tool body and cutting portion to cause the projections to enter respective ones of the recesses to bring the front flutes into alignment with the rear flutes, and to bring a stop surface of each projection into longitudinally opposing relationship with a stop surface of a respective recess for defining a bayonet connection preventing longitudinal displacement of the cutting portion relative to the tool body.

5,836,727

TOOL HEAD, IN PARTICULAR A FACING-TOOL HEAD

Gerhard Scheer, Löchgau, Germany, assignor to Komet Praezisionswerkzeuge Robert Breuning GmbH, Besigheim, Germany

PCT No. PCT/EP94/02271, § 371 Date Mar. 8, 1996, § 102(e) Date Mar. 8, 1996, PCT Pub. No. WO95/07160, PCT Pub. Date Mar. 16, 1995

PCT Filed Jul. 12, 1994, Ser. No. 596,355

Claims priority, application Germany, Sep. 11, 1993, P 43 30 903.8; Jun. 21, 1994, P 44 21 583.5

Int. Cl.⁶ B23B *3/26*

U.S. Cl. 408—158 **31 Claims**

1. A tool head, comprising a body adapted to be fastened on a hollow machine spindle of a machine tool, the machine spindle defining a spindle axis, at least one working slide displaceably mounted on the body, the working slide being displaceable essentially transversely to the spindle axis and having oblique, radially

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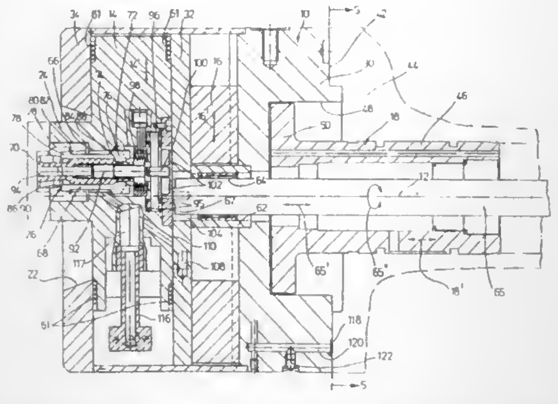


outwardly oriented toothing arrangement and at least one tool carrier, the tool carrier having a clamping mechanism for clamping at least one of a cutting tool and a tool holder thereto, an adjustment mechanism which can be actuated from the machine tool having an axially displaceable, hollow adjusting rod and gear mechanisms the adjusting rod being received centrally in the body and extending through the machine spindle, the gear mechanism converting the axial movement of the adjusting rod into the transverse movement of the working slide, an end of the adjusting rod near the slide supporting two off-center gear rods, the gear rods being located diametrically opposite one another, being aligned in an axis-parallel manner, being guided axially in the body and having an oblique toothing arrangement, the toothing arrangement of the gear rods being oriented essentially radially towards the body interior and being engaged with the complementary toothing arrangement of the at least one working slide.

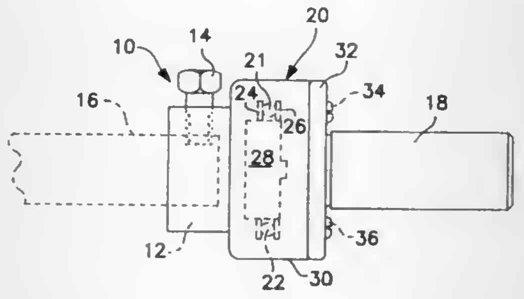
5,836,728
FLOATING REAMER HOLDER

Larry L. Zuber, Antwerp, Ohio, assignor to Dana Corporation, Toledo, Ohio

Filed Dec. 17, 1996, Ser. No. 769,223

Int. Cl.^{6} B23B *31/02*

U.S. Cl. 408—238 **11 Claims**



1. An adjustable floating reamer holder comprising:

a tool holder for rigidly holding a reamer;

a mounting shank for mounting the tool holder in the turret of a machine tool drive for rotating the tool holder and, thus, the tool; the mounting shank including a base flange fixed with respect to the mounting shank;

an adaptor to which the base of the mounting shank is adjustably fixed by an adjustable coupling, the adaptor including a threaded protrusion;

a float assembly axially disposed with respect to the threaded protrusion between the tool holder and adaptor;

a coupling for coupling the adaptor to the tool holder; and

a cap for axially holding the tool holder in engagement with the coupling and float assembly, the cap having threads thereon for threading with the threaded projecting end of the adaptor, whereby fine floating adjustments are made by adjusting the axial position of the cap with respect to the adaptor and alignment adjustment is accomplished by adjusting the mounting shank radially with respect to the adaptor.

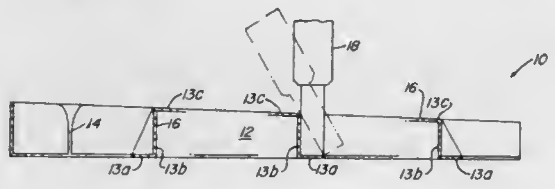
5,836,729
INTEGRATED FRAME AND METHOD OF MANUFACTURE

Carl Joseph Fink, Keller, Tex., assignor to Lockheed Martin Corporation, Fort Worth, Tex.

Filed Apr. 10, 1996, Ser. No. 628,993

Int. Cl.^{6} B23C *9/00*

U.S. Cl. 409—132 **5 Claims**



1. A method of manufacturing a unitary frame structure comprising the steps of:

machining with a machining element a unitary pallet in a first vertical direction, thereby forming a first lip and a first substantially vertical portion;

moving said unitary pallet in a horizontal direction relative to said machining element and selectively tilting said machining element relative to said first vertical direction, thereby forming stiffening elements on the substantially vertical portion, then machining said pallet with said machining element in a second vertical direction parallel to said first vertical direction to form a second lip and a second substantially vertical portion, wherein remaining first and second lips and said first and second substantially vertical portions form a Z cross-section; then

moving said machining element again relative to said unitary pallet in said horizontal direction; and

selectively tilting said machining element relative to said second vertical direction in selected locations, thereby forming stiffening elements on said second substantially vertical portion.

5,836,730
TIE-DOWN SYSTEM FOR VEHICLE TRANSPORTER

Robert D. Boydstun, IV, Clackamas; John T. Huey, Milwaukie, and Todd Papasadero, Portland, all of Oreg., assignors to Boydstun Metal Works, Inc., Portland, Oreg.

Continuation-in-part of Ser. No. 658,497, Jun. 5, 1996, Pat. No. 5,746,554. This application Feb. 18, 1997, Ser. No. 801,188

Int. Cl.^{6} B60P *7/08*

U.S. Cl. 410—12 **19 Claims**

1. A tie-down apparatus for securing a vehicle to a longitudinally-extending elongate vehicle transporter, comprising:

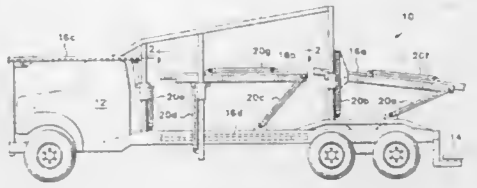
(a) a vehicle support assembly;

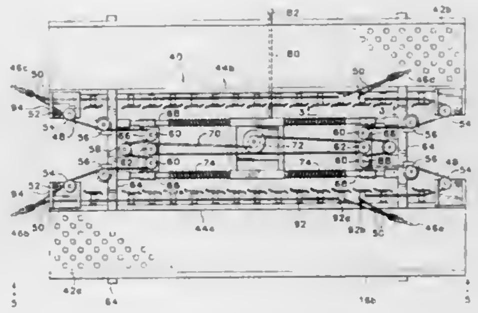
(b) at least four variably positionable securement devices associated with said vehicle support assembly and attachable to said vehicle;

(c) a respective flexible tension member portion interconnected with a respective one of each of said four securement devices to enable nonuniform variations in relative positions of said securement devices, each tension member portion capable of exerting a pull-down force on a respective one of said securement devices;

(d) a tension-applying mechanism interconnected with each said tension member portion to adjust said pull-down force on each of said securement devices; and

(e) a tension-equalizing mechanism, interconnected with each said tension member portion, capable of automatically distributing tension applied by said tension-applying mechanism among each said tension member portion so as to substantially equalize said pull-down force automatically with respect to said four securement devices despite nonuniform variations in the relative positions of said securement devices.





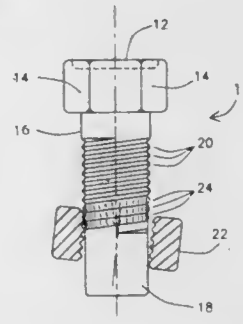
5,836,731
ANTI-CROSS THREADING FASTENER

Jerry J. Goodwin, Canton; Michael A. Garver, Brighton, and Anthony L. Snoddy, Ann Arbor, all of Mich., assignors to MAThread, Inc., Brighton, Mich.

Continuation of Ser. No. 859,660, May 20, 1987, which is a continuation of Ser. No. 645,058, May 13, 1996, abandoned, which is a continuation-in-part of Ser. No. 505,031, Jul. 21, 1995, abandoned. This application Jan. 12, 1998, Ser. No. 6,078

Int. Cl.^{6} F16B *25/00*

U.S. Cl. 411—386 **46 Claims**



1. An anti-cross threading fastener, comprising:

a substantially round shank member having first and second ends and a continuous helix comprised of a plurality of threads around a circumference of said shank member, the plurality of threads having a constant minor diameter and the plurality of threads being adapted to mate with corresponding threads of a receiving member;

at least one thread of the plurality of threads proximate the first end of said shank member and having an outside diameter and a surface;

the remaining plurality of threads having a major diameter; and

the outside diameter of the at least one thread is smaller than the major diameter of the plurality of threads, and the surface of the at least one thread is a transitional surface from the minor diameter to the outside diameter so that the at least one thread of the plurality of threads is adapted to cam over corresponding mating threads of a receiving member until there is substantially collinear alignment therebetween.

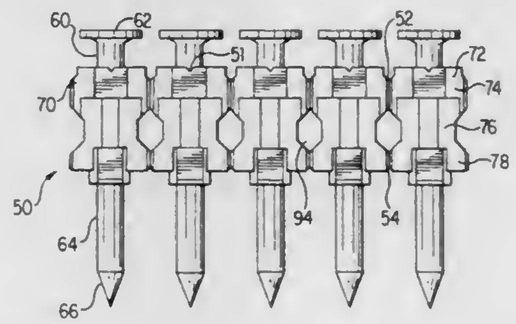
5,836,732
FASTENER ASSEMBLY

Harish C. Gupta, Naperville, and Richard J. Ernst, Palatine, both of Ill., assignors to Illinois Tool Works, Inc., Glenview, Ill.

Filed Oct. 7, 1997, Ser. No. 946,319

Int. Cl.^{6} F16B *15/08;39/00*

U.S. Cl. 411—443 **35 Claims**



12. A fastener assembly, comprising:

a plurality of fasteners arranged in a row, each fastener including a head and an elongated shank; and

a carrier including a plurality of connected carrier sleeves receiving and surrounding a portion of each fastener;

wherein the carrier includes a filled polyolefin material;

and each of the carrier sleeves includes an upper breakable collar, a middle wall portion and a lower breakable collar.

5,836,733
MATERIAL-HANDLING VEHICLE

John Moses, Mickleover, and John Pius Burke, Whitchurch, both of United Kingdom, assignors to J.C. Bamford Excavators Limited, Rocester, United Kingdom

Filed Jul. 14, 1995, Ser. No. 502,493

Claims priority, application United Kingdom, Jul. 15, 1994, 9414382; Aug. 1, 1994, 9415506; Mar. 23, 1996, 9505963

Int. Cl.^{6} E02F *5/22*

U.S. Cl. 414—685 **42 Claims**

1. A material-handling vehicle comprising a structure having ground engageable propulsion means, a loader arm, having a longitudinal axis, mounted at the rear of the structure for up and down swinging movement, an operator's cab, an engine to provide power for said swinging movement of the arm and propulsion of the vehicle, the engine having an output shaft, wherein the ground engageable propulsion means is driven by the engine via a mechanical transmission coupled to said output shaft, the engine and the mechanical transmission being rigidly connected and the mechanical transmission being mounted on the structure by mount-

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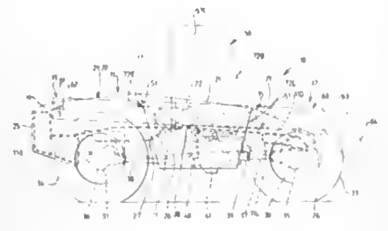
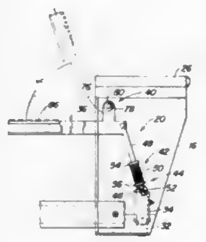
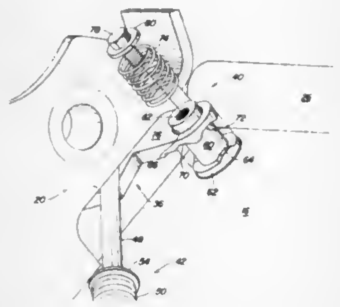


ing means and the engine being supported in cantilever on the mechanical transmission.

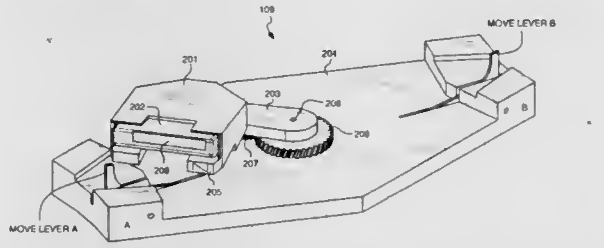
5,836,734
LATCHING DEVICE WITH DETENT
David Arthur Doering, Knoxville, Tenn., assignor to Deere & Company, Moline, Ill.
Filed Oct. 17, 1997, Ser. No. 953,760
Int. Cl.^{6} E02F *3/70*
U.S. Cl. 414—723 10 Claims





1. Latching means for releasably securing a vehicle carrier frame to a tool having an opening therein, said latching means including:
- a latch pin mounted on the frame for movement between a first position where the pin projects into the opening of the tool and a second position where the pin is not in said opening;
- a pivot support carried by the frame;
- a latch handle supported by the pivot support for swinging movement between a first and a second position;
- link means interconnecting the handle and pin so that the pin is moved between its first and second positions as the handle is respectively moved between its first and second positions;
- detent between the handle and frame adapted to releasably secure the handle in either its first or second position, said detent including first, second and third cam surfaces, the first cam surface being supported by the pivot support, the second and third cam surfaces being supported by the handle, and a spring for urging the second and third cam surfaces towards engagement with the first cam surface as the handle is moved between its first and second positions.

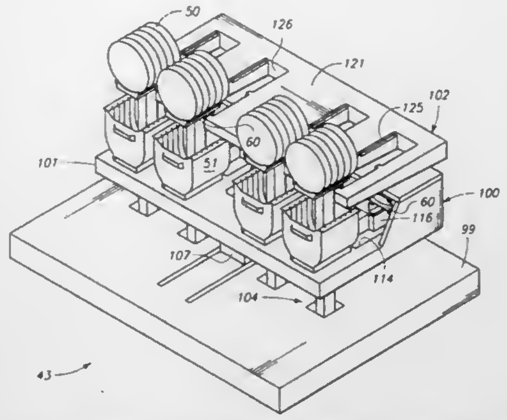
5,836,735
ROBOT POWERED PASS THRU PORT FOR AUTOMATED CARTRIDGE LIBRARY
Lester Marvin Yeakley, Estes Park, and Joseph Paul Manes, Arvada, both of Colo., assignors to Storage Technology Corporation, Louisville, Colo.
Filed Mar. 13, 1996, Ser. No. 615,595
Int. Cl.^{6} B65G *25/00*
U.S. Cl. 414—749 14 Claims



1. A pass thru port that is operable in an automated cartridge library system that includes a robot arm that transports cartridges among various locations in said automated cartridge library system, said pass thru port operable for transferring a cartridge from a first storage module wherein said cartridge resides at a first orientation and a first location to a second storage module wherein said cartridge resides at a second orientation and a second location, said pass thru port comprising:
- a transfer cell operable to hold said cartridge,
- a support means connected to said transfer cell and operable to simultaneously rotate and translate said transfer cell from said first orientation and said first location to said second orientation and said second location,
- a toggle means connected to said support means and operable to bias said support means such that said transfer cell is positioned at said first orientation and said first location; and
- a move means, connected to said toggle means and responsive to said robot contacting said move means, for reversing the bias of said toggle means whereby said transfer cell is moved from said first orientation and said first location to said second orientation and said second location.

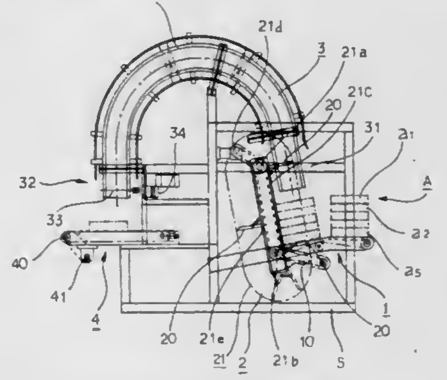
5,836,736
SEMICONDUCTOR PROCESSING SYSTEM WITH WAFER CONTAINER DOCKING AND LOADING STATION
Raymon F. Thompson; Robert W. Berner; Gary L. Curtis, all of Kalispell; Stephen P. Culliton, Bozeman; Blaine G. Wright, and Darryl S. Byle, both of Kalispell, all of Mont., assignors to Semitool, Inc., Kalispell, Mont.
Division of Ser. No. 415,927, Mar. 31, 1995, Pat. No. 5,660,517, which is a continuation-in-part of Ser. No. 236,424, Apr. 28, 1994, Pat. No. 5,544,421. This application Aug. 15, 1996, Ser. No. 698,034
Int. Cl.^{6} B65G *49/07*
U.S. Cl. 414—786 22 Claims

1. A method for processing semiconductor articles using an automated semiconductor processing system, comprising:
- providing a substantially enclosed working space within a processing system enclosure forming a part of said semiconductor processing system;



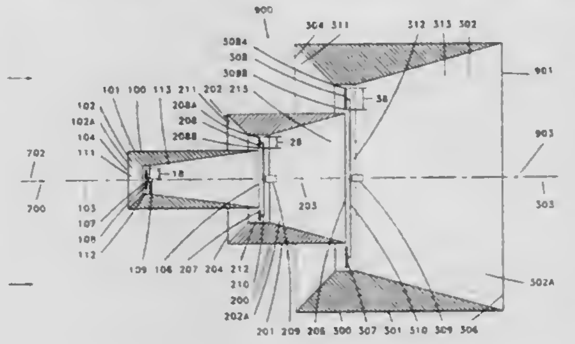
- engaging a sealed container with a docking station forming a part of said semiconductor processing system; said container containing a batch of semiconductor articles held by a carrier;
- opening the container into fluid communication with the enclosed working space;
- moving the carrier containing the semiconductor articles from the container and into the enclosed working space;
- relaying the carrier to a transfer apparatus contained within the enclosed working space;
- transferring semiconductor articles from the carrier to a tray suitable for subsequent processing; said transferring including:
  - positioning the carrier containing the semiconductor articles;
  - moving the tray through an opening in the carrier;
  - shifting semiconductor articles from the carrier to the tray;
- processing the semiconductor articles held upon the tray through at least one processing station.

5,836,737
STACKED-CONTAINER SEPARATING APPARATUS AND METHOD
Masami Hashimoto, Chiba, and Kunio Nishizawa, Tokyo, both of Japan, assignors to Misuzu Koki Company Limited, Mie-ken, Japan
Filed Mar. 20, 1997, Ser. No. 821,775
Claims priority, application Japan, Nov. 12, 1996, 8-315484
Int. Cl.^{6} B65G *59/02*
U.S. Cl. 414—796.4 4 Claims



1. A stack-separating equipment comprising:
- a supply conveyer for supplying a stack of containers;
- a lifting device for lifting the stack of containers at a downstream end of said supply conveyer;
- a separating and reversing device having an inverted U-shape and, having an upstream end positioned above said lifting device, for reversing each of the containers while transporting them respectively.
- wherein said separating and reversing device includes two vertical inverted U-shaped conveyers that are parallel to each other; and
- an ejection conveyer positioned below a downstream end of said separating and reversing device for ejecting each of the containers in a reversed position.

5,836,738
ADVANCED SUPERVENTURI POWER SOURCE
Clifton D. Finney, 1057 Oak Hills Pkwy., Baton Rouge, La. 70810
Continuation-in-part of Ser. No. 219,192, Mar. 28, 1994, Pat. No. 5,464,320, which is a continuation-in-part of Ser. No. 74,023, Jun. 2, 1993, abandoned. This application May 6, 1994, Ser. No. 239,029
Int. Cl.^{6} F03D *1/02;1/04*
U.S. Cl. 415—60 12 Claims



1. A superventuri power source comprising:
- a. a series of at least two venturi tubes whereof each of the venturi tubes includes a central axis through a substantially hollow conduit having a venturi constriction; and wherein the venturi constriction includes an inlet of nonzero length and generally decreasing normal cross-sectional area which leads to a throat of generally minimal normal cross-sectional area which, in turn, leads to an outlet of nonzero length and generally increasing normal cross-sectional area; and whereby each normal cross-sectional area is perpendicular to its respective central axis;
- b. a superventuri apparatus including: (i) at least one twosome in the series of at least two venturi tubes labeled an alpha- and a beta-venturi tube, respectively, and of predetermined successively increasing flow capacity, respectively: (ii) the substantially hollow conduit of the alpha-venturi tube having an open entrance and an open exit adjacent its inlet and outlet, respectively, to permit flow of a selected medium through the open entrance into the venturi constriction and out of the open exit; (iii) the respective inlets of the twosome each facing the intended direction of flow of the selected medium; (iv) the minimal normal cross-sectional area of the throat of the beta-venturi tube being greater than the maximal normal cross-sectional area of the open exit of the alpha-venturi tube with the open exit of the alpha-venturi tube being placed adjacent the throat of the beta-venturi tube in a manner that the respective central axes of the twosome essentially merge into a central super-axis along an intended line of flow of the selected medium; and (v) as referenced from the super-axis, the inlets of the alpha- and beta-venturi tubes being positioned to intercept relatively inner and outer portions of the selected medium as an alpha- and a beta-flow, respectively, whereby in operation the alpha-flow as exhaust from the open exit of the alpha-venturi tube joins the accelerated beta-flow adjacent the throat of the beta-venturi tube causing a pumping action by the beta-venturi tube on the alpha-venturi tube; and
- c. a beta-turbine adjacent the throat of the beta-venturi tube to recover useful rotary mechanical power from flow power of the selected medium.

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5,836,739

GAS TURBINE ENGINE

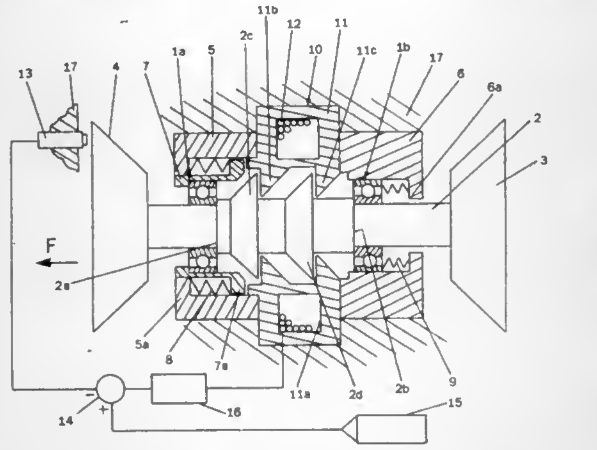
Shigenori Haramura, Hove; Peter H. Birch, Horsham; Mark G. Norton, Hove; Michael J. Raine, Kenilworth, and Graham A. Reynolds, Finham, all of United Kingdom, assignors to Rolls-Royce plc, London, England

Continuation of Ser. No. 602,184, Nov. 15, 1996, abandoned. This application Oct. 21, 1997, Ser. No. 955,300

Claims priority, application United Kingdom, Mar. 17, 1995, 9505452

Int. Cl.^{6} F01D *3/04*

U.S. Cl. 415—104 **10 Claims**



1. A gas turbine engine comprising turbine and compressor elements on a rotary shaft that is rotatably mounted in a stator body by bearings of the rotary type, in which there are provided electromagnetic means for opposing axial thrust loads on the shaft in use, comprising an electromagnetic coil supported in the stator body and surrounding the shaft, and means for energizing the electromagnetic coil in use to exert an electromagnetic axial force on the shaft to oppose axial thrust loads on the shaft resulting from rotation of the turbine and compressor elements, said shaft being rotatable mounted in said stator body by pre-loaded axial thrust bearings.

5,836,740

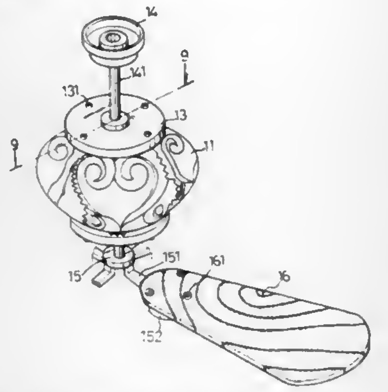
OUTER CASING MOUNTED AROUND A SUSPENSION ROD

Yuh-Shyong Wang, No. 5, Lane 30, Ta Chou Road, Shern Gang Hsiang, Taichung Hsien, Taiwan

Filed May 9, 1997, Ser. No. 853,602

Int. Cl.^{6} F04D *29/52;29/64*

U.S. Cl. 416—5 **19 Claims**



1. A ceiling fan/pendant assembly, comprising:
a rotatable suspension rod extending downwardly from a ceiling;
a fan means attached to the rotatable suspension rod to rotate therewith;
an outer casing mounted around the rotatable suspension rod;
a pendant assembly mounted below the fan means and including a plurality of lamps attached to the outer casing;
the outer casing including a plurality of sections each having a first teeth structure defined in a first side thereof and a second teeth structure defined in a second side thereof and having a curvature complimentary to that of the first teeth structure, the sections being assembled to form the outer casing due to engagements between the first teeth structures and the second teeth structures.

5,836,741

Patent Not Issued For This Number

5,836,742

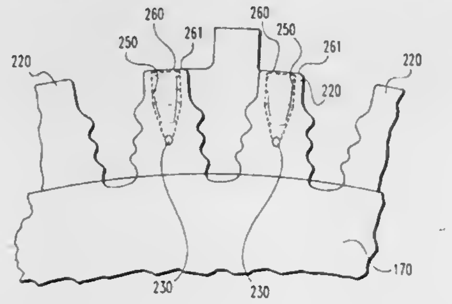
HIGH TEMPERATURE ROTOR BLADE ATTACHMENT

Douglas D. Dierksmeier, Columbus, and Tab M. Heffernan, Indianapolis, both of Ind., assignors to Allison Engine Company, Inc., Indianapolis, Ind.

Division of Ser. No. 509,777, Aug. 19, 1995, Pat. No. 5,688,108. This application Jan. 16, 1997, Ser. No. 784,350

Int. Cl.^{6} F04D *29/58*

U.S. Cl. 416—95 **18 Claims**



1. In combination:
a gas turbine engine, and
a rotor comprising:
a disk; and
a blade attachment lug connected to said disk, said blade attachment lug having at least one cooling fluid passageway therein.

5,836,743

VARIABLE PITCH COUNTERWEIGHTED PROPELLER SYSTEM WITH RELEASABLE HYDRAULIC PITCHLOCK

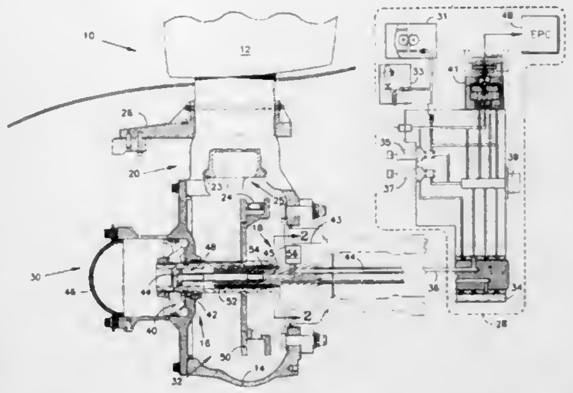
Paul A. Carvalho, Westfield, Mass., and Robert W. Pruden, Enfield, Conn., assignors to United Technologies Corporation, Windsor Locks, Conn.

Filed Oct. 22, 1997, Ser. No. 955,589

Int. Cl.^{6} B64C *11/38*

U.S. Cl. 416—139 **12 Claims**

1. A hydraulic propeller system, comprising:
a central hub including a nonrotatable portion and a rotatable portion;
a plurality of propeller blades connected with said rotatable portion, wherein each of said plurality of propeller blades has an adjustable pitch and a counterweight biasing said blades in a first pitch direction;
actuation means for adjusting said pitch of each of said plurality of propeller blades; and
means for locking said propeller blades at a last commanded pitch,



wherein said means for locking is located on and rotatable with said rotatable portion.

5,836,744

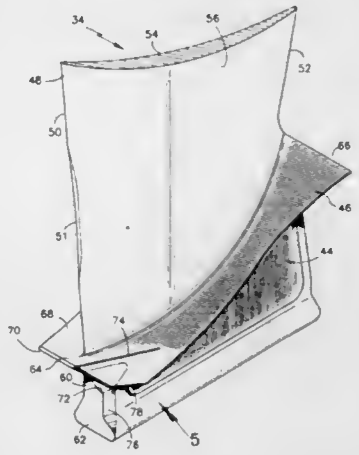
FRANGIBLE FAN BLADE

Robert H. Zipps, East Hartford; Reginald H. Spaulding, Hebron; Edward S. Todd, East Hampton; Robert F. Kasprow, Wethersfield; Herman C. Klapproth, Enfield; Douglas A. Welch, Portland; Phyllis L. Kurz, Hebron, and Joseph J. Cafasso, Glastonbury, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 24, 1997, Ser. No. 839,997

Int. Cl.^{6} F04D *29/38*

U.S. Cl. 416—193 A **10 Claims**



1. A blade for a fan in an axial flow gas turbine engine disposed about a longitudinal axis, the gas turbine engine including an axial flow path defining a passage for working medium gases, the fan blade comprising:
an airfoil portion having a leading edge, a trailing edge, a pressure side and a suction side and adapted to extend across the flow path for working medium gases,
a root portion disposed radially inward of the airfoil portion, the root portion including a dovetail neck and a dovetail attachment,
a platform disposed radially between the airfoil portion and the root portion, the platform extending circumferentially from the blade and including
a leading edge portion forward of the airfoil portion leading edge,
a trailing edge portion aft of the airfoil portion trailing edge,
an outer surface defining a flow surface of the flow path, and
an inner surface radially inward of the outer surface
said platform being constructed to fracture at a predetermined location such that the edge of the fracture is located in the dovetail neck thereby reducing the risk of airfoil fracture due to impact of said blade with successive rotating fan blades.

5,836,745

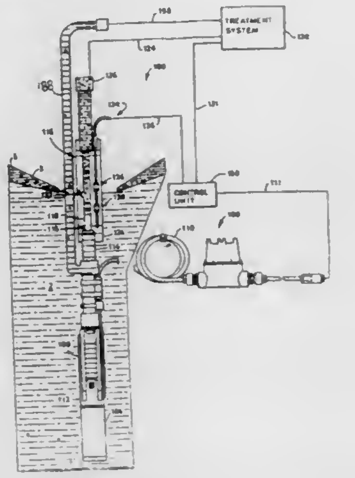
FLUID RECOVERY APPARATUS AND METHOD USING A MOTIVE FORCE

David K. Brogan, Rindge; John R. Couture, Marlborough, both of N.H., and Michael M. Gifford, Rochester, Mass., assignors to Sippican, Inc., Marion, Mass.

Filed Dec. 12, 1995, Ser. No. 571,082

Int. Cl.^{6} F04B *5/48*

U.S. Cl. 417—40 **22 Claims**



1. Apparatus for recovering fluid from a water formation having a water-product layer, comprising:
a submersible pump for pumping a fluid from the water formation;
an eductor comprising:
a bottom portion coupled to the pump;
a top portion for coupling to a treatment facility;
a fluid member having a venturi disposed therein, the fluid member extending from the bottom portion to the top portion for transporting the fluid from the pump to the top portion; and
a fluid inlet in fluid communication with the fluid member and positionable at the water-product layer, such that the fluid transported through the fluid member creates a motive force causing additional fluid to be drawn into the fluid inlet from the water-product layer.

5,836,746

VACUUM PUMP HAVING LUBRICATION AND COOLING SYSTEMS

Teruo Maruyama, Hirakata; Yoshikazu Abe, Neyagawa; Akira Takara, Higashiosaka, and Yoshihiro Ikemoto, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Filed Oct. 4, 1995, Ser. No. 539,219

Claims priority, application Japan, Oct. 4, 1994, 6-240066

Int. Cl.^{6} F04B *49/06*

U.S. Cl. 417—44.1 **6 Claims**

1. A vacuum pump comprising:
a housing having a gas suction hole and a gas discharge hole;
a plurality of rotors contained in said housing;
bearings for supporting rotating shafts of said rotors;
a plurality of motors for rotating the plurality of rotors independently and respectively;
a positive displacement pump section for performing gas suction and exhaust by making use of volumetric change of a space defined by the rotors and the housing; and
a detector for detecting angles of rotation and/or numbers of revolutions of the motors, the detector comprising rotational position sensors which make use of electromagnetic induction effect and which respectively include rotors, wherein the plurality of motors are controlled for synchronized rotation by a signal derived from the detector;

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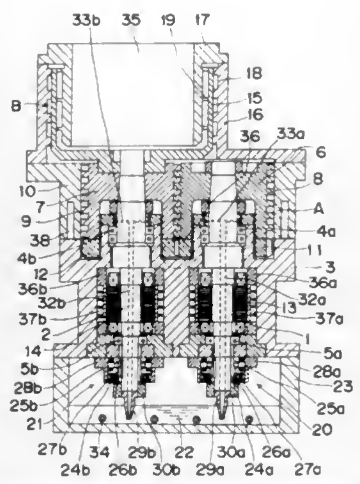


an oil tank provided at first end portions of the rotating shafts; and

an oil pump which functions to cause oil within the oil tank to be drawn up and fed to the bearings by making use of rotation of the rotating shafts, and wherein each of the rotating shafts has an oil flow passage provided for introducing the oil to the bearings;

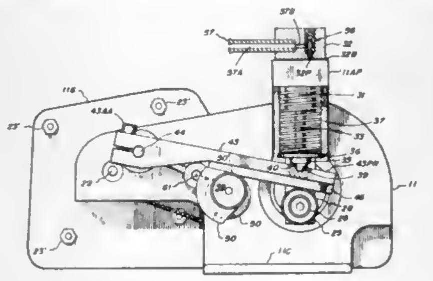
a cooling system for cooling the oil within the oil tank, wherein a suction member of the oil pump is immersed in the cooled oil of the oil tank; and

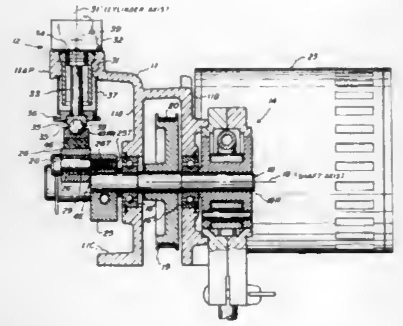
wherein at least one of the rotors of the rotational position sensors is formed outside the suction member.

5,836,747
VARIABLE VOLUME AIR PUMP

John T. Gondek, 1641 Innsbruck Cir. W., Columbia Heights, Minn. 55421

Filed Jun. 13, 1995, Ser. No. 489,977
Int. Cl.⁶ F04B *19/00*
U.S. Cl. 417—63 16 Claims





1. An air pump comprising:
a) a frame;
b) a shaft rotatably supported by said frame for rotation about a shaft axis and means for rotating said shaft;
c) crank arm means fixed to said shaft so as to rotate therewith;
d) a pump cylinder supported by said frame, having a cylinder head and a cylinder body depending therefrom along a cylinder axis;
e) a piston rod having a piston head at one end thereof positioned in said cylinder for relative reciprocation therewith along said cylinder axis, said piston head having a continuous top surface, said top surface being closely adjacent to said cylinder head upon completion of a compression stroke, and said piston rod having at its other end means for receiving force tending to move said piston head toward said cylinder head;
f) spring means connected between said frame and said piston rod for biasing said piston head away from said cylinder head;
g) piston rod engagement means:
  (i) rotatably mounted on said frame for movement relative to said cylinder axis,
  (ii) positioned to engage said other end of said piston rod whereby said piston rod engagement means is biased, by said force of said spring means, to move away from said cylinder head and,
  (iii) being further positioned so as to be contacted by said crank arm means;
h) adjusting means for selectively varying the extent of movement of said piston rod engagement means away from said cylinder head to thereby vary the intake stroke travel of said piston rod;
i) intake check valve means adapted to:
  (i) admit air into said pump cylinder during the intake stroke, and
  (ii) prevent airflow therethrough during the compression stroke; and
j) outlet port means including discharge check valve means located in said cylinder head, whereby each rotation of said shaft causes contact by said crank arm means with said piston rod engagement means to thereby periodically move said piston rod engagement means toward said cylinder head and thereby transmit force from said piston rod engagement means to said piston rod to thereby periodically move said piston head toward said cylinder head against the biasing force of said spring to thereby compress air in said cylinder admitted by said intake check valve means, and whereby, further, said adjusting means may be adjusted to a preselected condition to adjust the extent of the piston intake stroke travel to thereby adjust the volume of air admitted into said cylinder during the piston intake stroke and thus vary the volume of air pumped through said discharge check valve means during the compression stroke.

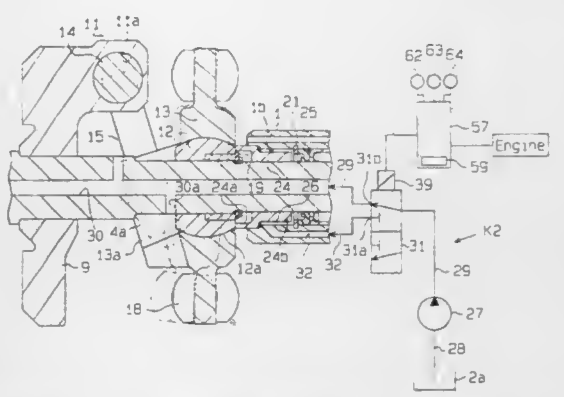
5,836,748
SWASH PLATE TYPE VARIABLE DISPLACEMENT COMPRESSOR UTILIZING A SPOOL FOR CONTROLLING THE INCLINATION

Masahiro Kawaguchi; Masanori Sonobe; Shigeki Kanzaki; Tomohiko Yokono, and Ken Suitou, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokkl Seisakusho, Kariya, Japan

PCT No. PCT/JP94/01148, § 371 Date Mar. 12, 1996, § 102(e) Date Mar. 12, 1996, PCT Pub. No. WO96/02751, PCT Pub. Date Feb. 1, 1996

PCT Filed Jul. 13, 1994, Ser. No. 615,239
Int. Cl.⁶ F04B *1/29*
U.S. Cl. 417—222.2 20 Claims

1. A compressor having a drive shaft rotatably supported in a housing, a swash plate mounted on for rotation with said drive shaft, and a piston slidably accommodated in a cylinder bore, rotation of the swash plate with said drive shaft being converted to reciprocating movement of the piston in the cylinder bore to compress gas containing oil mist which, upon circulation within the compressor, lubricates component parts of said compressor in moving contact with each other, said swash plate being tiltable between an upright position normal to the drive shaft and a range of inclining positions with respect to the longitudinal axis of the drive shaft to increase displacement of the compressor, and wherein compressed gas is discharged from a discharge chamber, said compressor comprising:

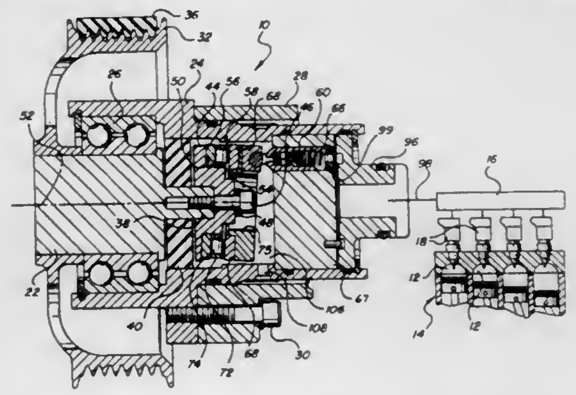


means for forcibly operating the swash plate to incline the swash plate from the upright position when said swash plate would otherwise be caused to assume the upright position to thereby compress and circulate within the compressor gas containing oil mist, whereby the oil mist is supplied to said component parts.

5,836,749
PISTON TYPE LIQUID FUEL PUMP WITH AN IMPROVED INLET VALVE

Margaret C. Novacek, South Lyon, and Gregg T. Black, Livonia, both of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.

Filed Dec. 13, 1996, Ser. No. 768,164
Int. Cl.⁶ F04B *1/14*
U.S. Cl. 417—269 8 Claims

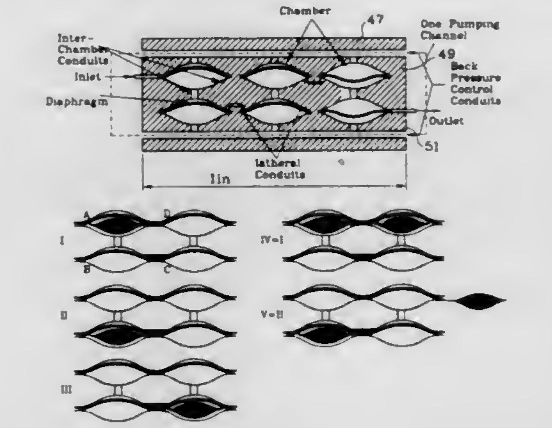


1. A piston pump for high pressure pumping of low lubricity fuels comprising,
  (1) a swash plate driven by said input for rotation about an axis and having an annular contact surface inclined with respect to said axis,
  (2) a bearing assembly having a first annular race mounted on said swash plate and a second annular race parallel to said first annular race and further having an anti-friction bearing unit sandwiched between said first and second races,
  (3) a stationary barrel member mounted in spaced relation to said swash plate and defining a plurality of cylinders,
  (4) a pumping piston in each of said cylinders mounted so as to permit axial movements in response to the action of the inclined surface of said swash plate as it is rotated by said input and thereby defining a pumping chamber,
  (5) a one-way inlet valve assembly associated with each said pumping piston for admitting fluid into said chamber, said inlet valve assembly comprising: an axially extending stepped bore formed in each pumping piston defining a shoulder portion; inlet passage means opening into said stepped bore; a valve seat about said inlet opening to the stepped bore; a valve member with an end adapted to seat against said valve seat annulus when in a closed operative mode; a spring seat forming member engaging said shoulder portion and spaced from said valving member; a first spring extending between said valving member and said spring seat forming member to yieldably urge said valving member against said seat forming annulus; a second spring urging said spring seat forming member against said shoulder to establish a normal axial position thereof in said piston bore whereby upon movement of said pumping piston, defining an inlet mode of operation the valve member moves against said first spring to draw fluid into said stepped bore from said inlet passage and upon an opposite movement of said pumping piston, defining a pumping mode of operation, the valve member is urged by said first spring against said valve seat to prevent flow of fluid back into said inlet passage.

5,836,750
ELECTROSTATICALLY ACTUATED MESOPUMP HAVING A PLURALITY OF ELEMENTARY CELLS

Cleopatra Cabuz, Edina, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 9, 1997, Ser. No. 947,802
Int. Cl.⁶ F04B *35/00*
U.S. Cl. 417—322 17 Claims



1. A mesopump having a plurality of elementary cells, each of said cells comprising:
  a body forming an electrode cavity having an upper electrode and a lower electrode, each of said electrodes having a curved surface facing toward the curved surface of the other electrode to define said cavity, said body including electrical activation means for selectively energizing said electrodes;
  a bistable diaphragm mounted and grounded in said body and having a major portion located in said cavity between said curved surfaces, said diaphragm being adapted to deflect toward said upper and lower electrode curved surfaces to conform thereto;
  lateral conduit means in said body forming an end conduit, said lateral conduit means being operably connected to the portion of said diaphragm mounted in said body and positioned to be opened and closed by movement of said diaphragm for controlling flow of fluid through said end conduit;
  vertical conduit means operatively connected to at least one curved surface of an electrode cavity for controlling flow of fluid there through by movement of said diaphragm into and out of contact with said vertical conduit means; and
  interconnecting conduit means for connecting said cell to said plurality of cells to form said mesopump;
  whereby activation of said electrodes causes movement of said diaphragm between said curved surfaces of said electrodes to move fluid into and out of said body.

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5,836,751

RECIPROCATING PISTON PUMP

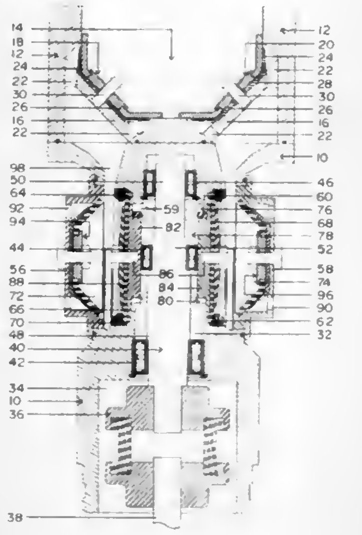
Ian Louis De Villiers, Randburg, South Africa, assignor to Divwatt (Proprietary) Limited, Randburg, South Africa

Filed Jun. 19, 1996, Ser. No. 671,017

Claims priority, application South Africa, Jun. 21, 1995, 95/5119

Int. Cl.^{6} F04B *17/00;17/04*

U.S. Cl. 417—413.1 **15 Claims**



1. A pump including a cylinder, a wall of elastomeric material closing each end of the cylinder, a pumping chamber backing onto each elastomeric wall, a valved inlet and a valved outlet to each pumping chamber, a piston within the cylinder, the piston having two ends each engaging a corresponding one of the elastomeric walls, and means to cause the piston to reciprocate within the cylinder, thereby alternating flexing the elastomeric wall inwardly to draw liquid into the pumping chamber through the valved inlet and outwardly to pump liquid within the pumping chamber through the valved outlet.

5,836,752

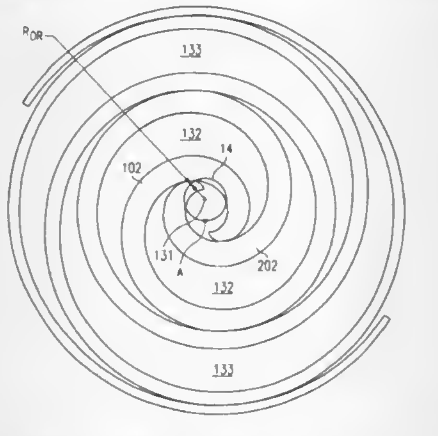
SCROLL-TYPE COMPRESSOR WITH SPIRALS OF VARYING PITCH

John L. Calhoun, Dallas, and David W. McClung, Sachse, both of Tex., assignors to Sanden International (U.S.A.), Inc., Wylie, Tex.

Filed Oct. 18, 1996, Ser. No. 733,255

Int. Cl.^{6} F01C *1/04*

U.S. Cl. 418—55.2 **21 Claims**



1. An apparatus for displacing a fluid, the apparatus comprising:

a first scroll having a first vane;

a second scroll having a second vane;

the first vane interleaved with the second vane to form at least one fluid pocket within the interleaved vanes;

means for entry of the fluid into the at least one fluid pocket;

means for exit of the fluid from the at least one fluid pocket; and

means coupled to at least one of the scrolls for causing a relative orbital motion between the first and second scrolls, wherein the relative orbital motion causes the at least one fluid pocket to be displaced, and

wherein a cross section of a space between the first and second vanes has a centerline defined by a spiral with a non-constant pitch.

5,836,753

SEAL ARRANGEMENT FOR ENGINE-DRIVEN SUPERCHARGER

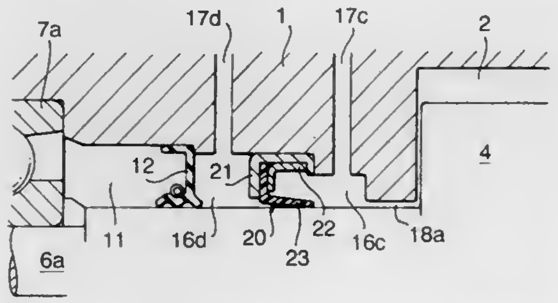
Nobuo Takei, Urayasu, and Shigeru Takabe, Sagamihara, both of Japan, assignors to Ishikawajima-Harima Heavy Industries Co., Ltd., Tokyo, Japan

Division of Ser. No. 711,258, Sep. 9, 1996, abandoned. This application Jul. 10, 1997, Ser. No. 891,216

Claims priority, application Japan, Nov. 22, 1995, 7-304481

Int. Cl.^{6} F04C *27/00*

U.S. Cl. 418—95 **24 Claims**



1. A seal arrangement for an engine-driven supercharger, the supercharger including a housing, a rotor chamber formed in the housing, a rotor rotatably placed in the rotor chamber, a shaft chamber formed next to the rotor chamber, a bearing provided inside the shaft chamber and means for feeding a lubrication oil to the bearing, the rotor having a longitudinal direction and a shaft projecting from the rotor chamber into the shaft chamber in the longitudinal direction of the rotor, the bearing being adapted to support the rotor shaft and the operation of the engine and the supercharger causing external air to be introduced into and sucked from the rotor chamber causing the pressure of the air in the rotor chamber to vary between a a positive pressure and a negative pressure, comprising:

a first oil seal fitted on the rotor shaft between the bearing and the rotor chamber for defining a lubrication oil chamber in the shaft chamber between the first seal and the bearing and defining an air chamber in the shaft chamber between the first seal and the rotor chamber;

a second seal provided in the air chamber to divide the air chamber into first sub-air chamber on the rotor chamber side and a second sub-air chamber on the lubrication oil chamber side, the second seal allowing gas leakage from the first sub-air chamber to the second sub-air chamber to a certain extent;

a first air passage extending to the outside atmosphere from the first sub-air chamber such that positive negative pressure of the air leaking to the first sub-air chamber from the rotor chamber is lowered toward the atmosphere pressure when the air enters the first sub-air chamber which communicates with the outside atmosphere the first air passage; and

a second air passage extending to the outside atmosphere from the second sub-air chamber such that the positive or negative pressure of the air further leaking to the second sub-air chamber from the second sub-air chamber is lowered still further toward the atmosphere pressure when the air enters the second sub-air chamber which also communicates with the outside atmosphere via the second air passage.

5,836,754

SCREW FLUID MACHINE AND SCREW GEAR USED IN THE SAME

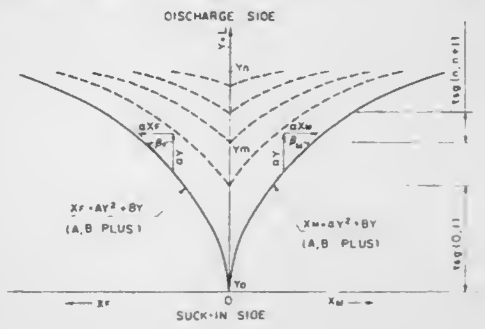
Masayuki Ozaki, Yotukaidou, and Isao Akutsu, Chiba, both of Japan, assignors to Diavac Limited, Chiba-Ken, Japan

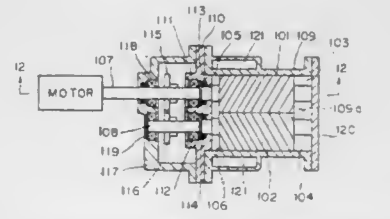
Continuation of Ser. No. 516,283, Aug. 17, 1995, Pat. No. 5,674,063. This application Mar. 13, 1997, Ser. No. 815,955

Claims priority, application Japan, Aug. 19, 1994, 6-218163

Int. Cl.^{6} F01C *1/16*

U.S. Cl. 418—201.3 **6 Claims**





1. A screw fluid machine, including male and female rotors which are engaged with each other, each rotor having a screw gear: a casing for accommodating said male and female rotors; fluid working rooms which are formed by said male and female rotors and said casing; and fluid inlet and outlet ports which are provided in said casing so as to intercommunicate one end protion of said fluid working rooms and with another end portion of said fluid working rooms, the improvement in which said screw gear constituting each of said male and female rotors, have a helix angle set to be consistently continuously variable in a helix advance direction as said fluid working rooms are advanced from said one end portion toward said other end portion such that a tooth-trace rolling curve on said pitch cylinder of said screw gear can be expressed by a substantially monotonically increasing function, and a screw thread pitch in the rotational axis direction of said gear is varible while said screw thread pitch in the direction perpendicular to the rotational axis direction of said screw gear is invariable and is determined in advance in accordance with the radius of pitch cylinder and the number of teeth of said screw gear.

5,836,755

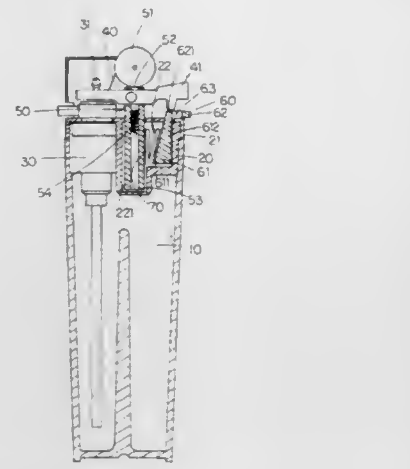
LOCKABLE LIGHTER

Andy Sheng, and Betty Sheng, both of P.O. Box 4268, Cerritos, Calif. 90703

Filed Oct. 9, 1997, Ser. No. 947,962

Int. Cl.^{6} F23D *11/36*

U.S. Cl. 431—153 **20 Claims**



1. A lockable lighter, comprising

a fuel tank capped by a cover seat which has a fuel releasable valve communicated therethrough, a fuel lever which has a depressable platform and is mounted on a supporting frame affixed on said cover seat for operating a fuel pipe provided by said fuel releasable valve, and a flint wheel assembly adjacent said fuel lever having a flint wheel for producing spark when said flint wheel is rotated against a flint subjacent said flint wheel to ignite said fuel released through said fuel releasable valve when said depressable platform of said fuel lever is depressed to lift said fuel pipe, in which said cover seat has a recess provided subjacent said depressable platform;

a blocking projection being protruded on said depressable platform underside;

a catch handle comprising an insert leg vertically received in said recess and a handle extended horizontally subjacent said depressable platform of said fuel lever, said handle having a perforation into which said blocking projection on said depressable platform is allowed to pass through; and

a resilient element which is received in said recess and props against said insert leg for pushing said handle outwards to a lock-up position, wherein said perforation on said handle of said catch handle is displaced to stagger said aligning with said blocking projection underside said depressable platform, whereby said blocking projection is blocked by a periphery surface of said perforation on said handle and is unable to be depressed downwards to prevent inadvertent fuel release; moreover, to ignite said lockable lighter, said catch handle being operated to a release position, in which said handle of said catch handle is pushed inward for aligning said perforation on said handle with said blocking projection on the underside of said depressable platform, and then said handle is lifted up until said blocking projection penetrating through said perforation, therefore said fuel lever is depressable to allow fuel release through said fuel releasable valve, and that when said depressable platform of said fuel lever is depressed to lift said fuel pipe, said catch handle is pressed downward simultaneously, in which said resilient element props and pushes said catch handle outwards to the lock-up position automatically.

5,836,756

GAS COLLECTOR ELECTRODE ASSEMBLY

Russell W. Moss, Richmond Heights, Ohio, assignor to Channel Products, Inc., Chesterland, Ohio

Filed Jan. 26, 1998, Ser. No. 13,251

Int. Cl.^{6} F23Q *7/06*

U.S. Cl. 431—263 **13 Claims**

1. A gas collector electrode assembly utilized in gas burner applications comprising a mounting member having an aperture therein, said mounting member being operatively attached to the gas burner, a spark electrode assembly receivable within said aperture in said mounting member and positioned therein so that a portion of said spark electrode assembly is adjacent the gas burner, and means for biasing said spark electrode assembly with respect

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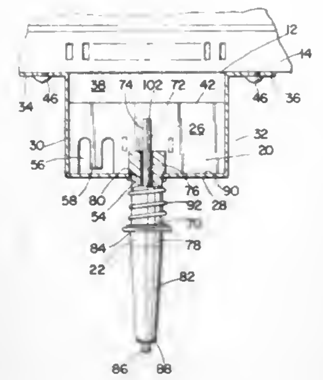


to said mounting member permitting radial and longitudinal movement of said spark electrode assembly within said mounting member.

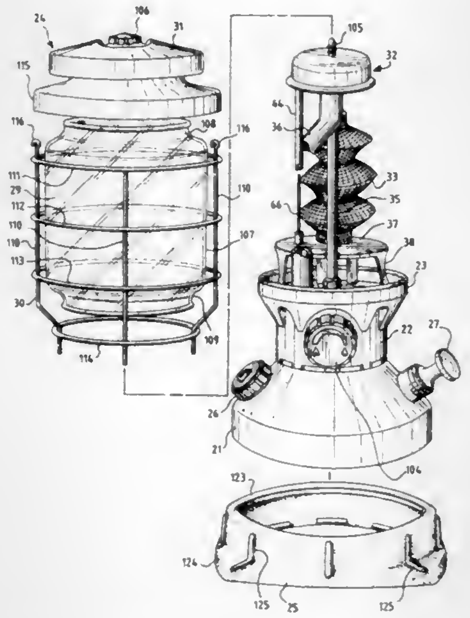
5,836,757
LIQUID FUEL LANTERN

Norris R. Long, Wichita; Randall L. May, Andover; Franklin T. Schmidt, Mulvane, all of Kans.; Bert D. Heizelman, Tenafly; Paul Lacotta, Glen Rock, both of N.J.; Lance V. Swearingen, Wichita, Kans.; Robert J. Taff, Wichita, Kans.; Robert J. Gross, Wichita, Kans., and Robert O. Van Driest, Wichita, Kans., assignors to The Coleman Company, Inc., Witchita, Kans.

Continuation-in-part of Ser. No. 281,743, Jul. 28, 1994, Pat. No. 5,533,892. This application Aug. 9, 1995, Ser. No. 512,939

Int. Cl.^{6} F23Q *3/00*

U.S. Cl. 431—264 **38 Claims**



1. A lantern comprising:
a) a fuel tank,
b) a burner assembly connected to the fuel tank, the burner assembly having:
  i) a fuel tube communicating with the fuel tank and
  ii) a burner tube communicating with the fuel tube and having an outlet end
c) an elongated tubular mantle having a pair of open ends, one of the open ends being releasably secured to the outlet end of the burner tube, and
d) holding means on the lantern for holding the other open end of the mantle, the other open end of the mantle being releasably secured to the holding means.

5,836,758
RECIPROCATING GRATE FOR THE TREATMENT OF BULK MATERIAL

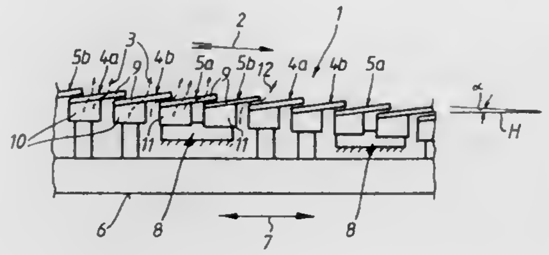
Karl Josef Menzel, Ennigerloh, Germany, and Jean-Paul Kauffmann, Chateauneuf-le-Rouge, France, assignors to Krupp Polysius AG, Germany

Filed Dec. 3, 1996, Ser. No. 759,763

Claims priority, application Germany, Jan. 25, 1996, 196 02 621.0

Int. Cl.^{6} F23H *7/08;* **F27D** *15/02*

U.S. Cl. 432—78 **17 Claims**



1. In a reciprocating grate construction for transporting bulk material along a path and treating such material with gas and comprising a plurality of rows of grate plates having gas openings therein and overlapping one another along said path, the rows of some of said grate plates being movable and the rows of others of said grate plates being stationary, the improvement wherein two adjacent rows of said movable grate plates are conjointly movable and alternate with two adjacent rows of said stationary grate plates.

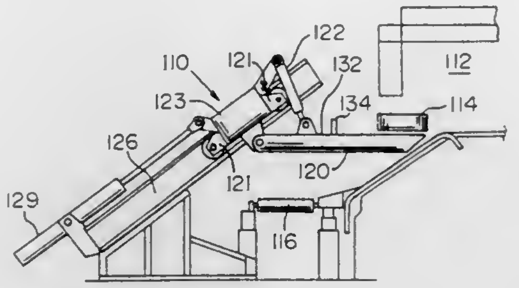
5,836,759
PUSHER FURNACE DROP-OUT CONVEYOR

John E. Thomas, Pittsburgh, and Jeffrey C. White, Allison Park, both of Pa., assignors to Tippins Incorporated, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 603,397, Feb. 20, 1996, Pat. No. 5,645,418. This application Jul. 7, 1997, Ser. No. 888,655

Int. Cl.^{6} F27D *3/04;3/00*

U.S. Cl. 432—239 **17 Claims**



1. A drop-out conveyor for a pusher-type furnace, said conveyor comprising:
at least one reciprocating carriage movable between a first slab loading position and a second slab discharge position;
a slab receiving means attached to each said carriage for receiving and holding a slab thereon;
a track supporting each said carriage for movement at least between said first slab loading position and said second slab discharge position; and
a means for reciprocating each said carriage between said first position and said second position.

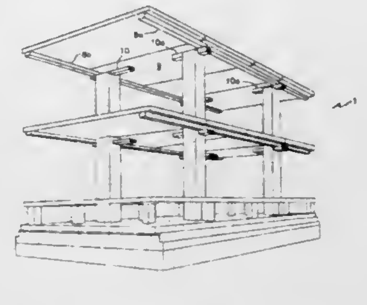
5,836,760
KILN FURNITURE POST DESIGN

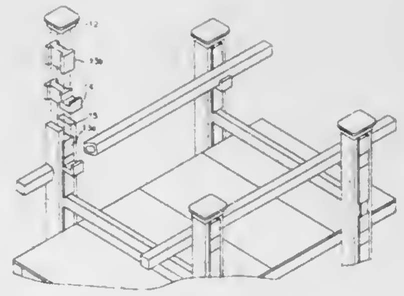
Craig A. Turner, Auburn, and Anthony J. Kulakusky, Oxford, both of Mass., assignors to Saint Gobain/Norton Industrial Ceramics Corporation, Worcester, Mass.

Continuation of Ser. No. 343,398, Nov. 22, 1994. This application Apr. 25, 1996, Ser. No. 637,585

Int. Cl.^{6} F27D *5/00*

U.S. Cl. 432—253 **7 Claims**





1. A kiln furniture assembly comprising:
a) a kiln car horizontal surface,
b) four vertical posts each having a first end fixed in the kiln car horizontal surface, said posts spaced so that the first ends of the posts define a rectangle in the kiln car surface,
c) four upper horizontal beams, one extending from each of said posts at the same upper height and in the same direction, the upper surfaces thereof defining an upper horizontal surface,
d) four lower horizontal beams, one extending from each of said posts at the same lower height and in the same direction, the upper surfaces thereof defining a lower horizontal surface,
e) two upper stringers, each seated upon two of the parallel but not coaxial upper beams, said upper stringers being in parallel horizontal relation,
f) two lower stringers, each seated upon two of the parallel but not coaxial lower beams, said lower stringers being in parallel horizontal relation,
g) upper and lower batts, each batt having two ends, wherein each end of each batt is supported by a single stringer, wherein the improvement comprises each vertical post comprises:
  i) a vertically disposed channel, and
  ii) a spacer block contacting and vertically separating the upper and lower horizontal beams which extend from the same cost,
wherein at least a portion of at least one of the spacer block and the horizontal beam above the spacer block is positioned within the vertically disposed channel.

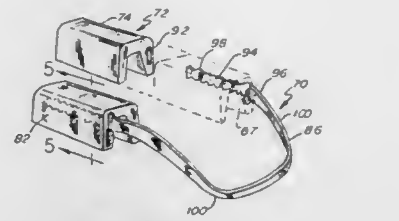
5,836,761
ADJUSTABLE CUSTOMIZED DENTAL APPLIANCE

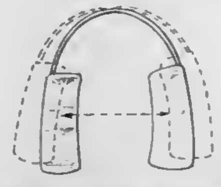
Paul C. Belvedere, Edina, and Jon D. Kittelsen, Fridley, both of Minn., assignors to Big Picture, Inc., Minneapolis, Minn.

Filed Aug. 5, 1996, Ser. No. 689,253

Int. Cl.^{6} A61C *3/00*

U.S. Cl. 433—6 **49 Claims**





1. An adjustable, customized dental appliance for the mouth of an athlete having an upper jaw with anterior teeth, posterior teeth with occlusal surfaces, a palate and fossae with cartilage forming sockets, a tongue, a movable lower jaw with anterior teeth, posterior teeth with occlusal surfaces and condyles movably fitted with connective tissue and muscles within the sockets forming the temporomandibular joints through which auriculo-temporalis nerves and supra-temporal arteries pass, the appliance comprising:
a pair of occlusal posterior pads comprising a base, a labial wall and a lingual wall and the base, the labial wall and the lingual wall enclosing a channel for receiving the teeth of the lower jaw and the base having an inner surface facing the teeth of the lower jaw, engageable with the occlusal surfaces of the posterior teeth to space apart the teeth, to absorb shock and clenching stress otherwise transferred from the connective tissues, the muscles and the lower jaw to the upper jaw, neck and back, to space apart the anterior teeth of the lower jaw from the anterior teeth of the upper jaw to facilitate breathing and speech, and to lessen condylar pressure, force and impact upon the cartilage, and temporomandibular joints, the arteries and nerves; and
an adjustable band connected to the posterior pads and said adjustable band having posterior ends connecting the posterior pads together within the mouth and out of the way of the tongue to maintain the positions of the occlusal posterior pads within the mouth and to prevent loss of the pads such as by swallowing, wherein said adjustable band posterior ends have an adjustable connection to said posterior pads whereby the adjustable band is adjustable fore and aft relative to the posterior pads to adapt to the location of the posterior teeth within the mouth.

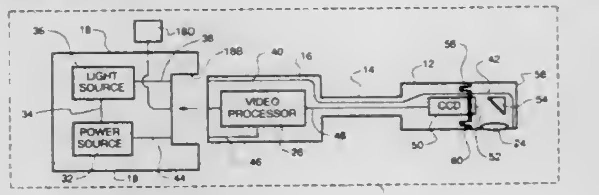
5,836,762
PORTABLE DENTAL CAMERA SYSTEM AND METHOD

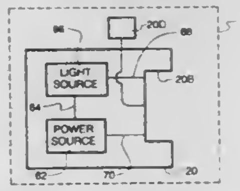
Keith C. Peithman, York, Pa., assignor to Dentsply International Inc., York, Pa.

Continuation of Ser. No. 541,564, Sep. 29, 1995, abandoned, which is a division of Ser. No. 134,158, Oct. 8, 1993, Pat. No. 5,487,661. This application Jul. 25, 1997, Ser. No. 900,713

Int. Cl.^{6} A61B *1/24*

U.S. Cl. 433—29 **31 Claims**





1. A dental camera system, comprising:
a handpiece,

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- a cable,
- a cable connector, and
- a plurality of dental operatory rooms each having a power source base,

said handpiece having a lens, said handpiece being supported by said cable, said cable connector being supported by said cable,

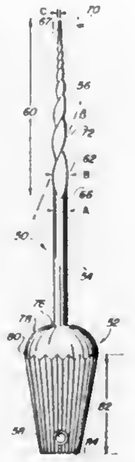
each said power source base having a base connector and a light source, said cable connector being adapted to be connected to each said base connector.

5,836,763

Patent Not Issued For This Number

5,836,764
ENDODONTIC TREATMENT SYSTEM

Leonard Stephen Buchanan, 2335 Foothill La., Santa Barbara, Calif. 93105
Division of Ser. No. 234,290, Apr. 28, 1994. This application May 24, 1996, Ser. No. 653,324
Int. Cl.^{6} A61C *5/02*
U.S. Cl. 433—102 **8 Claims**



1. In combination with an endodontic file for use in preparing a root canal in a tooth, said file having a tip, a flute portion and a shank, the improvement comprising:

a handle in which the shank is imbedded, the handle having a configuration which provides an enhanced gripping area to facilitate the application of torque to the file in combination with apically directed force,

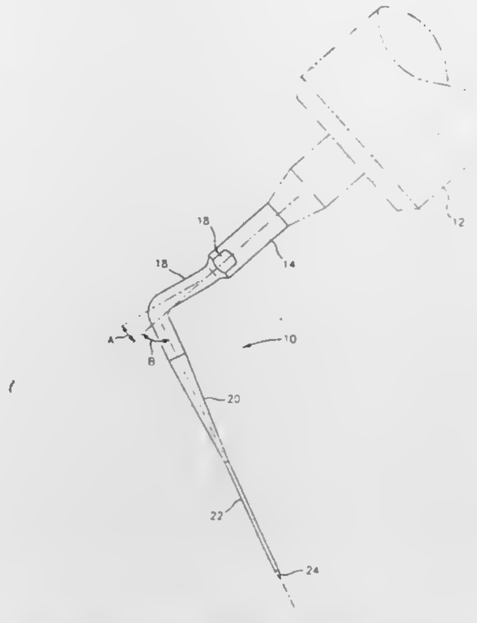
said configuration being generally pear-shaped and having only a single bulbous portion which is located near one end of the handle, said configuration tapering continuously from said bulbous portion to a truncation at the other end; and

said shank being imbedded in said one end.

5,836,765
MICROENDODONTICS TITANIUM ULTRASONIC DENTAL TOOL

Teresa R. Hickok, 4106 Paseo De La Vista, Bonita, Calif. 91902
Continuation-in-part of Ser. No. 766,787, Dec. 13, 1996. This application Mar. 28, 1997, Ser. No. 825,328
Int. Cl.^{6} A61C *1/07;3/03*
U.S. Cl. 433—119 **16 Claims**

1. A dental tool for use with an ultrasonic transducer, the tool comprising:

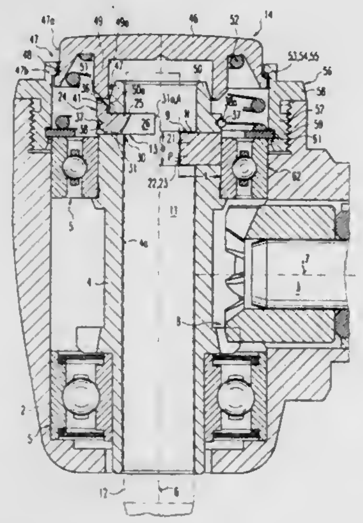


a substantially elongate tool defined by a shaft having a proximal end with attachment means at said proximal end for attachment to an ultrasonic transducer, and a distal end having a tip configured for performing a dental procedure; and

said tool formed substantially uniformly throughout of titanium alloy of about 5.5 to about 6.5% aluminum, about 3.5 to about 4.5% vanadium.

5,836,766
MEDICAL AND DENTAL HANDPIECE

Bernd Gugel, Ulm-Einsingen, and Bernhard Kuhn, Schemmerhofen, both of Germany, assignors to Kaltenbach & Voigt GmbH & Co., Biberach, Germany
Filed Jul. 24, 1997, Ser. No. 899,098
Claims priority, application Germany, Jul. 24, 1996, 196 29 902.0
Int. Cl.^{6} A61C *1/14*
U.S. Cl. 433—127 **22 Claims**



1. A medical or dental handpiece having a releasable retaining device for a tool, the tool having a shaft about which the tool rotates, the handpiece comprising:

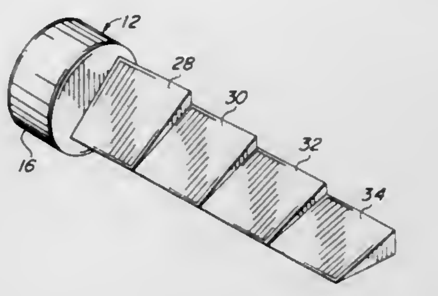
- a housing;
- a drive sleeve rotatably mounted in the housing, the drive sleeve having a hollow cylindrical insertion hole into which the shaft of the tool is placed;

- a drive means for rotation of the drive sleeve;
- a first releasable coupling for rotatably connecting the shaft to the drive sleeve such that the shaft rotates with the drive sleeve about a common axis of rotation;
- a second releasable coupling for axially connecting the shaft to the drive sleeve, the second releasable coupling comprising a coupling recess in the shaft, a coupling slider displaceable in a guide transverse to the axis of rotation of the drive sleeve between a coupling position engaging into the coupling recess and a decoupling position releasing the shaft from the handpiece, and a spring urging the coupling slider into its coupling position; and
- an actuating device for displacing the coupling slider into its decoupling position;

whereby the coupling slider is made of a ceramic material and fabricated into its final form by means of a single fabrication process without after treatment.

5,836,767
DENTAL SHIM

Thomas E. Aspel, 3149 Old Post Rd., Fallbrook, Calif. 92028
Filed Jul. 15, 1997, Ser. No. 893,183
Int. Cl.^{6} A61C *3/00*
U.S. Cl. 433—141 **17 Claims**



1. A dental shim for insertion between a tooth and one jaw of a dental pliers, the dental shim comprising:

a handle; and

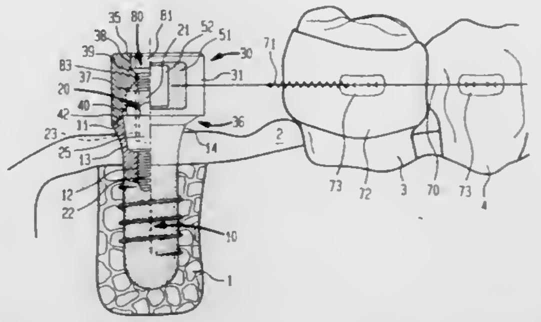
an elongated shim portion extending outward from the handle, the elongated shim portion having a base, a side and a hypotenuse, the base and the hypotenuse joined at a plurality of angles, the base adapted to engage a biting surface of a tooth and the hypotenuse adapted to engage one jaw of a dental pliers.

5,836,768
FASTENING DEVICE FOR FIXING ORTHODONTIC APPARATUSES ON A DENTAL IMPLANT

Christoph Hüskens, Horn; Ulrich Mundwiler, Tenniken, both of Switzerland, and Jürgen Glatzmaier, Munich, Germany, assignors to Institut Straumann AG, Waldenburg, Switzerland
PCT No. PCT/CH95/00303, § 371 Date Sep. 2, 1997, § 102(e) Date Sep. 2, 1997, PCT Pub. No. WO96/19946, PCT Pub. Date Jul. 4, 1996
PCT Filed Dec. 22, 1995, Ser. No. 860,331
Claims priority, application Switzerland, Dec. 23, 1994, 3921/94
Int. Cl.^{6} A61C *8/00*
U.S. Cl. 433—173 **10 Claims**

1. Fastening device on a dental implant for the fixing of orthodontic apparatus components and the subsequent use of the implant, fitted in the jaw bone and having an implant shoulder, as a support for a superstructure, in which:

a) the implant head protruding at least to some extent from the soft tissue, and



b) an anchoring base which can be fitted on the implant shoulder of the implant is provided with at least one fastening surface, and

c) this fastening surface serves for fastening of a support plate of a bracket, and

d) at least one apparatus component can be fixed on the bracket, and

e) the anchoring base has a vertically continuous bore, and

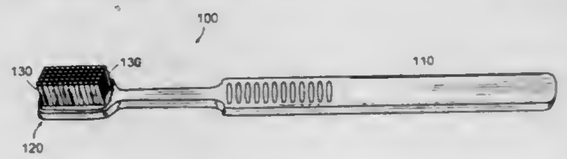
f) the anchoring base can be fixed on the implant by means of an occlusal screw which is guided through the bore and which engages into the implant, and

g) polygons of male and female configuration, respectively, are alternatingly present on the implant and on the anchoring base and engage with one another with positive locking, so that the anchoring base can be placed on the implant in various stable positions of rotation, characterized in that.

h) the bore is eccentrically provided in such a way that different distances from the bore to the fastening surfaces are obtained in a gradation.

5,836,769
TOOTHBRUSH, METHOD OF MAKING A TOOTHBRUSH, AND METHOD OF BRUSHING TEETH

Jean L. Spencer, Boston, Mass., assignor to Gillette Canada Inc., Kirkland, Canada
Filed Dec. 3, 1996, Ser. No. 753,927
Int. Cl.^{6} A61C *15/00*
U.S. Cl. 433—216 **39 Claims**



1. A method of manufacturing a toothbrush, comprising:

providing a bristle comprising a first opening, a second opening, and a lumen between said first opening and said second opening:

contacting said first opening with a substance;

applying a vacuum to said second opening thereby suctioning said substance into said lumen through said first opening to provide a bristle containing said substance; and

attaching said bristle containing said substance to a toothbrush.

5,836,770
MULTIMEDIA PRODUCT FOR USE IN PHYSICAL FITNESS TRAINING AND METHOD OF MAKING

Beth J. Powers, 139 Harbor Rd., Lake Barrington, Ill. 60010
Filed Oct. 8, 1996, Ser. No. 727,749
Int. Cl.^{6} A63B *69/00*
U.S. Cl. 434—247 **14 Claims**

1. A multimedia product for use in physical fitness training, comprising:

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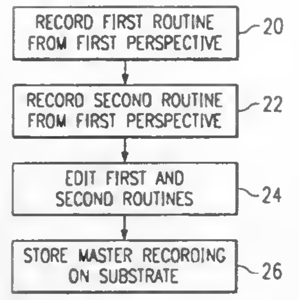
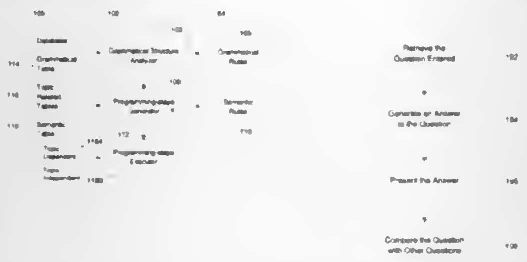

RECORD FIRST ROUTINE FROM FIRST PERSPECTIVE
20
RECORD SECOND ROUTINE FROM FIRST PERSPECTIVE
22
EDIT FIRST AND SECOND ROUTINES
24
STORE MASTER RECORDING ON SUBSTRATE
26

a player-readable storage medium having a substrate;
audiovisual program data encoded in the substrate of the player-readable storage medium, wherein the audiovisual program data comprises:
a first routine of physical movements captured from a first perspective; and
a second routine of physical movements captured from the first perspective;
wherein the first and second routines have mirror image physical movements such that when the program data is read by a player and displayed the first and second routines are juxtaposed in a predetermined format.

5,836,771
LEARNING METHOD AND SYSTEM BASED ON QUESTIONING

Chi Fai Ho, 4816 Cabello Ct., Union City, Calif. 94587, and Peter P. Tong, 1807 Limetree La., Mountain View, Calif. 94040

Filed Dec. 2, 1996, Ser. No. 758,896
Int. Cl.^{6} G09B *7/00*
U.S. Cl. 434—362 20 Claims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Database
Grammatical Table
Topic Related Tables
Semantic Table
Topic Dependent
Topic Independent
Grammatical Structure Analyzer
Programming-steps Generator
Programming-steps Executor
Grammatical Rules
Semantic Rules
Retrieve the Question Entered
192
Generate an Answer to the Question
194
Present the Answer
196
Compare the Question with Other Questions
198

1. A method of teaching a subject to a user depending on the user asking subject related questions to a computer system, the method comprising the steps of:
retrieving, by a computer system, a subject related question entered by a user into the system;
generating, by the system, an answer to the question;
presenting, by the system, the answer to the user, so as to teach the user the subject; and
comparing, by the system, the question with at least one question previously entered by the user to determine the user understanding level in the subject.

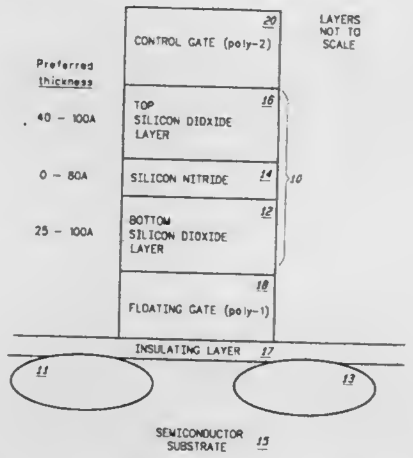
15. A method of teaching a subject to a user depending on the user asking subject related questions to a computer system, the method comprising the steps of:
retrieving, by a computer system, study materials of the subject stored in the system;
presenting, by the system, the study materials to a user;
retrieving, by the system, a subject related question entered into the system by the user;
generating, by the system, an answer to the question;
presenting, by the system, the answer to the user; and
repeating, by the system, the steps of retrieving, presenting, retrieving, generating and presenting, so as to answer another question entered by the user on the subject.

18. A computer system for teaching a subject to a user based on the user asking subject related questions, the system comprising:
an answer generator for generating an answer to a subject related question entered into the computer system by a user;
a presenter coupled to the answer generator for presenting the answer to the user so as to teach the user the subject; and
a comparator coupled to the answer generator for comparing the question with at least one question previously entered by the user to determine the user's understanding level in the subject;
such that the system provides the answer to the user's question and determines the user's understanding level in the subject based on the user's questions.

5,836,772
INTERPOLY DIELECTRIC PROCESS

Yun Chang; Fuchia Shone; Chin-Yi Huang, and Nai chen Peng, all of Hsinchu, Taiwan, assignors to Macronix International Co., Ltd., Hsinchu, Taiwan

Division of Ser. No. 315,209, Sep. 29, 1994, Pat. No. 5,619,052. This application Mar. 31, 1997, Ser. No. 829,028
Int. Cl.^{6} H01L *21/8247*
U.S. Cl. 438—265 11 Claims



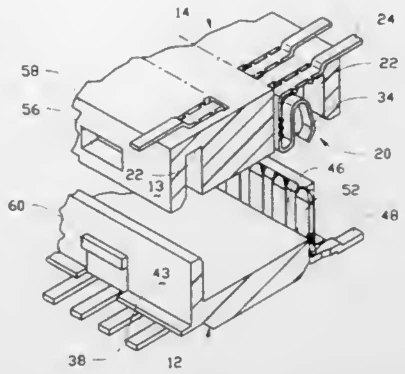
1. A process for fabricating a nonvolatile memory cell comprising:
a) forming source and drain regions on a first conductivity-type semiconductor substrate;
b) forming an insulating layer on said source and drain regions;
c) forming a floating gate positioned on said insulating layer;
d) forming a dielectric composite positioned on said floating gate, said dielectric composite including a bottom layer of silicon dioxide formed on said floating gate; a layer of silicon nitride formed on said bottom silicon dioxide layer, and a top layer of silicon dioxide formed on said nitride layer, wherein said silicon nitride layer of said composite has a thickness less than about 80 Å and is thinner than said top or said bottom silicon dioxide layer; and
e) forming a control gate positioned on said dielectric composite.

5,836,773
BOARD-TO-BOARD CONNECTOR

Robert G. McHugh, Evergreen, Calif., and Yu-Ming Ho, Taipei Hsien, Taiwan, assignors to Hon Hai Precision Ind. Co., Ltd., Taipei Hsien, Taiwan

Filed Jul. 29, 1996, Ser. No. 692,822
Int. Cl.^{6} H01R *9/09*
U.S. Cl. 439—74 9 Claims

1. An electrical connector assembly for board-to-board interconnection, comprising:



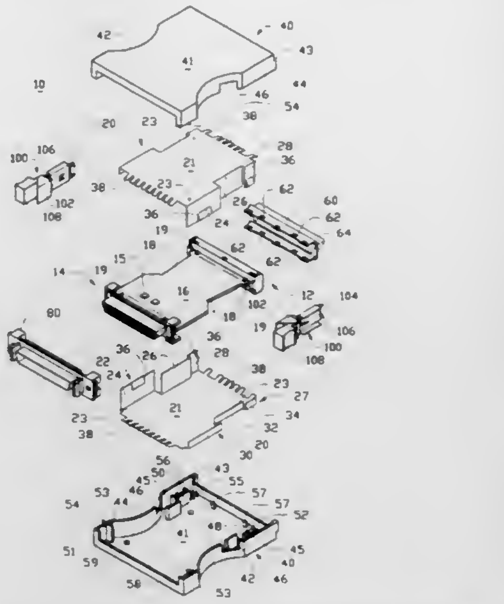
a plug connector having an insulative first housing defining two rows of staggered passageways for receiving a corresponding number of flexible contacts therein;
a pair of channels communicatively positioned aside two rows of the staggered passageways, respectively, under the condition that an engagement apex of each of said contacts projects into the corresponding channel;
a socket connector including an insulative second housing having circumferential walls with a plurality of ribs formed on two interior surfaces of two side walls, said ribs defining a plurality of passages for receiving therein a plurality of rigid contacts each of which includes front barbs and rear barbs, and said front barbs are coined to be thinner than the rear barbs, wherein an engagement surface of a main body of each of the rigid contacts lies above mating surfaces of two adjacent ribs; whereby
when the socket connector and the plug connector are engaged with each other, the two side walls of the socket connector are received within the corresponding channels of the plug connector, respectively, under the condition that each flexible contact of the plug connector engages each corresponding rigid contact of the socket connector.

5,836,774
ADAPTER AND MECHANISM THEREOF

Haw-Chan Tan, Diamond Bar; Gordon Lok, Montebello; Joel J. Yeh, San Gabriel, all of Calif., and Sung Liu Hsu, Taipei Hsien, Taiwan, assignors to Hon Hai Precision Ind. Co., Ltd., Taipei Hsien, Taiwan

Filed Nov. 12, 1996, Ser. No. 748,101
Int. Cl.^{6} H01R *9/09*
U.S. Cl. 439—76.1 19 Claims

1. An adapter comprising:
a first connector and a second connector positioned at two opposite ends of a PC board, each of said first connector and second connector having a metal housing;
a pair of identical metal shells commonly defining a space for receiving said PC board therein, and positioned between said first connector and said second connector;
each of said metal shells including a first row and a second row of grounding tangs at two opposite ends thereof for conductive engagement with the corresponding metal housings of the connectors; and

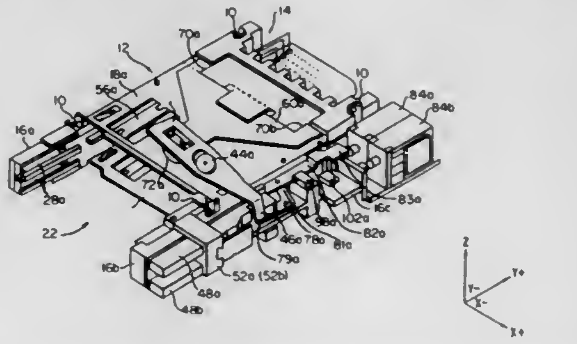


a pair of identical plastic cover commonly enclosing the metal shells and the connectors therein.

5,836,775
CONNECTOR APPARATUS

Naoki Hiyama; Kenji Suzuki, both of Kanagawa, Japan; Vincent D. Dimondi, Cary, N.C.; Nobuei Takai, Tokyo, Japan; Nai Hock Lwee, Singapore, Japan; Hiroshi Masuda, and Hiroaki Shimauchi, both of Kanagawa, Japan, assignors to Berg Tehnology, Inc., Reno, Nev.

PCT No. PCT/US94/05399, § 371 Date Oct. 28, 1996, § 102(e) Date Oct. 28, 1996, PCT Pub. No. WO94/27343, PCT Pub. Date Nov. 24, 1994
PCT Filed May 13, 1994, Ser. No. 545,829
Claims priority, application Japan, May 13, 1993, 5-111879; Oct. 18, 1993, 6-259899; Mar. 31, 1994, 6-063894
Int. Cl.^{6} H01R *13/62*
U.S. Cl. 439—159 23 Claims



1. A connector apparatus for a card-like data processing medium, said connector apparatus comprising:
a frame having opposing side walls spaced at an interval substantially equal to the width of said card-like data processing medium, said opposing side walls defining a storage space, one end of said frame defining an insertion inlet for inserting the card-like data processing medium into the storage space;
a header coupled to the end of the frame opposite the insertion inlet, said header containing a terminal array for electrically connecting with a mating terminal array disposed in a forward end face of the card-like data processing medium;
an ejection mechanism for ejecting the card-like data processing medium from the storage space of said connector apparatus,

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said ejection mechanism having a push rod coupled thereto for manually operating said ejection mechanism; and

means responsive to a control signal for automatically decoupling said push rod from said ejection mechanism thereby disabling the ejection mechanism.

5,836,776

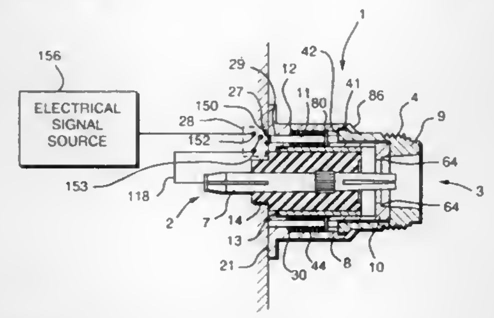
CONNECTOR WITH INTEGRAL INTERNAL SWITCH ACTUATOR AND METHOD OF USING THE SAME

Richard M. Koch, Wakefield, Mass., assignor to Tru-Cnnnector Corporatinn

Filed Aug. 29, 1997, Ser. No. 920,698

Int. Cl.^{6} H01R *29/00*

U.S. Cl. 439—188 **15 Claims**



1. An electrical connector comprising:

a connector body having a first end and a second end and a center conductor disposed therein to form an electrical path from said first end to said second end, said first end being adapted to removably receive a mating connector for creating an electrical connection between said center conductor and said mating connector;

an axially movable sleeve disposed within said body; and

at least one switch actuating pin in contact with said sleeve, said at least one switch actuating pin being axially movable with said sleeve;

wherein upon mating of said first end of said body with said mating connector, said sleeve moves axially within said body toward said second end of said body thereby causing a first end of said at least one switch actuating pin to extend outward from said body for tripping an external switch.

5,836,777

ELECTRICAL OUTLET DEVICE FOR CONNECTION WITH VARIOUS TYPES OF PLUGS

David Chien Hua Chen, Taipei, Taiwan, assignor to Board-Tech Electronic Co., Ltd., Taipei, Taiwan

Filed Jan. 3, 1997, Ser. No. 778,673

Claims priority, application Taiwan, Apr. 27, 1996, 85206144

Int. Cl.^{6} H01R *27/00*

U.S. Cl. 439—222 **12 Claims**

1. An electrical outlet device for connection with various types of plugs, comprising:

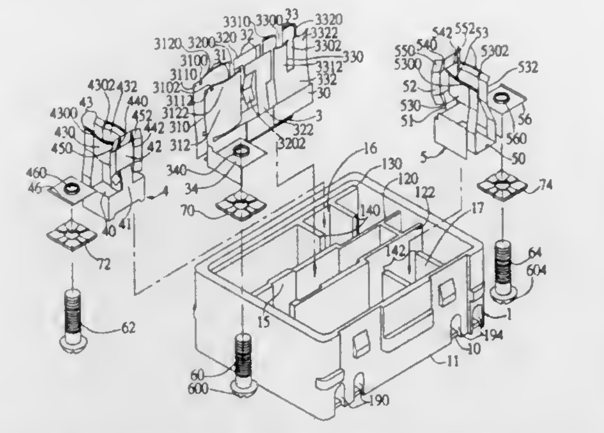
a base casing;

a cover covering said base casing;

a grounding conductive assembly including a base frame formed with at least a first clamping portion having a pair of elastic pieces, a second clamping portion having a pair of elastic pieces, and a third clamping portion having a pair of elastic pieces thereon;

a first contact conductive assembly and a second contact conductive assembly, each including a rib clamping portion composing a pair of elastic pieces and a third elastic piece;

wherein said elastic pieces of said first and third clamping portions of said grounding conductive assembly each have a top edge formed with a notch; and said elastic pieces of said rib clamping portion on said first and second contact conductive assemblies each have a top edge formed with a notch, said third elastic piece being bent away from said rib clamping portion.



5,836,778

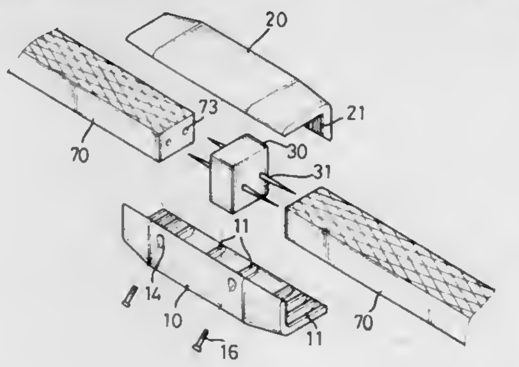
LAMP CONNECTOR

Tsui-tuan Wong Fan, 15th Fl. - D, No. 81, Sec. 1, Hsintai 5th Rd., Hsitzu Chen, Taipei Hsien, Taiwan

Filed Mar. 19, 1997, Ser. No. 822,571

Int. Cl.^{6} H01R *33/08*

U.S. Cl. 439—235 **6 Claims**



1. A lamp connector comprising:

an enclosure engaged between two adjacent lamps, said enclosure being composed of a first part and a second part opposed to each, and defining a space therein for receiving two opposed ends of the adjacent lamps, said enclosure further having a series of ribs extending from an inside wall thereof for fastening the two opposed ends of the lamps;

a terminal base received in the space of the enclosure and connected between the opposed ends of the adjacent lamps, said terminal base having an isolated pedestal and a plurality of pins extending through the pedestal to be inserted into a plurality of corresponding pin holes in the opposed ends of the lamps.

5,836,779

CODE CARD READER

Bernhard Vogler, Uniere Brunnengasse 3, D-97353 Wiesentheid, Germany

Filed Mar. 5, 1997, Ser. No. 811,212

Claims priority, application Germany, Mar. 5, 1996, 196 08 403.2

Int. Cl.^{6} H01R *13/15*

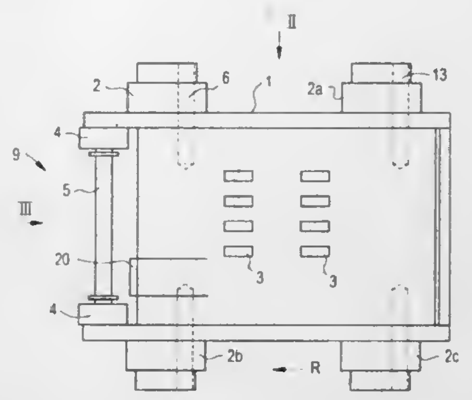
U.S. Cl. 439—260 **10 Claims**

1. A code card reader comprising:

a contact for contacting a contact-making area of an integrated circuit of a code card;

means for varying vertical distance between said contact and a code card received by said code card reader comprising a contact carrier and at least two wheels mounted eccentrically on the contact carrier for varying the vertical distance between said contact carrier and said code card; and

a track providing a path of rolling motion of said wheels.



5,836,780

CARD EDGE CONNECTOR

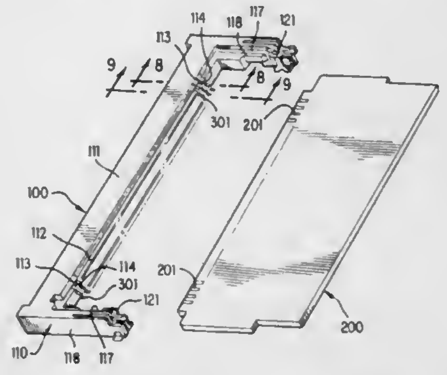
Akinori Mizumura; Ryozo Koyama, and Hirokatsu Yaegashi, all of Tokyo, Japan, assignors to Hirose Electric Co., Ltd., Tokyo, Japan

Filed May 19, 1997, Ser. No. 858,812

Claims priority, application Japan, May 17, 1997, 8-123136

Int. Cl.^{6} H01R *13/62*

U.S. Cl. 439—326 **13 Claims**



1. A card edge connector to be surface-mounted on a circuit board having a plurality of conductors, comprising:

an insulation housing having a base section with a slot for receiving a card edge on which a plurality of contact pads are provided;

a plurality of bent-type contact elements arranged in said slot on at least one side on which said connector is to be mounted on said circuit board; said bent-type contact elements comprising:

- a plurality of movable arms having contact points for contact with said contact pads of said card;
- a plurality of fixing arms having connection sections for connection to said conductors of said circuit boards and fixing sections to be fixed to said insulation housing; and
- a plurality of central arms for connecting said movable arms and said fixing arms to form substantially C-shaped, flexible contact elements;
- said connection sections of said fixing arms being at positions opposite to said central arms with respect to said fixing sections; and
- said contact points of said movable arms being at positions directly above said fixing sections or opposite to said central arms with respect to said fixing sections.

5,836,781

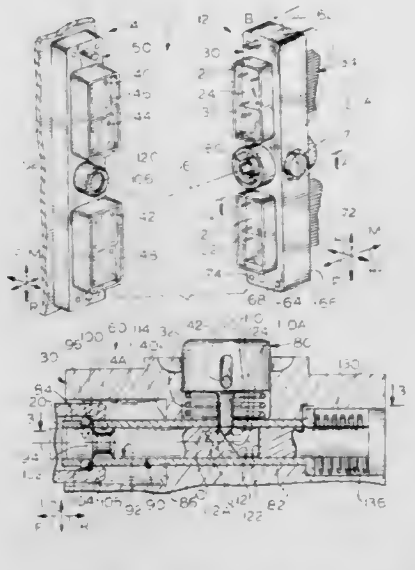
CONNECTOR QUICK COUPLING/DECOUPLING MECHANISM

Peter Joseph Hyzin, Lake Forest, Calif., assignor to ITT Manufacturing Enterprises, Inc., Wilmington, Del.

Filed Feb. 28, 1997, Ser. No. 808,200

Int. Cl.^{6} H01R *4/50*

U.S. Cl. 439—348 **2 Claims**



2. An electrical connector system that includes first and second connectors that each has a housing and that each has a plurality of contacts lying in the corresponding housing and having a mating end, with a plurality of conductors connected to the contacts of said first connector and extending rearwardly therefrom, and with said housings and contacts of said connectors being mateable by moving them together along a mating axis that extends in forward and rearward directions, said connector system including a latching device which can lock said connectors together when they have mated and which can be manually operated to unlock said connectors so they can be unmated, with said latching device having a manually operable actuator that can be operated to change said latching device from a lock position to an unlock position, wherein:

said first connector housing is of generally rectangular shape and has laterally spaced sides spaced in a lateral direction that is perpendicular to said forward and rearward directions, and said actuator comprises a button which lies at a first of said lateral sides and which is manually depressable toward the other of said sides to change said latching device from said lock position to said unlock position;

said second connector housing has walls forming a largely rearwardly-facing latch shoulder;

said first connector housing includes walls that form a passage with a passage axis extending parallel to said mating axis, with said first connector housing walls having a sleeve-shaped front part with a radial opening that extends radial to said passage axis, and including a lock member lying in said radial opening, said latching device also includes a shaft that is slidable along said passage and that has an outer push surface to push said lock member radially out along said opening and a shaft recess to receive said lock member in radially inward movement, said push surface and said recess being spaced along said passage axis;

said shaft having slot walls forming a shaft slot, said slot walls including an inclined slot wall that extends at an incline to said radial direction and that faces partially toward said button, said button connected to a plunger that is slidable in a direction radial to said passage axis into said shaft slot and against said inclined slot wall, so depression of said button causes said shaft to slide along said passage axis and allows said lock member to move into said shaft recess.

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5,836,782

INSULATION DISPLACEMENT CONNECTOR

Richard Austin Odley, West Midlands, and Martin Hebenstreit, Gwynedd, both of United Kingdom, assignors to Austin Taylor Communications Limited, North Wales, United Kingdom

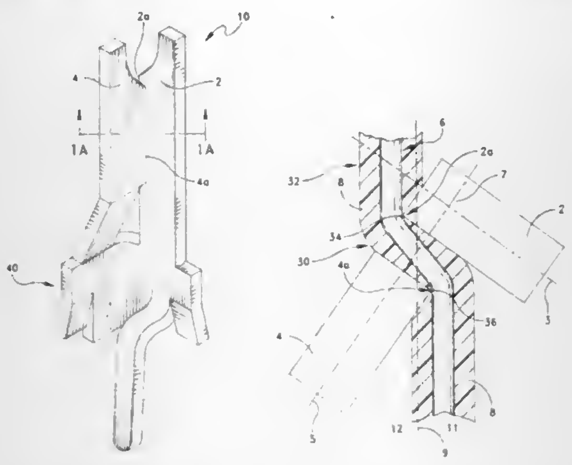
PCT No. PCT/GB95/01661, § 371 Date May 27, 1997, § 102(e) Date May 27, 1997, PCT Pub. No. WO96/02957, PCT Pub. Date Feb. 1, 1996

PCT Filed Jul. 13, 1995, Ser. No. 765,570

Claims priority, application United Kingdom, Jul. 13, 1994, 9414179

Int. Cl.^{6} H01R *4/24*

U.S. Cl. 439—397 **7 Claims**



2. An electrical connector comprising:

first and second spaced elements arranged to define a passage therebetween for receiving and retaining a wire, said first element lying in a first plane and including a first contact point and said second element lying in a second plane and including a second contact point, said first and second planes intersecting each other;

wherein said first element is substantially disposed on a first side of a central axis of said electrical connector and said second element is substantially disposed on a second side of said central axis of said electrical connector, and wherein said first contact point of said first element is disposed on said second side of said central axis and said second contact point is disposed on said first side of said central axis.

5,836,783

COMMUNICATION CABLE USED IN A COMPUTER SYSTEM

Tahei Morisawa; Nobuhiro Tani, and Harumi Aoki, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 325,924, Oct. 18, 1994, Pat. No. 5,573,425. This application Jul. 25, 1996, Ser. No. 687,218

Claims priority, application Japan, Oct. 18, 1993, 5-61041

Int. Cl.^{6} H01R *11/00*

U.S. Cl. 439—502 **2 Claims**

1. A computer system comprising:

a computer;

a peripheral device; and

a communication cable which connects said peripheral device to said computer, said communication cable comprising:

a first cable, said first cable enclosing:

a first set of data lines; and

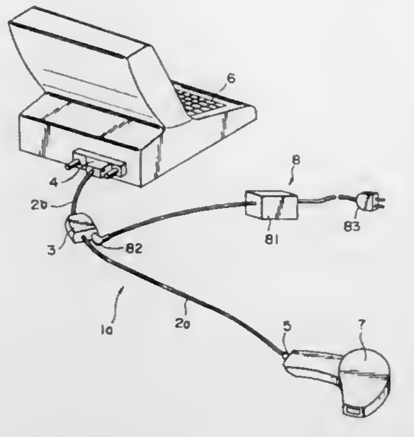
a first set of power lines;

a second cable, said second cable enclosing:

a second set of data lines;

a second set of power lines; and

a third set of power lines;



a connector attached to said second cable for connecting said communication cable to said computer; and

a patch unit, said patch unit including a socket, said socket comprising:

a first contact; and

a second contact,

wherein said patch unit connects said first set of data lines to said second set of data lines,

wherein one of said third set of power lines is connected to said first contact and another of said third set of power lines is connected to said second contact, and

whereby when said connector connects said communication cable with said computer, said first set of power lines, said second set of power lines and said third set of power lines are connected.

5,836,784

ELECTRICAL DISTRIBUTION WIRING SYSTEM

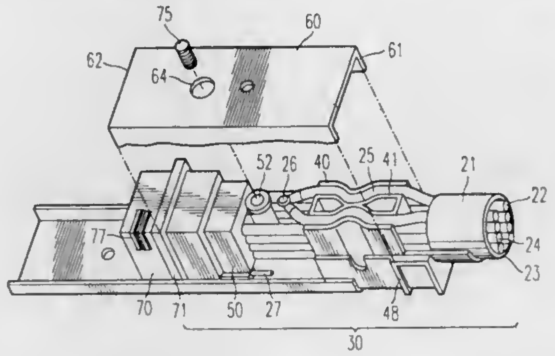
David De Oliveira, Dijon; Pascal Hubben, Arcelot, and Jean-Pierre Thierry, Arc-sur-Tille, all of France, assignors to Schneider Electric SA, Boulogne Billancourt, France

Filed Jan. 13, 1997, Ser. No. 782,919

Claims priority, application France, Jan. 19, 1996, 96 00837

Int. Cl.^{6} H01R *11/00*

U.S. Cl. 439—502 **13 Claims**



1. Electrical wiring system which may be composed by joining end to end several elements each housing a conductor unit consisted of several parallel electrical conductors and comprising a flexible element interposable between other elements having a tubular envelope, the flexible element including:

a flexible tubular envelope which houses an array of flexible conductors,

at each extremity, a junction member to another element, characterized in that the junction member includes:

a retaining piece equipped with channels housings in which the flexible conductors are housed,

a positioning end-piece for the bare extremities of the flexible conductors, and

a sleeve covering and holding in place the end-piece and the retaining piece.

5,836,785

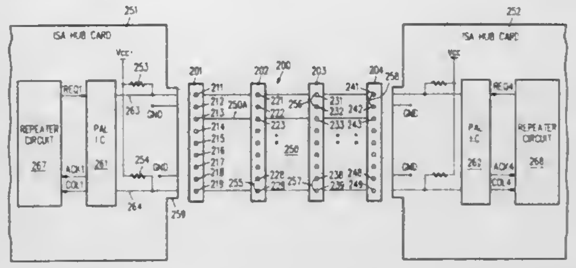
APPARATUS AND METHOD TO UNIQUELY IDENTIFY SIMILARLY CONNECTED ELECTRICAL DEVICES

Sherman Lee, Rancho Palos Verdes, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 399,323, Mar. 6, 1995, abandoned. This application May 12, 1997, Ser. No. 854,794

Int. Cl.^{6} H01R *11/00*

U.S. Cl. 439—505 **33 Claims**



1. An identity cable assembly comprising:

a sheath enclosing a plurality of electrical conductors;

a pair of conductive links; and

a plurality of connectors supported by the sheath, said plurality of connectors including a first connector having terminals identified as A1, A2, through As, and a second connector having terminals identified as B1, B2, through Bs;

wherein:

i, j, m and n are numbers in the range 1–s:

in said first connector a first pair of terminals (Ai, Aj) are unbreakably coupled to each other by one of the conductive links and a second pair of terminals (Am, An) are permanently uncoupled from each other;

in said second connector, a second pair of terminals (Bm, Bn) are unbreakably coupled to each other by another of the conductive links and a first pair of terminals (Bi, Bj) are permanently uncoupled from each other: and wherein a plurality of the terminals of each connector are interconnected to a plurality of the terminals of at least one other said connector by the electrical conductors.

5,836,786

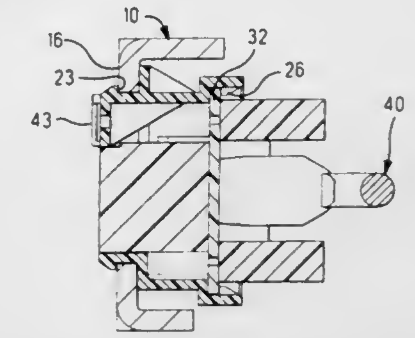
PATCH PANEL HAVING SNAP TOGETHER CONSTRUCTION

Paul John Pepe, Winston-Salem, N.C., assignor to The Whitaker Corporation, Wilmington, Del.

Filed May 21, 1996, Ser. No. 651,062

Int. Cl.^{6} H01R *13/74*

U.S. Cl. 439—557 **6 Claims**



1. A patch panel for a telecommunications system, comprising:

a mounting panel having an aperture therethrough;

an interface housing which is inserted into the aperture from a rear of the mounting panel and removably attached to the mounting panel by first snap latch means which is releasable from a front of the mounting panel, the interface housing having an opening therethrough in alignment with the aperture; and

a connector assembly which is inserted into in the opening and from a rear of the mounting panel and removably attached to the interface housing by second snap latch means, wherein the connector assembly prevents release of the first snap latch means when the connector assembly is disposed in the opening and wherein the connector asembly is replaceable without removal of the interface housing from the mounting panel.

5,836,787

CONNECTOR ASSEMBLY WITH CONNECTOR HOUSING RETAINING STRUCTURE

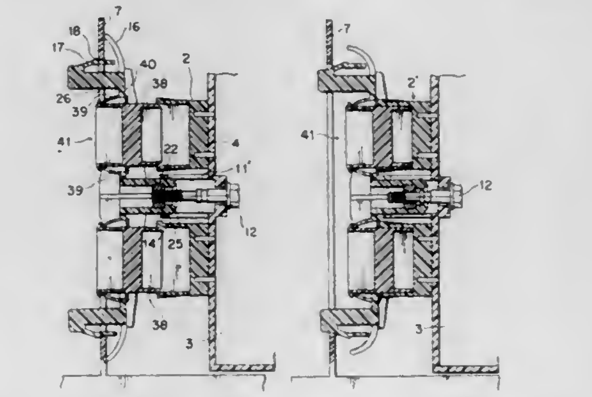
Shinji Kodama, Haibara-gun, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Apr. 15, 1997, Ser. No. 842,570

Claims priority, application Japan, Apr. 17, 1996, 8-95146

Int. Cl.^{6} H01R *13/60*

U.S. Cl. 439—567 **7 Claims**



1. A connector assembly with a connector housing retaining structure comprising:

a first connector housing to be attached to an electrical instrument and a second connector housing to be disposed toward a panel wall,

wherein said first and second connector housings are connected together by a screw-joining means including a bolt and a nut;

said second connector housing can be provisionally retained on said panel wall by a provisionally retaining means;

when said connector housings connect together, said second connector housing can release from said panel wall to move toward said first connector housing; and,

when said connectors separates from each other, said second connector housing can be provisionally retained on said panel wall by way of said provisionally retaining means.

5,836,788

WATERPROOF PRESS-CONNECTING CONNECTOR

Chieko Torii, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Aug. 15, 1996, Ser. No. 698,146

Claims priority, application Japan, Sep. 5, 1995, 7-228167

Int. Cl.^{6} H01R *13/40*

U.S. Cl. 439—587 **6 Claims**

1. A connector, comprising:

a housing which includes an opening having a peripheral edge portion:

a projection formed on an inner surface of said housing said projection having a slanting surface formed at the distal end thereof.

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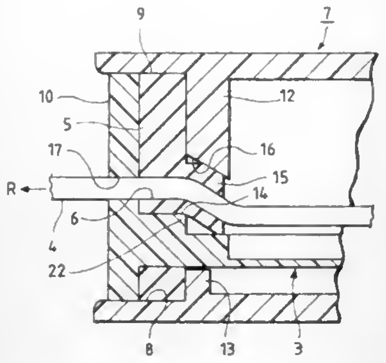


- a mat seal made of an elastic material, having a plurality of wire holes and a through hole formed respectively therethrough, and having an outer peripheral surface and a projected portion through which said wire holes extend, said projected portion formed integrally on a front surface thereof;
- a terminal holder extended through said through hole, said terminal holder including a cover plate formed at rear end thereof for pressing said mat seal to said housing;
- said slanting surface abutting said projected on of said mat seal when said mat seal is pressed to said housing;
- said terminal holder inserted into said housing so that said outer peripheral surface of said mat seal is fitted watertight in said peripheral edge portion of said opening in said housing;
- a plurality of press-connecting terminals mounted on said terminal holder; and
- a plurality of wires passing respectively through said wire holes, said wires press-connected to said press-connecting terminals.

5,836,789

MULTI PORT ELECTRICAL DEVICE AND HARNESS THEREFOR

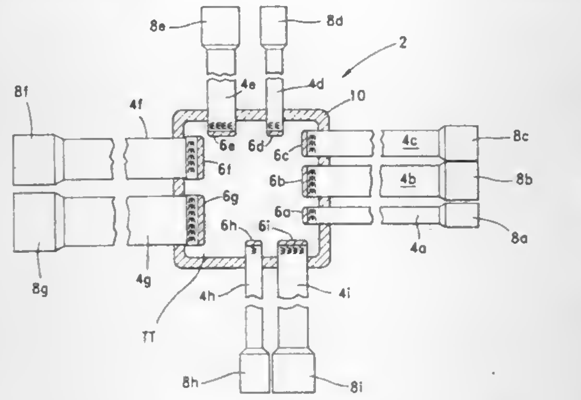
Fritz Josef Alois Kourimsky, Benshelm, and Michael Karl Albin Wenzel, Alzenau, both of Germany, assignors to The Whitaker Corporation, Wilmington, Del.

Filed Aug. 12, 1996, Ser. No. 695,732

Claims priority, application Germany, Aug. 15, 1995, 95 16 722.7

Int. Cl.⁶ H01R *13/58*

U.S. Cl. 439—604 **9 Claims**



1. An electrical harness for a device having a housing with multiple access ports that provide cable access to an electrical device therein, where the device has at least two connection points, the harness comprising at least two cables having one end of each terminated with a connector that is complementary to a respective one of the connection points on the electrical device characterized in that the cables are encapsulated within a seal member in their relative positions with respect to the connection points and the seal member is to be seated within the housing such that the respective connectors and connection points then correspond.

5,836,790

RADIO TELEPHONE CONNECTOR

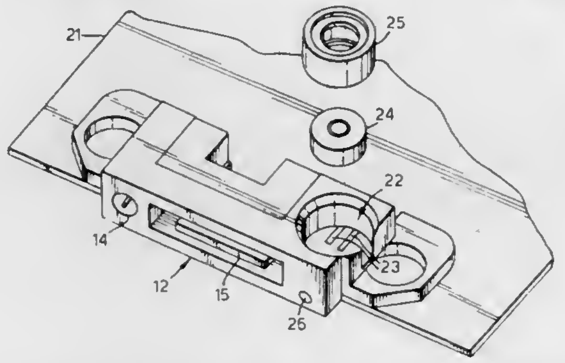
Ricky William Barnett, Hertfordshire, England, assignor to Nokia Mobile Phones Limited, Espoo, Finland

Filed Oct. 10, 1996, Ser. No. 728,201

Claims priority, application United Kingdom, Aug. 30, 1996, 9618224

Int. Cl.⁶ H01R *13/66*

U.S. Cl. 439—620 **10 Claims**



1. A connector having a body made from an insulated material for mounting on a circuit board of a radio telephone and providing external connection to the radio telephone, said radio telephone having a housing and said connector body being exposed along one of its surfaces by an opening in the radio telephone housing to allow external electrical connections to be made with the connector, said connector comprising:

- a first conductive track disposed within and through the connector body and having one end for coupling the first conductive track to an external connection and having another end with a tab connectable to the circuit board of the radio telephone, and a second conductive track disposed within and through the connector body and having one end for coupling the second conductive track to a microphone and having another end with a tab connectable to the circuit board of the radio telephone, wherein the connector includes means for receiving the microphone of the radio telephone and for maintaining the microphone in a predetermined position, and in which position an output terminal of the microphone contacts the second conductive track in the general vicinity of said one end thereof.

5,836,791

MODULAR TELECOMMUNICATIONS TERMINAL BLOCK

Charles W. Waas, Huntington Beach, and Mark R. Jespersen, Burbank, both of Calif., assignors to PSI Telecommunications, Inc., Burbank, Calif.

PCT No. PCT/US94/11908, § 371 Date Apr. 18, 1997, § 102(e) Date Apr. 18, 1997, PCT Pub. No. WO96/13077, PCT Pub. Date May 2, 1996

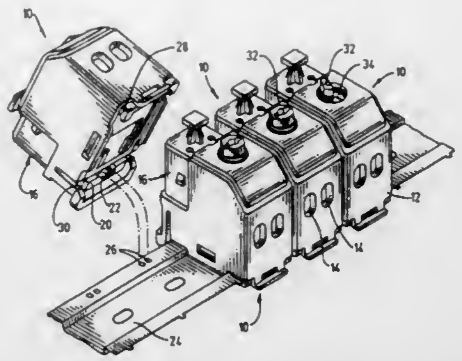
PCT Filed Oct. 24, 1994, Ser. No. 817,750

Int. Cl.⁶ H01R *9/22*

U.S. Cl. 439—709 **14 Claims**

1. A terminal block for connecting a telecommunications service wire and a telecommunications exchange wire comprising:

- a housing;
- service wire terminating means configured in the housing, said service wire terminating means including a service wire contact element;
- means for terminating an exchange wire, said exchange wire terminating means including an exchange wire contact element; and
- a removable linking module coupled to the housing, the linking module including movable contact means for electrically linking said service wire terminating means and said exchange wire terminating means, wherein said contact means is movable between a first position which forms an electrically conductive path between the service wire terminating means and the exchange wire terminating means and a second position which breaks the conductive path such that the service signal and the exchange signal may be independently tested.



5,836,792

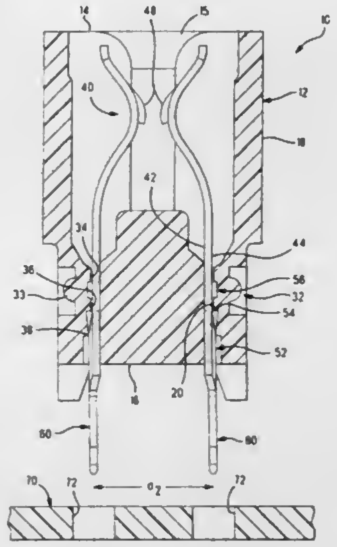
BOARD MOUNTABLE ELECTRICAL CONNECTOR

Mark Richard Thumma, Oberlin; Daniel Gerard Grab, Harrisburg; Charles Dudley Cooper, Harrisburg; Matthew Moo Uoong Cho, Harrisburg, and Ricky Edward Brown, Lykens, all of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Nov. 26, 1996, Ser. No. 756,859

Int. Cl.⁶ H01R *13/405*

U.S. Cl. 439—736 **3 Claims**



1. A connector of the type having an insulative housing including a plurality of passageways extending therethrough from a mating face to a board-mounting face and positioned to be aligned with terminal-receiving holes of a circuit board, with each passageway having a preselected dimension from an outer housing wall to an inner housing wall, and a plurality of terminals extending from mating sections at the mating face through respective passageways to board-mounting sections extending beyond the board-mounting face, with terminal body sections disposed in and along the passageways to be secured in the housing by staking of the outer housing wall against the terminal body sections adjacent the inner housing wall, characterized in that:

- said terminals each having a thickness dimension associated with and less than the preselected passageway dimension, each said terminal including the board-mounting section thereof and at least a portion of the body section thereof adjacent thereto being embossed laterally from the plane of the body section a selected distance, a remaining portion of the body section being disposed adjacent the inner housing wall, said outer housing wall having a portion staked into engagement with said embossed body portion of said terminal therby pressing said body section against said inner wall;
- whereby the terminals formed of thin stock are usable with the housing and stakable thereto, while the board-mount sections thereof remain accurately positioned with the terminal receiving holes.

5,836,793

FEMALE ELECTRICAL CONTACT TERMINAL OF THE REINFORCED-CAGE TYPE

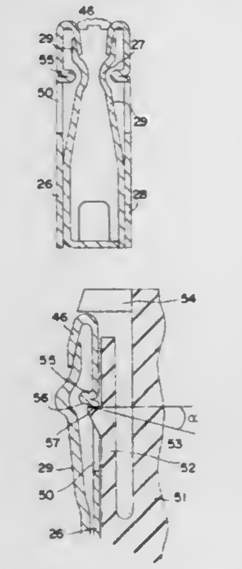
Georges Chaillot, Nogent le Roi, and Patrice Cappe, Faverolles, both of France, assignors to Framatome Connectors International, Courbevoie, France

Filed May 28, 1997, Ser. No. 864,695

Claims priority, application France, Jun. 3, 1996, 96/06785

Int. Cl.⁶ H01R *11/22*

U.S. Cl. 439—852 **6 Claims**



1. A female electrical contact terminal obtained from a single electrically conducting metal sheet having a rear part enabling it to be connected to an electrical conductor and a front part in the form of a cage comprising an end, two upper half-walls, two side walls provided with means for guiding a male contact during its insertion and with means for fixing said cage in connection housings, said fixing means comprising a window in each side wall, said window being adapted to receive a projection carried by a finger provided in an insulator of the connection housing, at least one edge of said window having a deformation defining a shoulder whose bearing surface area is substantially greater than a bearing surface area of the projection.

5,836,794

RETRACTABLE TROLLING MOTOR HOUSING FOR BOAT

William R. Krueger, New Berlin, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Sep. 30, 1997, Ser. No. 941,493

Int. Cl.⁶ B63H *5/12*

U.S. Cl. 440—54 **14 Claims**

1. A retractable housing apparatus for a boat trolling motor comprising:

- a bottom wall with a streamline surface;
- first and second generally vertical side walls connected to said bottom wall;
- an upstream opening formed in said apparatus for the passage of water in which the boat having the apparatus is floating;

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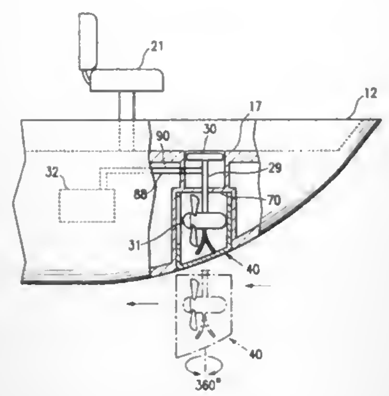


a downstream opening formed in said apparatus for the passage of water which enters through said upstream opening; and

a chamber formed above said bottom wall and between said side walls for receiving a trolling motor.

5,836,795
WATERCRAFT DRIVE WITH A RUDDER PROPELLER

Stefan Kaul, Mühlenweg 12, DE-56307 Harschbach, and Reinhold Reuter, Gartenstrasse 6, DE-56281 Schwall, both of Germany

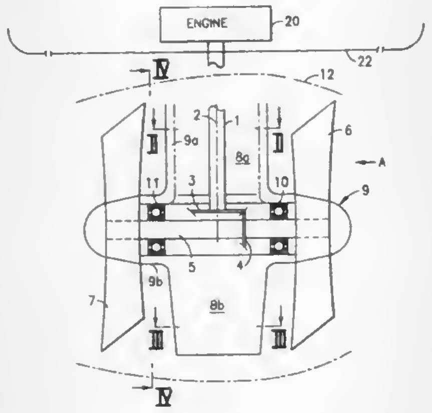
PCT No. PCT/EP95/04481, § 371 Date Apr. 14, 1997, § 102(e) Date Apr. 14, 1997, PCT Pub. No. WO96/15028, PCT Pub. Date May 23, 1996

PCT Filed Nov. 14, 1995, Ser. No. 817,472

Claims priority, application Germany, Nov. 15, 1994, 44 40 738.6

Int. Cl.^{6} B63H *1/18*

U.S. Cl. 440—66 **4 Claims**



1. A drive for a watercraft for travel on a body of water, said watercraft having a hull and a driving engine, a drive shaft operatively connected to said driving engine, a housing having a vertical section surrounding said drive shaft and a horizontal section, an angular gear having input means operatively connected to said drive shaft and output means, an output shaft operatively connected to said angular gear output means, said horizontal section circumscribing said angular gear and a length of said output shaft connected thereto, a first propeller mounted on one end of said output shaft outside of said horizontal section and a second propeller mounted on the other end of said output shaft outside of said horizontal section for rotation in unison, and a guiding device mounted between and spaced from the propellers, for reducing cavitation and increasing the efficiency of said drive, said guiding device comprising a plurality of blades one of which is integral with said housing vertical section, and at least another of which has an edge connected to said housing horizontal section and an opposite free edge.

5,836,796
FIELD EFFECT ELECTRON SOURCE, ASSOCIATED DISPLAY DEVICE AND THE METHOD OF PRODUCTION THEREOF

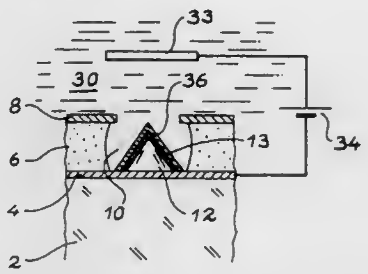
Joël Danroc, Grenoble, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Oct. 25, 1995, Ser. No. 548,039

Claims priority, application France, Nov. 8, 1994, 94-13372

Int. Cl.^{6} H01J *9/02*

U.S. Cl. 445—24 **12 Claims**



1. A method for production of a field effect electron source, comprising the steps of:

producing a structure having an electrically insulating substrate, at least one cathode conductor on said substrate, an electrically insulating layer covering each cathode conductor, and an electrically conductive grid layer covering the electrically insulating layer;

forming holes through the electrically conductive grid layer and the electrically insulating layer at each cathode conductor;

forming a microtip, in each of said holes, made from an electron emitting metallic material; and

covering each microtip with a main deposit of a carbon diamond based substance;

covering said main deposits with a secondary deposit of a metal;

wherein said step of covering each microtip includes the substep of forming said main deposits by one of electrophoresis and joint electromechanical deposition of at least a combination of metal and said carbon diamond based substance.

5,836,797
METHOD OF MANUFACTURING A FIELD EMISSION ARRAY

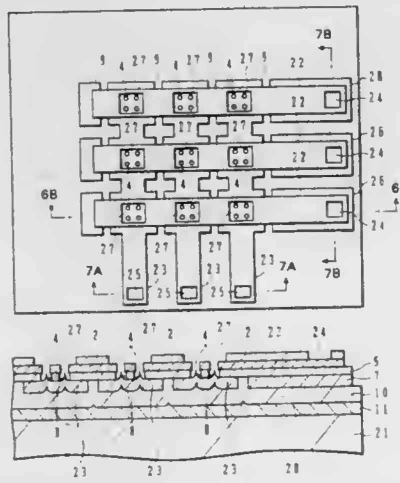
Toshihisa Suzuki, and Koji Ogata, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Japan

Filed Jul. 26, 1996, Ser. No. 687,759

Claims priority, application Japan, Jul. 27, 1995, 7-210986

Int. Cl.^{6} H01J *9/02*

U.S. Cl. 445—24 **10 Claims**



1. A method of manufacturing a field emission array, comprising the steps of:

a) providing a substrate having a gate layer and an insulating layer;

b) forming a hole through the gate layer;

c) forming a sacrificial layer over the gate layer, the sacrificial layer having a cusp thereon;

d) forming an electron emission layer on the sacrificial layer to provide a tip which is conformal to the cusp;

e) defining a space on the electron emission layer, which space is to be evacuated;

f) forming a plurality of slits in the electron emission layer within the space;

g) patterning the gate layer to provide a gate element in a vicinity of the tip and a contact electrode; and

h) patterning the electron emission layer to provide an electron emitter layer and a dummy layer under the contact electrode, the dummy layer being electrically isolated from the electron emitter layer by the slit.

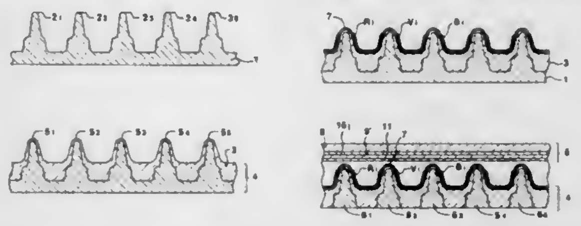
5,836,798
METHOD OF MAKING A PLASMA DISPLAY PANEL

Thierry L. A. Dannoux, Avon; Bernard Eid, LaGrande-Paroisse; Jean M. M. G. Pegouret, Paris, and Gilbert Dominique Pujol, Dammarie Les Lys, all of France, assignors to Corning Incorporated, Corning, N.Y.

Filed Aug. 27, 1996, Ser. No. 703,676

Int. Cl.^{6} H01J *9/02*

U.S. Cl. 445—24 **10 Claims**



1. A method of making an electrode/barrier rib structure for a plasma display panel comprising:

forming a metallic plate comprising a base area and a plurality of electrode/barrier rib preforms on said base area;

covering the preforms with a layer of dielectric material; and

removing said base area to form an electrode/barrier rib structure.

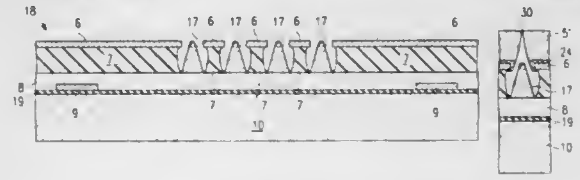
5,836,799
SELF-ALIGNED METHOD OF MICRO-MACHINING FIELD EMISSION DISPLAY MICROTIPS

Jules D. Levine, Dallas, and Kenneth G. Vickers, Whitesboro, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 6, 1996, Ser. No. 761,587

Int. Cl.^{6} H01J *9/02*

U.S. Cl. 445—24 **5 Claims**



1. A method of fabricating electron emission structures having enhanced emission characteristics comprising the steps of:

providing a substrate having electron emission structures thereon and having a layer over said electron emission structures, said layer having apertures in alignment with said electron emission structures; and

modifying said electron emission structures through said apertures with a directional ion milling beam.

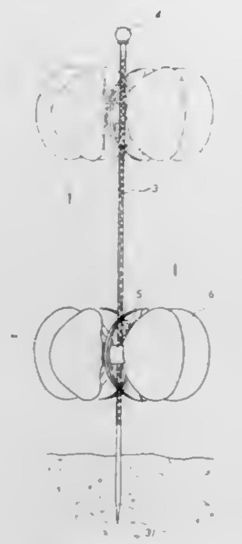
5,836,800
PINWHEEL

Chin-Hsiang Liu, 58, Ma Yuan West St., Taichung, Taiwan

Filed Apr. 3, 1997, Ser. No. 825,740

Int. Cl.^{6} A63H *1/00*

U.S. Cl. 446—236 **2 Claims**



1. A pinwheel comprising:

a rotating seat,

a screw rod having two opposite ends and passing through the rotating seat,

a head disposed on a top end of the screw rod,

a plurality of blades connected to the rotating seat.

the rotating seat having a center hole, a plurality of periphery recesses, a plurality of enlarged grooves, a round hole, and a plurality of blocking plates integral with the rotating seat, each blocking plate extending from the rotating seat adjacent to one of the periphery recesses,

each of the periphery recesses communicating with one of the enlarged grooves,

a plug having a guide plate,

the guide plate having a camber edge,

the screw rod having a screw recess to receive the camber edge,

the guide plate inserted into the round hole,

a spring inserted in the round hole,

a screw inserted in the round hole,

each of the blades having a post,

each of the posts inserted in one of the enlarged grooves, and

each of the blades inserted in one of the periphery recesses.

5,836,801
CLIMBING TOY DEVICE

Kuo Jung Lin, No. 100, Lane 175, Cheng Kung Road, Tainan, Taiwan

Filed Mar. 12, 1997, Ser. No. 815,204

Int. Cl.^{6} A63H *11/04*

U.S. Cl. 446—315 **2 Claims**

1. A climbing toy device comprising:

a) a ring;

b) a first climbing toy including a climbing mechanism disposed therein;

c) a rope including a first end connected to the ring and a second end connected to the climbing mechanism for permitting the first climbing toy to climb the rope towards the ring upon operation of the climbing mechanism;

d) a second climbing toy supported on the rope and freely movable therealong;

e) a string including a first end connected to the ring and a second end connected to the second climbing toy for positioning the second climbing toy on the rope at a location between the ring and the first climbing toy; and

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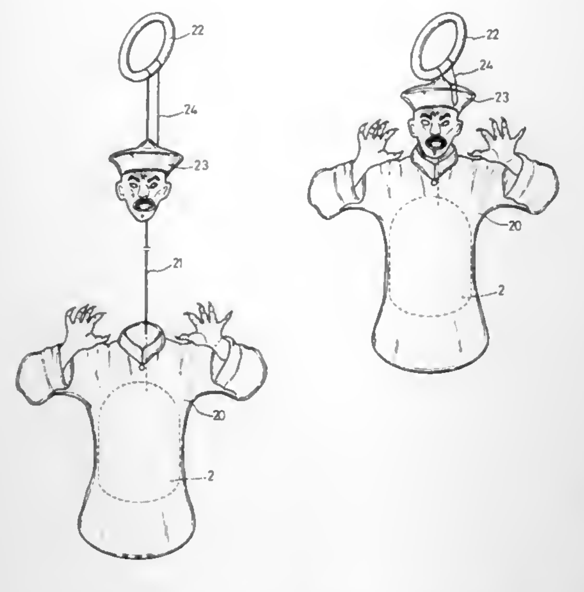
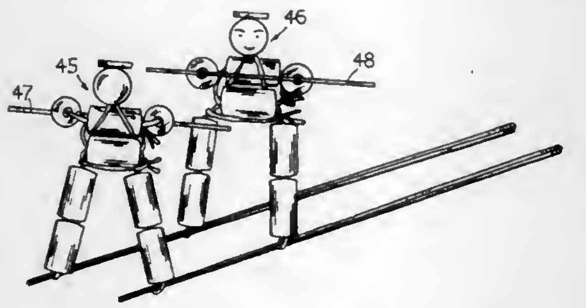


f) wherein when the first climbing toy climbs the rope towards the ring during operation of the climbing mechanism, the first climbing toy will eventually engage the second climbing toy, thereby causing both the first and second climbing toys to continue climbing the rope until the second climbing toy contacts the ring; thereby terminating the climbing action of both toys.

5,836,802
INTERACTIVE FIGURE TOY

David B. Harnett, 316 Miami Dr., Keswick, Ontario, Canada, L4P 2Z7
Filed Jul. 28, 1997, Ser. No. 901,007
Int. Cl.^{6} A63J *19/00*
U.S. Cl. 446—367 **18 Claims**



1. An interactive figure toy having at least one animated figure comprising,

a plurality of bead elements strung together with an elongated first resilient band under tension, said bead elements including a center bead element disposed in a substantially horizontal position and a first bead element located on one side of said center bead element, and a second bead element located on the other side of said center bead element,

a first elongated rod member secured to one end of said first resilient band extending outside of said first bead element,

a second elongated rod member secured to the other end of said first resilient band extending outside of said second bead element,

a restraining band tied over joints between said center bead element and said second bead element for retaining said first bead element and said second bead element to dispose downwardly relative to said center bead element and forming a substantially V-shaped configuration therewith,

a third bead element mounted on top of said center bead element,

a fourth bead element and a fifth bead element mounted in a substantially perpendicular manner to said third bead element by a second resilient band, said second resilient band having one end extending outside a front end of said fourth bead element, and a second end extending outside a front end of said fifth bead element,

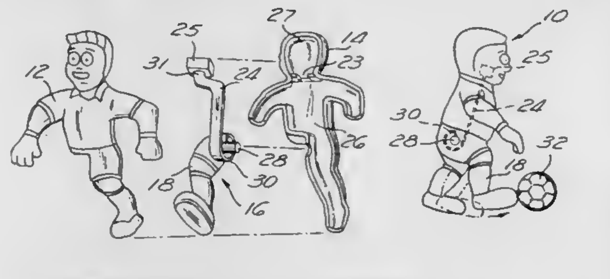
an elongated staff member mounted to said fourth bead element and fifth bead element and engaged with said one end and said second end of said second resilient band,

a spherical bead element mounted on top of said third bead element with a third resilient band, and

a hat member mounted on top of said spherical bead element and engaged with said third resilient band.

5,836,803
FIGURINE WITH MOVABLE LIMB

John Hamlin, Redondo Beach, Calif., assignor to Namkung Promotions Inc., Costa Mesa, Calif.
Filed Jun. 24, 1997, Ser. No. 881,704
Int. Cl.^{6} A63H *3/46;13/02;7/02*
U.S. Cl. 446—379 **32 Claims**



1. A figurine replica of a person comprising:

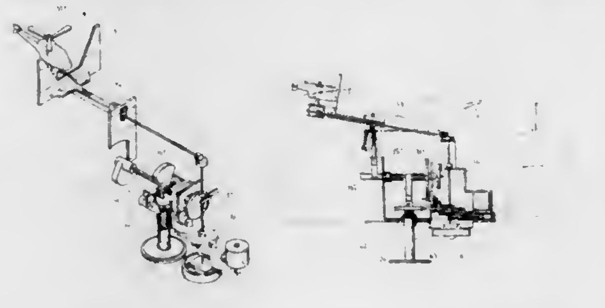
a) a front housing member replicating without moving parts the front portion of a body of a person except for one limb member;

b) a rear housing member secured to the front housing member and replicating without moving parts the rear portion of the body of the person of (a) above except for said limb member;

c) a movable limb member comprising a replication of a limb of a person and having a spring component projecting therefrom and retained between the housing members such that the limb member can be moved solely by hand contact therewith and the spring component returns the limb to its original position, with said front housing member, rear housing member, limb member, and spring component each of a size larger than a throat entry of a person.

5,836,804
TRANSMISSION APPARATUS OF A TOY MOTORCYCLE

Weh Ho Tsai, 8Fl., No. 113, Yu Jen Rd., Taipei, Taiwan
Continuation-in-part of Ser. No. 378,341, Jan. 26, 1995, Pat. No. 5,542,872. This application Nov. 3, 1995, Ser. No. 552,416
Int. Cl.^{6} A63H *17/21*
U.S. Cl. 446—440 **8 Claims**



1. A transmission apparatus of a toy motorcycle, comprising:

a transmission mechanism, a transmission casing for enclosing the transmission mechanism, a lifting mechanism, a rearward pushing mechanism and a laterally pushing mechanism, wherein:

the transmission casing is mounted on a chassis of a housing of the toy motorcycle;

the transmission mechanism includes a power source connected through a reducing gear set respectively to a driving shaft and a driven shaft, a bottom end of the driving shaft directly driving a rotary power wheel set, a top end of the driving shaft being coupled with a transmission shaft of the rearward pushing mechanism, one end of the driven shaft being coupled with a rotary disk, while the other end of the driven shaft is disposed with a first cam and a second cam, a front pushing block and a rear pushing block being respectively disposed on a front and a rear side of the rotary disk;

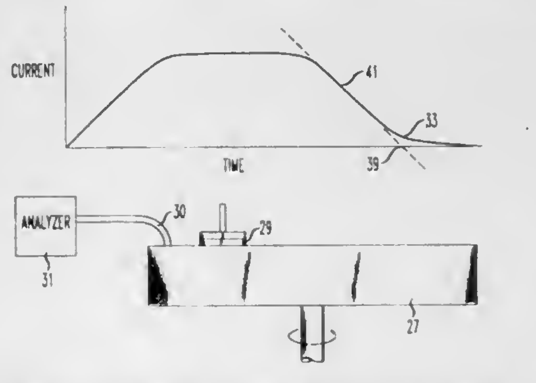
the lifting mechanism includes a lifting column extending outward and downward from the bottom of the transmission casing, a depression frame disposed at a top end of the lifting column and intermittently depressed by the first cam, and a plane disk disposed at a bottom end of the lifting column, the plane disk extending outward and downward when depressed to lift the transmission casing and when released from the depression, the plane disk is restored to lower the transmission casing;

one end of a transmission shaft of the rearward pushing mechanism is coupled with the driving shaft, while the other end of the transmission shaft extends into a lifting rod, one end of the lifting rod being coupled with a rearward pushing board, while the other end thereof being disposed with a decorative body and a pushing board, the second cam pushing the rearward pushing board to raise the lifting rod and thereby raise the pushing board so as to pivotally open a rear cover so as to show the decorative body;

the laterally pushing mechanism at least includes two laterally pushing members protruding respectively through two slots on two sides of the transmission casing, when pushed by the front and rear pushing blocks, the laterally pushing members laterally extending outward to pivotally open two lateral covers.

5,836,805
METHOD OF FORMING PLANARIZED LAYERS IN AN INTEGRATED CIRCUIT

Yaw Samuel Obeng, Orlando, Fla., assignor to Lucent Technologies Inc., Murray Hill, N.J.
Filed Dec. 18, 1996, Ser. No. 769,717
Int. Cl.^{6} B24C *1/08;* **B24B** *49/00*
U.S. Cl. 451—36 **4 Claims**



1. A method of polishing an integrated circuit comprising:

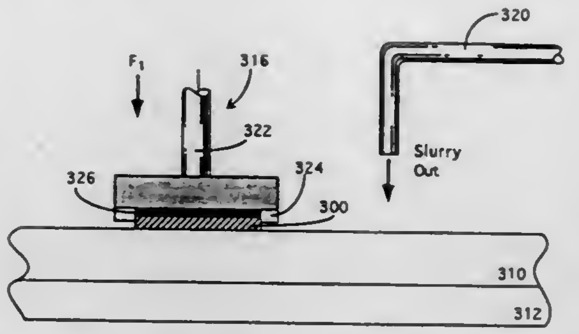
polishing a wafer having an overlying layer of metal with a polishing slurry, said polishing producing a waste slurry;

measuring the conductivity of said waste slurry; and

terminating said polishing operation after said conductivity begins to decrease.

5,836,806
SLURRIES FOR CHEMICAL MECHANICAL POLISHING

Kenneth C. Cadien, and Daniel A. Feller, both of Portland, Oreg., assignors to Intel Corporation, Santa Clara, Calif.
Division of Ser. No. 242,538, May 13, 1994. Pat. No. 5,516,346, which is a division of Ser. No. 146,923, Nov. 3, 1993, Pat. No. 5,340,370. This application Mar. 28, 1996, Ser. No. 623,487
Int. Cl.^{6} B24B *37/04*
U.S. Cl. 451—41 **30 Claims**



1. A method of chemically-mechanically polishing a film formed on a substrate, said method comprising the steps of:

placing said thin film in contact with a polishing pad;

providing movement to said polishing pad; and

depositing a slurry comprising:

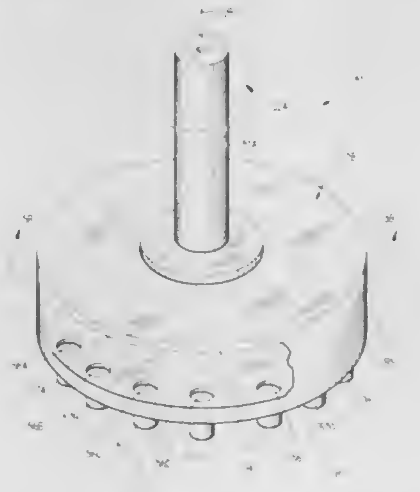
a fluoride salt;

an abrasive;

onto said polishing pad.

5,836,807
METHOD AND STRUCTURE FOR POLISHING A WAFER DURING MANUFACTURE OF INTEGRATED CIRCUITS

Michael A. Leach, 345 Sheridan #204, Palo Alto, Calif. 94306
Continuation of Ser. No. 287,639, Aug. 8, 1994, Pat. No. 5,607,341. This application Apr. 25, 1996, Ser. No. 638,056
Int. Cl.^{6} B24B *1/00*
U.S. Cl. 451—41 **63 Claims**



1. An apparatus for removing a portion of a wafer using relative motion between said block and said wafer, said apparatus comprising:

a plurality of blocks, each block having an eroding surface;

means for forcing said eroding surface of each of said blocks and said portion of said wafer against each other; and

means for providing relative motion between said plurality of blocks and said wafer;

wherein:

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said apparatus is devoid of means for forcing each block to rotate about an axis passing through said each block; and

said eroding surface has an area necessary for said eroding each block to remain in contact with at least three regions of slow material removal in said wafer, said area being smaller than an area of said wafer.

5,836,808

SLICING MACHINE WITH BUILT-IN GRINDER

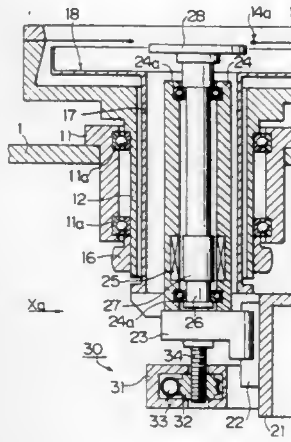
Susumu Sawafuji, and Nozomi Takai, both of Mitaka, Japan, assignors to Tokyo Seimitsu Co., Ltd., Tokyo, Japan

Filed Jun. 21, 1996, Ser. No. 667,791

Claims priority, application Japan, Jun. 30, 1995, 7-186711

Int. Cl.^{6} B24B *27/06;7/22*

U.S. Cl. 451—70 **7 Claims**



1. An inner diameter saw slicing machine with built-in grinder, comprising:

a doughnut-shaped blade provided with an edge formed at an inner diameter thereof and rotated for slicing an ingot into thin sheets; and

a grinding wheel disposed within the blade, its rotational center being eccentric in a slice feed direction of the ingot with regard to a rotational center of the blade, the grinding wheel being rotated for grinding a cutting face of the ingot.

5,836,809

APPARATUS AND METHOD FOR CLEANING LARGE GLASS PLATES USING LINEAR ARRAYS OF CARBON DIOXIDE (CO_2) JET SPRAY NOZZLES

Thomas J. Kosic, Redondo Beach, Calif., assignor to Eco-Snow Systems, Inc., Livermore, Calif.

Filed Oct. 7, 1996, Ser. No. 727,809

Int. Cl.^{6} B24C *3/00*

U.S. Cl. 451—89 **20 Claims**

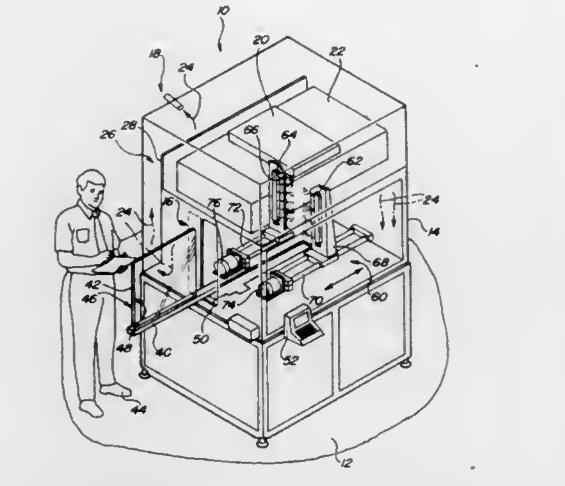
1. An apparatus for cleaning a glass plate having first and second major surfaces, comprising:

an enclosure for maintaining a cleaning environment in which the glass plate is decontaminated;

means for vertically supporting the glass plate within the enclosure with the first and second major surfaces substantially perpendicular to a ground plane;

a pressurized supply of liquid carbon dioxide; and

nozzle means, located within the enclosure and coupled to the pressurized supply of liquid carbon dioxide, for simultaneously directing carbon dioxide snow particles against the first and second major surfaces of the glass plate for removing contamination therefrom, whereby the carbon dioxide snow particles sublime within the cleaning environment.



5,836,810

ABRADING OR POLISHING DEVICE

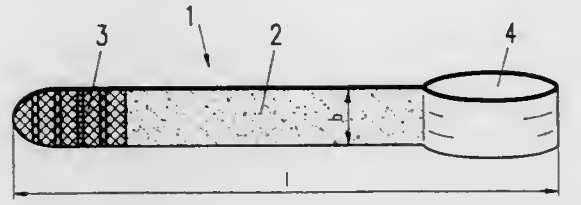
Thomas Åsum, Fridkullagatan 26, Göteborg, Sweden

Filed Dec. 27, 1994, Ser. No. 364,491

Claims priority, application Sweden, Jan. 4, 1994, 9400017

Int. Cl.^{6} B24D *15/04;* **A61C** *15/00*

U.S. Cl. 451—526 **21 Claims**



1. A device which may be resiliently extended in use for abrading tooth surfaces, said device comprising:

an abrasive section in the form of a strip, which is substantially inelastic in a longitudinal direction, and which is coated with an abrasive layer; and

an elastic section connected to the abrasive section at one end and which may be held stationary at the other end thereof.

5,836,811

AIR TOOL SUSPENSION DEVICE

Knut Christian Schoeps, Tyresö, Sweden, assignor to Atlas Copco Tools AB, Nacka, Sweden

Filed Apr. 10, 1997, Ser. No. 817,232

Claims priority, application Sweden, Oct. 14, 1994, 9403504

Int. Cl.^{6} A22B *3/02*

U.S. Cl. 452—62 **10 Claims**

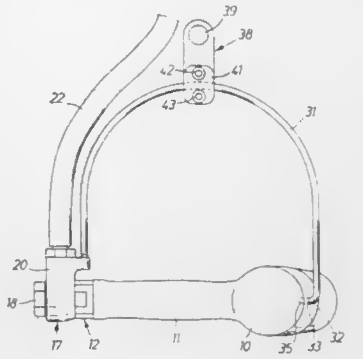
1. A suspension device for universally movably supporting a pneumatic power tool having a housing (**10**) and a tool handle (**11**), the suspension device comprising:

an arc-shaped yoke (**31**); and

a slip member (**38**) movably guided on said yoke (**31**) and connectable to an overhead balancing device, wherein:

a first end (**32**) of said yoke (**31**) comprises a swiveled pivot (**33**, **35**) for mounting to the tool housing (**10**) at a location opposite to the tool handle (**11**), and

a second end (**34**) of said yoke (**31**) is rigidly connected to a rotatable inlet part (**20**) of a right angle air supply conduit swivel connection (**17**) to be mounted at an outer end of the tool handle (**11**), said inlet part (**20**) being rotatable in a plane substantially transverse to a longitudinal direction of the tool handle (**11**).



5,836,812

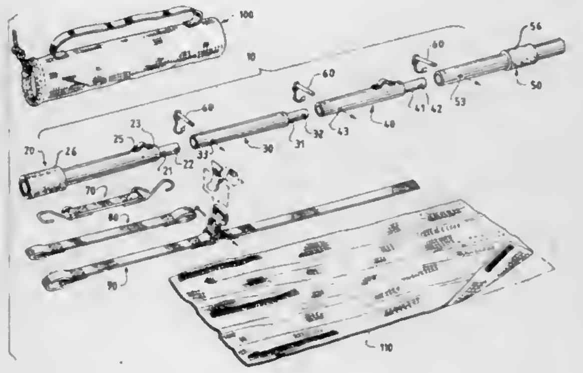
PORTABLE ANIMAL CARCASS CARRIER

Timothy J. Brackett, R.R. 1, Box 119C, Oakley, Ill. 62552

Filed Sep. 12, 1997, Ser. No. 928,614

Int. Cl.^{6} A22B *15/00*

U.S. Cl. 452—187 **8 Claims**



1. A portable carrier for an animal carcass having two hind legs, two front legs, and a head, the carrier comprising:

(a) a multi-section pole having a front end and a rear end from which the carcass is suspended when the ends of the pole are supported on the shoulders of two standing men, the pole having a length of about 5 to 15 feet, a pad at the rear end of the pole for cushioning the shoulder of the man supporting the rear end of the pole, and a pad near the front end of the pole for cushioning the shoulder of the man supporting the front end of the pole;

(b) a first strap having hooks at each end, the hooks adapted for inserting into the hind legs of the carcass, and the strap adapted for placement over and across the pole to suspend the hind legs of the carcass;

(c) a second strap having loops at each end, the loops adapted for connection to the front legs of the carcass, and the strap adapted for placement over and across the pole to suspend the front legs of the carcass; and

(d) a third strap having a loop at one end, the loop adapted for connection to the head of the carcass, and the strap adapted for placement over and across the pole to suspend the head of the carcass.

5,836,813

AIR CONDITIONER FOR VEHICLE

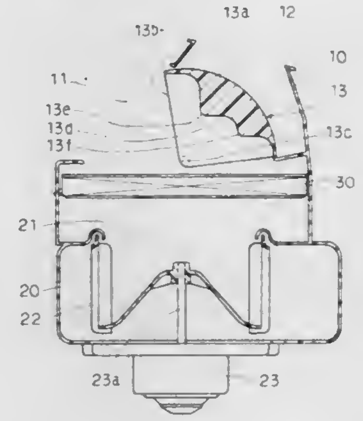
Manabu Miyata, Obu; Yuichi Shirota; Hisashi Tanaka, both of Anjo; Koji Ito, and Hikaru Sugi, both of Nagoya, all of Japan, assignors to Denso Corporation, Kariya, Japan

Filed Dec. 4, 1996, Ser. No. 760,677

Claims priority, application Japan, Dec. 5, 1995, 07-316915

Int. Cl.^{6} B60H *1/26*

U.S. Cl. 454—139 **8 Claims**



1. An air conditioner for a vehicle having a passenger compartment, comprising:

an air flow casing having a suction inlet and forming an air passage for introducing air sucked from said suction inlet toward said passenger compartment;

an air blowing fan disposed in said casing on a downstream air side of said suction inlet;

an inside air/outside air switching case disposed adjacently on an upstream air side of said suction inlet in communication with said suction inlet, said inside air/outside air switching case having an inside air introduction inlet for introducing air inside said passenger compartment thereinto and an outside air introduction inlet for introducing air outside said passenger compartment thereinto;

a rotary door rotatably disposed within said inside air/outside air switching case with a rotary shaft as its center, said rotary door having an arc-shaped circumferential wall for opening or closing said inside air introduction inlet and said outside air introduction inlet; and

an air flow guiding portion protruding from an inner surface of said circumferential wall of said rotary door for guiding air flow directed toward said suction inlet uniformly, said air flow guiding portion including a plurality of protruding portions formed in a corrugated shape of concavities and convexities.

5,836,814

DAMPER BLADE SYSTEM

Robert Ashley Cunningham, Jr., Argyle, Tex., assignor to NRG Industries, Inc., Carrollton, Tex.

Filed Sep. 16, 1996, Ser. No. 714,571

Int. Cl.^{6} F24F *13/15*

U.S. Cl. 454—234 **15 Claims**

1. A damper blade system for positioning proximate first and second ducts, comprising:

a housing having a first side and a second side opposing said first side;

a first damper for said first duct, comprising:

a first damper blade having first and second ends, said first end rotatably supported in said first side of said housing and coupled to a first damper gear, said second end rotatably supported in said second side of said housing;

a second damper blade having first and second ends, said first end rotatably supported in said first side of said housing and coupled to a second damper gear, said second end

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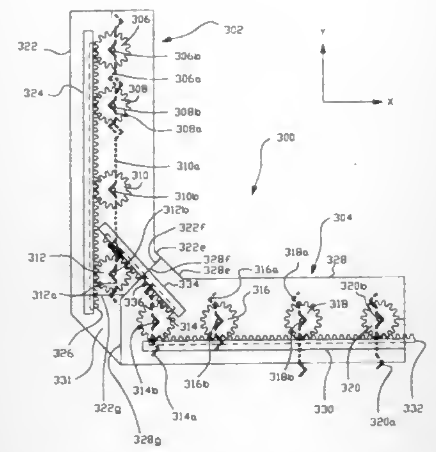


rotatably supported in said second side of said housing, said second damper blade disposed adjacent said first damper blade;

a first support means disposed on said first side of said housing; and

a first rack movably disposed in said first support means, said rack having a plurality of teeth engaging said first and second damper gears;

a second damper for said second duct and non-coplanar with said first damper, comprising:

a third damper blade having first and second ends, said first end rotatably supported in said first side of said housing and coupled to a third damper gear, said second end rotatably supported in said second side of said housing;

a fourth damper blade having first and second ends, said first end rotatably supported in said first side of said housing and coupled to a fourth damper gear, said second end rotatably supported in said second side of said housing, said fourth damper blade disposed adjacent said third damper blade;

a second support means disposed on said first side of said housing; and

a second rack movably disposed in said second support means, said second rack having a plurality of teeth engaging said third and fourth damper gears;

connecting means for coupling said first damper with said second damper; and

drive means, rotatably coupled to said first damper, said second damper, or said connecting means, for moving said first rack along said first support means, and for moving said second rack along said second support means.

5,836,815
METHOD AND SYSTEM FOR RADON MITIGATION

Paul V. Jennemann, 3220 Corporate Ct.-Ste. E, Ellicott City, Md. 21042

Filed Jun. 27, 1997, Ser. No. 884,652

Int. Cl.^{6} F24F *7/06*

U.S. Cl. 454—341 **20 Claims**

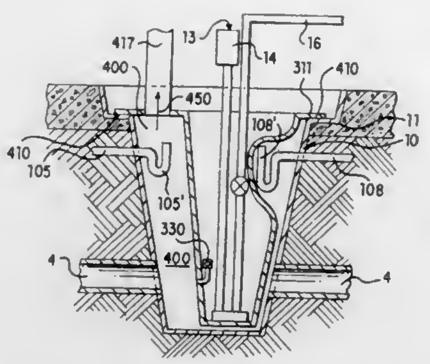
1. A method mitigating the migration of radon into a building structure having an in-ground collection basin formed in the foundation thereof and ground moisture drain conduits leading into said collection basin comprising the steps of:

(a) establishing in said basin a shoulder portion;

(b) establishing a liner member formed substantially of a gas impermeable material, said liner member having a sub-basin portion extending longitudinally from a laterally extended rim portion, said sub-basin portion having a predetermined dimensional configuration;

(c) placing said liner member within said basin, said liner member rim portion engaging said basin shoulder portion;

(d) establishing a plenum chamber between said basin and said liner member by forming a substantially airtight seal at said



engagement of said liner member rim portion and said basin shoulder portion, said plenum chamber receiving the discharge from said ground moisture drain conduit;

(e) establishing a gas exhaust conduit extending out of said building structure from said plenum chamber; and,

(f) generating an exhaust airflow from said plenum chamber through said gas exhaust conduit, whereby radon entering said plenum chamber is expelled out of said building structure.

5,836,816
GAME OF CHANCE

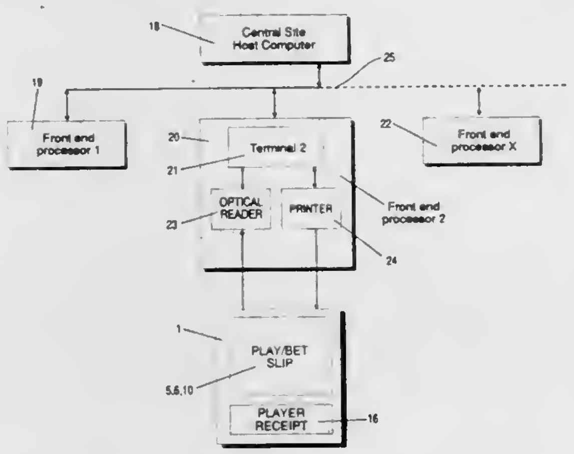
Wim Bruin; Edward E. E. Frietman, and Ton Grootens, all of The Hague, Netherlands, assignors to Tosso B.V., The Hague, Netherlands

PCT No. PCT/NL94/00033, § 371 Date Jul. 12, 1996, § 102(e) Date Jul. 12, 1996, PCT Pub. No. WO95/21425, PCT Pub. Date Aug. 10, 1995

PCT Filed Feb. 7, 1994, Ser. No. 676,119

Int. Cl.^{6} A63F *9/00*

U.S. Cl. 463—16 **18 Claims**



1. A method of playing a game of chance, wherein a plurality of m winning symbols is randomly drawn from a set of n play symbols (**1–16**), the method comprising the steps of:

each player selecting at least one stake indicia (**28**) from a first set of stake indicia (**27**), each stake indicia representing a predetermined collection of one or more combinations of play symbols from said set of n play symbols;

randomly drawing a group of m winning play symbols from said set of n play symbols (**1–16**);

comparing said combination of said m winning play symbols to the selected stake indicia;

selecting a further stake indicia from a second set of stake indicia (**32**), each further stake indicia representing a further combination of play symbols from said set of n play symbols not used in said first set of stake indicia (**27**) and one or more winning play symbols out of a predetermined collection of further play symbols (A–Z);

randomly drawing one or more said further play symbols from said predetermined collection of further play symbols (A–Z); and

comparing said further combination of said winning play symbols to the selected stake indicia.

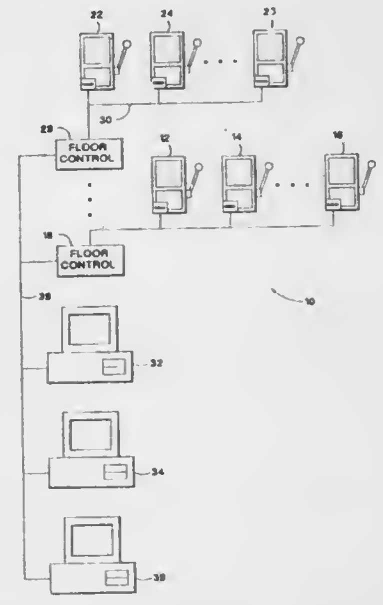
5,836,817
METHOD AND APPARATUS FOR OPERATING NETWORKED GAMING DEVICES

John F. Acres; Alec Ginsburg, and David Wiebenson, all of Corvallis, Oreg., assignors to Acres Gaming, Inc., Corvallis, Oreg.

Division of Ser. No. 322,172, Oct. 12, 1994, Pat. No. 5,655,961. This application Jun. 6, 1995, Ser. No. 465,717

Int. Cl.^{6} A63F *9/00*

U.S. Cl. 463—26 **29 Claims**



1. A method of operating gaming devices interconnected by a computer network to a host computer comprising:

selecting a plurality of the gaming devices;

using the network to track the amount of money played on the selected gaming devices;

allocating a predetermined percentage of the money played to a bonus pool;

issuing a command over the network including data establishing criteria to cause a bonus to be paid from the pool via one of said selected gaming devices upon the occurrence of a predetermined event;

storing the command in a memory connected to a controller associated with only one of the gaming devices;

transmitting data indicative of gaming device activity from the gaming device to the controller;

transmitting a pay command from the controller to the gaming device upon the occurrence of the predetermined event; and

paying the bonus via the gaming device responsive to receipt of the pay command.

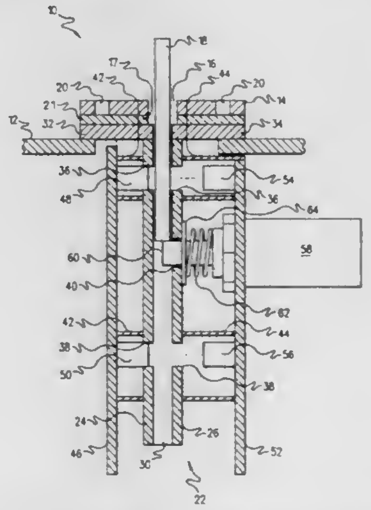
5,836,818
COIN ACCEPTOR INCLUDING MULTI-STATE VISUAL INDICATOR APPARATUS AND METHOD

Daniel A. Jones, Las Vegas, Nev.; Terry Adams, Coconut Creek, Fla.; Mark W. Duron, Ft. Lauderdale, Fla.; Yosef Har-Nov, Deerfield Springs, Fla.; John Stitt, Coral Springs, Fla., and James P. Suttle, Las Vegas, Nev., assignors to Progressive Games, Inc., Ft. Lauderdale, Fla.

Continuation-in-part of Ser. No. 328,498, Oct. 25, 1994, and Ser. No. 337,661, Nov. 9, 1994, which is a division of Ser. No. 40,925, Mar. 31, 1993, Pat. No. 5,364,104, which is a division of Ser. No. 800,631, Nov. 27, 1991, Pat. No. 5,288,077, which is a continuation-in-part of Ser. No. 361,276, Jun. 5, 1989, Pat. No. 5,078,405, which is a division of Ser. No. 214,934, Jul. 5, 1988, Pat. No. 4,861,041, which is a continuation-in-part of Ser. No. 182,374, Apr. 18, 1988, Pat. No. 4,836,553. This application Mar. 20, 1995, Ser. No. 408,267

Int. Cl.^{6} A63F *1/00;9/24*

U.S. Cl. 463—29 **16 Claims**



1. A coin acceptor including a multi-state visual display, comprising:

an acceptor for receiving a coin;

a first sensor operably connected with said acceptor for sensing placement of a coin into said acceptor;

a second sensor operably connected with said acceptor for sensing acceptance of a coin;

a microprocessor operably connected to said first and second sensors; and

a visual display operatively connected to said first and second sensors and said microprocessor and operative, pursuant to control instructions from said microprocessor, to display a first visual state corresponding to absence of a coin from said acceptor, a second visual state corresponding to placement of a coin into said acceptor, and a third visual state corresponding to acceptance of a coin.

5,836,819
IMAGE DISPLAY TYPE GAME APPARATUS

Shouhachi Ugawa, Gunma, Japan, assignor to Kabushiki Kaisha Sankyo, Gunma, Japan

Filed May 23, 1996, Ser. No. 652,039

Claims priority, application Japan, May 26, 1995, 7-128509

Int. Cl.^{6} A63F *7/30*

U.S. Cl. 463—30 **47 Claims**

1. An image display type game machine including an image display apparatus that can provide an image display of a play field, a flipped ball moving in the play field, and a variable display device that can have a visual representation of the display changed, said image display type game machine comprising:

game starter condition detection means for detecting establishment of a predetermined game starter condition;

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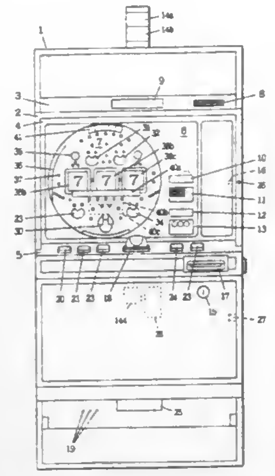


automatic ball-shoot display control means for providing an image display of said flipped ball automatically shooted and entered into said play field when said game starter condition detection means detects establishment of the game starter condition;
variable display control means for providing image display control of producing a display result after said variable display device begins to change the visual representations;
display result value award means for awarding a predetermined value to a player when a display result of said variable display device attains a predetermined particular visual appearance; and
value display control means for providing a display of an amount of value awarded to a player on said image display apparatus by said display result value award means,
wherein said value display control means controls displaying of a plurality of type of value images which differ in representation appearance in correspondence to the amount of value awarded to a player.

5,836,820

APPARATUS FOR DAMPING TORSIONAL VIBRATIONS

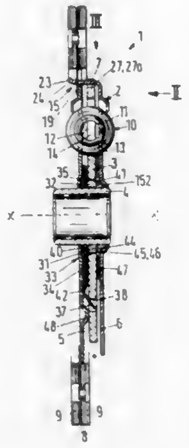
Wolfgang Reik, and Klaus Steeg, both of Bühl, Germany, assignors to Luk Lamellen Und Kupplungsbau GmbH, Bühl, Germany

Filed Nov. 7, 1994, Ser. No. 335,575

Claims priority, application Germany, Nov. 5, 1993, 43 37 723.8

Int. Cl.⁶ F16D *3/12*

U.S. Cl. 464—68 **41 Claims**



1. Apparatus for transmitting torque and for damping vibrations of transmitted torque, comprising: at least one damper including at least one input component and at least one output component rotatable with and relative to said input component about a common axis; and energy storing means interposed between said input and output components for yieldably opposing rotation of said input and output components relative to each other, at least one of said components including at least one substantially disc-shaped torque transmitting member of sheet material, said member being of one piece with a first end of each of a plurality of elongated resilient portions which are deformable in the direction of said common axis and form part of a friction generating device, said resilient portions having second ends and said at least one component further including portions extending substantially in a circumferential direction of said member and each connecting the second end of one of said resilient portions with the second end of at least one other resilient portion.

5,836,821

ELASTIC COUPLING FOR STEERING APPARATUS

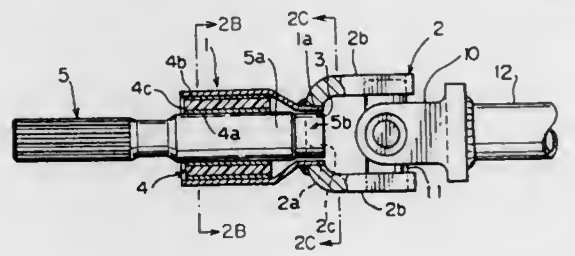
Masayoshi Yamada; Kenji Hoshino, and Isao Fujiu, all of Gunma-ken, Japan, assignors to Kabushiki Kaisha Yamada Seisakusho, Gunma-ken, Japan

Filed Mar. 10, 1997, Ser. No. 816,071

Claims priority, application Japan, Mar. 13, 1996, 8-56248

Int. Cl.⁶ F16C *3/03;3/76*

U.S. Cl. 464—89 **4 Claims**



1. An elastic coupling for a steering apparatus, comprising:
a thin-walled tubular member having an insertion joining portion;
a joint arm (2) which is inserted onto and fixed to said insertion joining portion;
an engaging through hole portion formed in the insertion joining portion in the region of said joint arm for joining said tubular member and said joint arm;
an elastic bearing member fitted to an inner periphery of said tubular member; and
a shaft fitted in said tubular member through said elastic bearing member and adapted to abut against an inner peripheral surface of said engaging through hole portion when said shaft is rotated by more than a predetermined rotating angle.

5,836,822

CONSTANT VELOCITY UNIVERSAL JOINT

Satoru Kudo; Shouichi Nakao; Takeshi Kayano; Tsutomu Kawakatsu, and Atsushi Nagaoka, all of Mooka, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

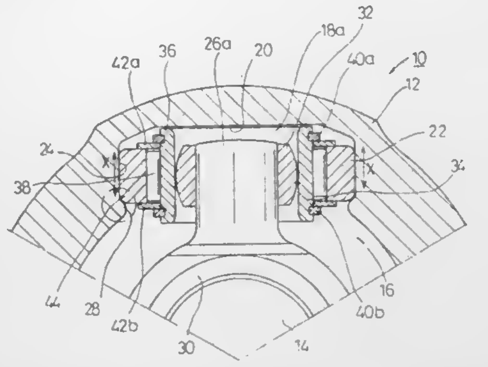
Filed Jan. 31, 1997, Ser. No. 791,559

Claims priority, application Japan, Feb. 1, 1996, 8-016920

Int. Cl.⁶ F16D *3/205*

U.S. Cl. 464—111 **10 Claims**

1. A constant velocity universal joint comprising:
a cylindrical outer member coupled to one transmitting shaft and having, on an inner circumferential surface, a plurality of guide grooves spaced apart from each other by a predetermined spacing and extending along an axial direction, and an inner member comprising trunnions coupled to a second transmitting shaft and inserted into an opening inner space of said outer member, each of said guide grooves having a first plane section and a second plane section, said second plane section having a linear cross section substantially perpendicular to said first plane section;



outer rollers each having an outer circumferential surface having a linear cross section corresponding to said second plane section of said outer member, each of said outer rollers being displaceable along said second plane section in a direction substantially perpendicular to said axial direction;
holders for holding said outer rollers on said trunnions, each of said holders having an upper end capable of abutting against and being separated from said first plane section by displacement of said outer rollers;
expanded sections on the outer member formed adjacent to said second plane sections, each of said expanded sections having at lest one of a curved and flat configuration and protruding toward each of said trunnions; and
curved sections having a curved configuration at one end in an axial direction of said outer roller, and making point-to-point contact with each of said expanded sections.

5,836,823

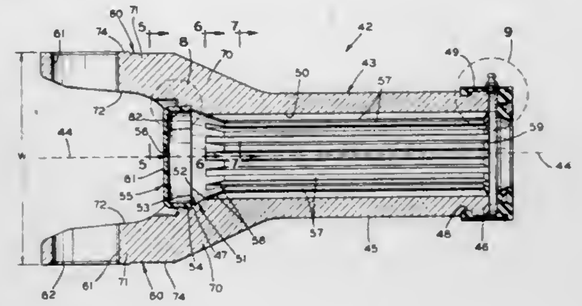
WEBBED YOKE FOR UNIVERSAL JOINT

James C. Shellaberger, Elida, Ohio, assignor to Dana Corporation, Toledo, Ohio

Filed Feb. 28, 1996, Ser. No. 607,934

Int. Cl.⁶ F16D *3/40*

U.S. Cl. 464—134 **13 Claims**



1. A slip yoke comprising:
a hollow body having a bore formed therethrough defining an inner cylindrical surface and having a counterbore formed at one end therein defining an inner frusto-conical surface contiguous with said inner cylindrical surface, said inner frusto-conical surface extending from a smaller diameter end that is connected to said bore to a larger diameter, said bore further includes a stepped region adjacent to said larger diameter end of said counterbore;
a plurality of splines formed on a portion of said inner cylindrical surface, and
a pair of yoke arms extending from said one end of said body and having aligned openings formed therethrough.

5,836,824

CONVOLUTED BOOT WITH COATED COLLAR REGIONS

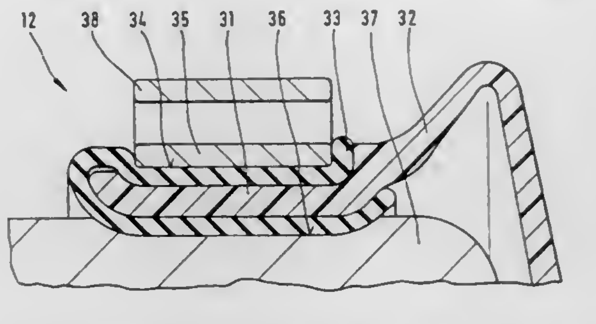
Herbert Konegen, Rösrath; Jürgen Kuhlit, Köln, and Peter Jünemann, Lohmar, all of Germany, assignors to GKN Automotive AG, Lohmar, Germany

Filed Apr. 18, 1997, Ser. No. 844,037

Claims priority, application Germany, Apr. 20, 1996, 196 15 861.3

Int. Cl.⁶ F16D *3/84*

U.S. Cl. 464—175 **9 Claims**



1. A convoluted boot made of thermoplastic elastomer for sealing an annular gap between two parts which are connected to one another so as to be rotationally fixed and articulatable relative to one another comprising:
a boot having two closed annular collar regions for being secured by a clamping element each on the two parts, and having a number of fold units extending therebetween, at least at one of said collar regions provided with a base body made of thermoplastic elastomer having inside and outside surfaces provided with a coating from a material having a greater elasticity than the material of said base body.

5,836,825

PROPELLER SHAFT FOR VEHICLE

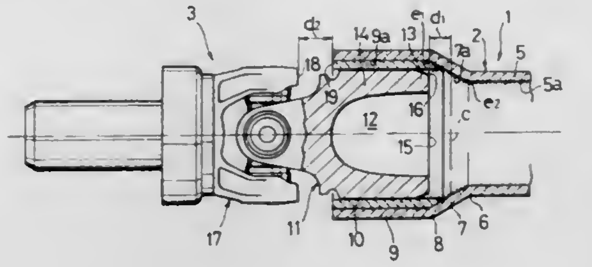
Yasuo Yamane, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 26, 1996, Ser. No. 773,349

Claims priority, application Japan, Dec. 28, 1995, 7-342315

Int. Cl.⁶ F16C *3/00*

U.S. Cl. 464—181 **3 Claims**



1. A propeller shaft for a vehicle, comprising:
an FRP (fiber-reinforced plastic) tube; and
a joint having a cylindrical portion including a tapered cylindrical portion connected to at least one end of said FRP tube,
said FRP tube including a cylindrical end portion into which said cylindrical portion of said joint is press-fitted, and an intermediate tubular portion which has a tapered inner peripheral surface continuously formed at a large-diameter end thereof to a terminal end of an inner peripheral surface of the cylindrical end portion and which is formed in a helical winding manner,
wherein said intermediate tubular portion is formed as a portion which is to be broken at the time of collision of the vehicle, and said cylindrical portion of said joint is formed as a breaking member which collides against the tapered inner

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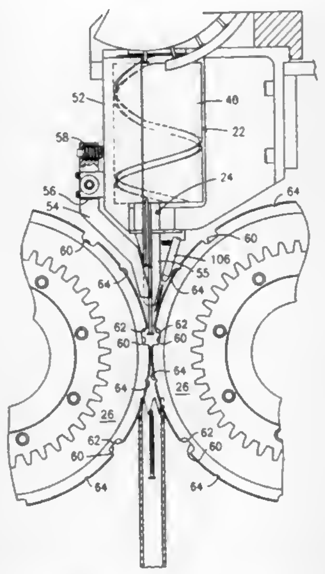
peripheral surface of said intermediate tubular portion by sliding in response to a shock load.

5,836,826
MACHINE FOR MAKING STAR NAILS

John Haraminac, North Royalton, Ohio, assignor to Star Technologies, Inc., Hinesville, Ga.
Filed Jan. 14, 1997, Ser. No. 782,405
Int. Cl.^{6} B21G *3/00*
U.S. Cl. 470—117 **7 Claims**



1. A machine for making nails having a star-shaped transverse cross-section, said machine including a bowl feeder that performs a hopper function and that delivers nails having flat heads and a substantially circular transverse cross section in sequential fashion to a nail discharge station, comprising:

a discharge chute disposed between said bowl feeder and an indexer means for delivering nails in single file to the indexer means;

a nail accelerating means for delivering nails from said discharge chute to said indexer means, said nail accelerating means positioned between said discharge chute and said indexer means;

said nail accelerating means including a pair of substantially parallel plates spaced apart from one another by a distance slightly greater than a diameter of a nail shank;

an air passageway formed in each plate of said substantially parallel plates, said air passageway being angled toward said indexer means so that pressurized air flowing therethrough provides a positive pressure behind a nail positioned between said substantially parallel plates thereby propelling the nail toward said indexer means;

the indexer means adapted to releasably and simultaneously engage a plurality of nails discharged by said discharge station;

said indexer means adapted to sequentially receive said nails in a first upright position and to invert said nails into an inverted position where respective heads thereof are positioned below respective points thereof, the indexer means further being mounted for rotation about an axis of rotation;

the indexer means further including a plurality of nail-receiving slots that are radially disposed with respect to said axis of rotation;

the indexer means further including a nail-receiving end and a nail-discharging end that are one hundred eighty degrees apart form one another;

a forming station including a plurality of rotatably mounted form rollers positioned in downwardly spaced relation to said indexer means;

a transfer means for displacing each nail away from said indexer means and delivering each nail to said forming station;

each form roller of said plurality of rotatably mounted form rollers having a plurality of circumferentially spaced apart nail head-receiving notches formed in its periphery to engage a head of each nail delivered to said forming station by said transfer means and to pull each nail into forming relation with said plurality of rotatably mounted form rollers;

each form roller further including a plurality of concavities formed in a periphery of each form roller in circumferentially spaced relation to said nail head-receiving notches, said concavities receiving work-hardened points of said nails to prevent said work-hardened points form being formed by said form rollers;

each form roller further including a bevel formed in the periphery of each form roller adjacent each nail head-receiving notch so that a short extent of each nail, adjacent its head, is not formed by said form rollers;

a nail collection means positioned below said forming station;

a motor means for operating said machine;

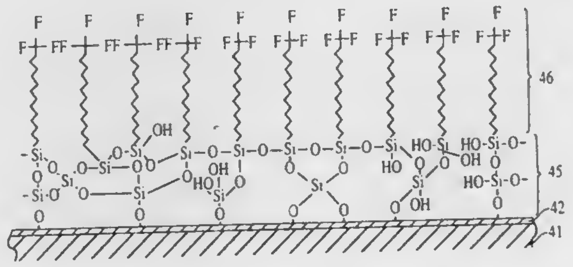
a drive means for interconnecting said indexer means and said motor means;

and a cooling means for cooling said form rollers;

whereby a nail having a formed shank drops into said collection means under the force of gravity when it is released by said plurality of forming rollers.

5,836,827
SELF-LUBRICATING DEVICE

Kazufumi Ogawa, Hirakata; Norihisa Mino, Settu, and Mamoru Soga, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Division of Ser. No. 458,703, Jun. 2, 1995, Pat. No. 5,731,077, which is a division of Ser. No. 145,669, Nov. 4, 1993, Pat. No. 5,425,989, which is a continuation of Ser. No. 840,050, Feb. 24, 1992, abandoned. This application Sep. 23, 1997, Ser. No. 935,551
Claims priority, application Japan, Feb. 27, 1991, 3-057902; Apr. 30, 1991, 3-098904; Apr. 30, 1991, 3-098908
Int. Cl.^{6} F16H *7/22*
U.S. Cl. 473—125 **3 Claims**

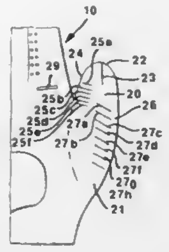


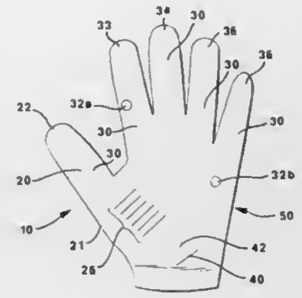
1. A self-lubricating device comprising a chemically adsorbed film as a surface layer of said device covalently bonded to said device by —Si— bonds, said chemically adsorbed film comprising fluorocarbon chain groups or hydrocarbon chain groups, wherein said device is a game ball.

5,836,828
GOLF TRAINING SYSTEM

Steven L. Sinton, Brooklyn Park, Minn., assignor to Precision Guesswork Company, Brooklyn Park, Minn.
Filed Aug. 13, 1996, Ser. No. 694,618
Int. Cl.^{6} A63B *69/36;* A41D *19/00*
U.S. Cl. 473—205 **18 Claims**

1. A golf training system for aligning upper and lower hands on a golf club comprising an upper hand golf glove having a palm, and a thumb, said glove including:





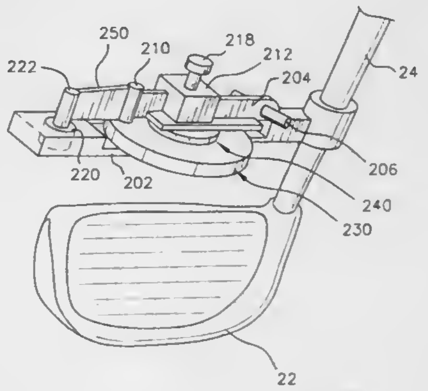
(a) hand positioning indicia for positioning the lower hand with respect to the upper hand, said hand positioning indicia comprising markings with an identification system located on an outer portion of the thumb;

(b) a first thumb alignment indicia on the back of the thumb for aligning the thumb with respect to the club; and

(c) club placement indicia across the palm for aligning the club across the palm of the upper hand.

5,836,829
GOLF SWING TRAINING DEVICE

Robert Van Cott, 21 Peachtree La., Mt. Sinai, N.Y. 11766, and John E. Campo, 2348 Cedar La., Secane, Pa. 19018
Filed Mar. 25, 1997, Ser. No. 823,832
Int. Cl.^{6} A63B *69/36*
U.S. Cl. 473—224 **28 Claims**



22. A golf swing training device, comprising:

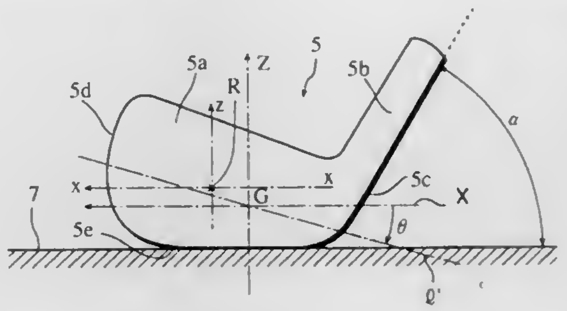
a golf club having a grip, a shaft, and a club head;

a pendulum, disposed in a plane perpendicular to an axis of said club shaft, said pendulum being rotatable about a pivot parallel to said axis of said club shaft, and said pivot being offset from said club shaft outward toward said outer end of said club head; and

means for generating an audible indication of straight orientation of a club face of said club head, at point in a swing path where a ball would be in a drive swing.

5,836,830
GOLF CLUB HEAD

Masahide Onuki, Miki; Masaya Tsunoda, Akashi, and Kazuo Asano, Kobe, all of Japan, assignors to Sumitomo Rubber Industries, Ltd., Kobe, Japan
Filed Sep. 24, 1996, Ser. No. 719,965
Claims priority, application Japan, Sep. 25, 1995, 7-246302; Jun. 18, 1996, 8-157291
Int. Cl.^{6} A63B *53/04*
U.S. Cl. 473—349 **8 Claims**



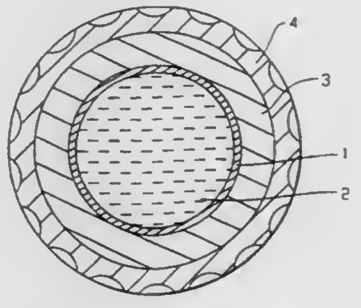
1. A golf club head, comprising:

a weight distribution which creates a principal axis of inertia intersecting an X axis on an XZ plane at a most acute angle among three principal axes of inertia perpendicular with each other at an angle between 10° and 40°,

wherein when the golf club head is placed on a plane with a predetermined loft angle and coordinate axes are arranged with a center of gravity of the golf club head as an origin, a Z axis is an axis perpendicular with the plane, the X axis is an axis perpendicular with the Z axis and parallel with a tangent of a midpoint of a face of the golf club head, and a Y axis is an axis intersecting the X axis and the Z axis at right angles.

5,836,831
GOLF BALL

Lawrence E. Stanton, Stoughton; Walter L. Reid, Jr., Mattapoisett; Stephen K. Scolamiero, Bridgewater, and Jeffrey L. Dalton, North Dartmouth, all of Mass., assignors to Acushnet Company, Fairhaven, Mass.
Continuation-in-part of Ser. No. 615,346, Mar. 11, 1996. This application Aug. 2, 1996, Ser. No. 691,756
Int. Cl.^{6} A63B *37/08*
U.S. Cl. 473—354 **17 Claims**



1. A wound golf ball comprising:

(a) a liquid filled center;

(b) a layer of windings surrounding said liquid filled center; and

(c) a cover wherein said liquid filled center comprises a center core shell, said center core shell comprising a polyether-amide block copolymer and having a seal on a portion of the outer surface thereof.

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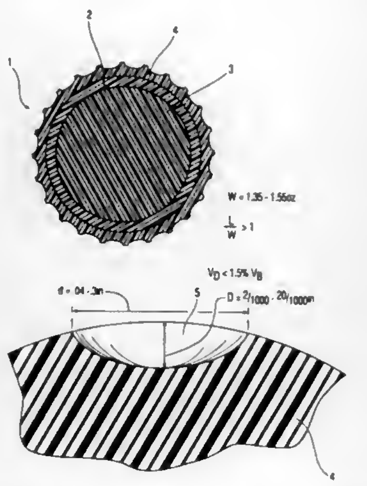
5,836,832
GOLF BALL

Herbert C. Boehm, Norwell, Mass.; William E. Morgan, Barrington, R.I.; Steven Aoyama, Marion, Mass.; Dean A. Snell, Acushnet, Mass.; Steven M. Gosetti, Providence, R.I., and Samuel A. Pasqua, Jr., Bristol, R.I., assignors to Acushnet Company, Fairhaven, Mass.

Filed Aug. 29, 1996, Ser. No. 705,025

Int. Cl.^{6} A63B *37/06;37/08;37/12;37/14*

U.S. Cl. 473—354 **15 Claims**



1. A golf ball having a volume and providing enhanced lofting characteristics for a low swing speed player which comprises:
- a core; and
- a cover having an exterior surface with a plurality of dimples formed thereon, wherein said dimples have a dimple volume of less than 1.5% of the total volume of the golf ball and wherein said golf ball has a weight from 1.35 ounces to 1.55 ounces and a lift-to-weight ratio greater than 1 during at least part of the ball's flight when hit at a speed of 150 ft/sec and a spin rate of 3000 rpm.

5,836,833
GOLF BALL

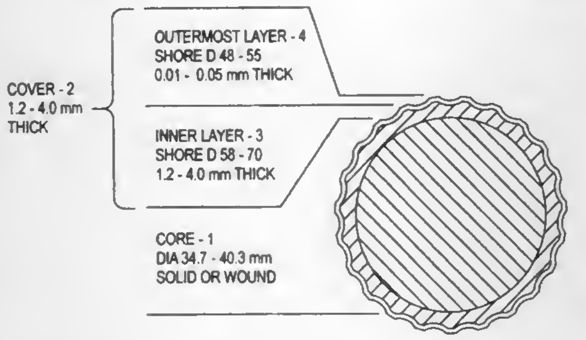
Hirotaka Shimosaka; Keisuke Ihara; Yutaka Masutani; Michio Inoue, and Atuki Kasasima, all of Chichibu, Japan, assignors to Bridgestone Sports Co., Ltd., Tokyo, Japan

Filed Feb. 26, 1997, Ser. No. 806,419

Claims priority, application Japan, Feb. 26, 1996, 8-063801

Int. Cl.^{6} A63B *37/12*

U.S. Cl. 473—365 **9 Claims**



1. A golf ball comprising, a core and a cover, the cover comprising at least an outermost layer and an inner layers wherein the outermost layer has a gage of 0.01 to 0.05 mm and a Shore D hardness of 48° to 55°, the inner laver having a gage of 1.2 to 4.0 mm and a Shore D hardness of 58° to 70°, and the outermost layer is a film selected from the group consisting of ionomer resins, polyurethane elastomers and ethylene-vinyl acetate copolymers.

5,836,834
GOLF BALLS

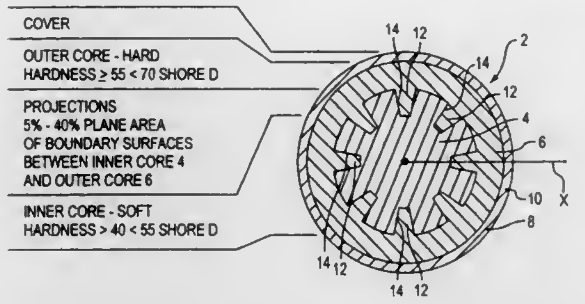
Yutaka Masutani; Keisuke Ihara; Hirotaka Shimosaka; Michio Inoue, and Atuki Kasasima, all of Saitama, Japan, assignors to Bridgestone Sports Co., Ltd., Tokyo, Japan

Filed Apr. 24, 1997, Ser. No. 847,582

Claims priority, application Japan, Apr. 24, 1996, 8-127857

Int. Cl.^{6} A63B *37/12;37/06*

U.S. Cl. 473—374 **5 Claims**



1. A three-piece golf ball comprising a two-layer solid core and a cover of ionomer resin which encloses the two-layer solid core, said two-layer solid core consisting of an inner core of low-hardness rubber and an outer core of high-hardness rubber disposed around the inner core with a boundary surface therebetween, wherein a plurality of projections are formed on the inner surface of the outer core such that the projections extend along an approximate radial direction, a plurality of depressions corresponding to the projections are formed in the outer surface of the inner core, the inner core and the outer core joined together such that the projections are closely inserted into the depressions, and the projections and the depressions are uniformly arranged over the entire boundary surface between the inner core and the outer core.

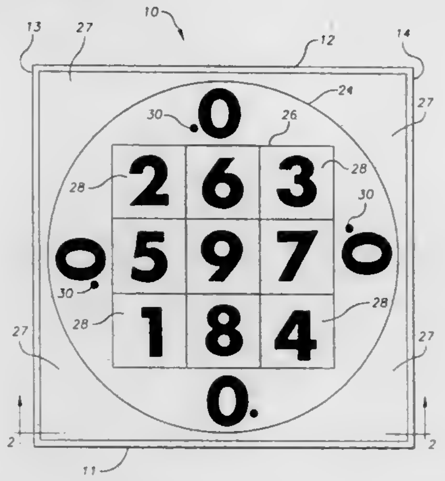
5,836,835
EXERCISE AND MEMORY GAME

Paul D. Grimsley, 1305 S. 3rd St., McAlester, Okla. 74501

Filed Oct. 14, 1997, Ser. No. 950,241

Int. Cl.^{6} A63B *67/00;* **G09B** *19/02*

U.S. Cl. 473—414 **4 Claims**



1. A combination math teaching and exercising game, comprising:
- a planar member having a circle adjacent its perimeter circumscribing a rectangle subdivided to form a plurality of juxtaposed equal area rectangular zones and forming an outer zone, within the circle, adjacent respective sides of the rectangle; and,
- a like plurality of single digit numerals in the respective zones whereby, a player when standing adjacent the circle and given a mathmatical problem to solve steps on the zone or zones in the order indicating the answer.

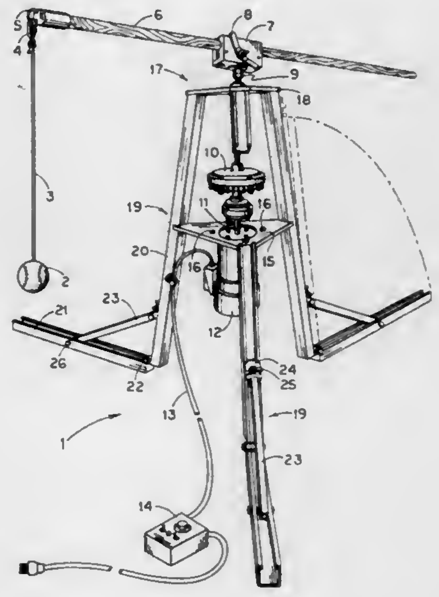
5,836,836
TETHERED BALL BATTING PRACTICE MACHINE

George Grimes, 213 Summerset, Bentonville, Ark. 72712

Filed Jan. 28, 1997, Ser. No. 790,052

Int. Cl.^{6} A63B *69/38*

U.S. Cl. 473—427 **5 Claims**



1. An improved batting practice device comprising:
- a frame having a plurality of foldable support legs providing stabilization to said frame, said support legs being in a substantially tripod configuration; each of said legs being substantially L-shaped and having a substantially vertical section and a horizontal base section when said device is in use; said base section having one end thereof pivotally attached to the lower end of said vertical section; brace means extending between said vertical and horizontal sections, and having one end thereof attached intermediate the ends of one of said vertical and horizontal sections and its other end releasably attached intermediate the ends of one of said vertical and horizontal sections, whereby said frame can be folded to a compact configuration when not in use;
- a laterally extended rotateable arm member supported by said frame,
- a tethered ball connected to one end of said arm member,
- and a driving apparatus supported by said frame and connected to said arm member and used for rotating said arm member about said frame.

5,836,837
APPARATUS FOR CIRCULAR COURT BALL GAME

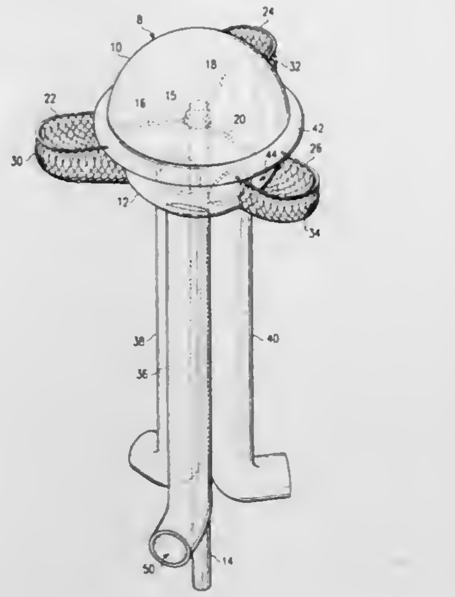
Gregory Alan Craig, Rowlett, Tex., assignor to Archworks, Inc., Dallas, Tex.

Filed Nov. 6, 1996, Ser. No. 792,547

Int. Cl.^{6} A63B *63/08*

U.S. Cl. 473—472 **5 Claims**

1. A tower structure comprising:
- (a) a center pole erected vertically;
- (b) a sphere-like and hollow domed surface affixed atop said center pole
- (c) a plurality of openings in said domed surface;
- (d) a plurality of goals attached to said domed surface with each goal placed above an opening into said surface;
- (e) a plurality of tubes attached to said surface each at a corresponding opening; and,
- (f) a net attached to each goal to provide a channel from said goal to the opening located under each goal.



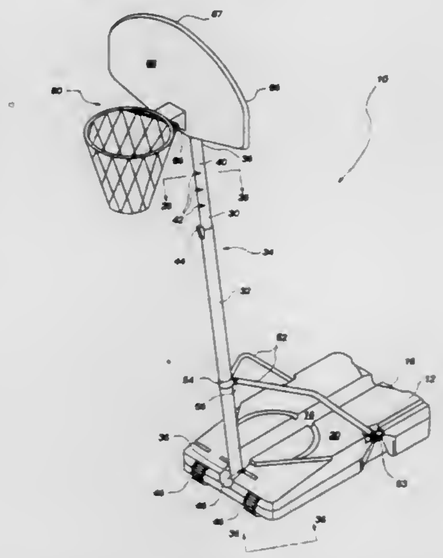
5,836,838
PORTABLE FOLDING BASKETBALL GOAL SYSTEM

Edward G. van Nimwegen, North Ogden; Brent R. Allen, East Ogden, and Richard C. Nordgran, South Roy, all of Utah, assignors to Lifetime Products, Inc., Clearfield, Utah

Filed Feb. 12, 1997, Ser. No. 799,426

Int. Cl.^{6} A63B *63/08*

U.S. Cl. 473—481 **47 Claims**



1. A portable basketball goal system capable of being manually manipulated into an extended position for use in game play and into a retracted position for compacted storage, comprising:
- a plurality of pole sections capable of assembly to form a telescoping pole of variable height having a base end and a backboard end;
- a base having an exterior contour forming a recess for receiving said pole, wherein said pole is pivotally connected to said base near the base end thereby allowing the movement of said pole between the extended position corresponding to said pole being disposed in generally upward direction suitable for use

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in game play and the retracted position corresponding to said pole being disposed in the recess of said base for compacted storage;

a support arm pivotally connected to said base thereby allowing movement of said support arm from the extended position for use in game play and the retracted position for compacted storage;

a slidable collar pivotally connected to said support arm and slidably engaging said pole, thereby allowing movement between said support arm and said pole, said collar and said support arm supporting said pole in the generally upward direction when the system is in the extended position;

a backboard connected to said pole near the backboard end; and

a rim assembly having a rim and connected to said backboard.

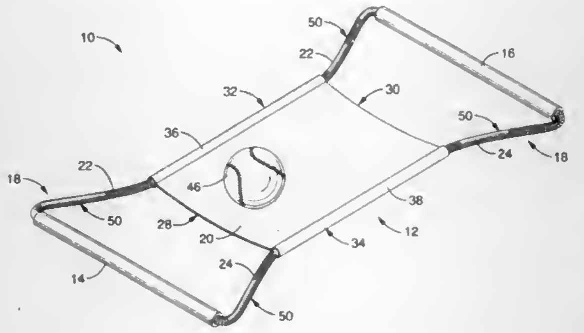
5,836,839
SLING AND BALL GAME APPARATUS

George H. Kay, 1300 Kingston Rd., Mt. Shasta, Calif. 96067

Filed Dec. 11, 1997, Ser. No. 988,805

Int. Cl.^{6} A63B *67/00*

U.S. Cl. 473—511 **34 Claims**



1. A sling for tossing and catching an object, comprising:

a. a first elongate, rigid handle having first and second ends;

b. a second elongate, rigid handle having first and second ends;

c. a first cord portion running between a first position on said first handle and a first position on said second handle;

d. a second cord portion running between a second position on said first handle and a second position on said second handle;

e. a flexible web panel;

f. means along a first edge of said web panel for secure, sliding receipt and retention of said first cord portion; and,

g. means along a second edge of said web for secure, sliding receipt and retention of said second cord portion.

5,836,840
HYDROPLANING DISK

Michael J. Bustamante, Southlake, and Jonathan J. Britt, Grapevine, both of Tex., assignors to Pungur Corporation, Southlake, Tex.

Filed Aug. 1, 1997, Ser. No. 905,071

Int. Cl.^{6} A63B *65/10*

U.S. Cl. 473—588 **33 Claims**

1. A hydroplaning disk comprising:

a bottom surface;

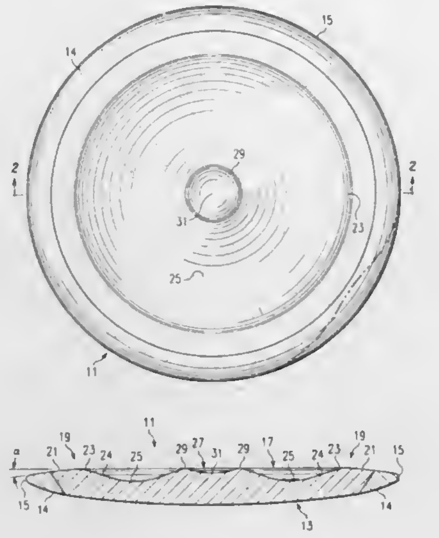
a deformable rim with a circular peripheral edge; and

a top surface joined to the bottom surface at the peripheral edge, the top surface including:

an aerodynamic rim section with a leading edge portion that extends inwardly and upwardly from the peripheral edge to an upraised annular peak portion, a trailing edge portion that extends inwardly and downwardly from the peak portion to a trough portion; and

an upraised central dome section of selected geometry integrated with the trough portion,

wherein the hydroplaning disk is projected for safely skimming or skipping upon and across the surface of a body of water at the air-water interface.



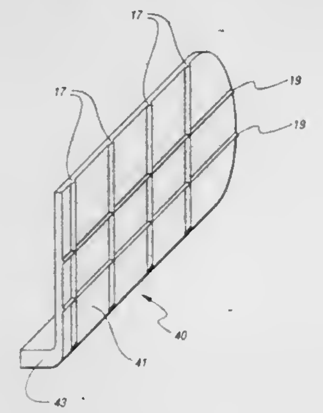
5,836,841
HOCKEY STICK BLADE WITH CONTROL FASCIA AND REPLACEABLE CONTROL FASCIA FOR USE THEREWITH

Barry M. Fell, 7124 Red Top Rd., Hummelstown, Pa. 17036

Filed Jun. 11, 1996, Ser. No. 661,620

Int. Cl.^{6} A63B *59/14*

U.S. Cl. 473—563 **1 Claim**



1. A control fascia adapted to be adhesively adhered to a face of a hockey stick blade, said control fascia comprising:

a blade side and a control side, said control side having a plurality of ridges having a vertical component and having a height H_r of from about 0.010 inch to about 0.075 inch, an average valley width of from about 0.01 inch to about 1.0 inch, and a granularity such that improved control of a scoring piece is obtained thereby, said control fascia supplied as a substantially planar sheet material to be applied to a face of said blade without requiring wrapping around said blade to effect mounting thereto, said substantially planar sheet material terminating at an edge thereof in a lip protruding in a direction away from said control side of said fascia, said lip adapted to cover at least a portion of the bottom surface of said hockey stick blade.

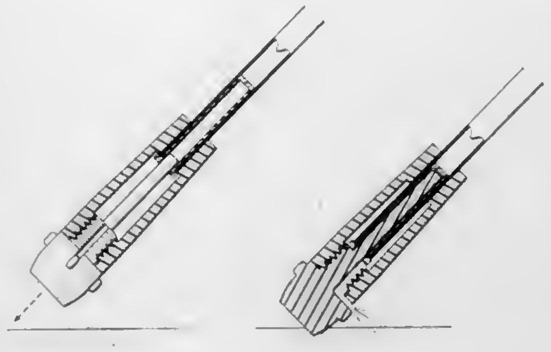
5,836,842
SCENT ARROW

Eddie Charles McLearan, Tulsa, Okla., assignor to McLearan Farms, Inc., Tulsa, Okla.

Filed Apr. 17, 1997, Ser. No. 843,868

Int. Cl.^{6} F41B *5/02*

U.S. Cl. 473—581 **1 Claim**



1. An improved scent dispensing arrow for use by a bow hunter for attracting game towards the hunter comprising:

an elongated tubular arrow shaft having a forward and a rearward end;

a formed rear member affixed to said rearward end of said arrow shaft; said rear member having a nock cut out at its rearward end to accommodate a bow string and a hole through its middle to allow securing a retrieval line to said arrow;

fletching affixed to the rearward end of said arrow shaft to provide aerodynamic stability to the arrow while in flight;

an elongated tubular cartridge having a rearward end and an opening at its forward end and having a lip or ring at its forward end, said cartridge affixed to said arrow shaft at its forward end such that said lip abuts against said forward end of said arrow shaft and extends radially outward slightly beyond the outer diameter of said arrow shaft;

a closure assembly comprised of two parts attachable to each other; said closure assembly comprising a moveable outer portion and a blunt pointed cap portion;

said moveable outer portion being a tubular segment having a first forward, a first rearward and a first middle segment, said first rearward segment having an inside diameter equal to said arrow shaft outside diameter yet allowing said moveable outer portion to be moveable along the forward end of said arrow shaft;

said first middle and first forward segments of said moveable outer portion of said closure assembly having an inner diameter greater than said outer diameter of said arrow shaft as well as said cartridge lip outer diameter;

said first forward segment of said moveable outer portion of said closure assembly further having threads on the inside thereof, said threads of a size to mate with threads on said blunt pointed cap portion of said closure assembly;

said blunt pointed cap portion of said closure assembly having a second forward, a second rearward and a second middle segment, said second rearward segment being a tubular piston with an outside diameter of a size to snugly fit inside said elongated tubular cartridge;

said second middle segment having a threaded portion, said threads being sized to mate with corresponding threads of said forward segment of said moveable outer portion;

a said second forward segment whose outside diameter is of a size equal to said moveable outer portion outside diameter and said second forward segment having a blunt end at a forward end;

said second middle segment threaded portion of said blunt pointed cap portion also having a narrow slit along the longitudinal axis thereof extending across the length of said second middle segment and into a rear end of said second forward segment where said slit extends radially outward along a rear surface of said second forward segment to an outer surface thereof.

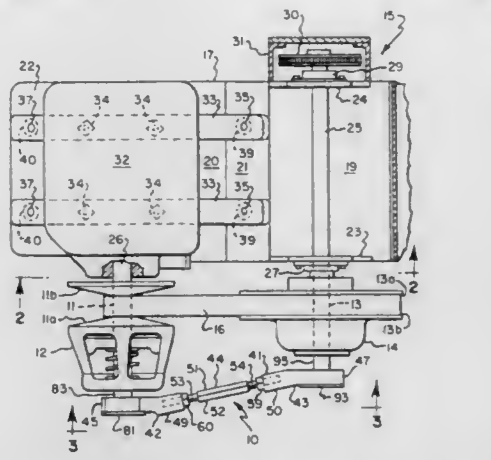
5,836,843
BRACE FOR OUTER ENDS OF VARIABLE PULLEY DRIVE

Dennis P. Richards, Lancaster, N.Y., assignor to Richards Racing Products, Inc., Buffalo, N.Y.

Filed Oct. 29, 1996, Ser. No. 744,731

Int. Cl.^{6} F16H *9/18;7/24*

U.S. Cl. 474—29 **42 Claims**



1. In a drive system having a pan, an engine having a driving shaft, said engine being resiliently mounted on said pan, a driven shaft rotatably mounted in bearings on said pan in substantially parallel relationship to said driving shaft, a first speed responsive variable diameter pulley coupled to said driving shaft, a first pulley shaft on said first pulley, a first outer end on said first pulley shaft, a second variable diameter pulley coupled to said driven shaft, a second pulley shaft on said second pulley, a second outer end on said second pulley shaft, and a belt between said first and second pulleys: wherein the improvement comprises a pulley brace mounted solely between said first and second outer ends of said first and second pulley shafts, respectively, said pulley brace comprising an elongated body, a first body end on said elongated body coupled solely to said first outer end of said first pulley shaft, and a second body end on said elongated body coupled solely to said second outer end of said second pulley shaft.

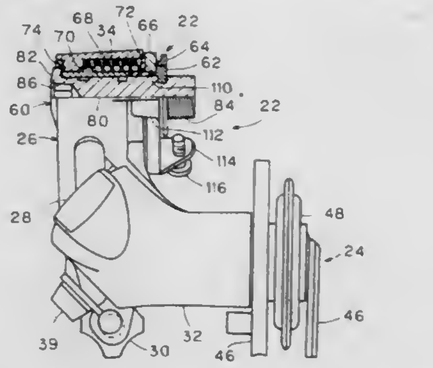
5,836,844
REAR DERAILLEUR FOR A BICYCLE

Yoshiyuki Yoshida, Amagasaki, Japan, assignor to Shimano Inc., Osaka, Japan

Filed May 15, 1997, Ser. No. 856,819

Int. Cl.^{6} F16H *9/00;* **F16B** *21/18*

U.S. Cl. 474—80 **34 Claims**



1. A bracket axle assembly for a rear derailleur, comprising:

a bolt having a shaft with a headed portion at a first end, a threaded portion at a second end and a groove formed adjacent said threaded portion; and

a locking ring having a first radially extending flange engaging said groove of said bolt and a second flange extending axially

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from said first flange to overlie a part of said shaft of said bolt, said locking ring having an outer surface with an outer width such that said locking ring extends outwardly from said shaft of said bolt to form an abutment.

5,836,845

HYDRAULIC PRESSURE CONTROL APPARATUS FOR AN AUTOMATIC TRANSMISSION

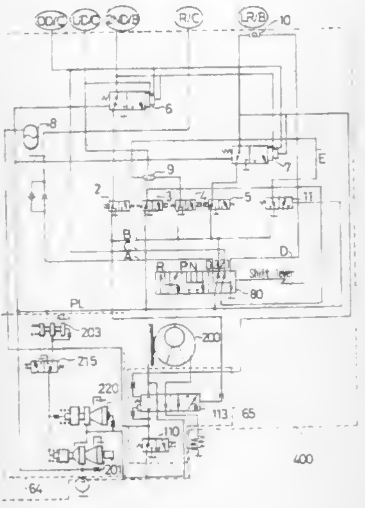
Shinya Sakaguchi, Kariya, and Akira Takagi, Obu, both of Japan, assignors to Denso Corporation, Kariya, Japan

Filed Jun. 5, 1997, Ser. No. 869,986

Claims priority, application Japan, Jun. 6, 1996, 8-144337; Mar. 18, 1997, 9-064964

Int. Cl.^{6} F16H *61/00*

U.S. Cl. 475—131 **5 Claims**



1. A hydraulic pressure control apparatus for an automatic transmission which comprises a first friction coupling element which is set into a coupling state when a vehicle moves forward and backward and a second friction coupling element which is set into a coupling state when the vehicle moves forward with a gear position different from that when the first friction coupling element is coupled, said hydraulic pressure control apparatus comprising;

a first pressure control device for controlling hydraulic pressure applied to said first friction coupling element, said first pressure control device providing low hydraulic pressure during its non-operated state;

a second pressure control device for controlling hydraulic pressure applied to said second friction coupling element, said second pressure control device providing high hydraulic pressure during its non-operated state; and

a changing device for changing a hydraulic pressure supplying source for said first friction coupling element from said first pressure control device to said second pressure control device when the vehicle moves backward.

5,836,846

ELECTRIC SWASHPLATE ACTUATOR FOR STIRLING ENGINE

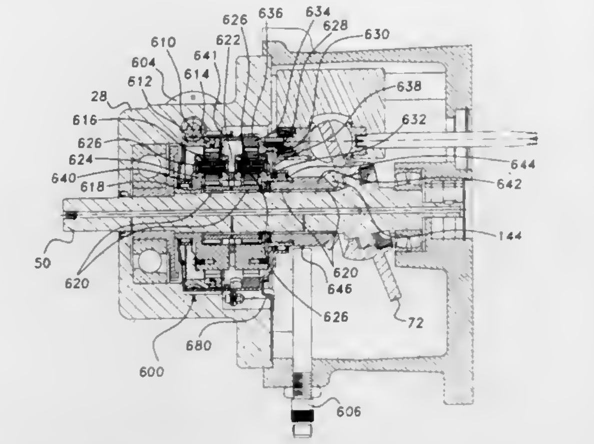
Lubomyr O. Hewko, Clarkston; David Bryan Hanes, and Randall Robert Gaiser, both of Ann Arbor, all of Mich., assignors to Stirling Thermal Motors, Inc., Ann Arbor, Mich.

Filed Aug. 28, 1996, Ser. No. 704,285

Int. Cl.^{6} F16H *35/08*

U.S. Cl. 475—149 **6 Claims**

1. A swashplate actuator for a Stirling engine having a drive shaft, a drive case, and a swashplate, for adjusting the incline angle of said swashplate with respect to said drive shaft, said actuator mechanism comprising:



a motor mounted to said drive case,

a first planetary gear set having: a first planetary gear set sun gear member, a first planetary gear set planet gear member, a first planetary gear set ring gear member, and a first planetary gear set planet gear carrier member, said first planetary gear set ring gear member coupled to and driven by said motor and said first planetary gear set planet gear carrier member fixed to said drive shaft, and

a second planetary gear set having: a second planetary gear set sun gear member, a second planetary gear set planet gear member, a second planetary gear set ring gear member, and a second planetary gear set planet gear carrier member, said second planetary gear set sun gear member coupled to said first planetary gear set sun gear member, said second planetary gear set ring gear member coupled to said drive case, and said second planetary gear set planet gear carrier member operably coupled to said swashplate, whereby said first and second planetary gear sets are operatively interconnected and actuation of said motor adjusts the incline angle of said swashplate with respect to said drive shaft.

5,836,847

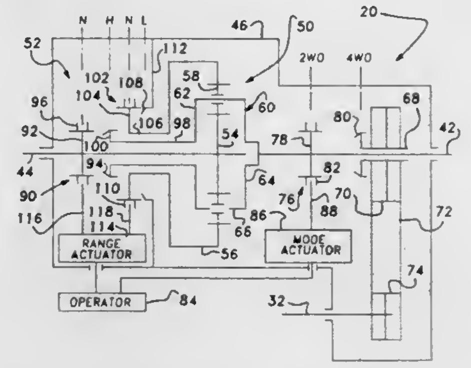
SYNCHRONIZED RANGE SHIFT FOR TWO-SPEED TRANSFER CASE

Larry A. Pritchard, Sterling Heights, Mich., assignor to New Venture Gear, Inc., Troy, Mich.

Filed Nov. 12, 1996, Ser. No. 748,252

Int. Cl.^{6} F16H *37/08*

U.S. Cl. 475—204 **15 Claims**



1. A transfer case for use in a four-wheel drive vehicle having a power source and front and rear drivelines comprising:

a housing;

an input shaft rotatably supported by said housing and driven by the power source;

a front output shaft rotatably supported by said housing and connected to the front driveline;

a rear output shaft rotatably supported in said housing and connected to the rear driveline;

means for transferring drive torque from said rear output shaft to said front output shaft:

a planetary gear assembly interconnecting said input shaft to said rear output shaft for delivering drive torque thereto, said planetary gear assembly having a sun gear fixed for rotation with said input shaft, a ring gear, and a planet carrier rotatably supporting a set of planet gears meshed with said sun gear and said ring gear;

a first range sleeve coupled for rotation with said input shaft and movable between a neutral position whereat said planet carrier is free to rotate relative to said input shaft and a high-range position whereat said first range sleeve couples said planet carrier for common rotation with said input shaft;

a second range sleeve coupled for rotation with said ring gear and movable between a neutral position whereat said ring gear is free to rotate relative to said housing and a low-range position whereat said range sleeve couples said ring gear to said housing; and

an actuator for moving said first and second range sleeves to establish one of a high-range drive mode, a low-range drive mode and a neutral non-driven drive mode, wherein said actuator is operable for locating said first range sleeve in its high-range position and said second range sleeve in its neutral position for establishing said high-range drive mode, wherein said actuator is operable for locating said first range sleeve in its neutral position and said second range sleeve in its low-range position for establishing said low-range drive mode, and wherein said actuator is operable for locating said first range sleeve in its neutral position and said second range sleeve in its neutral position for establishing said neutral non-driven mode.

5,836,848

TRANSMISSION FOR A FOUR WHEEL DRIVE VEHICLE WITH A TRANSVERSE ENGINE

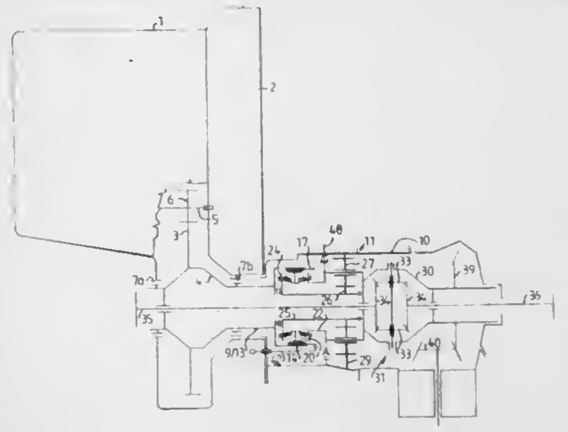
Grzegorz Janiszewski, Angered, and Kjell A. C. Bergström, Gothenburg, both of Sweden, assignors to AB Volvo, Gothenburg, Sweden

Filed Aug. 28, 1997, Ser. No. 919,263

Claims priority, application Sweden, Aug. 28, 1996, 9603117

Int. Cl.^{6} F16H *3/64*

U.S. Cl. 475—204 **6 Claims**



1. Transmission for a four wheel drive vehicle with a transversely mounted engine, comprising a basic gearbox (**1**) with a plurality of gear speeds between input and output elements (**4**), a supplementary gearbox (**11**) driveably coupled to the output element and being of planetary type with a planet gear carrier (**22**) which is joined to a differential housing (**30**) in a differential gear set (**31**) between two drive wheel axles (**35**,**36**) and with a gear (**39**) in an angle gear set and an engaging device (**14**,**17**,**20**,**24**) cooperating with the planetary gear set and having a first position in which the torque from the output element of the basic gearbox is transmitted without any change in rotational speed, and a second position in which the torque is transmitted with a change in rotational speed to the differential housing, characterized in that planet gears (**27**) of the planetary gear set mesh with a non-rotatably fixed ring gear (**29**) and that the engaging device, in its first position, releases a sun gear (**26**) of the planetary gear set and transmits torque from the output element (**4**) directly to the planet gear carrier (**22**) and, in its second position, locks the sun gear (**26**) to the output element (**4**) for transmitting torque via the planet gears to the planet gear carrier.

5,836,849

METHOD AND APPARATUS FOR TRANSMITTING TORQUE BY USING A CLUTCH OF AN AUTOMATIC PLANETARY TRANSMISSION AS A START CLUTCH IN A MOTOR VEHICLE

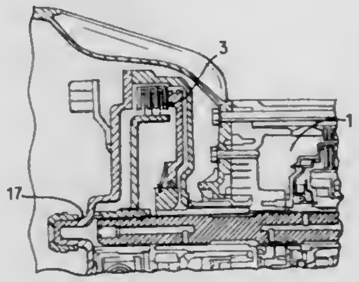
Detlef Mathiak, Munich, and Rahim Pour, Garching, both of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Germany

Filed Dec. 16, 1996, Ser. No. 766,034

Claims priority, application Germany, Dec. 14, 1995, 195 46 707.8

Int. Cl.^{6} B60K *17/00*

U.S. Cl. 475—269 **14 Claims**



1. An apparatus for transmitting torque in a motor vehicle comprising an automatically-shifted planetary transmission, a friction clutch arranged as a starting clutch to transmit a torque from an output shaft of a driving engine of the motor vehicle to said automatically-shifted planetary transmission, wherein an existing friction clutch of the automatically-shifted planetary transmission is used as the starting clutch.

5,836,850

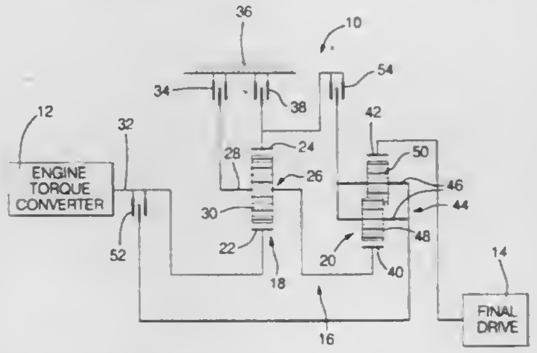
FOUR SPEED POWER TRANSMISSION

Sekhar Raghavan, and Kumaraswamy V. Hebbale, both of Troy, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 4, 1997, Ser. No. 869,260

Int. Cl.^{6} F16H *3/46*

U.S. Cl. 475—286 **2 Claims**



1. A power transmission comprising:

a power input shaft;

a power output shaft;

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a simple planetary gearset having a first sun gear continuously connected with said power input shaft, a first carrier assembly having a plurality of first pinion gears meshing with said sun gear and a first ring gear meshing with said first pinion gears;
a compound pinion planetary gearset having a second sun gear continuously connected with the first carrier assembly, a second ring gear continuously connected with said power output shaft for delivering power thereto and a second carrier assembly having a plurality of second pinion gears meshing with said second sun gear and a plurality of third pinion gears meshing with said second ring gear and with said second pinion gears;
a first clutch for selectively connecting said second carrier assembly with said power input shaft;
a second clutch for selectively connecting said second carrier assembly with said first ring gear for common rotation;
a first brake for selectively connecting said first ring gear with a stationary transmission housing; and
a second brake for selectively connecting said first carrier assembly with said transmission housing, said second clutch being engaged during the establishment of a lowest speed ratio, a highest forward speed ratio and a reverse speed ratio, said first clutch being engaged during two intermediate forward speed ratios and the highest speed ratio.

5,836,851

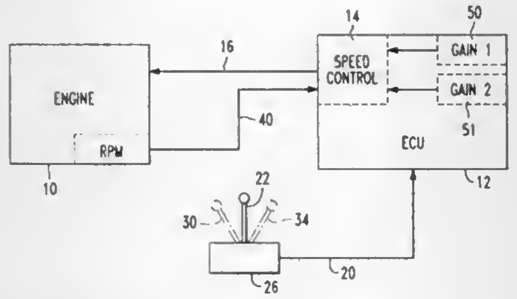
ENGINE CONTROL STRATEGY AS A FUNCTION OF GEAR SELECTOR MECHANISM

Mark A. Ruman, Fond du Lac, Wis., assignor to Brunswick Corporation, Lake Forest, Ill.

Filed Jul. 22, 1997, Ser. No. 898,693

Int. Cl.⁶ B60K *41/06*

U.S. Cl. 477—107 **18 Claims**



1. An engine control system, comprising:
a gear selection mechanism;
an engine control device having a first input signal representative of a position of said gear selection mechanism and a second input signal representative of the actual speed of said engine;
an engine speed controller, connected in signal communication with said engine control device, for maintaining the speed of said engine at a selected magnitude by comparing said actual speed to said selected magnitude and affecting the fuel flow to said engine as a function of a selected gain factor and the difference between said actual speed and said selected magnitude;
means, connected in signal communication with said engine speed controller, for storing a first gain factor;
means, connected in signal communication with said engine speed controller, for storing a second gain factor; and
means, connected in signal communication with said engine speed controller, for choosing said selected gain factor from said first and second gain factors as a function of a change of said position of said gear selection mechanism.

5,836,852

CONTROL MECHANISM FOR AUTOMATIC TRANSMISSION

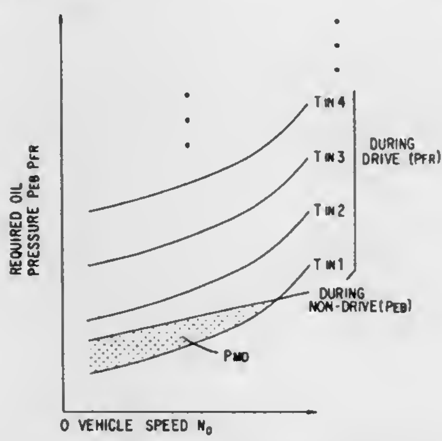
Hiroshi Tsutsui; Kazumasa Tsukamoto; Masahiro Hayabuchi; Takayuki Hisano, and Nobutada Sugiura, all of Anjo, Japan, assignors to Aisin AW Co., Ltd., Anjo, Japan

Filed Dec. 20, 1996, Ser. No. 771,135

Claims priority, application Japan, Jun. 6, 1996, 8-165102

Int. Cl.⁶ F16H *61/04*

U.S. Cl. 477—118 **6 Claims**



1. A control mechanism for an automatic transmission, comprising:
a control system which controls the oil pressure of a hydraulic servo of a brake in a transmission composed of a rotational element braked for establishing low stages, and the brake brakes the rotational element, wherein:
the brake comprises a band brake which creates differences in application forces using a self-energizing action and a deenergizing action;
the band brake configured such that an oil pressure during an engine drive condition is lower than the oil pressure during the an engine non-drive condition, by setting the self-energizing direction a direction of rotation of the rotational element during the drive and the deenergizing direction another direction of rotation of the rotational element during the non-drive; and
the control system has a supplying means for supplying, to a hydraulic servo of the band brake, oil pressure that is lower than the oil pressure during the non-drive and equal to or higher than the oil pressure during the drive.

5,836,853

SYSTEM FOR THE DETECTION AND SIGNALLING OF HITS IN THE SPORT OF FENCING

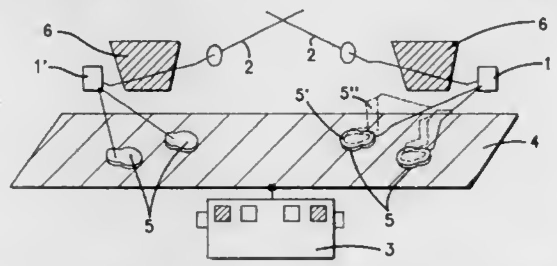
Frederic Marciano, Strasbourg, France, assignor to Computer Masters International, Besancon, France

Filed Oct. 15, 1996, Ser. No. 731,306

Claims priority, application France, Oct. 12, 1995, 95 12189

Int. Cl.⁶ A63B *69/02*

U.S. Cl. 482—12 **16 Claims**



1. A system for the detection and signalling of hits in a fencing bout between two fencers carrying conductive surfaces and a weapon, and moving on a conductive strip, the system comprising:

two portable hit detection units, each detection unit adapted to be carried by each fencer, and being electrically connected to a corresponding weapon;
each detection unit including a first transmitter of electrical detection signals, connected to a corresponding weapon, and a second transmitter for transmitting hit signalling signals when a hit is detected, said signalling signals being distinct from the detection signals and characteristic of each detection unit;
a single central unit for hit discrimination and signalling, said central unit being electrically connected to the conductive strip, and including means for receiving signals transmitted by the hit detection units and transmitted through the conductive strip; and
shoes with conductive soles adapted to be worn by each fencer for making an electrical connection between the conductive strip and the hit detection units, and the conductive surfaces of each fencers.

5,836,854

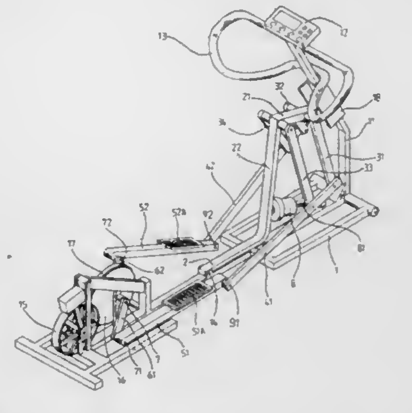
ROAMING EXCERCISER

Hai Pin Kuo, Chi-Lu-Chien No. 30, Pao-An Tsun, Jen-Te Hsiang, Tai-Nan Hsien, Taiwan

Filed Feb. 10, 1998, Ser. No. 21,487

Int. Cl.⁶ A63B *69/16:22/04*

U.S. Cl. 482—52 **3 Claims**



1. A roaming exerciser comprising:
a base having a bracket on which is mounted a resistance wheel;
a vertical post fixedly installed on said base;
a handle grip mounted on said post;
a driven wheel connected to said resistance wheel via an endless belt and provided with an axle;
a pair of cranks each having an end mounted on a respective end of said axle of driven wheel;
a Z-shaped link having a lower end pivotally connected with an intermediate portion of said base;
a pair of first oscillating links with different lengths having an end pivotally connected to an upper portion of said Z-shaped link;
a pair of second oscillating links with different lengths having an end pivotally connected to an upper portion of said Z-shaped link;
a pair of intermediate links having an end pivotally connected to another respective end of said first and second oscillating links; and
a pair of pedal links each having a first end pivotally connected to a respective end of said intermediate links and having a second end pivotally connected to another end of a respective one of said cranks.

5,836,855

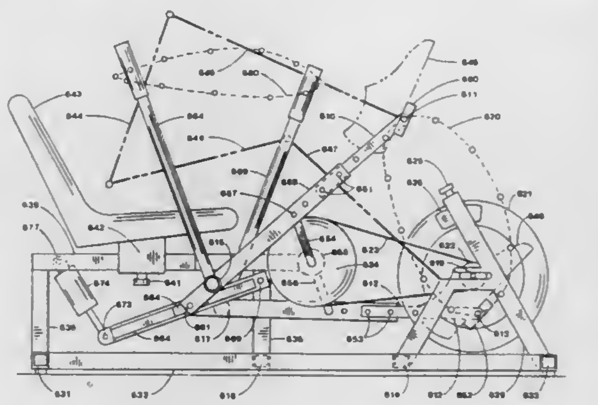
RECUMBENT ELLIPTICAL EXERCISE MACHINE

Paul William Eschenbach, 143 Lakeland Ave., Moore, S.C. 29369

Filed Feb. 18, 1997, Ser. No. 801,194

Int. Cl.⁶ A63B *69/16:22/00*

U.S. Cl. 482—57 **31 Claims**



12. A recumbent exercise machine comprising:
a framework means, said framework means configured to be supported by the floor and support a seat means;
a pedal means, said pedal means configured for each foot of a recumbent operator;
a linkage means having a crank means projecting outwardly therefrom on both sides thereof, said crank means rotatably connected to said framework means;
a coupling means operably associated with said linkage means and said framework means;
said pedal means connected to each said linkage means, whereby said pedal means follows a generally oblong inclined pedal path as said crank means rotates with the foot force acting upon said pedal means of a recumbent operator positioned in said seat means;
an actuator means connected to said coupling means on one end and operably associated with the framework on the other whereby the coupling means connection to said framework means can be moved during operation of said exercise machine thereby causing said oblong inclined pedal path to change.

5,836,856

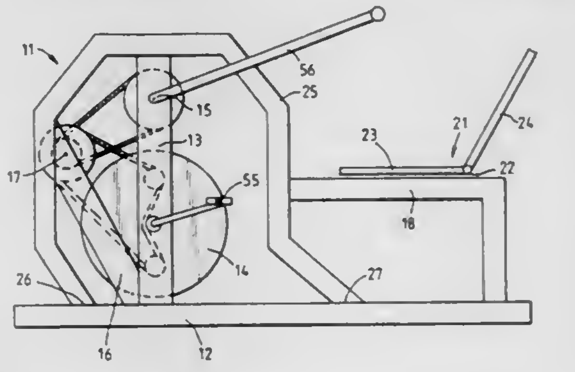
EXERCISE DEVICE

Sukhraj Singh Mattoo, 78 Somerset Road, Southall, Middlesex UB1 2TU, and Bhupinder Singh Padda, 296 Oldfield Lane, Greenford, Middlesex UB6 8PS, both of United Kingdom

Filed Mar. 22, 1996, Ser. No. 620,336

Int. Cl.⁶ A63B *69/06:22/12*

U.S. Cl. 482—62 **14 Claims**



1. An exercise device comprising:
a flywheel having an axis of rotation:

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oscillatory drive means having a single rotary input shaft and operable by a human user, said oscillatory drive means including a lever for imparting oscillatory rotary motion to the input shaft; and

two drive connection means for converting operation of the oscillatory drive means into rotary drive of the flywheel, one drive connection means converting clockwise rotation of the input shaft of the oscillatory drive means into rotation of the flywheel in a first direction and the other drive connection means converting counterclockwise rotation of the input shaft of the oscillatory drive means into rotation of the flywheel in the first direction.

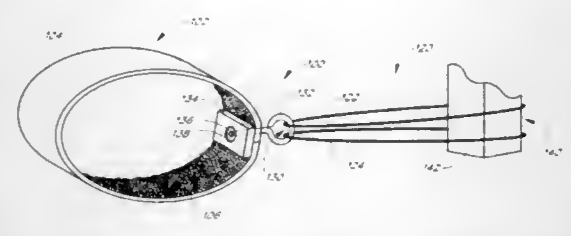
5,836,857
APPARATUS AND METHOD FOR APPLYING LATERAL FORCE TO BODY JOINTS

Fred C. Jennings, P.O. Box 295, Corona del Mar, Calif. 92625, assignor to Fred C. Jennings, Corona del Mar, Calif.

Filed Jul. 28, 1997, Ser. No. 905,786

Int. Cl.⁶ A63B *21/00*

U.S. Cl. 482—92 **17 Claims**



1. An apparatus for applying lateral force to the joints of a leg of a person standing on a generally level surface, comprising:

a generally inelastic interconnecting medium having a first end and a second end;

a cuff attached to the first end of the interconnecting medium and posititoned to initially rest on the generally level surface, the cuff sized to receive a portion of a foot of the leg to which the lateral force is to be applied, the cuff comprising a tubular member attached to a retaining block, the retaining block connecting the cuff to the first end of the interconnecting medium; and

an engager at the second end of the interconnecting medium for attaching the interconnecting medium to a substantially stationary object such that when the person pulls on the foot in the cuff in a direction away from the substantially stationary object, the foot remains substantially in one location proximate to the generally level surface and lateral force is applied to the joint of the leg.

5,836,858
WEIGHT LIFTING APPARATUS

William A. Sharff, 1620 Sunset Cir. Dr., Mt. Pora, Fla. 32757

Filed Dec. 6, 1996, Ser. No. 760,910

Int. Cl.⁶ A63B *21/072*

U.S. Cl. 482—106 **6 Claims**

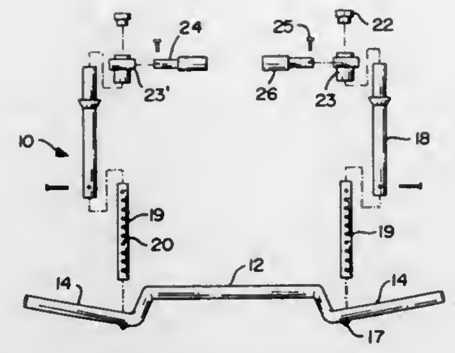
1. A safety weight lifting apparatus comprising:

a weight supporting bar having a generally U-shaped central portion and laterally, outwardly extending weight support extensions integrally secured to each end of the U-shaped portion, said U-shaped portion being located in a generally horizontal plane,

pivot means secured to said bar adjacent each juncture of said U-shaped portion with said weight support extensions,

a pair of elongated lift arms having upper and lower ends each pivotally connected to a respective said pivot means at a lower end thereof for movement about said pivot means only in a generally vertical plane common to both arms, each elongated lift arm including a generally centrally located longitudinally extending first axis,

a swivel coupling rotatably connected to the upper end of each lift arm for rotation about said first axis, and handle means rotatably connected to each said coupling for rotation about a second axis generally perpendicular to said first axis, whereby a user may grasp said handle means and raise said U-shaped frame and weight support extensions while maintaining said U-shaped frame in a generally horizontal plane and permitting the user to concurrently move his hands and said handle means in said generally vertical plane toward each other into substantial engagement.



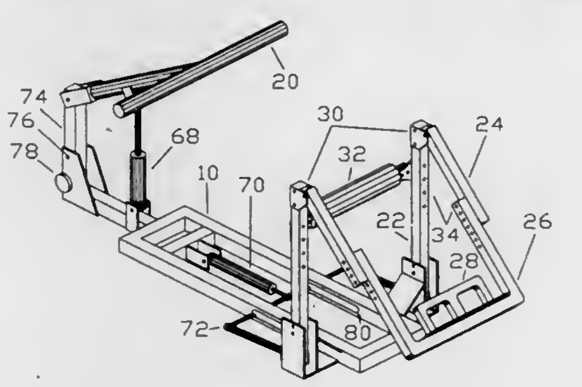
5,836,859
FULL BODY EXERCISE MACHINE

Philippe J. Van Herle, 10706 Lindbrook Dr., Los Angeles, Calif. 90024

Filed Jun. 12, 1997, Ser. No. 873,616

Int. Cl.⁶ A63B *21/008*

U.S. Cl. 482—112 **23 Claims**



1. An exercise machine to train the majority of the muscles of the human body simultaneously, comprising a frame, a lever hingeably connected by its first end to the first end of said frame, a handle bar mounted by its midpoint to the second end of said lever, a means of resistance connected at its first end to said frame and connected at its second end to said lever, a U-shaped lever hingeably connected by its first end to a point along the side of and near the second end of said frame and hingeably connected by its second end to a similar location along the opposite side of said frame, a second means of resistance connected at its first end to said frame and connected by its second end to said U-shaped lever, a post mounted at its first end to the midpoint of said U-shaped lever, a tube hingeably connected by its first end to the second end of said post, a bar inserted at its first end into said tube, a means of locking said tube and said bar together to vary the length at which said bar extends out of said tube, a plate mounted by the center of its top surface to the second end of said bar and two adjustable straps mounted to the top surface of said plate, each one located to opposite sides of said bar.

5,836,860
RESIN ROLL FOR CALENDERING MAGNETIC RECORDING MEDIUM AND MANUFACTURING METHOD THEREFOR

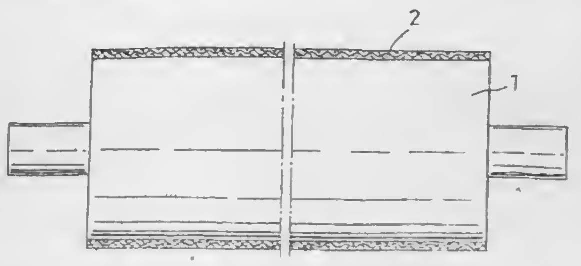
Atsuo Watanabe, Hirakata; Kenjiro Nakayama, Yawata, and Tatsuyuki Abe, Takatsuki, all of Japan, assignors to Yamauchi Corporation, Osaka, Japan

Filed Dec. 12, 1995, Ser. No. 571,232

Claims priority, application Japan, Dec. 12, 1994, 6-307862

Int. Cl.⁶ B21B *31/08*

U.S. Cl. 492—56 **14 Claims**



1. A resin roll for calendering a magnetic recording medium, comprising:

a metal roll core (**1**); and

a thermosetting resin outer layer (**3**); wherein

a surface portion of the thermosetting resin outer layer has a storage elastic modulus (E') from 5×10^{10} to 5×10^{11} dyn/cm^2 at a temperature from 50° to 150°C. at a frequency of 10 Hz.

8. A resin roll for calendering a magnetic recording medium comprising:

a metal roll core (**1**); and

a thermosetting resin outer layer (**3**); wherein at a surface portion of the thermosetting resin outer layer, an expression $(1-v^2)/E'$ representing relation between storage elastic modulus (E') and Poisson's ratio (v) in relation to Hertz's equation representing a nip width is within a range of

$$2\times10^{-12}\ \text{cm}^2/\text{dyn}<(1-v^2)/E'<2\times10^{-11}\ \text{cm}^2/\text{dyn}$$

at a temperature from 50° to 150° C. at a frequency of 10 Hz.

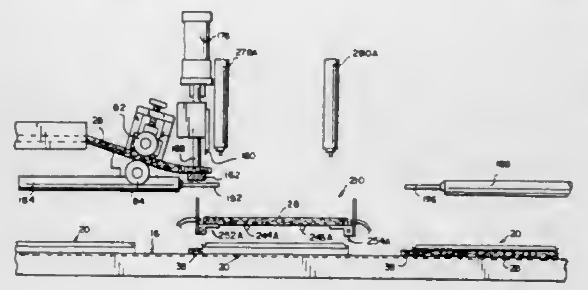
5,836,861
FILTER ASSEMBLY APPARATUS

Jose A. Diaz, Tampa, Fla., assignor to Precisionaire, Inc., Bartow, Fla.

Filed Oct. 29, 1996, Ser. No. 739,759

Int. Cl.⁶ B31D *5/00;* **B01D** *27/00*

U.S. Cl. 493—386 **14 Claims**



1. Apparatus for assembling a filter having a peripheral frame and at least one filter media component, the apparatus comprising a continuous conveyor for feeding in a forward direction a plurality of filter frames, in succession, to a plurality of workstations, each filter frame having a closed periphery which is defined by, with reference to said forward direction, a generally upstanding leading flap, side flaps and a trailing flap, the workstations arranged on a fixed machine frame including:

a) a first station including at least a pair of tools located so as to engage and open said side flaps;

b) a second station downstream of said first workstation in said forward direction including a media component supply roll, a cutter adapted to cut a predetermined length of media component; guide elements mounted on said fixed machine frame proximate to said cutter and adapted to guide the cut length of media component for movement away from the cutter; and a reciprocable carriage supported on said fixed machine frame above the conveyor and adapted to receive the cut length of media component at a first position, the carriage having a motive drive operatively connected to the carriage and adapted to accelerate the carriage in said forward direction to a second loading position where the carriage is located directly above an opened filter frame on the conveyor; and forward and rearward flippers mounted on said carriage and adapted to open said leading and trailing flaps and to move said media component from said carriage into said filter frame.

5,836,862
FOLDED AND UNFOLDED PAPER TOWEL DISPENSING APPARATUS

Maurice Granger, 17 rue Marcel Pagnol, 42270 Saint Priest En Jarez, France

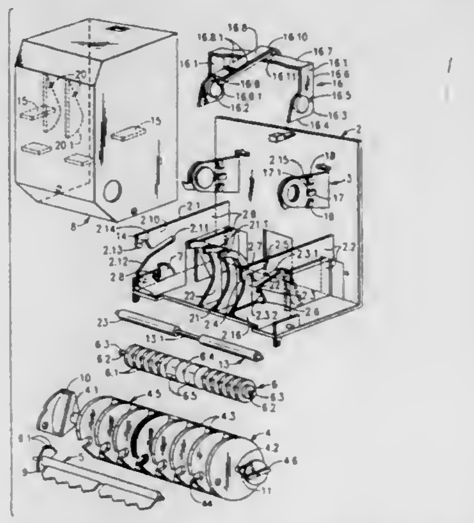
PCT No. PCT/FR95/00378, § 371 Date Sep. 6, 1996, § 102(e) Date Sep. 6, 1996, PCT Pub. No. WO95/26157, PCT Pub. Date Oct. 5, 1995

PCT Filed Mar. 27, 1995, Ser. No. 702,694

Claims priority, application France, Mar. 28, 1994, 94/04399; Apr. 26, 1994, 94/05698; May 27, 1994, 94/06907

Int. Cl.⁶ B65H *19/06*

U.S. Cl. 493—459 **32 Claims**



1. A paper dispenser comprising lateral flanges inside an upper part of a housing to support a reel of paper material and, inside a lower part of the housing, a drum designed to be fitted with a cutoff device, a tensioning device pressing onto said drum, with a paper band running from said reel of paper material along a paper path between said drum and said cutoff device, said cutoff device being hingably mounted relative to the drum to ensure a paper length pulled out by a user is cut according to a cycle that is determined by drum rotation and including means to start and reverse the rotation of said drum as well as a hinged cover located at the bottom of the housing and clicked in place with a locking device,

a controlled-stroke hinged device mounted onto said lateral flanges

and in that said cover includes a plurality of longitudinal ribs fitting said controlled-stroke hinged device such, that when the cover is closed and the device lowered in a first position, the length of paper the user pulls on is folded with the long ends partly under the band fed out by an upper part of the hinged device so that it may be introduced folded between the

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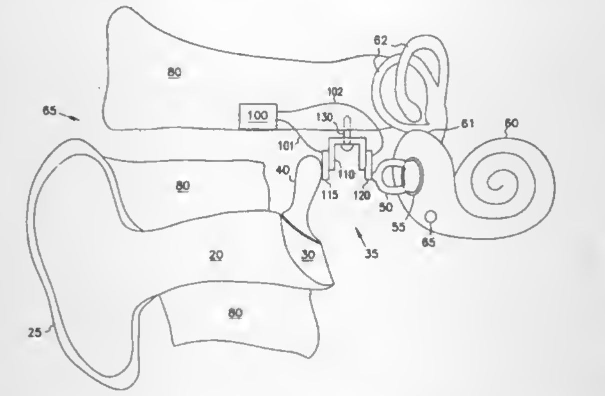
drum and the tensioning device, be severed by the cutoff device, folded and be pulled out as a folded napkin by the user, and in that said hinged device, when moved into a second raised position relative to the lateral flanges inside said housing and the assembly consisting of the drum and the tensioning device, will allow the paper to be fed unfolded between the drum and the tensioning device and severed by the cutoff device when pulled onto by the user.

5,836,863
HEARING AID TRANSDUCER SUPPORT

Donald J. Bushek, Plymouth, and Kai Kroll, Minnetonka, both of Minn., assignors to St. Croix Medical, Inc., Minneapolis, Minn.

Filed Aug. 7, 1996, Ser. No. 695,099
Int. Cl.^{6} H04R *25/00*

U.S. Cl. 600—25 **34 Claims**



1. A support system for coupling at least two transducer to at least two auditory elements within a middle ear, the support system comprising:
- a support member;
- a mechanical-to-electrical first transducer mounted to a first mounting portion of the support member and proportioned for coupling to a first auditory element in the middle ear; and
- an electrical-to-mechanical second transducer mounted to a second mounting portion of the support member, which is fixably attached to the first mounting portion of the support member, and the second transducer proportioned for coupling to a second auditory element in the middle ear, said support member including at least one pair of mutually alignable slotted opening portions for maintaining said first and second transducers at a spacing to conform to anatomical requirements of a patient.

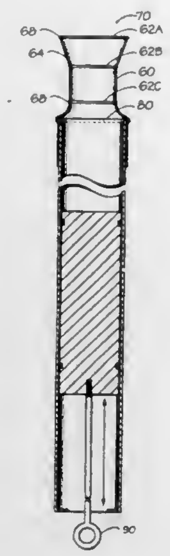
5,836,864
PENILE LENGTHENING TRACTION DEVICE

Roland T. Clark, Jr., 22052 Islander Ln., Huntington Beach, Calif. 92646

Continuation-in-part of Ser. No. 695,229, Aug. 7, 1996, abandoned. This application Sep. 30, 1997, Ser. No. 941,321
Int. Cl.^{6} A61F *5/00*

U.S. Cl. 600—38 **11 Claims**

1. A suction device for use in forming an attachment to a penis, the device comprising:
- a wall means for supporting a vacuum, provides a smooth inside wall surface, the wall means providing an aperture at one end thereof capable of accepting a human penis;
- a piston movable within the wall means and fitted therein so as to form a tight sliding fit so as to operably draw a vacuum within the wall means;
- a means adapted for sealing the penis in the wall means enabling exposure of the penis to the vacuum;



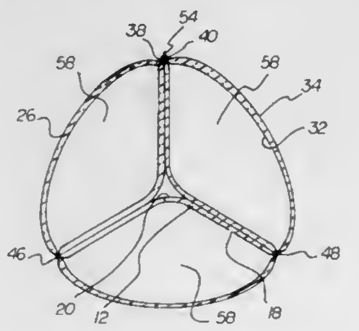
wherein the device provides such mass as to enable stretch training and conditioning of the penis.

5,836,865
MALE SEX AID

Steven D. Ritchie, 368 Bay Plz., Treasure Island, Fla. 33706, and Harley David Reynard, 5054 Johns Pass Ave., Madera Beach, Fla. 33708

Filed Oct. 14, 1997, Ser. No. 949,935
Int. Cl.^{6} A61F *5/00*

U.S. Cl. 600—38 **4 Claims**



1. A new and improved male sex aid device for the sexual stimulation of a penis comprising, in combination:
- a first sheet of a flexible vinyl material about 24 inches in length and about 15 inches in width and about 0.014 inches in thickness to thereby form long side edges and short end edges, the entire first sheet having a smooth interior surface over its entire extent and a textured exterior surface formed with shallow indentations of about 0.007 inches in depth in a grid-like pattern over its entire extent;
- a second sheet of a flexible vinyl material about 24 inches in length and about 15 inches in width and about 0.014 inches in thickness to thereby form long side edges and short end edges, the entire second sheet having a smooth interior surface over its entire extent and an exterior surface;
- the first and second sheets being superimposed, one over the other, with two long heat sealing lines coupling the long side edges of the sheets and two short heat sealing lines coupling the short end edges of the sheets and with two additional long heat sealing lines parallel with the long side edges equally spaced about five inches from the long side edges, and with both short end edges being formed with three convex projections, each convex projection having a radius of about five inches between the four long heat sealing lines, and further including a fifth heat sealing line coupling the long side edges to thereby form a two-ply tube from the heat sealed sheets;
- three inflatable pillows of similar configuration being formed between the two sheets of the tube radially and between and the five heat sealing lines of the tube circumferentially:
- a small air filler valve located on the exterior surface of the second sheet adjacent to one short edge of each pillow;
- a large water filler valve located on the exterior surface of the second sheet between the air filler valve and the adjacent short edge of each pillow; and
- the two sheets and heat sealing lines being configured whereby when the three pillows are inflated through a valve, there will be formed a small generally triangular opening with a textured surface along the length of the tube for the receipt of a penis.

5,836,866

Patent Not Issued For This Number

5,836,867
MAGNETIC COUPLING ASSEMBLY FOR ENDOSCOPE

Craig J. Speier, Santa Barbara, and Arthur James Devine, Escondido, both of Calif., assignors to Linvatec Corporation, Largo, Fla.

Filed Nov. 11, 1997, Ser. No. 967,516
Int. Cl.^{6} A61B *1/04*

U.S. Cl. 600—112 **24 Claims**

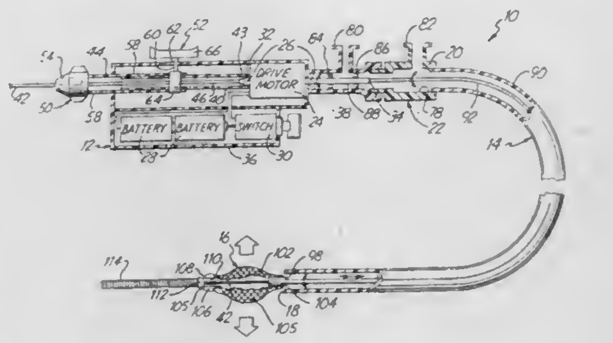
1. An adjustable endoscope coupler for optically coupling an endoscope to a viewing device, said coupler comprising:
- a lens;
- an elongated sealed chamber surrounding said lend and having a longitudinal axis, said chamber comprising a first peripheral wall and having an axially aligned opening at each end for permitting light to pass through said chamber and said lens;
- a lens holder supporting said lens and movable along said longitudinal axis within said chamber, said lens holder comprising a second peripheral wall parallel to said first peripheral wall;
- a hollow housing comprising a third peripheral wall interposed between said first and second peripheral walls, said housing having an open proximal end, an open distal end and adapted to slidable receive said lens holder therein:
- drive means movably supported outside said sealed chamber:
- driven means for moving said housing in response to motion of said drive means;
- motion transmitting means interconnecting said lens holder and said housing for transferring motion therebetween;
- wherein said drive means acts through said first peripheral wall to move said driven means.

5,836,868
EXPANDABLE INTRAVASCULAR OCCLUSION MATERIAL REMOVAL DEVICES AND METHODS OF USE

Thomas V. Ressemann, St. Cloud; Anthony C. Vrba; Steven S. Hackett, both of Maple Grove; Chad J. Kugler, Spring Lake Park, and Hans A. Mische, St. Cloud, all of Minn., assignors to SciMed Life Systems, Inc., Maple Grove, Minn.

Continuation-in-part of Ser. No. 206,053, Mar. 3, 1994, Pat. No. 5,501,694, and a continuation-in-part of Ser. No. 261,813, Jun. 17, 1994, Pat. No. 5,540,707, which is a continuation-in-part of Ser. No. 55,995, Apr. 29, 1993, Pat. No. 5,490,859, which is a continuation-in-part of Ser. No. 976,199, Nov. 13, 1992, abandoned. This application Mar. 25, 1996, Ser. No. 621,350
Int. Cl.^{6} A61B *17/32*

U.S. Cl. 606—159 **16 Claims**



1. A vascular occlusion material removal device for removing vascular occlusion material in a vascular lumen, the removal device comprising:
- an expandable removal element having a distal end and a proximal end insertable intravascularly into a patient; the expandable removal element being more highly stressed when expanded and less stressed when not expanded;
- a drive shaft extending to the proximal end of the removal element; the shaft being fixedly attached to the proximal end of the removal element and conjointly rotatable therewith; and
- an inner shaft disposed through the removal element and connected to the distal end of the expandable material removal element; the inner shaft being shiftable within the material removal element and the drive shaft; the material removal element being expandable responsive to shifting of the inner shaft with respect to the removal element and the drive shaft.

5,836,869
IMAGE TRACKING ENDOSCOPE SYSTEM

Masahiro Kudo, Hino; Kuniaki Kami, Machida; Hiroki Hibino, Hachioji; Hitoshi Mizuno, Koganei; Akihiro Horii, Akishima; Susumu Takahashi, Iruma, and Noriyuki Tateyama, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 1, 1995, Ser. No. 551,713

Claims priority, application Japan, Dec. 13, 1994, 6-308740; May 15, 1995, 7-115995; Jun. 8, 1995, 7-142133; Aug. 23, 1995, 7-214824

Int. Cl.^{6} A61B *1/04*

U.S. Cl. 600—173 **7 Claims**

1. An endoscope system comprising:
- an endoscope;
- a holder for holding said endoscope;
- an image pickup section including an image pickup optical system for receiving an endoscopic image from said endoscope, a path branch for branching an optical path of said image pickup optical system into a first optical path and a second optical path, a wide angle image pickup element provided in the first optical path for forming a wide angle image from the endoscopic image, and a magnified image

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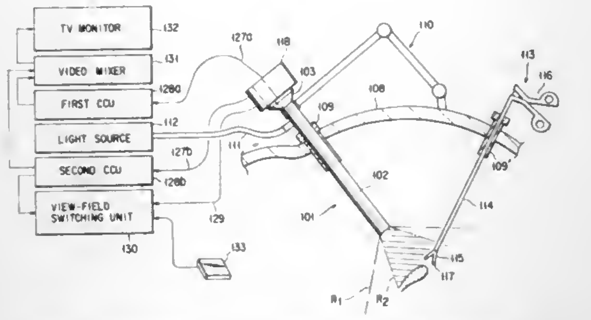


pickup element provided in the second optical path for forming a magnified image from the endoscopic image;

a display for displaying an image provided by said image pickup section;

an object identifier for identifying an object observed through said endoscope;

a position detector for detecting a position of the object from a wide angle image formed by said wide angle image pickup element of said image pickup section, and for generating position data representing the detected position; and

a view field switching control mechanism for moving the magnified image formed by said magnified pickup element of said image pickup section in accordance with said position data, without moving said endoscope, to thereby switch a view field of said endoscope.

5,836,870

Patent Not Issued For This Number

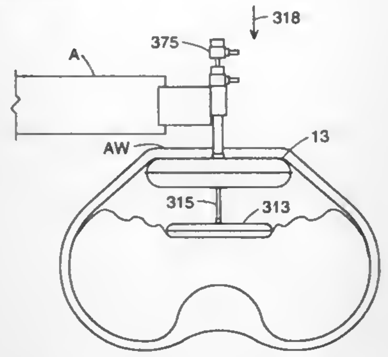
5,836,871
METHOD FOR LIFTING A BODY WALL USING AN INFLATABLE LIFTING APPARATUS

Daniel T. Wallace, Mountain View; Jeffery A. Smith, Sunnyvale; Richard Mueller, Byron; Joseph Mandato, Atherton, and Frederic H. Moll, San Francisco, all of Calif., assignors to Origin Medsystems, Inc., Menlo Park, Calif.

Continuation of Ser. No. 239,348, May 6, 1994, abandoned, which is a continuation-in-part of Ser. No. 794,590, Nov. 19, 1991, Pat. No. 5,309,896, which is a continuation-in-part of Ser. No. 706,781, May 29, 1991, abandoned, said Ser. No. 239,348 is a continuation-in-part of Ser. No. 62,707, May 18, 1993, Pat. No. 5,520,609, which is a continuation of Ser. No. 706,781, said Ser. No. 239,348 is a continuation-in-part of Ser. No. 134,573, Oct. 8, 1993, Pat. No. 5,425,357, which is a continuation-in-part of Ser. No. 794,590. This application Jun. 10, 1996, Ser. No. 660,728

Int. Cl.⁶ A61M *29/02*

U.S. Cl. 600—204 **2 Claims**



1. A method for lifting a body wall by applying an external lifting force to a large area of the body wall through a laparoscopic incision, the method comprising the steps of:

providing a lifting device, the lifting device including a body wall engaging element having a bore and further including a packaged state in which the body wall engaging element forms a package capable of passing through the laparoscopic incision, and a lifting member, the lifting member including a distal portion whereto the body wall engaging element is connected, and a proximal portion and further providing an inflatable retractor;

with the body wall engaging element in the packaged state, advancing the body wall engaging element through the laparoscopic incision;

inflating the body wall engaging element to an inflated state to release the body wall engaging element from the packaged state and to provide a plane lifting surface;

with the body wall engaging element oriented such that the plane lifting surface extends laterally of the distal portion of the lifting member, applying the external lifting force to the proximal portion of the lifting member to move the lifting surface into contact with the body wall;

passing the inflatable retractor in a packaged state through the bore from outside the body wall,

inflating the inflatable retractor to an inflated state, and

applying an external retraction force to the inflatable retractor in a direction substantially opposite to the direction of the lifting force, to retract tissue underlying the body wall using the inflated inflatable retractor.

5,836,872
DIGITAL OPTICAL VISUALIZATION ENANCEMENT QUINTIFICATION AND CLASSIFICATION OF SURFACE AND SUBSURFACE FEATURES OF BODY SURFACE

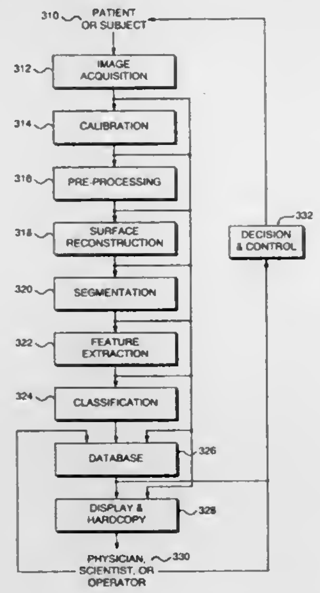
Robert O. Kenet; Barney J. Kenet, both of Lakeland, Fla., and Guillermo J. Tearney, Cambridge, Mass., assignors to Vanguard Imaging, Ltd., Cambridge, Mass.

Continuation-in-part of Ser. No. 337,304, Apr. 13, 1989, Pat. No. 5,016,173. This application Apr. 13, 1990, Ser. No. 509,039

The portion of the term of this patent subsequent to May 14, 2008, has been disclaimed.

Int. Cl.⁶ A61B *5/00*

U.S. Cl. 600—306 **4 Claims**



1. A method for enabling in vivo visualization of pigmented or capillary features within the skin otherwise not visible to the eye by eliminating optical effects at the skin surface, comprising:

applying onto a region of the skin surface a substance that decreases effects of refractive index mismatch at the air-skin interface;

providing an image transducer device comprised of one or more area imaging sensors;

illuminating the region of the skin surface with a standardized, controlled, area illumination source;

contacting the substance with a transparent member to smooth the substance surface for decreasing specular reflection off the substance surface;

positioning said image transducer device and said illumination source a predetermined distance over the region using a mechanical structure coupled to said image transducer device and said illumination source and placed on the skin to facilitate lighting, positioning and focus;

simultaneously transducing directly from the region through said transparent member using said image transducer device a plurality of spectrally different images of reflected and/or emitted light, in which each said image consists of a collection of image elements, and represents a different spectral region;

constructing a multispectral digital area image from said spectrally different images; and

displaying or presenting said multispectral digital area image for inspection, interpretation, analysis or classification.

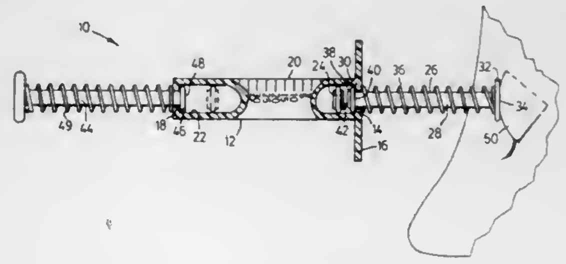
5,836,873
TONOMETER

Bernard Boaz Fresco, 349 Cortleigh Boulevard, Toronto, Ontario, Canada, M5N 1R4

Filed May 23, 1996, Ser. No. 652,045

Int. Cl.⁶ A61B *3/16*

U.S. Cl. 600—398 **15 Claims**



1. An applanation tonometer, for measuring pressure within the human eye, the tonometer comprising:

a main body which is generally tubular and defines a bore;

a plunger slidably mounted within the bore of the main body and including a head at one end located outside the bore for contacting an eyelid and the other end of the plunger being retained within the bore of the main body, wherein the head is unitary and is sufficiently large that, in use, the head flattens an eyeball and subjects an eyeball to applanation;

a spring biassing means acting between the plunger and the main body, biassing the head away from the main body;

a scale means provided on the main body, for providing an indication of the displacement of the plunger; and

a marker member frictionally retained within the bore of the main body and viewable from the exterior, the marker member being displaceable relative to the scale means so as to provide an indication relative to the scale means of the displacement of the plunger;

wherein the scale means is the only means in the apparatus for measuring a characteristic of an eye.

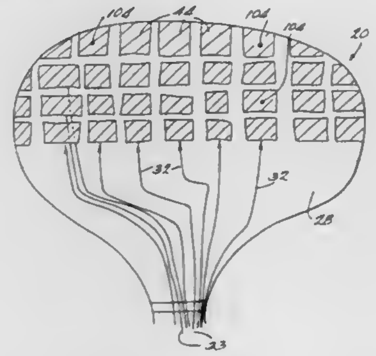
5,836,874
MULTI-FUNCTION ELECTRODE STRUCTURES FOR ELECTRICALLY ANALYZING AND HEATING BODY TISSUE

David K. Swanson, Mountain View; Dorin Panescu, Sunnyvale; James G. Whayne, Saratoga, and Jerome Jackson, Sunnyvale, all of Calif., assignors to EP Technologies, Inc., Sunnyvale, Calif.

Filed Apr. 8, 1996, Ser. No. 629,014

Int. Cl.⁶ A61B *5/04;17/39*

U.S. Cl. 600—374 **84 Claims**



1. A system for using in association with body tissue comprising

a structure including an exterior wall adapted to contact tissue, the exterior wall adapted to selectively assume an expanded geometry having a first maximum diameter and a collapsed geometry having a second maximum diameter less than the first maximum diameter,

an array of electrically conducting electrode segments carried by the exterior wall of the structure,

an electrically conductive network coupled to the electrode segments, including at least one electrically conductive path individually coupled to each electrode segment, and

a controller coupled to the electrically conductive network, the controller operating in a first mode during which the network is electrically conditioned to individually sense at each electrode segment local electrical events in tissue, the controller further operating in a second mode during which the network is electrically conditioned, based at least in part upon local electrical events sensed by the electrode segments, to couple at least two electrode segments together to simultaneously transmit electrical energy to create a physiological effect upon a region of body tissue.

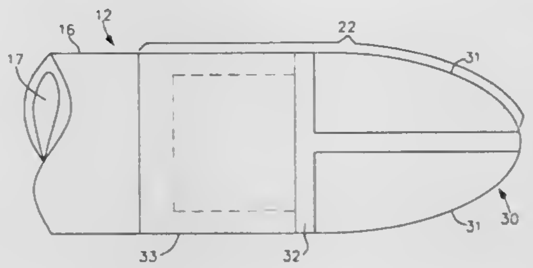
5,836,875
SPLIT TIP ELECTRODE CATHETER

Wilton W. Webster, Jr., Baldwin Park, Calif., assignor to Cordis Webster, Inc., Baldwin Park, Calif.

Filed Oct. 4, 1996, Ser. No. 726,380

Int. Cl.⁶ A61B *5/042;17/39;* **A61N** *1/05*

U.S. Cl. 600—374 **15 Claims**



1. An electrode catheter for cardiac electrophysiology comprising:

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- an elongated body suitable for intravascular insertion surrounding a plurality of electrode lead wires and a tip section at a distal end of the catheter body, said tip section comprising;
- a composite electrode at a distal end of the tip section having a distal portion comprising an external surface and a proximal portion which forms a recessed stem, said composite electrode comprising a plurality of longitudinally adjacent electrode members, each electrode member having an external surface and a recessed stem portion, each electrode member being electrically connected to an associated electrode lead wire and electrically isolated from adjacent electrode members; and
- a cup electrode spaced proximally from a proximal end of the distal portion of the composite electrode, said cup electrode being electrically connected to an associated electrode lead wire and comprising a generally cylindrical side wall that forms a ring electrode and a cavity that receives and fixedly secures at least a portion of the stem of the composite electrode, said cup electrode being electrically isolated from the composite electrode.

5,836,876

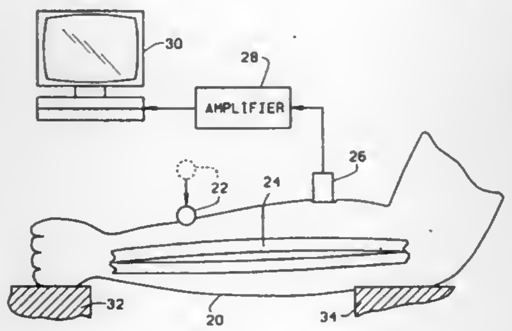
METHOD AND APPARATUS FOR DETERMINING BONE DENSITY AND DIAGNOSING OSTEOPOROSIS

Andrew D. Dimarogonas, St. Louis, Mo., assignor to Washington University, St. Louis, Mo.

Continuation-in-part of Ser. No. 25,941, Mar. 3, 1993, Pat. No. 5,402,781. This application Mar. 31, 1995, Ser. No. 414,274

Int. Cl.^{6} A61B *5/05*

U.S. Cl. 600—407 **10 Claims**



1. A method for estimating a modal damping factor of a bone positioned within the flesh in an organism, the method comprising the steps of:

- dynamically isolating the bone from the flesh;
- vibrating the isolated bone at a plurality of frequencies and through a plurality of cycles of displacement at each of the plurality of frequencies, each of the plurality of cycles of displacement having a substantially constant amplitude at each of the plurality of frequencies;
- measuring the amplitude at which the bone vibrates at each of the plurality of frequencies; and
- calculating the modal damping factor from the measured amplitudes.

5,836,877

SYSTEM FOR FACILITATING PATHOLOGICAL EXAMINATION OF A LESION IN TISSUE

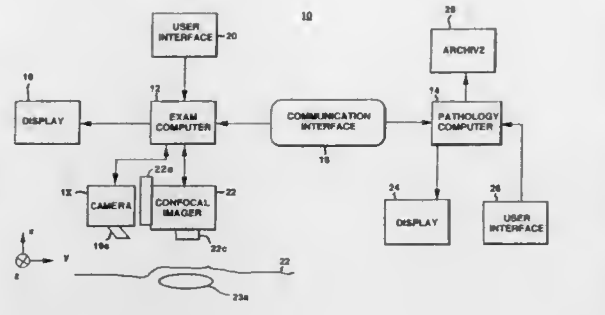
James M. Zavislan, Pittsford, N.Y., assignor to Lucid Inc, Henrietta, N.Y.

Filed Feb. 24, 1997, Ser. No. 805,045

Int. Cl.^{6} A61B *5/00*

U.S. Cl. 600—407 **15 Claims**

3. An apparatus for facilitating pathological examination of a lesion located in tissue comprising:



- a computer system;
- means coupled to said computer system for producing a digital macroscopic picture of the lesion;
- an imager coupled to said computer system for generating, responsive to said computer system, images representing microscopic sections of said lesion which provide sufficient information for pathological examination of the lesion; and
- said computer system further comprises means for generating location information referencing the location in said macroscopic picture of the lesion to said sections, and means for storing data in an electronic file structure which comprises at least a representation of said images, a representation of said macroscopic picture, and said location information, wherein said imager further comprises means for scanning the lesion through confocal optics to generate confocal images representing microscopic sections of said lesion.

5,836,878

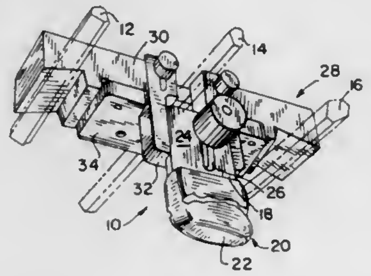
HEAD RESTRAINT METHOD AND APPARATUS FOR USE IN MRI

Bryan J. Mock, Monona, and William G. Irwin, Jr., Madison, both of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Aug. 11, 1997, Ser. No. 909,190

Int. Cl.^{6} H61B *5/055*

U.S. Cl. 600—415 **15 Claims**



1. An apparatus for immobilizing a patient's head within an MRI headcoil comprising:

- a bite plate having a first end for engagement within a patient's mouth and a second end extending outwardly and having an elongated adjustment slot therein; and
- a mounting bracket assembly having the bite plate adjustably mounted thereon to allow fore and aft adjustment of the bite plate, the mounting bracket assembly having a plurality of slots, each configured to accept a headcoil rung therein, and having a clamping plate adapted to secure at least one headcoil rung between the mounting bracket assembly and the clamping plate.

5,836,879

Patent Not Issued For This Number

5,836,880

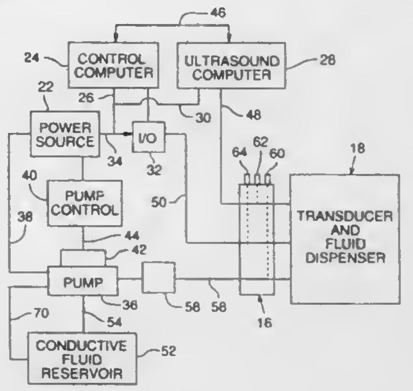
AUTOMATED SYSTEM FOR MEASURING INTERNAL TISSUE CHARACTERISTICS IN FEED ANIMALS

William C. Pratt, Canyon, Tex., assignor to Micro Chemical, Inc., Amarillo, Tex.

Continuation-in-part of Ser. No. 395,931, Feb. 27, 1995, Pat. No. 5,573,002. This application Nov. 12, 1996, Ser. No. 748,220

Int. Cl.^{6} A61B *8/00*

U.S. Cl. 600—443 **21 Claims**



1. A system for measuring internal tissue characteristics in feed animals, comprising:

- a tissue analysis device; and
- a remotely actuatable positioner coupled to the analysis device for positioning the device along a longitudinal axis of the feed animal and along flanks of the animal in a dorsal-to-ventral or in a ventral-to-dorsal manner to allowing] allow for tissue analysis.

5,836,881

FOCUSING DELAY CALCULATION METHOD FOR REAL-TIME DIGITAL FOCUSING AND APPARATUS ADOPTING THE SAME

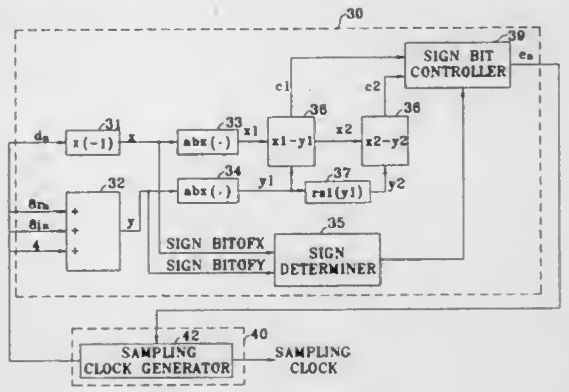
Moo-Ho Bae, Seoul, Rep. of Korea, assignor to Medison Co., Ltd., Rep. of Korea

Filed Feb. 3, 1998, Ser. No. 18,007

Claims priority, application Rep. of Korea, Feb. 4, 1997, 97-3418

Int. Cl.^{6} A61B *8/00*

U.S. Cl. 600—447 **10 Claims**



1. A method for calculating a focusing delay distance for each of a plurality of array elements constituting an array transducer in an ultrasonic imaging system in which a focal point is varied on the basis of a midpoint algorithm, the method comprising the steps of:

- (a) calculating a delay variable corresponding to each array element at an (n+1)th focal point, using a focusing reference distance, an integer focusing delay distance and a decision variable which correspond to said each array element at an n-th focal point;
- (b) calculating the focusing reference distance, the integer focusing delay distance and the decision variable corresponding to said each array element at the (n+1)th focal point, using the delay variable in step (a); and
- (c) producing the focusing delay distance corresponding to said each array element at the (n+1)th focal point, by adding the delay variable calculated in step (a) and the integer focusing delay distance calculated in step (b).

5,836,882

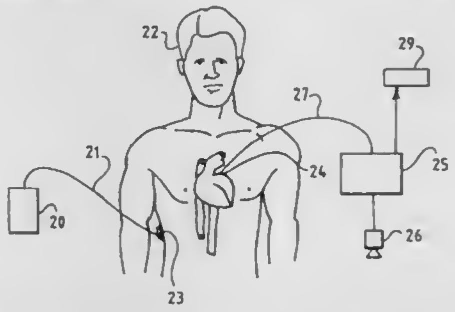
METHOD AND APPARATUS OF LOCALIZING AN INSERTION END OF A PROBE WITHIN A BIOTIC STRUCTURE

Leon J. Frazin, 542 Wilgate, Glencoe, Ill. 60022

Filed Mar. 17, 1997, Ser. No. 819,602

Int. Cl.^{6} A61B *0/00*

U.S. Cl. 600—462 **10 Claims**



1. Apparatus for localizing a tip of a probe relative to a sonifying transducer inside a biotic structure, such apparatus comprising:

- a probe with a Doppler transceiver attached proximate a tip of an insertion end of the probe;
- a velocimeter power supply coupled to the Doppler transceiver;
- an ultrasonic imaging system coupled to a sonifying transducer; and
- a speaker operatively coupled to the Doppler transceiver which reproduces sound information detected by the Doppler transceiver from an impact on the Doppler transceiver of a sonic wave from the sonifying transducer, which sound is indicative of a position of the probe relative to the sonifying transducer.

5,836,883

MEASURING THE CHARACTERISTICS OF A SCATTERING MEDIUM

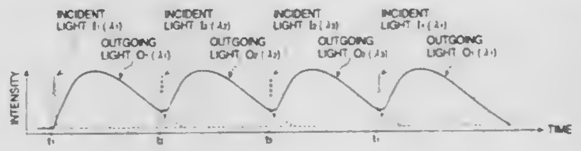
Yutaka Tsuchiya, and Yutaka Yamashita, both of Hamamatsu, Japan, assignors to Technology Research Association of Medical and Welfare Apparatus, Tokyo, Japan

Filed Aug. 8, 1996, Ser. No. 693,480

Claims priority, application Japan, Aug. 8, 1995, 7-202115

Int. Cl.^{6} A61B *5/00*

U.S. Cl. 600—476 **5 Claims**



1. A measurement apparatus for measuring internal characteristics of a scattering medium comprising:

- a plurality of light sources which emit a plurality of measurement light beams having a plurality of wavelengths different from each other;

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an irradiation light guide for causing said measurement light beams to be incident on the scattering medium;
a wavelength selector unit which selectively extracts diffused light having a particular wavelength from diffused light having mutually interfering light components corresponding to said measurement light beams which have been diffusively propagated through said scattering medium;
a photodetector unit for measuring a time-response characteristic of said diffused light extracted by said wavelength selector unit; and
a signal processing system which drives said plurality of light sources so as to sequentially cause said measurement light beams to be incident on the scattering medium respectively with emission timings different from each other, and which controls a measurement action of said photodetector unit corresponding to said emission timings such that time-response characteristics of said diffused light are sequentially measured, while analyzing the time-response characteristics measured by said photodetector unit so as to calculate the internal information in said scattering medium.

5,836,884

METHOD FOR DIAGNOSING, MONITORING AND TREATING HYPERTENSION AND OTHER CARDIAC PROBLEMS

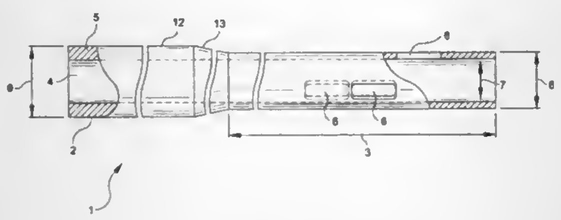
Shiu-Shin Chio, San Diego, Calif., assignor to Pulse Metric, Inc., San Diego, Calif.
Filed Dec. 17, 1993, Ser. No. 169,590
Int. Cl.^{6} A61B *5/02*
U.S. Cl. 600—485 29 Claims

1. A method for determining the cardiovascular condition of a patient comprising the steps of:
(1) gathering cardiovascular condition information from the patient through a non-invasive means,
(2) determining the patient's systolic, diastolic, and mean arterial pressure from the gathered cardiovascular condition information,
(3) using the gathered cardiovascular condition information to determine one of the peripheral resistance and the diastolic flow velocity of the patient, and using the determined one of the peripheral resistance and diastolic flow velocity to determine the other of the peripheral resistance and diastolic velocity of the patient, and
(4) assessing the patient's cardiovascular condition based on at least one of the determined peripheral resistance and diastolic flow velocity of the patient.

5,836,885

PRESSURE MONITORING GUIDEWIRE AND METHOD FOR MANUFACTURING SAME

Michael Schwager, Winterthur, Switzerland, assignor to Schneider (Europe) AG, Bulach, Switzerland
Filed Dec. 11, 1997, Ser. No. 988,583
Claims priority, application European Pat. Off., May 21, 1997, 97108245
Int. Cl.^{6} A61M *5/00*
U.S. Cl. 600—486 5 Claims

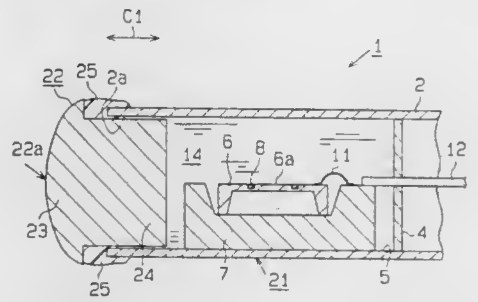


1. A pressure monitoring guidewire comprising:
an elongated tube made of one piece of elastic Nickel Titanium alloy having a distal end portion with transverse openings for the entry of pressure waves into the tube wherein the distal end portion of the tube is more malleable than an adjacent portion of the tube.

5,836,886

CATHETER HAVING A SENSOR

Koichi Itoigawa; Hitoshi Iwata, and Kenichi Kinoshita, all of Aichi-ken, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Japan
Filed Oct. 29, 1996, Ser. No. 739,378
Claims priority, application Japan, Nov. 1, 1995, 7-285369
Int. Cl.^{6} A61B *5/02*
U.S. Cl. 600—488 6 Claims



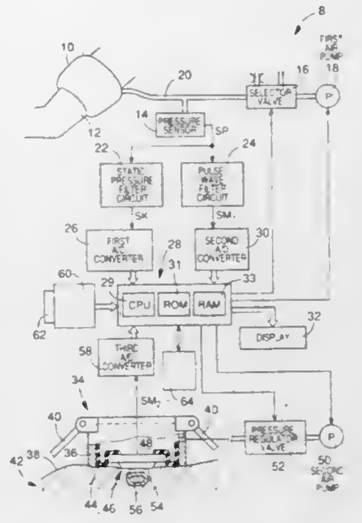
1. A catheter that is guided into an intra-corporeal passageway, said catheter comprising:
a catheter tube having a longitudinal axis;
means located at an end of the catheter tube to detect pressure in the intra-corporeal passageway, said detecting means including a piston member slidably attached to a distal end of the catheter tube, said piston member being arranged to project and retract with respect to the end of the catheter tube based on the pressure in the intra-corporeal passageway;
a pressure media accommodated in the catheter tube to transmit the detected pressure in the catheter tube, said pressure media consisting of either a gel or a liquid; and
means for outputting an electric signal indicative of the pressure in the catheter tube, said outputting means being disposed in the catheter tube and including a rectangular substrate, a rectangular semiconductor chip disposed on the substrate, and a strain gauge provided within the semiconductor, said substrate and semiconductor chip having a longitudinal axis extending in the same direction as the longitudinal axis of said catheter tube.

5,836,887

PHYSICAL INFORMATION MONITOR SYSTEM HAVING MEANS FOR DETERMINING REFERENCE RANGE FOR ABNORMALITY DETERMINATION, BASED ON MOVING AVERAGE OF PREVIOUSLY OBTAINED VALUES

Tohru Oka, Ichinomiya, and Makoto Takakura, Sapporo, both of Japan, assignors to Colin Corporation, Komaki, Japan
Filed Sep. 19, 1996, Ser. No. 716,604
Int. Cl.^{6} A61B *5/00*
U.S. Cl. 600—494 4 Claims

1. A physical information monitor system, comprising:
physical information obtaining means for successively obtaining physical information values of a living subject;
moving average calculating means for continuously calculating a moving average of said physical information values successively obtained by said physical information obtaining means;
reference range determining means for determining a reference range on the basis of said moving average calculated by said moving average calculating means; and



abnormality determining means for determining whether one of said physical information values which is currently obtained by said physical information obtaining means is abnormal, said abnormality determining means generating an abnormality signal when the currently obtained physical information value is outside said reference range, wherein said moving average calculating means calculates a first moving average of said physical information values successively obtained during a predetermined first time period, and a second moving average of said physical information values successively obtained during a predetermined second time period which is longer than said predetermined first time period, said reference range determining means determining a first reference range on the basis of said first moving average and a second reference range on the basis of said second moving average, said abnormality determining means generating a first abnormality signal if said current physical information value obtained by said obtaining means is outside said first reference range, and a second abnormality signal different from said first abnormal signal if said current physical information value is outside said second reference range.

5,836,888

BLOOD PRESSURE MEASURING APPARATUS

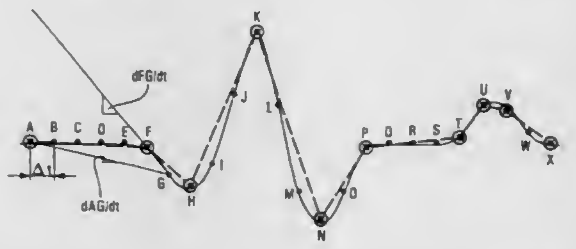
Toshihiko Ogura, Inuyama, and Toru Oka, Ichinomiya, both of Japan, assignors to Colin Corporation, Komaki, Japan
Division of Ser. No. 391,701, Feb. 21, 1995, Pat. No. 5,649,536. This application Feb. 13, 1997, Ser. No. 799,831
Claims priority, application Japan, Feb. 25, 1994, 6-28164; Mar. 1, 1994, 6-31064; Mar. 1, 1994, 6-31567; Apr. 5, 1994, 6-67112; May 17, 1994, 6-5342; Sep. 8, 1994, 6-214425
Int. Cl.^{6} A61B *05/00*
U.S. Cl. 600—494 8 Claims

1. An apparatus for monitoring a blood pressure of a living subject, comprising:
an inflatable cuff adapted to be wound around a body portion of the subject, said cuff being inflated to provide a pressure to press said body portion;
a detector which detects a plurality of pulse amplitudes produced in said cuff being inflated to press said body portion;
a pressure changing device which increases said pressure of said cuff to a prescribed value lower than a mean blood pressure of the subject, and subsequently decreases the cuff pressure from said prescribed value, in each of a plurality of periodic cycles;
rate-of-change determining means for determining, with respect to said cuff pressure, a rate of change of the pulse amplitudes detected by said detector while the cuff pressure is changed by said pressure changing device; and
first abnormality judging means for judging, based on the determined rate of change, whether said blood pressure of the subject is abnormal.

5,836,889

METHOD AND APPARATUS FOR STORING SIGNALS IN AN IMPLANTABLE MEDICAL DEVICE

Paul Wyborny; Indra Nigam, both of Lake Oswego, Oreg., and Max Schaldach, Erlangen, Germany, assignors to Biotronik Mess- und Therapiegeraete GmbH & Co. Ingenieurbuero Berlin, Berlin, Germany
Filed Mar. 3, 1997, Ser. No. 806,754
Claims priority, application Germany, Mar. 4, 1996, 196 09 411.9
Int. Cl.^{6} A61B *5/04*; G01D *1/12*
U.S. Cl. 600—509 15 Claims



1. Method of storing signals having a course over time in an implantable medical device and/or transmitting the signals out of the device and out of a patient's body, said method comprising the steps of:
sensing physiological signals of a patient's body;
detecting a course over time associated with said sensed physiological signals in the device, said course over time being detected at predetermined time intervals with a constant sampling interval;
obtaining a quantity of signal samples from the detected course over time;
selecting a partial quantity of said obtained signal samples based on predetermined selection criterion wherein the selection criterion is the first derivation of the course over time of the signals according to time and said selecting step includes determining an initial first derivation of the straight-line connection between an nth and the (n−1)th signal sample; and comparing the initial first derivation to an earlier first derivation of the straight-line connection between (n−1)th signal sample and the last-stored and/or last-transmitted signal sample; and
storing and/or transmitting the nth signal sample as the new last signal when the initial first derivation and the earlier first derivation differ by more than a predetermined value.

5,836,890

APPARATUS AND METHOD OF PROVIDING A PERSONAL FERTILITY PREDICTOR

Joseph N. Jackson, 13621 Cerise Ave., No. 1, Hawthorne, Calif. 90250, assignor to Joseph N. Jackson, Hawthorne, Calif.
Filed May 30, 1997, Ser. No. 865,506
Int. Cl.^{6} A61B *5/00*
U.S. Cl. 600—551 25 Claims

1. An apparatus for predicting fertility, comprising:
a housing;
a control panel enclosed within said housing, said control panel having a plurality of function keys for entering information related to a fertility cycle;
a memory that stores instruction sequences;
a processor coupled to said memory, for executing the stored instruction sequences;
wherein the stored instruction sequences include process steps to cause the processor to compute a chance of pregnancy for one of a first, second, third, and fourth periods in a predetermined month said first, second, third, and fourth periods corresponding to a menstrual cycle in progress, a maximum chance of preganancy, an increased chance of preganancy, and a decreased chance of pregnancy, respectively; and

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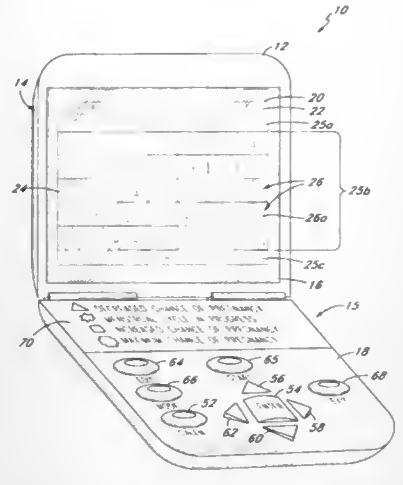
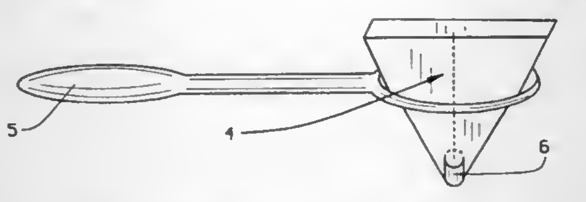


- a display coupled to said processor, said memory and said control panel, that displays a calendar showing days in said first, second, third and fourth periods of the predetermined month, each day being marked by one of a plurality of symbols to indicate said chance of pregnancy, said display being scrollable to display said first, second, third and fourth periods of the predetermined number of following months.

5,836,891
METHOD AND APPARATUS FOR DETERMINING THE DENSITY AND STRUCTURAL INTEGRITY OF BIOLOGICAL TISSUES, MEDICAL IMPLANTS AND STRUCTURAL PARTS

Andrew D. Dimarogonas, 7135 Pershing Ave., St. Louis, Mo. 63130

Filed May 20, 1997, Ser. No. 859,439
Int. Cl.^{6} A61B *5/00*
U.S. Cl. 600—552 **28 Claims**



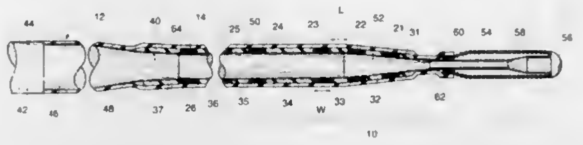
1. A measuring device for non-invasively determining the loss in density of a discrete piece of biological tissue, said device comprising:
- a striking mass of known mass for impacting the said tissue, said striking mass having a maximum approach velocity V prior to impacting said tissue and a maximum rebound velocity v after impacting said tissue; and
- means for determining an impact velocity ratio v/V of the maximum rebound velocity to the maximum approach velocity, the impact velocity ratio being indicative of the density of the tissue struck.

5,836,892
GUIDEWIRE WITH RADIOPAQUE MARKERS

Juan Lorenzo, Miami, Fla., assignor to Cordis Corporation, Miami Lakes, Fla.

Filed Oct. 30, 1995, Ser. No. 550,532
Int. Cl.^{6} A61B *5/00*
U.S. Cl. 600—585 **16 Claims**

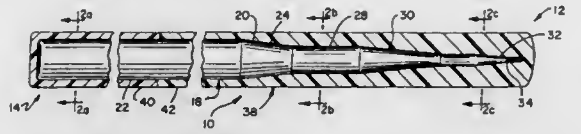
1. A guidewire comprising: a tip section including a core wire including a first tapered portion, a reduced-in-diameter portion, a second tapered portion and a rod end portion, at least three highly radiopaque annular marked bands having a length between 1 mm and 3 mm which are received on said core wire between said first tapered portion and said rod end portion, said middle band being received on said core wire, and precisely spaced apart on said core wire by at least two plastic sleeves each having a precise length between 5 mm and 8 cm, the precise length being the same or different for the two plastic sleeves, and an outer sleeve covering the marker bands and tubing segments or sleeves.



5,836,893
INTRAVASCULAR GUIDEWIRE

Michael J. Urick, Rogers, Minn., assignor to SciMed Life Systems, Inc., Maple Grove, Minn.

Filed Mar. 8, 1996, Ser. No. 612,751
Int. Cl.^{6} A61B *5/00*
U.S. Cl. 600—585 **8 Claims**



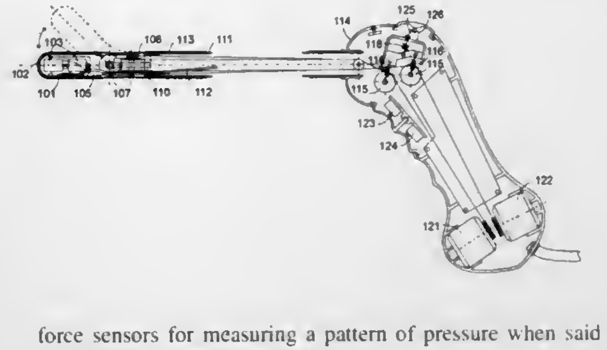
1. A guidewire comprising:
- an elongated core having a length, a width, proximal end, distal end, and an axial surface extending the length of said elongated core; and
- a plastic jacket extending around said axial surface of said elongated core, said plastic jacket including a proximal jacket portion and a distal jacket portion, said portions formed of a plastic material, wherein said distal jacket portion incorporates means for enhancing the radiopaque properties of said distal jacket portion relative to said proximal jacket portion;
- said distal jacket portion having a distal jacket section and a proximal jacket section, said proximal jacket section having a different radiopacity than said distal jacket section wherein said distal jacket section radiopacity is greater than said proximal jacket section radiopacity, and said distal jacket section is at least 80% loaded by weight with radiopaque material; and
- said distal jacket section including a softer material than said proximal jacket section and including a plastic atraumatic distal tip disposed distally of said distal end of said core.

5,836,894
APPARATUS FOR MEASURING MECHANICAL PARAMETERS OF THE PROSTATE AND FOR IMAGING THE PROSTATE USING SUCH PARAMETERS

Armen P. Sarvazyan, E. Brunwick, N.J., assignor to Artann Laboratories, Lambertville, N.J.

Continuation-in-part of Ser. No. 607,645, Feb. 27, 1996, which is a continuation-in-part of Ser. No. 994,109, Dec. 21, 1992, Pat. No. 5,524,636. This application Jun. 10, 1997, Ser. No. 872,561
Int. Cl.^{6} A61B *5/00*
U.S. Cl. 600—587 **9 Claims**

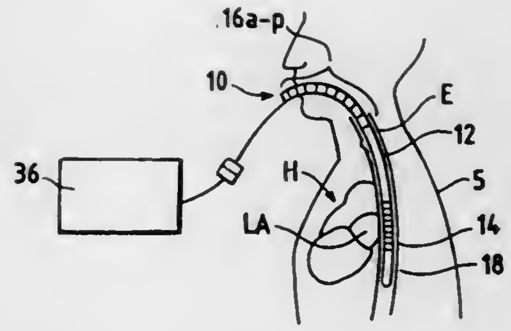
1. A transrectal probe for measuring mechanical properties of the prostate gland comprising:
- a control handle;
- a probe shaft having an axis, said shaft extending from said handle; and
- a tip at the end of said shaft for pressing against tissue overlying surfaces of the prostate gland, said tip comprising a position sensor for measuring the position of said tip and an array of force sensors for measuring a pattern of pressure when said tip is pressed against said tissue.



5,836,895
ESOPHAGEAL CATHETER WITH GAUGE

Maynard Ramsey, III, Tampa, Fla., assignor to Arzco Medical Systems, Inc., Tampa, Fla.

Filed Jan. 9, 1995, Ser. No. 370,164
Int. Cl.^{6} A61B *5/103*
U.S. Cl. 600—593 **22 Claims**



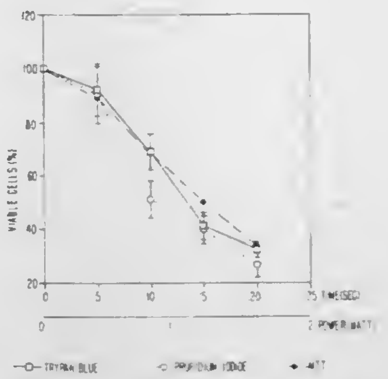
1. A gauging esophageal catheter insertable into an esophagus of an associated subject, the subject having a determinable height, the esophageal catheter comprising:
- an elongated, flexible body portion having a proximal end and a distal end, said flexible body portion being insertable at least partially orally or nasally, said distal end being insertable into the esophagus of the subject;
- an instrument carried on said distal end; and
- said body portion having a series of user visible gradations for permitting selective positioning of said distal end at a predetermined insertion depth within the subject, said gradations being calibrated according to subject height and said gradations labeled in measurements corresponding to subject height in accordance with oral or nasal insertion.

5,836,896
METHOD OF INHIBITING RESTENOSIS BY APPLYING ULTRASONIC ENERGY

Uri Rosenschein, Kfar Daniel, Israel, assignor to Angiosonics, Morrisville, N.C.

Filed Aug. 19, 1996, Ser. No. 700,064
Int. Cl.^{6} A61B *17/22*
U.S. Cl. 601—2 **16 Claims**

1. A method of inhibiting restenosis in mammals, comprising:
- treating a stenosis of a blood vessel of a mammal, said treatment causing injury to the vessel wall in the region of the stenosis;
- applying ultrasound within the vessel to cause cavitation within the vessel in the region of the injury and irradiating smooth muscle cells in the region of the injury with sufficient ultrasound energy to reduce the migration capacity of the smooth muscle cells at least about 2.4 fold without the use of restenosis inhibiting drugs.

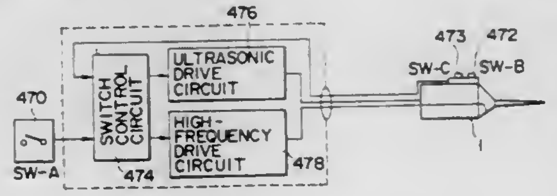


5,836,897
ULTRASONIC TREATMENT APPARATUS

Tomohisa Sakurai; Hideo Nagazumi; Kazuya Hijii; Toshihiko Suzuta; Masahiro Kudo, all of Hachioji; Kenji Yoshino, Tama; Tetsumaru Kubota, Hachioji; Tatsuya Kubota, Sagamihara; Hiroaki Kagawa, Hachioji; Yulchi Ikeda, Hachioji; Mitsumasa Okada, Hachioji; Hitoshi Karasawa, Hachioji, and Tadao Hagino, Yokohama, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 734,733, Oct. 21, 1996, abandoned, which is a continuation of Ser. No. 377,272, Jan. 20, 1995, abandoned, which is a division of Ser. No. 94,910, Jul. 20, 1993, Pat. No. 5,391,144, which is a continuation of Ser. No. 680,099, Apr. 2, 1991, abandoned, which is a continuation-in-part of Ser. No. 628,650, Dec. 14, 1990, abandoned. This application Aug. 14, 1997, Ser. No. 911,135

Claims priority, application Japan, Feb. 2, 1990, 2-22241; Feb. 13, 1990, 2-32099; Mar. 27, 1990, 2-77375; Mar. 28, 1990, 2-79716; Mar. 29, 1990, 2-78918; Mar. 29, 1990, 2-78919; Apr. 19, 1990, 2-89685; Jun. 15, 1990, 2-155522; Jun. 29, 1990, 2-170232; Jul. 24, 1990, 2-193802; Jul. 31, 1990, 2-201132; Oct. 23, 1990, 2-283322; Oct. 26, 1990, 2-286976
Int. Cl.^{6} A61B *17/36*
U.S. Cl. 601—2 **2 Claims**



1. An ultrasonic treatment apparatus comprising:
- a hand piece having a probe and ultrasonic oscillation means for emitting an ultrasonic vibration through said probe;
- a driving device including ultrasonic drive means for outputting an ultrasonic treatment signal and high-frequency drive means for outputting (i) a first high-frequency treatment signal for incising a tissue and (ii) a second high-frequency treatment signal for coagulating a blood;
- a signal transmission cable connecting said hand piece to said driving device so that said ultrasonic treatment signal and said first and second high-frequency treatment signals are supplied from said driving device to said ultrasonic oscillation means and said probe of the hand piece, respectively;
- switching means including a first switch element for said ultrasonic treatment signal, a second switch element for said first high-frequency treatment signal, and a third switch element for said second high-frequency treatment signal; and
- a control circuit for selectively controlling said ultrasonic drive means and said high-frequency drive means with operation of

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said first, second and third switch elements so that at a particular time only one of (a) said ultrasonic treatment signal, (b) said first high-frequency treatment signal, (c) said second high-frequency treatment signal, and (d) a combination of said ultrasonic treatment signal and said second high-frequency treatment signal is selectively supplied to said hand piece, wherein said control circuit includes means to prevent said ultrasonic treatment signal and said first high-frequency treatment signal from being simultaneously supplied to said hand piece even when said first and second switch elements are operated.

5,836,898
LITHOTRIPSY COMBINATION COMPRISING A THERAPY UNIT

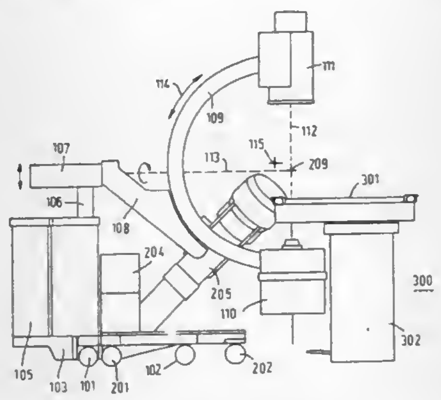
Horst Schwieker, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 6, 1995, Ser. No. 568,085

Claims priority, application Germany, Dec. 7, 1994, 44 43 495.2

Int. Cl.^{6} A61B *17/22*

U.S. Cl. 601—4 **11 Claims**



1. A lithotripsy combination, comprising a therapy unit and a separate X-ray locating unit, the X-ray locating unit including a first carriage detachably coupled to the therapy unit via a coupling unit, an X-ray source and an X-ray image converter for locating at least two defined locating positions, the therapy unit including a second carriage and a shockwave generator mounted thereon and having a focus which is stationary relative to the second carriage, the first and second carriages, or parts rigidly connected thereto, detachably coupled to one another via the coupling unit in such manner that when coupled the first and second carriages can be displaced together, and that, at least in the locating positions, a focus of the shockwave generator is situated on a central line which interconnects the X-ray source and the X-ray image converter.

5,836,899
VIBRATING MASSAGE SYSTEM FOR FOOTWEAR

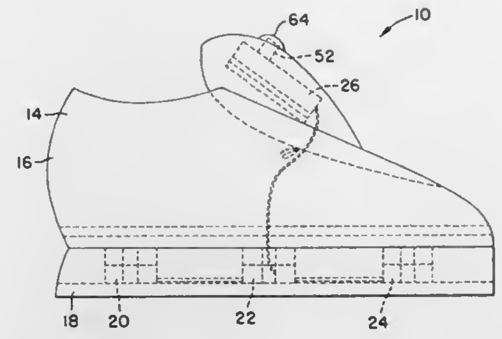
Peter C. Reilly, Three Hanover Sq., New York, N.Y. 10004

Filed Dec. 20, 1996, Ser. No. 769,838

Int. Cl.^{6} A61H *1/00;* **A61F** *5/14*

U.S. Cl. 601—46 **17 Claims**

1. A vibrating massage system for footwear comprising:
a tongue;
an upper member with said upper member having an arch wall;
a sole with said sole having an inner surface, an outer surface, a heel portion and a toe portion;
vibrator means mounted on said inner surface of said sole;
power supply means mounted on said tongue;
battery means mounted on said tongue;
control means mounted on said tongue;



electrical connection means with said electrical connection means connecting said vibrator means, said power supply means, said battery means and said control means.

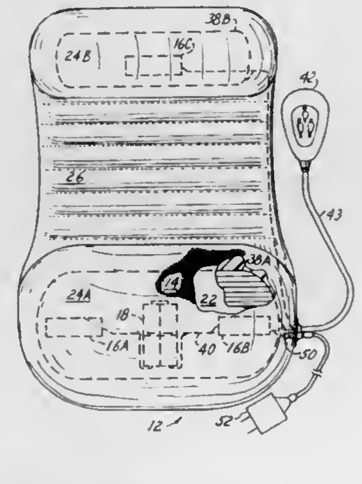
5,836,900
MASSAGING APPARATUS HAVING TRANSFORMABLE PAD

Robert D. Leventhal, Los Angeles, Calif., assignor to JB Research, Inc., Bellflower, Calif.

Filed Mar. 19, 1997, Ser. No. 821,020

Int. Cl.^{6} A61H *1/00;* **A47C** *17/70;17/82;4/28*

U.S. Cl. 601—57 **10 Claims**



1. A massaging apparatus comprising:

(a) a flexible foam pad having a top profile, a bottom profile, and including spaced apart first and second enlarged regions and a more flexible region connecting the enlarged regions for permitting the pad to be deformed from a flattened condition wherein the regions are generally coplanar to a folded condition wherein the first enlarged region is substantially inverted and offset relative to the second enlarged region for forming a composite top profile in the folded condition, the composite top profile having a first raised portion being formed by the first enlarged region being supported on a portion of the more flexible region, a second, lower portion of the composite top profile being formed by a portion of the second enlarged portion;

(b) a plurality of vibrators coupled to the foam pad for vibrating the pad, at least one of the vibrators being within each of the enlarged regions; and

(c) means for holding the pad in the folded condition.

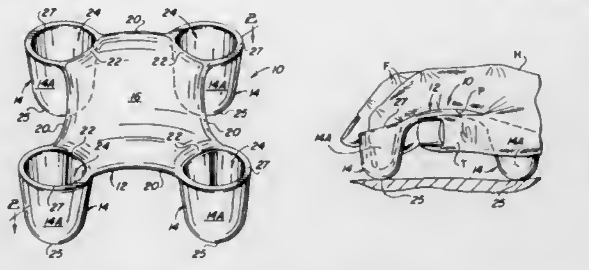
5,836,901
HAND HELD MASSAGING DEVICE HAVING CONTACT ELEMENTS WITH FINGER HOLD CAVITIES

Yuval Shenkal, San Diego, Calif., and Myra S. Per-Lee, 16136 Avenida Venusto, #2, San Diego, Calif. 92128, assignors to Myra S. Per-Lee, San Diego, Calif.

Filed Jan. 29, 1997, Ser. No. 790,924

Int. Cl.^{6} A61H *7/00*

U.S. Cl. 601—135 **20 Claims**



1. A hand held massaging device, comprising:

(a) a support body having a top for facing the palm of a hand of a user, a bottom for facing away from the palm of the hand of the user, a plurality of peripheral sides surrounding said top and said bottom, and a plurality of corners defined at adjacent ends of said peripheral sides; and

(b) a plurality of hollow contact elements attached to said respective corners of said support body, each of said contact elements being a cup-shaped wall spaced apart from one another about said peripheral sides of said support body and disposed outwardly from said top and bottom of said support body and extending downwardly away from said bottom of said support body at one of said respective corners of said support body, each of said cup-shaped walls forming a hollow cavity having an opening at a top end of said cup-shaped wall disposed outwardly from and adjacent to said respective corner and said top of said support body for receiving at least one of the fingers and thumb of the hand of the user therein for directing said plurality of contact elements over the surface of a body during a massage.

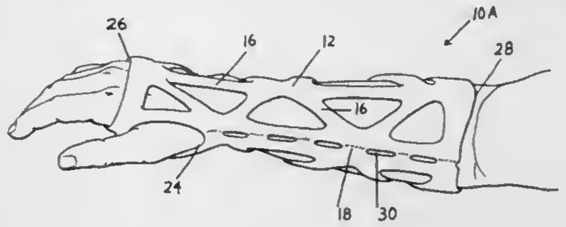
5,836,902
SPLINT

James C. Gray, 2405 Alcoa Hwy., Knoxville, Tenn. 37920

Filed Dec. 3, 1996, Ser. No. 759,800

Int. Cl.^{6} A61F *5/00;5/37*

U.S. Cl. 602—5 **24 Claims**



1. An improved splint for biasing a body portion of a patient to a preselected position and for at least partially immobilizing the body portion, said device comprising:

a splint body preformed to restrain the body portion in said preselected position, said splint body defining at least two ribs which are interconnected in a manner such that the body portion is biased in said preselected position, said splint body integrally fabricated of a resilient material to at least partially immobilize the body portion, said splint body being configured to surround the body portion, said splint body defining a flexible span integrally formed in said splint body for opening the splint to receive the body portion.

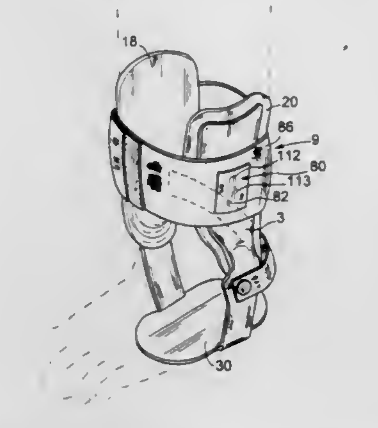
5,836,903
ANKLE BRACE WITH ADJUSTABLE STRAP POSITIONING FASTENER

Rick E. Peters, Louisville, Ky., assignor to Active Ankle Systems, Inc., Louisville, Ky.

Continuation-in-part of Ser. No. 489,758, Jun. 13, 1995, Pat. No. 5,676,642. This application May 13, 1997, Ser. No. 855,197

Int. Cl.^{6} A61F *5/00*

U.S. Cl. 602—27 **39 Claims**



1. An ankle brace, comprising:

a heel stirrup, including a bottom portion connecting inner and outer leg support members; and

at least one of said inner and outer leg support members having a first leg support member fastening means on an exterior surface thereof, said at least one of said inner and outer leg support members including a second leg support member fastening means extending from said exterior surface in proximity to said first leg support member fastening means;

at least one connecting strap for attaching to at least one of said inner and outer leg support members for releasably holding said inner and outer leg support members together, said connecting strap including a first strap fastening means for adjustably and releasably engaging said first leg support member fastening means, and said connecting strap including a second strap fastening means for adjustably and releasably engaging said second leg support member fastening means, said second strap fastening means extending over and covering said first strap fastening means.

5,836,904
ENHANCED COMFORT SLEEVE AND COVER FOR MEDICAL DEVICES AND SPORT PADS

Curtis R. Cooper, 3424 NW. 7th Pl., Gainesville, Fla. 32607

Filed Jan. 29, 1996, Ser. No. 593,271

Int. Cl.^{6} A61F *5/00*

U.S. Cl. 602—60 **3 Claims**

1. An integral sleeve and cover providing improved comfort and appearance to wearers of medical support devices and sports pads, comprising:

a tubular sleeve body formed substantially of cotton and elastomeric fibers,

said sleeve body having a lining portion and a cover portion and having a first and second end each said end forming an opening,

said sleeve body being formed of a generally rectangular shaped fabric piece having two opposing sides, said opposing sides

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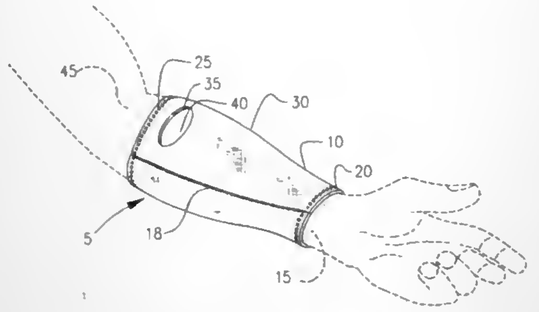


being joined by a longitudinal seam, said sleeve body also having a predetermined length from said first end to said second end, said length being essentially double the length of a typical support device, and

a loop formed within said sleeve body,

such that in use said sleeve body may be disposed over a person's forearm, a typical support device secured over the sleeve body lining portion and the sleeve body cover portion then drawn over the support device thereby covering it.

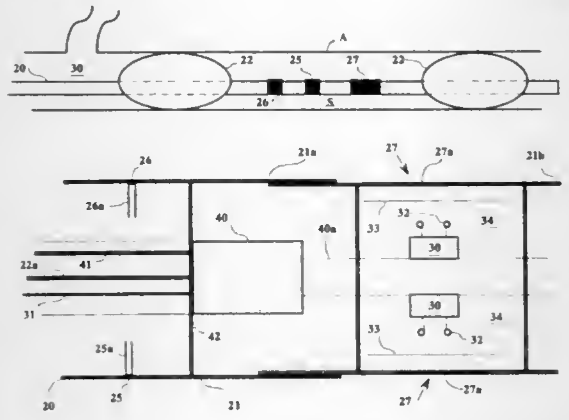
5,836,905
APPARATUS AND METHODS FOR GENE THERAPY

Jerome H. Lemelson, Suite 286, Unit 802, 930 Tahoe Blvd., Incline Village, Nev. 89451, and J. Kevin Parker, 551 Green Bay Rd., Highland Park, Ill. 60035

Continuation of Ser. No. 262,581, Jun. 20, 1994, abandoned. This application Dec. 27, 1996, Ser. No. 775,047

Int. Cl.⁶ A61N *1/30*

U.S. Cl. 604—21 **17 Claims**



1. A catheter for transferring medical material in vivo to a target tissue comprising:

- an elongated hollow flexible tubular member adapted to be inserted within a blood vessel;
- an operating head attached to said tubular member and containing a particle bombardment device disposed therein for discharging particles coated with medical material so that particles impinge in vivo on target tissue and deliver the medical material intracellularly thereto;
- a discharge port disposed on said operating head out through which are discharged said particles wherein said operating head further comprises telescoping proximal and distal sections which act to seal and unseal said discharge port;
- a hydraulic cylinder within said operating head for moving one of said telescoping sections with respect to the other so as to seal and unseal said discharge port;
- proximal and distal balloons girthing said tubular member supported adjacent said operating head; and
- a balloon inflation line running through said tubular member and communicating with said proximal and distal balloons so as to provide inflation pressure thereto wherein inflation of said proximal and distal balloons against the walls of an artery or other body duct in which said catheter is inserted serves to isolate a space therebetween into which coated particles may be discharged from said operating head toward a target tissue.

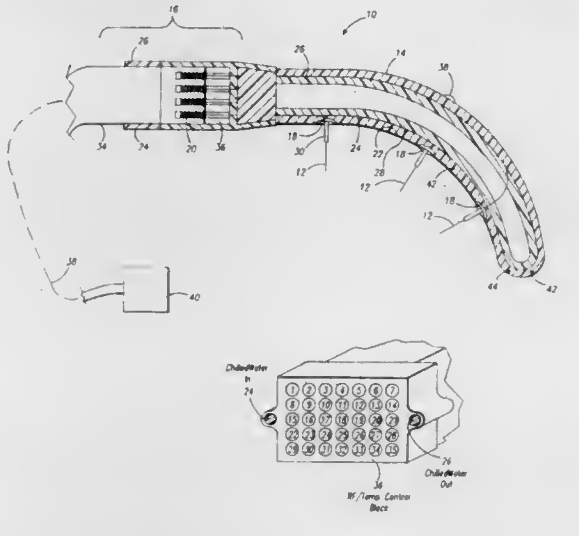
5,836,906
METHOD AND APPARATUS FOR TREATMENT OF AIR WAY OBSTRUCTIONS

Stuart D. Edwards, Los Altos, Calif., assignor to SOMNUS Medical Technologies, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 642,053, May 3, 1996, which is a continuation-in-part of Ser. No. 606,195, Feb. 23, 1996, Pat. No. 5,683,360. This application May 22, 1996, Ser. No. 651,800

Int. Cl.⁶ A61M *1/00*

U.S. Cl. 604—22 **40 Claims**



1. An apparatus for ablating at least a portion of an interior of a body structure, comprising:

- a catheter including a catheter tissue interface surface and a port formed in the catheter tissue interface surface;
- an energy delivery device at least partially positioned in the interior of the catheter and configured to be advanced and retracted in and out of the port, the energy delivery device including an energy delivery surface;
- a disinfectant medium introduction member coupled to the catheter and to a source of a disinfectant medium and including a distal end configured to extend into an oral cavity;
- an energy delivery device advancement and retraction device at least partially positioned in the interior of the catheter; and
- a cable coupled to the electrode.

5,836,907
DISPOSABLE GASTRIC LAVAGE KIT

Sharon L. Campbell, 4075 Seven Hills Ct., Stone Mt., Ga. 30083

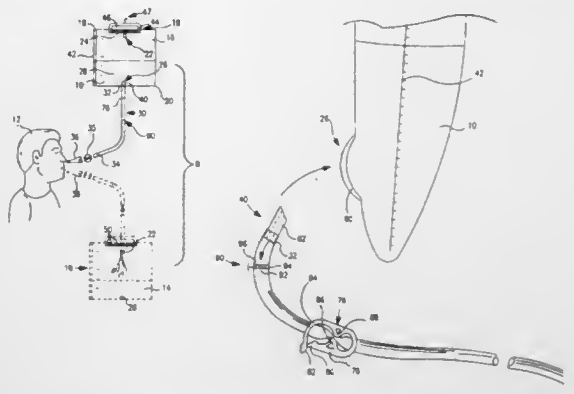
Filed Nov. 5, 1996, Ser. No. 743,821

Int. Cl.⁶ A61M *1/00*

U.S. Cl. 604—27 **15 Claims**

1. A method of lavaging a gastrointestinal cavity of a patient, comprising the steps of:

- providing two containers, each having an upper end and a lower end, a first self-sealing port located in a region of the upper end of the container, and a second self-sealing port located in a region of the lower end of the container; a flexible, essentially Y-shaped tubing having first, second and third ends; and at least two breaching devices for breaching selected ones of said self-sealing ports, with a first one of the breaching devices being attached to the first end of the tubing, and a second one of the breaching devices being attached to the second end of the tubing;
- filling a first one of the containers with a fluid;
- positioning the first container at an elevation above the patient;
- positioning the second container at an elevation below the gastrointestinal cavity of the patient;
- clamping the flexible tubing closed in regions of both the first and second ends;
- connecting the third end of the tubing to one of a nasogastric and orogastric adapter located within a nose or mouth, respectively, of the patient;
- breaching the second self-sealing port of the first container with the first breaching device to establish a fluid communication between an interior of the first container and an interior of the tubing;
- breaching the first self-sealing port of the second container with the second breaching device to establish a fluid communication between an interior of the second container and the interior of the tubing;
- unclamping the flexible tubing in the region of the first end to allow the fluid to flow from the first container into the gastrointestinal cavity of the patient; and
- unclamping the flexible tubing in the region of the second end to allow the fluid to flow from the gastrointestinal cavity of the patient into the second container.



5,836,908
DISPOSABLE BALANCING UNIT FOR BALANCING FLUIDS, AND RELATED MEDICAL TREATMENT DEVICE

Josef Beden, Mainz-Kastel; Hans-Jurgen Flaig, Lauterbach, and Bernd Steinbach, Friedberg, all of Germany, assignors to Fresenius Aktiengesellschaft, Bad Homburg, Germany

Filed Dec. 9, 1996, Ser. No. 762,084

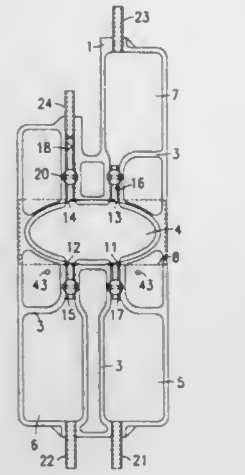
Claims priority, application Germany, Dec. 9, 1995, 195 46 028.6

Int. Cl.⁶ A61M *1/28*

U.S. Cl. 604—29 **20 Claims**

1. A disposable balancing unit for balancing fluids for a medical treatment device comprising: first and second superposed plastic sheets, which are joined together in a pressure-resistant manner, forming

- a balancing chamber in the unit that is divided by a flexible wall into a first and a second chamber half, said flexible wall of said balancing chamber being formed by an intermediate sheet, which is inserted between the first and second sheet in the area of the balancing volume and is so joined to the first and second sheets, forming the two chamber halves so that said first chamber half is separated in a pressure-tight manner from said second chamber half;
- a first equalization chamber in the unit, which is in fluid communication with the first chamber half via a first inlet channel and, which is able to be clamped off in a pressure-tight manner;
- a second equalization chamber in the unit, which is in fluid communication with the second chamber half via a second inlet channel, which is able to be clamped off in a pressure-tight manner; and
- a first outlet channel, which is able to be clamped off in a pressure-tight manner and is in fluid communication with said first chamber half, and a second outlet channel, which is able to be clamped off in a pressure-tight manner and is in fluid communication with said second chamber half.



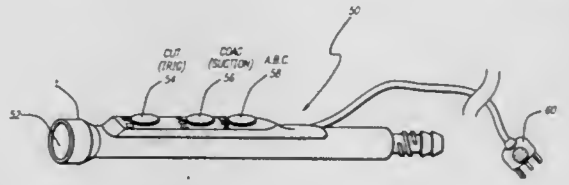
5,836,909
AUTOMATIC FLUID CONTROL SYSTEM FOR USE IN OPEN AND LAPAROSCOPIC LASER SURGERY AND ELECTROSURGERY AND METHOD THEREFOR

Ioan Cosmescu, 1449 N. 22nd St., Phoenix, Ariz. 85022

Filed Sep. 13, 1996, Ser. No. 713,447

Int. Cl.⁶ A61M *1/00;* **A61N** *1/30;* **A62B** *17/36*

U.S. Cl. 601—35 **48 Claims**



1. A manual fluid control system for surgical lasers and electrosurgery apparatus, for both open and laparoscopic procedures, comprising, in combination:

- at least one fluid irrigation container;
- an irrigation tubing connected to said at least one fluid irrigation container;
- a valve connected to the irrigation tubing for accessing irrigation fluid in said at least one fluid irrigation container;
- means for pumping said irrigation fluid through the irrigation tubing to a surgery site in a patient;
- a suction tubing connected to a suction container; and
- means for simultaneously suctioning fluid from the patient at the surgery site through the suctioning tube while pumping irrigation fluid, wherein said suctioning means comprises at least one of an independent suctioning means and a suctioning means contained within an automatic smoke evacuator system.

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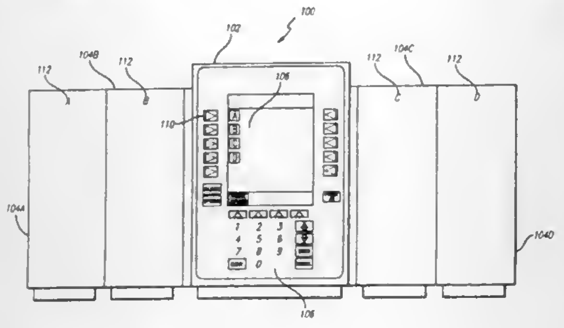
5,836,910
METHOD AND APPARATUS FOR LOGICAL ADDRESSING IN A MODULAR PATIENT CARE SYSTEM

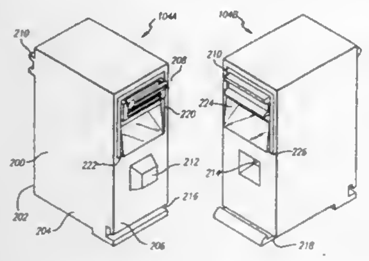
Robert J. Duffy, Poway; Casimer Domitrz, San Diego; Edward M. Richards, Pleasanton; Lon M. Severe, San Diego, and Benson C. Stone, Poway, all of Calif., assignors to Alaris Medical Systems, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 403,503, Mar. 13, 1995, Pat. No. 5,713,856. This application Jun. 9, 1997, Ser. No. 866,664

Int. Cl.^{6} A61B *31/00*

U.S. Cl. 604—65 **22 Claims**





1. A modular patient care system having a plurality of units detachably coupled to form a linear array of units, said linear array having a originating end and a terminating end, each of said units having an originating side facing said originating end and a terminating side facing said terminating end, said plurality of units comprising:
- an interface unit for providing a user interface to said system, said interface unit being capable of providing sequential logical ID's;
- a plurality of functional units, each functional unit having a unique resettable logical ID; and
- a communications bus formed by said linear array of units for allowing each functional unit to communicate with said interface unit and receive commands therefrom;
- wherein said patient care system is capable of automatically assigning said sequential logical ID's to said functional units according to their sequential positions in said linear array without requiring external user input or a prearranged locational scheme for indicating a relative physical position of a functional unit.

5,836,911
INJECTION DEVICE HAVING POSITIONING MEANS

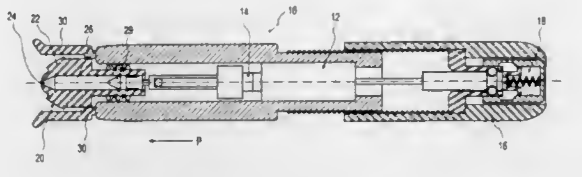
Matthew Marzynski; Paul Mulhauser, both of New York, N.Y., and Dave Schiff, Highland Park, N.J., assignors to Medi-Ject Corporation, Minneapolis, Minn.

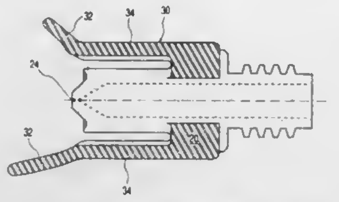
Filed Feb. 1, 1996, Ser. No. 595,140

Int. Cl.^{6} A61M *5/30*

U.S. Cl. 604—72 **12 Claims**

1. A nozzle assembly adapted for an injector comprising:
- a chamber for holding a fluid and having a first end, a second end and an orifice for passage of a stream of the fluid, the orifice located at the first end of the chamber;
- a guide for guiding the stream of fluid to a curved area of an injection site, said guide comprising first and second wings, each having a face and extending outwardly and away from the chamber at an angle, said first and second wings together forming a V-shape to accommodate the curved area of the injection site therebetween with the orifice directly contacting the injection site and with the face of each first and second wing at least partially contacting the curved area so as to align the chamber with the curved area for passing the stream of fluid directly into the injection site at a predetermined angle thereto; and
- a plunger slidingly received in said chamber for expelling fluid out of the chamber through the orifice at a velocity sufficient to penetrate skin tissue by moving the plunger relative to the chamber.





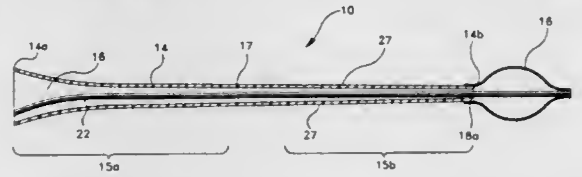
5,836,912
CATHETER HAVING NONLINEAR FLOW PORTION

Richard S. Kusleika, Eden Prairie, Minn., assignor to Schneider (USA) Inc., Plymouth, Minn.

Filed Oct. 21, 1996, Ser. No. 734,350

Int. Cl.^{6} A61M *29/00*

U.S. Cl. 604—96 **23 Claims**



1. An intravascular catheter comprising an elongated tube having a proximal portion and a distal portion, an outside diameter, a balloon mounted on the distal portion of the elongated tube, and at least one lumen having a plurality of flow cross-sectional areas forming a longitudinal length and communicating with the balloon wherein the flow cross-sectional areas change in area at a nonuniform rate per unit of longitudinal length over at least a portion of the lumen;
- wherein the flow cross-sectional area decreases at least 50% in area within about the first 25% of the lumen longitudinal length measured from the proximal end.

5,836,913
DEVICE AND METHOD FOR ACCESSING A BODY CAVITY

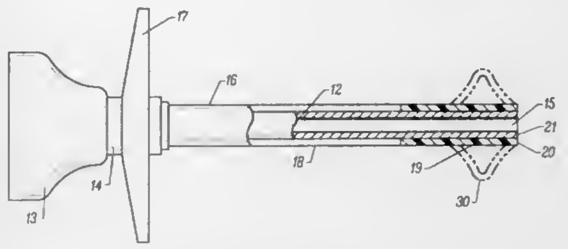
Michael J. Orth, Morgan Hill; John E. Carlson, San Jose; William R. Dubrul, Redwood City, and Steven P. Masterson, San Francisco, all of Calif., assignors to Innerdyne, Inc., Sunnyvale, Calif.

Filed May 2, 1997, Ser. No. 850,795

Int. Cl.^{6} A61M *37/00*

U.S. Cl. 604—107 **21 Claims**

1. An abdominal access assembly comprising:
- a tubular member having a proximal end, a distal end, and a lumen therethrough;
- a first sleeve disposed coaxially over the tubular member, said sleeve having:
  - (a) a distal radially expandable region,
  - (b) a proximal non-expandable region,
- wherein the sleeve is shiftable over the tubular member from an axially elongated configuration to an axially shortened configuration to radially expand the distal region, wherein the expanded distal region provides a structure which is capable of sealing against an internal surface of an abdominal wall;
- a pneumostasis valve attached to the proximal end of the tubular member; and
- an obturator removably receivable in the lumen of the tubular member.



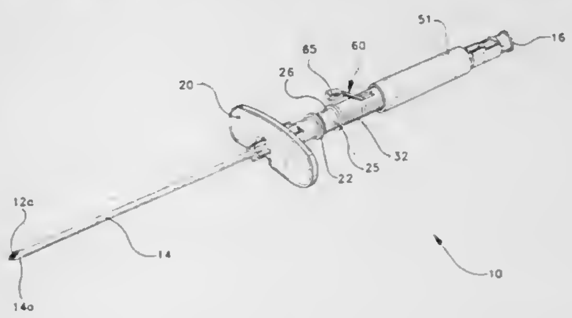
5,836,914
METHOD AND APPARATUS FOR VARIABLY REGULATING THE LENGTH OF A COMBINED SPINAL-EPIDURAL NEEDLE

Frederick C. Houghton, Sussex, N.J., assignor to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed Sep. 15, 1995, Ser. No. 529,301

Int. Cl.^{6} A61M *5/00*

U.S. Cl. 604—117 **22 Claims**



1. A device for regulating the extension of a spinal needle relative to an epidural needle, comprising:
- a first member for securing an epidural needle;
- a second member defining an internal cavity comprising a plurality of planar surfaces substantially circumferentially disposed about a central axis of said second member, said first member comprising an exterior surface in point contact with said planar surface and slidably disposed relative to said first member for securing said spinal needle; and
- a spring element for selectably locking said spinal needle relative to said epidural needle, said spring element having one end fixed to said first member, a free end manipulable by a practitioner, and at least one passage defined intermediate the fixed and free ends of the spring element, said spinal needle disposed through said at least one passage, wherein said spring element is deflectable between a locked position, wherein a portion of said spring element adjacent said at least one passage is disposed to engage the spinal needle so that said first member is locked relative to said second member, and an unlocked position, wherein said at least one passage is disposed to permit the spinal needle to freely slide therethrough allowing said second member to slide relative to said first member to regulate the extension of the spinal needle relative to the epidural needle.

5,836,915
IMPLANTABLE INFUSION PUMP

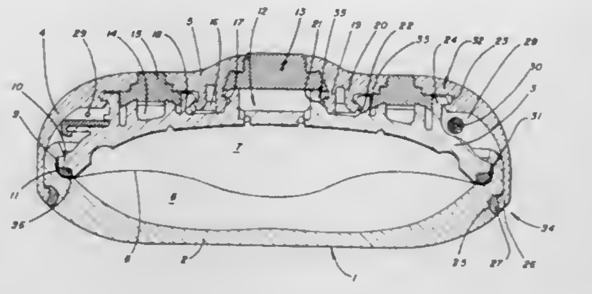
Bernd Steinbach, Friedberg; Claus Walter, Bad Homburg, and Andreas Wild, Friedberg, all of Germany, assignors to Fresenius AG, Bad Homburg, Germany

Filed Sep. 18, 1995, Ser. No. 529,776

Claims priority, application Germany, Sep. 16, 1994, 44 32 991.1

Int. Cl.^{6} A61M *37/00*

U.S. Cl. 604—131 **9 Claims**



1. Implantable infusion pump for dosed emission of medicines into the human body,
- comprising a pump chamber formed by a lower chamber portion and an upper chamber portion connected thereto, whereby
- the pump chamber is separated by a flexible membrane into two sectional chambers, of which the first sectional chamber is defined by the upper chamber portion and the membrane and is formed as the medicine reservoir, the upper chamber portion comprises a refill aperture sealed by at least one pierceable septum which is locked between a septum holder part connected to the upper chamber portion and the upper chamber portion,
- the medicine reservoir is connected through an outlet aperture and an outlet reducer means with an outlet catheter and
- the second sectional chamber is defined by the lower chamber portion and the membrane and is formed as a pressure chamber to accommodate a motive substance, and wherein internal pressure strain is generated under normal operating load; the infusion pump comprising:
- the lower chamber portion and the upper chamber portion being in engagement by at least two associated connections, one of which being a main connection located proximal to said chambers and the other of which being an ancillary connection located distal to said chambers whereby the
- the main connection substantially supports the infusion pump against said internal pressure strain generated under normal operating load and, in the case of deformation of the lower chamber portion, the upper chamber portion and the septum holder part or slippage between the upper chamber portion and the lower chamber portion caused by a pressure increase above normal operating pressure and in the case of failure or deflection of the main connection, the ancillary connection is subjected to corresponding stress and supports the infusion pump against the pressure overload.

5,836,916
COMBINED SPINAL EPIDURAL DEVICE

Stephen B. Corn, Sharon, Mass., assignor to Children's Medical Center Corporation, Boston, Mass.

Filed Mar. 12, 1996, Ser. No. 614,369

Int. Cl.^{6} A61M *5/178*

U.S. Cl. 604—158 **12 Claims**

1. A needle joinder kit, comprising:
- a first needle having an inner lumen;
- a second needle having an inner lumen and an outer diameter that is smaller than the inner diameter of the inner lumen of the first needle; and

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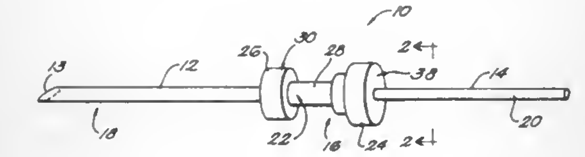
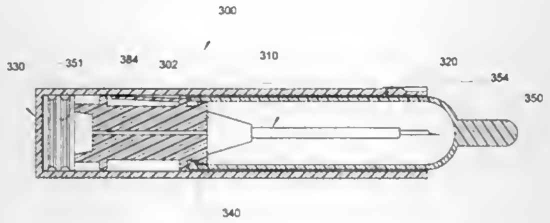


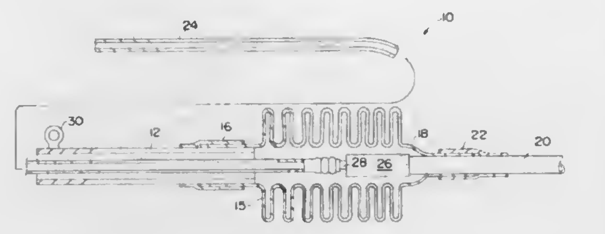
an adapter element adapted to facilitate connection and stabilization of the second needle within the first needle, the adapter element having
- a housing with distal and proximal ends,
- an internal channel, disposed within the housing, having an inner diameter that decreases in the direction from the proximal to the distal end, the distal end of the internal channel being matable with the first needle, and
- a cover associated with the proximal end of the housing of the adapter element, adjacent to the internal channel, through which the second needle is inserted to traverse the internal channel and the lumen of the first needle;
  - the cover including a puncturable membrane for providing positional stability to the second needle when the second needle is inserted into the internal channel.

5,836,917
SELF RETRACTING MEDICAL NEEDLE APPARATUS AND METHODS
David L. Thorne, Kaysville, and Gale H. Thorne, Bountiful, both of Utah, assignors to Specialized Health Products, Inc., Bountiful, Utah
Continuation-in-part of Ser. No. 565,881, Dec. 1, 1995, Pat. No. 5,616,135, which is a continuation-in-part of Ser. No. 455,514, May 31, 1995, Pat. No. 5,549,708, and a continuation of Ser. No. 370,728, Jan. 10, 1995, Pat. No. 5,480,385, and a continuation-in-part of Ser. No. 436,976, May 8, 1995, Pat. No. 5,487,794, and a continuation-in-part of Ser. No. 484,533, Jun. 7, 1995, Pat. No. 5,542,927, which is a continuation-in-part of Ser. No. 370,728, Jan. 10, 1995, Pat. No. 5,480,385. This application Nov. 5, 1996, Ser. No. 744,108
Int. Cl.^{6} A61M *5/00*
U.S. Cl. 604—164 **3 Claims**



1. An extendable and retractable catheter needle assembly comprising:
- a housing;
- a catheter needle which is disposed within an IV catheter for a medical procedure comprising transcutaneous insertion of the catheter into a patient;
- means for extending said catheter needle and catheter from the housing for use in the medical procedure, said extending means comprising:
  - a cover which provides protection for both needle and catheter and by which the needle is extended for use;
  - an energy storing means which stores energy as the catheter needle and catheter are extended;
  - latching means by which the catheter needle is latched in an extended state for use in a medical procedure;
- said housing comprising a cantilevered button which is integral with said housing and which is depressed to release the latching means from the latched state, thereby causing the needle to be safely retracted into the housing.

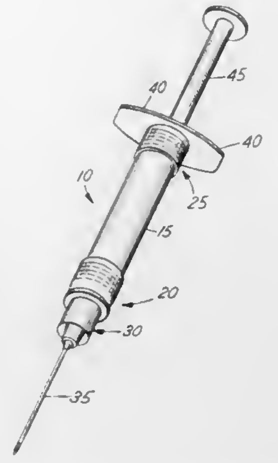
5,836,918
SLEEVED SUCTION DEVICE
Steven C. Dondlinger, 5513 Knoll Dr., Edina, Minn. 55436
Filed Jun. 1, 1995, Ser. No. 456,535
Int. Cl.^{6} A61M *8/00*
U.S. Cl. 604—171 **3 Claims**



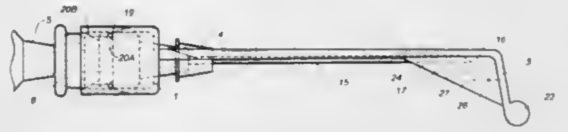
1. A sleeved suction device comprising:
- a. a suction tube for proximal connection to a suction producing device, the suction tube having a distal end;
- b. a connector member, the connector member having a first end secured to the distal end of the suction tube and a second end having a ribbed connector member;
- c. a flexible plastic cover member having a proximal end and a distal end, the proximal end of the flexible cover member secured over the suction tube, adjacent the distal end of the suction tube and adjacent the connector member by tape;
- d. a rigid end member, having a first end and a second end, the first end of the rigid end member secured to the distal end of the flexible plastic cover by tape and having a hanging loop adjacent the second end; and,
- e. a flexible suction catheter tube, having a proximal end and a distal end, the flexible suction catheter tube located within the flexible plastic cover member and attached at the proximal end to the ribbed connector member of the connector member and having the distal end of the flexible catheter tube extending partially into and loosely aligned within rigid end member; and wherein the flexible cover member and the rigid end member can be manually, slideably, proximally, drawn back to reveal the flexible suction catheter tube and subsequently repositioned distally to cover the previously revealed flexible suction catheter tube; and wherein the flexible cover member and the rigid end member can be gathered to expose the ribbed connector member of connector member to enable uncoupling of the the flexible suction catheter tube.

5,836,919
CAP ASSEMBLY
Gregory Skurka, Chicago, Ill.; Clinton A. Haynes, West Chester, and Douglas Marriott, South Lebenon, both of Ohio, assignors to Solopak Pharmaceuticals, Inc., Elk Grove Village, Ill.
Continuation of Ser. No. 652,151, May 23, 1996, abandoned. This application Mar. 10, 1997, Ser. No. 814,099
Int. Cl.^{6} A61M *5/00*
U.S. Cl. 604—187 **25 Claims**

1. A non-elastomeric thermoplastic cap that can be secured on a smooth end of a generally cylindrical body at room temperatures, comprising a deformable tubular sheath having an interior surface, an exterior surface, a first open end for receiving said end of said cylindrical body along a central axis of said sheath, a second end that is at least partially closed to inhibit passage of said cylindrical body through said second end, a gripping region adjacent said first open end for engaging said cylindrical body, and a transition region adjacent said second end having an inside radius (R') that is greater than an inside radius (R) of said gripping region, whereby said sheath is deformable upon interaction of said cylindrical body and said gripping region.

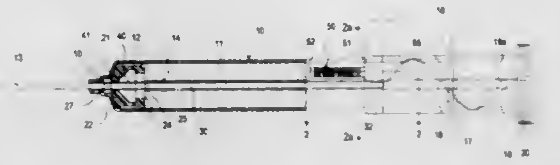


5,836,920
NEEDLE GUARD
William Frost Robertson, The Hollins, 103 Smithy Bridge Road, Littleborough Lancashire OL15 0BQ, United Kingdom
PCT No. PCT/GB95/02256, § 371 Date Mar. 18, 1997, § 102(e) Date Mar. 18, 1997, PCT Pub. No. WO96/09083, PCT Pub. Date Mar. 28, 1996
PCT Filed Sep. 20, 1995, Ser. No. 809,218
Claims priority, application United Kingdom, Sep. 24, 1994, 9419316
Int. Cl.^{6} A61M *5/32*
U.S. Cl. 604—192 **9 Claims**



1. A guard for a needle cannula comprising:
- a hub means for attachment to a needle;
- a shield which can be attached to the hub means and which is adapted to lie adjacent the needle;
- a lip which projects outwardly from the shield so as to cover the tip of the needle; and
- an enclosure means for the tip of the needle located adjacent the lip, the hub means and the shield each comprise complementary attachment means whereby the shield can be attached to the hub means in a first relative position wherein the needle can be used and the shield is capable of flexing away from the needle to uncover the tip as the lip is pressed against the body of a patient and the needle initially penetrates the body and of returning automatically back towards the needle as the needle is withdrawn from the patient so that the lip again covers the tip, and whereby by pulling the shield towards the hub means in a direction substantially parallel to the longitudinal axis of the needle, the shield is attached to the hub means in a second relative position thereto wherein the tip of the needle is enclosed by the enclosure means and thereby locks the shield in position with respect to the needle so that the shield cannot be flexed away from the needle to uncover the tip after use, said complementary attachment means comprise snap-fit fasteners said snap-fit fasteners comprise at least one projection and two longitudinally adjacent complementarily shaped grooves into which the projection can fit, a location of the projection in a first of the grooves providing attachment of the shield to the hub means in the first relative position, and the pulling of the shield towards the hub means in a direction substantially parallel to the longitudinal axis of the needle disengaging the projection from the first groove and engaging it in the second groove to provide attachment of the shield to the hub means in the second relative position, the second groove being of greater depth than the first groove so that after engagement the projection cannot be disengaged therefrom manually.

5,836,921
HYPODERMIC NEEDLE ASSEMBLY
Sakharam D. Mahurkar, 6171 N. Sheridan Rd., Suite 1112, Chicago, Ill. 60660
Continuation-in-part of Ser. No. 494,283, Jun. 23, 1995, Pat. No. 5,643,222, which is a continuation-in-part of Ser. No. 229,811, Apr. 19, 1994, Pat. No. 5,514,100, which is a division of Ser. No. 111,372, Aug. 23, 1993, Pat. No. 5,338,311. This application Jan. 16, 1996, Ser. No. 587,030
Int. Cl.^{6} A61M *5/32*
U.S. Cl. 604—195 **21 Claims**



1. A needle-syringe assembly, comprising:
- an elongated, generally cylindrical barrel forming a hollow nozzle located at the distal end of said barrel and opening into the interior of said barrel;
- a plunger slidably mounted in said barrel and forming a longitudinal cavity;
- a needle holder slidably mounted in said longitudinal cavity of said plunger;
- guide means forming a spiral channel extending along a proximal end portion of said barrel for engaging a lateral extension of said needle holder and retracting said needle holder within the barrel in response to relative rotational movement between the barrel and the plunger, and
- latching means on said barrel for latching and unlatching said lateral extension of said needle holder at the distal end of said spiral channel.

5,836,922
CONTAINER FOR DELIVERY OF FLOWABLE MATERIAL
Bernd Hansen, Heerstrasse 16, D-74429 Sulzbach-Laufen, Germany, and Willy Leu, Reitnau, Switzerland, assignors to Bernd Hansen, Sulzbach-Laufen, Germany
Filed Jun. 21, 1996, Ser. No. 670,187
Claims priority, application Germany, Jun. 21, 1995, 195 22 451.5
Int. Cl.^{6} A61M *5/178*
U.S. Cl. 604—214 **18 Claims**

1. A container for delivery of flowable material, comprising:
- a deformable, one piece, unitary plastic body compressible in a longitudinal direction thereof, and having a first transverse diameter and a shoulder projection, said body defining an interior volume and having an axial length;
- a neck unitarily formed with said body at one axial end of said body, said neck having a second transverse diameter smaller than said first transverse diameter, said neck having a small projection through which flowable material is delivered;
- a cup-shaped, one piece bushing formed of a small unitary piece of plastic receiving said body and having a bushing floor and a passage opening in said floor receiving said neck, said floor engaging said shoulder projection of said body;

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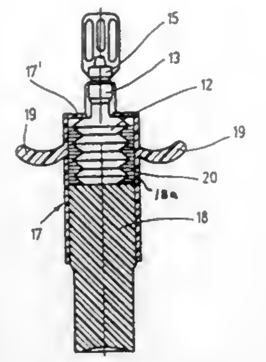


a piston formed of a single, unitary piece of plastic, slidably mounted in said bushing and movable to positions in said bushing relative to said bushing floor; and

indicators on said piston and said bushing indicating movement of said piston in said bushing, said indicators including cooperating checking means on said bushing and said piston for force-locking said bushing and said piston in relative positions along a path of movement of said piston;

whereby, movement of said piston in said bushing toward said bushing floor reduces said volume of said body by reducing said axial length for regulating quantitative discharge of flowable material through said neck.

5,836,923

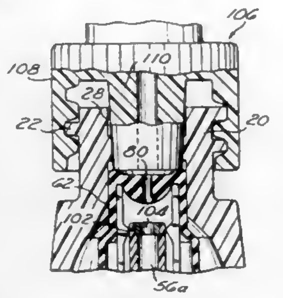
NEEDLELESS INJECTION SITE WITH FIXED FLOW RATE

Bruno Franz P. Mayer, Santa Ana, Calif., assignor to Critical Device Corp., Brea, Callf.

Continuation-in-part of Ser. No. 699,848, Aug. 20, 1996, which is a continuation-in-part of Ser. No. 493,744, Jun. 22, 1995, Pat. No. 5,616,130, whlch is a continuation-in-part of Ser. No. 401,854, Mar. 10, 1995, Pat. No. 5,616,129, which is a continuation-in-part of Ser. No. 262,994, Jun. 20, 1994, Pat. No. 5,470,319. This application Oct. 22, 1996, Ser. No. 735,217

Int. Cl.^{6} A61M *5/00*

U.S. Cl. 604—246 **28 Claims**



1. A fixed flow rate needleless injection site, comprising:
a housing defining;
an interior chamber;
a central opening which communicates with the interior chamber; and
an elongate, proximally extending dilator projection portion defining a fluid passage;
a reseal member disposed within said central opening and said interior chamber, said reseal member having an elastically openable and closable aperture disposed therein and normally residing in a first position within the housing wherein the aperture is in a closed configuration; and
a metering member disposed within the fluid passage of the dilator projection portion, said metering member having a thickness and defining a flow orifice having a diameter, at least one of the thickness of the metering member and the diameter of the flow orifice being sizeable to regulate the flow rate of a fluid through the fluid passage;
said reseal member being deformable such that the application of distally directed pressure thereto will cause the reseal member to distally advance within the housing to a second position wherein the aperture assumes an open configuration and communicates with the fluid passage, and the removal of the distally directed pressure therefrom will cause the reseal member to resiliently return to the first position wherein the aperture reassumes the closed configuration.

5,836,924

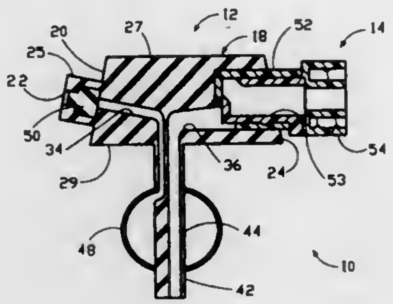
FEEDING TUBE APPARATUS WITH ROTATIONAL ON/OFF VALVE

John Kelliher, Tucson; Thomas Dew, Oro Valley; Arturo Fern, Tuscon; Hoang Chi Le, Tucson, and Charles Theurer, Tucson, all of Ariz., assignors to MRI Manufacturing and Research, Inc., Tucson, Ariz.

Filed Jan. 2, 1997, Ser. No. 775,869

Int. Cl.^{6} A61M *5/00*

U.S. Cl. 604—248 **9 Claims**



1. A feeding apparatus for insertion through an opening at the abdominal wall of an individual and terminating in the stomach, and used in conjunction with a feeding connector which has at least one lateral ear means, the apparatus comprising:
a. a structure having a main portion and a hollow shaft portion, the main portion having a proximal end with a socket opening, a distal end with an opening, and two interior channels communicating with the openings and the hollow shaft portion;
b. means for retaining said shaft portion of said structure within the stomach of the individual;
c. a valve assembly including an outer shell, an inner shell and a coupling member;
d. said outer shell having a distal end, of the outer shell a proximal end and a sidewall, the sidewall having an aperture located adjacent to the distal end of the outer shell and a recess located adjacent to the proximal end, said outer shell installed within said socket opening at said proximal end of said main portion of said structure, where the aperture on the sidewall of said outer shell communicates with one of said interior channels of said main portion of said structure;
e. said inner shell having a distal end, a proximal end and a sidewall, the sidewall having a complementary aperture located adjacent to the distal end of the inner shell and a protruding flange located adjacent to the proximal end, of the inner shell said inner shell installed within said outer shell such that the protruding flange is retained within said recess on said sidewall of said outer shell and the complementary aperture of said inner shell communicates with said aperture on said sidewall of said outer shell, where the protruding flange travels within said recess of said outer shell between an open condition and a closed condition so that when said valve assembly is in its open condition, the complementary aperture on said sidewall of said inner shell communicates with said aperture on said sidewall of said outer shell for allowing liquid food to flow therethrough, and when said valve assembly is in its closed condition, the complementary aperture of said inner shell is located away from said aperture of said outer shell to prevent liquid food from flowing therethrough;

f. a disk having a base, an attachment inlet port extending upwardly from the base, and at least one retaining means attached to the base, the base attached to said proximal end of said inner shell; and
g. said coupling member having a proximal rim, a distal retaining means and an interior groove, the proximal rim attached to said proximal end of said outer shell member such that said coupling member encompasses said attachment inlet port of said disk and said at least one retaining means of said disk;
h. whereby the feeding connector is connected to said attachment inlet port of said disk, the feeding connector rotated such that the at least one lateral ear means travels within said interior groove of said coupling member to engage said at least one retaining means on said disk, which in turn rotates said inner shell into said open condition to allow the liquid food to pass through said feeding apparatus, and when the feeding connector is rotated in the opposite direction, the at least one lateral ear means of the feeding connector is engaged with said at least one retaining means on said disk which in turn rotates said inner shell back to said closed condition for preventing liquid food flow therethrough.

5,836,925

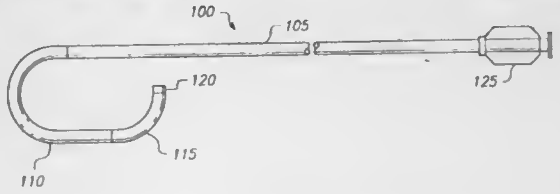
CATHETER WITH VARIABLE FLEXIBILITY PROPERTIES AND METHOD OF MANUFACTURE

Peter P. Soltesz, 4972 Miramar Ave., San Jose, Calif. 95129

Filed Mar. 27, 1997, Ser. No. 824,630

Int. Cl.^{6} A61M *25/00*

U.S. Cl. 604—280 **21 Claims**



1. A catheter with varying flexibility properties along its longitudinal axis comprising:
a first tubular segment formed from a first polymeric material having a first flexibility property;
a second tubular segment, adjacent the first tubular segment, formed from a combination of the first polymeric material and a second polymeric material having a second flexibility property; and
a third tubular segment, adjacent the second tubular segment, formed from the second polymeric material,
the second tubular segment forming a seamless transition between the first tubular segment and the third tubular segment.

5,836,926

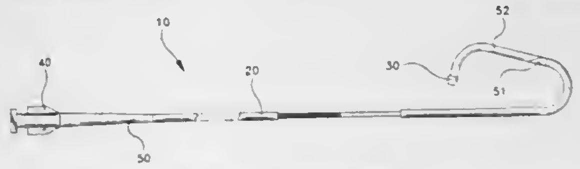
INTRAVASCULAR CATHETER

Alex A. Peterson, Maple Grove; John B. Logan, Plymouth; Mukund R. Patel, Plymouth, and William F. Polley, Mound, all of Minn., assignors to Schneider (USA) Inc, Plymouth, Minn.

Filed May 13, 1996, Ser. No. 647,606

Int. Cl.^{6} A61M *25/00*

U.S. Cl. 604—282 **26 Claims**



1. An intravascular catheter comprising:
(a) a first layer having an innermost surface, the first layer comprising a polymer having a kinetic coefficient of friction (steel on polymer) of less than about 0.50;
(b) a second layer disposed about the first layer and having an outermost surface, the second layer comprising a blend of polyetherester elastomer and polybutylene terephthalate; and
(c) a reinforcing element disposed between the innermost surface of the first layer and the outermost surface of the second layer.

5,836,927

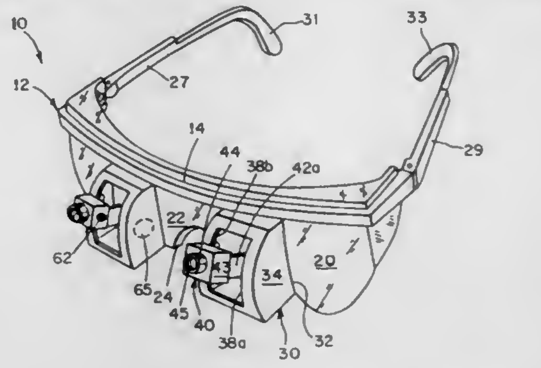
DEVICE TO AID IN THE SELF ADMINISTRATION OF EYEDROPS

George Fried, 222 Martling Ave., Tarrytown, N.Y. 10591

Filed Oct. 7, 1996, Ser. No. 729,700

Int. Cl.^{6} A61U *35/00*

U.S. Cl. 604—300 **32 Claims**



1. A device for administering eyedrops from an eyedrop container to an eye of a patient, comprising:
at least one eyedrop guide, said eyedrop guide selectively slidable along a substantially arcuate path proximate an eye;
means for attaching said eyedrop container to said eyedrop guide, wherein said attaching means is connected to said eyedrop guide; and
means for selectively positioning said eyedrop guide proximate the patient's eye, wherein said eyedrop guide is slidably connected to said positioning means.

5,836,928

SPINAL FLUID COLLECTION SYSTEM

Allen Gerber, 42 Nutmeg Rd., Highfalls, N.Y. 12440; Lewis Gluck, 14 Fox Run, Wappingers Falls, N.Y. 12590, and John G. Costa, P.O. Box 278, Highland, N.Y. 12528

Filed Feb. 4, 1997, Ser. No. 795,342

Int. Cl.^{6} A61B *5/00;* A61M *1/00*

U.S. Cl. 604—317 **6 Claims**

1. A spinal fluid collection system comprising a needle unit, a guide, a disposal unit, transmission means and container holding means; said needle unit comprising a hub; said disposal unit comprising a rigid cylinder and a plunger; said guide comprising engagement means complementary to engagement means of said hub wherein the engagement of the complementary engagement means of said guide and said hub attaches said guide to said hub; said guide comprising engagement means complementary to engagement means of said rigid cylinder wherein the engagement of the complementary engagement means of said guide and said rigid cylinder attaches said guide to said rigid cylinder; said plunger comprising engagement means complementary to engagement means of said hub wherein the engagement of the complementary engagement means of said plunger and said hub attaches said plunger to said hub and permits the withdrawal of said hub into said rigid cylinder; said hub comprising a chamber and a port, wherein the port of said hub receives fluid from said chamber and

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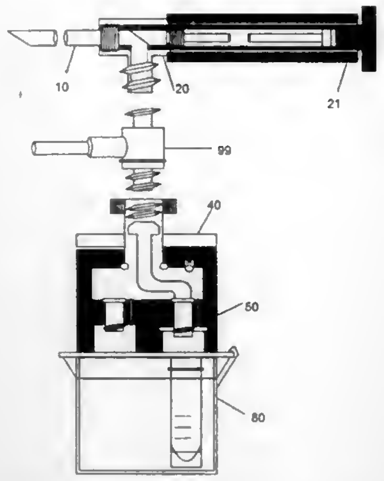


transmits said fluid to a port of said guide; said guide comprising a port, wherein the port of said guide is adapted to transmit said fluid received from the port of said hub to said transmission means; said transmission means comprising a channel external port, a channel, and a channel internal port, wherein said channel transmits fluid received at said channel external port to said channel internal port, said channel external port is adapted to receive fluid from said guide, and said channel internal port is adapted to transmit fluid to one or more sample containers; said container holding means comprising at least one adapter and at least one container holding recess, each said adapter comprising an adapter external port and an adapter internal port, each adapter external port adapted to receive fluid from said transmission means, each adapter internal port adapted to transmit fluid to a specimen container positioned in said container holding recess.

5,836,929
ABSORBENT ARTICLES

Christopher Phillip Bewick-Sonntag, Kelkheim/Ts; Manfred Plischke, Steinbach/Ts, and Mattias Schmidt, Idstein, all of Germany, assignors to The Procter & Gamble Company, Cincinnati, Ohio

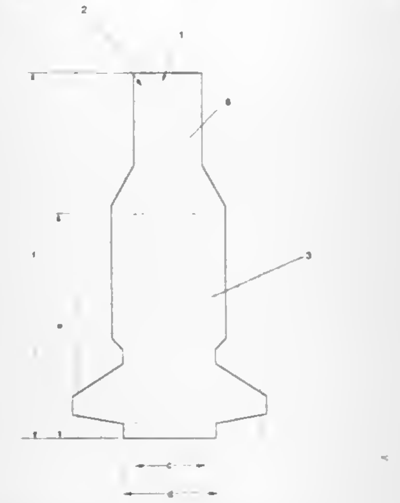
PCT No. PCT/US94/07203, § 371 Date Jan. 17, 1997, § 102(e) Date Jan. 17, 1997, PCT Pub. No. WO95/01147, PCT Pub. Date Jan. 12, 1995

PCT Filed Jun. 27, 1994, Ser. No. 569,068

Claims priority, application European Pat. Off., Jun. 30, 1993, 93305150; Dec. 1, 1993, 93309614

Int. Cl.^{6} A61F *13/15;13/20*

U.S. Cl. 604—368 **26 Claims**



1. An absorbent body comprising in sequence from the top an upper assembly (**3**, **4**, **5**) that includes

an upper acquisition layer (**3**) substantially free of superabsorbent material, and

a superabsorbent layer (**5**) consisting mainly of first superabsorbent material which has a Gel Layer Permeability (GLP) value of at least about 4×10^{-7} cm^{3}sec/g and which is present in an amount of at least about 20 g/m^2, and

a lower assembly (**6**, **7**, **8**) that includes second superabsorbent material having an Absorption Against Pressure of at least 15 g/g at 50 g/cm^2 and which comprises

an upper layer (**6**) having void space for storage of liquid discharges, and

a lower layer (**7**) which contains second superabsorbent material and wherein at least 70% by weight of the total amount of the second superabsorbent material which is in the upper and lower layers is in the lower half of the combined thickness of the upper and lower layers.

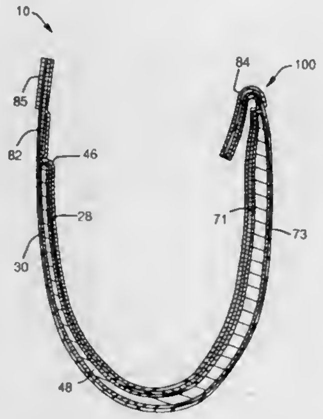
5,836,930
ABSORBENT ARTICLE HAVING AN UMBILICAL PROTECTION FEATURE AND AN ABBREVIATED ABSORBENT STRUCTURE

Joanne Mary Lantz; David Louis Zenker, both of Neenah, Wis.; Thomas Harold Roessler, Menasha; Rob David Everett, Neenah; Lynn Carol Brud, Appleton; Barbara Ann Gossen, Neenah; Eric Mitchell Johns, Roswell, and Cynthia Helen Nordness, Oshkosh, all of Wis., assignors to Kimberly-Clark Worldwide, Inc, Neenah, Wis.

Continuation of Ser. No. 53,531, May 3, 1993, abandoned. This application Aug. 2, 1994, Ser. No. 284,728

Int. Cl.^{6} A61F *13/15*

U.S. Cl. 604—378 **25 Claims**



1. An absorbent article, comprising:

a substantially liquid-impermeable outer cover having a length and a width, said outer cover providing a rear waistband portion and a front waistband portion, and said outer cover having a layer of polymer film material on an outer surface of at least said front waistband portion of said outer cover;

a liquid permeable topsheet layer for contacting a wearer's skin;

an absorbent body interposed between said outer cover and said topsheet layer, said absorbent body having a length and width which are smaller than said outer cover length and width, thereby providing end margins and side margins of said outer cover;

an adhesive fastening means for adhering to said polymer film layer to secure said front and rear waistband portions of said outer cover layer about the wearer;

an elastic member connected to provide elasticized gathers along a cross-direction of said rear waistband portion of said outer cover; and

an outermost fibrous layer of substantially nonwettable, resilient, non-elastomeric material connected to overlie said polymer film of said outer cover along said front waistband portion of said outer cover, thereby sandwiching said polymer film between said topsheet layer and said outermost layer of resilient material, said outermost fibrous layer having a lengthwise extent which is less than the length of said outer cover, and said front waistband being substantially ungathered.

5,836,931
SHORTS TYPE DISPOSABLE DIAPER

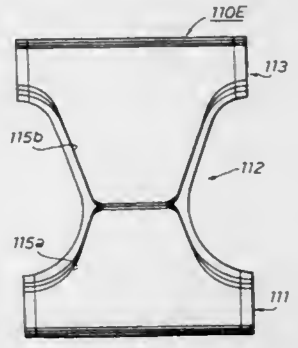
Harumitsu Toyoda; Kazuhiro Tagawa; Yoshinobu Machida; Kenji Ando, and Haruko Kawaguchi, all of Tochigi-ken, Japan, assignors to Kao Corporation, Tokyo, Japan

Continuation of Ser. No. 224,972, Apr. 8, 1994, abandoned. This application Sep. 10, 1996, Ser. No. 709,834

Claims priority, application Japan, Apr. 19, 1993, 5-091524; Apr. 20, 1993, 5-093226

Int. Cl.^{6} A61F *13/15*

U.S. Cl. 604—385.2 **16 Claims**



9. A shorts type disposable diaper including a waist opening portion, a pair of leg opening portions, and opposing side portions extending from the waist opening portion to the leg opening portions on opposing lateral sides of said diaper, said diaper comprising:

an absorptive body including a liquid permeable topsheet, a liquid impermeable backsheet, and an absorber interposed between said topsheet and said backsheet, said absorptive body being divided into a stomach side portion, an under-crotch portion, and a back side portion;

first and second elastically expansible members positioned at the pair of leg opening portions to extend from the opposing side portions of said diaper around the leg opening portions to the under-crotch portion, then laterally across substantially a center of the under-crotch portion of said diaper, the first and second elastically expansible members being

nonintersecting and spaced apart from each other generally up to a distance of 20 mm, or

having a single common overlapping region in the under-crotch portion defined by superimposing the first and second elastically expansible members laterally and across substantially the center of the under-crotch portion of said diaper, said overlapping region including said first and second elastically expansible members lying upon each other in a substantially parallel manner; and

a third continuous elastically expansible member disposed around an entirety of said diaper immediately adjacent the waist opening portion, whereby leakage of waste materials is substantially reduced while wearing comfortability is substantially increased.

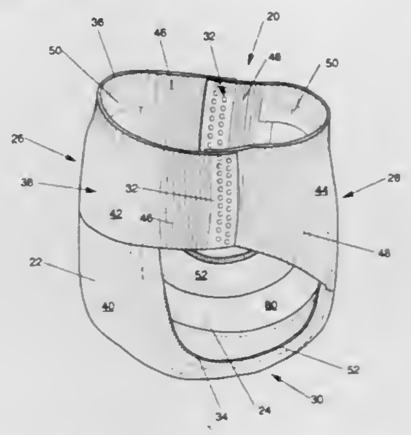
5,836,932
DISPOSABLE BREATHABLE GARMENT

Kenneth Barclay Buell, Cincinnati, and Edward Paul Carlin, Maineville, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 415,816, Apr. 3, 1995, Pat. No. 5,569,234. This application Sep. 12, 1996, Ser. No. 713,054

Int. Cl.^{6} A61F *13/15*

U.S. Cl. 604—396 **6 Claims**



1. A unitary disposable pull-on garment comprising:

(a) a chassis layer comprising a continuous sheet defining
  (i) a front region having an end edge, side edges, leg edges, a central panel comprising a waistband panel and a medial panel, side panels extending laterally outwardly from said central panel, and a seam panel extending laterally outwardly from each said side panel to said side edge, said seam panels and said side panels extending longitudinally from said end edge to said leg edge;
  (ii) a back region opposed to said front region, said back region having an end edge, side edges, leg edges, a central panel comprising a waistband panel and medial panel, side panels extending laterally outwardly from said central panel to said side edge, and a seam panel extending laterally outwardly from each said side panel to said side edge, said seam panels and said side panels extending longitudinally from said end edge to said leg edge; and
  (iii) a crotch region between said front region and said back region;

said chassis layer having an outer surface and an inner surface and comprising a nonwoven web;

(b) a backsheet positioned on said inner surface of said chassis layer, said backsheet having an outer surface adjacent said inner surface of said chassis layer and an inner surface opposite said outer surface, said backsheet comprising a central backsheet layer being liquid impervious and vapor pervious;

(c) an absorbent core positioned on said inner surface of said backsheet, said absorbent core having a garment-facing surface and a wearer-facing surface;

(d) a liquid pervious topsheet positioned on said wearer-facing surface of said absorbent core;

(e) an elastically extensible breathable front stretch laminate positioned in each said side panel of said front region, each said front stretch laminate comprising a portion of said chassis layer in said side panel, and an elastic panel member operatively joined with said chassis layer, each said front stretch laminate being elastically extensible in at least the lateral direction;

(f) an elastically extensible breathable back stretch laminate positioned in each said side panel of said back region, each said back stretch laminate comprising a portion of said chassis layer in said side panel, and an elastic panel member operatively joined with said chassis layer, each said back stretch laminate being elastically extensible in at least the lateral direction; and

(g) seams joining said front region to said back region adjacent said side edges in said seam panels so as to form two leg openings and a waist opening.

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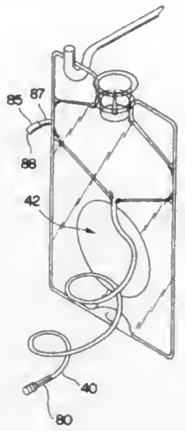
5,836,933
PARENTERAL FLUID DELIVERY BAG WITH INTEGRAL LINE SET

Anthony D. Buttitta; John M. Munsch, both of Libertyville; Ying-Cheng Lo, Green Oaks, and Marc Bellotti, Libertyville, all of Ill., assignors to Baxter International, Inc., Deerfield, Ill.

Filed Jun. 19, 1996, Ser. No. 666,190
Int. Cl.^{6} A61B *19/00*
U.S. Cl. 604—403 **17 Claims**

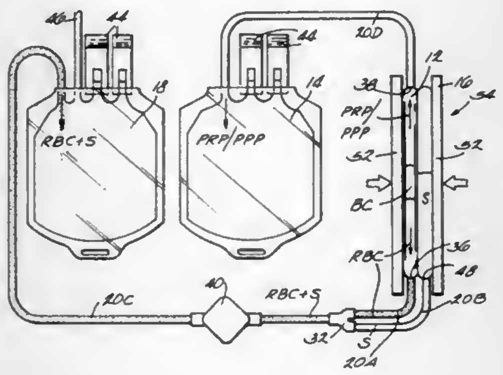


1. A bag for communicating fluids with a patient comprising a fluid chamber, a line set formed unitary with said fluid chamber and a bag web having a peelably releasable line set co-formed with said web and a line set aperture defined by said web and a tear seal between said web and said line set, wherein said aperture is opened by said line set being extended from said web by parting said tear seal from said web.

5,836,934
CLOSED SYSTEM AND METHODS FOR MIXING ADDITIVE SOLUTIONS WHILE REMOVING UNDESIRED MATTER FROM BLOOD CELLS

Richard Beshel, McHenry, Ill., assignor to Baxter International Inc., Deerfield, Ill.

Filed Jun. 7, 1995, Ser. No. 479,911
Int. Cl.^{6} A61B *19/00*
U.S. Cl. 604—410 **6 Claims**



1. A blood processing system comprising

a first variable volume chamber to hold blood,

a second variable volume chamber to hold additive solution for blood,

a separation device to remove undesired material from blood,

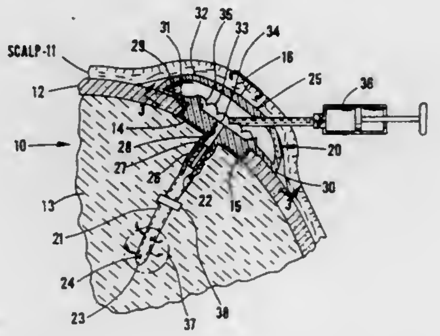
an actuated element comprising plates spaced apart to accommodate placement of both the first variable volume chamber and the second variable volume chamber between the plates and including means for moving the plates together to exert a squeezing force simultaneously upon both first and second variable volume chambers to simultaneously expel a first flow of blood from the first variable volume chamber and a second flow of additive solution from the second variable volume chamber, and

a fluid flow system to convey fluid flow in response to the squeezing force exerted by the actuated element and without application of external pumping force, the fluid flow system including a first branch communicating with the first variable volume chamber to convey the first flow of blood, a second branch communicating with the second variable volume chamber to convey the second flow of additive solution simultaneously with and independent of the first flow, a third branch communicating with the first and second branches to mix outside the first and second variable volume chambers the blood from the first branch with the additive solution from the second branch to create a mixed flow comprising blood and additive solution, the third branch further communicating with the separation device to direct the mixed flow of blood and additive solution through the separation device.

5,836,935
IMPLANTABLE REFILLABLE CONTROLLED RELEASE DEVICE TO DELIVER DRUGS DIRECTLY TO AN INTERNAL PORTION OF THE BODY

Paul Ashton, 75 Chestnut St., #13, Boston, Mass. 02108; Roy A. Patchell, 442 Fayette Park, Lexington, Ky. 40508; Jon Cooper, P.O. Box 55552, Lexington, Ky. 40555, and Byron A. Young, 2040 Von List Way, Lexington, Ky. 40502

Continuation of Ser. No. 339,246, Nov. 10, 1994, abandoned. This application Jan. 28, 1997, Ser. No. 789,242
Int. Cl.^{6} A61N *1/30*
U.S. Cl. 604—891.1 **9 Claims**



1. An implantable, refillable, rate controlled drug delivery device, comprising a hollow reservoir, a drug delivery tube communicating with the hollow reservoir, and one or more rate-limiting elements, said one or more elements consisting essentially of a permeable membrane in said drug delivery tube, which membrane passively regulates drug delivery.

5,836,936
DEVICE FOR PERFORMING ENDOSCOPIC OPERATIONS BY MEANS OF A SHEATH

Alfred Cuschieri, Dundee, Great Britain, assignor to Karl Storz GmbH & Co., Tuttlingen, Germany

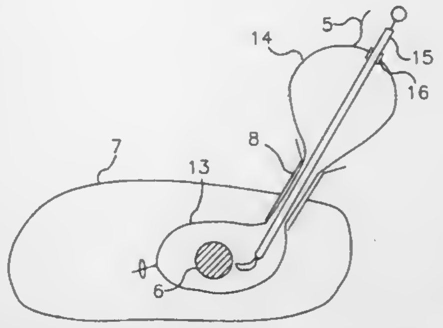
PCT No. PCT/DE95/00157, § 371 Date Mar. 5, 1996, § 102(e) Date Mar. 5, 1996, PCT Pub. No. WO95/20915, PCT Pub. Date Aug. 10, 1995

PCT Filed Feb. 7, 1995, Ser. No. 532,684

Claims priority, application Germany, Feb. 7, 1994, 44 03 567.5

Int. Cl.^{6} A61B *17/00*
U.S. Cl. 606—1 **3 Claims**

1. A sheath for receiving and protectively enclosing tissue severed during an endoscopic procedure, said sheath being foldable for insertion into a body catheter through a trocar, said sheath comprising:



a tubular body formed of a flexible, fluid impermeable material having a tubular proximal section, a tubular distal section, and a tubular transition section connecting said proximal and distal sections, said distal section having a diameter substantially larger than the diameter of the proximal section, and the transition section enlarging abruptly from said proximal to said distal section, said proximal section being proportioned to fit in said trocar shaft without substantial folding, and said distal section being proportioned to receive tissue of substantial size;

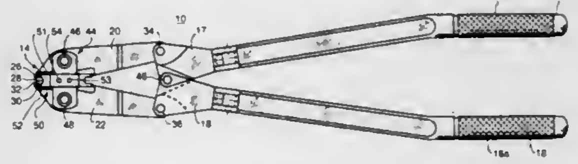
closure means to close the distal end of said distal section to retain contents in said distal section; and

a third tubular section which joins said proximal section, said third section having a diameter substantially larger than the diameter of the tubular proximal section, whereby, with said proximal section inside a said trocar and the distal section inside a cavity, said third section can receive tissue which is passed from said distal section through said proximal section, to enable procedures to be performed without exposing said tissue to the atmosphere, said third tubular section having an opening therethrough to permit the passage of an instrument into said third tubular section, and if desired also through said proximal and distal sections.

5,836,937
ROD CUTTER WITH DEPTH GAUGE

Russell P. Holmes, 201 Newbury St., Apt. #405, Boston, Mass. 02116

Filed Sep. 2, 1997, Ser. No. 922,717
Int. Cl.^{6} A61B *17/00*
U.S. Cl. 606—1 **8 Claims**



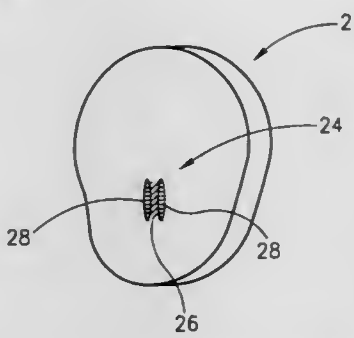
1. A surgical cutting instrument for severing a rod-shaped surgically-implanted component in situ, the cutting instrument including:

- (A) a set of jaws rotatably connected together at one end such that said jaws are capable of opening and closing in a scissor-like manner, each jaw in said set having a cutting blade on one edge thereof which opposes the cutting edge of the other jaw, the cutting blades defining a cutting area when in an open position;
- (B) a strap means attached across said jaws and displaced from the end of said jaws such that said strap restricts said jaws from opening more than a predetermined distance;
- (C) depth gauge means attached to said strap means, said depth gauge means having
  - i) a body portion for securing said depth gauge means to said strap, and
  - (ii) a first U-shaped guide attached to one end of said body portion and extending into said cutting area, said U-shaped guide being dimensioned to receive said rod-shaped component, the depth gauge being held by said strap to position the first U-shaped guide within said cutting area, the first U-shaped guide holding the rod such that said cutting blades extend sufficiently past the rod-shaped component to sever the component.

5,836,938
HAIR REMOVAL WITH A LASER SYSTEM AND WAVEGUIDE FOR RADIAL TRANSMISSION OF LASER ENERGY

Michael Slatkine, 59 Brenner Street, Herzlia, Israel. 46427

Filed Dec. 18, 1996, Ser. No. 769,492
Int. Cl.^{6} A61B *17/36*
U.S. Cl. 606—9 **17 Claims**



1. A method to remove hair, comprising the steps of:

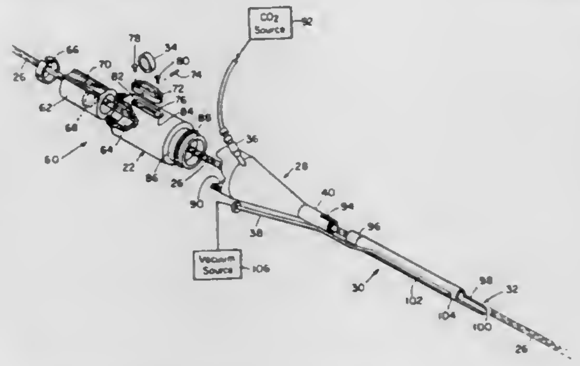
inserting an invasive element into a hair follicle, said invasive element being elongated and having an axis in a direction of elongation of the invasive element; and

applying laser energy into said invasive element, said invasive element including a frosted tip having roughened fiber that scatters the laser energy in a radial direction relative to said axis along an entire length of the frosted tip, the laser energy being of sufficient energy and pulse duration so as to substantially damage an entire lining of the hair follicle.

5,836,939
SURGICAL LASER HANDPIECE

Charles Christopher Negus, Taunton; Scott Andrew Morrell, Hopedale, and Stephen J. Linhares, Taunton, all of Mass., assignors to PLC Medical Systems, Inc., Milford, Mass.

Filed Oct. 25, 1995, Ser. No. 548,268
Int. Cl.^{6} A61B *17/36*
U.S. Cl. 606—11 **4 Claims**



1. A surgical laser handpiece comprising:

an outer barrel having a longitudinal axis and an inner chamber said outer barrel connected to a surgical laser device providing a laser beam;

an inner zoom barrel movable in the chamber relative to the outer barrel;

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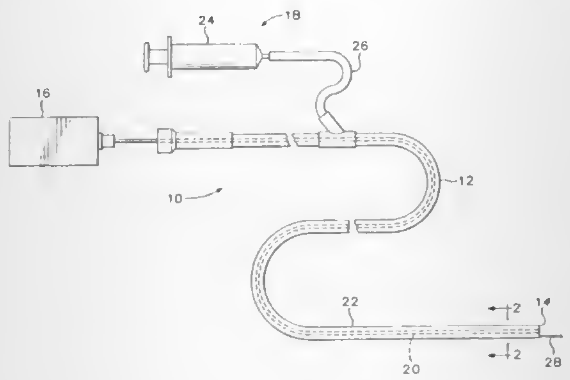
at least a first lens device in the zoom barrel for propagating and focusing a laser beam;
an opening in the outer barrel;
a drive member disposed through the opening and externally accessible on the outer barrel, the drive member engaging the inner zoom barrel for moving the inner zoom barrel and said first lens device with one hand in the direction of the longitudinal axis of the outer barrel thereby varying the focus of the laser beam.

5,836,940
PHOTOACOUSTIC DRUG DELIVERY

Kenton W. Gregory, Portland, Oreg., assignor to Latis, Inc., West Conshohocken, Pa.
Continuation-in-part of Ser. No. 328,857, Oct. 25, 1994, Pat. No. 5,571,151. This application May 10, 1996, Ser. No. 644,533
Int. Cl.^{6} A61B *17/36*
U.S. Cl. 606—15 **36 Claims**

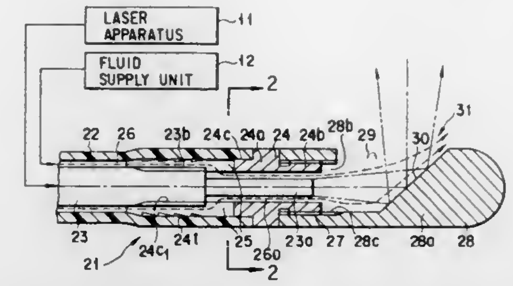


1. A method for locally delivering an active agent to a selected site in a body lumen containing an ambient body fluid using a catheter, the catheter including a flexible distal end for insertion into the lumen, the method comprising the steps of:
preparing a solution of the active agent;
inserting the flexible distal end of the catheter into the lumen;
directing the flexible distal end adjacent the selected site;
introducing the active agent solution adjacent the selected site; and
transmitting laser energy from an energy generating source to the site via the catheter, with an amplitude sufficient to create a hydraulic or pressure wave which drives the active agent into the site.

5,836,941
LASER PROBE

Masaya Yoshihara, and Masahiko Iida, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 297,803, Aug. 30, 1994, abandoned. This application May 31, 1996, Ser. No. 653,069
Claims priority, application Japan, Sep. 7, 1993, 5-222409; Nov. 1, 1993, 5-273635; Jun. 20, 1994, 6-137154
Int. Cl.^{6} A61B *17/36*
U.S. Cl. 606—15 **39 Claims**

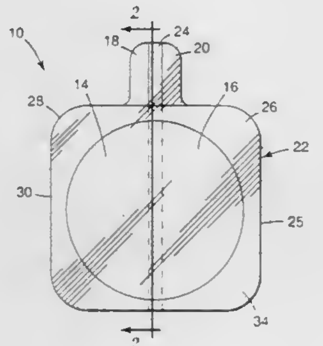
1. A laser probe comprising:
an optical fiber for guiding a laser beam;
a tube in which the optical fiber is inserted;
a holder for fixing the optical fiber and an end portion of the tube where the laser beam is emitted; and
a reflection tip detachably attached to the holder and having a reflection surface for reflecting the laser beam emitted from the optical fiber, the reflection surface reflecting the laser beam along a laser optical path; and



a lens positioned in said reflection tip between said optical fiber and said reflection surface, and in a path of said laser beam as it is emitted from said optical fiber;
wherein:
said holder includes a slit portion,
a cooling fluid passage is defined by a space between the optical fiber and the tube, and
the cooling fluid passage extends through the slit portion of said holder, through said space, and opens at an emission end portion of the optical fiber in the vicinity of the reflection surface of the reflection tip, such that cooling fluid flows through said fluid passage to contact said reflection surface, and flows along the laser optical path after contacting the reflection surface, whereby said cooling fluid passage communicates a fluid to outside of the reflection tip.

5,836,942
BIOMEDICAL ELECTRODE WITH LOSSY DIELECTRIC PROPERTIES

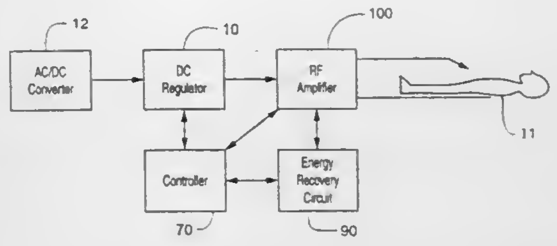
Samuel G. Netherly, Afton, and Hatim M. Carim, West St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Apr. 4, 1996, Ser. No. 628,182
Int. Cl.^{6} A61B *17/39*; A61N *1/04*
U.S. Cl. 606—32 **18 Claims**



1. A biomedical electrode, comprising:
an electrically non-conductive backing;
a conductive plate contacting the electrically non-conductive backing, wherein the conductive plate has a body contacting portion, wherein the body contacting portion has an exterior edge and a region adjacent the exterior edge;
a field of lossy dielectric material contacting the region adjacent the exterior edge; and
a field of conductive adhesive in contact with both the conductive plate and the field of lossy dielectric material and adapted to adhere the electrode to a body of a patient.

5,836,943
ELECTROSURGICAL GENERATOR

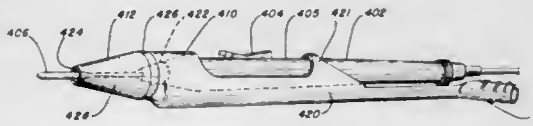
Scott A. Miller, III, Boulder, Colo., assignor to Team Medical, L.L.C., Boulder, Colo.
Filed Aug. 23, 1996, Ser. No. 702,282
Int. Cl.^{6} A61B *17/39*
U.S. Cl. 606—34 **23 Claims**



1. An electrosurgical generator for providing an output signal for use in the performance of a surgical operation on a tissue mass, comprising:
a) dc regulator means for converting a first dc signal from a power source into a second dc signal having a pre-determined voltage, including
inductive input means for reducing current ripple in the first dc signal,
capacitive energy storage means for storing and releasing energy,
switch means for alternately charging said capacitive energy storage means with the first dc signal and discharging said capacitive energy storage means to generate the second dc signal, and
inductive output means for reducing current ripple in the second dc signal;
b) amplifier means for converting the second dc signal into the output signal having a predetermined frequency; and
c) control means for providing control signals to the dc regulator means and said amplifier means for establishing at least one of said predetermined voltage and said predetermined frequency.

5,836,944
REMOVABLE SHROUD FOR USE WITH ELECTROSURGERY

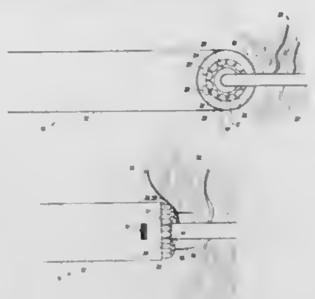
Ioan Cosmescu, 14449 N. 22 St., Phoenix, Ariz. 85022
Division of Ser. No. 500,045, Jul. 10, 1995, Pat. No. 5,693,044, which is a continuation-in-part of Ser. No. 196,802, Feb. 15, 1994, Pat. No. 5,431,650, which is a continuation of Ser. No. 989,238, Dec. 11, 1992, abandoned. This application Oct. 7, 1996, Ser. No. 726,820
Int. Cl.^{6} A61B *17/36*
U.S. Cl. 606—41 **4 Claims**



1. A removable shroud for use with an electro-surgical unit (ESU) pencil apparatus wherein said shroud is adaptably fitted over an external surface of said ESU pencil apparatus, said shroud comprising:
a cylindrical shaped handpiece holder having a distal end, a proximal end and a lumen located between said proximal and distal ends wherein a portion of said cylindrical handpiece is cut away to expose said lumen and thereby provide means for accessing a handswitch contained on said ESU pencil apparatus when said ESU pencil apparatus is positioned within said shroud;
a chute having a proximal end and a distal end located alongside a bottom length of said cylindrical handpiece wherein an interior of said chute opens into the lumen of said cylindrical handpiece near the distal end of said chute and the proximal end of said chute extends beyond the proximal end of said cylindrical handpiece; and
a tapered nozzle located near the distal ends of said cylindrical handpiece and said chute.

5,836,945
BIOLOGICAL VESSEL HARVESTING DEVICE

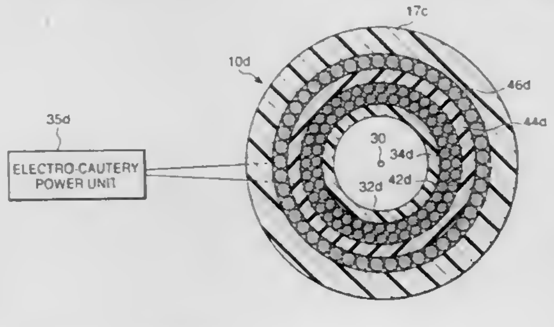
Rodney C. Perkins, 235 Mountain Wood La., Woodside, Calif. 94062
Filed Feb. 20, 1997, Ser. No. 801,382
Int. Cl.^{6} A61B *17/36*
U.S. Cl. 606—41 **38 Claims**



1. A biological vessel harvesting device comprising:
an outer catheter having a distal end and an outer catheter lumen;
a vessel grasping mechanism positioned within the outer catheter lumen for grasping an end of a segment of a biological vessel to be harvested, the outer catheter being movable relative to the vessel grasping mechanism such that the vessel grasping mechanism and the vessel segment grasped thereby can be drawn into the outer catheter lumen; and
a cautery-sectioning system positioned on a wall of the outer catheter adjacent the outer catheter distal end, the cautery-sectioning system having a cautery mechanism for cauterizing tributaries extending from the vessel segment and a sectioning mechanism for sectioning the cauterized tributaries.

5,836,946
CATHETER FOR DELIVERY OF ELECTRIC ENERGY AND A PROCESS FOR MANUFACTURING SAME

Cesar M. Diaz, and Christopher Reiser, both of Colorado Springs, Colo., assignors to The Spectranetics Corporation, Colorado Springs, Colo.
Continuation-in-part of Ser. No. 662,799, Jun. 12, 1996. This application Jun. 12, 1997, Ser. No. 873,753
Int. Cl.^{6} A61B *17/36*
U.S. Cl. 606—45 **14 Claims**



1. A catheter comprising:

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a core having an axis extending between a proximal end and a distal end of said catheter;
a layer of stranded fibers having a plurality of fibers that extend between said proximal end and said distal end of said catheter over said core; and
an electrically non-conductive layer disposed over said layer of stranded fibers so as to prevent a flow of electrical current in a radial direction through said electrically non-conductive layer,
wherein said layer of stranded fibers comprises a plurality of electrically conductive wires that extend to a most distal end of said catheter to form an electro-cautery cutting tip at said distal end of said catheter, and
said plurality of electrically conductive wires that form said electro-cautery cutting tip are brought directly into contact with tissue to be cauterized.

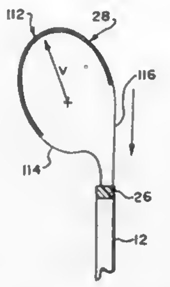
5,836,947
FLEXIBLE STRUCTURES HAVING MOVABLE SPLINES FOR SUPPORTING ELECTRODE ELEMENTS

Sidney D. Fleischman, Menlo Park; Thomas M. Bourne, Mountain View, and James G. Whayne, Saratoga, all of Calif., assignors to EP Technologies, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 320,198, Oct. 7, 1994, abandoned. This application Oct. 11, 1994, Ser. No. 321,092

Int. Cl.^{6} A61B *17/39*

U.S. Cl. 606—47 **43 Claims**



1. An electrode support structure comprising
a carrier having an axis,
a spline leg carried by the carrier having a resilient memory to define a normally flexed structure including an inner portion located generally along the axis of the carrier and an outer portion spaced radially from the axis of the carrier,
at least one elongated flexible electrode element on the outer portion of the flexed structure, and
at least one of the inner and outer portions of the flexed structure being free of attachment to the carrier,
a control element coupled to the at least one of the inner and outer portions to move the at least one of the inner and outer portions relative to the carrier to increase or decrease flexure of the structure and thereby change the shape of the elongated flexible electrode.

5,836,948
SPINE DISTRACTION IMPLANT AND METHOD

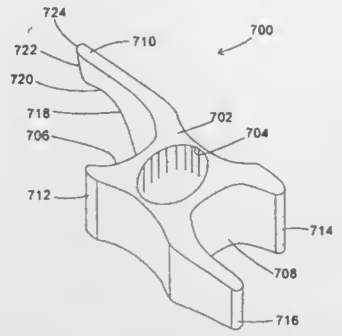
James F. Zucherman; Ken Y. Hsu, both of San Francisco; T. Wade Fallin, Hyde Park, and Henry A. Klyce, Piedmont, all of Calif., assignors to Saint Francis Medical Technologies, LLC, Piedmont, Calif.

Filed Jan. 2, 1997, Ser. No. 778,093

Int. Cl.^{6} A61B *17/70*

U.S. Cl. 606—61 **25 Claims**

1. An implant for flattening the spine in order to increase the volume of at least one of the spinal canal and the neural foramen comprising:
a central body with first and second saddles which are adapted to receive adjacent spinous processes;



first and second arms projecting from the first saddle and third and fourth arms projecting from the second saddle;
said first and fourth arms are longer than the central body with the first arm being longer than the fourth arm; and
the second and third arms are about the length of the central body and/or shorter than the central body with the second arm being shorter than the third arm.

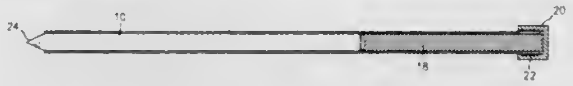
5,836,949
BIOABSORBABLE INTERMEDULLARY IMPLANT SYSTEM AND METHODS OF USE

Robert M. Campbell, Jr., 415 Stone Wood, San Antonio, Tex. 78216, and C. Mauli Agrawal, 2215 Pinoak Knolls, San Antonio, Tex. 78248

Filed May 5, 1997, Ser. No. 850,935

Int. Cl.^{6} A61B *17/72*

U.S. Cl. 606—62 **7 Claims**



1. An orthopedic intermedullary rod system comprising:
an elongate intermedullary rod member, constructed of bioabsorbable material;
a rod carrier member which is configured for telescopic engagement with said intermedullary rod member substantially along its entire length, said rod carrier member being constructed of a substantially rigid material;
force application means attached to said rod carrier member for transmitting forces to said rod carrier, and through said rod carrier to said intermedullary rod member, for moving said rod carrier member and said intermedullary rod member along their longitudinal lengths.

5,836,950
GUIDE INSTRUMENT

Henrik Lars Johan Hansson, Konsistoriegatan 6, Linköping, Sweden, S-582 22

PCT No. PCT/SE95/01379, § 371 Date May 13, 1997, § 102(e) Date May 13, 1997, PCT Pub. No. WO96/15727, PCT Pub. Date May 30, 1996

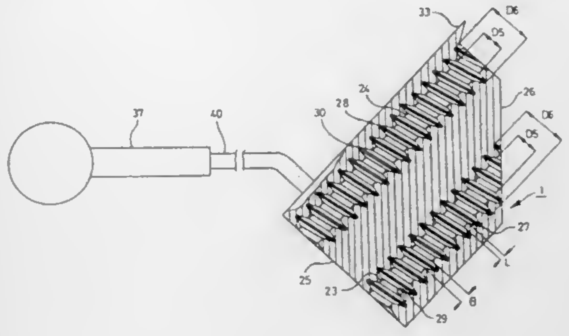
PCT Filed Nov. 21, 1995, Ser. No. 836,356

Claims priority, application Sweden, Nov. 22, 1994, 9404035

Int. Cl.^{6} A61B *17/76*

U.S. Cl. 606—65 **15 Claims**

1. A set of implements for use in fixing bone fragments (2, 3) relative to each other at bone fractures by means of at least two bone screws, said set of implements comprising:
a guide instrument (1),
at least two bone screws (6, 7), and
at least first and second drills (17, 19)
each of said bone screws (6, 7) having a front portion (8) with external threads (9) of a given diameter (D1) and a rear unthreaded portion (10) of a given diameter (D2) smaller than said diameter (D1) of said front portion,



each of said drills (17, 19) having a maximum diameter (D4) along a major portion of its length,
said guide instrument (1) including a body having a first and a second passage (23, 24) and internal threads (27, 28) provided along each of said passages (23, 24), with each of said passages (23, 24) having a minimum diameter (D5) which is so sized relative to the diameter (D4) of each of said drill steels (17, 19) and to the diameter (D2) of said rear portion (10) of each bone screw (6, 7) as to enable said internal thread (27, 29) of each passage to slidable support and guide one of said drill steels (17, 19) and one of said bone screws (6, 7), at different times, for movement through said guide instrument, the internal threads (27, 28) provided along each passage (23, 24) having a root diameter (D6) which is so sized relative to the diameter (D1) of the external threads (9) on the threaded portion (8) of each bone screw (6, 7) as to enable said internal threads of said passages to threadably slidably mesh with said external threads of said bone screws to allow said threaded portion of said bone screws to be rotatably driven through said guide instrument body.

5,836,951
BALLOON DILATION CATHETER

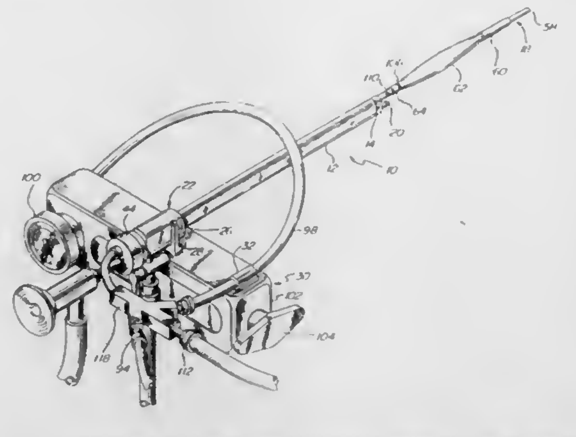
Robert F. Rosenbluth, Laguna Niguel; Jay Alan Lenker, Laguna Beach; George Robert Greene, Costa Mesa, and Barry M. Calvarese, Cardiff, all of Calif., assignors to Boston Scientific Corporation, Natick, Mass.

Continuation of Ser. No. 398,049, Mar. 2, 1995, Pat. No. 5,527,336, which is a continuation of Ser. No. 114,200, Aug. 30, 1993, abandoned, which is a continuation of Ser. No. 722,899, Jun. 28, 1991, Pat. No. 5,312,430, which is a continuation of Ser. No. 360,088, Jun. 1, 1989, Pat. No. 5,030,227, which is a continuation-in-part of Ser. No. 201,686, Jun. 19, 1988, Pat. No. 5,007,898, said Ser. No. 722,899 is a continuation of Ser. No. 535,999, Jun. 8, 1990, abandoned, which is a continuation of Ser. No. 427,924, Oct. 25, 1989, abandoned, which is a continuation of Ser. No. 229,155, Aug. 5, 1988, abandoned, which is a continuation of Ser. No. 939,754, Dec. 9, 1986, Pat. No. 4,762,128. This application Jun. 7, 1995, Ser. No. 481,126

Int. Cl.^{6} A61M *29/00*

U.S. Cl. 606—108 **9 Claims**

1. An intraluminal dilation apparatus for restoring patency to an obstructed portion of a body lumen, said apparatus comprising:
an introduction sheath having a longitudinal axis,
an axially movable radially expandable support structure for expanding the body lumen, said support structure initially positioned within said introduction sheath, in a manner such that said support structure is detachable from said introduction sheath,
a visual indicator, said visual indicator being
(a) insertable into the body lumen and visible under direct vision while inside the body lumen,
(b) positioned on said apparatus along said longitudinal axis of said introduction sheath, and



(c) positioned at a particular position relative to said support structure such that the position of the visual indicator provides an indication of the position of the support structure,
an axially elongate shaft for displacing said support structure from the initial position within said introduction sheath into the body lumen and depositing said support structure in the body lumen such that said support structure is detached from said introduction sheath and remains in the body lumen following removal of said introduction sheath from the body lumen thereby expanding the body lumen, and
a cystoscope inside said sheath for visualizing the position of said visual indicator relative to the anatomical landmark within the body lumen.

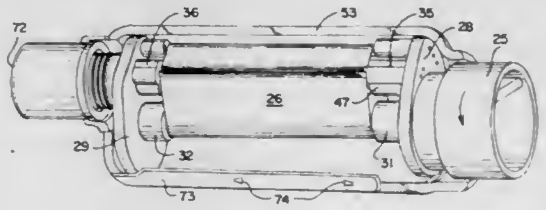
5,836,952
HAND-HELD STENT CRIMPER

Horace R. Davis, Pembroke Pines, and Phillip G. Reed, Davie, both of Fla., assignors to Cordis Corporation, Miami Lakes, Fla.

Filed Aug. 21, 1996, Ser. No. 700,816

Int. Cl.^{6} A61F *11/00*

U.S. Cl. 606—108 **33 Claims**



1. A crimper for receiving a catheter and for placing and crimping a balloon-deployable device onto a catheter, the crimper comprising:
a guide member having a longitudinal axis generally coinciding with a longitudinal feed axis of the crimper;
a holding member positioned with respect to said guide member so as to accommodate a balloon-deployable device such as a stent and a catheter slidingly inserted along said guide member, into said crimper, and into a balloon-deployable device along said crimper longitudinal feed axis;
an elongated wrapping member which wraps substantially around said holding member so as to generally define a substantially cylindrical compression site lying along said longitudinal feed axis of the crimper; and
a moving and guiding assembly along which the elongated wrapping member passes and by which the elongated wrapping member imparts a cylindrical compressive force onto said holding member and a balloon-deployable device positioned therewithin, whereby a balloon-deployable device is crimped onto the catheter.

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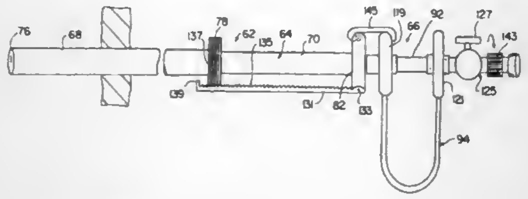
MULTIFUNCTIONAL DEVICES HAVING LOOP CONFIGURED PORTIONS AND COLLECTION SYSTEMS FOR ENDOSCOPIC SURGICAL PROCEDURES AND METHODS THEREFOR

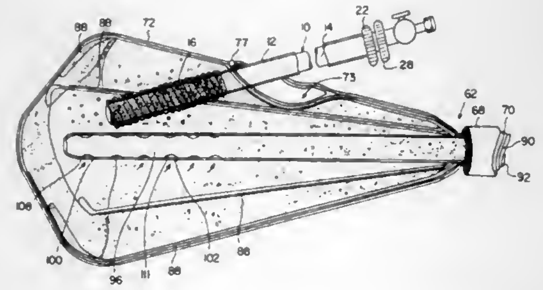
InBae Yoon, 2101 Highland Ridge Dr., Phoenix, Md. 21131

Continuation of Ser. No. 546,750, Oct. 23, 1995, Pat. No. 5,755,724, which is a division of Ser. No. 287,007, Aug. 8, 1994, Pat. No. 5,556,376, said Ser. No. 287,007 is a continuation-in-part of Ser. No. 45,768, Apr. 14, 1993, Pat. No. 5,451,204, which is a continuation-in-part of Ser. No. 600,775, Oct. 23, 1990, Pat. No. 5,374,261, which is a continuation-in-part of Ser. No. 596,937, Oct. 15, 1990, abandoned, said Ser. No. 45,768 is a continuation-in-part of Ser. No. 789,599, Nov. 8, 1991, abandoned, said Ser. No. 789,599 is a division of Ser. No. 556,081, Jul. 24, 1990, Pat. No. 5,074,840, said Ser. No. 600,775 is a continuation-in-part of Ser. No. 556,081, Jul. 24, 1990, which is a continuation-in-part of Ser. No. 596,937, Oct. 15, 1990, abandoned, which is a continuation-in-part of Ser. No. 222,776, Jul. 22, 1988, abandoned. This application Dec. 2, 1997, Ser. No. 982,334

Int. Cl.^{6} A61B *17/24;17/26*

U.S. Cl. 606—114 **10 Claims**





1. A collection system for collecting substances in the body of a patient in operative procedures wherein access to an internal operative site in the patient's body is gained through a narrow portal in the patient's body comprising

a cutter having a distal end for being disposed at the operative site through the portal, a proximal end for being disposed external of the patient's body, a cutting edge at said distal end for cutting anatomical tissue and a handle at said proximal end for moving said cutting edge to cut the anatomical tissue; and

a collection bag disposed over said distal end of said cutter and having a closed distal end, a proximal end fixedly attached to said cutter, an interior receiving said cutting edge and a selectively openable access slot providing communication with said interior of said collection bag from external thereof, said collection bag being movable, from external of the patient's body, from a collapsed position facilitating introduction of said collection bag at the operative site simultaneously with introduction of said distal end of said cutter at the operative site to an expanded position after introduction of said collection bag and said distal end of said cutter at the operative site to allow substances to be introduced in said interior of said collection bag through said access slot to be cut by said cutter.

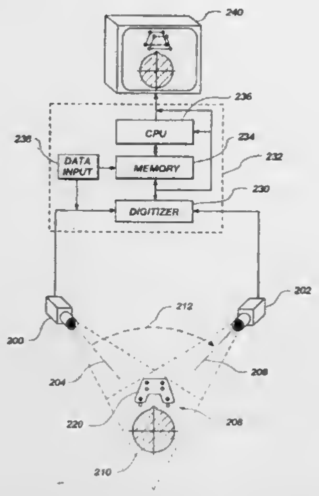
5,836,954
APPARATUS AND METHOD FOR PHOTOGRAMMETRIC SURGICAL LOCALIZATION

Mark Peter Heilbrun; Paul McDonald; J. Clayton Wiker; Spencer Koehler, and William Peters, all of Salt Lake City, Utah, assignors to University of Utah Research Foundation, Salt Lake City, Utah

Continuation of Ser. No. 145,777, Oct. 29, 1993, Pat. No. 5,603,318, which is a continuation-in-part of Ser. No. 871,382, Apr. 21, 1992, Pat. No. 5,389,101. This application Feb. 18, 1997, Ser. No. 801,662

Int. Cl.^{6} A61B *19/00*

U.S. Cl. 606—130 **6 Claims**



1. A fiducial structure for establishing a three-dimensional coordinate framework for a portion of a patient's body from a photographic image pair, comprising:

a sufficient number of fiducial indicators arranged to a three-dimensional coordinate system; and

a frame supporting and connecting said fiducial indicators, said frame constructed to hold said fiducial indicators in fixed relation to each other, wherein said frame is in proximate, but non-contact relationship with said portion of said patient's body.

5,836,955
WOUND CLOSURE APPARATUS AND METHOD

Terrence J. Buelna, Laguna Beach; Wayne A. Noda, Mission Viejo, and Paul Lubock, Laguna Niguel, all of Calif., assignors to C.R. Bard, Inc., Murray Hill, N.J.

Division of Ser. No. 715,714, Sep. 19, 1996, which is a continuation-in-part of Ser. No. 502,482, Jul. 14, 1995, Pat. No. 5,700,273. This application Jul. 14, 1997, Ser. No. 891,916

Int. Cl.^{6} A61B *17/04*

U.S. Cl. 606—148 **20 Claims**

1. A method for suturing a wound in a body wall having a near side and a far side, comprising the steps of:

providing a wound closure apparatus including a proximal section a distal section and an intermediate section;

inserting the distal section through the wound from the near side to the far side of the body wall;

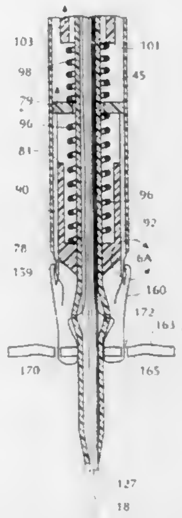
providing a deployment mechanism in the proximal section of the apparatus;

operating the deployment mechanism on the near side of the body wall to deploy a pair of needles through the body wall;

providing a suture having a first a first end, a second end and a loop disposed between the first and second ends;

providing a tensioning mechanism for supporting the suture loop;

manipulating the tensioning mechanism to prevent the suture from slackening;



manipulating the suture to thread the needles on the far side of the body wall;

withdrawing the threaded needles through the needle holes to access the ends of the suture on the near side of the body wall; and

withdrawing the distal section of the apparatus through the wound.

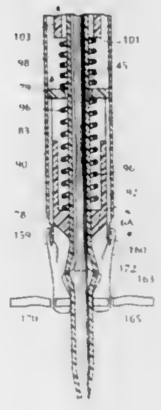
5,836,956
WOUND CLOSURE APPARATUS AND METHOD

Terrence J. Buelna, Laguna Beach; Wayne A. Noda, Mission Viejo, and Paul Lubock, Laguna Niguel, all of Calif., assignors to C.R. Bard, Inc., Murray Hill, N.J.

Continuation of Ser. No. 502,482, Jul. 14, 1995, Pat. No. 5,700,273. This application Jul. 14, 1997, Ser. No. 891,957

Int. Cl.^{6} A61B *17/04*

U.S. Cl. 606—148 **11 Claims**



1. A method for suturing a wound in a body wall having a near side and a far side, comprising the steps of:

providing a wound closure apparatus including a proximal section, a distal section and an intermediate section;

inserting the distal section through the wound from the near side to the far side of the body wall;

deploying a pair of needles through the body wall surrounding the wound to form an associated pair of needle holes;

inserting a suture having two ends and a suture loop extending therebetween directly into and through the wound from the near side to the far side of the body wall;

manipulating the suture into threading engagement with the needles;

withdrawing the threaded needles through the needle holes to access the ends of the suture on the near side of the body wall; and

withdrawing the distal section of the apparatus through the wound.

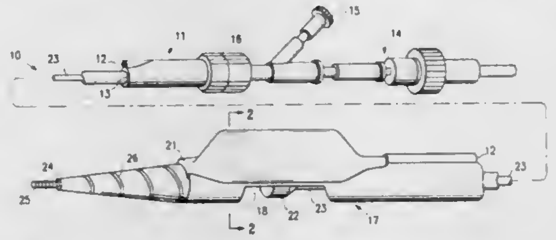
5,836,957
LARGE VOLUME ATHERECTOMY DEVICE

Grace Y. Schulz, San Carlos; Gerri Chatelain, Pleasanton; Mark E. Deem, San Francisco, and Ferolyn T. Powell, San Carlos, all of Calif., assignors to Devices For Vascular Intervention, Inc., Santa Clara, Calif.

Continuation of Ser. No. 361,599, Dec. 22, 1994, abandoned. This application Feb. 26, 1997, Ser. No. 807,822

Int. Cl.^{6} A61B *17/22*

U.S. Cl. 606—159 **19 Claims**



1. An atherectomy catheter comprising:

a) a catheter shaft having a proximal end, a distal end and an inflation lumen extending therein;

b) an elongated housing at the distal end of the catheter shaft having an inner chamber and a window in fluid communication with the inner chamber in a wall portion of the elongated housing;

c) means for cutting stenotic material which extends through the window into the inner chamber of the housing;

d) an elongated large volume inflatable support which is secured to the housing on a side thereof opposite the window, which is in fluid communication with the inflation lumens, which has an effective diameter when inflated such that the ratio of the effective diameter thereof to the diameter of the elongated housing is at least about 1.1:1 and which has an unsecured portion radially constrained only toward the side of the housing opposite the window when uninflated to prevent the unsecured portion of the uninflated large volume inflatable support from extending through the window into the inner chamber of the elongated housing.

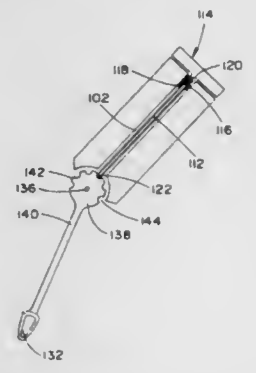
5,836,958
SURGICAL CURETTE HAVING A VARIABLY ANGLED HANDLE

James D. Ralph, 71 Manito Ave., Oakland, N.J. 07436

Filed Oct. 30, 1996, Ser. No. 741,573

Int. Cl.^{6} A61B *17/16;17/24*

U.S. Cl. 606—160 **6 Claims**



1. A surgical curette, comprising:

a handle having a receiving locus formed in a distal end thereof;

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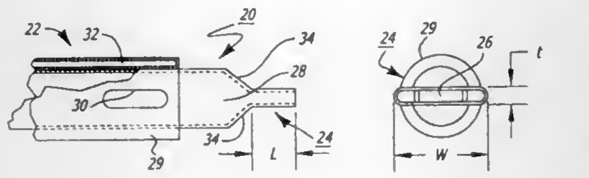
a member having a disc shaped proximal end which includes discrete topological features at spaced angular intervals on the surface thereof, and a distal end having a spoon shaped conformation;
first means for retaining the proximal end of said member within said receiving locus, such that said member may rotate within said receiving locus; and
second means for selectively engaging at least one of said discrete topological features of said disc shaped proximal end of said member, whereby the member is prevented from further rotation within the receiving locus.

5,836,959
ULTRASONIC TIP AND A METHOD FOR INTEROCULAR SURGERY

Barry S. Seibel, 11756 Kiowa Ave. #203, Los Angeles, Calif. 90049, and Alex Urich, 27402 Via Caudaloso, Mission Viejo, Calif. 92692

Filed Apr. 12, 1996, Ser. No. 631,007
Int. Cl.^{6} A61B *17/32*

U.S. Cl. 606—169 **5 Claims**



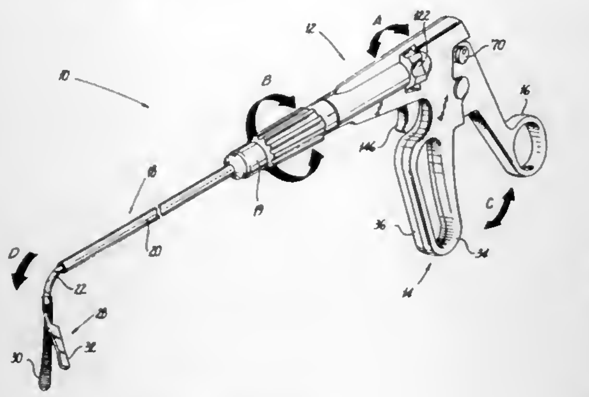
1. A phaco emulsifying tip, comprising:
a tip which has an inner aspiration channel, said tip having a cylindrical proximal end and a flat distal end which has an oblong opening that provides fluid communication to said inner aspiration channel, said oblong opening of said flat distal end forms a pair of inner shoulders at said cylindrical proximal end that are within said inner aspiration channel and face said oblong opening to induce a cavitation of a fluid.

5,836,960
ENDOSCOPIC SURGICAL APPARATUS WITH ROTATION LOCK

Michael S. Kolesa, Norwalk; Ernie Aranvi, Easton, both of Conn., and Gary S. Kappel, Waltham, Mass., assignors to United States Surgical Corporation, Norwalk, Conn.

Division of Ser. No. 311,493, Sep. 23, 1994, Pat. No. 5,609,601. This application Feb. 24, 1997, Ser. No. 804,854
Int. Cl.^{6} A61B *17/00*

U.S. Cl. 606—170 **4 Claims**



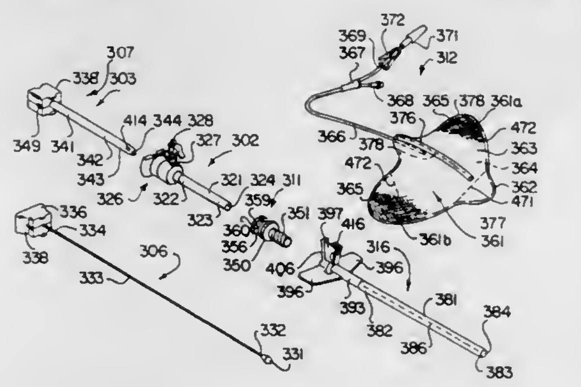
1. A surgical apparatus comprising:
a handle portion;
a body portion extending from said handle portion and defining a longitudinal axis;
tool means operatively associated with a distal portion of the body portion and remotely actuatable from said handle portion for manipulation of tissue;
rotation means operatively associated with said tool means for effecting remote rotation of the tool means about a longitudinal axis of the body portion relative to the handle portion; and
rotation locking means for locking the rotation means at a fixed position such that the rotation means cannot be rotated with respect to the handle portion;
wherein said rotation locking means comprises ratchet structure coaxial with a rotatable collar, the ratchet structure mounted for reciprocal longitudinal movement between an engaged position in restrictive engagement with the rotatable collar and a disengaged position out of engagement with said rotatable collar.

5,836,961
APPARATUS AND METHOD FOR DEVELOPING AN ANATOMIC SPACE FOR LAPAROSCOPIC HERNIA REPAIR AND PATCH FOR USE THEREWITH

Maciej J. Kieturakis, San Carlos; Kenneth H. Mollenauer, Santa Clara; Michelle Y. Monfort, Los Gatos, and Helmut L. Kayan, Redwood City, all of Calif., assignors to General Surgical Innovations, Inc., Cupertino, Calif.

Continuation-in-part of Ser. No. 893,988, Jun. 2, 1992. This application Sep. 20, 1993, Ser. No. 124,283
Int. Cl.^{6} A61B *17/00;* A61M *29/00*

U.S. Cl. 606—190 **16 Claims**



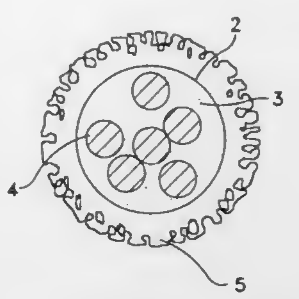
1. An apparatus for creating an anatomic space comprising:
a tubular member having a bore extending therethrough;
a substantially rigid tunneling shaft slidably mounted in said bore of said tubular member, said tunneling shaft having a blunt distal end for tunneling bluntly through tissue;
a deflated balloon disposed alongside said tunneling shaft;
means for securing said balloon to said tunneling shaft;
a sheath enclosing said balloon, said sheath having a weakened region extending longitudinally thereof permitting said sheath to be removed from said balloon; and
means for inflating said balloon after said sheath has been removed to create the anatomic space.

5,836,962
ENDOPROSTHESIS

Marc Gianotti, Wiesendangen, Switzerland, assignor to Schneider (Europe) AG, Bulach, Switzerland

Continuation of Ser. No. 326,630, Oct. 20, 1994, abandoned. This application Jan. 22, 1997, Ser. No. 787,817
Claims priority, application European Pat. Off., Oct. 20, 1993, 93116918
Int. Cl.^{6} A61M *29/00;* A61F *02/06*

U.S. Cl. 606—191 **22 Claims**



9. A body compatible stent comprising at least two interwoven sets of elongate, resilient elements substantially uniform in lateral cross-section over their lengths and forming a tubular latticework which is compressible upon radially internally directed forces to a reduced diameter and self-expandable upon release of the radially internally directed forces to an expanded diameter, wherein the elements comprise:
(a) multiple fibers having high tensile strength;
(b) a first thermoplastic material embedding the fibers to form a composite; and
(c) a second thermoplastic material embedding the composite.

5,836,963

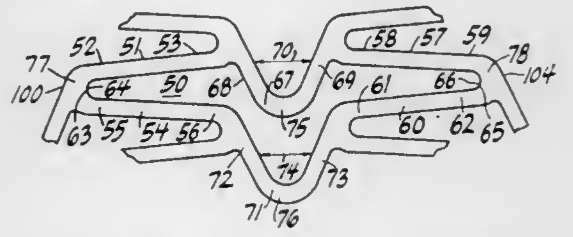
Patent Not Issued For This Number

5,836,964
STENT FABRICATION METHOD

Jacob Richter, Tel Aviv, and Ira Yaron, Jerusalem, both of Israel, assignors to Medinol Ltd., Tel Aviv, Israel

Filed Oct. 30, 1996, Ser. No. 742,422
Int. Cl.^{6} A61M *29/00*

U.S. Cl. 606—194 **21 Claims**



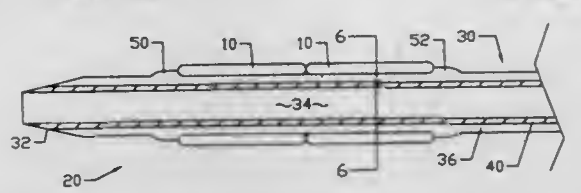
1. A sheet for fabricating a stent having a longitudinal lumen having a longitudinal axis comprising:
a) a flat piece of metal provided with a plurality of stent patterns, each of said patterns comprising a plurality of flexible connected cells, each of said flexible cells comprising:
a) a first member having a longitudinal component having a first end and a second end;
b) a second member having a longitudinal component having a first end and a second end;
c) a third member having a longitudinal component having a first end and a second end;
d) a fourth member having a longitudinal component having a first end and a second end;
e) a first loop defining a first angle disposed between said first end of said member and said first end of said second member;
f) a second loop defining a second angle disposed between said second end of said third member and said second end of said fourth member, and disposed generally opposite to said first loop;
g) a first flexible compensating member having a first end and a second end disposed between said first member and said third member, said first end of said first flexible compensating member communicating with said second end of said first member and said second end of said first flexible compensating member communicating with said first end of said third member, said first and said second ends disposed a variable longitudinal distance from each other:
h) a second flexible compensating member having a first end and a second end disposed between said second member and said fourth member, said first end of said second flexible compensating member communicating with said first end of said fourth member, said first and said second ends disposed a variable longitudinal distance from each other, said first and said second flexible compensating member differentially expendable or compressible when said stent is bent in a curved direction away from said longitudinal axis of said lumen; and
I) said first, said second, said third, and said fourth members and said first and said second loops, and said first and said second flexible compensating members disposed so that as said stent is expanded the distance between said first and said second flexible compensating member increases and the longitudinal component of said first, second, third and fourth members decreases while said first and said second loops remain generally opposite to one another, the ends of said first and said second flexible compensating member open so as to increase said variable longitudinal distance between said first and said second ends of said first flexible compensating member and so as to increase said variable longitudinal distance between said first and said second ends of said second flexible compensating member so as to compensate for the decreasing of the longitudinal component of said first, second, third, and fourth members and substantially lessen the foreshortening of said stent upon its expansion:
each of said plurality of stent patterns having a first long side and a second long side, said first long side provided with a plurality of pairs of engagement troughs, said second long side provided with a plurality of pairs of engagement protrusions, said plurality of pairs of engagement troughs and said plurality of pairs of engagement protrusions disposed substantially opposite each other, each of said plurality of pairs of said engagement troughs comprising a first engagement trough and a second engagement trough, said engagement troughs sized and disposed to receive and engage said engagement protrusions when said sheet is deformed and rolled into a tubular shape, each pair of said engagement troughs provided with a bridge disposed between said first engagement trough and said second engagement trough, wherein said first loop, said second loop, said first compensating member, and said second compensating member are wider than said first, second, third and fourth members.

5,836,965
STENT DELIVERY AND DEPLOYMENT METHOD

Brad Jendersee, and Robert Lashinski, both of 5345 Skylane Blvd., Santa Rosa, Calif. 95403

Continuation-in-part of Ser. No. 326,023, Oct. 19, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 478,192
Int. Cl.^{6} A61M *29/00*

U.S. Cl. 606—198 **14 Claims**



1. An endovascular support device for implantation in a vessel within the human body comprising:
at least one compressible stent means mounted on a balloon of a balloon catheter; and
wherein said at least one compressible stent means is encapsulated by said balloon of said balloon catheter.

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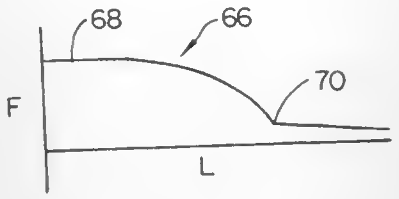
5,836,966
VARIABLE EXPANSION FORCE STENT

Jon P. St. Germain, Elk River, Minn., assignor to SciMed Life Systems, Inc., Maple Grove, Minn.
Filed May 22, 1997, Ser. No. 861,798
Int. Cl.^{6} A61M *29/00*
U.S. Cl. 606—198 **1 Claim**



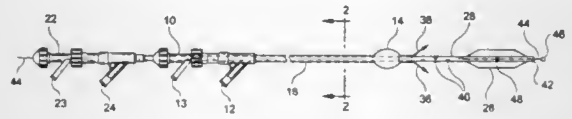
1. A method of stenting a narrowing vessel region, the narrowing region having a wider end and a narrower end, comprising the steps of:

providing a stent having a tubular shaped structure, said structure having a radially outward biased force, said force being varied along said length, said tubular structure having a first end region, a middle region, and a second end region, wherein said force is weakest in said first end region, stronger in said middle region than in said first region, and stronger in said second end region than in said middle region; and

placing the stent in the narrowing region such that the first end region of the stent is disposed toward the narrower end of the narrowing vessel region.

5,836,967
CATHETER ASSEMBLY

Ernst Schneider, Langnau am Albis, Switzerland, assignor to Schneider (Europe) AG, Bulach, Switzerland
Filed Dec. 15, 1997, Ser. No. 990,361
Claims priority, application European Pat. Off., Jun. 23, 1997, 97110241
Int. Cl.^{6} A61M *29/00*
U.S. Cl. 606—198 **3 Claims**

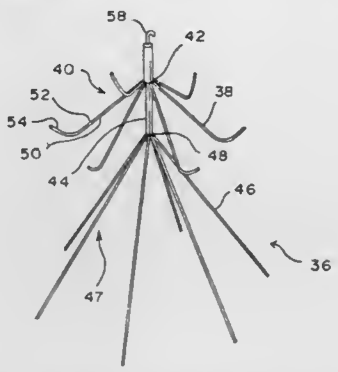


1. A catheter assembly for the treatment of vessels carrying body fluid, comprising:

an inner catheter provided with a guidewire lumen for receiving a guidewire and an inflation lumen for a balloon provided at its distal end, an outer catheter provided with an inflation lumen for a balloon provided at its distal end and a lumen in which the inner catheter is applied shiftable for changing the spacing of said two balloons and which features a larger cross-section than that of said inner catheter so that between the outer wall of said inner catheter and the inner wall of said outer catheter a cross-section employable as an inflation lumen exists and ports into the portion sited between said two balloons, wherein said guidewire lumen of said inner catheter is connected to said portion sited between said two balloons via ports in said catheter wall, said guidewire lumen is dimensioned cross-sectionally so that it can be used as said inflation lumen also when said guidewire is in the lying position, said guidewire is provided at its distal end with an occlusion element for closing off said port located at the distal end of said guidewire lumen.

5,836,968
REMOVABLE EMBOLUS BLOOD CLOT FILTER

Morris Simon, Boston; Stephen J. Kleshinski, Scituate, and Thomas F. Kinst, Chelsea, all of Mass., assignors to Nitinol Medical Technologies, Inc., Boston, Mass.
Division of Ser. No. 682,192, Jul. 17, 1996, Pat. No. 5,669,933. This application Jul. 16, 1997, Ser. No. 896,964
Int. Cl.^{6} A61M *29/00*
U.S. Cl. 606—200 **19 Claims**



1. A blood clot filter having a central longitudinal axis which is collapsible into a collapsed configuration toward said longitudinal axis for insertion into a blood vessel and which is radially expansible outwardly from said longitudinal axis to an expanded configuration for contact with an inner wall of said blood vessel at two longitudinally spaced locations, said blood clot filter having leading and trailing ends and comprising:

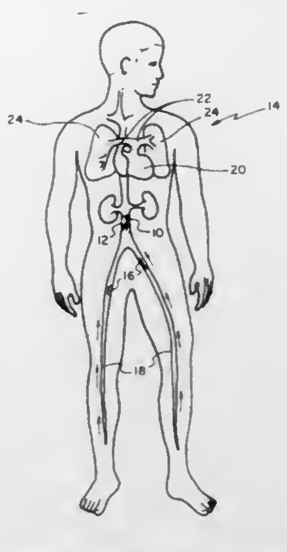
a first plurality of spaced wires which, in the expanded configuration of said filter extend outwardly away from said longitudinal axis toward the leading end and bend back to form a first filter basket opening towards the trailing end; and

a second plurality of spaced wires which, in the expanded configuration of said filter angle outwardly away from said longitudinal axis toward the leading end of said blood clot filter to form a second filter basket opening toward said leading end, and a central shaft extending along said central longitudinal axis, said first plurality of spaced wires forming elongate arms having first ends connected to said shaft at a first juncture therewith, and said second plurality of spaced wires forming elongate legs having first ends connected to said shaft at a second juncture spaced from said first juncture, said first and second junctures being fixed in position on said shaft.

5,836,969
VENA CAVA FILTER

Hannah S. Kim, Arlington; David L. Sandock, Littleton, and Sepideh H. Nott, Fall River, all of Mass., assignors to Boston Scientific Corporation, Watertown, Mass.
Continuation of Ser. No. 704,843, Aug. 28, 1996, abandoned, which is a continuation of Ser. No. 131,203, Oct. 1, 1993, abandoned. This application Jul. 28, 1997, Ser. No. 901,126
Int. Cl.^{6} A61B *17/00;* **A61M** *29/00*
U.S. Cl. 606—200 **29 Claims**

1. A vascular filter for placement in a blood vessel for preventing the movement of emboli in the blood stream of a human, the filter including a set of filter-wires that diverge from a central region in a generally upstream direction along the blood vessel when implanted forming an emboli-capturing array, the filter wires having portions that engage the vessel wall, and an anchoring assembly defined by at least one set of struts joined centrally with said set of filter-wires, portions of said anchoring assembly constructed and arranged to engage the wall of said blood vessel in a manner anchoring said filter in position, the region of said anchoring being spaced downstream from the region of contact of said set of filter wires with said vessel wall, wherein said anchoring assembly comprises anchoring formations distributed about said filter, said anchoring formations being mounted on parallelogram-like supports arranged to adapt to the walls of vessels over a range of sizes while maintaining substantially the same attitude with respect to the wall of the vessel.



5,836,970
HEMOSTATIC WOUND DRESSING

Abhay S. Pandit, Providence, R.I., assignor to The Kendall Company, Mansfield, Mass.
Filed Aug. 2, 1996, Ser. No. 691,655
Int. Cl.^{6} A61B *17/04*
U.S. Cl. 606—213 **20 Claims**

1. A wound dressing comprising a blend or mixture consisting of effective amounts of chitosan and alginate in a weight ratio within the range of about 5:1 to 1:5, wherein the chitosan and alginate are present in a form selected from the group consisting of a multilayered composite, a powder, a composite fiber, a film, a gel, a foam or a mixture thereof.

5,836,971
DYNAMIC REZONING OF A TIERED THERAPY INPLANTABLE CARDIOVERTER DEFIBRILLATOR/ PACEMAKER (ICD) DEVICE

Timothy J. Starkweather, Boulder Creek, Calif., assignor to Pacesetter, Inc., Sylmar, Calif.
Filed Feb. 26, 1997, Ser. No. 806,960
Int. Cl.^{6} A61N *1/39*
U.S. Cl. 607—4 **21 Claims**

1. An implantable cardioverter defibrillator/pacemaker (ICD) delivering tiered level therapies corresponding to hierarchical arrhythmia rate zones, the ICD comprising:

at least one electrode for coupling to a patient's heart;

a sensing circuit for detecting an arrhythmia through the at least one electrode;

an output switch coupled to the at least one electrode;

an output capacitor coupled to the at least one electrode through the output switch;

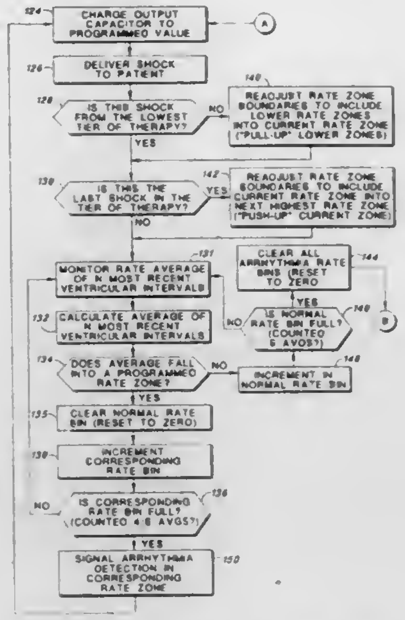
a charging circuit, coupled to the output capacitor, for charging the output capacitor to a programmed energy level; and

a control circuit, coupled to the sensing circuit, the charging circuit and the output switch, for determining a current rate zone in which the detected arrhythmia falls and for generating control signals to control the charging of the output capacitor and closure of the output switch in accordance with a prescribed tiered therapy corresponding to the current rate zone, the control circuit further comprising:

means for defining a plurality of rate zones, each rate zone having rate zone boundaries associated therewith, and each having a prescribed tiered therapy associated therewith, wherein each tiered level therapy includes a preprogrammed number of shocks including a last shock of greatest energy;

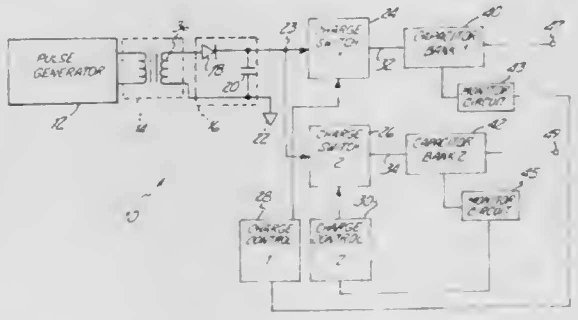
means for dynamically readjusting the rate zone boundaries of the current rate zone prior to a subsequent arrhythmia redetection to include all lower rate zones into the current rate zone; and

means for dynamically readjusting the rate zone boundaries to include the current rate zone in a higher rate zone in the event that the last shock of a tiered level of therapy for the current rate zone is delivered.


124
CHARGE OUTPUT CAPACITOR TO PROGRAMMED VALUE
A
126
DELIVER SHOCK TO PATIENT
128
IS THIS SHOCK FROM THE LOWEST TIER OF THERAPY?
NO
140
READJUST RATE ZONE BOUNDARIES TO INCLUDE LOWER RATE ZONES INTO CURRENT RATE ZONE ("PULL-UP" LOWER ZONES)
YES
130
IS THIS THE LAST SHOCK IN THE TIER OF THERAPY?
YES
142
READJUST RATE ZONE BOUNDARIES TO INCLUDE CURRENT RATE ZONE INTO NEXT HIGHEST RATE ZONE ("PUSH-UP" CURRENT ZONE)
NO
131
MONITOR RATE AVERAGE OF N MOST RECENT VENTRICULAR INTERVALS
CLEAR ALL ARRHYTHMIA RATE BINS (RESET TO ZERO
144
YES
132
CALCULATE AVERAGE OF N MOST RECENT VENTRICULAR INTERVALS
NO
IS NORMAL RATE BIN FULL? (COUNTED 5 AVGS?)
146
B
134
DOES AVERAGE FALL INTO A PROGRAMMED RATE ZONE?
NO
148
INCREMENT IN NORMAL RATE BIN
YES
135
CLEAR NORMAL RATE BIN (RESET TO ZERO)
138
INCREMENT CORRESPONDING RATE BIN
NO
IS CORRESPONDING RATE BIN FULL? (COUNTED 4:6 AVGS?)
136
YES
SIGNAL ARRHYTHMIA DETECTION IN CORRESPONDING RATE ZONE
150

5,836,972
PARALLEL CHARGING OF MIXED CAPACITORS

Gary B. Stendahl, Crystal, and James E. Brewer, St. Paul, both of Minn., assignors to SurVivaLink Corp., Minnetonka, Minn.
Filed Jun. 27, 1996, Ser. No. 673,804
Int. Cl.^{6} A61N *1/39*
U.S. Cl. 607—5 **23 Claims**



1. An apparatus for selectively charging a plurality of capacitor banks in an external defibrillator circuit comprising:

pulse generator means for generating a train of pulses;

a pulse transformer having a primary winding connected to the pulse generator means and having a secondary winding magnetically coupled to the primary winding;

low pass filter means connected to the secondary winding for filtering the train of pulses; and

a pair of solid state switches, each having an input connected to the low pass filter means, and an output connected to a plurality of separate capacitor banks such that the voltage across the filter means is coupled to one of the plurality of capacitor banks when one of the plurality of switches in ON

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and the voltage across the filter means is uncoupled from that capacitor bank when the one switch is OFF.

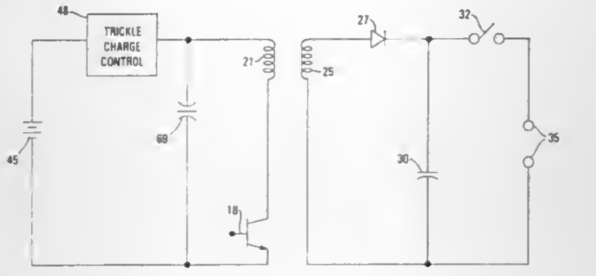
5,836,973
STAGED ENERGY CONCENTRATION FOR AN IMPLANTABLE BIOMEDICAL DEVICE

Mark W. Kroll, 13011 Brenwood Trail, Minnetonka, Minn. 55343

Continuation of Ser. No. 486,760, Sep. 7, 1995, Pat. No. 5,674,248, which is a continuation-in-part of Ser. No. 993,094, Dec. 18, 1992, Pat. No. 5,407,444, which is a continuation-in-part of Ser. No. 126,044, Sep. 23, 1993, Pat. No. 5,439,482, which is a continuation-in-part of Ser. No. 93,292, Dec. 18, 1992, Pat. No. 5,383,907. This application Nov. 12, 1996, Ser. No. 745,724

Int. Cl.^{6} A61N *1/39*

U.S. Cl. 607—5 **4 Claims**



1. An implantable defibrillator for delivering high voltage electrical pulses to a plurality of implantable electrodes within a human patient for treating cardiac arrhythmias, comprising:
- monitor circuitry that detects the occurrence of a cardiac arrhythmia in the human patient;
- a charge storage system that stores a high voltage electrical output pulse to be delivered to the implantable electrodes;
- control circuitry operably connected to the monitor circuitry and the charge storage system to control the charging and discharging of the charge storage system in response to the cardiac arrhythmia; and
- a power source system including a low voltage battery system operably connected to the monitor circuitry and the control circuitry to provide power thereto and a low voltage rechargeable energy storage system operably connected to a transformer to provide the power for the charge storage system.

5,836,974
REAL-TIME AND ADAPTIVE METHOD AND SYSTEM FOR SUPPRESSING A PATHOLOGICAL NON-CHAOTIC RHYTHM

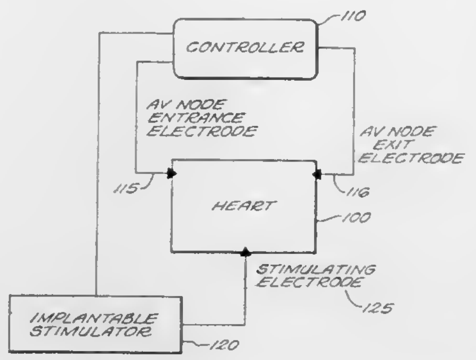
David J. Christini, Allston, and James J. Collins, Bringhton, both of Mass., assignors to Trustees of Boston University, Boston, Mass.

Filed Dec. 18, 1996, Ser. No. 768,458

Int. Cl.^{6} A61N *1/39*

U.S. Cl. 607—5 **30 Claims**

1. A method of stabilizing a non-chaotic alternating conduction time for cardiac impulses through the atrioventricular node comprising the steps of:
- initiating a control sequence in response to the development of a non-chaotic alternation in conduction time, said control sequence comprising:
- estimating the unstable period-1 fixed point for said non-chaotic alternating conduction time through the atrioventricular node;



- calculating a time at which a control stimulation will be input to the heart based on said estimated unstable period-1 fixed point and a control sensitivity parameter;
- inputting a control stimulation to the heart;
- monitoring the conduction time to the control stimulation through the atrioventricular node;
- adjusting said unstable period-1 fixed point based on said response of the heart to said control stimulation; and
- adapting said control sensitivity parameter automatically:
- wherein the steps of said control sequence are repeated in real-time to achieve stabilization of said conduction time.

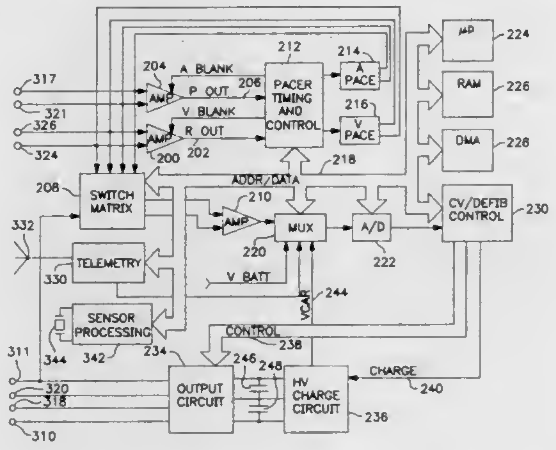
5,836,975
METHOD AND APPARATUS FOR DIAGNOSIS AND TREATMENT OF ARRHYTHMIAS

Paul J. DeGroot, Brooklyn Park, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Jun. 5, 1997, Ser. No. 816,822

Int. Cl.^{6} A61N *1/39*

U.S. Cl. 607—5 **22 Claims**



1. An implantable anti-arrhythmia device comprising:
- an cardioversion or defibrillation pulse generator;
- means for receiving a patient's request for cardioversion or defibrillation;
- means for detecting a retrigger signal from the patient; and
- control circuitry responsive to the detecting means for triggering the pulse generator to deliver a cardioversion or defibrillation pulse in response to a detected patient retrigger signal following a received request for cardioversion or defibrillation.

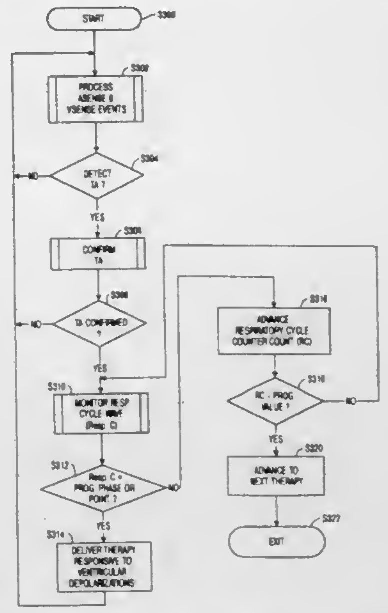
5,836,976
CARDIOVERSION ENERGY REDUCTION SYSTEM

Xiaoyi Min, Plymouth; Li Wang, White Bear Township; Rahul Mehra, Stillwater; Paul J. DeGroot, Brooklyn Park; Walter H. Olson, North Oaks; Luc R. Mongeon, and Michael R. S. Hill, both of Minneapolis, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 30, 1997, Ser. No. 846,747

Int. Cl.^{6} A61N *1/39*

U.S. Cl. 607—6 **24 Claims**



1. A method of effecting atrial cardioversion, comprising:
- implanting cardioversion electrodes in a patient's body;
- monitoring the patient's cardiac cycle;
- detecting an atrial tachyarrhythmia from the monitored cardiac cycle;
- monitoring the patient's respiratory cycle;
- detecting an optimum point or phase of the respiratory cycle affecting the volume of the patient's lungs and the impedance between the cardioversion electrodes;
- defining acceptable times for delivery of cardioversion therapy relative to ventricular depolarizations;
- detecting occurrences of ventricular depolarizations; and
- delivering the cardioversion therapy at an acceptable time relative to ventricular depolarizations within the determined optimum point or phase of the respiratory cycle.

5,836,977
DEFIBRILLATOR METHOD AND SYSTEM FOR MAKING POST-DISCHARGE MEASUREMENTS OF ENERGY AND IMPEDANCE

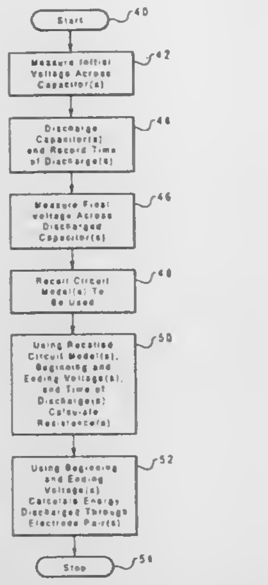
Richard C. Myers, McMinnville, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 741,894, Oct. 31, 1996, abandoned. This application Nov. 7, 1997, Ser. No. 967,271

Int. Cl.^{6} A61N *1/39*

U.S. Cl. 607—5 **4 Claims**

1. A method for determining the energy delivered from a capacitor to biological tissues by a defibrillator, and said method comprising the steps of:
- indicating that said capacitor is in the process of being connected to a load;
- measuring a pre-discharge voltage across said capacitor to be discharged into biological tissues in response to an indication that said capacitor is in the process of being connected to said load;
- indicating that said capacitor has been disconnected from said load;


Start
40
Measure Initial Voltage Across Capacitor(s)
42
Discharge Capacitor(s) and Record Time of Discharge(s)
44
Measure Final Voltage Across Discharged Capacitor(s)
46
Recall Circuit Model(s) To Be Used
48
Using Recalled Circuit Model(s), Beginning and Ending Voltage(s), and Time of Discharge(s) Calculate Resistance(s)
50
Using Beginning and Ending Voltage(s) Calculate Energy Discharged Through Electrode Pair(s)
52
Stop
54

- measuring a post-discharge voltage across said capacitor which has been discharged into said biological tissues in response to an indication that said capacitor has been disconnected from said load; and
- calculating the energy delivered to said biological tissues based upon said measured pre-discharge and post-discharge voltages.

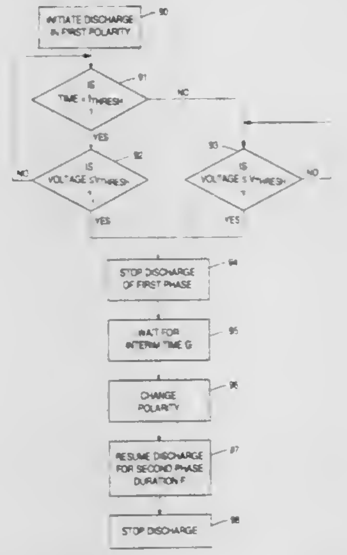
5,836,978
ELECTROTHERAPY METHOD FOR PRODUCING A MULTIPHASIC DISCHARGE BASED UPON A PATIENT-DEPENDENT ELECTRICAL PARAMETER AND TIME

Bradford E. Gliner, Bellevue; Thomas D. Lyster, Bothell; Clinton S. Cole, Kirkland; Daniel J. Powers, and Carlton B. Morgan, both of Bainbridge Island, all of Wash., assignors to Heartstream, Inc., Seattle, Wash.

Continuation of Ser. No. 601,091, Feb. 14, 1996, abandoned, which is a division of Ser. No. 103,837, Aug. 6, 1993, abandoned. This application Aug. 12, 1997, Ser. No. 909,656

Int. Cl.^{6} A61N *1/39*

U.S. Cl. 607—7 **7 Claims**



1. A method for applying electrotherapy to a patient through electrodes connected to an energy source, the method comprising the following steps:

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discharging the energy source across the electrodes to deliver electrical energy to the patient in a multiphasic waveform having an earlier phase and a later phase, the later phase having a fixed duration;

simultaneously monitoring a patient-dependent electrical parameter and time during the discharging step;

adjusting a discharge parameter based on a value of the monitored electrical parameter and the monitored time.

5,836,979

Patent Not Issued For This Number

5,836,980

METHODS AND APPARATUS FOR DISCRIMINATING CHARACTERISTIC SIGNALS FROM PARASITIC SIGNALS IN ACTIVE IMPLANTABLE MEDICAL DEVICES

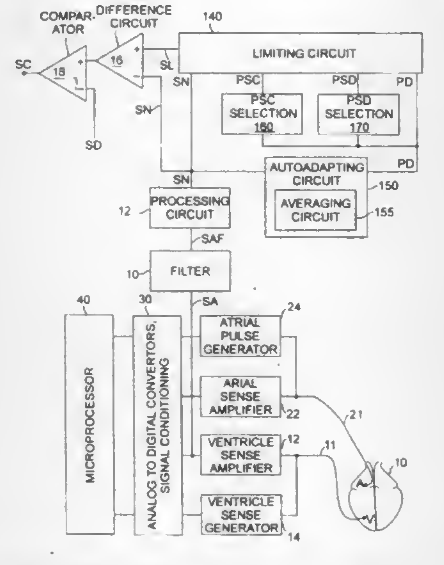
Thierry Legay, Fontenay Les Brilis, France, assignor to ELA Medical S.A., Montrouge, France

Filed Nov. 22, 1996, Ser. No. 755,335

Claims priority, application France, Nov. 22, 1995, 95 13831

Int. Cl.^{6} A61N *1/362*

U.S. Cl. 607—9 **24 Claims**



1. An active implantable medical device comprising;

a detector to collect a cardiac signal (SA), said collected cardiac signal comprising a characteristic signal component and a parasitic signal component, in which the detector further comprises an analog to digital converter having as an input the collected cardiac signal, and having as an output a digital cardiac signal comprising successive samples corresponding to said collected cardiac signals and

a discriminating means for receiving as an input the collected cardiac signal and delivering as an output a signal (ST) corresponding essentially to the characteristic wherein the discriminating means further comprises:

a differentiating and limiting means for evaluating the cardiac signal for variations in said cardiac signal relative to a predetermined discriminating range, said range being between a positive value and a negative value, and for limiting, in response to a variation being outside said predetermined discriminating range, said variation to a predetermined limit, said predetermined limit being one of a positive limit value for variations greater than the positive value and a negative limit value for variations less than said negative value, the differentiating and limiting means further comprising:

means for determining an increment between two successive digital cardiac signal samples (SNi, SLi-1) as said variation; and

means for establishing successive slope values of the digital cardiac signal samples by evaluation of said increment,

means for subtracting from each digital signal sample (SNi) the preceding limited digital cardiac signal sample (SLi-1), and

means for taking an absolute value of the resulting difference and comparing the absolute to a predetermined discriminating slope value (PD); and

first means for adjusting the discriminating slope value (PD) as a function of the collected cardiac signal.

5,836,981

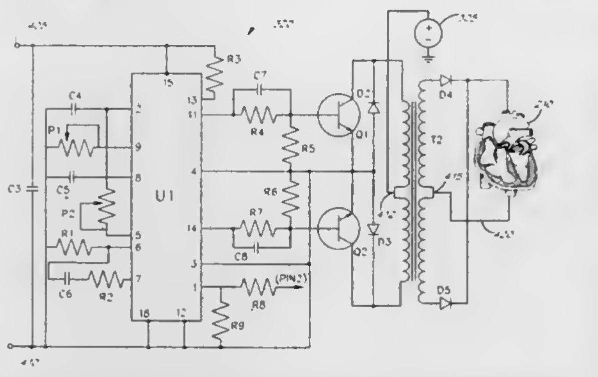
PACEMAKER CIRCUIT AND ASSOCIATED METHODS FOR GENERATING ELECTRICAL STIMULATION SIGNALS

Steve Chang, Valencia, Calif., and Robert R. Weyant, Redmond, Wash., assignors to Pacesetter, Inc., Sylmar, Calif.

Filed Jan. 17, 1997, Ser. No. 785,193

Int. Cl.^{6} A61N *1/362*

U.S. Cl. 607—9 **26 Claims**



1. An implantable stimulation device having a pacing circuit for providing a stimulation signal to a heart, comprising:

a battery which provides a DC voltage signal;

a switching stage which receives the DC voltage signal and generates a pulse burst having a first voltage, the pulse burst being defined as a rapid sequence of pulses used to cause a single contraction event; and

a transformer which boosts the first voltage of the pulse burst to generate the stimulation signal having a second voltage suitable for capturing the heart.

5,836,982

SYSTEM AND METHOD OF DATA COMPRESSION AND NON-LINEAR SAMPLING FOR IMPLANTABLE AND BATTERY-POWERED DEVICES

Lambert Mühlenberg, Al Landgraaf, and Keon Weijand, Ev Hoensbroek, both of Netherlands, assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Feb. 19, 1997, Ser. No. 801,335

Int. Cl.^{6} A61N *1/36;1/362;* A61B *5/04;5/0402*

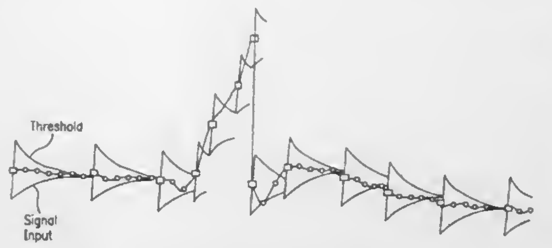
U.S. Cl. 607—9 **24 Claims**

12. A method of obtaining a compressed data representation of an analog signal, comprising:

establishing threshold data relating to anticipated values of said analog signal;

sampling said analog signal at an effective non-linear rate to obtain non-linear sample data, said non-linear sampling including comparing said analog signal to said threshold data and deriving said non-linear rate from said comparing;

obtaining a measure of said non-linear rate corresponding to each sample, and converting said measures into rate data;



losslessly compressing said sample data establishing discrete threshold data points, first sampling said analog signal at a fixed rate to obtain first sample data, comparing said first sample data with said threshold data points, and non-linear sampling said first sample data as a function of said comparison; and

writing said rate data and said sample data.

5,836,983

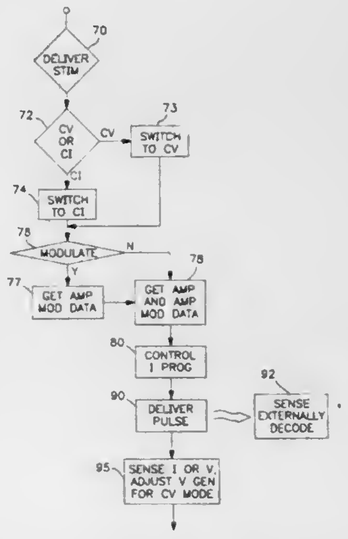
OUTPUT STAGE WITH SWITCHABLE CONSTANT CURRENT MODES

Koen J. Weijand, Hoensbroek, and Robert Leinders, Limbricht, both of Netherlands, assignors to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 585,216, Jan. 11, 1996, abandoned. This application Jun. 19, 1997, Ser. No. 879,214

Int. Cl.^{6} A61N *1/362*

U.S. Cl. 607—9 **27 Claims**



1. An output circuit for delivering a controllable output pulse to a patient, comprising:

a pulse generating circuit for generating an output pulse;

control mode means, for controlling said pulse generating circuit to operate in a constant voltage mode during the generation of a first portion of an output pulse and in a constant current mode during the generation of a second portion of the output pulse; and

amplitude control means for controlling the amplitude of the output pulse as it is being delivered and means for delivering said output pulse to the tissue of a patient.

5,836,984

HEART STIMULATING DEVICE

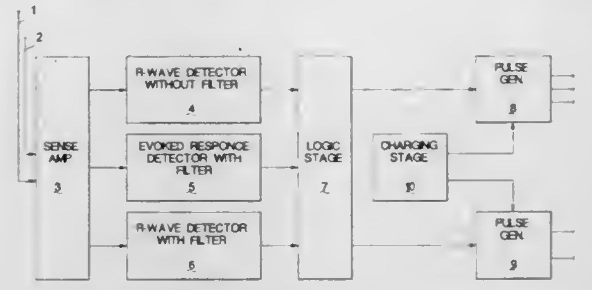
Martin Obel, Danderyd, Sweden, assignor to Pacesetter AB, Järfälla, Sweden

Filed Oct. 20, 1997, Ser. No. 954,688

Claims priority, application Sweden, Oct. 21, 1996, 9603865

Int. Cl.^{6} A61N *1/00*

U.S. Cl. 607—9 **7 Claims**


1
2
SENSE AMP
3
R-WAVE DETECTOR WITHOUT FILTER
4
EVOKED RESPONCE DETECTOR WITH FILTER
5
R-WAVE DETECTOR WITH FILTER
6
LOGIC STAGE
7
CHARGING STAGE
10
PULSE GEN
8
PULSE GEN
9

1. A heart stimulating device comprising:

a pulse generator which emits stimulation pulses, each stimulation pulse being preceded by a basic escape interval;

lead means adapted for interaction with cardiac tissue for delivering said stimulation pulses to cardiac tissue and for obtaining IEGM signals from cardiac tissue;

first sensing means containing a filter, and connected to said lead means, for sensing QRS indications in said IEGM signals;

second sensing means without a filter, and connected to said lead means, for sensing QRS indications in said IEGM signals; and

control means connected to said first sensing means, said second sensing means and said pulse generator, for activating said second sensing means preceding an end of each basic escape interval and for prolonging said basic escape interval in said pulse generator by a predetermined extension interval if said second sensing means senses a QRS indication when activated.

5,836,985

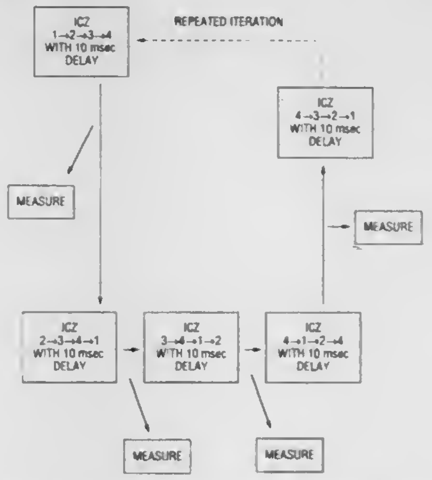
METHOD FOR TREATING ABNORMAL ARIAL OR VENTRICULAR ACTIVITY

Ader M. Rostami, Bainbridge Island; David C. DeCoster, Buckley, both of Wash., and Eustathios Vassiliou, Newark, Del., assignors to The Regents of The University of Michigan, Ann Arbor, Mich.

Filed Sep. 18, 1997, Ser. No. 932,785

Int. Cl.^{6} A61N *1/362*

U.S. Cl. 607—14 **29 Claims**


ICZ 1→2→3→4 WITH 10 msec DELAY
REPEATED ITERATION
ICZ 4→3→2→1 WITH 10 msec DELAY
MEASURE
MEASURE
ICZ 2→3→4→1 WITH 10 msec DELAY
ICZ 3→4→1→2 WITH 10 msec DELAY
ICZ 4→1→2→4 WITH 10 msec DELAY
MEASURE
MEASURE

1. A method for treating irregular heart activity, comprising the steps of:

a. providing:

i) a subject having a heart.

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- ii) a means for sectioning said heart, and
- iii) a means for stimulating said heart;
- b. sectioning said heart into independent conduction zones with said means for sectioning; and
- c. stimulating said independent conduction zones with said means for stimulating.

5,836,986

Patent Not Issued For This Number

5,836,987

APPARATUS AND METHOD FOR OPTIMIZING CARDIAC PERFORMANCE BY DETEARMINING THE OPTIMAL TIMING INTERVAL FROM AN ACCELEROMETER SIGNAL

Lawrence S. Baumann, Bloomington; Bruce A. Tockman, Scandia; Rodney W. Salo, Fridley, and Emanuel II. Silvermint, Shoreview, all of Minn., assignors to Cardiac Pacemakers, Inc., St. Paul, Minn.

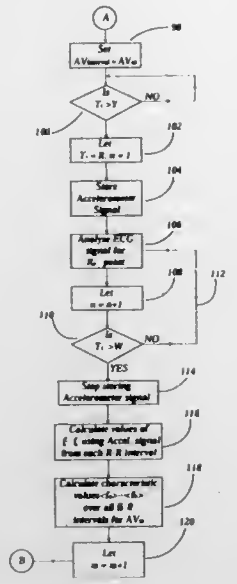
Continuation-in-part of Ser. No. 558,837, Nov. 15, 1995, abandoned. This application Mar. 12, 1997, Ser. No. 815,697

Int. Cl.^{6} A61N *1/365*

U.S. Cl. 607—17 20 Claims

1. A cardiac stimulating apparatus functioning in a preset pacing mode, and programmed to optimize cardiac performance of a patient's heart, comprising:

- a) a dual chamber cardiac pacer and leads coupled to said cardiac pacer for sensing atrial and ventricular events of a patient's heart and for stimulating preselected chambers of the heart, and further including a cardiac cycle means for identifying cardiac cycles of the patient's heart;
- b) a cardiac electrogram coupled to said cardiac pacer for identifying R—R intervals of the patient's heart;
- c) an accelerometer contained within a housing of said cardiac pacer and coupled to a microprocessor based controller of said cardiac pacer, said accelerometer having a filter wherein said accelerometer transmits to the cardiac pacer a waveform having various features associated with mechanical movement events within an atrium and mechanical movement events within a ventricle; and
- d) said microprocessor based controller including feature means for identifying pre-selected features of the waveform transmitted by the accelerometer, means for corresponding the R—R interval identified by the cardiac electrogram with the features identified by the feature means, and analyzing means for analyzing identified features over corresponding R—R intervals, wherein the identified features are analyzed and compared by said microprocessor over a preselected number of R—R intervals for a plurality of preselected timing intervals, said timing intervals being a time between at least one of intrinsic and paced stimulations of pre-selected chambers of the heart, to thereby determine an optimum timing interval.


A
Set AVcurrent = AVn
98
Is T1 > Y
NO
100
Let T1 = R, m = 1
102
Store Accelerometer Signal
104
Analyze ECG signal for Rn point
106
Let m = m+1
108
112
110
Is T1 > W
NO
YES
Stop storing Accelerometer signal
114
Calculate values of f (using Accel. signal from each R R interval
116
Calculate characteristic values <f1>...<fk> over all R R intervals for AVn
118
B
Let n = n+1
120

5,836,988

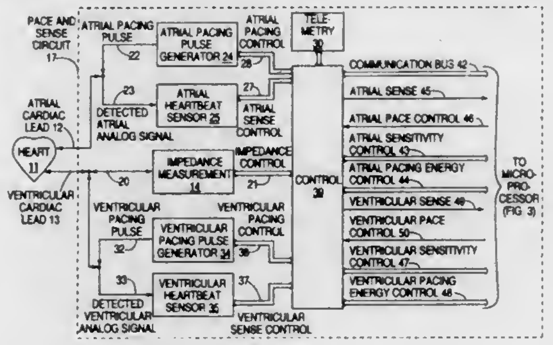
RATE RESPONSIVE PACEMAKER WITH EXERCISE RECOVERY USING MINUTE VOLUME DETERMINATION

Daniel Cooper, Hauguenau, France; Tibor A. Nappholz, Englewood, Colo., and Chih-ming James Chiang, Chandler, Ariz., assignors to Pacesetter, Inc., Sylmar, Calif.

Filed May 2, 1997, Ser. No. 850,692

Int. Cl.^{6} A61N *1/365*

U.S. Cl. 607—19 18 Claims


PACE AND SENSE CIRCUIT 17
ATRIAL PACING PULSE
22
ATRIAL PACING PULSE GENERATOR 24
ATRIAL PACING CONTROL
TELE-METRY 30
28
COMMUNICATION BUS 42
23
ATRIAL HEARTBEAT SENSOR 25
27
ATRIAL SENSE 45
ATRIAL CARDIAC LEAD 12
DETECTED ATRIAL ANALOG SIGNAL
ATRIAL SENSE CONTROL
ATRIAL PACE CONTROL 46
ATRIAL SENSITIVITY CONTROL 43
HEART 11
IMPEDANCE MEASUREMENT 14
IMPEDANCE CONTROL
20
21
CONTROL 39
ATRIAL PACING ENERGY CONTROL 44
TO MICRO-PROCESSOR (FIG. 3)
VENTRICULAR CARDIAC LEAD 13
VENTRICULAR SENSE 49
VENTRICULAR PACING PULSE
VENTRICULAR PACING CONTROL
VENTRICULAR PACE CONTROL 50
32
VENTRICULAR PACING PULSE GENERATOR 34
36
VENTRICULAR SENSITIVITY CONTROL 47
33
VENTRICULAR HEARTBEAT SENSOR 35
37
VENTRICULAR PACING ENERGY CONTROL 48
DETECTED VENTRICULAR ANALOG SIGNAL
VENTRICULAR SENSE CONTROL

1. A rate responsive implantable pacemaker for implantation in a patient, said pacemaker comprising:

- a cardiac sensor for sensing cardiac activity and for generating a cardiac activity signal;
- a pace generator for generating pacing pulses in response to pacing commands;
- a parameter sensor for sensing a metabolic demand parameter;

- a parameter processing-circuit for processing said metabolic demand parameter to generate a metabolic indicated parameter;
- an exercise recovery identifying circuit for identifying when said patient is recovering from exercise, said exercise recovery circuit generating a corresponding recovery signal;
- a controller receiving said cardiac activity signal, said exercise recovery signal and said metabolic indicated parameter for generating said pacing commands.

5,836,989

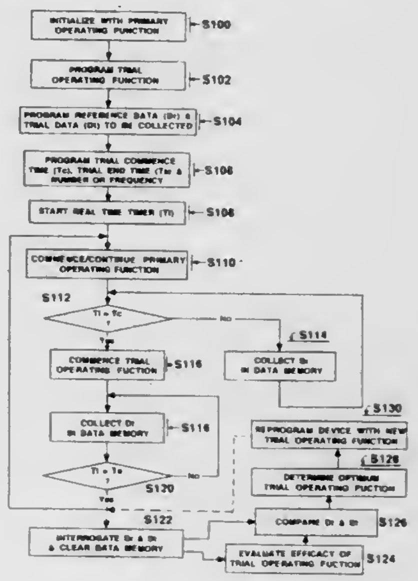
METHOD AND APPARATUS FOR CONTROLLING AN IMPLANTED MEDICAL DEVICE IN A TIME-DEPENDENT MANNER

Michael B. Shelton, Minneapolis, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Dec. 26, 1996, Ser. No. 777,840

Int. Cl.^{6} A61N *1/36;1/362*

U.S. Cl. 607—27 17 Claims


INITIALIZE WITH PRIMARY OPERATING FUNCTION
S100
PROGRAM TRIAL OPERATING FUNCTION
S102
PROGRAM REFERENCE DATA (Dr) & TRIAL DATA (Dt) TO BE COLLECTED
S104
PROGRAM TRIAL COMMENCE TIME (Tc), TRIAL END TIME (Te) & NUMBER OR FREQUENCY
S106
START REAL TIME TIMER (Ti)
S108
COMMENCE/CONTINUE PRIMARY OPERATING FUNCTION
S110
S112
Ti = Tc ?
No
S114
Yes
COMMENCE TRIAL OPERATING FUCTION
S116
COLLECT Dr IN DATA MEMORY
COLLECT Dt IN DATA MEMORY
S118
S130
REPROGRAM DEVICE WITH NEW TRIAL OPERATING FUNCTION
S128
Ti = Te ?
No
S120
DETERMINE OPTIMUM TRIAL OPERATING FUCTION
Yes
S122
COMPARE Dr & Dt
S126
INTERROGATE Dr & Dt & CLEAR DATA MEMORY
EVALUATE EFFICACY OF TRIAL OPERATING FUCTION
S124

6. A method of providing a therapy or monitoring function in an implantable, programmable medical device, the therapy or function being under the control of a programmable sequence of operating instructions controlling an operating function of the implantable medical device, the implantable device having a telemetry transceiver for receiving external programmable sequences of operating instructions and for transmitting data externally from the implantable medical device, the implantable device having a memory for storing the sequence of operating instructions and for storing data related to the delivery of the therapy or the monitoring function, the implantable device being employed in conjunction with an external programmer for programming a trial operating function for a trial time period, the method comprising the steps of:

- (a) programming the device to have a primary operating function or primary operating mode;
- (b) programming the device to have a trial operating function or trial operating mode for delivery of the therapy or enablement of the monitoring function;
- (c) programming the device to acquire reference data and trial data;
- (d) programming the device with a trial time period during which the trial operating function is enabled;
- (e) during each trial time period, operating the medical device in accordance with the trial operating function to acquire and store trial data in memory; and
- (f) at times other than during trial time periods, operating the medical device in accordance with the primary operating function to acquire and store reference data in memory;
- (g) interrogating the memory of the implantable device; and
- (h) retrieving reference data and trial data stored in memory.

5,836,990

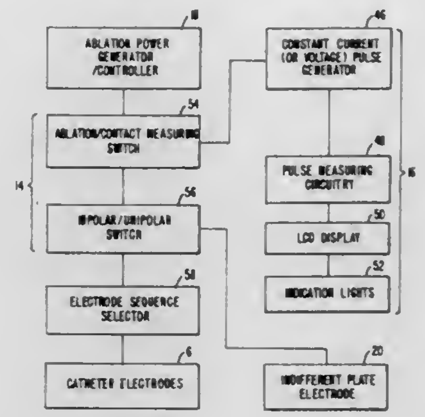
METHOD AND APPARATUS FOR DETERMINING ELECTRODE/TISSUE CONTACT

Hong Li, Cupertino, Calif., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Sep. 19, 1997, Ser. No. 934,286

Int. Cl.^{6} A61N *1/08*

U.S. Cl. 607—28 29 Claims


18
ABLATION POWER GENERATOR /CONTROLLER
46
CONSTANT CURRENT (OR VOLTAGE) PULSE GENERATOR
54
ABLATION/CONTACT MEASURING SWITCH
48
PULSE MEASURING CIRCUITRY
14
16
56
BIPOLAR/UNIPOLAR SWITCH
50
LCD DISPLAY
52
INDICATION LIGHTS
58
ELECTRODE SEQUENCE SELECTOR
6
CATHETER ELECTRODES
20
INDIFFERENT PLATE ELECTRODE

1. A method for determining electrode/tissue contact comprising the following steps:

- choosing a constant current pulsed signal or a constant voltage pulsed signal, said chosen pulsed signal comprising a series of signal pulses;
- applying said series of signal pulses to an electrode, each said signal pulse having a leading edge portion and a following portion;
- placing the electrode into contact with a tissue site;
- the placing step taking place with an ionic liquid covering the tissue site; and
- determining when the electrode contacts the tissue by monitoring a chosen electrical characteristic at the electrode during a period of time before, during, and after the electrode contacts the tissue.

5,836,991

Patent Not Issued For This Number

5,836,992

FILTERED FEEDTHROUGH ASSEMBLY FOR IMPLANTABLE MEDICAL DEVICE

David L. Thompson, Fridley, Minn.; Robert T. Sawchuk, Phoenix, Ariz., and Lynn M. Seifried, Minneapolis, Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 317,512, Oct. 4, 1994, Pat. No. 5,735,884. This application Sep. 18, 1997, Ser. No. 932,973

Int. Cl.^{6} A61N *1/375*

U.S. Cl. 607—36 3 Claims

1. A filtered feedthrough assembly for an implantable medical device, the feedthrough assembly having internal and external portions, the internal portion being configured to be disposed inside a case of the implantable medical device, the external portion being configured to be disposed outside the case, the assembly comprising:

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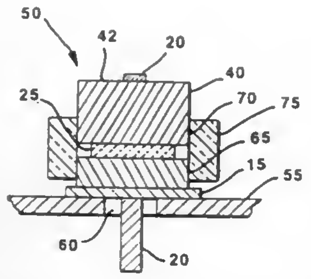
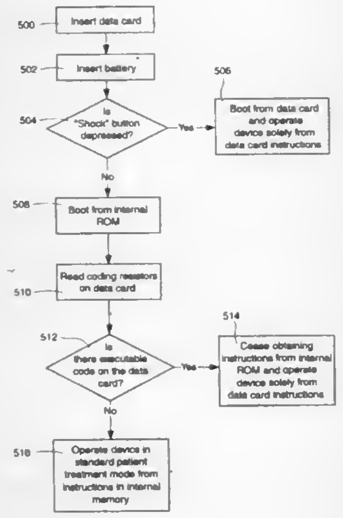


(a) an electrically conductive ferrule having opposing first and second ends and a centrally disposed opening extending between the first and second ends;
(b) an electrically conductive pin having first and second ends, the pin being disposed within and extending through the opening, the first end of the pin forming part of the internal portion, the second end of the pin forming part of the internal portion;
(c) an electrical insulator disposed between the ferrule and the pin, and
(d) a chip capacitor having first and second electrical contacts, the chip capacitor being mounted on the external portion, the first contact being connected electrically to the second end of the pin, the second contact being connected electrically to the second end of the ferrule.

5,836,993
ELECTROTHERAPY DEVICE CONTROL SYSTEM AND METHOD

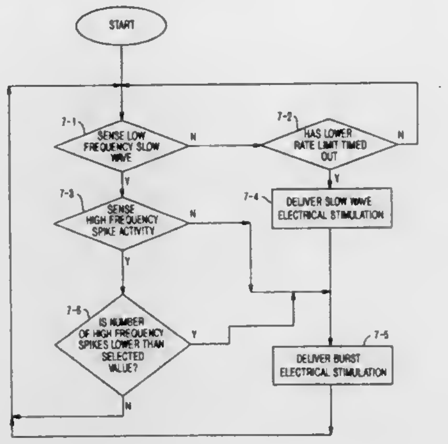
Clinton S. Cole, Seattle, Wash., assignor to Heartstream, Inc., Seattle, Wash.
Filed May 16, 1996, Ser. No. 648,776
Int. Cl.^{6} A61N *1/08*
U.S. Cl. 607—59 46 Claims


500
Insert data card
502
Insert battery
504
Is "Shock" button depressed?
Yes
506
Boot from data card and operate device solely from data card instructions
No
508
Boot from internal ROM
Read coding resistors on data card
510
512
Is there executable code on the data card?
Yes
514
Cease obtaining instructions from internal ROM and operate device solely from data card instructions
No
516
Operate device in standard patient treatment mode from instructions in internal memory

21. A method of operating an electrotherapy device comprising:
attaching a memory to a memory port in a housing of the electrotherapy device; and
reading instructions from the memory to operate the electrotherapy device.

5,836,994
METHOD AND APPARATUS FOR ELECTRICAL STIMULATION OF THE GASTROINTESTINAL TRACT

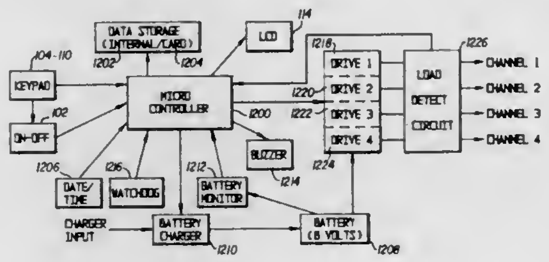
Ivan Bourgeois, Verviers, Belgium, assignor to Medtronic, Inc., Minneapolis, Minn.
Filed Apr. 30, 1997, Ser. No. 846,786
Int. Cl.^{6} A61N *1/36*
U.S. Cl. 607—40 19 Claims


START
7-1
SENSE LOW FREQUENCY SLOW WAVE
N
7-2
HAS LOWER RATE LIMIT TIMED OUT
N
Y
7-4
DELIVER SLOW WAVE ELECTRICAL STIMULATION
Y
7-3
SENSE HIGH FREQUENCY SPIKE ACTIVITY
N
Y
7-6
IS NUMBER OF HIGH FREQUENCY SPIKES LOWER THAN SELECTED VALUE?
Y
7-5
DELIVER BURST ELECTRICAL STIMULATION
N

1. An apparatus for providing electrical stimulation to the gastrointestinal tract comprising:
a medical electrical lead having means for electrically coupling to the gastrointestinal tract;
a first sensor for sensing intrinsic gastrointestinal electrical activity between the frequency of 100–5000 Hz, the sensor coupled to the means for electrically coupling to the gastrointestinal tract, the sensor emitting an intrinsic gastrointestinal electrical activity signal upon the sensing of intrinsic gastrointestinal electrical activity;
a pulse generator coupled to the medical electrical lead having means for electrically coupling to the gastrointestinal tract and the first sensor, the pulse generator emitting asynchronous stimulation pulse trains at a first rate, the pulse generator inhibiting the emission of asynchronous stimulation pulse trains at a first rate upon the emission of the intrinsic gastrointestinal electrical activity signal by the first sensor.

5,836,995
PORTABLE MUSCLE STIMULATOR WITH PULSE WIDTH CONTROL

Michael B. MGraw, Vancouver, Wash., and William A. Rux, Hillsboro, Oreg., assignors to International Rehabilitative Sciences, Inc., Vancouver, Wash.
Continuation of Ser. No. 536,924, Sep. 29, 1995, Pat. No. 5,755,745. This application Feb. 26, 1997, Ser. No. 806,601
Int. Cl.^{6} A61N *1/36*
U.S. Cl. 607—48 42 Claims

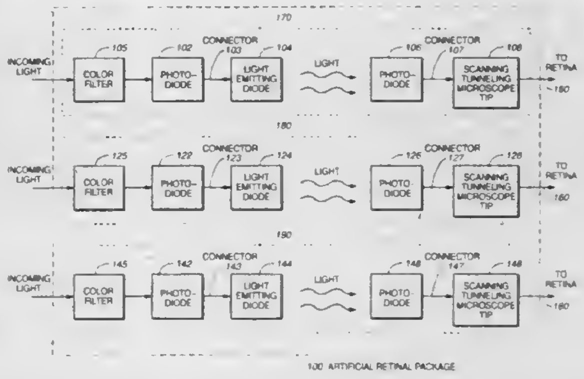


1. A portable muscle stimulator for generating a plurality of muscle stimulating signals for application to a patient using a plurality of electrodes, comprising:

a plurality of independently driven channels connected respectively to a like plurality of electrodes for independently treating a like plurality of separate muscle groups of a patient, each of said plurality of independently driven channels including its own drive circuit;
a digital data processor connected to each of said drive circuits for each providing a drive control signal for causing each of said drive circuits to generate said plurality of muscle stimulating signals;
each of said drive control signals causing its respective drive circuit to generate a muscle stimulating signal as a series of on and off pulses over a given time period; and
said pulses having a predetermined constant voltage and an intensity and a waveform shape such that the beginning of said pulse has a ramp portion from zero to maximum intensity, a middle portion constant at maximum intensity, and an end ramp portion from maximum intensity to zero,
such that there is a smooth transition from no pulses to the maximum pulse intensity and then back to no pulses in order to provide smooth muscle contractions and release of contractions.

5,836,996
ARTIFICIAL RETINA

John F. Doorish, 1581 E. 12th St., Brooklyn, N.Y. 11230-7101
Filed Dec. 30, 1996, Ser. No. 777,075
Int. Cl.^{6} A61N *1/05*
U.S. Cl. 607—54 32 Claims

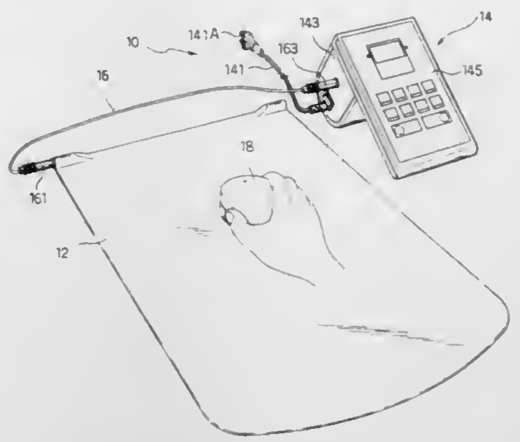


1. An artificial retina for implantation in a human eye having a retina, said artificial retina comprising:
a light sensing element to sense incoming visible light having an intensity, said light sensing element producing an output signal;
an emitter element coupled to said light sensing element, wherein said emitter element senses said output signal of said light sensing element and emits an output;
a detector element, wherein said detector element senses the output of said emitter element and produces an output signal whose magnitude is proportional to the intensity of said incoming visible light; and
a coupler to couple the output signal of said detector element to the retina.

5,836,997
SYSTEM FOR PREVENTING AND CURING OSTEOPOROSIS AND OBESITY

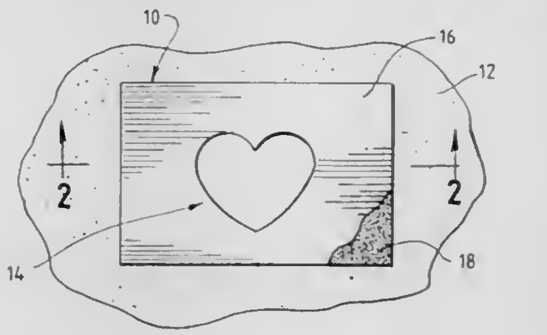
Shinnosuke Hirano, Kanagawa, Japan, assignor to Kohgen Kizai Kabushiki Kaisha, Yokohama, Japan
Filed Nov. 25, 1996, Ser. No. 755,659
Claims priority, application Japan, Apr. 3, 1996, 8-104734
Int. Cl.^{6} A61N *1/20*
U.S. Cl. 607—75 3 Claims

1. A system for preventing and curing osteoporosis and obesity comprising a mat essentially consisting of a first sheet with a volume resistivity of less than 10^4 Ω.cm and a second sheet, laminated on said first sheet, having a volume resistivity of 10^4 Ω.cm or more; an electric power source having an electrical circuit to apply 25–800 VDC to said first sheet; and a control unit for controlling said electric power source.



5,836,998
ADHESIVE STENCIL FOR BODY ART

Linda Mueller, 2720 H N. Greenview, Chicago, Ill. 60614, and Beata R. deVirion, 1037 Des Plaines Ave., #303, Forest Park, Ill. 60130
Filed Oct. 8, 1997, Ser. No. 947,004
Int. Cl.^{6} A61N *33/00*
U.S. Cl. 607—95 4 Claims



1. A method for applying a decorative stain to the epidermis of a human, said method comprising the steps of:
applying a stencil having a decorative pattern formed therein to a predetermined area of said epidermis, said stencil comprising an adhesive layer for removably securing said stencil to said epidermis and an opaque non-absorbent layer coextensive with said adhesive layer;
covering said decorative pattern and a portion of the non-absorbant layer of said stencil with a predetermined amount of an epidermal stain material to cause said epidermal stain material to contact said epidermis only via the decorative pattern formed in said stencil;
drying said epidermal stain material, a portion of said epidermal stain material being absorbed into the portion of said epidermis that is coextensive with said decorative pattern to form a decorative stain in said epidermis in the form of said decorative pattern; and
removing said stencil and the portion of said epidermal stain material that was not absorbed into said epidermis from said epidermis.

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5,836,999

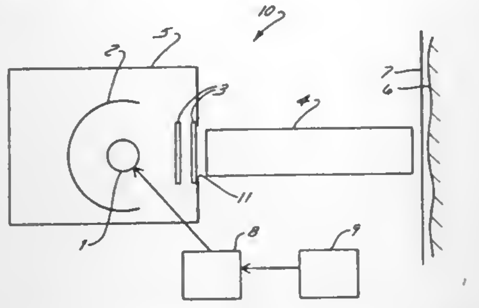
METHOD AND APPARATUS FOR TREATING PSORIASIS USING PULSED ELECTROMAGNETIC RADIATION

Shimon Eckhouse, and Michael Kreindel, both of Haifa, Israel, assignors to ESC Medical Systems Ltd., Yokneam, Israel

Filed Sep. 28, 1995, Ser. No. 535,705

Int. Cl.^{6} A61N *5/06*

U.S. Cl. 607—88 **12 Claims**



1. A method of treating psoriasis comprising the steps of generating at least one pulse of incoherent electromagnetic energy and directing the pulse of electromagnetic energy to a psoriatic plague to be treated.

5,837,000

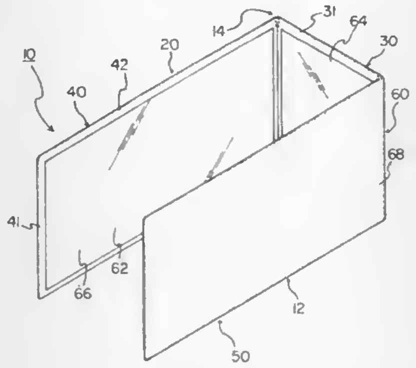
TANNING SCREEN

Jerome Boudreau, 262 E. Beaudoin, Bourbonnais, Ill. 60914

Filed Nov. 19, 1997, Ser. No. 974,753

Int. Cl.^{6} A61N *33/00*

U.S. Cl. 607—95 **4 Claims**



1. A foldable tanning screen, comprising:

a frame member having a rectangular end wall frame portion, a U-shaped shaped first side wall frame portion, and a U-shaped second side wall frame portion;

said end wall portion having four mounting arms being extended therefrom;

said first side wall frame portion having a pair of spaced apart and substantially parallel elongate horizontal arms, and a vertical cross arm;

each of said first side wall frame portion horizontal arms having a terminal end and elongate proximal and distal extension portions with a common length equal to that of the end wall portion, said terminal end of said first side wall frame portion horizontal arms being pivotally coupled to a said mounting arm of said end wall frame portion, said proximal and distal extension portions of each said first side wall frame portion horizontal arm being pivotally coupled to one another, said proximal extension portions of first side wall frame portion horizontal arms being connected together by said first side wall frame portion vertical cross arm extending therebetween;

said second side wall frame portion having a pair of spaced apart and substantially parallel elongate horizontal arms, and a vertical cross arm;

each of said second side wall frame portion horizontal arms having a terminal end and elongate proximal and distal extension portions with a common length equal to that of the end wall portion, said terminal end of said second side wall frame portion horizontal arms being pivotally coupled to a said mounting arm of said end wall frame portion, said proximal and distal extension portions of each said second side wall frame portion horizontal arm being pivotally coupled to one another, said proximal extension portions of second side wall frame portion horizontal arms being connected together by said second side wall frame portion vertical cross arm extending therebetween; and

an elongate rectangular panel member being mounted to said frame member such that said panel member substantially covers said frame member, said panel member having a light reflective surface;

wherein said end wall frame portion comprises a pair of spaced apart and substantially parallel elongate horizontal tubes each having a pair of opposite ends, said end wall frame portion horizontal tubes being connected by a pair of spaced apart and substantially parallel elongate vertical tubes being extended between said end wall frame portion horizontal tubes, said end wall frame portion horizontal tubes and said end wall frame portion vertical tubes being substantially coplanar, each said end of said end wall frame portion horizontal tubes having a mounting arm being extended substantially perpendicular to the longitudinal axis of its respective said end wall frame portion horizontal tube and being fixed with respect thereto, wherein a first one of the mounting arms of each end wall frame portion horizontal tube is greater than a second one of the mounting arms of each end wall frame portion horizontal tube;

wherein each said side wall frame portions is pivotable between an open position and a closed position with respect to said end wall frame portion, said open position of each said side wall frame portion being characterized by said side wall frame portion being extended substantially perpendicular from said end wall frame portion, said first side wall frame portion facing said second side wall frame portion when said first and second side wall frame portions are positioned in said open position, said closed position of each said side wall frame portion being characterized by each said horizontal arm of said side wall frame portions being substantially parallel to said horizontal tubes said end wall frame portion.

5,837,001

RADIO FREQUENCY ENERGY DELIVERY SYSTEM FOR MULTIPOLAR ELECTRODE CATHETERS

Sean Mackey, Sunneyvale, Calif., assignor to C. R. Bard, Murray Hill, N.J.

Filed Dec. 8, 1995, Ser. No. 569,771

Int. Cl.^{6} A61N *1/08*

U.S. Cl. 607—102 **10 Claims**

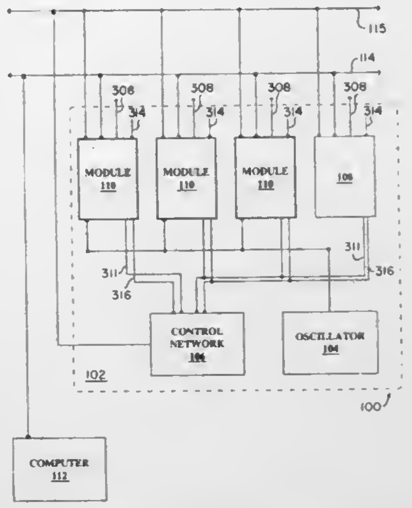
1. A radio-frequency ablation system for biological tissues, comprising:

an electrode catheter having a generally longitudinally extending shaft defining a lumen and an array of externally conductive, individually connected electrodes arranged in spaced serial relation along said shaft;

a plurality of temperature sensors, each thermally associated with a different electrode in said array for providing a temperature signal representative of the temperature of that electrode;

a plurality of RF amplifiers, each electrically connected to a different electrode in said array, each of said RF amplifiers providing drive signals representative of the voltage and current applied to that electrode;

a feedback control network which receives said temperature and drive signals associated with a particular electrode and provides an amplification signal to the RF amplifier connected to that electrode in response to the received temperature and drive signals; and



a RF sine wave oscillator having an output which is separately amplified in phase by each of said RF amplifiers in accordance with the amplification signal from the feedback control network for that RF amplifier, to independently drive each of the electrodes in the array of electrodes in phase with each other.

5,837,002

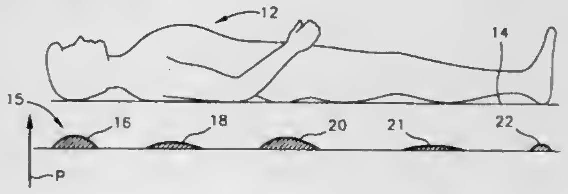
SUPPORT APPARATUS WITH LOCALIZED COOLING OF HIGH-CONTACT-PRESSURE BODY SURFACE AREAS

Scott D. Augustine, Bloomington; Paul Anthony Iaizzo, White Bear Lake; Ephraim M. Sparrow, St. Paul; Paul Steven Johnson, White Bear Lake; Randall C. Arnold, Minnetonka, and Donald E. Stapf, Minneapolis, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 30, 1996, Ser. No. 704,887

Int. Cl.^{6} A61F *7/00*

U.S. Cl. 607—104 **25 Claims**



1. An apparatus for supporting a body while selectively cooling areas of the body in contact with the apparatus, comprising:

a cooling layer;

a layer of compressible, thermally insulating material disposed over the cooling layer;

a surface on the layer of compressible, thermally insulating material;

a thermally conductive material disposed in the layer of compressible, thermally insulating material and acting between the cooling layer and the layer of compressible, thermally insulating material;

the layer of compressible, thermally insulating material being responsive to pressure exerted against the surface for providing a thermal resistance between the surface and the cooling layer that varies inversely with the pressure; and

means for maintaining the cooling layer at a predetermined temperature that is below normal human body temperature.

5,837,003

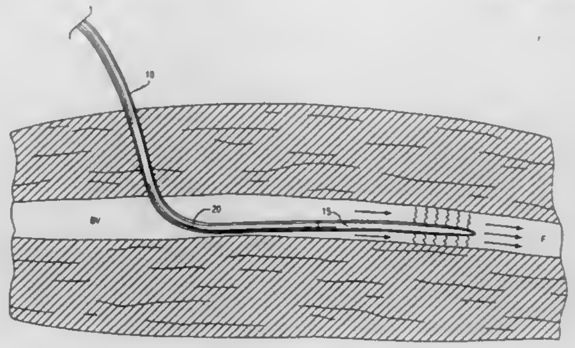
METHOD AND APPARATUS FOR CONTROLLING A PATIENT'S BODY TEMPERATURE BY IN SITU BLOOD TEMPERATURE MODIFICATION

Robert Ginsburg, Greenwood Village, Colo., assignor to Radiant Medical, Inc., Portola Valley, Calif.

Continuation-in-part of Ser. No. 324,853, Oct. 18, 1994, Pat. No. 5,486,208, which is a continuation of Ser. No. 15,774, Feb. 10, 1993, abandoned. This application Jan. 11, 1996, Ser. No. 584,013

Int. Cl.^{6} A61F *7/00*

U.S. Cl. 607—106 **19 Claims**



1. A method for restoring normal body temperature to a patient having a body temperature above or below normal body temperature, said method comprising;

selectively introducing heat to the blood flow for a hypothermic patient having a body temperature that is below normal body temperature or removing heat from the blood flow from a hyperthermic patient having a body temperature that is above normal body temperature;

monitoring a temperature characteristic of the hypothermic or hyperthermic patient to detect indication of temperature overshoot; and

selectively removing heat through a catheter from the blood flow of the initially hypothermic patient to lower the patient's core body temperature if the temperature characteristic indicates that the patient has or will become hyperthermic, wherein the catheter includes a region that is in contact with the blood, and the region is at a temperature below normal body temperature, or introducing heat through the catheter to the blood flow of the initially hyperthermic patient to raise the patient's core body temperature if the temperature characteristic indicates that the patient has or will become hypothermic, wherein the catheter includes a region that is in contact with the blood, and the region is at a temperature above normal body temperature.

5,837,004

DEVICE FOR TREATMENT OF TEMPOROMANDIBULAR JOINT DYSFUNCTION

Joseph S. Lavore, 6492 Sugar Tree Dr., Spring Hill, Fla. 34607

Filed Mar. 18, 1997, Ser. No. 819,784

Int. Cl.^{6} A61F *7/00*

U.S. Cl. 607—109 **18 Claims**

1. A treatment device for soothing and relaxing the bones, joints, and muscles one side of the face of a patient having temporomandibular joint dysfunction which typically affects a facial area in front of said patient's ear covering the rear portion of said patient's mandible, the zygomatic arch, the front portion of the temporal bone, the great wing of the sphenoid bone, the lower front portion of the parietal bone, and the lower rear portion of the frontal bone, said device comprising a flexible outer envelope having a hexagonal configuration of sufficient size to minimally cover said facial area; non-stretchable strap means for attaching said outer envelope against said facial area of said patient during treatment use; fastening means connected to said strap means and said outer envelope to attach said strap means to said outer envelope during use; and

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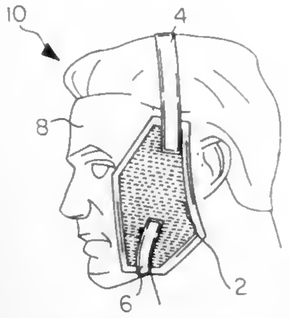


thermal means within said outer envelope for both chilling and heating said facial area, said thermal means being able to remain heated and chilled for extended periods of time, and able to become chilled without hardening; and wherein said fastening means further comprises said outer envelope having a top panel with an outside surface intended for placement away from said facial area, and said outside surface of said top panel substantially comprising hooking material; and wherein said fastening means also comprises said strap means having a sufficient quantity of pile material configured for secure connection to said hooking material so that said strap means can be releasably attached to said outer envelope to position said outer envelope comfortably against said facial area of said patient; and further wherein said outer envelope further comprises a bottom panel having an outside surface intended for placement against said facial area and said outside surface of said bottom panel substantially comprising soft material, wherein said top panel and said bottom panel each comprise an inside surface, said inside surface of said top panel substantially comprising hooking material, and said inside surface of said bottom panel substantially comprising soft material, and further wherein said bottom panel comprises an access slit therethrough to facilitate turning said outer envelope inside-out to create a configuration suitable for treating the bones, joints, and muscles on the opposite side of said patient's face.

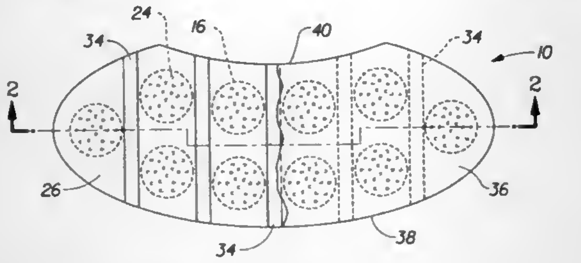
5,837,005
THERMAL PAD HAVING A COMMON ATTACHMENT AND OXYGEN PERMEABLE SIDE

L. John Viltro, Hamilton; William R. Ouellette, Cincinnati, and Leane K. Davis, Milford, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 672,166, Jun. 27, 1996, Pat. No. 5,674,270. This application Mar. 18, 1997, Ser. No. 819,897

Int. Cl.^{6} A61F *7/00*

U.S. Cl. 607—112 **10 Claims**



1. A disposable thermal pad comprising:

a) a substantially planar laminate structure having a first side and a second side and a plurality of heat generating cells having an oxygen activated heat generating chemistry embedded between said first and said second sides, said plurality of heat generating cells each being spaced apart and fixedly attached to said laminate structure, said laminate structure having means for providing oxygen permeability to each of said plurality of heat generating cells, said means for providing oxygen permeability located entirely on said first side of said laminate structure; and

b) means for releasably attaching said thermal pad to an inside portion of a user's clothing, said means for releasably attaching being located on said first side of said laminate structure so that said second side of said thermal pad may be placed directly against a user's body.

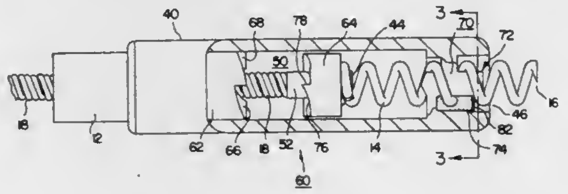
5,837,006
RETRACTION STOP FOR HELICAL MEDICAL LEAD ELECTRODE

Jon M. Ocel, New Brighton; Gregory A. Boser, Richfield, and Timothy W. Holleman, Ham Lake, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Sep. 10, 1996, Ser. No. 711,747

Int. Cl.^{6} A61N *1/05*

U.S. Cl. 607—127 **10 Claims**



1. An implantable lead formed of materials substantially inert to body fluids and tissue comprising:

a length of electrical lead conductor having proximal and distal ends;

sheath means having proximal and distal ends for loosely receiving and insulating said conductor from body tissue;

an electrode connected to the distal end of said lead conductor, said electrode having tissue engaging means adopted for securely engaging said electrode in contact with body tissue;

electrode head means attached to the distal end of said sheath means for supporting said electrode and for receiving and isolating said tissue engaging means from body fluids and tissue;

a lead connector coupled to the proximal end of said lead conductor and adapted to be rotated with respect to said sheath means for imparting rotation to said conductor with respect to said sheath means and said tissue engaging means with respect to said electrode head means;

guide means for translating rotation of said lead conductor in a first direction into axial advancement of said tissue engaging means for a predetermined distance from said electrode head means and for translating rotation of said lead conductor in a second direction into axial retraction of said tissue engaging means into said electrode head means; and

retraction stop means for stopping rotation of said tissue engaging means in said second direction upon full retraction of said tissue engaging means into said electrode head means, wherein said tissue engaging means further comprises a helix having a tissue piercing point and a number of tissue engaging turns, said helix being mechanically connected to the distal end of said lead conductor and adapted to be advanced from said electrode head means and screwed into body tissue, to firmly lodge in and permanently secure said electrode to the body tissue, upon rotation in of said lead conductor in said first direction and wherein said guide means contacts at least one turn of said helix for allowing axial advancement and retraction of said helix with respect to said electrode head means only by rotation of said lead conductor with respect to said sheath means and wherein said guide means contacts said at least one turn of said helix when said helix is fully retracted into said electrode head.

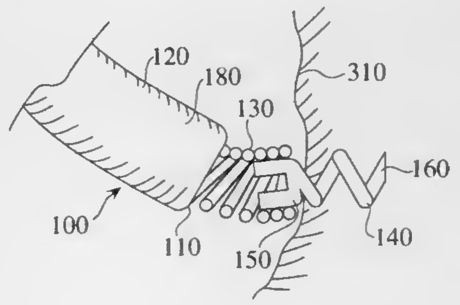
5,837,007
INTRACARDIAC LEAD HAVING A COMPLIANT FIXATION DEVICE

Peter A. Altman, San Francisco; M. Elizabeth Bush, Fremont, and Dean F. Carson, Mountain View, all of Calif., assignors to Pacesetter, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 574,801, Dec. 19, 1995, Pat. No. 5,658,327. This application Mar. 26, 1997, Ser. No. 824,101

Int. Cl.^{6} A61N *1/05*

U.S. Cl. 604—127 **17 Claims**



1. A compliant fixation mechanism comprising:

a fixation helix for transvenously securing a lead to a patient's cardiac tissue; and

a flexible connector attached between said fixation helix and said lead, said flexible connector reducing forces transferred between said fixation helix and said lead.

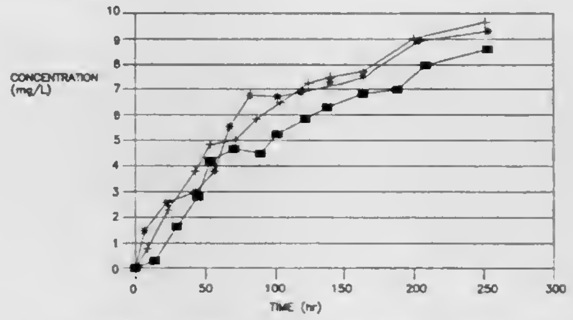
5,837,008
INTRAVASCULAR STENT AND METHOD

Eric P. Berg; Ronald J. Tuch, both of Plymouth; Michael Dror, Edina, and Rodney G. Wolff, Minnetonka Beach, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Division of Ser. No. 52,878, Apr. 26, 1993, Pat. No. 5,464,650. This application Apr. 27, 1995, Ser. No. 429,969

Int. Cl.^{6} A61F *2/06*

U.S. Cl. 623—1 **36 Claims**



1. A method for delivery of a therapeutic substance to the interior of a body lumen comprising the steps of:

(a) providing a generally cylindrical, radially expandable stent body having a surface;

(b) applying to the surface a solution which includes a solvent, a polymer dissolved in the solvent and a therapeutic substance dispersed in the solvent;

(c) evaporating the solvent to provide a coat of therapeutic substance and polymer on the surface;

(d) repeating steps (b) and (c) until a plurality of coats of therapeutic substance and polymer are on the surface;

(e) introducing the stent body and the plurality of coats of therapeutic substance and polymer transluminally into a selected portion of the body lumen; and

(f) radially expanding the stent body and the plurality of coats of therapeutic substance and polymer into contact with the body lumen such that the plurality of coats of therapeutic substance and polymer are retained on the surface.

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5,837,009

METHOD FOR THE PRODUCTION OF QUALITY COTTON YARNS INVOLVING A LOW-COST PROCESS, FREE OF ENVIRONMENTAL POLLUTION

George N. Valkanas, Marousi, Greece, assignor to Innoval Management Limited, Curacao, Netherlands Antilles

PCT No. PCT/GR95/00015, § 371 Date Jul. 19, 1996, § 102(e) Date Jul. 19, 1996, PCT Pub. No. WO96/07776, PCT Pub. Date Mar. 14, 1996

PCT Filed Sep. 5, 1995, Ser. No. 676,210

Claims priority, application Greece, Sep. 6, 1994, 940100414

Int. Cl.^{6} D01C *1/00;* **D06M** *11/44*

U.S. Cl. 8—125 **11 Claims**

1. A method for spinning cotton, comprising the steps of:

passing cotton into a processing solution of calcium hydroxide which is at a concentration of 2–4% by weight of calcium to cotton, and a non-ionic detergent which is at a concentration of 0.4–4 grams/liter, wherein the concentration of cotton in the solution is 10–20 volumes of water per weight of cotton,

heating the solution with agitation at a temperature of 60° to 150° C., for 1–3 hours,

transporting the cotton to a press,

removing water from the cotton by pressure,

bleaching the cotton in the presence of a solution of 10% ClONa or 10% hydrogen peroxide,

washing the cotton in water,

drying the cotton, and

spinning the cotton that is produced into a yarn.

5,837,010

DETERGENT COMPOSITIONS CONTAINING A LIPASE VARIANT AT LOW LEVELS

Andre Baeck, Bonheiden, Belgium, and Chandrika Kasturi, Fairfield, Ohio, assignors to Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 341,826, Nov. 18, 1994, abandoned. This application Oct. 11, 1996, Ser. No. 728,733

Int. Cl.^{6} C11D *3/386;* **D06F** *35/00*

U.S. Cl. 8—137 **2 Claims**

1. A method of improving the whiteness of a fabric and preventing the dinginess buildup on a fabric by preventing redeposition of removed soils in solution from reattaching to the fabric by contacting the fabric to be cleaned with a composition comprising the following:

(a) a mutated enzyme D96L derived from Humicola lanuginosa in an amount of 50 to 7500 Lu per liter of aqueous solution;

(b) 10% to 80% of a builder;

(c) 0.1% to 60% of a surfactant; and

(d) an additional enzyme selected from the group consisting of xylanase, protease, amylase peroxidase, cellulase, and mixtures thereof.

5,837,011

METHOD FOR MAKING METAL OXIDE TEXTILES FOR SPECTRAL EMITTERS

Eva M. Wong, San Diego, Calif., assignor to Quantum Group, Inc., San Diego, Calif.

Division of Ser. No. 571,605, Dec. 13, 1995, Pat. No. 5,686,368. This application Feb. 27, 1997, Ser. No. 807,576

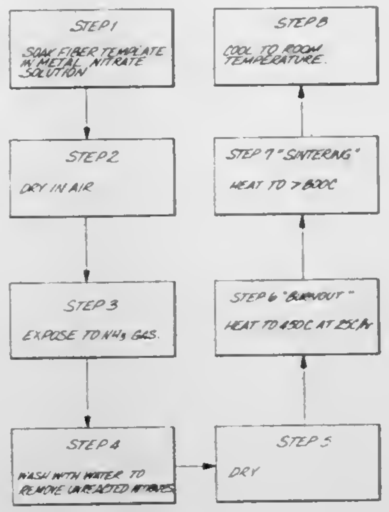
Int. Cl.^{6} D06M *13/322*

U.S. Cl. 8—181 **19 Claims**

1. A method of making a metal oxide textile comprising:

imbibing a polymeric organic textile template with an aqueous metal nitrate solution;

exposing the metal nitrate imbibed textile to gaseous ammonia to produce a metal hydroxide imbibed textile; and



heating the metal hydroxide imbibed textile under conditions sufficiently controlled to produce a metal oxide textile having tensile strength greater than 75 kPa.

5,837,012

DYEING METHOD OF PHOTOGRAPHIC POLYESTER SUPPORT

Fumio Kawamoto, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 549,178, Oct. 27, 1995, abandoned. This application Jan. 31, 1997, Ser. No. 792,117

Claims priority, application Japan, Oct. 28, 1994, 6-265180

Int. Cl.^{6} C03C *1/78;* **C08L** *67/02;* **D06P** *1/20;3/36*

U.S. Cl. 8—489 **3 Claims**

1. A method for dyeing a photographic polyester support before said polyester support is completely formed comprising the steps of:

(a) granulating a dye by a roller compactor,

(b) dyeing transparent polyester pellets by mixing transparent polyester pellets with the granulated dye, and

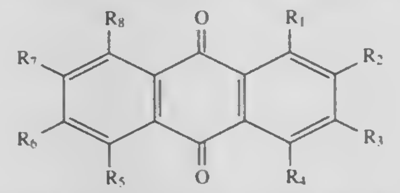
(c) melting, extruding and stretching the resulting product of part (b) to form a dyed photographic polyester support, wherein said dye satisfies the following requirements:

(1) a particle size such that at least 50% of the particles pass through a 16 mesh sieve and remain on a 32 mesh sieve;

(2) an angle of repose of 60° or less;

(3) a particle hardness of from 160 to 400 g on average having a lower limit of 50 g; and

(4) is represented by at least one of formula (I) and (II):



(I)

wherein R_1, R_2, R_3, R_4, R_5, R_6, R_7 and R_8, each represents a hydrogen atom, a hydroxyl group, an aliphatic group, an aromatic group, a heterocyclic group, a halogen atom, a cyano group, a nitro group, COR_9, $COOR_9$, NR_9R_{10}, $NR_{10}SO_2R_{11}$, $CONR_9R_{10}$, $SO_2NR_9R_{10}$, COR_{11}, SO_2R_{11}, $OCOR_{11}$, $NR_9CONR_{10}R_{11}$, $CONHSO_2R_{11}$, or SO_2NHCOR_{11}, R_9 and R_{10}, each represents a hydrogen atom, an aliphatic group, an aromatic group or a heterocyclic group, R_{11} represents an aliphatic group, an aromatic group, R_9 and R_{10} may be combined to form a 5- or 6-membered ring, and R_1 and R_2 or R_2 and R_3 may be combined to form a ring;

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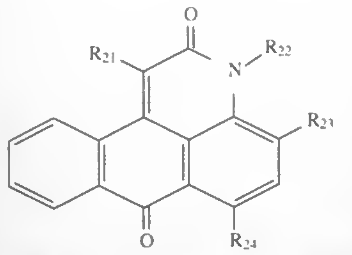


(II)

wherein R_{21}, R_{23} and R_{24}, each represents a hydrogen atom, a hydroxyl group, a nitro group, a cyano group, an aliphatic group, an aromatic group, COR_{29}, $COOR_{29}$, $NR_{29}R_{30}$, $NR_{30}COR_{31}$, $NR_{30}SO_2R_{31}$, R_{22} represents an aliphatic group or an aromatic group, R_{29} and R_{30}, each has the same meaning as that of R_9 or R_{10} in formula (I) and R_{31} has the same meaning as that of R_{11} in formula (I), provided that at least one of R_{21}, R_{22}, P_{23} and R_{24} is a group other than hydrogen.

5,837,013
PREPARATION OF COLORED MELAMINE-FORMALDEHYDE CONDENSATION PRODUCTS

Erhard Guenther, Hassloch, and Wolfgang Reuther, Heidelberg, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP95/04928, § 371 Date Jun. 16, 1997, § 102(e) Date Jun. 16, 1997, PCT Pub. No. WO96/20229, PCT Pub. Date Jul. 4, 1996

PCT Filed Dec. 13, 1995, Ser. No. 849,954

Claims priority, application Germany, Dec. 23, 1994, 44 46 386.3

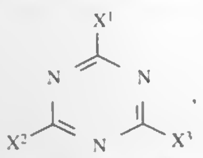
Int. Cl.^{6} D06P *3/02*

U.S. Cl. 8—49.4 **9 Claims**

1. A process for preparing colored melamine-formaldehyde condensation products by mixing pigments or dyes into a reaction mixture comprising starting compounds for preparing the melamine-formaldehyde condensation products, which comprises

(A) dispersing a mixture consisting essentially of

(a) a substituted melamine of the formula I



I

where X^1, X^2 and X^3 are each selected from the group consisting of $—NH_2$, $—NHR^1$ and $—NR^1R^2$, and X^1, X^2 and X^3 are not all $—NH_2$, and R^1 and R^2 are each selected from the group consisting of hydroxy-C_2–C_{10}-alkyl, hydroxy-C_2–C_4-alkyl-(oxa-C_2–C_4-alkyl)$_n$, where n is from 1 to 5, and amino-C_2–C_{12}-alkyl, or mixtures of melamines I, and

(b) formaldehyde or formaldehyde-donating compounds in a molar ratio of formaldehyde to melamines I within the range from 40:1 to 0,

(c) a pigment or dye, and

(d) phenol, unsubstituted or substituted by radicals selected from the group consisting of C_{1-9}-alkyl and hydroxyl, C_{1-4}-alkanes substituted by 2 or 3 phenol groups, di(hydroxyphenyl) sulfones or mixtures thereof,

the pigment or dye being added in an amount within the range from 0.01 to 30% by weight, based on (a) and (b), and the phenol in an amount within the range from 0 to 5 mol %, based on (a) and (b),

by intensive stirring until there are no longer any pigment agglomerates ≧1 μm,

and then

(B) admixing the mixture prepared in (A) with melamine and if desired with further phenol, substituted melamine I and formaldehyde or formaldehyde-donating compounds, the amounts being chosen so that the molar ratio of melamines (melamine and (a)) to (b) is within the range from 1:1.15 to 1:4.5, the pigment or dye is present in an amount within the range from 0.01 to 5% by weight, based on melamine and (a) and (b), and the phenol is present in an amount within the range from 0 to 5 mol %, based on melamine and (a) and (b), and then condensing to form the colored products.

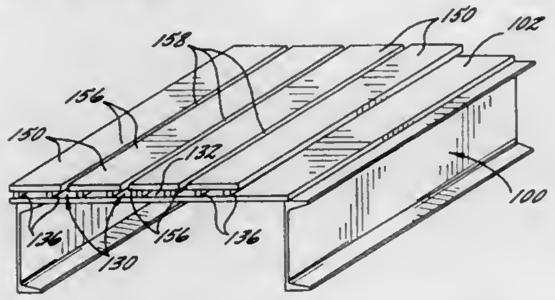
5,837,014
TRUSS TABLE WITH INTEGRATED POSITIONING STOPS

Thomas H. Williams, Edenton, N.C., assignor to Tee-Lok Corporation, Edenton, N.C.

Filed Oct. 31, 1996, Ser. No. 741,670

Int. Cl.^{6} B21K *21/16;* **B25B** *27/14*

U.S. Cl. 29—401.1 **6 Claims**



1. A method of constructing a truss table surface on an existing truss table, comprising:

providing a truss table having a generally horizontal first table upper surface for truss construction;

attaching a plurality of spacer members to said table upper surface; and

attaching a plurality of elongate panels to said spacer members, each of the panels having opposed lateral edges, an upper surface, and a lower surface, the panels being attached to the spacer members so that each of the panels has a lateral edge in substantially parallel, adjacent, noncontacting relationship with a lateral edge of another of said panels such that a gap is formed therebetween, the upper surfaces of the panels are substantially coplanar, and so that the lower surfaces of said panels are spaced away from said truss table upper surface, and at least one lateral edge portion of each panel extends horizontally away from a respective said attached spacer member and toward a respective said gap;

wherein at least one channel is defined by a first portion of the first table upper surface, a pair of said spacer members positioned on opposite sides of a respective said gap that is located above the first table upper surface first portion; and

wherein the plurality of panels form a second truss table surface above the first table upper surface.

5,837,015
METHOD OF MAKING A MULTILAYERED GEL ELECTROLYTE BONDED RECHARGEABLE ELECTROCHEMICAL CELL

Ganesh Venugopal, Duluth, and John Moore, Stone Mountain, both of Ga., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 26, 1997, Ser. No. 937,980

Int. Cl.^{6} H01M *10/04*

U.S. Cl. 29—623.2 **21 Claims**

1. A method of making a rechargeable electrochemical cell including first and second electrodes, and a porous separator element having first and second opposing sides, said method comprising the steps of:

providing said porous separator element as a first polymer region comprising a multilayered polymer region

spraying a wet, non-aqueous, dispersion coating upon each of the electrodes, the coating comprising a layer of gelling polymer which will, when exposed to an electrolyte active species and heat, bond said porous separator element to said electrodes;

disposing said first and second electrodes on opposite sides of said separator element;

introducing an electrolyte active species into at least said gelling polymer;

sealing said first and second electrodes and said separator element in a liquid and vapor impermeable package; and

heating the electrodes, separator and layer of gelling polymer to a temperature sufficient to cause the gelling polymer to bond the electrodes to the separator element.

5,837,016
FUEL ADDITIVE

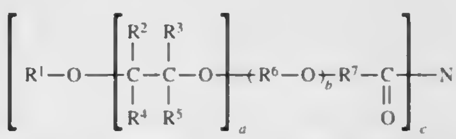
Noboru Ishida; Takashi Nakano; Masaki Nagao, and Takashi Kaneko, all of Yokohama, Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Apr. 10, 1997, Ser. No. 827,739

Int. Cl.^{6} C10L *1/22*

U.S. Cl. 44—333 **7 Claims**

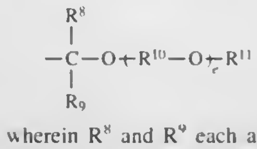
6. A fuel composition which comprises a base gasoline blended with an amide compound of the formula



$$\left[R^{1}-O-\left[\begin{array}{cc}R^{2} & R^{3}\\ | & |\\ C- & C-O\\ | & |\\ R^{4} & R^{5}\end{array}\right]_{a}-(R^{6}-O)_{b}-R^{7}-\underset{\underset{O}{\|}}{C}\right]_{c}-N-(X)_{d} \qquad (I)$$

wherein R^1 is hydrogen or a C_1–C_{30} hydrocarbon group, R^2, R^3, R^4 and R^5 each are selected from the group consisting of hydrogen, a C_1–C_{10} hydrocarbon group and a group of formula (II) below, provided that at least one of R^2, R^3, R^4 and R^5 is a group of formula (II), R^6 is a C_2–C_6 alkylene group, R^7 is a C_1–C_6 alkylene group, a is an integer of 1–100, b is an integer of 0–100, the sum of a and b being equal to 1–200, c is an integer of 1–3, d is an integer of 0–2, the sum of c and d being equal to 3, and X is selected from the group consisting of hydrogen, a C_1–C_{30} hydrocarbon group, a group of formula (III) below and a group of formula (IV) below:

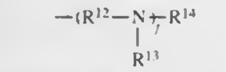
said formula (II) being represented by



$$-\underset{\underset{R_{9}}{|}}{\overset{\overset{R^{8}}{|}}{C}}-O-(R^{10}-O)_{e}-R^{11} \qquad (II)$$

wherein R^8 and R^9 each are hydrogen, a C_1–C_{10} hydrocarbon group or a C_2–C_{10} alcoxyalkyl group, R^{10} is a C_2–C_6 alkylene group or a C_4–C_{10} alkylene group having an alkoxyalkyl substituent, R^{11} is hydrogen or a C_1–C_{30} hydrocarbon group, and e is an integer of 0–50:

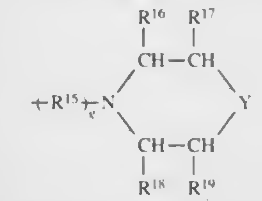
said formula (III) being represented by



$$-(R^{12}-\underset{\underset{R^{13}}{|}}{N})_{f}-R^{14} \qquad (III)$$

wherein R^{12} is a C_2–C_6 alkylene group, R^{13} is hydrogen or a C_1–C_4 alkyl group, R^{14} is hydrogen or a C_1–C_{30} hydrocarbon group, and f is an integer of 1–5:

and said formula (IV) being represented by



(IV)

wherein R^{15} is a C_2–C_6 alkylene group, R^{16}, R^{17}, R^{18} and R^{19} each are hydrogen or a C_1–C_{10} hydrocarbon group, Y is a methylene group, a C_1–C_{10} hydrocarbon-substituted methylene group, an imino group, a C_1–C_{10} hydrocarbon-substituted imino group or oxygen, g is 1 if d is equal to 1 and 0 or 1 if d is equal to 2, and if g is equal to 0, N in formula (IV) corresponds to N in formula (I).

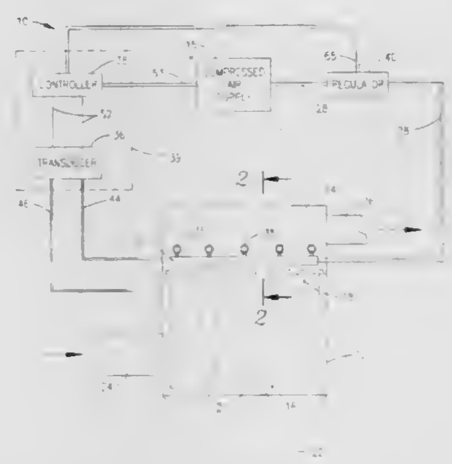
5,837,017
APPARATUS FOR CLEANING BAGHOUSE FILTERS

Mark Santschi, Lee's Summit, and Gregg Zoltek, Kansas City, both of Mo., assignors to BHA Group Holdings, Inc., Kansas City, Mo.

Filed May 2, 1996, Ser. No. 643,206

Int. Cl.^{6} B01D *29/17;29/66*

U.S. Cl. 55—302 **9 Claims**



6. A system for cleaning filters in a baghouse, said baghouse having a clean air chamber and a dirty air chamber separated by a sheet having rows of apertures therein, and a plurality of filters attached to said sheet, each said filter aligned with one of said apertures, said cleaning system comprising:

means for supplying compressed air to at least one row of said filters to thereby clean said filters in said row; and

a controller for controlling the pressure of said compressed air in response to a pressure differential between said dirty air chamber and said clean air chamber, wherein said system supplies said compressed air to said baghouse, for cleaning said filters, at a pressure that is proportional to the differential in pressure between said clean air chamber and said dirty air chamber.

5,837,018
OIL MIST SEPARATING ELEMENT

Guenther Goerg, Moeglingen, Germany, assignor to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Germany

Filed Apr. 25, 1997, Ser. No. 845,791

Claims priority, application Germany, May 8, 1996, 196 18 413.4

Int. Cl.^{6} B01D *39/12;46/00*

U.S. Cl. 55—385.3 **20 Claims**

1. An oil mist separating element comprising a web of material formed at least partially of a mesh, raschel, knit or woven fabric, said web of material including a coarse portion with a plurality of coarse strands and a fine portion with a plurality of fine strands, said coarse and fine strands comprising fibers, yarns, or wires, said

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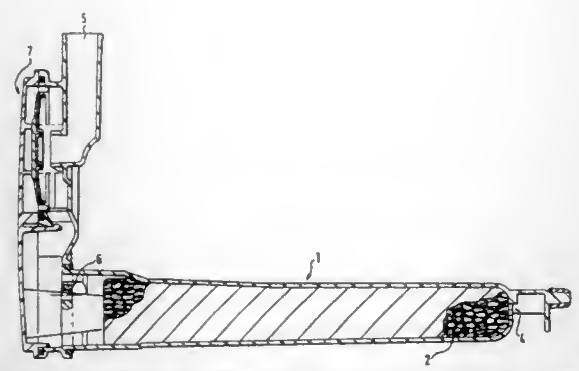
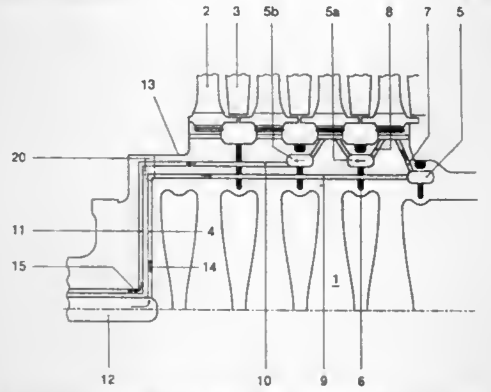


fine strands being interknitted or interwoven with said coarse strands over at least a portion of the seperating element such that said fine strands run parallel to said coarse strands.

5,837,019
DEVICE FOR SEPARATING DUST PARTICLES

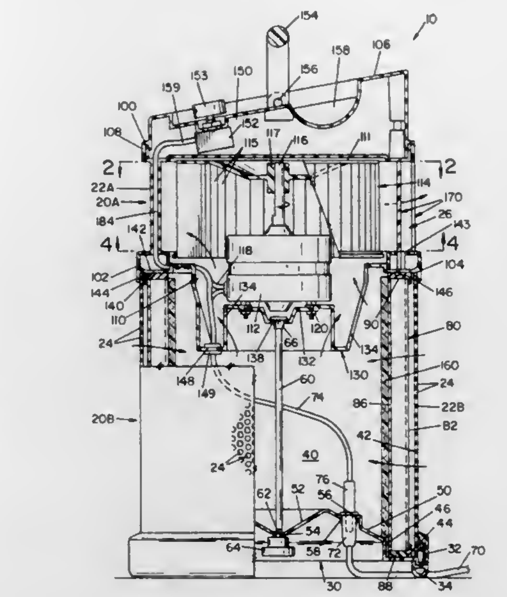
Wilhelm Endres, Traunstein, Germany, assignor to Asea Brown Boveri AG, Baden, Switzerland
Filed Jul. 14, 1997, Ser. No. 891,786
Claims priority, application Germany, Aug. 8, 1996, 196 32 038.0
Int. Cl.^{6} B01D *45/12*
U.S. Cl. 55—404 **6 Claims**



1. A device for separating dust particles inside a cooling system of a rotor, fitted with moving blades, of a turbo-machine, wherein the device is arranged upstream of the moving blades to be cooled, said device comprising:
at least one feed channel through which a coolant flows, the feed channel being directed in the radial direction inside the rotor such that dust particles located in the coolant accumulate on the side accelerating in the direction of rotation of the rotor, and
a separation chamber operationally connected to the feed channel, dust particles being subsequently captured inside said device in said separation chamber.

5,837,020
ROOM AIR CLEANER

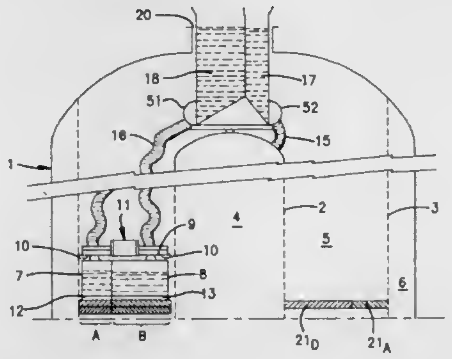
Mark A. Cartellone, Broadview Hts., Ohio, assignor to HMI Industries, Inc., Cleveland, Ohio
Filed Jun. 20, 1997, Ser. No. 879,883
Int. Cl.^{6} B01D *29/21*
U.S. Cl. 55—459.3 **58 Claims**



1. A portable air cleaner comprising a housing having an outer peripheral edge and an inner chamber, an air intake, air exhaust means for providing a passageway for the expulsion of air from said inner chamber, a blower to draw air into said inner chamber through said air intake and to expel air from said inner chamber through said air exhaust means, a filter disposed in said inner chamber between said air intake and air exhaust means, the improvement comprising said exhaust means having a plurality of arcuate vanes radiating outwardly from said blower, said arcuate vanes directing said air in a substantially unobstructed manner to said outer peripheral sides of said housing.

5,837,021
INSTALLATION FOR THE TREATMENT OF AT LEAST ONE FLUID, BY PASSAGE THROUGH TWO ADJACENT MASSES OF MATERIAL

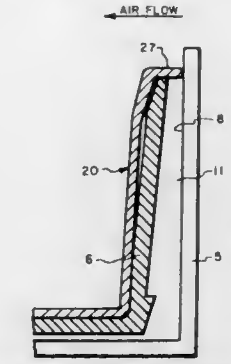
Jean-Yves Lehman, Maisons-Alfort, France, assignor to L'Air Liquide, Societe Anonyme Pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris Cedex, France
Continuation-in-part of Ser. No. 389,804, Feb. 16, 1995, abandoned. This application Feb. 6, 1996, Ser. No. 597,185
Claims priority, application France, Dec. 9, 1994, 94 14825
Int. Cl.^{6} B01D *53/04*
U.S. Cl. 55—486 **15 Claims**



8. An apparatus for treating at least one fluid, in a vertically extending vessel, comprising: a first vertically extending chamber and a second vertically extending chamber, the first and second chambers separated by at least two adjacent vertically extending masses of particulate material through which pass the at least one fluid circulating from the first chamber to the second chamber along a substantially horizontal circulation path, the two adjacent masses being in direct contact with each other along a contact interface zone, the interface zone extending in more than one plane, each mass having a horizontal thickness along the circulation path less than ¼ of its maximum transverse dimension perpendicular to the circulation path.

5,837,022
HIGH EFFICIENCY AIR FILTER SYSTEM

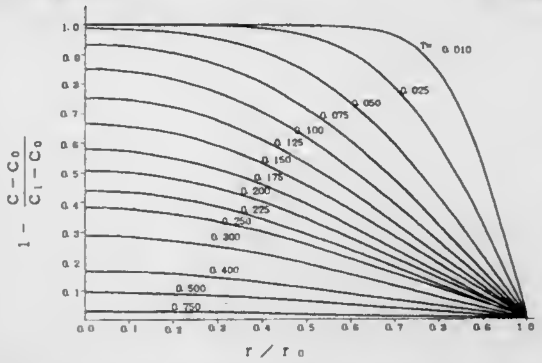
Rick L. Chapman, 1977 Valley Meadow, Oak View, Calif. 93022
Filed May 19, 1997, Ser. No. 858,730
Int. Cl.^{6} B01D *46/00*
U.S. Cl. 55—496 **16 Claims**



1. A high efficiency air filter system comprising:
a filter frame support member having an interior surface;
an adjustable air filter frame having a plurality of inner and outer telescoping sections, said inner telescoping sections having an exterior surface, said adjustable air filter frame being retained by said filter frame support member;
a filter element supported by the telescoping sections of said frame;
said filter frame support member and said adjustable air filter frame defining an air bypass space therebetween; and
a plurality of air bypass sealing clips between the inner telescoping sections of said adjustable air filter frame and said filter element and grill assembly, said bypass clips further being sealingly fitted against the interior surface of said filter frame support member thereby preventing the flow of air through said air bypass space.

5,837,023
PROCESS FOR MAKING GRADIENT INDEX OPTICAL ELEMENTS

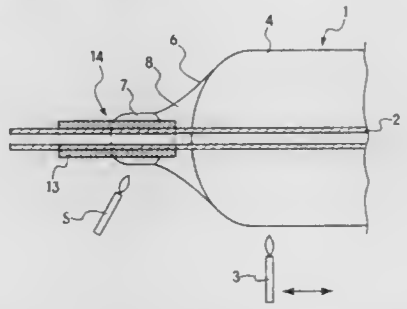
Hisashi Koike, Koganei, and Yuko Morita, Akiruno, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Apr. 2, 1997, Ser. No. 831,943
Claims priority, application Japan, Aug. 8, 1996, 8-210070
Int. Cl.^{6} C03B *8/00;* **C03C** *15/00;17/00;21/00*
U.S. Cl. 65—17.2 **21 Claims**



1. A process for making a gradient index optical element which comprises steps of:
preparing a gel by a sol-gel technique,
forming a concentration profile of a metal component across the obtained gel, and
fixing the formed concentration profile of the metal component by dipping the gel in a concentration profile-fixing solution, and wherein:
a concentration profile-fixing rate of diffusion of the concentration profile-fixing solution in the gel at the step of fixing the concentration profile of the metal component is higher than a concentration profile-forming rate of diffusion of the metal component at the step of forming said concentration profile.

5,837,024
PROCESS FOR THE PRODUCTION OF QUARTZ GLASS BODIES

Heinz Fabian, Freigericht, Germany, assignor to Heraeus Quarzglas GmbH, Hanau, Germany
Filed Nov. 26, 1997, Ser. No. 980,072
Claims priority, application Germany, Dec. 2, 1996, 196 49 935.6
Int. Cl.^{6} C03B *19/06;37/018;37/10*
U.S. Cl. 65—17.4 **4 Claims**



1. Process for the production of a quartz glass body, said process comprising
providing a cylindrical mandrel having a longitudinal axis and a cylindrical surface,
providing a holding element comprising a hollow quartz glass body which is fitted concentrically about a section of said mandrel,
depositing SiO_2 particles onto said cylindrical surface of said mandrel while rotating said mandrel about said longitudinal axis, thereby forming an essentially cylindrical porous blank of quartz glass, said blank having an end formed on said holding element, and
fusing said holding element into said end of said blank by maintaining a sufficiently high surface temperature of said end during deposition so that said end acquires an average relative density of at least 80% of theoretical density of quartz glass.

5,837,025
METHOD OF PRODUCING FINE-PARTICLE MULTICOMPONENT GLASS POWDERS FOR USE AS A GLASS FLOW FOR PRODUCING LAYERS AND DECORATIONS ON GLASS, GLASS CERAMIC OR CERAMIC

Petra Auchter-Krummel, Vendersheim; Waldemar Weinberg, Seibersbach; Christoph Lesniak, Saarbrücken; Rüdiger Nass, Riegelsberg; Helmut Schmidt, Saarbrücken-Güdingen, and Nanning Arfsten, Ockenheim, all of Germany, assignors to Schott Glaswerke, Mainz, Germany
Filed Jun. 3, 1996, Ser. No. 660,178
Claims priority, application Germany, Jun. 3, 1995, 195 20 448.4
Int. Cl.^{6} C03B *9/00;19/00;23/00;37/00*
U.S. Cl. 65—21.1 **17 Claims**

1. A method of producing a low-sintering multicomponent glass powder of nanoscale particles, the method comprising the steps of:
preparing a microemulsion including: a non-ionic, ambiphilic emulsifier which is 10 to 15 percent by weight of said microemulsion; an oil phase which is 50 to 70 percent by weight of said microemulsion; and, aqueous salt solution which is 15 to 31.3 percent by weight of said microemulsion, said aqueous salt solution containing glass precursors and having a salt content of 40 to 45 percent by weight of said salt solution;

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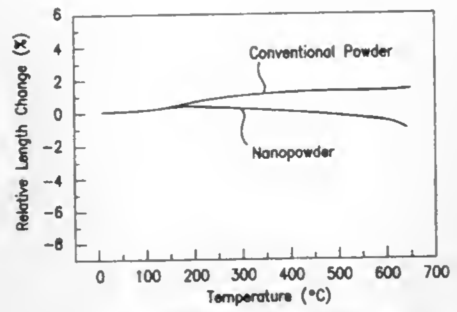


Dilatometer Curve of System I
Comparison of Nanopowder to Standard Powder

- adding a precipitating agent to said microemulsion to change the pH value of said microemulsion thereby causing said nanoscale particles to precipitate out of said microemulsion;
- thereafter, drying, calcinating and redispersing said particles to form said glass powder; and,
- selecting at least one of said aqueous salt solution and said precipitating agent to contain sodium ions.

5,837,026

METHOD FOR PRODUCING A GLASS PANEL FOR A CATHODE RAY TUBE

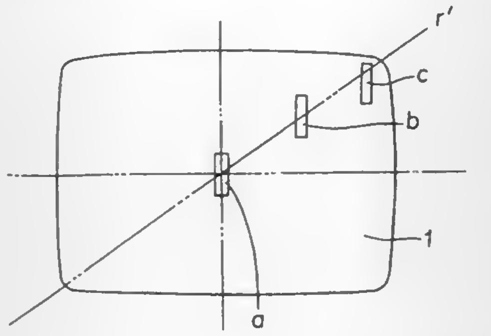
Tsunehiko Sugawara; Toshikazu Ikezawa; Naoya Shimizu, and Hiroshi Yamasaki, all of Funabashi, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Dec. 8, 1997, Ser. No. 986,871

Claims priority, application Japan, Dec. 26, 1996, 8-348613

Int. Cl.⁶ C03B *9/30*

U.S. Cl. 65—66 **6 Claims**



1. A method for producing a glass panel for a cathode ray tube which comprises:

- a first stage of press-forming molten glass put in a mold and solidifying the formed glass until a glass surface temperature reaches lower than a sticking temperature; said formed glass having an inner and outer face portions, both said inner and outer face portions having a central portion,
- a second stage of cooling for strengthening the formed glass after it has been taken out from the mold,
- a third stage of relaxing a temporary stress in the formed glass which is produced during the second stage, and
- a fourth stage of cooling the formed glass to room temperature to produce a sufficient permanent stress, wherein corner portions in said inner face portion of the formed glass, which are in the highest temperature region in the second stage, are cooled more quickly than the central portion of the inner face portion to reduce a temperature gradient to the central portion of the inner face portion which is in the lowest temperature region.

5,837,027

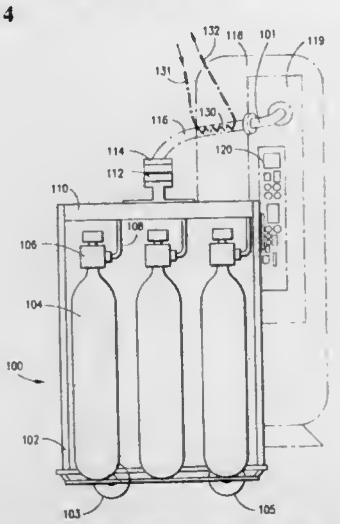
MANUFACTURING PROCESS FOR GAS SOURCE AND DISPENSING SYSTEMS

W. Karl Olander, New Milford, and James V. McManus, Danbury, both of Conn., assignors to Advanced Technology Materials, Inc., Danbury, Conn.

Filed May 20, 1997, Ser. No. 859,171

Int. Cl.⁶ B01D *53/04*

U.S. Cl. 95—14 **18 Claims**



1. A method of manufacturing a fluid storage and dispensing vessel containing sorbent material for holding a sorbable fluid, for on-demand dispensing of the fluid in the use of the vessel, said method comprising filling the vessel with sorbent material, and coupling the vessel containing sorbent material with a source of sorbable fluid for flowing of sorbable fluid into the vessel for sorption on the sorbent material in the vessel and retention of the fluid therein, wherein the vessel is bulk filled with an initial quantity of fluid, and then stored at reduced temperature conditions in relation to the fluid fill temperature condition, for sufficient time to thermally equilibrate the vessel containing the sorbent filled with the initial quantity of fluid to the reduced temperature conditions, and following thermal equilibration, completing the fill of the vessel with said fluid.

5,837,028

METHOD FOR REDUCING CO EMISSIONS FROM A REGENERATIVE GLASS FURNACE

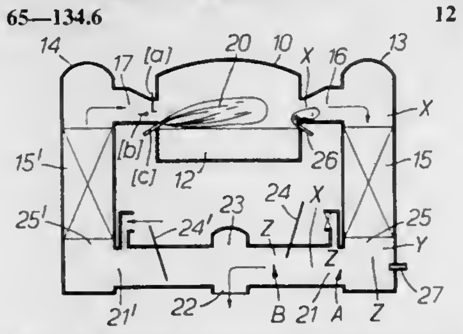
Richard Quirk, Aughton; David Alan Bird, Rufford, Nr. Ormskirk; Ian Nigel William Shulver, Southport, and Robin Maxwell McIntosh, Newburgh, all of United Kingdom, assignors to Pilkington Glass Limited, St. Helens, United Kingdom

Division of Ser. No. 686,371, Jul. 25, 1996, which is a division of Ser. No. 153,986, Nov. 18, 1993, Pat. No. 5,569,312. This application Nov. 12, 1996, Ser. No. 746,456

Claims priority, application United Kingdom, Nov. 27, 1992, 9224852

Int. Cl.⁶ C03B *5/16;5/237*

U.S. Cl. 65—134.6 **12 Claims**



1. A method of operating a cross-fired regenerative glass furnace for melting flat glass so as to minimize emission of carbon monoxide (CO) in waste gases leaving the furnace, the furnace including a melting chamber and sealed regenerators which act as heat exchangers, wherein waste gases generated in the melting chamber enter the regenerators and thereafter leave the furnace and exit to atmosphere, each regenerator containing a checkerwork structure, the method comprising providing air and supplying fuel to the melting chamber of the furnace to ensure that glass of a required quality at a required production rate is obtained, supplying fuel in excess of that required to ensure the glass quality and production rate at least to the melting chamber or the sealed regenerators such that the waste gases in the sealed regenerators contain combustible material including CO, and removing the CO from the waste gases in the regenerators by combusting the CO downstream of the checkerwork structure of the regenerators at a temperature of greater than about 650° C.

5,837,029

DRIED PARTICULATE HYDROPHILIC GEL AS MICRONUTRIENT DELIVERY SYSTEM

Allan D. Behel, Jr., Florence, Ala., and John J. Mortvedt, Fort Collins, Colo., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Division of Ser. No. 311,228, Sep. 23, 1994, Pat. No. 5,632,799. This application Feb. 3, 1997, Ser. No. 794,523

Int. Cl.⁶ C05D *9/00;* **C05G** *3/04*

U.S. Cl. 71—63 **5 Claims**

1. A composition of matter comprising dried particles of iron-containing hydrophilic gel, said gel containing from about 14 percent to about 60 percent by weight of a hydrophilic polymer comprising polyacrylamide; from about 1 percent to about 50 percent by weight of hydroxy acid; and from about 14 percent to about 30 percent by weight of iron sulfate, said composition further characterized by the following tabulation of peak numbers, peak positions, peak intensities, and relative intensities of infrared absorption band frequency (cm^{-1}):

Peak No.	Peak Position	Peak Intensity	Relative Intensity
1	3481	MS-Sp	4
2	3400	MS-Sp	4
3	3215	MS-B	4
4	2937	Sh	3
5	2700	Sh	2
*6	2621	W-B	2
7	2540	W-B	2
*8	1730	S-Sp	5
9	1659	Ms-Sp	4
10	1610	S-Sp	4
11	1566	Sh	4
12	1419	Ms-Sp	4
*13	1396	S-Sp	4
14	1377	Sh	4
15	1325	MS-Sp	3
16	1286	Ms-Sp	3
*17	1225	Ms-Sp	4
18	1194	MS-Sp	4
19	1142	S-Sp	4
*20	1109	S-Sp	4
21	1074	MS-Sp	4
*22	978	Sh	3
*23	937	W-Sp	2
*24	891	M-Sp	3
25	850	M-Sp	3
*26	795	M-Sp	3
*27	613	Ms-Sp	4
28	580	Ms-Sp	4
29	540	Sh	4

wherein Sh=shoulder; B=broad; Sp=sharp; S=strong; MS=medium strong; M=medium; W=weak; VW=very weak: wherein the relative intensities are on a scale of 1 to 10 and peaks that occurred in mixtures both before and after hydration are indicated with an asterisk (*).

5,837,030

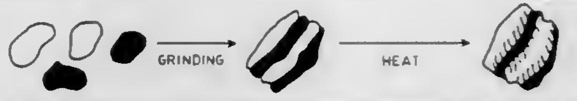
PREPARATION OF NANOCRYSTALLINE ALLOYS BY MECHANICAL ALLOYING CARRIED OUT AT ELEVATED TEMPERATURES

Robert Schulz, Ste-Julie; Reynald Rioux, Boucherville; Sabin Boily, Chambly, and Jacques Huot, Ste-Julie, all of Canada, assignors to Hydro-Quebec, Montreal, Canada

Filed Nov. 20, 1996, Ser. No. 752,893

Int. Cl.⁶ B22F *9/04*

U.S. Cl. 75—352 **13 Claims**



1. In a process for preparing a nanocrystalline powder of an alloy made of at least two metals, said nanocrystalline powder consisting of crystallites having a grain size lower than 100 nm, said process comprising the step of subjecting to an intensive mechanical grinding a powder of one of said at least two metals with a powder of every other one of said at least two metals in such amounts as to obtain said alloy, said intensive mechanical grinding being carried out at atmospheric pressure under an inert atmosphere and for a period of time sufficient to achieve formation of said crystallites and reduction of the grain size of said crystallites to lower than 100 nm;

- the improvement comprising carrying out said intensive mechanical grinding at an elevated temperature ranging from about 100° C. to about 400° C., whereby said crystallites of said grain size are obtained in a period of time lower by about an order of magnitude than that necessary to obtain said crystallites of said grain size by a substantially identical mechanical grinding step carried out at ambient temperature.

5,837,031

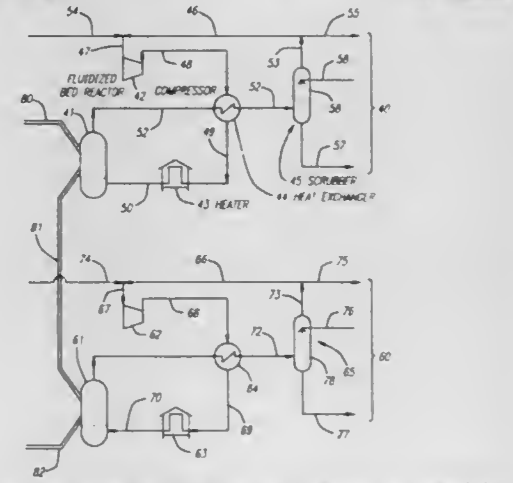
METHOD FOR PRODUCING IRON CARBIDE

Torakatsu Miyashita, Kobe; Yoshio Uchiyama, Akashi; Eiji Inoue; Junya Nakatani, both of Kobe; Teruyuki Nakazawa, Koganei, and Satoru Iijima, Naka-gun, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan, and Mitsubishi Corporation, Japan

Filed May 20, 1996, Ser. No. 650,419

Int. Cl.⁶ C22B *5/14;* **C01B** *31/30*

U.S. Cl. 75—505 **20 Claims**



1. A method of producing iron carbide from an iron-containing material comprising hematite which comprises:

- providing a first distinct apparatus and a second distinct apparatus, each apparatus having an independent circulating loop of reaction gas, the reaction gas being distinct for each loop;
- passing the iron-containing material comprising hematite to said first distinct apparatus;
- contacting said iron-containing material in said first distinct apparatus with said independent circulating loop of reaction gas to partially reduce said iron-containing material to have a reduction degree of about 50% to 65%;

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passing said partially reduced iron-containing material to said second distinct apparatus; and

contacting the partially reduced iron-containing material in said distinct apparatus with an independent circulating loop of reaction gas to reduce and carburize said iron-containing material.

5,837,032

GAS SEPARATIONS UTILIZING GLASSY POLYMER MEMBRANES AT SUB-AMBIENT TEMPERATURES

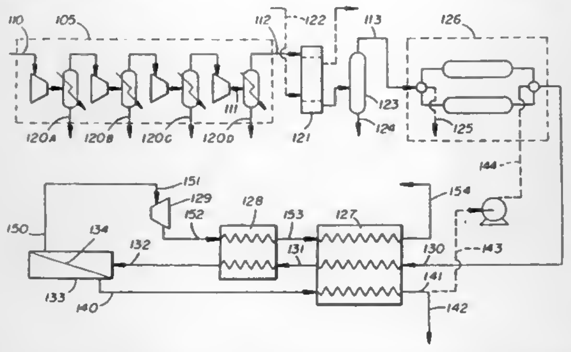
David J. Moll; Alan F. Burmester, both of Midland, Mich.; Thomas C. Young, Walnut Creek, Calif.; Kent B. McReynolds; James E. Clark, both of Midland, Mich.; Charles Z. Hotz, Walnut Creek, Calif.; Ritchie A. Wessling, Midland, Mich.; George J. Quarderer, Midland, Mich.; Ronald M. Lacher, Midland, Mich.; Thomas O. Jeanes, Antioch; Henry N. Beck, Walnut Creek, both of Calif.; Stephen E. Bales, Midland, and Bethanne L. Smith, Freeland, both of Mich., assignors to The Cynara Company, Houston, Tex.

PCT No. PCT/US93/07696, § 371 Date Feb. 10, 1995, § 102(e) Date Feb. 10, 1995, PCT Pub. No. WO94/04250, PCT Pub. Date Mar. 3, 1994

Continuation-in-part of Ser. No. 930,059, Aug. 13, 1992, Pat. No. 5,352,272, which is a continuation-in-part of Ser. No. 803,921, Dec. 9, 1991, abandoned, which is a continuation-in-part of Ser. No. 647,960, Jan. 30, 1991, abandoned. This PCT application Aug. 13, 1993, Ser. No. 382,032

Int. Cl.^{6} B01D *53/22*

U.S. Cl. 95—45 **57 Claims**



1. A method of separating component gases in a gas mixture, which method comprises:

A. contacting a first side of a gas separation membrane, the membrane comprising a discriminating layer or region of a glassy polymer, with the gas mixture while maintaining a difference in chemical potential from the first side of the membrane to a second side of the membrane, such that at least one first component gas of the gas mixture selectively permeates relative to at least one second component gas in the gas mixture from the first side of the membrane through the membrane to the second side of the membrane, wherein said contacting occurs at a temperature of −5° C. or lower, with the proviso that said permeation of gas occurs at or above the freezing point of any liquid present in the gas mixture, wherein said membrane is selected so that, when using a mixture of 80 mole percent nitrogen and 20 mole percent oxygen as a feed at 30° C. with a pressure of 30 psia on the first side of the membrane and a vacuum of less than 1 mm Hg on the second side of the membrane, the permeability of oxygen in barrers is less than 2000 and has the following relationship to oxygen/nitrogen selectivity:

$$\text{Permeability} > \frac{2000}{(\text{Selectivity})^{7/2}}\ ;\text{and}$$

B. recovering at least one of the permeate gas or rejected non-permeate gas, with the proviso that cellulose triacetate polymer membranes are excluded.

5,837,033

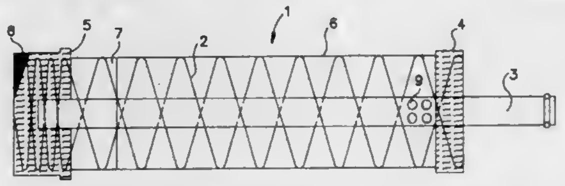
HOLLOW FIBER MEMBRANE SEPARATION APPARATUS

Salvatore Giglia, Norwood, and Benjamin Bikson, Brookline, both of Mass., assignors to Praxair Technology, Inc., Danbury, Conn.

Filed Mar. 29, 1996, Ser. No. 622,318

Int. Cl.^{6} B01D *63/00*

U.S. Cl. 95—45 **15 Claims**



1. An annular fluid separation hollow fiber membrane module comprising a plurality of helically wound layers of semi-permeable hollow fibers wound on a cylindrical core pipe, wherein the fiber wind angle varies along the axial length of the module in one or more layers, and wherein the diameter of the plurality of helically wound layers of semi-permeable hollow fibers wound on said cylindrical core pipe is constant along the axial length of the module.

9. A process for separating a mixture of gases into its components, said process comprising contacting said gas mixture with an annular fluid separation hollow fiber membrane module having a plurality of helically wound layers of semi-permeable hollow fibers wound on a cylindrical core pipe, said module having at least one tubesheet region and an active region, wherein the fiber wind angle varies along the axial length of the module in one or more layers, and wherein the diameter of the plurality of helically wound layers of semi-permeable hollow fibers wound on said cylindrical core pipe is constant along its axial length.

5,837,034

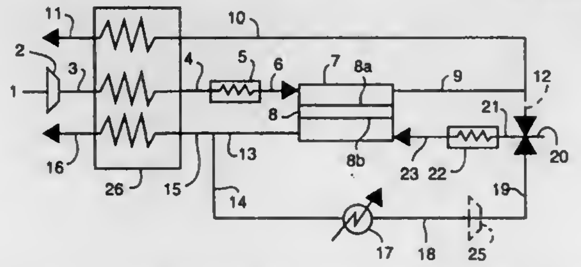
PROCESS FOR REDUCING CARBON PRODUCTION IN SOLID ELECTROLYTE IONIC CONDUCTOR SYSTEMS

Nitin Ramesh Keskar, Grand Island, and Ravi Prasad, East Amherst, both of N.Y., assignors to Praxair Technology, Inc., Danbury, Conn.

Filed Jun. 23, 1997, Ser. No. 880,878

Int. Cl.^{6} B01D *53/22*

U.S. Cl. 95—54 **18 Claims**



1. A process for inhibiting the formation of carbon and/or coke from a carbon-containing reactive gas stream on the permeate side of an oxygen ion transport membrane, the process comprising:

separating a feed gas stream containing elemental oxygen and at least one other gas using an oxygen ion transport module having the oxygen ion transport membrane with a retentate side and a permeate side such that an oxygen-depleted gas stream forms on the retentate side and a gas stream containing oxygen reaction products forms on the permeate side;

purging the permeate side of the oxygen ion transport membrane with the carbon-containing reactive gas stream; and

recirculating at least a portion of an exhaust gas stream formed from the reaction of the reactive gas stream with the oxygen gas stream permeating through the oxygen ion transport membrane to purge the permeate side of the oxygen ion transport membrane, thereby inhibiting the formation of carbon and/or coke thereon.

5,837,035

METHOD AND APPARATUS FOR ELECTROSTATICALLY PRECIPITATING IMPURITIES, SUCH AS SUSPENDED MATTER OR THE LIKE, FROM A GAS FLOW

Werner Braun, Wilen-Sarnen; Joseph Gebhart, Dietzenbach; Jerry Rzeznik, Heuchelheim; Gerhard Scheuch, Gemünden, and Knut Sommerer, Maintal, all of Germany, assignors to Maxs AG, Switzerland

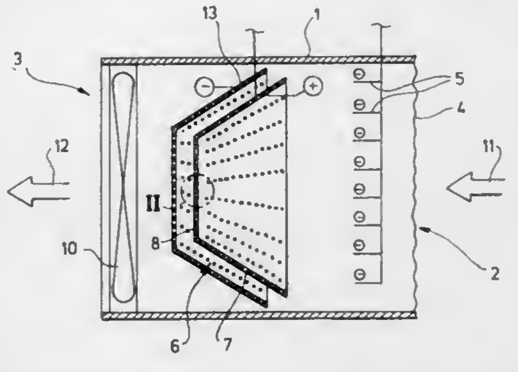
PCT No. PCT/EP95/00073, § 371 Date Mar. 8, 1996, § 102(e) Date Mar. 8, 1996, PCT Pub. No. WO95/18680, PCT Pub. Date Jul. 13, 1995

PCT Filed Jan. 10, 1995, Ser. No. 522,404

Claims priority, application Germany, Jan. 10, 1994, 44 00 420.6

Int. Cl.^{6} B03C *3/45*

U.S. Cl. 95—78 **14 Claims**



1. A method for electrostatically precipitating impurities from a gas flow, said gas flow being first supplied to an ionization source for charging said impurities, whereupon said impurities are attracted on account of their charge by an oppositely poled precipitation electrode and are precipitated thereon, said gas flow being guided substantially entirely through openings of a perforated plate which is used as said precipitation electrode and whose opening dimensions are dimensioned such that at least part of the impurities can penetrate through said openings, wherein said gas flow being guided through said openings which are tapered on their edges forming cutting edges towards said opening.

2. An apparatus for electrostatically precipitating impurities from a gas flow, comprising at least one first electrode as an ionization source for charging said impurities, and at least one second, oppositely poled precipitation electrode for precipitating said ionized impurities from said gas flow, said precipitation electrode comprising as a perforated plate which permits passage of said gas flow and at least part of said impurities and which is arranged in said gas flow such that said gas flow is bound to pass through the openings of said perforated plate entirely, wherein the edges of said openings of said perforated plate being tapered and forming cutting edges towards their respective opening.

5,837,036

PROCESS AND FILTER FOR REMOVING ORGANIC SUBSTANCES AND OZONE FROM GASES

Andreas Schleicher, Beselich; Jörg Von Eysmondt, Hofheim, and Georg Frank, Tübingen, all of Germany, assignors to Ticona GmbH, Germany

PCT No. PCT/EP95/02624, § 371 Date Apr. 7, 1997, § 102(e) Date Apr. 7, 1997, PCT Pub. No. WO96/03201, PCT Pub. Date Feb. 8, 1996

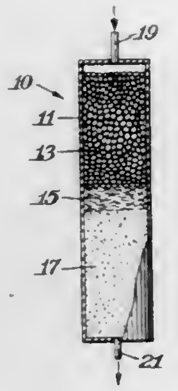
PCT Filed Jul. 6, 1995, Ser. No. 776,825

Claims priority, application Germany, Jul. 21, 1994, 44 25 913.1

Int. Cl.^{6} B01D *53/04*

U.S. Cl. 95—138 **16 Claims**

1. A process for removing ozone and an organic substance from a gas which contains ozone and at least one organic substance, which process comprises first contacting the gas with an ozone-binding polymer and then with activated carbon.



5,837,037

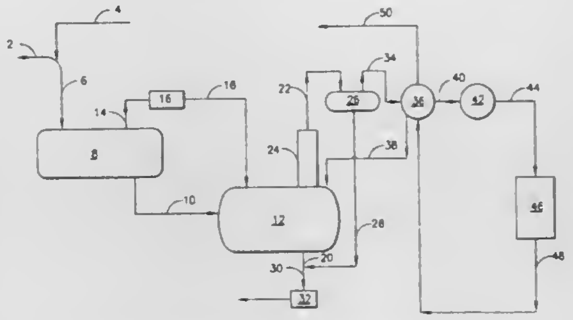
GAS HANDLING FOR PLASTICS LIQUEFACTION

John Duckett Winter, Yorba Linda, Calif., assignor to Texaco Inc, White Plains, N.Y.

Filed Jul. 3, 1997, Ser. No. 887,978

Int. Cl.^{6} B01D *47/00*

U.S. Cl. 95—172 **8 Claims**



1. A method for removing high molecular weight, high melting point hydrocarbon vapors by condensation from a hydrocarbon-containing offgas vapor produced during the liquefaction of particulate waste plastic material, and utilizing the remaining uncondensed offgas vapor as a heater fuel for said liquefaction, comprising:

(a) contacting the hydrocarbon-containing offgas vapor directly with water at a condensation temperature above the melting point of the high molecular weight hydrocarbon vapors to produce a first high molecular weight liquid hydrocarbon condensate and a first uncondensed vapor stream;

(b) separating the first high molecular weight liquid hydrocarbon condensate from the first uncondensed vapor stream;

(c) cooling the first uncondensed vapor stream to a temperature of about 180° F. to about 200° F. to produce a second liquid condensate and a second uncondensed vapor stream;

(d) separating the second liquid condensate from the second uncondensed vapor stream;

(e) contacting the second uncondensed vapor stream with a caustic scrubbing solution to neutralize any halide vapors and to form a hydrogen halide acid-free vapor stream; and

(f) passing the hydrogen halide acid-free vapor to the waste plastic liquefaction step wherein it serves as a heater fuel to melt the particulate waste plastic material.

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5,837,038

CLOSING ELEMENT INTENDED FOR CLOSING OFF AN END OF A CAPILLARY GAS CHROMATOGRAPHY COLUMN

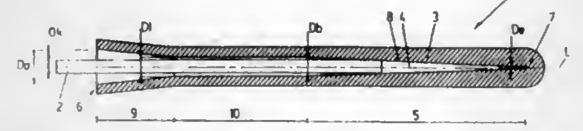
Martinus Frans van der Maas, Arnemuiden, Netherlands, assignor to SGT Exploitatie B.V., Netherlands

Filed Jul. 3, 1997, Ser. No. 887,976

Claims priority, application Netherlands, Jul. 5, 1996, 1003526

Int. Cl.^{6} B01D *15/08*

U.S. Cl. 96—101 **5 Claims**



1. A closing element intended for closing off an end of a capillary gas chromatography column (2) with a certain external column diameter (Dk), the closing element (1) comprising a closing body (3) provided with a blind hole (4), the blind hole (4) tapering over at least a portion (5) of the length thereof, viewed from an opening (6) towards a blind end (7) of the hole (4), the tapering portion (5) of the hole (4) having at its end proximal to the opening (6) a diameter (Db) greater than the external column diameter (Dk), while a diameter (De) of the tapering portion (5) of the hole (4) at the end (7) thereof remote from the opening (6) is smaller than the external diameter of the column (Dk), the walls (8) of the tapering portion (5) of the hole (4) including an angle with the centerline (L) of the hole (4) which is so small that upon placement of the closing element (1) on the end of the capillary gas chromatography column (2) a self-locking engagement between the end of the column (2) and the closing element (1) occurs, the closing element (1) being manufactured from a form-retaining, inert, gastight material.

5,837,039

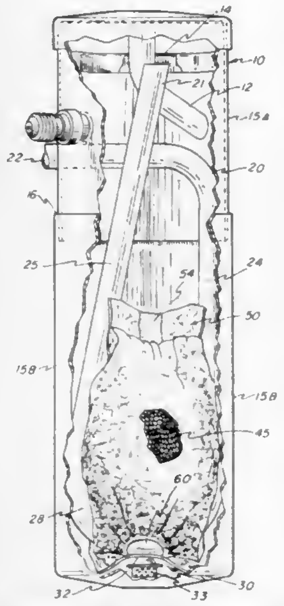
ADSORBENT PACKET FOR AIR CONDITIONING ACCUMULATORS

Douglas E. LeConey, Clayton, and Raymond B. Wood, Brookville, both of Ohio, assignors to Stanhope Products Company, Brookville, Ohio

Filed Apr. 17, 1996, Ser. No. 633,434

Int. Cl.^{6} B01D *53/04*

U.S. Cl. 96—121 **6 Claims**



1. An adsorbent material package for use in a canister having a tube disposed therein, said package comprising first and second pouches, each of said pouches having sealed upper ends and sealed lower ends for capturing a quantity of adsorbent material therein, each of said sealed lower ends having an opening formed therein, said pouches adapted for overlapping relation of said sealed lower ends with the sealed lower end of the other of said pouches whereby said openings are in registry one over the other with said openings mounted on said tube; wherein each of said sealed upper ends comprise a transversely extending flange, said flanges secured in juxtaposition to thereby join said pouches together, an aperture formed in at least one of said flanges and adapted for mounting on said tube.

5,837,040

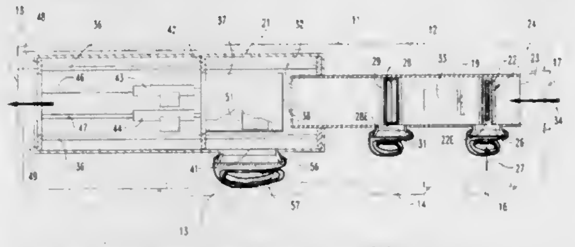
ROOM AIR DECONTAMINATION DEVICE

James S. Caughron, Pendleton, and John C. Williams, Knox, both of Ind., assignors to International Decontamination Systems LLC, Pendleton, Ind.

Filed Sep. 9, 1996, Ser. No. 711,172

Int. Cl.^{6} B01D *50/00*

U.S. Cl. 96—224 **15 Claims**



1. Air decontamination apparatus comprising:
a cabinet having an inlet for contaminated air and an outlet for cleaned air;
a duct assembly inside the cabinet and having an air inlet associated with the cabinet inlet and having an outlet associated with the cabinet outlet for cleaned air;
a blower in the duct assembly and arranged to move air from the inlets, through the duct assembly and out through the outlets;
a first filter in the duct assembly upstream from the blower;
a germicidal light generator in the duct assembly downstream from the blower;
a final filter in the duct assembly and arranged to filter all of the air passing through the duct assembly to the outlets;
a bag associated with at least one of the filters to facilitate removal of the filter from the duct assembly without exposure of the filter to the environment outside the duct assembly;
wall openings in the duct assembly adjacent the filters;
flanges around the wall openings; and
closures on the flanges;
the bag associated with the one filter having an end secured around the flange at the opening adjacent the filter, with the closure inside the bag, whereby the closure can be removed from the end of the flange, and then the filter can be removed from the duct assembly into the bag, and then the closure can be re-installed on the flange without air communication between the interior of the duct assembly and the environment outside the duct assembly at the wall openings.

5,837,041

INK CARTRIDGES HAVING INK COMPOSITIONS WITH PIGMENTED PARTICLES AND METHODS FOR THEIR MANUFACTURE AND USE

Lloyd F. Bean, London, England; Bing R. Hsieh, Webster, and Leonard M. Carreira, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 15, 1997, Ser. No. 843,366

Int. Cl.^{6} C09D *11/00*

U.S. Cl. 106—31.6 **16 Claims**

1. A method comprising:
providing a pigment solution comprising
a solubilized pigment-Lewis acid complex and

an aprotic solvent system;
mixing a pigment separator with the pigment solution to form a heterogeneous mixture comprising pigmented particles;
concentrating the pigmented particles of the heterogeneous mixture to form a concentration of pigmented particles;
dispersing the concentration of pigmented particles in a formulating solvent to form an ink composition; and
introducing the ink composition into an ink cartridge.

5,837,042

INVISIBLE FLUORESCENT JET INK

Bruce A. Lent, Oak Park; Godwin Deng, Schaumburg, and Jose F. Ezpeleta, Chicago, all of Ill., assignors to Videojet Systems International, Inc., Wood Dale, Ill.

Filed Jun. 10, 1996, Ser. No. 661,180

Int. Cl.^{6} C09D *11/02*

U.S. Cl. 106—31.14 **66 Claims**

1. A jet ink composition suitable for providing a mark on white or light colored substrates, wherein said composition comprises a colorant and an ink carrier and has a viscosity of from about 1.8 centipoises (cps) to about 6 cps at 25° C., an electrical resistivity of from about 20 ohm-cm to about 2,000 ohm-cm, and a sonic velocity of from about 1200 meters/second to about 1700 meters/second, wherein said mark is completely or substantially invisible to the unaided eye and is visible only when excited by ultraviolet light, and said colorant comprises a rare earth metal and a chelating ligand, absorbs at a wavelength of from about 275 nm to about 400 nm, and fluoresces at a wavelength of from about 575 nm to about 700 nm, with the proviso that when the rare earth metal is europium, dysprosium, or terbium, the chelating ligand is not dibenzoylmethane.

5,837,043

INKS WITH ALCOHOL SURFACTANTS

Raymond W. Wong; Marcel P. Breton, and Yvan Gagnon, all of Mississauga, Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 13, 1997, Ser. No. 782,725

Int. Cl.^{6} C09D *11/02*

U.S. Cl. 106—31.58 **35 Claims**

1. An imaging process which comprises the development of an image with an aqueous ink jet ink composition comprised of colorant, water, and an alcohol surfactant comprised of a mixture of linear secondary alcohols, and which mixture has been reacted with ethylene oxide.

5,837,044

INK JET INKS CONTAINING POLYETHYLENE FATTY ETHER ADDITIVES

Domenic Santilli, Webster, and Ravi Sharma, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 13, 1996, Ser. No. 689,640

Int. Cl.^{6} C09D *11/02*

U.S. Cl. 106—31.67 **6 Claims**

1. A liquid ink jet ink wherein said ink comprises a carrier, a pigment, a dispersing agent and a polyoxyethylene fatty ether additive having the structure (I):

$RO(C_2H_4O)_nH;$

wherein R represents:
(a) lauryl and n is 23;
(b) cetyl and n is 20;
(c) stearyl and n is 20 or 100 and
(d) oleyl and n is 20.

5,837,045

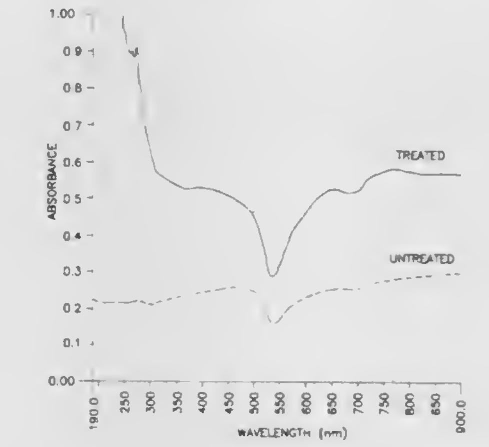
COLORED PIGMENT AND AQUEOUS COMPOSITIONS CONTAINING SAME

Joseph E. Johnson, Nashua, N.H., and James A. Belmont, Acton, Mass., assignors to Cabot Corporation, Boston, Mass.

Filed Jun. 17, 1996, Ser. No. 664,455

Int. Cl.^{6} C09B *67/50*

U.S. Cl. 106—31.85 **38 Claims**



1. A surface-modified colored pigment comprising a colored pigment having no primary amines and at least one attached hydrophilic organic group, wherein said organic group comprises a) at least one aromatic group, and b) at least one ionic group or ionizable group, or a mixture of an ionic group or an ionizable group, wherein said aromatic group is directly attached to the surface of the colored pigment.

5,837,046

INK JET PRINTER INK COMPOSITION

John David Schofield, Greenmount; John Philip Tatum, and Jill Woods, both of Cambridgeshire, all of England, assignors to Xaar Technology Limited, Cambridge, United Kingdom

Filed Jul. 23, 1997, Ser. No. 898,764

Claims priority, application United Kingdom, Feb. 8, 1995, 9502439; Feb. 20, 1995, 9503287

Int. Cl.^{6} C09D *11/02*

U.S. Cl. 106—31.86 **15 Claims**

1. An ink jet printer ink comprising a pigment dispersed in a non-aqueous diluent wherein the diluent is a single phase liquid comprising aliphatic hydrocarbon and a polar component, the aliphatic hydrocarbon forming more than 50% by weight of the diluent and the polar component being oleyl alcohol alone or in combination with at least one other polar liquid.

5,837,047

HEAT CURABLE BINDER SYSTEMS AND THEIR USE

Helena Twardowska, and John J. Cooper, both of Columbus, Ohio, assignors to Ashland Inc., Columbus, Ohio

Filed Dec. 11, 1996, Ser. No. 763,666

Int. Cl.^{6} B28B *7/28*

U.S. Cl. 106—38.3 **14 Claims**

1. A heat-curable mix comprising in admixture:
(a) an aggregate;
(b) a heat-curable water-soluble binder comprising:
  (1) colloidal silica,
  (2) an alcohol in the amount of 1.0 weight percent to 10 weight percent based upon the weight of the binder, and
  (3) an alkali aluminate.

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5,837,048

FLOWABLE POWDER FOR HIGH TEMPERATURE PLASMA SPRAY COATING APPLICATIONS

Kurtis C. Kelley, Washington, Ill., assignor to Caterpillar Inc., Peoria, Ill.

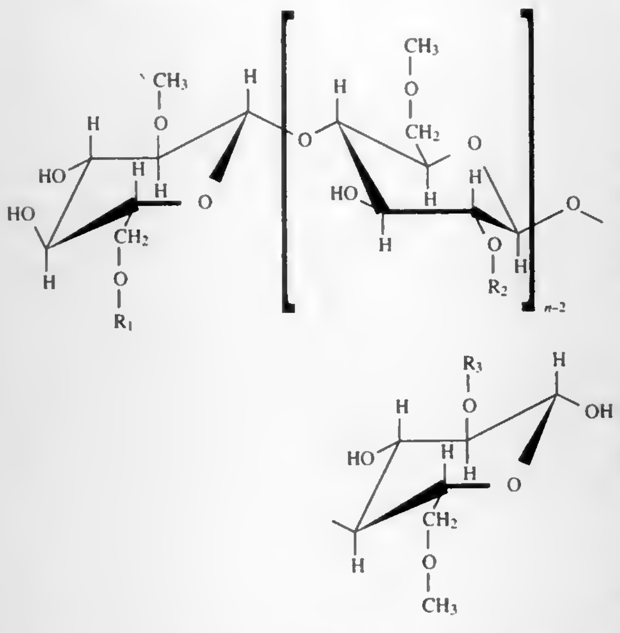
Filed Jul. 18, 1997, Ser. No. 896,704

Int. Cl.^{6} C08L *1/28;1/26;* **C08K** *3/10;3/34*

U.S. Cl. 106—197.01 **23 Claims**

1. A process for enhancing the high temperature flowability of a powder for spray coatings, comprising the steps of:

mixing a metal, ceramic, or mixtures thereof powder with a blend of polymeric cellulose ether and water, said blend having a dough-like consistency, said polymeric cellulose ether having a general formula;



wherein R_1 is selected from the group consisting of CH_3 and $CH_2CH(OH)CH_3$; R_2 is selected from the group consisting of CH_3 and $CH_2CH(OCH_3)CH_3$; R_3 is selected from a group consisting of H and CH_3; and the value of n is at least 100, and said powder and said blend being mixed in a volumetric ratio in the range of about 90:10 to about 99:1, powder:blend;

forming a paste of said powder-blend mixture;

drying said paste; and

particulating said dry paste and forming a flowable powder having a particle size in the range of about 50 μm to about 300 μm.

5,837,049

TREATED INORGANIC SOLIDS

Colin Lloyd Watson, Hurworth Place, England, and Peter James Allen, Ridgeley, Australia, assignors to Tioxide Group Services Limited, United Kingdom

Continuation of Ser. No. 539,899, Oct. 6, 1995, abandoned. This application Oct. 23, 1997, Ser. No. 957,411

Claims priority, application United Kingdom, Oct. 14, 1994, 9420707; Aug. 5, 1995, 9516106

Int. Cl.^{6} C08C *3/08;* **C08J** *3/20;* **C08K** *3/32*

U.S. Cl. 106—427 **19 Claims**

1. A treated inorganic solid comprising particulate titanium dioxide or zinc oxide, the particles of which are coated with a composition consisting essentially of an organophosphorus compound selected from the group consisting of alkylphosphonic acids and esters of alkylphosphonic acids wherein the alkylphosphonic acid contains from 8 to 22 carbon atoms.

16. A method of treating particulate titanium dioxide or zinc oxide comprising forming an aqueous dispersion or slurry of said particulate titanium dioxide or zinc oxide, mixing said aqueous dispersion or slurry with an organophosphorus compound selected from the group consisting of alkylphosphonic acids and esters of alkylphosphonic acids wherein the alkylphosphonic acid contains from 8 to 22 carbon atoms and adding a polymer to the treated titanium dioxide or zinc oxide- containing aqueous dispersion or slurry.

5,837,050

ULTRAFINE IRON-CONTAINING RUTILE TITANIUM OXIDE AND PROCESS FOR PRODUCING THE SAME

Haruo Okuda; Hideo Futamata; Akihito Sakai, and Masakazu Hattori, all of Yokkaichi, Japan, assignors to Ishihara Sangyo Kaisha, Ltd., Osaka, Japan

Division of Ser. No. 501,053, Aug. 11, 1995, Pat. No. 5,714,260. This application Aug. 22, 1997, Ser. No. 916,287

Int. Cl.^{6} C09C *1/36;* **C09D** *5/33;1/00;* **C01G** *49/00*

U.S. Cl. 106—439 **8 Claims**

1. An oily dispersion comprising ultrafine iron-containing rutile titanium dioxide particles, wherein said rutile titanium dioxide particles have a crystalline structure, an average particle size of 0.01 to 0.1 μm and contain an iron component in solid solution at a concentration of 1–15% by weight as expressed as Fe based on the titanium dioxide in the crystalline structure.

5,837,051

PROCESS FOR THE THERMAL TREATMENT OF IRON OXIDES IN A CIRCULATING FLUIDIZED BED

Jörg Krekel, Essen; Berndt-Ullrich Köhler, Krefeld, and Horst Brunn, Meerbusch, all of Germany, assignors to Bayer AG, Leverkusen, Germany

Filed Dec. 13, 1995, Ser. No. 571,726

Claims priority, application Germany, Dec. 27, 1994, 44 46 873.3; Aug. 14, 1995, 195 29 864.0

Int. Cl.^{6} C09C *1/22*

U.S. Cl. 106—456 **17 Claims**

1. Process for the production of iron oxide pigments, said process comprising agglomerating at least one material having an average primary particle size of ≦10 μm and selected from the group consisting essentially of iron (II) oxides, iron (II) hydroxides, iron (II) oxyhydroxides, iron (III) oxides, iron (III) hydroxides, iron (III) oxyhydroxides, iron (II,III) oxides, iron (II,III) hydroxides or, iron (II,III) oxyhydroxides and thermally treating said agglomerated material in a system consisting essentially of a first heated apparatus and a second, down-stream apparatus, wherein in said first heated apparatus the material is fluidized by an upwardly directed gas mixture with a gas velocity of from about 0.5 to 1 m/s in such a manner that a gas/solid flow is formed, the resultant gas/solid mixture flows from the bottom upwards through the heated apparatus and is separated into gas and solid components in said second, down-stream apparatus, in which a portion of the solid components are discharged and the remaining solid components are returned to the first heated apparatus, further wherein the gas/solid ratio in the heated apparatus is adjusted to 200 to 1,300 Nm^3/t of solid.

5,837,052

PROCESS FOR PRODUCING CEMENT CLINKER CONTAINING COAL ASH

David Bridson Oates, Kettleby, Canada; Horace Hershel Compton, Independence, Kans., and Syed Suhail Akhtar, Montreal, Canada, assignors to Lafarge Canada Inc., Canada

Filed Apr. 10, 1997, Ser. No. 833,927

Int. Cl.^{6} C04B *7/12;7/47;7/48;7/13*

U.S. Cl. 106—705 **20 Claims**

1. A process for producing a cement clinker having a content of pozzolanic coal ash comprising:

a) producing hot cement clinker from cement clinker raw ingredients in a cement kiln;

b) feeding hot cement clinker from step a) into a cooler;

c) feeding a pozzolanic coal ash, having a content of a contaminant, into contact with said hot cement clinker in said cooler and liberating said contaminant from said coal ash with heat evolved from said hot cement clinker as said hot cement clinker cools in said cooler; and

d) recovering a cooled cement clinker containing said coal ash free of said contaminant.

5,837,053

PROCESS FOR PREPARING SINGLE CRYSTAL MATERIAL AND COMPOSITE MATERIAL FOR FORMING SUCH SINGLE CRYSTAL MATERIAL

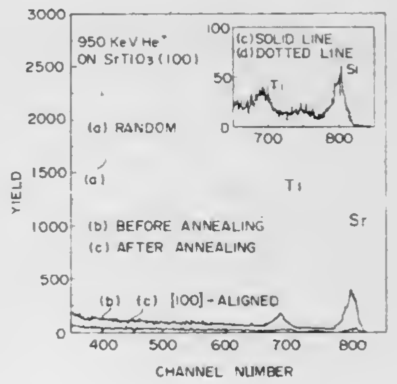
Furen Wang, Tokyo, and Tadataka Morishita, Kanagawa-ken, both of Japan, assignors to International Superconductivity Technology Center, Japan

Filed Nov. 28, 1995, Ser. No. 563,383

Claims priority, application Japan, Dec. 8, 1994, 6-304735

Int. Cl.^{6} C30B *1/02*

U.S. Cl. 117—7 **7 Claims**



1. A process for the production of a single crystal material, comprising the steps of:

forming a layer of an amorphous substance over a surface of a substrate of a single crystal, said amorphous substance having the same chemical composition as that of said substrate and said layer having a thickness of 100 Å or less, thereby obtaining a composite material; and

heating said composite material to epitaxially grow said amorphous layer, in its entirety, into a single crystal layer.

5,837,054

CRYSTALS FOR ULTRAVIOLET LIGHT FILTERS

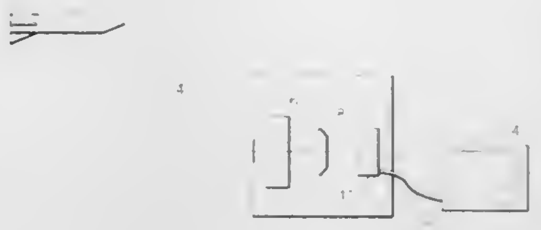
Narsingh B. Singh; William D. Partlow, both of Export, Pa.; Steven Strauch, Ellicott City, Md.; Albert M. Stewart, Pittsburgh; John F. Jackovitz, Monroeville, both of Pa.; David W. Coffey, Columbia, Md., and Robert Mazelski, Monroeville, Pa., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Aug. 30, 1996, Ser. No. 709,399

Int. Cl.^{6} C30B *7/00;29/12*

U.S. Cl. 117—10 **14 Claims**

1. An ultraviolet light filter comprising a single crystal of the formula $NiSiF_66H_2O$ which is stable above 85° C. and transmits ultraviolet light in the missile warning band and blocks light at longer wavelengths and wherein the crystal has a diameter of at least 3 cm.



5,837,055

LEVITATION MELTING METHOD AND MELTING AND CASTING METHOD

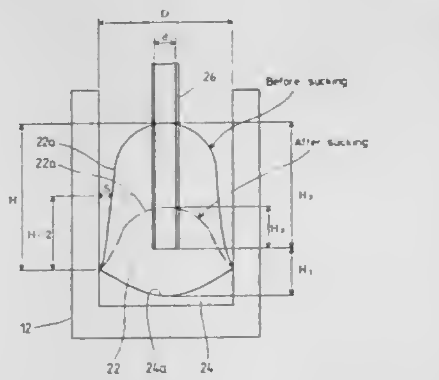
Junji Yamada, Nagoya, and Noboru Demukai, Kaizu-gun, both of Japan, assignors to Daido Tokushuko Kaisha, Aichi, Japan

Filed May 1, 1996, Ser. No. 641,972

Claims priority, application Japan, May 19, 1995, 7-145537; Jun. 29, 1995, 7-188205

Int. Cl.^{6} C30B *11/02*

U.S. Cl. 117—82 **7 Claims**



1. A levitation melting method comprising:

applying a high-frequency current to a high-frequency induction coil wound around a melting crucible to induction-heat a material introduced to said melting crucible; and

erecting the resulting molten metal to be in no contact with the inner wall surface of said melting crucible with the bottom of said material being maintained in the solidified state; and wherein:

a power input P of a high-frequency power source to said high-frequency induction coil, an inner radius R at the bottom of said crucible and super heat ΔT of said molten metal satisfy the following relationship:

$P/R2=\Delta T\cdot(0.0008 \text{ to } 0.002)$; and

said method is carried out such that the super heat ΔT of said molten metal may be maintained in the range of 20° to 300° C.

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5,837,056

METHOD FOR GROWING III-V GROUP COMPOUND SEMICONDUCTOR CRYSTAL

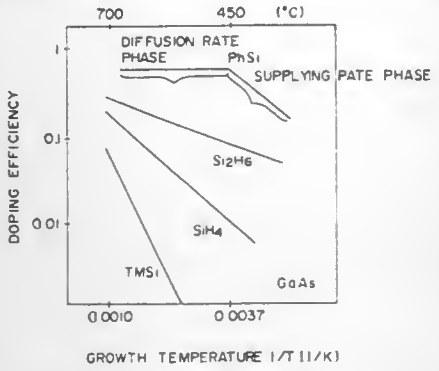
Toshihide Kikkawa, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 451,436, May 26, 1995, Pat. No. 5,656,076. This application Apr. 3, 1997, Ser. No. 832,274

Claims priority, application Japan, May 30, 1994, 6-116151

Int. Cl.^{6} C30B *25/22*

U.S. Cl. 117—84 **14 Claims**



1. A method for growing a III-V group compound semiconductor crystal comprising the steps of:
   doping a III-V group compound semiconductor with a silicon dopant; and
   growing a crystal growth layer including growing said III-V group compound semiconductor doped with silicon dopant,
   wherein said silicon dopant has a general formula $SiR_{4-m}H_m$, in which R represents a phenyl group and m represents an integral number 1–3, said phenyl group and said hydrogen atom being bonded to silicon.

5,837,057

FILM FORMING APPARATUS WITH PARTICLE PREVENTION PLATE

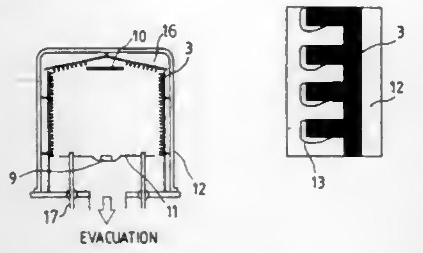
Shuji Koyama, Kawasaki; Yukio Kawajiri, Yokohama; Makoto Shibata, Kawasaki; Manabu Sueoka, Yokohama; Toshio Suzuki, Inagi; Hisashi Yamamoto, Machida, and Takumi Suzuki, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 169,991, Dec. 16, 1993, abandoned. This application Apr. 22, 1996, Ser. No. 635,786

Claims priority, application Japan, Dec. 21, 1992, 4-340758

Int. Cl.^{6} C23C *16/00;14/24;14/34*

U.S. Cl. 118—723 VE **7 Claims**



1. A film-forming apparatus which can be used in forming a thin film, comprising a chamber, an internal pressure of which can be reduced, an arranging portion for arranging thereon a starting material source to be arranged in the chamber, and a particle prevention plate provided on an inner surface of the chamber other than a surface which includes or is coplanar with the arranging portion, said particle prevention plate being arranged to provide a gap between the particle prevention plate and the inner surface of the chamber, wherein the particle prevention plate has a tongued-and-grooved pattern comprising a plurality of tongued portions formed at a pitch of 1 to 50 mm, wherein the tongued portions of the tongued-and-grooved pattern are provided such that each grooved portion between two adjacent tongued portions has a shape corresponding to the shape of the tongued portions, or the tongued portions are positioned to be apart from each other by a distance not smaller than the thickness of each of the tongued portions, and wherein the tongued portions each have a first portion opposite to the arranging portion and a second portion which is not opposite to the arranging portion, such that a material from the starting material source is not deposited continuously on the tongued-and-grooved pattern, and such that the material is deposited on the first portions and is not deposited on the second portions, whereby a deposited film is formed discontinuously on the particle prevention plate.

5,837,058

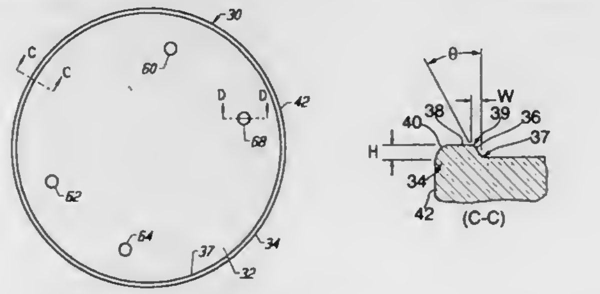
HIGH TEMPERATURE SUSCEPTOR

Steven Aihua Chen, Fremont; Ming Xi, Santa Clara, and Ruiping Wang, Fremont, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Jul. 12, 1996, Ser. No. 680,328

Int. Cl.^{6} C23C *16/00*

U.S. Cl. 118—728 **22 Claims**



1. An apparatus, comprising:
   a planar substrate mounting surface having an area;
   a lip surrounding the substrate mounting surface and defining said area; having a height above the mounting surface and a first rounded edge between an inner edge and the planar surface, the lip further having a top side and an outer side, and a second rounded edge coupling the outer side to the top side.

5,837,059

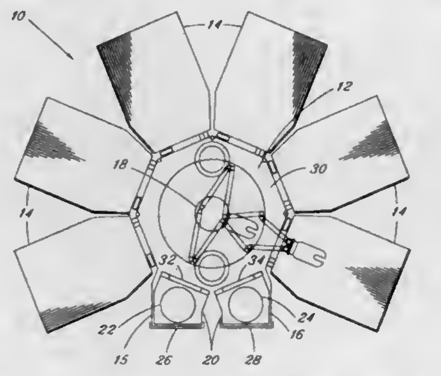
AUTOMATIC POSITIVE PRESSURE SEAL ACCESS DOOR

Alex Glants, Brookline, Mass., assignor to Brooks Automation, Inc., Chelmsford, Mass.

Filed Jul. 11, 1997, Ser. No. 891,550

Int. Cl.^{6} C23C *16/00*

U.S. Cl. 118—733 **10 Claims**



1. A processing chamber having a compact automatic sliding door means for sealing a port of said chamber against leakage in the presence of either a higher internal or external pressure, comprising a door means having an inner panel section, an outer panel section flexibly attached to the inner panel section, and expansion means between said panel sections and activatable to cause said panel sections to be forced apart; support means for supporting said door means for sliding movement into closed position with said inner panel closely spaced from said port, and carrying stop means closely-spaced from the rear surface of said outer door panel when the latter is in closed position, means for sliding said door means on said support means between open and closed position, and means for activating said expansion means when the door means is moved into closed position to compress the outer panel section against the stop means and compress the inner panel section against the port of the processing chamber to seal the latter by the application of positive pressure.

5,837,060

PROCESS FOR THE MANUFACTURE OF A STARCH HYDROLYSATE OF LOW POLYMOLECULARITY INDEX, OBTENTION AND USE OF NOVEL STARCH HYDROLYSATE IN PERITONEAL DIALYSIS

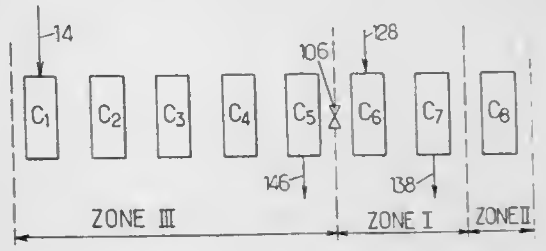
Catherine Fouache née Ducroquet, Sailly Labourse, and Pierrick Duflot, Richebourg, both of France, assignors to Roquette Freres, Paris, France

Continuation of Ser. No. 820,241, Mar. 18, 1997, abandoned, which is a continuation of Ser. No. 388,237, Feb. 14, 1995, abandoned. This application Jan. 6, 1998, Ser. No. 3,130

Claims priority, application France, Feb. 15, 1994, 94 01707

Int. Cl.^{6} C13K *30/00;1/06;* **C13F** *3/00;* **C13D** *3/12*

U.S. Cl. 127—36 **11 Claims**



1. Process for the manufacture of a starch hydrolysate of polymolecularity index below 7, comprising:
   (a) subjecting a waxy starch milk that is a milk containing a starch composed almost exclusively of amylopectin to acid hydrolysis to produce an acid hydrolysate having a DE of between 8 and 15;
   (b) submitting the hydrolysate thus obtained to a chromatographic separation on macroporous strong cationic resins in alkali metal or alkaline-earth metal form; and
   (c) collecting the starch hydrolysate excluded during this chromatographic step.

5,837,061

PICKLED STEEL PRODUCT SUBSEQUENT TREATMENT PROCESS AND DEVICE, IN PARTICULAR FOR PICKLED CARBON STEEL HOT STRIPS

Wilhelm Karner, Eichgraben, and Karl Jirenec, Maria-Enzersdorf, both of Austria, assignors to Andritz-Patentverwaltungs-Gesellschaft m.b.H, Graz, Austria

PCT No. PCT/EP94/02205, § 371 Date Apr. 8, 1996, § 102(e) Date Apr. 8, 1996, PCT Pub. No. WO95/02080, PCT Pub. Date Jan. 19, 1995

PCT Filed Jul. 5, 1994, Ser. No. 581,523

Claims priority, application Austria, Jul. 8, 1993, 1345/93

Int. Cl.^{6} C23G *3/02*

U.S. Cl. 134—3 **16 Claims**

1. In a process for rinsing pickled, hot steel with water in at least one rinsing section of a continuous rinsing system, wherein the improvement is characterized in that carbon dioxide is blown into at least one rinsing section of the rinsing system.

5,837,062

CATALYST REMOVAL

Thomas Peyton Easterly, Friendswood, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 31, 1996, Ser. No. 741,503

Int. Cl.^{6} B08B *7/00;9/03*

U.S. Cl. 134—6 **8 Claims**

1. A method for dislodging catalyst particles stuck inside catalyst tubes comprising:
   inserting a ram rod into one or more of the catalyst tubes;
   moving the rod to ram the catalyst by a rotating means having cams which cyclically raise and drop the rods; and
   removing said catalyst.

5,837,063

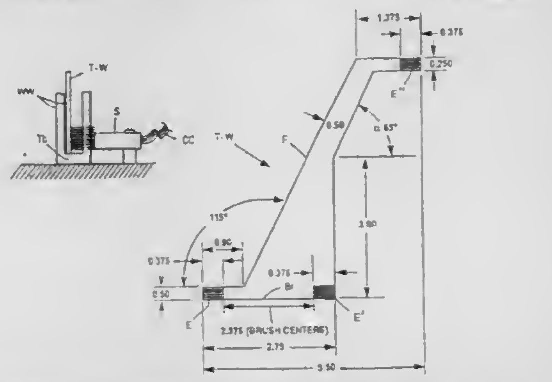
OPERATOR AID FOR CLEANING RECESSED REFLECTIVE SENSORS IN DOCUMENT PROCESSING

Philip D. Klug, Westland, Mich., assignor to Unisys Corp, Blue Bell, Pa.

Continuation of Ser. No. 579,031, Dec. 18, 1995, abandoned. This application Apr. 22, 1997, Ser. No. 844,803

Int. Cl.^{6} B08B *1/00*

U.S. Cl. 134—6 **8 Claims**



1. A method of cleaning a document handling machine having a track with side walls along which documents are transported past sensors separated by a first distance and recessed away from the side walls of the track, this method comprising: taking a wand including a rigid handle with, at one end, a rigid elongate spacer bar carrying a pair of brushes spaced apart by said first distance and said brushes having bristles long enough to reach a face of said sensors, when the spacer bar is swept along the track.

5,837,064

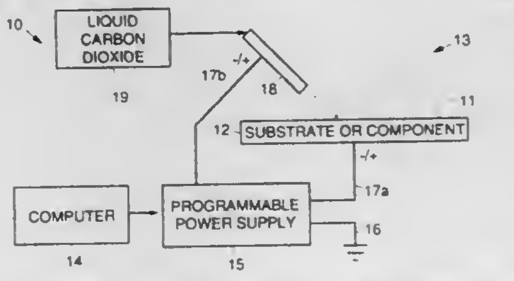
ELECTROSTATIC DISCHARGE PROTECTION OF STATIC SENSITIVE DEVICES CLEANED WITH CARBON DIOXIDE SPRAY

Charles W. Bowers, Torrance, Calif., assignor to Eco-Snow Systems, Inc., Livermore, Calif.

Filed Oct. 4, 1996, Ser. No. 821,960

Int. Cl.^{6} B08B *6/00*

U.S. Cl. 134—6 **3 Claims**



3. A method of cleaning a surface of a static-sensitive component using a cleaning spray device that generates a carbon dioxide cleaning spray, said method comprising:

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a) providing a cleaning spray device for generating a carbon dioxide cleaning spray;
b) connecting a static-sensitive component to a programmable power supply;
c) connecting the cleaning spray device to the programmable power supply;
d) cleaning the surface of the static-sensitive component using the carbon dioxide cleaning spray;
e) generating a first charge on the surface of the static-sensitive component as a result of cleaning with the carbon dioxide cleaning spray;
f) monitoring the first charge to determine an amount and polarity of the first charge that is generated by the carbon dioxide cleaning spray; and
g) applying a reverse bias to the cleaning spray device during cleaning of the static-sensitive component to produce a second charge which is equal in magnitude and opposite in polarity to the first charge, wherein said second charge neutralizes the first charge on the surface of the static-sensitive component.

5,837,065

CONCENTRATED ALL-PURPOSE LIGHT DUTY LIQUID CLEANING COMPOSITION AND METHOD OF USE

Kalliopi S. Haley, Byron Center, and Jeffrey J. Fisher, Grand Rapids, both of Mich., assignors to Amway Corporation, Mich.

Continuation of Ser. No. 216,682, Mar. 23, 1994, abandoned. This application Mar. 26, 1996, Ser. No. 622,257

Int. Cl.^{6} C11D *3/22;1/74;* **B08B** *1/00*

U.S. Cl. 134—42 **4 Claims**

1. A dilutable concentrated all-purpose homogeneous liquid cleaning composition free of builder salts comprising:

(a) from about 6% to about 16% of alkyl ethoxy carboxylates;
(b) from about 8% to about 18% of an alkylpolyglycoside;
(c) from about 25% to about 55% of a glycol ether solvent selected from the group consisting of ethylene glycol n-butyl ether, propylene glycol methyl ether, propylene glycol propyl ether, propylene glycol n-butyl ether and mixtures thereof;
(d) water.

5,837,066

COMPOSITION FOR MAKING GALLED JOINT, PROCESS OF MAKING AND PROCESS OF USING COMPOSITION

Geoffrey Robert Linzell, Hatfield, England, assignor to Ball Burnishing Machine Tools Limited, Hatfield, England

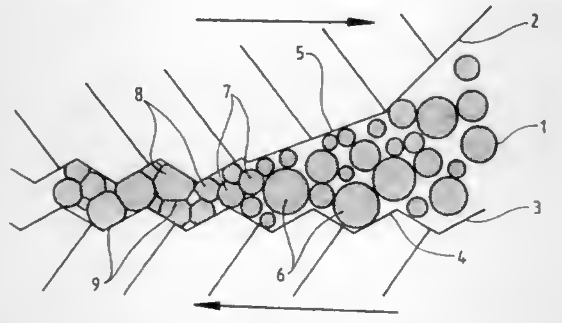
PCT No. PCT/GB94/00869, § 371 Date Oct. 30, 1995, § 102(e) Date Oct. 30, 1995, PCT Pub. No. WO94/25216, PCT Pub. Date Nov. 10, 1994

PCT Filed Apr. 25, 1994, Ser. No. 535,260

Claims priority, application United Kingdom, Apr. 30, 1993, 9309023

Int. Cl.^{6} B23K *20/12*

U.S. Cl. 148—22 **20 Claims**



1. A composition which is effective in the making of a galled joint between two metal members, and specifically in the filling of possible gaps in the joint prior to and during its formation, which composition comprises a multiplicity of small metal particles and a gall-enhancing material.

5,837,067

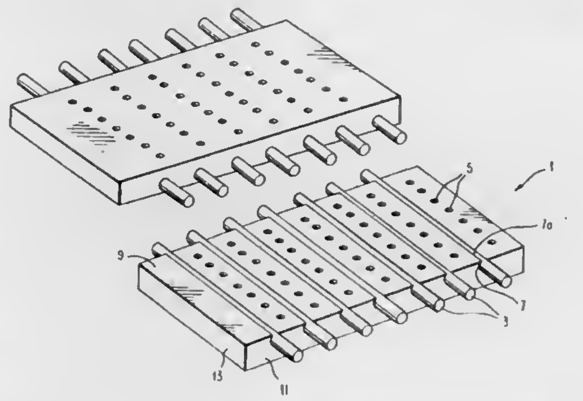
PRECISION FLUID HEAD TRANSPORT

Michael James Canestaro, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 7, 1995, Ser. No. 483,581

Int. Cl.^{6} B08B *1/02*

U.S. Cl. 134—32 **19 Claims**



1. A method of treating substrate, said method comprising the following steps:

providing a fluid treatment apparatus including:
  a first sheet of material having an upper surface, lower surface, and two side surfaces interconnecting said upper surface to said lower surface;
  a plurality of spaced apart drive rod member receiving passages extending through said first sheet from one of said side surfaces to the other of said side surfaces and through said upper surface of said first sheet, an inside surface of each of said drive rod member receiving passages providing a bearing surface for a drive rod member inserted therein;
  at least one fluid injection passage and at least one fluid drain passage through said first sheet of material from said upper surface to said lover surface between said drive rod member receiving passages of said first sheet;
  a drive rod member inserted into each of said drive rod member receiving passages such that said drive rod members are rotatably supported by said bearing surfaces and at least partially extending above said upper surface;
  a second sheet of material having an upper surface, lower surface, and two side surfaces interconnecting said upper surface to said lower surface;
  a plurality of spaced apart drive rod member receiving passages extending through said second sheet from one of said side surfaces to the other of said side surfaces and through said lower surface of said second sheet, an inside surface of each of said drive rod member receiving passages providing a bearing surface for a drive rod member inserted therein;
  at least one fluid injection passage and at least one fluid drain passage through said second sheet of material from said upper surface to said lover surface between said drive rod member receiving passages;
  a drive rod member inserted into each of said drive rod member receiving passages such that said drive rod members are rotatably supported by said bearing surfaces and at least partially extending below said lower surface;
  wherein said second sheet is arranged over said first sheet, such that said drive rod members of said first sheet and said second sheet face each other;
  a drive mechanism for rotating a plurality of said drive rod members;
  a fluid supply apparatus for supplying fluid to said fluid injector passages; and
  a fluid source;
causing a substrate to be treated to pass between said first sheet of material and said second sheet of material; and
causing a fluid to flow from said fluid source using said fluid supply apparatus through said fluid injector passages to treat said substrate.

5,837,068

MAGNETORESISTANCE EFFECT MATERIAL, PROCESS FOR PRODUCING THE SAME, AND MAGNETORESISTIVE ELEMENT

Kazuaki Fukamichi; Noriyuki Kataoka; Yutaka Shimada, and Hideki Takeda, all of Sendai, Japan, assignors to Kazuaki Fukamichi and YKK Corporation, Miyagi, Japan

Division of Ser. No. 580,476, Dec. 29, 1995, abandoned, which is a continuation of Ser. No. 282,745, Jul. 29, 1994, abandoned. This application Jan. 6, 1997, Ser. No. 778,920

Claims priority, application Japan, Aug. 3, 1993, 5-192372

Int. Cl.^{6} H01F *1/00*

U.S. Cl. 148—121 **2 Claims**

1. A process for producing a bulk magnetoresistance effect material, comprising the steps of:

casting a molten composition represented by the general formula $T_{100-A}M_A$, where T is at least one ferromagnetic element selected from the group consisting of Cu and Au, up to 25 atomic percent of T being substituted with at least one transition element other than Cu, Au, Co, Fe, or Ni, and M is at least one paramagnetic or diamagnetic element selected from the group consisting of Co, Fe, and Ni, up to 25 atomic percent of M being partially substituted with at least one transition element other than Cu, Au, Co, Fe, and Ni; wherein A is in the range, $1 \leqq A \leqq 50$ atomic percent; and
subjecting the resulting casting to homogenization, followed by heat treatment the homogenization being conducted at a temperature T_1 which is in the range: $(Tm-200)°K<T_1<(Tm-5)°K$, Tm being the melting point of the material, and for a time t_1 which is in the range: 0.5 hour$<t_1<$24 hours, and the heat treatment being conducted at a temperature T_2 which is in the range: $673°K \leqq T_2 \leqq 973°K$ for a time t_2 which is in the range: 5 minutes$\leqq t_2$24 hours;
the resulting magnetoresistance effect material having a thickness of 0.1 to 500 mm and containing precipitated ferromagnetic particles having a size of from about 1 to about 1000 nm.

5,837,069

CAST IRON COMPONENTS AND METHOD OF MAKING

Nicola Deards, Cheltenham, England, and Mark Gavin Taylor, Spring Lake, Mich., assignors to Weyburn-Bartel Inc., Grand Haven, Mich.

Filed Sep. 16, 1997, Ser. No. 932,139

Int. Cl.^{6} C22C *37/00;* **C21D** *5/00*

U.S. Cl. 148—323 **8 Claims**

1. A cast iron component having a wear-resistant layer formed on at least one surface portion thereof, said layer being rich in primary carbides, wherein the cast iron surrounding the carbides and in the remainder of the component has a structure which is substantially ausferritic.

5,837,070

ALUMINUM-SILICON ALLOY SHEET FOR USE IN MECHANICAL, AIRCRAFT AND SPACECRAFT CONSTRUCTION

Pierre Sainfort, Grenoble, and Denis Bechet, Saint-Egreve, both of France, assignors to Pechiney Rhenalu, Courbevoie, France

PCT No. PCT/FR95/00693, § 371 Date Jan. 22, 1996, § 102(e) Date Jan. 22, 1996, PCT Pub. No. WO95/34691, PCT Pub. Date Dec. 21, 1995

PCT Filed May 29, 1995, Ser. No. 537,864

Claims priority, application France, Jun. 13, 1994, 94 07405

Int. Cl.^{6} C22C *21/04*

U.S. Cl. 148—552 **11 Claims**

1. A high-strength aluminum alloy sheet which is produced by casting, hot rolling and optionally cold rolling followed by heat treating by solution heat treating, quenching and possibly tempering so as to obtain a yield strength $R_{0.2}$ greater than 320 MPa, for use in mechanical, naval, aircraft, and spacecraft construction, said sheet having a composition consisting essentially of, by weight:

Si: 6.5 to 11%
Mg: 0.5 to 1.0%
Cu: <0.8%
Fe: <0.3%
Mn: <0.5% and/or Cr: <0.5%
Sr: 0.008 to 0.025%
Ti: <0.02%
total other elements: <0.2%
the remainder being aluminum.

5,837,071

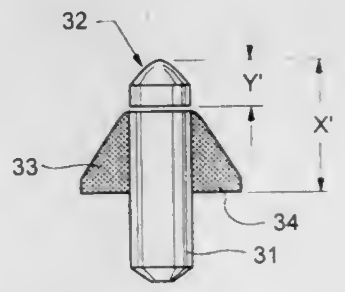
DIAMOND COATED CUTTING TOOL INSERT AND METHOD OF MAKING SAME

Jan Magnus Andersson, Bristol, Va., and Nathan Anderson, Pleasant Grove, Utah, assignors to Sandvik AB, Sandviken, Sweden, and Megadiamond, Provo, Utah

Continuation-in-part of Ser. No. 145,233, Nov. 3, 1993, abandoned. This application Jan. 29, 1996, Ser. No. 593,465

Int. Cl.^{6} C21D *9/22*

U.S. Cl. 148—528 **6 Claims**



1. A method of forming a cutting tool comprising:

brazing an insert to a tool body with a braze alloy by heating the insert and tool body to a temperature at which the braze alloy melts;
cooling the insert and tool body such that the braze alloy solidifies;
quenching the insert and tool body such that a martensitic transformation takes place;
tempering the insert and tool body; and
brazing a diamond enhanced tip to the insert at a brazing temperature while maintaining a temperature of the tool body at a lower temperature, said lower temperature being below a temperature at which softening of the tool body would take place.

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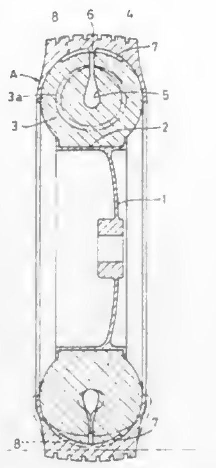
5,837,072
SOLID TIRE

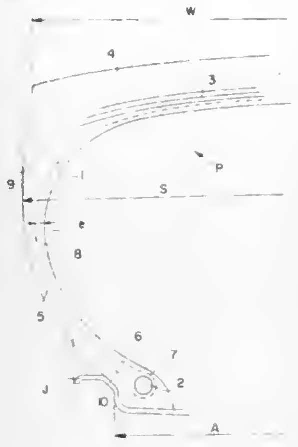
Muneyasu Fukunaga, Osaka, Japan, assignor to Fukunaga Engineering Co., Ltd., Osaka, Japan
Filed Dec. 13, 1996, Ser. No. 766,614
Claims priority, application Japan, Aug. 22, 1996, 8-221282; Nov. 6, 1996, 8-293866
Int. Cl.^{6} B60C *07/10*
U.S. Cl. 152—312 **16 Claims**



1. A solid tire comprising:
- an annular rubber member adapted to be mounted on a rim of a wheel; and
- a tire detachably fitted on an outer peripheral surface of said annular rubber member in order to cover only a part of said outer peripheral surface of said annular rubber member,
- said annular rubber member having an annular groove which is open along an outer circumferential location of said annular rubber member, wherein said annular groove has an enlarged inner circumferential end.

5,837,073
TIRE-RIM ASSEMBLY FOR HEAVY VEHICLES WITH SPECIFIED RIM FLANGE STRUCTURE

Georges Cauquot, Gerzat; Guy-Noël Lambert, Clermont-Ferrand, and Guy Ott, Chamalieres, all of France, assignors to Compagnie Générale des Etablissements Michelin—Michelin & Cie, Clermont-Ferrand Cedex, France
Filed Jan. 8, 1997, Ser. No. 778,241
Claims priority, application France, Jan. 15, 1996, 96 00519
Int. Cl.^{6} B60B *21/02;21/10;* **B60C** *3/04;9/00*
U.S. Cl. 152—158 **10 Claims**

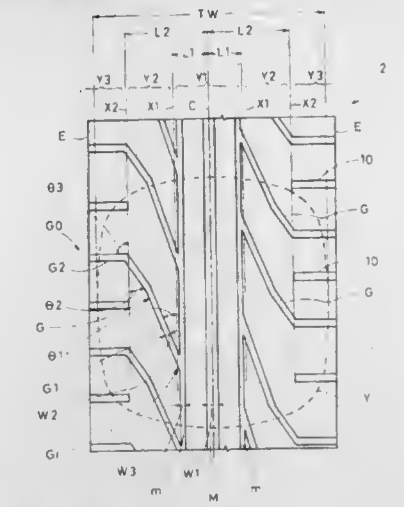


1. A rim J characterized by the fact that it has, on each side of the equatorial plane, axially to the outside of each seat (**20**), a flange R formed of a frustoconical portion (**23**) having a generatrix forming an angle of between 20° and 60° with a direction parallel to the axis of rotation, connected axially towards the inside to the rim seat (**20**) by an S-shaped portion and extended axially to the outside by a cylindrical portion (**25**), in turn extended by a curved end (**26**), said cylindrical portion (**25**) having an axial width L_{25} at least equal to the axial width L_{23} of the frustoconical portion (**23**), and the sum L_2 of these widths being between 10% and 20% of the axial width A of the rim, the height H of the said flange R being reduced with respect to the height of the flange of a standard rim of the same axial width A, and being a linear function of said width A, of the form H=a·A, with a being between 0.105 and 0.115.

3. A rolling assembly formed of a tire P with sidewalls (9), beads each with a bead core (2) therein, a crown region with a crown reinforcement (3) therein, a tread (4) and radial carcass reinforcement (1), the equilibrium curve of the thickness center line of which is tangent to the bead cores (2), and of a rim J comprising axially to the outside of each seat (20), a flange **R** formed of a frustoconical portion (23) having a generatrix forming an angle of between 20° and 60° with a direction parallel to the axis of rotation, which portion is connected axially towards the inside to the rim seat by an S-shaped portion and having axially to the outside a curved end (**26**), the rolling assembly characterized by the fact that, seen in meridian section,
- the tire P is mounted on rim J the axial width A of which is at most equal to 0.65 times the maximum axial width S of the tire inflated to its pressure of use,
- on both sides of the equatorial plane, the frustoconical portion (**23**) is extended axially to the outside by a cylindrical portion (**25**), itself extended by the curved end (**26**),
- the height H of said flange R is reduced as compared with the height of the flange of a standard rim of the same axial width A and is a linear function of said width A, of the form H=a·A, with a being between 0.105 and 0.115.

5,837,074
PNEUMATIC TIRE

Yoshiaki Uemura, Kobe, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo-ken, Japan
Filed Dec. 23, 1996, Ser. No. 771,923
Claims priority, application Japan, Dec. 29, 1995, 7-353094
Int. Cl.^{6} B60C *11/03;101/00;103/00;105/00*
U.S. Cl. 152—209 R **4 Claims**

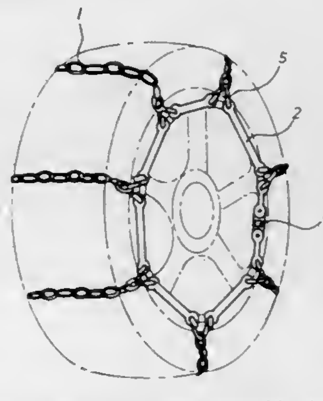


1. A pneumatic tire comprising
- a tread portion having a ground contacting width TW and a non-directional tread pattern the tread portion provided in a central region with a wide circumferential groove having a groove width W1 of from 0.05 to 0.15 times the ground contacting width and extending continuously in the tire circumferential direction,
- the central region defined between a pair of first circumferential lines each drawn on each side of the tire equator at an axial distance from the tire equator of 0.1 to 0.15 times the ground contacting width,

- the tread portion not provided in a middle regions and shoulder regions with a circumferential groove extending continuously in the tire circumferential direction, but being provided with a plurality of axial grooves each extending from the central region through one of the middle regions and one of the shoulder regions to one of tread edges, the axial grooves having a groove width of from 0.02 to 0.035 times the ground contacting width,
- the middle regions defined between the first circumferential lines and a pair of second circumferential lines each drawn on each side of the tire equator at an axial distance from the tire equator of from 0.325 to 0.375 times the ground contacting width,
- the shoulder regions each defined as extending axially outwardly from each of the second circumferential lines,
- the axial grooves intersecting the first circumferential lines at an angle of from 10 to 25 degrees,
- the axial grooves intersecting the second circumferential lines at an angle of from 30 to 45 degrees,
- the tread portion further provided in the central region with a pair of narrow circumferential grooves each disposed on each side of the wide circumferential groove, the narrow circumferential grooves having a groove width of less than 0.05 times the ground contacting width, and the axially inner ends of the axial grooves connected to the narrow circumferential grooves.

5,837,075
ANTI-SKID CHAIN

Yang-Cheng Fu, 3F., No.18, Lane 24, Sec.3, Jen-Ai Rd., Taipei City, Taiwan
Filed Oct. 16, 1996, Ser. No. 731,481
Int. Cl.^{6} B60C *27/06*
U.S. Cl. 152—213 A **1 Claim**



1. An anti-skid chain for a wheel assembly that includes a tire having a peripheral tread, which chain comprises:
- a) a plurality of chain units for positioning in a spaced parallel array around the peripheral tread of the tire;
- b) a pair of substantially circular connection assemblies for positioning on opposite sides of the wheel assembly for connecting the chain units together and securing the chain units against the peripheral tread of the tire;
- c) each connecting assembly including a plurality of connection bars, each connection bar having a first hole formed in each of a pair of opposite ends of the bar, a plurality of coupling members, each coupling member having a second hole formed in each of a pair of opposite ends of the member, the second holes of each coupling member being aligned with the first holes of an adjacent pair of connection bars, a plurality of hook bars, each hook bar including a pair of hooked ends engaged through the aligned first and second holes of each coupling member and its associated connector bars, and each chain unit having a first end connected to a hook bar on one side of the wheel assembly and a second end connected to a hook bar on the opposite side of the wheel assembly;
- d) one connection assembly including a locking means at a connection bar for permitting the connection assembly to open during attachment of the chain to and removal of the chain from the wheel assembly; and
- e) the other connection assembly including means for extending the connection bars and tightening the chain units around the peripheral tread of the tire.

5,837,076
PROTECTIVE COATING ON TIRE SIDEWALLS AND METHOD FOR PROTECTING TIRE SIDEWALLS

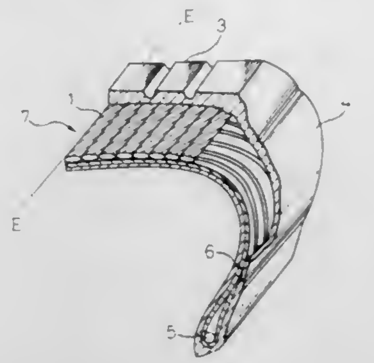
Mortimer Joseph Huber, White Bear Lake, Minn.; Bharat Kanchanlal Kansupada, and Fredrick Lewis Magnus, both of Mogadore, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Sep. 18, 1997, Ser. No. 933,453
Int. Cl.^{6} B60C *13/00*
U.S. Cl. 152—524 **9 Claims**

1. A pneumatic tire composed of cured rubber of which at least a portion of said cured rubber contains a pigment in the absence of carbon black wherein the surface of said portion has a coating thereon comprising: greater than about 15 percent by weight polyvinyl alcohol; greater than about 65 percent by weight polyvinyl acetate; greater than about 0.5 percent by weight plasticizer; and a sufficient amount of a silicone emulsion for increasing the scuff resistance of the coating.

4. A method for protecting the sidewall on a pneumatic tire from staining and scuffing, said method comprising applying to a pneumatic tire sidewall an aqueous composition including polyvinyl alcohol and polyvinyl acetate, wherein the weight ratio of polyvinyl alcohol to polyvinyl acetate is provided between about 15:85 to about 40:60; and a silicone emulsion in an amount sufficient to provide increased scuff resistance for a coating prepared from the composition.

5,837,077
PNEUMATIC VEHICLE TIRE HAVING BELT WOUND FROM FLATTENED TUBULAR TAPE

Kazuyuki Kabe; Shuji Takahashi, and Tomohiko Kogure, all of Hiratsuka, Japan, assignors to The Yokohama Rubber, Co., Ltd., Tokyo, Japan
Filed Aug. 13, 1996, Ser. No. 693,671
Claims priority, application Japan, Aug. 18, 1995, 7-210795; Oct. 24, 1995, 7-275648
Int. Cl.^{6} B60C *9/18*
U.S. Cl. 152—527 **11 Claims**



1. In a pneumatic tire having a carcass layer, a tread portion and a belt layer annularly arranged around an outer circumferential surface of the carcass layer in the tread portion of the tire, the improvement wherein said belt layer comprises a tubular member that has been flattened in a longitudinal direction to form a continuous tape having a laterally flattened tubular cross-section, said continuous tape including a core member comprising a rubber sheet that has been inserted inside the laterally flattened tubular cross-section of the tape along the longitudinal direction thereof and being annularly wound continuously around the outer circum-

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ferential surface of the carcass layer a plurality of times in a spiral to form a substantially continuous belt layer in the width direction, wherein said tubular member comprises a plurality of mutually parallel reinforcement cords that have been embedded in a matrix and wound back and forth in a spiral at an angle of 10° to 45° with respect to the longitudinal direction of the continuous tape to form the tubular member.

5,837,078

VOC-FREE PROTECTIVE COATING

Darren E. Lowe, 5337 Tusa Dr., Marrero, La. 70072, assignor to Molecular Architects, and Darren E. Lowe, both of Marrero, La.

Continuation-in-part of Ser. No. 866,685, May 30, 1997. This application Jun. 6, 1997, Ser. No. 870,703

Int. Cl.⁶ C08L *91/06;* **C09G** *1/04*

U.S. Cl. 106—10 13 Claims

1. A water-based wax emulsion composition consisting essentially of:

(a) 5–80 parts by volume beeswax;
(b) 0–80 parts by volume paraffin wax;
(c) 1–3 parts by volume ammonia;
(d) 150–175 parts by volume water.

5,837,079

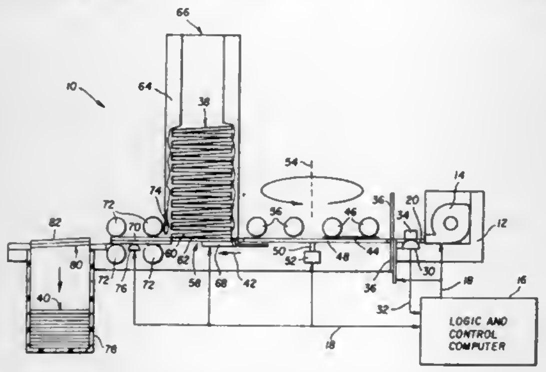
FILM ORIENTING SLIDE MOUNTER AND METHOD

David L. Patton, Webster; Daniel M. Pagano; Dale F McIntyre, both of Honeoye Falls, and Edward Weissberger, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 18, 1997, Ser. No. 896,374

Int. Cl.⁶ B32B *31/00*

U.S. Cl. 156—64 19 Claims



15. A method for generating a film slide comprising the steps of:

(a) detecting the orientation of a film segment;
(b) orienting the film segment into a predetermined orientation;
(c) mounting the oriented film segment into a slide mount; and
(d) magnetically writing the orientation of the film segment onto the slide mount in a region of magnetic material disposed upon the slide mount.

5,837,080

METHOD FOR MANUFACTURING A BELT FOR A LONG NIP PRESS

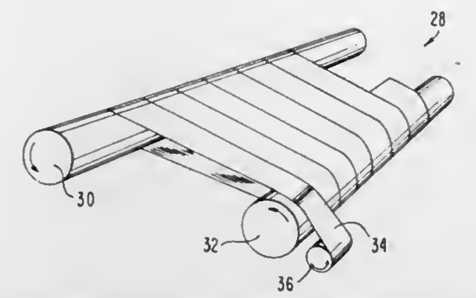
Erik Wilhelm Grondahl, Velp, Netherlands, assignor to Albany International Corp., Albany, N.Y.

Division of Ser. No. 524,470, Sep. 7, 1995. This application Aug. 6, 1996, Ser. No. 693,010

Int. Cl.⁶ B29D *29/00;* **F16G** *1/14;1/26*

U.S. Cl. 156—73.4 27 Claims

1. A method for manufacturing a belt for a long nip press for dewatering a fibrous web comprising the steps of:



a) manufacturing a prepared structure strip having a preselected width;
b) spirally winding said prepared structure strip in a plurality of non-overlapping turns;
c) abutting each turn of said prepared structure strip against that previously wound;
d) joining each turn of said prepared structure strip directly to that previously wound to form a base of width greater than said preselected width of said prepared structure strip and to provide a base in the form of an endless loop having an inner surface, an outer surface, a longitudinal direction and a transverse direction;
e) coating at least one of said inner and outer surfaces of said base with a polymeric resin to cover said base and to form a layer of said polymeric resin thereon to provide said belt with a desired thickness; and

curing said polymeric resin.

5,837,081

METHOD FOR MAKING A CARBON-CARBON COMPOSITE

Jyh-Ming Ting, Fairborn, and Max Laverne Lake, Yellow Springs, both of Ohio, assignors to Applied Sciences, Inc., Cedarville, Ohio

Continuation-in-part of Ser. No. 332,903, Nov. 1, 1994, Pat. No. 5,604,037, which is a division of Ser. No. 44,223, Apr. 7, 1993, Pat. No. 5,389,400. This application Mar. 13, 1996, Ser. No. 614,993

Int. Cl.⁶ B32B *31/12;* **C23C** *16/26*

U.S. Cl. 156—89.26 11 Claims

1. A method for making a carbon-carbon composite comprising the steps of:

providing a preform including a plurality of mats, each of said mats including interwoven, graphitized vapor grown carbon fibers having randomly spaced junctions between individual fibers, said preform having interstices therein; and

densifying said preform by depositing pyrolytic carbon into the interstices of said preform to produce a carbon-carbon composite,

wherein said vapor grown carbon fibers are interwoven to have said randomly spaced junctions between individual fibers during in situ growth of said vapor grown carbon fibers.

5,837,082

METHOD OF MANUFACTURING PRISMS, PARTICULARLY MICROPRISMS AND BEAM-SPLITTING PRISMS

Günther Gräfe, Siedlung 16, Camburg, Germany, 07774

PCT No. PCT/DE95/01081, § 371 Date Jul. 25, 1996, § 102(e) Date Jul. 25, 1996, PCT Pub. No. WO96/05525, PCT Pub. Date Feb. 22, 1996

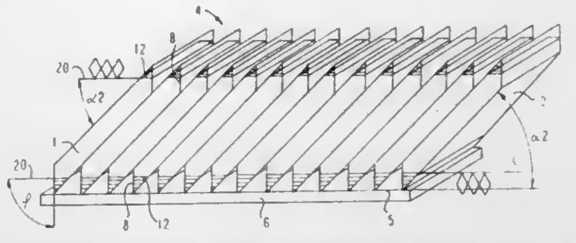
PCT Filed Aug. 17, 1995, Ser. No. 628,670

Claims priority, application Germany, Aug. 17, 1994, 44 29 080.2

Int. Cl.⁶ B32B *31/00*

U.S. Cl. 156—154 19 Claims

1. A method of manufacturing prisms, particularly microprisms and beam-splitting prisms, from rectangular plane-parallel plates, including the steps of:



a) producing rectangular plates, each plate having plane-parallel plate surfaces, a support face, and a cover face;
b) stacking a plurality of these plates on top of each other on their plate surfaces, wherein the plates are aligned on at least two of their side faces and on their plate surfaces to form a rectangular block;
c) placing all plates of the block into an inclined arrangement plate, such that each of the plates of the block lie with a support face edge on said plane alignment plate, and that all plate surfaces assume a predetermined first angle relative to the plane surface of the alignment plate, and fixing the plates in their position of relative displacement;
d) cementing a carrier body onto several blocks with inclined plates that have been produced according to steps a) to c), wherein the carrier body is cemented to the stepped cover faces of the inclined plates;
e) grinding and polishing the projecting support faces of the exposed side of the blocks for producing optically effective projecting parts;
f) repeating steps c) through e) several times with inclinations differing from said first angle, and repeating step e) to produce further optically effective projecting parts by grinding and polishing;
g) rearranging the plates of the blocks such that all plate surfaces are arranged at a predetermined angle with respect to the plane surface of an auxiliary plate;
h) cementing the auxiliary plate to the blocks at the side with the optically effective projecting parts, wherein the projecting parts of the individual plates are placed on the surface of the planar auxiliary plate;
i) cutting a plate of prism strips out of the blocks by sawing the blocks in a plane parallel to the plane of the auxiliary plate, the plane of cutting within the blocks being arranged such that its distance to the projecting parts of the optically effective surfaces on the auxiliary plate corresponds to the height of the prisms;
j) cutting individual prisms by sawing the prism strips with cuts that are parallel to each other at a predetermined angle relative to the longitudinal direction of the prism strips; and
k) detaching the cut prisms from the auxiliary plate.

5,837,083

METHOD OF FORMING A RIGID TUBULAR BODY

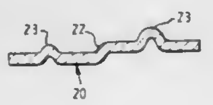
John Peter Booth, 36 Moorside Road, Honley, Huddersfield, West Yorkshire, England

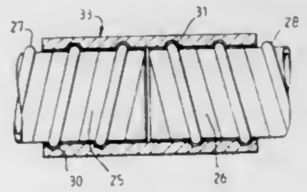
Continuation-in-part of Ser. No. 288,466, Aug. 10, 1994, abandoned. This application Aug. 16, 1996, Ser. No. 698,721

Claims priority, application United Kingdom, Aug. 12, 1993, 9316776

Int. Cl.⁶ B29C *63/08;65/56;* **B32B** *31/16*

U.S. Cl. 156—158 21 Claims





1. A method of forming a rigid tubular body, comprising:

(a) providing an elongated strip of material having opposing longitudinal side edges;
(b) forming at least one step in the strip extending longitudinally from one end thereof to the opposite end thereof, each step forming first and second integral and offset tiers collectively spanning the entire width of the strip, and at least one of the first and second tiers having a thickness corresponding generally to the height of the step;
(c) crimping at least one of the first and second tiers to form a raised longitudinal rib and opposing tier sections integrally formed with the rib, and said tier sections residing substantially within the same plane;
(d) helically winding the strip such that the tier forming one side edge of the strip overlaps the tier forming the opposite side edge of the strip, and such that the rib forms a helically-extending internal screw thread on the tubular body; and
(e) attaching a coupling at one end of the tubular body for connecting the tubular body together with a second tubular body in a series, said coupling having an external screw thread adapted for mating with the internal screw thread of the first tubular body.

5,837,084

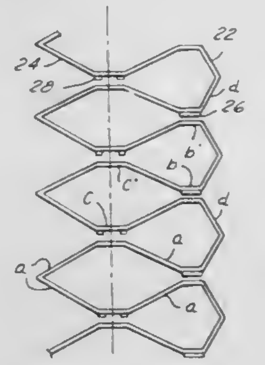
METHOD OF MAKING A SINGLE-CELL HONEYCOMB FABRIC STRUCTURE

James L. Barss, Porter Corners, N.Y., assignor to Comfortex Corporation, Watervliet, N.Y.

Filed Sep. 14, 1995, Ser. No. 528,456

Int. Cl.⁶ B32B *31/18;3/12*

U.S. Cl. 156—197 7 Claims



1. A method of making a cellular structure from a single continuous length of foldable material having a first face and a second face, said method comprising the steps of:

coating portions of both faces of the material with an adhesive in a predetermined pattern, said pattern including narrow stripes extending transversely to the length of the material;

folding the material upon itself in alternatingly opposite directions along fold lines extending transversely to the length of the material, said fold lines being positioned relative to said pattern to provide alternately folded lengths of the material separated by transverse folds, wherein adjacent pairs of alternately folded lengths of the material include one of said adhesive stripes on each face of the material, and wherein each adhesive stripe on the first face of the material is positioned substantially closer to the nearest fold line than each adhesive stripe on the second face of the material;

accumulating a stack of alternatingly folded lengths of the material, wherein alternating folds define a first side and a second side of said stack, respectively, and wherein alternatingly folded lengths of the material are joined together along said adhesive stripes to define a plurality of tubular cells on said first and second side of the stack, said cells extending transversely to the length of the material, each cell including one fold, the cells on the first side of said stack being substantially smaller than the cells on the second side of said stack; and

removing alternatingly folded material from the first side of the stack adjacent the folds therein to thereby eliminate cells on

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said first side of the stack, whereby the remaining cells on the second side of the stack form the cellular structure.

5,837,085

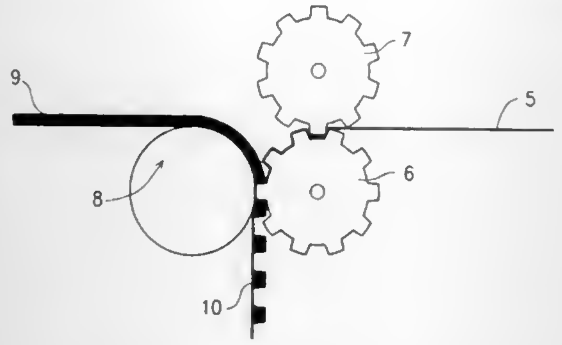
METHOD OF MAKING A TOOTHED BELT WITH A REINFORCED FABRIC COVERING

Te-Cheng Chen, Chung-Li; Mao-Song Lee, Hsinchu; Ruey-Sheng Shih, Hsinchu Hsien, and Huo-Sheng Liao, Hsinchu, all of Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Apr. 16, 1996, Ser. No. 633,230

Int. Cl.^{6} B31F *1/28;* **B32B** *31/08;* **F16S** *5/08*

U.S. Cl. 156—138 **9 Claims**



1. A method of making a toothed belt comprising the steps of:
(a) guiding a strip of fabric to pass through a thermosetting resin to soak the fabric with said thermosetting resin and form a soaked fabric;
(b) guiding said soaked fabric to pass through a pair of heated and toothed rollers having a plurality of outer teeth wherein said outer teeth are meshed together in a conjugated way to harden the resin in said soaked fabric and to form a series of toothed grooves on said soaked fabric simultaneously;
(c) keeping said soaked fabric sticking on one of said toothed rollers located at a downstream side of said soaked fabric and simultaneously guiding said soaked fabric to pass by a rotating plane roller in a manner that said soaked fabric moves in said downstream direction with guidance of said rotating plane roller, said rotating plane roller having a smooth outer peripheral surface and being disposed at a distance substantially equal to the thickness of said soaked fabric with said toothed rollers located at said downstream side of said soaked fabric, and simultaneously feeding a rubber material into a space between the outer peripheral surface of said rotating plane roller and said soaked fabric to fill the toothed grooves of said soaked fabric with said rubber material and coat a surface of said soaked fabric with a thin layer of said rubber material;
(d) wrapping said soaked fabric together with said rubber material thereon onto a cylindrical mold having corresponding toothed grooves formed on an outer peripheral surface and gluing two ends of said soaked fabric together to loop around the cylindrical mold in such a manner that the surface of said soaked fabric having said rubber material coated thereon faces outward and the toothed grooves formed in each said soaked fabric mesh together with the corresponding toothed grooves of the cylindrical mold;
(e) covering said strip of fabric together with said rubber material thereon with a cord and a rubber sheet; and
(f) vulcanizing said rubber material on said strip of fabric to form a toothed belt.

5,837,086

METHOD OF INJECTION-MOULDING PLASTICS FOR ELECTRICAL SHIELDING CASINGS

Karl-Erik Leeb, Lillebo, and Lars Persson, Vinslov, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

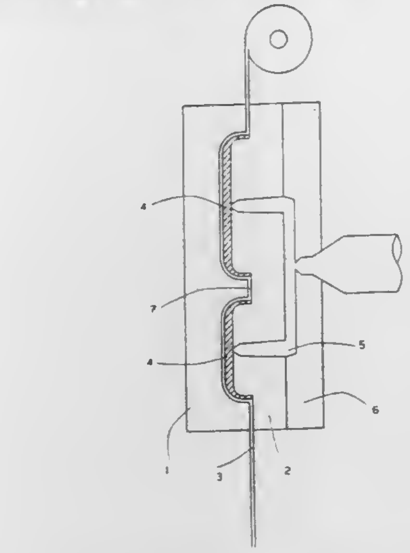
PCT No. PCT/SE95/00688, § 371 Date Dec. 13, 1996, § 102(e) Date Dec. 13, 1996, PCT Pub. No. WO95/34423, PCT Pub. Date Dec. 21, 1995

PCT Filed Jun. 8, 1995, Ser. No. 750,619

Claims priority, application Sweden, Jun. 14, 1994, 9402084

Int. Cl.^{6} H05K *13/00*

U.S. Cl. 156—245 **13 Claims**



1. A method of manufacturing a plastic electric shielding casing for at least partially enclosing electrical equipment, said method comprising the steps of:
- enclosing in an injection-moulding tool a foil laminate, the foil laminate including two plastic layers and an intermediate metal foil;
- injecting a plastic material into the tool onto one of the plastic layers of the foil laminate, so that the foil laminate is deep-drawn into the tool, the plastic material forming a plastic structure with at least one of said plastic layers adhering to said plastic structure so as to form a plastic element which includes the foil laminate and the plastic structure, wherein a certain part of the plastic element includes only the foil laminate; and
- attaching the certain part of the plastic element to one of a circuit board containing the electrical equipment and another foil laminate in another part of the shielding casing.

5,837,087

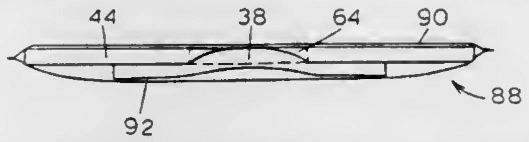
PROCESS FOR MAKING AND INCORPORATING ACQUISITION/DISTRIBUTION INSERTS INTO ABSORBENT CORES

Nicholas Albert Ahr, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 341,503, Nov. 17, 1994, Pat. No. 5,591,297. This application Aug. 13, 1996, Ser. No. 693,679

Int. Cl.^{6} B32B *31/00*

U.S. Cl. 156—250 **3 Claims**



1. A process of assembling an absorbent article formed of an absorbent core member and a distribution member, the core member having a window opening therein, comprising the steps of:

a) placing a series of one of said members on a moveable conveyer in spaced relation;
b) rotating a drum in timed relation with movement of said members on said conveyer, said drum being located above said conveyer and a series of the other of said members being located on a periphery of said drum, said timed relation being such that said other of said members are deposited onto said members while said members are on said conveyer with at least a portion of said distribution member adjacent said window;
c) depositing said other of the members from said drum onto said members such that at least a portion of said distribution member is adjacent said window;
d) compressing a portion of said distribution member into said window to combine said members; and
e) disposing said combined members between a liquid pervious topsheet and a liquid impervious backsheet.

5,837,088

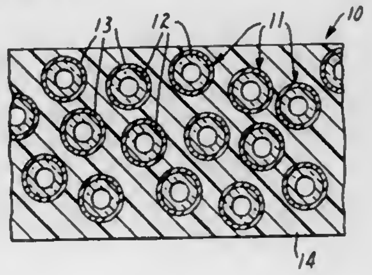
RADIO FREQUENCY INDUCTION HEATABLE COMPOSITIONS

Charlotte M. Palmgren; Craig S. Chamberlain, and Brian J. Fish, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 156,406, Nov. 19, 1993, abandoned, which is a continuation of Ser. No. 668,974, Mar. 13, 1991, abandoned. This application May 26, 1995, Ser. No. 452,320

Int. Cl.^{6} B32B *5/16;* **B05D** *5/00*

U.S. Cl. 156—272.4 **14 Claims**



1. Method of heating a composition, comprising the steps of:
(a) providing the composition comprising (a) a susceptor having the capability of absorbing radio frequency magnetic energy, said susceptor comprising a non-magnetic particle bearing a magnetic coating capable of absorbing magnetically coupled radio frequency energy; and (b) a matrix substantially non-reflective of radio frequency energy; and
(b) subjecting said composition to magnetically coupled radio frequency energy.

5,837,089

HEAT REACTIVATABLE ADHESIVE

Glenn Robert Magrum, Ashland, Ohio, assignor to Ashland Inc., Russell, Ky.

Continuation-in-part of Ser. No. 442,087, May 16, 1995, abandoned, which is a continuation of Ser. No. 180,937, Jan. 12, 1994, abandoned. This application Apr. 22, 1996, Ser. No. 636,080

Int. Cl.^{6} C09J *123/04*

U.S. Cl. 156—275.5 **7 Claims**

1. A method of making a heat stable laminate of a flexible vinyl substrate and a solid substrate adhered together by the dried residue of a heat activatable organic solvent-free adhesive composition comprising the mixture of:
a) styrene/butyl acrylate/methyl methacrylate/hydroxyethyl acrylate copolymer emulsion,
b) ethylene/vinyl acetate copolymer emulsion, and
c) wax,
comprising the steps of:
i) applying said adhesive composition using a roll coater onto a vinyl substrate,
ii) drying said coated vinyl substrate in the absence of a release liner,
iii) rolling said dried coated vinyl substrate,
iv) shipping said rolled dried coated vinyl substrate to the laminator customer,
v) unrolling said substrate into juxtaposition above a solid substrate, and
vi) applying pressure and heat of greater than 71° C. to heat activate said adhesive, whereby a laminate is formed having resistance to heat of greater than 190° F. (88° C.), said laminate failing by tearing said substrate when tested.

5,837,090

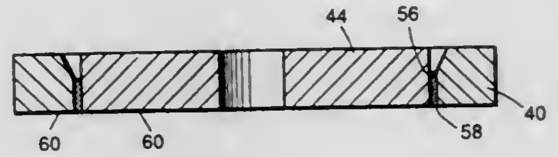
PRECISION ALIGNING AND JOINING OF TWO ARTICLES USING A FLOWABLE ADHESIVE

John F. Binnie, Jr.; Keith W. Everill, and Roderick M. Harris, all of Tucson, Ariz., assignors to Raytheon Company, Los Angeles, Calif.

Filed Dec. 8, 1994, Ser. No. 353,851

Int. Cl.^{6} B29C *65/54*

U.S. Cl. 156—294 **15 Claims**



1. A method of aligning and joining a first article and a second article in a preselected relationship to each other, comprising the steps of:
- providing a first article having
  - a first local length, and
  - a bore therethrough with an inner diameter;
- providing a second article having
  - the same first local length as the first article, and
  - an outer diameter that fits within the inner diameter of the bore with a clearance therebetween;
- forming a chamfer at one end of the clearance of at least one of the first article and the second article, the volume of a chamfer-bounded region between the first article and the second article being no less than the volume of an unchamfered clearance region between the first article and the second article;
- assembling the second article into the bore of the first article, wherein the step of assembling includes the steps of
  - providing assembly tooling operable to hold the first and second articles in the preselected relationship to each other, and
  - assembling the first and second articles together using the assembly tooling to hold the first and second articles in the preselected relationship to each other; thereafter
- placing a quantity of a thermosetting adhesive into the chamfer-bounded region; thereafter
- heating the assembly of first article and second article to a flow temperature at which the adhesive flows into and completely fills the unchamfered clearance region but does not flow out a back side of the clearance region and does not cure in the time required for the adhesive to flow and fill the unchamfered clearance region; and thereafter
- curing the adhesive.

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5,837,091
METHOD FOR THERMAL ADHESION OF ACRYLIC PLASTIC PARTS

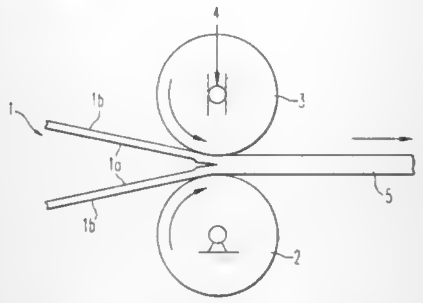
Alexander Theil, Reinheim; Karl-Heinz Fehring, Stockstadt, and Manfred Rimpl, Riedstadt, all of Germany, assignors to Roehm GmbH Chemische Fabrik, Darmstadt, Germany

Filed Nov. 3, 1995, Ser. No. 552,933

Claims priority, application Germany, Nov. 4, 1994, 44 39 419.5

Int. Cl.⁶ B32B *31/20*

U.S. Cl. 156—308.2 **13 Claims**



1. A method for the production of flat laminates from polymethacrylate plastic, by thermal adhesion of at least two parts of polymethacrylate plastic heated at their surface, comprising

(i) heating an adhesion side of at least two parts of polymethacrylate plastic, to a surface temperature of 130° to 200° C., while maintaining the original shape of said polymethacrylate plastic during the heating phase,

(ii) pressing directly together said adhesion sides of said at least two parts of polymethacrylate plastic between a pair of rollers, by means of which a pressure force can be exerted, while applying a pressure force of between 10–500 N, at a feed velocity being between 5 and 200 mm/s

wherein at least one roller of said pair of rollers is mounted in a movable manner.

5,837,092
ADHESIVE PRIMER

Richard Grieves, Hillbrow, and Kimleigh George Montague Pratley, Krugersdorp, both of South Africa, assignors to Pratley Investments (Proprietary) Limited, South Africa

Continuation of Ser. No. 619,021, Nov. 28, 1990, abandoned. This application Feb. 16, 1993, Ser. No. 18,356

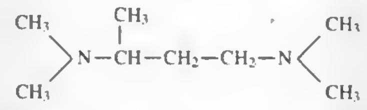
Claims priority, application South Africa, Aug. 27, 1990, 90/6778

Int. Cl.⁶ C09J *5/04*

U.S. Cl. 156—314 **1 Claim**

1. A method of bonding a first plastic substrate which is conventionally difficult to bond comprised of a plastic material selected from the group consisting of a plastic material with a low surface energy and a highly crystalline plastic material to a second plastic substrate with cyanoacrylate adhesive comprising the steps of:

(i) treating the first plastic substrate or the second plastic substrate or both the first plastic substrate and the second plastic substrate with a primer for the promotion of bonding of the two plastic substrates with the cyanoacrylate adhesive, which primer is a compound of the formula:



$$\mathrm{(CH_3)_2N{-}\underset{\displaystyle CH_3}{CH}{-}CH_2{-}CH_2{-}N(CH_3)_2}$$

(ii) applying the cyanoacrylate adhesive to the first plastic substrate or to the second plastic substrate or to both the first plastic substrate and the second plastic substrate; and

(iii) adhering the first plastic substrate to the second plastic substrate.

5,837,093
APPARATUS FOR PERFORMING PLAIN ETCHING TREATMENT

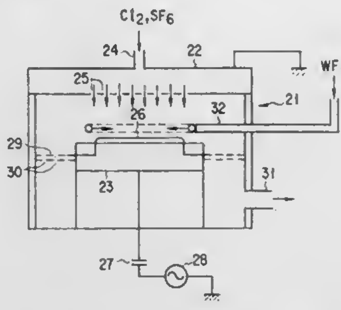
Makoto Hasegawa, Kawasaki, and Atsuo Sanda, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 4,413, Jan. 14, 1993, Pat. No. 5,415,728. This application Feb. 6, 1995, Ser. No. 383,990

Claims priority, application Japan, Jan. 17, 1992, 4-6605

Int. Cl.⁶ C23F *1/02*

U.S. Cl. 156—345 **11 Claims**



1. A dry etching apparatus for dry etching a workpiece, the apparatus comprising:

means for holding a reactive etching gas;

a first electrode located within the gas-holding means, for supporting the

a second electrode located within the gas-holding means and spaced from the first electrode;

means for supplying high-frequency power to the first electrode, thereby to convert the reactive etching gas into a plasma in the space between the first and second electrodes; and

means for supplying a reaction product gas, wherein the means for supplying a reaction product gas surrounds the first electrode.

5,837,094
SEMICONDUCTOR MANUFACTURING APPARATUS

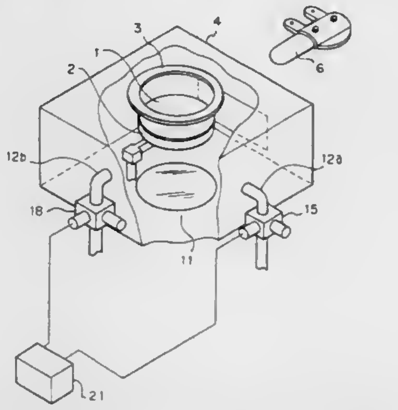
Hisashi Tsukazaki; Makoto Doi; Shigemi Miyazaki, and Akira Oohisa, all of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 12, 1997, Ser. No. 798,117

Claims priority, application Japan, Mar. 25, 1996, 8-068452

Int. Cl.⁶ C23C *16/00*

U.S. Cl. 156—345 **7 Claims**



1. A semiconductor manufacturing apparatus comprising:

a process chamber in which a semiconductor wafer is accommodated, a thin film is deposited on the semiconductor wafer, and the deposited thin film is etched by plasma or an internally adhered deposit is cleaned by plasma thereby generating a number of particles;

a plurality of exhaust pipes mounted to a plurality of positions in the process chamber;

a plurality of particle monitors respectively mounted to said plurality of exhaust pipes to count the number of particles being generated at a time of the plasma etching or the plasma cleaning;

a signal processor connected to said plurality of particles monitors to perform a calculation to find a position of particle generation based on particle generation time detection signals generated and transmitted from the plurality of particle monitors; and

an end point detection controller connected to said plurality of particles monitors to observe the number of particles counted by the plurality of particle monitors in time sequence so as to detect an end point time of the plasma etching or the plasma cleaning, and control an operation in which the plasma etching or the plasma cleaning is terminated.

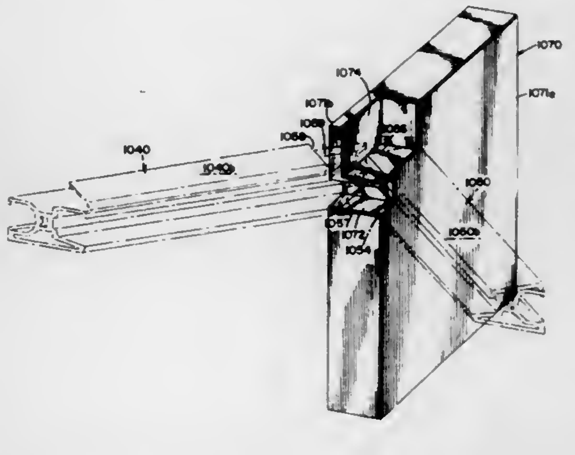
5,837,095
HEATING PLATEN FOR JOINING FRAMING MEMBERS

Todd W. Bruchu, Lake Elmo, and Scott R. Beske, Stillwater, both of Minn., assignors to Andersen Corporation, Bayport, Minn.

Division of Ser. No. 325,696, Oct. 19, 1994, Pat. No. 5,603,585, which is a continuation-in-part of Ser. No. 243,981, May 17, 1994, abandoned. This application Dec. 20, 1996, Ser. No. 770,864

Int. Cl.⁶ B29C *35/02;65/02*

U.S. Cl. 156—499 **2 Claims**



1. A heating platen for use in joining adjacent ends of first and second framing members, each having first and second sides and a mating portion disposed at an end of the framing member, wherein each mating portion is formed of a heat weldable material and includes a mating surface defined thereon for mating with a mating surface defined on the other mating portion, the first framing member including a flange disposed on the first side of the first framing member at said end thereof, and the second framing member including a recess defined on the first side of the second framing member at said end thereof, the recess for receiving the flange on the first framing member, the heating platen comprising first and second opposing heating surfaces for contacting the mating surfaces of the first and second framing members, respectively, wherein the first heating surface has a recess defined thereon for receiving the flange on the first framing member; whereby the flange does not contact the heating surfaces while the heating platen applies heat to the mating surfaces.

5,837,096
FALLING FILM EVAPORATOR

Olof Fagerlind, Foreboda, Sweden; Juhani Hoikkala, Varkaus, Finland; Krister Sannholm, Espoo, Finland; Ake Schonberg, Varkaus, Finland, and Erik Agren, Esbo, Finland, assignors to Ahlstrom Machinery Oy, Noormarkku, Finland

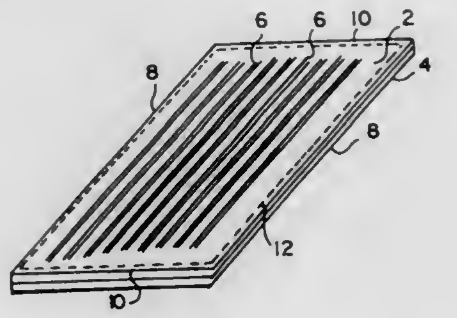
PCT No. PCT/FI95/00059, § 371 Date Jan. 23, 1996, § 102(e) Date Jan. 23, 1996, PCT Pub. No. WO95/23015, PCT Pub. Date Aug. 31, 1995

PCT Filed Feb. 13, 1995, Ser. No. 530,118

Claims priority, application Finland, Feb. 25, 1994, 940887

Int. Cl.⁶ F28B *9/04;* **F28D** *3/04;* **F28F** *3/12*

U.S. Cl. 159—13.3 **14 Claims**



1. A method of making a falling film evaporator, and evaporating a liquid using a falling film evaporator comprising a shell with a plurality of evaporator elements vertically disposed therein, each evaporator element comprising two substantially rectangular metal heat transfer plates having first and second vertical side edges and a plurality of seams connecting the plates together at spaced locations substantially parallel to the side edges and forming tube-like flow channels within the elements, the plates having outer major surfaces and defining an interior; said method comprising the steps of:

(a) welding together the two substantially rectangular metal heat transfer plates for forming each evaporator element, to form a plurality of seams substantially parallel to each other and to the plate side edges and defining channels between the seams;

(b) placing the metal heat transfer plates between support plates of the same shape and at least the same size as the heat transfer plates, the support plates comprising longitudinal protrusions the length and width of which correspond to the dimensions of the seams of the metal heat transfer plates, and the support plates being positioned so that the longitudinal protrusions engage the seams;

(c) inflating the channels between the seams to make tube-like flow channels by forcing between the seams liquid under a pressure sufficient to slightly exceed the yield limit of the metal heat transfer plates;

(d) installing the evaporator elements in the shell so that the tube-like flow channels are substantially vertical;

(e) feeding liquid to be evaporated into the shell so that it flows down the outer surfaces of the metal evaporator elements as a thin film;

(f) feeding steam into the interiors of the evaporator elements so that the steam flows through the tube-like flow channels of the evaporator elements from a top portion to a bottom portion thereof; and

(g) discharging steam and any formed condensate from adjacent the bottom portions of the evaporator elements.

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5,837,097
DEINKING AGENT FOR REGENERATING WASTE PAPER AND METHOD FOR DEINKING WASTE PAPER

Junta Egawa, Chiba; Yoko Takubo, Tokyo, and Kohji Masamizu, Kanagawa, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Aug. 23, 1996, Ser. No. 701,955

Claims priority, application Japan, Dec. 20, 1995, 7-331683

Int. Cl.⁶ D21C *5/02*

U.S. Cl. 162—5 **10 Claims**

1. A method of deinking a waste paper comprising converting said waste paper to a pulp and contacting said pulp with an enzyme and a compound-represented by the following formula (2):

$$R^1O—(PO)_x—[(EO)_y—(AO)_z]—H \qquad (2)$$

wherein R^1 represents alkyl group or alkenyl group having 8–24 straight or branched chain carbon atoms; PO represents propylene oxide unit; EO represents ethylene oxide unit; AO represents alkylene oxide unit having not less than three carbon atoms; x is an integer in the range of 2 to 20, z is an integer in the range of 10 to 50 and satisfy the following formula, $10 \leqq x+z \leqq 100$; y is an integer in the range of 15 to 50; PO is added in the form of a block configuration; and EO and AO are added in the form of a block or a random configuration, and

the amount of said enzyme being in the range of 0.002 to 3 wt. % based on the dry weight of said waste paper and the amount of said compound represented by the formula (2) being in the range of 0.01 to 5 wt. % based on the dry weight of said waste paper.

5,837,098
METHOD FOR DEINKING ELECTROSTATIC PRINTED WASTEPAPER USING A COMBINATION OF NONIONIC SURFACTANTS

Chin Li, Murrysville; Kevin Hipolit, Carnegie, and Bhima R. Vijayendran, Monroeville, all of Pa., assignors to BASF Corporation, Mount Olive, N.J.

Continuation-in-part of Ser. No. 231,553, Apr. 22, 1994, Pat. No. 5,560,806. This application Oct. 1, 1996, Ser. No. 724,342

Int. Cl.⁶ D21C *5/02*

U.S. Cl. 162—5 **16 Claims**

1. A method of deinking printed paper selected from the group consisting of electrostatically printed paper and a mixture of electrostatically printed paper and impact ink printed paper comprising the steps of:

(a) pulping such printed paper in an alkaline aqueous medium, thereby to produce an aqueous slurry of paper fibers and particles of electrostatic ink,

(b) adding to said slurry with agitation a deinking amount of the deinking agent comprising in combination,

(i) a first nonionic surfactant material represented by the formula:

$$R—Ph—(OC_2H_4)_m—(OC_3H_6)_n—(OC_4H_8)_p—R^1$$

wherein R is an aliphatic hydrocarbon group containing from 8 to 10 carbon atoms, Ph is the bivalent phenylene group, R^1 is selected from the group consisting of chloro and phenoxy, m, n, and p are each a number of between 0 and 10, and the sum of m, n, and p is between 1 and 10; and

(ii) a second deinking nonionic surfactant material selected from the group consisting of:

a) nonionic surfactant represented by the formula, $R^5—C_6H_{4O}—(C_2H_{4O})_t—H$, wherein R^5 is a C_8–C_{13} alkyl, and t is a number of between 1 and 9;

b) nonionic surfactant block copolymers of ethylene oxide and propylene oxide selected from the group consisting of ethoxylated polyoxypropylene glycols and propoxylated polyoxyethylene glycols each having an average of 1 to 45 poly(ethylene oxide) units and 14 to 77 poly(propylene oxide)units; and

c) mixtures of said second nonionic surfactant,

wherein the ratio of said first nonionic surfactant material

(i) to the second deinking nonionic surfactant material

(ii) being selected and adjusted to provide enhanced agglomeration of electrostatic ink,

(c) agitating the slurry of step (b) to agglomerate the particles of electrostatic ink, and

(d) separating the agglomerated electrostatic ink particles from the aqueous slurry of paper fibers.

5,837,099
OFFICE WASTEPAPER DEINKING PROCESS

John Keith Borchardt, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 541,376, Oct. 10, 1995, abandoned. This application Jan. 28, 1997, Ser. No. 788,478

Int. Cl.⁶ D21C *5/02*

U.S. Cl. 162—5 **12 Claims**

1. A process for the deinking of office wastepaper stocks which consists essentially of:

a) converting the wastepaper to a pulp,

b) contacting the pulp with an aqueous medium of alkaline pH containing between about 0.05 and about 2 percent by weight, calculated on a dry weight basis of the pulp, of a deinking agent comprising a first component comprising at least one ethylene oxide adduct of a detergent-range alcohol having in the range of from about 8 to about 20 carbon atoms and an average of from about 3 to about 20 oxyethylene units per molecule of alcohol, and a second component selected from the group consisting of one or more detergent-range alpha olefins having from about 8 to about 22 carbon atoms, one or more saturated hydrocarbons having from about 8 to about 20 carbon atoms wherein said deinking agent has a ratio of first component to second component in the range of from about 10:1 to about 2:1, and mixtures thereof, and

c) treating the resulting pulp-containing medium by flotation to remove suspended ink therefrom.

5,837,100
USE OF BLENDS OF DISPERSION POLYMERS AND COAGULANTS FOR COATED BROKE TREATMENT

Alessandra Gerli, Leiden, and David I. Weinstein, Wassenaar, both of Netherlands, assignors to Nalco Chemical Company, Naperville, Ill.

Filed Jul. 3, 1996, Ser. No. 675,134

Int. Cl.⁶ D21H *17/45*

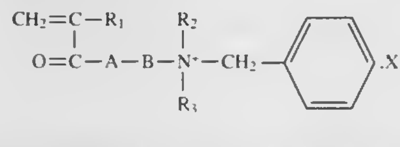
U.S. Cl. 162—168.2 **4 Claims**

1. A papermaking process comprising:

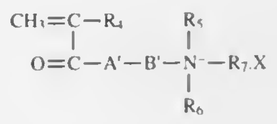
forming an aqueous coated broke slurry;

adding a blend of:

a water-soluble dispersion polymer, the water-soluble polymer being formed by polymerizing a water-soluble mixture which comprises: (a) a first cationic monomer represented by the following formula (I):



wherein R_1 is H or CH_3 each of R_2 and R_3 is an alkyl group having 1 to 3 carbon atoms; A is an oxygen atom or NH; B is an alkylene group of 2 to 4 carbon atoms or a hydroxypropylene group; and X− is an anionic counterion, and/or a second cationic monomer represented by the following general formula (II):



$$\begin{array}{l} CH_2{=}C{-}R_4 \qquad\quad R_5 \\ \quad\ | \qquad\qquad\qquad\ \ | \\ O{=}C{-}A'{-}B'{-}N^+{-}R_7.X \\ \qquad\qquad\qquad\quad\ \ | \\ \qquad\qquad\qquad\quad\ R_6 \end{array}$$

wherein R_4 is H or CH_3; each of R_5 and R_6 is an alkyl group having 1 to 2 carbon atoms; R_7 is H or an alkyl group of 1 to 2 carbon atoms; A' is an oxygen atom or NH; B' is an alkylene group of 2 to 4 carbon atoms or a hydroxypropylene group; and X− is an anionic counterion; and (b) (meth)acrylamide in an aqueous solution of a polyvalent anion salt;

wherein the polymerization is carried out in the presence of either an organic high-molecular weight multivalent cation comprising a water-soluble polymer containing at least one monomer of formula (II) or an alkyl ester of acrylic acid; and a cationic coagulant;

wherein the weight ratio of said water soluble dispersion and said cationic coagulant is from about 5/95 to about 95/5, and said blend is added to the coated broke slurry in amounts of from about 0.1 kilograms product per ton of broke to about 1.0 kilograms product per ton of broke draining the slurry to form a sheet; and drying the sheet.

5,837,101
DEVICE FOR THREADING A PAPER WEB

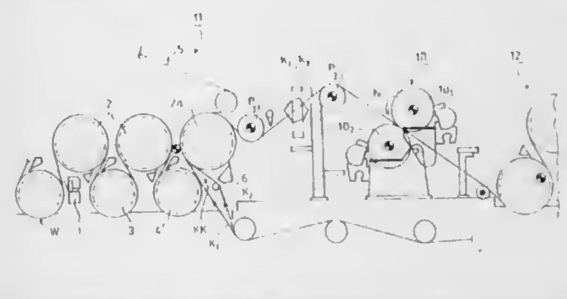
Heikki Ilvespää, and Antti Kuhasalo, both of Jyväskylä, Finland, assignors to Valmet Corp., Helsinki, Finland

Filed Oct. 2, 1996, Ser. No. 727,839

Claims priority, application Finland, Oct. 5, 1995, 954735

Int. Cl.⁶ D21F *7/00;7/04*

U.S. Cl. 162—255 **18 Claims**



1. A device for threading a paper web from a dryer section to a finishing device situated after the dryer section in a running direction of the web, the dryer section including a last drying cylinder arranged in the running direction of the web and the web being supported on a drying wire in the dryer section and carried by the drying wire over the last drying cylinder, comprising

a pair of ropes,

guide means for guiding said ropes in a substantially common loop at least over the last drying cylinder and into the finishing device at a side of the web,

forming means for forming a rope gap between said ropes at a location before the last drying cylinder, and

transfer means for transferring a portion of the web while the portion of the web is support the drying wire at a location before the last drying cylinder into said rope gap between said ropes such that the portion of the web is carried between said ropes over the last drying cylinder and into the finishing device.

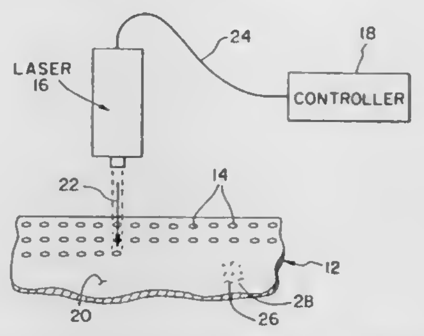
5,837,102
PERFORATED AND EMBOSSED SHEET FORMING FABRIC

Edwin X. Graf, Menasha, Wis., assignor to Voith Sulzer Paper Technology North America, Inc., Appleton, Wis.

Continuation-in-part of Ser. No. 847,564, Apr. 24, 1997, abandoned. This application Mar. 12, 1998, Ser. No. 41,486

Int. Cl.⁶ D21F *1/10*

U.S. Cl. 162—296 **12 Claims**



1. A paper-making machine for forming a paper web from a fiber suspension, said paper-making machine comprising:

a headbox configured to receive and discharge the fiber suspension;

a plurality of rotatable rolls; and

an endless forming fabric carried by said plurality of rolls and configured to directly carry the fiber suspension discharged by said headbox, said forming fabric comprised of a monolithic plastic sheet with a plurality of water drainage holes therein, said sheet having an embossed outer surface configured for contacting the fiber suspension, said outer surface having a plurality of generally rounded projections and a plurality of generally rounded depressions, said plurality of projections having an average height of at least 125 microns, said embossed outer surface of said sheet being formed using a calender having at least one embossing roll.

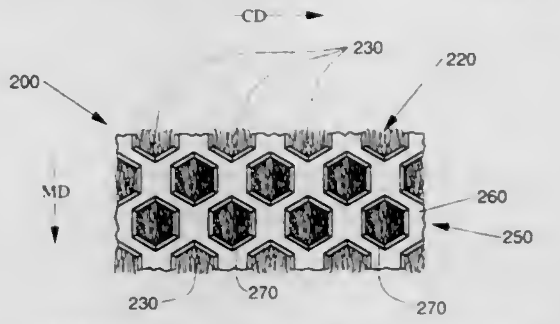
5,837,103
WEB PATTERNING APPARATUS COMPRISING A FELT LAYER AND A PHOTOSENSITIVE RESIN LAYER

Paul Dennis Trokhan, Hamilton, and Dean Van Phan, West Chester, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 268,154, Jun. 29, 1994, abandoned. This application Jun. 5, 1995, Ser. No. 461,832

Int. Cl.⁶ D21F *3/00*

U.S. Cl. 162—358.2 **14 Claims**



1. An apparatus for use in making a web of papermaking fibers, the apparatus comprising:

a dewatering felt layer comprising a nonwoven batt of fibers, the dewatering felt layer capable of receiving and containing water pressed from a web, the felt layer having a first web facing felt surface at a first elevation and an oppositely facing second felt surface; and

a web patterning layer comprising a photosensitive resin, wherein the patterning layer penetrates the first felt surface.

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and wherein the patterning layer extends from the first felt surface to form a web contacting top surface at a second elevation different from the first elevation.

5,837,104
EXTENDERS FOR HOT FACE REFRACTORY OF COKE OVEN PUSHER SIDE DOOR

Paul V. Suey, 255 Green Parrot La., Natrona Heights, Pa. 15065

Filed Jul. 8, 1996, Ser. No. 677,575
Int. Cl.⁶ C10B *1/06*

U.S. Cl. 202—248 **6 Claims**

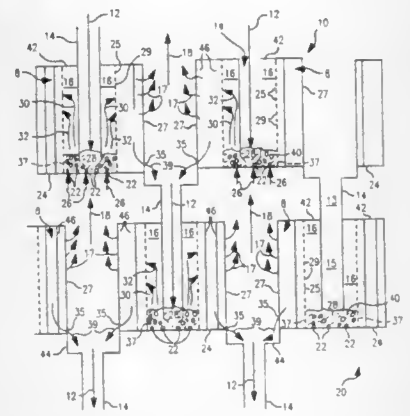
1. In a coke oven pusher side door assembly of the type having a door, a cold face refractory wall attached to the door, a hot face refractory wall attached to and spaced from the cold face refractory wall and having a top section of L-shape having a horizontally-disposed leg extending across the space between the cold face wall and the hot face wall, the improvement comprising a pair of extender plates mounted on a top surface of the leg and extending vertically thereabove to prevent coal spillage and entry into the space between the cold face wall and the hot face wall during coal levelling.

5,837,105
CO-CURRENT CONTACTING SEPARATION TRAY DESIGN AND METHODS FOR USING SAME

Berne K. Stober, Ringoes, N.J., and Raymond M. Sowiak, Newtown, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Apr. 7, 1997, Ser. No. 833,490
Int. Cl.⁶ B01D *3/14;3/26;3/32;* **F02M** *11/00*

U.S. Cl. 203—40 **12 Claims**



1. A separation column for distilling or fractionating a feedstream, comprising:
(a) a plurality of interconnected trays having a tray top and a tray bottom;
(b) a plurality of co-current vapor and liquid contacting sections, located on the trays, comprising a volume in which vapors and liquid can be in concurrent contact;
(c) a plurality of de-entrainment devices, located on the trays, for separating entrained liquids from a vapor stream, the de-entrainment devices having an inner and an outer side, the inner side being adjacent to the co-current contacting sections, and the inner and outer sides of the de-entrainment devices being permeable to vapors and liquids;
(d) a plurality of liquid downcomers, having an upper portion and a lower portion, the upper portion of the liquid downcomer being capable of accepting liquid from the outer side of the de-entrainment device of a first tray, and the lower portion of the liquid downcomer being located within the co-current contacting section of a second tray that is vertically lower in the column from the first tray; and
(e) vapor openings, located through the bottom of the trays at a point beneath the co-current contacting sections, through which vapors can pass into the co-current contacting section of a tray.

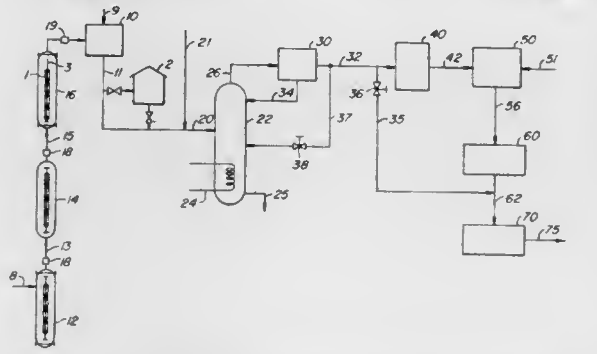
7. A method for operating a separation column, comprising the steps of:
(a) providing a column comprising:
  (i) a plurality of inteconnected trays having a tray top and a tray bottom;
  (ii) a plurality of co-current vapor and liquid contacting sections, located on the trays, comprising a volume in which vapors and liquid can be in co-current contact;
  (iii) a plurality of de-entrainment devices, located on the trays, the de-entrainment devices having an inner and an outer side, the inner side being adjacent to the co-current contacting sections;
  (iv) a plurality of liquid downcomers, having an upper portion and a lower portion, the lower portion of the liquid downcomer being located within the co-current contacting section of a tray; and
  (v) vapor openings, located through the bottom of the trays at a point beneath the co-current contacting sections;
(b) flowing liquid through a first liquid downcomer and into the co-current contacting section of a first tray;
(c) directing vapors through the vapor openings of the first tray and into the co-current contacting section of the first tray, whereby the vapors entrain liquid within the co-current contacting section of the first tray to form an entrained fluid that travels upward through the first tray;
(d) passing the entrained fluid through the de-entrainment device of the first tray to thereby separate at least a portion of the entrained liquid from the vapors;
(e) directing the de-entrained liquid from the de-entrainment device of the first tray to a second liquid downcomer and into the co-current contacting section of a second tray that is vertically below the first tray; and
(f) directing the de-entrained vapors from the de-entrainment device of the first tray to the co-current contacting section of a third tray that is vertically above the first tray.

5,837,106
HALOHYDROCARBON RECOVERY PROCESS

Mark J. Ng, Pleasant Hill, and Bruce T. Maeda, San Jose, both of Calif., assignors to Technichem Engineering, Ltd., Emeryville, Calif.

Continuation of Ser. No. 110,023, Aug. 20, 1993, Pat. No. 5,374,337. This application Dec. 12, 1994, Ser. No. 353,789
Int. Cl.⁶ B01D *3/00*

U.S. Cl. 203—41 **3 Claims**



1. A solvent recovery process for purification of a solvent comprising halohydrocarbons, said method comprising the steps of:
heating a gross mixture comprising halohydrocarbons, fatty-acid impurities and water in a bath to vaporize at least a portion of said halohydrocarbons and said impurities;
condensing at least a portion of said vapor in a reflux condenser to form a condensate mixture;
collecting the condensate mixture;
drying at least a portion of said condensate mixture in a dryer to remove said water, said dryer containing a quantity of calcium silicate, magnesium silicate or a combination thereof;
adsorbing the dried condensate mixture to remove a majority of said fatty acid impurities in an adsorber, said adsorber containing a quantity of adsorbent, wherein said adsorbent is silica gel; and
recovering halohydrocarbon solvent product of at least 99% purity.

5,837,107
PROCESS FOR PRODUCTION OF AQUEOUS SOLUTIONS OF FREE HYDROXYLAMINE

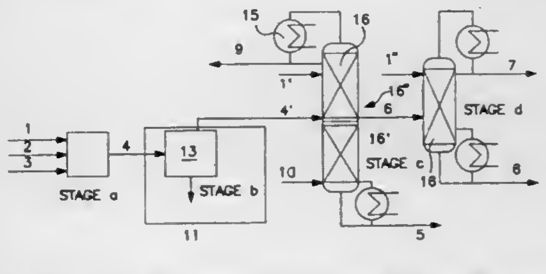
Otto Watzenberger, Ludwigshafen; Hans-Michael Schneider, Worms; Bernd Leutner, Frankenthal, all of Germany, and Albrecht Wilhelm Friederang, New York, N.Y., assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Jul. 29, 1996, Ser. No. 688,281

Claims priority, application Germany, Dec. 20, 1995, 195 47 758.8

Int. Cl.⁶ B01D *3/38;* **C01B** *21/14*

U.S. Cl. 203—78 **14 Claims**



1. A process for the preparation of a salt-free, aqueous hydroxylamine solution, comprising
a) mixing a hydroxylammonium salt and an inorganic base in water,
b) separating off any insoluble components to obtain a hydroxylamine and salt containing aqueous solution, and
c) treating the aqueous hydroxylamine and salt solution with water or steam to separate the aqueous solution into a salt-free, aqueous hydroxlamine solution and a salt solution,
wherein the separation (c) is carried out
c1) at ≦80° C.
c2) in a stripping column, and
c3) the water or steam is passed counter current into the bottom of the stripping column, and wherein the salt-free, aqueous hydroxylamine solution is optionally distilled to give a concentrated hydroxylamine solution.

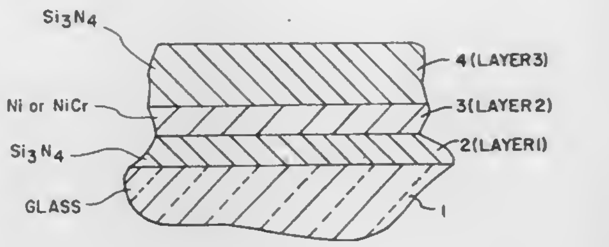
5,837,108
MATCHABLE, HEAT TREATABLE, DURABLE, IR-REFLECTING SPUTTER-COATED GLASSES AND METHOD OF MAKING SAME

Philip J. Lingle, Temperance; Klaus W. Hartig, Brighton, and Steven L. Larson, Monroe, all of Mich., assignors to Guardian Industries Corp., Auburn Hills, Mich.

Division of Ser. No. 572,061, Dec. 14, 1995, Pat. No. 5,688,585, which is a continuation-in-part of Ser. No. 486,643, Jun. 7, 1995, which is a continuation-in-part of Ser. No. 102,281, Aug. 5, 1993. This application Aug. 7, 1997, Ser. No. 908,180
Int. Cl.⁶ C23C *14/00;14/23*

U.S. Cl. 204—192.15 **10 Claims**

1. A method of heat treating a coated glass article comprising:
a) sputter-coating onto a glass substrate having a thickness of about 1.5 mm–13 mm a layer system comprising from the glass substrate outwardly:
an undercoat layer comprised of silicon nitride;



a substantially metallic layer which includes nickel or a nickel alloy having a nickel content of at least 10% by weight Ni, and which is substantially free of any nitride, or oxide; and
an overcoat layer comprised of silicon nitride, and
b) thereafter subjecting said coated glass substrate to a heat treatment selected from the group consisting of bending, tempering, heat strengthening and combinations thereof;
wherein after said heat treatment the resultant article exhibits a glass side reflectance Δ_H of no greater than about 2.0.

5,837,109
APPARATUS FOR TREATING A STRIP

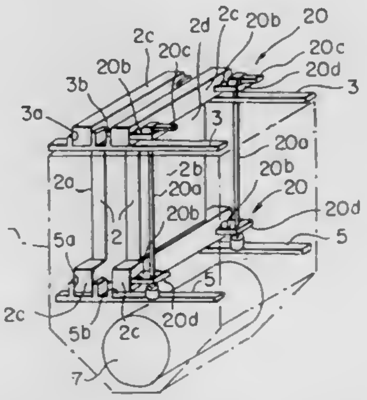
Tadashi Fujii, and Eiichiro Sugioka, both of Yamaguchi, Japan, assignors to Toyo Kohan Co., Ltd., Japan

PCT No. PCT/JP95/00982, § 371 Date Jan. 31, 1997, § 102(e) Date Jan. 31, 1997, PCT Pub. No. WO95/32322, PCT Pub. Date Nov. 30, 1995

PCT Filed May 22, 1995, Ser. No. 737,489

Claims priority, application Japan, Jun. 14, 1994, 6-156603; Feb. 17, 1995, 7-053325; Feb. 17, 1995, 6-134970
Int. Cl.⁶ C25D *17/00*

U.S. Cl. 204—206 **28 Claims**



1. An apparatus for treating a strip, comprising;
at least one pair of homopolar electrodes, arranged to face each other in a bath tank; strip to any one of a plating treatment, a cleaning treatment and another treatment,
insulators provided so as to be projected on opposite surfaces of said at least one pair of homopolar electrodes, and each of said insulators has a slant face inclined from a side of each of said at least one pair of homopolar electrodes in a travelling direction of said strip;
one electrode of said at least one pair of homopolar electrodes being stationarily secured to said bath tank; and
an opening and closing mechanism for adjusting a distance between said at least one pair of homopolar electrodes being provided at an other electrode of said at least one pair of homopolar electrodes;
said opening and closing mechanism being located above said bath tank.

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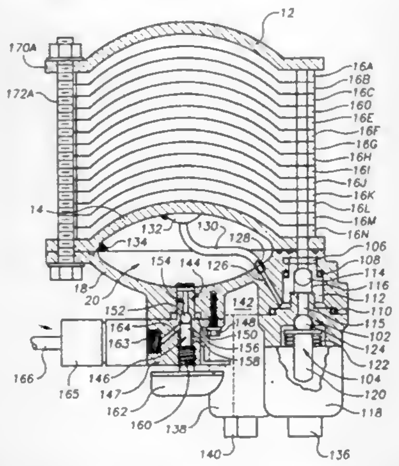
5,837,110
SPHERICAL SECTION ELECTROCHEMICAL CELL STACK

W. Clark Dean, Simsbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 17, 1996, Ser. No. 768,248

Int. Cl.^{6} C25B *9/00;15/08*

U.S. Cl. 204—240 **20 Claims**



1. A spherical section electrochemical cell stack, comprising:
- a. a spherical section top end plate and a spherical section bottom end plate;
- b. a spherical section electrochemical cell secured between the top and bottom end plates so that curvature dimensions of the top and bottom end plates and of the spherical section electrochemical cell are in parallel alignment;
- c. electrical conductivity means for passing a current through the cell; and
- d. a spherical section pressure header secured to the spherical section bottom end plate so that curvature dimensions of the bottom end plate and spherical section pressure header are in opposed alignment to thereby define a high pressure chamber between the bottom end plate and pressure header.

5. The spherical section electrochemical cell stack of claim 1. wherein the high pressure chamber is filled with a product gas dryer and filter so that a product gas produced by the electrochemical cell is directed to pass through the high pressure chamber to be dried and filtered before the product gas leaves the cell stack.

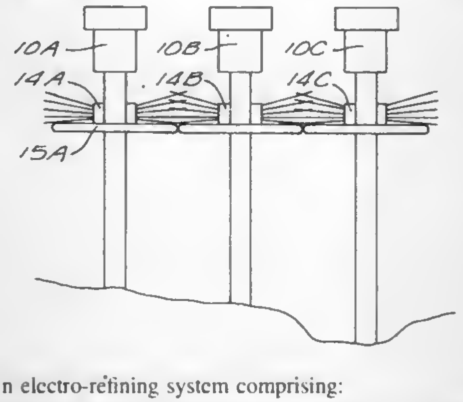
5,837,111
CORROSIVE MIST SCRUBBER

William Arthur Ebert, 15 E. Sahuaro, Tucson, Ariz. 85705

Filed Aug. 20, 1997, Ser. No. 914,898

Int. Cl.^{6} C25C *7/00;* **C25D** *21/04*

U.S. Cl. 204—267 **22 Claims**



17. An electro-refining system comprising:
- a) a bath having wall members and adapted for containing a slurry of targeted chemicals;
- b) an electrical source providing electrical energy; and,
- c) a multitude of electrodes receiving electrical energy from said electrical source and adapted for partial immersion within said slurry, each of said electrodes having,
  - 1) a solid metal core adapted to be hung in said slurry,
  - 2) a mounting mechanism secured to said solid metal core above adopted to be a line created by said slurry, and,
  - 3) a brush member secured to said mounting mechanism, bristles of said brush member having sufficient length to contact bristles of a neighboring electrode within said bath.

5,837,112
ELECTROCHEMICAL MEASURING CELL FOR DETECTING PHOSGENE

Robert Kessel, Bad Oldesloe, Germany, assignor to Drägerwerk AG, Lübeck, Germany

Filed Jul. 16, 1997, Ser. No. 895,304

Claims priority, application Germany, Feb. 28, 1997, 197 08 038.3

Int. Cl.^{6} G01N *27/26*

U.S. Cl. 204—415 **9 Claims**

1. An electrochemical measuring cell for detecting phosgene, comprising:

a measuring electrode made of silver;

a counterelectrode;

an electrolyte containing an organic solvent, said counterelectrode being provided in said electrolyte;

a conductive salt added to said electrolyte; and

an amine provided as an additional additive to said electrolyte, wherein said amine is an aromatic amine.

5,837,113
SMALL GLASS ELECTRODE

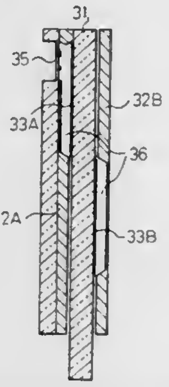
Hiroaki Suzuki; Akio Sugama, and Naomi Kojima, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 153,054, Nov. 17, 1993, abandoned, which is a continuation-in-part of Ser. No. 803,433, Dec. 6, 1991, Pat. No. 5,417,837. This application Feb. 8, 1996, Ser. No. 598,287

Claims priority, application Japan, Dec. 6, 1990, 2-400550; Jul. 5, 1991, 3-164750; Nov. 17, 1992, 4-306847; Mar. 29, 1993, 5-070328

Int. Cl.^{6} G01N *27/36*

U.S. Cl. 204—420 **23 Claims**



1. A small glass electrode having a bonded structure comprising:

a planar glass substrate having a first main surface and having embedded therein, from the first main surface, an inside reference electrode, a first pad and a first lead-in line interconnecting said inside reference electrode and said first pad, said planar glass substrate having a second main surface and having embedded therein, from the second main surface, an outside reference electrode, a second pad and a second lead-in line interconnecting said outside reference electrode and said second pad;

a first silicon semiconductor substrate bonded to the first main surface of said glass substrate and having a first main surface, at least one reservoir extending into the first silicon semiconductor substrate from the first main surface for holding an aqueous electrolyte and a groove forming a fluid passageway in communication with the reservoir for injecting the aqueous electrolyte into the reservoir, said groove and said reservoir being formed by anisotropic etching of the first silicon semiconductor substrate, the reservoir extending from the first main surface and toward a second opposite main surface of the first silicon semiconductor substrate and the reservoir having a sidewall defining an aperture at the second main surface of the first silicon semiconductor substrate to expose the interior of the reservoir, the aperture being disposed at a location corresponding to the position of the inside reference electrode embedded in the glass substrate;

a glass sensing film covering and sealing the aperture in the sidewall and thus at a position corresponding to said inside reference electrode; and

a second silicon semiconductor substrate bonded to the second main surface of said glass substrate and having a first main surface, at least one reservoir extending into the second silicon semiconductor substrate from the first main surface for holding an aqueous electrolyte and a groove for forming a salt bridge communicating between the reservoir and the exterior, said groove and reservoir being formed by anisotropic etching of the second silicon semiconductor substrate, the reservoir covering said outside reference electrode.

5,837,114
ARRANGEMENT FOR DETERMINING THE CONCENTRATION OF A COMPONENT IN A GAS MIXTURE

Erich Junginger, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

PCT No. PCT/DE96/00611, § 371 Date Jan. 13, 1997, § 102(e) Date Jan. 13, 1997, PCT Pub. No. WO96/35120, PCT Pub. Date Nov. 7, 1996

PCT Filed Mar. 29, 1996, Ser. No. 765,735

Claims priority, application Germany, May 3, 1995, 195 16 139.4

Int. Cl.^{6} G01N *27/26*

U.S. Cl. 204—425 **5 Claims**

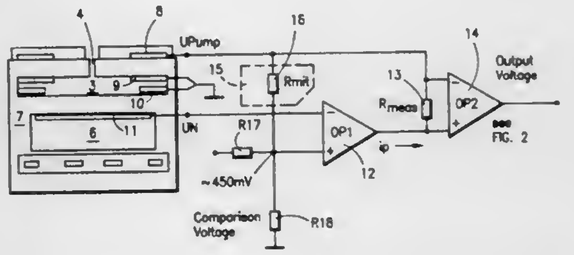


FIG. 2

1. An arrangement for determining the concentration of a component in a gas mixture, the arrangement comprising:

a structure defining a first volume;

diffusion resistance means defining a coupling between said first volume and said gas mixture;

said first volume holding the concentration of said component constant in opposition to the influence of said coupling;

said structure including a solid electrolyte region between said gas mixture and said first volume;

pump circuit means connected to said solid electrolyte region for controlling a flow of ions of said component through said first electrolyte region to compensate for said influence so that a measure for said flow defines a measure for the wanted concentration of said component in said gas mixture;

said structure including a second volume for accommodating a reference concentration of said component therein;

supply means for supplying a comparison voltage;

a Nernst cell arranged between said first and second volumes for supplying a Nernst voltage dependent upon the respective concentrations of said component in said first and second volumes;

ancillary circuit means connected to said supply means and said Nernst cell for supplying an output current to said pump circuit means indicative of the difference between said comparison voltage and said Nernst voltage thereby controlling said flow of said ions of said component of said gas mixture and producing a drive voltage across said solid electrolyte region which can be measured; and,

feedback means for influencing said comparison voltage as a function of said drive voltage.

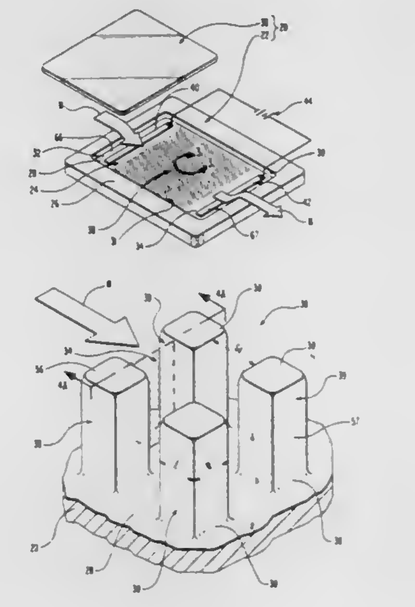
5,837,115
MICROLITHOGRAPHIC ARRAY FOR MACROMOLECULE AND CELL FRACTIONATION

Robert H. Austin, Princeton, N.J.; Wayne D. Volkmuth, Saint Cloud, Minn., and Lynn C. Rathbun, Ithaca, N.Y., assignors to British Technology Group USA Inc., Gulph Mills, Pa., and Cornell Research Foundation, Inc., Ithaca, N.Y.

Division of Ser. No. 074,432, Jun. 8, 1993, Pat. No. 5,427,663. This application Jun. 7, 1995, Ser. No. 474,688

Int. Cl.^{6} B01D *57/02;* **G01N** *27/453*

U.S. Cl. 204—450 **121 Claims**



90. A method for manufacturing a sorting apparatus for fractionating and simultaneously viewing individual microstructures in a fluid medium, said method comprising the steps of:
- a. forming on one side of a substrate a receptacle having a floor bound by a pair of upstanding opposing side walls, the height of said side walls defining a depth of said receptacle, said depth of said receptacle being commensurate with the size of the microstructures in the fluid medium, whereby when the microstructures are caused to migrate in the fluid medium through said receptacle the microstructures do so in essentially a single layer;
- b. building a two-dimensional array of upstanding obstacles in a preselected and reproducible pattern on said floor of said receptacle, the end of each of said obstacles remote from said floor defining the top of said obstacle; and
- c. engaging a transparent coverslip to said tops of said obstacles, thereby to preclude migration of the microstructures between said coverslip and said tops of obstacles.

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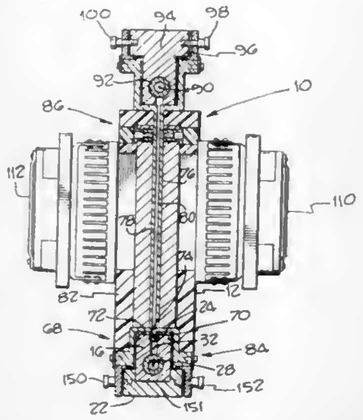
5,837,116
TWO DIMENSIONAL ELECTROPHORESIS APPARATUS

Michael G. Harrington, and Douglas Packard, both of La Canada, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Jul. 12, 1996, Ser. No. 691,001
Int. Cl.^{6} G01N *27/26*
U.S. Cl. 204—606 **15 Claims**



1. An apparatus for conducting two dimensional electrophoresis of a sample, said apparatus comprising:

A) a first dimension electrophoresis box assembly comprising:

1) a first dimension housing comprising an upstream end at which said sample is located prior to first dimension electrophoresis and a downstream end toward which said sample migrates during electrophoresis, said first dimension housing further comprising interior walls which define a longitudinal first dimension electrophoresis zone which extends from said upstream end of said first dimension housing to said downstream end, said first dimension housing further comprising interior walls which define a second dimension electrophoresis electrode chamber which extends longitudinally parallel to said first dimension electrophoresis zone, wherein said first dimension electrophoresis zone is in fluid communication with said second dimension electrophoresis electrode chamber;

2) a liquid permeable gel support bar located in said first dimension electrophoresis zone and extending from said upstream end to said downstream end, said gel support bar including a first dimension electrophoresis gel support surface upon which a first dimension electrophoresis gel may be supported, said gel support surface comprising a longitudinal depression in said surface which defines a channel through which fluids may be introduced for interaction with a gel located on said first dimension electrophoresis gel support surface;

3) means for connecting an upstream electrophoresis electrode to the upstream end of said first dimension housing so that said upstream electrode is in fluid communication with said first dimension electrophoresis zone;

4) means for connecting a downstream electrophoresis electrode to the downstream end of said first dimension housing so that said downstream electrode is in fluid communication with said first dimension electrophoresis zone, wherein during first dimension electrophoresis, said sample is separated into first dimension sample bands within said first dimension electrophoresis gel, said first dimension sample bands being present at spaced locations between said upstream and downstream ends of the first dimension housing;

B) a second dimension electrophoresis box assembly comprising:

1) a second dimension housing comprising an upfield end located adjacent to said first dimension housing and a downfield end towards which the sample bands migrate during second dimension electrophoresis, said second dimension housing further comprising interior walls which define a second electrophoresis zone which extends from the upfield end of said second dimension housing to said downfield end, wherein said interior walls of said second dimension housing include at least one second dimension electrophoresis gel support surface for supporting an electrophoresis gel for conducting second dimension electrophoresis of said sample bands, said second dimension electrophoresis gel support surface extending laterally from the upstream end of said first dimension housing to the downstream end of said first dimension housing and extending longitudinally from the upfield end of said second dimension housing to the downfield end of said second dimension housing;

2) a second dimension downfield electrophoresis electrode located at the downfield end of said second dimension housing;

3) a second dimension upfield electrode located in said second dimension electrophoresis electrode chamber which is located in said first dimension housing, wherein during second dimension electrophoresis, said first dimension sample bands from said first dimension electrophoresis migrate towards said downfield electrophoresis electrode and are each separated into second dimension sample bands; and

C) connection means for connecting said first dimension electrophoresis box assembly to said second dimension electrophoresis box assembly so that said first dimension electrophoresis gel support surface is positioned relative to said second dimension electrophoresis gel support surface so that the first dimension gel and second dimension gel are coplanar whereby said first dimension sample bands present in the first dimension electrophoresis gel may be transferred by electrophoretic migration to the second dimension electrophoresis gel for second dimension electrophoresis.

5,837,117
TWO-STAGE PROCESS FOR ELECTROLYTICALLY POLISHING METAL SURFACES TO OBTAIN IMPROVED OPTICAL PROPERTIES AND RESULTING PRODUCTS

Francis Allegret, Goncelin, France, assignor to Satma, Concelin, France

Filed May 8, 1996, Ser. No. 646,386
Int. Cl.^{6} C25D *11/16;11/18*
U.S. Cl. 205—50 **17 Claims**

1. Process for polishing a metal surface comprising:

a first polishing step by chemical or electrolytic means to obtain a surface roughness less than about 10 nm, followed by

a second electrolytic micro-polishing step by anodizing in a solution of mineral acid, organic acid or mixture thereof to form an oxide layer of barrier oxide layer having a thickness between about 100 and 500 nm.

7. Part or product having a polished metal surface obtained according to the process of claim **1**, wherein the polished metal surface has a micro-roughness measured after deoxidizing the anodic layer by selective pickling of less than 1.4 nm(Ra).

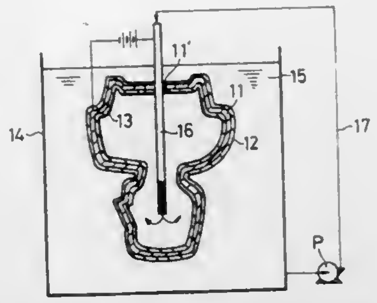
5,837,118
METHOD OF PRODUCING HOLLOW ELECTROFORMED PRODUCT OF PRECIOUS METAL

Shozui Yasui, and Tetsuya Kotoda, both of Tokyo, Japan, assignors to M. Yasui & Co., Ltd., Tokyo, Japan

Filed Feb. 7, 1996, Ser. No. 598,266
Claims priority, application Japan, Feb. 14, 1995, 7-047969; Dec. 18, 1995, 7-347518
Int. Cl.^{6} C25D *1/02*
U.S. Cl. 205—73 **3 Claims**

1. A method of producing a hollow electroformed product of precious metal, the method comprising the steps of:

forming a hollow soluble metal electroformed layer with a hole, which is soluble in an inorganic acid, on an outer surface of a master model formed of a low melting point material or a chemically soluble material soluble in a chemical;



melting or dissolving said master model within said soluble metal electroformed layer and removing it out of said hole;

coating an outer surface of the remaining soluble metal electroformed layer with a masking layer;

inserting an anode into said soluble metal electroformed layer through said hole;

applying a current between said anode and said soluble metal electroformed layer serving as a cathode and spraying an entire inner surface of said soluble metal electroformed layer with a precious metal electroforming solution, thereby forming a precious metal electroformed layer on said entire inner surface;

stripping said masking layer; and

dissolving said soluble metal electroformed layer with the inorganic acid.

5,837,119
METHODS OF FABRICATING DENDRITIC POWDER MATERIALS FOR HIGH CONDUCTIVITY PASTE APPLICATIONS

Sung Kwon Kang, Chappagua; Sampath Purushothaman, Yorktown Heights, and George Frederick Walker, New York, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 414,063, Mar. 31, 1995, abandoned. This application Aug. 9, 1996, Ser. No. 689,553
Int. Cl.^{6} C25C *5/02*
U.S. Cl. 205—74 **28 Claims**

1. A method comprising the steps of:

disposing a platable surface in contact with a first plating solution;

growing copper dendrites on said surface from said first plating solution in a three stage process comprising initial plating of dense copper, dendrite nucleation and dendrite growth;

wherein said dendrite growth is conducted at a different current density than said dendrite nucleation;

forming on said copper dendrites a coating to form coated dendrites, said coating having a lower melting temperature than said copper dendrites;

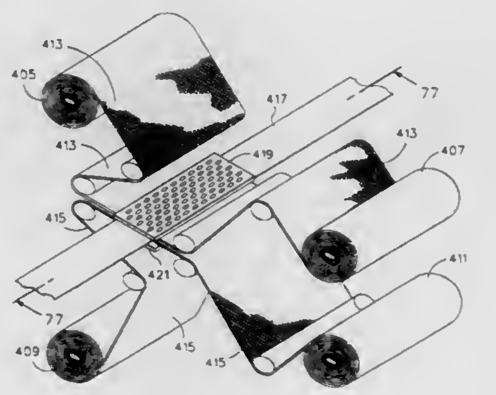
removing said dendrites from said platable surface;

heating a group of said coated dendrites to a temperature sufficient to fuse said coating between adjacent coated dendrites, said temperature being insufficient to melt said copper.

5,837,120
METHOD AND APPARATUS FOR ELECTROCHEMICAL PROCESSING

James L. Forand; Harold M. Keeney, both of Whitehall, Pa., and Erik S. Vananglen, Gheens, La., assignors to Electroplating Technologies, Inc., Coplay, Pa.

Continuation-in-part of Ser. No. 316,530, Sep. 30, 1994, Pat. No. 5,476,578, which is a continuation-in-part of Ser. No. 533,500, Sep. 25, 1995, Pat. No. 5,679,233. This application Dec. 15, 1995, Ser. No. 574,416
Int. Cl.^{6} C25D *17/00*
U.S. Cl. 205—93 **61 Claims**



10. A method of electrochemical processing a continuous metal strip section comprising:

(a) passing a charged continuous metal strip section through an electrochemical processing bath having a dielectric breakdown potential adjacent an oppositely charged electrode with respect to which the metal strip moves while applying electrical energy to said strip as a portion of an electrical circuit between said strip and the adjacent electrode,

(b) maintaining a dielectric separation element extending generally transversely across the strip between the electrode and strip and in at least periodic contact with the strip to space the strip from the electrode a minimum sufficient distance to prevent arcing between the strip and electrode, at least at some power levels, and restricting the power applied to the circuit to less than sufficient to exceed the dielectric breakdown potential of the electrolyte for the minimum distance to be maintained between the strip and the electrode, and

(c) wherein the dielectric separator element with respect to which the strip is passed is a unitary transversely extended open-web, plastic mesh dielectric section maintained generally parallel to and covering the strip surface.

5,837,121
METHOD FOR ANODIZING VALVE METALS

John T. Kinard, Simpsonville; Brian J. Melody, Greer, and Philip M. Lessner, Simpsonville, all of S.C., assignors to Kemet Electronics Corporation, Greenville, S.C.

Filed Oct. 10, 1997, Ser. No. 948,783
Int. Cl.^{6} C25D *11/26*
U.S. Cl. 205—322 **9 Claims**

1. A method of anodizing a metal comprising forming a film on the metal with an electrolytic solution comprising glycerine and dibasic potassium phosphate.

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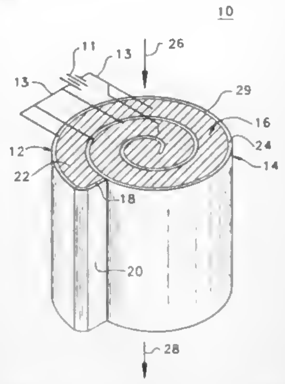
5,837,122
ELECTROWINNING ELECTRODE, CELL AND PROCESS

Thomas Stephen Snyder, Oakridge, and John Gregorie Wagner, Harriman, both of Tenn., assignors to The Scientific Ecology Group, Inc., Oak Ridge, Tenn.

Filed Apr. 21, 1997, Ser. No. 837,614
Int. Cl.^{6} C25D *21/18;17/20*
U.S. Cl. 205—560 **18 Claims**

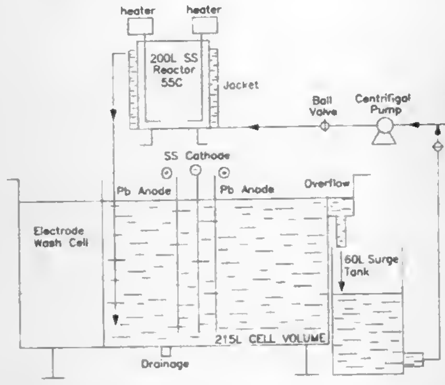


15. An electrowinning process comprising the steps of:
a. dissolving a contaminated metal into an electrolyte to form a solution flow of metal and contaminants;
b. oxidizing at least a portion of said solution contaminants;
c. plating said solution metal onto a cathode comprised of a porous form of one or more conductive filaments to produce a clean stream;
d. stripping an oxidant from said solution flow after said oxidizing step, wherein said oxidizing step comprises adding an oxidant to said solution flow;
e. adsorbing said oxidized solution contaminants from said solution flow after said stripping step; and
f. using said clean stream as said electrolyte in said dissolving step.

5,837,123
PREVENTION OF CATHODE CORROSION DURING ELECTROWINNING

Fook-Sin Wong, Jindalee, and Sharon Wild, Paddington, both of Australia, assignors to MIM Holdings Limited, Queensland, Australia

Continuation of Ser. No. 504,208, Jul. 19, 1995, abandoned. This application Dec. 9, 1996, Ser. No. 762,471
Claims priority, application Australia, Jul. 21, 1994, PM6946
Int. Cl.^{6} C25C *1/12*
U.S. Cl. 205—574 **5 Claims**



1. A method of reducing corrosion of a stanless steel cathode in an electrowinning system, wherein

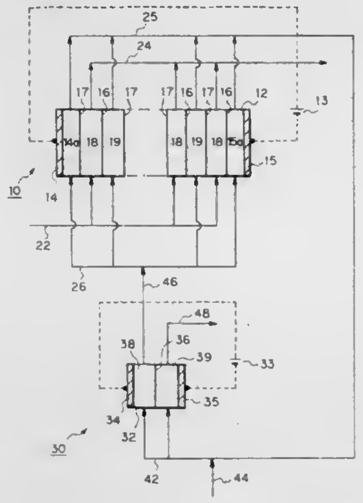
(a) a metal from an electrowinning solution is electrowon on a stainless steel cathode, the metal having been separated from a metal-bearing mineral by the steps of leaching said metal from said mineral into a leachate, extracting the metal from the leachate with an organic solvent and stripping the metal from the organic solvent into the electrowinning solution;
(b) a surface of said cathode comprises a lower surface portion which remain below a liquid level of the electrowinning solution during electrowinning and an upper surface portion which remains above the liquid level of the electrowinning solution during electrowinning, the upper surface portion having a splash zone located immediately above the liquid level of the electrowinning solution,
(c) the electrowinning solution has a chloride level above 30 ppm and free chlorine evolves from the electrowinning system when a current is passed through the system; and
(d) the cathode is removed from the electrowinning solution after the metal has been electrowon on the cathode, the electrowon metal is stripped from the lower surface portion of the cathode, the electrowinning solution is recycled to the stripping step, and the cathode is replaced in the electrowinning solution,

said method being for reducing corosion of the upper surface portion of the cathode in the splash zone, the method comprising reducing the amount of free chlorine evolved from the electrowinning system by maintaining in the electrowinning solution an amount in a range from about 1–30 ppm of at least one compound selected from the group consisting of thiourea, and derivatives of thiourea, for causing a reduction in free chlorine evolved from said electrowinning solution.

5,837,124
METHOD AND APPARATUS FOR PREVENTING SCALE FROM PRECIPITATING IN PRODUCING DEIONIZED WATER

Qingquan Su; Syu Nakanishi; Takayuki Saito, and Masato Nakatsu, all of Kanagawa-ken, Japan, assignors to Ebara Corporation, Tokyo, Japan

Filed Oct. 29, 1997, Ser. No. 959,859
Claims priority, application Japan, Oct. 29, 1996, 8-302377
Int. Cl.^{6} C02F *1/461;1/469;* B01D *61/44*
U.S. Cl. 205—746 **13 Claims**



1. A method for preventing scale from precipitating in producing deionized water comprising the steps of:

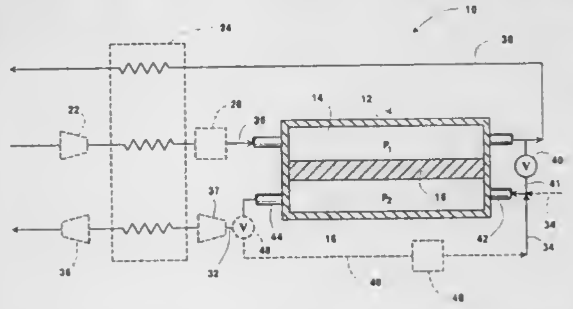
providing a continuous deionization unit having: a first housing; a pair of first electrodes serving as an anode and a cathode; a plurality of anion exchange membranes being disposed between the pair of the first electrodes in the first housing; and a plurality of cation exchange membranes being disposed between the pair of the first electrodes in the first housing and alternated with the anion exchange membranes; wherein the first housing, the anion exchange membranes and the cation exchange membranes define at least one diluting compartment and at least one concentrating compartment being alternated with each other;

providing an electrolysis unit having: a second housing; a pair of second electrodes serving as an anode and a cathode; wherein the second housing and an ion exchange membrane define an anode compartment and a cathode compartment;
introducing water into the anode compartment and the cathode compartment in the electrolysis unit;
applying an electric direct current to the pair of the second electrodes so as to produce an acidic water in the anode compartment; and
introducing the acidic water into the concentrating compartment in the continuous deionization unit.

5,837,125
REACTIVE PURGE FOR SOLID ELECTROLYTE MEMBRANE GAS SEPARATION

Ravi Prasad, East Amherst; Christian Friedrich Gottzmann, Clarence, and Nitin Ramesh Keskar, Grand Island, all of N.Y., assignors to Praxair Technology, Inc., Danbury, Conn.

Filed Dec. 5, 1995, Ser. No. 567,699
Int. Cl.^{6} B01D *53/22*
U.S. Cl. 205—763 **20 Claims**



1. A process for producing a high-purity product from a feed stream containing elemental oxygen, comprising:

applying said feed stream to a first separator including a first feed zone and a first permeate zone separated by a first solid electrolyte membrane capable of transporting oxygen ions;
driving a first portion of oxygen contained in said feed stream from said first feed zone to said first permeate zone through said first membrane by applying a reactive purge stream to said first permeate zone, said reactive purge stream including a reactive gas that consumes oxygen to establish a lower partial pressure of oxygen in said first permeate zone; and
obtaining an oxygen-depleted product stream after the first portion of oxygen has been driven from said first feed zone.

5,837,126
GASOLINE FUEL

Peter J. Jessup, and Michael C. Croudace, both of Santa Ana, Calif., assignors to Union Oil Company of California, El Segundo, Calif.

Division of Ser. No. 464,554, Jun. 5, 1995, Pat. No. 5,653,866, which is a continuation of Ser. No. 409,074, Mar. 22, 1995, Pat. No. 5,593,567, which is a continuation of Ser. No. 77,243, Jun. 14, 1993, abandoned, which is a division of Ser. No. 628,488, Dec. 13, 1990, Pat. No. 5,288,393. This application Aug. 1, 1997, Ser. No. 904,594
Int. Cl.^{6} C10L *1/04*
U.S. Cl. 208—16 **66 Claims**

1. An unleaded gasoline, suitable for combustion in an automotive engine, having the following properties:
(a) a Reid Vapor Pressure less than 7.5 psi;
(b) a 10% D-86 distillation point no greater than 158° F.;
(c) a 50% D-86 distillation point less than 203° F.;
(d) a 90% D-86 distillation point less than 300° F.;
(e) a paraffin content greater than 65 volume percent;
(f) an olefin content less than 8 volume percent;
(g) an aromatics content of at least 4.5 volume percent; and
(h) an octane value of at least 87.

5,837,127
PROCESS FOR CRACKING AND TRANSHYDROGENATION OF HYDROCARBON FEEDSTOCK

Arthur Gough, North Yorkshire; Stephen Keith Turner, Cleveland; Jane Mercer, and Edmund Hugh Stitt, both of Cleveland, all of United Kingdom, assignors to Institut Francais du Petrole, France

PCT No. PCT/GB93/02136, § 371 Date Jun. 23, 1995, § 102(e) Date Jun. 23, 1995, PCT Pub. No. WO94/10264, PCT Pub. Date May 11, 1994
PCT Filed Oct. 15, 1993, Ser. No. 407,019
Claims priority, application United Kingdom, Oct. 26, 1992, 9222416
Int. Cl.^{6} C10G *69/02*
U.S. Cl. 208—60 **11 Claims**

1. A process comprising subjecting a hydrocarbon feedstock to cracking at a first pressure to produce a cracker product, compressing the the cracker product to a second pressure greater than said first pressure, and then separating the compressed cracker product into a number of components including at least one stream containing one or more polyunsaturated hydrocarbons,

subjecting at least part of said at least one stream containing polyunsaturated hydrocarbons to transhydrogenation with at least one paraffin stream at a pressure below said second pressure, whereby said polyunsaturated hydrocarbons undergo transhydrogenation with said paraffins, and combining the products from said transhydrogenation with said cracker product stream before the compression thereof.

5,837,128
METHOD FOR GRADING CYLINDRICAL CATALYST PARTICLES IN A BED TO REDUCE PRESSURE DROP

George A. Huff, Jr., Naperville; Frederick T. Clark, Wheaton, and James L. Taylor, Naperville, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed May 24, 1996, Ser. No. 653,384
Int. Cl.^{6} C10G *47/02*
U.S. Cl. 208—112 **5 Claims**

1. A method for grading cylindrical, spherical or multilobe catalyst particles in a bed in order to reduce the pressure drop through the bed under particulate-free flow conditions, which method comprises:

providing a catalyst comprising cylindrical, spherical or multilobe catalyst particles, each of the catalyst particles having a longest dimension and a shortest dimension, segregated into catalyst manufacturing process lots, each of the lots ranging from about 100 pounds to about 10,000 pounds, and each of the lots associated with a relatively smaller representative sample of the lot;
ranking the lots by pressure drop by measuring at reproducible conditions the pressure drop across about one quart to about 3 gallons of each of the representative samples;
loading the lots in order of progressively increasing or decreasing pressure drop into a reactor having an inlet and an outlet, with the lot having the highest pressure drop near the outlet and the lot having the lowest pressure drop near the inlet, to form a graded bed wherein the catalyst particles throughout the bed have substantially the same shape and wherein the ratios of the longest dimension to the shortest dimension of the catalyst particles within the bed are progressively lower in the direction of feed flow; and
passing a particulate-free feed through the bed and observing reduced pressure drop across the bed under particulate-free flow conditions, as compared to the pressure drop that would

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be exhibited at the same conditions by a reference bed which is otherwise identical but is formed by uniformly mixing lots of catalyst.

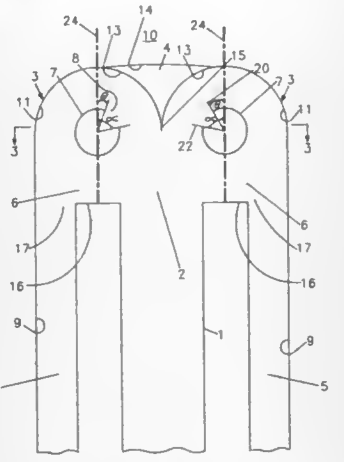
5,837,129
PROCESS AND APPARATUS FOR SEPARATING FLUIDIZED CRACKING CATALYSTS FROM HYDROCARBON VAPOR

Joseph L. Ross, Jr., Dallas, and Charles Schaub, Katy, both of Tex., assignors to Stone & Webster Engineering Corp., Boston, Mass.

Continuation of Ser. No. 41,721, Apr. 1, 1993, abandoned, which is a division of Ser. No. 756,479, Sep. 9, 1991, abandoned. This application May 2, 1994, Ser. No. 237,224

Int. Cl.^{6} C10G *35/00;* **B01D** *45/12;* **B04C** *5/04*

U.S. Cl. 208—161 **13 Claims**



1. A process for separating fluidized cracking catalyst solids from hydrocarbon vapors comprising:
  (a) feeding a mixture of fluidized cracking catalyst solids and hydrocarbon vapors from a riser reactor into a separator having at least one semi-circular separating area;
  (b) deflecting the mixture off of a deflecting means in the separator into said at least one semi-circular separating area;
  (c) separating said mixture by inertial separation in said at least one semi-circular separating area into a hydrocarbon vapor product stream and a fluidized cracking catalyst stream;
  (d) withdrawing said hydrocarbon vapor product stream from said at least one semi-circular separating area through a horizontally upwardly disposed opening on the side of a horizontally disposed gas outlet which extends through said at least one separating area and parallel to said deflector in said at least one semi-circular separating area; and
  (e) withdrawing the fluidized cracking catalyst from said at least one semi-circular separating area.

9. A process for separating fluidized cracking catalyst solids from hydrocarbon vapors comprising:
  (a) feeding a mixture of fluidized cracking catalyst solids and hydrocarbon vapors from a riser reactor into a separator having at least one semi-circular separating area;
  (b) deflecting the mixture off of a deflecting means in the separator into said at least one semi-circular separating area;
  (c) separating said mixture by inertial separation in said at least one semi-circular separating area into a hydrocarbon vapor product stream and a fluidized cracking catalyst stream;
  (d) withdrawing said hydrocarbon vapor product stream from said at least one semi-circular separating area through a horizontally disposed opening on the side of a horizontally disposed gas outlet which extends through said at least one separating area and parallel to said deflector in said at least one semicircular separating area, wherein said opening is oriented towards the riser reactor with the lower edge of the opening at an angle between 30° and 135° to the vertical center line of the outlet and the upper edge of the opening at an angle between −30° and 75° to the vertical center line of the outlet; and
  (e) removing the fluidized cracking catalyst from said at least one semi-circular separating area.

11. A process for separating fluidized cracking catalyst solids from hydrocarbon vapors comprising:
  (a) feeding a mixture of fluidized cracking catalyst solids and hydrocarbon vapors from a riser reactor into a separator having at least one semi-circular separating area;
  (b) deflecting the mixture off of a deflecting means in the separator into said at least one semi-circular separating area;
  (c) separating said mixture by inertial separation in said at least one semi-circular separating area into a hydrocarbon vapor product stream and a fluidized cracking catalyst stream;
  (d) withdrawing said hydrocarbon vapor product stream from said at least one semi-circular separating area through a horizontally disposed opening on the side of a horizontally disposed gas outlet which extends through said at least one separating area and parallel to said deflector in said at least one semicircular separating area, wherein said opening is oriented away from the riser reactor with the lower edge of the opening at an angle between 30° and 135° to the vertical center line of the outlet and the upper edge of the opening at an angle between −30° and 75° to the vertical center line of the outlet; and
  (e) removing the fluidized cracking catalyst from said at least one semi-circular separating area.

13. A process for separating fluidized cracking catalyst solids from a mixture of hydrocarbon vapors and fluidized cracking catalyst solids comprising utilizing a separator comprising (a) an upwardly directed gas-solids separator inlet; (b) a separator housing; (c) a means at the top of the separator housing for deflecting the mixture to substantially separate the fluidized cracking catalyst solids from the hydrocarbon vapors; (d) a solids outlet from the separator housing; and (e) a horizontally disposed vapor outlet means extending through the separator housing parallel to the means for deflecting the mixture having at least one horizontally upwardly disposed opening on the side of the gas outlet means.

5,837,130
CATALYTIC DISTILLATION REFINING

Clifford S. Crossland, Pasenda, Tex., assignor to Catalytic Distillation Technologies, Pasadena, Tex.

Filed Oct. 22, 1996, Ser. No. 735,234

Int. Cl.^{6} C10G *25/00*

U.S. Cl. 208—213 **22 Claims**

1. A process for hydrotreating petroleum fractions comprising the steps of:
  (a) feeding a petroleum fraction containing organic sulfur compounds to an atmospheric distillation column wherein an overheads is taken, a bottoms is taken and at least one side stream is taken;
  (b) feeding a portion of said side stream to a separate side column;

provided that at least one of said columns contains a hydrodesulfurization catalyst wherein a portion of the organic sulfur contained in each of said side streams is reacted with hydrogen to form hydrogen sulfide and unreacted hydrogen;
  (c) returning said hydrogen sulfide and unreacted hydrogen in said side column to said atmospheric column; and
  (d) recovering said side stream from said side column having less organic sulfur compounds than in step (b).

5,837,131
DESULFURIZATION PROCESS

Peter David Clark, Calgary, Canada, assignor to University Technnlogies International Inc., Calgary, Canada

Filed Apr. 5, 1996, Ser. No. 628,754

Int. Cl.^{6} C10G *45/04*

U.S. Cl. 208—216 PP **29 Claims**

1. A method for the desulfurization of a hydrocarbon fluid, the hydrocarbon fluid including sulfur containing hydrocarbons, the method comprising:
  contacting the hydrocarbon fluid with a mosoporous catalyst having a pore diameter of between 20 and 200 Angstroms at temperatures in the range of 20°–500° C. to promote C—C and C—S bonding and increase the boiling point of the sulfur containing hydrocarbons.

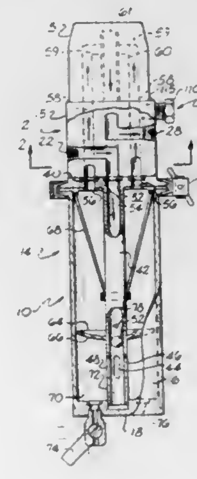
5,837,132
FUEL SYSTEM WITH SIGHT-GLASS

Erwin E. Hurner, 920 Belsly Blvd. South, Moorhead, Minn. 56560

Division of Ser. No. 376,420, Jan. 23, 1995, Pat. No. 5,682,661, which is a continuation-in-part of Ser. No. 176,641, Dec. 30, 1993, Pat. No. 5,471,964. This application Feb. 18, 1997, Ser. No. 802,307

Int. Cl.^{6} B01D *35/143*

U.S. Cl. 210—95 **20 Claims**



1. A fuel filter support head, comprising:
a unitary block, comprising:
  opposite upper and lower surfaces;
  an outer peripheral surface extending between said upper and lower surfaces;
  a first passage extending through said block from said outer peripheral surface to said upper surface;
  a second passage, separate from said first passage, extending through said block from said outer peripheral surface to said lower surface;
  at least one through passage, separate from said first and second passages, extending from said upper surface to said lower surface; and
  a bore extending from said outer peripheral surface to said at least one through passage; and
a sight glass structure positioned adjacent said outer peripheral surface and extending into said bore;
wherein a mechanic can see if any fuel is in said through passage by looking at said sight glass.

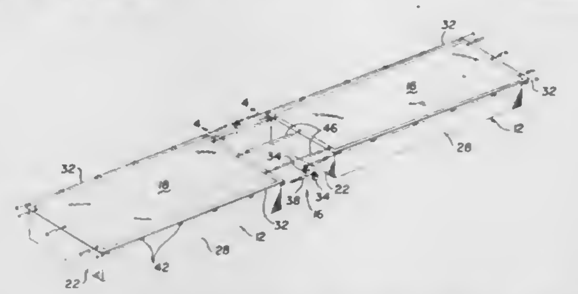
5,837,133
METHOD AND APPARATUS FOR PREVENTING ALGAE GROWTH IN OPEN-TOPPED COOLING TOWER RESERVOIRS

John M. Natale, 1805 Brazos Dr., Corpus Christi, Tex. 75412

Filed Mar. 3, 1997, Ser. No. 811,433

Int. Cl.^{6} B01F *3/04*

U.S. Cl. 210—167 **3 Claims**



1. An algae growth inhibiting liquid handling assembly comprising:
  a trough for containing a volume of liquid, said trough having a generally rectangular cross section in the plan view and having a bottom, two ends, and two elongated sides, the upper edges of the sides and ends forming an open top,
  an algae growth inhibiting cover assembly of flexible porous sheet material for covering said open top of said trough, said cover assembly being generally rectangular with at least two parallel extending opposed elongated side edges of a length to substantially extend along said elongated sides of said trough and two end edges of a length to substantially extend along said ends of said trough, said sheet material having a porosity selected to produce a shade factor in the range of about 55% to 96%, said cover assembly being of a size and shape to substantially cover said open top of said trough, reinforcing webbing attached along at least a portion of the edges of said sheet material, connection means on the side edges of said cover assembly for supporting said cover assembly over said trough, said connection means comprising ring members connected along the side edges of said sheet material and along the end edges of said sheet material, said side edge members being mounted in the plane of said cover and positioned to extend from the side edges thereof, and
  support members mounting said cover in a position providing an unsupported span over the open top of said trough, said support members comprising at least two cables suspended in spaced parallel relationship along the length of said sides of said trough, said cables being in close proximity to the upper edges of the sides of the trough, said side edge members being connected to said cables in sliding engagement to support said cover from said cables, said cover being connected to said cables to be moved between a first position wherein said cover is positioned substantially over said open top and a second position wherein said cover is moved along said parallel cables to a position away from at least a portion of the open top of said trough to allow unrestricted access to said trough, members engaging said end edge ring members to hold said sheet material in position over the open top of the trough.

5,837,134
SCALE REDUCTION

Don E. Heskett, White Pigeon, Mich., assignor to KDF Fluid Treatment Systems, Inc., Three Rivers, Mich.

Filed Apr. 22, 1997, Ser. No. 837,721

Int. Cl.^{6} C02F *5/08*

U.S. Cl. 210—175 **12 Claims**

1. A system for retaining and supplying hot water, said system comprising:
  a reservoir for retaining and supplying the hot water;
  means for heating the water;

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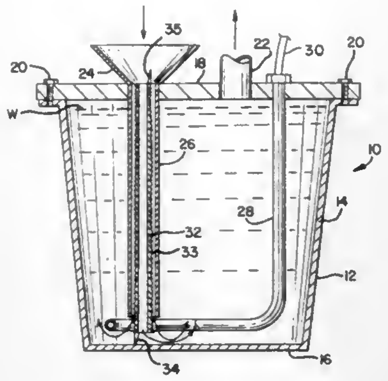


an inlet to the reservoir for adding new water to the hot water that is already in the reservoir;

an outlet from the reservoir for removing hot water from the reservoir; and

at least one metal element comprising copper and zinc in the reservoir and positioned to be in the hot water therein, said metal element being exposed to the hot water in the reservoir and having a surface area of sufficient size and an effective amount of copper and zinc to substantially reduce the formation of scale during use of the reservoir, and wherein said metal element is in or closely associated with said inlet.

5,837,135
CHROMATOGRAPHY AND RELATED APPARATUS SYSTEM

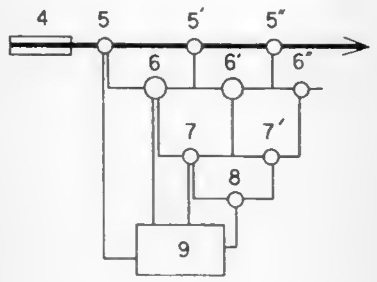
Susumu Nakamura, Tsuchiura, Japan, assignor to Agency of Industrial Science and Technology, Japan

Filed Jul. 3, 1997, Ser. No. 887,646

Claims priority, application Japan, Jul. 9, 1996, 8-178832

Int. Cl.^{6} B01D *15/08*

U.S. Cl. 210—198.2 1 Claim



1. In a chromatographic apparatus system comprising a reservoir for a mobile phase fluid, mobile phase feeding means, sample-introducing means, adsorption and separation column and detecting means connected in series and a recording means to which the signals from the detecting means are inputted to be recorded, the improvement which comprises providing, in the detecting means, at least two detectors differentially operating with a phase difference and having a recording means capable of recording a differential signal between the outputs from the detectors in the detecting means.

5,837,136
MINERAL ELUTING MATERIAL AND MANUFACTURING METHOD THEREOF, AND STRUCTURAL BODY OF MINERAL ELUTING MATERIAL

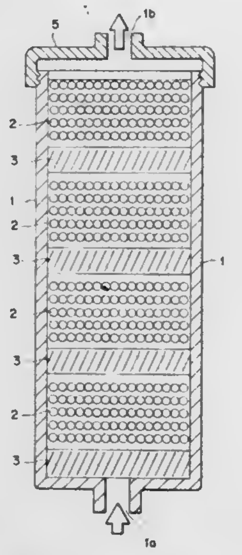
Duk-Soo Lee, Seongnam, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Oct. 18, 1996, Ser. No. 734,001

Claims priority, application Rep. of Korea, Dec. 18, 1995, 1995-51454

Int. Cl.^{6} B01D *39/06;39/20*

U.S. Cl. 210—207 23 Claims



1. A method of manufacturing a mineral eluting material, comprising the steps of:

submerging granite particles in a glucose solution for a time effective to adsorb the glucose solution therein;

baking said granite particles; and

cooling said granite particles.

12. A mineral eluting material, prepared by the method according to claim 1.

17. A structural body of mineral eluting material comprising:

a column containing the mineral eluting material according to claim 12 and a silver activated charcoal;

a water inlet; and

a water outlet.

5,837,137
BASE/CARTRIDGE LOCATION AND KEY SYSTEM FOR FUEL FILTER ASSEMBLY

Leon P. Janik, Suffield, Conn., assignor to Stanadyne Automotive Corp., Windsor, Conn.

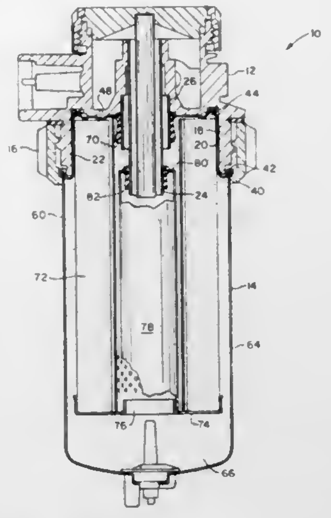
Filed Aug. 21, 1996, Ser. No. 700,792

Int. Cl.^{6} B01D *35/30*

U.S. Cl. 210—232 19 Claims

1. A filter system comprising:

a base comprising an inlet, an outlet, a central axis, first axial conduit means coaxially surrounding said central axis for communicating with said inlet, second axial conduit means coaxially surrounding said first axial conduit for communicating with said outlet, a skirt coaxially surrounding said second axial conduit means, an annular surface extending generally radially from said second axial conduit means to said skirt, said skirt and said annular surface and said second axial conduit means together defining a cavity, wherein said annular surface defines an engagement surface positioned within said cavity, wherein a plane coextensive with said engagement surface intersects said second axial conduit means, and protrusion means comprising at least one protrusion protruding axially outwardly from said engagement surface; and



cartridge means mountable to said base for defining a flow path communicable with said inlet and said outlet, said cartridge means comprising filter means for filtering fluid passing through said cartridge means and enclosure means for enclosing said filter means, said enclosure means comprising an end portion disposed within said cavity, said end portion comprising an axial opening for receiving said first and second axial conduit means, said end portion further including receptacle means for receiving said protrusion, said receptacle means being dimensioned and located for longitudinally receiving a corresponding said protrusion, said receptacle means being engageable with said protrusion for locking said cartridge means at a fixed angular position of said base.

5,837,138
FILTER DEVICE

Hendrik Arie Boele, Dussen, Netherlands, assignor to Rowe Parsons International Inc., Switzerland

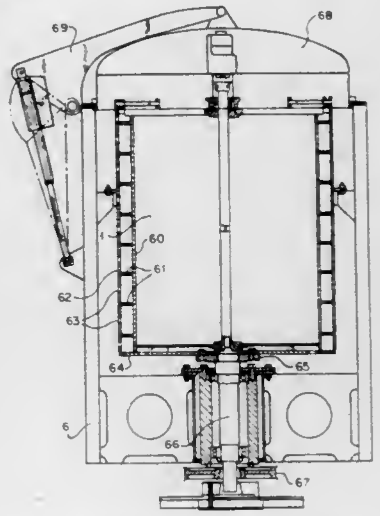
PCT No. PCT/NL93/00198, § 371 Date May 26, 1995, § 102(e) Date May 26, 1995, PCT Pub. No. WO94/07586, PCT Pub. Date Apr. 14, 1994

PCT Filed Oct. 7, 1993, Ser. No. 411,793

Claims priority, application Netherlands, Oct. 7, 1992, 9201731

Int. Cl.^{6} B01D *33/067*

U.S. Cl. 210—237 7 Claims



1. A device for separating at least one component from a fluid, the device comprising:

a closed carrier drum having a fluid inlet and a fluid outlet;

a filter element positioned in the carrier drum, the filter element having a top face and a bottom face and a cylindrical wall extending therebetween; and

a fluid duct positioned between the top and bottom faces of the filter element along a longitudinal axis of the filter element, wherein:

the longitudinal axis of the filter element is positioned coaxially with a longitudinal axis of the carrier drum; and

the filter element and the carrier drum are rotatable about their coaxially positioned longitudinal axes.

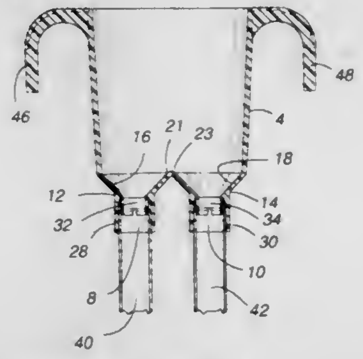
5,837,139
FLUID COLLECTING AND DIVIDING APPARATUS

Andrea M. Lerch, 2512 Rimrock Dr., Colorado Springs, Colo. 80915

Filed Apr. 14, 1997, Ser. No. 839,504

Int. Cl.^{6} B01D *29/085*

U.S. Cl. 210—474 7 Claims



1. A fluid collecting vessel comprising,

side walls having upper and lower perimeters and forming an enclosure,

a bottom member attached to the side walls and including,

a pair of spaced apart fluid discharge openings,

a pair of funnels, each having a hollow substantially cone shaped upper portion surrounding one of the openings and a walled drainage tube depending from the point of the cone, where the base of the cone is a closed plane figure congruent with one half of the lower perimeter of the side walls.

5,837,140
BLOOD FILTER AND EXTRACORPOREAL CIRCUIT

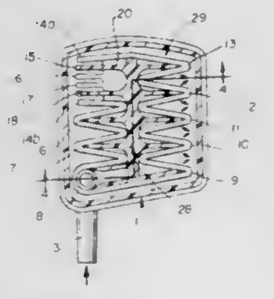
Massimo Fini, Mirandola; Nicola Ghelli, Casale, and Giuseppe Grandi, Felice, all of Italy, assignors to Dideco S.p.A, Mirandola, Italy

Filed May 28, 1996, Ser. No. 652,671

Claims priority, application Italy, May 29, 1995, MI95A1114; May 29, 1995, MI95A1115

Int. Cl.^{6} B01D *29/05;29/07*

U.S. Cl. 210—483 19 Claims



1. A blood filter comprising:

a housing having a top portion, a base portion and a sidewall portion;

a blood inlet; .

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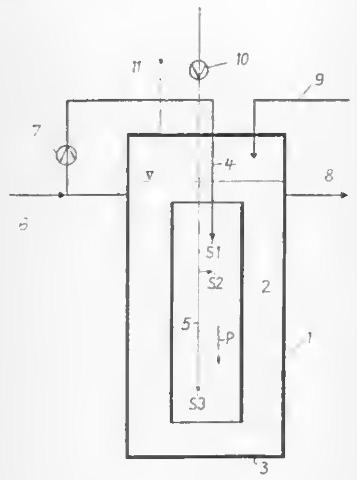
a filter element disposed within the housing and dividing the housing into an inlet chamber in flow communication with the blood inlet and an outlet chamber;
the filter element comprising a portion of non-woven filter material and a portion of screen filter material, the non-woven filter material portion being in direct contact with the inlet chamber and in direct contact with the outlet chamber; and the screen filter material portion being in direct contact with the inlet chamber and in direct contact with the outlet chamber; and
a blood outlet in flow communication with the outlet chamber.

5,837,141
PROCESS FOR THE BIOLOGICAL TREATMENT OF WASTE WATER

Alfons Vogelpohl, Clausthal-Zellerfeld, Germany, assignor to Technische Consult TECON GmbH, Germany
Filed Oct. 24, 1996, Ser. No. 736,552
Claims priority, application Germany, Oct. 26, 1995, 195 39 758.4; Aug. 31, 1996, 196 35 443.9
Int. Cl.⁶ C02F *3/20*
U.S. Cl. 210—629 **7 Claims**

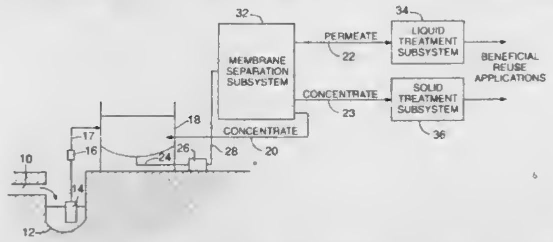


1. A process for the biological purification of waste water, comprising the steps of:
providing a reaction tank having microorganisms therein, and having at least one vertically arranged guide pipe therein, the guide pipe having open upper and lower ends, and being positioned so that the lower end is located at a distance from a bottom of the reaction tank;
supplying the waste water and a gas to the reaction tank to form a mixture, said supplying step including:
supplying the waste water under pressure to the guide pipe at the upper end; and
supplying the gas separate from the waste water at at least two positions into the guide pipe, the at least two positions being located at different levels and at positions downstream of the upper end, relative to a flow direction of the waste water; and
moving the mixture of the waste water and the gas in the reaction tank in a cycle that passes through the guide pipe.

7. An arrangement for biologically purifying waste water, comprising:
a reaction tank having microorganisms therein;
at least one vertically arranged guide pipe located within said reaction tank, said guide pipe having open upper and lower ends, and being positioned so that the lower end is located at a distance from a bottom of said reaction tank;
a first conduit for supplying the waste water under pressure to the guide pipe at the upper end;
a second conduit for supplying the gas separate from the waste water into the guide pipe at at least two positions, the at least two positions being located at different levels and at positions downstream of the upper end, relative to a flow direction of the waste water; and
means for moving a mixture of the waste water and the gas in the reaction tank in a cycle that passes through the guide pipe.

5,837,142
MEMBRANE PROCESS FOR TREATING SANITARY WASTEWATER

Steven B. Mullerheim, Berkeley, and Guy W. Roy, Danville, both of Calif., assignors to Great Circle Associates, Berkeley, Calif.
Continuation-in-part of Ser. No. 718,762, Sep. 23, 1996, abandoned. This application Mar. 24, 1997, Ser. No. 823,254
Int. Cl.⁶ B01D *61/58*
U.S. Cl. 210—650 **16 Claims**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PERMEATE
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LIQUID TREATMENT SUBSYSTEM
MEMBRANE SEPARATION SUBSYSTEM
BENEFICIAL REUSE APPLICATIONS
CONCENTRATE
23
SOLID TREATMENT SUBSYSTEM
36
18
17
16
CONCENTRATE
10
24
26
28
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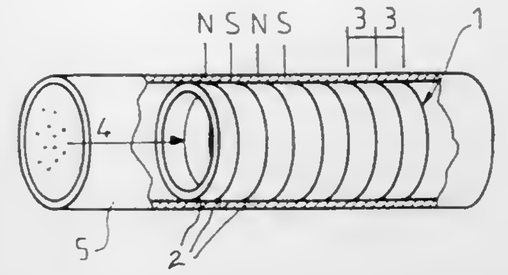
14
12

1. A process for treating fresh wastewater containing sanitary wastes from a fresh wastewater stream into reusable liquid and solid components, comprising:
withdrawing wastewater containing sanitary wastes from said wastewater stream,
comminuting converting said wastewater containing sanitary wastes into a slurry;
applying said slurry to the exterior surface of a membrane having an exterior surface and an interior surface, said membrane being permeable to selected liquid components of the slurry;
applying a pressure to motivate permeation of said membrane by said selected liquid components of the slurry;
extracting the selected liquid components as a liquid permeate from the interior surface of said membrane and removing the liquid permeate from the membrane, for discharge or productive reuse;
concentrating solids from said slurry on the exterior surface of said membrane;
extracting the solids concentrate from the exterior surface of said membrane and removing the solids concentrate from the membrane; and
said process including a step of treating the liquid permeate of said wastewater without any biological processes, thereby avoiding problems inherent with said biological processes.

5,837,143
PROCESS AND DEVICE FOR THE MAGNETIC TREATMENT OF A FLUID

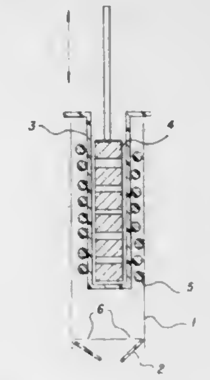
Dominique Mercier, Meudon-la-Forêt, France, assignor to Codiex SNC, Puteaux, France
Continuation of Ser. No. 844,669, Apr. 3, 1992, Pat. No. 5,364,536. This application Sep. 16, 1994, Ser. No. 307,320
Claims priority, application France, Oct. 13, 1989, 89 13386; Apr. 11, 1990, 90 04680
The portion of the term of this patent subsequent to Apr. 3, 2009, has been disclaimed.
Int. Cl.⁶ C02F *1/48*
U.S. Cl. 210—695 **5 Claims**

1. A device for the magnetic treatment of a fluid flowing through a working enclosure, comprising:
a working enclosure having an inner surface,
a flexible sheet means positioned within said working enclosure relative to said flowing fluid through said working enclosure and having an inner surface surrounding a central opening and an outer surface proximate to the inner surface of said working enclosure, said sheet means including adjacent magnetized band means extending coaxially about an axis, said adjacent band means forming part of said sheet means and being equally spaced apart from each other and being each of the same width as measured in a direction parallel to said axis;
wherein each of said band means contains a plurality of small magnets polarized in a single direction normal to inner and outer surfaces of said sheet means, each of said band means including a first polar face means of a first polarity and a second polar face means of a second polarity opposite said first polarity, wherein the polarity of the first polar face means of one of said band means is opposite to that of the polarity of the first polar face means of an adjacent band and the polarity of the second polar face means of said one band means is opposite to that of the polarity of the second polar face means of said adjacent band means.



5,837,144
METHOD OF MAGNETICALLY SEPARATING LIQUID COMPONENTS

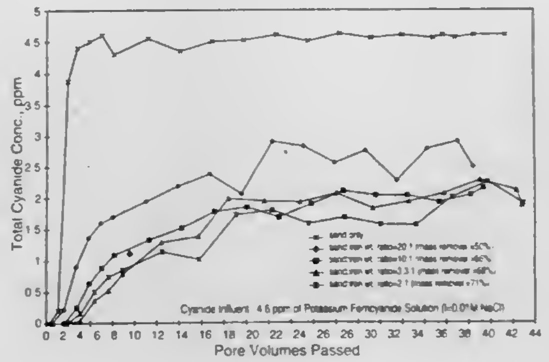
Gerhard Bienhaus, Wielenbach; Burkhard Stolz, Huglfing, and Ulrich Schubert, Starnberg, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany
Filed Jun. 15, 1995, Ser. No. 490,986
Claims priority, application Germany, Jun. 16, 1994, 44 21 058.2
Int. Cl.⁶ B01D *35/06*
U.S. Cl. 210—695 **8 Claims**



1. A method of separating a first component of a liquid from other components in the liquid utilizing magnetic particles, comprising the steps of:
(a) providing a vessel;
(b) adding the liquid and a quantity of magnetic particles therein to form a suspension of the magnetic particles and the liquid within said vessel;
(c) immobilizing the first component on the suspended magnetic particles in the vessel;
(d) immersing a magnetic device into the suspension contained in the vessel, while separating the device from the suspension by means of a protective sleeve which is made of a non-magnetic material, to apply a magnetic field to the suspension to adhere the magnetic particles having the first component immobilized thereon to the protective sleeve, and thereafter
(e) separating the other components from the immobilized first component by removing the liquid containing the other components from the vessel while maintaining the protective sleeve with the magnetic particles having the first component immobilized thereon adhering to the protective sleeve within the vessel.

5,837,145
METHOD FOR TREATING WATER CONTAMINATED WITH CYANIDE

David A. Dzombak; Rajat S. Ghosh, and Richard G. Luthy, all of Pittsburgh, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.
Filed May 23, 1997, Ser. No. 862,204
Int. Cl.⁶ C02F *1/58*
U.S. Cl. 210—715 **19 Claims**



1. A method for treating cyanide contaminated water comprising:
passing said water through a fixed, permeable bed containing elemental iron;
dissolving at least a portion of said elemental iron in said water;
reacting said dissolved elemental iron with cyanide in said water to form an iron-cyanide precipitate; and
allowing said precipitate to deposit in said fixed, permeable bed.

5,837,146
OIL COAGULANT PRODUCTS AND METHODS OF USE THEREFOR

Haluk Alper, Flowery Branch, Ga., assignor to Mansfield & Alper, Inc., Gainesville, Ga.
Continuation-in-part of Ser. No. 572,986, Dec. 15, 1995, Pat. No. 5,746,925, which is a continuation-in-part of Ser. No. 506,968, Jul. 28, 1995, Pat. No. 5,698,139, which is a division of Ser. No. 74,114, Jun. 8, 1993, Pat. No. 5,437,793. This application Dec. 12, 1996, Ser. No. 764,439
Int. Cl.⁶ B01J *13/00;* C02F *1/54;1/56*
U.S. Cl. 210—728 **50 Claims**

29. A process for treating an oil spill, comprising the steps of:
applying a coagulant composition that is the homogenous thermal reaction product of an oil component selected from the group consisting of glycerides, fatty acids, alkenes, and alkynes and a methacrylate or acrylate polymer component to spilled oil, wherein the percentage of said composition to said spilled oil ranges about 5–15%; and
allowing said composition and spilled oil to mix such that said composition coagulates said spilled oil.

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5,837,147

METHODS AND APPARATUS FOR CONTROLLING THE DRAINING OF WATER FROM A WATER PURIFIER

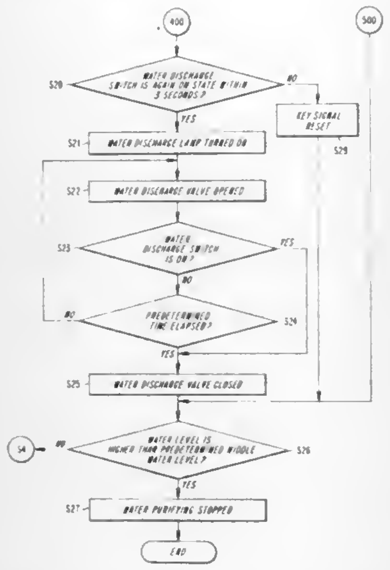
Geum-Suk Joung, Suwin, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jul. 29, 1996, Ser. No. 690,645

Claims priority, application Rep. of Korea, Jul. 29, 1995, 1995-23141

Int. Cl.⁶ B01D *17/00;17/12*

U.S. Cl. 210—739 **3 Claims**


400
500
S20
WATER DISCHARGE SWITCH IS AGAIN ON STATE WITHIN 3 SECONDS?
NO
YES
KEY SIGNAL RESET
S29
S21
WATER DISCHARGE LAMP TURNED ON
S22
WATER DISCHARGE VALVE OPENED
S23
WATER DISCHARGE SWITCH IS ON?
YES
NO
PREDETERMINED TIME ELAPSED?
S24
S25
WATER DISCHARGE VALVE CLOSED
54
WATER LEVEL IS HIGHER THAN PREDETERMINED MIDDLE WATER LEVEL?
S26
S27
WATER PURIFYING STOPPED
END

2. A method of operating a water purifier, the water purifier comprising filters for purifying water, a main tank for storing purified water, a hot water tank and a cold water tank for receiving water from the main tank and cooling and heating, respectively, the received water, dispensing pipes for dispensing cooled water and heated water, respectively, an electrically actuated water discharge valve openable to drain all water from the main tank, hot water tank, and cold water tank through a discharge pipe, a switch electrically connected to the valve for opening and closing the valve, and a display having a water discharge lamp; the method comprising the steps of:

A. manipulating the switch a first time, causing the water discharge lamp to flash on and off and initiating a predetermined time period; and

B. manipulating the switch a second time within the predetermined time period, causing the water discharge lamp to stay on and opening the valve.

5,837,148

NITRATE RECOVERY PLANT

Erich Danzmann, Bergkamen; Wilhelm-Heinrich Trautmann; Bernd Muskulus, both of Burbach; Bernd Neitzert, Wissen, and Frank Zips, Eschenburg, all of Germany, assignors to Dynamit Nobel Atkiengesellschaft, Troisdorf, Germany

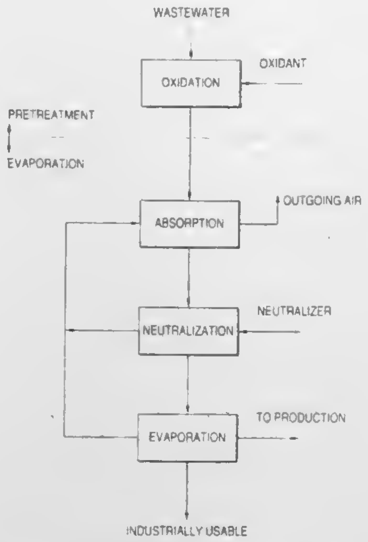
PCT No. PCT/EP95/03590, § 371 Date Mar. 17, 1997, § 102(e) Date Mar. 17, 1997, PCT Pub. No. WO96/08447, PCT Pub. Date Mar. 21, 1996

PCT Filed Sep. 12, 1995, Ser. No. 809,486

Claims priority, application Germany, Sep. 15, 1994, 44 32 840.0

Int. Cl.⁶ C02F *1/72;1/78*

U.S. Cl. 210—758 **9 Claims**



1. Method for eliminating inorganic nitrogen compounds from wastewater, comprising the steps of neutralizing wastewater with a neutralizer to a pH of approximately 7 to obtain a neutralized solution, wherein the neutralizer is a sodium hydroxide solution or ammonia, and evaporating said neutralized solution, whereby inorganic nitrate compounds present in the inorganic nitrogen compounds are eliminated from the wastewater in the form of the corresponding neutralized nitrate.

5,837,149

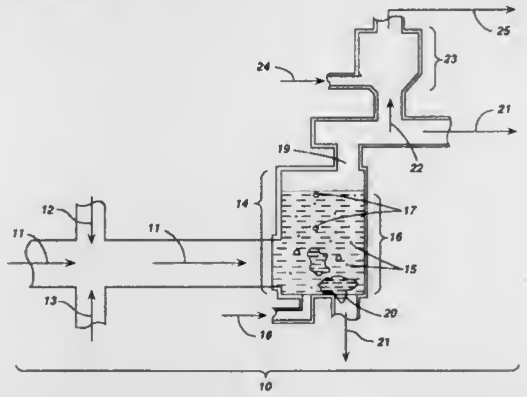
METHOD FOR HOT AND SUPERCRITICAL WATER OXIDATION OF MATERIAL WITH ADDITION OF SPECIFIC REACTANTS

David S. Ross, Palo Alto; Indira Jayaweera, Fremont, and Roald N. Leif, San Francisco, all of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Mar. 22, 1996, Ser. No. 621,746

Int. Cl.⁶ C02F *1/72*

U.S. Cl. 210—759 **19 Claims**



1. A process for the decomposition of material selected from the group consisting of organic compounds, inorganic compounds, or combinations thereof, to compounds which are environmentally acceptable, or which are amenable to further degradation by conventional disposal systems to produce environmentally acceptable products, which process comprises:

(a) conveying an aqueous solution or an aqueous slurry of material to be decomposed into a reaction zone capable of withstanding the temperatures and pressures of decomposition of the material; and

(b) contacting the material in the reaction zone in the presence of water with a reactive fluidized bed of a specific reactant present as a solid in an amount effective to decompose the material under hot water or supercritical water oxidation conditions of between about 300° and 600° C. and a pressure of between about 10 and 400 atmospheres, wherein the specific reactant is at least about 90% insoluble in an aqueous medium at said hot water or supercritical water oxidation conditions, and reacts to neutralize any acid gases produced in the decomposition, and wherein the process occurs in the presence of a gaseous oxidant which is present in an amount of between about 0.1 and 50% by weight of the material to be decomposed;

wherein said reactive fluidized bed is fluidized by said oxidant and said solution or slurry, and wherein said specific reactant is selected from the group consisting of sodium carbonate, calcium oxide, calcium hydroxide, magnesium hydroxide, magnesium oxide, and combinations thereof;

said contacting being carried out for a time sufficient to convert about 99% or greater of the material to compounds which are environmentally acceptable, or to conversion compounds which are amendable to further degradation to environmentally acceptable products.

5,837,150

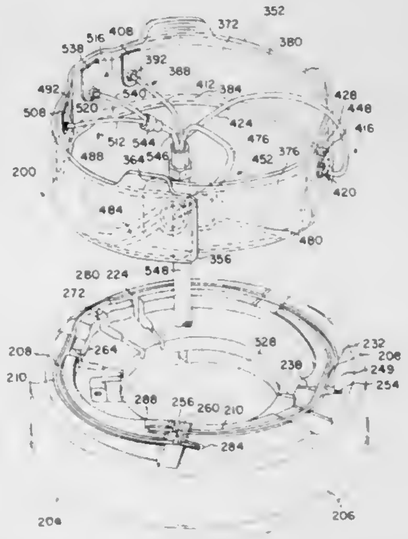
EXTRACORPOREAL BLOOD PROCESSING METHODS

Robert W. Langley, Westminster; Brian M. Holmes, Evergreen, and Marlene Adele Bainbridge, Littleton, all of Colo., assignors to COBE Laboratories, Inc., Lakewood, Colo.

Filed Jun. 7, 1995, Ser. No. 484,209

Int. Cl.⁶ B01D *21/26;* **B04B** *1/00*

U.S. Cl. 210—782 **12 Claims**



8. A method for processing blood in an apheresis system comprising a blood processing vessel and a channel housing having a diameter of no greater than about ten inches and comprising a blood processing channel, said blood processing vessel being positioned in said channel, said method comprising the steps of:

selecting a packing factor of blood components in a first stage of said channel of at least 10, wherein said packing factor is a dimensionless quantification of the degree of packing of the blood components in said first stage;

rotating said channel housing and providing a flow to said blood processing vessel at a rate ranging from about 40 milliliters per minute to about 70 milliliters per minute, said flow comprising blood to separate said blood into a plurality of blood components in said first stage of said channel at said packing factor of blood components; and

removing at least one of said plurality of blood components from said blood processing vessel.

5,837,151

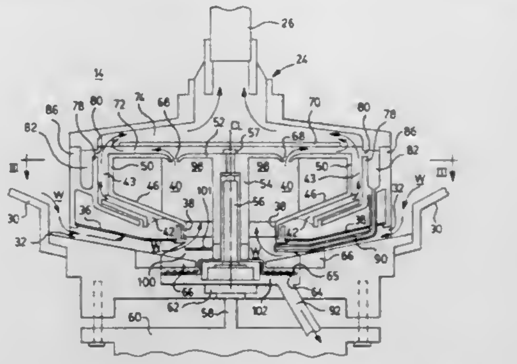
METHODS FOR SEPARATING SOIL FROM SOIL LADEN WATER IN DISHWASHERS

Todd M. Jozwiak, Benton Harbor, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Division of Ser. No. 713,488, Sep. 13, 1996, Pat. No. 5,770,058. This application Apr. 29, 1997, Ser. No. 848,615

Int. Cl.⁶ B08B *3/02;* **B01D** *21/26*

U.S. Cl. 210—787 **12 Claims**



1. A method for separating soil from soil laden water for a recirculating wash water dishwasher; comprising the steps of:

providing a soil separator including a centrifuge;

receiving wash water from a dish compartment of said dishwasher into said soil separator;

in said soil separator receiving a first flow of said wash water into said centrifuge;

spinning said centrifuge with a motor to maintain a spinning column of water having a vertically upwardly increasing diameter;

pumping water through said centrifuge by said spinning of said centrifuge to an exit located at a top region of said centrifuge;

reapplying water exiting said centrifuge to said dish compartment; and

draining at least some of the soil from the soil separator.

5,837,152

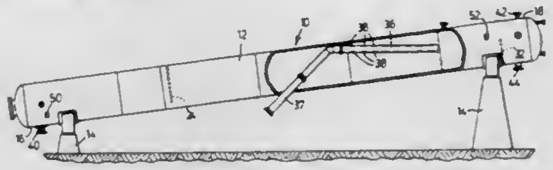
INCLINED SEPARATION TANK

Stephen Michael Komistek, and Clark Faulkner Walker, both of Alberta, Canada, assignors to Corlac Inc., Alberta, Canada

Filed Apr. 9, 1997, Ser. No. 827,700

Int. Cl.⁶ C02F *1/40*

U.S. Cl. 210—801 **6 Claims**



4. A method of separating oil well fluids, comprising:

providing a free water knockout vessel for receiving and separating oil well fluids, the vessel being in the form of an elongate structure with a longitudinal axis disposed at an oblique angle to the horizontal, the structure having closed lower and upper ends, and a plurality of spaced-apart baffle plates within the vessel, dividing the vessel into a plurality of interior compartments, one of said baffle plates being a water baffle adjacent the lower end of said vessel, the water baffle having a manway opening in the lower region thereof, a manway panel adapted to close said manway opening but defining a water opening, the water baffle further having a weir opening adjacent the top thereof, another one of said baffle plates being an oil baffle located adjacent the upper end of the vessel to provide a barrier to water, the oil baffle including a weir opening adjacent the top thereof,

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transmitting oil well fluids into said vessel by passing them through a feed conduit connected to the upstream end of an elongate inlet stratifier pipe within said vessel, the stratifier pipe having a longitudinal axis disposed substantially horizontally and having spaced apart perforations through which said oil well fluids pass, and

withdrawing each separated fluid from said vessel through its own exit coupling, for further processing;

said step of withdrawing including allowing water to flow through the water opening into the lower end of said vessel, the step of withdrawing further including allowing oil trapped below the water baffle to escape into the higher region of the vessel by flowing over the weir opening of the water baffle, and in which said step of withdrawing includes allowing oil to flow over the top of the oil baffle.

5,837,153

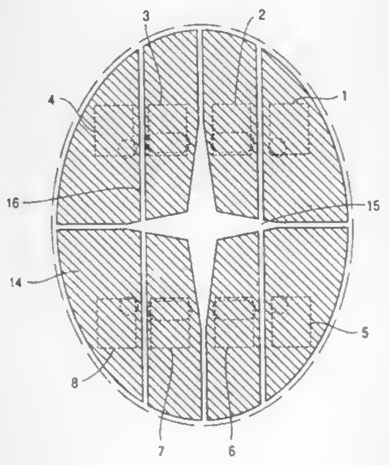
METHOD AND SYSTEM FOR CREATING AND USING A LOGOTYPE CONTACT MODULE WITH A SMART CARD

Joseph C. Kawan, 2034 Paramount Dr., Hollywood, Calif. 90068

Filed Jan. 15, 1997, Ser. No. 784,262

Int. Cl.^{6} B44C *1/22*

U.S. Cl. 216—2 **39 Claims**



1. A method for creating a contact surface for a smart card comprising:

imprinting a pattern comprising a source identifier on a board comprising a substrate with conducting material on its surface;

etching away a portion of the conducting material in the pattern such that separated conducting contact points are created within said pattern;

attaching said substrate and etched conducting material to a semiconductor chip such that the conducting contact points are electrically connected to the semiconductor chip;

encapsulating the semiconductor chip; and

emplacing said substrate, conducting material, and encapsulated semiconductor chip device in a cavity of a plastic frame.

5,837,154

METHOD OF MANUFACTURING DOUBLE-SIDED CIRCUIT TAPE CARRIER

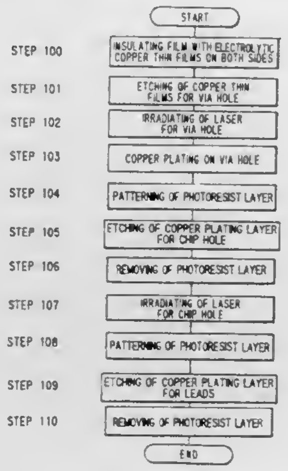
Norio Okabe; Yasuharu Kameyama; Katsutoshi Taga; Takayuki Sato; Mamoru Mita; Hiroki Tanaka, and Hiroshi Ishikawa, all of Ibaraki, Japan, assignors to Hitachi Cable, Ltd., Tokyo, Japan

Filed Apr. 23, 1997, Ser. No. 847,753

Claims priority, application Japan, Apr. 23, 1996, 8-101012; Feb. 20, 1997, 9-036110

Int. Cl.^{6} B44C *1/22*

U.S. Cl. 216—14 **12 Claims**


START
STEP 100
INSULATING FILM WITH ELECTROLYTIC COPPER THIN FILMS ON BOTH SIDES
STEP 101
ETCHING OF COPPER THIN FILMS FOR VIA HOLE
STEP 102
IRRADIATING OF LASER FOR VIA HOLE
STEP 103
COPPER PLATING ON VIA HOLE
STEP 104
PATTERNING OF PHOTORESIST LAYER
STEP 105
ETCHING OF COPPER PLATING LAYER FOR CHIP HOLE
STEP 106
REMOVING OF PHOTORESIST LAYER
STEP 107
IRRADIATING OF LASER FOR CHIP HOLE
STEP 108
PATTERNING OF PHOTORESIST LAYER
STEP 109
ETCHING OF COPPER PLATING LAYER FOR LEADS
STEP 110
REMOVING OF PHOTORESIST LAYER
END

1. A method of manufacturing a double-sided circuit tape carrier, said double sided circuit tape carrier comprising an insulating film, circuit wiring patterns on both sides thereof, and a via hole through which at least a part of the circuit wiring patterns on both sides are electrically connected with each other, said method comprising the steps of:

patterning at least one conductive thin film by photoetching, said conductive thin film being formed on each side of an insulating film;

forming a first hole through said insulating film by irradiating a laser beam by using said patterned conductive thin film as a first mask;

forming a conductive layer on the side wall of said first hole; then,

patterning one of said conductive thin films by photoetching;

forming a second hole through said insulating film by irradiating a laser beam by using said patterned conductive thin film as a second mask; then,

patterning one of said conductive thin films by photoetching to form circuit wiring pattern.

5,837,155

INSULATING RESIN COMPOSITION FOR BUILD-UP BY COPPER FOIL LAMINATION AND METHOD FOR PRODUCTION OF MULTILAYER PRINTED CIRCUIT BOARD USING THE COMPOSITION

Shoji Inagaki, Ranzan-machi, and Eiji Takehara, Higashimurayama, both of Japan, assignors to Taiyo Ink Manufacturing Co., Ltd., Tokyo, Japan

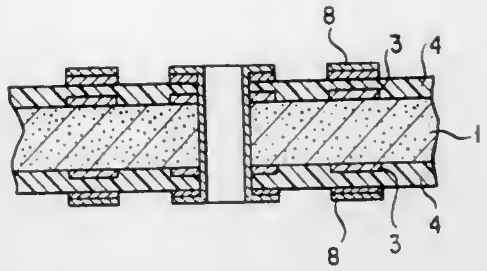
Filed Aug. 14, 1996, Ser. No. 696,661

Claims priority, application Japan, Aug. 28, 1995, 7-240495

Int. Cl.^{6} B44C *1/22*

U.S. Cl. 216—18 **30 Claims**

15. A method for the production of a multilayer printed circuit board, comprising the steps of providing a printed circuit board comprising an insulating substrate and at least one layer of conductor pattern formed thereon and forming on said printed circuit board an outer circuit layer containing an insulating resin layer and a layer of outer conductor pattern, said step of forming the outer circuit layer comprising:



applying a thin layer of an insulating resin composition to said printed circuit board throughout the entire surface thereof having the conductor pattern formed thereon so as to form an insulating resin layer covering said conductor pattern, wherein said insulating resin composition comprising (A) at least one species of epoxy resin having a softening point of not more than 110° C., (B) a monomer or an oligomer possessing an unsaturated double bond, (C) an epoxy resin curing agent, and (D) a photopolymerization initiator,

irradiating the insulating resin layer with ultraviolet light,

superposing a copper foil on said insulating resin layer by means of a heated pressure roller thereby effecting lamination thereof,

thermally curing said insulating resin composition thereby obtaining a multilayer laminate,

forming a through-hole in said multilayer laminate,

depositing a copper layer on surfaces of said copper foil and wall of said through-hole,

selectively etching said copper layer and said copper foil of said multilayer laminate to impart an outer conductor pattern thereto, and

covering said outer conductor pattern except in those areas to be soldered with a solder mask, thereby obtaining a multilayer printed circuit board.

5,837,156

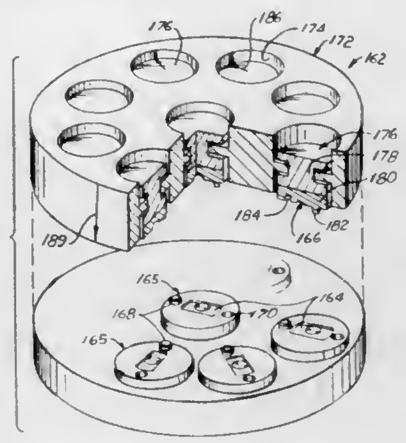
METHODS OF FABRICATING INTRAOCULAR LENSES AND LENS MOLDS

J. Stuart Cumming, 1211 W. #201 LaPalma Ave., Anaheim, Calif. 92801

Continuation of Ser. No. 230,740, Apr. 21, 1994, abandoned. This application Sep. 30, 1996, Ser. No. 727,177

Int. Cl.^{6} C25D *1/10*

U.S. Cl. 249—119 **44 Claims**



22. For use in making a mold for molding a lens, the combination comprising:

a plurality of discrete separately formed mold members devoid of any bridging connection between the mold members joining the mold members to one another and each having a mold formation at one side and an opposite posterior portion,

a planar base formed separately from said mold members,

means mounting each mold member on said base for limited free movement relative to and parallel to the plane of said base and independently of the other mold members on the base, and wherein

said combination is devoid of any adjustment for altering said limited free movement of each mold member.

5,837,157

POLYMER SOLID ELECTROLYTE

Shinzo Kohjiya; Yuko Ikeda, both of Kyoto; Katsuhito Miura, Sanda; Shigeru Shoji, Amagasaki; Yasuo Matoba, Nishinomiya; Masayoshi Watanabe, Yokohama, and Takahiro Sakashita, Osaka, all of Japan, assignors to Daiso Co., Ltd., Osaka-Fu, Japan

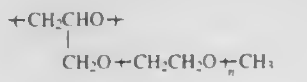
Continuation of Ser. No. 643,882, May 7, 1996, abandoned. This application Oct. 27, 1997, Ser. No. 959,707

Claims priority, application Japan, May 8, 1995, 7-109616; Feb. 15, 1996, 8-027896; Apr. 2, 1996, 8-079898

Int. Cl.^{6} H01M *6/18*

U.S. Cl. 252—62.2 **13 Claims**

1. A polymer solid electrolyte, comprising a polyether copolymer having an oligooxyethylene side chain and an electrolyte salt compound soluble therein, wherein said polyether copolymer is a solid random copolymer having a main chain structure consisting of 5 to 30 molar % of a structural unit of the following formula (1) and 95 to 70 molar % of a structural unit of the following formula (2).



$$\left(\begin{matrix}\text{CH}_2\text{CHO}\\ |\\ \text{CH}_2\text{O}\left(\text{CH}_2\text{CH}_2\text{O}\right)_n\text{CH}_3\end{matrix}\right) \quad (1)$$

$$\left(\text{CH}_2\text{CH}_2\text{O}\right) \quad (2)$$

wherein n is 1 to 12, and the polyether copolymer has a number-average molecular weight of 100.000 to 2.000.000, a glass transition temperature measured by a differential scanning calorimeter (DSC) of not more than −60° C. and a heat of fusion of not more than 70 J/g.

5,837,158

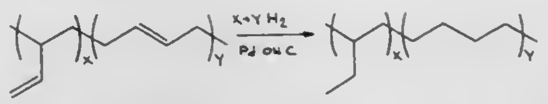
POLYMER FORMULATIONS FOR GETTERING HYDROGEN

Timothy Jon Shepodd, and LeRoy L. Whinnery, both of Livermore, Calif., assignors to Sandia Corporation, Livermore, Calif.

Filed Sep. 23, 1996, Ser. No. 716,752

Int. Cl.^{6} H01J *7/18;35/20;* H01K *1/56;* C01B *3/50*

U.S. Cl. 252—181.6 **15 Claims**



1. A hydrogen getter composition for removing hydrogen and its isotopes from within an enclosed space, comprising:

an organic polymer, said organic polymer further comprising a plurality of repeating monomer units, said units having up to six side branches, said side branches further comprising C_1–C_8 alkyl that contain or are substituted with one or more functionalities selected from the group consisting of C_2–C_8 alkene, C_2–C_8 alkyne, C_1–C_8 ether, C_1–C_8 alcohol, C_1–C_8 ester, phenyl, C_1–C_{10} anhydride, C_1–C_8 isocyanate, C_1–C_8 ketone, C_1–C_8 epoxide, and C_1–C_8 carboxylic acid such that each said unit contains at least one carbon-carbon double bond;

a hydrogenation cataylst consisting essentially of a noble metal catalyst and an inert catalyst support material, said hydrogenation catalyst distributed throughout said getter composition

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wherein said double bonds and said noble metal catalyst are in reactive association; and

an inert diluent, said diluent selected from the list consisting of carbon black powders, mineral powders, salts, thixotropic agents and combinations thereof.

5,837,159
CHEMICAL DETOXIFIER FOR EMBALMING SOLUTIONS

Gabriel J. Farkas, 9843 Forbes Ave., Northridge, Calif. 91343, and Michel Iskarous, 659 Pierre Rd., Walnut, Calif. 91789
Filed Sep. 23, 1996, Ser. No. 717,908
Int. Cl.^{6} A01N *1/00;* **C09K** *3/00*
U.S. Cl. 252—193 **2 Claims**

1. A composition for use in rapid detoxification of toxic formaldehyde vapors and absorbtion of hydrogen sulfide and carbon dioxide from incidental releases of unused or spent embalming solutions of various concentrations, comprising tris(hydroxymethyl) aminomethane and 2-amino-2-ethyl-1,3-propanediol and beta-cyclodextrin.

5,837,160
CHIRAL CLCPS CONTAINING COLORED MONOMERS

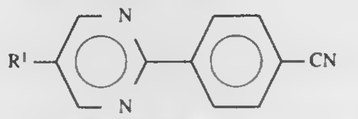
Erwin Dietz, Königstein, and Axel Schönfeld, Wiesbaden, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany
Filed May 21, 1997, Ser. No. 859,750
Claims priority, application Germany, May 23, 1996, 196 20 746.0
Int. Cl.^{6} C09K *19/52;19/32;19/34;* **F21V** *9/00*
U.S. Cl. 252—299.01 **11 Claims**

1. A cholesteric liquid-crystalline polymer which contains:
- at least one colored comonomer which absorbs light in the visible wavelength region, and
- at least one cholesteric liquid-crystalline polymer wherein said cholesteric liquid-crystalline polymer is a main-chain polymer, a side-group polymer, or a combination thereof, wherein:
  - said cholesteric liquid-crystalline side-group polymer is a polysiloxane, a cyclic siloxane, a polyacrylate, a polymethacrylate or a combination thereof, containing mesogens in the side-group or groups;
  - said cholesteric liquid-crystalline main-chain polymer is a polyester, a polyamide or a polyesteramide, containing an aromatic hydroxycarboxylic acid, a cycloaliphatic hydroxycarboxylic acid, an aromatic aminocarboxylic acid, an aromatic dicarboxylic acid, a cycloaliphatic dicarboxylic acid, an aromatic diol, a cycloaliphatic diol, an aromatic diamine, a cycloaliphatic diamine or a combination thereof, and containing a chiral, bifunctional comonomer;
  - said colored comonomer is a bifunctional hydroxyl derivative, a bifunctional amino derivative, or a bifunctional carboxyl derivative, of an anthanthrone pigment, an anthraquinone pigment, a dioxazine pigment, a phthalocyanine pigment, a quinacridone pigment, a diketopyrrolopyrrol pigment, a perylene pigment, a perinone pigment, an azomethine pigment, an azo pigment, an aminostilbenecarboxylic acid or a combination thereof.

5,837,161
LIQUID CRYSTAL COMPOSITION AND LIQUID CRYSTAL DISPLAY DEVICE

Yasuko Sekiguchi; Katsuyuki Murashiro; Fusayuki Takeshita; Tetsuya Matsushita, and Etsuo Nakagawa, all of Chiba, Japan, assignors to Chisso Corporation, Osaka, Japan
Filed Mar. 24, 1997, Ser. No. 822,688
Claims priority, application Japan, May 8, 1996, 8-139441
Int. Cl.^{6} C09K *19/34;19/30;19/12*
U.S. Cl. 252—299.61 **12 Claims**

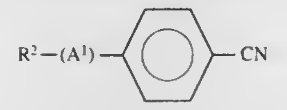
1. A liquid crystal composition comprising, as a first component, a compound expressed by formula (I)



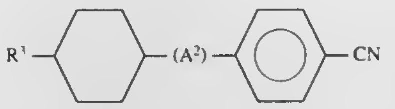
(I)

wherein R_1 represents an alkyl group having 1 to 10 carbon atoms and any one or not-adjacent two or more methylene groups (—CH_2—) in the alkyl group may be replaced by oxygen atom (—O—) or —CH=CH—,

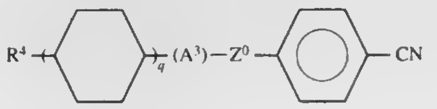
as a second component, at least one compound expressed by any one of formulas (II-a) to (II-d)



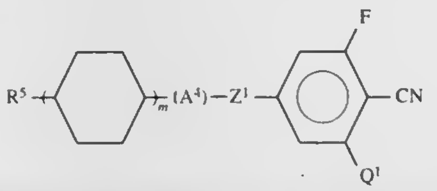
(II-a)



(II-b)



(II-c)



(II-d)

wherein R^2, R^3, R^4, and R^5 independently represent an alkyl group having 1 to 10 carbon atoms and any one or not-adjacent two or more methylene groups (—CH_2—) in each of the alkyl groups may be replaced by oxygen atom (—O—) or —CH=CH—; Z^0 represents —COO— or —CH_2CH_2—; Z^1 represents —CH_2CH_2—, —COO—, or single bond; Q^1 represents H or F; A^1 represents 1,4-cyclohexylene, 1,4-phenylene, or 1,3-dioxane-2,5-diyl; A^2 and A^3 independently represent 1,4-cyclohexylene or 1,4-phenylene; A^4 represents 1,4-cyclohexylene, or 1,4-phenylene whose H atom at a lateral position may be replaced by F; and q and m are independently 0 or 1,

as a third component, at least one compound expressed by formula (III) or formula (IV)

$$R^6—(B)—Z^2—(C)—R^7 \qquad \text{(III)}$$

wherein R^6 and R^7 independently represent an alkyl group having 1 to 10 carbon atoms and any one or not-adjacent two or more methylene groups (—CH_2—) in the alkyl group may be replaced by oxygen atom (—O—) or —CH=CH—; B represents 1,4-cyclohexylene, 1,3-pyrimidine-2,5-diyl, or 1,4-phenylene; C represents 1,4-cyclohexylene or 1,4-phenylene; and Z^2 represents —C≡C—, —COO—, —CH_2CH_2—, —CH=CH—, or single bond,

$$R^8—(D)—Z^3—(E)—Z^4—(G)—R^9 \qquad \text{(IV)}$$

wherein R^8 and R^9 independently represent an alkyl group having 1 to 10 carbon atoms and any one or not-adjacent two or more methylene groups (—CH_2—) in the alkyl group may be replaced by oxygen atom (—O—) or —CH=CH—; D represents 1,4-cyclohexylene or 1,3-pyrimidine-2,5-diyl; E represents 1,4-cyclohexylene, or 1,4-phenylene whose H atom at a lateral position may be replaced by F; G represents 1,4-cyclohexylene or 1,4-phenylene; Z^3 represents —CH_2CH_2— or single bond; and Z^4 represents —C=—C—,—COO—, —CH=CH—, or single bond; and

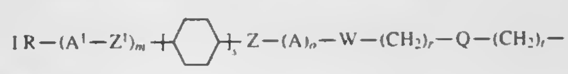
as a fourth component, a chiral component in an amount necessary for maintaining the ratio d/P of the cell thickness d (μm) to the pitch length of twist P (μm) in the range of 0.4 to 0.6 when the liquid crystal composition is used for liquid crystal display devices,

the content of the third component being 40 to 70% by weight based on the total weight of the liquid crystal composition.

5,837,162
LIQUID-CRYSTALLINE COMPOUNDS

Volker Reiffenrath, Rossdorf; Herbert Plach; Detlef Pauluth, both of Darmstadt; Reinhard Hittich, Modautal 1; Eike Poetsch, Mühltal 6; Thomas Geelhaar, Mainz; Georg Weber, and Ekkehard Bartmann, both of Erzhausen, all of Germany, assignors to Merck Patent Gesellschaft mit Beschrankter Haftung, Germany
Division of Ser. No. 844,676, Apr. 10, 1992. This application Jan. 30, 1997, Ser. No. 790,803
Claims priority, application Germany, Feb. 12, 1991, 41 04 126.7; Mar. 2, 1991, 41 09 809.9; Aug. 3, 1991, 41 25 844.4; Aug. 20, 1991, 41 27 450.4
Int. Cl.^{6} C09K *19/30;19/52;19/12;* **C07C** *22/00*
U.S. Cl. 252—299.63 **12 Claims**

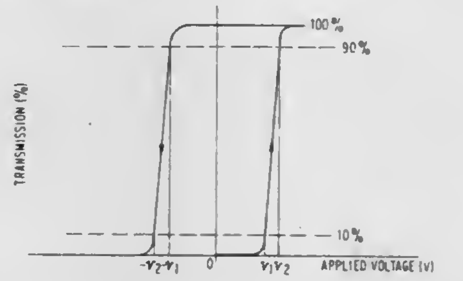
1. Liquid-crystalline compounds of the formula



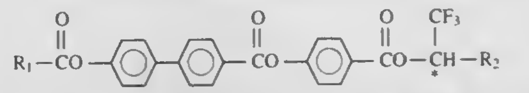
in which
- R is H, an alkyl or alkylene radical having 1 to 15 carbon atoms which is unsubstituted, monosubstituted by CN or CF_3 or at least monosubstituted by halogen, it also being possible for one or more CH_2 groups in these radicals each to be replaced, independently of one another, by —O—, —s—, —◇—, —CO—, —CO—O—, —O—CO— or —O—CO—O— in such a way that oxygen atoms are not linked directly to one another,
- Z^1 and Z are each, independently of one another, —CH_2CH_2—, —CH=CH—, —C≡C— or a single bond, and one of the radicals Z^1 and Z is alternatively —$(CH_2)_4$— or —CH=CH— CH_2CH_2—,
- A is trans-1,4-cyclohexylene in which, in addition, one or two non-adjacent CH_2 groups may be replaced by —O—,
- A^1 is trans-1,4-cyclohexylene in which, in addition, one or two non-adjacent CH_2 groups may be replaced by —O—, or is 1,4-phenylene which is unsubstituted or monosubstituted or disubstituted by fluorine and/or Cl atoms and in which, in addition, one or two CH groups may be replaced by N,
- m is 0, 1, 2or 3,
- o and s are each 0, 1 or 2, where (s+o) is≧2,
- W is —O—,
- Q is a single bond,
- r is 1 to 7,
- t is 0 to 7, and
- Y is F, Cl, OCF_3, CHF_2, $OCHF_2$ or OCHF, and where r+t≧2, Y can be CF_3.

5,837,163
LIQUID CRYSTAL COMPOUNDS

Koichi Numazawa; Noriko Yamakawa; Yoshiichi Suzuki, and Ichiro Kawamura, all of Tokyo, Japan, assignors to Showa Shell Sekiyu K.K., Tokyo, Japan
Division of Ser. No. 557,845, Jul. 25, 1990, Pat. No. 5,207,946. This application Sep. 30, 1992, Ser. No. 953,783
Claims priority, application Japan, Jul. 26, 1989, 1-193694
Int. Cl.^{6} C09K *19/12:19/20;* **C07C** *69/76*
U.S. Cl. 252—299.65 **2 Claims**



1. A liquid crystal compound represented by formula (IV):

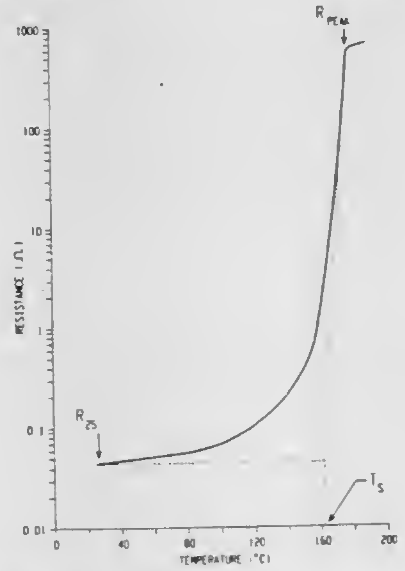


(IV)

wherein R_1 represents an alkyl group having from 3 to 18 carbon atoms, R_2 represents an alkyl group having from 4 to 15 carbon atoms, and the compound exhibits tristability when in an $S^*_{(3)}$ phase.

5,837,164
HIGH TEMPERATURE PTC DEVICE COMPRISING A CONDUCTIVE POLYMER COMPOSITION

Liren Zhao, Mansfield, Ohio, assignor to Therm-O-Disc, Incorporated, Mansfield, Ohio
Filed Oct. 8, 1996, Ser. No. 729,822
Int. Cl.^{6} H01B *1/20:1/22:1/24;* **H01C** *7/02*
U.S. Cl. 252—500 **43 Claims**



1. A conductive polymeric composition which exhibits PTC behavior, comprising:
- (a) a semicrystalline polymer component that includes nylon 12: and
- (b) a particulate conductive filler;
- said composition having a resistivity at 25° C. of 100 Ωcm or less and a resistivity at a T_s greater than 125° C. that is at least 10^3 times the resistivity at 25° C.

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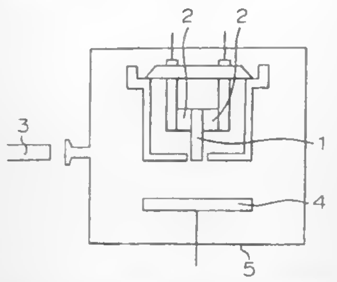
5,837,165
RARE EARTH HEXABORIDE ELECTRON-EMITTING MATERIAL

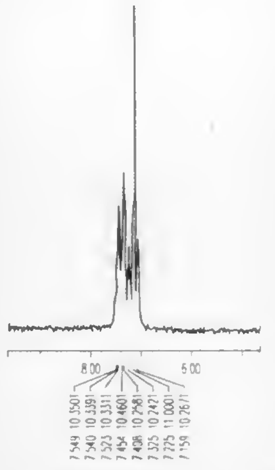
Shigeki Otani; Ryutaro Soda, and Yoshio Ishizawa, all of Tsukuba, Japan, assignors to National Institute for Research in Inorganic Materials, Tsukuba, Japan
Filed Sep. 3, 1996, Ser. No. 707,071
Claims priority, application Japan, Dec. 21, 1995, 7-349891
Int. Cl.^{6} H01B *1/06*
U.S. Cl. 252—519.14 **4 Claims**



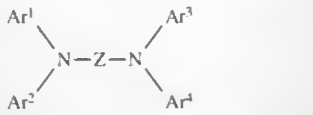
1. In a method for emitting electrons comprising heating and applying a voltage to an electron-emitting material, the improvement comprising selecting as the electron-emitting material a rare earth hexaboride of the formula ReB_{6+x}, wherein Re is a mixture of La and Ce, and $0.05 \leqq x \leqq 0.20$.

5,837,166
ORGANIC ELECTROLUMINESCENCE DEVICE AND ARYLENEDIAMINE DERIVATIVE

Hisayuki Kawamura; Chishio Hosokawa; Tadashi Kusumoto, and Hiroaki Nakamura, all of Sodegaura, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan
PCT No. PCT/JP94/01585, § 371 Date Mar. 27, 1996, § 102(e) Date Mar. 27, 1996, PCT Pub. No. WO95/09147, PCT Pub. Date Apr. 6, 1995
PCT Filed Sep. 28, 1994, Ser. No. 615,281
Claims priority, application Japan, Sep. 29, 1993, 5-243024
Int. Cl.^{6} G02F *1/00;* **C09K** *11/06;* **C07C** *211/00*
U.S. Cl. 252—583 **9 Claims**



1. An organic electroluminescence device at least containing a p-phenylenediamine derivative having 6 or more benzene ring skeletons which is represented by the general formula (I):

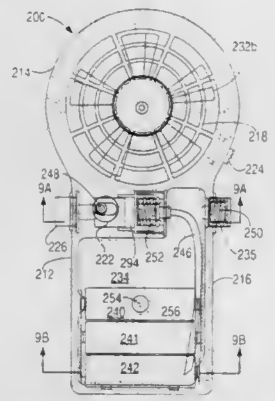


(I)

wherein Z represents p-phenylene group; Ar^1, Ar^2, Ar^3, and Ar^4 represent each an aryl group having 6 to 20 carbon atoms, and may be the same with each other or different from each other; Z, Ar^1, Ar^2, Ar^3, and Ar^4 may each be substituted with alkyl groups having 1 to 6 carbon atoms, alkoxy groups having 1 to 6 carbon atoms, or phenyl groups; and the combination of Ar^1, Ar^2, Ar^3, Ar^4, and Z of the central skeleton must have 6 or more benzene ring skeletons.

5,837,167
COMPACT PORTABLE MISTING FAN

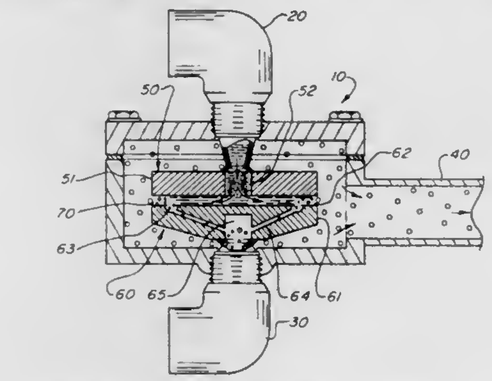
Jeffrey H. Lederer, 56 Husted La., Greenwich, Conn. 06830
Continuation of Ser. No. 521,311, Aug. 30, 1995, Pat. No. 5,667,732. This application May 5, 1997, Ser. No. 851,601
Int. Cl.^{6} B01F *3/04*
U.S. Cl. 261—28 **23 Claims**



1. A compact hand held portable misting fan operable by one hand of a user, said fan comprising:
- a) a housing dimensioned to be easily held in the user's hand, said housing having a front air baffle and a rear air baffle;
- b) an electric fan mounted in said housing;
- c) a fluid container mounted in said housing;
- d) an electrical switch for supplying power to said electric fan, said electrical switch being mounted on said housing; and
- e) an atomizer coupled to said fluid container for pumping fluid from said fluid container and atomizing said fluid, said atomizer having a spray outlet and a push button mounted on said housing wherein
  - when said fan is held in the user's hand, said switch can be activated by a thumb or finger and said push button can be pushed by a finger or thumb, respectively, of the same hand.

5,837,168
FOAM GENERATING APPARATUS

Carroll G. Rowe, P.O. Box 69, Washington, Ark. 71862
Filed Dec. 3, 1996, Ser. No. 759,888
Int. Cl.^{6} B01F *3/04*
U.S. Cl. 261—78.2 **7 Claims**

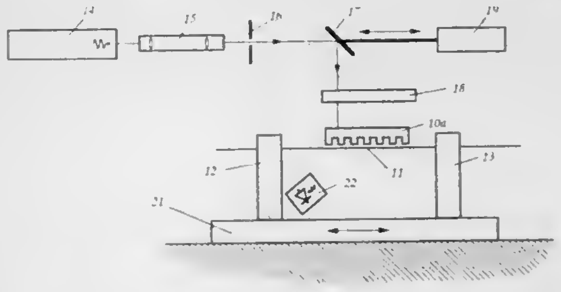


1. An apparatus for generating foam, comprising:
- means for introducing a solution of pressurized water and surfactant into a chamber;

- means for introducing pressurized air into said chamber; and
- means for rapidly reducing the velocity of the solution of pressurized water and surfactant and for rapidly reducing the velocity of said pressurized air upon entering said chamber;
- wherein said means for rapidly reducing said velocity of said solution of pressurized water and surfactant and for rapidly reducing said velocity of said pressurized air upon entering said chamber comprises:
  - a first plate having an inner surface and having a central bore through said first plate and further having means for introducing through said central bore said solution of pressurized water and a surfactant to said inner surface; and
  - a second plate having an inner surface fixed in spaced relationship to said inner surface of said first plate forming a gap having a determined distance between said inner surface of said first plate and said inner surface of said second plate, an annular groove disposed on one of said inner surfaces of said first or second plate and having means for introducing pressurized air to said annular groove.

5,837,169
CREATION OF BRAGG REFLACTIVE GRATINGS IN WAVEGUIDES

Howard Neil Rourke, Bishop's Stortford, United Kingdom, assignor to Northern Telecom Limited, Montreal, Canada
Filed Nov. 19, 1996, Ser. No. 752,699
Int. Cl.^{6} B29D *11/00*
U.S. Cl. 264—1.27 **9 Claims**

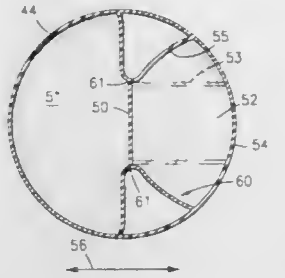


1. A method of creating a Bragg reflective grating in an optical waveguide, in which method the grating is created step-by-step in a succession of sections each section of which is created by irradiation through a mask, and in which method each section, after the first to be created section is created in adjoining relationship with respect to a previously created section, and before it is created, light is projected through the series combination of a portion of the mask to be used for creating the section and a portion of the adjoining already created section, and the relative position of mask and grating is adjusted for maximised transmission of the projected light, and, while the relative position of maximised transmission is maintained, said section is created.

5,837,170
PROCESS FOR OBTAINING BLOW MOLDED PLASTIC CONTAINERS

Emery I. Valyi, Katonah, N.Y., assignor to PepsiCo, Inc., Purchase, N.Y.
Filed Dec. 20, 1996, Ser. No. 771,234
Int. Cl.^{6} B29C *49/78*
U.S. Cl. 264—40.1 **7 Claims**

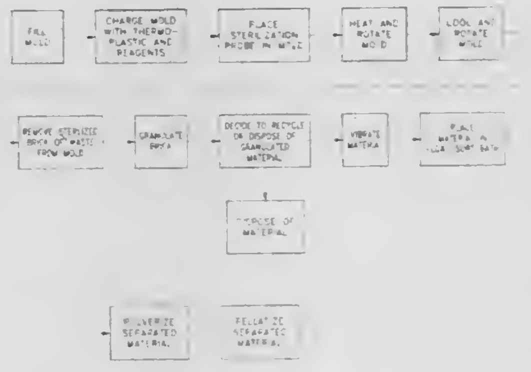
1. A process for forming a blow molded plastic container for carbonated beverages, which comprises:
- forming a first blow molded plastic precursor by blow molding said first precursor from a preform, said first precursor having a shape and wall thickness and including an external wall with an inner and outer surface and with an internal cavity and an internal wall member extending across the internal cavity and connecting a first portion of the inner surface to a second portion of the inner surface;



- determining the relationship of tensile strength to deformation in several chosen locations and the stress distribution in the first precursor due to internal pressure in the vicinity of said locations;
- computing, based on data obtained in said step of determining, the wall thickness and shape of an altered second blow molded precursor that will deform under pressure into a desired shape, said second precursor having a shape and wall thickness and including an external wall with an inner and outer surface thereof, and with an internal cavity and an internal wall member therein extending across the internal cavity and connecting a first portion of the inner surface to a second portion of the inner surface; and
- preparing said altered second blow molded precursor by blow molding a second preform at least one of the wall thickness and shape of said second precursor being altered in relation to said first precursor so as to obtain a desired pattern of deformation in said internal and external walls due to stresses resulting from the application of internal pressure; thereby providing a desired blow molded plastic container.

5,837,171
METHOD OF ENCAPSULATING AND STERILIZING WASTE PRODUCTS FOR DISPOSAL OR REUSE

Dennis M. Danzik, 360 Arroyo Grande Blvd., #818, Henderson, Nev. 89014, and R. Lindsey Dalley, 5060 Moapa Valley Blvd., Logandale, Nev. 89021
Filed Sep. 10, 1996, Ser. No. 711,485
Int. Cl.^{6} B29C *41/04*
U.S. Cl. 264—45.7 **9 Claims**


FILL MOLD
CHARGE MOLD WITH THERMO-PLASTIC AND REAGENTS
PLACE STERILIZATION PROBE IN MOLD
HEAT AND ROTATE MOLD
COOL AND ROTATE MOLD
REMOVE STERILIZE BRICK OF WASTE FROM MOLD
GRANULATE BRICK
DECIDE TO RECYCLE OR DISPOSE OF GRANULATED MATERIAL
VIBRATE MATERIAL
PLACE MATERIAL IN
DISPOSE OF MATERIAL
PULVERIZE SEPARATED MATERIAL
PELLATIZE SEPARATED MATERIAL

1. A method of encapsulating and sterilizing waste comprising:
- charging a mold containing said waste with a plastic material and at least one reactant selected from the group consisting of: Azodicarbonomide, modified Azodicarbonomide, p-Toluene sulfonyl semicarbazide, p,p-Oxybis benzene sulfonyl hydrazine, and p-Toluene sulfonyl hydrazine, said reactant adapted to cause the plastic material to expand when heated;
- heating the mold, said heating causing the plastic and charged material to expand and envelop and sterilize the waste material;

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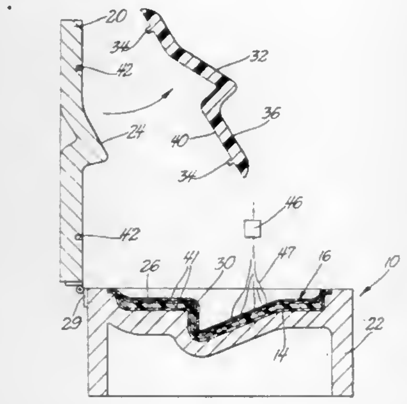
spinning the mold to impose centripetal force on the mold, waste material and charging material;
cooling the mold and forming a solid brick of encapsulated waste material in said mold.

5,837,172
METHOD FOR MANUFACTURING AN AUTOMOTIVE TRIM PRODUCT

James R. Pritchard, Somersworth, and Lawrence R. Nichols, Dover, both of N.H., assignors to Davidson Textron Inc., Dover, N.H.
Continuation of Ser. No. 549,879, Oct. 30, 1995, abandoned. This application Jul. 15, 1997, Ser. No. 892,740
Int. Cl.⁶ B29C *44/06;44/12*
U.S. Cl. 264—46.4 **7 Claims**



1. A method of manufacturing an interior trim article having an outer flexible skin bonded to a low density rigid foam substrate and an energy absorbing foam backing, the method comprising the steps of:
preparing a mold insert representing the energy-absorbing foam backing to be formed;
preparing an outer skin of flexible material;
in a first stage foam molding operation, (a) positioning the mold insert in a mold cavity of an openable foam molding tool made from first and second mold sections and releasably mounted to one of said first and second mold sections to block off and preserve a secondary foam space in the cavity for subsequent molding of the energy absorbing foam backing, (b) positioning the outer skin in the mold cavity in spaced relation to the mold insert to provide a primary foam space between the skin and mold insert, and (c) reacting a first precursor mixture within the primary foam space to generate therein a low density rigid foam structural substrate bonded to the skin; and
in a subsequent stage foam molding operation within the same molding tool made from said first and second mold sections, (a) removing the mold insert from the mold cavity and releasing it from the respective mold section to open the secondary foam space, and (b) reacting a second precursor mixture within the secondary space to generate therein an energy absorbing foam backing bonded to the substrate for absorbing the energy of an impact imparted to the article.

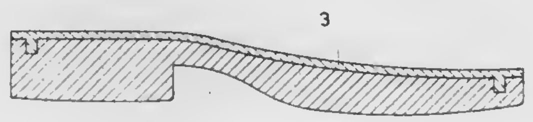
5,837,173
PROCESS FOR PREPARING EXPANDED ARTICLES BASED ON CHLOROTRIFLUOROETHYLENE COPOLYMERS

Giandomenico Vita, Como, and Massimo Pozzoli, Monza, both of Italy, assignors to Ausimont S.p.A., Milan, Italy
Continuation of Ser. No. 547,333, Oct. 24, 1995, abandoned. This application Jan. 30, 1997, Ser. No. 791,410
Claims priority, application Italy, Nov. 4, 1994, MI94A2237
Int. Cl.⁶ B29C *44/00*
U.S. Cl. 264—50 **5 Claims**

1. A process for preparing expanded articles based on ethylenechlorotrifluoroethylene copolymers having closed cells with an average size not higher than 40 microns consisting essentially of mixing the copolymer with 0.5–2% by weight of boron nitride, melting the mixture and extruding it at 260°–300° C., injecting into the molten blend nitrogen under a pressure of 50–150 Atm., and reducing the pressure so as to obtain the copolymer expansion.

5,837,174
INJECTION MOULDING PROCESS FOR SOLES IN EXPANSIBLE AND CROSS-LINKING "EVA" BASED COMPOUNDS

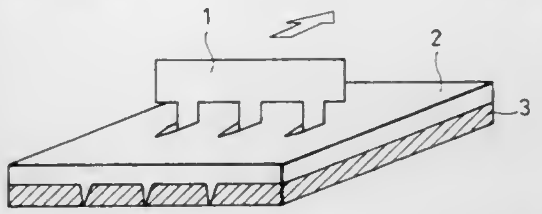
Bruno Bisconti, Civitanova Marche, Italy, assignor to Finproject -S.P.A., Rome, Italy
Filed Feb. 26, 1997, Ser. No. 806,631
Claims priority, application Italy, Apr. 19, 1996, AN96A0008
Int. Cl.⁶ B29C *44/02*
U.S. Cl. 264—54 **2 Claims**



1. An injection moulding process for soles produced with expansible and cross-linking "EVA" based compounds, comprising:
injecting expansible and cross-linking EVA based compound granules into a mould whose impression is sized to ensure that the sole off the mould after spontaneous and complete shrinkage is slightly undersized with respect to dimensions of a desired sole size, and is designed so that said moulded sole has a series of perimeter holes on its upper surface;
coupling a template on the upper surface of the sole during cooling, said template comprised of a thin flexible plate made of a rigid material having a profile similar to that of the sole and having provided on its bottom surface a series of pin elements designed to fit into the corresponding series of holes of the sole
maintaining said pin elements in the holes until the cooling process of the sole is completed; and
extracting said pin elements of the template from the holes of the sole, after cooling.

5,837,175
PROCESS FOR PRODUCING ARTIFICIAL MARBLE HAVING STRIPED PATTERN

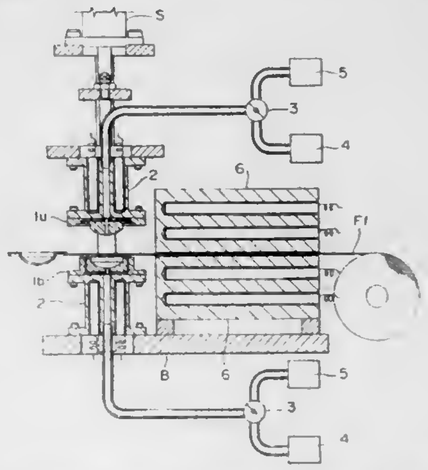
Nobuhiro Mukai, and Masaaki Shibazaki, both of Toyama, Japan, assignors to Du Pont-MRC Co., Ltd., Tokyo, Japan
Filed Oct. 20, 1997, Ser. No. 954,229
Claims priority, application Japan, Oct. 29, 1996, 8-286834
Int. Cl.⁶ B29C *39/12*
U.S. Cl. 264—73 **5 Claims**



1. A process for producing artificial marble by curing liquid resins in a molding cell, which comprises a step in which liquid resins each having different color are laminated by injection in the molding cell so that at least two layers are formed, then a comblike tool is moved in the liquid resins laminated while the blades of the tool are in contact with the bottom of the molding cell to produce a striped pattern formed from at least the liquid resin of a layer which is adjacent a bottom layer and which flows to the bottom of the molding cell, and then the liquid resins are cured to produce artificial marble having a striped pattern.

5,837,176
METHOD OF HOT-PRESS MOLDING POLYPARAPHENYLENETEREPHTHALAMIDE FILM

Yoshio Sakamoto, Tokyo, Japan, assignor to Kabushiki Kaisha Kenwood, Japan
Continuation of Ser. No. 223,964, Apr. 6, 1994, abandoned. This application Mar. 5, 1996, Ser. No. 610,841
Claims priority, application Japan, Apr. 9, 1993, 5-107368
Int. Cl.⁶ B29C *43/04*
U.S. Cl. 264—101 **11 Claims**



1. A film molding method of hot-press molding a film made of polyparaphenyleneterephthalamide and containing a swelling agent, into a predetermined shape, said method comprising:
a first process of evaporating the swelling agent from a polyparaphenyleneterephthalamide film containing at least 50% or more swelling agent so that the swelling agent containing film becomes an amorphous film which has a density less than a predetermined density and percentage elongation at break of about 70%;
a second process of hot-press molding said polyparaphenyleneterephthalamide film for a predetermined time period by metal molds heated to at least 330° C. to crystallize said film to said predetermined density, said second hot pressing molding process occurring subsequent to, and noncontemporaneous with, said first evaporating process.

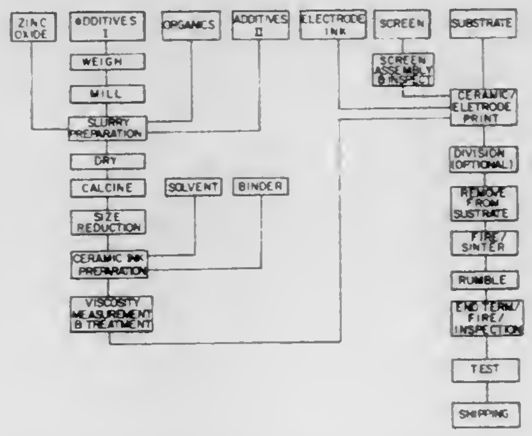
5,837,177
CONTROLLED NUCLEATION OF POLYPROPYLENE IN BIAXIALLY ORIENTED FILMS

Victor M. DiNardo, and Nicholas Z. Karnavas, both of Monroeville Boro, Pa., assignors to Aristech Chemical Corporation, Pittsburgh, Pa.
Filed Jun. 23, 1997, Ser. No. 880,232
Int. Cl.⁶ B29B *9/06;* **B29C** *47/00;55/14*
U.S. Cl. 264—101 **9 Claims**

1. A method of making a polypropylene product comprising the steps of:
(a) providing an extrusion grade polypropylene;
(b) combining said extrusion grade polypropylene with a solution comprising a nucleating agent and a liquid miscible with said nucleating agent, to form a composition; and
(c) processing said composition into said product, wherein said liquid is removed.

5,837,178
METHOD OF MANUFACTURING VARISTOR PRECURSORS

Stephen P. Cowman; Alan J. Ratcliffe, both of Dundalk, Ireland; Derek A. Nicker, Great Yarmouth, England; John M. Shreeve, Norwich, England, and Anthony L. Oliver, Great Yarmouth, England, assignors to ECCO Limited, Dundalk, Ireland
Continuation of Ser. No. 935,640, Aug. 25, 1992, abandoned, which is a division of Ser. No. 543,529, Jun. 26, 1990, abandoned. This application Jun. 18, 1993, Ser. No. 79,159
Claims priority, application United Kingdom, Mar. 16, 1990, 9005994
Int. Cl.⁶ B28B *11/12*
U.S. Cl. 264—157 **15 Claims**



1. A method for producing a plurality of varistor precursors comprising the steps of:
(a) applying a first layer of a ceramic material to a substrate,
(b) applying a multiplicity of spaced areas of conductive material to said ceramic layer for forming respective electrodes,
(c) coating a further ceramic layer onto said multiplicity of conductive areas,
(d) repeating steps (b) and (c) at least once to form a composite,
(e) subdividing the composite of step (d) into said plurality of varistor precursors, and
(f) detaching said plurality of varistor precursors from said substrate.

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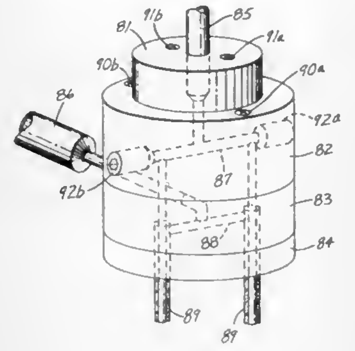
5,837,179
METHOD OF MAKING ABRASIVE FILAMENTS COMPRISING ABRASIVE-FILLED THERMOPLASTIC ELASTOMER

Richard M. Pihl, Cottage Grove, Minn.; Duane J. Hayes, Ellsworth; Loren L. Barber, Jr., Lake Elmo, both of Wis.; Dennis G. Welygan, Woodbury; R. Eugene Hardwick, Maplewood, both of Minn., and Ronald O. Zemke, deceased, late of St. Paul, Minn., by Joy D. Zemke, legal representative, assignors to Minnesota Mining and Manufacturing Copmany, St. Paul, Minn.

Division of Ser. No. 65,858, May 21, 1993, Pat. No. 5,427,595, which is a division of Ser. No. 854,330, Mar. 19, 1992, abandoned. This application Mar. 23, 1995, Ser. No. 409,160

Int. Cl.⁶ B29C *47/06*

U.S. Cl. 264—172.11 **12 Claims**



1. A method of making an abrasive filament, the abrasive filament comprising a first elongate filament component having a continuous surface throughout its length and being comprised of a first hardened organic polymeric material, and a second elongate filament component coterminous with said first elongate filament component comprised of a second hardened organic polymeric material in melt fusion adherent contact with first elongate filament component along said continuous surface, the second hardened organic polymeric material being the same or different than the first hardened organic polymeric material,

wherein at least one of the first and second hardened organic polymeric materials comprises a thermoplastic elastomer, the thermoplastic elastomer having abrasive particles dispersed and adhered therein, said method comprising:

(a) rendering a first organic polymeric material comprising a thermoplastic elastomer molten and adding abrasive particles thereto;

(b) rendering a second organic polymeric material molten, the second organic polymeric polymer selected from the group consisting of thermoplastic elastomers, thermoplastic polymers, and mixtures thereof,

(c) forcing the first and second molten organic materials simultaneously through distinct first and second passages within the same die, the distinct passages forcing the first and second molten organic polymeric materials to assume the shape of first and second elongate filament components in melt fusion adherent contact along a continuous surface of the first component, thus forming an abrasive filament precursor; and

(d) cooling the abrasive filament precursor to a temperature sufficient to harden the first and second molten organic polymeric materials and thus form the abrasive filament.

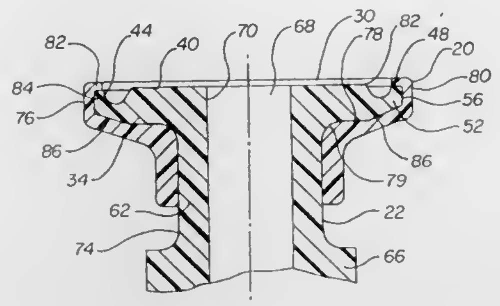
5,837,180
COMPOSITE PLASTIC SANITARY FITTING

James C. Linder, Shorewood, and Jeffrey J. McKenzie, Watertown, both of Minn., assignors to Fluoroware, Inc., Chaska, Minn.

Filed Feb. 5, 1997, Ser. No. 796,082

Int. Cl.⁶ B29C *41/00*

U.S. Cl. 264—230 **9 Claims**



1. A method of manufacturing a composite fitting comprising the steps of:

1) injection molding a body portion comprising of PFA having a connecting end with a flange portion at said connecting end;
2) baking said body portion at an elevated temperature whereby said body portion shrinks;
3) preloading the body portion in a mold at an interface at the connecting end; and
4) injecting molten PEEK into a mold cavity extending around the flange portion thereby forming a sleeve around the body portion.

5,837,181
THERMOPLASTICALLY FORMABLE COMPOSITE MATERIALS BASED ON POLYAMIDE 12 MATRIX

Roland Leimbacher, Domat/Ems, and Eduard Schmid, Bonaduz, both of Switzerland, assignors to EMS-American Grilon Inc., Sumter, S.C.

Continuation of Ser. No. 530,896, Sep. 20, 1995, abandoned. This application May 19, 1997, Ser. No. 858,442

Claims priority, application Germany, Jul. 25, 1995, 195 27 154.8

Int. Cl.⁶ B32B *31/04*

U.S. Cl. 264—258 **27 Claims**

1. A discontinous process for producing shaped bodies of thermoplastically formable laminated composite materials of reinforcing fibers in a polyamide 12 matrix, comprising:

a. preparing an activatd anionic lactam 12 melt;
b. placing a reinforcing fiber arrangement in the form of woven fabrics, mats, layments, knitted fabrics, non-woven fabrics, plaited fabrics, embroidered fabrics, cross-wise arranged rovings or cobinations thereof in a mold or tool, and feeding said activated anionic lactam 12 melt in the liquid state into said mold or tool to pentrate and impregnated said fiber arrangement, wherein the reinforcing fibers are present in an amount of 25 to 60% by volume, and heating the so-impregnated fiber arrangement to a temperature of at least the melting point of polyamide 12 and at least the melting point of the activated anionic amount lactam 12 and not in excess of 300° C., whereby the lactam 12 forms a matrix for a shaped body;
c. polymerizing said activated anionic lactam 12 melt under the effects of temperature and pressure in said mold or tool in such a way that the shape of said shaped body is achieved; and
d. optionally reshaping said shaped body by subjecting said shaped body to an after-shaping step under the effects of pressure and temperature.

5,837,182
METHOD OF MOLDING SYNTHETIC RESIN SCREWS

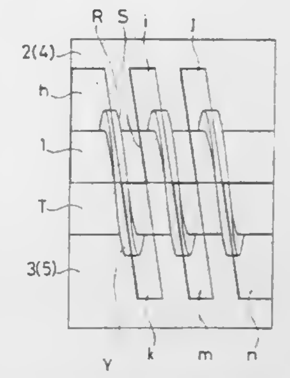
Toyohisa Hiroki, Chiba-ken, Japan, and Tadashi Suzuki, Saitama-ken, Japan, assignors to Toska Co., Ltd., Tokyo, and Optec Co., Ltd., Saitama-ken, both of Japan

Continuation of Ser. No. 256,362, Jul. 20, 1994, Pat. No. 5,595,702. This application Jun. 13, 1996, Ser. No. 663,548

Claims priority, application Japan, Dec. 25, 1992, 4-347167

Int. Cl.⁶ B29C *45/33*

U.S. Cl. 264—318 **3 Claims**



1. A method of molding a synthetic resin screw having a screw thread comprising: providing a mold assembly having one parting plane extending only along a crest of said screw thread for a length exceeding a single pitch of said screw thread and another parting plane extending only along a root of said screw thread for a length exceeding a single pitch of said screw thread; injecting synthetic resin into the mold assembly to mold the synthetic resin screw; and opening the mold assembly along the parting planes so as to remove the molded screw from the mold assembly.

5,837,183
GOLF BALL MOLDING METHOD AND APPARATUS

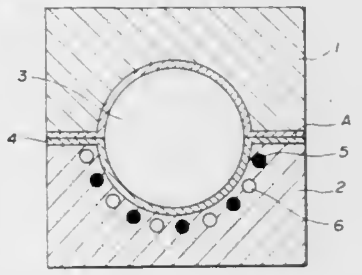
Michio Inoue, and Keisuke Ihara, both of Chichibu, Japan, assignors to Bridgestone Sports Co., Ltd., Tokyo, Japan

Filed Mar. 10, 1997, Ser. No. 812,924

Claims priority, application Japan, Mar. 11, 1996, 8-082120

Int. Cl.⁶ H05B *6/10;* **B29C** *33/02*

U.S. Cl. 264—403 **10 Claims**



1. A method for molding a golf ball using a mold having a pair of upper and lower mold halves adapted to be mated to define a spherical cavity therebetween, each mold half being formed of a non-magnetic material and having a layer of a magnetic material having a thickness of 0.5 to 5 mm applied to a cavity-defining surface and a mating surface thereof, an induction heating coil embedded in each said mold half in electromagnetic induction relation to the layer, said coil including a hollow copper pipe and a conductor spirally wound on the pipe, a cooling channel extended in each of said mold halves adjacent to the layer and being juxtaposed to said induction heating coil having said hollow copper pipe, and a high-frequency oscillator coupled to said coil,

said method comprising the steps of;

energizing the high-frequency oscillator for causing the coil to generate a magnetic field having magnetic lines of force across the layer, thereby causing the layer to generate an eddy current to heat a cavity-defining surface portion of each mold half to a predetermined temperature,

introducing a predetermined amount of a molten stock material into the cavity to fill the cavity therewith, and

feeding a coolant through said hollow copper pipe and said cooling channel to rapidly cool said molten stock material and the mold.

5,837,184
PROCESS FOR THE PRODUCTION OF CELLULOSE FIBRES HAVING A REDUCED TENDENCY TO FIBRILLATION

Heinrich Firgo, Vöcklabruck; Markus Eibl, Lambach, and Johann Schickermüller, Vöcklamarkt, all of Austria, assignors to Lenzing Aktiengesellschaft, Lenzing, Austria

Continuation of Ser. No. 495,890, Jun. 28, 1995, Pat. No. 5,662,858, Continuation-in-part of Ser. No. 223,578, Apr. 6, 1994, abandoned. This application Jun. 2, 1997, Ser. No. 867,474

Claims priority, application Austria, Apr. 21, 1993, A 787/93

Int. Cl.⁶ D01D *10/02;10/06;* **D01F** *2/02*

U.S. Cl. 264—474 **9 Claims**

1. A process for the production of cellulose fibers having a reduced tendency to fibrillation comprising the steps of:

spinning a solution of cellulose in a tertiary amine-oxide into fibers;

contacting the freshly spun fibers with a textile agent the textile agent having at least two reactive groups; and

heating the fibers by irradiation with electromagnetic waves thereby producing cellulose fibers with a reduced tendency to fibrillation.

5,837,185
PREPARATION OF BOAT HULLS

Mark Livesay, 1374 Merritt Dr., El Cajon, Calif. 92020, and Maury Shepherd, 2702 Arbuckle St., Houston, Tex. 77005

Continuation of Ser. No. 258,389, Jun. 9, 1994, abandoned. This application Jul. 22, 1996, Ser. No. 681,275

Int. Cl.⁶ B29C *43/12;70/02*

U.S. Cl. 264—511 **12 Claims**

1. A process for the preparation of boat hulls having one or more fiber layers that can be used to combine with other photocurable structures without forming bond lines, said process comprises the steps of:

A. enclosing at least one reinforcing fiber mat or fabric within an ultraviolet radiation transparent conformable and textured vacuum film forming an upper layer and a lower substrate to form a vacuum chamber, said film permitting transmission of ultraviolet radiation and flow of gases and resin around said mat or fabric, said chamber having at least one vacuum port and at least one resin supply port;

B. evacuating said vacuum chamber and introducing a flow of a photocurable resin so as to form a rein impregnated layer or layers of reinforcement; and then

C. partially photocuring said resin impregnated layer or layers whereby said partially cured layer or layers are capable of being bonded to other photocurable structures without forming bond lines.

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5,837,186
PROCESS OF AND AN APPARATUS FOR INJECTION MOLDING HOLLOW-BLOWN PLASTIC BODIES

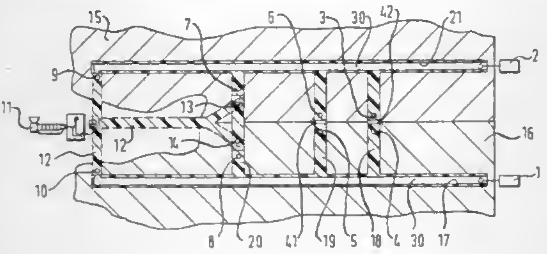
Klaus Gotterbauer, Vilsheim, Germany, assignor to Eldra Kunststofftechnik GmbH, Germany

Filed May 22, 1996, Ser. No. 651,649

Claims priority, application Germany, May 23, 1995, 195 18 964.7

Int. Cl.⁶ B29C *45/00*

U.S. Cl. 264—572 7 Claims



1. A process of injection molding hollow-blown plastic bodies comprising:

- providing a tool containing a mold cavity having at least one wall and comprising at least one main mold cavity and at least one side mold cavity;
- completely filling the mold cavity with a flowable plastic melt;
- commencing hardening of the plastic melt at the wall of the mold cavity to form hardened plastic melt at the wall of the mold cavity and leaving a core of plastic melt surrounded by the hardened plastic melt;
- introducing a first pressurized fluid into the main mold cavity, the mold cavity having been previously completely filled with the flowable plastic melt, the first pressurized fluid effective for forcing the molten core of the plastic melt out of the main mold cavity to form at least one gas channel having at least one wall comprised of hardened plastic melt; and
- introducing a second pressurized fluid into the side mold cavity, the second pressurized fluid effective for forcing a side mold cavity molten core of the plastic melt out of the side mold cavity into the gas channel in the main mold cavity where the side mold cavity molten core of plastic melt, which is still capable of flowing, is deposited on the hardened walls of the gas channel formed in the main mold cavity.

5,837,187
HEAT TREATMENT APPARATUS FOR SOLUTION ANNEALING ALUMINUM ALLOY COMPONENTS

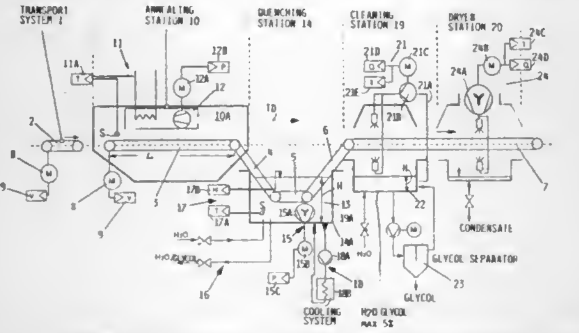
Hans Doersing, Delmenhorst, and Dietmar Mietrach, Bookholzberg, both of Germany, assignors to Daimler-Benz Aerospace Airbus GmbH, Hamburg, Germany

Filed Jan. 8, 1997, Ser. No. 780,513

Claims priority, application Germany, Jan. 9, 1996, 196 00 479.9

Int. Cl.⁶ C21D *11/00*

U.S. Cl. 266—78 17 Claims



1. An apparatus for treating, including solution annealing components made of aluminum alloys, comprising a plurality of sequentially arranged treatment stations and a transport system (**1**) including movable elements for holding and moving said components in a transport direction (TD) sequentially through said treatment stations without securing said components to said movable elements of said transport system, said treatment stations comprising:

- (a) an annealing station (**10**) including a feed through furnace (**10A**) including a heater (**11**) for maintaining in said feed through furnace a temperature controllable within the range of 470° C. to 570° C.,
- (b) a quenching station (**14**) arranged downstream of said annealing station including a quenching basin (**14A**) arranged downstream of said furnace (**10**) as viewed in said transport direction (TD) for holding a liquid quenchant (**13**),
- (c) a cleaner station (**19**) arranged downstream of said quenching station (**14**) for cleaning quenched components,
- (d) a dryer station (**20**) arranged downstream of said cleaner station (**19**) for drying cleaned components, and

wherein said transport system comprises a transfer section (**4**) positioned at an exit of said feed through furnace at an angle to the horizontal for transporting said components out of said feed through furnace (**10A**) into said quenching basin (**14A**) of said quenching station (**14**), said angle being so selected that said components enter said liquid quenchant (**13**) free of bubbles, said apparatus further comprising a central processing unit (CPU) including a computerized control system operatively connected to said treatment stations and to said transport system (**1**) for controlling the operation of said treatment stations and transport system so that said components have a controlled residence time in said feed through furnace and so that the operations of all treatment stations are coordinated to each other.

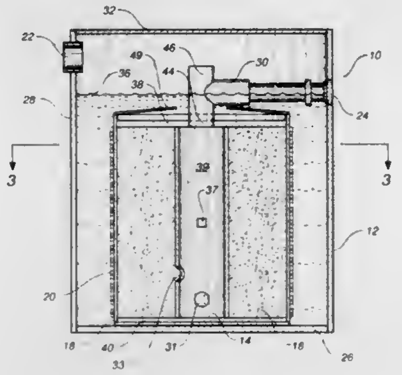
5,837,188
SILVER RECOVERY SYSTEM

David Peterson, 402 Fintona Way, Houston, Tex. 77015

Filed Mar. 7, 1997, Ser. No. 813,177

Int. Cl.⁶ C22B *3/00*

U.S. Cl. 266—101 18 Claims



1. The present invention is a silver recovery system comprising:

- a container having an inlet and an outlet;
- a filler material positioned within said container, said filler material being a metal above silver in the electromotive force series; and
- a non-metallic mesh material positioned within 3/32 of an inch from an exterior surface of said filler material, said mesh material having a mesh size suitable for allowing water to pass therethrough.

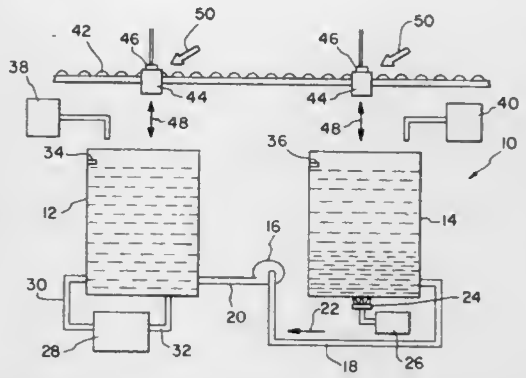
5,837,189
QUENCH MANAGEMENT SYSTEM

Kurt H. Westman, Roanoke, Ind., assignor tn Alfe Systems, Inc., Fort Wayne, Ind.

Filed Jun. 9, 1995, Ser. No. 489,136

Int. Cl.⁶ C21D *1/62*

U.S. Cl. 266—131 9 Claims



1. A quench management system for cooling heat treated workpieces in an alkylene glycol solution, said system comprising:

- a quench tank adapted to contain a solution of alkylene glycol into which the heat treated workpieces are immersed for quenching;
- a rinse tank adapted to contain a solution of alkylene glycol into which the quenched workpieces are immersed;
- means for heating the alkylene glycol solution in said rinse tank to thereby cause some of the alkylene glycol in solution to precipitate in said rinse tank;
- a cooling mechanism in communication with the alkylene glycol solution in said quench tank, said cooling mechanism adapted to keep said solution in said quench tank below a temperature at which the alkylene glycol precipitates; and
- fluid transport means, fluidly connected to each of said rinse tank and said quench tank, for moving the precipitated alkylene glycol solution from said rinse tank into said quench tank.

5,837,190
FREE-MACHINING AUSTENITIC STAINLESS STEEL

Theodore Kosa; John H. Magee, Jr., both of Reading; James W. Martin, Sinking Spring, and Ronald P. Ney, Sr., Reading, all of Pa., assignors to CRS Holdings, Inc., Wilmington, Del.

PCT No. PCT/US95/08594, § 371 Date Dec. 17, 1996, § 102(e) Date Dec. 17, 1996, PCT Pub. No. WO96/01911, PCT Pub. Date Jan. 25, 1996

Continuation-in-part of Ser. No. 271,199, Jul. 7, 1994, Pat. No. 5,482,674. This PCT application Jul. 7, 1995, Ser. No. 750,688

Int. Cl.⁶ C22C *38/42*

U.S. Cl. 420—42 6 Claims

1. An austenitic, stainless steel alloy having a good combination of machinability and a low magnetic permeability consisting essentially of, in weight percent, about

C	0.01 max
Mn	1.0–2.0
Si	1.0 max
P	0.1 max
S	0.25–0.45
Cr	17.0–19.0
Ni	9.5–12.0
Mo	0.75 max
Cu	0.46–2.0
N	0.035 max
Se	0.05 max

the balance essentially iron.

5,837,191
LEAD-FREE SOLDER

Alan E. Gickler, Clinton, Iowa, assignor to Johnson Manufacturing Company, Princeton, Iowa

Filed Oct. 22, 1996, Ser. No. 734,979

Int. Cl.⁶ C22C *13/00*

U.S. Cl. 420—560 3 Claims

1. Lead-free solder consisting of, in weight %, about 0.8% to about 1.8% antimony, about 0.05% to about 0.5% copper, about 0.05% to about 0.5% silver, about 0.05% to about 0.5% Ni and balance tin.

5,837,192
PROCESS AND APPARATUS FOR INERT BLANKETING OF REACTORS

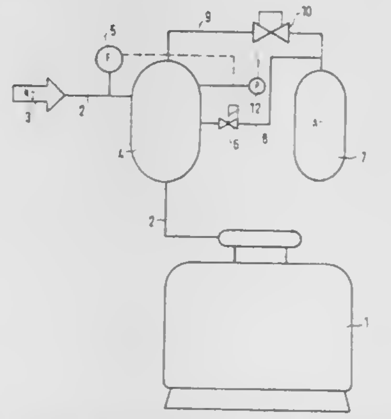
Franz Luerken, Kempen, Germany, assignor to Messer Griesheim GmbH, Germany

Filed Sep. 1, 1995, Ser. No. 522,633

Claims priority, application Germany, Sep. 12, 1994, 44 32 344.1

Int. Cl.⁶ A61L *2/00*

U.S. Cl. 422—2 14 Claims



1. A process for the inert blanketing of an at least temporarily open reactor containing flammable substances comprising feeding nitrogen as a main component inert-blanketing gas to a mixing location, feeding at least one additional component as a further inert-blanketing gas to the mixing location, mixing the main component and the at least one additional component in the mixing location to create an inert-blanketing gas mixture having a density above the density of the air surrounding the reactor, and blanketing the interior of the reactor with the inert-blanketing gas mixture.

5,837,193
METHOD OF DECONTAMINATING FREEZE DRYERS

Robert Warren Childers, Garner; Columbus Clark Cockerham, Jr., Apex; Matthew Stuart Dixon, Releigh, all of N.C.; John William Johnson, Vicksburg, Mich.; Thaddeus J. Mielnik, Apex, N.C., and Manfred Michael Steiner, Hurth, Germany, assignors to American Sterilizer Company, Erie, Pa.

Continuation of Ser. No. 973,371, Nov. 12, 1992, abandoned. This application May 24, 1995, Ser. No. 450,931

Int. Cl.⁶ A61L *7/00*

U.S. Cl. 422—28 15 Claims

1. A method for decontaminating a freeze dryer after a freeze drying cycle has been completed, the condenser has been defrosted and the chamber has been rinsed with water, comprising the steps of:

- a) providing a freeze dryer comprising a chamber and a condenser fluidly connected to each other and to a source of sterilant vapor, wherein the chamber comprises a chamber floor having a first drain port fluidly connected to a first drain

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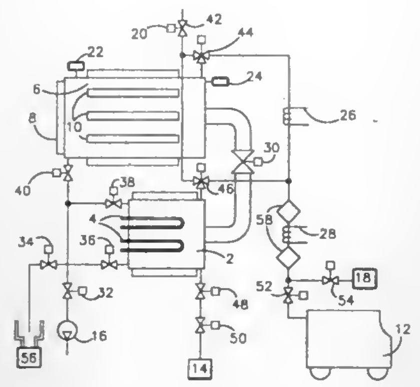


line, and the condenser comprises a condenser floor having a second drain port fluidly connected to a second drain line;

b) providing a vacuum pump fluidly coupled to each of the drain lines downstream of their drain ports;

c) operating the vacuum pump for a period of time sufficient to evacuate substantially all moisture remaining in the chamber through the first drain port and first drain line and in the condenser through the second drain port and second drain line, while heating the chamber and the condenser at a temperature sufficient to prevent freezing of substantially all of the remaining moisture during the evacuation of the chamber and the condenser;

d) after the simultaneous evacuating and heating of the chamber and the condenser, cooling the chamber and the condenser for a period of time sufficient to lower the temperature in the chamber and the condenser to between about 10° C. and about 40° C.; and

e) exposing the chamber and the condenser to a sterilant vapor comprising hydrogen peroxide vapor and water vapor, at a subatmospheric pressure and at a temperature between about 10° C. and about 40° C. for a period of time sufficient to achieve a predetermined level of decontamination.

5,837,194

APPARATUS FOR MEASURING CHEMILUMINESCENCE OF MULTIPLE SAMPLES ON A CONTINUOUS MATRIX

Colin G. Potter, 12 Beech Road, Headington, Oxford 0X3 7RR Oxyon, United Kingdom, and Larry J. Anderson, Bldg. 7, Room B43, MS G17, Centers for Disease Control, Atlanta, Ga. 30333

PCT No. PCT/US94/04471, § 371 Date Jan. 11, 1996, § 102(e) Date Jan. 11, 1996, PCT Pub. No. WO94/25855, PCT Pub. Date Nov. 10, 1994

PCT Filed Apr. 25, 1994, Ser. No. 537,810

Claims priority, application Finland, Apr. 23, 1993, 931858

Int. Cl.^{6} G01N *21/01;33/53;21/00;* **C12Q** *1/68*

U.S. Cl. 422—52 **13 Claims**

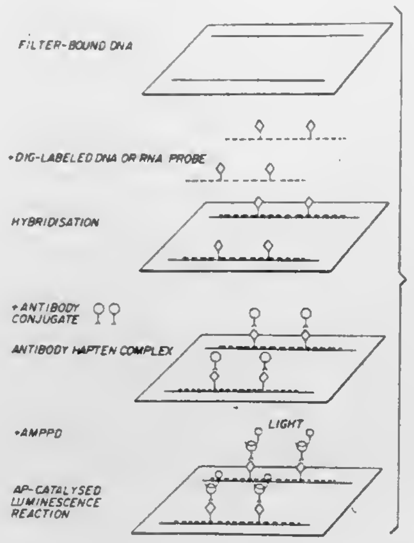
1. An apparatus for performing a chemiluminescent assay on multiple test samples deposited together on a continuous support, the continuous support containing a reactant that effectuates chemiluminescence of the multiple test samples, the apparatus comprising:

flat bed means for holding the multiple test samples deposited on the continuous support during the performance of the assay;

light detector means for detecting light emitted during chemiluminescence of the multiple test samples, said light detector means being disposed opposite said flat bed;

chemiluminescence counter means for counting chemiluminescence of the multiple test samples, said chemiluminescence counter means coupled to said light detector means; and

filter means for filtering light emitted during chemiluminescence and passing the light to said light detector means, said filter means being disposed in the optical path between said flat bed means and said light detector means, wherein said filter means is a light attenuation optical filter that precludes low energy chemiluminescence from being detectable by said light detector means.



5,837,195

LUMINOMETER

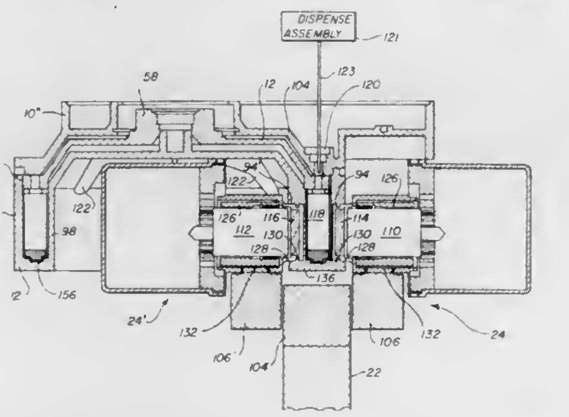
Michael L. Malek, North Olmstad; Glen A. Carey, Grafton, and Gregory A. Coghlan, Elyria, all of Ohio, assignors to Chiron Diagnostics Corporation E. Walpole, Mass.

Division of Ser. No. 502,005, Jul. 1ɔ, 1995, Pat. No. 5,686,046.

This application Apr. 9, 1997, Ser. No. 826,895

Int. Cl.^{6} G01N *21/76*

U.S. Cl. 422—52 **4 Claims**



1. A luminometer comprising:

a rotor having a plurality of rotor segments suspended in spaced relationship below the rotor;

the rotor segments having first and second opposing ends and first and second opposing surfaces and a bore between the first and second opposing surfaces of said rotor segment;

a coupling suspending each said rotor segment to said rotor;

a housing having a channel through which are moved sequentially plural sample containers and having an aperture provided therethrough into said channel, and rotatably supporting the rotor so as to suspend the segments in said housing channel along which said segments travel with rotation of said rotor;

said coupling accommodating segment motion within said channel to provide limited motion that maintains consistent spacing between opposing ends of adjacent segments and avoids binding in said channel wherein said spacing is sufficient to support a sample container between said adjacent segments;

sample load, test and removal stations along the channel;

a detector coupled to said housing and disposed through the aperture to detect light emitted from a predetermined region of the channel of said housing; and

a temperature detection and control circuit coupled to said detector.

5,837,196

HIGH DENSITY ARRAY FABRICATION AND READOUT METHOD FOR A FIBER OPTIC BIOSENSOR

Daniel Pinkel, Walnut Creek; Richard L. Segraves, Fremont; Ye Yz Zhai, Palo Alto; Donna G. Albertson, Lafayette, and Joe Gray, San Francisco, all of Calif., assignors to The Regents of the University of California, Oakland, Calif., and Medical Research Council, London, United Kingdom

Filed Jan. 26, 1996, Ser. No. 592,779

Int. Cl.^{6} G01N *21/00;15/06;21/29;* **C12Q** *1/68*

U.S. Cl. 422—55 **24 Claims**

1. A process for attaching a biological binding partner to a solid surface using a matrix polymer dissolved in solution, the process comprising the steps:

providing a matrix solution comprising mixing the biological binding partner and a solubilized matrix polymer dissolved in solution;

contacting the matrix solution with the solid surface, thereby attaching the biological binding partner such that it can specifically recognize and bind a second molecule.

5,837,197

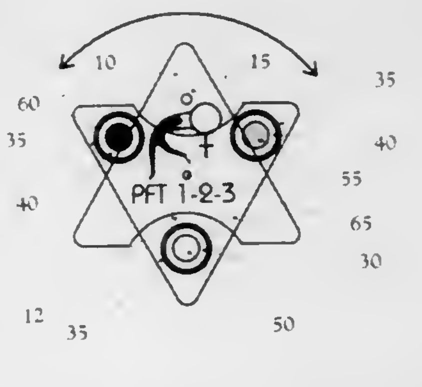
POSITIVE FERTILITY TESTING AND REPRODUCTIVE HEALTH SYSTEM

Karen Pamela Orell Porrazzo, and Edward Michael Porrazzo, both of Carmichael, Calif., assignors to Personal Fertility Technologies, Inc., Gold River, Calif.

Filed Dec. 22, 1995, Ser. No. 577,334

Int. Cl.^{6} G01N *21/84*

U.S. Cl. 422—61 **12 Claims**



1. A device for diagnosing mammalian reproduction states utilizing mammalian fluids comprising;

a. a testing area section including mammalian fluid sample containment means having at least a first fluid receptacle and a second fluid receptacle spaced along said testing area section from said first fluid holder;

b. a viewing section having optical means for magnifying an image of said sample containment means; and

c. means for selectively aligning said magnification means with said first and second fluid receptacles to observe the crystalline state of said fluid sample at said first and second fluid receptacles following evaporation of at least a portion of said fluid sample.

5,837,198

PHYSIOLOGICAL TISSUE TREATMENT APPARATUS

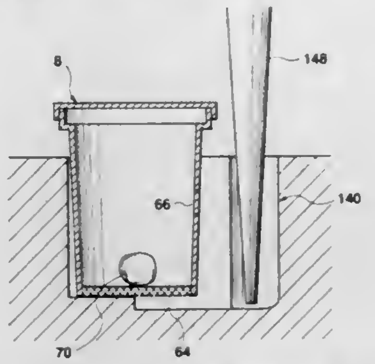
Kazunori Itani, Mitaka, Japan, assignor to Aloka Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1996, Ser. No. 771,799

Claims priority, application Japan, Dec. 28, 1995, 7-343944; Nov. 29, 1996, 8-319566

Int. Cl.^{6} G01N *35/10*

U.S. Cl. 422—63 **13 Claims**



1. A physiological tissue treatment apparatus for treating physiological tissue samples with a reagent, comprising:

a reagent bath for collecting said reagent,

a least one sample container inserted in and withdrawn from said reagent bath, said sample being held in the interior of said sample container, and at least part of said sample container being formed of a material of finer mesh than the size of said sample, wherein said reagent bath comprises a sample container insertion part for accommodating said sample containers, and a nozzle insertion part communicating with said sample container insertion part for accommodating a nozzle for discharging said reagent.

5,837,199

MEASUREMENT APPARATUS FOR ANALYZING FLUIDS

Christa Dumschat, Münster, Germany, assignor to Institut Fur Chemo-Und Biosensorik Munster E.V., Munster, Germany

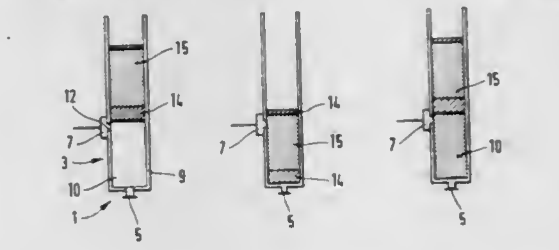
PCT No. PCT/DE95/01041, § 371 Date May 13, 1996, § 102(e) Date May 13, 1996, PCT Pub. No. WO96/04548, PCT Pub. Date Feb. 15, 1996

PCT Filed Aug. 4, 1995, Ser. No. 615,192

Claims priority, application Germany, Aug. 5, 1994, 44 27 725.3

Int. Cl.^{6} G01N *27/00;21/00;33/00*

U.S. Cl. 422—68.1 **28 Claims**



1. A measurement apparatus for analyzing a medium, comprising:

a container including an opening, a cavity in fluid communication with the opening, and at least one sensor being one of integrated in and mounted on a wall of the container;

at least one plunger movably disposed in the cavity;

the at least one plunger including at least one reservior;

a calibrating solution disposed in the at least one reservoir;

the at least one plunger for drawing the medium into the cavity through the opening; and

the a least one reservoir and the at least one sensor arranged such that the calibrating solution and the medium in the cavity separately contact the at least one sensor.

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5,837,200
SORTING DEVICE FOR BIOLOGICAL CELLS OR VIRUSES

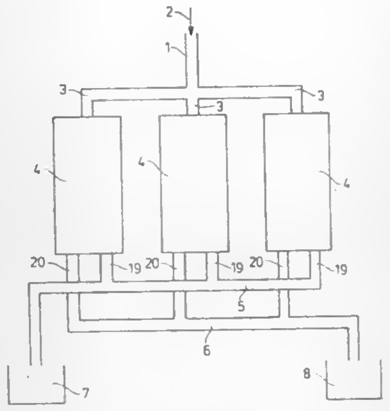
Edgar Diessel, Köln, and Walter Weichel, Odenthal, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 24, 1996, Ser. No. 653,143

Claims priority, application Germany, Jun. 2, 1995, 195 20 298.8

Int. Cl.^{6} G01N *33/00*

U.S. Cl. 422—73 **10 Claims**



1. A sorting device for biological objects dispersed in liquids, particularly cells or viruses, wherein the objects are magnetically marked in a significant manner for sorting, comprising

a feed inlet through which flows a liquid containing magnetically marked and unmarked biological objects,

wherein

a) the feed inlet branches into a microstructured system of a plurality of main channels which are operated in parallel and simultaneously fed with the liquid, each having a sorting module and two different outlet channels, and each sorting module having a switch unit for distribution of the magnetically marked and unmarked objects to said two different outlet channels,

b) each said switch unit comprising a magnetic deflection module as a sorting actuator which distributes the magnetically marked objects selectively to one of said two outlet channels and the magnetically unmarked objects selectively to the other of said two outlet channels, and

c) each of said two outlet channels on each main channel is connected to a separate summing channel for the magnetically marked and unmarked objects selectively distributed to it.

5,837,201

Patent Not Issued For This Number

5,837,202
METAL CHELATING LIPIDS WHICH ARE USEFUL AS SENSORS IN FLUOROMETRIC METHODS FOR THE DETECTION OF METAL IONS

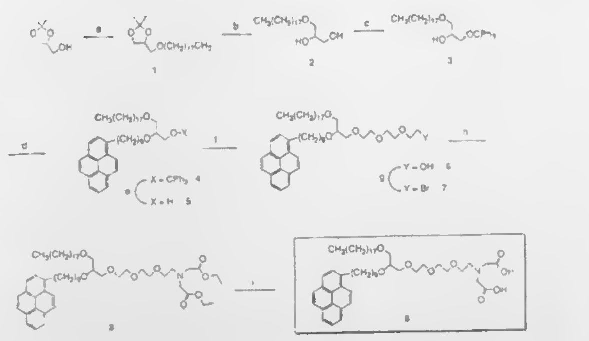
Frances H. Arnold, Pasadena, Calif., and Darryl Y. Sasaki, Albuquerque, N. Mex., assignors to California Institute of Technology, Pasadena, Calif.

Division of Ser. No. 342,369, Nov. 18, 1994, Pat. No. 5,616,790. This application Sep. 11, 1996, Ser. No. 712,193

Int. Cl.^{6} G01N *21/64;* C07C *229/34;* C07D *255/02*

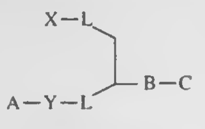
U.S. Cl. 422—82.08 **12 Claims**

1. A lipid-based sensor for use in detecting the presence of a metal ion, said sensor exhibiting a change in fluorescence when said sensor is exposed to said metal ion, said sensor comprising:



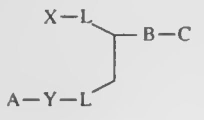
A matrix lipid comprising at least one lipid layer, said lipid layer having a hydrophobic interior region and a hydrophilic outer surface;

a plurality of fluorescent metal-chelating amphiphiles incorporated in said lipid layer, each of said fluorescent metal-chelating amphiphiles having the structure:



configuration a

or



configuration b

wherein A is a hydrophobic fluorophore, X is an aliphatic hydrocarbon having from 18 to 20 carbon atoms and Y is an aliphatic hydrocarbon having from 9 to 11 carbon atoms, B is cysteine, glycine, cysteamine or $C_nH_{2n}O_n$ where n=2–10, C is a metal chelator selected from the group consisting of iminodiacetic acid, cyclam, penicillamine, dimercaptosuccinic acid, tartrate, thiomalic acid, crown ethers, nitrolotriacetatic acid, ethylenediaminetetraacetic acid, ethylenebis(oxyethylenenitrilo)tetraacetic acid, 3,6-dioxaoctanedithioamide, 3,6-dioxaoctanediamide, salicyladoximine, dithiooxamide, 8-hydroxyguinoline, cupferron, 2,2'-thiobis(ethyl acetoacetate), 2,2'-dipyridyl, and L is either an ether or ester linkage.

5,837,203
DEVICE TO ALTERNATELY SUPPLY A FLUID TO AN ANALYZER

Richard D. Godec, Longmont; Frank J. Silvester, Boulder, and Blaine R. Bateman, Louisville, all of Colo., assignors to Sievers Instruments, Inc., Boulder, Colo.

Filed Apr. 9, 1996, Ser. No. 629,609

Int. Cl.^{6} G01N *1/10*

U.S. Cl. 422—100 **32 Claims**

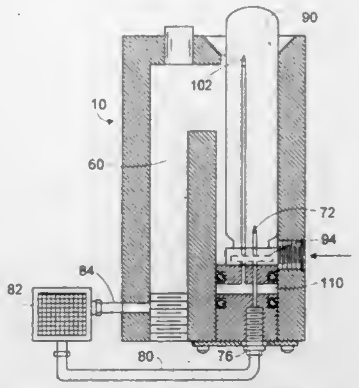
1. A fluid sampling apparatus comprising in combination:

(a) housing means comprising at least a side wall portion and a top wall portion, said housing means defining an interior chamber having an upper region adjacent said top wall portion and a lower region located below said upper region;

(b) a fluid inlet aperture in said housing means providing fluid communication from outside said housing means into said lower region;

(c) a primary fluid outlet aperture in said housing means positioned so as to define a primary fluid flow path extending from an upstream location at said inlet aperture, respectively through said lower and upper regions of said chamber, to a downstream location at said outlet aperture;

(d) a container aperture in the top wall portion of said housing means, said container aperture being adapted to receive a container, and means for alternately sealing or opening said container aperture; and,



(e) a hollow sampling tube positioned in said chamber with an upper end oriented in alignment with said container aperture, said upper end also having a fluid opening between said chamber and the sampling tube interior, said tube interior providing at least a portion of a sample withdrawal passageway extending through a sample withdrawal aperture in said housing means.

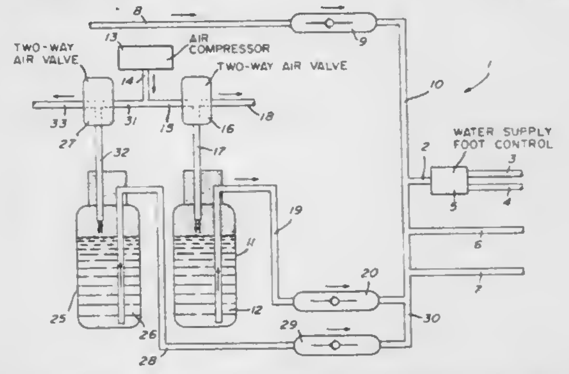
5,837,204
SYSTEM FOR DISINFECTING THE WATER LINES OF A DENTAL UNIT

André Prevost; Jean Barbeau, both of Montréal; Ludger Cote, Matane; Robert Charland, Boucherville; Gary Savage, Montréal, and Michel Swift, Outremont, all of Canada, assignors to Universite de Montreal, and Theratechnologies, Inc., both of Montreal, Canada

Division of Ser. No. 189,434, Jan. 31, 1994. This application Apr. 18, 1997, Ser. No. 844,249

Int. Cl.^{6} A61L *2/26;* B08B *9/06;* A61G *13/00*

U.S. Cl. 422—105 **9 Claims**



1. A water line disinfecting system for disinfecting water lines of a dental unit, said water lines to be connected to a source of water at a first pressure, comprising:

a first unidirectional valve device for establishing a first unidirectional connection from the source to the water lines whereby water at the first pressure from the source is supplied to the water lines through the first unidirectional valve device;

a reservoir of liquid disinfectant;

a second unidirectional valve device for establishing a second unidirectional connection from the reservoir of liquid disinfectant to the water lines;

means for pressurizing the reservoir of liquid disinfectant at a second pressure higher than the first pressure in order to supply the liquid disinfectant from the reservoir to the water lines through the second unidirectional valve device;

wherein the first unidirectional valve device comprises means responsive to the difference between the first and second pressures for preventing the liquid disinfectant supplied to the water lines from reaching the source and wherein, when the reservoir of liquid disinfectant is not pressurized, the second unidirectional valve device comprises means responsive to the first pressure for preventing the water supplied to the water lines from reaching the reservoir; and

wherein the reservoir of liquid disinfectant comprises an upper neck and a bottom, and wherein said water line disinfecting system further comprises a housing on which an upper stopper fitting into said neck and a lower reservoir bottom support means are mounted, whereby for mounting the reservoir of liquid disinfectant on said housing, one successively tilts said reservoir, places said neck on said stopper and slides said reservoir bottom on said support means.

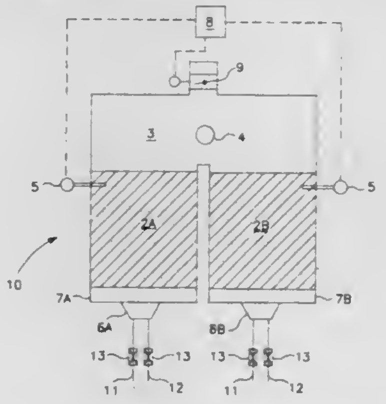
5,837,205
BYPASS SYSTEM AND METHOD FOR REGENERATIVE THERMAL OXIDIZERS

Craig E. Bayer, Orange, Calif., and Edward G. Blazejewski, Green Bay, Wis., assignors to Megtec Systems, Inc., DePere, Wis.

Filed May 7, 1996, Ser. No. 643,901

Int. Cl.^{6} F01N *3/10*

U.S. Cl. 422—109 **5 Claims**



1. A regenerative oxidizer system for purifying a gas, comprising:

a plurality of regenerator columns, each of said columns comprising heat exchange media;

gas inlet means in communication with each of said plurality of regenerator columns;

gas outlet means in communication with each of said plurality of regenerator columns;

a combustion chamber in communication with each of said plurality of regenerator columns;

means in said combustion chamber for generating heat;

valve means in communication with said gas inlet means and said gas outlet means for alternately directing said gas into the inlet means of one of said plurality of columns in a first direction and through another of said plurality of columns in a second direction;

temperature sensing means disposed in each of said regenerator columns amongst said heat exchange media for sensing a predetermined temperature therein; and

means coupled to said temperature sensing means and to said combustion chamber for extracting a portion of said gas from said combustion chamber when said temperature sensing means senses said predetermined temperature.

5,837,206
INTEGRAL MANIFOLD FOR A SINGLET DELTA OXYGEN GENERATOR

Michael W. Traffenstedt, Moorpark, and Alan Z. Ullman, Northridge, both of Calif., assignors to Boeing North American, Inc., Seal Beach, Calif.

Filed Sep. 4, 1996, Ser. No. 707,549

Int. Cl.^{6} H01S *3/00;* A62B *7/08*

U.S. Cl. 422—120 **10 Claims**

1. A V-shaped integral manifold comprising:

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- a V-shaped singlet delta oxygen duct bounded by a distribution plate and a straight wall forming arms of the V-shaped singlet delta-oxygen generator, the V-shaped singlet delta oxygen duct having a top and a bottom, an open end and a closed end, wherein singlet delta oxygen enters the V-shaped singlet delta oxygen duct as a plurality of subdivided flows through said distribution plate, said flows being simultaneously turned and accelerated toward the open end of the V-shaped singlet delta oxygen duct and combined at the open end thereby compacting the flow cross-section and achieving a rapid increase in velocity.

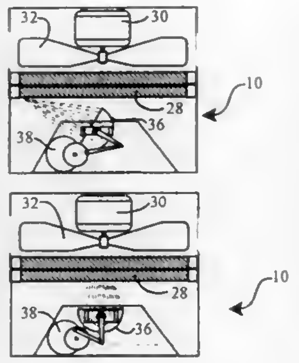
5,837,207
PORTABLE GERMICIDAL AIR FILTER

George Robert Summers, Carleton Place, Canada, assignor to Engineering Dynamics Limited, Ontario, Canada

Filed Apr. 17, 1997, Ser. No. 841,900

Int. Cl.^{6} A61L *9/00;9/20*

U.S. Cl. 422—121 **24 Claims**



1. A germicidal air filter, comprising:

- a stationary filter medium for removing particulate matter including at least a portion of microorganisms from an air stream to be filtered, the filter medium having an upstream side exposed to the air to be filtered;
- at least one ultraviolet radiation source located in proximity of the upstream side of the filter medium for exposing at least a portion of that side of the filter medium to ultraviolet radiation;
- means for focusing the ultraviolet radiation emitted by the source so that a predefined area of the upstream side of the filter medium is exposed to the focused ultraviolet radiation at any given time; and
- means for oscillating the means for focusing the ultraviolet radiation so that a surface of the upstream side of the filter medium is systematically exposed to germicidal levels of radiation.

5,837,208
HYDROPROCESSING REACTOR MIXER/DISTRIBUTOR

Jeffrey Richard Grott; Robert L. Bunting, Jr., both of Chicago; Richard K. Hoehn, Mt. Prospect, all of Ill., and Randall Forrest Goedspeed, Flint, Tex., assignors to UOP, Des Plaines, Ill.

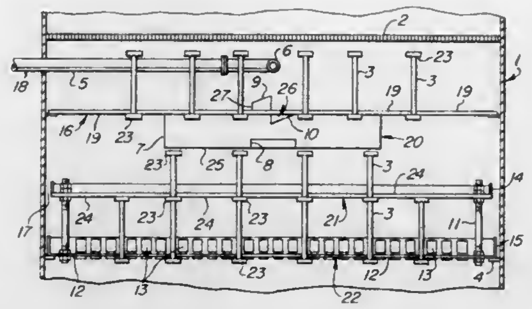
Filed Apr. 8, 1997, Ser. No. 841,984

Int. Cl.^{6} B01J *8/04*

U.S. Cl. 422—195 **3 Claims**

1. An apparatus for mixing and distributing generally downward flowing gas and liquid phase fluids in a vertical catalytic reactor having a cylindrical sidewall (1) and containing one or more fixed beds of solid catalyst separated by the apparatus, which apparatus comprises:

- (a) a horizontal vapor-liquid mixing and liquid distribution tray (**22**) which is supported in place by a support (**4**) attached to the sidewall (**1**) of the reactor, with multiple vapor-liquid contacting means (**13**) being uniformly distributed across the surface of the tray (**22**);



- (b) a horizontal liquid distribution tray (**21**) which is supported above the vapor-liquid mixing and liquid distribution tray (**22**) by vertical members (**11**) extending upward from the vapor-liquid mixing and liquid distribution tray (**22**), the liquid distribution tray being evenly perforated to provide a plurality of liquid passageways through the tray and having a smaller diameter than said catalytic reactor sidewall to define an annular vapor passageway (**17**) between the outer edge of the liquid distribution tray (**21**) and the inner surface of the sidewall (**1**);
- (c) a horizontal substantially imperforate liquid collection tray (**16**) located above the liquid distribution tray (**21**) and defining a cylindrical void volume located between the liquid collection tray (**16**) and the vapor-liquid mixing and liquid distribution tray (**22**);
- (d) a pair of opposed, tangentially aligned liquid spillways (**26**) having a downward inclined bottom plate (**10**), the spillways being located on the liquid collection tray (**16**) and providing common liquid and vapor passageways through the liquid collection tray (**16**); and,
- (e) a cylindrical mixing chamber (**20**) having a cylindrical outer wall (**7**) and symmetrically located under the liquid spillways (**26**).

5,837,209
TIN OXIDE WHISKER

Kunio Saegusa, Tsukuba-gun, Japan, assignor to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 10, 1996, Ser. No. 630,607

Claims priority, application Japan, Apr. 10, 1995, 7-110089

Int. Cl.^{6} C01G *19/00*

U.S. Cl. 423—89 **4 Claims**

1. A tin oxide whisker having a length of 0.1 to 100 μm, a thickness of 0.005 to 5 μm, and a ratio of the length to the thickness of at least 5.

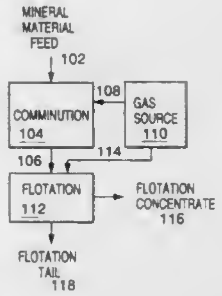
5,837,210
METHOD FOR PROCESSING GOLD-BEARING SULFIDE ORES INVOLVING PREPARATION OF A SULFIDE CONCENTRATE

Gary L. Simmons, Albuquerque, N. Mex., and John C. Gathje, Longmont, Colo., assignors to Newmont Gold Company, Denver, Colo.

Continuation-in-part of Ser. No. 423,839, Apr. 18, 1995, Pat. No. 5,653,945. This application Oct. 23, 1996, Ser. No. 735,783

Int. Cl.^{6} B03D *1/00;* **C01G** *7/00;* **C22B** *11/00*

U.S. Cl. 423—26 **40 Claims**



1. A method for flotation processing of a gold-bearing mineral material feed that is refractory to gold recovery due to association of gold in the mineral material with one or more iron-containing sulfide mineral species, the method comprising the steps of:

- subjecting to flotation in a liquid medium said mineral material feed in particulate form, said mineral material feed comprising at least one iron-containing sulfide selected from the group consisting of pyrite, marcasite, arsenopyrite, arsenous pyrite, and pyrrhotite, said flotation including passing bubbles of a flotation gas through said liquid medium;
- during said flotation, a first portion of said mineral material feed rising through said liquid medium with said bubbles and said first portion being collected from a flotation froth as a flotation concentrate, a second portion of said mineral material feed being collected as a flotation tail;
- said flotation concentrate being enriched, relative to said mineral material feed, in said iron-containing sulfide and in gold;
- said flotation tail being depleted, relative to said mineral material feed, in said iron-containing sulfide and in gold;
- wherein, said flotation gas comprises no greater than about 10 volume percent of oxygen gas.

5,837,211
COMPOSITIONS AND METHOD FOR FOAM CONTROL IN BAYER PROCESS

Samuel S. Wang, Cheshire, Conn.; Dennis G. Downing, Brewster, N.Y., and Peter V. Avotins, Easton, Conn., assignors to Cytec Technology Corp., Wilmington, Del.

Continuation of Ser. No. 556,527, Nov. 13, 1995, abandoned. This application May 7, 1997, Ser. No. 852,367

Int. Cl.^{6} B01J *19/00;* **B01D** *17/00;* **C01F** *7/00*

U.S. Cl. 423—121 **8 Claims**

1. A method for reducing foam in a Bayer process liquor comprising adding to said liquor from about 1 to about 200 parts per million of a composition comprising a tri(alkoxy alkyl) phosphate and a hydroxyl group containing carrier, wherein the ratio of said phosphate to said carrier ranges from about 1:9 parts by weight to about 2:3 parts by weight.

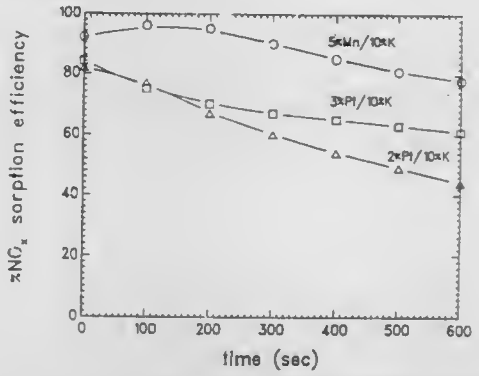
5,837,212
POTASSIUM/MANGANESE NITROGEN OXIDE TRAPS FOR LEAN-BURN ENGINE OPERATION

Jeffrey Scott Hepburn, Dearborn; Eva Thanasiu, Trenton, both of Mich.; William Lewis Henderson Watkins, Toledo, Ohio; Carolyn Parks Hubbard, Dearborn Heights, Mich.; Douglas A. Dobson, Livonia, Mich., and Haren Sakarlal Gandhi, Farmington Hills, Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.

Filed Sep. 21, 1995, Ser. No. 531,502

Int. Cl.^{6} B01D *53/56*

U.S. Cl. 423—213.2 **6 Claims**



1. A process for trapping and converting nitrogen oxides from the exhaust gases generated during lean-burn operation of an internal combustion engine, said process comprising the steps of:

- oxidizing and adsorbing said nitrogen oxides on a nitrogen oxide trap by bringing said oxygen-rich exhaust gases, whose oxygen content is more than that required for oxidizing the components to be oxidized therein, into contact with a nitrogen oxide trap located in an exhaust gas passage of said engine, the trap comprising:
  - a porous support; and
  - materials consisting essentially of manganese and potassium, wherein one or both of said materials may be present as an oxygen containing compound thereof, loaded on said porous support; and
- desorbing and reducing said nitrogen oxides by lowering the oxygen concentration of the exhaust gases contacting the trap.

5,837,213
PROCESS FOR THE DESULFURIZATION OF SULFUROUS ACID GAS-CONTAINING WASTE GAS

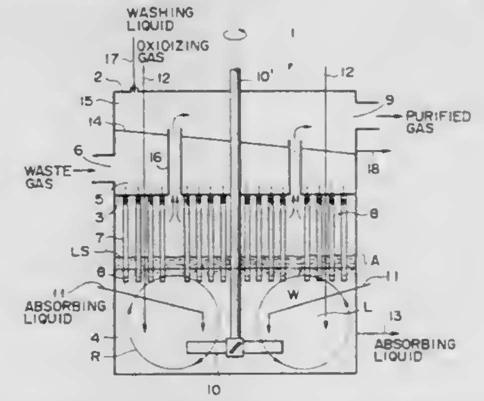
Haruo Nishino, Kawasaki; Yoshio Ogawa, Tokyo, and Kazushige Kawamura, Yokohama, all of Japan, assignors to Chiyoda Corporation, Yokohama, Japan

Filed May 23, 1996, Ser. No. 653,723

Claims priority, application Japan, May 30, 1995, 7-155119

Int. Cl.^{6} B01D *53/50*

U.S. Cl. 423—243.01 **10 Claims**



1. A process for the desulfurization of a waste gas containing sulfur dioxide, the process comprising:

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(1) providing a reaction vessel containing:
- (a) a pool of absorbing liquid having a liquid level, said liquid capable of absorbing said sulfur dioxide and thus desulfurizing the waste gas,
- (b) at least one stirrer for said pool of absorbing liquid;
- (c) a partition plate above the pool of absorbing liquid,
- (d) a plurality of gas dispersing pipes each vertically extending downward from the partition plate into said absorbing liquid and each having a side peripheral wall provided with a multiplicity of gas injection holes at a lower portion thereof,
  - (i) said gas injection holes of each of said gas dispersing pipes being substantially horizontally aligned;
  - (ii) each adjacent two gas injection holes of each of said gas dispersing pipes are spaced apart from each other such that, when each of said two gas injection holes is regarded as a circle having the same area as the area of the respective gas injection hole, the distance P in meters between the centroid of said adjacent two gas injection holes satisfies the following condition:

$$1.15 \leqq P/D \leqq 6$$

wherein D is a diameter in meters of one circle of said two circles relating to the two adjacent gas injection holes which is smaller than the other circle;
  - (iii) said gas dispersing pipes being arranged such that the distance L_l in meters between nearest two dispersing pipes satisfies the following condition:

$$1.5 \leqq L_l/S \leqq 10.00$$

wherein S is defined as below; and
- (e) an upper space defined between said partition plate and said liquid level of said absorbing liquid,

(2) providing said waste gas at a pressure Y where:

$$0.05\ \text{m (waste gas)} \leqq Y \leqq 1.0\ \text{m (waste gas)}$$

(3) blowing said waste gas into a said pool of absorbing liquid through said gas injection holes up to a maximum velocity V_{max} in meters/sec so that said waste gas is desulfurized by contact with said absorbing liquid, while
- (a) stirring the liquid with the stirrer;
- (b) controlling the maximum velocity V_{max} of said waste gas passing through each of said gas injection holes such that the following conditions are satisfied:
  - (i) $0.005\ \text{m} \leqq S \leqq 0.06\ \text{m}$
  - (ii) $4.5\ S \leqq Y \leqq 24\ S$

wherein S represents a value in meters obtained by dividing the dynamic pressure of said waste gas injected through said gas injection hole at said maximum velocity V_{max} by the density of said absorbing liquid, and such that
  - (iii) said gas injection holes of each of said gas dispersing pipes are located so that the average distance L_{ll} in meters between the liquid level of said absorbing liquid in the state where no gases are injected thereinto and the center of each of said gas injection holes satisfies the following condition:

$$2 \leqq L_{ll}/S \leqq 20$$

wherein S is defined as above; and

(4) passing the resulting desulfurized gas the upper space defined between said partition plate and said liquid level of said absorbing liquid.

5,837,214

METHOD FOR PRODUCING CUBIC BORON NITRIDE

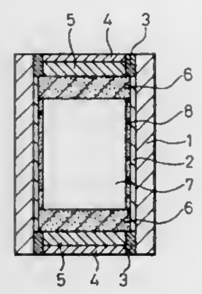
Kousuke Shioi; Tomoyuki Masuda, and Hidefumi Nakano, all of Shiojiri, Japan, assignors to Showa Denko K.K., Tokyo, Japan

Filed May 21, 1997, Ser. No. 861,016

Claims priority, application Japan, May 21, 1996, 8-125712

Int. Cl.^{6} C01B *21/064*

U.S. Cl. 423—290 **16 Claims**



1. A method for producing cubic boron nitride, characterized by keeping hexagonal boron nitride under temperature and pressure conditions within the range of stability of cubic boron nitride in the presence of at least one carbide selected from the group consisting of carbides of alkali metals and alkaline earth metals to convert said hexagonal boron nitride to cubic boron nitride.

5,837,215

METHOD OF REMOVING INSOLUBLE MATERIALS FROM BAYER PROCESS WITH FATTY ACID AND FATTY ACID FREE POLYMER FLOCCULANTS

James Morton Tippett, Oatley; Graeme John Farquarson, Carlton, both of Australia; Radhakrishnan Selvarajan, Downers Grove, and John T. Malito, Oswego, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Division of Ser. No. 566,345, Dec. 1, 1995, which is a continuation-in-part of Ser. No. 506,936, Jul. 26, 1995, abandoned. This application Jul. 18, 1997, Ser. No. 896,591

Int. Cl.^{6} C01F *7/00*

U.S. Cl. 423—600 **8 Claims**

1. A method of removing water-insoluble materials from a Bayer process alumina slurry consisting essentially of:
- adding a fatty acid ester free latex polymer to the alumina slurry to flocculate the water said insoluble materials;
- wherein said fatty acid ester free latex polymer is prepared in the absence of fatty acids by adding to a polymerizing water-in-oil solution emulsion an effective amount of a fatty acid ester free emulsifier having a hydrophilic-lipophilic balance less than 7.

5,837,216

USE OF SYNTHETIC, IRON RAW MATERIALS FOR PREPARING IRON OXIDE PIGMENTS

Wilfried Burow; Wolfgang Oehlert; Ulrike Pitzer, and Heribert Bade, all of Krefeld, Germany, assignors to Bayer AG, Leverkusen, Germany

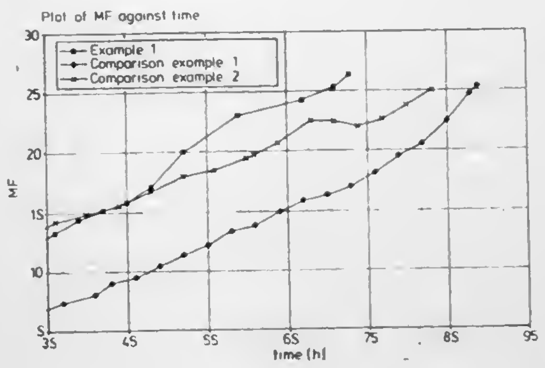
Filed Feb. 24, 1997, Ser. No. 805,223

Claims priority, application Germany, Feb. 28, 1996, 196 07 456.8

Int. Cl.^{6} C01G *49/02;* **C09C** *1/22*

U.S. Cl. 423—632 **8 Claims**

1. A method of using synthetic iron raw materials consisting essentially of spherical iron particles with an average particle size between 20 and 100 mm and a metallic iron content greater than 80 wt. % to prepare iron oxide pigments in iron-dissolution processes, wherein said method comprises reacting said iron raw materials with oxidizing agents to form iron oxides or iron hydroxides or mixtures thereof in an acidic aqueous solution.



5,837,217

PROCESS FOR THE PREPARATION OF HYDROGEN RICH GAS

Poul Erik Højlund Nielsen, Fredensborg; Peter Lehrmann, Birkerød, and Nials Jørgen Blom, Hillerød, all of Denmark, assignors to Haldor Topsoe A/S, Lyngby, Denmark

Filed Jul. 11, 1996, Ser. No. 678,093

Claims priority, application Denmark, Jul. 21, 1995, 0852/95

Int. Cl.^{6} C01B *3/02*

U.S. Cl. 423—648.1 **4 Claims**

1. Process for the preparation of hydrogen rich gas from a feed stock consisting of dimethyl ether and steam, wherein the dimethyl either is reacted with steam in the presence of (1) an ether hydration catalyst consisting essentially of a member of the group consisting of ZSM in its hydrogen form and SIRAL 5; and (2) a methanol decomposition catalyst, said catalysts being arranged in physical admixture in a fixed bed reactor.

5,837,218

NON-RECEPTOR CELL MEDIATED IMAGING AGENTS

Susan H. Peers; Anne Goodbody; Alfred Pollak, and John Thornback, all of Toronto, Canada, assignors to Resolution Pharmaceuticals Inc., Mississauga, Canada

Division of Ser. No. 529,060, Sep. 15, 1995, Pat. No. 5,688,489. This application Aug. 22, 1996, Ser. No. 700,776

Int. Cl.^{6} A61K *51/00;* **A61M** *36/14*

U.S. Cl. 424—1.69 **17 Claims**

1. A non-receptor mediated cell-associating compound coupled to a detectable label for use in imaging a target site in a mammal, wherein said compound essentially retains its native conformation on coupling to said label.

5,837,219

LABELLED ACYL-L-CARNITINE AND DIAGNOSTIC AGENT

Yasuyoshi Watanabe, Minoh; Hirohiko Kuratsune, Toyonaka; Teruo Kitani, Suita, all of Japan, and Bengt Langström, Upsala, Sweden, assignors to Japan Science and Technology Corporation, Japan

Filed Oct. 30, 1996, Ser. No. 742,183

Claims priority, application Japan, Oct. 31, 1995, 7-284002

Int. Cl.^{6} A61K *37/00;* **A61M** *36/14*

U.S. Cl. 424—1.81 **8 Claims**

1. A labelled acyl-L-carnitine, which is an acyl-L carnitine or a salt thereof, of which the secondary carbon atom of acyl group is labelled with ^{11}C.

5,837,220

METHOD FOR ANALYZING THE IMMUNOSUPPRESSANT ACTIVITY OF ION CHANNEL BLOCKERS USING THE MINI-PIG

J. Thomas Blake, Scotch Plains, N.J.; William P. Feeney, Yardley, Pa.; Gloria C. Koo, Woodbridge, and Althea D. Talento, Convent Station, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 10, 1996, Ser. No. 711,576

Int. Cl.^{6} A61K *49/00*

U.S. Cl. 424—9.2 **10 Claims**

1. A method for analyzing the immunomodulating effect of a Kv1.3 ion channel blocker administered in vivo to a test pig comprising the steps of:
- (a) immunizing the test pig and a control pig with an immunizing antigen;
- (b) measuring the mononuclear cell proliferation or delayed-type hypersensitivity (DTH) response of the test pig and that of the control pig to said immunizing antigen;
- (c) administering a pharmaceutical preparation of a Kv1.3 ion channel blocker to the test pig;
- (d) administering said pharmaceutical preparation without the Kv1:3 ion channel blocker to the control pig;
- (e) re-measuring the mononuclear cell proliferation or delayed-type hypersensitivity (DTH) response of the test pig and that of the control pig to said immunizing antigen;
- (f) challenging the test pig and the control pig with a challenging antigen;
- (g) measuring the mononuclear cell proliferation or delayed-type hypersensitivity (DTH) response of the test pig and that of the control pig to said challenging antigen;
- (h) comparing the mononuclear cell proliferation or delayed-type hypersensitivity (DTH) response to said challenging antigen of the test pig to the mononuclear cell proliferation or delayed-type hypersensitivity (DTH) response to said challenging antigen of the control pig, respectively.

5,837,221

POLYMER-LIPID MICROENCAPSULATED GASES FOR USE AS IMAGING AGENTS

Howard Bernstein, Cambridge; Julie Ann Straub, Winchester; Henry T. Brush, Somerville, and Charles C. Church, Arlington, all of Mass., assignors to Acusphere, Inc., Cambridge, Mass.

Filed Jul. 29, 1996, Ser. No. 681,710

Int. Cl.^{6} A61K *49/04;9/14*

U.S. Cl. 424—9.52 **28 Claims**

1. A method for making microparticles for diagnostic imaging, wherein the microparticles are formed of a biocompatible polymer and have incorporated therein gas, the improvement comprising
- (a) incorporating into the polymer a hydrophobic compound by either dissolving the polymer and hydrophobic compound in an organic solvent or melting the polymer with the hydrophobic compound, prior to forming the microparticles, and
- (b) forming the microparticles by either removing the polymer solvent or cooling the polymer,
- wherein the hydrophobic compound is mixed with the polymer in the microparticle in an amount effective to increase the echogenicity of the microparticle as compared to the echogenicity of the microparticle without the hydrophobic compound and
- wherein the hydrophobic compound is selected from the group consisting of fatty acids, fatty acid alcohols, fatty acid anhydrides, hydroxy fatty acids, prostaglandins, phospholipids, sphingolipids, steroids and steroid derivatives, fat soluble vitamins, terpenes, tryptophan, tyrosine, isoleucine, leucine, valine, alkyl paraben, and benzoic acid.

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5,837,222

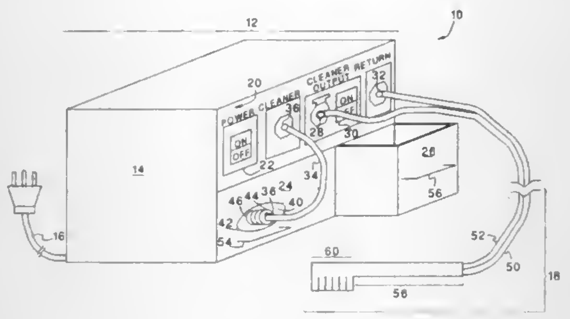
LIQUID DENTAL CLEANING SOLUTION

Richard A. Cloonan, 17750 Plaza Marlena, San Diego, Calif. 92128, and Lawrence E. Towle, 14721 Caminito Orense Oeste, San Diego, Calif. 92129

Continuation-in-part of Ser. No. 476,205, Jun. 7, 1995, abandoned, which is a continuation-in-part of Ser. No. 259,917, Jun. 10, 1994, Pat. No. 5,573,398. This application Oct. 25, 1996, Ser. No. 740,238

Int. Cl.^{6} A61K *7/16;7/18*

U.S. Cl. 424—49 **24 Claims**



1. A dental hygiene solution that includes:
water;
sodium tripolyphosphates from 100 to 1000 mg per gallon of water;
disodium edetate from 0.01 cc to 0.5 cc per gallon of water; and a detergent from 1 to 10 cc per gallon of water.

5,837,223

TRANSFER RESISTANT HIGH LUSTRE COSMETIC STICK COMPOSITIONS

Salvatore Joseph Barone, Staten Island, N.Y.; Ann Marshall Krog, Red Bank, N.J.; Natividad Jose, Jamaica, N.Y., and Renee Joan Ordino, Edison, N.J., assignors to Revlon Consumer Products Corporation, New York, N.Y.

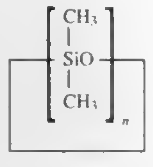
Filed Aug. 12, 1996, Ser. No. 689,588

Int. Cl.^{6} A61K *7/027*

U.S. Cl. 424—64 **14 Claims**

1. An anhydrous cosmetic stick composition with improved transfer resistance and lustre finish comprising, by weight of the total composition:

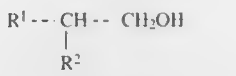
a) 10–70% of a volatile solvent having a viscosity of 0.5 to 20 centipoise at 25° C. selected from the group consisting of:
  (i) a cyclic silicone having the formula:



$$\left[-\overset{CH_3}{\underset{CH_3}{SiO}}-\right]_n$$

where n=3–7;
  (ii) a linear silicone of the formula $(CH_3)_3Si—O—[Si(CH_3)_2—O]_n—Si(CH_3)_3$
  where n=0–7;
  (iii) a C_{5-40} paraffinic hydrocarbon; and
  (iv) mixtures thereof;

b) 0.5–40% of a fluoro-guerbet ester selected from the group consisting of:
  (i) fluoro octyldodecyl meadowfoamate,
  (ii) a fluoro-guerbet ester which is the reaction product of A and B wherein B is a mixture of a guerbet alcohol having the formula:



$$R^1 -- \underset{R^2}{\underset{|}{CH}} -- CH_2OH$$

and a fluoroalcohol having the formula:

$$CF_3—(CF_2)_n—CH_2—CH_2—OH$$

wherein n is from 3–20,

and A is a carboxylic acid having the formula:

$$R^3COOH,$$

or

$$HOOC—R^3—COOH$$

wherein R^1 and R^2 are each independently a C_{4-20} alkyl and R^3 is a substituted or unsubstituted C_{1-50} straight or branched chain alkyl or alkylene, or phenyl, wherein the substituents are halogen, hydroxyl, carboxyl, and alkylcarbonylhydroxy; and
  (iii) mixtures thereof;

c) 0.1–20% of a siloxy silicate polymer having the formula:

$$[(RR'R'')_3SiO_{1/2}]_x[SiO_2]_y$$

wherein R, R' and R" are each independently a C_{1-10} straight or branched chain alkyl or phenyl, and x and y are such that the ratio of $(RR'R'')_3SiO_{1/2}$ units to SiO_2 units is 0.5 to 1 to 1.5 to 1

d) 0.1–40% of a cosmetically acceptable wax,
e) 0.1–30% of a cosmetically acceptable oil, and
f) 5–50% dry particulate matter having a particle size of 0.02 to 200 microns.

5,837,224

METHOD OF INHIBITING PHOTOAGING OF SKIN

John J. Voorhees, Ann Arbor, and Gary J. Fisher, Ypsilanti, both of Mich., assignors to The Regents of the University of Michigan, Ann Arbor, Mich.

Filed Jan. 19, 1996, Ser. No. 588,771

Int. Cl.^{6} A61K *7/42;31/59*

U.S. Cl. 424—59 **20 Claims**

1. A method for inhibiting photoaging of unphotodamaged skin of a human due to exposure of the skin of the human to ultraviolet B radiation (UVB) comprising administering an inhibitor of a UVB-inducible matrix metalloproteinase (MMP) to the human prior to said exposure in an amount sufficient to inhibit the production or activity of UVB-inducible MMPs in said skin.

5,837,225

TEST METHODS FOR ASSESSING K^+ CHANNEL AGONIST OR MITOGENIC ACTIVITY

Ian J. Fiddes; Terence G. Kealey; Michael P. Philpott; Deborah A. Sanders; Darren M. Thompson, all of Cambridge, and Gillian E. Westgate, Northampton, all of United Kingdom, assignors to Cambridge University Technical Services Ltd., Cambridge, United Kingdom

Filed Apr. 5, 1996, Ser. No. 628,463

Claims priority, application United Kingdom, Oct. 6, 1995, 9520411

Int. Cl.^{6} A61K *7/06;* **C12Q** *1/02;1/04*

U.S. Cl. 424—70.1 **10 Claims**

1. A test method for assessing the activity of a test substance as a K^+ channel agonist, comprising:
(i) culturing fibroblasts in a test medium free of aminoglycoside antibiotics;
(ii) supplementing the medium with (a) serum, and (b) the test substance;

(iii) assessing the response of the supplemented cells to the test substance as a basis for determining K^+ channel agonist activity.

5,837,226

OCULAR MICROSPHERE DELIVERY SYSTEM

Lisa B. Jungherr, Los Altos, and Thomas B. Ottoboni, Belmont, both of Calif., assignors to Vitaphore Corporation C/O Integra Lifesciences Corp., Plainsboro, N.J.

Continuation-in-part of Ser. No. 164,082, Dec. 8, 1993, abandoned. This application Sep. 19, 1995, Ser. No. 530,949

Int. Cl.^{6} A61K *9/50*

U.S. Cl. 424—78.1 **2 Claims**

1. A sustained-release drug delivery composition, comprising an aqueous carrier, and microspheres containing a pharmaceutically active agent,

said microspheres comprising a core said core, comprising an ion exchange resin; and a non-crosslinked plymeric coating completely surrounding said core, wherein said coating is selected from the group consisting of a cellulose derivative, a polycaprolactone, a polyurethane, a polymethacrylate, a polyester, ammonio methacrylate copolymers, and copolymers comprising a polycaprolactone, polyurethane, polymethacrylate, or polyester.

5,837,227

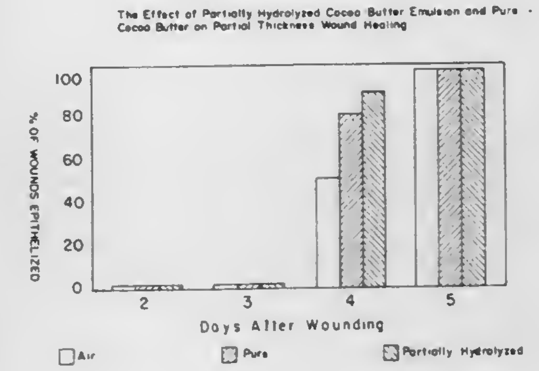
USE OF COCOA BUTTER OR PARTIALLY HYDROLYZED COCOA BUTTER FOR THE TREATMENT OF BURNS AND WOUNDS

Barry L. Zoumas; Stanley M. Tarka, both of Hershey; J. Michael McKim; Bryan J. Simmons, both of Elizabethtown; James G. Marks, Jr., Hershey, and Michael Santanna, Harrisburg, all of Pa., assignors to Hershey Foods Corporation, Hershey, Pa.

Filed Dec. 26, 1995, Ser. No. 578,456

Int. Cl.^{6} A61K *35/78*

U.S. Cl. 424—78.06 **26 Claims**



1. A method for treating a partial thickness thermal burn to the skin of a warm-blooded animal comprising applying topically to the locus of the skin that is injured a medicament comprising as the active ingredient a burn-healing effective amount of cocoa butter.

5,837,228

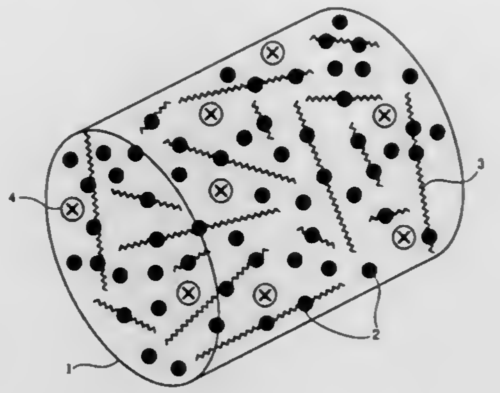
BIOERODIBLE IMPLANTS

Chung Shih; Gaylen M. Zentner; Randall V. Sparer, all of Lawrence, Kans., and R. Lee Seward, Watchung, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 570,742, Aug. 22, 1990, abandoned. This application Sep. 2, 1992, Ser. No. 939,539

Int. Cl.^{6} A61K *9/14;* **A61F** *2/02*

U.S. Cl. 424—78.37 **18 Claims**



1. A bioerodible controlled release dosage form comprising:
(a) a bioerodible polymer selected from a poly(ortho ester) or polyacetal in which from 1% to 100% of a biologically active ingredient, containing at least 2 hydroxyl groups, is covalently incorporated into a chain backbone of the polymer, wherein
  (i) during a condensation reaction, the viscosity of the mixture is maintained between 2,000 cp and 2,000,000 cp at 20° C. and 10 sec^{-1} prior to extrusion into a mold; and wherein
  (ii) the total equivalents of hydroxyl are present in stoichiometric ratios of 1 equivalent of hydroxyl to 0.1 to 1.5 equivalents of ketene acetal or vinyl ether, and
(b) wherein the biologically active ingredient is
  (i) present at a level between 0.1 to 50% of the total dosage form weight; and
  (ii) capable of being released from the polymer into the environment of use.

5,837,229

USES OF RECOMBINANT COLONY STIMULATING FACTOR-1

Peter Ralph, Orinda, and Kong T. Chong, Union City, both of Calif., assignors to Chiron Corporation, Emeryville, Calif.

Division of Ser. No. 220,454, Mar. 31, 1994, Pat. No. 5,556,620, which is a continuation of Ser. No. 24,094, Feb. 26, 1993, abandoned, which is a continuation of Ser. No. 505,256, Apr. 5, 1990, abandoned, which is a continuation-in-part of Ser. No. 243,253, Sep. 14, 1988, abandoned, which is a continuation-in-part of Ser. No. 99,872, Sep. 22, 1987, Pat. No. 5,104,650, which is a continuation-in-part of Ser. No. 876,819, Jun. 20, 1986, abandoned, which is a continuation-in-part of Ser. No. 821,068, Jan. 21, 1986, abandoned, which is a continuation-in-part of Ser. No. 756,814, Jul. 18, 1985, abandoned, which is a continuation-in-part of Ser. No. 744,924, Jun. 14, 1985, abandoned, which is a continuation-in-part of Ser. No. 728,834, Jun. 30, 1995, abandoned, which is a continuation-in-part of Ser. No. 698,359, Feb. 5, 1985, abandoned. This application Jan. 11, 1995, Ser. No. 371,805

Int. Cl.^{6} A61K *38/19*

U.S. Cl. 424—85.1 **17 Claims**

1. A method for stimulating the proliferation or differentiation of monocytes, macrophages, and neutrophils in a mammal suffering from immunosuppression comprising administering an effective amount of colony stimulating factor-1 (CSF-1) to said mammal in need thereof to stimulate said monocytes, macrophages, and neutrophils.

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5,837,230

METHODS OF TREATING ALLERGIES WITH M-CSF

Satoru Nakai, Itano-gun; Masayuki Takahashi, Naruto; Hiroyuki Ichikawa, Tokushima, and Yoshikatsu Hirai, Itano-gun, all of Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Japan

Continuation of Ser. No. 730,882, Sep. 13, 1991, abandoned, which is a continuation-in-part of Ser. No. 517,752, May 2, 1990, abandoned. This application Jun. 5, 1995, Ser. No. 464,463

Claims priority, application Japan, Dec. 13, 1989, 323518; WIPO, Dec. 12, 1990, PCT/JP90/01629

Int. Cl.^{6} A61K *38/19*

U.S. Cl. 424—85.1 **8 Claims**

1. A method of treating a Type I allergy or a Type IV allergy comprising administering biologically active macrophage-colony stimulating factor (M-CSF), wherein said macrophage-colony stimulating factor is a macrophage-colony stimulating factor having an amino acid primary sequence of Val at position 3 or Ser at position 4 to Thr at position 153 or an amino acid primary sequence of Val at position 3 or Ser at position 4 to Pro at position 214, or an amino acid primary sequence of Met at position -32 to Val at position 522 of the formula (1), wherein formula (1) is:

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-32                                                -23
Met—Thr—Ala—Pro—Gly—Ala—Ala—Gly—Arg—Cys—
                                                   -13
Pro—Pro—Thr—Thr—Trp—Leu—Gly—Ser—Leu—Leu—
                                                    -3
Leu—Leu—Val—Cys—Leu—Leu—Ala—Ser—Arg—Ser—
            1                                        8
Ile—Thr—Glu—Glu—Val—Ser—Glu—Tyr—Cys—Ser—
                                                    18
His—Met—Ile—Gly—Ser—Gly—His—Leu—Gln—Ser—
                                                    28
Leu—Gln—Arg—Leu—Ile—Asp—Ser—Gln—Met—Glu—
                                                    38
Thr—Ser—Cys—Gln—Ile—Thr—Phe—Glu—Phe—Val—
                                                    48
Asp—Gln—Glu—Gln—Leu—Lys—Asp—Pro—Val—Cys—
                                                    58
Tyr—Leu—Lys—Lys—Ala—Phe—Leu—Leu—Val—Gln—
                                                    68
X—Ile—Met—Glu—Asp—Thr—Met—Arg—Phe—Arg—
                                                    78
Asp—Asn—Thr—Pro—Asn—A!a—Ile—Ala—Ile—Val—
                                                    88
Gln—Leu—Gln—Glu—Leu—Ser—Leu—Arg—Leu—Lys—
                                                    98
Ser—Cys—Phe—Thr—Lys—Asp—Tyr—Glu—Glu—His—
                                                   108
Asp—Lys—Ala—Cys—Val—Arg—Thr—Phe—Tyr—Glu—
                                                   118
Thr—Pro—Leu—Gln—Leu—Leu—Glu—Lys—Val—Lys—
                                                   128
Asn—Val—Phe—Asn—Glu—Thr—Lys—Asn—Leu—Leu—
                                                   138
Asp—Lys—Asp—Trp—Asn—Ile—Phe—Ser—Lys—Asn—
                                                   148
Cys—Asn—Asn—Ser—Phe—Ala—Glu—Cys—Ser—Ser—
                                                   158
Gln—Asp—Val—Val—Thr—Lys—Pro—Asp—Cys—Asn—
                                                   168
Cys—Leu—Tyr—Pro—Lys—Ala—Ile—Pro—Ser—Ser—
                                                   178
Asp—Pro—Ala—Ser—Val—Ser—Pro—His—Gln—Pro—
                                                   188
Leu—Ala—Pro—Ser—Met—Ala—Pro—Val—Ala—Gly—
                                                   198
Leu—Thr—Trp—Glu—Asp—Ser—Glu—Gly—Thr—Glu—
                                                   208
Gly—Ser—Ser—Leu—Leu—Pro—Gly—Glu—Gln—Pro—
                                                   218
Leu—His—Thr—Val—Asp—Pro—Gly—Ser—Ala—Lys—
                                                   228
Gln—Arg—Pro—Pro—Arg—Ser—Thr—Cys—Gln—Ser—
                                                   238
Phe—Glu—Pro—Pro—Glu—Thr—Pro—Val—Val—Lys—
                                                   248
Asp—Ser—Thr—Ile—Gly—Gly—Ser—Pro—Gln—Pro—
                                                   258
Arg—Pro—Ser—Val—Gly—Ala—Phe—Asn—Pro—Gly—
                                                   268
Met—Glu—Asp—Ile—Leu—Asp—Ser—Ala—Met—Gly—
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                                                   278
Thr—Asn—Trp—Val—Pro—Glu—Glu—Ala—Ser—Gly—
                                                   288
Glu—Ala—Ser—Glu—Ile—Pro—Val—Pro—Gln—Gly—
                                                   298
Thr—Glu—Leu—Ser—Pro—Ser—Arg—Pro—Gly—Gly—
                                                   308
Gly—Ser—Met—Gln—Thr—Glu—Pro—Ala—Arg—Pro—
                                                   318
Ser—Asn—Phe—Leu—Ser—Ala—Ser—Ser—Pro—Leu—
                                                   328
Pro—Ala—Ser—Ala—Lys—Gly—Gln—Gln—Pro—Ala—
                                                   338
Asp—Val—Thr—Gly—Thr—Ala—Leu—Pro—Arg—Val—
                                                   348
Gly—Pro—Val—Arg—Pro—Thr—Gly—Gln—Asp—Trp—
                                                   358
Asn—His—Thr—Pro—Gln—Lys—Thr—Asp—His—Pro—
                                                   368
Ser—Ala—Leu—Leu—Arg—Asp—Pro—Pro—Glu—Pro—
                                                   378
Gly—Ser—Pro—Arg—Ile—Ser—Ser—Pro—Arg—Pro—
                                                   388
Gln—Gly—Leu—Ser—Asn—Pro—Ser—Thr—Leu—Ser—
                                                   398
Ala—Gln—Pro—Gln—Leu—Ser—Arg—Ser—His—Ser—
                                                   408
Ser—Gly—Ser—Val—Leu—Pro—Leu—Gly—Glu—Leu—
                                                   418
Glu—Gly—Arg—Arg—Ser—Thr—Arg—Asp—Arg—Arg—
                                                   428
Ser—Pro—Ala—Glu—Pro—Glu—Gly—Gly—Pro—Ala—
                                                   438
Ser—Glu—Gly—Ala—Ala—Arg—Pro—Leu—Pro—Arg—
                                                   448
Phe—Asn—Ser—Val—Pro—Leu—Thr—Asp—Thr—Gly—
                                                   458
His—Glu—Arg—Gln—Ser—Glu—Gly—Ser—Ser—Ser—
                                                   468
Pro—Gln—Leu—Gln—Glu—Ser—Val—Phe—His—Leu—
                                                   478
Leu—Val—Pro—Ser—Val—Ile—Leu—Val—Leu—Leu—
                                                   488
Ala—Val—Gly—Gly—Leu—Leu—Phe—Tyr—Arg—Trp—
                                                   498
Arg—Arg—Arg—Ser—His—Gln—Glu—Pro—Gln—Arg—
                                                   508
Ala—Asp—Ser—Pro—Leu—Glu—Gln—Pro—Glu—Gly—
                                                   518
Ser—Pro—Leu—Thr—Gln—Asp—Asp—Arg—Gln—Val—
            522
Glu—Leu—Pro—Val
```

wherein x is Tyr or Asp.

5,837,231

GM-CSF ADMINISTRATION FOR THE TREATMENT AND PREVENTION OF RECURRENCE OF BRAIN TUMORS

Walter C. Low, Shorewood, and Margaret A. Wallenfriedman, Edina, both of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Jun. 27, 1996, Ser. No. 671,251

Int. Cl.^{6} A61K *38/19;35/12;38/00*

U.S. Cl. 424—85.1 **11 Claims**

1. A method for inhibiting the growth of brain tumor cells in a patient having a brain tumor, the method comprising:

co-administering to the patient granulocyte/macrophage colony stimulating factor (GM-CSF) and brain tumor antigen obtained from said brain tumor.

5,837,232

USE OF AN INTERLEUKIN-10 ANTAGONIST TO TREAT A B CELL MEDIATED AUTOIMMUNE DISORDER

Rene De Waal Malefty, Sunnyvale; Maureen Howard, Los Altos Hills; Di-Hwei Hsu, Sunnyvale, all of Calif.; Hiroshi Ishida, Kyoto, Japan; Anne O'Garra, Palo Alto, Calif.; Hergen Spits, Badhoevedorp, Netherlands, and Albert Zlotnik, Palo Alto, Calif., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 410,640, Mar. 24, 1995, which is a continuation of Ser. No. 229,854, Apr. 19, 1994, which is a continuation of Ser. No. 926,853, Aug. 6, 1992, which is a continuation of Ser. No. 742,129, Aug. 6, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 474,851

Int. Cl.^{6} A61K *38/19;39/00*

U.S. Cl. 424—85.2 **7 Claims**

1. A method for treating a B cell mediated autoimmune disorder in a mammal comprising administering an effective amount of an interleukin-10 antagonist to a mammal afflicted with a B cell mediated autoimmune disorder.

5,837,233

METHOD FOR TREATING TUMORS

Gale A. Granger, Laguna Beach, Calif., assignor to University Of California, Oakland, Calif.

Continuation-in-part of Ser. No. 406,388, Mar. 17, 1995, abandoned. This application Mar. 15, 1996, Ser. No. 616,880

Int. Cl.^{6} A61K *48/00;* **C12N** *5/00*

U.S. Cl. 424—93.1 **37 Claims**

1. A method of treating a human patient having a tumor, comprising implanting at or around the site of a solid tumor in said patient, a cell population comprising alloactivated human donor lymphocytes, wherein said alloactivated human donor lymphocytes are produced by coculturing human donor lymphocytes ex vivo with leukocytes from said human patient, and wherein the implanted cell population induces the human patient to generate a therapeutic response against tumor growth.

5,837,234

BIOARTIFICIAL ORGAN CONTAINING CELLS ENCAPSULATED IN A PERMSELECTIVE POLYETHER SUFLFONE MEMBRANE

Frank T. Gentile, Warwick; Shelley R. Winn, Smithfield; Michael Lysaght, East Greenwich, all of R.I.; Ulrich Baurmeister, Germany; Friedbert Wechs, and Henning Röttger, both of Wörth, Germany, assignors to CytoTherapeutics, Inc., Lincoln, R.I.

Filed Jun. 7, 1995, Ser. No. 488,317

Int. Cl.^{6} C12N *11/04;5/00;11/08;* **A61F** *2/00*

U.S. Cl. 424—93.7 **18 Claims**

1. A bioartificial organ comprising:

(a) a cell core of one or more living cells, and

(b) an encapsulating, permselective polyether sulfone membrane shaped to define an internal volume, the cell core of one or more living cells being disposed within the internal volume, the membrane comprising a dense, fine-pored permselective inner region next to the cell core, a middle region that lacks macrovoids, and a fine-pored outer region,

wherein the fine-pored inner and outer regions of the membrane are interconnected through the middle region via a system of open pores to define an open network structure across the thickness of the membrane, said membrane having a molecular weight cutoff permitting passage of nutrients, but not the passage of cells thereacross to maintain viability of the cell core, and said membrane having pores ranging in size between 0.02 μm and 2.0 μm, the pores have polyhedrally symmetric boundaries and being arranged asymmetrically from one surface of the membrane to the other surface, asymmetry factor AF relative to the maximum pore diameter being 0.01 to 2.0, and ratio of the maximum mean free path length to the diameter of the largest pore being greater than 3.

5,837,235

PROCESS FOR REGENERATING BONE AND CARTILAGE

Werner Mueller, Wiesendangen, and Thomas Thaler, Zürich, both of Switzerland, assignors to Sulzer Medizinaltechnik AG, Winterthur, Switzerland

PCT No. PCT/CH95/00158, § 371 Date May 9, 1996, § 102(e) Date May 9, 1996, PCT Pub. No. WO96/01641, PCT Pub. Date Jan. 25, 1996

PCT Filed Jul. 6, 1995, Ser. No. 602,833

Claims priority, application Switzerland, Jul. 8, 1994, 2190/94

Int. Cl.^{6} C12N *5/06;5/08;11/02;11/08*

U.S. Cl. 424—93.7 **26 Claims**

1. A process for the forming and applying an implant material with bone regenerating characteristics to form bone in a patient, comprising:

removing fatty tissue containing no osteoblasts or mesanchymal cells derived from bone, bone marrow or periosteum from a patient in need of bone regeneration;

comminuting said fatty tissue material to produce small fatty tissue particles;

suspending at least some of the small fatty tissue particles in a physiologically acceptable, liquid to form a suspension comprising the particles;

depositing at least a substantial portion of the suspended fatty tissue particles from said suspension on a physiologically acceptable, solid carrier material by contacting the suspension with the carrier material to form a solid implanting material;

implanting said solid implanting material into a bone in need of regeneration in a patient; and

allowing bone to regenerate in the patient,

wherein said removing of said fatty tissue and implanting of said implanting material are carried out in at most about 1 hour of elapsed time.

14. A process for forming and applying an implant material with cartilage regenerating characteristics to form cartilage in a patient, comprising:

removing fatty tissue material containing no chondrocytes or other cartilage forming cells derived from cartilage, bone marrow or periosteum from a patient in need of cartilage regeneration;

comminuting said fatty tissue to produce small fatty tissue particles;

suspending at least some of said small fatty tissue particles in a physiologically acceptable, liquid to form a suspension comprising the fatty tissue particles;

depositing at least a substantial portion of said fatty tissue particles from said suspension on a physiologically acceptable, solid carrier, by contacting the suspension with the carrier material to form a solid implanting material;

implanting said solid implanting material into a cartilage in need of regeneration in a patient; and

allowing cartilage to regenerate in the patient;

wherein said removing of the fatty tissue and implanting of said implanting material are carried out collectively in at most about 1 hour.

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5,837,236

ISOLATED PORCINE PANCREATIC CELLS FOR USE IN TREATMENT OF DISEASES CHARACTERIZED BY INSUFFICIENT INSULIN ACTIVITY

Jonathan Dinsmore, Brookline, Mass., assignor to Diacrin, Inc., Charlestown, Mass.

Division of Ser. No. 327,506, Oct. 21, 1994, Pat. No. 5,629,194. This application Jan. 15, 1997, Ser. No. 784,098

Int. Cl.^{6} A01N *63/00;* **C12N** *5/00*

U.S. Cl. 424—93.7 **35 Claims**

1. A method of treating a disease characterized by insufficient insulin activity in a subject, comprising administering to the subject an isolated population of porcine pancreatic cells, which cells, in unmodified form, have at least one antigen on the surface of the cells which is capable of stimulating an immune response against the cells in a xenogeneic subject, wherein the antigen on the surface of the cells is altered to inhibit rejection of the cells when administered to the subject.

5,837,237

BACILLUS THURINGIENSIS STRAINS AND THEIR GENES ENCODING INSECTICIDAL TOXINS

Marnix Peferoen, Gent; Bart Lambert, Beernem, and Katrien Van Audenhove, Brugge, all of Belgium, assignors to Plant Genetic Systems, N.V., Gent, Belgium

Division of Ser. No. 443,679, May 18, 1995, which is a division of Ser. No. 952,755, Nov. 17, 1992, Pat. No. 5,466,597. This application Jan. 29, 1997, Ser. No. 790,597

Int. Cl.^{6} A01N *63/00;25/00;* **C12N** *1/00;1/20*

U.S. Cl. 424—93.461 **7 Claims**

1. A Btl109P crystal, crystal protein, protoxin or toxin comprising the amino acid sequence of SEQ ID. NO. 1 or an insecticidally effective portion thereof.

5,837,238

TREATMENT OF DIARRHEA

Ivan A. Casas, Raleigh, N.C., and Bo Mollstam, Lerum, Sweden, assignors to Biogaia Biologics AB, Stockholm, Sweden

Filed Jun. 5, 1996, Ser. No. 658,473

Int. Cl.^{6} C12N *5/00;* **A01N** *63/00*

U.S. Cl. 424—93.45 **20 Claims**

1. A method of treating acute diarrhea that is efficient and rapid in stopping dehydration of young patients, comprising:

a) determining that the patient has diarrhea or is imminently susceptible to diarrhea;
b) selecting a strain of *Lactobacillus reuteri;*
c) preparing at least one aliquot of cells of the strain containing about 10^7–10^{10} cells for administration to the patient; and
d) orally administering the at least one aliquot to the patient as soon as possible after diagnosis of diarrhea.

5,837,239

PHYSIOLOGICALLY ACTIVE SUBSTANCE DESIGNATED AS EPIMORPHIN GENES ENCODING THE SAME AND ANTIBODIES THERETO

Yohei Hirai, Chigasaki; Makoto Takashina, and Kyoko Takehe, both of Yokohama, all of Japan, assignors to Biomaterial Research Institute Co., Ltd., Kanagawa, Japan

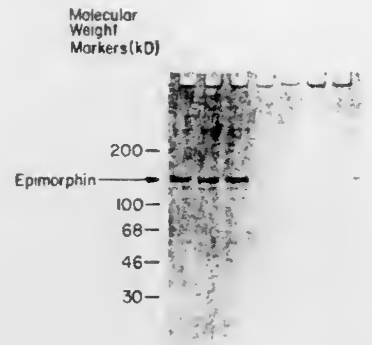
Division of Ser. No. 78,309, Aug. 16, 1993, abandoned. This application Apr. 5, 1996, Ser. No. 628,187

Claims priority, application Japan, Oct. 16, 1991, 3-294856; Apr. 17, 1992, 4-122906; Apr. 30, 1992, 4-135692

Int. Cl.^{6} A61K *39/395;* **C07K** *16/00;* **C12P** *21/08*

U.S. Cl. 424—130.1 **5 Claims**

1. A polyclonal antibody epimorphin wherein said epimorphin is capable of effecting epithelial morphogenesis in mammals, comprising n-terminal sequence shown in SEQ ID No. 2, and having a molecular weight of between 32–33 kD as determined by SDS-PAGE when synthesized in a cell-free system.



5,837,240

MULTIMERIC, RECOMBINANT UREASE VACCINE

Cynthia K. Lee, Needham; Thomas P. Monath, Harvard; Samuel K. Ackerman, Weston; William D. Thomas, Winchester; Gopalan Soman, Belmont; Harold Kleanthous, Allston; Richard A. Weltzin, Lunenburg; Jacques Pappo, Newton; Thomas Ermak, Brookline; Farshad Guirakhoo, Melrose; Hitesh Bhagat, Framingham, and Ilene Sussman, Newton, all of Mass., assignors to OraVax-Merieux Co., Cambridge, Mass.

Continuation of Ser. No. 431,041, Apr. 28, 1995, abandoned. This application Aug. 26, 1997, Ser. No. 920,095

Int. Cl.^{6} A61K *38/46;39/02;39/106*

U.S. Cl. 424—94.6 **10 Claims**

1. A method of treating *Helicobacter pylori* infection in a patient, said method comprising administering to a mucosal surface of said patient an immunogenically effective amount of a composition comprising multimeric complexes of recombinant, enzymatically inactive Helicobacter urease.

5,837,241

METHOD OF TREATING HEART FAILURE USING LEUKEMIA INHIBITORY FACTOR ANTAGONISTS OPTIONALLY WITH ENDOTHELIN ANTAGONISTS

Napoleone Ferrara, San Francisco; Kathleen King, Pacifica; Elizabeth Luis, San Francisco; Jennie P. Mather, Millbrae, and Nicholas F. Paoni, Belmont, all of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Continuation of Ser. No. 428,002, Apr. 24, 1995, Pat. No. 5,573,762. This application Jul. 26, 1996, Ser. No. 693,826

Int. Cl.^{6} A61K *39/395;* **C12N** *5/12;* **C07K** *16/18;16/22*

U.S. Cl. 424—136.1 **4 Claims**

1. A method for treating a mammal experiencing heart failure to prevent or lessen hypertrophy comprising administering chronically to a mammal in need of such treatment a therapeutically effective amount of a leukemia inhibitory factor antagonist antibody, wherein the antagonist antibody binds LIF and blocks or prevents interaction between LIF and its cellular receptor.

5,837,242

MULTIVALENT AND MULTISPECIFIC BINDING PROTEINS, THEIR MANUFACTURE AND USE

Kaspar-Philipp Holliger; Andrew David Griffiths, both of Cambridge, United Kingdom; Hendricus Renerus Jacobus Matheus Hoogenboom, Hasselt, Belgium; Magnus Malmqvist, Upsala, Sweden; James David Marks, Kensington, Calif.; Brian Timothy McGuinness, Cambridge, United Kingdom; Anthony Richard Pope, Cambridge, United Kingdom; Terence Derek Prospero, Cambridge, United Kingdom, and Gregory Paul Winter, Cambridge, United Kingdom, assignors to Medical Research Council, London, and Cambridge Antibody Technology Limited, Melbourn, both of England

PCT No. PCT/GB93/02492, § 371 Date May 14, 1996, § 102(e) Date May 14, 1996, PCT Pub. No. WO94/13804, PCT Pub. Date Jun. 23, 1994

PCT Filed Dec. 3, 1993, Ser. No. 448,418

Claims priority, application United Kingdom, Dec. 4, 1992, 9225453; Jan. 16, 1993, 9300816; European Pat. Off., May 10, 1993, 93303614; United Kingdom, Sep. 22, 1993, 9319969

Int. Cl.^{6} C07K *16/46;* **C12N** *15/62*

U.S. Cl. 424—136.1 **85 Claims**

1. A dimer comprising:

(i) a first polypeptide comprising a first domain which comprises a binding region of an immunoglobulin heavy chain variable region, and a second domain which comprises a binding region of an immunoglobulin light chain variable region, the first and second domains of the first polypeptide being linked directly to each other by an amide bond or by a polypeptide linker of from 1 to 5 amino acids; and
(ii) a second polypeptide which has a first domain, which comprises a binding region of an immunoglobulin heavy chain variable region, a second domain, which comprises a binding region of an immunoglobulin light chain variable region, the first and second domains of the second polypeptide being linked directly to each other by an amide bond or by a polypeptide linker of from 1 to 5 amino acids;

the first domain of the first polypeptide and the second domain of the second polypeptide associating to form a first antigen binding site; and
the second domain of the first polypeptide and the first domain of the second polypeptide associating to form a second antigen binding site;
said first antigen binding site being different from said second antigen binding site.

5,837,243

THERAPEUTIC COMPOUNDS COMPRISED OF ANTI-FC RECEPTOR ANTIBODIES

Yashwant M. Deo, Audubon, Pa.; Joel Goldstein, Edison; Robert Graziano, Frenchtown, both of N.J., and Chezian Somasundaram, Allentown, Pa., assignors to Medarex, Inc., Annandale, N.J.

Continuation-in-part of Ser. No. 484,172, Jun. 7, 1995. This application Jun. 7, 1996, Ser. No. 661,052

Int. Cl.^{6} A61K *39/365;39/00;38/00;* **C12P** *21/08*

U.S. Cl. 424—136.1 **18 Claims**

1. A method of inducing antibody-dependent cellular cytotoxicity (ADCC) against a tumor cell which tumor cell is characterized by overexpression of HER 2/neu or epidermal growth factor receptor (EGFR), comprising contacting the tumor cell with a multispecific protein molecule comprising:

an anti-Fc receptor n(FcR) antibody or an antigen binding fragment thereof;
a portion which binds to HER 2/neu; and
a portion which binds to EGFR.

10. A method of inducing antibody-dependent cellular cytotoxicity (ADCC) against a tumor cell characterized by overexpression of a surface receptor selected from the group consisting of receptors for HER 2, HER 3, HER 4, epidermal growth factor (EGF) and bombesin, comprising contacting the tumor cell with a fusion protein comprising:

antibody H22 produced by the cell line having an ATCC accession number CRL 1117 or an antigen binding fragment thereof; and
at least one ligand which binds to said surface receptor.

5,837,244

ONCOPROTEIN PROTEIN KINASE

Michael Karin; Masahiko Hibi, both of San Diego, and Anning Lin, La Jolla, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Division of Ser. No. 276,860, Jul. 18, 1994, Pat. No. 5,593,884, which is a continuation-in-part of Ser. No. 220,602, Mar. 25, 1994, which is a continuation-in-part of Ser. No. 94,533, Jul. 19, 1993, Pat. No. 5,534,426. This application Sep. 12, 1996, Ser. No. 711,893

Int. Cl.^{6} A61K *31/70;39/395*

U.S. Cl. 424—139.1 **3 Claims**

1. A method of treating a cell proliferative disorder associated with c-Jun N-terminal kinase having a molecular weight of 46 kD or 55 kD as determined by reducing SDS-PAGE; having serine and threonine kinase activity; and phosphorylating the c-Jun N-terminal activation domain, comprising administering to a subject with the disorder, a therapeutically effective amount of reagent which modulates the kinase activity.

5,837,245

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5,837,246
VACCINATION AND METHODS AGAINST DISEASES RESULTING FROM PATHOGENIC RESPONSES BY SPECIFIC T CELL POPULATIONS

Mark D. Howell, San Diego; Steven W. Brostoff, Carlsbad, and Dennis J. Carlo, Rancho Santa Fe, all of Calif., assignors to The Immune Response Corporation, Carlsbad, Calif.

Continuation of Ser. No. 10,483, Jan. 28, 1993, abandoned, which is a continuation of Ser. No. 530,229, May 30, 1990, abandoned, which is a continuation-in-part of Ser. No. 382,085, Jul. 18, 1989, abandoned, and Ser. No. 382,086, Jul. 18, 1989, abandoned, which is a continuation-in-part of Ser. No. 326,314, Mar. 21, 1989, abandoned, said Ser. No. 382,085 is a continuation-in-part of Ser. No. 326,314. This application Jan. 20, 1995, Ser. No. 376,049

Int. Cl.^{6} A61K *38/00;* **C07K** *14/725*

U.S. Cl. 424—185.1 14 Claims

1. A single chain peptide comprising an amino acid sequence for a T cell receptor present on the surface of autoaggressive T cells mediating rheumatoid arthritis wherein said peptide induces an immune response against said autoaggressive T cell that reduces the severity of rheumatoid arthritis.

5,837,247
CHEMOTACTIC AGENTS FOR T-CELLS

Joost J. Oppenhelm, Bethesda; Dennis Michiel, Funkstown; Oleg Chertov, Frederick; Dennis D. Taub, Thurmont, all of Md.; Luoling Xu, London, Canada; Ji Ming Wang, and William J. Murphy, both of Frederick, Md., assignors to United States of America as represented by the Public Health Service National Institutes of Health, Washington, D.C.

Filed Jun. 16, 1995, Ser. No. 491,204

Int. Cl.^{6} A61K *39/00*

U.S. Cl. 424—185.1 7 Claims

1. A method for inducing or stimulating T-cell chemotaxis in a subject which would benefit from such induction or stimulation, said method comprising administering to said subject a pharmaceutical composition comprising a therapeutically effective amount of a defensin protein.

5,837,248
PEPTIDE CAPABLE OF INDUCING IMMUNE RESPONSE TO HUMAN GASTRIC CANCER AND AGENT FOR PREVENTING OR TREATING HUMAN GASTRIC CANCER, CONTAINING THE PEPTIDE

Kokichi Kikuchi, No. 7-1, Fushimi 3-chome, Chuo-ku, Sapporo-shi, Hokkaido; Noriyuki Sato, Sapporo; Hiromitsu Sahara, Rishirifuji-machi; Takahiro Yasojima, Setana-gun; Yoshimasa Wada, Sapporo, all of Japan; Manabu Suzuki, and Junji Hamuro, both of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, and Koklchi Kikuchi, Sapporo, both of Japan

Filed Sep. 30, 1996, Ser. No. 723,116

Claims priority, application Japan, Sep. 29, 1995, 7-253491; Aug. 19, 1996, 8-217140

Int. Cl.^{6} A61K *38/08;39/00*

U.S. Cl. 424—185.1 4 Claims

1. A peptide which is a fragment of a gastric cancer antigen protein present in a human gastric cancer cell wherein said peptide comprises SEQ. ID. NO. 1 and consists of 10–12 amino acid residues and wherein said peptide is capable of binding to HLA-A3 1 and is capable of inducing a cytotoxic T cell that targets said gastric cancer cell.

2. A peptide which is a fragment of a gastric cancer antigen protein present in a human gastric cancer cell wherein said peptide comprises SEQ. ID. NO. 2 and consists of 9–12 amino acid residues and wherein said peptide is capable of binding to HLA-A31 and is capable of inducing a cytotoxic T cell that targets said gastric cancer cell.

3. A composition which is prepared by incubating a peptide of claim **1** or **2** with an HLA-A31 molecule in conditions suitable to form a complex wherein said complex is capable of inducing a cytotoxic T cell that targets said gastric cancer cell.

4. A method of reducing the severity of gastric cancer comprising administering to a patient in need thereof an effective amount of composition of claim **3**.

5,837,249
METHOD FOR GENERATING AN IMMUNOGENIC T CELL RESPONSE PROTECTIVE AGAINST A VIRUS

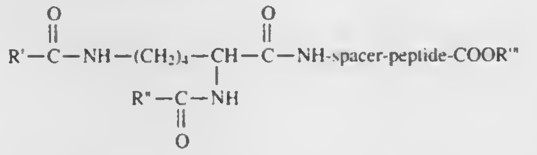
Ellen Heber-Katz, Philadelphia, and Bernhard Dietzschold, Newtown Square, both of Pa., assignors to The Wistar Institute, Philadelphia, Pa.

Continuation of Ser. No. 868,946, Apr. 15, 1992, abandoned, which is a continuation-in-part of Ser. No. 685,459, Apr. 12, 1991, abandoned, which is a continuation of Ser. No. 47,443, May 8, 1987, abandoned, which is a continuation-in-part of Ser. No. 725,087, Apr. 19, 1985, abandoned. This application Oct. 20, 1993, Ser. No. 139,609

Int. Cl.^{6} A61K *39/12;39/205;39/245;* **C07K** *14/145*

U.S. Cl. 424—186.1 21 Claims

1. A method for inducing a cytotoxic T cell response in a mammalian host against a viral infection comprising administering to the host an immunologically effective amount of a peptide-fatty acid conjugate of the formula:



$$R'-\overset{\overset{\displaystyle O}{\|}}{C}-NH-(CH_2)_4-\underset{\underset{\displaystyle R''-\underset{\underset{\displaystyle O}{\|}}{C}-NH}{|}}{CH}-\overset{\overset{\displaystyle O}{\|}}{C}-NH\text{-spacer-peptide-}COOR'''$$

where R' and R" are alkyl groups containing from 5 to 30 carbon atoms, and R"' is selected from the group consisting of hydrogen and at least one amino acid residue; wherein the peptide comprises an amino acid sequence corresponding to the sequence of a fragment of a viral protein which fragment produces a protective T cell response; and wherein the peptide-fatty acid conjugate is administered in association with a liposome composition and an adjuvant so that the peptide protrudes from the liposome.

5,837,250
ADJUVANT COMPOSITIONS

Ali Kandil, Willowdale; Olive A. James, Toronto; Michel H. Klein, Willowdale, and Pele Chong, Richmond Hill, all of Canada, assignors to Connaught Laboratories Limited, North York, Canada

Continuation of Ser. No. 261,194, Jun. 16, 1994. This application Jun. 7, 1995, Ser. No. 483,856

Int. Cl.^{6} A61K *39/00;38/00;31/00;* **C07K** *17/00*

U.S. Cl. 424—193.1 10 Claims

1. A compound comprising an antigen covalently linked to N-(2-deoxy-2-L-leucylamino-β-D-glycopyranosyl)-N-octadecyldodecanamide acetate.

5,837,251
COMPOSITIONS AND METHODS USING COMPLEXES OF HEAT SHOCK PROTEINS AND ANTIGENIC MOLECULES FOR THE TREATMENT AND PREVENTION OF NEOPLASTIC DISEASES

Pramod K. Srivastava, Riverdale, N.Y., assignor to Fordham University, Bronx, N.Y.

Filed Sep. 13, 1995, Ser. No. 527,391

Int. Cl.^{6} A61K *39/385;39/00;* **C07K** *1/00;* **A23J** *1/00*

U.S. Cl. 424—193.1 33 Claims

1. A method of eliciting an immune response in a human individual of greater than 20 kg body weight comprising administering to the individual a composition comprising an amount of a purified complex in the range of 10 to 600 micrograms, said complex consisting essentially of heat shock protein gp96 noncovalently bound to an antigenic molecule.

8. A method of treating a human individual of greater than 20 kg body weight having a type of cancer, comprising administering to the individual a composition comprising an amount of a purified complex in the range of 10 to 600 micrograms, said complex consisting essentially of heat shock protein gp96 noncovalently bound to a tumor-specific antigenic molecule specific to said type of cancer.

16. A method of treating a human individual of greater than 20 kg body weight having a type of cancer, comprising:

(a) administering to the individual a composition comprising about 25 micrograms of a purified complex, said complex consisting essentially of heat shock protein gp96 noncovalently bound to a peptide, said complex having been isolated from cancerous tissue of said individual; and

(b) repeating said administering of step (a) at weekly intervals for five weeks, the first administration being on the left arm, the second administration being on the right arm, the third administration being on the left belly, the fourth administration being on the right belly, the fifth administration being on the left thigh, and the sixth administration being on the right thigh; said first through sixth administration being subcutaneously.

5,837,252
NONTOXIC EXTRACT OF *LARREA TRIDENTATA* AND METHOD OF MAKING SAME

Robert A. Sinnott, Chandler; W. Dennis Clark, Phoenix, both of Ariz., and Kenneth Frank DeBoer, Belgrade, Mont., assignors to Larreacorp, Ltd., Chandler, Ariz.

Filed Oct. 7, 1996, Ser. No. 726,686

Int. Cl.^{6} A01N *65/00*

U.S. Cl. 424—195.1 8 Claims

1. A method of preparing a medicinally effective, nontoxic composition containing an extract of *Larrea tridentata* plant material produced by the steps of:

harvesting pant material comprising leaves from *Larrea tridentata* shrubs;

air drying said harvested plant material at ambient temperature and humidity for at least one week;

maintaining said plant material in whole form without chopping, grinding or powdering;

extracting said *Larrea tridentata* plant material in whole form by recirculating acetone over said plant material at least three times to produce a *Larrea tridentata* extract which comprises NDGA quinone;

filtering particulate impurities from said extract;

adding polysorbate 80 to said extract as an emulsifying and stabilizing agent, wherein 5 mL of polysorbate 80 are added per 50 L of extract;

reducing said NDGA quinone in said extract to NDGA by passing said extract through a column packed with powdered ascorbic acid to produce a reduced extract, wherein 5 g of ascorbic acid powder are provided per liter of extract being reduced;

concentrating said reduced extract by boiling off the acetone solvent at about 100°C. until the volume of said extract is reduced by 90% to produce a concentrated extract;

adding additional amounts of ascorbic acid effective to prevent oxidation of said NDGA in said concentrated extract; and

optionally, combining said concentrated extract with a pharmaceutically acceptable carriers, excipients and/or agents.

5,837,253
PREPARATION AND USE OF INULA EXTRACTS AS A FUNGICIDE FOR THE CONTROL OF PLANT DISEASES

Yigal Cohen, Kiryat Ono, Israel, assignor to Agrogene Ltd., Israel

Continuation-in-part of Ser. No. 690,423, Jul. 26, 1996. This application Oct. 29, 1996, Ser. No. 739,699

Int. Cl.^{6} A61K *35/78*

U.S. Cl. 424—195.1 16 Claims

1. A method for preparing a suspension of Inula species which comprises:

(a) drying and grinding shoots of the species to form a powder;

(b) mixing said powder with an emulsifier to form a mixture; and

(c) suspending said mixture in a solvent to form a suspension.

5,837,254
METHOD OF TREATING CANDIDA AND CRYPTOCOCCUS FUNGAL INFECTIONS BY ADMINISTERING GENTIAN

Yu Chen, 1520 Taylor Ave., Baltimore, Md. 21234

Filed Nov. 14, 1996, Ser. No. 748,949

Int. Cl.^{6} A61K *35/78;9/02;9/20;9/48*

U.S. Cl. 424—195.1 5 Claims

1. A method of treating systemic fungal infection caused by candida or cryptococcus comprising administering an effective amount of gentian obtained from *Radix gentianae* Longdancao and an effective amount of American Radix Ginseng, Radix Scutellariae Basica Lensis and Fructus Gardeniae Jasminoidis in combination with a pharmaceutically acceptable carrier to a patient in need thereof.

5,837,255
METHOD OF REDUCING BLOOD GLUCOSE BY ADMINISTERING HARUNGANIN OR VISMIN

Wayne DeWald Inman, Belmont, and Jian Luo, Brisbane, both of Calif., assignors to Shaman Pharmaceuticals, Inc., South San Francisco, Calif.

Filed Dec. 10, 1996, Ser. No. 762,785

Int. Cl.^{6} A61K *35/78;38/28;31/12;* **C07C** *50/18*

U.S. Cl. 424—195.1 14 Claims

1. A method for reducing the blood glucose of a mammal, comprising administering to said mammal a hypoglycemically effective amount of isolated harunganin or isolated vismin, or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

5,837,256
METHOD FOR TREATMENT OF LUPUS NEPHRITIS

William F. Clark, 1132 Richmond Street, London, Ontario, Canada, N6A 3K8, and Anwar Parbtani, 418 Rippleton Rd., London, Ontario, Canada, N6G 1L3

Filed Dec. 19, 1996, Ser. No. 770,147

Int. Cl.^{6} A61K *31/045*

U.S. Cl. 424—195.1 9 Claims

1. A method for the treatment of lupus nephritis which comprises administering to a patient an effective amount of secoisola-

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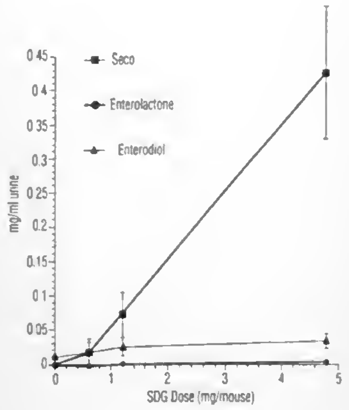


riciresinol or secoisolariciresinol diglucoside (SDG) in substantially pure form, wherein the secoisolariciresinol or secoisolariciresinol diglucoside in substantially pure form has been demonstrated to be effective in the MRL/lpr mouse model of lupus nephritis.

5,837,257
USE OF PLANT EXTRACTS FOR TREATMENT OF HIV, HCV AND HBV INFECTIONS

Hsiu-Hsien Tsai, Chang-Huah, Taiwan; Shie-Ming Hwang, Columbus, Ohio, and Pai-Chu Kung, Chaug-Huah, Taiwan, assignors to Sage R&D, Columbus, Ohio

Filed May 27, 1997, Ser. No. 863,803

Int. Cl.^{6} A61K *35/78;9/20;9/48*

U.S. Cl. 424—195.1 13 Claims

1. A method for treating a subject having a viral infection selected from the group consisting of hepatitis B virus (HBV), hepatitis C virus (HCV), leukemia virus (LV) and human immunodeficiency virus (HIV), said method comprising administering to said subject in need thereof, a therapeutically effective amount of a composition which comprises at least one herbal medicine selected from the group consisting of:

a) SOLANI HERBA, prepared from the whole plant of *Solanum nigrum;*

b) LESPEDEZAE HERBA, prepared from the whole plant of *Lespedeza cuneata;*

c) SENECINIS HERBA, prepared from the whole plant of *Senecio scandens;* and

d) LIGUSTRI FRUCTUS, prepared from the mature fruit of at least one plant selected from the group consisting of *Ligustrum lucidum* and *Ligustrum japonicum.*

5,837,258
INDUCTION OF TISSUE, BONE OR CARTILAGE FORMATION USING CONNECTIVE TISSUE GROWTH FACTOR

Gary R. Grotendorst, Miami, Fla., assignor to University of South Florida, Tampa, Fla., and University of Miami, Miami, Fla.

Continuation-in-part of Ser. No. 459,717, Jun. 2, 1995, which is a continuation-in-part of Ser. No. 386,680, Feb. 10, 1995, Pat. No. 5,585,270, which is a division of Ser. No. 167,628, Dec. 14, 1993, Pat. No. 5,408,040, which is a continuation of Ser. No. 752,427, Aug. 30, 1991, abandoned. This application May 31, 1996, Ser. No. 656,393

Int. Cl.^{6} A61K *38/18*

U.S. Cl. 424—198.1 18 Claims

1. A method for inducing bone formation comprising the administration to a patient in need a composition comprising CTGF and a pharmaceutical acceptable carrier.

7. A method for inducing tissue formation comprising the administration to a patient in need a composition comprising CTGF and a pharmaceutical acceptable carrier.

11. A method for inducing cartilage formation comprising the administration to a patient in need a composition comprising CTGF and a pharmaceutical acceptable carrier.

5,837,259

Patent Not Issued For This Number

5,837,260
CHIMERIC HEPATITIS A VACCINE

Jeffrey I. Cohen, Brighton, Mass.; Robert H. Purcell, Boyds, Md.; Stephen M. Feinstone, Washington, D.C., and John R. Ticehurst, Bethesda, Md., assignors to The United of America as represented by the Department of Health and Human Services, Washington, D.C.

Division of Ser. No. 120,646, Sep. 13, 1993, Pat. No. 5,478,746, which is a continuation of Ser. No. 789,640, Nov. 12, 1991, abandoned, which is a continuation of Ser. No. 462,915, Jan. 12, 1990, abandoned, which is a continuation of Ser. No. 462,915, Jan. 12, 1990, abandoned, which is a continuation of Ser. No. 88,220, Aug. 24, 1987, abandoned, which is a continuation-in-part of Ser. No. 905,146, Sep. 9, 1986, abandoned, which is a continuation-in-part of Ser. No. 652,067, Sep. 19, 1984, Pat. No. 4,620,978, which is a continuation-in-part of Ser. No. 366,165, Apr. 7, 1982, Pat. No. 4,532,215. This application Jun. 7, 1995, Ser. No. 473,304

Int. Cl.^{6} A61K *39/29;39/12;* **C12N** *7/00;7/04*

U.S. Cl. 424—226.1 6 Claims

1. An attenuated, cell-culture adapted, infectious hepatitis A virus of the HM-175 strain produced by cells containing a nucleic acid molecule which has a nucleic acid sequence corresponding to the sequence of HAV HM-175/7 MK-5 except for the nucleotides at positions 7027 and 7425 which are those of wild-type hepatitis A virus HM-175.

5,837,261
VIRAL VACCINES

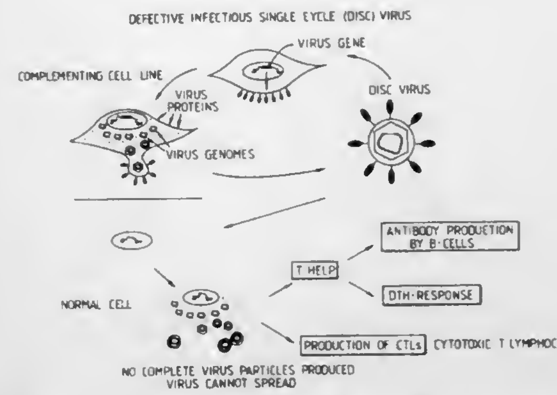
Stephen Charles Inglis, Linton; Michael Edward Griffith Boursnell, Cambridge, and Anthony Charles Minson, Great Shelford, all of United Kingdom, assignors to Cantab Pharmaceuticals Research Limited, United Kingdom

Continuation-in-part of Ser. No. 30,073, May 20, 1993, abandoned, and a continuation-in-part of Ser. No. 168,643, Dec. 16, 1993, abandoned. This application Mar. 21, 1994, Ser. No. 216,260

Claims priority, application United Kingdom, Sep. 25, 1990, 9020799; Mar. 8, 1991, 9104903; Dec. 16, 1992, 9226172; Mar. 19, 1993, 9305710; Dec. 6, 1993, 9324964

Int. Cl.^{6} A61K *39/245;* **C12N** *7/04;15/00*

U.S. Cl. 424—229.1 41 Claims



1. A pharmaceutical which comprises an infectious virus, said infectious virus in said pharmaceutical consisting essentially of an effective immunizing amount of a mutant herpesvirus which has an inactivating mutation in a viral gene, said viral gene being essential for the production of infectious new virus particles, wherein said mutant herpesvirus is able to cause production of infectious new virus particles in a recombinant complementing host cell expressing a gene which complements said essential viral gene, but is unable to cause production of infectious new virus particles when said mutant virus infects a host cell other than said recombinant complementing host cell, for prophylactic or therapeutic use in generating an immune response in a subject infected therewith.

5,837,262
PHARMACEUTICAL COMPOSITIONS AGAINST SEVERAL HERPES VIRUS INFECTIONS AND/OR ATHEROSCLEROTIC PLAQUE

Daniel Golubev, Jackson Heights, N.Y., and Alexander Chaihorsky, Sparks, Nev., assignors to Bio-Virus Research Incorporated, Sparks, Nev.

Continuation-in-part of Ser. No. 281,702, Jul. 27, 1994, Pat. No. 5,534,258. This application Mar. 20, 1996, Ser. No. 618,917

Int. Cl.^{6} A61K *39/245;38/00;39/295;39/25*

U.S. Cl. 424—231.1 3 Claims

1. A composition for generating an immune response to a herpes infection which consists essentially of:

(a) 10 to 30% of a peptide having Sequence ID 2;

(b) 10 to 30% of a peptide having Sequence ID 4;

(c) 10 to 30% of a peptide having Sequence ID 6; and

(d) 10 to 30% of a peptide having Sequence ID 8 all in combination with a pharmaceutically acceptable inert carrier.

5,837,263
LEPTOSPIRA MEMBRANE PROTEINS

David A. Haake, Culver City, and Ellen S. Shang, Los Angeles, both of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed May 19, 1995, Ser. No. 444,646

Int. Cl.^{6} A61K *39/02;* **C12P** *21/02;* **C07K** *1/00*

U.S. Cl. 424—234.1 12 Claims

1. A purified protein possessing the amino acid sequence selected from the group consisting of: LipL1 of SEQ ID No. 3 or LipL2 of SEQ ID No. 6.

5,837,264
POTENTIATION OF IMMUNOGENIC RESPONSE

Robert S. Becker, Henryville; Karen Biscardi, South Sterling; Laura Ferguson, Bethlehem, and Lorne Erdile, Stroudsberg, all of Pa., assignors to Connaught Laboratories, Inc., Swiftwater, Pa.

Division of Ser. No. 385,587, Feb. 8, 1995, Pat. No. 5,662,909, which is a continuation of Ser. No. 943,173, Sep. 14, 1992, abandoned. This application Jun. 6, 1995, Ser. No. 470,278

Int. Cl.^{6} A61K *39/02;39/21;39/00;39/38*

U.S. Cl. 424—234.1 16 Claims

1. A method of achieving an enhanced immune response to an antigen in a naive animal, wherein a naive animal is an animal which has not been previously immunized by a highly immunogenic form of the antigen, which method comprises:

simultaneously administering said antigen to said naive animal in at least two different physio-chemical forms to provide a synergistic immune response to the antigen in the naive animal greater than the immune response to the individual physiochemical forms of the antigen in the naive animal; wherein the antigen is the OspA protein from *Borrelia burgdorferi.*

5,837,265
CHEMICALLY-MODIFIED CLOSTRIDIATOXIN WITH IMPROVED PROPERTIES

Mauricio Montal, and Antonio Ferrer-Montiel, both of La Jolla, Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Mar. 8, 1996, Ser. No. 612,571

Int. Cl.^{6} A61K *39/00;39/02;39/06*

U.S. Cl. 424—239.1 16 Claims

1. A Clostridium neurotoxin having tyrosine residues phosphorylated to have a negative charge, wherein the proteolytic activity and thermal stability of the neurotoxin are enhanced as compared to Clostridium neurotoxins in which negatively charged tyrosine residues are absent.

5,837,266
COMPOSITION, BARRIER FILM, AND METHOD FOR PREVENTING CONTACT DERMATITIS

Joan Dalla Riva Toma, Piscataway, and Curtis L. Karl, Somerset, both of N.J., assignors to Hydromer, Inc., Branchburg, N.J.

Filed Apr. 30, 1996, Ser. No. 642,227

Int. Cl.^{6} A61K *7/48*

U.S. Cl. 424—401 12 Claims

1. A composition for inhibiting or reducing contact dermatitis which comprises:

(1) a polysaccharide, said polysaccharide is a nonionic cellulose derivative selected from the group consisting of methylcellulose, ethylcellulose, hydroxyethylcellulose, hydroxypropylcellulose, hydroxybutylcellulose, methylhydroxyethylcellulose, methylhydroxypropylcellulose, methylhydroxybutylcellulose, hydroxyethylhydroxypropylcellulose, and ethylhydroxyethylcellulose;

(2) a low molecular weight, synergistic saccharide, said low molecular weight, synergistic saccharide is selected from the group consisting of fructose, glucose, mannose, sucrose, maltose, maltodextrin, corn syrup solids, derivatized monosaccharide, derivatized disaccharide, and derivatized starch hydrolysate,

said derivatized monosaccharide is selected from the group consisting of ethoxylates of methyl glucoside, propoxylates of methyl glucoside, propoxylates of methyl glucoside distearate, and methyl glucose dioleate,

said derivatized disaccharide is selected from the group consisting of about 10 mole ethoxylates, about 20 mole ethoxylates, about 10 mole propoxylates, about 20 mole propoxylates,

said derivatized starch hydrolysate is selected from the group consisting of about 10 mole ethoxylates, about 20 mole ethoxylates, about 10 mole propoxylates, and about 20 mole propoxylates;

(3) a solvent; and

(4) optionally one or more additives.

7. A method for inhibiting or reducing contact dermatitis which comprises:

applying a dermatologically-compatible barrier film composition to skin of mammals, wherein said composition comprises (1) a polysaccharide, said polysaccharide is a nonionic cellulose derivative selected from the group consisting of methylcellulose, ethylcellulose, hydroxyethylcellulose, hydroxypropylcellulose, hydroxybutylcellulose, methylhydroxyethylcellulose, methylhydroxypropylcellulose, methylhydroxybutylcellulose, hydroxyethylhydroxypropylcellulose, and ethylhydroxyethylcellulose; (2) a low molecular weight, synergistic saccharide,

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said low molecular weight, synergistic saccharide is selected from the group consisting of fructose, glucose, mannose, sucrose, maltose, maltodextrin, corn syrup solids, derivatized monosaccharide, derivatized disaccharide, and derivatized starch hydrolysate, said derivatized monosaccharide is selected from the group consisting of ethoxylates of methyl glucoside, propoxylates of methyl glucoside, propoxylates of methyl glucoside distearate, and methyl glucose dioleate, said derivatized disaccharide is selected from the group consisting of about 10 mole ethoxylates, about 20 mole ethoxylates, about 10 mole propoxylates, about 20 mole propoxylates, said derivatized starch hydrolysate is selected from the group consisting of about 10 mole ethoxylates, about 20 mole ethoxylates, about 10 mole propoxylates, and about 20 mole propoxylates; (3) a solvent; and (4) optionally one or more additives.

5,837,267

Patent Not Issued For This Number

5,837,268
GNRH-LEUKOTOXIN CHIMERAS

Andrew A. Potter, and John G. Manns, both of Saskatoon, Canada, assignors to University of Saskatchewan, Saskatoon, Canada

Continuation-in-part of Ser. No. 387,156, Feb. 10, 1995, Pat. No. 5,723,129, which is a continuation-in-part of Ser. No. 960,932, Oct. 14, 1992, Pat. No. 5,422,110, which is a continuation-in-part of Ser. No. 779,171, Oct. 16, 1991, abandoned. This application Aug. 9, 1996, Ser. No. 694,865

Int. Cl.^{6} A61K *38/00;39/02;* **C12N** *15/00;* **C07K** *2/00*

U.S. Cl. 424—255.1 **23 Claims**

1. A chimeric protein comprising a leukotoxin polypeptide fused to first and second multimers, wherein the C-terminus of the first multimer is fused to the N-terminus of the leukotoxin polypeptide and the N-terminus of the second multimer is fused to the C-terminus of the leukotoxin polypeptide, and further wherein each of said multimers comprises more than one selected GnRH polypeptide.

5,837,269
VACCINE COMPOSITIONS AND METHOD FOR ENHANCING AN IMMUNE RESPONSE

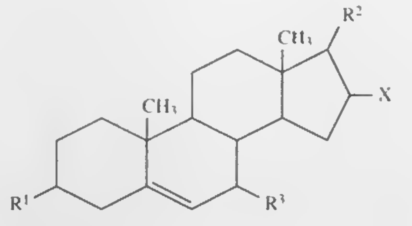
Raymond A. Daynes, Park City, and Barbara A. Araneo, Salt Lake City, both of Utah, assignors to University of Utah Research Foundation, Salt Lake City, Utah

Continuation-in-part of Ser. No. 123,843, Sep. 9, 1993, Pat. No. 5,562,910, which is a continuation-in-part of Ser. No. 13,972, Feb. 4, 1993, abandoned, and Ser. No. 779,499, Oct. 18, 1991, abandoned, which is a continuation-in-part of Ser. No. 412,270, Sep. 25, 1989, abandoned. This application Jun. 7, 1995, Ser. No. 487,173

Int. Cl.^{6} A61K *39/00;31/56;31/59*

U.S. Cl. 424—278.1 **50 Claims**

1. A vaccine composition comprising 1) an amount of a specific antigen, wherein said amount of specific antigen causes an immune response, and 2) an amount of a dehydroepiandrosterone (DHEA) congener in a physiologically acceptable carrier, wherein said congener is selected from the group consisting of i) a compound or ii) a pharmaceutically acceptable salt of said compound wherein said compound has the formula



wherein

X is H or halogen;

R^1, R^2 and R^3 are independently =O, —OH, —SH, H, halogen, pharmaceutically acceptable ester, pharmaceutically acceptable thioester, pharmaceutically acceptable ether, pharmaceutically acceptable thioether, pharmaceutically acceptable inorganic esters, pharmaceutically acceptable monosaccharide, disaccharide or oligosaccharide, spirooxirane, spirothirane, —OSO_2R^5 or —$OPOR^5R^6$; and

R^5 and R^6 are independently —OH, pharmaceutically acceptable esters or pharmaceutically acceptable ethers; and

wherein said amount of congener causes an increase of said immune response as compared to an immune response seen in the absence of said congener, with the proviso that said congener is not selected from the group consisting of 5-androstene-3β,17β-diol (AED) and 5-androstene-3β,17β,17β-triol (AET).

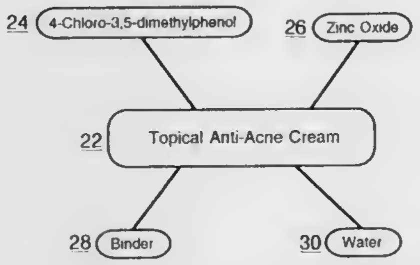
5,837,270
TOPICAL ANTI-ACNE COMPOSITION

Nelson Leon Burgess, 120-8E Einstein Loop North, Bronx, N.Y. 10475

Filed Aug. 26, 1996, Ser. No. 697,468

Int. Cl.^{6} A61K *9/06;9/10*

U.S. Cl. 424—401 **1 Claim**



1. A topical anti-acne formulation comprising the following ingredients:

Water, deionized	60 wt. %;
Cetyl alcohol	7.5;
Stearyl alcohol	6.8;
Spermwax	6.0;
Isopropyl myristate	5.0;
Bees wax (white)	2.5;
Polyethylene lauryl ether	2.4;
4-chloro-3,5-dimethylphenol	0.5 to 3.0;
Mineral oil	2.0;
Fragrance	1.5;
Zinc oxide	1.0 to 5.0;
Sodium lauryl sulfate	1.0;
Camphor	0.75;
Silicone	0.50;
Methylparaben	0.40;
Propylparaben	0.20; and
Methocel	0.20.

5,837,271

Patent Not Issued For This Number

5,837,272
PROCESS FOR FORMING STABLE GELLED AQUEOUS COMPOSITION

Louis Anthony Fierro, Jr., Clifton; Gregory M. Renga, Princeton, and Joseph Frank Stima, Edison, all of N.J., assignors to Colgate Palmolive Company, Piscataway, N.J.

Filed Dec. 13, 1996, Ser. No. 764,372

Int. Cl.^{6} A61K *7/00;* **B01F** *11/02;* **B01J** *13/00*

U.S. Cl. 424—401 **19 Claims**

1. A process for compatibly hydrating a fragmented solid which forms a gel with an aqueous composition, said process comprising:

a. generating a first aqueous composition and a second oily composition containing the said fragmented solid;

b. combining the first and second compositions in at least the essential absence of air; and

c. contacting the combined composition with a means for vibratorily mixing the combined composition, thereby causing the combined composition to be sufficiently mixed so as to hydrate the said fragmented solid to the extent that it is compatibilized into the composition and provides a stable gelled aqueous composition.

5,837,273
METHODS AND COMPOSITIONS OF ADHERENT STARCH GRANULES FOR ENCAPSULATING PEST CONTROL AGENTS

Baruch S. Shasha, Peoria, and Michael R. McGuire, Metamora, both of Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jul. 16, 1991, Ser. No. 730,763

Int. Cl.^{6} A01N *25/12;25/24*

U.S. Cl. 424—405 **13 Claims**

1. A method for preparing adherent granules encapsulating a biologically active agent, the method comprising:

a) providing a mixture of water and a volatile organic solvent selected from the group consisting of 2-propanol, ethanol, n-butyl alcohol, and 1,4-dioxane;

b) combining said mixture with pregelatinized starch, wherein the proportion of water, solvent and pregelatinized starch is sufficient to form discrete granules, wherein said starch is selected from the group consisting of pregelatinized corn flour, pregelatinized pearl cornstarch, pregelatinized waxy cornstarch, pregelatinized potato amylopectin, and mixtures, thereof, and wherein the biologically active agent is provided as a component of the granules in an amount effective to induce the desired response in a target organism; and

c) exposing the mixture to conditions sufficient to permit evaporation of the solvent and formation of granules comprising an effective amount of the agent encapsulated in said starch.

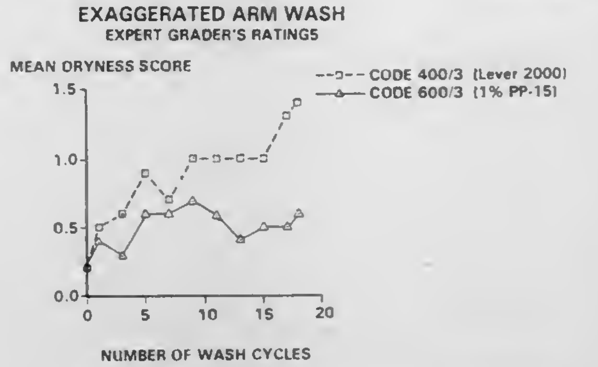
5,837,274
AQUEOUS, ANTIMICROBIAL LIQUID CLEANING FORMULATION

Richard L. Shick, Alpharetta, Ga., and Claude R. Wheeler, Jr., Philadelphia, Pa., assignors to Kimberly Clark Corporation, Neenah, Wis.

Filed Oct. 22, 1996, Ser. No. 735,039

Int. Cl.^{6} A01N *25/32*

U.S. Cl. 424—406 **19 Claims**



1. An aqueous, anti-microbial liquid cleaning formulation for cleansing the skin comprising:

a polymeric deposition aid comprising a mixture of liquid, hydroxyl-terminated urethane polymers in polyethylene glycol;

an antimicrobial agent having a phenol moiety; and

a surfactant system comprising predominantly nonionic surfactants, amphoteric surfactants and/or combinations thereof such that the liquid cleaning formulation provides at least about 10 percent greater antimicrobial activity than the same formulation without the polymeric deposition aid.

5,837,275
ANTI-MICROBIAL MATERIALS

Robert Edward Burrell, Sherwood Park; Larry Roy Morris, Yarker; Prasad Shrikrishna Apte, St. Albert; Sudhindra Bharat Sant, Edmonton, and Kashmir Singh Gill, Sherwood Park, all of Canada, assignors to Westaim Technologies, Inc., Fort Saskatchewan, Canada

Division of Ser. No. 154,694, Nov. 18, 1993, which is a continuation-in-part of Ser. No. 57,968, May 7, 1993, Pat. No. 5,681,575, which is a continuation-in-part of Ser. No. 885,758, May 19, 1992, abandoned. This application Jun. 2, 1995, Ser. No. 459,470

Int. Cl.^{6} A01N *25/12*

U.S. Cl. 424—409 **9 Claims**

1. A fine grain anti-microbial material, comprising:

one or more anti-microbial metals selected from the group consisting of Ag, Au, Pt, Pd, Ir, Sn, Cu, Sb, Bi, and Zn, or an alloy or compound thereof, said metals having a grain size less than 200 nm, and being characterized by sufficient atomic disorder such that the material, in contact with an alcohol or a water based electrolyte, provides a sustained release of atoms, ions, molecules or clusters containing at least one of the

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anti-microbial metals at an enhanced rate relative to its normal ordered crystalline state and at a concentration sufficient to provide a localized anti-microbial effect, wherein the atomic disorder in the material provides irregularities in surface topography and inhomogeneities in structure on a nanometer scale and is caused by high concentrations of at least one of point defects in a crystal lattice, vacancies, line defects comprising dislocations, interstitial atoms, amorphous regions and grain and sub grain boundaries, relative to a normal ordered crystalline state for the anti-microbial metal.

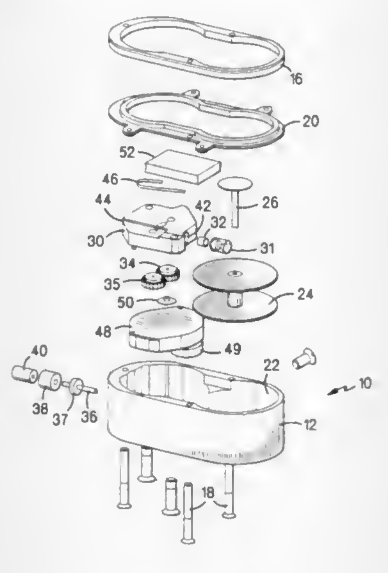
5,837,276
APPARATUS FOR THE DELIVERY OF ELONGATE SOLID DRUG COMPOSITIONS

Roland Cherif Cheikh, Issy-Les-Moulineaux, France, assignor to Delab, Paris, France

Filed Sep. 2, 1994, Ser. No. 300,138

Int. Cl.^{6} A61K *9/00;* **B65D** *83/00*

U.S. Cl. 424—423 **13 Claims**



1. A sterilizable and implantable device for the automatic parenteral delivery of a drug according to an adjustable delivery profile, said device, comprising;

a housing sealed watertight;

a reservoir arranged within said housing to store an elongate solid composition comprising said drug;

a transit assembly attached to said housing and configured to allow the elongate solid composition to pass out of the housing while maintaining a watertight seal around the solid composition;

an actuator comprising a wheel and arranged within said housing to contact and move the solid composition from said reservoir to said transit assembly, wherein the solid composition exits said housing through said transit assembly;

a controller that acts on said actuator to adjust movement of the solid composition out of said housing according to the adjustable delivery profile; and

a power source arranged to provide energy to said actuator and said controller.

5,837,277
PALATABLE PHARMACEUTICAL COMPOSITIONS

Marshall Hayward, Guildford, United Kingdom, assignor to SmithKline Beecham Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 347,325, Feb. 15, 1995, Pat. No. 5,578,316, which is a continuation-in-part of Ser. No. 893,288, Jun. 4, 1992, abandoned. This application Sep. 13, 1996, Ser. No. 713,878

Int. Cl.^{6} A61K *9/16;9/22;9/58*

U.S. Cl. 424—441 **23 Claims**

1. A taste masked pharmaceutical granule composition for oral administration comprising a core material containing a nonsteriodal antiinflammatory drug, said core having an inner polymeric coating of high permeability comprising poly(ethylacrylate-methylmethacrylate) trimethylammonio ethyl methacrylate chloride in a 1:2:0.2 ratio and an outer polymeric coating of low permeability comprising poly(ethylacrylate-methylmethacrylate) trimethylammonio ethyl methacrylate chloride in a 1:2:0.1 ratio said coating providing an immediate release of the drug in the stomach.

5,837,278
RESORBABLE COLLAGEN MEMBRANE FOR USE IN GUIDED TISSUE REGENERATION

Peter Geistlich, Stansstad, Switzerland; Zdenek Eckmayer, Weinheim, Germany, and Philip Boyne, Loma Linda, Calif., assignors to Ed Geistlich Söhne AG Für Chemische Industrie, Switzerland

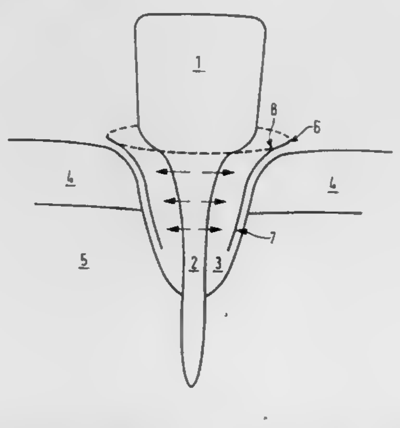
PCT No. PCT/GB95/00008, § 371 Date Nov. 18, 1996, § 102(e) Date Nov. 18, 1996, PCT Pub. No. WO95/18638, PCT Pub. Date Jul. 13, 1995

PCT Filed Jan. 4, 1995, Ser. No. 669,448

Claims priority, application United Kingdom, Jan. 6, 1994, 9400163

Int. Cl.^{6} A01N *25/34;* **A61L** *15/16*

U.S. Cl. 424—444 **24 Claims**



1. A resorbable collagen membrane for use in guided tissue regeneration comprising a substantially purified collagen membrane which is physiologically acceptable for implant into a mammalian body, and which is at least about 95% by weight native collagen, wherein a first face of said membrane is fibrous thereby allowing cell growth thereon and an opposite face of said membrane is smooth, thereby inhibiting cell adhesion thereon and acts as a barrier to prevent passage of cells therethrough.

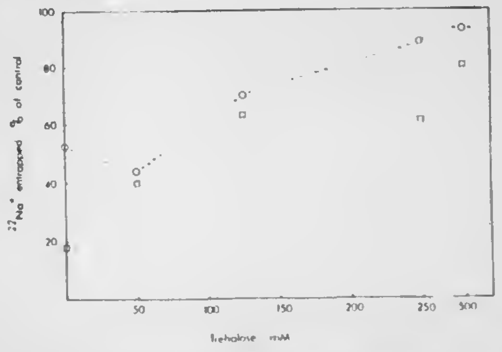
5,837,279
ENCAPSULATION OF IONIZABLE AGENTS IN LIPOSOMES

Andrew S. Janoff, Yardley, Pa.; Pieter R. Cullis; Marcel B. Bally, both of Vancouver, Canada; Michael W. Fountain, Griggstown, N.J.; Richard S. Ginsberg, Monroe, N.J.; Michael J. Hope; Thomas D. Madden, both of Vancouver, Canada; Hugh P. Schieren, Yardley, Pa., and Regina L. Jablonski, Trenton, N.J., assignors to The Lipsome Company, Inc., Princeton, N.J.

Division of Ser. No. 22,819, Feb. 24, 1993, which is a continuation of Ser. No. 360,964, Jun. 2, 1989, abandoned, which is a division of Ser. No. 759,419, Jul. 26, 1985, Pat. No. 4,880,635, which is a continuation-in-part of Ser. No. 638,809, Aug. 8, 1994, abandoned, and Ser. No. 749,161, Jun. 26, 1985, abandoned. This application May 25, 1995, Ser. No. 450,831

Int. Cl.^{6} A61K *9/127;* **B01J** *13/02;13/04*

U.S. Cl. 424—450 **6 Claims**



1. A method of loading a liposome with an ionizable biologically active agent which comprises:

(a) preparing a composition comprising a liposome;
(b) dehydrating the composition;
(c) storing the dehydrated composition; and
(d) rehydrating the composition;

wherein:

the liposome has a protective concentration of a protective sugar at its inside and outside bilayer surfaces;

the protective sugar is a monosaccharide, disaccharide or aminoglycoside;

the liposome is a large unilamellar liposome or a multilamellar liposome;

the liposome has a pH gradient across its outermost bilayer which is capable of generating a transmembrane potential having an orientation that loads the ionizable agent into the liposome; and wherein,

the ionizable agent is added to the external medium so that it is loaded into the liposome by the transmembrane potential.

5,837,280
TRANSDERMAL ADMINISTRATION OF AZAPIRONES

James N. Kenealy, Miami, and Cheryl M. Gentile, Plantation, both of Fla., assignors to Sano Corporation, Miramar, Fla.

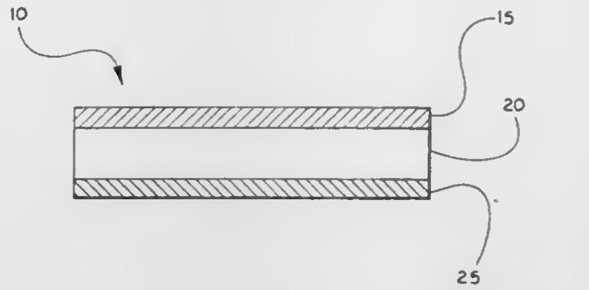
Continuation of Ser. No. 152,258, Nov. 12, 1993, Pat. No. 5,633,009, which is a continuation of Ser. No. 919,603, Jul. 24, 1992, abandoned, which is a continuation-in-part of Ser. No. 841,869, Feb. 26, 1992, abandoned, which is a continuation of Ser. No. 620,064, Nov. 28, 1990, abandoned. This application Jun. 7, 1995, Ser. No. 473,518

Int. Cl.^{6} A61F *13/00*

U.S. Cl. 424—449 **10 Claims**

1. A transdermal composition for use in the administration of an azapirone into the circulation of a warm-blooded animal by absorption through the skin or mucosa of the warm-blooded animal, the composition comprising:

a. an adhesive layer containing an azapirone and a solubilizing agent effective to inhibit recrystallization of the azapirone within the adhesive layer, the adhesive layer having a first face and a second face, and b. a backing layer substantially impermeable to the azapirone and contacting the first face of the adhesive layer.



5,837,281
STABILIZED INTERFACE FOR IONTOPHORESIS

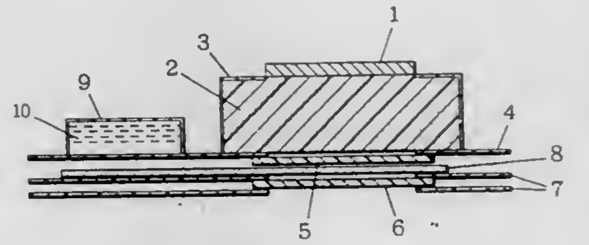
Katsumi Iga, Suita; Masafumi Misaki, Takarazuka; Keiichiro Okabe, Komae, and Emi Kyo, Kawasaki, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka; Advance Co., Ltd., and Teikoku Hormone Mfg. Co., Ltd., both of Tokyo, all of Japan

Filed Mar. 12, 1996, Ser. No. 614,375

Claims priority, application Japan, Mar. 17, 1995, 7-086291

Int. Cl.^{6} A61K *9/70;* **A61M** *37/00;* **B32B** *3/00*

U.S. Cl. 424—449 **31 Claims**



1. A stabilized interface for use in an iontophoresis device, wherein one side of the interface communicates with an ion exchange membrane of the device which faces an electrically conductive gel, and the other side of the interface directly contacting the skin, said stabilized interface comprising a matrix holding a mixture comprising a water-soluble protein and a drug, wherein the matrix has a porous or capillary structure.

5,837,282
IONIPHORE-MEDIATED LIPOSOME LOADING

David B. Fenske, Surrey; Pieter R. Cullis, Vancouver; Kim Wong, Vancouver; Maurer Norbert, Vancouver; Johanna M. Leenhouts, Vancouver; Elisabeth Maurer, Vancouver, and Nancy Boman, Surrey, all of Canada, assignors to University of British Columbia, Canada

Filed Oct. 30, 1996, Ser. No. 741,622

Int. Cl.^{6} A61K *9/137*

U.S. Cl. 424—450 **25 Claims**

15. A method of loading a weakly basic drug into liposomes comprising incubating said liposomes having an encapsulated medium comprising a salt of a monovalent metal ion with an external solution comprising said weakly basic drug and an ionophore to form drug loaded liposomes, wherein said ionophore facilitates the electroneutral transport of a metal ion out of the

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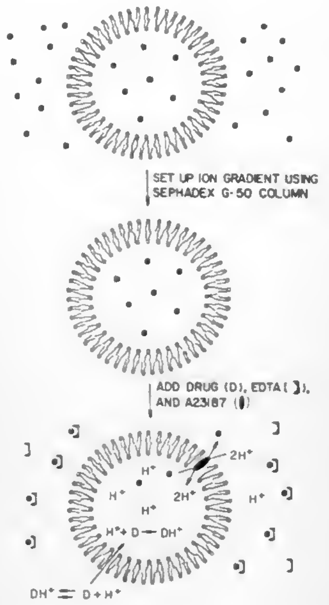

SET UP ION GRADIENT USING SEPHADEX G-50 COLUMN
ADD DRUG (D), EDTA ( ]), AND A23187 (▮)
2H⁺
H⁺
H⁺
2H⁺
H⁺
H⁺
H⁺+ D — DH⁺
DH⁺ ⇌ D + H⁺

liposome in exchange for inward movement of hydrogen ions and is present in said external medium in an amount of from about 0.1 ng to about 2000 ng per μmol of lipid.

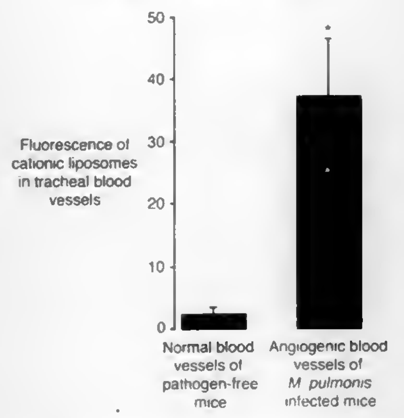
5,837,283
CATIONIC LIPID COMPOSITIONS TARGETING ANGIOGENIC ENDOTHELIAL CELLS

Donald M. McDonald, San Francisco; John McLean, Redwood City; O. Gavin Thurston, and Peter Baluk, both of San Francisco, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Mar. 12, 1997, Ser. No. 820,337
Int. Cl.^{6} A61K *9/127*

U.S. Cl. 424—450 **13 Claims**

Uptake of DOTAP:cholesterol liposomes by endothelial cells of tracheal blood vessels in C3H/HeNCr mice



1. A method of selectively affecting angiogenic endothelial cells in vivo, comprising the steps of:

administering to a mammal a liposomal composition comprising cationic lipids and a substance that affects angiogenesis which substance is selected from the group consisting of angiogenic enhancers and angiogenic inhibitors wherein the liposomal composition has greater affinity for angiogenic endothelial cells as compared to corresponding normal endothelial cells; and

allowing the liposomal composition to selectively associate with angiogenic endothelial cells of an angiogenic blood vessel for a time and in a manner such that the liposomal composition enters the angiogenic endothelial cells.

5,837,284
DELIVERY OF MULTIPLE DOSES OF MEDICATIONS

Atul M. Mehta, 252 E. Cresent Ave., Ramsey, N.J. 07446; Andrew L. Zeitlin, 1500 Whitebridge Rd., Millington, N.J. 07946, and Maghsoud M. Dariani, 11 Byron La., Fanwood, N.J. 07023

Continuation-in-part of Ser. No. 567,131, Dec. 4, 1995, abandoned, and a continuation-in-part of Ser. No. 583,317, Jan. 5, 1996, and a continuation-in-part of Ser. No. 647,642, May 15, 1996. This application Jul. 14, 1997, Ser. No. 892,190
Int. Cl.^{6} A61K *9/56;9/54;9/58;9/22;31/21*

U.S. Cl. 424—459 **30 Claims**

1. A dosage form for the oral administration of a methylphenidate drug, comprising two groups of particles, each containing said drug, wherein:

a) said first group of particles provides a substantially immediate dose of said drug upon ingestion by a mammal, and

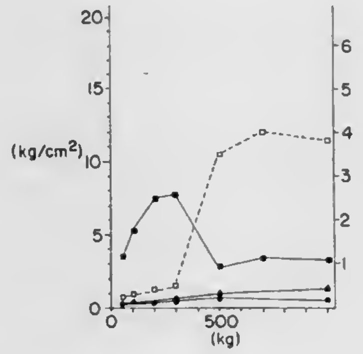
h) said second group of particles comprises coated particles, said coated particles comprising from about 2% to about 75% by weight of said drug in admixture with one or more binders, said coating comprising a pharmaceutically acceptable ammonio methacrylate in a quantity sufficient to provide a dose of said medication delayed by from about 2 hours to about 7 hours following said ingestion.

5,837,285
FAST SOLUBLE TABLET

Kouichi Nakamichi, 13-16, Kitayamadai 1-chome, Koseicho, Koga-gun Shiga 520-32, Japan; Shogo Izumi, 3-94, Nishitsutsujigaoka Miyamadai 1-chome, Kameoka-shi Kyoto 621, Japan, and Hiroyuki Yasuura, 10-20-312, Hirai 5-chome, Kusatsu-shi, Shiga 525, Japan

PCT No. PCT/JP93/00192, § 371 Date Aug. 18, 1994, § 102(e) Date Aug. 18, 1994, PCT Pub. No. WO93/15724, PCT Pub. Date Aug. 19, 1993
PCT Filed Feb. 17, 1993, Ser. No. 290,890
Claims priority, application Japan, Feb. 18, 1992, 4-069565
Int. Cl.^{6} A61K *9/20*

U.S. Cl. 424—464 **28 Claims**



1. A rapidly soluble tablet for oral administration of a therapeutic substance to a human or animal which comprises a kneaded wet compressed shaped tablet which comprises an amount of xylitol and at least one member selected from the group consisting of lactose and mannitol sufficient to form a rapidly soluble tablet, in combination with a therapeutically effective amount of a therapeutic substance, said tablet having been compression shaped with a compression force of from about 50 to about 1000 kg in a wet state and thereafter dried, said wet tablet containing from about 1 to about 10% by weight of water.

5,837,286
TASTE MASKING FOR UNPLATABLE FORMULATIONS

Harish B. Pandya, 11 Floral Dr., Randolph, N.J. 07869, and Thomas P. Callahan, 705 Lindsley Dr. AB#1-K, Morristown, N.J. 07960

Filed Jan. 15, 1997, Ser. No. 782,433
Int. Cl.^{6} A61K *9/46*

U.S. Cl. 424—466 **3 Claims**

1. An effervescent formulation, comprising:
a) an effervescent couple;
b) acetylsalicylic acid;
c) a soluble diphenhydramine salt;
d) clove oil; and
e) a supportive flavor component.

5,837,287
PROCESS FOR PREPARING SOLID PHARMACEUTICAL DOSAGE FORMS

Richard J. Yarwood; Patrick Kearney, and Andrew R. Thompson, all of Wiltshire, United Kingdom, assignors to R P Scherer Corporation, Troy, Mich.

Division of Ser. No. 330,936, Oct. 28, 1994, Pat. No. 5,738,875. This application May 9, 1995, Ser. No. 437,925
Int. Cl.^{6} A61K *9/00;9/20*

U.S. Cl. 424—484 **2 Claims**

1. An oral solid rapidly disintegrating dosage form comprising domperidone free base as the pharmaceutically active substance in uncoated and uncomplexed form in a network of a carrier material selected from the group consisting of water-soluble and water-dispersible carrier material.

5,837,288
METHODS FOR STORAGE OF SEQUENCING GELS AND STORED SEQUENCING GELS USED BY SUCH METHODS

Keith Vincent Sylvester, San Diego, and Joseph Sorge, Rancho Santa Fe, both of Calif., assignors to Stratagene, La Jolla, Calif.

Filed Jan. 10, 1996, Ser. No. 587,879
Int. Cl.^{6} C25B *1/00;7/00;* B01D *61/42*

U.S. Cl. 424—484 **16 Claims**

1. A packaged electrophoresis gel comprising a hermetically sealed storage container having an interior chamber, an electrophoresis gel, a storage buffer, wherein the gel and buffer are located within said interior chamber, and wherein the interior chamber encloses a reduced atmospheric environment.

5,837,289
TRANSDERMAL DELIVERY OF MEDICATIONS USING A COMBINATION OF PENETRATION ENHANCERS

John C. Grasela, 4521 Saluto Ct., San Diego, Calif. 92130; Joseph E. Grasela, 4767 Ocean Blvd., San Diego, Calif. 92109; Robert M. Jubenville, 550 Washington St., San Diego, Calif. 92103, and Joseph J. McCloskey, 1167 Cooperwood, Bloomfield Hills, Mich. 48302

Filed Jul. 23, 1996, Ser. No. 685,172
Int. Cl.^{6} A61L *15/16;* A61F *13/02*

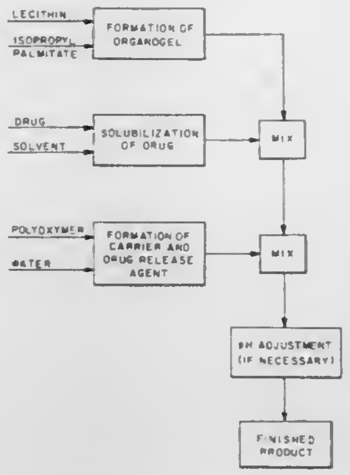
U.S. Cl. 424—484 **22 Claims**

1. A composition for diffusional transdermal delivery of medication to a patient, which comprises:

a. <1 to 20 parts by weight of a medication capable of being administered transdermally;

b. <1 to 20 parts by weight of a solvent for said medication;

c. 20 to 40 parts by weight of a first penetration enhancer which improves diffusion of said medication into and within said patient's skin, said first penetration enhancer comprising an organogel which comprises a fatty acid phospholipid emulsifying agent and a fatty acid or ester thereof; and



d. 40 to 70 parts by weight of a second penetration enhancer which improves diffusion of said medication out of said composition for transdermal migration;

said composition having a viscosity in a range such that it may be applied topically and conform to and adhere to said patient's skin for a period of time sufficient for a significant portion of said medication to be delivered transdermally to said patient.

5,837,290
PROCESS FOR THE PREPARATION OF MICROCAPSULES

Hans Walter Hässlin, Grenzach-Wyhlen, Germany, assignor to Ciba-Geigy Corporation, Tarrytown, N.Y.

Division of Ser. No. 333,941, Nov. 3, 1994, abandoned, which is a continuation of Ser. No. 14,972, Feb. 9, 1993. This application Jun. 5, 1995, Ser. No. 464,502
Int. Cl.^{6} A61K *9/14*

U.S. Cl. 424—489 **8 Claims**

1. A composition comprising an aqueous suspension of microcapsules including a capsule wall of polyurea and encapsulating a water-immiscible pesticide selected from the group consisting of diazinon, isazofos, furathiocarb, metolachlor, fenpropidin and propiconazol, characterized in that the suspension is stabilized with an effective amount of a water-soluble nonionic surfactant having an average molecular weight of between 1,000 and 250,000 daltons, wherein the nonionic surfactant has a block copolymer structure represented by the formulae (1), (2) or (3):

A-B-A (1),
A-B (2), or
$-(A\text{-}B)_n-$ (3) where n is an integer between 1 and 5,

and where

A represents at least one hydrophilic block selected from the group consisting of polyethyleneglycol (POE), polyvinylpyrrolidone (PVP), polyvinyl alcohol (PVA), polyhydroxyethylcellulose (PHEC), polyvinylmethylether (PVME), hydroxypropylcellulose (HPC), polyhydroxyethylmethacrylate (PHEMA), polyethyleneimine (PEI) and ethylhydroxyethylcellulose (EHEC), and

B represents at least one hydrophobic block selected from the group consisting of polyoxypropylene (POP), polyvinylacetate (PVAc), polystyrene (PS), polyoxybutylene (POB), polyisoprene (PIP), polybutadiene (PBD), polyvinylchloride (PVC), polyalkylvinylpyrrolidone, polydimethylsiloxane (PDMS), polyalkylacrylate (PAA), polyalkylmethacrylate (PAM), ethylcellulose and poly(alkyl)etheroles.

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5,837,291
ENTERIC PREPARATION COATED WITH A NON-SOLVENT ENTERIC COATING AGENT USING A LIQUID PLASTICIZER

Naosuke Maruyama, and Hiroyasu Kokubo, both of Kubiki-Mura, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed May 31, 1996, Ser. No. 657,691

Claims priority, application Japan, Jun. 2, 1995, 7-159766

Int. Cl.^{6} A61K *9/14;9/28;9/54*

U.S. Cl. 424—489 **4 Claims**

1. A method of preparing an enteric preparation coated with a non-solvent enteric coating agent without drying, said method comprising applying to a solid dosage form a non-solvent coating composition consisting essentially of a fine powder polymeric enteric coating agent while spraying a liquid plasticizer therefor.

5,837,292
GRANULATE FOR THE PREPARATION OF FAST-DISINTEGRATING AND FAST-DISSOLVING COMPOSITIONS CONTAINING A HIGH AMOUNT OF DRUG

Bernardus Leonardus Johannes Dijkgraaf, Delft, and Aart Mühlenbruch, Haarlem, both of Netherlands, assignors to Yamanouchi Europe B.V., Netherlands

Filed Dec. 20, 1996, Ser. No. 770,421

Claims priority, application European Pat. Off., Jul. 3, 1996, 96201829

Int. Cl.^{6} A61K *9/16;9/20*

U.S. Cl. 424—494 **7 Claims**

1. A granulate comprising a drug having a solubility in water of 1:>10 in admixture with a water dispersible cellulose, which is a microcrystalline cellulose and sodium carboxymethyl cellulose, wherein the water dispersible cellulose is present in an amount of ≦15 weight percent based on the weight of the drug.

5,837,293
USE OF INTERLEUKIN-10 ANALOGS FOR ANTAGONISTS TO TREAT ENDOTOXIN- OR SUPERANTIGEN-INDUCED TOXICITY

Rene De Waal Malefyt, Sunnyvale; Maureen Howard, Los Altos Hills; Di-Hwei Hsu, Sunnyvale, all of Calif.; Hiroshi Ishida, Kyoto, Japan; Anne O'Garra, Palo Alto, Calif.; Hergen Spits, Badhoevedorp, Netherlands, and Albert Zlotnik, Palo Alto, Calif., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 410,654, Mar. 24, 1995, which is a continuation-in-part of Ser. No. 229,854, Apr. 19, 1994, abandoned, which is a continuation-in-part of Ser. No. 926,853, Aug. 6, 1992, abandoned, which is a continuation-in-part of Ser. No. 742,129, Aug. 6, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 481,560

Int. Cl.^{6} A61K *38/19;38/20*

U.S. Cl. 424—852 **18 Claims**

1. A method for reducing an inflammatory response characterized by substantially elevated levels of IL-1α, IL-1β, IL-6, IL-8 and TNFα in a mammal comprising administering to a mammal afflicted with such an inflammatory response, or at risk of developing such an inflammatory response, an amount of IL-10 effective to substantially lower the levels of such cytokines.

5,837,294
WINDSHIELD REPAIR TOOL WITH PRESSURE

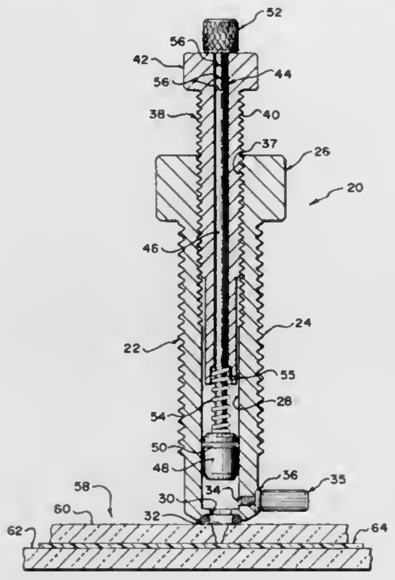
Ronald J. Shrimpton, P.O. Box 8321, Saskatoon, Saskatchewan, Canada, S7K 6C6

Filed Jul. 29, 1996, Ser. No. 688,201

Claims priority, application Canada, Dec. 20, 1995, 2165737

Int. Cl.^{6} B32B *35/00*

U.S. Cl. 425—12 **11 Claims**



1. A windshield repair tool having an injector and means for mounting said injector on the windshield for injecting repair medium from said injector into a fault in the windshield, wherein said injector comprises:

- a hollow outer cylinder having outer and inner ends, a cylinder bore through said cylinder between said outer and inner ends, said cylinder bore defining an injection port at said inner end;
- a sleeve engagable in said cylinder bore, said sleeve having outer and inner ends and a sleeve bore through said sleeve between said outer and inner sleeve ends;
- a plunger extending along said sleeve bore and having a plunger head at an inner end thereof, between said sleeve and said injection port, and means sealing said plunger head to said through bore of said outer cylinder;
- resilient means biasing said plunger towards said injection port, said resilient means having a spring force that varies with displacement of said plunger along said sleeve;
- means for adjusting the position of said sleeve along said cylinder bore; and
- indicia displaying the quantity of displacement of said plunger in said sleeve against the force of said resilient means.

5,837,295
SCRAPER BLADES FOR EXTRUDER

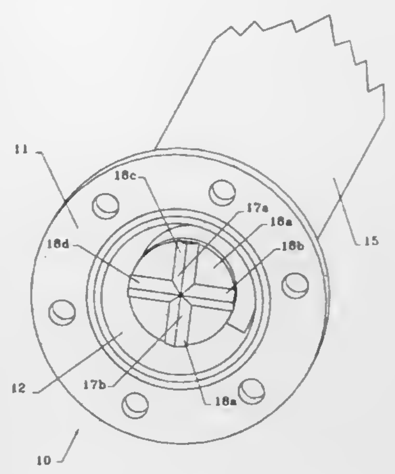
Ramon Alberto Diaz, Beaumont, Tex., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 16, 1997, Ser. No. 951,223

Int. Cl.^{6} B29C *47/38*

U.S. Cl. 425—207 **5 Claims**

1. A screw type extruder comprising a housing containing a rotatable shaft with flights for transporting and masticating, or drying a polymer composition and extruding said composition through a die plate having a die opening attached to an end of said housing, the improvement comprising a plurality of scraper blades having an angle of 30° to 60° relative to an end surface of said shaft for propelling polymer composition through the die opening and preventing trapping and decomposition of polymer between the die plate and the shaft.



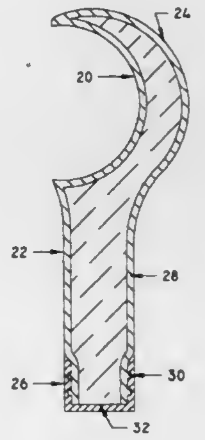
5,837,296
WATER HEATED ICE CREAM SCOOP

Lois Virkler, P.O. Box 470, Downsville, N.Y. 13755

Filed Dec. 11, 1996, Ser. No. 762,003

Int. Cl.^{6} A23G *9/04;9/22*

U.S. Cl. 425—277 **1 Claim**



1. An ice cream scoop comprising:

- a bowl shaped section having a concave front surface forming a rim at the highest point of said concave front surface rounding outward forming a back surface and a handle between 5 inches and 8 inches in length extending from said front and back surfaces of said bowl shaped section in the same direction from one side of said bowl shaped section forming a hollow tunnel interior throughout said handle and said bowl shaped section forming an opening between 4 inches and 8 inches in circumference at the end of said handle opposite said bowl shaped section whereby said ice cream scoop can be filled with warm tap water.

5,837,297
AUTOMOBILE WINDSHIELD MOLDING AND THE METHOD OF PRODUCING THE SAME

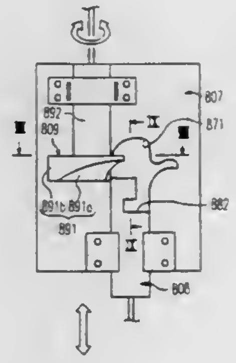
Yukihiko Yada, and Tosikazu Ito, both of Nagoya, Japan, assignors to Tokai Kogyo Kabushiki Kaisha, Ohbu, Japan

Continuation of Ser. No. 579,806, Dec. 28, 1995, abandoned, which is a continuation-in-part of Ser. No. 475,618, Jun. 7, 1995, Pat. No. 5,567,449, which is a division of Ser. No. 291,088, Aug. 18, 1994, Pat. No. 5,474,729, which is a division of Ser. No. 192,623, Feb. 7, 1994, Pat. No. 5,374,096, which is a continuation of Ser. No. 781,371, Oct. 23, 1991, abandoned. This application Jun. 10, 1996, Ser. No. 660,925

Claims priority, application Japan, Oct. 23, 1990, 2-283344; Dec. 28, 1994, 6-338728

Int. Cl.^{6} B29C *47/12*

U.S. Cl. 425—381 **14 Claims**



1. An apparatus for producing an automobile windshield molding for decorating along a periphery of a windshield located in an opening of a vehicle body panel, said automobile windshield molding having an exterior wing extending, when installed, along said periphery of the windshield, a cross-sectional profile of which continuously varies in a longitudinal direction from a second molding section to a first molding section and which has a waterdrain channel in and along the second molding section, said apparatus comprising:

- dies for forming an outer surface and an inner surface of the exterior wing and an inner surface of the waterdrain channel by extrusion;
- means for gradually changing a position of said dies in a direction perpendicular to an extruding direction when moving from the forming of said second molding section to the first molding section; and
- means for moving the die for forming the waterdrain channel with distance from the other dies so as to reduce a size of the waterdrain channel from the second molding section to the first molding section;
- said die for forming the waterdrain channel comprising a cylindrical portion with a circumferential surface which defines a first triangular portion that corresponds to a shape of the water drain channel at a corner molding section of said second molding section, a second triangular portion which is larger than said first triangular portion that corresponds to a shape of the waterdrain channel at a first side section of said second molding section which extends from the corner molding section, and a constant rectangular portion that corresponds to a shape of the waterdrain channel at a second side section of said second molding section which extends from the first side section.

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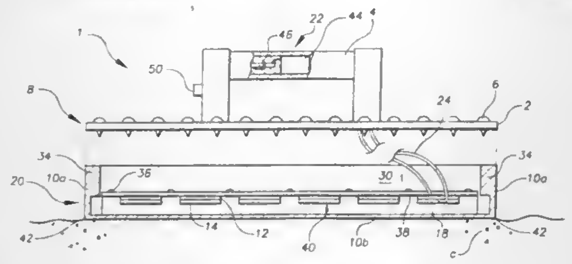
5,837,298
PIEZOELECTRICALLY-ACTUATED VIBRATING SURFACE-FINISHING TOOL

Samuel A. Face, Jr., Norfolk; Glenn F. Rogers, Jr., Hampton, and Richard P. Bishop, Fairfax Station, all of Va., assignors to Face International Corp., Norfolk, Va.

Filed Oct. 15, 1997, Ser. No. 950,553
Int. Cl.^{6} B28B *1/08;* E01C *19/22*
U.S. Cl. 425—456 8 Claims



1. A hand-held vibrating apparatus comprising:

a housing;

said housing comprising a base;

said base comprising a blade member for engagement with a surface of a work material;

a handle rigidly attached to said housing;

said base further comprising means for vibrating said blade member;

said means for vibrating said blade member comprising a first actuator member in mechanical communication with said blade member;

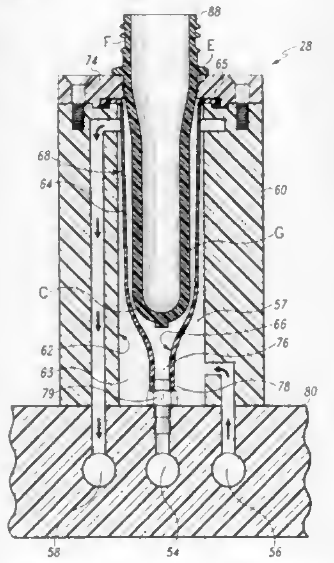
said first actuator member comprising a piezoelectric material;

and energizing means in communication with said first actuator member for electrically energizing said first actuator member.

5,837,299
VARIABLE DIMENSION COOLING CHAMBER

Timothy L. Bright, Greenville; Stephen A. Bright, Troy; Terry A. Shroder, Arcanum, and Daniel A. Hartman, Cincinnati, all of Ohio, assignors to Electra Form, Inc., Vandalia, Ohio

Continuation-in-part of Ser. No. 359,037, Dec. 19, 1994. This application Apr. 9, 1996, Ser. No. 629,781
Int. Cl.^{6} B29C *49/64*
U.S. Cl. 425—526 36 Claims



1. A cooling assembly for cooling a molded article having an outer surface of substantially fixed geometry, the cooling assembly comprising:

a base and at least one body fixed to the base, the body having an inner surface,

an insert situated within each body inner surface, each insert having an inner surface defining a cooling chamber for receiving a molded article, each insert having an outer surface confronting a corresponding body inner surface to define a volume for receiving fluid coolant, and

at least one connection between said volume and a source of fluid coolant for filling the volume with the fluid coolant,

the insert including at least one movable portion having a biasing means, the movable portion movable between a first position defining a first cooling chamber size and a second position defining a second cooling chamber size larger than the first cooling chamber size, whereby the insert is disposed in conforming contact with said molded article outer surface to enhance heat transfer between the molded article and the fluid coolant across the insert when the movable portion is disposed in the second position, the biasing means biasing the movable portion to return to the first position upon removal of the molded article from the insert.

5,837,300
PHYSIOLOGICALLY COMPATIBLE LIQUID SUCROSE ESTERS AS LOW CALORIE FAT MIMETICS

Lawrence P. Klemann, Somerville, and John W. Finley, Whippany, both of N.J., assignors to Nabisco Technology Company, Chicago, Ill.

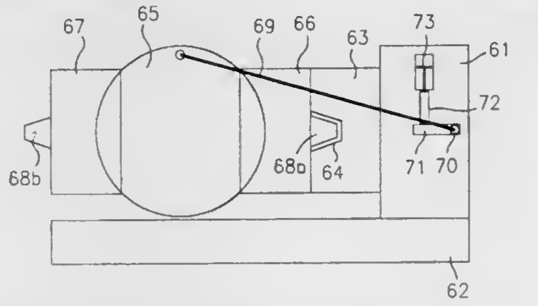
Continuation-in-part of Ser. No. 336,821, Apr. 11, 1989, abandoned. This application Dec. 19, 1990, Ser. No. 630,452
Int. Cl.^{6} C07H *13/06*
U.S. Cl. 426—611 23 Claims

1. A food composition comprising a fat mimetic comprising at least 35% by weight of the mixture of sucrose tetra- to hexa- fatty acid esters and at least one additional food material.

5,837,301
INJECTION MOLDING MACHINE HAVING A HIGH SPEED TURRET

Robin A. Arnott, Alliston, and William James Andrew Jacovich, Newmarket, both of Canada, assignors to Husky Injection Molding Systems Ltd., Canada

Filed Apr. 28, 1997, Ser. No. 847,895
Int. Cl.^{6} B29C *45/16*
U.S. Cl. 425—574 9 Claims



1. An injection molding machine, comprising:

an injection molding machine having only two platens and including a first platen carrying a first mold half having one of at least one mold cavity and at least one mold core;

a second platen in association with said first platen, wherein said second platen is a rotatable turret means rotatable on an axis for rotating at least one movable mold half thereof into alignment with said first mold half, each of said at least one movable mold half including one of at least one mold cavity and at least one mold core matable with said first mold half for forming a mold for molding a molded article, said rotatable turret means further clamping said at least one movable mold half and said first mold half together;

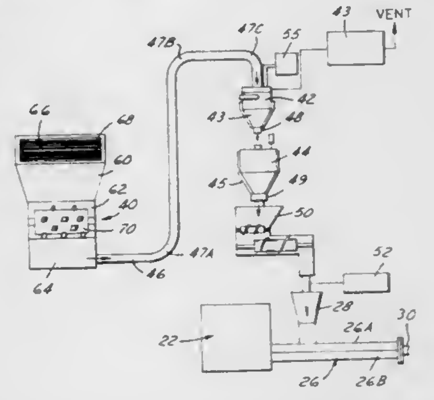
means for moving said rotatable turret means, relative said first mold half, away from and towards said first platen and means for rotating the rotatable turret means, wherein the means for rotating includes a movable linkage means affixed to said turret operative to rotate said turret during the movement of said turret away from and towards said first platen; and

a first injection means for injecting melt into said at least one mold cavity.

5,837,302
POLYVINYL ACETATE PROCESS FOR CHEWING GUM

Marc Degady, Morris Plains, N.J.; Kevin R. Tebrinke, Fort Madison, Iowa; James A. Duggan, Machesney Park, Ill.; Susan B. Filardo, Tuxedo, N.Y.; Tony R. Puri, Sparta, N.J., and Arthur W. Upmann, Rockton, Ill., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Oct. 3, 1996, Ser. No. 725,359
Int. Cl.^{6} A23G *3/30*
U.S. Cl. 426—3 8 Claims



1. A method of continuously producing a gum product utilizing a main continuous extruder and a side-feeder continuous extruder, said gum product comprising a first ingredient material and several other ingredients, said method comprising the steps of:

(a) introducing said first ingredient material into a lump breaker apparatus;

(b) separating said first ingredient material into individual pieces for future processing;

(c) cooling said separated individual pieces and maintaining them within a prescribed temperature range;

(d) conveying said pieces to a storage hopper, said pieces being conveyed by cooled air through at least one conduit, said conduit having enlarged corner members for minimizing heat build-up in said pieces;

(e) adding a lubricating agent to said pieces;

(f) metering said pieces by a feeding mechanism onto said side-feeder continuous extruder;

(g) introducing said pieces under pressure into said main continuous extruder;

(h) intermixing said pieces in said main continuous extruder with said other ingredients; and

(i) producing said gum product by said main continuous extruder.

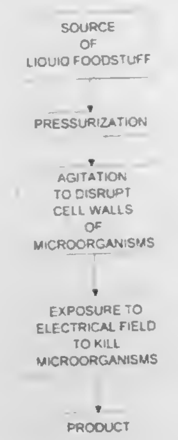
5,837,303
METHOD FOR KILLING MICROORGANISMS IN LIQUIDS

Steven Mark Hayden, Wetumpka, Ala., assignor to Mark Hayden, Wetumpka, Ala.

Filed Apr. 7, 1997, Ser. No. 835,173
Int. Cl.^{6} A23C *3/00;* A23L *3/00*
U.S. Cl. 426—237 26 Claims

1. A method for treating liquid foodstuffs to kill microorganisms therein, comprising the steps of:

a) agitating said liquid foodstuffs to disrupt cell walls of said microorganisms and introduce breaks therein; and

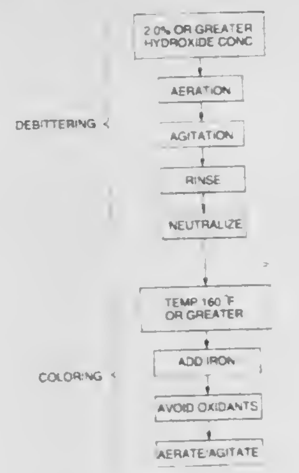

SOURCE OF LIQUID FOODSTUFF
PRESSURIZATION
AGITATION TO DISRUPT CELL WALLS OF MICROORGANISMS
EXPOSURE TO ELECTRICAL FIELD TO KILL MICROORGANISMS
PRODUCT

b) exposing said liquid foodstuffs to an electrical field comprising a continuous DC current so that an electrical current is induced through said breaks in said cell walls into the cells to kill said microorganisms.

5,837,304
OLIVE PROCESSING METHOD

Donald Jepson, Modesto; Robert Moore, Madera; Mehran Samimi; Cyrus Kashefi, both of Modesto, and Michael Bodine, Merced, all of Calif., assignors to Tri Valley Growers, Modesto, Calif.

Filed Mar. 25, 1997, Ser. No. 824,009
Int. Cl.^{6} A23L *1/272*
U.S. Cl. 426—270 16 Claims



1. A method of coloring black ripe olives comprising the steps of:

(a) immersing debittered black ripe olives in water;

(b) heating the water to a temperature of at least 160° F;

(c) while maintaining the temperature of at least 160° F., adding ferrous iron to said water to form an iron containing solution;

(d) while maintaining the temperature of at least 160° F., soaking said olives in said iron containing solution, without aeration, for a period sufficient for said iron to penetrate surfaces of said olives; and

(e) aerating said iron containing solution.

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5,837,305

PROCESS FOR MAKING BACON BITS

Gale F. Kunert, Austin, Minn., assignor to Hormel Foods Corporation, Austin, Minn.

Filed May 29, 1997, Ser. No. 864,777

Int. Cl.^{6} A23L *1/01;1/31*

U.S. Cl. 426—438 13 Claims

1. A method for making bacon bits from bacon or bacon ends and pieces comprising the steps of:

a) reducing the bacon or bacon ends and pieces to a first size;

b) cooking the bacon or bacon ends and pieces to a time sufficient to bring a water activity level in the bacon or bacon ends and pieces to a first level, wherein the bacon or bacon ends and pieces after the cooking step have a pink color; and

c) frying the bacon or bacon ends and pieces to bring the water activity level from the first level to a second level, wherein the bacon or bacon ends and pieces after the flying step have a dark red color.

5,837,306

Patent Not Issued For This Number

5,837,307

PROCESS FOR MAKING SPREADS

Janos Bodor, Rijswijk, Netherlands; Matthew Patrick, Naperville, Ill.; Thomas Wajda, Jr., Columbia, and Leendert Hendrik Wesdorp, Elliott City, both of Md., assignors to Van den Bergh Foods Co., Division of Conopco, Inc., Lisle, Ill.

Continuation of Ser. No. 445,485, May 22, 1995, Pat. No. 5,554,407, which is a continuation of Ser. No. 335,568, Nov. 7, 1994, abandoned, which is a continuation of Ser. No. 84,752, Jun. 29, 1993, abandoned, which is a continuation of Ser. No. 822,503, Jan. 17, 1992, abandoned. This application Mar. 26, 1996, Ser. No. 622,096

Int. Cl.^{6} A23D *7/04*

U.S. Cl. 426—603 11 Claims

1. A process for making a fat-continuous emulsion having less than 30 wt. % fat, comprising

a) mixing an at least partially pre-gelled aqueous composition having less than 50% fat and one or more gelling or thickening agents at a concentration at or above the critical concentration required for gelling of said agent or combination of agents with an at least partially pre-solidified fat-continuous water-in-oil starting emulsion in such a way that at no time during or after the mixing step does the temperature exceed the melting point of the fat-continuous emulsion, the resulting emulsion having less than 30 wt. % fat.

5,837,308

OIL/WATER EMULSION HEAT-STABILIZED WITH PROTEIN AND DATEM

Lydia Campbell, Waldprechtsweiermalsch, and Hans Uwe Trueck, Stuttgart, both of Germany, assignors to Nestec S.A., Vevey, Switzerland

Filed Aug. 29, 1995, Ser. No. 521,399

Claims priority, application European Pat. Off., Sep. 24, 1994, 94115076

Int. Cl.^{6} A23J *1/00*

U.S. Cl. 426—604 27 Claims

1. In a process for preparing an emulsion wherein a food-grade oil and water and an emulsifier are combined to obtain oil and aqueous phases which are emulsified and wherein the emulsion has a pH of from 3 to 8 and does not comprise egg yolk, the improvements comprising, for preparing the emulsion so that the emulsion is heat-stable:

preparing an aqueous mixture with ingredients which comprise protein, which do not comprise egg yolk protein, and which comprise diacetyl tartaric acid ester of monoglyceride ("DATEM") and at least one of salt and sugar to obtain an aqueous mixture, adding the oil to the aqueous mixture to obtain the oil and aqueous phases and emulsifying the phases to obtain a first emulsion composition and then adding vinegar to the first emulsion composition to obtain a second emulsion composition so that, by weight based upon the second emulsion composition weight, the amounts of the oil, protein, DATEM and vinegar for preparing the second composition, and so that the second composition is heat-stable, are from 5% to 75% oil, from 0.1% to 10% protein, from 0.1% to 5% DATEM and from 0.1% to 10% vinegar.

5,837,309

PROCESS OF MAKING A BABY FOOD CONTAINING LIGHT FLESHED VEGETABLES AND PRODUCT THEREOF

Richard C. Theuer, Chesterfield, Mo., assignor to Beech-Nut Nutrition Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 741,703, Oct. 31, 1996, which is a continuation-in-part of Ser. No. 604,616, Feb. 21, 1996, Pat. No. 5,723,166. This application Jun. 12, 1997, Ser. No. 873,940

Int. Cl.^{6} A23L *1/212*

U.S. Cl. 426—615 26 Claims

1. A baby food comprising water, a food suitable for consumption by babies, and a filler, the filler being comminuted non-bleeding beet root, the food, the filler and the baby food being acceptable for use as a baby food suitable for consumption by babies.

5,837,310

METHOD TO PRODUCE A COOKED LOW FAT GROUND MEAT PRODUCT

Geoffrey Margolis, 12229 Falkirk La., Los Angeles, Calif. 90049, and Joaquin Pelaez, 17901 Von Karmen, Irvine, Calif. 92614

Continuation of Ser. No. 494,342, Jun. 26, 1995, Pat. No. 5,622,101, which is a division of Ser. No. 304,381, Sep. 9, 1994, Pat. No. 5,576,047. This application Nov. 15, 1996, Ser. No. 749,664

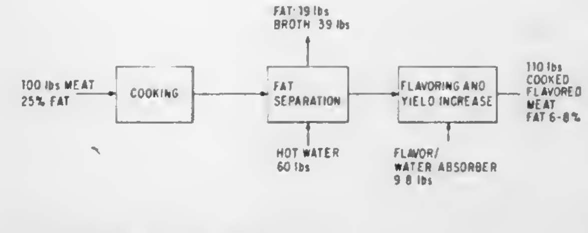
Int. Cl.^{6} A23L *1/317*

U.S. Cl. 426—646 3 Claims

1. A method for extracting fat from a meat mixture employing an extracting apparatus, comprising the steps of:

(a) cooking the meat mixture so as to form a generally crumbly cooked meat mixture including liquified fat and broth;

(b) adding sufficient water at a temperature greater than about 180° F. to the meat mixture so as to cause the fat in the meat to float above a level of the cooked meat mixture;



(c) agitating the meat mixture;

(d) permitting the liquified fat to float above the level of the meat mixture in a defined fat layer;

(e) suctioning off the fat layer by a first suction tube located at a position above the level of the meat mixture;

(f) agitating the meat mixture to release any remaining liquified fat;

(g) suctioning off any remaining liquid fat and broth employing a second suction tube located at a position lower than the first suction tube and above the level of the meat mixture; and

(h) suctioning off remaining water and broth through a third suction tube located at a position lower than the second suction tube and below the level of the meat mixture.

5,837,311

INDUSTRIAL PROCESSING OF TOMATOES AND PRODUCT THEREOF

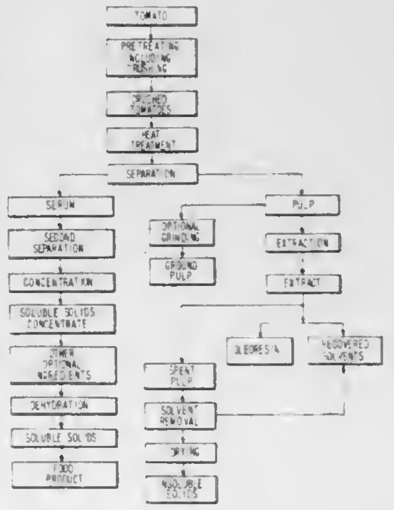
Morris Zelkha, Omer; Mordechai Ben-Yehuda, Beer-Sheva; Dov Hartal, Tel-Aviv; Yigal Raveh, Haifa, and Nissim Garti, Jerusalem, all of Israel, assignors to Makhteshim Chemical Works Ltd., Israel, and Makhteshim Agan of North America Ltd.

Continuation-in-part of Ser. No. 661,670, Jun. 11, 1996, abandoned. This application Jun. 21, 1996, Ser. No. 667,463

Claims priority, application Israel, Dec. 13, 1993, 107999

Int. Cl.^{6} A23L *1/221;1/222*

U.S. Cl. 426—651 18 Claims



1. Process for the manufacture of tomato products, comprises the steps of:

a) pretreating the tomatoes by conventional operations, including crushing;

b) subjecting them to a heat treatment;

c) separating the crushed tomatoes into serum and pulp containing at least 500 ppm of lycopene;

d) subjecting the pulp to solvent extraction, in order to extract therefrom an oleoresin containing lycopene;

e) separating the spent pulp; and

f) separating the lycopene extract from the solvents, whereby to obtain oleoresin containing the lycopene and to recover the solvents.

5,837,312

DEBITTERED PROTEIN PRODUCT HAVING IMPROVED ANTIGENICITY AND METHOD FOR MANUFACTURE

Christopher T. Cordle, Centerburg, Ohio; Shih-Bin Lin, Central, S.C.; Lynn P. Nelles, Westerville, Ohio, and Ronald L. Thomas, Clemson, S.C., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Sep. 20, 1996, Ser. No. 717,004

Int. Cl.^{6} A23L *1/00;* **A23P** *1/00;* **A23J** *1/00;* **C07C** *227/00*

U.S. Cl. 426—656 21 Claims

1. A method for debittering protein hydrolysates comprising:

providing an aqueous solution of a protein hydrolysate, said protein hydrolysate being sufficiently hydrolyzed to exhibit bitterness, said protein hydrolysate comprising a bitter fraction and a non-bitter fraction;

applying said solution to a bed of siloxane wherein the alkyl chain of said siloxane is 18 or more carbon atoms; and

collecting a portion orsaid solution which does not bind to said siloxane to obtain the debittered protein hydrolysate.

5,837,313

DRUG RELEASE STENT COATING PROCESS

Ni Ding, Plymouth, Minn., and Michael N. Helmus, Long Beach, Calif., assignors to Schneider (USA) Inc, Plymouth, Minn.

Continuation-in-part of Ser. No. 526,273, Sep. 11, 1995, abandoned, and Ser. No. 424,884, Apr. 19, 1995, abandoned. This application Jun. 13, 1996, Ser. No. 663,490

Int. Cl.^{6} B05D *3/00;* **A61L** *27/00;33/00*

U.S. Cl. 427—2.21 18 Claims

1. A method of coating at least a portion of an implantable prosthesis, having at least one opening therein, with a hydrophobic elastomeric material incorporating an amount of biologically active material therein for timed delivery therefrom comprising the steps of:

(a) applying a coating comprising the elastomeric material, a solvent and an amount of finely divided biologically active material onto at least a portion of the prosthesis; wherein when the biologically active material is particulate the average particle size of the biologically active material is less than or equal to about 15 μm; and wherein the coating is applied to the prosthesis in a manner to adheringly conform thereto to preserve the opening; and

(b) curing the coating such that at least some of the biologically active material is particulate after curing.

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5,837,314

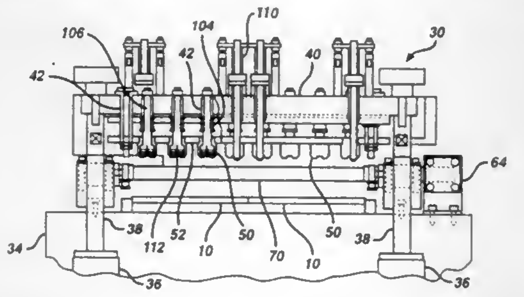
METHOD AND APPARATUS FOR APPLYING A SURFACTANT TO MOLD SURFACES

Stephen Robert Beaton, Neptune Beach; Wallace Anthony Martin, Orange Park, both of Fla.; Ture Kindt-Larsen, Holte, Denmark; Craig William Walker, and Gregory Scott Duncan, both of Jacksonville, Fla., assignors to Johnson & Johnson Vision Products, Inc., Jacksonville, Fla.

Continuation-in-part of Ser. No. 258,263, Jun. 10, 1994, Pat. No. 5,542,978. This application May 1, 1995, Ser. No. 431,612

Int. Cl.^{6} B05C *1/00;* B05D *3/02*

U.S. Cl. 427—133 **37 Claims**



1. An apparatus for applying a surfactant to at least one surface of a mold part of a two-part mold having said first mold part engageable with a cooperative second mold part for the molding of polymer articles, wherein said surfactant assists in the release between said first and second mold parts and enables removal of excess polymer molding material adherent to said at least one surface of said first mold part; said apparatus comprising:

a) support means mounting at least one said first mold part being movable to a predetermined location in said apparatus;

b) applicator means including at least one surfactant applicator being arranged in spaced relationship above said support means, said at least one surfactant applicator being positionable in vertical alignment with said at least one first mold part;

c) means mounting an upwardly opening reservoir containing a surfactant being interposable between said applicator means and said support means for said at least one first mold part at least one pad member arranged in said reservoir for absorbing surfactant from said reservoir;

d) actuating means for imparting a vertical downward displacement to said applicator means to cause said at least one surfactant applicator to contact said at least one pad member and assume a quantity of said surfactant therefrom, said actuating means thereafter imparting a vertical upward displacement to said applicator means;

e) means for displacing said reservoir mounting means from the interposition thereof in said apparatus between said applicator means and said at least one first mold part, said actuating means for said applicator means displacing said applicator means downwardly to an extent such that the surfactant-wetted surface portions of said at least one surfactant applicator contact said at least one surface of said first mold part so as to impart a coating of said surfactant thereto and

f) a cover member fixedly positioned on said reservoir having at least one aperture formed in said cover member in alignment with said at least one pad member to enable said at least one surfactant applicator to contact said at least one pad member.

23. A method for applying a surfactant to at least one surface of at least one first mold part of a two-part mold utilized for the molding of polymer articles so as to facilitate disengagement between said first mold part from a second mold part and the removal of any excess molding material present on said at least one surface on said first mold part, said method comprising the steps of:

a) moving support means mounting said at least one first mold part to a predetermined location;

b) arranging applicator means including at least one surfactant applicator in spaced relationship above said support means, and positioning said at least one surfactant applicator in vertical alignment with said at least one first mold part;

c) coating said at least one surfactant applicator with a layer of surfactant by contacting at least one pad member located in a reservoir containing a supply of said surfactant;

d) withdrawing said reservoir containing said at least one pad member to a position offset from said at least one surfactant applicator; and

e) displacing said applicator means downwardly to an extent such that surfactant-wetted surface portions of said at least one surfactant applicator contact the at least one surface on said at least one first mold part to impart a coating of said surfactant to said surface.

5,837,315

COMPOSITIONS AND PROCESSES FOR REMEDIATING HARDENED CEMENTITIOUS MATERIALS

Gary Earl Foltz, McAdenville; Hugh Hong Wang, Gastonia; David Brian Stokes, Shelby, and Claudio Emilio Manissero, Maiden, all of N.C., assignors to FMC Corporation, Philadelphia, Pa.

Filed Dec. 23, 1996, Ser. No. 772,691

Int. Cl.^{6} B05D *1/00;* C04B *41/45*

U.S. Cl. 427—136 **20 Claims**

1. A process for treating hardened cementitious material to control and remediate damage to cementitious materials as a result of alkali-silica reaction (ASR), comprising applying to a surface of a hardened cementitious material a composition comprising at least one lithium containing material, with the proviso that said lithium containing material is not lithium silicate, and at least one surface tension reducing agent, wherein said composition delivers lithium beyond the surface of the cementitious material.

5,837,316

ULTRA FINE PARTICLE GAS DEPOSITION APPARATUS

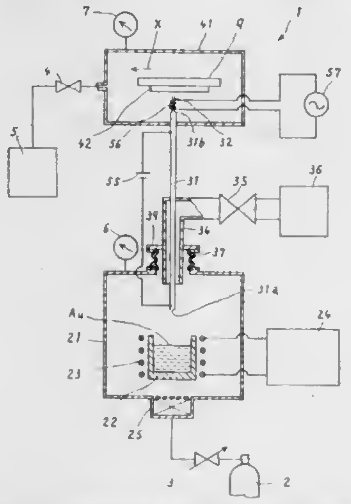
Eiji Fuchita, Naraita, Japan, assignor to Vacuum Metallurgical Co., Ltd., Chiba-Ken, Japan

Continuation of Ser. No. 351,701, Dec. 8, 1994, Pat. No. 5,536,324. This application Dec. 28, 1995, Ser. No. 580,143

Claims priority, application Japan, Dec. 10, 1993, 5-341484

Int. Cl.^{6} B05D *3/02;3/08;3/10;* C23C *16/00*

U.S. Cl. 427—191 **3 Claims**



1. In a method for operating a gas deposition apparatus in which ultra fine particles selected from the group consisting of organic and inorganic materials are formed in an evaporation chamber, carried with inert gas through a transfer pipe and nozzle to a deposition chamber, and ejected from said nozzle for deposit on a substrate located in the deposition chamber to form a film or condensate on the substrate, the improvement comprising the steps of providing heating means for said transfer pipe, heating said transfer pipe to a temperature less than the gasification temperature for said particles, forming said particles in said evaporation chamber, carrying the particles with inert gas through the transfer pipe whereby the particles are prevented from adhering and coagulating on said transfer pipe and nozzle, and depositing the particles on said substrate without aggregations of said particles scattering into said film or condensate on said substrate.

5,837,317

METHOD OF PRODUCING HYDROGEN STORAGE ALLOY FOR BATTERY

Yoshio Moriwaki, Hirakata; Yoichi Izumi, Habikino; Yasuharu Yamamura, and Hideo Kaiya, both of Chigasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd.

Filed Mar. 7, 1997, Ser. No. 813,889

Claims priority, application Japan, Mar. 8, 1996, 8-051264

Int. Cl.^{6} B05D *7/00;3/02;3/12;5/12*

U.S. Cl. 427—217 **5 Claims**

1. A method of producing a hydrogen storage alloy for a battery comprising the steps of:

powdering an Mm-Ni system hydrogen storage alloy having a crystal structure of $CaCU_5$ and containing 15 atom % or less of cobalt to have an average particle diameter of 10–100 μm;

immersing the resultant powdered alloy in a treatment solution at 80°–130° C., said treatment solution comprising an alkaline aqueous solution containing 10 g/l or more of lithium hydroxide and having a specific gravity of 1.1 or higher, and cobalt ions which are contained in said alkaline aqueous solution, thereby forming a layer containing nickel and cobalt onto a surface of said powdered alloy, wherein a concentration of said nickel on said surface is higher than a concentration of said nickel in a remainder of said powdered alloy, and wherein a concentration of said cobalt on said surface is higher than a concentration of cobalt in a remainder of said powdered alloy; and

washing said powdered alloy having said layer with water and drying the powdered alloy.

5,837,318

PROCESS FOR PRODUCTION OF LOW DIELECTRIC CERAMIC COMPOSITES

James E. French, Ballwin, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Apr. 26, 1995, Ser. No. 429,307

Int. Cl.^{6} B05D *3/02*

U.S. Cl. 427—226 **6 Claims**

1. A method of producing a fiber reinforced ceramic composite with a real dielectric constant of <5.0 consisting of selecting ceramic fibers with dielectric constant <6.5, coating the fibers with a boron nitride or a ceramic having a modulus, and dielectric constant as low as boron nitride, embedding the fibers in polymers selected from the group consisting of polysilazane, polysiloxane and mixtures thereof, pyrolyzing the polymer to ceramic in inert atmosphere, followed by air oxidation at from about ≧350° C. so as to remove free elemental carbon.

5,837,319

SPIN PROCESS FOR HIGHLY CONFORMAL COATINGS

David W. Walters, Walworth, and Susan S. Collier, LeRoy, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 359,371, Dec. 20, 1994, abandoned. This application Jun. 28, 1996, Ser. No. 670,983

Int. Cl.^{6} B05D *3/12*

U.S. Cl. 427—240 **4 Claims**

1. A process for spin coating a substrate comprising:

providing a spiral-grooved substrate;

applying a liquid coating composition to the substrate;

spinning the substrate at a speed of less than or equal to 500 rpm until the coating composition, at a inner diameter of the substrate has reached a thickness;

accelerating the rotational speed of the substrate in two linked steps, the first step comprising accelerating the rotational speed at a first rate of about 300 rpm/sec to 1200 rpm/sec or, until the rotational speed of the substrate is less than or equal to 3000 rpm; and the second step comprising accelerating the rotational speed of the substrate at a second rate of greater than or equal to 3000 rpm/sec during which the coating solvent is evaporated.

5,837,320

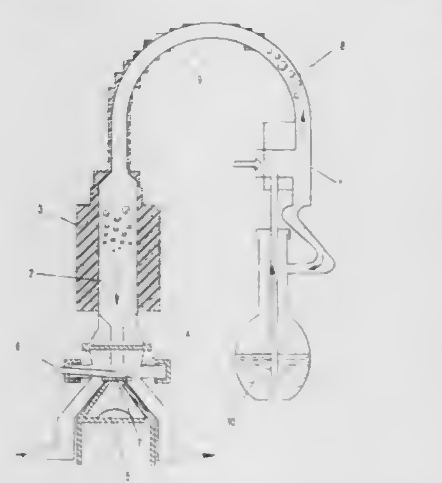
CHEMICAL VAPOR DEPOSITION OF METAL SULFIDE FILMS FROM METAL THIOCARBOXYLATE COMPLEXES WITH MONODENATE OR MULTIDENTATE LIGANDS

Mark Hampden-Smith; Klaus Kunze, and May Nyman, all of Albuquerque, N. Mex., assignors to The University of New Mexico, Albuquerque, N. Mex.

Filed Feb. 27, 1996, Ser. No. 607,390

Int. Cl.^{6} C23C *16/00;* B05D *5/12*

U.S. Cl. 427—248.1 **22 Claims**



1. A method of depositing a metal sulfide film on a substrate, said method comprising the steps of:

preparing a solution containing at least one metal compound precursor comprising:

a) at least one thiocarboxylate ligand SECR, wherein E is selected from the group consisting of O and S and wherein R is selected from the group consisting of alkyl, aryl, substituted alkyl, substituted aryl, halogenated alkyl, and halogenated aryl and

b) at least one coordinated ligand L selected from the group consisting of monodentate ligands and multidentate ligands;

heating the substrate to a reaction temperature;

evaporating the solution to form vapors of said metal compound precursor; and

contacting the vapors and the substrate heated to said reaction temperature, said reaction temperature sufficient to decompose said metal compound precursor to form said metal sulfide film of at least one metal M on the substrate.

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5,837,321

VOLATILE ORGANIC LANTHANIDE COMPOUNDS AND METHODS FOR THE PREPARATION OF LANTHANIDE-CONTAINING LAYERED MATERIALS FORM THESE COMPOUNDS

Klaas Timmer, Bilthoven, Netherlands; Stephen L. Cook, Chester, Great Britain, and Carolus Spee, Helmond, Netherlands, assignors to The Associated Octel Company Limited, London, England

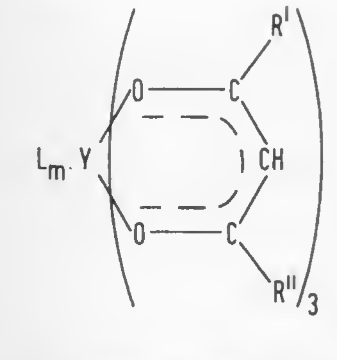
PCT No. PCT/GB94/02576, § 371 Date Aug. 2, 1996, § 102(e) Date Aug. 2, 1996, PCT Pub. No. WO95/14698, PCT Pub. Date Jun. 1, 1995

PCT Filed Nov. 24, 1994, Ser. No. 640,902

Claims priority, application Netherlands, Nov. 24, 1993, 9302030

Int. Cl.^{6} C23C *16/18*

U.S. Cl. 427—248.1 **11 Claims**



1. In an yttrium-containing material deposition process, wherein the deposition process is a vapour deposition process, the improvement comprising the use of an yttrium β-diketonate/donor ligand adduct to deposit the material on a substrate and wherein the donor ligand is an N-oxide.

5,837,322

DEPOSITION OF POLYCRYSTALLINE DIAMOND FILM ON ZINC SULFIDE SUBSTRATE HAVING NITRIDE INTERLAYER

Mark B. Moran; Linda F. Johnson, both of Ridgecrest, Calif., and Karl A. Klemm, Largo, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Arlington, Va.

Continuation of Ser. No. 702,208, May 16, 1991, Pat. No. 5,800,879. This application Aug. 11, 1997, Ser. No. 914,010

Int. Cl.^{6} C23C *16/26;16/34*

U.S. Cl. 427—249 **10 Claims**

1. A method of forming a continuous, polycrystalline, diamond layer on a zinc sulfide substrate, the method comprising depositing a refractory nitride layer on said zinc sulfide substrate and subsequently depositing said diamond layer directly on said nitride layer from activated gas containing carbon, wherein during said depositing of said nitride layer on said zinc sulfide substrate and during said depositing of said diamond layer on said nitride layer, said zinc sulfide substrate is at a temperature greater than 600 degrees centigrade and less than a temperature resulting in damage to said zinc sulfide substrate.

5,837,323

SURFACE IMPROVING METHOD OF POLYPROPYLENE PRODUCTS FOR PLATING, JOINING OR COATING

Tugio Hashimoto, Takaishi; Matagoro Maeno, Izumi, and Ryoji Hirayama, Sakai, all of Japan, assignors to Hashimoto Chemical Co., Ltd., Osaka-fu, Japan

Filed Aug. 17, 1995, Ser. No. 516,335

Claims priority, application Japan, Sep. 1, 1994, 6-234011; May 10, 1995, 7-137305

Int. Cl.^{6} B05D *3/04*

U.S. Cl. 427—322 **1 Claim**

1. A method of plating or coating a surface of a polypropylene product which consists essentially of the steps of contacting the surface of the polypropylene product with a diluted fluorine gas of concentration of 0.1–10% by volume for 1–15 minutes to make it hydrophilic with a surface contact angle of 80 degrees or less, and then plating or coating said surface with a plating agent or coating composition.

5,837,324

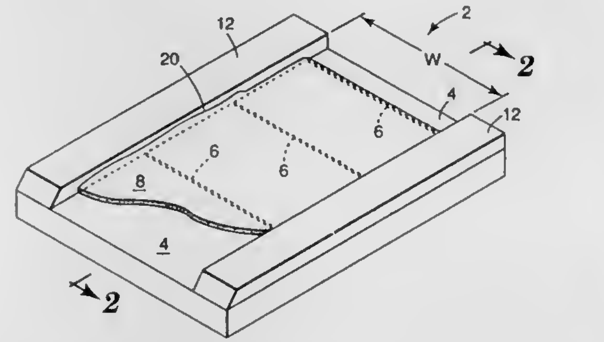
PROFILED EDGE GUIDE

Robert A. Yapel, Oakdale; Aparna V. Bhave, Woodbury, and Thomas M. Milbourn, Mahtomedi, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 31, 1996, Ser. No. 657,842

Int. Cl.^{6} B05D *1/30;* **B05C** *5/02;5/00*

U.S. Cl. 427—402 **22 Claims**



1. A method of coating a fluid onto a substrate comprising the steps of:

providing a coating fluid;

providing a slide coating apparatus comprising:

a coater face having one or more feed slots,

edge guides extending lengthwise along the edges of the slide coater face, the edge guides comprising a wetting surface and a non-wetting surface contacting the wetting surface along a wetting line, the wetting line having a physical characteristic that maintains contact between the wetting line and a surface of the coating fluid flowing down the coater face, the wetting line providing a non-linear wetting profile between the coating fluid and the edge guide;

flowing the coating fluid from the one or more feed slots and down the slide coater face to a substrate.

5,837,325

METHOD AND APPARATUS FOR REGULATING NEUTRALIZATION OF CONTAMINATED SOIL

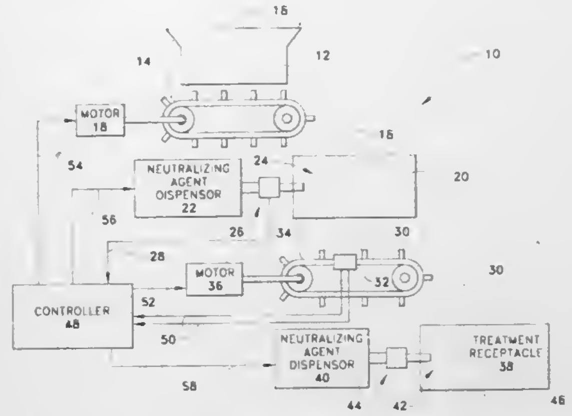
Gary E. Heacock, 12807 Marimba Trail, Austin, Tex. 78729

Continuation-in-part of Ser. No. 502,500, Jul. 14, 1995. This application May 1, 1996, Ser. No. 640,555

Int. Cl.^{6} B05D *1/02;* **B09B** *1/08*

U.S. Cl. 427—421 **4 Claims**

1. An apparatus for regulating neutralization of contaminated soil, said apparatus comprising:



a soil dispenser for dispensing contaminated soil at a regulated soil volume rate, said soil dispenser including a hopper and a first conveyor proximate said hopper;

a first motor operably coupled to said first conveyor;

a first treatment receptacle to receive and treat the contaminated soil from said soil dispenser to produce a first treated soil, said first treatment receptacle including means for grinding the contaminated soil into particles;

a first neutralizing agent dispenser coupled to said first treatment receptacle for dispensing a first neutralizing agent at a first regulated agent volume rate;

a first monitor coupled to said first neutralizing agent dispenser for monitoring the first regulated agent volume rate and generating a first agent representative signal;

a second conveyor proximate said first treatment receptacle, said second conveyor including a soil volume monitor for monitoring soil volume rate and generating a soil representative signal;

a second motor operably coupled to said second conveyor;

a second treatment receptacle for receiving and further treating the first treated soil to produce uncontaminated soil;

a second neutralizing agent dispenser coupled to said second treatment receptacle for dispensing a second neutralizing agent at a second regulated agent volume rate;

a second monitor coupled to said second neutralizing agent dispenser for monitoring the second regulated agent volume rate and generating a second agent representative signal; and

a controller communicating with said first motor, said second motor, said first monitor, said second monitor, said soil volume rate monitor, said first neutralizing agent dispenser and said second neutralizing agent dispenser, wherein said controller responsive to the soil representative signal, the first agent representative signal and the second agent representative signal controls the regulated soil volume rate, the first regulated agent volume rate and the second regulated agent volume rate.

5,837,326

THERMALLY SPRAYED TITANIUM DIBORIDE COMPOSITE COATINGS

Serge Dallaire, and Henri L. Levert, both of Quebec, Canada, assignors to National Research Council of Canada, Ottawa, Canada

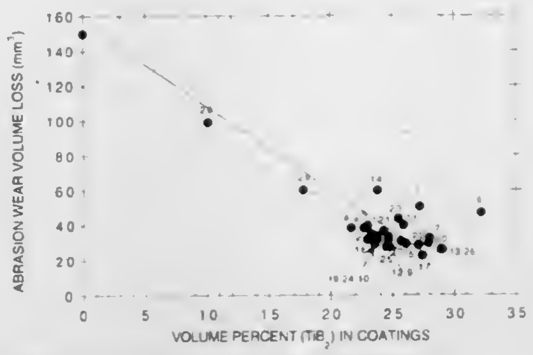
Filed Apr. 10, 1996, Ser. No. 630,445

Int. Cl.^{6} C23C *4/06;4/10;4/16*

U.S. Cl. 427—449 **4 Claims**

1. A process for producing a wear resistant coating an a metallic substrate, the coating when arc-sprayed having a volume loss, as measured by Dry Sand/Rubber Wheel Test, ASTM G-65, Procedure B, of not more than 98.99 mm^3, said process comprising the steps of:

providing a composite wire having a steel sheath and a compacted powder core, said core comprising itanium diboride powder in the amount from 10 wt. % to 65 wt. % and a steel powder in an amount from 35 wt. % to 84 wt. %, and



thermally spraying said wire onto said substrate.

5,837,327

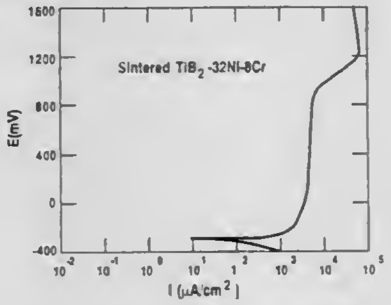
METHOD FOR PRODUCING A TIB$_2$-BASED COATING

Jiinjen Albert Sue, Carmel; Robert Clark Tucker, Jr., Brownsburg, and Antony John Stavros, Carmel, all of Ind., assignors to Praxair S.T. Technology, Inc., Danbury, Conn.

Continuation of Ser. No. 489,664, Jun. 12, 1995, abandoned. This application Jan. 10, 1997, Ser. No. 782,200

Int. Cl.^{6} C23C *4/10*

U.S. Cl. 427—456 **12 Claims**



1. A method for producing a TiB$_2$-based coating on a substrate comprising the steps:

(a) sintering a mixture of TiB$_2$powders with powders of a metallic component selected from the group consisting of nickel, chromium, iron, cobalt and alloys thereof, by heating said mixture to between 850° C. to 1600° C. to produce a sintered product;

(b) reducing the sintered product of step (a) to powders; and

(c) thermally depositing the powders of step (b) onto a substrate to produce a TiB$_2$-based article, suitable for use in wear, corrosion and/or erosion resistant applications.

5,837,328

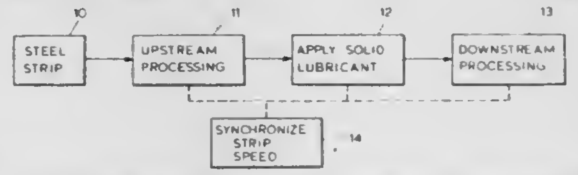
METHOD FOR PROVIDING IN-LINE APPLICATION OF SOLID LUBRICANT TO STEEL STRIP

Elliott Y. Spearin, Crown Point, Ind., and James C. Carney, Middletown, Ohio, assignors to Inland Steel Company, Chicago, Ill.

Division of Ser. No. 437,039, May 8, 1995, Pat. No. 5,620,513, which is a division of Ser. No. 234,541, Apr. 28, 1994, abandoned. This application Sep. 27, 1996, Ser. No. 721,676

Int. Cl.^{6} B05D *3/00;1/00*

U.S. Cl. 427—542 **3 Claims**



1. The combination of (a) a multi-step method for processing a continuous steel strip in a line and (b) a solid lubricant application

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procedure incorporated in-line with said strip processing method between steps thereof, for applying, to said steel strip, as alternatives, either a wax or polymer material, each of which forms a transparent film of solid lubricant on the steel strip, wherein said strip-processing method comprises the steps of:

performing at least one processing step at an upstream location:

performing at least one processing step downstream of the location of said upstream processing step;

said strip having a strip speed in the upstream processing step and a strip speed in the downstream processing step;

moving said steel strip in a downstream direction during said processing steps;

and synchronizing the speed of the moving steel strip in said downstream processing step with the strip speed employed in said upstream processing step;

said strip having a strip temperature as it undergoes processing;

said combination comprising performing said lubricant application procedure in-line with said strip-processing method, between said upstream and downstream processing steps;

and wherein said lubricant application procedure comprises the steps of:

providing said line with both (a) a capability for applying a film-forming wax material, as a liquid, and (b) a capability for applying a film-forming polymer material, as a liquid;

applying one of said film forming materials, as a liquid, to said moving steel strip while the other material remains unapplied;

said material-applying step being capable of applying, as alternatives, either said wax material or said polymer material;

providing said line with a capability for adjusting the temperature of said moving steel strip upstream of said material-applying step;

said upstream temperature-adjusting capability constituting (i) a heating technique or (ii) a cooling technique, or the capability of employing techniques (i) and (ii) alternatively;

providing said line with a capability for adjusting the temperature of said strip downstream of said material-applying step, using a heating technique;

providing said line with a capability for adjusting the temperature of said strip downstream of said material-applying step, using a cooling technique;

sensing the temperature of said moving steel strip upstream of said material-applying step;

employing said upstream temperature-adjusting capability selectively (1) in response to the particular film-forming material that is applied or (2) in response to said upstream temperature sensing step or (3) in response to a combination of (1) and (2) to subject said strip to (a) heating or (b) cooling or (c) neither (a) nor (b);

sensing the temperature of said moving steel strip downstream of said material-applying step;

adjusting the temperature of said moving steel strip downstream of said material-applying step either (a) by using said heating technique while said cooling technique remains unemployed or (b) by using said cooling technique while said heating technique remains unemployed;

each of said upstream and downstream cooling techniques comprising a cooling expedient that employs a refrigerated cooling medium;

and synchronizing the speed of said moving steel strip during said lubricant application procedure with the strip speed employed in said strip-processing steps.

5,837,329
METHOD FOR MACHINING ROLLERS AND OTHER OBJECTS USING LASER LIGHT AND EQUIPMENT FOR MACHINING

Kyoji Kokufuda, Tokyo, Japan, assignor to Shinozaki Manufacturing Co., Ltd., Tokyo, Japan

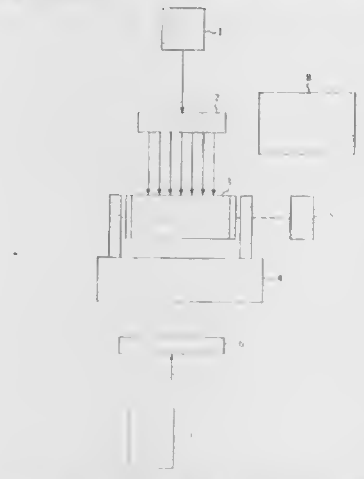
PCT No. PCT/JP95/02626, § 371 Date Aug. 26, 1996, § 102(e) Date Aug. 26, 1996, PCT Pub. No. WO96/20435, PCT Pub. Date Jul. 4, 1996

PCT Filed Dec. 21, 1995, Ser. No. 700,417

Claims priority, application Japan, Dec. 28, 1994, 6-337772

Int. Cl.⁶ B05D *3/00;* **C08J** *7/18*

U.S. Cl. 427—555 **36 Claims**



1. A method for removing a portion of an organic film from the surface of a roller, comprising the step of irradiating the portion of the film to be removed from the roller surface with high-intensity pulsed laser light of a wavelength of 9.0 micron to 11.0 micron;

wherein the step of irradiating further comprises dividing a laser light beam into a plurality of sections with at least one half mirror and at least one full mirror; broadening each section with a concave lens to produce a broadened section, shaping each broadened section to produce a rectangular shaped beam; and irradiating a rotating roller along a longitudinal axis thereof with the elongated rectangular shaped beam to remove the portion of an organic film from the surface of the roller.

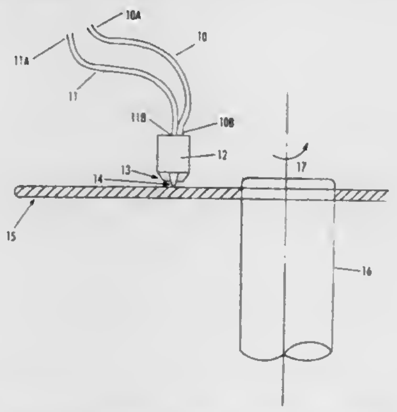
5,837,330
DUAL FIBER OPTIC LASER TEXTURING

Jialuo Jack Xuan, Milpitas, Calif., assignor to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Aug. 28, 1997, Ser. No. 919,601

Int. Cl.⁶ B05D *3/00*

U.S. Cl. 427—555 **11 Claims**



1. A method of manufacturing a magnetic recording medium, which method comprises:

exposing a first surface of a substrate to a pulsed laser light beam through a first lens to form a first focused laser light beam spot on the first surface having a first diameter and to heat the first surface to a first temperature; and

exposing the first surface to a pulsed laser light beam through a second lens to form a second focused laser light beam spot overlapping at least a portion of the first spot and having a second diameter less than the first diameter and to heat the first surface to a second temperature greater than the first temperature, thereby texturing the first surface by forming a plurality of protrusions thereon extending above the first surface.

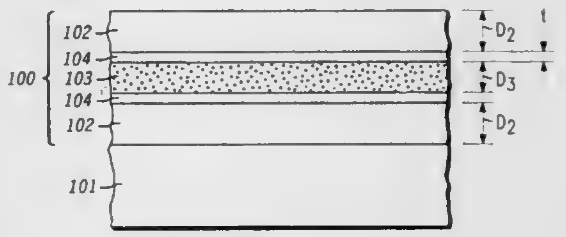
5,837,331
AMORPHOUS MULTI-LAYERED STRUCTURE AND METHOD OF MAKING THE SAME

Eric P. Menu, Mesa; John Song, Tempe, both of Ariz., and Bernard F. Coll, Sparta, N.J., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 13, 1996, Ser. No. 614,703

Int. Cl.⁶ H05H *1/24;* **C23C** *16/00;* **B05D** *1/36;5/12*

U.S. Cl. 427—569 **18 Claims**



1. A method for forming an amorphous multi-layered structure comprising the steps of:

providing a physical vapor deposition apparatus having an evacuated enclosure;

providing a deposition substrate within the evacuated enclosure;

providing a precursor of a multi-phase material within the evacuated enclosure;

ionizing the precursor of the multi-phase material thereby forming a gaseous plasma having a plurality of plasma ions having a total ion impinging energy; and

modulating the total ion impinging energy in a predetermined manner with respect to time thereby depositing on the deposition substrate a plurality of amorphous layers having predetermined properties corresponding to values of the total ion impinging energy.

5,837,332
METHOD AND APPARATUS FOR PREPARING CRYSTAL THIN FILMS BY USING A SURFACE ACOUSTIC WAVE

Migaku Takahashi, Sendai; Katsuya Yokoyama, Yokohama; Jun Yamada, Yokohama, and Takashi Shiba, Yokohama, all of Japan, assignors to Nihon Victor Kabushiki-kaisha, and Kabushiki-kaisha Hitachi Seisakusho, both of Japan

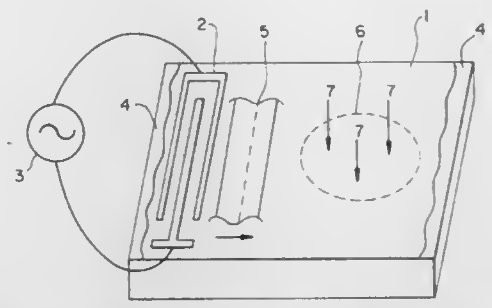
Continuation of Ser. No. 378,062, Jan. 25, 1995, abandoned, which is a continuation of Ser. No. 773,588, Nov. 15, 1991, abandoned. This application Jul. 31, 1996, Ser. No. 690,030

Claims priority, application Japan, Nov. 19, 1989, 1-300177; WIPO, Nov. 19, 1990, PCT/JP90/01507

Int. Cl.⁶ B06B *1/00;* **H03H** *9/00*

U.S. Cl. 427—600 **12 Claims**

1. A method for preparing a crystal thin film on a surface of substrate of one of a semiconductor device, magnetic device, and superconductor device, wherein said crystal thin film is prepared by one of sputtering, evaporation, and chemical vapor deposition and is deposited as said substrate or said surface of said substrate is being excited by a surface acoustic wave, wherein the amplitude of the surface acoustic wave excitation is in the range of 1.5 to 3.0 nm.



5,837,333
CHROMOGENIC FILM HAVING A DIFFRACTION PATTERN SIMILAR TO AN OPAL

Kuniaki Nagayama, Tokyo, and Antony S. Dimitrov, Tsukuba, both of Japan, assignors to Research Development Corporation of Japan, Japan

Filed Feb. 28, 1996, Ser. No. 608,542

Claims priority, application Japan, Feb. 28, 1995, 7-041038

Int. Cl.⁶ B44F *9/04*

U.S. Cl. 428—15 **4 Claims**

1. A chromogenic film having a diffraction pattern similar to an opal comprising a hexagonally close-packed grating monolayer film of micron-order particulates having a diffraction pattern similar to an opal, when light is irradiated thereupon.

5,837,334
LARGE SIZED QUARTZ GLASS TUBE, LARGE SCALE QUARTZ GLASS PREFORM, PROCESS FOR MANUFACTURING THE SAME AND QUARTZ GLASS OPTICAL FIBER

Kiyoshi Yokokawa, Annaka; Masaaki Aoyama, Koriyama, both of Japan, and Gerhart Vilsmeier, Aschaffenburg, Germany, assignors to Heraeus Quarzglas GmbH, Germany, and Shin-ETSU Quartz Products Col, Ltd., Japan

Continuation of Ser. No. 154,692, Nov. 18, 1993, abandoned. This application Sep. 17, 1996, Ser. No. 710,401

Claims priority, application Japan, Nov. 19, 1992, 4-332203; Aug. 19, 1993, 5-226669; Aug. 20, 1993, 5-226670; Aug. 20, 1993, 5-226671

Int. Cl.⁶ C03B *37/012*

U.S. Cl. 428—34.4 **3 Claims**

1. A large-sized quartz glass preform comprising:

(a) a large-sized quartz glass tube having an outer diameter falling in a range from 50 mmϕ to 300 mmϕ; an outer to inner diameter ratio falling in a range from 2.5 to 7, a wall thickness being 10 mm or more, a wall thickness error being 2% or less, an inner surface roughness of 20 μm or less, wherein the large-sized quartz glass tube is a high purity synthetic quartz glass tube; and

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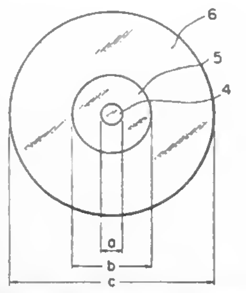


(b) a core glass rod for an optical fiber combined integrally with the large-sized quartz glass tube, where the refractive index of the glass tube differs within 0.02% from a predetermined value relative to the refractive index of the core glass rod.

5,837,335

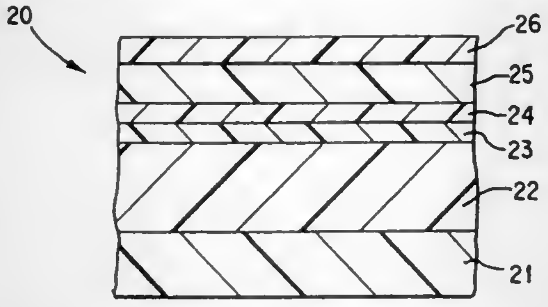
HIGH SHRINK MULTILAYER FILM WHICH MAINTAINS OPTICS UPON SHRINKING

Robert Babrowicz, Spartanburg, S.C., assignor to Cryovac, Inc., Duncan, S.C.

Continuation-in-part of Ser. No. 332,990, Nov. 1, 1994, abandoned, which is a continuation-in-part of Ser. No. 317,509, Oct. 4, 1994, abandoned. This application Jul. 29, 1996, Ser. No. 681,642

Int. Cl.⁶ B65B *53/00;* **F16B** *4/00*

U.S. Cl. 428—34.9 **34 Claims**



1. A heat-shrinkable, biaxially-oriented, multilayer film comprising a first layer comprising an ethylene/alpha-olefin copolymer having a major DSC peak of less than 105° C., wherein the multilayer film has a total free shrink, at 185° F., of from about 80 to 180 percent, and all layers of the multilayer film are shrink-compatible with respect to one another, and the film has peak load strength per unit thickness of from about 20 to 50 pounds per mil.

5,837,336

FILM-WRAPPED ARTICLES WITH IMPROVED OPENING PROPERTIES

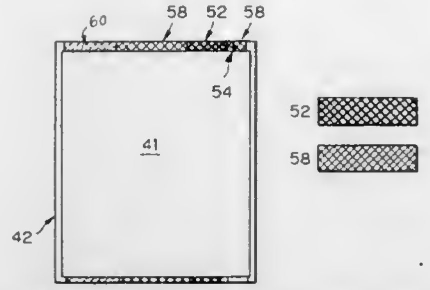
Yuji Ichimura, and Tatsuo Fujii, both of Saku, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Nov. 25, 1996, Ser. No. 753,419

Claims priority, application Japan, Dec. 1, 1995, 7-335717

Int. Cl.⁶ B65D *85/575;65/10*

U.S. Cl. 428—34.9 **3 Claims**



1. A film-wrapped article consisting of a rectangular product wrapped with a heat-shrinkable plastic film in intimate contact with said product, upper and under edge portions of the film being overlapped and sealed together along the product to form a seal, a part of the seal on one side of the article being formed as a weakly joined zone whose adhesion strength increases by continuous or stepwise gradations from an opening zone where the adhesion strength is the lowest toward both ends of the article, said weakly joined zone being made up of joined and unjoined regions extending along the interface between said upper and under edge portions, in a repetitive pattern of the regions varying in adhesion strength by varying ratio of surface area of the joined region to surface of the unjoined region, and a cut being made in said opening zone or a zone adjacent to said opening zone of said upper edge portion.

5,837,337

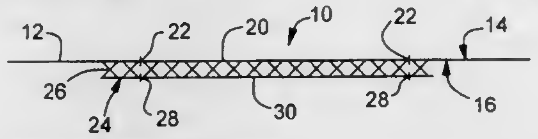
BUSINESS FORM WITH INTEGRATED LAMINATION

David H. Schnitzer, Buffalo Grove, Ill., assignor to The Standard Register Company, Dayton, Ohio

Filed Jun. 10, 1996, Ser. No. 660,818

Int. Cl.⁶ G09F *3/10*

U.S. Cl. 428—40.1 **38 Claims**



1. A protectible form, comprising:
a base ply having a printable face and a release face;
a clear ply secured to said base ply release face by an adhesive, said clear ply having a greater adherence to said adhesive than said base ply release face such that said adhesive will remain with said clear ply upon separation of said clear ply from said base ply; and
a boundary cut defining matching and aligned selected portions of said base ply and said clear ply, such that said clear ply selected portion is removed from said base ply release face and adhered to the base ply printable face in a printing protecting position over substantially all of the base ply selected portion with said clear ply selected portion being substantially the same size as said base ply selected portion.

5,837,338

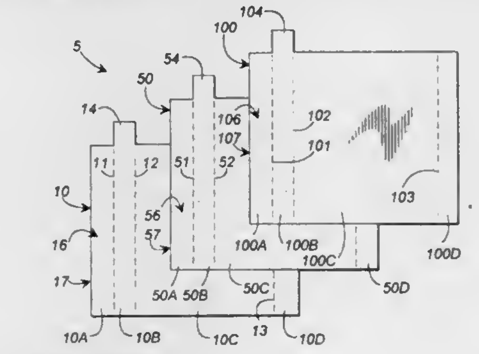
MULTI-PLY LABEL CONTAINING REMOVABLE PIECES

Benny R. Rich; Frank Joseph Tortorici, Sr., both of Oakwood; Jerome P. Jacobson, Duluth; James J. Carides, Lawrenceville, and David M. Good, Peachtree City, all of Ga., assignors to Dittler Brothers Incorporated, Atlanta, Ga.

Filed Jul. 22, 1996, Ser. No. 681,211

Int. Cl.⁶ B32B *3/10;7/06*

U.S. Cl. 428—42.3 **23 Claims**



1. A label comprising:
a. a base ply comprising:
i. an underside suitable for adhesion to a substrate; and
ii. an opposed face; and
b. a second ply comprising:
i. an underside and opposed face;
ii. a first edge region having an underside adhered to the opposed face of the base ply;
iii. a second edge region having an underside adhered to the opposed face of the base ply;
iv. a centerpiece region coupled to the first and second edge regions and having an underside; and
v. means for decoupling the centerpiece region sequentially from the first and second edge regions to expose the underside of the centerpiece region;
wherein the decoupling means of the second ply comprises:
a strip region, defined by two transecting parallel rows of perforations, that separates the centerpiece region from the first edge region and couples together the centerpiece and first edge regions; and
a transecting row of perforations that separates the centerpiece and second edge regions;
wherein a ratio of the length of perforations to the length of spacing between perforations varies along at least one of the rows of perforations and the ratio is greatest in the middle of at least one row of perforations.

5,837,339

RIGID POLYMERIC BEVERAGE BOTTLES WITH IMPROVED RESISTANCE TO PERMEANT ELUTION

Willard E. Wood, Arden Hills, and Neil J. Beaverson, Hugo, both of Minn., assignors to Cellresin Technologies, LLC, Minneapolis, Minn.

Continuation of Ser. No. 603,486, Feb. 20, 1996, abandoned, which is a continuation-in-part of Ser. No. 264,771, Jun. 23, 1994, Pat. No. 5,492,947. This application Sep. 16, 1997, Ser. No. 931,324

Int. Cl.⁶ B65D *23/02;* **C08L** *5/16;* **B29D** *22/00;23/00*

U.S. Cl. 428—36.6 **8 Claims**

1. A beverage container comprising at least two layers, a first layer comprising a thermoplastic polymer and a second layer comprising a thermoplastic polymer and uniformly dispersed in at least one layer, an effective barrier, and beverage extractable compound absorbing, amount of a modified cyclodextrin material, substantially free of an inclusion complex compound, the cyclodextrin having pendant moieties or substituents that render the cyclodextrin material with the thermoplastic.

5,837,340

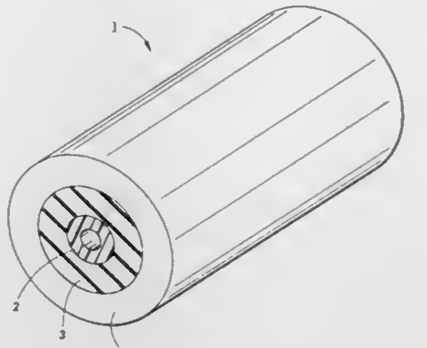
INSTANT ON FUSER SYSTEM MEMBERS

Kock-Yee Law, Penfield; Ihor W. Tarnawskyj, Webster; Joseph Mammino, Penfield; Kathleen M. McGrane; Martin A. Abkowitz, both of Webster; Robert M. Ferguson, Penfield, and Frederick E. Knier, Jr., Wolcott, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 30, 1996, Ser. No. 706,387

Int. Cl.⁶ B29D *23/00;* **G03G** *15/20*

U.S. Cl. 428—36.8 **33 Claims**



1. A fuser member comprising:
a) a plastic substrate;
b) a heat generating layer provided on said substrate, said heat generating layer comprising a fluorinated carbon filled fluoroelastomer; and
c) a toner release layer provided on said heat generating layer.

5,837,341

LAMINATED PRINTING SHEET

Gordon Douglas Folster Johnstone, Norscot, South Africa, assignor to Sharon Jane Johnstone, Houghron, United Kingdom

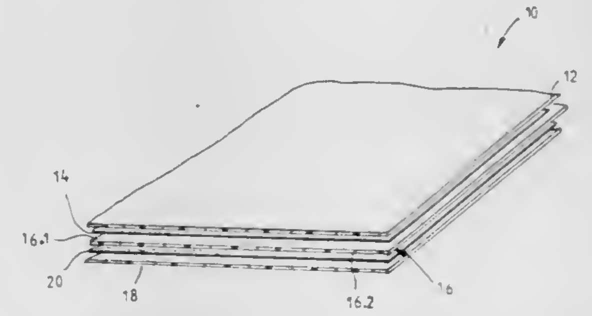
PCT No. PCT/GB94/02736, § 371 Date Oct. 28, 1996, § 102(e) Date Oct. 28, 1996, PCT Pub. No. WO95/16575, PCT Pub. Date Jun. 22, 1995

PCT Filed Dec. 14, 1994, Ser. No. 676,271

Claims priority, application South Africa, Dec. 14, 1993, 93/9364

Int. Cl.⁶ B32B *27/08*

U.S. Cl. 428—41.3 **17 Claims**



1. A laminated printing sheet (**10**) for producing a composite tamper resistant product, the laminated printing sheet (**10**) including a sheet of fusible synthetic paper (**12**) having an outer surface and an inner surface, the inner surface of the fusible synthetic paper (**12**) being removably adhered by a partially activated adhesive (**14**) to one side (**16.1**) of a polymeric sheet (**16**), with a backing sheet (**18**) adhered to the opposite side (**16.2**) of the polymeric sheet (**16**) by an adhesive (**20**), which opposite side (**16.2**) of the polymeric sheet (**16**) is modified to ensure that the adhesive (**20**) will adhere to it, the sheet of synthetic paper (**12**) and the backing sheet (**18**) being discrete sheets and being made of different materials, the synthetic paper (**12**) and the partially activated adhesive (**14**) in use being peeled away from the polymeric sheet (**16**) so that the partially activated adhesive (**14**) can be adhered to a further surface (**22**), and so that the outer surface of the fusible synthetic paper (**12**) can be fused to a transparent panel to prevent tampering with information applied to the outer surface of the synthetic paper and covered by the fused transparent panel.

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5,837,342
PROCESS FOR APPLYING ANTIDRIP EDGE TO A GLASS SHEET

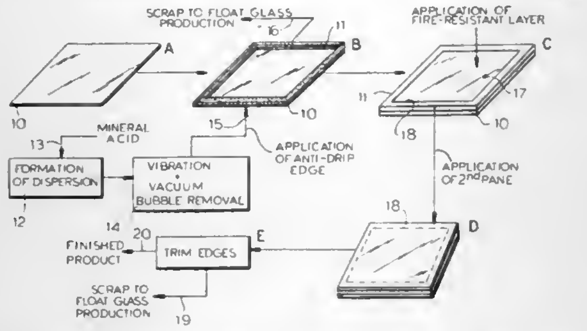
Hans-Henning Nolte; Helga Grünzel, both of Gelsenkirchen, and Bernhard Sattler, Dortmund, all of Germany, assignors to Flachglas AG, Furth, Germany

Filed Oct. 6, 1995, Ser. No. 540,399

Claims priority, application Germany, Oct. 7, 1997, 44 35 843.1

Int. Cl.^{6} B32B *3/02*

U.S. Cl. 428—45 **15 Claims**


SCRAP TO FLOAT GLASS PRODUCTION
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APPLICATION OF FIRE-RESISTANT LAYER
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APPLICATION OF ANTI-DRIP EDGE
FORMATION OF DISPERSION
VIBRATION + VACUUM BUBBLE REMOVAL
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E
FINISHED PRODUCT
TRIM EDGES
SCRAP TO FLOAT GLASS PRODUCTION
19

1. A process for applying an antidrip edge to a glass sheet, comprising the steps of:

- (a) forming a bonding cement as a dispersion by combining a fine-particle glass forming filler and a cellulosic polymer with water;
- (b) controlling a pot life of said cement by adding a mineral acid as a pot-life regulator, thereby prolonging a pot life of said dispersion to 10 to 20 minutes;
- (c) freeing said dispersion from bubbles after the addition of said mineral acid thereto and permitting the dispersion freed from bubbles to mature and form an edge-forming material; and
- (d) applying said edge-forming material during said pot life to an edge portion of a glass sheet, thereby forming part of a fire-resistant glass panel.

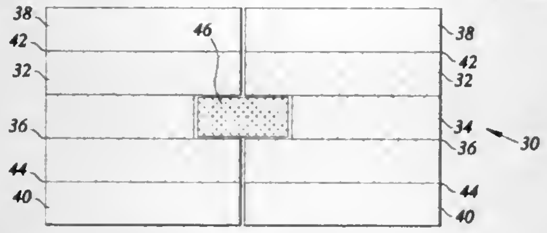
5,837,343
REDUCED-FRICTION COMPOSITE STRUCTURAL ELEMENT

Henry H. Park, 2028 Barry Ave., #A, West Los Angeles, Calif. 90025, and Edward Y. Park, 2008 Foothill Dr., Fullertnn, Calif. 92633

Filed Sep. 11, 1996, Ser. No. 712,076

Int. Cl.^{6} B32B *5/12;21/04;23/08*

U.S. Cl. 428—109 **8 Claims**



1. A segmented low-friction composite structure comprising at least two segments, each segment comprising:

- (a) a core material of Baltic birch plywood with a uniform cross section and having dimensional stability, the core material having two substantially planar surfaces; and
- (b) at least one polyethylene polymer layer adhesively attached to one of the substantially planar faces of the core material by an epoxy adhesive, the polymer layer substantially lacking cavities, the polymer layer having applied thereto silicone oil, the polymer layer further comprising:
  - (i) calcium stearate;
  - (ii) a glycerol ester;
  - (iii) bis(2,2,6,6-tetramethyl-4-piperidinyl)sebacate;
  - (iv) 2-(2"-hydroxy-3',5'-di-tert-amylphenyl)benzotriazole;
  - (v) butylhydroxytoluene; and
  - (vi) octyldodecyl 3,5-di-tert-butyl4-hydroxyhydrocinnamate;

the segments being assembled to form the structure.

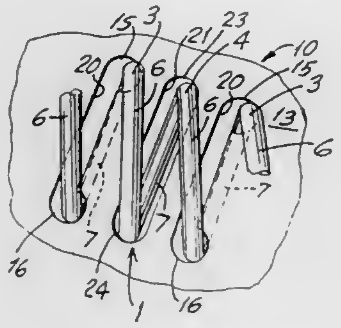
5,837,344
SPIRAL COIL BINDING SYSTEM

Carl G. Braun, Woodbury, Conn., assignor to Gunther Technologies, Inc., Mystic, Conn.

Filed Aug. 22, 1996, Ser. No. 701,645

Int. Cl.^{6} B32B *3/10*

U.S. Cl. 428—139 **29 Claims**



1. A system for holding a spiral coil binding assembly formed from a coiled filament and having a plurality of coils with a predetermined pitch comprising a carrier sheet, a row of cut-outs on said carrier sheet, at least some of said cut-outs in the carrier sheet being holding cut-outs, said holding cut-outs comprising spaced holding openings and an intermediate opening interposed between said spaced holding openings, each of said holding openings adapted to receive the filament of a spiral coil binding assembly in order to hold the spiral coil binding assembly in place on the carrier sheet and being large enough to receive the filament, said intermediate opening and the spaced holding openings are in cooperative juxtaposition in order to receive a coil of a spiral coil binding assembly, said intermediate opening having an axis, said spaced holding openings being arranged along the said axis, said axis being substantially the same pitch and spacing as the pitch and spacing of the coils in a spiral coil binding assembly.

5,837,345
SUPPORT FOR LITHOGRAPHIC PRINTING PLATE, PROCESS FOR THE PREPARATION THEREOF AND ELECTROCHEMICAL ROUGHENING APPARATUS

Atsuo Nishino; Akio Uesugi; Hidehito Sasaki; Kiyotaka Fukino; Hirokazu Sakaki, and Yoshinori Hotta, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 6, 1996, Ser. No. 611,955

Claims priority, application Japan, Mar. 6, 1995, 7-045708; Mar. 7, 1995, 7-047557

Int. Cl.^{6} B32B *3/00;* **D06N** *7/04;* **B41N** *1/00*

U.S. Cl. 428—141 **2 Claims**

1. A support for a lithographic printing plate having a corrugated surface processed by roughening, wherein:

said corrugation on the support surface comprises big corrugation having an average pitch of from not less than 5 μm to not more than 30 μm, and middle corrugation superimposed on said big corrugation, said middle corrugation comprising honeycomb pits having an average diameter of from not less than 0.5 μm to not more than 3.0 μm; and

said support surface has a surface inclination distribution which comprises an inclination of not less than 30 degrees in a proportion of from not less than 5% to not more than 20% as determined by an atomic force microscope.

5,837,346
PROJECTION SCREENS HAVING LIGHT COLLIMATING AND LIGHT DIFFUSING PROPERTIES

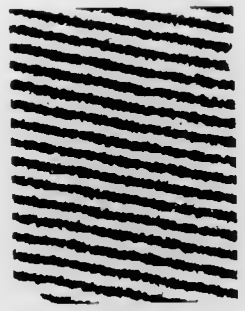
William Langille, Amherst, N.H., and Robin Clabburn, Sevenhampton, United Kingdom, assignors to Nashua Corporation, Nashua, N.H., and Nashua Photo Limited, United Kingdom

Filed Nov. 15, 1996, Ser. No. 749,983

Claims priority, application United Kingdom, Nov. 27, 1995, 9524220

Int. Cl.^{6} G03B *21/60*

U.S. Cl. 428—141 **26 Claims**



1. A layer of polymeric material having a matrix and at least one surface, the layer of material suitable for use in a projection screen and comprising:

an array of graded refractive index variations contained in the matrix, the variations imparting light-diffusing properties to the material; and

a plurality of substantially random features on the surface, the features imparting light-collimating properties to the material.

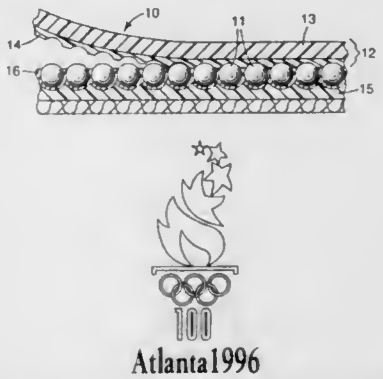
5,837,347
RETROREFLECTIVE TRANSFER SHEET AND APPLIQUE

Paul E. Marecki, May Township, Washington County, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 528,906, Sep. 15, 1995, Pat. No. 5,674,605. This application Jul. 9, 1997, Ser. No. 891,419

Int. Cl.^{6} G02B *5/128;* **D06Q** *1/12;* **B41M** *3/12*

U.S. Cl. 428—143 **18 Claims**



1. A kit for preparing a retroreflective applique comprising:

- (a) a base sheet material comprising:
  - (i) a carrier comprising a heat-resistant backing and a layer of a heat-softenable material coated thereon: and
  - (ii) a layer of optical lens elements partially embedded in and protruding from the heat-softenable material: and
- (b) ingredients for preparation of a transfer adhesive composition comprising a vinyl plastisol and a substantially nonhydrolyzed aminosilane adhesion promoter; wherein the aminosilane adhesion promoter is used in an amount effective to produce an applique capable of:
  - (i) retaining at least about 60% of its initial retroreflectivity after being laminated to 65/35 polyester/cotton blend fabric (100 g/m^2) at about 174° C. and about 2.8 Kg/cm^2 pressure for about 20 seconds and subjected to home laundering conditions five times; and
  - (ii) retaining at least about 40% of its initial retroreflectivity after being laminated to 65/35 polyester/cotton blend fabric (100 g/m^2) at about 174° C. and about 2.8 Kg/cm^2 pressure for about 20 seconds and subjected to home laundering conditions twenty five times.

11. A method for preparing a retroreflective applique; the method comprising:

- (a) providing a base sheet material comprising:
  - (i) a carrier comprising a heat-resistant backing and a layer of a heat-softenable material coated thereon; and
  - (ii) a layer of optical lens elements partially embedded in and protruding from the heat-softenable material: and
- (b) imagewise printing a transfer adhesive composition prepared from ingredients comprising a vinyl plastisol and a substantially nonhydrolyzed aminosilane adhesion promoter to form a retroreflective applique transfer sheet; wherein the aminosilane adhesion promoter is used in an amount effective to produce an applique capable of:
  - (i) retaining at least about 60% of its initial retroreflectivity after being laminated to 65/35 polyester/cotton blend fabric (100 g/m^2) at about 174° C. and about 2.8 Kg/cm^2 pressure for about 20 seconds and subjected to home laundering conditions five times; and
  - (ii) retaining at least about 40% of its initial retroreflectivity after being laminated to 65/35 polyester/cotton blend fabric (100 g/m^2) at about 174° C. and about 2.8 Kg/cm^2 pressure for about 20 seconds and subjected to home laundering conditions twenty-five times.

5,837,348
REVERSIBLE THERMAL RECORDING MEDIUM AND METHOD OF PRODUCING THE SAME

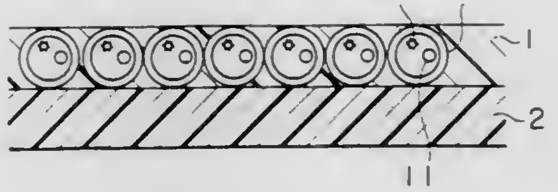
Niro Watanabe; Yuji Nakatsu, both of Kitakatsushika-gun; Keiki Yamada, and Masaru Ohnishi, both of Kamakura, all of Japan, assignors to Toppan Printing Co., Inc., and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan

Continuation of Ser. No. 462,199, Jun. 5, 1995, Pat. No. 5,658,845, which is a division of Ser. No. 201,067, Feb. 24, 1994, abandoned, which is a continuation of Ser. No. 883,152, May 14, 1992, abandoned. This application Jan. 13, 1997, Ser. No. 782,937

Claims priority, application Japan, May 23, 1991, 3-118310

Int. Cl.^{6} B41M *5/30*

U.S. Cl. 427—150 **7 Claims**



1. A method of producing a reversible thermal recording medium, said method comprising the steps of:

- A) providing a core material comprising a resin admixed with a basic leuco dyestuff and a color developing/subtracting agent comprising a salt of bisphenolic acetic acid and a higher fatty acid amine;
- B) forming capsules containing the core material; and
- C) forming on a substrate a recording layer comprising a layer of a binder and the capsules dispersed in said binder, said recording layer being capable of undergoing repeated recording and erasing of visible states by heat through reversible visible chemical change.

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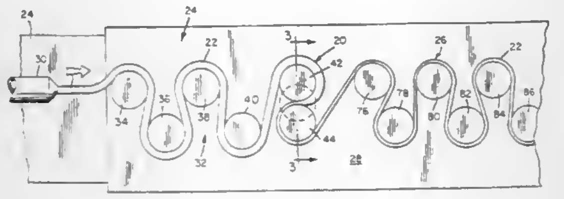
5,837,349
METHOD AND APPARATUS FOR PRODUCING ORIENTED PLASTIC STRAP, AND STRAP PRODUCED THEREBY

Donald L. Van Erden, Wildwood, and Manuel C. Enriquez, Morton Grove, both of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Division of Ser. No. 474,355, Jun. 7, 1995, Pat. No. 5,660,787, which is a continuation-in-part of Ser. No. 353,721, Dec. 12, 1994, Pat. No. 5,525,287, which is a continuation-in-part of Ser. No. 958,803, Oct. 9, 1992, Pat. No. 5,387,388. This application Aug. 14, 1996, Ser. No. 696,541

Int. Cl.^{6} B32B *9/00*

U.S. Cl. 428—192 **6 Claims**



1. A plastic strap made from a solid sheet of material having a predetermined original thickness dimension, comprising:

a solid sheet of material for engaging a first circumferential portion of a first one of a pair of opposed rollers which are spaced apart with respect to each other so as to define a nip therebetween which has a predetermined space dimension which is substantially less than said predetermined original thickness dimension of said solid sheet of material, wherein said pair of opposed rollers are rotated in opposite directions at different lineal surface velocities; for passing through said nip defined between said pair of opposed rollers so as to be simultaneously milled and stretched within said nip defined between said pair of opposed rollers; and for engaging a second circumferential portion of a second one of said pair of opposed rollers; and

opposite heated side portions of said solid sheet of material disposed upstream of said nip defined between said pair of opposed rollers and at axial positions across the width of said solid sheet of material which are located predetermined distances axially inwardly from opposite side edge portions of said solid sheet of material so as to increase the degree of flatness of said simultaneously milled and stretched solid sheet of material across said width of said simultaneously milled and stretched solid sheet of material after said simultaneously milled and stretched solid sheet of material has passed through said nip defined between said pair of opposed rollers by eliminating any concave portions and bump transitional points defined between said concave portions and a main central portion of said solid sheet of material which tend to form at and within the vicinity of said axial positions located at said predetermined distances from said opposite side edge portions of said solid sheet of material.

5,837,350
WIDE RANGE VERTICAL RETROREFLECTIVE DELINEATOR

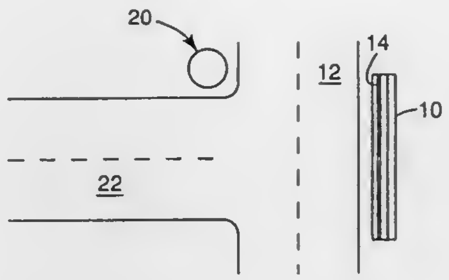
Gregory F. Jacobs, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 27, 1996, Ser. No. 672,129

Int. Cl.^{6} B32B *3/00;* **E01F** *9/00*

U.S. Cl. 428—195 **10 Claims**

1. A traffic delineator having a vertically disposed marking thereon, wherein at least a portion of said marking is disposed substantially parallel to a first road and is retroreflective at substantially all incidence angles between 0° and 85° and wherein the retroreflective brightness of said marking at an incidence angle of about 88° is at least 20 percent of the retroreflective brightness of said marking at an incidence angle of about 5°.



5,837,351
IMAGE-RECEPTIVE SHEET

John J. Chernovitz, East Haven, Conn., and David Habib, East Greenwich, R.I., assignors to OCE USA, Inc., Chicago, Ill.

Filed Dec. 6, 1996, Ser. No. 759,674

Int. Cl.^{6} B23B *3/00*

U.S. Cl. 428—195 **10 Claims**

1. An imageable sheet, comprising:

a base support having an image-receptive surface coating layer on at least one side thereof,

wherein said surface coating layer possesses a hardness of at least 4B to 9H, a pencil abrasivity of from 0.001 to 0.010 gram, a surface resistivity of from 1×10^8 to 1×10^{15} ohms per square, and an ink contact angle of from 27° to 120°.

wherein said surface coating layer is prepared from an aqueous-based coating formulation that comprises (i) an aqueous dispersion of a crosslinking polymer or copolymer and a crosslinking agent therefor, and (ii) a pigment, and

wherein said surface coating layer is formed by applying said aqueous-based coating formulation to at least one side of the base support and drying the same.

5,837,352
MECHANICALLY COMPATIBILIZED FILM/NONWOVEN LAMINATE

Karen Lynn English, Marietta, and Ann Louise McCormack, Cumming, both of Ga., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

Continuation of Ser. No. 359,985, Dec. 20, 1994, abandoned. This application Jun. 12, 1997, Ser. No. 874,057

Int. Cl.^{6} B32B *27/14*

U.S. Cl. 428—198 **9 Claims**

1. A film/nonwoven laminate comprising:

a film layer and a nonwoven layer laminated to one another to form a film/nonwoven laminate, said film layer having a machine direction and a cross machine direction, said nonwoven layer having a machine direction and a cross machine direction and said laminate having a machine direction and a cross machine direction, said film having been oriented in said machine direction prior to being laminated to said nonwoven layer, said film layer having an effective thickness of about 13 micrometers or less,

said film layer after machine direction orientation and lamination defining a film elongation at break value in said cross machine direction, said nonwoven layer defining a nonwoven elongation at peak load value in said cross machine direction and said laminate defining an elongation at peak load value in said cross machine direction, said film elongation at break value in said cross machine direction being greater than said nonwoven elongation at peak load value in said cross machine direction,

said film layer defining a film peak load value in said cross machine direction, said nonwoven layer defining a nonwoven peak load value in said cross machine direction, and said laminate defining a laminate peak load value in said cross machine direction, said nonwoven peak load value in said cross machine direction being greater than said film peak load value in said cross machine direction and said film peak load value in said cross machine direction being less than said laminate peak load value in said cross machine direction, said laminate peak load value in said cross machine direction being at least 300 grams.

5,837,353
LOW VOC REFINISH COATING COMPOSITION

Robert J. Barsotti, Franklinville, N.J., and Lee R. Harper, Media, Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

PCT No. PCT/US95/07123, § 371 Date Jan. 7, 1997, § 102(e) Date Jan. 7, 1997, PCT Pub. No. WO96/01864, PCT Pub. Date Jan. 25, 1996

PCT Filed Jun. 16, 1995, Ser. No. 765,535

Int. Cl.^{6} B32B *27/06;27/08;27/38*

U.S. Cl. 428—204 **6 Claims**

1. A coating composition comprising, by weight of composition, 10 to 70 percent organic solvent and 30 to 90 percent of a binder comprising:

(a) an anhydride resin having a weight average molecular weight of less than about 3000 that contains
  (1) a central moiety, and
  (2) on average, at least 3 pendant, non-cyclic anhydride moieties bonded to each central moiety;

(b) an oligomer or polymer crosslinker having a weight average molecular weight of about 150 to 20,000 and having epoxy functionality of at least 2, at least a portion of which crosslinker has at least one hydroxy functionality; and

(c) a functional amount of at least one active catalyst,

wherein the ratio of equivalents of hydroxy to anhydride is at least about 0.05 and the ratio of equivalents of epoxy to anhydride is 0.5 to 1.8 and wherein said coating composition cures under ambient conditions.

5,837,354
FLEXIBLE METALLIZED PRODUCTS AND PROCESS FOR PRODUCING THE SAME

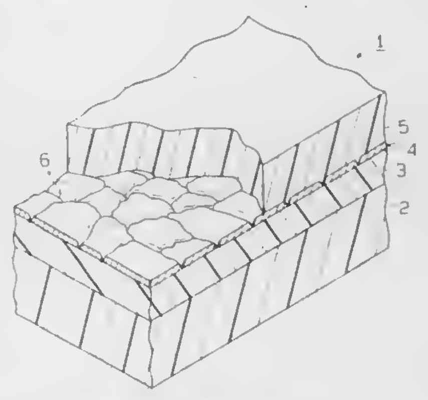
Yasuhiko Ogisu, Nagoya, and Yukitaka Hasegawa, Anjyo, both of Japan, assignors to Toyoda Gosei Co., Ltd., Aichi-ken, Japan

Filed Jul. 1, 1996, Ser. No. 673,000

Claims priority, application Japan, Jun. 30, 1995, 7-166378; Oct. 4, 1995, 7-257690

Int. Cl.^{6} B32B *15/06;15/08;25/16;27/32*

U.S. Cl. 428—208 **6 Claims**



1. A flexible metallized product comprising:

a base material made from a resin selected from the group consisting of a polypropylene material mixed with a diene polymer having hydroxyl groups and a polypropylene material mixed with a rubber component;

a base coat layer disposed on at least part of a surface of said base material;

a metal thin film layer disposed on at least part of said surface of said base coat layer, said metal thin film layer being defined by a corrosion resistant metal having a thickness of at least 150 Å and not greater than 800 Å, and wherein said metal thin film layer is constituted by a plurality of individual metal particles of said metal disposed such that adjacent metal particles are in contact with one another so as to form a grain boundary therebetween; and

a top coat layer disposed on at least said metal thin film layer.

5,837,355
MULTILAYER PRINTED CIRCUIT BOARD AND PROCESS FOR PRODUCING AND USING THE SAME

Hiroshi Hayai, Fujieda, Japan, assignor to Sumitomo Bakelite Company Limited, Tokyo, Japan

Filed Nov. 7, 1996, Ser. No. 745,217

Int. Cl.^{6} B32B *3/00*

U.S. Cl. 428—209 **11 Claims**

1. A multilayer printed circuit board comprising an interlayer circuit board laminated to a prepreg,

wherein the prepreg is obtained by impregnating base material with a thermosetting resin, and

the multilayer printed circuit board is obtained by applying a thermosetting epoxy resin undercoating agent comprising dicyandiamide and a micro-encapsulated imidazole compound to at least one side of an interlayer circuit board on at least one side of which a circuit has been formed, heating the applied undercoating agent to dry or semi-cure the undercoating agent, and laying the prepreg on said at least one side of the dried or semi-cured undercoating agent-applied interlayer circuit board and subjecting them to laminating.

5,837,356
WIRING BOARD AND METHOD FOR MANUFACTURING THE SAME

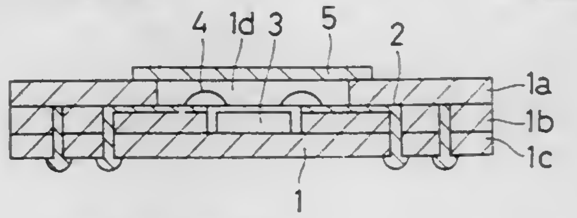
Naohiro Katori; Kiyoshi Tomita; Fujito Nakakawaji; Yoichi Sekioka; Syogo Matsuo, all of Gamou-gun, and Koichi Uchimoto, Kokubu, all of Japan, assignors to Kyocera Corporation, Kyoto, Japan

Filed Sep. 20, 1996, Ser. No. 717,119

Claims priority, application Japan, Sep. 22, 1995, 7-244469; Sep. 22, 1995, 7-244470; Sep. 25, 1995, 7-245829; Dec. 7, 1995, 7-319025; Dec. 7, 1995, 7-319026; Dec. 14, 1995, 7-326033; Dec. 20, 1995, 7-332263; Dec. 20, 1995, 7-332264; Dec. 22, 1995, 7-335167; Dec. 22, 1995, 7-335168; Dec. 22, 1995, 7-335169; Dec. 25, 1995, 7-337500; Feb. 23, 1996, 8-036080; Feb. 23, 1996, 8-036081; Feb. 26, 1996, 8-038463; Feb. 26, 1996, 8-038464

Int. Cl.^{6} H01B *1/22;* **C09J** *3/00*

U.S. Cl. 428—210 **26 Claims**



1. A wiring board comprising:

an insulating substrate comprising 60–95% by weight of a powder of an inorganic insulating material and 5–40% by weight of a thermosetting resin, wherein the powders of an inorganic insulating material are bonded with the thermosetting resin to form the insulating substrate; and

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wiring conductors comprising 70–95% by weight of a metal powder and 5–30% by weight of a thermosetting resin, the wiring conductors being integrally attached to the insulating substrate by coating.

5,837,357
MAGNETIC RECORDING MEDIUM HAVING A CARBON PROTECTIVE LAYER AND METHOD FOR MANUFACTURING THE SAME

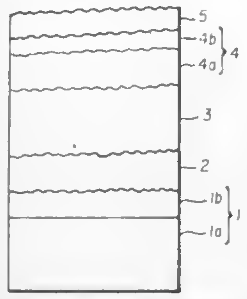
Souta Matsuo; Hiroshi Minazawa; Masaki Miyazato, and Yoshiharu Kashiwakura, all of Nagano, Japan, assignors to Fuji Electric Co., Ltd., Japan

Filed Nov. 6, 1996, Ser. No. 744,648

Claims priority, application Japan, Nov. 6, 1995, 7-286985

Int. Cl.^{6} G11B *5/72*

U.S. Cl. 428—212 **9 Claims**



1. A magnetic recording medium comprising:

a non-magnetic base;

a magnetic layer laminated on said non-magnetic base;

a carbon protective layer containing hydrogen and laminated on said magnetic layer, said carbon protective layer including a surface layer opposite said magnetic layer that comprises a binary composition $C_{1-x}N_x$, in which X is not smaller than 0.07 when measured at the surface thereof, wherein an amount of hydrogen with respect to all elements contained in said surface layer is not larger than 40 at %; and

a lubrication layer formed by applying a liquid lubricant to said carbon protective layer.

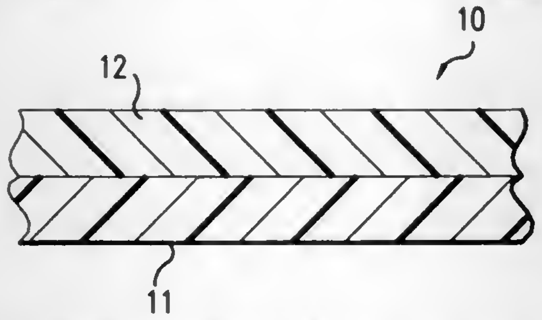
5,837,358
FILM HAVING ANHYDRIDE FUNCTIONALITY IN OUTER LAYER, PROCESS FOR MAKING SAME, PACKAGING USING SAME, AND PACKAGED PRODUCT COMPRISING SAME

Frank T. Bauer, Greenville; Thomas D. Kennedy, Summerville; Ram K. Ramesh, Greer; Paul J. Satterwhite; John S. Sczesny, both of Simpsonville; G. Vincent Sharps, Greer, and Richard K. Watson, Simpsonville, all of S.C., assignors to W.R. Grace & Co.-Conn., Duncan, S.C.

Division of Ser. No. 229,049, Apr. 18, 1994. This application Jun. 1, 1995, Ser. No. 457,892

Int. Cl.^{6} B32B *7/02*

U.S. Cl. 428—213 **20 Claims**



1. A multilayer film comprising a first layer which is an outer sealant layer and a second layer which is a core layer which is directly adhered to the seal layer, and a third layer which is a second outer layer, wherein the first layer has a thickness less than 100% of the thickness of the second layer, and the second layer has a Vicat softening point less than 5° C. higher than the Vicat softening point of the outer sealant layer, wherein the outer sealant layer comprises an anhydride functionality, and upon carrying out a Condition A extraction, the anhydride is extractable from the film to a level of less than 50 parts per billion.

5,837,359
SATIN AND TINTED SATIN IRIDESCENT FILMS

Ramakrishna S. Shetty, Pelham, and Scott A. Cooper, Yorktown Heights, both of N.Y., assignors to The Mearl Corporation, Ossining, N.Y.

Filed Jun. 3, 1996, Ser. No. 657,189

Int. Cl.^{6} B32B *7/02;27/08;27/30;27/36*

U.S. Cl. 428—213 **13 Claims**

1. A thermoplastic multilayer coextruded resinous film comprising a plurality of coextruded very thin layers of transparent thermoplastic resinous materials, said layers being substantially parallel, the contiguous layers being of different transparent thermoplastic resinous materials differing in refractive index, each outermost layer constituting a skin, said skin constituting at least 5% of the total thickness of the film, said multilayer film containing a sufficient quantity of a pearlescent pigment to render it non-glossy wherein said pearlescent pigment is incorporated in at least one of the interior layers.

5,837,360
POLYPROPYLENE-LAMINATED STEEL SHEET

Koujiro Takano; Mamoru Ishii, both of Hyogo-ken; Masaharu Mito, Yamaguchi-ken, and Satoshi Akiyama, Chiba-ken, all of Japan, assignors to Mitsui Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 3,808, Jan. 13, 1993, Pat. No. 5,516,397. This application Oct. 6, 1995, Ser. No. 540,035

Claims priority, application Japan, Jan. 17, 1992, HEI-4-25905; Dec. 21, 1992, HEI-4-355422

Int. Cl.^{6} B32B *15/08*

U.S. Cl. 428—216 **18 Claims**

7. A polypropylene-laminated steel sheet comprising, on at least one side of the steel sheet, (A) a 5–70 μm thick layer of modified polypropylene grafted with 0.001–10% by weight of an unsaturated carboxylic acid or its derivative, and (B) a 5 to 295 μm thick layer of polypropylene formed on the layer A, wherein the modified polypropylene is a random copolymer of 99.5 to 93 mol % of a propylene and 0.5 to 7 mol % of an α-olefin and has a melt flow rate of 0.1–100 g/10 min, and the layers A and B each have a crystallinity of not more than 54.1&, and the propylene-laminated steel sheet has a whitened area of less than 50% of a protruded portion formed by subjecting the polypropylene-laminated steel sheet to an impact test according to JIS K5400 by dropping a load of 500 g from a height of 30cm onto a side of the steel sheet opposite the side laminated to the polypropylene.

5,837,361
SUBSTRATES COATED WITH A STACK OF THIN LAYERS HAVING REFLECTION PROPERTIES IN THE INFRARED AND/OR WITH RESPECT TO SOLAR RADIATION

Hans Glaser, Gummersbach; Bernhard Heinz, deceased, late of Aachen; Peter Heinz, heir, and Ursula Heinz, heiress, both of Saarburg, all of Germany, assignors to Saint-Gobain Vitrage, Courbevoie, France

Filed Nov. 12, 1996, Ser. No. 746,489

Claims priority, application Germany, Nov. 10, 1995, 195 41 937.5

Int. Cl.^{6} B32B *7/02;15/08*

U.S. Cl. 428—216 **21 Claims**

1. A coated substrate, comprising:

(I) a transparent substrate;

(II) a lower coating on said transparent substrate, comprising:

  (a) a first layer comprising (i) silicon or a metal and (ii) nitrogen or oxygen, and

  (b) a second layer comprising zinc oxide and having a thickness of at least 16 nm;

(III) a functional layer on said lower coating; and

(IV) an upper coating comprising a dielectric material, on said functional layer:

wherein (b) said second layer is in contact with (III) said functional layer, and (III) said functional layer has been formed onto (b) said second layer.

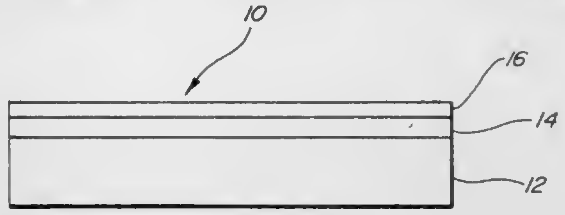
5,837,362
MIRROR WITH SCRATCH RESISTANT SURFACE

Lawrence E. O'Connell, 14090 Summerhill Way, Louisville, Ky. 48223, and David H. Bozeman, 8602 Canopus Pl., Louisville, Ky. 40219

Filed Nov. 21, 1996, Ser. No. 754,689

Int. Cl.^{6} B32B *15/00;* **C03C** *17/34*

U.S. Cl. 428—217 **7 Claims**



1. A mirror which comprises:

a substrate including a front side adapted to be viewed and a rear side;

a multi-layered coating on said front side of said substrate;

said coating including a reflective layer having a luminous transmittance of less than approximately 4%;

said coating including an outer layer of titanium nitride in an amount sufficient to provide a Vickers scale hardness of said coating above 550 while maintaining the spectral reflectance above 55%; and

said outer layer being in an amount sufficient to maintain the CIELAB color scale b* value less than +5 of said coating.

5,837,363
RIGID FOAM ROOFING PRODUCT

Ralph Colafati, Glendora, Calif., assignor to Building Materials Corporation of America, Wayne, N.J.

Filed Oct. 9, 1996, Ser. No. 729,257

Int. Cl.^{6} B32B *3/26;27/00;* **B05D** *7/00;* **B27N** *9/00*

U.S. Cl. 428—311.11 **13 Claims**

1. A roofing product selected from the group consisting of tile, shingle, shake, board and a panel which is capable of withstanding a wind uplift speed of 100 mph or more comprising:

(a) a substantially rigid foam core of water-insoluble urethane having a density of about 1–15 lbs/ft^3 wherein the foam is Class A in the spread of flame, Class II in the ASTM E-84, has a walkable compressive strength of greater than 40 psi, backed with a moisture resistant coating,

(b) a mineral aggregate layer overlying said foam core,

(c) an elastomer membrane layer which is selected from the group consisting of an epoxy, polyester and polyurethane resin, and mixtures thereof,

(d) a plurality of glass fibers embedded within said membrane layer or present as a separate layer between said aggregate and membrane layers, and

(e) a topcoat polymer shell which is an aliphatic urethane coating at least about 3 mils thick on said membrane layer and overlying the edges of the product.

5,837,364
CERAMIC MATRIX COMPOSITES USING MODIFIED HYDROGEN SILSESQUIOXANE RESIN

Gregg Alan Zank, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Continuation of Ser. No. 439,263, May 11, 1995, abandoned. This application Oct. 21, 1996, Ser. No. 734,642

Int. Cl.^{6} C04B *35/56*

U.S. Cl. 428—312.6 **17 Claims**

1. A ceramic composite comprising:

a ceramic matrix comprising silicon, carbon and oxygen having a char stoichiometry of about SiO_yC_z, wherein y=1.2 to 1.6 and z=0.2 to 0.6 and the carbon content of the matrix is 9.3 wt % or less and

within the ceramic matrix, a refractory fiber coated with a material which provides a non-bonding interface between the refractory fiber and the ceramic matrix.

5,837,365
HYDROPHILIC POLYPROPYLENE MEMBRANES

Tze-Chiang Chung, State College, Pa., assignor to The Penn State Research Foundation, University Park, Pa.

Filed Apr. 8, 1996, Ser. No. 629,176

Int. Cl.^{6} B32B *5/18;27/32*

U.S. Cl. 428—318.8 **9 Claims**

1. A porous hydrophilic polypropylene membrane structure which has been prepared by removing fugitive pore-forming agent from a film comprised of a physical mixture of hydrophobic polypropylene, functionalized polypropylene and fugitive pore-forming agent, wherein said fugitive pore-forming agent (a) is soluble in water or in a non-solvent for said hydrophobic polypropylene and said functionalized polypropylene and (b) exhibits a chemical affinity for functional groups in said functionalized polypropylene, wherein said functionalized polypropylene (a) has a viscosity average molecular weight (Mv) between about 30,000 and about 1,000,000 and (b) comprises from about 0.3 to about 10 mole % of functional groups selected from the group consisting of —OH, —NH_2, —COOH and mixtures thereof, and wherein said functionalized polypropylene is concentrated within the portions of the membrane structure that had been occupied by said fugitive pore-forming prior to the removal thereof from the physical mixture of said hydrophobic polypropylene, functionalized polypropylene and fugitive pore-forming agent.

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5,837,366
STRIPPING FINGERS FOR COPYING MACHINES AND PRINTERS

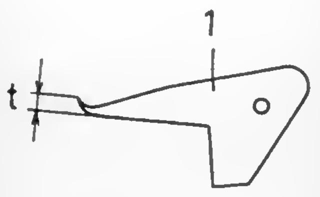
Mitsuru Tanaka, Mie, Japan, assignor to NTN Corporation, Osaka, Japan

Filed Jul. 8, 1997, Ser. No. 889,735

Claims priority, application Japan, Jul. 8, 1996, 8-177672

Int. Cl.^{6} B32B *5/16;* B36H *29/54*

U.S. Cl. 428—327 **16 Claims**



1. A stripping finger molded from a polyphenylene sulfide resin composition comprising 40–70 wt % of a polyphenylene sulfide resin, 18–30 wt % of polytetrafluoroethylene powder having an average particle diameter of 1–5 μm, 2–7 wt % of a polyolefin resin, and 10–40 wt % of a fibrous reinforcing material.

5,837,367
MEMORY CARD AND METHOD OF PRODUCTING SAME

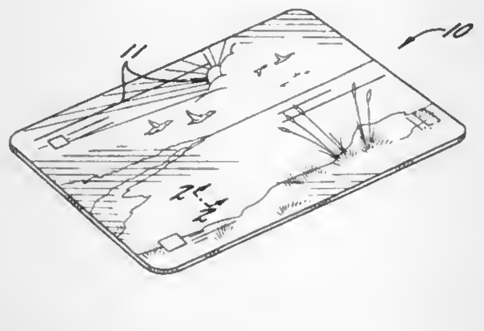
Fernando Ortiz, Jr., Sao Paulo, Brazil, and James T. Faris, Stanley, N.C., assignors to Interprint Formularios Ltda., Sao Paulo, Brazil

PCT No. PCT/BR95/00006, § 371 Date May 1, 1996, § 102(e) Date May 1, 1996, PCT Pub. No. WO96/23277, PCT Pub. Date Aug. 1, 1996

PCT Filed Jan. 27, 1995, Ser. No. 637,762

Int. Cl.^{6} G11B *5/66*

U.S. Cl. 428—332 **19 Claims**



1. A memory card comprising:

a flexible composite substrate having a thickness of approximately 9 to 14 mils, said composite substrate comprising a flexible thermoplastic polymer base film, a flexible thermoplastic polymer top film laminated one surface of said base film, and an adhesive layer disposed between and bonding together said base film and said top film,

a layer of a magnetic metal adhered to the exposed surface of said top film,

a circuit layer overlying said metal layer and forming at least one site on the card which is readable by an external reading device, and

a protective layer overlying and protecting said circuit layer.

5,837,368
INSULATING FILM WITH IMPROVED PUNCHING CHARACTERISTICS AND LEAD FRAME USING THE SAME

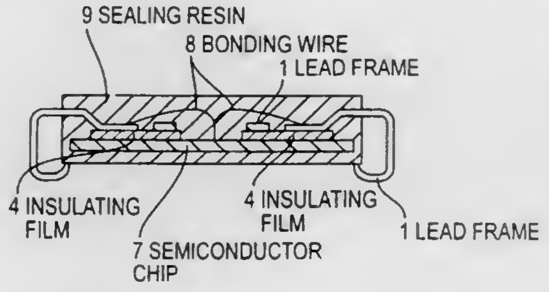
Toshikatsu Hiroe; Kenichi Kaneko; Noboru Imai; Hiroyuki Takasaka, and Toshio Kawamura, all of Ibaraki, Japan, assignors to Hitachi Cable, Ltd., Tokyo, Japan

Continuation of Ser. No. 586,478, Jan. 16, 1996, Pat. No. 5,593,774, which is a continuation of Ser. No. 249,734, May 26, 1994, abandoned. This application Dec. 4, 1996, Ser. No. 760,654

Claims priority, application Japan, May 26, 1993, 5-146989

Int. Cl.^{6} B32B *7/12;* H01L *23/495*

U.S. Cl. 428—343 **6 Claims**



1. An insulating film with improved punching characteristics, comprising:

a polyimide insulating base film having an edge tearing resistance in a range of 56 to 70 kgf/20 mm; and

one of insulating thermoplastic and insulating thermosetting adhesive layers provided on at least one surface of said insulating base film.

5,837,369
MULTILAYER POLYPROPYLENE-BASED PACKAGING FILM AND ITS USE

Manfred Grünberger, Traun; Paul De Mink, Frelstadt, and Anton Wolfsberger, Engerwitzdorf, all of Austria, assignors to PCD Polymere Gesellschaft m.b.H., Austria

Filed Sep. 27, 1996, Ser. No. 724,229

Claims priority, application Austria, Sep. 28, 1995, 1606/95

Int. Cl.^{6} B32B *7/12*

U.S. Cl. 428—349 **11 Claims**

1. A packaging film which comprises:

a) a sealing ply comprising a mixture of:

a_1) 40 to 80% by weight of a C_2–C_3 random copolymer having a C_2 content of 1–15% by weight or

a_2) 40 to 80% by weight of a polymer blend consisting of

$a_{2.1}$) 60 to 98% by weight of a crystalline copolymer of propylene with ethylene and/or an α-olefin of the general formula CH_2=CHR, where R is a linear or branched alkyl radical having 2–8 carbon atoms, containing 85–99.5% by weight of propylene, and

$a_{2.2}$) 2 to 40% by weight of a resilient copolymer of ethylene with propylene and/or an α-olefin of the general formula CH_2=CHR, containing 20–70% by weight of ethylene, or

a_3) 40 to 80% by weight of a highly amorphous polypropylene having a crystalline polypropylene fraction of up to 10% by weight with an enthalpy of fusion of not more than 40 J/g and a melt flow index between 0.1 and 100 g/10 min, where the polypropylene may be a homopolymer of propylene or a copolymer of propylene with one or more α-olefins and with a propylene fraction of at least 80 mol %, and

a_4) 20 to 60% by weight of an ethylene polymer and

b) a monolayer or multilayer base ply comprising thermoplastic polymers,

the packaging film being peelable after sealing against a polypropylene ply with a force of not more than 30N/15 mm.

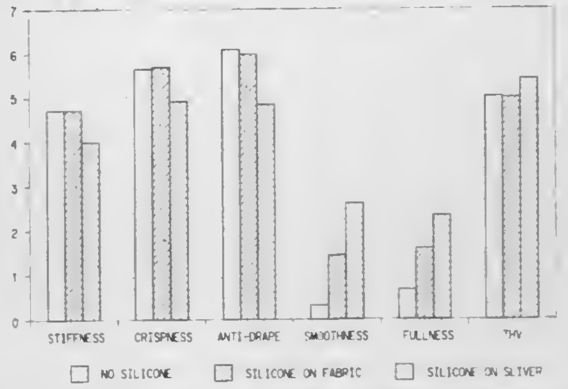
5,837,370
FABRICS OF WOOL AND/OR POLYESTER FIBERS

Arun Pal Aneja, Greenville, N.C., assignor to E.I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 662,896, Jun. 12, 1996, abandoned, and Ser. No. 662,804, Jun. 12, 1996, Pat. No. 5,698,319, each which is a continuation-in-part of Ser. No. 497,495, Jun. 30, 1995, Pat. No. 5,591,523, and Ser. No. 642,650, May 3, 1996, Pat. No. 5,626,961, which is a continuation-in-part of Ser. No. 497,499, Jun. 30, 1995, abandoned. This application Jun. 30, 1997, Ser. No. 860,527

Int. Cl.^{6} D02G *3/00*

U.S. Cl. 428—359 **2 Claims**



1. A sliver of polyester cut fibers, comprising polyester fibers having an average denier per filament about 0.7 to about 4.5, of cut length about 3 to about 4.5 inches, and of scalloped-oval cross-section, wherein said sliver is suitable for processing on a worsted or woollen system, and wherein said sliver is slickened.

5,837,371
ACRYLIC YARN DYEING AND LUBRICATION PROCESS

Dominick J. Rivas, Newport, N.C., assignor to Amital Spinning Corporation, New Bern, N.C.

Filed Mar. 28, 1997, Ser. No. 826,024

Int. Cl.^{6} B32B *27/00;* D02G *3/00*

U.S. Cl. 428—394 **18 Claims**

15. A synthetic fiber with a multi-layer lubricating coating thereon comprised of:

a) a first layer of polyethylene wax adjacent said fiber;

b) a second layer of a first paraffin wax over said polyethylene wax layer, said first paraffin wax having a melting point of less than 70° C.; and

c) a third layer of a second paraffin wax over said first paraffin wax, said second paraffin wax having a melting point of from about 70° C. to about 115° C.

5,837,372
PLIABLE TACKIFIED FIBER TOW AND METHOD OF PRODUCING SAME

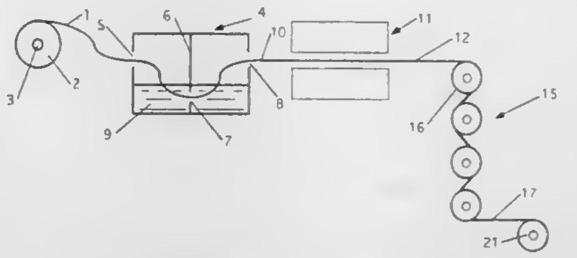
Curt Goodwyn Wilkinson, Wallingford; Mark Oldham, Meriden, and Ronald David Gross, Storrs, all of Conn., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 6, 1996, Ser. No. 643,538

Int. Cl.^{6} D02G *3/00*

U.S. Cl. 428—400 **5 Claims**

1. A pliable tackified fiber tow comprising a plurality of fibers substantially uniformly coated with about 1–15 percent by weight, based on the weight of the fibers, of a tackifier, the tackifier being a solid material fractured into substantially discrete particles.



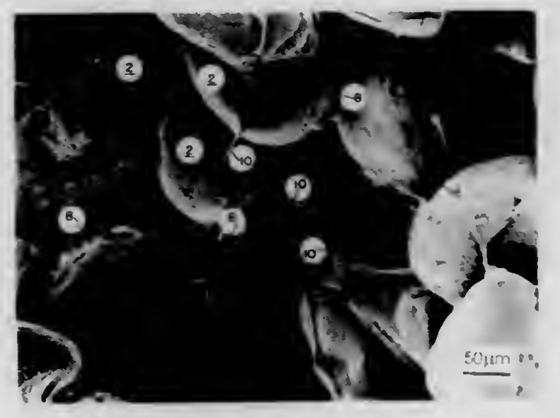
5,837,373
SAND MOLD MEMBER AND METHOD

June-Sang Siak, Troy; William Thomas Whited, Saginaw; Mark Allen Datte, Auburn, and Richard Michael Schreck, Bloomfield Hills, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 431,923, Apr. 28, 1995, Pat. No. 5,582,231. This application Jun. 19, 1996, Ser. No. 666,178

Int. Cl.^{6} B32B *5/16*

U.S. Cl. 428—404 **5 Claims**



1. A mass of foundry sand suitable for forming a sand mold member comprising a mass of sand particles each coated with a film of binder consisting essentially of collagen-derived gelatins selected from the group consisting of gelatins having a Bloom rating less than 175 Bloom grams for migration to the contact points between contiguous sand particles during heating of the core prior to drying of the core.

5,837,374
LIGHT-SHIELDING LAYER, METHOD FOR PRODUCING SAME, AND METHOD FOR PRODUCING SUBSTRATE

Takayuki Hirayama, Kawasaki; Yoshifumi Morita, Muroran; Haruyoshi Sato, Kawasaki; Yutaka Otsuki, Yokohama, and Masayuki Ando, Funabashi, all of Japan, assignors to Nippon Oil Co., Ltd., and Dai Nippon Printing Co., Ltd., both of Tokyo, Japan

Filed Aug. 14, 1996, Ser. No. 696,469

Claims priority, application Japan, Aug. 17, 1995, 7-209427

Int. Cl.^{6} G02F *1/1355*

U.S. Cl. 428—408 **30 Claims**

1. A light-shielding layer comprising a light-shielding material containing a grafted carbon material, said light-shielding material being electrodeposited to form said light-shielding layer, said grafted carbon material having an exposed carboxyl group, said carboxyl group having been exposed by grafting a polymer having acrylate as a polymer unit on a carbon material, and severing an ester bond in the acrylate by heating the grafted product at a temperature of 30° to 150° C.

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5,837,375

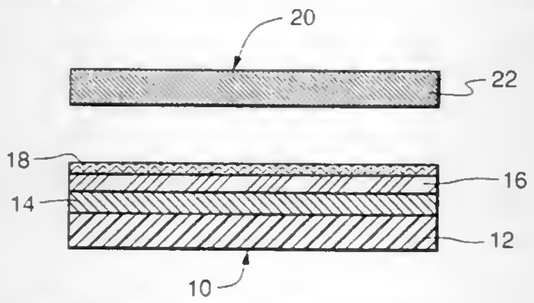
INK JET IMAGING PROCESS AND RECORDING ELEMENT FOR USE THEREIN

Donald Armand Brault, Granby; Douglas Allan Cahill, Belchertown; Richard Scott Himmelwright, Welbraham, and Dene Harvey Taylor, Holyoke, all of Mass., assignors to Rexham Graphics Incorporated, South Hadley, Mass.

Division of Ser. No. 115,561, Sep. 3, 1993. This application Dec. 20, 1996, Ser. No. 771,577

Int. Cl.^{6} B41M *5/00*

U.S. Cl. 428—411.1 **9 Claims**



1. An ink recording element comprising, in order:

1) a temporary carrier layer;

2) an image transparent, protective layer; and

3) an image transparent, adhesive, ink receptive layer; wherein:

the image transparent, adhesive, ink receptive layer is receptive to aqueous ink jet inks;

the protective layer is permanently adhered to the image transparent, adhesive, ink receptive layer and temporarily adhered to the temporary carrier layer;

the image transparent, adhesive, ink receptive layer comprises a hydrophilic resin material and an adhesive material;

the adhesive material comprises a thermally activated adhesive material; and

the thermally activated adhesive material is a thermoplastic polyurethane, polycaprolactone, acrylic copolymer, or a combination thereof.

5,837,376

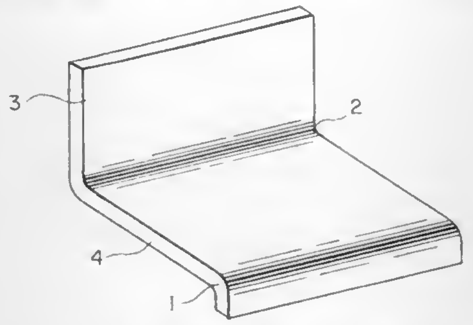
POSTFORMING DECORATIVE LAMINATES

David E. Knox; Edward P. Klein, both of Goose Creek; Robert C. Streisel, and Stanley M. Nuzum, both of Mt. Pleasant, all of S.C., assignors to Westvaco Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 426,531, Apr. 28, 1995, abandoned, which is a continuation-in-part of Ser. No. 188,718, Jan. 31, 1994, Pat. No. 5,443,902. This application Dec. 21, 1995, Ser. No. 576,447

Int. Cl.^{6} B32B *29/00*

U.S. Cl. 428--340 **16 Claims**



1. An improved postformable laminate comprising a decorative layer, core layer of saturable kraft, and a postforming sheet wherein the improvement comprises, as the postforming sheet, a sheet prepared from wood pulp comprising greater than 50% treated hardwood pulp and characterized by a basis weight of from about 80 pounds/3,000 ft.^{2} to about 310 pounds/3,000 ft.^{2}, a tensile modulus of from about 200 kpsi to about 600 kpsi and a cross directional stretch of from about 1% to about 4%, wherein said treated hardwood pulp is refined hardwood pulp subsequently subjected to a mechanical treatment at an energy input of from about 2 to about 15 hp-days/ton which imparts kinking and curling characteristics to individual pulp fibers.

5,837,377

BIOMEDICAL ARTICLES WITH IONICALLY BONDED POLYELECTROLYTE COATINGS

Min-Shyan Sheu, Lowell, and Ih-Houng Loh, Lexington, both of Mass., assignors to Advanced Surface Technology, Inc., Billerica, Mass.

Division of Ser. No. 357,415, Dec. 16, 1994, Pat. No. 5,700,559. This application Nov. 17, 1995, Ser. No. 560,023

Int. Cl.^{6} B32B *27/04;27/28;* **G02C** *7/04*

U.S. Cl. 428—412 **15 Claims**

1. A hydrophilic biomedical article for use with aqueous environments, comprising

a biomedical substrate;

an ionic polymeric layer on said substrate; and

a disordered polyelectrolyte coating consisting of a polyelectrolyte polymer selected from the group consisting of polyethyleneimine, polyaminoalkyl methacrylate, polyvinylpyridine, polylysine, polyacrylic acid, polymethacrylic acid, polysulfonic acid, polyvinyl sulfate, polyacrylamido-2-methyl-1-propanesulfonic acid, and polystyrene sulfonic acid, and being attached via ionic bonding to said polymeric layer;

wherein the initial advancing water contact angle of said coating is less than 56°.

5,837,378

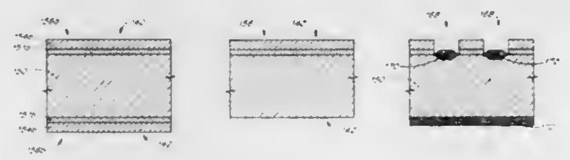
METHOD OF REDUCING STRESS-INDUCED DEFECTS IN SILICON

Viju K. Mathews; Nanseng Jeng; Pierre C. Fazan, and Thomas A. Figura, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Sep. 12, 1995, Ser. No. 527,026

Int. Cl.^{6} H01L *21/76*

U.S. Cl. 438—439 **13 Claims**



6. A process for producing a silicon wafer having reduced stress in regions adjacent an upper surface of said wafer, comprising the steps of

forming a layer of pad oxide on the top and bottom surfaces of said silicon wafer;

depositing a layer of silicon nitride on said layer of pad oxide on the top and bottom surfaces of said silicon wafer;

etching said layers of silicon nitride and pad oxide from siad bottom surface of said wafer;

subsequent to etching said layers of silicon nitride and pad oxide from said bottom surface, forming field oxidation isolation regions on said top surface of said silicon wafer, wherein said step of forming field oxidation isolation regions results in the formation of a layer of silicon dioxide on said bottom surface of said silicon wafer and wherein said layer of silicon dioxide reduces stresses in regions of said silicon wafer adjacent said top surface resulting from said formation of field oxidation isolation regions; and

removing said layer of silicon dioxide on said bottom surface of said silicon wafer.

5,837,379

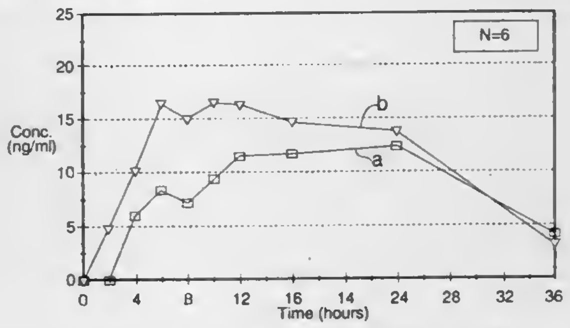
ONCE DAILY PHARMACEUTICAL TABLET HAVING A UNITARY CORE

Chih-Ming Chen, Davie, and Joseph C. H. Chou, Coral Spring, both of Fla., assignors to Andrx Pharmaceuticals, Inc., Fort Lauderdale, Fla.

Filed Jan. 31, 1997, Ser. No. 791,999

Int. Cl.^{6} A61K *9/20*

U.S. Cl. 424—465 **15 Claims**



1. A once a day controlled release tablet which comprises:

(a) a homogeneous compressed core of granules produced in a fluidized bed, said core said core comprising:

(i) a medicament;

(ii) a water soluble osmotic compound;

(iii) one or more osmotic polymers wherein one of the osmotic polymers is a water swellable osmotic polymer; and

(b) a membrane coating which completely covers said core tablet which comprises a mixture of:

(i) a water insoluble pharmaceutically acceptable polymer; and

(ii) an enteric polymer.

5,837,380

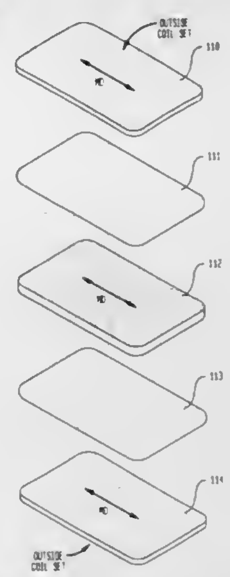
MULTILAYER STRUCTURES AND PROCESS FOR FABRICATING THE SAME

Jae Hong Choi, Carmel; Chen-Chieh Lin, Indianapolis, both of Ind.; William Mitchel Gibbs, Benton, and Carl J. Tiegelmann, Little Rock, both of Ark., assignors to Lucent Technologies, Inc., Murray Hill, N.J.

Filed Dec. 26, 1995, Ser. No. 578,816

Int. Cl.^{6} B32B *7/12:27/08:27/36*

U.S. Cl. 428—480 **5 Claims**



1. A substantially warp-free laminated polymeric substrate, comprising:

a plurality of layers of polymeric film, each of said polymeric film layers having internal and thermal stresses not equal to zero, the plurality of layers including at least a first, a second and a third polymeric film layer wherein the first polymeric film layer is positioned between the second and the third polymeric film layers to form a multiple layer structure; the first, second and third polymeric film layers each having a tensile strength, an elongation factor and a shrinkage rate, and

a plurality of adhesive layers, each of said adhesive layers being disposed between a corresponding pair of adjacent polymeric firm layers;

wherein said second and third polymeric film layers define an outer pair of said multiple layer structure; and wherein the tensile strength, elongation factor and shrinkage rate of the second polymeric film layer are substantially equal to, respectively, the tensile strength, elongation factor and shrinkage rate of the third polymeric film layer, and the tensile strengths of the second and third polymeric film layers are each greater than the tensile strength of the first polymeric film layer,

and wherein said adhesive layers have a tack point temperature that is within 10° C. of the glass transition temperature of said polymeric film layers.

5,837,381

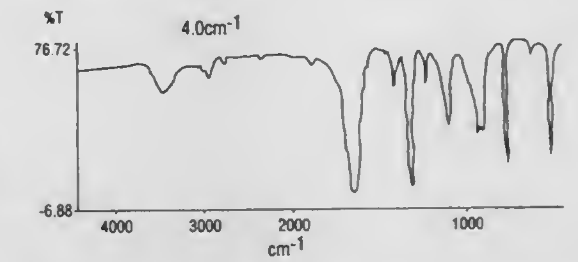
LAMINATES OF GLASS OR METAL AND POLY(ALKYLENE DICARBOXYLATES)

A. G. Pinkus, Box 6426, Waco, Tex. 76706, and Rajan Hariharan, 1501 S. 9th St., Apt. #403, Waco, Tex. 76707-2311

Division of Ser. No. 343,374, Nov. 22, 1994, Pat. No. 5,668,224, which is a division of Ser. No. 123,368, Sep. 17, 1993, Pat. No. 5,451,643, and a continuation-in-part of Ser. No. 27,134, Mar. 5, 1993, Pat. No. 5,371,171. This application Sep. 15, 1997, Ser. No. 929,969

Int. Cl.^{6} B32B *27/06;* **C08G** *63/02*

U.S. Cl. 428—480 **23 Claims**



1. A multilayered structure comprising a poly(methylene dicarboxylate1-co-alkylene dicarboxylate2) copolymer layer exhibiting adhesive interactions with at least one of metal and glass and having a first side and a second side, a metal or glass layer adherent to the first side and a metal or glass layer adherent to the second side.

5,837,382

THERMAL TRANSFER SHEET

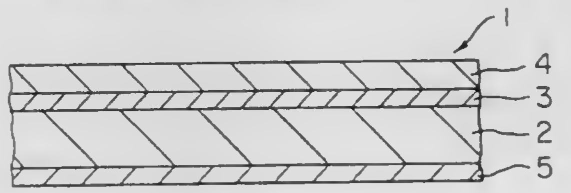
Masafumi Hayashi; Fumihiko Mizukami, and Yuji Sano, all of Tokyo-To, Japan, assignors to Dai Nippon Printing Co., Ltd., Japan

Filed May 17, 1996, Ser. No. 649,813

Claims priority, application Japan, May 19, 1995, 7-145353

Int. Cl.^{6} B41M *5/26*

U.S. Cl. 428—484 **3 Claims**



1. A thermal transfer sheet comprising:

a substrate; and

VOL 1216 ISS 3 NO 17 1998 UMI

a hot-melt ink layer provided on one side of the substrate, the hot-melt ink layer comprising a colorant, a binder resin, a dispersing agent containing a phytosterol component, and a wax,

wherein said binder resin comprises a linear low density polyethylene having a melt index (MI) of 30 to 200 and said phytosterol component consists of at least one of phytosterol and a modified phytosterol selected from an esterified phytosterol and a hydrogenated phytosterol.

5,837,383

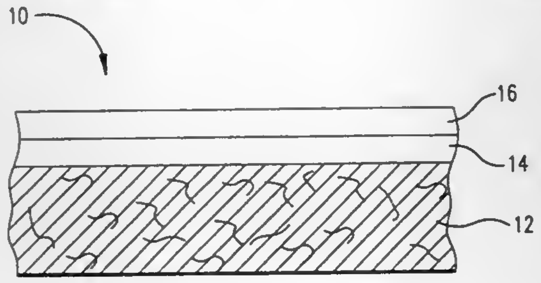
RECYCLABLE AND COMPOSTABLE COATED PAPER STOCKS AND RELATED METHODS OF MANUFACTURE

Donna J. Wenzel, Middletown; Gene W. Bartholomew, Tuxedo Park; James R. Quick, Greenwood Lake; Morton S. Delozier, Claryville, and Maxine Klass-Hoffman, Highland Mills, all of N.Y., assignors to International Paper Company, Purchase, N.Y.

Continuation-in-part of Ser. No. 59,790, May 10, 1993, Pat. No. 5,763,100. This application Aug. 15, 1994, Ser. No. 290,276

Int. Cl.^{6} B32B *27/10*

U.S. Cl. 428—486 **22 Claims**



1. A recyclable and compostable coated paper stock comprising:

a substrate coated on at least one surface with a primer coat and at least one top coat over said primer coat;

said primer coat comprising a water based dispersion of a polymer selected from the group consisting of acrylic polymers, acrylic copolymers, polyvinyl acetate, polyvinyl alcohol, ethylene-vinyl acetate, polyethylene vinyl chloride, styrene-butadiene copolymers, polyvinylidene chloride and starch; wherein said primer coat results in dry add-on levels in the range of 1 to 8 lbs per 3,000 sq ft on said substrate surface;

said top coat consisting essentially of a wax component and a water-based dispersion of a polymer selected from the group consisting of acrylic polymers, acrylic copolymers, styrene-butadiene copolymers and polyvinylidene chloride;

wherein the coated paper stock is resistant to water, resistant to grease and has moisture vapor barrier characteristics.

5,837,384

POLYSTYRENIC STRETCHED FILM AND PROCESS FOR PRODUCING THE POLYSTYRENIC STRETCHED FILM

Keisuke Funaki, and Takaaki Uchida, both of Ichihara, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

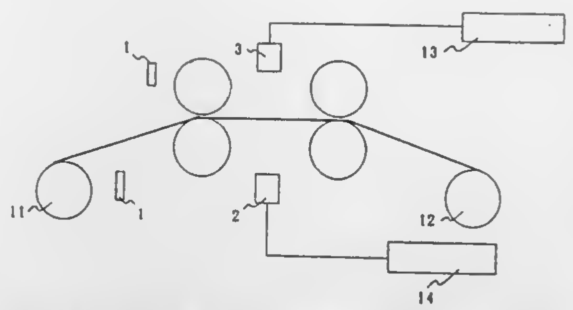
PCT No. PCT/JP95/02430, § 371 Date Jul. 16, 1996, § 102(e) Date Jul. 16, 1996, PCT Pub. No. WO96/17005, PCT Pub. Date Jun. 6, 1996

PCT Filed Nov. 29, 1995, Ser. No. 669,387

Claims priority, application Japan, Dec. 2, 1994, 6-299254

Int. Cl.^{6} B29C *55/12;71/02;* B29L *7/00;* B29K *25/00*

U.S. Cl. 428—521 **4 Claims**



1. A polystyrenic stretched film which comprises a styrenic resin composition containing 70 to 100% by weight of a styrenic polymer having a syndiotacticity such that a proportion of racemic pentad is at least 30%, has a crystallinity of 35% or more, and contains 200 ppm or less of residual monomers and 1000 or less particles of foreign substances having a size of 9 μm or larger and not larger than 10 μm in 1 cm^3.

3. A process for producing a polystyrenic stretched film which comprises extruding a styrenic resin composition containing 70 to 100% by weight of a styrenic polymer having a syndiotacticity such that a proportion of racemic pentad is at least 30%, at 330° C. or lower in 60 minutes or less in combination with melt filtration of the styrenic resin composition to reduce to 1000 or less the number of particles of foreign substances having a size of 9 μm or larger and not larger than 10 μm in 1 cm^3, cooling the extruded styrenic resin composition, biaxially stretching the cooled styrenic resin composition, and heat treating the biaxially stretched styrenic resin composition under the condition that the degree of heat treatment A expressed by the following equation (I) is in the range of 0.1 to 500:

$$A=\Sigma[T\times t/d^2] \tag{I}$$

wherein T represents temperature of the heat treatment (K), t represents time of the heat treatment (second), and d represents thickness of the film (μm).

5,837,385

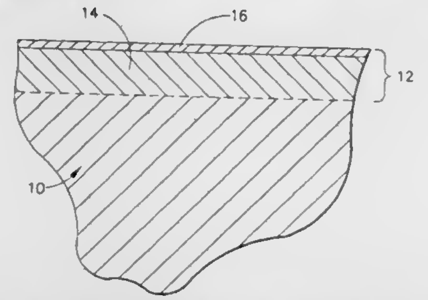
ENVIRONMENTAL COATING FOR NICKEL ALUMINIDE COMPONENTS AND A METHOD THEREFOR

Jon C. Schaeffer, Milford, and David F. Lahrman, Powell, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Mar. 31, 1997, Ser. No. 829,295

Int. Cl.^{6} B32B *15/04;* F01D *5/28;* C23C *10/28;10/60*

U.S. Cl. 428—610 **17 Claims**



1. A component having at least a body portion that consists essentially of nickel aluminide, the body portion having an environmental coating protecting a surface thereof, the environmental coating consisting of:

a metal diffused into the surface of the body portion so as to form a diffusion region starting at the surface of the body portion and extending into the body portion, the metal being at least one element chosen from the group consisting of noble metals, chromium, and MCr alloys where M is nickel, cobalt and/or iron, the diffusion region containing nickel aluminide and at least one intermetallic chosen from the group consisting of noble metal-aluminides and chromium-aluminides; and

an aluminum oxide layer on and contacting the surface of the body portion.

5,837,386

MULTILAYER FILM MATERIALS SYSTEM

Joseph Miller; Derek P. A. Pearson, both of Reading, and Philip G. Pitcher, Alton, all of United Kingdom, assignors to Johnson Matthey Public Limited Company, London, United Kingdom

Continuation of Ser. No. 554,926, Nov. 9, 1995, abandoned, which is a continuation of Ser. No. 304,592, Sep. 12, 1994, abandoned, which is a continuation of Ser. No. 996,685, Dec. 24, 1992, abandoned. This application Jan. 14, 1997, Ser. No. 782,242

Claims priority, application United Kingdom, Dec. 27, 1991, 9127439; Apr. 13, 1992, 9208118

Int. Cl.^{6} B32B *15/04;* G11B *13/04*

U.S. Cl. 428—623 **12 Claims**

1. A sputtered Pt/Co multilayer film materials system having a polar Kerr rotation of 0.1 or more, a square polar Kerr hysteresis loop, and a room temperature coercivity in excess of 2000 Oe up to 7.31 kOe, comprising a substrate material, a metal interlayer of Pt of as-deposited thickness up to 16 Å, and an alternating Pt-Co multilayer.

5,837,387

TWO-PHASE (TIAL+TICRAL) COATING ALLOYS FOR TITANIUM ALUMNIDES

Michael P. Brady, Cleveland; James L. Smialek, Strongesville, and William J. Brindley, North Royalton, all of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 3, 1996, Ser. No. 675,126

Int. Cl.^{6} B32B *15/04;* C22C *21/00;30/00;14/00*

U.S. Cl. 428—650 **11 Claims**

4. A coating for a substrate, said coating consisting essentially of titanium, aluminum, and chromium in the following approximate atomic ratio:

Ti(41.5–34.5)Al(49–53)Cr(9.5–12.5), wherein said coating is a gamma based, gamma+ Laves coating having a volume fraction of TiAl (gamma) phase greater than 0.50 and a volume fraction of Ti-Cr-Al (Laves) phase less than 0.50.

5,837,388

ALUMINUM ALLOY SOLDER MATERIAL, ITS MANUFACTURING METHOD, BRAZING SHEET USING THIS MATERIAL, AND METHOD OF MANUFACTURING ALUMINUM ALLOY HEAT EXCHANGER USING THIS SHEET

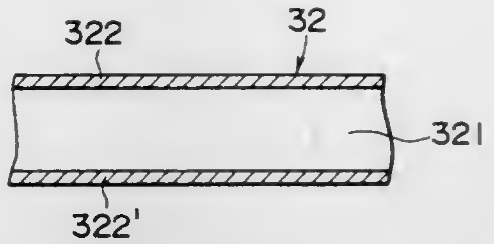
Takeyoshi Doko, and Koji Okada, both of Tokyo, Japan, assignors to The Furukawa Electric Co., Ltd., Japan

Filed Aug. 5, 1996, Ser. No. 692,441

Claims priority, application Japan, Aug. 7, 1995, 7-201177; Jan. 18, 1996, 8-006240; Apr. 18, 1996, 8-096937

Int. Cl.^{6} C22C *21/12;21/02;* B32B *15/10*

U.S. Cl. 428—654 **7 Claims**



3. A brazing sheet for a fin of a heat exchanger, comprising:

a core sheet made of an Al-Si-Fe or Al-Si-Fe-Cu-Mn alloy and having a pair of opposing surfaces;

a layer of an Al alloy solder clad on both of said opposing surfaces of said core sheet, said Al alloy solder having a composition comprising:

>7.0 to 12.0 weight % Si;
>0.4 to 8.0 weight % Cu;
>0.5 to 6.0 weight % Zn;
>0.05 to 1.2 weight % Mn;
>0.05 to 0.5 weight % Fe;
0.0 to 0.3 weight % In;
0.0 to 0.3 weight % Sn; and

wherein the balance is Al and inevitable impurities.

5,837,389

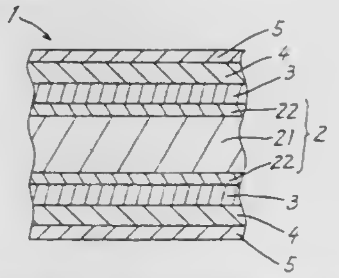
METAL THIN FILM MAGNETIC RECORDING MEDIUM HAVING A CR TA CU UNDERLAYER AND A COPT MAGNETIC LAYER

Yoshinobu Okumura, Takarazuka, and Tadashi Akita, Ibaraki, both of Japan, assignors to StorMedia Incorporated, Santa Clara, Calif.

Filed Apr. 25, 1997, Ser. No. 847,467

Int. Cl.^{6} G11B *05/66*

U.S. Cl. 428—667 **1 Claim**



1. A metal thin film recording medium comprising a ground layer, a magnetic layer of Pt-containing Co alloy and a protective film successively formed in superposed layers over a nonmagnetic medium base plate, the magnetic recording medium being characterized in that the ground layer has a composition comprising, as expressed in atomic %, 1 to 6% of Ta, 1 to 6% of Cu and the balance substantially Cr.

5,837,390

METAL COMPLEX, METHOD FOR PRODUCING THE SAME AND OPTICAL DEVICE

Noriyuki Kishii, Kanagawa; Yasunori Kijima, Tokyo; Masafumi Ata, Kanagawa; Nobutoshi Asai, Kanagawa, and Andrew Hudson, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 1, 1996, Ser. No. 641,493

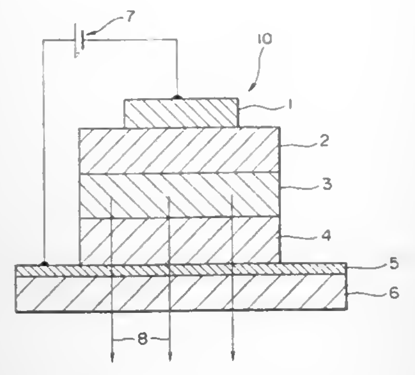
Claims priority, application Japan, May 10, 1995, 7-137306; May 10, 1995, 7-137307; May 12, 1995, 7-138618

Int. Cl.^{6} B32B *4/00*

U.S. Cl. 428—690 **26 Claims**

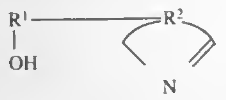
1. A bi-nuclear metal complex comprising:

a bi-nuclear metal complex having the formula:

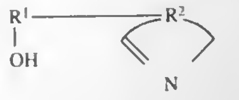


$$M_2(L^1\text{-}O)_m(L^2\text{-}O)_n(L^3\text{-}O)_{3\text{-}m\text{-}n}Xp, \qquad (I)$$

wherein M is a metal selected from the group consisting of Be, Mg, Ca, Sr, Ba, Ra, Zn, Cd and Hg; X is a halogen or an anion capable of pairing with an alkoxyl group or a phenoxyl group, m and n are, independently, integers of from 0 to 3, p is an integer of from 0 to 4; L^1, L^2 and L^3 are ligands individually different from each other and each is a ligand derived from a compound having a hydroxyl group and an aromatic nitrogen atom within the compound represented by the formulas:



OR



wherein R^1 and R^2 are independently a group or an atomic group; R^1 may form a ring in cooperation with an atom adjacent to the aromatic nitrogen atom and/or a part of R^2; and R^2 together with the aromatic nitrogen atom and/or an atom adjacent to the nitrogen atom forms a ring.

5,837,391

ORGANIC ELECTROLUMINESCENT ELEMENT HAVING ELECTRODE BETWEEN TWO FLUORESCENT MEDIA FOR INJECTING CARRIER THEREINTO

Koji Utsugi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 16, 1997, Ser. No. 784,791

Claims priority, application Japan, Jan. 17, 1996, 8-005493

Int. Cl.^{6} H05B *33/14*

U.S. Cl. 428—690 **18 Claims**

1. An organic electroluminescent element comprising:

a multi-layer structure having a plurality of thin films which form a plurality of boundaries therebetween, said plurality of thin films including

a first organic luminescent layer for emitting light in a first color,

a second organic luminescent layer for emitting light in a second color different from said first color,

a third organic luminescent layer for emitting light in a third color different from said first and second colors; and

a plurality of electrodes selectively connected to a first source of power voltage and a second source of power voltage different in potential level from said first source of power voltage for applying potentials to said first, second and third organic luminescent layers, and including at least one electrode provided at one of said plurality of boundaries for injecting first electric charges into two of said first, second and third organic luminescent layers and other electrodes injecting second electric charges opposite in polarity to said first electric charges into said two of said first, second and third organic luminescent layers.

5,837,392

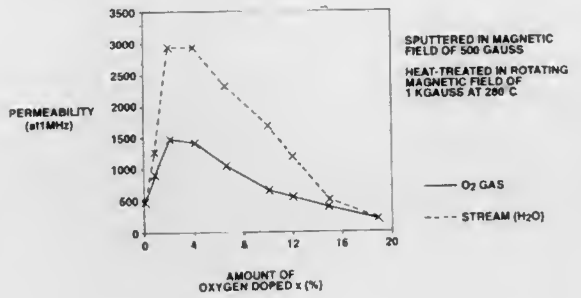
SOFT MAGNETIC THIN FILM AND THIN FILM MAGNETIC HEAD USING SAME

Kenji Katori; Hiroyuki Ohmori; Mitsuharu Shouji, all of Kanagawa, and Hiroshi Onuma, Miyagi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 7, 1996, Ser. No. 745,180

Int. Cl.^{6} G11B *5/66*

U.S. Cl. 428—692 **7 Claims**



1. A soft magnetic thin film comprising a soft magnetic thin film selected from the group consisting of:

$(Fe_{96}Al_{1.1}V_{0.4}Nb_{0.4}Ru_{1.6}\,Cu_{0.5})_{94}N_4O_2$;

$(Fe_{96.6}Al_{1.1}V_{0.4}Nb_{0.4}\,Ru_{1.6})_{94}N_4O_2$;

$(Fe_{97.6}Al_{1.1}V_{0.4}Nb_{0.4}\,Cu_{0.5})_{94}N_4O_2$; and

$(Fe_{98.1}Al_{1.1}V_{0.4}Nb_{0.4})_{94}N_4O_2$;

said soft magnetic thin film being prepared by a reaction sputtering in which nitrogen and steam (H_2O) are introduced.

5,837,393

FUEL BATTERY SYSTEM

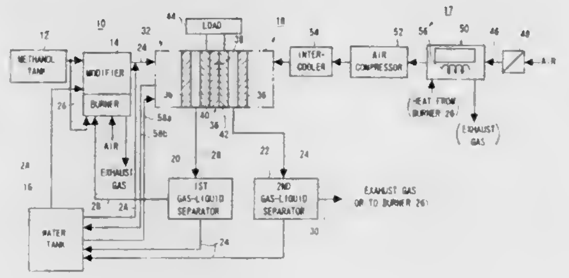
Takafumi Okamoto, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 30, 1996, Ser. No. 704,018

Claims priority, application Japan, Aug. 30, 1995, 7-221898

Int. Cl.^{6} H07M *8/06*

U.S. Cl. 429—20 **19 Claims**



1. A fuel cell system comprising:

a fuel cell assembly including a plurality of stacked fuel cells each having an anode, a cathode, and a solid polymer electrolyte membrane sandwiched between said anode and said cathode;

a fuel gas supply for supplying a fuel gas to the anode of each of the fuel cells through a first passage;

an oxygen-containing gas supply for supplying an oxidizing gas to the cathode of each of the fuel cells through a second passage, said second passage having an air inlet at one end thereof and being connected to a cathode side of said fuel cell at the other end thereof; and

a catalytic converter disposed in said second passage between said air inlet and said fuel cell for selectively oxidizing carbon monoxide contained in air introduced into said second passage through said air inlet.

5,837,394

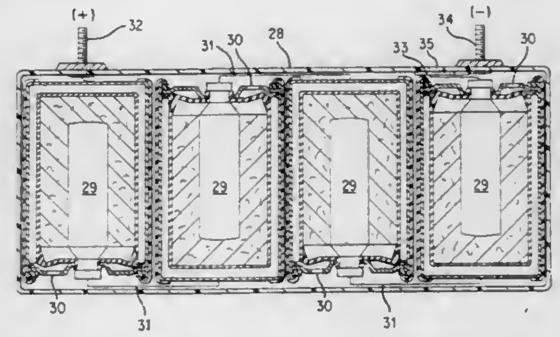
ELECTRIC APPLIANCE AND FLUID DEPOLARIZED CELL WITH LOW PARASITIC USAGE MICROACTUATED VALVE

Brooke Schumm, Jr., 31220 Lake Rd., Bay Village, Ohio 44140, assignor to Brooke Schumm, Jr.; Elizabeth Schumm; Brooke Schumm, III, and Kari J. Schumm, all of Bay Village, Ohio

Continuation-in-part of Ser. No. 440,079, May 12, 1995, Pat. No. 5,541,016, which is a continuation-in-part of Ser. No. 183,651, Jan. 19, 1994, Pat. No. 5,449,569, which is a continuation-in-part of Ser. No. 886,513, May 20, 1992, Pat. No. 5,304,431. This application Jul. 29, 1996, Ser. No. 681,764

Int. Cl.^{6} H01M *2/12;12/06*

U.S. Cl. 429—27 **60 Claims**



1. An improved electrical appliance powered by a fluid depolarized electrochemical battery having at least one cell, the improvement comprising:

said electrical appliance having a case;

said battery having an aperture;

said aperture being the sole means of admission of fluid to the interior of said battery;

said case being juxtaposed sealingly to said aperture;

said battery being insertable to said electrical appliance;

said electrical appliance further having a microactuator valve system disposed on said case to occlude admission of fluid to the interior of said battery when said appliance is not operating and to admit fluid to the interior of said battery when said appliance is operating.

5,837,395

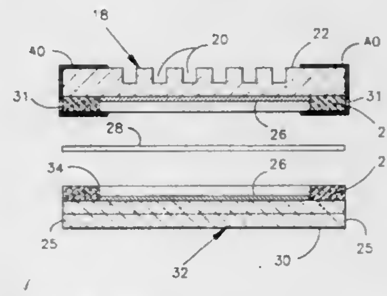
CORROSION RESISTANT FUEL CELL ASSEMBLY

Richard D. Breault, Coventry; Robert R. Fredley, and Glenn W. Scheffler, both of Tolland, all of Conn., assignors to International Fuel Cells, South Windsor, Conn.

Filed Dec. 21, 1995, Ser. No. 576,606

Int. Cl.^{6} H01M *2/08*

U.S. Cl. 429—35 **5 Claims**



1. A fuel cell comprising:

a. an electrolyte, said electrolyte having an electrolyte edge region;

b. a porous anode and a porous cathode electrode each having a substrate positioned on opposite sides of said electrolyte;

c. wherein said anode and said cathode substrate each have a first major surface and a second opposing major surface;

d. wherein said first major surface of both the anode and the cathode have a catalyst layer situated on said first major surface and extending over all of said surface except for respective anode and cathode edge regions;

e. wherein a fuel gas flow field is present on the second major surface of the anode and an oxidant gas flow field is present on the second major surface of the cathode and each flow field has respective flow field edge regions; and

f. an inlet and an outlet for the introduction and removal of said fuel gas and said oxidant gas into and out of their respective flow fields, wherein said field edge region of said respective flow field, electrolyte anode and cathode superjacent to said oxidant inlet and outlet are narrower than said edge regions positioned parallel to the oxidant flow path and wherein an ion impermeable layer is positioned between said narrow edge region of said anode and cathode.

5,837,396

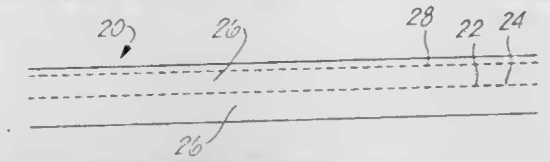
NEGATIVE ELECTRODE CONSTRUCTION FOR A SECONDARY BATTERY

Kyeng-Ho Han, Suwon, Rep. of Korea, assignor to Samsung Display Devices Co., Ltd., Kyunggi-do, Rep. of Korea

Continuation-in-part of Ser. No. 539,196, Oct. 4, 1995, abandoned. This application May 28, 1996, Ser. No. 654,373

Int. Cl.^{6} H01M *4/72;6/10*

U.S. Cl. 429—94 **9 Claims**



1. A secondary battery comprising:

a cylindrically wound laminate comprising:

a positive electrode plate, a negative electrode plate and a separator plate interposed therebetween;

a protective can for enclosing said cylindrically wound laminate; and

an electrolyte;

wherein said negative electrode plate comprises:

a perforated steel plate;

an electrolytically active substance disposed on at least one surface of the steel plate to form an active substance layer; and

a supplementary support embedded in the active substance layer to a position beneath a surface of the active layer, the supplementary support comprising a conductive network formed from a plurality of interconnecting electrically conductive members.

5,837,397

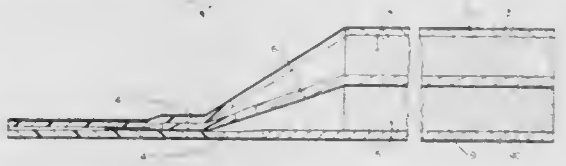
LAMINAR (FLAT OR PAPER-TYPE) LITHIUM-ION BATTERY WITH SLURRY ANODES AND SLURRY CATHODES

Xuekun Xing, Richmond Heights, Ohio, assignor to Gould Electronics Inc., Eastlake, Ohio

Filed Nov. 8, 1996, Ser. No. 747,143

Int. Cl.^{6} H01M *6/46*

U.S. Cl. 429—162 **19 Claims**



1. A lithium-ion battery comprising:

a slurry anode comprising about 55 to about 80% by weight of a carbonaceous material, about 1 to about 4% by weight of a first electrolyte salt and about 18 to about 40% by weight of a first organic solvent; and

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a slurry cathode comprising about 1 to about 5% by weight of a second electrolyte salt, about 20 to about 45% by weight of a second organic solvent, about 55 to about 80% by weight of a lithium transition metal oxide and about 1 to about 20% by weight of the lithium transition metal oxide of a conductor;

with the proviso that neither the slurry anode nor the slurry cathode contain a binder.

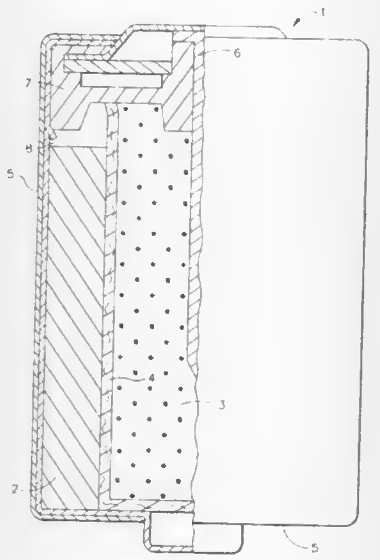
5,837,398
RADIATION CURABLE SEALING MATERIAL FOR BATTERIES

John E. Adams; Kazuhiro Hirabayashi, and Toru Takeoka, all of Cincinnati, Ohio, assignors to Three Bond Co., Ltd., Hachioji, Japan

Filed Sep. 25, 1997, Ser. No. 936,407

Int. Cl.^{6} H01M *2/08*

U.S. Cl. 429—174 **7 Claims**



1. An electrochemical cell which includes between its anode and cathode portions a seal which comprises the photoinitiated polymerization product of a sealant composition which comprises an epoxy resin capable of undergoing polymerization by internally photogenerated cationic initiation and a polyol material having a hydroxyl functionality of at least 2 and a hydroxyl equivalent weight of from about 100 to about 5,000, and wherein the epoxy resin and polyol are used in amounts such that their epoxy-polyol equivalence ratio is from about 4 to about 30, together with from about 0.1% to about 4% of a cationic photoinitiator, and from 0 to about 25% of a radiation curable monomer.

5,837,399
THROUGH-WALL ELECTRICAL TERMINAL AND ENERGY STORAGE CELL UTILIZING THE TERMINAL

Walter R. Oswald, Huntington Beach, and Robert K. Taenaka, Granada Hills, both of Calif., assignors to Hughes Electronics Corporatiun, Los Angeles, Calif.

Filed Jul. 22, 1997, Ser. No. 898,412

Int. Cl.^{6} H01M *2/30*

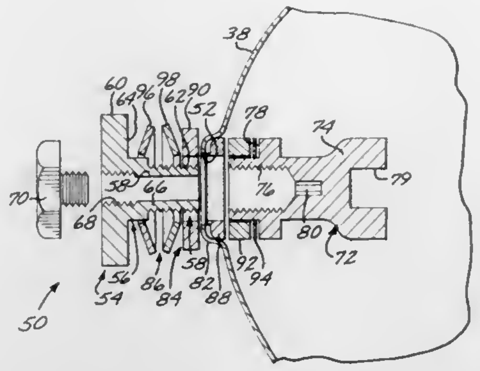
U.S. Cl. 429—178 **16 Claims**

1. An energy storage cell, comprising:

a pressure vessel having a wall with an aperture therethrough, and a vessel interior within the wall;

at least one plate set within the vessel interior, each plate set comprising a positive electrode and a negative electrode;

an internal electrical lead connected at a first end to a first one of the electrodes; and



a hermetic electrical terminal extending through the aperture in the wall of the pressure vessel, the hermetic electrical terminal comprising:

an external electrical conductor exterior to the pressure vessel,

an internal electrical conductor within the interior of the pressure vessel, the internal electrical conductor having a second end of the internal electrical lead connected thereto,

an electrically nonconductive mounting support that mounts at least one of the internal electrical conductor and the external electrical conductor to the wall of the pressure vessel and electrically insulates the internal electrical conductor and the external electrical conductor from the wall of the pressure vessel, and

means for engaging the external electrical conductor to the internal electrical conductor, the means for engaging including

a cooperative engagement having a first element on the external electrical conductor and a second element on the second electrical conductor,

a seal between the external electrical conductor and the internal electrical conductor, on the one hand, and the wall of the pressure vessel, on the other, and

means for applying a biasing force between the seal and at least one of the external electrical conductor and the internal electrical conductor.

5,837,400
IONICALLY CONDUCTIVE MATERIALS INCLUDING BIS(PHENYLSULPHONYL) IMIDES

Paul Baudry, Avon; Hervé Majestre, Quimper; Léonard Reibel, Hoenheim, and Sami Bayoud, Strasbourg, all of France, assignors to Electricite de France-Service National, Paris, France

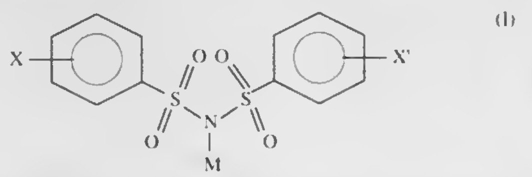
Filed Dec. 12, 1996, Ser. No. 764,031

Claims priority, application France, Dec. 14, 1995, 95 14 870

Int. Cl.^{6} H01M *6/18;10/40;6/16*

U.S. Cl. 429—192 **26 Claims**

1. Ionically conductive material comprising at least one compound of formula (1):



(1)

in which X and X' are identical or different and denote at least one electrophilic group in an ortho, meta and/or para position and M denotes an alkali or alkaline-earth metal,

in solution in a solid solvent consisting of a macromolecular material made up, at least partially, of a polymer in which the monomer units contain at least one heteroatom, selected from the group consisting of oxygen and nitrogen, capable of forming donor-acceptor bonds with the at least one compound of formula (1).

5,837,401
ADDITIVES FOR LUBRICATING AGENTS USED IN THE LAMINATION OF LITHIUM SHEETS INTO THIN FILMS

Michel Gauthier, La Prairie; Patrick Bouchard, Fleurimont; Paul-Emile Guerin, Cap-De-La-Madeleine, all of Canada, and Michel Armand, St-Martin D'Uriage, France, assignors to Hydro-Quebec, Montreal, Canada

Filed Jul. 12, 1994, Ser. No. 273,756

Int. Cl.^{6} H01M *4/02;6/00;* **B32B** *15/04;15/08*

U.S. Cl. 429—212 **2 Claims**

1. A sheet of an alkaline metal or an alloy thereof having a layer of non-volatile additive thereon, essentially constituting a lubricating agent therefor, said sheet to be used in an electrochemical cell operating with a polymer electrolyte while said layer remains between said sheet and said polymer electrolyte, wherein said additive has the formula:

$$CH_3-(CH_2)_{16}-COO-(CH_2-CH_2-O)_n-OOC(CH_2)_{16}-CH_3$$

wherein n ranges from 3–100.

5,837,402
ZINC POWDERS FOR USE IN BATTERIES AND A SECONDARY ALKALINE ZINC BATTERY USING SAID ZINC POWDERS

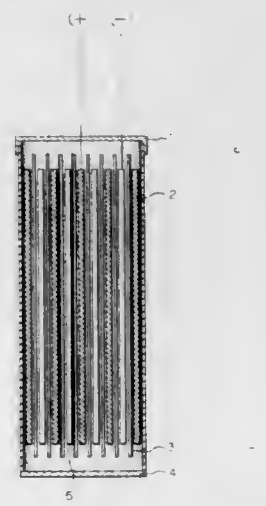
Kiyoshi Araki; Masamitsu Kaga; Toshiya Kitamura; Makiko Yanagisawa, and Fumihiro Sato, all of Tokyo, Japan, assignors to Dowa Mining Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1996, Ser. No. 769,768

Claims priority, application Japan, Dec. 21, 1995, 7-349701; Nov. 13, 1996, 8-316944; Dec. 3, 1996, 8-337645

Int. Cl.^{6} H01M *4/42*

U.S. Cl. 429—229 **16 Claims**



1. A zinc powder for use in batteries which comprises zinc particles having surfaces and which have a part or all of the particle surfaces coated either with indium and copper, or with copper, or with silver.

5,837,403
PHOTOMASK FOR REMOVING THE NOTCHING PHENOMENON

Joon Hwang, Kyoungkido, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyoungkido, Rep. of Korea

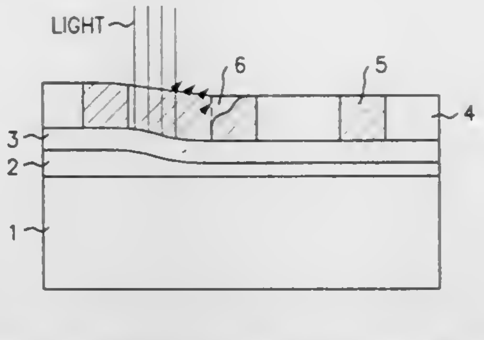
Filed Apr. 2, 1997, Ser. No. 832,348

Claims priority, application Rep. of Korea, Jun. 25, 1996, 1996-23656

Int. Cl.^{6} G03F *9/00*

U.S. Cl. 430—5 **5 Claims**

1. A photomask used in forming photoresist patterns in a semiconductor device, wherein said semiconductor device includes a



metal layer having an inclined portion by a topology of underlayers, said photomask comprising:

a transparent substrate;

main patterns formed on said transparent substrate, which are used in forming the photoresist patterns on said metal layer; and

dummy patterns formed in said transparent substrate, wherein said dummy patterns are positioned on an area between the main patterns and corresponding to said inclined portion, and wherein said dummy patterns are determined to leave no corresponding photoresist pattern on said metal layer and to remove the notching phenomenon occurring on the photoresist pattern by decreasing the intensity of a light passing through the photomask.

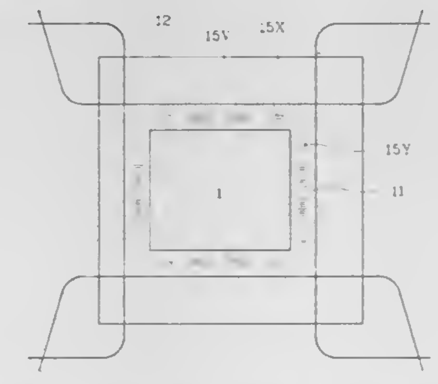
5,837,404
FABRICATION OF ZERO LAYER MASK

Bing-Yau Lu, Taipei, Taiwan, assignor to Holtek Microelectronics, Inc., Hsinchu, Taiwan

Filed Jan. 4, 1997, Ser. No. 792,749

Int. Cl.^{6} G03F *9/00*

U.S. Cl. 430—5 **4 Claims**



1. A method of fabricating a universal zero layer photomask of an integrated circuit, said method comprising the steps of:

(a) obtaining a transparent photomask having a plurality of corners, each corner being formed by two intersecting edges;

(b) forming a collection of opaque regions comprising an integrated circuit layout, a pair of alignment marks and at least a vernier key on said transparent photomask;

(c) wherein said alignment marks and vernier keys are arranged in such a manner that they are clustered around one of said corners, with said alignment marks being respectively disposed on said intersecting edges that form said corner and said vernier key being disposed on one of said intersecting edges;

(d) further wherein said alignment marks and said vernier key are disposed at a predetermined distance away from said integrated circuit layout so as to allow said photomask, which contains said alignment marks and said vernier key clustered around one corner, to serve as a universal zero layer photomask.

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5,837,405

RETICLE

Yoko Tomofuji; Makoto Nakase, both of Tokyo, Japan; Takashi Sato, Fishkill, N.Y.; Hiroaki Hazama, Kanagawa, Japan; Haruki Komano, Kanagawa, Japan, and Shinichi Ito, Kanagawa, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 726,756, Oct. 7, 1996, abandoned, which is a division of Ser. No. 453,465, May 30, 1995, Pat. No. 5,589,305, which is a division of Ser. No. 192,091, Feb. 4, 1994, abandoned, which is a continuation-in-part of Ser. No. 798,721, Nov. 29, 1991, abandoned. This application Oct. 27, 1997, Ser. No. 958,869

Claims priority, application Japan, Nov. 29, 1990, 2-331308; Jul. 3, 1991, 3-163131; Nov. 11, 1991, 3-294540; Nov. 13, 1991, 3-297461

Int. Cl.^{6} G03F *9/00*

U.S. Cl. 430—5 **12 Claims**

1. A reticle for fabrication of semiconductor circuits by a photolithography technique using a light beam having a predetermined wavelength (λ) and numerical aperture (NA), wherein the light beam passes through the reticle, the reticle comprising:

a light-transmissible substrate; and

a mask pattern disposed on the light-transmissible substrate and having at least one pattern width,

wherein the mask pattern includes a semi-transparent film for causing the light beam passing therethrough to be phase-shifted by about 180 degrees from the light beam passing through the light-transmissible substrate,

wherein an amplitude transmissivity ratio of the semi-transparent film is a value determined according to the pattern width and is less than or equal to about 50% when the pattern width divided by a quotient λ/NA is equal to or less than 0.61 so that lithographic light passed through the semi-transparent film pattern is phase-shifted by 180 degrees and then added to the lithographic light slightly passed through the semi-transparent film pattern, whereby light intensity is sharpened at pattern boundaries, and

wherein the mask pattern is formed by determining ranges of refractive index and extinction coefficient of the semi-transparent film within which amplitude transmissivity ratio and a phase difference about 180 degrees between the semi-transparent film and air that has the same thickness of the semi-transparent film fall within ranges necessary to obtain desired resolution and depth of focus, obtaining relationship in the form of a curved line between the refractive index and the extinction coefficient by changing conditions for formation of the mask pattern, selecting values of the refractive index and the extinction coefficient from the ranges thus determined, and determining the conditions for formation of the mask pattern such that the refractive index and the extinction coefficient become the selected values, and forming a mask film pattern based on the conditions for formation of the mask pattern.

5,837,406

TONER IMAGE RESISTANT TO SCRATCHING

Serge Tavernier, Lint; Stefaan De Meutter, Antwerp, and Danny Van Wunsel, Nijlen, all of Belgium, assignors to AGFA-Gevaert, N.V., Mortsel, Belgium

Filed May 21, 1997, Ser. No. 859,721

Claims priority, application European Pat. Off., May 21, 1996, 96201373

Int. Cl.^{6} G03G *13/20*

U.S. Cl. 430—12 **20 Claims**

1. A toner image fixed on a final substrate comprising a plurality of different types of fused toner particles and on top thereof a non-imagewise applied layer of an abhesive compound, said abhesive compound being present in an amount between 3.0 mg/m^2 and 300 mg/m2 and having a viscosity at 25° C. between 50 and 50,000 mPas wherein at least one of said different types of toner particles comprises a toner resin containing reactive groups (A) and said abhesive compound comprises reactive groups (B), reactive groups A and B being chosen such that groups A and B will react together forming a chemical bond between said fused toner particles and said abhesive compound.

5,837,407

METHOD FOR MAKING A SCREEN PANEL FOR A COLOR CRT

Jong-ho Cho, Kyungki-do, and Choong-lak Kim, Daejeon-si, both of Rep. of Korea, assignors to Samsung Display Devices Co., Ltd., Kyungki-do, Rep. of Korea

Filed Feb. 12, 1997, Ser. No. 797,970

Claims priority, application Rep. of Korea, Nov. 25, 1996, 96-57051

Int. Cl.^{6} G03C *5/00;* **G03G** *13/00*

U.S. Cl. 430—25 **5 Claims**

1. A method for making a screen panel for a color cathode ray tube the screen panel having an organic conductive layer and an organic photoconductive layer, the method comprising the steps of:

(a) depositing a conductive black matrix on the photoconductive layer

(b) electrostatically charging the photoconductive layer to a potential;

(c) exposing a portion of the charged photoconductive layer to light in a predetermined pattern so that the potential remains on an unexposed area of the photoconductive layer;

(d) applying a potential to the black matrix, said black matrix potential being lower than the remaining potential on the photoconductive layer; and

(e) contacting a phosphor material having a same polarity as the remaining potential on the photoconductive layer so that the phosphor material is deposited on the photoconductive layer by repulsive force of the black matrix potential and the remaining potential on the photoconductive layer.

5,837,408

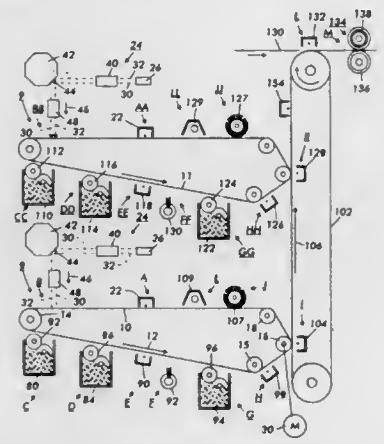
XEROCOLOGRAPHY TANDEM ARCHITECTURES FOR HIGH SPEED COLOR PRINTING

Delmer G. Parker, Rochester, N.Y., and Gregory J. Kovacs, Ontario, Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 20, 1997, Ser. No. 915,403

Int. Cl.^{6} G03G *13/01*

U.S. Cl. 430—42 **20 Claims**



1. A method of creating process color images in a single pass using dot next to dot imaging devices in tandem, said method including the steps of:

uniformly charging a charge retentive structure of a first tandem imaging device to a predetermined voltage level;

using a single exposure device operating at two different wavelengths, creating trilevel latent electrostatic images comprising CAD and DAD images at two different voltage levels, background areas at a third voltage level and a virtual image at said background voltage level;

developing said CAD and DAD images of said first tandem engine with two different color inks;

conditioning said charge retentive member of said first tandem engine for converting said virtual image to a DAD image;

developing said image formed by said step of conditioning of said first tandem engine with an ink of a different color from said two different color inks;

transferring said developed images of said first tandem engine to an intermediate support member;

uniformly charging a charge retentive structure of a second tandem imaging device to a predetermined voltage level;

using a single exposure device operating at two different wavelengths, creating trilevel latent electrostatic images comprising CAD and DAD images at two different voltage levels, background areas at a third voltage level and a virtual image at said background voltage level;

developing said CAD and DAD images of said second tandem engine with two different color inks from said two different color inks;

conditioning said charge retentive member of said second tandem engine for converting said virtual image to a DAD image;

developing said image formed by said step of conditioning said charge retentive surface of said second tandem engine;

transferring said developed images of said second tandem engine to said intermediate support member to yield process color images with the images transferred from the first tandem engine;

at least one of said steps of developing images using said second tandem engine being effected using a color ink which is the same as one of the color inks used in developing images using said first tandem engine.

5,837,409

COLORED TONER AND DEVELOPER COMPOSITIONS AND PROCESS FOR ENLARGED COLOR GAMUT

Jacques C. Bertrand, Ontario, Canada; Roger N. Ciccarelli, Rochester, N.Y.; Edul N. Dalal, Webster, N.Y.; Sue E. Blaszak, Penfield, N.Y.; Kristen M. Natale-Hoffman, Rochester, N.Y., and Thomas R. Pickering, Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 729,224, Oct. 9, 1996, Pat. No. 5,723,245. This application Nov. 19, 1997, Ser. No. 974,661

Int. Cl.^{6} G03G *13/01;15/01*

U.S. Cl. 430—45 **6 Claims**

1. An imaging process which comprises the generation of an electrostatic image on a photoconductive imaging member, followed by the development thereof with a combination, set, or gamut of toners, and wherein six unmixed toners are selected, and which toners are comprised of a cyan toner, a magenta toner, a yellow toner, an orange toner, a green toner, and a black toner, each of said toners being comprised of resin and pigment, and wherein the pigment for the orange toner is Orange 5, C.I. number 12075, Orange 13, C.I. number 21110, Orange 16, C.I. number 21160, or Orange 34, C.I. number 21115, the pigment for the green toner is Green 7, C.I. number 74260, or Green 36, C.I. number 74265, and the pigment for the black toner is carbon black; thereafter transferring the developed images to a substrate, and fixing the images thereto.

5,837,410

PHOTOCONDUCTOR FOR ELECTROPHOTOGRAPHY

Yoichi Nakamura, and Shinichiro Nishimaki, both of Nagano, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Sep. 19, 1996, Ser. No. 715,850

Claims priority, application Japan, Sep. 20, 1995, 7-241173

Int. Cl.^{6} G03G *5/06;5/14*

U.S. Cl. 430—58 **9 Claims**

1. A photoconductor apparatus comprising:

a conductive substrate;

an organic film on said conductive substrate;

said organic film having a photoconductive layer, said photoconductive layer including an organic photoconductive material; and

said photoconductor being exposed to an atmosphere of a controlled temperature and humidity effective to regulate a final water content of said organic film, said final water content being from about 0.02 to about 5.0 weight percent with respect to a total weight of said organic film.

5,837,411

PHTHALOCYANINE ELECTROPHOTOGRAPHIC PHOTORECEPTOR FOR CHARGE GENERATION LAYER

Yoshii Morishita; Megumi Matsui, both of Ibaraki-ken; Shigeru Hayashida, Hitachi; Takayuki Akimoto, Tsukuba, and Mikio Itagaki, Hitachi, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Dec. 6, 1996, Ser. No. 761,348

Claims priority, application Japan, Dec. 6, 1995, 7-317886

Int. Cl.^{6} G03G *5/06*

U.S. Cl. 430—59 **13 Claims**

1. An electrophotographic photoreceptor having a photoconductive layer containing an organic photoconductive substance on a conductive substrate, in which the organic photoconductive substance is a phthalocyanine composition having clear diffraction peaks at 17.9°, 24.0°, 26.2° and 27.2° of Bragg angles ($2\theta \pm 0.2°$) in an X-ray diffraction spectrum with Cu Kα.

5,837,412

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER, AND PROCESS CARTRIDGE AND ELECTROPHOTOGRAPHIC APPARATUS UTILIZING THE SAME

Koichi Suzuki, Shizuoka-ken; Toshihiro Kikuchi; Kazushige Nakamura, both of Yokohama; Tetsuro Kanemaru, Tokyo, and Kouichi Nakata, Numazu, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

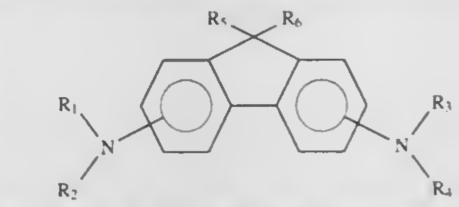
Filed Aug. 7, 1997, Ser. No. 908,377

Claims priority, application Japan, Aug. 8, 1996, 8-209502

Int. Cl.^{6} G03G *5/047*

U.S. Cl. 430—59 **9 Claims**

1. An electrophotographic photosensitive member comprising a support and a photosensitive layer provided thereon, wherein said photosensitive layer contains a hindered phenol compound and a fluorene compound represented by the following formula (1):



(1)

wherein R_1, R_2, R_3 and R_4 are each independently substituted or unsubstituted aryl, and R_5 and R_6 are each independently hydrogen, substituted or unsubstituted alkyl, substituted or unsubstituted aryl, or substituted or unsubstituted aralkyl.

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5,837,413
ELECTROPHOTOGRAPHIC TONER, AND DEVELOPER

Yoshio Yada, and Naoki Ito, both of Akita, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Nov. 21, 1997, Ser. No. 975,460

Claims priority, application Japan, Nov. 29, 1996, 8-334758; Nov. 29, 1996, 8-334759

Int. Cl.^{6} G03G *9/083*

U.S. Cl. 430—106.6 **9 Claims**

1. A magnetic toner for electrophotography comprising a toner particle containing at least a binder resin and a magnetic powder, and an additive, wherein:

said additive comprises an ultrafine particle form of titanium oxide treated on a surface thereof with an aluminum compound of a fatty acid to make said surface hydrophobic, and a hydrophobic silica, and

said ultrafine particle form of titanium oxide has a specific surface area of 80 to 120 m^2/g, a degree of hydrophobicity of 50 to 80% by weight, and an alumina content of 0.4 to 1.1% by weight.

5,837,414
TONER FOR DEVELOPING ELECTROSTATIC IMAGE AND METHOD FOR FORMING MULTICOLOR IMAGE

Ryuji Kitani; Meizo Shirose; Tatsuya Nagase, and Shoichiro Ishibashi, all of Hachioji, Japan, assignors to Konica Corporation

Filed May 27, 1997, Ser. No. 863,332

Claims priority, application Japan, May 29, 1996, 8-135013

Int. Cl.^{6} G03G *9/08*

U.S. Cl. 430—107 **19 Claims**

1. A toner for developing an electrostatic latent image, comprising colored particles containing a colorant and a binder resin, and fine particles, wherein said toner have a releasing index of 10 to 50 in terms of a turbidity.

5,837,415
ELECTROPHOTOGRAPHIC TONER

Tsuyoshi Uchida, Hachioji, Japan, assignor to Konica Corporation, Japan

Filed Apr. 18, 1997, Ser. No. 844,160

Claims priority, application Japan, Apr. 24, 1996, 8-102626

Int. Cl.^{6} G03G *13/20;9/08*

U.S. Cl. 430—109 **7 Claims**

1. An electrophotographic toner comprising

a lower molecular weight component resin A essentially consisting of a styrene monomer unit of not less than 90% by weight of a styrene monomer unit and an acrylic acid or methacrylic acid monomer unit,

a medium molecular weight component resin B comprising not more than 90% by weight of a styrene monomer unit, and an acrylic acid ester monomer unit or a methacrylic acid ester monomer unit, and an acrylic acid or a methacrylic acid monomer unit, and

a high molecular weight component resin C comprising not more than 90% by weight of a styrene monomer unit and an acrylic acid ester monomer unit or a methacrylic acid ester monomer unit,

and a glass transition point of component resin A, TgA, that of component resin B, TgB and that of component resin C, TgC, satisfy the following equations 1 and 2;

$$80° \text{ C.} \geqq TgA \geqq TgC \geqq TgB \geqq 40° \text{ C.} \tag{1}$$

$$TgA \geqq 60° \text{ C.} \tag{2}$$

5,837,416
TONER PARTICLES COMPRISING SPECIFIED POLYMERIC BEADS IN THE BULK OF THE TONER PARTICLES

Serge Tavernier, Lint; Ronny De Clercq, Aalter; Ludo Joly, Hove, and Werner Op de Beeck, Keerbergen, all of Belgium, assignors to AGFA-Gevaert, N.V., Mortsel, Belgium

Filed Jun. 5, 1997, Ser. No. 870,422

Claims priority, application European Pat. Off., Jun. 6, 1996, 96201584

Int. Cl.^{6} G03G *9/097;13/20*

U.S. Cl. 430—110 **15 Claims**

1. Toner particles, having an average volume diameter d_{vt} and comprising a binder resin with melting point TSM_t, and comprising polymeric beads incorporated in the bulk of said toner particles, wherein said polymeric beads have a melting point TSM_p in °C., such that $TSM_p \geqq TSM_t+10°$ C. and an average volume diameter d_{vp} such that $0.20 \leqq d_{vp}/d_{vt} \leqq 0.75$.

5,837,417
QUINONE DIAZIDE COMPOSITIONS CONTAINING LOW METALS P-CRESOL OLIGOMERS AND PROCESS OF PRODUCING THE COMPOSITION

M. Dalil Rahman; Dinesh N. Khanna, both of Flemington; Daniel Aubin, Oxford, all of N.J., and Douglas McKenzie, Easton, Pa., assignors to Clariant Finance (BVI) Limited, United Kingdom

Filed Dec. 30, 1994, Ser. No. 366,635

Int. Cl.^{6} G03F *7/023*

U.S. Cl. 430—169 **9 Claims**

1. A method for producing a positive photoresist composition comprising:

(a) p-cresol oligmers, having a sodium ion level ≦650 ppb, an iron ion level of <20 ppb and a potassium ion level of <20 ppb, by reacting p-cresol and a formaldehyde solution in water in the presence of an acid catalyst, removing water and excess unreacted p-cresol, adding a polar organic solvent to the oligomers and filtering the solution through a filer having a pore size from 0.01 μm to 0.10 μm;

(b) preparing a photosensitive component by the esterification of from about 60 mol % to about 100 mol % of the hydroxy groups of the p-cresol oligomers of (a) by one or more diazo sulfonyl chlorides, the diazo ester moieties comprising from about 60 to about 100 mol % of 2,1,4- diazo ester and/or 2,1,5-diazo ester;

(c) providing an admixture of:

(1) said photosensitive component of (b) in an amount sufficient to uniformly photosensitize the photoresist composition,

(2) a water insoluble, aqueous alkali soluble novolak resin, this resin being present in the photoresist composition in an amount sufficient to form a substantially uniform photoresist composition, and

(3) a suitable photoresist solvent.

5,837,418
SILVER HALIDE BLACK AND WHITE PHOTOGRAPHIC LIGHT SENSITIVE MATERIAL

Takeo Arai, and Junichi Fukawa, both of Tokyo, Japan, assignors to Konica Corporation, Japan

Filed Apr. 23, 1996, Ser. No. 636,339

Claims priority, application Japan, Apr. 26, 1995, 7-125866

Int. Cl.^{6} G03C *1/06*

U.S. Cl. 430—264 **3 Claims**

1. A silver halide black-and-white photographic light sensitive material comprising a support having thereon photographic component layers including a first silver halide emulsion layer containing a first hydrazine compound and a second silver halide emulsion layer containing a second hydrazine compound, the second silver halide emulsion layer being provided farther from the support than the first silver halide emulsion layer and having sensitivity higher than that of the first silver halide emulsion layer, wherein said first and second silver halide emulsion layers each have a coating weight of silver of not less than 0.5 g/m^2 and are sensitized substantially to the same spectral region, each of said first and second hydrazine compounds being different from the other and said first hydrazine compound having an activity of development nucleation higher than that of said second hydrazine compound.

5,837,419
PHOTOSENSITIVE COMPOSITION

Toru Ushirogouchi, Yokohama; Koji Asakawa, Kawasaki; Makoto Nakase, Tokyo; Naomi Shida, Kawasaki, and Takeshi Okino, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 29, 1996, Ser. No. 705,260

Claims priority, application Japan, Aug. 31, 1995, 7-223812; Aug. 22, 1996, 8-221230

Int. Cl.^{6} G03F *7/004*

U.S. Cl. 430—270.1 **14 Claims**

1. A photosensitive composition containing an acid-decomposable resin, a photo-acid-generating agent, and a naphthol novolak resin with a molecular weight of not more than 2000.

6. A photosensitive composition comprising an alkali-soluble resin, a compound having an acid-decomposable group, and a photo-acid-generating agent, wherein said compound having an acid-decomposable group is a naphthol novolak compound with a molecular weight of not more than 2000, and wherein said alkali-soluble resin is a copolymer containing a polymerizable compound having an alicyclic skeleton as a monomer.

9. A photosensitive composition containing an alkali-soluble resin, a compound having an acid-decomposable group, a photo-acid-generating agent, and a naphthol novolak compound with a molecular weight of not more than 2000.

14. A photosensitive composition containing an alkali-soluble resin, an acid-decomposable compound, and a photo-acid-generating agent,

wherein said alkali-soluble resin is a naphthol novolak compound with a molecular weight of not more than 2000.

5,837,420
POSITIVE WORING PHOTOSENSITIVE COMPOSITION

Toshiaki Aoai; Kunihiko Kodama; Kazuya Uenishi, and Tsukasa Yamanaka, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

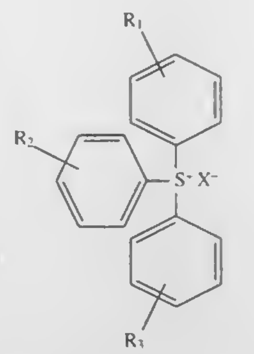
Filed Mar. 6, 1997, Ser. No. 812,165

Claims priority, application Japan, Mar. 8, 1996, 8-052006

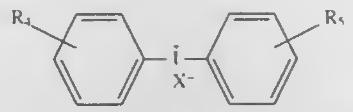
Int. Cl.^{6} G03C *1/492*

U.S. Cl. 430—270.1 **5 Claims**

5. A positive working photosensitive composition comprising (b) a compound represented by formula (I) or (II) generating a sulfonic acid by irradiation with active rays or radiant rays, (c) a low molecular weight, acid-decomposable, dissolution-inhibiting compound having a molecular weight of no greater than 3,000, having a group capable of being decomposed by an acid and increasing solubility of the resin in an alkali developer due to the action of the acid and (d) a resin which is insoluble in water but soluble in an aqueous alkali solution:



(I)



(II)

wherein R_1, R_2, R_3, R_4 and R_5 each represent a hydrogen atom, an alkyl group, a cycloalkyl group, an alkoxy group, a hydroxy group, a halogen atom or a —S—R_6 group; R_6 represents an alkyl group or an aryl group; and X^- represents a benzenesulfonic, naphthalenesulfonic or anthracenesulfonic acid anion having at least one ester group.

5,837,421
WATER-DEVELOPABLE PHOTOSENSITIVE RESIN COMPOSITION

Kazunori Kanda, Yao; Koichi Ueda, Neyagawa; Tadahiro Kakiuchi, Kawanishi; Hisaichi Muramoto, Hirakata; Kenji Yasuda, Yokkaichi; Hozumi Sato, Tsukuba; Katsuo Koshimura, and Takashi Nishioka, both of Yokkaichi, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka-fu, and Japan Synthetic Rubber Co., Ltd., Tokyo-to, both of Japan

Continuation of Ser. No. 570,632, Dec. 11, 1995, abandoned.

This application Jul. 31, 1997, Ser. No. 904,267

Claims priority, application Japan, Dec. 9, 1994, 6-306212

Int. Cl.^{6} G03C *1/725*

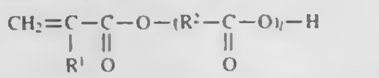
U.S. Cl. 430—281.1 **22 Claims**

1. A water-developable photosensitive resin composition comprising:

(1) granular copolymer particles produced by polymerizing a monomer mixture ((i)+(ii)+ (iii)+(iv)=100 mol %) comprising:

(i) 10 to 95 mol % of an aliphatic conjugated diene monomer,

(ii) 0.1 to 30 mol % of a monomer represented by the following general formula (1):



$$CH_2{=}\underset{\underset{R^1}{|}}{C}-\underset{\underset{O}{\|}}{C}-O-(R^2-\underset{\underset{O}{\|}}{C}-O)_l-H \tag{1}$$

in which R^1 represents a hydrogen atom or a methyl group, R^2 represents an alkylene group having a carbon number of 3 to 20, and l represents an integer of 1 to 20,

(iii) 0.1 to 20 mol % of a monomer having at least two addition-polymerizable groups, and

(iv) 0 to 70 mol % of an addition-polymerizable monomer other than (i), (ii) and (iii);

(2) a photo-polymerizable unsaturated monomer;

(3) an amino group-containing compound, and

(4) a photo-polymerization initiator.

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5,837,422
PHOTOPOLYMERIZABLE COMPOSITION AND PHOTOSENSITIVE LITHOGRAPHIC PRINTING PLATE EMPLOYING IT

Mitsuru Sasaki; Fumiyuki Matsuo, and Toshiaki Yokoo, all of Yokohama, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Filed Jul. 11, 1996, Ser. No. 678,779

Claims priority, application Japan, Jul. 25, 1995, 7-189095

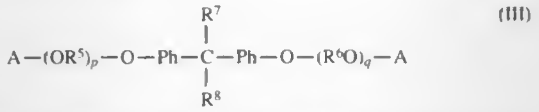
Int. Cl.^{6} G03F *7/029;7/028;7/031*

U.S. Cl. 430—284.1 **12 Claims**

1. A photosensitive lithographic printing plate having a photopolymerizable composition provided on a substrate, the photopolymerizable composition comprising addition-polymerizable ethylenically unsaturated double bond-containing compounds and a photopolymerization initiator system containing a hexaarylbiimidazole or titanocene compound, wherein as the addition-polymerizable ethylenically unsaturated double bond-containing compounds, a compound (A) having at least 2 urethane bonds and at least 6 ethylenically unsaturated double bonds, and a compound (B) having no urethane bond and at least 3 ethylenically unsaturated double bonds, are contained in a weight ratio of from 4:1 to 1:4.

10. A photosensitive lithographic printing plate comprising addition-polymerizable ethylenically unsaturated double bond-containing compounds and a photopolymerization initiator system, wherein, as the addition-polymerizable ethylenically unsaturated double bond-containing compounds, a compound (A) having at least 2 urethane bonds and at least 6 ethylenically unsaturated double bonds, a compound (B) having no urethane bond and at least 3 ethylenically unsaturated double bonds are contained in a weight ratio of from 4:1 to 1:4. and a compound (C) having no urethane bond and 2 ethylenically unsaturated double bonds, as an additional polymerizable ethylenically unsaturated double bond-containing compound, in an amount of from 10 to 70 wt % in all addition-polymerizable ethylenically unsaturated double bond-containing compounds,

wherein the compound (C) having no urethane bond and 2 ethylenically unsaturated double bonds, is a compound of the following formula (III):



$$A-(OR^5)_p-O-Ph-\overset{\displaystyle R^7}{\underset{\displaystyle R^8}{C}}-Ph-O-(R^6O)_q-A \qquad (III)$$

wherein A is an acryloyl group or a methacryloyl group, each of R^5 and R^6 is an alkylene group which is branched or is not branched, each of R^7 and R^8 is a hydrogen atom, an alkyl group which is unsubstituted or is substituted, a cycloalkyl group which is unsubstituted or is substituted, or a phenyl group which is unsubstituted or is substituted, Ph is a phenylene group, and p and q are positive integers satisfying p+q=2 to 30.

5,837,423
SEMICONDUCTOR IC DEVICE FABRICATING METHOD

Yoshihiko Okamoto, Kodaira, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 393,914, Feb. 24, 1995, Pat. No. 5,641,715. This application Feb. 24, 1997, Ser. No. 804,922

Claims priority, application Japan, Feb. 24, 1994, 6-26992; Oct. 12, 1994, 6-246596

Int. Cl.^{6} G03C *5/00*

U.S. Cl. 430—296 **22 Claims**

1. A process of forming patterns overlying a major surface of a plate member using a resist pattern as an etching mask, the resist pattern being formed by irradiating a chemical amplification electron beam resist film, overlying the major surface of the plate member, with at least one electron beam, comprising:

(a) forming a chemical amplification electron beam resist film over a first film, and coating a protective polymer film over the resist film;
(b) irradiating the resist film and protective polymer film with the at least one electron beam, forming an irradiated protective polymer film;
(c) removing the irradiated protective polymer film;
(d) after removing the irradiated protective polymer film, baking the resist film to promote a resist dissolving reaction using, as a catalyst, an acid produced in the resist film by irradiating the resist film with the at least one electron beam;
(e) developing the resist film to form the resist pattern; and
(f) etching the first film by using the resist pattern as a mask to form the patterns.

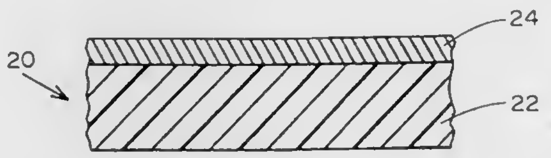
5,837,424
OPTICAL STORAGE MEDIUM AND PROCESS

Joseph Chaiken, Fayetteville, and Joseph M. Osman, Utica, both of N.Y., assignors to Syracuse University, Syracuse, N.Y.

Division of Ser. No. 481,818, Jun. 7, 1995, Pat. No. 5,691,091. This application May 1, 1997, Ser. No. 846,848

Int. Cl.^{6} G11B *7/24;7/00*

U.S. Cl. 430—270.12 **7 Claims**



3. A device which contains an optically readable image which comprises:

a. an erasable high speed, high density, storage medium which includes a transition metal oxide layer where said oxide layer is capable of undergoing an optically readable chemical change when simultaneously exposed to heat and to light of a selected wavelength; and
b. where said layer has been simultaneously exposed to heat and to radiation in the blue-green or shorter wavelength spectrum under ambient conditions which include oxygen whereby a photochemical reaction is induced which includes an exchange of oxygen resulting in the formation of an optically readable image in the exposed regions of said oxide layer.

5,837,425
METHOD OF PREPARING A LITHOGRAPHIC PRINTING PLATE USING A DEVELOPER CONTAINING A DEVELOPMENT STABILIZER

Haruo Nakanishi; Tadao Toyama, and Hiroshi Matsumoto, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara, Japan

Division of Ser. No. 567,275, Dec. 5, 1995, abandoned. This application Nov. 19, 1997, Ser. No. 974,228

Claims priority, application Japan, Dec. 6, 1994, 6-302325; Feb. 23, 1995, 7-035492

Int. Cl.^{6} G03F *7/00*

U.S. Cl. 430—302 **6 Claims**

1. A method of preparing a lithographic printing plate comprising:

A) providing a presensitized plate comprised of a support and a photosensitive layer;
B) exposing the presensitized plate to actinic radiation through an original film; and
C) developing the exposed plate with a developer containing as a development stabilizer at least one sugar in a proportion of at least 0.01 mole/l, said developer having a pH value adjusted to the range of from 11.0 to 13.5 with an alkali agent selected from the group consisting of sodium hydroxide, potassium hydroxide and lithium hydroxide.

5,837,426
PHOTOLITHOGRAPHIC PROCESS FOR MASK PROGRAMMING OF READ-ONLY MEMORY DEVICES

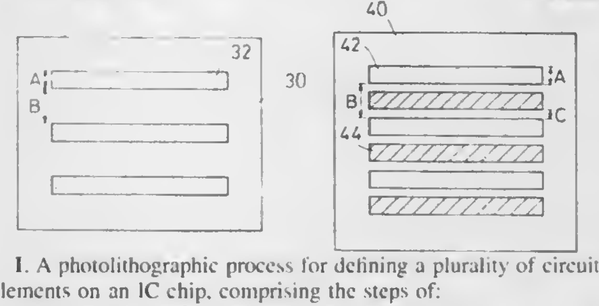
Che-Pin Tseng, Hsinchu; Wei-Jiang Lin, Yungho; Wen-Cheng Tien, Taipei, and Yun-Kuei Yang, Tai Chung, all of Taiwan, assignors to United Microelectronics Corp., Hsinchu, Taiwan

Filed Sep. 11, 1996, Ser. No. 712,406

Claims priority, application Taiwan, Jul. 29, 1996, 85109208

Int. Cl.^{6} G03F *7/20*

U.S. Cl. 430—311 **6 Claims**



1. A photolithographic process for defining a plurality of circuit elements on an IC chip, comprising the steps of:

(1) forming a photoresist layer over the IC chip:
(2) covering the photoresist layer with a first photomask, wherein the first photomask is an opaque sheet having a first plurality of transparent portions forming a pattern thereon:
(3) performing a first exposure process on the photoresist layer by illuminating the photoresist layer through the first photomask so as to expose a first selected set of areas on the photoresist layer;
(4) replacing the first photomask with a second photomask, the second photomask having a second plurality of transparent portions forming a pattern, the transparent portions arranged in positions interleaving with the first selected exposed areas on the photoresist layer such that the transparent portions and the first selected exposed areas do not overlap:
(5) performing a second exposure process on the photoresist layer by illuminating the photoresist layer through the second photomask so as to expose a second selected set of areas on the photoresist layer, wherein the first and second selected sets of exposed areas on the photoresist layer in combination form a layout for the plurality of circuit elements to be defined on the IC chip; and
(6) developing the photoresist layer.

5,837,427
METHOD FOR MANUFACTURING BUILD-UP MULTI-LAYER PRINTED CIRCUIT BOARD

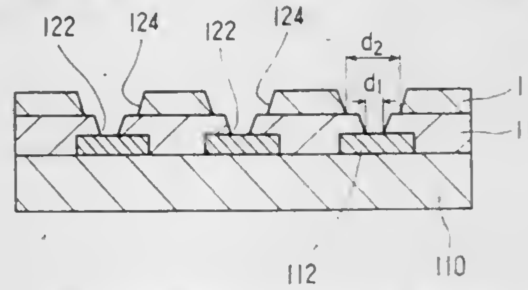
Se Meyung Hwang; Keon Yang Park, and Young Hwan Shin, all of Taejeon-si, Rep. of Korea, assignors to Samsung Electro-Mechanics Co Co., Ltd., Kyongki-do, Rep. of Korea

Filed Aug. 9, 1996, Ser. No. 693,655

Claims priority, application Rep. of Korea, Apr. 30, 1996, 1996/13843

Int. Cl.^{6} G03C *5/00;* **B05D** *5/12*

U.S. Cl. 430—312 **17 Claims**



1. A method for manufacturing a build-up multi-layer printed circuit board, comprising the steps of:

photo etching a printed circuit pattern on a copper clad substrate;
spreading a first photosensitive insulating resin layer on a face of said substrate having said pattern, pre-drying it at a temperature of 50°–130° C. for 5–45 minutes to pre-cure, spreading another first photosensitive insulating resin on another face of said substrate, pre-drying it at a temperature of 50°–130° C. for 5–45 minutes to pre-cure, attaching mask films having unexposed portions on said first photosensitive insulating resin layers which are formed on the opposite faces of said substrate, and carrying out an exposure with an energy of 50–700 mj/cm^2 and a development for 20–130 seconds, thereby forming a first photo via hole having a diameter of 0.05–0.4 mm;
spreading a second photosensitive insulating resin layer on one of said first photosensitive insulating resin layers having said photo via hole, pre-drying it at a temperature of 50°–130° C. for 5–45 minutes to pre-cure, spreading another second photosensitive insulating resin layer on the other one of said first photosensitive insulating resin layers having said photo via hole, pre-drying it at a temperature of 50°–130° C. for 5–45 minutes to pre-cure, attaching mask films having unexposed portions on said second photosensitive insulating resin layers which are formed on the opposite faces of said substrates, and carrying out an exposure with an energy of 50–700 mj/cm^2 and a development for 20–130 seconds, thereby forming a second photo via hole larger than the first via hole; and
finally drying and curing said first and second photosensitive insulating resin layers having said first and second via holes;
carrying out an electroless Cu plating on said substrate on which said first and second photosensitive insulating resin layers have been finally dried and cured, and carrying out an electrolytic Cu electroplating to form an electroplated layer.

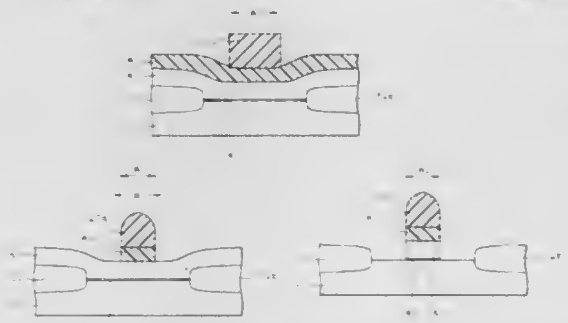
5,837,428
ETCHING METHOD FOR EXTENDING I-LINE PHOTOLITHOGRAPHY TO 0.25 MICRON LINEWIDTH

Yuan-Chang Huang, and Shu-Chih Yang, both of Hsin-Chu, Taiwan, assignors to Taiwan Semiconductor Manufacturing Compnay Ltd., Hsin-Chu, Taiwan

Filed Aug. 22, 1996, Ser. No. 701,605

Int. Cl.^{6} G03F *7/00;7/26*

U.S. Cl. 430—313 **14 Claims**



1. A method for forming a patterned layer within an integrated circuit comprising:

providing a substrate:
forming upon the substrate a blanket target layer;
forming upon the blanket target layer a blanket focusing layer, the blanket focusing layer being formed of an organic material, the blanket focusing layer being susceptible to a reproducible negative etch bias with respect to a patterned photoresist layer employed as a first etch mask layer within a first etch method employed in forming from the blanket focusing layer a patterned focusing layer:
forming upon the blanket focusing layer a blanket photoresist layer;
photoexposing and developing the blanket photoresist layer to form the patterned photoresist layer;
etching with the first etch method the blanket focusing layer to form the patterned focusing layer while employing the patterned photoresist layer as the first etch mask layer, the patterned focusing layer having the reproducible negative etch bias with respect to the patterned photoresist layer; and

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etching while employing a second etch method the blanket target layer to form a patterned target layer while employing the patterned focusing layer as a second etch mask layer, the patterned target layer having a reproducible second etch bias with respect to the patterned focusing layer, where the reproducible second etch bias does not compensate the reproducible negative etch bias.

5,837,429
PRE-DYES, PRE-DYE COMPOSITIONS, AND METHODS OF DEVELOPING A COLOR

Ronald Sinclair Nohr, Alpharetta, and John Gavin MacDonald, Decatur, both of Ga., assignors to Kimberly-Clark Worldwide, Neenah, Wis.

Continuation-in-part of Ser. No. 649,754, May 29, 1996, abandoned, which is a continuation-in-part of Ser. No. 463,187, Jun. 5, 1995, abandoned. This application Jun. 5, 1996, Ser. No. 659,497

Int. Cl.^{6} G03C *1/73*

U.S. Cl. 430—343 **28 Claims**

1. A pre-dye composition comprising a dye covalently bound to a radiation transorber adapted so that the pre-dye is colorless and will form a color when irradiated with radiation, the radiation transorber comprising a wavelength-selective sensitizer covalently bonded to a reactive species-generating photoreactor, wherein said composition further comprises a molecular includant covalently bonded to the radiation transorber.

5,837,430
IMAGE FORMING METHOD

Kazuhiro Miyazawa, and Shigeo Tanaka, both of Hino, Japan, assignors to Konica Corporation, Japan

Filed Jun. 13, 1997, Ser. No. 874,216

Claims priority, application Japan, Jun. 17, 1996, 8-155353; Apr. 1, 1997, 9-082804

Int. Cl.^{6} G03C *7/407*

U.S. Cl. 430—373 **9 Claims**

1. An image forming method comprising

imagewise exposing to light a silver halide photographic material comprising a support having thereon a photographic layer including a yellow image forming silver halide emulsion layer, a magenta image forming silver halide emulsion layer and a cyan image forming silver halide emulsion layer, and

developing said silver halide photographic light-sensitive material with an amplifying development,

wherein silver halide grains in each of said yellow image forming silver halide emulsion layer, magenta image forming silver halide emulsion layer and said cyan image forming silver halide emulsion layer have a silver chloride content of not less than 80 mole-%, and

the number of silver halide grains per unit area in said magenta silver halide emulsion layer is larger than that in said yellow image forming silver halide emulsion layer and that in said cyan image forming silver halide emulsion layer, the number of silver halide grains per unit area in said magenta image forming silver halide emulsion is 1.5 to 2.1 times that in said cyan image forming silver halide emulsion layer, and

the total amount of silver halide in said yellow image forming emulsion layer, magenta image forming silver halide emulsion layer and cyan image forming silver halide emulsion layer is silver.

5,837,431
PHOTOGRAPHIC DEVELOPER/AMPLIFIER COMPOSITIONS

Peter Jeffrey Twist, Missenden, and Christopher John Winscom, Pinner, both of United Kingdom, assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 911,403, Aug. 14, 1997, Pat. No. 5,738,980, which is a continuation of Ser. No. 556,553, Nov. 13, 1995, abandoned. This application Dec. 5, 1997, Ser. No. 985,534

Claims priority, application United Kingdom, Nov. 19, 1994, 9423382

Int. Cl.^{6} G03C *7/407*

U.S. Cl. 430—373 **18 Claims**

1. A method for processing imagewise exposed color photographic element comprising contacting said element with an aqueous redox amplifier composition comprising a color developing agent, an antioxidant for said composition which is hydroxylamine or a derivative thereof, hydrogen peroxide or a compound which provides hydrogen peroxide in an amount of from 0.1 to 10 ml/l (as a 30% weight % hydrogen peroxide solution), and nitrite ions as a dye yield stabilizer for said composition.

5,837,432
PHOTOGRAPHIC REVERSAL PROCESS PREBLEACH CONCENTRATE AND METHOD OF USE

Jean Marie Buongiorne, Brockport, and Michael John Haight, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 27, 1996, Ser. No. 670,307

Int. Cl.^{6} G03C *7/46*

U.S. Cl. 430—379 **12 Claims**

1. A method for processing a color silver halide photographic element comprising:

A) treating an imagewise exposed and developed color silver halide photographic element with a conditioning solution concentrate that is free of sodium ions and comprises:
  a formaldehyde bisulfite salt other than the sodium salt, said salt being present in an amount of from about 200 to about 600 g/l,
  sulfite ions present in an amount of from 0 to about 200 g/l,
  a bleach accelerating agent present in an amount of from about 1.5 to about 25 g/l, and
  a metal ion chelating agent present in an amount of less than or equal to 60 g/l,
  said concentrate having been diluted up to 25:1 with water, and
B) bleaching said treated element.

5,837,433
METHOD FOR PROVIDING A COLOR DISPLAY IMAGE USING DUPLITIZED COLOR SILVER HALIDE PHOTOGRAPHIC ELEMENTS

Anne E. Bohan; John M. Buchanan, and Richard P. Szajewski, all of Rochester, N.Y., assigoors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 834,591, Apr. 7, 1997, Pat. No. 5,747,228. This application Nov. 20, 1997, Ser. No. 975,423

Int. Cl.^{6} G03C *7/407*

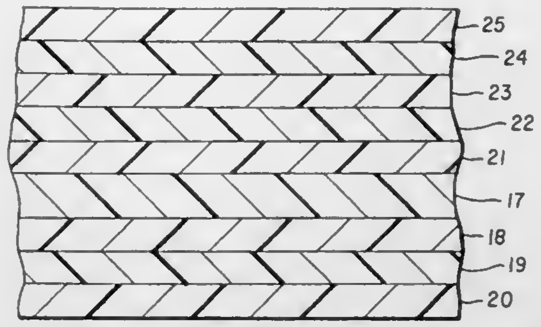
U.S. Cl. 430—380 **20 Claims**

1. A method of providing a digitized image comprising the step of:

scanning an imagewise exposed and photographically processed light sensitive silver halide color photographic element exhibiting a sensitivity of at least ISO 25, and comprising a support having thereon at least two color recording units,

each of said at least two color recording units being sensitive to a distinct region of the electromagnetic spectrum, and comprising at least one silver halide emulsion layer having light sensitive silver halide emulsion grains in reactive association with a compound capable of forming an image dye during a color development step, thereby providing at least two such silver halide emulsion layers sensitive to distinct regions of the electromagnetic spectrum,

wherein said support is interposed between two of said silver halide emulsion layers sensitive to distinct regions of the electromagnetic spectrum.



5,837,434
PHOTOGRAPHIC DEVELOPERS CONTAINING A DEVELOPING AGENT OF THE ASCORBIC ACID TYPE AND AN ACCELERATOR

Jacques Roussilhe, Virey Le Grand, France, and Siu-Chung Tsoi, Hertfordshire, England, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 25, 1997, Ser. No. 936,406

Claims priority, application France, Sep. 25, 1996, 9611958

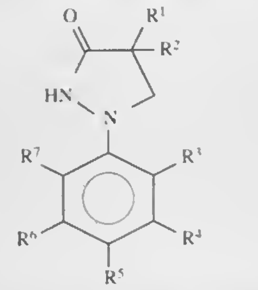
Int. Cl.^{6} G03E *5/30*

U.S. Cl. 430—480 **9 Claims**

1. An aqueous developer solution for the development of photographic silver halides, comprising a first silver halide developing agent that is an ascorbic acid, an auxiliary developing agent that is 1-phenyl-3-pyrazolidinone, and at least one development accelerator,

wherein:

(I) said auxiliary developing agent has the formula:



(I)

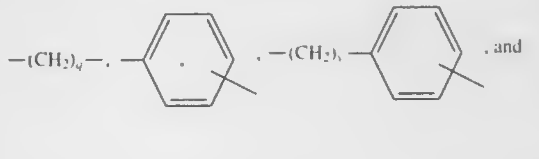
wherein R^1 to R^7 in formula (I) each separately represent hydrogen, an alkyl group, a substituted or non-substituted alkoxy group, substituted or non-substituted aryloxy group, or a group represented by the formula:

$(X)_p$—A-(Sol)

wherein p is 0 or 1; X represents a divalent group chosen from

—O—, —S—, and —NR^8—

wherein R^8 is H, an alkyl or A-(Sol); A represents a divalent group chosen from



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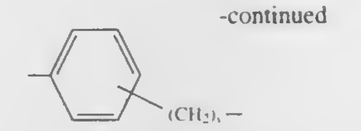
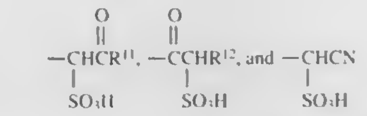


wherein q is between 0 and 5, and y is between 1 and 3; (Sol) is a solubilizing group chosen from:

CO_2H, SO_3H, $NHSO_2R^{10}$, SO_2NH_2, SO_2NHR^{10}, polyhydroxyalkyl,



$$-\underset{SO_3H}{\underset{|}{CH}}\overset{\overset{O}{\|}}{C}R^{11},\ -\overset{\overset{O}{\|}}{C}\underset{SO_3H}{\underset{|}{CH}}R^{12},\ \text{and}\ -\underset{SO_3H}{\underset{|}{CH}}CN$$

wherein R^{10} is an alkyl or aryl, R^{11} is OH, an alkyl or aryl, and R^{12} is hydrogen, an alkyl or aryl;

with the additional conditions that

(a) at least one of the radicals R^1 to R^7 must contain a (SOL) group, and

(b) A can represent a covalent bond, and

(II) said development accelerator is selected from the class consisting of:

(a) thioethers having at least one ammonium group

(b) triazolium thiolates, and

(c) substituted thioalkanes.

5,837,435
LIQUID COLOR DEVELOPER FOR SILVER HALIDE COLOR PHOTOSENSITIVE MATERIALS AND PROCESSING METHOD USING THE SAME

Akira Abe, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

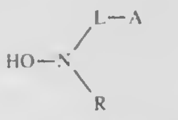
Continuation of Ser. No. 604,900, Feb. 22, 1996, abandoned. This application Oct. 30, 1997, Ser. No. 961,275

Claims priority, application Japan, Feb. 24, 1995, 7-060119

Int. Cl.^{6} G03C *7/413*

U.S. Cl. 430—490 **9 Claims**

1. A liquid color developer for a silver halide color photosensitive material, wherein said developer is a single color developer solution-type containing at least one compound represented by the following formula (I), containing sulfite in an amount of at least 0.01 mole/λ, and having a specific gravity of from 1.08 to 1.10 at 25° C.:



(I)

wherein L represents an unsubstituted or substituted alkylene group; A represents a carboxyl group, a sulfo group, a phosphono group, a hydroxy group, or an unsubstituted or alkyl-substituted amino group; and R represents a hydrogen atom, or an unsubstituted or substituted alkyl group.

5,837,436
SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL AND PACKAGE THEREOF

Keiji Mihayashi, and Mamoru Sakurazawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 26, 1996, Ser. No. 686,541

Claims priority, application Japan, Jul. 28, 1995, 7-211304

Int. Cl.^{6} G03C *1/46*

U.S. Cl. 430—503 **9 Claims**

1. A silver halide color photographic light-sensitive material comprising a support having on one surface thereof at least one

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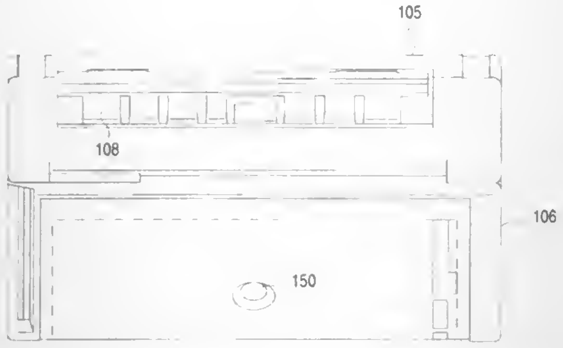
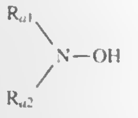
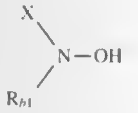
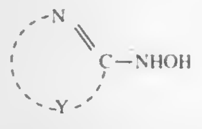


light-sensitive silver halide emulsion layer and at least one light-insensitive layer, wherein said silver halide color photographic light-sensitive material contains at least one compound selected from the group consisting of compounds represented by formulae (A-I), (A-II) and (A-III) and a coupler represented by formula (m):


(A-I)

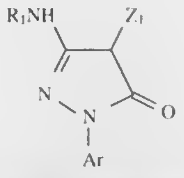

(A-II)


(A-III)

wherein in formula (A-I), R_{a1} represents an alkyl group, an alkenyl group, an aryl group, an acyl group, an alkylsulfonyl group, an arylsulfonyl group, an alkylsulfinyl group, an arylsulfinyl group, a carbamoyl group, a sulfamoyl group, an alkoxycarbonyl group or an aryloxycarbonyl group, R_{a2} represents a hydrogen atom, an alkyl group, an alkenyl group, an aryl group, an acyl group, an alkylsulfonyl group, an arylsulfonyl group, an alkylsulfinyl group, an arylsulfinyl group, a carbamoyl group, a sulfamoyl group, an alkoxycarbonyl group or an aryloxycarbonyl group, provided that when R_{a1} is an alkyl group, an alkenyl group or an aryl group, R_{a2} is an acyl group, an alkylsulfonyl group, an arylsulfonyl group, an alkylsulfinyl group, an arylsulfinyl group, a carbamoyl group, a sulfamoyl group, an alkoxycarbonyl group or an aryloxycarbonyl group, and R_{a1} and R_{a2} may be combined with each other to form a 5-, 6- or 7-membered ring, provided that an S-triazine ring is not formed;

in formula (A-II), X represents a heterocyclic group exclusive of an S-triazine ring, R_{b1} represents an alkyl group, an alkenyl group or an aryl group and X and R_{b1} may be combined with each other to form a 5-, 6- or 7-membered ring, provided that an S-triazine ring is not formed; and

in formula (A-III), Y represents a nonmetallic atom group necessary for forming a 5-membered ring together with an —N=C— group or Y represents a nonmetallic atom group necessary for forming a 6-membered ring together with an —N=C— group with the terminal of Y to be bonded to the carbon atom of the —N=C— group being a group selected from $-N(R_{c1})-$, $-C(R_{c2})(R_{c3})-$, $-C(R_{c4})=$, —O— and —S— (the carbon atom of —N=C— is bonded to the left site of each group), provided that an S-triazine ring is not formed, and R_{c1}, R_{c2}, R_{c3} and R_{c4} each represents a hydrogen atom or a substituent;


(m)

wherein R_1 represents an alkyl group, an aryl group, an acyl group or a carbamoyl group, Ar represents a phenyl group or a phenyl group substituted by one or more of a halogen atom, an alkyl group, a cyano group, an alkoxy group, an alkoxycarbonyl group, an acylamino group, a sulfonamido group, a sulfonyl group and a sulfamoyl group, and Z_1 represents a group capable of releasing off upon reaction with an oxidation product of an aromatic primary amine developing agent,

wherein silver halide color photographic light-sensitive material contains at least one compound selected from the group consisting of compounds represented by formulae (A-I), (A-II) and (A-III) and a coupler represented by formula (m) in the same layer.

5,837,437

DIFFUSIONAL FLUX CONTROL OF SOLUBLE COMPONENTS IN PHOTOGRAPHIC ELEMENTS

Ravi Sharma, Fairport, and John Texter, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 12, 1996, Ser. No. 614,428

Int. Cl.^{6} G03C *1/42;1/76*

U.S. Cl. 430—537 **18 Claims**

1. An aqueous developable chromogenic photographic element coated on a single dimensionally stable support wherein said element comprises in reactive association (1) an aqueous diffusible photographically useful organic compound or precursor to an aqueous diffusible photographically useful organic compound, (2) radiation sensitive silver halide, (3) hydrophilic binder, and (4) one or more contiguous overcoat layers devoid of silver halide wherein said one or more overcoat layers comprise hydrophilic binder at a level greater than 10 g/m^2.

5,837,438

SILVER HALIDE COLOR PHOTOGRAPHIC PHOTOSENSITIVE MATERIAL

Atsuhiro Ohkawa, and Keiji Mihayashi, both of Minami-Ashigara, Japan, assignors to Fuji Photo Film, Co., Ltd., Kanagawa, Japan

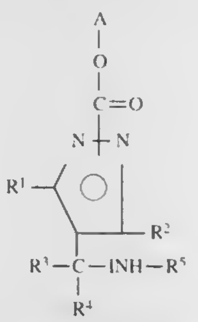
Continuation of Ser. No. 835,572, Feb. 14, 1992, abandoned. This application Mar. 23, 1993, Ser. No. 35,878

Claims priority, application Japan, Feb. 15, 1991, 3-43008

Int. Cl.^{6} G03C *7/305*

U.S. Cl. 430—544 **15 Claims**

1. A silver halide color photographic photosensitive material in which at least one silver halide emulsion layer is formed on a support, wherein said material contains a compound represented by general formula (I) below in at least one layer:


General Formula (I)

where A represents a coupler moiety, each of R^1 and R^2 independently represents a hydrogen atom or a substituent, each of R^3 and

R^4 independently represents a hydrogen atom or an alkyl group, INH represents a group having a development inhibiting function, and R^5 represents a nonsubstituted phenyl group, a nonsubstituted primary alkyl group, or a primary alkyl group substituted with a group other than an aryl group, at least one of R^1 to R^4 being a substituent other than a hydrogen atom, and an —OC(=O)— group combining with one of two nitrogen atoms forming a pyrazole ring.

5,837,439

SILOXANE NONAGGLOMERATING ANTIFOAMANTS

Richard L. Daubendiek; Michael W. Orem; Douglas L. Oehlbeck, and Joseph G. Lighthouse, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 4, 1997, Ser. No. 812,089

Int. Cl.^{6} G03C *1/015;1/04;1/047*

U.S. Cl. 430—569 **12 Claims**

1. A solution for forming silver halide emulsions comprising water, a gelatin containing less than 30 micromoles of methionine per gram of gelatin, and at least one antifoamant of Formula I

$$(H_3C)_3Si-(OSi(CH_3)_2)_m-OSi(CH_3)_3 \qquad (I)$$

wherein m is between 50 and 1000.

5,837,440

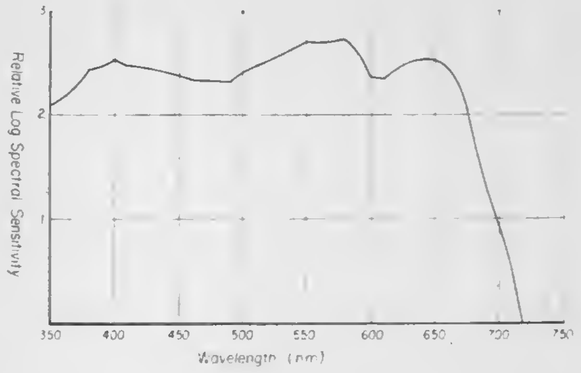
SOUND RECORDING FILM

Steven Mark Gerlach, Fairport, and Gregory Edward Farrell, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 20, 1996, Ser. No. 699,876

Int. Cl.^{6} G03C *1/12;1/29;5/14;5/28*

U.S. Cl. 430—572 **10 Claims**



1. A black and white silver halide motion picture sound recording film comprising a support bearing at least one silver halide emulsion layer comprising monodispersed silver halide grains having an average grain size of less than 0.35 microns and a coefficient of variation of grain size of less than 55%, wherein the contrast overall gradient of the film is greater than 3.7., wherein the overall gradient is defined as the slope of the straight line portion of a D logE characteristic curve between 0.3 and 2.3 above minimum density obtained upon tungsten white light exposure and standard processing in a D-97 process comprising a 4 minute developer step at 23.9°±0.3° C. with standard Kodak D-97 Developer as specified in the Kodak Publication H-24, a wash or stop step, and a fixer step, and wherein said film is spectrally sensitized with a first sensitizing dye providing a peak sensitivity at less than or equal to 600 nm and a second sensitizing dye providing a peak sensitivity above 600 nm.

5,837,441

HANTAVIRUS-ASSOCIATED RESPIRATORY DISTRESS VIRUS ANTIGENS

Brian Hjelle, and Steve Jenison, both of Albuquerque, N. Mex., assignors to University of New Mexico, Albuquerque, N. Mex.

Continuation-in-part of Ser. No. 120,096, Sep. 13, 1993, abandoned, and a continuation-in-part of Ser. No. 111,519, Aug. 25, 1993, abandoned, and a continuation-in-part of Ser. No. 141,035, Oct. 26, 1993, abandoned. This application Mar. 22, 1994, Ser. No. 210,762

Int. Cl.^{6} C12Q *1/70*

U.S. Cl. 435—5 **29 Claims**

1. A purified antigenic protein encoded by an RNA nucleotide sequence or a DNA copy (cDNA) thereof of the Hantavirus Associated Respiratory Distress Syndrome (HARDS) virus genome M or S segments, wherein said protein is encoded by the coding sequence of the M segment according to SEQ. ID NO:23, or is an antigenic portion of said M segment, or is encoded by the coding sequence of the S segment according to SEQ. ID NO:20, or is an antigenic polypeptide portion of said S segment.

5,837,442

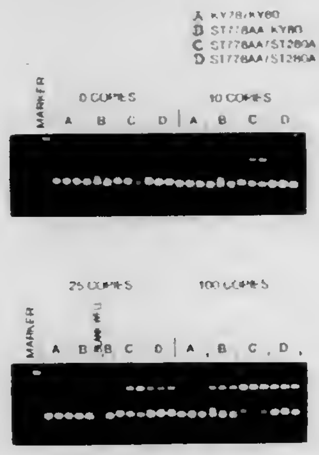
OLIGONUCLEOTIDE PRIMERS FOR AMPLIFYING HCV NUCLEIC ACID

Sue Yen Tsang, Walnut Creek, Calif., assignor to Roche Molecular Systems, Inc., Branchburg, N.J.

Filed Oct. 28, 1996, Ser. No. 738,928

Int. Cl.^{6} C12Q *1/70;1/68;* **C12P** *29/34;* **C07H** *21/04*

U.S. Cl. 435—5 **17 Claims**



14. A method for detecting hepatitis C virus (HCV) nucleic acid in a sample, comprising:

(a) treating said sample in a polymerase chain reaction amplification mixture comprising a pair of oligonucleotide primers selected from the group consisting of ST280A (SEQ ID NO: 1) and ST778AA (SEQ ID NO: 2), ST280A (SEQ ID NO: 1) and ST678A (SEQ ID NO: 3), and KY80 (SEQ ID NO: 4) and ST778AA (SEQ ID NO: 2, under amplification conditions so that HCV nucleic acid, if present, is amplified; and

(b) detecting if amplification has occurred, which indicates that HCV nucleic acid is present.

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5,837,443

DIAGNOSTIC METHOD EMPLOYING MSH2 PROTEIN

Albert de la Chapelle, Bergmansgatan, Finland; Bert Vogelstein, and Kenneth W. Kinzler, both of Baltimore, Md., assignors to The Johns Hopkins University, Baltimore, Md.

Division of Ser. No. 160,295, Dec. 2, 1993, which is a continuation-in-part of Ser. No. 56,546, May 5, 1993, Pat. No. 5,492,808. This application Jun. 1, 1995, Ser. No. 457,374

Int. Cl.^{6} C12Q *1/25;* C07K *14/47*

U.S. Cl. 435—4 **3 Claims**

1. A method to aid in determining a predisposition to cancer comprising:

testing a protein-containing body sample of a human selected from the group consisting of a biopsy, blood, prenatal tissue, and embryonic tissue to determine if the sample contains a mutant form of hMSH2 protein, wherein the mutant form has a different primary sequence from that shown in SEQ ID NO:2, wherein determination of a mutant form of hMSH2 protein in the body sample suggests a predisposition to cancer in the human.

5,837,444

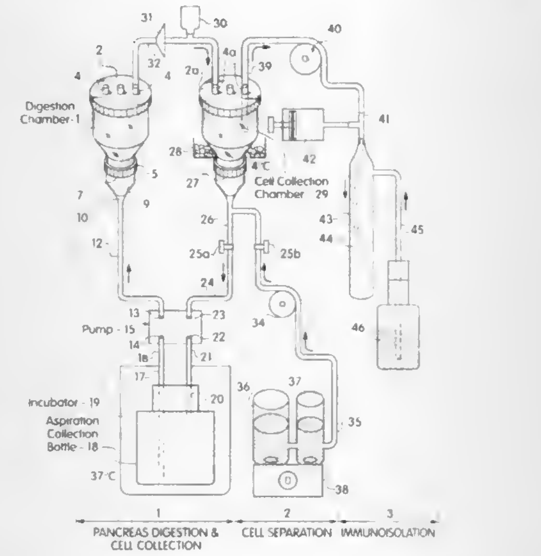
ISLET CELL TRANSPLANTATION MACHINE FOR DIABETES CURE

Kumarpal A. Shah, 28 Ridge Rd., Searingtown, N.Y. 11507

Filed Jul. 16, 1996, Ser. No. 680,795

Int. Cl.^{6} C12Q *1/00;* C12M *3/08*

U.S. Cl. 435—4 **18 Claims**



1. An apparatus for collecting a subpopulation of cells larger than a predetermined size from a digested organ comprising:

a closed loop system including (i) a chamber for digesting the organ to liberate cells, (ii) a cell collection chamber and (iii) a filter adjacent said cell collection chamber for retaining cells larger than the predetermined size;

a first pump for circulating a physiologically compatible medium through the closed loop to transport the liberated cells through said cell collection chamber to said filter;

a second pump for flushing the cells retained on said filter back into said cell collection chamber with a density medium;

a tube for withdrawing the desired subpopulation of cells from said cell collection chamber; and

a hollow fiber for containing the withdrawn cells.

5,837,445

Patent Not Issued For This Number

5,837,446

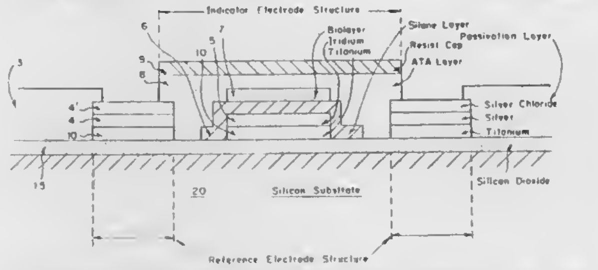
PROCESS FOR THE MANUFACTURE OF WHOLLY MICROFABRICATED BIOSENSORS

Stephen N. Cozzette, Nepean, Canada; Graham Davis, Plainsboro; Jeanne Itak, West Windsor, both of N.J.; Imants R. Lauks, Yardley, Canada; Sylvia Piznik, Jackson; Nicolaas Smit, Hightstown, both of N.J.; Susan Steiner, Trenton, N.J.; Paul Van Der Werf, Princeton Junction, N.J.; Henry J. Wieck, Plainsboro, N.J., and Randall M. Mier, deceased, late of Morrisville, Pa., by James F. Corrigan, executor, assignors to i-STAT Corporation, Princeton, N.J.

Division of Ser. No. 943,345, Sep. 10, 1992, Pat. No. 5,466,575, which is a division of Ser. No. 432,714, Nov. 7, 1989, Pat. No. 5,200,051, which is a continuation-in-part of Ser. No. 381,223, Jul. 13, 1989, abandoned, which is a continuation-in-part of Ser. No. 270,171, Nov. 14, 1988, abandoned. This application Jun. 7, 1995, Ser. No. 482,517

Int. Cl.^{6} G01N *33/53;33/543;33/68*

U.S. Cl. 435—6 **35 Claims**



1. A method of detecting the presence and quantity of at least one analyte species in a liquid sample which comprises:

(a) contacting a microfabricated biosensor with a liquid sample, said biosensor comprising: (i) a base sensor, (ii) a permselective layer, superimposed over at least a portion of said base sensor, having a thickness sufficient to exclude substantially molecules with a molecular weight of about 120 or more while allowing the free permeation of molecules with a molecular weight of about 50 or less, and (iii) a biolayer superimposed over at least a portion of said permselective layer and said base sensor, which biolayer comprises a sufficient amount of a bioactive molecule capable of selectively interacting with a particular analyte species, and a support matrix in which said bioactive molecule is incorporated, which matrix is selected from the group consisting of a photoformable proteinaceous mixture, a film-forming latex, and combinations thereof and through which matrix said analyte species may freely permeate and interact with said bioactive molecule; and

b) obtaining a measured signal output from said biosensor, from which signal output the presence and quantity of an analyte species may be deduced.

5,837,447

MONITORING AN IMMUNE RESPONSE BY ANALYSIS OF AMPLIFIED IMMUNOGLOBULIN OR T-CELL-RECEPTOR NUCLEIC ACID

Jack Gorski, Mukwonago, Wis., assignor to Blood Center Research Foundation, Inc., The, Milwaukee, Wis.

Continuation-in-part of Ser. No. 868,569, Apr. 15, 1992, abandoned. This application Apr. 19, 1994, Ser. No. 229,528

Int. Cl.^{6} C12Q *1/68;* C12P *19/34*

U.S. Cl. 435—6 **27 Claims**

1. A method for the monitoring of an immune response that involves somatic recombination between elements of at least two gene segments associated with a hypervariable region, comprising the steps of

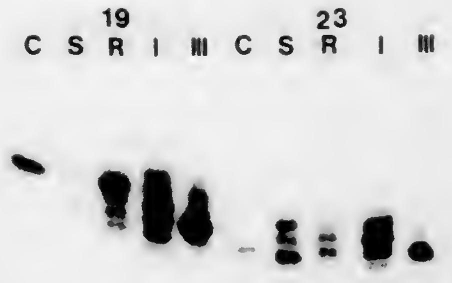
(A) providing a sample of a polynucleotide obtained from B- or T-cells of an individual;

(B) subjecting said sample to an amplification which employs a first primer and a second primer, wherein said first primer is specific for a variable gene segment and said second primer is specific for a constant or a joining gene segment of said individual, such that products of said amplification are amenable to resolution on the basis of a difference in length between of 2 to 3 base pairs;

(C) separating said products of said amplification by a technique whereby products with lengths differing by 3 base pairs can be resolved;

(D) determining the range of lengths represented among said separated products to obtain a spectratype of the immune response of the individual; and

(E) comparing the spectratype to a previously obtained standard to determine the immune status of the individual and monitor the immune response.



5,837,448

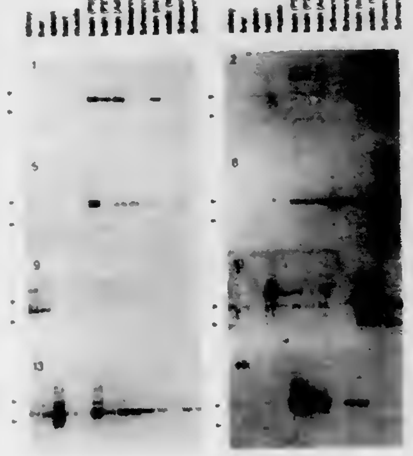
PROTEIN-TYROSINE KINASE GENES

Greg E. Lemke, Del Mar, and Cary H. C. Lai, La Jolla, both of Calif., assignors to The Salk Institute for Biological Studies, La Jolla, Calif.

Continuation of Ser. No. 884,486, May 15, 1992, abandoned. This application May 2, 1994, Ser. No. 237,401

Int. Cl.^{6} C12Q *1/68;* C07H *21/04*

U.S. Cl. 435—6 **10 Claims**



1. An isolated polynucleotide selected from the group consisting of Sequence ID Nos. 1, 3, 5, 7, 9, 11, 15, 19, 21 and 23 and degenerate variants thereof, wherein said polynucleotide(s) encodes protein(s) having a tyrosine kinase domain and a tissue expression pattern of a receptor protein-tyrosine kinase subtype selected from tyro-1, tyro-2, tyro-3, tyro-4, tyro-5, tyro-6, tyro-8, tyro-10, tyro- 11, and tyro-12, respectively.

3. The polynucleotide of claim 1 which is RNA.

5,837,449

COMPOSITIONS AND METHODS FOR MODULATING β-AMYLOID

Brett P. Monia, Carlsbad; Susan M. Freier, San Diego, and David J. Ecker, Leucadia, all of Calif., assignors to Isis Pharmaceuticals, Inc., Carlsbad, Calif.

Continuation-in-part of Ser. No. 814,963, Dec. 24, 1991, abandoned. This application Oct. 28, 1994, Ser. No. 331,389

Int. Cl.^{6} C12Q *1/68;* C07H *21/02*

U.S. Cl. 435—6 **3 Claims**

1. An oligonucleotide consisting of 8 to 50 nucleotides comprising a nucleotide sequence selected from the group consisting of SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12, SEQ ID NO:13, SEQ ID NO:14, SEQ ID NO:15, SEQ ID NO:28, SEQ ID NO:29, SEQ ID NO:30, SEQ ID NO:31, SEQ ID NO:32, SEQ ID NO:33, SEQ ID NO:34, SEQ ID NO:35, wherein said oligonucleotide is specifically hybridizable with a nucleic acid encoding an abnormally expressed β-amyloid precursor protein, and wherein at least one of the linkages between the nucleotides of said oligonucleotide is a phosphorothioate linkage.

5,837,450

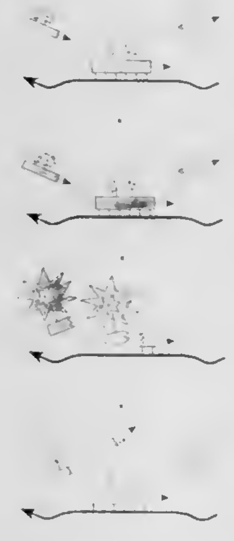
DETECTION OF TARGET NUCLEIC ACID MOLECULES USING THERMOSTABLE 5' NUCLEASE

James E. Dahlberg; Victor I. Lyamichev, and Mary Ann D. Brow, all of Madison, Wis., assignors to Third Wave Technologies, Inc., Madison, Wis.

Division of Ser. No. 254,359, Jun. 6, 1994, Pat. No. 5,614,402, which is a continuation-in-part of Ser. No. 073,384, Jun. 4, 1993, Pat. No. 5,541,331, which is a continuation-in-part of Ser. No. 986,330, Dec. 7, 1992, Pat. No. 5,422,253. This application Jun. 6, 1995, Ser. No. 471,066

Int. Cl.^{6} C12Q *1/68;1/30;* C07H *21/07;* C12P *19/34*

U.S. Cl. 435—6 **20 Claims**



1. A method of detecting the presence of a nucleic acid molecule comprising:

a) providing:

i) a thermostable 5' nuclease derived from a thermostable polymerase modified to have reduced synthetic activity, wherein said 5' nuclease is capable of cleaving a linear nucleic acid duplex structure so as to create substantially a single, single-stranded nucleic acid cleavage product,

ii) a target nucleic acid having a first and a second portion,

iii) a first oligonucleotide complementary to said first portion of said target nucleic acid, and

iv) a second oligonucleotide having a 5' and a 3' end, said second oligonucleotide comprising a 5' region and a 3' region, wherein said 3' region is complementary to said second portion of said target nucleic acid and said 5' region

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is non-complementary to said target nucleic acid and provides a single-stranded arm;
- b) mixing said 5' nuclease, said target nucleic acid, said first oligonucleotide and said second oligonucleotide under conditions wherein said first oligonucleotide and said 3' region of said second oligonucleotide are annealed to said target nucleic acid sequence so as to create a first cleavage structure and cleavage of said first cleavage structure results in the liberating of said single-stranded arm of said second oligonucleotide to generate a first signal oligonucleotide and a cleaved second oligonucleotide; and
- c) detecting the presence of said first signal oligonucleotide.

5,837,451

MITOGEN ACTIVATED PROTEIN KINASE, FRK

Tiliang Deng, Gainesville, Fla., and Michael Karin, San Diego, Calif., assignors to The Regents of the University of California, Oakland, Calif.

Division of Ser. No. 315,067, Sep. 29, 1994. This application Sep. 9, 1996, Ser. No. 707,874

Int. Cl.^{6} C12Q *1/48;1/68*

U.S. Cl. 435—6 **3 Claims**

1. A method for identifying a composition which affects a kinase wherein the kinase is characterized as having a molecular weight of 88 kD as determined by reducing SDS-PAGE; having threonine and serine kinase activity: and phosphorylating the c-Fos activation domain at amino acid residue Thr 232, comprising:
- (a) incubating components comprising the composition and the kinase or polynucleotide encoding the kinase, wherein the incubating is carried out under conditions sufficient to allow the components to interact: and
- (b) measuring the effect of the composition on the kinase or polynucleotide encoding the kinase.

5,837,452

METHODS FOR EXTRACTING NUCLEIC ACIDS FROM A WIDE RANGE OF ORGANISMS BY NONLYTIC PERMEABILIZATION

Kathleen A. Clark, Cardiff by the Sea, and Daniel L. Kacian, San Diego, both of Calif., assignors to Gen-Probe Incorporated, San Diego, Calif.

Continuation of Ser. No. 433,149, May 3, 1995, abandoned, which is a division of Ser. No. 390,826, Feb. 17, 1995, abandoned, which is a continuation of Ser. No. 158,940, Nov. 29. 1993, abandoned. This application Jan. 3, 1997, Ser. No. 778,582

Int. Cl.^{6} C12Q *1/68;* **C12N** *1/00;1/06;* **B01F** *17/00*

U.S. Cl. 435—6 **20 Claims**

1. A method for identifying a wide range of microorganisms in a sample, said method comprising the steps of:
- a) providing to said sample a permeabilization reagent consisting essentially of a non-ionic detergent, an anionic detergent, and a metal chelating agent;
- b) heating said sample at a temperature of from about 80° to about 100° C. so that cells from a wide range of microorganisms present in said sample are permeabilized and release nucleic acids;
- c) providing one or more probe oligonucleotides to said sample under stringent hybridization conditions, each said probe being able to form a detectable hybrid with a target nucleic acid from at least one of said cells under said conditions; and
- d) detecting the presence of one or more of said hybrids as an indication of the identity of one or more microorganisms from said wide range of microorganisms present in said sample,

wherein said method is conducted in the absence of lysozyme or chaotropes, and shear or mechanical forces are not used to permeabilize said cells.

5,837,453

TELOMERASE ACTIVITY ASSAYS

Calvin Bruce Harley, Palo Alto; Nam Woo Kim, San Jose, and Scott Lawrence Weinrich, San Francisco, all of Calif., assignors to Geron Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 315,214, Sep. 28, 1994, Pat. No. 5,629,154, which is a continuation-in-part of Ser. No. 255,774, Jun. 7, 1994, which is a continuation-in-part of Ser. No. 153,051, Nov. 12, 1993, Pat. No. 5,645,987, and Ser. No. 151,477, Nov. 12, 1993, each which is a continuation-in-part of Ser. No. 60,952, May 13, 1993, Pat. No. 5,695,932, which is a continuation-in-part of Ser. No. 38,706, Mar. 24, 1993, Pat. No. 5,489,508, which is a continuation-in-part of Ser. No. 882,438, May 13, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 482,132

Int. Cl.^{6} C12Q *1/68;* **C12P** *19/34;* **C07H** *21/02;21/04*

U.S. Cl. 435—6 **30 Claims**

1. A kit for detecting telomerase activity, said kit comprising:
- (a) a telomerase substrate;
- (b) a primer comprising a sequence complementary to a telomeric repeat sequence: and
- (c) instructions.

5,837,454

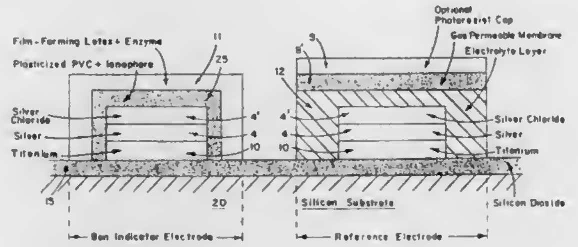
PROCESS FOR THE MANUFACTURE OF WHOLLY MICROFABRICATED BIOSENSORS

Stephen N. Cozzette, Nepean, Canada; Graham Davis, Plainsboro, N.J.; Imants R. Lauks, Yardley, Pa.; Randall M. Mier, deceased, late of Morrisvile, Pa., by James F. Corrigan, executor; Sylvia Piznik, Jackson, N.J.; Nicolaas Smit, Hightstown, N.J.; Paul Van Der Werf, Princeton Junction, N.J.; Henry J. Wieck, Plainsboro, N.J.; Susan Steiner, Trenton, N.J., and Jeanne Itak, West Windsor, N.J., assignors to i-STAT Corporation, Princeton, N.J.

Division of Ser. No. 943,345, Sep. 10, 1992, Pat. No. 5,466,575, which is a division of Ser. No. 432,714, Nov. 7, 1989, Pat. No. 5,200,051, which is a continuation-in-part of Ser. No. 381,223, Jul. 13, 1989, abandoned, which is a continuation-in-part of Ser. No. 270,171, Nov. 14, 1988, abandoned. This application Jun. 7, 1995, Ser. No. 484,095

Int. Cl.^{6} G01N *33/543;33/545*

U.S. Cl. 435—6 **34 Claims**



1. A method of manufacturing a plurality of uniform microfabricated sensing devices which comprises:
- (a) establishing a plurality of base sensors on a substrate wafer;
- (b) establishing a permselective layer, superimposed over at least a portion of each base sensor, having a thickness sufficient to exclude substantially molecules with a molecular weight of about 120 or more while allowing free permeation of molecules with a molecular weight of about 50 or less; and
- (c) establishing a topmost layer comprising an immobilized ligand receptor in an amount sufficient to be superimposed over said permselective layer.

5,837,455

MYCOBACTERIAL NUCLEIC ACID HYBRIDIZATION PROBES AND METHODS OF USE

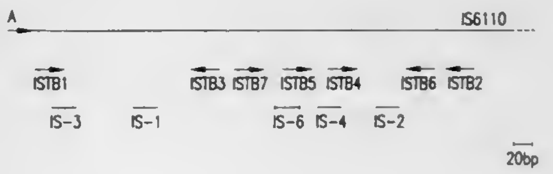
Jean-Luc Guesdon, Paris; Dominique Thierry, Boulogne; Agnès Ullmann; Brigitte Gicquel, both of paris, and Anne Brisson-Noel, Paris, all of France, assignors to Institut Pasteur, Paris, France

Continuation of Ser. No. 829,016, Apr. 14, 1992, Pat. No. 5,597,911. This application Jun. 7, 1995, Ser. No. 487,645

Claims priority, application France, Sep. 6, 1989, 89 11665; Mar. 2, 1990, 90 02676; WIPO, Sep. 6, 1990, PCT/FR90/00591

Int. Cl.^{6} C12N *15/00;* **C07H** *21/02;21/04;21/00*

U.S. Cl. 435—6 **11 Claims**



1. An isolated polynucleotide of the formula 5'-(SEQ ID NO:1)-(nucleotides 343–1152 of SEQ ID NO:3)-(SEQ ID NO:2)-3'.

5,837,456

HIGH AFFINITY OLIGONUCLEOTIDE LIGANDS TO CHORIONIC GONADOTROPIN HORMONE AND RELATED GLYCOPROTEIN HORMONES

Larry Gold; Sumedha D. Jayasena, both of Boulder; Dan Nieuwlandt, Broomfield, all of Colo., and Ken Davis, Los Altos, Calif., assignors to NeXstar Pharmaceuticals, Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 714,131, Jun. 10, 1991, Pat. No. 5,475,096, Ser. No. 931,473, Aug. 17, 1992, Pat. No. 5,270,163, Ser. No. 964,624, Oct. 21, 1992, Pat. No. 5,496,938, Ser. No. 117,991, Sep. 8, 1993, abandoned, and Ser. No. 536,428, Jun. 11, 1990, abandoned. This application Jun. 7, 1995, Ser. No. 488,402

Int. Cl.^{6} C12P *19/34;* **C12Q** *1/68;* **C07H** *21/04;21/02*

U.S. Cl. 435—6 **14 Claims**

1. A method of identifying nucleic acid ligands to a Chorionic Gonadotropin (CG)-related glycoprotein hormone, comprising:
- a) preparing a candidate mixture of nucleic acids;
- b) contacting the candidate mixture of nucleic acids with a CG-related glycoprotein hormone, wherein nucleic acids having an increased affinity to the CG-related glycoprotein hormone relative to the candidate mixture may be partitioned from the remainder of the candidate mixture;
- c) partitioning the increased affinity nucleic acids from the remainder of the candidate mixture; and
- d) amplifying the increased affinity nucleic acids to yield a mixture of nucleic acids enriched for nucleic acids with relatively higher affinity and specificity for binding to the CG-related glycoprotein hormone, whereby nucleic acid ligands of CG-related glycoprotein hormone may be identified.

5,837,457

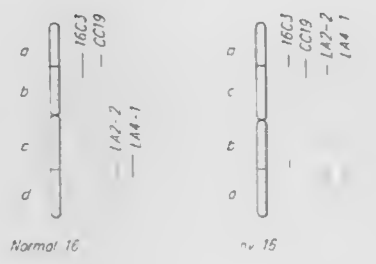
MARKERS FOR DETECTION OF CHROMOSOME 16 REARRANGEMENTS

Pu Liu, Rockville; Francis S. Collins, Bethesda, both of Md.; Michael J. Siciliano, and David Claxton, both of Houston, Tex., assignors to The Regents of the University of Michgan, Ann Arbor, Mich., and The Board of Regents University of Texas System, Austin, Tex.

Continuation of Ser. No. 99,869, Jul. 29, 1993, abandoned. This application Sep. 25, 1995, Ser. No. 533,306

Int. Cl.^{6} H04N *1/32*

U.S. Cl. 435—6 **35 Claims**



27. A probe which is HCBFB-MYH11 fused DNA comprising the contiguous nucleotide sequence of SEQ ID No. 1 or which is a DNA fragment comprising contiguous nucleotides on the 5' and 3' sides of the fused site of HCBFB-MYH11 fused DNA, the fused site being the site between bases 492 and 493 of the nucleotide sequence of SEQ ID No. 1, wherein the DNA fragment specifically hybridizes, with the nucleotide sequence of SEQ ID No. 1, but does not specifically hybridize with HCBFB DNA or MYH11 DNA.

28. A method for detecting fused DNA containing the fused site of HCBFB-MYH11 fused DNA, the fused site being the site between bases 492 and 493 of the nucleotide sequence of SEQ ID No. 1, comprising the steps of:
- a) contacting the probe of claim **27** with a sample to be tested: and
- b) determining whether the probe specifically hybridizes with the fused DNA in the sample but not with HCBFB DNA or MYH11 DNA.

5,837,458

METHODS AND COMPOSITIONS FOR CELLULAR AND METABOLIC ENGINEERING

Jeremy Minshull, San Francisco, and Willem P. C. Stemmer, Los Gatos, both of Calif., assignors to Maxygen, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 198,431, Feb. 17, 1994, Pat. No. 5,605,793, Ser. No. 537,874, Mar. 4, 1996, Ser. No. 621,859, Mar. 25, 1996, Ser. No. 621,430, Mar. 25, 1996, abandoned, and Ser. No. 42,568, Apr. 18, 1995. This application May 20, 1996, Ser. No. 650,400

Int. Cl.^{6} C12Q *1/68;* **C12N** *15/00*

U.S. Cl. 435—6 **36 Claims**

1. A method of evolving a biocatalytic activity of a cell, comprising:
- (a) recombining at least a first and second DNA segment from at least one gene conferring ability to catalyze a reaction of interest, the segments differing from each other in at least two nucleotides, to produce a library of recombinant genes;
- (b) screening the library to identify at least one recombinant gene from the library that confers enhanced ability to catalyze the reaction of interest by the cell relative to a wildtype form of the gene;
- (c) recombining at least a segment from the at least one recombinant gene with a further DNA segment from the at least one gene, the same or different from said first and second DNA segments, to produce a second library of recombinant genes;
- (d) screening the second library of recombinant genes to identify at least one further recombinant gene from the second library

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of recombinant genes that confers enhanced ability to catalyze the reaction of interest by the cell relative to a previous recombinant gene;

(e) repeating (c) and (d), as necessary, until the further recombinant gene confers a desired level of enhanced ability to catalyze the reaction of interest by the cell,

wherein the reaction of interest is the ability to utilize a substrate as a nutrient source.

5,837,459

NUCLEIC ACID ANALOGUE INDUCED TRANSCRIPTION OF DOUBLE STRANDED DNA

Rolf Henrik Berg, Fredericksberg, Denmark; Ole Buchardt, deceased, late of Yaerlose, Denmark, by Dorte Buchardt, heir; Michael Egholm, Lexington, Mass., and Peter Eigil Nielsen, Kokkedal, Denmark, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

Filed May 24, 1996, Ser. No. 653,605

Claims priority, application United Kingdom, Nov. 25, 1993, 9324245

Int. Cl.^{6} C12Q *1/68;* C12P *19/34*

U.S. Cl. 435—6 **59 Claims**

15. A method of detecting a double-stranded DNA, comprising:

(a) hybridizing said double-stranded DNA with a least one oligo-nucleic acid analogue to form a hybrid having a transcription initiation site, wherein the hybrid is more stable against heat denaturation than a hybrid between a conventional deoxyribonucleotide corresponding in sequence to said at least one oligo-nucleic acid analogue;

(b) combining said hybrid with a prokaryotic DNA dependent RNA polymerase and a plurality of nucleoside triphosphates;

(c) thereafter transcribing RNA by attaching together a plurality of nucleoside triphosphates from step (b), using said double-stranded DNA as a template; and

(d) determining said double-stranded DNA by detecting said RNA produced in step (c).

5,837,460

METHODS OF IDENTIFYING BIOLOGICALLY ACTIVE RECEPTOR-BINDING PEPTIDES

Joan M. Von Feldt, Wilmington, Del.; Thomas Kieber-Emmons, Newtown Square, Pa.; David B. Weiner, Merion, Pa., and William V. Williams, Havertown, Pa., assignors to Trustees of the University of Pennsylvania, and The Wistar Institute, both of Philadelphia, Pa.

Continuation of Ser. No. 235,404, Apr. 29, 1994, abandoned. This application Sep. 3, 1996, Ser. No. 712,212

Int. Cl.^{6} C12Q *1/68;* G01N *33/53*

U.S. Cl. 435—6 **13 Claims**

1. A method of identifying a peptide having an amino acid sequence consisting of 15–25 amino acids, wherein said peptide mimics binding activity of a helix of an active region of a biologically active protein to its receptor in which an active region of said biologically active protein is a helix, said method comprising the steps of:

a) inoculating a first animal with an amount of a biologically active protein sufficient to invoke an immune response in said first animal which includes production of anti-biologically active protein antibodies by said first animal, wherein an active region of said biologically active protein is a helix;

b) isolating said anti-biologically active protein antibodies from said first animal;

c) inoculating a second animal with an amount of the isolated anti-biologically active protein antibodies sufficient to invoke an immune response which includes production by said second animal of antibodies which specifically bind to anti-biologically active protein antibodies;

d) isolating RNA from spleen cells from said second animal;

e) generating cDNA from said RNA;

f) amplifying fragments of said cDNA that encode antibody light chain regions including a complementarity determining region, and inserting said fragments into expression vectors to form recombinant expression vectors, wherein said expression vectors provide signal sequences to cDNA fragments for secretion of proteins encoded thereby;

g) transforming suitable host cells with said recombinant expression vectors to produce transformed host cells;

h) maintaining said transformed host cells under conditions which allow for expression of said fragments to produce proteins encoded thereby, wherein said proteins are secreted;

i) screening said proteins to identify a recombinant antibody light chain which competes with said biological active protein to bind with a neutralizing anti-biologically active protein monoclonal antibody;

j) identifying the amino acid sequences of complementarity determining regions of said recombinant antibody light chain which competes with said helix of an active region of a biological active protein to bind with said neutralizing anti-biologically active protein monoclonal antibody and

k) synthesizing a peptide with an amino acid sequence that consists of between 15–25 amino acid residues and which comprises an amino acid sequence of a complementarity determining region of said recombinant antibody wherein said peptide mimics the binding activity of a helix of an active region of a biologically active protein to its receptor.

5,837,461

DETECTION OF CONE-PHOTORECEPTOR-BASED VISION DISORDERS

Maureen E. Neitz, and John F. Neitz, both of New Berlin, Wis., assignors to MCW Research Foundation, Milwaukee, Wis.

Filed Oct. 31, 1996, Ser. No. 739,401

Int. Cl.^{6} C12Q *1/68*

U.S. Cl. 435—6 **6 Claims**

1. A method of detecting cone-photoreceptor-based vision disorders, comprising the steps of

a) examining the amino acid sequence of a patient's red or green photopigments, and

b) correlating the amino acid sequence with amino acid combinations associated with vision disorder,

wherein the amino acid sequence is the sequence at positions selected from the group consisting of codon positions **65**, **111**, **116**, **153**, **171**, **174**, **178**, **180**, **230**, **233**, **236**, **274**, **275**, **277**, **279**, **285**, **298**, and **309** of the gene encoding the red or green photopigment and wherein the correlation comprises comparison of the amino acid sequence with amino acid sequences shown to be diagnostic of vision disorders.

5,837,462

TUMORIGENIC CELL LINES ALTERED BY GENETIC ENGINEERING AND THEIR USE FOR THE TESTING OF ANTITUMOR DRUGS

Thomas Beckers, Frankfurt; Thomas Klenner, Ingelheim, and Silke Baasner, Hanau, all of Germany, assignors to Asta Medica Aktiengesellschaft, Germany

Filed Nov. 8, 1996, Ser. No. 746,383

Claims priority, application Germany, Nov. 10, 1995, 195 42 051.9

Int. Cl.^{6} C12Q *1/68*

U.S. Cl. 435—6 **7 Claims**

1. A vector comprising a nucleotide sequence of the general formula I

R-X-A-X-IRES-X-B-X-polyA (I)

in which

R is a regulatory nucleotide sequence for inducible gene expression, which comprises a tetracycline operator sequence and a minimal promotor,

A is a gene coding for a protein which can induce a tumorigenic growth of cells,

IRES is a nucleotide sequence of viral, cellular or synthetic origin which is responsible in the stage for internal initiation of translation,

B is a gene coding for a detectable, secreted protein,

poly(A) is a nucleotide sequence for the polyadenylation of the transcript and

X is an optional linker sequence.

5,837,463

NUCLEIC ACID OF C TYPE HEPATITIS VIRUS DERIVATION AND PROCESS FOR DETECTION VIRUS USING SAID NUCLEIC ACID

Torahiko Tanaka; Nobuyuki Katoh, and Kunitada Shimotohno, all of Tokyo, Japan, assignors to Rational Drug Design Laboratories, Fukushima, and National Cancer Center, Tokyo, both of Japan

Filed Oct. 11, 1996, Ser. No. 731,272

Claims priority, application Japan, Oct. 17, 1919, 7-268700

Int. Cl.^{6} C12Q *1/68;* C07H *21/04*

U.S. Cl. 435—6 **14 Claims**

1. An isolated single-stranded nucleic acid which specifically hybridizes a minimum sequence length of 15 nucleotides of a sequence of Sequence ID No: 2 or a sequence complementary to said sequence.

5,837,464

COMPOSITIONS AND METHODS FOR DETERMINING ANTI-VIRAL DRUG SUSCEPTIBILITY AND RESISTANCE AND ANTI-VIRAL DRUG SCREENING

Daniel Capon, Hillsborough, and Christos J. Petropoulos, Half Moon Bay, both of Calif., assignors to ViroLogic, Inc., San Francisco, Calif.

Filed Jan. 29, 1997, Ser. No. 790,963

Int. Cl.^{6} C12Q *1/68*

U.S. Cl. 435—6 **83 Claims**

1. A method for determining susceptibility for an anti-HIV drug comprising:

(a) introducing a resistance test vector comprising a patient-derived segment and an indicator gene into a host cell;

(b) culturing the host cell from (a);

(c) measuring expression of the indicator gene in a target host cell, wherein the expression of the indicator gene is dependent upon the patient-derived segment; and

(d) comparing the expression of the indicator gene from (c) with the expression of the indicator gene measured when steps (a)–(c) are carried out in the absence of the anti-HIV drug,

wherein a test concentration of the anti-HIV drug is present at steps (a)–(c); at steps (b)–(c); or at step (c).

5,837,465

LUCIFERASE LABELLING METHOD

David James Squirrell, and Melanie Jane Murphy, both of Porton Down, United Kingdom, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland of Defence Evaluation & Research Agency, United Kingdom

PCT No. PCT/GB95/02038, § 371 Date Feb. 28, 1997, § 102(e) Date Feb. 28, 1997, PCT Pub. No. WO96/07100, PCT Pub. Date Mar. 7, 1996

PCT Filed Aug. 30, 1995, Ser. No. 793,504

Claims priority, application United Kingdom, Sep. 1, 1994, 9417593

Int. Cl.^{6} C12Q *1/68;1/66*

U.S. Cl. 435—6 **24 Claims**

1. A method for conjugating firefly luciferase to an antibody or nucleic acid, comprising the steps of:

(a) mixing firefly luciferase with a reagent selected from the group consisting of (i) D-luciferin, (ii) magnesium ions and adenosine triphosphate (ATP), and (iii) D-luciferin, magnesium ions and adenosine triphosphate, such that the concentrations of magnesium ions and adenosine triphosphate, when present, are greater than 0.2 mmol/liter and 0.05 mmol/liter, respectively; and

(b) covalently coupling the luciferase and the antibody or nucleic acid using a covalent coupling agent;

with the proviso that if reagent (iii) is used, then oxygen is excluded from the reaction.

5,837,466

DEVICES AND METHODS FOR DETECTING NUCLEIC ACID ANALYTES IN SAMPLES

David J. Lane, Wheaton, and Michael P. Farrell, Sugar Grove, both of Ill., assignors to Vysis, Inc., Downers Grove, Ill.

Filed Dec. 16, 1996, Ser. No. 768,177

Int. Cl.^{6} C12Q *1/68;* C12P *19/34;* C07H *21/02;21/04*

U.S. Cl. 435—6 **25 Claims**

5. A method for detecting the presence of a nucleic acid analyte in a sample, said method comprising the steps of:

(a) applying the sample to a solid support having covalently bound thereto a two-dimensional field of first analyte-specific nucleic acid probes, each of the first probes comprising a first end bound to the solid support and including a 5' portion of an autocatalytically replicable nucleic acid, and a second end including a first analyte-binding segment, wherein the first analyte-binding segment of each of the first probes hybridizes to a first region of the analyte;

(b) applying a second nucleic acid probe to the solid support, the second probe comprising a second analyte-binding segment that hybridizes to a second region of the analyte, the second probe further comprising a remainder of said autocatalytically replicable nucleic acid, wherein the first and second regions of the analyte are adjacent nucleotide segments, and wherein the analyte, the first probe, and the second probe hybridize together on the support to form a complex including a complete autocatalytically replicable nucleic acid;

(c) applying a diffusion limiting matrix to the solid support;

(d) amplifying the complete autocatalytically replicable nucleic acid to generate an amplified product; and

(e) detecting the amplified product as a measure of the presence of the analyte in the sample.

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5,837,467

METHOD FOR PREDICTING THE RESPONSE TO TREATMENT WITH BCG OF SUPERFICIAL BLADDER CARCINOMA

Raymond Kaempfer, Jerusalem, and Amos Shapiro, Mevaseret Ziyon, both of Israel, assignors to Yissum Research Development Company of the Hebrew University of Jerusalem, and Hadasit Medical Research Services and Development Company Ltd., both of Jerusalem, Israel

Filed Jan. 21, 1997, Ser. No. 786,503

Int. Cl.^{6} G01N ***33/574;*** **C12Q** ***1/68***

U.S. Cl. 435—6 **15 Claims**

1. A method for the prediction of the response of a patient suffering from superficial bladder carcinoma to treatment with bacillus Calmette-Guérin (BCG), by calculating the inducibility of the Interleukin-2 (IL-2) gene of the patient in a sample of peripheral blood mononuclear cells from the patient, comprising the steps of:

a) dividing at least one peripheral blood sample collected from a patient in the course of treatment of the patient with BCG, at least one week after said treatment, into at least two aliquots;

b) culturing the cells in each aliquot obtained in step (a) wherein:

  (i) the cells in a first aliquot are cultured in the presence of an inducing agent for inducing expression of the IL-2 gene, and

  (ii) the cells in a second aliquot are cultured in the absence of the inducing agent;

c) determining quantitatively the extent of expression of the IL-2 gene in each aliquot;

d) calculating the ratio of the extent of the expression of the IL-2 gene in the first aliquot to the extent of the expression of the IL-2 gene in the second aliquot wherein the ratio is providing a measure of the inducibility of the IL-2 gene wherein

the inducibility being in direct relationship with the probability of entering remission, relapse or persistence of bladder carcinoma in the patient.

5,837,468

PCR-BASED CDNA SUBSTRACTIVE CLONING METHOD

Xun Wang, Urbandale; Jonathan P. Duvick, and Steven P. Briggs, both of Des Moines, all of Iowa, assignors to Pioneer Hi-Bred International, Inc., Johnston, Iowa

Continuation of Ser. No. 481,687, Jun. 7, 1995, abandoned. This application May 19, 1997, Ser. No. 858,767

Int. Cl.^{6} C12Q ***1/68;*** **C12P** ***19/34;*** **C12N** ***15/00***

U.S. Cl. 435—6 **4 Claims**

1. A method for generating and screening a cDNA library with anchored ends, comprising the steps of

(a) providing an RNA preparation that comprises polyadenylated mRNA from a biological sample, said polyadenylated mRNA having a polyA portion and a non-polyA portion;

(b) preparing a first oligonucleotide primer that anneals to said polyA portion of said polyadenylated mRNA, anchoring said first primer such that a reverse transcriptase reaction can start within one nucleotide from the 3' end of said non-polyA portion;

(c) contacting said first primer to generate by PCR from said RNA preparation DNA strands that are complementary to said polyadenylated mRNA;

(d) adding a polynucleotide tail at the 3' end of said DNA strands by terminal deoxynucleotidyl transferase, whereby said DNA strands have a first portion that is complementary to said polyadenylated mRNA and a tail portion;

(e) preparing a second oligonucleotide primer that anneals to said polynucleotide tail attached in step (d), anchoring said second primer such that a reverse transcriptase reaction can start one nucleotide downstream from the 5' end of said first portion of said DNA strands;

(f) contacting said first primer and said second primer to amplify said DNA strands by PCR and produce a cDNA library with anchored ends; and

(g) screening said cDNA library with anchored ends without the necessity of cloning and propagating said library in a recombinant host system.

5,837,469

ASSAY FOR *CHLAMYDIA TRACHOMATIS* BY AMPLIFICATION AND DETECTION OF *CHLAMYDIA TRACHOMATIS* NUCLEIC ACID

James M. Harris, Columbia, Md., assignor to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed Nov. 4, 1997, Ser. No. 963,933

Int. Cl.^{6} C12Q ***1/68;*** **C07H** ***21/02***

U.S. Cl. 435—6 **19 Claims**

1. A nucleic acid selected from the group consisting of LB-PD1.1 (SEQ ID NO:7) and LB-PD 1.2 (SEQ ID NO:8).

5,837,470

METHOD OF RECOVERING A BIOLOGICAL MOLECULE FROM A RECOMBINANT MICROORGANISM

Peter S. Carlson, Alexandria; Ernesto J. Quintero, McLean, both of Va.; David M. Manyak, Ellicott City, and Alan B. Chmurny, Frederick, both of Md., assignors to Oceanix Biosciences Corporation, Hanover, Md.

Division of Ser. No. 766,308, Dec. 13, 1996. This application Feb. 11, 1998, Ser. No. 21,984

Int. Cl.^{6} C12Q ***1/68;*** **C12P** ***21/02***

U.S. Cl. 435—6 **14 Claims**

1. A method of producing a biological molecule from a recombinant microorganism, wherein the recombinant microorganism is produced by a method comprising:

(a) obtaining an environmental sample having microorganisms;

(b) preparing donor protoplasts from the environmental sample;

(c) providing recipient protoplasts;

(e) fusing said donor protoplasts with said recipient protoplasts to produce a recombinant microorganism, wherein the recombinant microorganism produces a biological molecule; and

(f) recovering or isolating the biological molecule.

5,837,471

IN VITRO ASSAY FOR BIOCHEMICAL MECHANISMS OF CARCINOGENICITY USING PHENOTYPIC TRANSFORMATION OF HUMAN CELLS

Linda A. Kowalski, Vancouver, Canada, assignor to Viratest Carcinogen Monitoring, Ltd., Vancouver, Canada

Division of Ser. No. 696,695, Aug. 14, 1996. This application Mar. 17, 1998, Ser. No. 42,651

Int. Cl.^{6} C12Q ***1/68;1/04;*** **G01N** ***33/48***

U.S. Cl. 435—6 **5 Claims**

1. A method to identify the biochemical mechanism of carcinogenicity of a compound, said method comprising:

(a) contacting a putative carcinogen with a first test cell having a defect in a first protective cellular mechanism;

(b) contacting said putative carcinogen with a second test cell having a defect in a second protective cellular mechanism, wherein said defect in said second protective cellular mechanism is different from said defect in said first protective cellular mechanism; and

(c) scoring cell growth of said first test cell and said second test cell based on a phenotypic transformation characteristic, wherein a positive transformation characteristic in either of said first or second test cells indicates that said putative carcinogen is a carcinogen, and wherein a difference in the magnitude of a positive transformation characteristic between said first and second test cells indicates that the biochemical mechanism of said carcinogen is associated with said defect in a protective cellular mechanism of the test cell in which the magnitude of said positive transformation characteristic is greater.

5,837,472

NUCLEOTIDE SEQUENCES CODING FOR A PROTEIN WITH UREASE ACTIVITY

Agnès Labigne, Bures Sur Yvette, France, assignor to Institut Pasteur, and Institut National de la Sante et de la Recherche Medicale, both of Paris, France

Division of Ser. No. 499,325, Jun. 5, 1990, Pat. No. 5,695,931. This application Jun. 6, 1995, Ser. No. 467,283

Claims priority, application France, Oct. 6, 1988, 88/13135

Int. Cl.^{6} G01N ***33/53;*** **C12P** ***21/02;*** **A61K** ***39/395;37/48***

U.S. Cl. 435—7.1 **19 Claims**

1. A synthetic or recombinant *Campylobacter pylori* urease polypeptide or an immunogenic fragment thereof.

5,837,473

METHODS OF SCREENING FOR AGENTS AFFECTING THE DEPOSITION OF β-AMYLOID PEPTIDES ON AMYLOID PLAQUES IN HUMAN TISSUE

John Edward Maggio, Brookline, Mass., and Patrick William Mantyh, Edina, Minn., assignors to President and Fellows of Harvard College, Cambridge, Mass., and Regents of the University of Minnesota, Minneapolis, Minn.

Continuation of Ser. No. 744,767, Aug. 13, 1991, Pat. No. 5,434,050. This application May 3, 1995, Ser. No. 433,734

Int. Cl.^{6} G01N ***33/53***

U.S. Cl. 435—7.21 **7 Claims**

1. An in vitro method of screening for an agent capable of affecting the deposition of β-amyloid peptide or peptide fragment thereof on tissue, the method comprising:

(a) combining a sample of human tissue evidencing the presence of Alzheimer's amyloidosis, with an amount of labelled β-amyloid peptide or labelled active peptide fragment thereof and an agent to be screened for a time effective to allow binding of the labelled β-amyloid peptide of the labelled fragment thereof to amyloid plaques in the tissue;

(b) detecting the amount of labelled β-amyloid peptide or labelled peptide fragment bound to the tissue sample; and

(c) assessing the effect the agent has on β-amyloid peptide or peptide fragment deposition.

5,837,474

IMMUNOLOGICAL METHOD FOR THE DETECTION OF MALIGNANT TUMORS AND KIT FOR PERFORMING THE METHOD

Erwin Schauenstein, Am Eisernen Tor 2, A-8010; Konrad Schauenstein, Carnerigasse 20, A-8010, both of Graz, and Franz Dachs, Spattendorf 10, A-4210, Gallneukirchen, all of Austria

PCT No. PCT/AT93/00032, § 371 Date Jan. 30, 1995, § 102(e) Date Jan. 30, 1995, PCT Pub. No. WO93/17343, PCT Pub. Date Sep. 2, 1993

PCT Filed Feb. 25, 1993, Ser. No. 295,720

Claims priority, application Australia, Feb. 27, 1992, 368/92

Int. Cl.^{6} G01N ***33/574;33/53;33/48;*** **A01N** ***1/02***

U.S. Cl. 435—7.23 **11 Claims**

1. A method of screening for malignant tumors, which comprises:

withdrawing blood from a patient, and preparing samples of blood or serum obtained therefrom;

stabilizing the blood or serum sample with a radical inhibitor;

determining (i) the amount of at least one immune globulin G subclass and (ii) the amount of all immune globulin G subclasses in the sample;

calculating the ratio between (i) and (ii) and comparing the ratio with the ratio of (i) and (ii) in a normal serum or blood sample;

wherein a shift of the ratio of (i) and (ii) relative to the ratio in a normal sample is indicative of the presence of a tumor in the patient.

5,837,475

APPARATUS AND METHOD FOR SCANNING A CHEMICAL ARRAY

Andreas Dorsel, Menlo Park; Steven M. Lefkowitz, Millbrae, and John W. Sadler, Belmont, all of Calif., assignors to Hewlett-Packard Co., Palo Alto, Calif.

Filed Jan. 30, 1997, Ser. No. 790,775

Int. Cl.^{6} G01N ***33/53;21/64***

U.S. Cl. 435—7.1 **8 Claims**

1. A method for analyzing a chemical array having a plurality of array elements some of which are suspected to contain fluorescent material, comprising:

(a) selecting a first number of pixels and irradiating the first number of pixels sequentially in the array elements and detecting the fluorescence resulting from the irradiation in the pixels, the first number of pixels being more than one pixel and less than the total number of pixels in the array and being selected such that a period elapses adequate for the fluorescent material in a pixel to recover from a metastable state before the pixel is irradiated again; and

(b) repeating the irradiation and detecting on the first number of pixels one or more times before irradiating pixels of a second number of pixels that are different from the pixels of the first number of pixels in the array.

5,837,476

METHODS FOR DETERMINING DISORDERS BY ASSAYING FOR A NON-TYROSINASE, TUMOR REJECTION ANTIGEN PRECURSOR

Vincent Brichard; Aline Van Pel, both of Brussels, Belgium; Catia Traversari, Milan, Italy; Thomas Wölfel, Mainz, Germany; Thierry Boon-Falleur, and Etienne De Plaen, both of Brussels, Belgium, assignors to Ludwig Institute, New York, N.Y.

Continuation of Ser. No. 398,409, Mar. 3, 1995. This application Jan. 16, 1998, Ser. No. 7,966

Int. Cl.^{6} G01N ***33/574;33/53;*** **A61K** ***38/00;*** **C07H** ***21/04***

U.S. Cl. 435—7.23 **2 Claims**

1. Method for diagnosing a disorder characterized by expression of a tumor rejection antigen precursor which is not tyrosinase, and is encoded nucleic acid molecule having the nucleotide sequence of SEQ ID NO: 1 and is processed to a tumor rejection antigen which forms a complex with an HLA-A2 molecule, comprising contacting a sample from a subject with an agent specific for said complex and determining interaction between said complex and said agent as a determination of said disorder.

5,837,477

T CELL RECEPTOR LIGANDS AND METHODS OF USING SAME

Ronald N. Germain, Potomac, Md.; Luigi Racioppi, Bethesda, Md., and Franca Ronchese-Le Gros, Brooklyn, New Zealand, assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Jan. 15, 1993, Ser. No. 4,936

Int. Cl.^{6} C07K ***14/74;*** **G01N** ***33/50***

U.S. Cl. 435—7.24 **11 Claims**

1. An altered TCR ligand comprising an MHC molecule and a peptide, wherein the MHC molecule is altered by mutation or the

peptide is altered by replacement of at least one residue; which altered TCR ligand substantially inhibits at least one T-cell effector response evoked by activating peptide-MHC molecule complexes available to responding T-cells when said TCR ligand is in the presence of said T-cells, wherein said ligand does not substantially inhibit at least one other T-cell effector response evoked by activating peptide-MHC molecule complexes available to responding T-cells.

5,837,478

METHOD OF IDENTIFYING MODULATORS OF BINDING BETWEEN AND VCAM-1

W. Michael Gallatin, Mercer Island, and Monica Van der Vieren, Seattle, both of Wash., assignors to ICOS Corporation, Bothell, Wash.

Continuation-in-part of Ser. No. 605,672, Feb. 22, 1996, which is a continuation-in-part of Ser. No. 362,652, Dec. 21, 1994, Pat. No. 5,766,850, which is a continuation-in-part of Ser. No. 286,889, Aug. 5, 1994, Pat. No. 5,470,953, which is a continuation-in-part of Ser. No. 173,497, Dec. 23, 1993, Pat. No. 5,437,958. This application Oct. 3, 1997, Ser. No. 943,363

Int. Cl.^{6} G01N *33/53;33/566*

U.S. Cl. 435—7.24 **4 Claims**

1. A method for identifying a modulator of binding between α_d and VCAM-1 comprising the steps of:

a) contacting α_d and VCAM-1 in the presence and absence of a putative modulator compound;
b) detecting binding between α_d and VCAM-1; and
c) identifying a putative modulator compound in view of decreased or increased binding between α_d and VCAM-1 in the presence of the putative modulator as compared to binding in the absence of the putative modulator.

5,837,479

SCREENING ASSAYS FOR INHIBITORS OF MAMMALIAN PROSTAGLANDIN H SYNTHASE-2

Donald A. Young, 540 Clover Hills Dr., Rochester, N.Y. 14618; Michael K. O'Banion, 3613 Clover St., Pittsford, N.Y. 14534, and Virginia D. Winn, 139 Raleigh St., Rochester, N.Y. 14620

Division of Ser. No. 487,752, Jun. 7, 1995, which is a continuation-in-part of Ser. No. 231,456, Apr. 20, 1994, abandoned, which is a continuation-in-part of Ser. No. 54,364, Apr. 28, 1993, abandoned, which is a continuation-in-part of Ser. No. 983,835, Dec. 1, 1992, abandoned, which is a continuation-in-part of Ser. No. 949,780, Sep. 22, 1992, abandoned, said Ser. No. 480,065 is a continuation-in-part of Ser. No. 34,143, Mar. 22, 1993, abandoned, which is a continuation of Ser. No. 949,780. This application Jun. 7, 1995, Ser. No. 480,065

Int. Cl.^{6} C12Q *1/26;1/28;1/02*

U.S. Cl. 435—25 **7 Claims**

1. A method for identifying a compound that inhibits prostaglandin synthesis catalyzed by mammalian prostaglandin H synthase-2 (PGHS-2) comprising:

(a) contacting a genetically engineered host cell that contains a sequence encoding mammalian PGHS-2 operatively associated with a regulatory sequence that controls gene expression, so that a PGHS-2 gene product is stably expressed by the host cell, with the compound in the presence of a pre-determined amount of arachidonic acid;
(b) measuring the conversion of the arachidonic acid to its prostaglandin metabolite; and
(c) comparing the amount of arachidonic acid converted by the cells exposed to the test compound to the amount of arachidonic acid converted by control cells that were not exposed to the test compound.

5,837,480

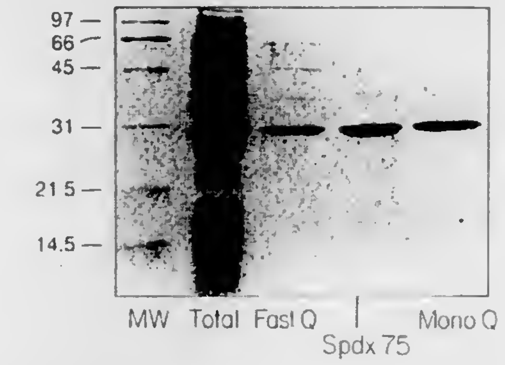
METHOD AND COMPOUNDS FOR INHIBITING LIPID BIOSYNTHESIS OF BACTERIA AND PLANTS

James Sacchettini, New Rochelle; John Blanchard, Pelham Manor, and William R. Jacobs, Jr., City Island, all of N.Y., assignors to Albert Einstein College of Medicine of Yeshiva University, a Division of Yeshiva University, Bronx, N.Y.

Division of Ser. No. 234,011, Apr. 28, 1994. This application Aug. 21, 1996, Ser. No. 700,306

Int. Cl.^{6} C12Q *1/26;1/04;1/00;* **G01N** *33/53*

U.S. Cl. 435—25 **8 Claims**



1. A method for determining whether a compound is useful as a bacteriocide or a herbicide comprising (i) combining InhA enzyme and a compound suspected of having bacteriocidal or herbicidal activity, wherein said compound is present in an amount effective to inhibit InhA-mediated enoyl reductase activity, and (ii) determining whether said compound inhibits InhA-mediated enoyl reductase activity by measuring the level of binding causing inhibition of InhA-mediated enoyl reductase activity which indicates the utility of said compound as a bacteriocide or a herbicide.

5,837,481

MICROBIAL SYSTEM FOR FORMALDEHYDE SENSING AND REMEDIATION

Timothy J. Donohue, Middleton; Robert D. Barber, Cross Plains, and Vern Witthuhn, Madison, all of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Division of Ser. No. 608,241, Feb. 28, 1996, Pat. No. 5,747,328. This application Aug. 29, 1997, Ser. No. 919,953

Int. Cl.^{6} C12Q *1/02;1/32*

U.S. Cl. 435—29 **12 Claims**

1. A method for detecting formaldehyde in a sample, the method comprising the steps of:

providing a *Rhodobacter sphaeroides* bacterial cell that comprises a protein-encoding indicator gene, a transcriptional adhl promoter from *Rhodobacter sphaeroides* operably linked to the indicator gene, a cis-acting operator from *Rhodobacter sphaeroides* operably linked to the promoter, a protein that senses formaldehyde, and a trans-acting protein that modulates transcription of the indicator gene from the transcriptional promoter in response to a signal from the protein that senses formaldehyde, wherein the promoter and the operator together specifically direct transcription of the indicator gene when the bacterial cell is exposed to formaldehyde;
adding the bacterial cell to the sample; and
monitoring for a product of the indicator gene in the sample.

5,837,482

CULTURE MEDIUM AND METHODS FOR DETECTING STAPHYLOCOCCI

Patrick A. Mach, Shorewood, and Marlys E. Lund, Eden Prairie, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 23, 1997, Ser. No. 785,398

Int. Cl.^{6} C12Q *1/04;1/02;1/54;1/00*

U.S. Cl. 435—34 **25 Claims**

1. A medium for detecting staphylococci in a sample, said medium comprising components selective for growing staphylococci and egg-yolk as a differential detection agent, said medium further comprising a glucopyranoside indicator substance in an amount sufficient to distinguish colonies containing staphylococci from colonies containing Bacillus microorganisms when said sample is cultured in said medium.

5,837,483

ENZYMATIC METHOD FOR PRODUCING N-FORMYL-α-L-ASPARTYL-L-PHENYLALANINE METHYL ESTER

Akira Hirata, Tokyo, Japan, assignor to Holland Sweetener Company V.o.F., Maastricht, Netherlands

Filed Sep. 29, 1997, Ser. No. 939,949

Int. Cl.^{6} C12P *21/60;13/04*

U.S. Cl. 435—68.1 **7 Claims**

1. An enzymatic method for producing N-formyl-α -L-aspartyl-L-phenylalanine methyl ester by a condensation reaction between N-formyl-L-aspartic acid and L-phenylalanine methyl ester or D,L-phenylalanine methyl ester, which comprises:

supplying an organic phase comprising a water-immiscible solvent containing N-formyl-L-aspartic acid and L- or D,L-phenylalanine methyl ester onto an aqueous phase comprising a thermolysin-like metalloprotease;
proceeding the condensation reaction in the aqueous phase to produce N-formyl-a-L-aspartyl-L-phenylalanine methyl ester; and
extracting the N-formyl-α-L-aspartyl-L-phenylalanine methyl ester thus produced from the aqueous phase to the organic phase.

5,837,484

STABLE CELL LINES CAPABLE OF EXPRESSING THE ADENO-ASSOCIATED VIRUS REPLICATION GENE

James P. Trempe, Toledo, Ohio, and Qicheng Yang, San Diego, Calif., assignors to Medical College of Ohio, Toledo, Ohio

PCT No. PCT/US94/12582, § 371 Date Jan. 9, 1995, § 102(e) Date Jan. 9, 1995, PCT Pub. No. WO95/13392, PCT Pub. Date May 18, 1995

Continuation of Ser. No. 273,563, Jul. 11, 1994, abandoned, which is a continuation of Ser. No. 151,065, Nov. 9, 1993, abandoned. This PCT application Nov. 3, 1994, Ser. No. 362,608

Int. Cl.^{6} C12N *15/63*

U.S. Cl. 435—69.1 **18 Claims**

1. A stable mammalian cell line with an adeno-associated virus (AAV) rep gene operably linked to a heterologous promoter, which cell line contains a gene encoding functional Rep protein.

5,837,485

DNA ENCODING AND BIOSYNTHETIC PROCESS FOR THE PREPARATION OF CHEMICAL COMPOUNDS, LANTIBIOTICS

Karl-Dieter Entian, Oberursel, Germany; Friedrich Götz, Tübingen, Germany; Norbert Schnell, Pasadena, Calif.; Johannes Augustin, Tübingen, Germany; Germar Engelke, Frankfurt am Main, Germany; Ralf Rosenstein, Reutlingen, Germany; Curtina Kaletta, Münich, Germany; Cora Klein, Offenbach, Germany; Bernd Wieland, Rottenburg, Germany; Thomas Kupke; Günther Jung, both of Tübingen, Germany, and Roland Kellner, Heppenheim, Germany, assignors to Dr. Karl Tomae GmbH, Biberach an der Riss, Germany

Continuation of Ser. No. 876,791, Apr. 30, 1992, abandoned, which is a continuation of Ser. No. 784,234, Oct. 31, 1991, abandoned, which is a continuation-in-part of Ser. No. 353,590, May 18, 1989, abandoned. This application Feb. 22, 1995, Ser. No. 392,625

Claims priority, application United Kingdom, May 18, 1988, 88 11761.9

Int. Cl.^{6} C12N *15/52;15/63*

U.S. Cl. 435—69.1 **14 Claims**

1. A plasmid capable of transforming a bacterial host, the plasmid comprising (a) a nucleotide molecule coding for the prepeptide sequence −30 to −1 of pre-epidermin; and operably linked, in the 5' to 3' direction, to (b) a DNA molecule coding for gallidermin.

5,837,486

METHOD FOR PREPARING SOLUBLE ANALOGUES OF INTEGRINS

Sarah C. Bodary; Cornelia M. Gorman; John W. McLean, all of San Francisco, and Mary A. Napier, Hillsborough, all of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Division of Ser. No. 380,227, Jan. 30, 1995, abandoned, which is a continuation of Ser. No. 218,878, Mar. 28, 1994, abandoned, which is a continuation of Ser. No. 821,337, Jan. 19, 1992, abandoned, which is a continuation of Ser. No. 444,490, Dec. 1, 1989, abandoned, which is a continuation-in-part of Ser. No. 290,224, Dec. 22, 1988, abandoned. This application May 19, 1995, Ser. No. 445,443

Int. Cl.^{6} C12N *15/12*

U.S. Cl. 435—69.1 **15 Claims**

1. A method for the preparation of a soluble analogue of a naturally occurring multiple subunit polypeptide (MSP),

wherein the MSP is an integrin comprising an α and a β subunit, said integrin selected from the group consisting of GPIIb-IIIa; p-150,95; Mac-1; LFA-1; a leukocyte adhesion receptor; a member of the VLA family; and a heterodimeric receptor that participates directly in intercellular adhesion or adhesion of cells to extracellular matrix proteins;
wherein each subunit is encoded by a discrete nucleic acid and wherein at least one subunit comprises a membrane anchor domain, the method comprising:
1) mutating the nucleic acid encoding one of the subunits which comprises a membrane anchor domain to produce a subunit variant, by modifying or deleting sufficient of the membrane anchor domain to render the membrane anchor domain no longer sufficiently hydrophobic to anchor the subunit variant in a cell membrane;
2) repeating step 1 for the nucleic acid encoding each subunit comprising a membrane anchor domain;
3) co-expressing the subunits which do not comprise a membrane anchor domain and the subunit variants of steps 1 and 2 in a host cell;
4) culturing the host cell of step 3; and
5) recovering from the host cell culture a biologically active soluble analogue.

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5,837,487

Patent Not Issued For This Number

5,837,488

CLONING AND PRODUCTION OF HUMAN VON WILLEBRAND FACTOR GP1B BINDING DOMAIN POLYPEPTIDES AND METHODS OF USING SAME

Leonard Garfinkel, Rehovot, and Tamar Richter, Nes Ziona, both of Israel, assignors to Bio-Technology General Corp., Iselin, N.J.

Division of Ser. No. 347,594, Nov. 30, 1994, which is a continuation of Ser. No. 80,690, Jun. 22, 1993, abandoned, which is a continuation of Ser. No. 753,815, Sep. 3, 1991, abandoned, which is a continuation-in-part of Ser. No. 487,767, Mar. 2, 1990, abandoned. This application Jun. 5, 1995, Ser. No. 465,563

Int. Cl.^{6} C12P *21/06;* **C12N** *1/20;15/00;* **A61K** *38/00*

U.S. Cl. 435—69.1 **6 Claims**

1. An expression plasmid encoding a polypeptide having the amino acid sequence X-A-Cys Ser Arg Leu Leu Asp Leu Val Phe Leu Leu Asp Gly Ser Ser Arg Leu Ser Glu Ala Glu Phe Glu Val Leu Lys Ala Phe Val Val Asp Met Met Glu Arg Leu Arg Ile Ser Gln Lys Trp Val Arg Val Ala Val Val Glu Tyr His Asp Gly Ser His Ala Tyr Ile Gly Leu Lys Asp Arg Lys Arg Pro Ser Glu Leu Arg Arg Ile Ala Ser Gln Val Lys Tyr Ala Gly Ser Gln Val Ala Ser Thr Ser Glu Val Leu Lys Tyr Thr Leu Phe Gln Ile Phe Ser Lys Ile Asp Arg Pro Glu Ala Ser Arg Ile Ala Leu Leu Leu Met Ala Ser Gln Glu Pro Gln Arg Met Ser Arg Asn Phe Val Arg Tyr Val Gln Gly Leu Lys Lys Lys Lys Val Ile Val Ile Pro Val Gly Ile Gly Pro His Ala Asn Leu Lys Gln Ile Arg Leu Ile Glu Lys Gln Ala Pro Glu Asn Lys Ala Phe Val Leu Ser Ser Val Asp Glu Leu Glu Gln Gln Arg Asp Glu Ile Val Ser Tyr Leu Cys Asp Leu Ala Pro Glu Ala Pro Pro Pro Thr Leu Pro Pro Asp Met Ala Gln Val Thr Val Gly Pro Gly Leu Leu Gly Val Ser Thr Leu Gly Pro Lys-COOH

wherein X is NH_2-methionine- or NH_2—;

A is a sequence of at least 1, but no more than 5 amino acids, which sequence is present in naturally-occurring human vWF, the carboxy terminal amino acid of which is the tyrosine #508 shown in FIG. **12** and each succeeding amino acid of which is the next successive N-terminal amino acid shown in FIG. **12**; and

the two cysteines included in the sequence are joined by a disulfide bond.

5,837,489

HUMAN NEURONAL NICOTINIC ACETYLCHOLINE RECEPTOR AND CELLS TRANSFORMED WITH SAME DNA AND MRNA ENCODING AN—SUBUNIT OF

Kathryn J. Elliott; Steven B. Ellis, both of San Diego, and Michael M. Harpold, El Cajon, all of Calif., assignors to SIBIA Neurosciences, Inc., LaJolla, Calif.

Division of Ser. No. 28,031, Mar. 8, 1993, abandoned. This applicatinn Jun. 5, 1995, Ser. No. 466,589

Int. Cl.^{6} C12N *15/00*

U.S. Cl. 435—69.1 **24 Claims**

1. An isolated nucleic acid molecule, comprising a sequence of nucleotides or ribonucleotides that encodes an α_7 subunit of a human neuronal nicotinic acetylcholine receptor, wherein the sequence of nucleotides or ribonucleotides encoding the α_7 subunit is selected from the group consisting of:

(a) a sequence of nucleotides or ribonucleotides that encodes a human α_7 subunit and comprises the coding portion of the sequence set forth in SEQ.ID.No:7;

(b) a sequence of nucleotides or ribonucleotides that encodes a human α_7-subunit and that hybridizes under conditions of high stringency to the complement of the entire coding portion of the sequence of nucleotides set forth in SEQ.ID.No:7;

(c) a sequence of nucleotides that encodes an α_7 subunit, hybridizes under conditions of high stringency to the complement of the sequence of nucleotides set forth in SEQ.ID.No:7, and, if it is DNA, is fully complementary or, if it is RNA, is identical to mRNA native to a human cell; and

(d) a sequence of nucleotides or ribonucleotides degenerate with the α_7 subunit encoding sequence of (a), (b) or (c).

5,837,490

SECRETED PROTEINS AND POLYNUCLEOTIDES ENCODING THEM

Kenneth Jacobs, Newton; John M. McCoy, Reading; Edward R. LaVallie, Tewksbury; Lisa A. Racie; David Merberg, both of Acton; Maurice Treacy, Chestnut Hill, and Vikki Spaulding, Billerica, all of Mass., assignors to Genetics Institute, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 721,923, Sep. 27, 1996, abandoned, which is a continuation-in-part of Ser. No. 664,596, Jun. 17, 1996. This application Oct. 30, 1996, Ser. No. 739,775

Int. Cl.^{6} C12N *15/00*

U.S. Cl. 435—69.1 **21 Claims**

1. A composition comprising an isolated polynucleotide selected from the group consisting of:

(a) a polynucleotide comprising the nucleotide sequence of SEQ ID NO:1;

(b) a polynucleotide comprising the nucleotide sequence of SEQ ID NO:1 from nucleotide 800 to nucleotide 907;

(c) a polynucleotide comprising the nucleotide sequence of the full-length protein coding sequence of clone AS152_1 deposited under accession number ATCC 98079;

(d) a polynucleotide encoding the full-length protein encoded by the cDNA insert of clone AS152_1 deposited under accession number ATCC 98079;

(e) a polynucleotide comprising the nucleotide sequence of the mature protein coding sequence of clone AS152_1 deposited under accession number ATCC 98079;

(f) a polynucleotide encoding the mature protein encoded by the cDNA insert of clone AS152_1 deposited under accession number ATCC 98079;

(g) a polynucleotide encoding a protein comprising the amino acid sequence of SEQ ID NO:2;

(h) a polynucleotide comprising the nucleotide sequence of the full-length protein coding sequence of isolate AS152_2 deposited under accession number ATCC 98181;

(i) a polynucleotide encoding the full:length protein encoded by the cDNA insert of isolate AS152_2 deposited under accession number ATCC 98181;

(j) a polynucleotide comprising the nucleotide sequence of the mature protein coding sequence of isolate AS152_2 deposited under accession number ATCC 98181;

(k) a polynucleotide encoding the mature protein encoded by the cDNA insert of isolate AS152_2 deposited under accession number ATCC 98181;

(l) a polynucleotide comprising the nucleotide sequence of SEQ ID NO:5;

(m) a polynucleotide comprising the nucleotide sequence of SEQ ID NO:5 from nucleotide 459 to nucleotide 521;

(n) a polynucleotide encoding a protein comprising the amino acid sequence of SEQ ID NO:6; and

(o) a polynucleotide which is an allelic variant of a polynucleotide of (a)–(n) above.

5,837,491

POLYNUCLEOTIDES ENCODING GELONIN SEQUENCES

Marc D. Better, Los Angeles; Stephen F. Carroll, Walnut Creek, and Gary M. Studnicka, Santa Monica, all of Calif., assignors to Xoma Corporation, Berkeley, Calif.

PCT No. PCT/US94/05348, § 371 Date May 13, 1996, § 102(e) Date May 13, 1996, PCT Pub. No. WO94/26910, PCT Pub. Date Nov. 24, 1994

Continuation-in-part of Ser. No. 64,691, May 12, 1993, abandoned, which is a continuation-in-part of Ser. No. 988,430, Dec. 9, 1992, Pat. No. 5,416,202, which is a continuation-in-part of Ser. No. 901,707, Jun. 19, 1992, Pat. No. 5,376,546, which is a continuation-in-part of Ser. No. 787,567, Nov. 4, 1991, abandoned. This PCT application May 12, 1994, Ser. No. 646,360

Int. Cl.^{6} C12P *21/02;* **C12N** *1/21;15/29*

U.S. Cl. 435—69.1 **20 Claims**

1. A purified polynucleotide comprising a polynucleotide sequence that encodes a gelonin sequence that has enzymatic activity and that has a cysteine at a position corresponding to amino acid 44 of SEQ ID No. 2.

2. A purified polynucleotide comprising a polynucleotide sequence that encodes a gelonin sequence that has enzymatic activity and that has a lysine at a position corresponding to amino acid 104 of SEQ ID No. 2, that is adjacent to a threonine.

5,837,492

CHROMOSOME 13-LINKED BREAST CANCER SUSCEPTIBILITY GENE

Sean V. Tavtigian; Alexander Kamb, both of Salt Lake City, Utah; Jacques Simard, St. Augustin de Desmuures, Canada; Fergus Couch, St. Davids, Pa.; Johanna M. Rommens, Toronto, Canada, and Barbara L. Weber, Merion, Pa., assignors to Myriad Genetics, Inc., Salt Lake City, Utah; Endo Recherche, Inc., Sainte-Foy, Canada; HSC Research & Development Limited Partnership, Toronto, Canada, and Trustees of the University of Pennsylvaina, Philadelphia, Pa.

Continuation-in-part of Ser. No. 585,391, Jan. 11, 1996, abandoned, which is a continuation-in-part of Ser. No. 576,559, Dec. 21, 1995, abandoned, which is a continuation-in-part of Ser. No. 575,359, Dec. 20, 1995, abandoned, which is a continuation-in-part of Ser. No. 573,779, Dec. 18, 1995, abandoned. This application Apr. 29, 1996, Ser. No. 639,501

Int. Cl.^{6} C12N *15/63;15/79;15/09;5/10*

U.S. Cl. 435—69.1 **30 Claims**

1. An isolated DNA molecule coding for a BRCA2 polypeptide, said DNA molecule comprising a nucleic acid sequence encoding the amino acid sequence set forth in SEQ ID NO:2.

16. An expression vector which comprises the isolated DNA of claim 1, or at least 15 contiguous nucleotides of the isolated DNA molecule of claim 1, operably linked to transcription regulatory regions.

21. An isolated host cell transformed with the expression vector of claim **16**.

29. A pair of single-stranded DNA primers of at least 15 nucleotides in length for determination of the nucleotide sequence of a BRCA2 gene by a polymerase chain reaction, the sequence of said primers being isolated from human chromosome 13, wherein the use of said primers in a polymerase chain reaction results in the synthesis of DNA comprising all or at least 15 contiguous nucleotides of the BRCA2 gene.

5,837,493

HUMAN GALECTINS

Jennifer L. Hillman, San Jose; Surya K. Goli, Sunnyvale; Olga Bandman; Phillip R. Hawkins, both of Mountain View, and Joanne R. Petithory, Fremont, all of Calif., assignors to Incyte Pharmaceuticals, Inc., Palo Alto, Calif.

Filed Jan. 23, 1997, Ser. No. 788,584

Int. Cl.^{6} C12N *15/00;1/20;* **C12P** *21/02;* **C07H** *21/04*

U.S. Cl. 435—69.1 **9 Claims**

1. An isolated and purified polynucleotide sequence encoding a polypeptide comprising the amino acid sequence of SEQ ID NO:1.

5,837,494

E. COLI MUTANT WITH SUPPRESSED ORGANIC ACID PRODUCTION

Jong Ho Lee; Hau Choi; Il Lae Jung; Doe Sun Na, and Young Min Park, all of Seoul, Rep. of Korea, assignors to Korea Green Cross Corporation, Kyungki-Do, Rep. of Korea

PCT No. PCT/KR96/00186, § 371 Date Jun. 30, 1997, § 102(e) Date Jun. 30, 1997, PCT Pub. No. WO97/16530, PCT Pub. Date May 9, 1997

PCT Filed Oct. 29, 1996, Ser. No. 860,529

Claims priority, application Rep. of Korea, Oct. 30, 1995, 1995-38044

Int. Cl.^{6} C12P *21/06;* **C12N** *15/00;1/20*

U.S. Cl. 435—69.1 **5 Claims**

1. An *E. coli* mutant which is not capable of growing under anaerobic culture conditions with glucose as a carbon source, said mutant being capable of utilizing glucose as a carbon source under aerobic growth conditions but having organic acid production under aerobic growth conditions which is suppressed compared to its parent strain.

5,837,495

DNA ENCODING INTERLEUKIN-1 ANTAGONIST

Francesco Colotta; Marta Muzio, and Alberto Mantovani, all of Milan, Italy, assignors to Applied Research Systems ARS Holding N.V., Curacao, Netherlands Antilles

Continuation-in-part of Ser. No. 476,860, Jun. 7, 1995, Pat. No. 5,739,282. This application Aug. 13, 1997, Ser. No. 910,733

Claims priority, application Italy, Oct. 13, 1994, MI94A2097

Int. Cl.^{6} C12N *15/12;* **C07K** *14/47*

U.S. Cl. 435—69.1 **9 Claims**

1. An isolated DNA molecule which encodes an IL-1 antagonist having the amino acid sequence of SEQ ID NO:13.

5,837,496

MEROSIN FRAGMENTS AND USES THEREOF

Eva Engvall, Escondido, Calif., and Ilmo Leivo, Helsinki, Finland, assignors to La Jolla Cancer Research Foundation, La Jolla, Calif.

Division of Ser. No. 125,077, Sep. 22, 1993, which is a continuation-in-part of Ser. No. 919,951, Jul. 27, 1992, abandoned, which is a continuation of Ser. No. 472,319, Jan. 30, 1990, abandoned. This application Jun. 2, 1995, Ser. No. 460,309

Int. Cl.^{6} C12P *21/06;* **C07K** *1/00*

U.S. Cl. 435—69.3 **3 Claims**

2. A method of promoting cell attachment to a substrate, comprising contacting a cell which binds to merosin with a substrate containing a merosin fragment or a cell attachment promoting portion thereof, wherein cell attachment to the substrate is promoted.

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5,837,497

DNAS ENCODING MAMMALIAN ZPC AND USES THEREOF

Jeffrey D. Harris, The Woodlands, Tex., assignor to Zonagen, Inc., The Woodlands, Tex.

Division of Ser. No. 149,223, Nov. 9, 1993, which is a continuation-in-part of Ser. No. 12,990, Jan. 29, 1993, abandoned, which is a continuation-in-part of Ser. No. 973,341, Nov. 9, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 484,993

Int. Cl.^{6} C12P *21/06;* **C12N** *1/20;15/00;* **C07H** *21/04*

U.S. Cl. 435—693 **8 Claims**

1. An isolated DNA encoding a ZPC polypeptide, the DNA being selected from the group consisting of

DNA set out in SEQ ID NOS 5, 7, 11, 17, and 23.

5,837,498

CORPUSCLES OF STANNIUS PROTEIN, STANNIOCALCIN

Henrik S. Olsen, Gaithersburg, and Mark D. Adams, Potomac, both of Md., assignors to Human Genome Scienes, Inc., Rockville, Md.

Filed Mar. 8, 1994, Ser. No. 208,005

Int. Cl.^{6} C12N *15/12;15/18*

U.S. Cl. 435—69.4 **24 Claims**

1. An isolated polynucleotide comprising a polynucleotide which is at least 95% identical to a member selected from the group consisting of:

(a) a polynucleotide encoding a polypeptide comprising amino acids having the sequence set fort in SEQ ID NO: 2;

(b) a polynucleotide encoding a polypeptide comprising amino acid 1 to amino acid 214 as set forth in SEQ ID NO: 2; and

(c) a polynucleotide complementary to the polynucleotide of (a) or (b).

5,837,499

DNA ENCODING C5A RECEPTOR ANTAGONISTS HAVING SUBSTANTIALLY NO AGONIST ACTIVITY AND METHODS OF EXPRESSING SAME

Jan van Oostrum, Flueh, Switzerland; William C. Boyar, New Providence; Nicholas G. Galakatos, Summit, both of N.J.; Albert Schmitz, Basel, and Gino Van Heeke, Witterswil, both of Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Continuation-in-part of Ser. No. 162,591, Dec. 6, 1993, abandoned. This application Jun. 5, 1995, Ser. No. 463,377

Int. Cl.^{6} C12P *21/00;* **C07K** *14/435;* **C12N** *15/12*

U.S. Cl. 435—69.6 **45 Claims**

41. A method of preparing a biologically active human C5a analogue, wherein said analogue is a C5a receptor antagonist that exhibits substantially no agonist activity, and wherein said analogue comprises a C-terminal region which differs from the corresponding C-terminal region of human C5a in that it is truncated by at least two amino acid residues, and contains at least one cysteine residue, provided that the C-terminal amino acid of said region is a cysteine residue, and wherein said analogue comprises an N-terminal region comprising C5a(2-63) or at least one fragment or a conservatively substituted variant thereof, comprising the steps of:

culturing host cells stably transformed with a recombinant DNA molecule encoding the C5a analogue in the form of a fusion protein wherein said culturing is conducted under conditions suitable to cause expression of said fusion protein;

isolating the fusion protein from the thus-cultured host cells; and

cleaving the thus-isolated fusion protein so that the C5a analogue can be obtained.

5,837,500

DIRECTED EVOLUTION OF NOVEL BINDING PROTEINS

Robert Charles Ladner, Ijamsville, Md.; Sonia Kosow Gutterman, Belmont, Mass.; Bruce Lindsay Roberts; William Markland, both of Milford, Mass.; Arthur Charles Ley, Newton, Mass., and Rachel Baribault Kent, Boxborough, Mass., assignors to Dyax, Corp., Cambridge, Mass.

Continuation of Ser. No. 9,319, Jan. 26, 1993, Pat. No. 5,403,484, which is a division of Ser. No. 664,989, Mar. 1, 1991, Pat. No. 5,223,409, which is a continuation-in-part of Ser. No. 487,063, Mar. 2, 1990, abandoned, which is a continuation-in-part of Ser. No. 240,160, Sep. 2, 1988, abandoned. This application Apr. 3, 1995, Ser. No. 415,922

Int. Cl.^{6} C12N *15/62;* **C07K** *19/00*

U.S. Cl. 435—69.7 **43 Claims**

1. A method of obtaining a nucleic acid encoding a proteinaceous binding domain that binds a predetermined.target material comprising:

a) preparing a variegated population of filamentous phage, each phage including a nucleic acid construct coding for a chimeric potential binding protein, each said construct comprising DNA encoding (i) a potential binding domain which is a mutant of a predetermined parental binding domain, and (ii) an outer surface transport signal for obtaining the display of the potential binding domain on the outer surface of the phage, wherein said variegated population of phage collectively display a plurality of different potential binding domains, the differentiation among said plurality of different potential binding domains occurring through the at least partially random variation of one or more predetermined amino acid positions of said parental binding domain to randomly obtain at each said position an amino acid belonging to a predetermined set of two or more amino acids, the amino acids of said set occurring at said position in predetermined expected proportions in said phage being separable on the basis of the potential binding domains displayed thereon;

(b) causing the expression of said potential proteins and the display of said potential binding domains on the outer surface of said phage;

(c) contacting said phage with the predetermined target material such that said potential binding domains and the target material may interact;

(d) separating phage displaying a potential binding domain that binds the target material from phage that do not so bind, and

(e) recovering at least one phage displaying on its outer surface a chimeric binding protein comprising a successful binding domain (SBD) which bound said target, said phage enclosing SBD-encoding nucleic acid, and amplifying said SBD-encoding nucleic acid in vivo or in vitro.

5,837,501

NUCLEIC ACID QUANTITATION BY CO-AMPLIFICATION OF TARGET WITH MULTIPLE INTERNAL CONTROLS

Thomas Augustinue Maria Beumer; Marinus Gerardus Johannes van Beuningen, both of Oss, and Tim Kievits, Vught, all of Netherlands, assignors to Akzo Nobel N.V., Arnhem, Netherlands

Continuation of Ser. No. 661,340, Jun. 12, 1996, abandoned, which is a continuation of Ser. No. 397,172, Mar. 8, 1995, abandoned. This application Sep. 26, 1997, Ser. No. 938,499

Claims priority, application European Pat. Off., Jul. 9, 1993, 93202015.9; Dec. 6, 1993, 93203424.2

Int. Cl.^{6} C12P *19/34;* **C12Q** *1/68;* **C07H** *21/04;21/02*

U.S. Cl. 435—91.2 **17 Claims**

1. A method for the quantification of an unknown amount of an analyte nucleic acid in a sample comprising:

(a) adding to a predetermined volume of said sample different and known amounts of more than one nucleic acid construct, wherein each construct is separately measurable from the analyte nucleic acid and from one another, each construct is capable of being co-amplified with the analyte nucleic acid, and wherein the constructs and the analyte are amplified with comparable efficiency:

(b) subjecting the sample from step (a) to a nucleic acid amplification procedure using amplification reagents that react with both the analyte nucleic acid and the nucleic acid constructs;

(c) detecting the amplification products from step (b) of the analyte nucleic acid and each nucleic acid construct using a detection method that generates a measurable signal; and

(d) determining the amount of analyte nucleic acid in the sample by comparing the signal of the analyte to the signals of each of the constructs.

5,837,502

HELICOBACTER PYLORI HAEMAGGLUTININ PROTEASE PROTEIN, NUCLEIC ACID ENCODING THEREFOR AND ANTIBODIES SPECIFIC THERETO

Andrew William Smith, Kent, Great Britain, assignor to Reckitt & Colman Products Limited, London, United Kingdom

PCT No. PCT/GB94/01406, § 371 Date Sep. 16, 1996, § 102(e) Date Sep. 16, 1996, PCT Pub. No. WO95/01445, PCT Pub. Date Jan. 12, 1995

PCT Filed Jun. 29, 1994, Ser. No. 578,516

Claims priority, application United Kingdom, Jun. 30, 1993, 9313437

Int. Cl.^{6} C12P *19/34;* **C12N** *15/00;* **C07K** *13/00;15/28*

U.S. Cl. 435—91.2 **18 Claims**

1. An isolated nucleic acid molecule encoding *H. pylori* HAP protein comprising a nucleic acid molecule which encodes the amino acid sequence of Sequence I.D. No. 6.

5,837,503

VECTOR CONTAINING VIRAL GENE TRANSCRIBED BY RNA POLYMERASE III AND METHODS FOR USE

Alain Doglio, St Andre; Jean-Claude Lefebvre, Drap, and Laurence Cagnon, Nice, all of France, assignors to Universite de Nice-Sophia-Antipolis, Nice, France

Continuation of Ser. No. 87,054, Jul. 7, 1993, abandoned. This application Jun. 12, 1996, Ser. No. 661,893

Int. Cl.^{6} C12P *19/34;* **C12N** *15/86*

U.S. Cl. 435—91.31 **29 Claims**

1. A recombinant DNA vector containing a cassette for transcription by RNA polymerase III, comprising an adenovirus VA gene transcribed by RNA polymerase III into which a DNA oligonucleotide has been inserted between or outside the bosses A and B constituting the promoter of said VA gene, wherein the secondary structure of the adenovirus VA gene is maintained and the functionality of the VA gene is maintained except that it is inactivated as regards inhibition of interferon action.

5,837,504

METHOD OF MAKING L-DOPA FROM L-TYROSINE

Luying Xun, Richland, Wash., and Jang Young Lee, Taejon, Rep. of Korea, assignors to Battelle Memorial Institute, Richland, and The Washington State University Research Foundation, Pullman, both of Wash.

Filed Mar. 4, 1998, Ser. No. 34,987

Int. Cl.^{6} C12P *13/22*

U.S. Cl. 435—108 **16 Claims**

1. A method of making L-dopa from L-tyrosine, comprising the steps of:

(a) oxidizing said L-tyrosine in the presence of HPAH; and

(b) co-consuming molecular oxygen and NADH; thereby

(c) producing a reacted mixture containing said L-dopa.

5,837,505

MELANIN PRODUCTION FROM TRANSFORMED *ESCHERICHIA COLI*

Guy della-Cioppa; Stephen J. Garger, Jr.; Genadie G. Sverlow; Thomas H. Turpen; Laurence K. Grill, and Miles R. Chedekal, all of Vacaville, Calif., assignors to Biosource Technologies, Inc., Vacaville, Calif.

Division of Ser. No. 857,602, Mar. 20, 1992, Pat. No. 5,631,151, which is a division of Ser. No. 607,119, Nov. 2, 1990, abandoned, which is a continuation-in-part of Ser. No. 545,075, Jun. 29, 1990, abandoned, which is a continuation-in-part of Ser. No. 251,809, Oct. 3, 1988, abandoned. This application Mar. 9, 1995, Ser. No. 401,746

Int. Cl.^{6} C12P *13/00;* **C12N** *9/10;9/60;15/54*

U.S. Cl. 435—128 **26 Claims**

1. A method for over-producing melanins, comprising:

(a) growing a melanin-producing *Escherichia coli* microorganism, wherein said microorganism has been transformed with a vector comprising a first DNA sequence which encodes a tyrosinase, and a second DNA sequence which encodes a tyrosinase activator sequence selected from the group consisting of a *Streptomyces antibioticus* tyrosinase activator sequence derived from the mel locus, and a *Streptomyces glaucescens* tyrosinase activator sequence derived from the mel locus; in a growth medium comprising:

  (i) casein hydrolysate or casein peptone or Luria broth or an equivalent media as a nitrogen source;

  (ii) $CuSO_4$—$5H_2O$:

  (iii) 20–90% dissolved oxygen; and

  (iv) between 1.2 and 1.6 g/l of L-tyrosine, or an amount sufficient to saturate the solution during fermentation; and

(b) extracting said melanins from the growth medium.

5,837,506

CONTINUOUS PROCESS FOR MAKING ETHANOL

Lee R. Lynd, Meriden, N.H., and Colin R. South, Waltham, Mass., assignors to The Trustee of Dartmouth College, Hanover, N.H.

Continuation of Ser. No. 439,232, May 11, 1995, abandoned. This application Aug. 19, 1997, Ser. No. 916,742

Int. Cl.^{6} C12P *7/10*

U.S. Cl. 435—165 **13 Claims**

1. A method for producing ethanol from a cellulosic substrate, comprising the steps of

a) providing within a reaction vessel, a reaction mixture in the form of a slurry comprising cellulosic substrate, catalysts and fermentation agents;

b) agitating the reaction mixture for a first selected time interval, wherein the reaction mixture is reacted under conditions sufficient to initiate and maintain a fermentation reaction;

c) ceasing agitation of the reaction mixture for a sufficient period of time to permit insoluble substrate of the reaction mixture to settle during a second selected time interval, thereby forming an ethanol containing effluent layer substantially free of suspended solids and a residual solids layer;

d) removing from the reaction vessel the ethanol-containing effluent upon expiration of the second selected time interval, and before any further agitation;

e) adding a second reaction mixture, comprising the components of the reaction mixture of step a), to the reaction vessel which contains the residual solids; and

f) repeating steps (b) through (e) to maintain a continuous fermentation reaction.

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5,837,507
HOX-INDUCED ENHANCEMENT OF IN VIVO AND IN VITRO PROLIFERATIVE CAPACITY AND GENE THERAPEUTIC METHODS

Corey Largman, Berkley; Hugh Jeffrey Lawrence, Lafayette, both of Calif.; R. Keith Humphries, Vancouver, Canada, and Guy Sauvageau, 7390 De Tilly, Montreal, P.O., Canada, H3R 3E3, assignors to The Regents of the University of California; Keith Humphries, and Guy Sauvageau, all of Oakland, Calif.

Filed Nov. 13, 1995, Ser. No. 557,973

Int. Cl.^{6} C12N *15/00;5/10*

U.S. Cl. 435—172.1 **18 Claims**

1. A stem cell modified to express an exogenous gene, wherein said gene is a HOX gene selected from the group consisting of a class HOXA, HOXB, HOXC, and HOXD gene, and wherein said modified stem cell has an enhanced ability to proliferate to form an expanded population of pluripotent stem cells.

5,837,508
MEMBRANE-TYPE MATRIX METALLOPROTEINASE-5 GENE

Anne Romanic Arnold, Wynnewood; Anthony Joseph Arleth, Hatfield, and Usman Shabon, Swarthmore, all of Pa., assignors to Smithkline Beecham Corporation, Philadelphia, Pa.

Filed Mar. 6, 1997, Ser. No. 816,755

Int. Cl.^{6} C12N *15/57;9/64*

U.S. Cl. 435—172.3 **19 Claims**

1. An isolated polynucleotide comprising a nucleotide sequence that has at least 80% identity over its entire length to a nucleotide sequence coding the polypeptide of SEQ ID NO:2 said identity being calculated using FASTA with the sequences aligned to obtain the highest order match between the sequences.

5,837,509
RECOMBINANT LACTIC ACID BACTERIUM CONTAINING AN INSERTED PROMOTER AND METHOD OF CONSTRUCTING SAME

Hans Israelsen, Alleroed; Egon Bech Hansen, Broenshoej; Eric Johansen, Hoersholm; Soeren Michael Madsen; Dan Nilsson, both of Copenhagen, and Astrid Vrang, Lyngby, all of Denmark, assignors to Bioteknologisk Institut, Lyngby, and CHR Hansen's Labortorium Danmark A/S, Hoersholm, Denmark

PCT No. PCT/DK94/00004, § 371 Date Mar. 1, 1995, § 102(e) Date Mar. 1, 1995, PCT Pub. No. WO94/16086, PCT Pub. Date Jul. 21, 1994

Continuation-in-part of Ser. No. 36,681, Mar. 25, 1993, abandoned. This PCT application Mar. 1, 1994, Ser. No. 179,557

Claims priority, application Denmark, Dec. 30, 1992, 1579/92; Sep. 1, 1993, 0988/93

Int. Cl.^{6} C12N *15/11;15/74;1/21;* **C12P** *21/02*

U.S. Cl. 435—172.3 **71 Claims**

1. A method of isolating a lactic acid bacterial DNA fragment comprising a promoter, the method comprising the steps of:

(i) selecting a DNA molecule replicating in a lactic acid bacterium, said molecule comprising (a) a transposable element comprising a promoterless structural gene as a promoter probe gene, (b) a detectable selective marker gene, and (c) an origin of replication which is functional in lactic acid bacteria,

(ii) introducing the DNA molecule into a population of a lactic acid bacterium, followed by subjecting the population to conditions allowing transposition of the transposable element to occur,

(iii) selecting a cell of the lactic acid bacterial population in which the promoterless gene is expressed,

(iv) cloning said cell and isolating from the clone a DNA fragment comprising a lactic acid bacterial promoter being operably linked to the originally promoterless gene.

5,837,510
METHODS AND POLYNUCLEOTIDE CONSTRUCTS FOR TREATING HOST CELLS FOR INFECTION OR HYPERPROLIFERATIVE DISORDERS

Mark A. Goldsmith, 263 Chenery St., San Francisco, Calif. 94131, and Robert O. Ralston, 2863 Judah, San Francisco, Calif. 94122

Continuation of Ser. No. 965,039, Oct. 22, 1992, which is a continuation of Ser. No. 461,461, Jan. 17, 1990, abandoned, which is a continuation-in-part of Ser. No. 300,637, Jan. 23, 1989, abandoned. This application Jun. 6, 1995, Ser. No. 472,056

Int. Cl.^{6} C12N *15/09;15/11;15/63;15/86*

U.S. Cl. 435—172.3 **34 Claims**

1. A method for rendering a mammalian host cell protected from a hyperproliferative disorder or susceptible to destruction when said hyperproliferative disorder arises, wherein said hyperproliferative disorder is associated with expression in said host cell of a trans-acting regulatory factor, and wherein said trans-acting regulatory factor is capable of regulating expression of genes under the control of a cis-acting regulatory sequence, which method comprises:

inserting into said host cell a polynucleotide construct comprising said cis-acting regulatory sequence and

an effector gene under the control of the cis-acting regulatory sequence, wherein the effector gene is expressed in the presence of the trans-acting regulatory factor to provide an effector gene product which renders said host cell protected from said hyperproliferative disorder or susceptible to destruction when said hyperproliferative disorder arises, said effector gene product being selected from the group consisting of a cytokine, a ribozyme, a glycosylation inhibitor, a myristylation inhibitor, and an RNase.

5,837,511
NON-GROUP C ADENOVIRAL VECTORS

Erik S. Falck-Pedersen, Dobbs Ferry, N.Y.; Ronald G. Crystal, Potomac, Md.; Andrea Mastrangeli, and Karil Abrahamson, both of New York, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Oct. 2, 1995, Ser. No. 537,402

Int. Cl.^{6} C12N *15/00;15/86*

U.S. Cl. 435—172.3 **17 Claims**

1. A stock of a replication deficient adenoviral gene transfer vector, said vector comprising (a) an expression cassette that encodes a foreign gene product, and (b) an adenoviral DNA segment isolated from an adenovirus selected from the group consisting of A, B, D, E and F adenovirus, wherein said vector stock is free of replication competent adenovirus.

10. A method of testing the expression of a foreign gene product upon transfection into an isolated target cell, which method comprises (a) selecting a target cell, (b) contacting said target cell with the vector stock of claim 1, and (c) determining the expression of said foreign gene product in said isolated target cell.

5,837,512
HIV-1 VECTORS

Arnold B. Rabson, Princeton; Hsin-Ching Lin, Edison, both of N.J.; Marion Bodkin, Massapequa, N.Y., and Roger Strair, Skillman, N.J., assignors to University of Medicine & Dentistry of NJ, Newark, N.J.

Continuation-in-part of Ser. No. 247,788, May 23, 1994, abandoned. This application Dec. 14, 1995, Ser. No. 574,586

Int. Cl.^{6} C12N *15/86;5/10;15/64;15/49*

U.S. Cl. 435—172.3 **3 Claims**

1. An isolated human immunodeficiency virus type 1 (HIV-1) vector altered by having the HIV-1 long terminal repeat (LTR) promoter and enhancer sequences replaced by two copies of the HTLV-I LTR 21 base pair repeat Tax-responsive element (TRE), wherein the promoter and enhancer sequences consist of the

NF-K-B and SP1 binding sites, and the altered HIV-1 vector will replicate only in human CD4+ cells that express the Tax protein of HTLV-I.

5,837,513
METHOD FOR CRYSTALLIZATION OF ENZYMES

Niels-Viktor Nielsen, Ryegade 5, DK-4060 Kirke Saaby, Denmark, and Torben Kjærsgaard Nielsen, Tinggårdsvænget 90, Tune, DK-4000 Roskilde, Denmark

Continuation of Ser. No. 265,984, Jun. 27, 1994, abandoned, which is a continuation of Ser. No. 865,897, May 14, 1992. This application Jun. 7, 1995, Ser. No. 472,357

Claims priority, application Denmark, Apr. 5, 1990, 0847/90; Apr. 5, 1990, 0848/90; Dec. 21, 1990, 6540/89

Int. Cl.^{6} C12N *9/00*

U.S. Cl. 435—183 **18 Claims**

1. A rapid and inexpensive method for crystallizing an enzyme from an impure enzyme solution, comprising

(a) obtaining an impure enzyme preparation, wherein the enzyme is present in an amount of more than 20% of the total dry matter;

(b) adding an effective amount of a crystallization agent to the impure enzyme preparation of step(a); wherein

  (i) the crystallization agent is one or more salts selected from the group consisting of sodium formate, sodium acetate, sodium nitrate, potassium formate, potassium acetate, potassium nitrate, calcium formate, calcium acetate, calcium nitrate, magnesium formate, magnesium acetate and magnesium nitrate;

  (ii) the concentration of the crystallization agent added to the aqueous solution is less than a concentration of the crystallization agent which precipitates the enzyme in an amorphous form;

  (iii) the method obtains a yield of the crystallized enzyme of at least 35% within 12 hours, and

  (iv) wherein said method is suitable for industrial use.

5,837,514
IκB KINASES

Zhaodan Cao, S. San Francisco, Calif., assignor to Tularik Inc., South San Francisco, Calif.

Filed Mar. 7, 1997, Ser. No. 812,533

Int. Cl.^{6} C12N *9/12;1/20;5/00;* **C07H** *21/04*

U.S. Cl. 435—194 **6 Claims**

1. A recombinant nucleic acid encoding a T2K protein comprising SEQ ID NO: 2 or an enzymatically active fragment thereof.

5,837,515
ENZYME PREPARATIONS AND METHODS FOR THEIR PRODUCTION

Pirkko Suominen, Helsinki, Finland; Helena Nevalainen, North Epping, Australia; Ritva Saarelainen; Marja Palohеimo, both of Helsinki, Finland, and Richard Fagerström, Espoo, Finland, assignors to Alko-Yhtiöt Oy, Helsinki, Finland

Continuation-in-part of Ser. No. 78,478, Jun. 18, 1993, abandoned, which is a continuation-in-part of Ser. No. 889,893, May 29, 1992, abandoned, which is a continuation-in-part of Ser. No. 524,308, May 16, 1990, Pat. No. 5,298,405. This application Sep. 16, 1993, Ser. No. 121,436

Int. Cl.^{6} C12N *1/21;9/24;15/56;15/63*

U.S. Cl. 435—200 **37 Claims**

25. A method for the production of an enzyme preparation enriched in xylanase activity, said method comprising:

(1) transforming a host cell with a recombinant construct encoding *T. reesei* xln1 and/or *T. reesei* xln2;

(2) culturing said host cell under conditions that express said xln1 and/or said xln2 from said host cell of step (1); and

(3) collecting said culture medium.

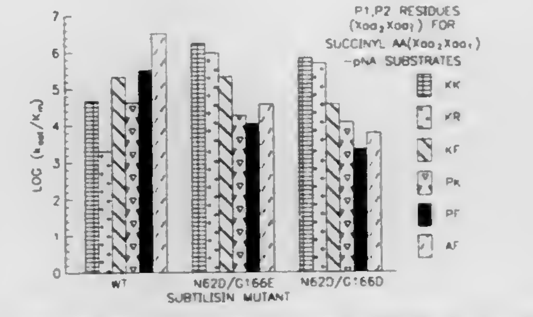
5,837,516
SUBTILISIN VARIANTS CAPABLE OF CLEAVING SUBSTRATES CONTAINING BASIC RESIDUE

Marcus D. Ballinger, and James A. Wells, both of Burningame, Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Continuation-in-part of Ser. No. 398,028, Mar. 3, 1995. This application Jul. 19, 1995, Ser. No. 504,265

Int. Cl.^{6} C12P *21/06;* **C12N** *9/54;15/57;15/75*

U.S. Cl. 435—221 **11 Claims**



1. A subtilisin modified to have substrate specificity for peptide or polypeptide substrates having basic amino acids at the P_1, P_2 and P_4 positions of the substrate said subtilisin having an Asp or Glu at positions corresponding to amino acid Asn 62, Tyr 104 and Gly 166 in the amino acid sequence of the subtilisin having the amino acid sequence of SEQ ID NO: 90 naturally produced by *Bacillus amyloliquefaciens.*

5,837,517
PROTEASE VARIANTS AND COMPOSITIONS

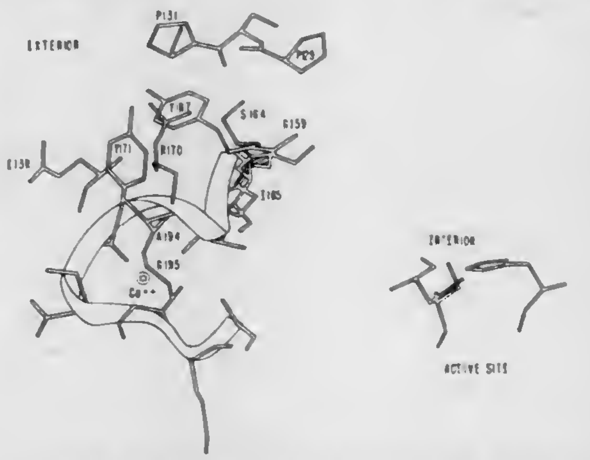
Laurens Nicolaas Sierkstra, Delft; Jan Klugkist, Vlaardingen, both of Netherlands; Peter Markvardsen, Bagsværd, Denmark; Claus von der Osten, Lyngby, Denmark, and Peter Bauditz, Koebenhavn, Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

Filed May 6, 1996, Ser. No. 642,987

Claims priority, application Denmark, May 5, 1995, 0519/95; European Pat. Off., May 5, 1995, 95201161; Denmark, Apr. 12, 1996, 0421/96

Int. Cl.^{6} C12N *9/54;15/57;15/74;* **C11D** *3/386*

U.S. Cl. 435—221 **36 Claims**



1. A variant of a subtilase, having a mutation in the amino acid sequence of the subtilase, wherein the mutation comprises:

a) S57P+R170L.

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a') S57P+R170I
b) R170L+N218S,
b') R170I+N218S,
c) S57P+R170L+N218S,
c') S57P+R170I+N218S,
c") S57P+V104Y+R170L+N218S,
c'") S57P+V104Y+R170I+N218S,
d) R170L+N218S+M222A,
d) R170I+N218S+M222S,
d") R170L+N218S+M222A,
d'") R170I+N218S+M222S,
e) S57P+R170L+S188P+A194P,
e') S57P+R170I+S188P+A194P,
f) Y167L+R170L,
f') Y167L+R170I,
g) Y167I+R170L,
g') Y167I+R170I
h) N76D+R170L+N218S,
h') N76D+R170I+N218S,
i) S57P+N76D+R170L+N218S,
i') S57P+N76D+R170I+N218S,
j) N76D+R170L+N218S+M222A,
j') N76D+R170I+N218S+M222S,
j") N76D+R107I+N218S+M222A,
j"') N76D+R170L+N218S+M222S,
k) S57P+R170I+S188P+A 194P+N218S,
k') S57P+R170I+S188P+A194P+N218S,
l) *36D+N76D+H120D+R170L+G195E+K235L,
l') *36D+N76D+H120D+R170I+G195E+K235L,
l") *36D+N76D+H120D+Y167I+R170L+G195E+K235L,
l"') *36D+N76D+H120D+Y167I+R170I+G195E+K235L,
m) N76D+H120D+R170L+G195E+K235L,
m') N76D+H120D+R170I+G195E+K235L,
m") N76D+H120D+Y167I+R170L+G195E+K235L,
"') N76D+H120D+Y167I+R170I+G195E+K235L,
n) *36D+G97N+V104Y+H120D+R170L+A194P+G195E+K235L,
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o) S57P+R170L+Q206E,
o') S57P+R170I+Q206E,
p) R170L+Q206E,
p') R170I+Q206E,
q) Y167I+R170L+Q206E,
q) Y167I+R170L+Q206E,
r) Y167F+R170L,
r') Y167F+R170I
t) Y167I+R170L+A194P,
t') Y167I+R170I+A194P,
t") Y167L+R170L+A194P,
t"') Y167L+R170I+A194P,
u) Y167I+R170L+N218S,
u') Y167I+R170I+N218S,
u") Y167L+R170L+N218S,
u"') Y167L+R170I+N218S,
v) Y167I+R170L+A194P+N218S,
v') Y167I+R170I+A194P+N218S,
v") Y167L+R170L+A194P+N218S,
v"') Y167L+R170I+A194P+N218S,
x) R170L+P131V,
x') R170I+P131V,
y) *36D+Y167I+R170L,
y') *36D+Y167I+R170I
z) Y167I+Y171I,
aa) Y167V+R170L,
aa') Y167V+R170I
bb) R170L+Y171I
bb') R170I+Y171L,
bb") R170L+Y171L,
bb"') R170I+Y171I
cc) Y167I+Y171L+N218S, or
cc') Y167I+Y171I+N218S.

5,837,518

THROMBOLYTIC PROTEINS

Glenn R. Larsen, Sudbury, and Tim J. Ahern, Arlington, both of Mass., assignors to Genetics Institute, Inc., Cambridge, Mass.

Continuation of Ser. No. 370,713, Jan. 10, 1995, abandoned, which is a continuation of Ser. No. 103,938, Aug. 6, 1993, Pat. No. 5,418,158, which is a continuation of Ser. No. 805,415, Dec. 10, 1991, Pat. No. 5,258,298, and Ser. No. 382,678, Oct. 19, 1988, Pat. No. 5,071,972, which is a continuation-in-part of Ser. No. 861,699, May 9, 1986, abandoned, Ser. No. 853,781, Apr. 18, 1986, abandoned, Ser. No. 825,104, Jan. 31, 1986, abandoned, and Ser. No. 882,051, Jul. 3, 1986, Pat. No. 5,002,887. This application Jul. 10, 1997, Ser. No. 891,245

Int. Cl.^{6} C12N *9/64;15/55;* **A61K** *38/49*

U.S. Cl. 435—226 **6 Claims**

1. A DNA molecule encoding a thrombolytic protein consisting of the peptide sequence of human t-PA wherein the following modifications are made:

(a) deletion of DNA sequence encoding an amino acid fragment selected from the group consisting of (i) Cys-6 through Ser-50; and (ii) Cys-51 through Asp-87, and

(b) modification of DNA sequence encoding the N-linked glycosylation sites at one or more positions selected from 117–119, 184–186, and 448–450 are modified such that one or more of said N-linked glycosylation sites are not glycosylated in the encoded thrombolytic protein.

5,837,519

DRY-HEAT VIRAL INACTIVATION UNDER CONTROLLED MOISTURE CONDITIONS

Margaret Savage, Clayton, and Juan Torres, Raleigh, both of N.C., assignors to Bayer Corporation, Berkeley, Calif.

Filed Nov. 21, 1996, Ser. No. 749,354

Int. Cl.^{6} A01N *1/02;* **C12N** *7/04*

U.S. Cl. 435—236 **4 Claims**

1. In a method for substantially reducing the virus titer of a lyophilized biologically active protein containing composition, the composition having a residual moisture content, the method comprising the steps of heat treating the composition in a dry state under controlled conditions of temperature and time,

the improvement comprising the steps of (a) establishing a threshold moisture level necessary to assure at least a substantial reduction in virus titer when the composition is heat treated under pasteurizing conditions and (b) then applying the heat treatment under at least said threshold moisture level to assure at least a substantial reduction in virus titer while maintaining biological activity of the protein.

5,837,520

METHOD OF PURIFICATION OF VIRAL VECTORS

Paul W. Shabram, Olivenhain; Bernard G. Huyghe, San Diego, both of Calif.; Xiaodong Liu, New York, N.Y., and H. Michael Shepard, Rancho Santa Fe, Calif., assignors to Canji, Inc., San Diego, Calif.

Filed Mar. 7, 1995, Ser. No. 400,793

Int. Cl.^{6} C12N *7/02;7/00;15/00*

U.S. Cl. 435—239 **27 Claims**

1. A method for purification of an intact viral particle from a cell lysate, the method comprising:

a) treating said cell lysate which contains said intact viral particle with an enzymatic agent that selectively degrades both unencapsulated DNA and RNA;

b) chromatographing the treated lysate from step a) on a first resin; and

c) chromatographing the eluant from step b) on a second resin; wherein one resin is an anion exchange resin and the other is an immobilized metal ion affinity resin.

25. A method of determining the number of intact viral particles in a sample, the method comprising:

a) chromatographing the sample containing the intact viral particles on an anion exchange resin;

b) monitoring the absorbance of the eluate from the chromatography of step (a) at a selected wavelength; and

c) determining the total number of intact viral particles in the sample by comparing the absorbance value obtained in step (b) to a standard curve which relates absorbance to number of viral particles.

5,837,521

NUCLEIC ACIDS ENCODING THE γ-MSH RECEPTOR MC3-R

Roger D. Cone, Oregon City; Linda Roselli-Rehfuss, Portland; Kathleen G. Mountjoy, Portland, and Linda S. Robbins, Portland, all of Oreg., assignors to State of Oregon, Portland, Oreg.

Filed Apr. 8, 1993, Ser. No. 44,812

Int. Cl.^{6} C07H *21/04;* **C12N** *15/12*

U.S. Cl. 435—240.1 **8 Claims**

1. An isolated nucleic acid comprising a nucleotide sequence encoding a mammalian melanocortin receptor, wherein the nucleotide sequence encodes an amino acid sequence identified as SEQ ID No. 4.

5,837,522

METHOD FOR INTRODUCING OXYGEN INTO A PROPAGATION ZONE OF FERMENTATION PROCESS

Robert L. B. Swain, 212 Fairfax Way, Williamsburg, Va. 23185

Filed Feb. 4, 1997, Ser. No. 795,421

Int. Cl.^{6} C12N *1/00;1/02;* **C12M** *1/36*

U.S. Cl. 435—243 **12 Claims**

1. A method for introducing oxygen into a propagation zone of a fermentation process, the method comprising the steps of:

a) providing a propagation zone comprising a liquid ferment and microorganisms;

b) removing a portion of the liquid ferment from the propagation zone;

c) introducing a molecular oxygen source into the removed liquid ferment to form a mixture comprising an oxygenated liquid ferment and non-dissolved gases;

d) separating the oxygenated liquid ferment from the non-dissolved gases;

e) venting the non-dissolved gases; and

f) introducing the oxygenated liquid ferment into the propagation zone.

5,837,523

COMPOSITIONS AND METHODS OF TREATING TUMORS

Mark I. Greene, Penn Valley, and Xiaolan Qian, Philadelphia, both of Pa., assignors to The Trustees of the university of Pennsylvania, Philadelphia, Pa.

PCT No. PCT/US95/05614, § 371 Date Feb. 11, 1997, § 102(e) Date Feb. 11, 1997, PCT Pub. No. WO95/30331, PCT Pub. Date Nov. 16, 1995

Continuation-in-part of Ser. No. 239,202, May 5, 1994, abandoned. This PCT application May 5, 1995, Ser. No. 737,269

Int. Cl.^{6} C12N *15/00;* **C07H** *21/02*

U.S. Cl. 435—320.1 **29 Claims**

1. A nucleic acid molecule that comprises a nucleotide sequence that encodes a protein that can form a dimer with epidermal growth factor receptor, and can form a dimer with p185, wherein said protein lacks tyrosine kinase activity.

5,837,524

PYK2 RELATED POLYNUCLEOTIDE PRODUCTS

Joseph Schlessinger, New York, N.Y., and Sima Lev, San Carlos, Calif., assignors to Sugen, Inc., Redwood City, Calif., and New York University, New York, N.Y.

Filed Dec. 15, 1994, Ser. No. 357,642

Int. Cl.^{6} C12N *15/64;1/21;* **C07H** *21/04*

U.S. Cl. 435—252.3 **25 Claims**

1. An isolated or purified nucleic acid molecule encoding a polypeptide comprising the amino acid sequence of SEQ ID NO:1.

5,837,525

ISOLATED POLYNCULEOTIDES ENCODING T-CAHDERIN ADHESION MOLECULE, VECTORS AND TRANSFORMED HOSTS

Barbara Ranscht, Del Mar, Calif., assignor to La Jolla Cancer Research Foundation, La Jolla, Calif.

Division of Ser. No. 213,361, Mar. 14, 1994, Pat. No. 5,585,351, which is a continuation of Ser. No. 607,293, Oct. 31, 1990, abandoned. This application Jun. 7, 1995, Ser. No. 474,068

Int. Cl.^{6} C07H *21/04;* **C12N** *1/21*

U.S. Cl. 435—252.3 **6 Claims**

1. An isolated nucleic acid sequence which encodes the amino acid sequence set forth in SEQ ID NO:2 or SEQ ID NO:4.

5,837,526

BACILLUS STRAIN AND HARMFUL ORGANISM CONTROLLING AGENTS

Toshihiko Iizuka, Sapporo; Michito Tagawa, Shiraoka-machi; Satoshi Arai, Shiraoka-machi; Masatsugu Niizeki, Shiraoka-machi, and Toshiro Miyake, Shiraoka-machi, all of Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Division of Ser. No. 542,921, Oct. 13, 1995. This application Jun. 23, 1997, Ser. No. 880,684

Claims priority, application Japan, Oct. 14, 1994, 6-276082

Int. Cl.^{6} C12N *1/00;15/32;* **A01H** *5/00;5/10*

U.S. Cl. 435—252.3 **4 Claims**

1. An isolated and substantially purified DNA coding for an insecticidal crystal protein produced by *Bacillus thuringiensis* var. *japonensis* strain N141 having the amino acid sequence of SEQ ID NO:2.

5,837,527

β-FRUCTOFURANOSIDASE ITS PREPARATION AND USES

Tetsuya Nakada; Hiroto Chaen, and Toshiyuki Sugimoto, all of Okayama, Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama, Japan

Division of Ser. No. 763,885, Dec. 11, 1996, Pat. No. 5,753,469. This application Sep. 30, 1997, Ser. No. 941,552

Claims priority, application Japan, Dec. 18, 1995, 7-347543

Int. Cl.^{6} C12N *1/20;9/26;* **C12P** *19/14*

U.S. Cl. 435—252.5 **3 Claims**

1. A biologically pure culture of a microorganism of the genus Bacillus which forms an isolated β-fructofuranosidase having the following physicochemical properties:

(1) Action

Releasing fructose when hydrolizing the β-fructofuranosidic linkage of sucrose, raffinose, and erlose; using these saccharides as saccharide donors, it catalyzes the transfer of β-fructofuranosyl residue to an acceptor selected from the group consisting of other saccharides, sugar alcohols, and alcohols;

(2) Molecular weight

49,000±5,000 daltons on sodium dodecyl sulfate polyacrylamide gel electrophoresis (SDS-PAGE);

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- (3) Isoelectric point (pI)
  4.6±0.5 on electrophoresis using ampholyte;
- (4) Optimum pH
  A pH of about 5.5–6.0 when incubated at 40° C. for ten minutes;
- (5) Optimum temperature
  About 45° C. and about 50° C. in the absence of and in the presence of calcium ion, respectively, when incubated at pH 6.0 for ten minutes;
- (6) pH stability
  Stable at a pH of about 5.0–8.0 when incubated at 4° C. for 24 hours; and
- (7) Thermal stability
  Stable up to a temperature of about 45° C. when incubated at pH 6.0 for an hour.

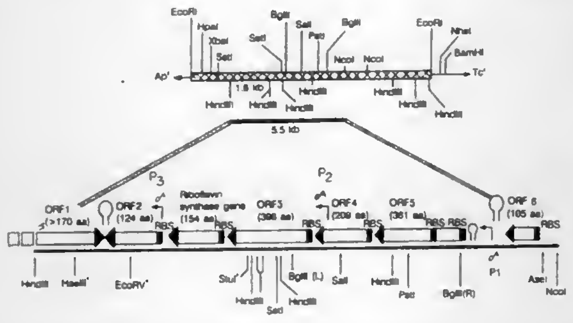
5,837,528
BACTERIAL STRAINS WHICH OVERPRODUCE RIBOFLAVIN

John B. Perkins, Reading; Alan Sloma, Watertown, and Janice G. Pero, Lexington, all of Mass., assignors to Hoffmann La Roche, Inc., Nutley, N.J.

Continuation of Ser. No. 873,572, Apr. 21, 1992, abandoned, which is a continuation of Ser. No. 581,048, Sep. 11, 1990, abandoned, which is a continuation-in-part of Ser. No. 370,378, Jun. 22, 1989, abandoned. This application Feb. 6, 1995, Ser. No. 384,626

Int. Cl.^{6} C12N *1/21;15/31;15/52*

U.S. Cl. 435—252.31 43 Claims



1. A purified nucleic acid comprising a bacterial rib operon which includes a bacterial ORF3 structural gene and an exogenous promoter, said ORF3 structural gene being hybridizable to *B. subtilis* rib ORF3 and encoding a protein that has ORF3 activity, said promoter being positioned to transcribe said ORF3 structural gene.

5,837,529
METHOD FOR LYSING CELLS

Nick C. Wan, Newton; David S. McNeilly, Saugus, and Charles William Christopher, Rockport, all of Mass., assignors to Genzyme Corporation, Cambridge, Mass.

Continuation of Ser. No. 324,455, Oct. 17, 1994, abandoned. This application Apr. 15, 1996, Ser. No. 632,203

Int. Cl.^{6} C12N *1/06*

U.S. Cl. 435—259 16 Claims

1. A method of lysing cells while avoiding shearing genomic DNA, said method comprising:

providing a static mixer having no moving parts;

providing a quantity of fluid containing a cell suspension;

flowing the fluid containing the cell suspension through the mixer until the entire quantity of cell suspension has passed through the mixer;

simultaneously flowing a lysis solution through the static mixer at a flow rate which allows sufficient contact of the cells and the lysis solution to provide for lysis of the cells,

wherein the fluid that exits the static mixer contains lysed cells.

5,837,530

Patent Not Issued For This Number

5,837,531
RECOMBINANT ADENOVIRUSES FOR GENE THERAPY IN CANCERS

Jean-François Dedieu, Paris; Aude Le Roux, Chevilly La Rue, and Michel Perricaudet, Ecrosnes, all of France, assignors to Rhone-Poulenc Rorer S.A., Antony Cedex, France

PCT No. PCT/FR94/01284, § 371 Date May 13, 1996, § 102(e) Date May 13, 1996, PCT Pub. No. WO95/14101, PCT Pub. Date May 26, 1995

PCT Filed Nov. 7, 1994, Ser. No. 646,246

Claims priority, application France, Nov. 18, 1993, 93/13766

Int. Cl.^{6} C12N *15/63*

U.S. Cl. 425—320.1 16 Claims

1. A replication defective recombinant adenovirus comprising a heterologous DNA sequence under the control of an expression signal which is inducible by the Epstein-Barr virus (EBV) or by a papilloma virus antigen.

5,837,532
HERPES SIMPLEX CIRUS TYPE 1 MUTANT

Christopher Maurice Preston, Glasgow, United Kingdom, and Christopher Ian Ace, Worcester, Mass., assignors to British Technology Group Limited

Continuation of Ser. No. 112,882, Aug. 27, 1993, abandoned, which is a continuation of Ser. No. 998,703, Dec. 30, 1992, abandoned, which is a continuation of Ser. No. 834,273, Feb. 12, 1992, abandoned. This application May 5, 1995, Ser. No. 435,280

Claims priority, application United Kingdom, Aug. 15, 1989, 8918616

Int. Cl.^{6} C12N *15/86*

U.S. Cl. 435—320.1 13 Claims

1. A viral expression vector comprising

(i) a herpes simplex virus type 1 with a DNA sequence change in the gene coding for Vmw65 protein, the DNA sequence change being a transition or transversion alteration of 1 to 72 base pairs or a deletion of 3 to 72 base pairs or an insertion of an oligonucleotide sequence, said sequence change at a position within said gene coding for said protein between amino acids 289 and 412 of the protein; and

(ii) a heterologous gene inserted into a region of the HSV-1 genome which is nonessential for culture of the virus, and a promoter therefor which expresses said heterologous gene in neuronal cells.

5,837,533
COMPLEXES COMPRISING A NUCLEIC ACID BOUND TO A CATIONIC POLYAMINE HAVING AN ENDOSOME DISRUPTION AGENT

Raymond H. Boutin, Thornton, Pa., assignor to American Home Products Corporation, Madison, N.J.

Filed Sep. 28, 1994, Ser. No. 314,060

Int. Cl.^{6} C12N *5/00;150/00*

U.S. Cl. 435—320.1 49 Claims

1. A multifunctional molecular complex for the transfer of a nucleic acid composition to a target cell comprising in combination: A) said nucleic acid composition non-covalently bonded to B) a transfer moiety, wherein said transfer moiety comprises one or more cationic polyamine components bound to said nucleic acid composition, each independently comprising a cationic polyamine of the formula (1):

$$NR(R^3)—[—(CR^1R^2)_m—N(R^3)—]_n—(CR^1R^2)_m—NR(R^3) \qquad (1)$$

wherein:

R, R^1 and R^2 are each independently selected from the group consisting of hydrogen and C_{1-6} alkyl;

m in each occurrence is independently selected from the integers 2 through 5 inclusive;

n is selected from the integers 1 through 10 inclusive;

R^3 is independently selected from the group consisting of hydrogen; C_{1-6} alkyl; and one or more endosome membrane disruption promoting components independently selected from the group consisting of:

a) $—B—(CR^1R^2)_j—C(R)_3$, where R, R^1 and R^2 are each independently defined as above; j is an integer from 6 to 24 inclusive; and B is optionally absent, or is a bridging group of the formula:

$$—(CR^1R^2)_k—C(=O)—Z—; \qquad i)$$

$$—(CR^1R^2)_k—N(R)—C(=O)—Z—; \qquad ii)$$

$$—(CR^1R^2)_k—N(R)—\{—C(=O)—CH_2—O—[—(CH_2)_2—O—]_l—(CH_2)_2—N(R)\}_p—C(=O)—Z—; \text{ or} \qquad iii)$$

$$—(CR^1R^2)_k—C(=O)—\{—N(R)—[—(CH_2)_2—O—]_l—CH_2—C(=O)\}_p—Z—; \qquad iv)$$

where k is an integer from 1 to 6 inclusive, l is an integer from 0 to 4 inclusive, and p is an integer from 1 to 3 inclusive: R, R^1 and R^2 are each independently defined as above; and Z is O, S, N(R), or is absent;

b) $—B—(R^4)R$, where R, R^1 and R^2 are each independently defined as above; B cannot be absent and is a bridging group independently selected from groups i) through iv) above, and the group of the formula:

$$—(CR^1R^2)_{j'}—X—, \qquad v)$$

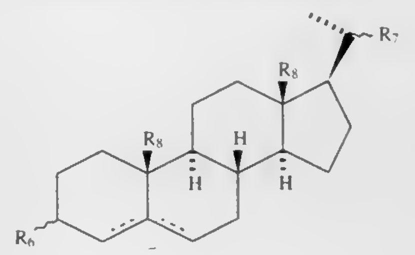
where j' is an integer from 1 to 8 inclusive; R^1 and R^2 are each independently defined as above:

X is O, S, N(R), or absent; and

R^4 is independently selected from the group consisting of:

i) fusogenic peptides comprising spike glycoproteins of enveloped animal viruses;

ii) cholic acid derivatives of the formula (2):



(2)

where:

4 ∼ represents a bond of unspecified stereochemistry;

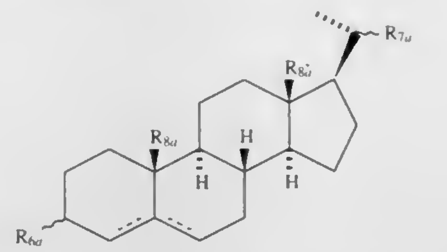
- - - represents a single or double bond, forming a saturated or unsaturated portion of the ring system, provided that they cannot both be unsaturated at the same time, whereby the ring system must be either Δ4 or Δ5;

R^6 is —H, —OH, —CO_2H, —$C(=O)NH_2$, —$OC(=O)NH_2$, —NH_2, or —$O(CH_2CH_2O)_{n'}H$, where n' is an integer from 1 to 6 inclusive;

R^7 is a radical that forms the point of attachment of the cholic acid derivative, comprising —C_{1-6}alkyl— or —C_{1-6}alkylcarbonyl—; and

R^8 is C_{1-6}alkyl; and

iii) cholesteryl derivatives of the formula (3):



(3)

where:

4 ∼ represents a bond of unspecified stereochemistry;

- - - represents a single or double bond, forming a saturated or unsaturated portion of the ring system, provided that they cannot both be unsaturated at the same time, whereby the ring system must be either Δ4 or Δ5;

R^{6a} is a radical that forms the point of attachment of the cholesteryl derivative, comprising —C_{1-6}alkyl—, —$OC(=O)$—, or —$OCH_2C(=O)$—;

R^{7a} is C_{1-6}alkyl; and

R^{8a} is C_{1-6}alkyl;

PROVIDED THAT R^3 is one or more endosome membrane disruption promoting components attached to at least one nitrogen atom of at least one of said cationic polyamine components; and

OPTIONALLY, R^3 may be one or more groups defined below, attached either to a further nitrogen atom of at least one of said cationic polyamine components to which said one or more endosome membrane disruption promoting components is attached, or to a nitrogen atom of at least one further polyamine component which does not have attached thereto any endosome membrane disruption promoting component:

c) $—B—(R^5)R$, where B cannot be absent, and is a bridging group independently selected from groups i) through v) inclusive; R is independently defined as above; and

R^5 is a receptor specific binding component independently selected from the group consisting of:

i) D-biotin;

ii) β-3'-propionyl galactosyl-β1-4-thioglucoside;

iii) N^2,N^6-bis(β-3'-propionyl galactosyl-β1-4-thioglucoside)lysine;

iv) N^2,N^6-bis(β1-3'-propionyl galactosyl-β1-4-thioglucoside)lysyl-N^6-(β-3'-propionyl galactosyl-β1 -4-thioglucoside)lysine;

v) 5-methyitetrahydrofolate;

vi) folic acid;

vii) folinic acid;

viii) α-3'-propionyl thiomannoside; and

ix) α-3'-propionyl thiomannoside-6-phosphate.

5,837,534
SMOOTH MUSCLE 22α PROMOTER, GENE TRANSFER VECTORS CONTAINING THE SAME, AND METHOD OF USE OF THE SAME TO TARGET GENE EXPRESSION IN ARTERIAL SMOOTH MUSCLE CELLS

Eric N. Olson; Li Li, both of Dallas, Tex., and Joseph M. Miano, Milwaukee, Wis., assignors to The Board of Regents of the University of Texas System, Austin, Tex.

Filed Nov. 14, 1995, Ser. No. 555,723

Int. Cl.^{6} C07H *21/04;* **C12N** *15/00;15/09;15/11*

U.S. Cl. 435—320.1 6 Claims

2. A gene transfer vector comprising the mouse SM22α promoter operably linked to foreign DNA encoding a desired polypeptide or RNA, wherein said promoter has a nucleotide sequence selected from the group consisting of SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5 and SEQ ID NO:6.

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NEURONAL-NEONATAL GENE: NEURONATIN

Rajiv Joseph, Birmingham, and Dexian Dou, Dearborn, both of Mich., assignors to Henry Ford Health System, Detroit, Mich.

Continuation-in-part of Ser. No. 259,299, Jun. 13, 1994, abandoned. This application Feb. 15, 1996, Ser. No. 602,093

Int. Cl.^{6} C12N *15/85;15/63;15/11*

U.S. Cl. 435—325 **10 Claims**

1. A purified, isolated and cloned nucleic acid which has a genomic DNA sequence as set forth in SEQ ID NO:6 or a cDNA sequence as set forth SEQ ID NO:5.

5,837,536

EXPRESSION OF HUMAN MULTIDRUG RESISTANCE GENES AND IMPROVED SELECTION OF CELLS TRANSDUCED WITH SUCH GENES

Kevin T. McDonagh, Silver Spring; Arthur Nienhuis, Bethesda, and Paul Tolstoshev, Potomac, all of Md., assignors to Genetic Therapy, Inc., Gaithersburg, Md., and The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 332,444, Oct. 31, 1994, abandoned, which is a continuation of Ser. No. 887,712, May 22, 1992, abandoned. This application Jan. 5, 1996, Ser. No. 583,276

Int. Cl.^{6} C12N *5/22;15/12;15/86*

U.S. Cl. 435—325 **21 Claims**

1. Isolated DNA or RNA encoding human mdr1 p-glycoprotein wherein said DNA or RNA includes a first sequence:

CAGGTATGC (SEQ ID NO: 1), and

a second sequence:

ACATTTTTCCTTCAGG (SEQ ID NO:2), or

the RNA equivalent(s) thereof and wherein at least one base of at least one of (SEQ ID NO:1) and (SEQ ID NO:2) or RNA equivalent(s) thereof has been changed to a different base to suppress splicing.

5,837,537

δ-SARCOGLYCAN NUCLEIC ACID SEQUENCES

Kevin P. Campbell; Daniel Jung; Franck Duclos; Volker Straub, all of Iowa City, Iowa, and John McPherson, St. Louis, Mo., assignors to Washington University, St. Louis, Mo., and University of Iowa Research Foundation, Iowa City, Iowa

Filed Sep. 25, 1996, Ser. No. 719,758

Int. Cl.^{6} C12N *15/12;15/85;15/63*

U.S. Cl. 435—325 **6 Claims**

6. A eukaryotic cell transformed with a DNA expression construct comprising a nucleic acid molecule encoding the amino acid sequence shown in SEQ ID NO:2.

5,837,538

PATCHED GENES AND THEIR USE

Matthew P Scott, Stanford; Lisa V. Goodrich, Palo Alto, and Ronald L. Johnson, Redwood City, all of Calif., assignors to Trustees of Leland Stanford, Jr. University, Stanford, Calif.

Continuation-in-part of Ser. No. 319,745, Oct. 7, 1994, abandoned. This application Oct. 6, 1995, Ser. No. 540,406

Int. Cl.^{6} C12N *5/16;15/11;15/09*

U.S. Cl. 435—325 **32 Claims**

1. An isolated nucleic acid comprising a ptc coding sequence for a naturally occurring vertebrate patched polypeptide, or allelic variant thereof, wherein the ptc coding sequence hybridizes which binds to a hedgehog polypeptide to the complement of the coding sequence of SEQ ID Nos. 9 or 18 under stringency conditions equivalent to 5× SSC at 60° C.

21. A cell comprising and expressing the nucleic acid of claim 1, 8, 17, or 25.

5,837,539

MONOCLONAL ANTIBODIES FOR HUMAN MESENCHYMAL STEM CELLS

Arnold I. Caplan, and Stephen E. Haynesworth, both of Cleveland Heights, Ohio, assignors to Osiris Therapeutics, Inc., Baltimore, Md.

Continuation-in-part of Ser. No. 193,262, Feb. 8, 1994, Pat. No. 5,486,359, and a continuation-in-part of Ser. No. 38,517, Mar. 29, 1993, abandoned, and a continuation-in-part of Ser. No. 38,512, Mar. 29, 1993, abandoned, which is a division of Ser. No. 614,915, Nov. 16, 1990, Pat. No. 5,197,985, said Ser. No. 193,262 is a continuation-in-part of Ser. No. 34,272, Mar. 22, 1993, abandoned, which is a continuation-in-part of Ser. No. 716,917, Jun. 18, 1991, abandoned, which is a continuation-in-part of Ser. No. 615,430, Nov. 16, 1990, abandoned, said Ser. No. 38,517 is a division of Ser. No. 614,912, Nov. 16, 1990, Pat. No. 5,226,914. This application Jun. 2, 1995, Ser. No. 458,494

Int. Cl.^{6} C12N *5/20;* **C07K** *16/28*

U.S. Cl. 435—332 **12 Claims**

1. An isolated antibody which binds to the same epitope on human mesenchymal stem cells as the antibody produced by the hybridoma cell line deposited as ATCC Accession No. 10743.

3. An isolated antibody which binds to the same epitope on human mesenchymal stem cells as the antibody produced by the hybridoma cell line deposited as ATCC Accession No. 10744.

5. An isolated antibody which binds to the same epitope on human mesenchymal stem cells as the antibody produced by the hybridoma cell line deposited as ATCC Accession No. 10745.

5,837,540

METHOD OF PRODUCING FIBRIN-SPECIFIC ANTIBODIES USING SOLUBLE FIBRIN POLYMERS AS AN IMMUNOGEN

Paul E. Gargan, Granger; David G. M. Carville, Mishawaka, both of Ind., and Nada Dimitrijevic, Belgrade, Yugoslavia, assignors to American Biogenic Sciences, Inc., Copiague, N.Y.

Filed Jun. 28, 1996, Ser. No. 672,611

Int. Cl.^{6} A61K *39/00;* **C12N** *15/06;5/16;* **C07N** *16/36*

U.S. Cl. 435—337 **12 Claims**

1. A method for the production of a fibrin-specific antibody comprising immunizing an animal with a composition comprising soluble crosslinked DesAABB fibrin polymers and soluble non-crosslinked DesAABB fibrin polymers and selecting an antibody which specifically binds to soluble crosslinked DesAABB fibrin polymers and soluble non-crosslinked DesAABB fibrin polymers, but which does not crossreact with (a) fibrinogen, (b) plasmin-derived fibrinogen degradation products, (c) DesAA fibrin monomers, (d) DesAA fibrin polymers, (e) DesAABB fibrin monomers, (f) crosslinked fibrinogen, (g) DesAA fibrin monomer-fibrinogen complex, and (h) plasmin-derived fibrin degradation products.

5,837,541

CROSS-PROTECTIVE HUMAN MONOCLONAL ANTIBODY COMPOSITIONS

Howard V. Raff, Seattle, Wash., assignor to Bristol-Myers Squibb Company, New York, N.Y.

Division of Ser. No. 300,118, Sep. 2, 1994, Pat. No. 5,717,071, which is a continuation of Ser. No. 58,987, May 5, 1993, abandoned, which is a continuation of Ser. No. 785,184, Oct. 31, 1991, abandoned, which is a continuation of Ser. No. 944,495, Dec. 19, 1986, abandoned, which is a continuation-in-part of Ser. No. 828,005, Feb. 7, 1986, abandoned. This application Jun. 5, 1995, Ser. No. 464,495

Int. Cl.^{6} C12N *5/06;* **C07K** *16/00*

U.S. Cl. 435—340 **10 Claims**

1. An immortal cell line which secretes a human monoclonal antibody or antigen binding fragment thereof which specifically binds to an accessible carbohydrate determinant of outer membrane lipopolysaccharide shared by serotypes of at least two different species and which is protective against infection by bacteria of the serotypes, wherein one of the species is *E. coli*.

5,837,542

INTERCELLULAR ADHESION MOLECULE-1 (ICAM-1) RIBOZYMES

Susan Grimm; Dan T. Stinchcomb; James McSwiggen; Sean Sullivan, and Kenneth G. Draper, all of Boulder, Colo., assignors to Ribozyme Pharmaceuticals, Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 8,895, Jan. 19, 1993, abandoned, which is a continuation-in-part of Ser. No. 989,849, Dec. 7, 1992, abandoned. This application Aug. 17, 1994, Ser. No. 292,620

Int. Cl.^{6} C12Q *1/68;* **C12N** *15/85;* **A61K** *48/00*

U.S. Cl. 435—366 **13 Claims**

1. An enzymatic RNA molecule which specifically cleaves intercellular adhesion molecule-1(ICAM-1) mRNA.

5,837,543

HUMAN EMBRYO CO-CULTURE SYSTEM AND USES THEREOF

Barbara-Ann Conway-Myers, Helena, and Michael P. Steinkampf, Bimingham, both of Ala., assignors to UAB Research Foundation, Birmingham, Ala.

Continuation-in-part of Ser. No. 409,650, Mar. 24, 1995, abandoned. This application May 22, 1997, Ser. No. 861,888

Int. Cl.^{6} C12N *5/00;* **A61B** *17/435;* **A61D** *7/00*

U.S. Cl. 435—373 **12 Claims**

1. A human embryo co-culture system comprising a suspension of cultured human tubal epithelial cells, wherein said human tubal epithelial cells are cultured by the steps of:

culturing ampullary cells in a container holding a first medium until about 40% to about 80% confluence, wherein said first medium is CHANG MEDIUM® A supplemented with fetal calf serum, antibiotics and antifungal agents;

detaching said cells from the surface of said container; and

resuspending said cells in PC-I™ medium with serum, antibiotics and antifingal agents and replating said cells until about 40% to abut 80% confluence.

5,837,544

METHOD OF INDUCING A CELL TO PROLIFERATE USING A CHIMERIC RECEPTOR COMPRISING JANUS KINASE

Daniel J. Capon, Hillsborough, Calif.; Huan Tian, Cupertino, Calif.; Douglas H. Smith, Foster City, Calif.; Genine A. Winslow, Hayward, Calif., and Miriam Siekevitz, New York, N.Y., assignors to Cell Genesys, Inc., Foster City, Calif.

Continuation of Ser. No. 382,846, Feb. 3, 1995. This application Jun. 7, 1995, Ser. No. 485,293

Int. Cl.^{6} C12N *5/10;1/38*

U.S. Cl. 435—375 **5 Claims**

1. A method of inducing a cell to proliferate comprising:

(a) introducing a proliferation receptor construct into said cell under conditions suitable for expression to produce a cell expressing a proliferation receptor protein; and

(b) contacting said receptor in said cell with an inducer, said construct comprising in reading frame:

a DNA sequence encoding an intracellular inducer-responsive clustering domain comprising an immunophilin or a cyclophilin; and

a DNA sequence encoding a proliferation signaling domain comprising a Janus tyrosine kinase.

5,837,545

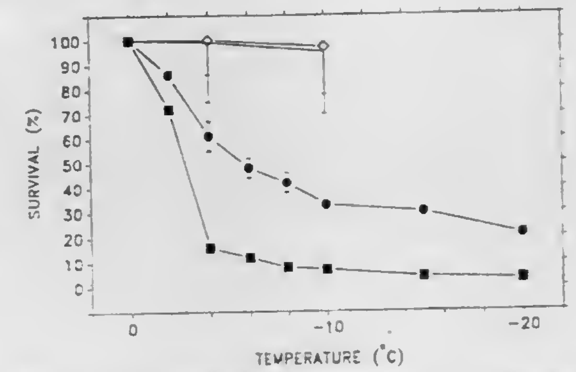
GENES, POLYPEPTIDES, AND COMPOSITIONS FOR COLD TOLERANCE IN PLANTS

Charles L. Guy; Dale W. Haskell, both of Gainesville; Andrea Hofig, Newberry, all of Fla., and Lisa Gail Neven, Yakima, Wash., assignors to Research Corporation Technologies, Inc., Tucson, Ariz.

Filed Jan. 21, 1993, Ser. No. 7,107

Int. Cl.^{6} C07K *14/415;* **C12N** *1/15;15/29;15/63*

U.S. Cl. 435—419 **14 Claims**



6. A process for enhancing cold tolerance of a cell, wherein said process comprises the step of transforming said cell with a DNA molecule comprising a coding sequence for a cold acclimation protein selected from the group consisting of CAP85 having an amino acid sequence as given in SEQ ID NO:2 and CAP160 having an amino acid sequence as given in SEQ ID NO:4, wherein expression of said coding sequence results in enhanced cold tolerance of said cell.

12. A transformed cell, wherein said cell is transformed according to the process of claim 6.

13. The transformed cell, according to claim 12, wherein said cell is a plant cell.

5,837,546

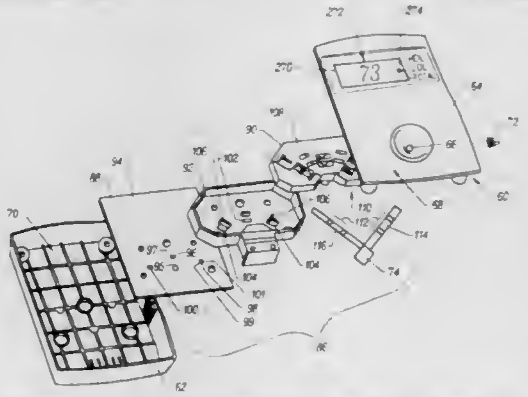
ELECTRONIC ASSAY DEVICE AND METHOD

Michael P. Allen, Los Gatos; Joel M. Blatt, Palo Alto, and Joseph T. Widunas, Fremont, all of Calif., assignors to Metrika, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 455,236, May 31, 1995, Pat. No. 5,580,794, which is a continuation of Ser. No. 111,347, Aug. 24, 1993, abandoned. This application Jun. 7, 1996, Ser. No. 657,894

Int. Cl.^{6} G01N *21/78*

U.S. Cl. 436—169 **29 Claims**



1. An assay device for determining the presence of one or more selected analytes in a sample, the device comprising:

a housing having an exterior surface and defining an interior area;

sample receptor means for receiving a sample, the sample receptor means being located on the exterior surface of the housing;

sample treatment means for reacting the sample with a reagent to yield a physically detectable change which correlates with

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the amount of selected analyte in the sample, the sample treatment means being located within the housing and in fluid communication with the sample receptor means;

detector means for responding to the physically detectable change and producing an electrical signal which correlates to the amount of selected analyte in the sample, the detector means being located within the housing and in electrical or optical communication with the sample treatment means;

processing means for storing assay calibration information, the assay calibration information being uniquely characteristic to the specific reagent and physically detectable change of the sample treatment means and to the specific detector means of the individual assay device, the processing means further calibrating the sample treatment means and the detector means using the stored assay calibration information, and the processing means further converting the electrical signal to a digital output, the processing means being located within the housing and connected to the detector means;

starting means for automatically activating the processing means and detector means upon the application of the sample to the device, the starting means being located within the housing and connecting to the processing means; and

display means for visually displaying the digital output external to the housing, the display means being connected to the processing means.

5,837,547

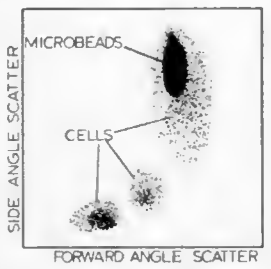
FLOW CYTOMETER CALIBRATION METHOD

Abraham Schwartz, Hato Rey, Puerto Rico, assignor to Caribbean Microparticles Corporation, Hato Rey, Puerto Rico

Filed Dec. 27, 1995, Ser. No. 579,186

Int. Cl.^{6} G01N *33/547*

U.S. Cl. 436—10 **7 Claims**



1. A method for increasing accuracy, precision and reliability of studies of protein-labeled cell samples using a flow cytometer or fluorescent microscope, comprising:

(a) providing a microbead suspension containing:

(i) a plurality of specific populations of microbeads which bind and are in equilibrium with a saturating amount of a selected protein; and

(ii) a microbead population having no binding capacity for said selected protein;

(b) providing information on calibrated binding capacities of the microbead populations;

(c) using the microbead suspension to obtain a calibration plot by a method selected from the group consisting of:

(i) washing the microbead suspension, analyzing the washed suspension on the flow cytometer or fluorescence microscope to determine representative peak channels, and using the representative peak channels and the calibrated binding capacities to obtain a calibration plot for the flow cytometer or fluorescence microscope, to obtain performance parameters and determine protein binding of cells; and

(ii) adding the microbead suspension without washing, to sample cells, which fluorescently labels the sample cells due to the excess labeled protein, to form a mixture of microbeads and sample cells, incubating the mixture, washing the mixture, analyzing the washed mixture by gating on the microbeads in the mixture using the flow cytometer or fluorescence microscope to determine representative peak channels, and using the representative peak channels and the calibrated binding capacities to obtain a calibration plot for the flow cytometer or fluorescence microscope, to obtain performance parameters for using the flow cytometer or fluorescence microscope; wherein gating on the fluorescently-labeled sample cells with the flow cytometer or fluorescence microscope allows determination of the antibody-binding capacity of the sample cells.

5,837,548

TREATMENT OF INFLAMMATION BY INHIBITION OF LIPID BODY FORMATION

Peter F. Weller, Wellesley; Ann M. Dvorak, Newton, and Patricia T. Bozza, Boston, all of Mass., assignors to Beth Israel Hospital, Boston, Mass.

Filed Dec. 1, 1995, Ser. No. 565,869

Int. Cl.^{6} G01N *33/48*

U.S. Cl. 436—63 **22 Claims**

1. A method for assessing the ability of a compound to inhibit inflammation, comprising the steps of:

(a) contacting a plurality of cells with a compound to be assessed;

(b) priming the cells of (a) for lipid body formation;

(c) determining the extent of lipid body formation in the cells;

(d) comparing the extent of lipid body formation in the cells with the extent of lipid body formation in control cells,

wherein if the extent of lipid body formation determined in (c) is less than the extent of lipid body formation in control cells, the compound is an inhibitor of lipid body formation; and, if the compound is an inhibitor of lipid body formation,

(e) assessing the inflammatory activity of the compound in an animal model of inflammation or in a human.

5,837,549

Patent Not Issued For This Number

5,837,550

METHOD FOR SCREENING AN EXPRESSION CDNA CLONE BANK FOR THE DETECTION OF POLYNUCLEOTIDES

Michael Breitenbach; Dietrich Kraft; Helmut Rumpold, all of Vienna; Otto Scheiner, Mariaenzersdorf; Heimo Breiteneder; Karin Pettenburger, both of Vienna, and Rudolf Valenta, Theresienfeld, all of Austria, assignors to Biomay Produktions-Und Handelsgesellschaft m.b.H., Linz, Austria

Continuation of Ser. No. 59,197, May 5, 1993, abandoned, which is a continuation of Ser. No. 353,844, May 18, 1989, abandoned. This application Jun. 7, 1994, Ser. No. 255,127

Claims priority, application Austria, Oct. 14, 1988, 2554/88

Int. Cl.^{6} G01N *33/563;* **C07K** *16/16*

U.S. Cl. 436—513 **2 Claims**

1. A method for identifying a cDNA coding for an allergenic plant protein, said method comprising the steps of:

(a) preparing a cDNA clone bank from tissue of a plant suspected of producing an allergenic protein to which IgE antibodies in serum of an allergic individual are capable of binding;

(b) expressing said cDNA clone bank in a bacterial expression system to produce proteins;

(c) contacting the proteins produced from said cDNA clone bank with the serum of said allergic individual to form IgE antibody-protein complexes; and

(d) determining which cDNA clones express a protein able to bind to said IgE antibodies by screening for said antibody-protein complexes with anti-IgE antibodies.

5,837,551

BINDING ASSAY

Roger P. Ekins, Pondweed Place, Friday Street, Abinger, Common Dorking Surrey, Great Britain, RH5 GJR

PCT No. PCT/GB94/02814, § 371 Date Jun. 14, 1996, § 102(e) Date Jun. 14, 1996, PCT Pub. No. WO95/18377, PCT Pub. Date Jul. 6, 1995

PCT Filed Dec. 23, 1994, Ser. No. 663,176

Claims priority, application United Kingdom, Dec. 24, 1993, 9326450

Int. Cl.^{6} G01N *33/53*

U.S. Cl. 436—518 **21 Claims**

1. A method for determining the concentration of at least one analyte in a liquid sample, said method comprising, for each analyte, the steps of:

(a) immobilizing a specific binding agent including binding sites specific for the analyte on a solid support, wherein the specific binding agent used to determine the concentration of the analyte is present in an amount less than 0.1 V/K moles, where V is the volume of the liquid sample and K is the association constant for the analyte specifically binding to the specific binding agent, and wherein said specific binding agent is divided into an array of spatially separated locations;

(b) contacting the support with the sample so that a fraction of the binding sites of the specific binding agent specific for the analyte specifically binds the analyte;

(c) contacting the support with a developing agent labelled with a signal-producing marker such that the labelled developing agent binds to unoccupied binding sites, to specifically bound analyte or to the binding sites with specifically bound analyte;

(d) separating non-specifically bound developing agent from the solid support and measuring the signal produced by the marker at each of the locations in the array to obtain a value which represents the fraction of the binding sites occupied by the analyte at each location;

(e) adding the values obtained at the locations in the array to provide a total signal; and

(f) comparing the total signal to corresponding values obtained from a series of standard solutions containing known concentrations of the analyte, to determine the concentration of the analyte in the liquid sample.

17. A method for determining a value representative of a fraction of binding sites of a specific binding agent including binding sites specific for an analyte which binding sites are occupied by the analyte present in a liquid sample, said method comprising the steps of:

(a) immobilizing the specific binding agent on a solid support, wherein the specific binding agent used for the fractional occupancy determination is present in an amount less than 0.1 V/K moles, where V is the volume of the liquid sample and K is the association constant for the analyte specifically binding to the specific binding agent, and wherein said specific binding agent is divided into an array of spatially separated locations;

(b) contacting the support with the liquid sample so that a fraction of the binding sites of the binding agent specific for the analyte specifically bind the analyte;

(c) contacting the support with a developing agent labelled with a signal-producing marker such that the labelled developing agent binds to unoccupied binding sites, to specifically bound analyte or to the binding sites with specifically bound analyte;

(d) separating non-specifically bound developing agent from the solid support and measuring the signal produced by the marker at each of the locations in the array to obtain a value which represents the fraction of the binding sites occupied by the analyte at each location; and

(e) adding the values obtained at the locations in the array to provide a total signal which indicates the fraction of the binding sites in the specific binding agent occupied by the analyte.

5,837,552

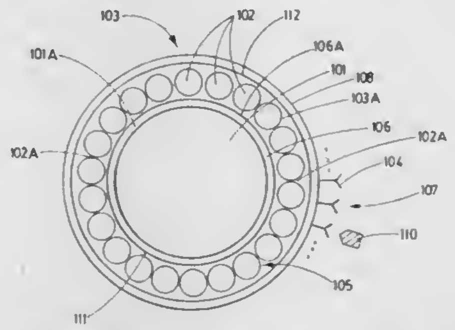
SURFACE-ENHANCED ANALYTICAL PROCEDURES AND SUBSTRATES

Therese M. Cotton; George Chumanov; Konstantin Sokolov, all of Ames, Iowa, and Timothy M. Sheehy, Denville, N.J., assignors to Medifor, Ltd., Geneva, Switzerland

Continuation-in-part of Ser. No. 453,443, May 30, 1995, Pat. No. 5,527,712, which is a continuation of Ser. No. 138,890, Oct. 19, 1993, abandoned, which is a continuation of Ser. No. 858,163, Mar. 27, 1992, abandoned, which is a continuation-in-part of Ser. No. 733,728, Jul. 22, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 477,288

Int. Cl.^{6} G01N *33/553*

U.S. Cl. 436—525 **35 Claims**



1. A surfaced article for use in surfaced-enhanced, analytical procedures, comprising:

a substrate body having a substrate surface;

a population of spaced apart metal islands on said substrate surface;

interconnections being formed between at least some of the metal islands, the interconnections being metal and of lesser thickness than the metal islands;

a continuous layer coating said islands, and also coating all surfaces between the metal islands which were exposed before the continuous layer was applied, said continuous layer including a coupling agent; and

first and second binding partner molecules, the first partner molecules bonded to the coupling agent and the second binding partner molecules not bonded to the coupling agent, the first binding partner molecules being binding partners of the second binding partner molecules, said first and second partner molecules being different molecules having specific binding affinity for each other, and said second binding partner molecules binding to said first binding partner molecules.

5,837,553

METHOD OF MAKING HIGH VOLTAGE, JUNCTION ISOLATION SEMICONDUCTOR DEVICE HAVING DUAL CONDUCTIVITY TYPE BURIED REGIONS

Lawrence G. Pearce, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.

Division of Ser. No. 383,261, Feb. 3, 1995, Pat. No. 5,567,978. This application Jul. 15, 1996, Ser. No. 683,599

Int. Cl.^{6} H01L *21/265*

U.S. Cl. 437—31 **10 Claims**

1. A method of manufacturing a semiconductor device comprising the steps of:

(a) selectively forming a first masking layer on a surface of a semiconductor substrate so as to expose first and second surface portions of said semiconductor substrate through first and second respective apertures of said first masking layer;

(b) introducing first impurities of a first conductivity type through said first and second apertures of said first masking layer, so as to form first and second doped regions of said first conductivity type in said first and second surface portions of said semiconductor substrate;

(c) selectively forming a second masking layer on said first masking layer so as to mask a first portion of said first

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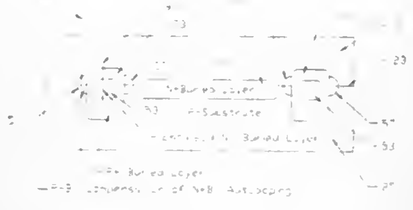
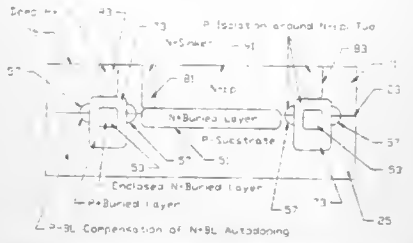




masking layer including said first aperture, while exposing a second portion of said first masking layer including said second aperture;

(d) introducing second impurities of a second conductivity type through said second aperture of said first masking layer, so as to modify the doping composition of said second doped region in said second surface portion of said semiconductor substrate;

(e) removing said second portion of said first masking layer, thereby exposing, in addition to said second surface portion of said substrate, a third surface portion of said substrate adjacent to said second surface portion thereof; and

(f) introducing third impurities of said second conductivity type into the exposed second and third surface portions of said semiconductor substrate, so as form a third doped region of said second conductivity type that is adjacent to said second doped region.

5,837,554

INTEGRATED CIRCUIT WITH EPROM CELLS.

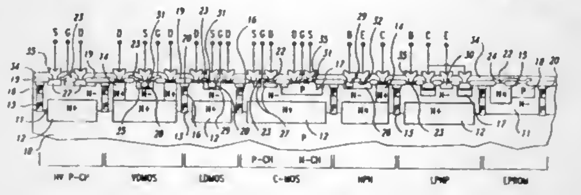
Claudio Contiero, Milan; Tiziana Cavionl, and Stefano Manzini, both of Novara, all of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Division of Ser. No. 358,152, Dec. 15, 1994. This application Jun. 7, 1995, Ser. No. 477,304

Claims priority, application European Pat. Off., Dec. 15, 1993, 93830505

Int. Cl.^{6} H01L *21/8247*

U.S. Cl. 437—43 **10 Claims**



1. A method of forming an electrically programmable read-only memory cell within a semiconductor structure having a top surface, the method comprising the steps of:

forming an epitaxial layer overlying a substrate, the epitaxial layer being of the opposite conductivity type as the substrate;

forming an isolation region extending from the top surface into the epitaxial layer, the isolation region being of the opposite conductivity type as the epitaxial layer;

forming a control electrode region extending from the top surface into the epitaxial layer, the control electrode region being of the same conductivity type as the epitaxial layer;

forming two thin regions extending from the top surface into a portion of the isolation region, the two thin regions being of the same conductivity type as the control electrode region and defining the source and the drain regions of the memory cell;

forming an insulating layer overlying the isolation region, the control electrode region and a selected portion of the region between the two thin regions; and

forming a floating gate region overlying the insulating layer and extending over the selected portion of the region between the two thin regions and over a selected portion, of the control electrode region.

5,837,555

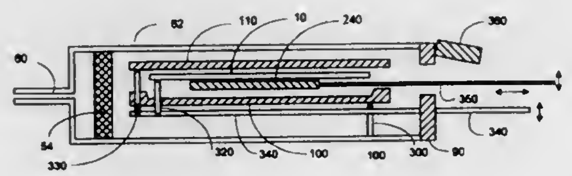
APPARATUS AND METHOD FOR RAPID THERMAL PROCESSING

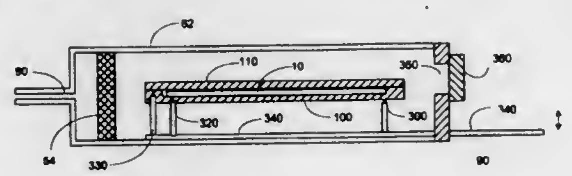
Guenter Kaltenbrunner, Baldham; Zsolt Nenyei, Blaustein, and Helmut Sommer, Deggingen, all of Germany, assignors to AST Electronik, Kirchheim, Germany

Filed Apr. 12, 1996, Ser. No. 631,265

Int. Cl.^{6} H01L *21/324;21/477;* **C23C** *16/00;* **A21B** *2/00*

U.S. Cl. 437—248 **22 Claims**





1. A method for Rapid Thermal Processing (RTP) of an object, the object having an object volume, in an RTP system comprising a radiation source and a closable enclosure having an enclosed volume less than 10 times greater than the object volume, comprising;

a) placing the object in the closable enclosure;

b) surrounding the object with a process gas;

c) after the step of surrounding the object, then closing the closable enclosure; and

d) after the step of closing the closable enclosure,then processing the object with radiation from the radiation source.

5,837,556

METHOD OF REMOVING A COMPONENT FROM A SUBSTRATE

Dennis R. Ostendorf, Rockford, and Donald J. Geralds, Rochelle, both of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jan. 6, 1997, Ser. No. 778,619

Int. Cl.^{6} H01L *21/58;21/68*

U.S. Cl. 438—4 **15 Claims**

1. A method of disassembling an electrical component from a substrate wherein the substrate includes a first bore and the component is releasably bonded to a first face of the substrate over the first bore, the method comprising the steps of:

providing a fixture for accepting the substrate wherein the fixture has a second bore and a pin in the bore;

securing a second face of the substrate opposing its first face to the fixture such that the first bore is aligned with the second bore;

pushing the pin through the aligned bores into contact with the component; and

advancing the pin against the component to force the component away from the substrate.

5,837,557

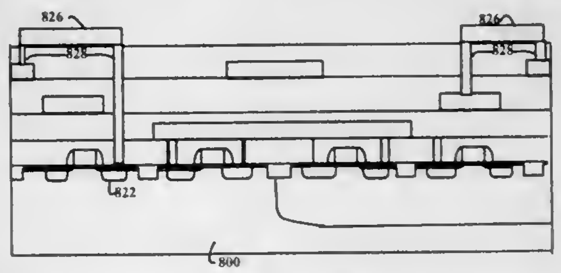
SEMICONDUCTOR FABRICATION METHOD OF FORMING A MASTER LAYER TO COMBINE INDIVIDUALLY PRINTED BLOCKS OF A CIRCUIT PATTERN

H. Jim Fulford, Jr.; Robert Dawson, both of Austin; Mark I. Gardner, Cedar Creek; Frederick N. Hause, Austin; Mark W. Michael, Cedar Park; Bradley T. Moore, and Derick J. Wristers, both of Austin, all of Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Mar. 14, 1997, Ser. No. 818,478

Int. Cl.^{6} H01L *21/82*

U.S. Cl. 438—6 **20 Claims**



1. A method of fabricating an integrated circuit comprising the steps of:

fabricating a plurality of electronically and spatially independent device regions extending laterally on a substrate wafer, the semiconductor device regions being electrically isolated by an isolation;

individually patterning the regions of the plurality of device regions;

etching the plurality of device regions in accordance with the individual patterning of the regions;

depositing an insulating layer overlying the plurality of device regions on the substrate wafer;

forming a plurality of patterned vias extending through the insulating layer to selected locations of the plurality of device regions;

depositing a conductive material in the vias electrically-coupled to the selected locations of the plurality of device regions; and

depositing a conductive master layer overlying the insulating layer and extending laterally overlying the plurality of device regions, the conductive master layer electrically-coupling to the conductive material in the vias.

5,837,558

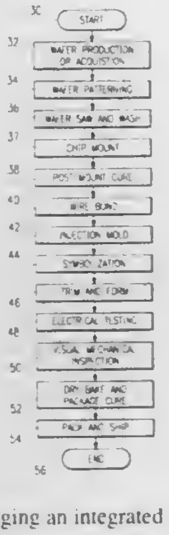
INTEGRATED CIRCUIT CHIP PACKAGING METHOD

Edgar R. Zuniga, Sherman, and Mary E. Helmick, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 4, 1997, Ser. No. 963,799

Int. Cl.^{6} G01R *31/26;* **H01L** *21/66;21/44;21/48;21/50*

U.S. Cl. 438—15 **12 Claims**



1. A method for packaging an integrated circuit chip, comprising the steps of:

mounting the integrated circuit chip on a leadframe having a plurality of leads;

molding an encapsulant around the integrated circuit chip and the leadframe;

forming the leads of the leadframe into a selected shape;

curing the encapsulant subsequent to the forming step; and

removing moisture from the encapsulant simultaneously with the curing step.

5,837,559

METHOD OF PRODUCING AN ELECTRO-OPTICAL DEVICE

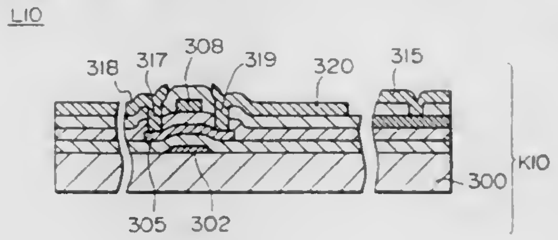
Ken Kawahata, Sendai; Akira Nakano, Furukawa; Hirofumi Fukui, Miyagi-ken; Hiroyuki Hebiguchi, Sendai; Kenji Yamamoto, and Chisato Iwasaki, both of Miyagi-ken, all of Japan, assignors to Frontec Incorporated, Japan

Division of Ser. No. 459,925, Jun. 2, 1995, Pat. No. 5,726,077. This application Nov. 7, 1996, Ser. No. 745,904

Claims priority, application Japan, Jun. 3, 1994, 6-122883; Oct. 17, 1994, 6-251052

Int. Cl.^{6} H01L *21/336;21/84*

U.S. Cl. 438—30 **1 Claim**



1. A method for producing an electro-optical device in which an electro-optical material is put between a pair of substrates opposed to each other, at least a portion of opposing surfaces of the substrates is insulative, a plurality of source wirings and a plurality of gate wirings are formed crossing each other on the surface of one of the substrates and a transparent pixel electrode and a thin film transistor are formed at each of crossing points between the source wirings and the gate wirings, wherein the method comprises:

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- a step L1 of forming a light screening thin film on the surface of the one substrate,
- a first photolithographic step L2 of patterning the light screening thin film to form a light screening thin film pattern,
- a step L3 of forming a first insulator film and a semiconductor active film on the surface of the one substrate after the first photolithographic step,
- a second photolithographic step L4 of patterning the semiconductor active film to form a semiconductor portion above the light screening film pattern,
- a step L5 of forming a second insulator film and a first metal film on the surface of the one substrate after the second photolithographic step,
- a third photolithographic step L6 of patterning the first metal film to form a gate electrode and a gate wiring,
- a step L7 of forming a third insulator film on the surface of the one substrate after the third photolithographic step,
- a fourth photolithographic step L8 of patterning the second insulator film and the third insulator film to form a contact hole to one end of the semiconductor portion and a contact hole to the other end of the semiconductor portion, and patterning the third insulator film to form a contact hole to the gate wiring,
- a step L9 of forming a transparent conductive film on the surface of the one substrate after the fourth photolithographic step, and
- a fifth photolithographic step L10 of patterning the transparent conductive film to form a source electrode, a source wiring and drain electrode on both sides of the gate electrode and a pixel electrode.

5,837,560

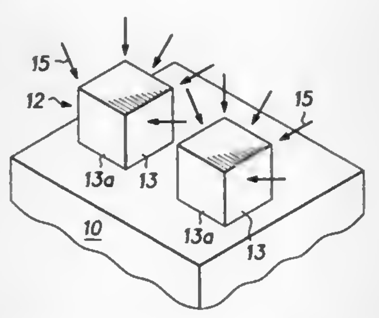
METHOD OF MASKING SUBSTRATES LEAVING EXPOSED FACETS

Kumar Shiralagi, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 20, 1997, Ser. No. 879,352

Int. Cl.⁶ H01L *21/033*

U.S. Cl. 438—39 **20 Claims**



1. A method of masking during fabrication of semiconductor devices comprising the steps of:

- providing a substrate including a semiconductor material and having a structure projecting therefrom, the structure including a facet; and
- selectively directing ultraviolet light onto the substrate at an angle to the structure and opposite the facet so that the structure shades the facet from the ultra violet light, the ultra violet light reacting with the material to form an oxide mask on the substrate leaving the facet unmasked.

5,837,561

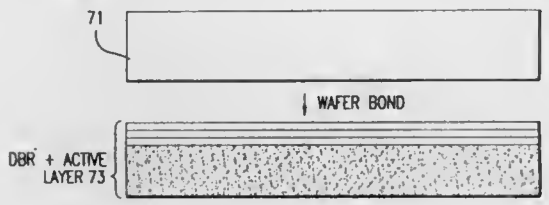
FABRICATION OF TRANSPARENT SUBSTRATE VERTICAL CAVITY SURFACE EMITTING LASERS BY SEMICONDUCTOR WAFER BONDING

Fred A. Kish, Jr., San Jose, and Richard P. Schneider, Jr., Mountain View, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 565,537, Nov. 30, 1995, Pat. No. 5,724,376. This application May 23, 1997, Ser. No. 862,870

Int. Cl.⁶ H01S *3/043*

U.S. Cl. 438—47 **15 Claims**



1. A method for fabricating a vertical cavity surface emitting laser with a transparent substrate, the method comprising the steps of:

- growing a first distributed Bragg reflector on and lattice matched to an absorbing substrate;
- growing a lattice matched active region on the first distributed Bragg reflector, the active region comprising at least a quantum well and confining regions with larger bandgaps than the quantum well and generating light in response to current injection;
- growing a lattice matched second distributed Bragg reflector on top of the active region;
- wafer bonding a second substrate transparent to the light generated by the active region to the second distributed Bragg reflector;
- selectively removing the absorbing substrate; and
- forming upper and lower contacts for injecting current into the active region, wherein the laser exhibits low thermal resistance.

5,837,562

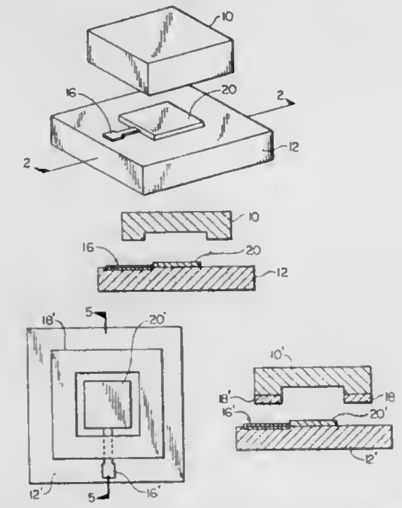
PROCESS FOR BONDING A SHELL TO A SUBSTRATE FOR PACKAGING A SEMICONDUCTOR

Steve T. Cho, Newport Beach, Calif., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Jul. 7, 1995, Ser. No. 499,411

Int. Cl.⁶ H01L *21/60;21/48*

U.S. Cl. 438—51 **11 Claims**



1. A method for forming a vacuum enclosure enclosing a semiconductor device, said method comprising:

- providing a substrate;
- disposing a semiconductor device on said substrate;

- forming a plurality of electrical leads in communication with said semiconductor device on said substrate, wherein said step of forming further comprises
  - depositing a lower layer of refractory metal on said substrate, and
  - depositing an upper layer of soft metal over said lower layer;
- positioning a shell having a concave surface with surrounding edges on said substrate, on said plurality of electrical leads, and over said semiconductor device; and
- anodically bonding said shell to said substrate, including eutectically sealing said shell edges to said upper layer of each of said plurality of electrical leads.

5,837,563

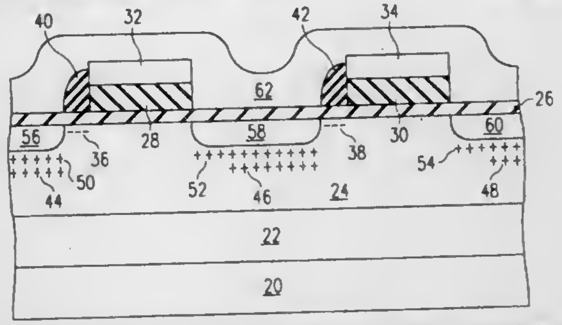
SELF ALIGNED BARRIER PROCESS FOR SMALL PIXEL VIRTUAL PHASE CHARGED COUPLED DEVICES

Jaroslav Hynecek, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 26, 1996, Ser. No. 703,262

Int. Cl.⁶ H01L *21/339*

U.S. Cl. 438—60 **20 Claims**



1. A method for making a virtual phase charge coupled device comprising:

- forming a semiconductor region of a first conductivity type;
- forming gate regions overlying and separated from the semiconductor region;
- forming clocked barrier implants of a second conductivity type in the semiconductor region and aligned to the gate regions;
- depositing a semiconductor layer overlying and separated from the semiconductor region and the gate regions;
- removing a portion of the semiconductor layer leaving first semiconductor side walls coupled to first edges of the gate regions and second semiconductor side walls coupled to second edges of the gate regions;
- forming virtual well implants in the semiconductor region aligned to the first and second side walls;
- removing the second side walls; and
- forming virtual gates of a second conductivity type in the semiconductor region aligned to the first side walls and the second edges of the gate regions.

5,837,564

METHOD FOR OPTIMAL CRYSTALLIZATION TO OBTAIN HIGH ELECTRICAL PERFORMANCE FROM CHALCOGENIDES

Gurtej S. Sandhu, and Alan R. Reinberg, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

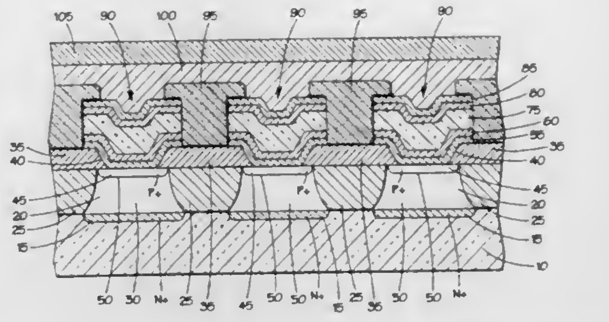
Filed Nov. 1, 1995, Ser. No. 551,726

Int. Cl.⁶ H01L *21/00*

U.S. Cl. 438—95 **15 Claims**

1. A method of fabricating a plurality of individual chalcogenide elements, comprising the steps of:

- applying a layer of amorphous chalcogenide material onto a substrate;
- etching said layer of amorphous chalcogenide material to form a memory array comprising a plurality of individual amorphous chalcogenide elements; and



- transforming all of said individual amorphous chalcogenide elements in the memory array to a crystalline state at once.

5,837,565

SEMICONDUCTOR DEVICE

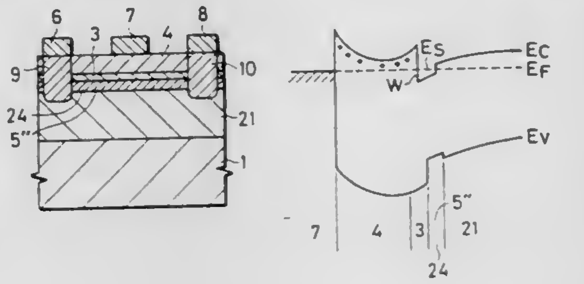
Takao Kuroda, Kokubunji, and Yasuhiro Shiraki, Hino, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 235,155, Apr. 28, 1994, which is a continuation of Ser. No. 863,471, Apr. 2, 1992, abandoned, which is a continuation of Ser. No. 528,898, May 29, 1990, abandoned, which is a continuation of Ser. No. 316,658, Feb. 28, 1989, abandoned, which is a continuation of Ser. No. 56,294, May 29, 1987, abandoned, which is a continuation of Ser. No. 745,226, Jun. 17, 1985, abandoned. This application May 25, 1995, Ser. No. 450,621

Claims priority, application Japan, Jun. 18, 1984, 6-123606

Int. Cl.⁶ H0IL *21/20;21/338*

U.S. Cl. 438—172 **10 Claims**



1. A method of manufacturing a semiconductor device having a field-effect transistor structure, comprising the steps of:

- forming a substantially undoped GaAs layer on a semi-insulating GaAs substrate;
- forming a substantially undoped $In_yGa_{1-y}As$ layer on the undoped GaAs layer, where y is greater than 0 and up to 1, said $In_yGa_{1-y}As$ layer having a thickness in a range of 100–200 Å;
- forming a substantially undoped $Ga_{1-x}Al_xAs$ layer on the undoped $In_yGa_{1-y}As$ layer, where x is greater than 0 and up to 1;
- forming an n-type $Ga_{1-x}Al_xAs$ layer over said substantially undoped $Ga_{1-x}Al_xAs$ layer; and
- forming a gate electrode so as to apply voltage to said substantially undoped $In_yGa_{1-y}As$ layer via said n-type $Ga_{1-x}Al_xAs$ layer.

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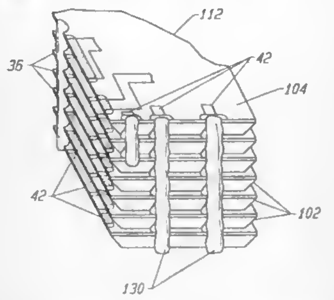
5,837,566
VERTICAL INTERCONNECT PROCESS FOR SILICON SEGMENTS

David V. Pedersen, Scotts Valley; Michael G. Finley, Cambria, and Kenneth M. Sautter, Sunnyvale, all of Calif., assignors to Cubic Memory, Inc., Scotts Valley, Calif.

Division of Ser. No. 265,081, Jun. 23, 1994, Pat. No. 5,675,180. This application Apr. 24, 1997, Ser. No. 847,309

Int. Cl.^{6} H01L *21/44;21/48;21/50*

U.S. Cl. 438—109 **5 Claims**



1. A method for forming a stack of segments, comprising the steps of:

providing a wafer having a plurality of die;

creating a plurality of segments, each one of said plurality of segments formed by grouping a plurality of adjacent ones of said die on said wafer,

interconnecting said plurality of adjacent die on said each one of said plurality of segments;

separating said each one of said plurality of segments from said wafer;

placing said plurality of segments on top of one another to create a stack of segments, said stack having external vertical sides;

electrically interconnecting said stack of segments;

providing internal electrically conductive contact points on each of said plurality of die;

providing external electrically conductive contact points said each one of said plurality of segments;

providing a layer of metal traces on said each one of said plurality of segments, said metal traces extending between said internal electrically conductive contact points on said plurality of die and said external electrically conductive contact points on said each one of said plurality of segments; and

applying electrically conductive epoxy to more than one of said external vertical sides of said stack such that said electrically conductive epoxy is in contact with said external electrically conductive contact points on said each one of said segments in said stack, to thereby electrically interconnect said plurality of segments in said stack.

5,837,567
LEAD FRAME AND SEMICONDUCTOR DEVICE

Naotaka Tanaka; Akihiro Yaguchi, both of Ibaraki-ken; Makoto Kitano, Tsuchiura; Tatsuya Nagata, Ishioka; Tetsuo Kumazawa, Ibaraki-ken; Atsushi Nakamura, Fuchu; Hiromichi Suzuki, Machida, and Masayoshi Tsugane, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 438,467, May 10, 1995, Pat. No. 5,637,914. This application Mar. 31, 1997, Ser. No. 829,230

Claims priority, application Japan, May 16, 1994, 6-100444

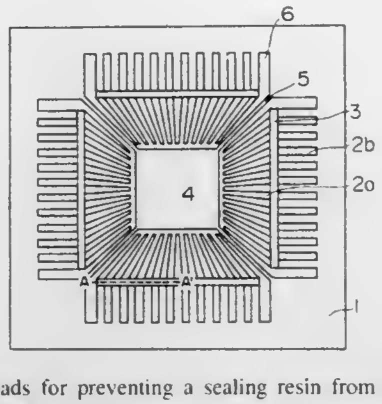
Int. Cl.^{6} H01L *21/44*

U.S. Cl. 438—123 **26 Claims**

1. A method of manufacturing a lead frame including a tab for mounting thereon a semiconductor chip, the tab having four edges in a substantially rectangular contour, at least two chip pad supporting leads connected to the tab for supporting the tab, of leads including inner leads and outer leads and having end surfaces being apart from at least two edges of the four edges of the tab and opposing to each other, the chip pad supporting leads having an end connected only to an outer frame of the lead frame, and a dam member made of an insulating material and disposed only between the outer leads for preventing a sealing resin from flowing out, comprising the steps of

mounting the semiconductor chip on the tab; and

forming the dam member in a linear shape, the dam member traversing the groups of leads and being apart from the chip pad supporting leads.



5,837,568
MANUFACTURING METHOD OF SEMICONDUCTOR DEVICES

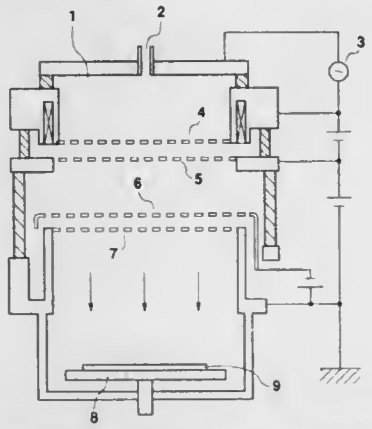
Kiyoshi Yoneda, Motosu-gun; Yoshihiro Morimoto, Inazawa; Kiichi Hirano, Anpachi-gun; Koji Suzuki, and Masaru Takeuchi, both of Ogaki, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Dec. 10, 1996, Ser. No. 763,556

Claims priority, application Japan, Dec. 12, 1995, 7-323203; Feb. 29, 1996, 8-043695

Int. Cl.^{6} H01L *21/339*

U.S. Cl. 438—147 **23 Claims**



1. A manufacturing method of a semiconductor device, comprising:

a first step of forming a low concentration region by doping a given region of a semiconductor layer with a small dose of first impurities which cause a conductive type; and

a second step of forming a high concentration region by doping a given region which is at least partially different from the low concentration region with a large dose of second impurities which cause a same conductive type as the first impurities;

wherein, in the first step, ions of the first impurities are selected through mass spectrometry from ions which have been extracted from material source containing elements of the first impurities through electrical discharging and application of a high electric field thereto, and doped in the semiconductor layer, and

in the second step, ions of the second impurities are extracted together with other ions from material source containing elements of the second impurities through electrical discharging and application of a high electric field thereto, and all doped in the semiconductor layer.

5,837,569
SEMICONDUCTOR DEVICE AND METHOD FOR PRODUCING THE SAME

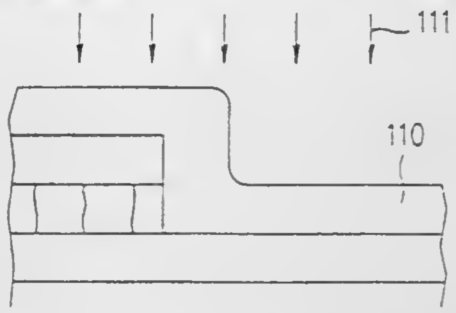
Naoki Makita, Nara, and Yoshitaka Yamamoto, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 421,910, Apr. 14, 1995, Pat. No. 5,619,044. This application Dec. 30, 1996, Ser. No. 777,029

Claims priority, application Japan, Apr. 15, 1994, 6-077699

Int. Cl.^{6} H01L *21/84*

U.S. Cl. 438—166 **10 Claims**



10. A method for producing a semiconductor device comprising the steps of:

forming a first amorphous silicon film over an insulating surface of a substrate;

introducing at least one catalyst element for promoting the crystallization into a selected portion of the first amorphous silicon film;

first annealing the first amorphous silicon film so as to crystallize the selected portion of the first amorphous silicon film, and then to form a laterally grown crystalline portion of the first amorphous silicon film;

forming a second amorphous silicon film so as to contact with a selected area of the laterally grown crystalline portion of the first amorphous silicon film;

second annealing the second amorphous silicon film so as to crystallize the second amorphous silicon film using the selected area of the laterally grown crystalline portion of the first amorphous silicon film as a seed for crystal growth.

5,837,570
HETEROSTRUCTURE SEMICONDUCTOR DEVICE AND METHOD OF FABRICATING SAME

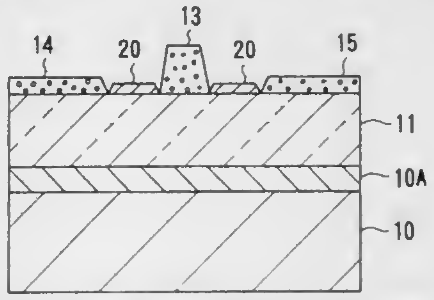
Tetsuro Asano, Ora-Gun, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Dec. 26, 1996, Ser. No. 773,347

Claims priority, application Japan, Dec. 28, 1995, 7-343398; Dec. 28, 1995, 7-343400; Dec. 28, 1995, 7-343401; Dec. 28, 1995, 7-343402

Int. Cl.^{6} H01L *21/338*

U.S. Cl. 438—172 **4 Claims**



1. A heterostructure semiconductor device comprising:

a substrate;

an n-type GaAs layer disposed as a channel region in said substrate;

a gate electrode disposed on said n-type GaAs layer in direct contact therewith;

source and drain electrodes disposed on said n-type GaAs layer; and

a GaInP layer disposed as a passivation layer on said n-type GaAs layer in lattice alignment therewith between said gate electrode and said source and drain electrodes.

5,837,571
HIGH VOLTAGE TRANSISTOR FOR SUB-MICRON CMOS PROCESSES

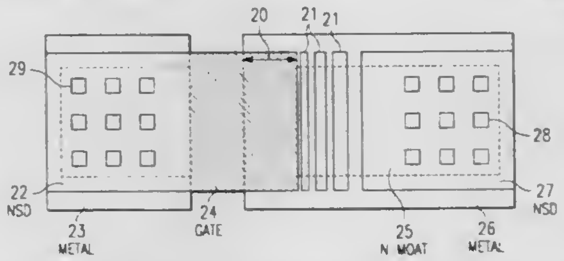
Vijay Pathak, Roquefort les Pins, France, assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 359,509, Dec. 20, 1994, Pat. No. 5,501,577. This application Jul. 23, 1996, Ser. No. 685,229

Claims priority, application United Kingdom, Dec. 23, 1993, 9326344

Int. Cl.^{6} H01L *21/8238*

U.S. Cl. 438—199 **5 Claims**



1. A method of forming a semiconductor device comprising the steps of:

forming a layer of a first conductivity type on a substrate;

forming source, drain and gate regions in said layer, one of said source and drain regions being formed by forming a mask over said layer having a plurality of disjoint windows of varying widths therein, said width variation being in conformance with a desired dopant profile;

diffusing a dopant through said window to form said source or drain, said diffusion forming disjoint strips of dopant in said layer which vary in accordance with said width;

heating said device to allow said dopant to diffuse into said layer to form a graded profile having a thickness which decreases towards said gate region; and

forming a metal layer over said gate region.

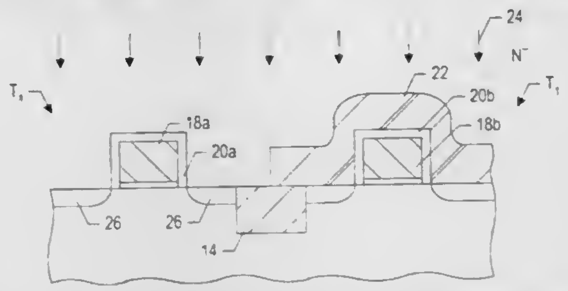
5,837,572
CMOS INTEGRATED CIRCUIT FORMED BY USING REMOVABLE SPACERS TO PRODUCE ASYMMETRICAL NMOS JUNCTIONS BEFORE ASYMMETRICAL PMOS JUNCTIONS FOR OPTIMIZING THERMAL DIFFUSIVITY OF DOPANTS IMPLANTED THEREIN

Mark I. Gardner, Cedar Creek; Fred N. Hause, and H. Jim Fulford, Jr., both of Austin, all of Tex., assignors to Advanced Micro Devices, Inc.

Filed Jan. 10, 1997, Ser. No. 781,461

Int. Cl.^{6} H01L *21/82*

U.S. Cl. 438—199 **21 Claims**



1. A method for forming a transistor having asymmetrically doped n-type and p-type junction areas, comprising:

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- providing a first gate conductor spaced above an n-channel area interposed between a first pair of junction areas;
- using the first gate conductor as a mask, implanting a first concentration of n-type dopants into the first pair of junction areas;
- patterning a spacer upon opposed sidewall surfaces of said first gate conductor;
- using the spacer and the first gate conductor as a mask, implanting a second concentration of n-type dopants into the first pair of junction areas; and
- covering one of said first pair of junction areas to allow removal of the spacer from one of the sidewall surfaces and, while retaining coverage, implanting a third concentration of n-type dopants only into the first junction area under which the removed spacer pre-existed to produce an asymmetrically doped pair of n-type junction areas.

5,837,573

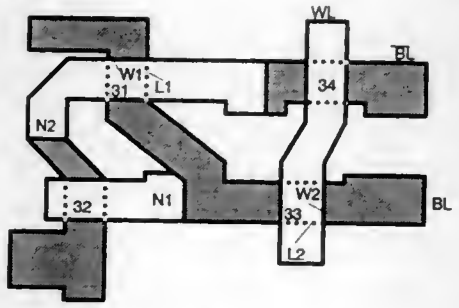
MINIMUM SIZE INTEGRATED CIRCUIT STATIC MEMORY CELL

Jeng-Jong Guo, Hsin-Chu, Taiwan, assignor to Utron Technology Inc., Hsin-Chu, Taiwan

Division of Ser. No. 460,035, Jun. 2, 1995, Pat. No. 5,703,392. This application Sep. 10, 1997, Ser. No. 929,305

Int. Cl.^{6} H01L *21/8244*

U.S. Cl. 438—238 **6 Claims**



1. A method to manufacture an integrates circuit static memory cell having two MOSFET pass transistors coupled to two cross-coupled inverters, comprising the step of adjusting the difference between the threshold voltage of pass transistor and the threshold voltage of the pull-down MOSFET of said inverters to be positive, wherein the width-to-length ratio of the gate of the pull-down MOSFET is less than 2.5 times the width-to-length ratio of the gate of the pass transistor.

5,837,574

METHOD OF MANUFACTURING A THIN POLY, CAPACITOR COUPLED CONTACTLESS IMAGER WITH HIGH RESOLUTION AND WIDE DYNAMIC RANGE

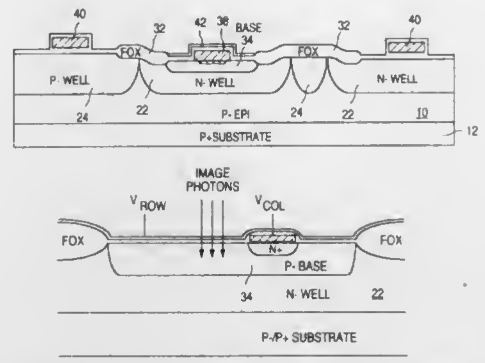
Albert Bergemont, Palo Alto; Carver A. Mead, Pasadena; Minhwa Chi, Palo Alto, and Hosam Haggag, Santa Clara, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 438,347, May 10, 1995, abandoned. This application Jan. 29, 1997, Ser. No. 789,397

Int. Cl.^{6} H01L *21/8242*

U.S. Cl. 438—239 **2 Claims**

1. A method of fabricating a capacitor coupled contactless imager structure in a semiconductor substrate of p-type conductivity while simultaneously fabricating a metal-oxide-semiconductor (MOS) transistor structure in said semiconductor substrate, the method comprising:



- (a) forming first and second spaced-apart wells of n-type conductivity (n-wells) in the semiconductor substrate, the first and second n-wells having a region of isolation oxide formed therebetween, the first n-well forming the collector region of the imager structure;
- (b) forming a first mask that covers the second n-well;
- (c) forming a p-type region in the first n-well, the p-type region forming the base region of the imager structure;
- (d) after removing the first mask from the second n-well, forming a layer of gate oxide on the first n-well and on the second n-well;
- (e) forming a second mask that covers the second n-well and that covers a peripheral portion of the first n-well while leaving gate oxide formed on a central portion of the first n-well exposed;
- (f) removing the exposed gate oxide from the central portion of the first n-well;
- (g) after removing the second mask, forming a first polysilicon layer over a structure resulting from foregoing steps (a)–(g) and patterning the first polysilicon layer to form a polysilicon emitter contact region on the central portion of the first n-well and a polysilicon gate electrode on the gate oxide on the second n-well;
- (h) forming a silicon dioxide layer over the polysilicon emitter contact region and exposed surfaces of the first n-well and over the polysilicon gate electrode and exposed surfaces of the second n-well;
- (i) forming a second polysilicon layer over the structure resulting from foregoing steps (a)–(h) and patterning the second polysilicon layer to provide a polysilicon upper capacitor plate on the silicon dioxide layer over the first n-well, the polysilicon upper capacitor plate covering the entire base region of the imager structure.

5,837,575

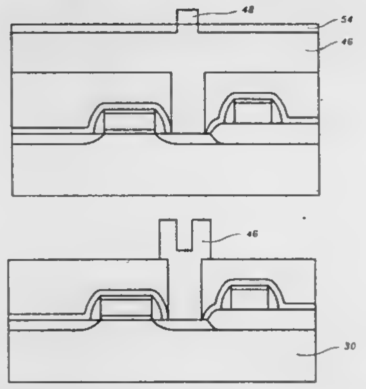
METHOD FOR FORMING A DRAM CAPACITOR

Horng-Huei Tseng, Hsinchu, Taiwan, assignor to Vanguard International Semiconductor Corporation, Hsinchu, Taiwan

Filed Oct. 11, 1996, Ser. No. 731,261

Int. Cl.^{6} H01L *21/8242*

U.S. Cl. 438—253 **11 Claims**



1. A method for forming a capacitor of a dynamic random access memory cell, said method comprising:

- forming a dielectric layer on a substrate;
- forming and patterning a first photoresist layer on the dielectric layer, said first photoresist layer defining a storage node area over a portion of a substrate surface;

- removing a portion of said dielectric layer to form a first trench using the first photoresist layer as a mask, thereby exposing said portion of the substrate surface;
- removing said first photoresist layer;
- forming a doped polysilicon layer over the dielectric layer, said first trench in the dielectric layer being filled by the doped polysilicon layer;
- forming a nitride layer on said doped polysilicon layer;
- forming and patterning a second photoresist layer on said nitride layer, wherein said second photoresist layer covering the storage node area over the portion of the substrate surface;
- isotropically etching said second photoresist layer, thereby narrowing a width of said second photoresist layer;
- anisotropically etching said nitride layer using said etched second photoresist layer as a mask, thereby forming a nitride mask; removing said etched second photoresist layer;
- forming an oxide layer on said doped polysilicon layer not covered by said nitride mask;
- removing said nitride mask, thereby exposing a portion of said doped polysilicon layer;
- anisotropically etching said exposed portion of said doped polysilicon layer to form a second trench;
- removing said oxide layer to expose a top surface of said doped polysilicon layer;
- forming and patterning a third photoresist layer on the etched doped polysilicon layer, said third photoresist layer covering the first trench; and
- removing portions of said doped polysilicon layer not covered by said third photoresist layer, thereby forming a bottom electrode of the capacitor of the dynamic random access memory cell.

5,837,576

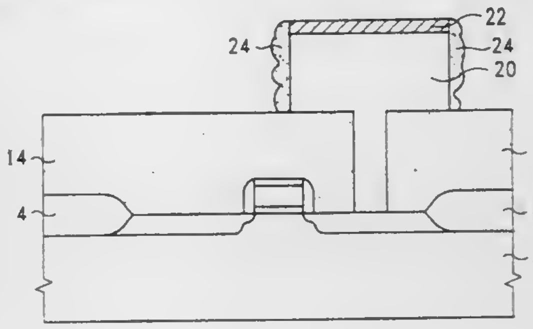
METHOD FOR FORMING A CAPACITOR USING A SILICON OXYNITRIDE ETCHING STOP LAYER

Li-Yeat Chen; Jin-Dong Chen; Erik S. Jeng, and Ing-Ruey Liaw, all of Hsinchu, Taiwan, assignors to Vanguard International Semiconductor Corporation, Hsinchu, Taiwan

Filed Oct. 31, 1997, Ser. No. 961,577

Int. Cl.^{6} H01L *21/8242*

U.S. Cl. 438—253 **8 Claims**



1. A method of manufacturing a capacitor, comprising the steps of:

- forming a silicon layer;
- forming a silicon oxynitride layer on said silicon layer to serve as an etching stop layer and a bottom anti reflective bottom coating;
- patterning said silicon layer and said silicon oxynitride layer to define a first storage node for said capacitor;
- forming a hemispherical grained (HSG) silicon on side walls of said first storage node and on said silicon oxynitride layer;
- removing said HSG silicon on said silicon oxynitride layer;
- removing said silicon oxynitride layer and a portion of said HSG layer remaining on said side walls of said first storage node;
- forming a dielectric layer along a surface of said first storage node and on said portion of said HSG layer; and
- forming a conductive layer over said dielectric layer to serve as a second storage node of said capacitor.

5,837,577

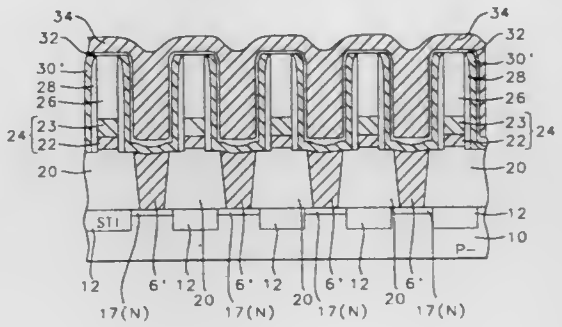
METHOD FOR MAKING SELF-ALIGNED NODE CONTACTS TO BIT LINES FOR CAPACITOR-OVER-BIT-LINE STRUCTURES ON DYNAMIC RANDOM ACCESS MEMORY (DRAM) DEVICES

George Meng-Jaw Cherng, Hsinchu, Taiwan, assignor to Vanguard International Semiconductor Corporation, Hsin-Chu, Taiwan

Filed Apr. 24, 1998, Ser. No. 66,010

Int. Cl.^{6} H01L *21/8242*

U.S. Cl. 438—253 **29 Claims**



1. A method for making an array of dynamic random access memory (DRAM) cells having capacitor node contacts self-aligned to bit lines comprising the steps of:

- providing a semiconductor substrate having device areas, and further providing semiconductor devices from a patterned first polysilicon layer and having contact areas for said semiconductor devices;
- depositing a first insulating layer having a planar surface;
- anisotropically etching openings in said first insulating layer to said contact areas and thereby forming concurrently bit line contact openings and capacitor node contact openings for said semiconductor devices;
- depositing a second polysilicon layer thereby filling said bit line contact openings and further filling said capacitor node contact openings to form node contacts;
- depositing a refractory metal silicide layer on said second polysilicon layer thereby forming a polycide layer;
- patterning said polycide layer to form an array of bit lines over said bit line contact openings and leaving portions of said polycide layer between said bit lines over said node contact openings;
- depositing a second insulating layer on said polycide layer;
- etching openings aligned over said node contact openings in said second insulating layer to said polycide layer and further etching said polycide layer over said node contacts to electrically isolate adjacent said bit lines from each other;
- depositing a third insulating layer and anisotropically etching back to form sidewall liners on said bit lines thereby isolating said bit lines from said node contacts;
- depositing a third polysilicon layer over said substrate in said openings in said second insulating layer;
- chemical/mechanically polishing back said third polysilicon layer to said second insulating layer thereby forming bottom electrodes for an array of crown capacitors in said openings in said second insulating layer;
- forming an interelectrode dielectric layer on said bottom electrodes;
- depositing and patterning a fourth polysilicon layer to form top electrodes and thereby completing said array of DRAM cells.

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5,837,578

PROCESS OF MANUFACTURING A TRENCHED STACK-CAPACITOR

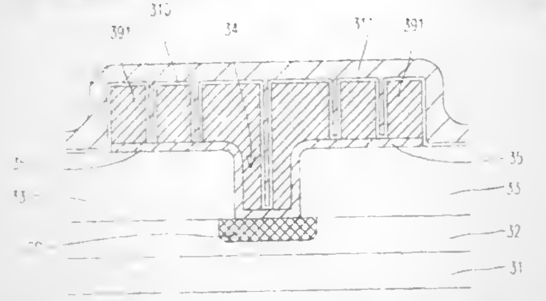
Der-Tsyr Fan; Jyh-Min Tsaur; Chon-Shin Jou, and Tings Wang, all of Hsinchu, Taiwan, assignors to Mosel Vitelic Inc., Hsinchu, Taiwan

Filed Jul. 16, 1997, Ser. No. 895,107

Claims priority, application Taiwan, Feb. 24, 1997, 86102222

Int. Cl.^{6} H01L *21/8242*

U.S. Cl. 438—254 **33 Claims**



1. A process of manufacturing a trenched stack-capacitor applied in a memory unit including a silicon substrate forming thereon a device forming thereon an insulator, which comprises steps of:

a) forming a contact window in said insulator for exposing a cell contact of said device;

b) forming a first conducting layer over said insulator and on side-walls and a base of said contact window;

c) forming an etching sacrificial layer over said first conducting layer and inside said contact window;

d) forming an etching masking layer over a portion of said etching sacrificial layer;

e) forming a plural cylindrical etching sacrificial areas by removing portions of said etching sacrificial layer while retaining said etching sacrificial layer under said etching masking layer;

f) forming a second conducting layer on a top surface of said etching masking layer, on side walls of said plural cylindrical etching sacrificial areas, over said first conducting layer and in said contact window;

g) removing said plural cylindrical etching sacrificial areas while retaining said first conducting layer and said second conducting layer to form a first capacitor plate;

h) forming a dielectric layer on a top surface of said first conducting layer and on a top and side walls of said second conducting layer; and

i) forming a third conducting layer over said dielectric layer to serve as a second capacitor plate.

5,837,579

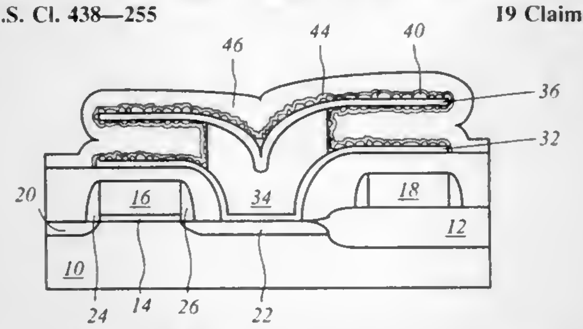
RUGGED POLYSILICON PROCESS FOR DRAM CAPACITORS

Heng-Sheng Huang, Taipei, Taiwan, assignor to United Microelectronics Corporation, Taiwan

Filed Feb. 26, 1997, Ser. No. 806,830

Int. Cl.^{6} H01L *28/8242*

U.S. Cl. 438—255 **19 Claims**



1. A method of making a memory device on a substrate, the memory device including a charge storage capacitor, the method comprising the steps of:

providing a transistor having source/drain regions formed on a surface of the substrate, and having a gate electrode formed above the surface of the substrate;

providing a first insulating layer over the transistor;

providing an opening through the first insulating layer to expose a first source/drain region of the transistor;

depositing a first layer of conductive material over the first insulating layer, the first layer of conductive material electrically coupled to the first source/drain region of the transistor;

depositing a second layer of a second material different from the conductive material over the first layer of conductive material;

depositing a third layer of a third material over the second layer of the second material, the third material different form the second material;

etching the third and second layers to laterally define a portion of a capacitor electrode;

laterally etching the second layer of the second material using an etching process that selectively etches the second material at a faster rate than either the first or third material is etched during the etching process;

etching the first layer to further laterally define the portion of the capacitor electrode;

depositing a layer of silicon on the third layer, on a remaining surface of the second layer and on the first layer;

forming a dielectric layer over the portion of the capacitor electrode; and

forming a fourth layer of a conductive material over the dielectric layer, thereby providing an upper capacitor electrode.

5,837,580

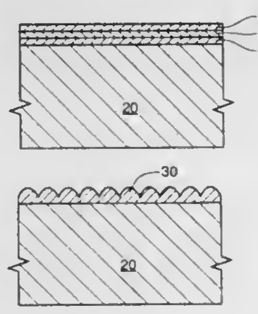
METHOD TO FORM HEMI-SPHERICAL GRAIN (HSG) SILICON

Randhir P. S. Thakur, Boise, and Lyle D. Breiner, Meridan, both of Id., assignors to Micron Technology, Inc., Boise, Id.

Continuation of Ser. No. 573,467, Dec. 15, 1995, Pat. No. 5,656,531, which is a continuation-in-part of Ser. No. 166,058, Dec. 10, 1993, Pat. No. 5,407,534. This application Apr. 23, 1997, Ser. No. 842,303

Int. Cl.^{6} H01L *21/8242*

U.S. Cl. 438—255 **8 Claims**



1. A process for forming Hemi-Spherical Grained silicon comprising the steps of:

forming multiple amorphous silicon layers where each layer of said multiple amorphous silicon layers has a dissimilar grain boundary than an adjacent layer; and

annealing said amorphous silicon layers for a sufficient amount of time and at an elevated annealing temperature, thereby transforming at least a portion of said amorphous silicon into said Hemi-Spherical Grained silicon.

5,837,581

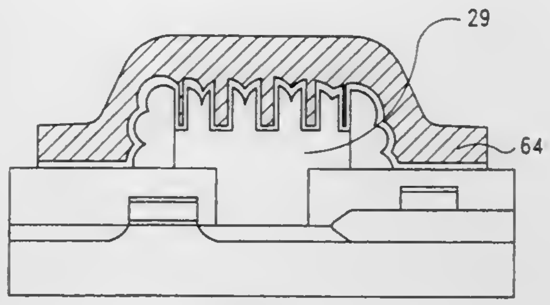
METHOD FOR FORMING A CAPACITOR USING A HEMISPHERICAL-GRAIN STRUCTURE

Chih-Hsiung Cheng, Hsinchu, Taiwan, assignor to Vanguard International Semiconductor Corporation, Hsinchu, Taiwan

Filed Apr. 4, 1997, Ser. No. 825,524

Int. Cl.^{6} H01L *21/8242*

U.S. Cl. 438—255 **17 Claims**



1. A method for forming a capacitor in an integrated circuit, said method comprising:

forming a first oxide layer over a substrate;

forming a first photoresist layer over said first oxide layer, said photoresist layer defining a node contact area;

removing a portion of said first oxide layer using said first photoresist layer as a mask, thereby forming a node trench in said first oxide layer, said node trench exposing a portion of said substrate;

forming a polysilicon layer on said first oxide layer, said polysilicon layer filling said node trench in said first oxide layer;

forming a second photoresist layer on said polysilicon layer, said second photoresist layer defining an electrode area;

removing portions of said polysilicon layer left uncovered by said second photoresist layer, wherein portions of said first oxide layer uncovered by said second photoresist layer are exposed;

forming a hemispherical-grain (HSG) polysilicon layer on said polysilicon layer and said exposed portions of said first oxide layer;

etching back said HSG polysilicon layer until portions of said first oxide layer are exposed, wherein a plurality of grooves is formed in an upper portion of said polysilicon layer, said plurality of grooves corresponding to grooves between grains of said HSG polysilicon layer;

forming a conformal silicon nitride layer on said first oxide layer and said polysilicon layer, wherein said silicon nitride layer lines said plurality of grooves;

forming a second oxide layer on said silicon nitride layer, wherein said plurality of nitride-lined grooves is filled with oxide of said second oxide layer;

anisotropically etching back said second oxide layer until portions of said silicon nitride layer aligned between said plurality of grooves are exposed, wherein residual oxide from said second oxide layer remains in said plurality of nitride-lined grooves;

removing said exposed portions of said silicon nitride layer, wherein portions of said polysilicon layer are exposed;

anisotropically etching said exposed portions of said polysilicon layer using said residual oxide in said plurality of nitride-lined grooves as a mask, wherein a plurality of trenches is formed in the polysilicon layer aligned between said plurality of nitride-lined grooves;

removing said residual oxide;

removing remaining portions of said silicon nitride layer;

forming a conformal dielectric layer on said polysilicon layer; and

forming a conductive layer on said dielectric layer.

5,837,582

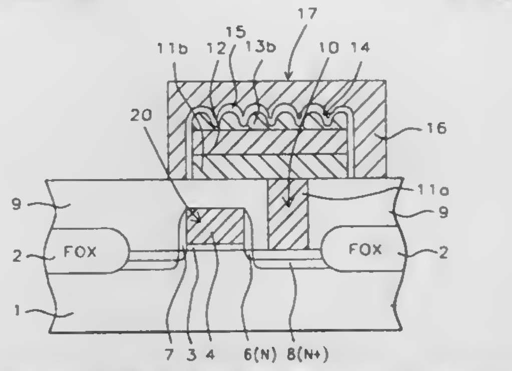
METHOD TO INCREASE CAPACITANCE OF A DRAM CELL

Chung-Hui Su, Hsin-chu, Taiwan, assignor to Taiwan Semiconductor Manufacturing Company, Ltd., Hsin-Chu, Taiwan

Filed May 22, 1998, Ser. No. 83,418

Int. Cl.^{6} H01L *21/8242*

U.S. Cl. 438—255 **18 Claims**



1. A method for creating a storage node electrode, for a dynamic random access memory, (DRAM), device, on a semiconductor substrate, comprising the steps of:

providing a transfer gate transistor, comprised of a gate structure, on a gate insulator layer, and with a source/drain region, located in a region of said semiconductor substrate, not covered by said gate structure;

forming a storage node contact hole, in an insulator layer, exposing a source region, of said source/drain region;

forming a polysilicon plug structure, in said storage node contact hole;

depositing a first polysilicon layer;

depositing a second polysilicon layer, on said first polysilicon layer;

depositing an amorphous silicon layer on said second polysilicon layer;

annealing of said amorphous silicon layer, converting said amorphous silicon layer to a hemispherical grain, (HSG), silicon layer; and

patterning of said HSG silicon layer, of said second polysilicon layer, and of said first polysilicon layer, to form said storage node electrode.

5,837,583

METHOD OF FORMING SEPARATED FLOATING GATE FOR EEPROM APPLICATION

K.-J. Chuang, Peng Hu Hsien, and H.-S. Lui, Hsinchu, both of Taiwan, assignors to Taiwan Semiconductor Manufacturing Co., Ltd., Hsinchu, Taiwan

Division of Ser. No. 824,686, Apr. 8, 1997, Pat. No. 5,786,614. This application Nov. 18, 1997, Ser. No. 972,634

Int. Cl.^{6} H01L *21/336*

U.S. Cl. 438—257 **2 Claims**

1. A method of forming a EEPROM having a separated floating gate on a wafer, said method comprising:

forming a control gate in said wafer by ion implantation;

forming a gate oxide layer on said wafer;

forming a tunneling window in a portion of said gate oxide;

forming a polysilicon layer on said gate oxide and said tunneling window;

separating said polysilicon layer into a first portion and a second portion using a first mask, wherein said first portion is used to define a gate of a transistor, a first contact window and a floating gate, and wherein said second portion is used to define a second contact window;

removing said first mask;

forming a dielectric layer on said polysilicon layer;

patterning and etching said dielectric layer using a second mask to define a first contact hole and a second contact hole, wherein said first contact hole is connected to said first

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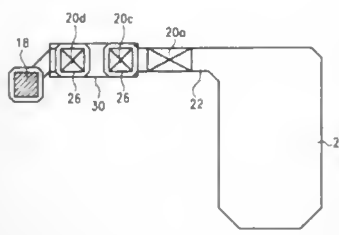
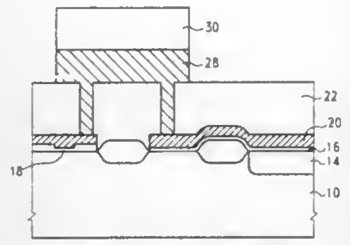




contact window and wherein said second contact hole is connected to said second contact window;

removing said second mask; and

forming a metal layer in said first contact hole, second contact hole and on said dielectric layer.

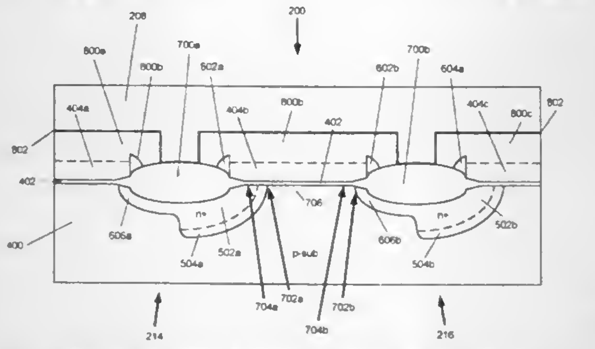
5,837,584

VIRTUAL GROUND FLASH CELL WITH ASYMMETRICALLY PLACED SOURCE AND DRAIN AND METHOD OF FABRICATION

Wenpin Lu, I-Lan, and Mam-Tsung Wang, Hsinchu, both of Taiwan, assignors to Macronix International Co., Ltd., Hsinchu, Taiwan

Filed Jan. 15, 1997, Ser. No. 783,994
Int. Cl.^{6} H01L *21/8247*

U.S. Cl. 438—263 **6 Claims**



1. A method for manufacturing a virtual ground memory cell array having nonvolatile asymmetric memory cells, the method comprising the steps of:

forming a dielectric covering a semiconductor substrate characterized by a first conductivity type;

forming a first and second column of floating gate cores on the dielectric;

implanting a first dopant along a first dopant strip, the first dopant strip aligned adjacent the second column and displaced from the first column, the first dopant having a second conductivity type opposite the first conductivity type;

forming floating gate sidewalls in contact with the floating gate cores and defining between them a second dopant strip;

implanting a second dopant in the second dopant strip, the second dopant having the second conductivity type;

forming a thermal oxide between the first and second column of floating gate cores such that an oxide encroachment is formed below each floating gate core of the first and second column and the first dopant is separated from the second column of each floating gate core by the dielectric and the second dopant is separated from the first column of each floating gate core by the oxide encroachment; and

completing formation of control gate dielectric and control gates.

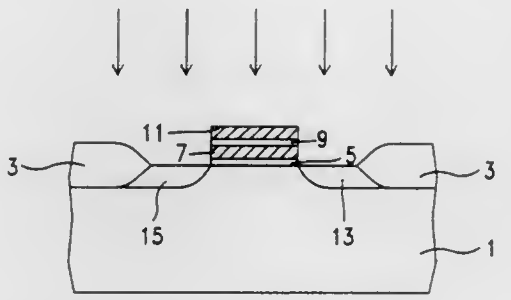
5,837,585

METHOD OF FABRICATING FLASH MEMORY CELL

Shye-Lin Wu, Hsinchu Hsien, and Bu-Chin Chung, Taipei, both of Taiwan, assignors to Vanguard International Semiconductor Corporation, Hsinchu, Taiwan

Filed Jul. 23, 1996, Ser. No. 685,306
Int. Cl.^{6} H01L *21/8247*

U.S. Cl. 438—264 **11 Claims**



1. A method of fabricating a flash memory cell comprising:

forming a tunnel oxide layer on a semiconductor substrate;

forming a first polysilicon layer on said tunnel oxide layer;

doping nitrogen ions through said first polysilicon layer and said tunnel oxide layer into said silicon substrate, wherein the step of said doping nitrogen ions results in a peak concentration of nitrogen ions occurring at an interface of said substrate and said tunnel oxide;

forming an insulating layer on said first polysilicon layer;

forming a second polysilicon layer on said insulating layer;

etching said second polysilicon layer, said insulating layer, said first polysilicon layer and said tunnel oxide to form a gate structure; and

forming doped impurity regions adjacent said gate structure by using ion implantation.

5,837,586

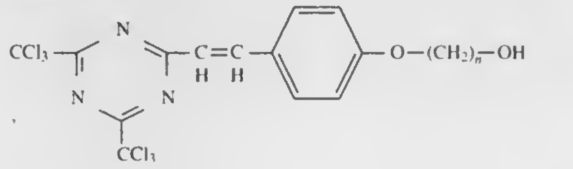
4-(ALKOXYHYDROXY)STYRYL TRIAZINE PHOTINITIATORS AND PHOTO SENSITIVE COMPOSITION

Paul A. Perron, Springfield, Mass., assignor to Kodak Polychrome Graphics Company, Ltd., Norwalk, Conn.

Filed Feb. 14, 1997, Ser. No. 801,735
Int. Cl.^{6} G03C *1/725;* C07D *251/00*

U.S. Cl. 430—285.1 **21 Claims**

1. A 4-(alkoxyhydroxy)styryl triazine photoinitiator compound having the formula:

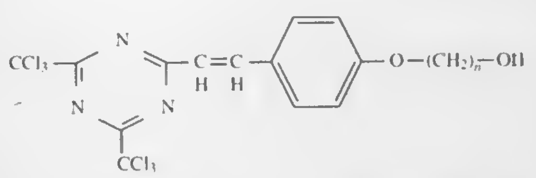


wherein n is 3 or 4.

4. A photosensitive composition which comprises

(a) at least one photopolymerizable monomer, oligomer or polymer compound having at least one olefinically unsaturated double bond, which photopolymerizable compound is present in an amount sufficient to photopolymerize in the presence of a photoinitiator compound (b) upon exposure to sufficient actinic radiation; and

(b) at least one 4-(alkoxyhydroxy)styryl triazine photoinitiator compound having the formula:



wherein n is 3 or 4, in an amount sufficient to effect photopolymerization of the photopolymerizable compound upon exposure to sufficient actinic radiation.

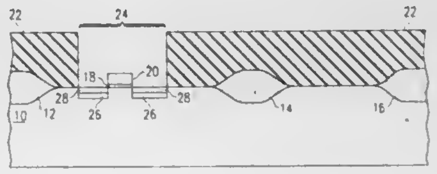
5,837,587

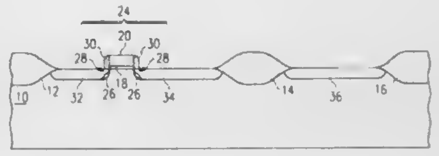
METHOD OF FORMING AN INTEGRATED CIRCUIT DEVICE

Che-Chia Wei, Plano, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Continuation of Ser. No. 426,874, Apr. 24, 1995, abandoned, which is a division of Ser. No. 769,185, Sep. 30, 1991. This application Oct. 3, 1996, Ser. No. 726,335
Int. Cl.^{6} H01L *21/336*

U.S. Cl. 438—305 **8 Claims**





1. A method for fabricating a portion of an integrated circuit device, comprising the steps of:

forming a first masking layer over a semiconductor substrate, said first masking layer having an opening formed therein;

performing a threshold voltage adjust implant through the first masking layer opening;

removing the first masking layer;

forming a gate electrode on the semiconductor substrate with a gate insulating layer therebetween;

then prior to forming a lightly doped drain implant, forming a second masking layer over the substrate, said second masking layer having an opening over the same region as the first masking layer opening where the gate electrode crosses an active area of the substrate to define a field effect transistor, said second masking layer opening exposing only portions of said active area adjacent to said gate electrode and not the remaining portions of said active area;

performing a lightly doped drain implant of impurities having a second conductivity type, and a halo implant of impurities having a first conductivity type into the substrate through the opening in said second masking layer; and

after said halo implant performing step, removing said second masking layer, and forming sidewall spacers alongside the gate electrode, and implanting heavily doped source and drain regions in the substrate in the exposed and remaining portions of said active area adjacent the gate electrode.

2. The method of claim 1, wherein the first masking layer comprises photoresist.

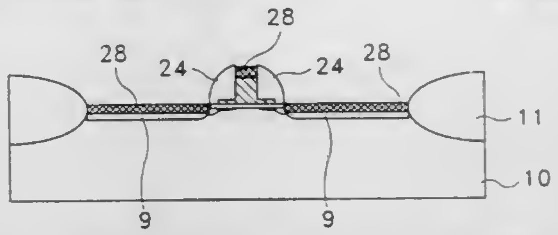
5,837,588

METHOD FOR FORMING A SEMICONDUCTOR DEVICE WITH AN INVERSE-T GATE LIGHTLY-DOPED DRAIN STRUCTURE

Shye-Lin Wu, Hsinchu, Taiwan, assignor to Texas Instruments-Acer Incorporated, Hsinchu, Taiwan

Filed Jan. 26, 1998, Ser. No. 13,682
Int. Cl.^{6} H01L *21/336*

U.S. Cl. 438—305 **14 Claims**



1. A method for forming a semiconductor device with an inverse-T gate lightly-doped drain (ITLDD) structure, said method comprising:

forming a silicon layer over a semiconductor substrate;

forming a dielectric layer on said silicon layer;

forming a sacrificial region on said dielectric layer, said sacrificial region defining a gate region;

oxidizing a portion of said sacrificial region to form an oxide layer in said sacrificial region and along the sidewalls and top surface of said sacrificial region, at least a portion of said sacrificial region being unoxidized;

removing said dielectric layer and a portion of said silicon layer using said oxide layer as a mask, thereby forming a step in said silicon layer;

removing said oxide layer;

removing said silicon layer using said unoxidized sacrificial region and said dielectric layer as a mask, thereby resulting in an inverse-T structure in said silicon layer; and

implanting said substrate though the inverse-T structure, thereby forming the inverse-T gate lightly-doped drain (ITLDD) structure.

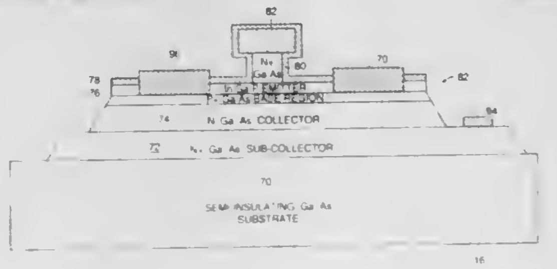
5,837,589

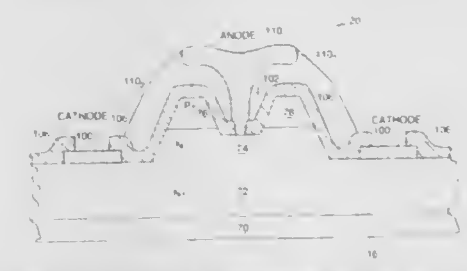
METHOD FOR MAKING HETEROJUNCTION BIPOLAR MIXER CIRCUITRY

Brian J. McNamara, Worcester; John P. Wendler, Stowe, and Kamal Tabatabaie-Alavi, Sharon, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 27, 1996, Ser. No. 774,237
Int. Cl.^{6} H01L *21/331*

U.S. Cl. 438—314 **9 Claims**





1. A method for forming a transistor and a diode on a common, single crystal body, comprising the steps of:

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providing the single crystal body, such body comprising: a III–V substrate having a subcollector layer formed over the substrate, a collector layer over the subcollector layer, a base layer formed over the collector layer, and an emitter layer formed over the base layer;

simultaneously forming a collector contact electrode in contact with a first portion of the body for the transistor and a cathode contact in a second, different portion of the body for the diode;

removing a portion of the emitter layer from the second portion of the body to expose an underlying portion of the base layer;

forming an opening in a portion of the exposed portion of the base layer in the second portion and exposing an underlying upper portion of the collector layer;

forming an insulating layer over the body thus formed;

forming an opening in the insulating layer to expose an underlying portion of the collector layer in the second portion;

forming an anode in Schottky barrier contact with the exposed portion of the collector layer in the second portion of the body.

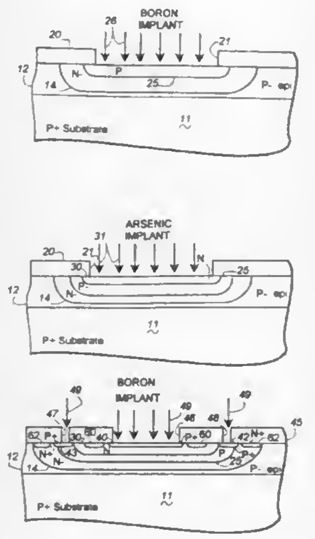
5,837,590
ISOLATED VERTICAL PNP TRANSISTOR WITHOUT REQUIRED BURIED LAYER

Lawrence F. Latham, Garland, and Theresa M. Keller, Houston, both of Tex., assignors to Texas Instruments Incorporated

Continuation of Ser. No. 599,267, Feb. 9, 1996, abandoned, which is a continuation of Ser. No. 310,610, Sep. 22, 1994, abandoned. This application Jun. 5, 1997, Ser. No. 869,646

Int. Cl.^{6} H01L *21/331*

U.S. Cl. 438—364 2 Claims



1. A method of forming a PNP transistor, comprising:

forming a surface layer of P– conductivity at a surface of a P+ substrate;

forming an isolation region of N– conductivity in said surface layer;

forming a collector region of P– conductivity in said isolation region by implanting an acceptor impurity through a window, defined by a mask, into said surface layer resulting in the isolation region surrounding and containing said collector region;

forming a base region of N conductivity in said collector region by implanting a donor impurity through said window into said collector region resulting in the collector region surrounding and containing said base region;

performing co-diffusion of said base and collector region; and

forming an emitter region of P+ conductivity in said base region.

5,837,591
METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

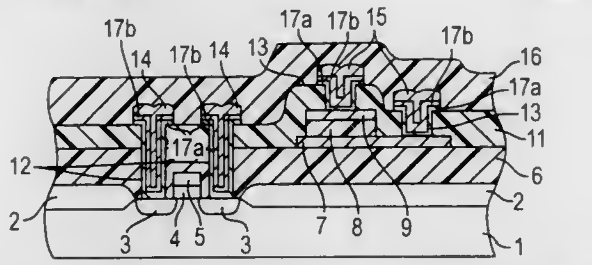
Yasuhiro Shimada, Osaka; Atsuo Inoue, Kyoto; Koji Arita, Osaka; Toru Nasu, Kyoto; Yoshihisa Nagano, and Akihiro Matsuda, both of Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 492,913, Jun. 20, 1995, Pat. No. 5,627,391. This application Feb. 19, 1997, Ser. No. 803,144

Claims priority, application Japan, Jun. 28, 1994, 6-146265

Int. Cl.^{6} H01L *21/20*

U.S. Cl. 438—381 6 Claims



1. A method of manufacturing a semiconductor device comprising the steps of:

(a) forming a first insulating layer on a substrate on which an integrated circuit is formed,

(b) forming a capacitor comprising a lower electrode, a dielectric film having a high dielectric constant, and an upper electrode on said first insulating layer,

(c) forming a second insulating layer which covers said capacitor,

(d) forming contact holes which lead to said lower electrode and upper electrode independently in said second insulating layer,

(e) forming a diffusion barrier layer which covers at least the inside wall of said contact holes, and touches said lower electrode and said upper electrode at the bottom of said contact holes, wherein a layer thickness of said diffusion barrier layer is formed to be between 200 nm and 300 nm,

(f) forming an interconnection layer on said diffusion barrier layer, and

(g) providing heat treatment under a temperature ranging from 300° C. to 420° C.

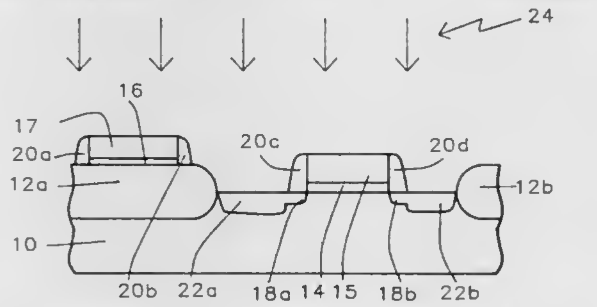
5,837,592
METHOD FOR STABILIZING POLYSILICON RESISTORS

Ming-Hsung Chang, Hsin-Chu, and Chun-Wen Weng, Chia-I, both of Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Ltd., Hsin-Chin, Taiwan

Filed Dec. 7, 1995, Ser. No. 568,712

Int. Cl.^{6} H01L *21/20*

U.S. Cl. 438—382 23 Claims



1. A method for forming a polysilicon resistor comprising:

providing a semiconductor substrate having a polysilicon resistor formed thereupon;

treating the polysilicon resistor with a nitrogen plasma to form a nitrogen plasma treated polysilicon resistor; and

forming over the nitrogen plasma treated polysilicon resistor a dielectric layer.

5,837,593
METHODS OF FABRICATING MICROELECTRONIC CAPACITORS HAVING TANTALUM PENTOXIDE DIELECTRICS

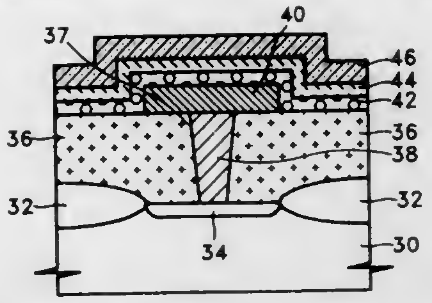
In-sung Park, Seoul, and Eui-song Kim, Kyungki-do, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Sep. 3, 1996, Ser. No. 707,298

Claims priority, application Rep. of Korea, Sep. 1, 1995, 95-28572

Int. Cl.^{6} H01L *21/20;21/8242*

U.S. Cl. 438—396 14 Claims



1. A method of fabricating a microelectronic capacitor comprising the steps of:

forming a first tantalum pentoxide film on a conductive electrode on a microelectronic substrate;

annealing the first tantalum pentoxide film in the presence of ultraviolet radiation and ozone; and

repeating said forming step and said annealing step at least once to form at least a second tantalum pentoxide film which has been annealed in the presence of ultraviolet radiation, on the first tantalum pentoxide film.

5,837,594
METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE WHEREIN ONE OF CAPACITOR ELECTRODES COMPRISES A CONDUCTOR POLE AND A TRAY-SHAPED CONDUCTOR LAYER

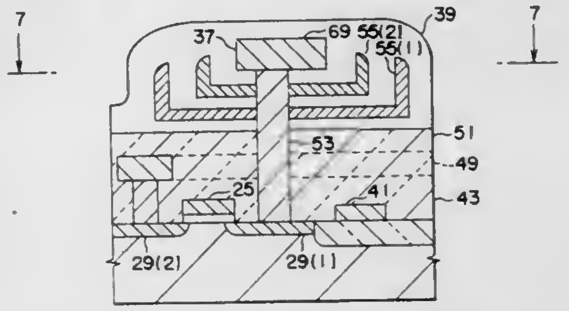
Ichiro Honma, and Hirohito Watanabe, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Division of Ser. No. 710,939, Sep. 24, 1996, Pat. No. 5,753,949. This application Jun. 4, 1997, Ser. No. 868,582

Claims priority, application Japan, Sep. 29, 1995, 8-710939

Int. Cl.^{6} H01L *21/20;21/8242*

U.S. Cl. 438—396 5 Claims



1. A method of manufacturing a semiconductor device comprising a capacitor which comprises a first capacitor electrode and a second capacitor electrode with a capacitor dielectric film interposed, comprising the steps of:

forming a stack of a spacer film and a conductor layer on an insulator layer covering a principal surface of a semiconductor substrate;

forming a spacer layer on said conductor layer;

forming through said spacer layer, said conductor layer, said spacer film, and said insulator layer a conductor pole having a lengthwise pole axis, a pole end and a peripheral surface;

forming an overlying layer of a conductor on said pole end;

patterning said overlying layer into a planar conductor layer to make said first capacitor electrode further comprise said planar conductor layer;

selectively etching said spacer layer to leave on said conductor layer a spacer block having a block surface parallel to said pole axis;

forming a conductor block in contact with said block surface and said conductor layer;

selectively etching said conductor block and said conductor layer to leave a plate portion and peripheral portion; and

selectively etching away said spacer block and said spacer film to leave said conductor pole, said plate portion, and said peripheral portion collectively as said first capacitor electrode.

5,837,595
METHODS OF FORMING FIELD OXIDE ISOLATION REGIONS WITH REDUCED SUSCEPTIBILITY TO POLYSILICON RESIDUE DEFECTS

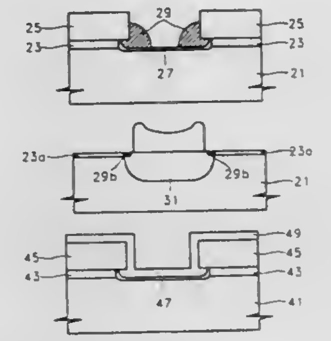
Dong-ho Ahn; Min-wook Hwang, and Young-woo Park, all of Kyungki-do, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jan. 21, 1997, Ser. No. 785,999

Claims priority, application Rep. of Korea, Jun. 7, 1996, 1996-20369

Int. Cl.^{6} H01L *21/76*

U.S. Cl. 438—443 10 Claims



1. A method of forming a field oxide isolation region in a semiconductor substrate, comprising the steps of:

forming a pad oxide layer on a face of a semiconductor substrate;

forming a masking layer on the pad oxide layer, opposite the face of the substrate;

patterning the masking layer to define an opening therein which exposes an upper surface of the pad oxide layer;

isotropically etching the pad oxide layer at the exposed upper surface using the patterned masking layer as an etching mask;

forming a region containing silicon in the opening;

oxidizing the substrate and the region containing silicon in the opening to define a preliminary field oxide isolation region containing residues of silicon therein;

removing the masking layer to expose the pad oxide layer;

etching the preliminary field oxide isolation region to expose at least one of the residues of silicon therein;

etching an exposed residue of silicon;

oxidizing the etched residue; and

etching the preliminary field oxide isolation region to define a field oxide isolation region.

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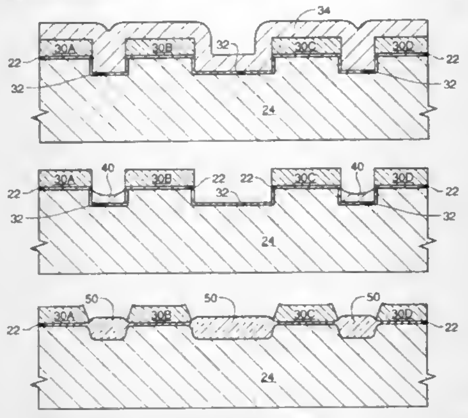
5,837,596
FIELD OXIDE FORMATION BY OXIDATION OF POLYSILICON LAYER

Thomas A. Figura, and Nanseng Jeng, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Continuation of Ser. No. 205,663, Mar. 2, 1994, Pat. No. 5,438,016. This application Mar. 20, 1995, Ser. No. 408,411

Int. Cl.^{6} H01L *21/76*

U.S. Cl. 438—446 **24 Claims**



1. A method used during the formation of a semiconductor device comprising the following steps:

providing a first layer having first and second trenches therein, said first trench having a narrower width than said second trench;

forming an oxidizable layer in said first trench, said second trench being free from said oxidizable layer;

oxidizing said oxidizable layer in said first trench; and

oxidizing said first layer at said second trench.

5,837,597
METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE WITH SHALLOW IMPURITY LAYERS

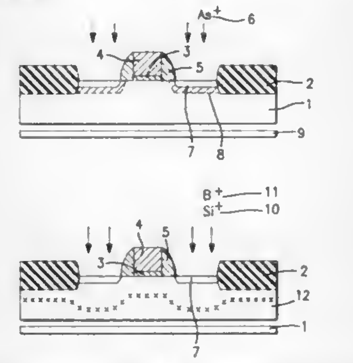
Shuichi Saito, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 21, 1995, Ser. No. 576,458

Claims priority, application Japan, Dec. 21, 1994, 6-318127

Int. Cl.^{6} H01L *21/425*

U.S. Cl. 438—528 **23 Claims**



1. A method of manufacturing a semiconductor device comprising the steps of:

implanting first impurities with a first projection range into a semiconductor substrate;

implanting first ions with a second projection range into said semiconductor substrate to introduce vacancies into said semiconductor substrate, said second projection range being deeper than said first projection range; and

implanting second ions with a third projection range into said semiconductor substrate, said second ions being formed from impurity atoms that have a same conduction type as said semiconductor substrate at a location of said third projection range, said third projection range being set so that both distributions of said first and second ions overlap each other.

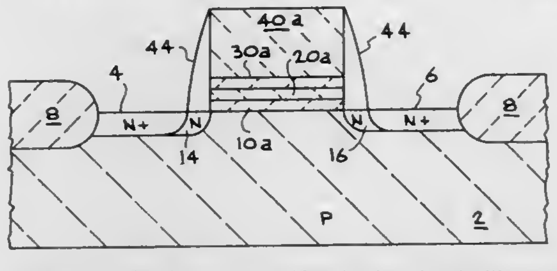
5,837,598
DIFFUSION BARRIER FOR POLYSILICON GATE ELECTRODE OF MOS DEVICE IN INTEGRATED CIRCUIT STRUCTURE, AND METHOD OF MAKING SAME

Sheldon Aronowitz, San Jose; Valeriy Sukharev, Cupertino; Jon Owyang, San Jose, and John Haywood, Santa Clara, all of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed Mar. 13, 1997, Ser. No. 816,254

Int. Cl.^{6} H01L *21/425*

U.S. Cl. 438—532 **15 Claims**



1. A process for forming a uniformly doped polysilicon gate electrode of an MOS device comprising an integrated circuit structure formed on a semiconductor substrate which comprises:

a) forming a thin layer of amorphous or polycrystalline silicon over a gate oxide portion of said MOS device on said semiconductor substrate;

b) exposing said thin layer of silicon to a nitrogen plasma to thereby form a barrier layer of silicon and nitrogen over said gate oxide;

c) depositing polysilicon over said barrier layer of silicon and nitrogen to form said polysilicon gate electrode; and

d) doping said polysilicon gate electrode by implanting said electrode with a dopant and then annealing said electrode to diffuse and activate said dopant uniformly through said polysilicon gate electrode above said barrier layer of silicon and nitrogen;

whereby said uniformly doped polysilicon gate electrode of an MOS device is formed without penetration of said dopant through said barrier layer to said gate oxide and said semiconductor substrate underlying said barrier layer.

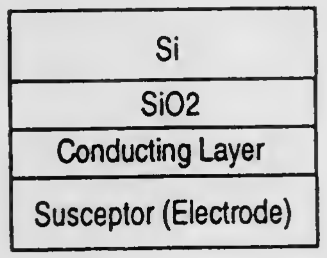
5,837,599
WAFER SURFACE MODIFICATION FOR IMPROVED ELECTROSTATIC CHUCKING EFFICIENCY

Hun-Jan Tao, and Chia-Shiung Tsai, both of Hsin-chu, Taiwan, assignors to Taiwan Semiconductor Manufacturing Co. Ltd., Hsin-Chu, Taiwan

Filed Aug. 9, 1996, Ser. No. 695,006

Int. Cl.^{6} H01L *21/20*

U.S. Cl. 438—584 **15 Claims**



1. A method of improving electrostatic chucking efficiency between a silicon wafer and a susceptor situated in a wafer processing chamber comprising the steps of:

providing a silicon wafer having an insulating layer formed on the side to be contacted by the susceptor,

forming an electrically conducting layer on top of said insulating layer, and

positioning said wafer on and with said electrically conducting layer juxtaposed to said susceptor.

5,837,600
METHOD FOR FABRICATING A SEMICONDUCTOR DEVICE

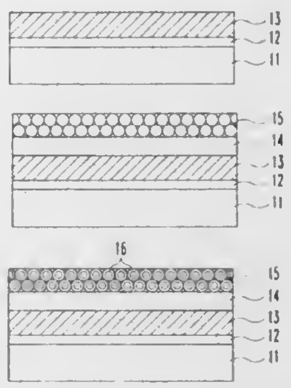
Jae Eun Lim, and Jong Choul Kim, both of Ichon, Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., Kyoungki-do, Japan

Filed Jun. 25, 1996, Ser. No. 669,916

Claims priority, application Rep. of Korea, Jun. 30, 1995, 1995-18866

Int. Cl.^{6} H01L *21/3205;21/336*

U.S. Cl. 438—592 **7 Claims**



1. A method for fabricating a semiconductor device, the method comprising the steps of:

preparing a semiconductor substrate;

forming a gate oxide film on said semiconductor substrate, and a poly silicon film on said gate oxide film;

subsequently forming a lower tungsten silicide film and an upper tungsten silicon film having an amorphous construction on said poly silicon film, wherein said amorphous construction has a plurality of small grains between which gaps are defined, said upper tungsten silicide film is being formed on said lower tungsten silicide film in series, and said lower tungsten silicide film and said upper tungsten silicide film is formed by a chemical deposition method; and

crystallizing the amorphous construction of said lower tungsten silicide film and said upper tungsten silicide film and simultaneously forming oxide films on surfaces of the plurality of the small grains crystallized in said upper tungsten silicide film by subjecting said lower tungsten silicide film and said upper tungsten silicide film to heat treatment.

5,837,601
CMOS SEMICONDUCTOR DEVICE HAVING DUAL-GATE ELECTRODE CONSTRUCTION AND METHOD OF PRODUCTION OF THE SAME

Koichi Matsumoto, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 24, 1997, Ser. No. 788,191

Claims priority, application Japan, Jan. 25, 1996, 8-010835

Int. Cl.^{6} H01L *21/3205;21/4763*

U.S. Cl. 438—592 **4 Claims**

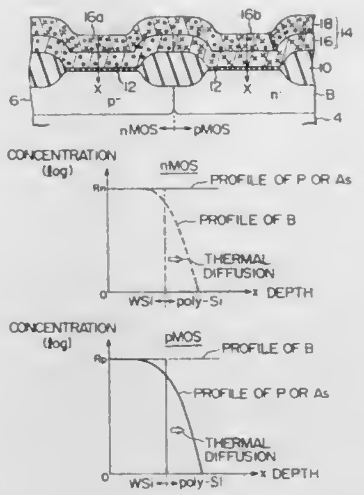
1. A method of forming a CMOS semiconductor device having a dual-gate construction, comprising the steps of

at the time of forming dual-layer construction gate electrodes comprised of a lower gate electrode layer with p-type or n-type impurities doped separately for the different channel conductivity type transistor regions of the p-channel and n-channel MOS transistors and an upper common silicide electrode layer,

forming a polycrystalline silicon film for forming the lower gate electrode layer,

selectively doping said polycrystalline silicon film with p-type or n-type impurities for said different channel conductivity type transistor regions, and

forming a silicide film to form the upper common silicide electrode layer on the polycrystalline silicon film,



the silicide film being doped with both the same degree of p-type impurities as the concentration of the p-type impurities of the lower gate electrode layer and the same degree of n-type impurities as the concentration of n-type impurities of the gate electrode layer while being formed.

5,837,602
METHOD OF MANUFACTURING DOPED INTERCONNECT

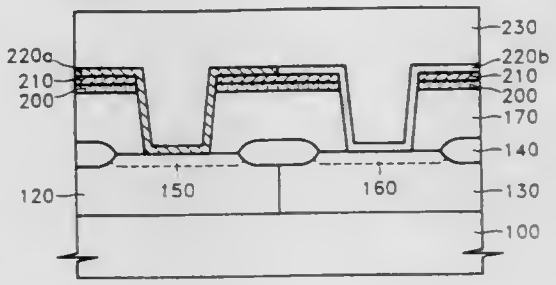
Soo-cheol Lee, and Heon-jong Shin, both of Seoul, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Division of Ser. No. 578,913, Dec. 27, 1995, abandoned. This application Nov. 5, 1996, Ser. No. 743,652

Claims priority, application Rep. of Korea, Jul. 24, 1995, 1995 21945

Int. Cl.^{6} H01L *21/28*

U.S. Cl. 438—621 **6 Claims**



1. A manufacturing method of a semiconductor device comprising the steps of:

implanting impurities into a semiconductor substrata to form p-type and n-type impurity diffusion regions;

forming an interlevel insulating layer having a plurality of contact holes exposing the p-type and the n-type impurity diffusion regions;

forming a first conductive layer on top of the interlevel insulating layer; and

forming a second conductive layer over the p-type impurity region, the n-type impurity region, and the first conductive layer,

wherein a first portion of the second conductive layer formed over the p-type impurity diffusion region is doped with p-type impurities and a second portion of the second conductive layer formed over the n-type impurity diffusion region is doped with n-type impurities,

wherein the first portion of the second conductive layer has a greater concentration of p-type impurities than the first conductive layer, and

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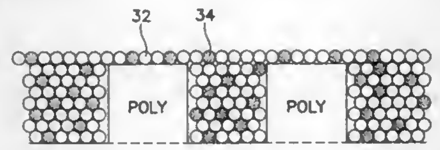
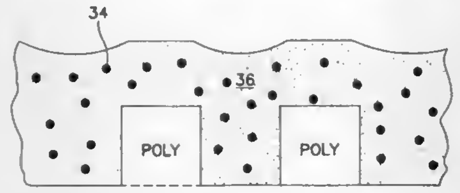
wherein the second portion of the second conductive layer has a greater concentration of n-type impurities than the first conductive layer.

5,837,603
PLANARIZATION METHOD BY USE OF PARTICLE DISPERSION AND SUBSEQUENT THERMAL FLOW

Jack H. Linn, Melbourne; John J. Hackenberg, Palm Bay, and David A. DeCrosta, Melbourne, all of Fla., assignors to HArris Corporation, Melbourne, Fla.
Filed May 8, 1996, Ser. No. 643,295
Int. Cl.^{6} H01L *21/28;21/304*
U.S. Cl. 438—632 **23 Claims**

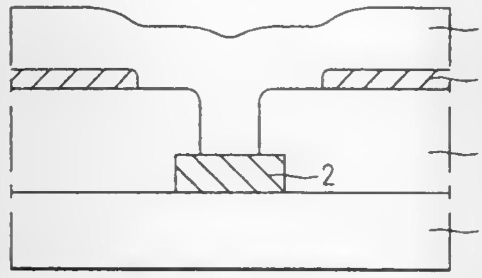




1. A method of smoothing irregularities in a surface of a semiconductor device comprising the steps of:
(a) augmenting flowable particles with non-flowable particles;
(b) dispersing the particles onto a surface of the semiconductor device which is to be smoothed so that the particles fill the irregularities in the surface of the semiconductor device; and
(c) altering the physical state of the particles so that they flow and thereby encapsulate the non-flowable particles and fill the irregularities so that the surface of the semiconductor device is substantially smoothed with a layer of flowed material from the flowable particles.

5,837,604
METHOD FOR FORMING INTERCONNECTION OF SEMICONDUCTOR DEVICE

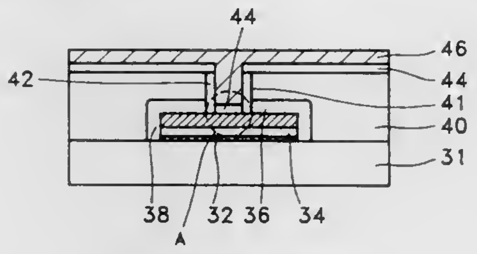
Young Kwon Jun, Seoul, Rep. of Korea, assignor to LG Semicon Co., Ltd., Chungcheongbuk-do, Rep. of Korea
Filed Aug. 16, 1996, Ser. No. 698,699
Claims priority, application Rep. of Korea, Dec. 19, 1995, 1995/52205
Int. Cl.^{6} H01L *21/441*
U.S. Cl. 438—641 **16 Claims**



1. A method for forming an interconnect of a semiconductor device comprising the steps of:
sequentially forming an interlevel insulating layer and auxiliary layer on a substrate supporting a lower conductive line;
doping impurity ions into said auxiliary layer; selectively removing portions of said auxiliary layer and interlevel insulating layer to thereby form a contact hole exposing a portion of said lower conductive line such that an inner edge of the auxiliary layer is spaced from the sidewalls of the contact hole as formed in the interlevel insulating layer; and
depositing and growing a conductive material in said contact hole and on said auxiliary layer to thereby form an upper conductive line.

5,837,605
MANUFACTURING METHOD OF TRANSISTORS

Young-wook Park; Dae-rok Bae, both of Kyungki-do, and Mun-han Park, Seoul, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea
Filed Nov. 27, 1995, Ser. No. 563,082
Claims priority, application Rep. of Korea, Mar. 8, 1995, 1995-4715
Int. Cl.^{6} H01L *21/441*
U.S. Cl. 438—649 **7 Claims**

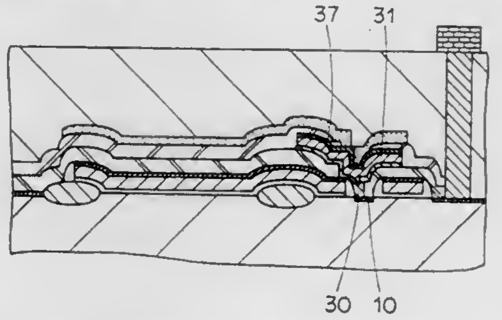


(CELL ARRAY REGION)

1. A manufacturing method, comprising the steps of:
depositing a doped first silicide film to form a gate electrode of a transistor in an active region of a substrate;
forming an interlayer dielectric film over said substrate, and forming a contact hole to expose a portion of said doped first silicide film;
forming a doped polysilicon film on the exposed portion of said doped first silicide film; and
depositing a doped second silicide film on said doped polysilicon film,
wherein said doped first and second silicide films are doped by one of phosphine (PH_3) and arsenic trihydride (AsH_3).

5,837,606
SEMICONDUCTOR DEVICE HAVING INTERNAL WIRE AND METHOD OF FABRICATING THE SAME

Takehisa Yamaguchi, and Hidekazu Oda, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 339,662, Nov. 14, 1994, Pat. No. 5,550,409. This application Jun. 17, 1996, Ser. No. 668,012
Claims priority, application Japan, Jun. 29, 1994, 6-148240
Int. Cl.^{6} H01L *21/4763*
U.S. Cl. 138—649 **3 Claims**

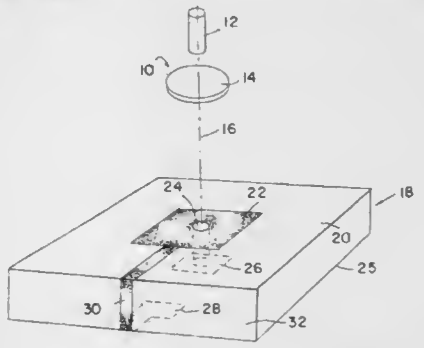


1. A method of fabricating a semiconductor device having an internal wire, comprising:

a first step of forming a conductive layer in a surface of a semiconductor substrate;
a second step of forming a conductor on said semiconductor substrate in proximity to said conductive layer;
a third step of forming a first silicide layer on the surface of said conductive layer and forming a second silicide layer on the surface of said conductor;
a fourth step of forming an interlayer insulating film covering said conductor and said conductive layer;
a fifth step of forming a contact hole in said interlayer insulating film for exposing both the surface of said first silicide layer and a surface of an end of said second silicide layer;
a sixth step of forming a titanium film for covering a side wall surface and a bottom surface of said contact hole by sputtering, to be in contact with both said surface of said first silicide layer and said end of said second silicide layer;
a seventh step of forming a third silicide layer on said titanium film by sputtering; and
an eighth step of patterning said third silicide layer and said titanium film in the form of said internal wire.

5,837,607
METHOD OF MAKING A LASER SYNTHESIZED CERAMIC ELECTRONIC DEVICES AND CIRCUITS

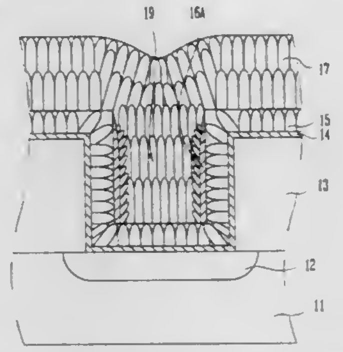
Nathaniel R. Quick, 894 Silverado Ct., Lake Mary, Fla. 32746
Filed Dec. 5, 1996, Ser. No. 759,235
Int. Cl.^{6} H01L *21/44;21/302;21/461*
U.S. Cl. 438—667 **3 Claims**



1. A method for making a plurality of electrical components and elements on a monolithic substrate having first and second parallel surfaces, essentially of a crystalline or polyctystalline ceramic compound in oxygen-containing atmosphere, said method comprising, the steps of:
a. directing a focussed laser beam onto a surface portion of said substrate and causing relative motion between said laser beam and substrate so as to laser synthesize a conductive hole or via through said substrate between said first and second parallel surfaces said conductive hole or conductive hole or via having a first end and a second end;
b. further directing said focussed laser beam onto said first parallel surface of said substrate and causing relative motion between said laser beam and said substrate so as to laser synthesize an area on said first parallel surface which is converted to a semiconductor material and which is connected to said first end of said conductive hole or via;
c. further directing said focussed laser beam onto said first parallel surface portion of said substrate and causing relative motion between said laser beam and said substrate so as to delineate a continuous conductive trace connected to said semiconductive material on said first parallel surface to said second parallel surface as said laser beam traverses a surface of said substrate connecting said first and second parallel surfaces and terminating said trace with an electrical tab formed by laser synthesis with said laser beam; and
d. further directing said focussed laser beam onto said first parallel surface portion of said substrate and causing relative motion between said laser beam and said substrate so as to laser synthesize an area which is converted to an electrical conductive area connected to said second end of said conductive hole or via to thereby provide an electrical connection to said semiconductive material on the reverse side of said substrate.

5,837,608
METHOD OF FILLING A CONTACT HOLE IN A SEMICONDUCTOR DEVICE USING VERTICAL GROWTH OF METAL

Kyeong Keun Choi, Suwon, Rep. of Korea, assignor to Hyundai Electronics Industries Co.,, Kyungki-Do, Rep. of Korea
Filed Jun. 25, 1997, Ser. No. 882,049
Claims priority, application Rep. of Korea, Jun. 28, 1996, 96-24939
Int. Cl.^{6} H01L *21/44*
U.S. Cl. 438—675 **7 Claims**



1. A method of filling a contact hole in a semiconductor device using vertical growth of metal, comprising the steps of:
forming a contact hole in a silicon substrate on which an insulating layer is formed;
forming a barrier metal layer on the entire semiconductor device including said contact hole;
forming a first metal layer on said barrier metal layer, wherein said fist metal layer is made of a different material than said metal layer;
forming a second metal layer on said first metal layer, wherein said second metal layer is made of a different material said first metal layer;
etching a portion of said second metal layer to form a second metal layer spacer on said first metal layer at a side wall of said contact hole, thereby exposing a portion of said first metal layer at the bottom of said contact hole;
forming a third metal layer on said first metal layer including said second metal layer spacer until said contact hole is completely buried, wherein said third metal layer is made of the same material as said first metal layer and is grown vertically from the bottom of said contact hole; and
etching said third and first metal layers to expose said barrier metal layer formed on said insulating layer, thereby forming a metal plug within said contact hole.

5,837,609
FULLY ADDITIVE METHOD OF APPLYING A CIRCUIT PATTERN TO A THREE-DIMENSIONAL, NONCONDUCTIVE PART

Michael George Todd, South Lyon; Robert Edward Belke, Jr., West Bloomfield, and Andrew Zachary Glovatsky, Ypsilanti, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Jan. 16, 1997, Ser. No. 784,886
Int. Cl.^{6} H01L *21/44*
U.S. Cl. 438—678 **10 Claims**

1 A fully additive method of applying a circuit pattern to a three-dimensional, nonconductive part, comprising:
pretreating the surface of the part:

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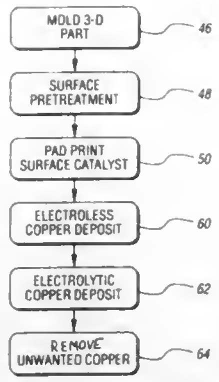

MOLD 3-D PART
46
SURFACE PRETREATMENT
48
PAD PRINT SURFACE CATALYST
50
ELECTROLESS COPPER DEPOSIT
60
ELECTROLYTIC COPPER DEPOSIT
62
REMOVE UNWANTED COPPER
64

pad-printing a surface catalyst in a solvent carrier onto the surface in the shape of a desired circuit pattern; and

applying an electroless copper deposit onto the surface catalyst, thereby providing a copper layer on the surface in the desired circuit pattern shape.

5,837,610
CHEMICAL MECHANICAL POLISHING (CMP) APPARATUS AND CMP METHOD USING THE SAME

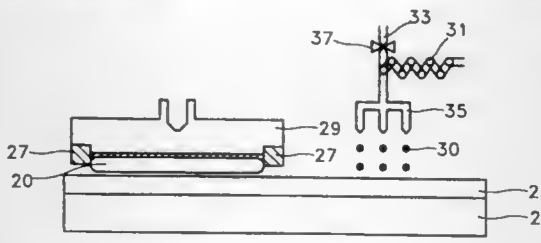
Byoung-hun Lee, Suwon, and Joon-hee Lee, Seoul, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Feb. 27, 1997, Ser. No. 805,659

Claims priority, application Rep. of Korea, Feb. 28, 1996, 1996 5097

Int. Cl.^{6} H01L *21/304*

U.S. Cl. 438—692 **8 Claims**



1. A chemical mechanical polishing (CMP) apparatus for planarizing a semiconductor wafer, comprising:

a wafer carrier for loading and fixing a semiconductor wafer to be polished;

a polishing platen rotating at a constant speed, disposed at a lower portion of said wafer carrier;

a polishing pad provided on an upper surface of said polishing platen, being in contact with a surface of said semiconductor wafer; and

a spiral slurry feed line for supplying a slurry solution to said polishing pad.

5,837,611
PRODUCTION METHOD FOR AN INSULATION LAYER FUNCTIONING AS AN INTERMETAL DIELECTRIC

Zvonimir Gabric, Zorneding; Oswald Spindler, Vaterstetten, and Thomas Grassl, Freising, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 6, 1997, Ser. No. 907,210

Claims priority, application Germany, Aug. 6, 1996, 196 31 743.6

Int. Cl.^{6} H01L *21/00*

U.S. Cl. 438—692 **9 Claims**

1. A production method for an insulation layer functioning as an intermetal dielectric (IMD) on a substrate, which comprises:

a) covering a substrate surface with a first insulation layer;

b) covering the first insulation layer with a metal layer;

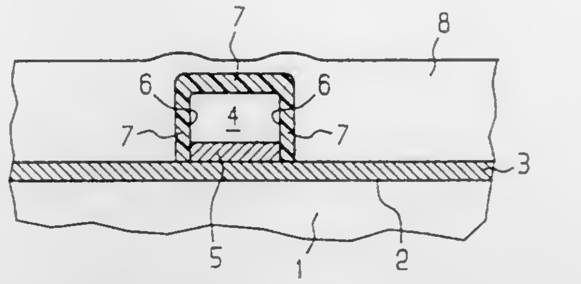
c) structuring metal conductor tracks into the metal layer by a photographic step;

d) covering surfaces and side edges of the metal conductor tracks with a second insulation layer;

e) removing the second insulation layer between the metal conductor tracks on the first insulation layer;

f) depositing a third insulation layer by an ozone-activated CVD method onto the structured substrate; and

g) selecting the first insulation layer and the second insulation layer to cause a rate of growth of the third insulation layer onto the first insulation layer to be greater than onto the second insulation layer.



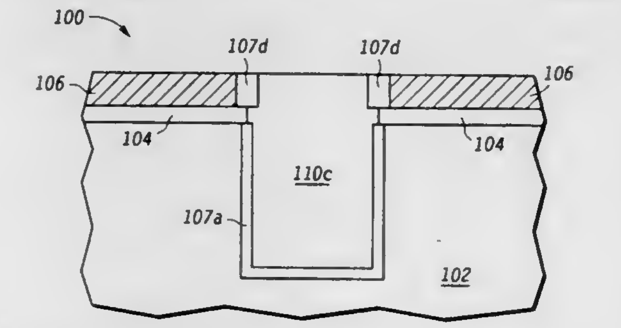
5,837,612
SILICON CHEMICAL MECHANICAL POLISH ETCH (CMP) STOP FOR REDUCED TRENCH FILL EROSION AND METHOD FOR FORMATION

Sergio Ajuria, and Soolin Kao, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 1, 1997, Ser. No. 905,478

Int. Cl.^{6} H01L *21/44;21/48*

U.S. Cl. 438—697 **33 Claims**



28. A method for forming a semiconductor structure, the method comprising the steps of:

providing a semiconductor substrate;

forming a dielectric layer over the semiconductor substrate;

depositing a silicon-containing layer over the dielectric layer, the silicon-containing layer being semiconductive;

forming an isolation trench through the silicon-containing layer, the dielectric layer, and the semiconductor substrate, wherein the isolation trench includes a silicon-containing sidewall portion, a dielectric sidewall portion, and a semiconductor substrate sidewall portion;

forming an oxide on the silicon-containing sidewall portion to form a first oxidized sidewall and forming an oxide on the semiconductor substrate sidewall portion to form a second oxidized sidewall;

depositing a dielectric fill layer over the isolation trench;

densifying the dielectric fill layer;

patterning a reverse masked region above the isolation trench to form exposed portions of the dielectric fill layer;

etching the exposed portions of the dielectric fill layer using the silicon-containing layer as an etch stop;

removing the reverse masked region;

chemical mechanical polishing to form a planarized surface using the silicon-containing layer as a polish stop;

etching the silicon-containing layer whereby a portion of the dielectric fill layer and a portion of the first oxidized sidewall remain behind to form a trench isolation plug; and

processing an active area of the semiconductor substrate to erode the first oxidized sidewall at a slower rate than the dielectric fill layer in the isolation trench wherein the first oxidized sidewall prevents substantial exposure of a sidewall of the active area.

5,837,613
ENHANCED PLANARIZATION TECHNIQUE FOR AN INTEGRATED CIRCUIT

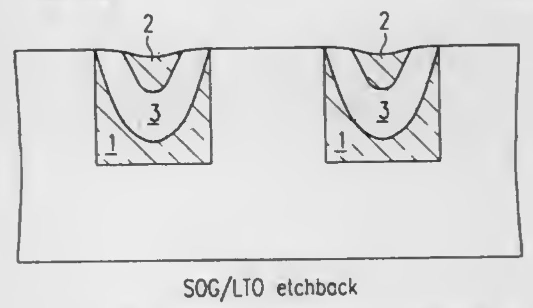
Alex Kalnitsky, Grenoble, France, and Yih-Shung Lin, Plano, Tex., assignors to STMicroelectronics, Inc., Carrollton, Tex.

Division of Ser. No. 456,343, Jun. 1, 1995, which is a continuation of Ser. No. 163,043, Dec. 6, 1993, Pat. No. 5,435,888.

This application Nov. 24, 1997, Ser. No. 976,760

Int. Cl.^{6} H01L *21/00*

U.S. Cl. 438—697 **21 Claims**



SOG/LTO etchback

1. An integrated circuit fabrication method, comprising the acts of:

(a.) providing a partially fabricated integrated circuit structure which has an uneven topography containing high points;

(b.) applying and curing spin-on glass, to form a first dielectric;

(c.) depositing dielectric material from a vapor phase, to form a second dielectric layer over said first layer;

(d.) applying and curing spin-on glass, to form a dielectric stack including a third dielectric layer over said first and second layers;

(e.) substantially removing said dielectric stack from said high points of said partially fabricated structure while leaving said dielectric stack in other portions of said partially fabricated structure;

(f.) depositing an interlevel dielectric;

(g.) etching holes in said interlevel dielectric in locations; and

(h.) depositing and patterning a metallization layer to form a pattern of connections, including connections through said holes.

5,837,614
INSULATING FILM AND METHOD OF PRODUCING SEMICONDUCTOR DEVICE

Shunpei Yamazaki, Tokyo; Takeshi Fukada, Kanagawa; Mitsunori Sakama, Kanagawa; Yukiko Uehara, Kanagawa, and Hiroshi Uehara, Kanagawa, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

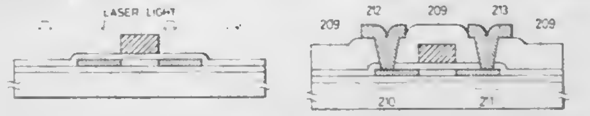
Continuation of Ser. No. 198,054, Feb. 18, 1994, abandoned.

This application Jan. 7, 1997, Ser. No. 781,930

Claims priority, application Japan, Feb. 19, 1993, 5-055236

Int. Cl.^{6} H01L *21/31*

U.S. Cl. 438—789 **21 Claims**



1. A method of producing a semiconductor device comprising: forming semiconductor region comprising silicon; and

forming a film comprising silicon oxide over the semiconductor region by generating a plasma in an atmosphere comprising an organic silane having an ethoxy group, oxygen, and a halogen-containing gas comprising carbon,

wherein the film includes a halogen element and carbon, a concentration of the halogen element in the film is 1×10^{17} to 5×10^{20} cm^{-3}, and a concentration of the carbon in the film is 5×10^{19} cm^{-3} or less.

5,837,615
INTEGRATED CIRCUIT DEVICE FABRICATION BY PLASMA ETCHING

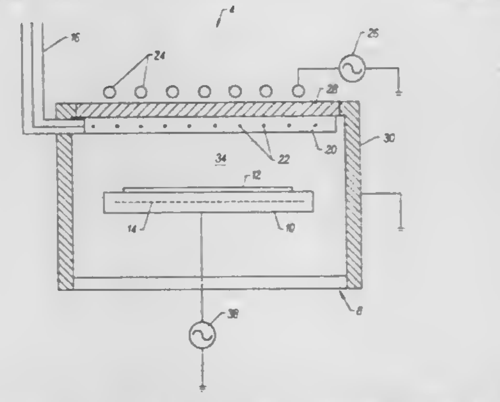
Michael D. Rostoker, Boulder Creek, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.

Continuation of Ser. No. 531,473, Sep. 21, 1995, abandoned.

This application Aug. 14, 1997, Ser. No. 912,944

Int. Cl.^{6} H01L *21/302*

U.S. Cl. 438—711 **25 Claims**



1. A method of etching a trench in a substrate having a top surface, the method comprising the following steps:

supporting said substrate within an enclosure; and

plasma etching selected portions of said substrate under defined etch conditions such that material from the top surface of the substrate is forward sputtered to induce deposition on sidewalls of said trench during etching,

wherein a first electrode includes a coil electrically coupled to a radio frequency power source such that by inductive coupling a plasma is generated about the substrate by applying a potential between a first and a second electrode, and wherein charged species are directed from said plasma onto said substrate by applying a potential to a third electrode.

5,837,616
DRY ETCHING METHOD FOR ALUMINUM ALLOY AND ETCHING GAS THEREFOR

Michinari Yamanaka, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jan. 22, 1997, Ser. No. 787,352

Claims priority, application Japan, Jan. 22, 1996, 8-008525

Int. Cl.^{6} H01L *21/302*

U.S. Cl. 438—735 **10 Claims**

FLOW RATIO OF NH_3 (%)	0	9	11	20	33	39	43
SHAPE OF ETCHED Al ALLOY FILM	×	×	△	△	○	○	○
MICRO-LOADING EFFECT	×	△	△	○	○	○	○
RESIDUES OF ETCHING	×	×	×	△	○	○	○

○: EXCELLENT
△: FINE
×: NO GOOD

1. A method of dry etching an Al alloy film, comprising the steps of:

forming the Al alloy film on a semiconductor substrate;

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forming a resist pattern on the Al alloy film; and

dry etching the Al alloy film using said resist pattern as a mask with a chlorine system gas to which ammonia gas is added,

wherein a flow rate of said ammonia gas is between not less than half of a flow rate of said chlorine system gas and not more than the flow rate of said chlorine system gas and wherein AlN is formed on the Al alloy film during dry etching.

5,837,617
HETEROJUNCTION COMPOUND SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THE SAME

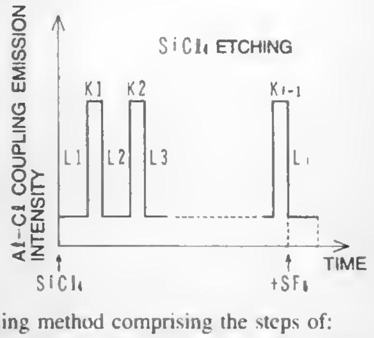
Hiroyuki Oguri, and Teruo Yokoyama, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Apr. 1, 1994, Ser. No. 221,900

Claims priority, application Japan, Apr. 30, 1993, 5-104506

Int. Cl.^{6} H01L *21/302*

U.S. Cl. 438—738 **13 Claims**



1. An etching method comprising the steps of:

etching a laminated layer of a plurality of layers made of different kinds of materials by an etchant gas A until one of the layers is completely etched, leaving a first lower layer disposed under said one layer, and a second lower layer disposed under said first lower layer, the second lower layer being made of one kind of material and the first lower layer being made of another kind of material, said etchant gas A being capable of etching layers made of said different kinds of materials and a mixture of said etchant gas A and an additive gas B being capable of etching said another kind of material but substantially unable to etch said one kind of material; and

etching said first layer under said one layer by adding said additive gas B to said etchant gas A, thereby automatically stopping etching at said second lower layer.

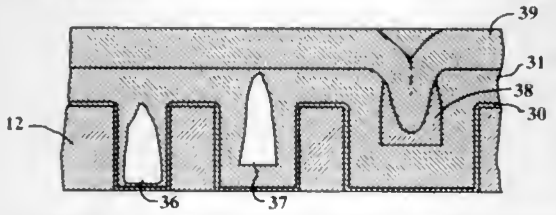
5,837,618
UNIFORM NONCONFORMAL DEPOSITION FOR FORMING LOW DIELECTRIC CONSTANT INSULATION BETWEEN CERTAIN CONDUCTIVE LINES

Steven Avanzino, Cupertino; Darrell Erb, Los Altos, and Robin Cheung, Cupertino, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Division of Ser. No. 481,906, Jun. 7, 1995. This application Aug. 6, 1997, Ser. No. 906,772

Int. Cl.^{6} H01L *21/56*

U.S. Cl. 438—778 **9 Claims**



1. A method of depositing silicon containing insulating material on a patterned surface of metal conductive lines on a substrate separated by gaps, with at least one pair of said conductive lines with opposing walls having a narrow gap of about 0.5 microns or less between said walls and an aspect ratio of 2 to 1 or greater, comprising the steps of:

depositing a nonconformal silicon containing insulating material between the walls of the conductive lines under conditions to provide a poor step coverage between the bottom of the gap and the top of the conductive lines so that the material forms shoulders on the tops of the conductive lines and bridges across the lines with a gap of about 0.5 microns or less, thereby forming a void in said narrow gap having an effective dielectric constant of less than about 3;

filling remaining open gaps between the conductive lines by depositing a flowable insulating material on said nonconformal insulating material; and

depositing a silicon containing insulating material on said nonconformal layer and over said flowable insulating material to complete the insulating layer between and over the conductive lines.

5,837,619
METHOD OF FABRICATING SEMICONDUCTOR DEVICE AND METHOD OF PROCESSING SUBSTRATE

Hiroki Adachi; Yuugo Goto; Hongyong Zhang, and Toru Takayama, all of Kanagawa, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Division of Ser. No. 282,598, Jul. 29, 1994, Pat. No. 5,492,843. This application Nov. 3, 1995, Ser. No. 552,678

Claims priority, application Japan, Jul. 31, 1993, 5-209053; Jul. 31, 1993, 5-209055; Sep. 20, 1993, 5-256569

Int. Cl.^{6} H01L *21/324*

U.S. Cl. 438—795 **8 Claims**

PREHEATING PROCESS OF SUBSTRATE AT 640°C FOR 4 HOURS	HEATING ANNEAL AT 600°C FOR 4 HOURS	SUBSTRATE SHRINKAGE (ppm)
SLOW COOLING (0.2°C/min)	RAPID COOLING 50°C/min	FROM LESS THAN LIMIT OF MEASURE TO 44
	USUAL COOLING (1~2°C/min)	FROM 60 TO 90
	SLOW COOLING (0.2°C/min)	300

1. A method of fabricating a semiconductor device, comprising the steps of:

forming a bottom film on a glass substrate having a strain point;

thermally annealing said glass substrate at a first temperature higher than said strain point of said glass substrate after said bottom film forming step;

cooling said substrate from said first temperature to a second temperature lower than said strain point at a rate of less than 2° C./min;

forming a semiconductor film comprising silicon on said bottom film; and

thermally annealing said substrate at a third temperature not exceeding said strain point of the glass substrate after said semiconductor film forming step,

wherein all film forming steps subsequent to said semiconductor film forming step are performed at a temperature less than said strain point.

5,837,620
FIBER GLASS MATS AND METHOD OF MAKING

Richard Emil Kajander, Toledo, Ohio, assignor to Johns Manville International, Inc., Denver, Colo.

Filed Oct. 10, 1996, Ser. No. 728,655

Int. Cl.^{6} C08G *8/04;* **B29C** *67/12;* **B32B** *5/00*

U.S. Cl. 442—63 **9 Claims**

1. A fiber glass mat for bonding and which, when so bonded, provides a tough surface for a wood product, comprising glass fibers bonded together with about 15–75 weight percent of a resin binder wherein the resin binder is derived from an aqueous resin selected from the group consisting of furfuryl alcohol based resin, phenol formaldehyde resin and melamine resin and is only partially cured to a "B" stage condition and wherein said mat also contains cellulosic fibers or fibers of a cellulose derivative.

5,837,621
FIRE RESISTANT GLASS FIBER MATS

Richard Emil Kajander, Toledo, Ohio, assignor to Johns Manville International, Inc., Denver, Colo.

Continuation-in-part of Ser. No. 428,460, Apr. 25, 1995, abandoned. This application Nov. 1, 1996, Ser. No. 742,529

Int. Cl.^{6} C03C *25/00;25/02*

U.S. Cl. 442—143 **18 Claims**

1. A fire resistant glass fiber product comprised of glass fibers held together with a binder, said binder comprising at least one nitrogen containing compound, wherein when said nitrogen containing compound is a nitrogen containing resin, said resin containing from none to no more than 1.5 weight percent, based on the weight of said resin, of a phosphorous compound as a curing catalyst, said product also containing at least one boron containing compound in contact with said nitrogen containing compound, wherein said boron containing compound is present in amounts that would produce a boron content in the fiber glass product equivalent to what at least 15 wt. percent boric acid in the fiber glass product would produce and wherein said nitrogen containing compound(s) is present in an amount to produce at least about one mol or atom of nitrogen for every mol or atom of boron that is in said boron containing compound, and wherein said glass fibers constitute at least 20 weight percent of said product.

5,837,622
ELASTIC WOVEN PLAIN SATIN OR SATEEN FABRIC

Cathy Jane Hamilton, Wilmington, Del., and Becky June Lewis, Fishersville, Va., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 529,962, Sep. 19, 1995, Pat. No. 5,645,924, which is a continuation-in-part of Ser. No. 339,168, Nov. 10, 1994, Pat. No. 5,478,514. This application May 23, 1997, Ser. No. 861,499

Int. Cl.^{6} D03D *3/00*

U.S. Cl. 442—184 **7 Claims**

1. A smooth elastic stretch woven plain, satin, or sateen fabric which is the product of a process that comprises the steps of

weaving a fabric with warp yarns and weft yarns, wherein at least half of the warp yarns or of the weft yarns are combination yarns which comprise an elastomeric strand and a non-elastomeric companion yarn, the non-elastomeric companion yarn being of partially molecularly oriented synthetic organic polymer and the elastic strand having a heat setting temperature that is higher than the heat setting temperature of the non-elastomeric companion yarn, and wherein the sum of the reciprocal of the weft apparent fractional cover and the reciprocal of the warp apparent fractional cover (1/WeAFC+1/WaAFC) is in the range between about 2.34 and about 3.11,

stretching the woven fabric by 25 to 85% in the direction of at least the warp combination yarns or the weft combination yarns,

heat setting the stretched woven fabric for at least 20 seconds while in the stretched condition at a temperature in the range of 80° to 180° C., said temperature being below the heat setting temperature of the elastomeric strand, and

finishing the heat-treated fabric in an aqueous bath for at least ½ hour at temperature that is no higher than 135° C.

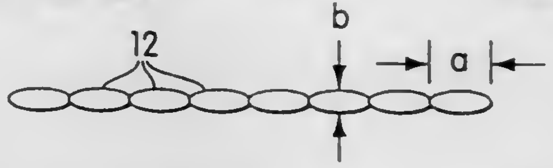
5,837,623
PROTECTIVE FABRIC HAVING HIGH PENETRATION RESISTANCE

Charles A. Howland, Weston, Mass., assignor to Warwick Mills, Inc., New Ipswich, N.H.

Continuation-in-part of Ser. No. 297,593, Aug. 29, 1994, Pat. No. 5,565,264. This application Oct. 15, 1996, Ser. No. 729,926

Int. Cl.^{6} D03D *3/00*

U.S. Cl. 442—189 **3 Claims**



1. A fabric substrate comprising:

a plurality of warp yarns densely interwoven with a plurality of fill yarns, the substrate having a cover between adjacent yarns at the fill crossing of at least 100%; and

wherein the warp crimp is greater than the fill crimp.

5,837,624
WOVEN GLASS CLOTH FOR PRINTED WIRING BOARD AND PRINTED WIRING PRODUCTS MANUFACTURED THEREFROM

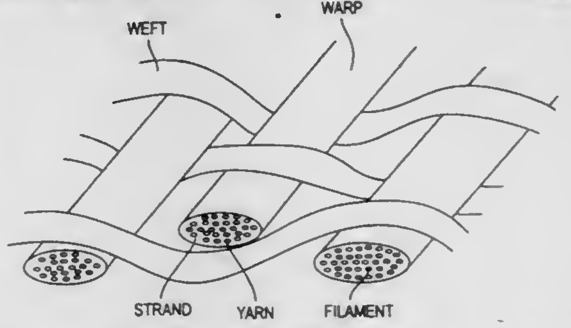
Kozo Sakaguchi, Tokyo; Fumio Nagamine; Keita Miyasato, both of Fukushima; Hiromasa Hattori, Kyoto; Tatsuya Watanabe, and Akinori Hibino, both of Kouriyama, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, and Nitto Boseki Co., Ltd., Fukushima, both of Japan

Filed Oct. 15, 1996, Ser. No. 730,393

Claims priority, application Japan, Oct. 16, 1995, 7-267504

Int. Cl.^{6} H05K *3/00;1/03*

U.S. Cl. 442—208 **13 Claims**



GLASS CLOTH (SINGLE YARN)

1. A woven glass cloth comprising warps and wefts and having a mass of 15 to 30 g/m^2, suitable for use as a base material to be resin-impregnated for printed wiring board material, wherein one of the warps and the wefts comprise strands having a denier of 75 or more, said strands having a denier of 75 or more being thicker than strands of the other of the warps and the wefts, and a thread count of the thicker strands per unit length is set smaller than that of the other strands.

5,837,625
INSULATION MATERIAL

Bobby Mal Phillips, Jonesborough, and Jackson Lee Nelson, Johnson City, both of Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.

Continuation-in-part of Ser. No. 510,950, Jul. 31, 1995, abandoned, which is a continuation of Ser. No. 311,998, Sep. 26, 1994, abandoned. This application Jan. 28, 1997, Ser. No. 789,263

Int. Cl.^{6} D04H *1/42;13/00;* **D01D** *5/253*

U.S. Cl. 442—337 **8 Claims**

1. A thermally insulating fibrous structure wherein

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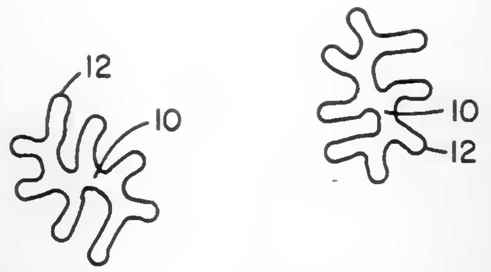


A) the softness of the structure is equal to or less than about 0.18 inch-pounds per square inch.

B) the constant K in the expression

% Compression at 1 psi load=100−K*p is equal to or greater than 2.00 ft^3/lb for the structure,

C) the structure has an uncompressed density of about 0.3 to about 3.0 lb/ft^3 and an uncompressed thickness of less than 0.5 inch,

D) the fibers in the structure have a plurality of finger-shaped projections in cross section such that the shape factor is greater than 1.5,

E) the fibers in the structure have a specific volume of about 1.5 to about 5.0 cc per gram and a denier of about 2 to about 15, and

wherein

(i) Softness is measured by the sum of the energy of (1) compression to 1 psi and (2) recovery to 0 psi,

$$\text{(ii) \% Compression at 1 psi load} = \frac{\begin{array}{c}\text{Initial Thickness of}\\ \text{Structure Minus Peak Load}\\ \text{Thickness of Structure}\end{array}}{\begin{array}{c}\text{Initial Thickness of}\\ \text{Structure.}\end{array}} \times 100$$

(iii) p is the compressed density of the structure at 1 psi load in lb/ft^3, and

(iv) Shape factor is defined by the equation

$$\text{Shape Factor} = \frac{\text{Perimeter of Fiber}}{\sqrt{4\,\pi \times \text{Cross Sectional Area of Fiber}}}$$

wherein the units of perimeter and area are consistent.

5,837,626
IGNITION RESISTANT OR FIRE BLOCKING COMPOSITE

Francis Patrick McCullough, 104 Fir Dr., Lake Jackson, Tex. 77566

Division of Ser. No. 428,691, Apr. 25, 1995, Pat. No. 5,700,573. This application Jul. 31, 1997, Ser. No. 903,696

Int. Cl.^{6} D02G *3/00*

U.S. Cl. 442—353 **6 Claims**

1. An ignition resistant or fire blocking composite comprising a multiplicity of biregional carbonaceous fibers with a thermoplastic or thermoset polymer, wherein each said biregional carbonaceous fiber comprises an inner region of a thermoplastic polymeric core and an outer region of a carbonaceous sheath, and wherein said biregional fibers are present in the composite in an amount of from 10 to 95% by weight, based on the total weight of the composite.

5,837,627
FIBROUS WEB HAVING IMPROVED STRENGTH AND METHOD OF MAKING THE SAME

Donald D. Halabisky, Tacoma; Hugh West, Seattle; Andre S. Hajnal, Federal Way, and Terry M. Grant, Auburn, all of Wash., assignors to Weyerhaeuser Company, Federal Way, Wash.

Continuation-in-part of Ser. No. 399,408, Mar. 6, 1995, abandoned. This application Jan. 13, 1997, Ser. No. 669,406

Int. Cl.^{6} A61F *13/15*

U.S. Cl. 442—385 **62 Claims**

1. An article comprising:

a web of pulped cellulosic fibers, said fibers being interspersed with each other;

a bonding medium for bonding at least some of said cellulosic fibers to the bonding medium; and

a solvent for said bonding medium, said cellulosic fibers being insoluble in said solvent, said bonding medium when contacted with said solvent at least partially solubilizing the medium and rendering it tacky so that said bonding medium adheres to itself and to at least some of said cellulosic fibers, said solvent being present in an amount insufficient to completely solubilize the bonding medium, said solvent after partially solubilizing the surface of the bonding medium thereafter being sufficiently dissipated so that said bonding medium can resolidify, thereby bonding the medium to itself and to at least some of the cellulosic fibers, wherein the bonding medium is coated on fibers that are insoluble in said solvent, the medium coated fibers being interspersed throughout said web.

5,837,628
LOW COST AND ENVIRONMENTALLY IMPROVED INFRARED TRANSMITTING GERMANATE GLASSES

Jenn-Shing Wang; Moo Chin Wang, and Min-Hsiung Hon, all of Tainan, Taiwan, assignors to National Science Council, Taipei, Taiwan

Filed Feb. 20, 1996, Ser. No. 603,346

Int. Cl.^{6} C03C *3/23;3/253*

U.S. Cl. 501—42 **16 Claims**

1. A germanate glass formed from a composition consisting essentially of the following oxides in the following weight percents:

Metal Oxide	Weight Percent
GeO_2	35–65
Al_2O_3	10–25
ZnO	3–8
CaO	5–15
BaO	6–15

and at least one alkali metal halide or alkaline earth metal halide, or a mixture of said metal halides, wherein said metal halide is present in said composition in an amount of less than 25 percent by weight.

5,837,629
GLASS COMPOSITION FOR MAKING GLAZING

Jean-Marie Combes, Paris, and Pedro Pahlo Mazon-Ramos, Oviedo, both of France, assignors to Saint-Gobain Vitrage, Courbevoie, France

PCT No. PCT/FR95/00828, § 371 Date Jun. 27, 1996, § 102(e) Date Jun. 27, 1996, PCT Pub. No. WO96/00194, PCT Pub. Date Jan. 4, 1996

PCT Filed Jun. 22, 1995, Ser. No. 596,372

Claims priority, application France, Jun. 23, 1994, 94/07724

Int. Cl.^{6} C03C *3/087*

U.S. Cl. 501—70 **16 Claims**

1. A glass composition which consists essentially of the following constituents expressed in weight percentage, defined by the following limits:

SiO_2	69 to 75%
Al_2O_3	0 to 3%
B_2O_3	0 to 5%
CaO	2 to 10%
MgO	0 to 2%
Na_2O	9 to 17%
K_2O	0 to 8%
Fe_2O_3 (total iron)	0.2 to 4%, and as an additional colouring agent, at least one of
Se, CoO, Cr_2O_3, NiO, and CuO	0 to 0.45%

the additional colouring agent content being at least equal to 0.0002% when the Fe_2O_3 content is equal to or less than to 1.5%, wherein said composition may contain fluorine, zinc oxide, zirconium oxide, cerium oxide, titanium oxide and less than 4% of barium oxide, the sum of alkaline earth metal oxide percentages being equal or less than 10%.

5,837,630
HIGH SURFACE AREA MESOPOUROUS DESIGEL MATERIALS AND METHODS FOR THEIR FABRICATION

Lynne Owens, Ann Arbor; Levi T. Thompson, Jr., Northville, and Michael R. Wixom, Ann Arbor, all of Mich., assignors to T/J Technologies Inc., Northville, Mich.

Filed Oct. 31, 1996, Ser. No. 741,674

Int. Cl.^{6} C04B *38/00*

U.S. Cl. 501—80 **20 Claims**

1. A method of making a mesoporous desigel comprising:

providing a solution containing a first compound of a metal:

reacting said first compound in said solution so as to produce a gel comprised of a network of a second compound of said metal embedded in a solvent;

removing said solvent from the gel while maintaining at least some of the structure of the network of the second compound, whereby a mesoporous desigel of said second compound is produced; and

reacting said mesoporous desigel so as to convert at least a portion of said second compound to a third compound of said metal.

5,837,631
MOLDED SILICON CARBIDE BODIES

Ingo Elstner, Wiesbaden; Daniel Grimm, Bad Schwalbach; Rudolf Hebel, Ginsheim, and Klaus Santowski, Pleitersheim, all of Germany, assignors to Didier-Werke AG, Wiesbaden, Germany

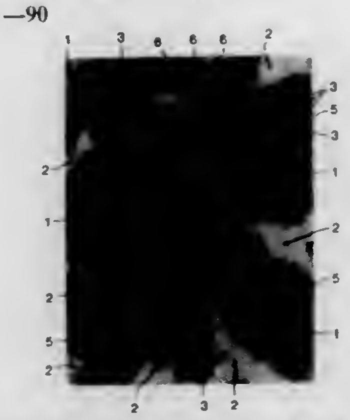
PCT No. PCT/EP96/01704, § 371 Date Nov. 8, 1996, § 102(e) Date Nov. 8, 1996, PCT Pub. No. WO96/33959, PCT Pub. Date Oct. 31, 1996

PCT Filed Apr. 24, 1996, Ser. No. 737,233

Claims priority, application Germany, Apr. 28, 1995, 195 15 627.7; Apr. 17, 1996, 195 14 968.1

Int. Cl.^{6} C04B *35/565*

U.S. Cl. 501—90 **29 Claims**



1. A molded SiC body comprising secondarily formed SiC, 3–33 percent by weight free carbon, and 0.1–10 percent by weight of an oxygen-containing silicon compound, and having a porosity of 8–23 percent by volume, and a pore distribution with a fraction of the pores having a mean pore diameter greater than 1 μm, of less than 3 percent by volume.

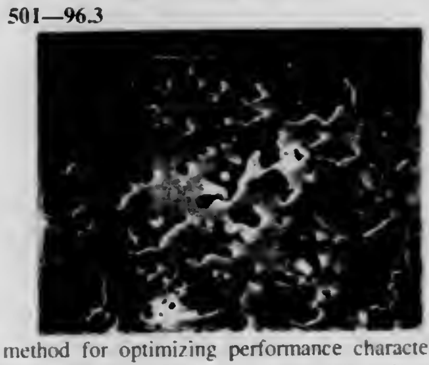
5,837,632
METHOD FOR ELIMINATING POROSITY IN MICROPYRETICALLY SYNTHESIZED PRODUCTS AND DENSIFIED

Jainagesh A. Sekhar, and Naiping Zhu, both of Cincinnati, Ohio, assignors to Micropyretics Heaters International, Inc., Cincinnati, Ohio

Filed Mar. 8, 1993, Ser. No. 27,710

Int. Cl.^{6} C04B *35/58*

U.S. Cl. 501—96.3 **11 Claims**



1. A method for optimizing performance characteristics of a combustion synthesized ceramic or metal ceramic product, the product having thermal and mass gradients, a lowest melting phase having a melting point and said product having homogenous sections separated by non-homogenous sections, each said homogenous section being separated from the next homogenous section by an average repetitive distance, the product having been manufactured by blending a mixture comprising between about 5% and 95% by total weight of the mixture, of at least one reactive system, wherein said reactive system comprises at least two particulate combustible materials which will react exothermically with one another by combustion synthesis and are present in such proportion to one another that combustion of said mixture will occur when ignited, up to 95% by total weight of the mixture, of a filler

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material, and optionally a sufficient amount of a liquid phase in order to form a slurry, fashioning said mixture into a desired and uncombusted shape, and combusting said shape by ignition at a temperature between about 150° C. and 1800° C.; the method comprising the steps of:

initially applying sufficient current to the product so as to heat the product to a minimum of 50% of the melting point in degrees Kelvin, of the lowest melting phase in the product, wherein the current applied is selected from the group consisting of a DC current, an AC current, a pulsed current and an induction current; and

greatly reducing porosity of said product so as to make the repetitive distance between consecutive homogenous sections of said product to less than 0.002 in, by increasing said current applied so as to cause elimination of said thermal and mass gradients.

5,837,633
METHOD FOR PRODUCTION OF ALUMINUM NITRIDE SINTERED BODY AND ALUMINUM NITRIDE POWDER

Motohiro Toriyama; Kiyoshi Hirao; Masayoshi Ohashi; Syuzo Kanzaki, and Masaaki Obata, all of Aichi, Japan, assignors to Agency of Industrial Science and Technology, and Fine Ceramics Research Association, both of Tokyo, Japan

Filed Oct. 29, 1996, Ser. No. 741,218

Claims priority, application Japan, Nov. 2, 1995, 7-310140; Aug. 14, 1996, 8-232590

Int. Cl.^{6} C01B *21/072;* **C04B** *35/581*

U.S. Cl. 501—98.4 **20 Claims**

1. A method for producing aluminum nitride, comprising:

heating aluminum metal powder in a vacuum to a temperature in the range of 550° C. to the melting point of aluminum; and then

nitriding said aluminum metal powder under N_2 pressure of at least 1 kg/cm^2 at a temperature in the range of 550° C. to the melting point of aluminum.

5,837,634
PROCESS FOR PRODUCING STABILIZED ALUMINA HAVING ENHANCED RESISTANCE TO LOSS OF SURFACE AREA AT HIGH TEMPERATURES

Kevin J. McLaughlin, Austin; Ben L. Decker, Lago Vista, and Mark M. Chavez, Round Rock, all of Tex., assignors to Condea Vista Company, Houston, Tex.

Filed Nov. 12, 1992, Ser. No. 974,560

Int. Cl.^{6} C04B *35/10*

U.S. Cl. 501—127 **2 Claims**

1. A process for preparing a stabilized alumina comprising:

forming an aqueous slurry of a precursor boehmite alumina;

admixing said aqueous slurry with from about 0.5 to about 20% by weight calculated as metal oxide based on the Al_2O_3 content of said stabilized alumina of a stabilizer selected from the group consisting of water-soluble salts of polyvalent metal cations of Groups IIA and IIIB of the periodic table, oxides of metals of Groups IIA and IIIB of the periodic table, compounds containing metals from Groups IIA and IIIB of the periodic table that hydrolyze in aqueous solutions to produce water-soluble salts of polyvalent metal cations and/or oxides of metals in Groups IIA and IIIB of the periodic table, and mixtures thereof;

aging said alumina slurry containing said stabilizer at a pH of from about 3 to about 9 and at a temperature greater than about 70° C. for a period of time sufficient to convert the greater portion of said alumina to a colloidal sol of boehmite alumina containing said stabilizer;

recovering said colloidal sol; and

calcining said colloidal sol to produce a stabilized alumina.

5,837,635
PROCESS FOR PRODUCING MIXED OXIDE POWDERS FROM DEACTIVATED DENOX CATALYSTS

Jürgen Kischkewitz, Ratingen; Günter Linde, Krefeld; Hans-Joachim Schittenhelm, Köln; Günter Lailach, Krefeld, and Kai Bütje, Duisburg, all of Germany, assignors to Bayer AG, Leverkusen, Germany

Filed Apr. 16, 1997, Ser. No. 840,790

Claims priority, application Germany, Apr. 29, 1996, 196 17 081.8

Int. Cl.^{6} B01J *20/34*

U.S. Cl. 502—24 **10 Claims**

1. A process for producing mixed oxide powders from deactivated DENOX catalysts comprising thallium by recycling, wherein:

a) the deactivating DENOX catalyst is crushed;

b) the crushed material from step a) is treated with an aqueous mineral acid to remove the thallium,

c) the material from step b) from which thallium has been removed is digested with sulphuric acid and/or oleum;

d) the digested cake obtained in step c) is dissolved in water or dilute sulphuric acid and the undissolved constituents are separated off;

e) arsenic is removed from the solution obtained in step d);

f) the solution from which arsenic has been removed is hydrolysed and then filtered, and the dilute sulphuric acid obtained is optionally re-processed;

g) the hydrolysate obtained in step f) is dried and calcined, optionally after post-doping with compounds of one or more elements from the group W, Mo and V, to form a product.

5,837,636
METHOD FOR REDUCING CHLORIDE EMISSIONS FROM A CATALYST REGENERATION PROCESS

Paul A. Sechrist, Des Plaines, and Delmar W. Robinson, Palatine, both of Ill., assignors to UOP LLC, Des Plaines, Ill.

Filed Oct. 3, 1996, Ser. No. 724,652

Int. Cl.^{6} B01J *38/42;20/34*

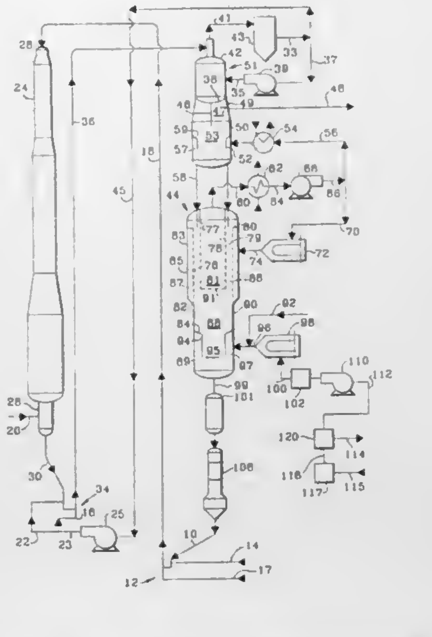
U.S. Cl. 502—35 **23 Claims**

1. A method for decreasing the environmental release of chloro-species from a process for regenerating spent catalyst particles wherein a recycle stream comprising chloro-species contacts said spent catalyst particles, said method comprising:

(a) withdrawing a recycle stream comprising chloro-species from a regeneration zone containing chlorided catalyst particles comprising chloride;

(b) passing a first portion of said recycle stream comprising chloro-species to said regeneration zone, and at least partially regenerating at least a portion of said chlorided catalyst particles and removing at least a portion of the chloride from said chlorided catalyst particles at regeneration conditions to produce regenerated catalyst particles; and

(c) passing a second portion of said recycle stream to a sorption zone containing spent catalyst particles, sorbing at least a portion of the chloro-species in said second portion of said recycle stream on said spent catalyst particles at sorption conditions to produce said chlorided catalyst particles having an increased content of chloride relative to said spent catalyst particles, said sorption conditions comprising the substantial absence of carbon combustion, and withdrawing from said sorption zone a vent stream having a reduced concentration of chloro-species relative to said second portion of said recycle stream.



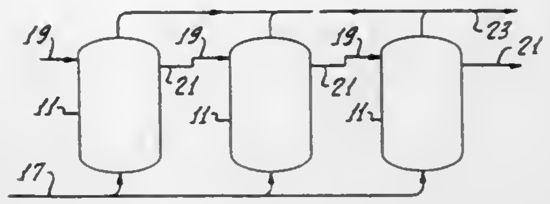
5,837,637
CATALYST REGENERATION

Cloyd P. Reeg, Fullerton; Phillip K. Maher, Orange, both of Calif.; David K. Morash, Friday Harbor, Wash., and James J. Prosser, Fawn Grove, Pa., assignors to Tricat Industries, Inc., McAlester, Okla.

Continuation of Ser. No. 361,866, Dec. 22, 1994, abandoned, which is a continuation of Ser. No. 30,697, Mar. 12, 1993, abandoned. This application Apr. 12, 1996, Ser. No. 631,907

Int. Cl.^{6} B01J *38/30:20/34*

U.S. Cl. 502—41 **29 Claims**



1. A process for continuously regenerating a spent catalyst or an adsorbent which comprises the steps of:

(a) establishing at least one ebullating or expanded bed by passing a gaseous stream upwardly through a plurality of particles having a size ranging from 1/16" to 1/8" diameter confined in a regeneration zone,

(b) establishing at least one downflow zone and at least one upflow zone wherein each downflow zone is in fluid communication with a downstream upflow zone within each bed and maintaining the height of the particles in each upflow zone at the same height as the height of the particles in the adjacent upstream downflow zone to provide a looped pathway in said ebullating bed,

(c) passing a spent catalyst into said ebullating bed and moving said spent catalyst along said looped pathway, and

(d) removing a regenerated catalyst from said ebullating bed.

5,837,638
ZEOLITE COMPOSITION

Huibert Van Der Stok, Rotterdam, and Nasir Javid, AH Bilthoven, both of Netherlands, assignors to NV Holding Company Belgie, Belgium

Filed Nov. 17, 1995, Ser. No. 560,112

Claims priority, application Netherlands, Jul. 13, 1995, 1000794

Int. Cl.^{6} B01J *29/04*

U.S. Cl. 502—62 **9 Claims**

1. A zeolite composition comprising a culture of denitrificating bacteria, potassium ions, carbonate ions and a weak acid.

5,837,639
HYDROPROCESSING CATALYST

Charles T. Kresge, Westchester, Pa.; Michael E. Leonowicz, Medford Lakes; Wieslaw J. Roth, Sewell, both of N.J., and James C. Vartuli, West Chester, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 625,245, Dec. 10, 1990, Pat. No. 5,098,684, which is a continuation-in-part of Ser. No. 470,008, Jan. 25, 1990, Pat. No. 5,102,643. This application Jul. 24, 1991, Ser. No. 734,998

The portion of the term of this patent subsequent to Mar. 24, 2009, has been disclaimed.

Int. Cl.^{6} B01J *29/00:29/064*

U.S. Cl. 502—64 **35 Claims**

1. A catalytic composition comprising a metal having hydrogenation-dehydrogenation functionality supported on a support material comprising a non-layered, inorganic, porous crystalline phase material exhibiting, after calcination, an X-ray diffraction pattern with at least one peak having a relative intensity of 100 at a d-spacing greater than about 18 Å and having a benzene sorption capacity greater than about 15 grams benzene per 100 grams of the material at 50 torr and 25° C.

5,837,640
CARBON-SUPPORTED HYDRODEAROMATIZATION CATALYST

Chakka Sudhakar, Wappingers Falls; Frank Dolfinger, Jr., Poughkeepsie; Dennis Joseph Rao, Hopewell Junction, and John Hazen, Cragsmoor, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Continuation of Ser. No. 425,547, Apr. 20, 1995, abandoned, which is a division of Ser. No. 189,992, Jan. 31, 1994, Pat. No. 5,435,907, which is a continuation of Ser. No. 871,145, Apr. 20, 1992, abandoned. This application Apr. 19, 1996, Ser. No. 635,101

Int. Cl.^{6} B01J *21/18*

U.S. Cl. 502—185 **7 Claims**

1. A catalyst composition useful after sulfiding, for the hydrodearomatization, hydrodesulfurization and hydrodenitrogenation of charge naphtha or middle distillate hydrocarbons wherein the hydrodearomatization reduces the aromatic content of said charge from 25–40 v % to 5–15 v % at a temperature of 570–770° F. and a pressure of 600–2500 psig consisting essentially of:

(I) a catalyst support consisting essentially of activated carbon having a B.E.T. (Brunauer-Emmett-Teller) Surface Area of at least about 900 m^2/g, an Average Pore Diameter of between 16 Å and 50 Å, and a Total Pore Volume (for nitrogen) of 0.4 to 1.2 cc/g, bearing metals consisting essentially of:

(ii) 1–40 wt. % of a Group VI-B metal selected from molybdenum and tungsten, and

(iii) 0.1 –15 wt. % of a Group VIII metal, selected from cobalt and nickel, the total of said Group VI-B and Group VIII metals being about 1–50 wt. %.

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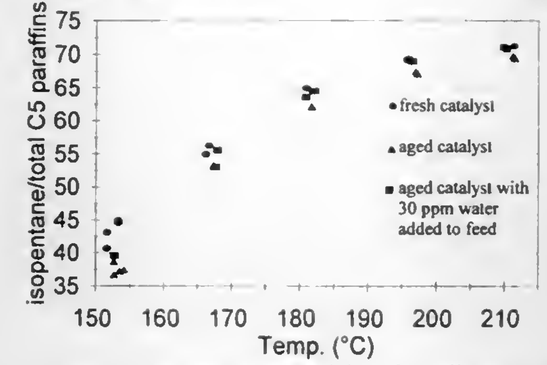
5,837,641
METHOD OF PROMOTING THE ACTIVITY OF SOLID STRONG ACID CATALYSTS

Christopher D. Gosling, Roselle; Paul G. Blommel, Bolingbrook; Michelle J. Cohn, Mount Prospect; Ralph D. Gillespie, Gurnee, and Jennifer S. Holmgren, Bloomingdale, all of Ill., assignors to UOP LLC, Des Plaines, Ill.

Filed Jan. 16, 1996, Ser. No. 585,986

Int. Cl.^{6} B01J *27/047;23/00;23/14*

U.S. Cl. 502—219 **13 Claims**



1. A method of promoting the activity of a solid strong acid catalyst in catalyzing continuous isomerization of a linear alkane containing from about 4 to about 8 carbon atoms to a branched alkane, said catalyst having both Lewis acid sites and Brönsted acid sites and selected from the group consisting of sulfated metal oxides, tungstated metal oxides, and molybdated metal oxides, said method comprising converting Lewis acid sites to Brönsted acid sites in situ by adding water in an amount ranging from about 1 ppm to about 50 ppm or a water precursor in an amount sufficient to generate from about 1 ppm to about 50 ppm water.

5,837,642
HEAT-RESISTANT OXIDE

Hirohisa Tanaka, and Mari Yamamoto, both of Gamo-gun, Japan, assignors to Daihatsu Motor Co., Ltd., Osaka, Japan

Filed Oct. 21, 1996, Ser. No. 734,074

Claims priority, application Japan, Dec. 26, 1995, 7-339733; Dec. 26, 1995, 7-339734

Int. Cl.^{6} B01J *23/00*

U.S. Cl. 502—304 **11 Claims**

1. A heat-resistant oxide represented by the following formula:

$$Ce_{1-(x+y)}Zr_xR_yO_{2-z}$$

where R is a rare earth metal, z is an oxygen deficiency, x is 0.40 to 0.70, y is 0.15 to 0.25, and x+y is 0.55 to 0.95.

5,837,643

Patent Not Issued For This Number

5,837,644
SURFACE HYDROPHOBIC ACTIVE CARBON AND METHOD FOR PRODUCTION THEREOF

Yoichiro Nakanishi; Takako Honjoh, both of Ikeda, and Kuniaki Honjo, Ibaraki, all of Japan, assignors to Agency of Industrial Science & Technology, and Ministry of International Trade & Industry, both of Tokyo, Japan

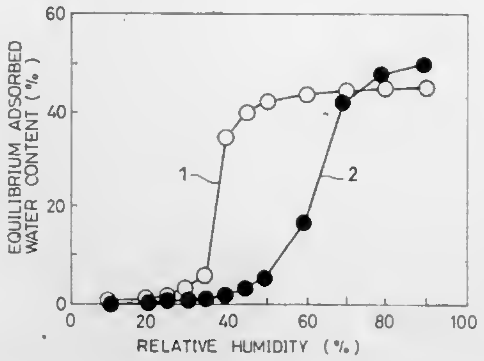
Filed Sep. 13, 1996, Ser. No. 712,602

Claims priority, application Japan, Sep. 14, 1995, 7-262359

Int. Cl.^{6} B01J *20/02*

U.S. Cl. 502—416 **4 Claims**

1. A method for the production of a surface hydrophobic active carbon, which comprises charging a decompressed tightly sealed container with active carbon and trimethyl chlorosilane, exposing said active carbon to said trimethyl chlorosilane in the form of vapor, decompressing the interior of the container below 0.1 torr, and heating at a temperature in the range of 80°–150° C. said active carbon in the decompressed state; wherein said surface hydrophobic carbon exhibits a silicon concentration on the surface thereof, Si_{2p}/C_{1s}, in the range of 0.005–0.03 as determined by X-ray photoelectron spectroscopy and a humidity for starting adsorption of water in the range of 45–60% as determined from the equilibrium absorbed water content curve.



3. A method for the production of a surface hydrophobic active carbon, which comprises charging a container with a solution comprising trimethyl chlorosilane and an oleophilic solvent, immersing active carbon in the resultant solution thereby establishing contact between trimethyl chlorosilane and said active carbon, separating said active carbon from said solution, decompressing the interior of the container below 0.1 torr, and heating said active carbon at a temperature in the range of 80°–150° C. in the decompressed state; wherein said surface hydrophobic carbon exhibits a silicon concentration on the surface thereof, Si_{2p}/C_{1s}, in the range of 0.005–0.03 as determined by X-ray photoelectron spectroscopy and a humidity for starting absorption of water in the range of 45–60% as determined from the equilibrium absorbed water content curve.

5,837,645
MATERIALS AND METHODS UTILIZING A TEMPORARY VISUAL INDICATOR

Ronnie S. Fuerst, 112 Turtle Cove Ct., Lexington, S.C. 29072; Richard Melker, and Christopher D. Batich, both of 3733 N.W. 40th St., Gainsville, Fla. 32606

Continuation of Ser. No. 388,402, Feb. 14, 1995, Pat. No. 5,532,029, which is a division of Ser. No. 242,517, May 13, 1994, abandoned, which is a continuation-in-part of Ser. No. 61,412, May 13, 1993, Pat. No. 5,523,075. This application Jul. 1, 1996, Ser. No. 674,069

Int. Cl.^{6} B41M *5/00;* **B32B** *1/06;* **A61K** *31/34;7/42*

U.S. Cl. 503—201 **6 Claims**

1. A method for marking a surface with a temporary visual indicator comprising:

(a) applying an indicator to the surface at a first pH, the indicator being invisible at the first pH and visible at a second pH;

(b) applying a pH-modifying substance to the surface in an amount sufficient to adjust the pH of the indicator to the second pH and which evaporates or degrades, thereby causing the pH to change to said first pH.

5,837,646
REVERSIBLE THERMAL RECORDING MEDIUM

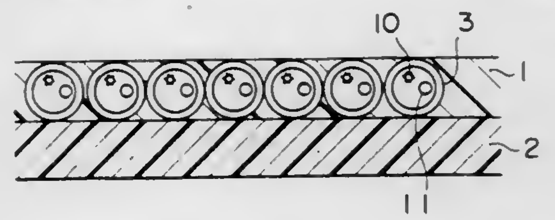
Niro Watanabe; Yuji Nakatsu, both of Kitakatsushika-gun; Keiki Yamada, and Masaru Ohnishi, both of Kamakura, all of Japan, assignors to Toppan Printing Co., Ltd., and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan

Continuation of Ser. No. 531,865, Sep. 21, 1995, Pat. No. 5,672,559, which is a division of Ser. No. 462,199, Jun. 5, 1995, Pat. No. 5,658,845, which is a division of Ser. No. 201,067, Feb. 24, 1994, abandoned, which is a division of Ser. No. 883,152, May 14, 1992, abandoned. This application Jan. 15, 1997, Ser. No. 784,021

Claims priority, application Japan, May 23, 1991, 3-118310

Int. Cl.^{6} B41M *5/30*

U.S. Cl. 503—201 **5 Claims**



1. A reversible thermal recording medium comprising:

A) a substrate and

B) a first recording layer on the substrate and a second recording layer on the first recording layer, each layer comprising a binder and a plurality of capsules dispersed in the binder, at least one of said capsules containing a core material comprising a resin admixed with a basic leuco dyestuff and a color developing/subtracting agent comprising a salt of bisphenolic acetic acid and a higher fatty acid amine, said first and second recording layers being capable of undergoing repeated recording and erasing of visible states by heat through reversible visible chemical change.

5,837,647
REVERSIBLE THERMAL RECORDING MEDIUM

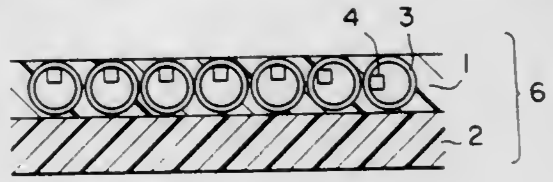
Niro Watanabe, Kitasaitama-gun; Yuji Nakatsu, Kitakatsushika-gun; Keiki Yamada, and Masaru Ohnishi, both of Kamakura, all of Japan, assignors to Toppan Printing Co., Ltd., and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan

Continuation of Ser. No. 714,970, Sep. 17, 1996, Pat. No. 5,637,551, which is a continuation of Ser. No. 201,067, Feb. 24, 1994, abandoned, which is a continuation of Ser. No. 883,152, May 14, 1992, abandoned. This application Jan. 15, 1997, Ser. No. 784,099

Claims priority, application Japan, May 23, 1991, 3-118310

Int. Cl.^{6} B41M *5/30*

U.S. Cl. 503—201 **6 Claims**



1. A reversible thermal recording medium comprising:

A) a substrate and

B) a recording layer on the substrate, said recording layer comprising a binder and a plurality of capsules dispersed in the binder, at least one of the capsules containing a core material comprising a resin admixed with a basic leuco dyestuff and a color developing/subtracting agent comprising a salt of bisphenolic acetic acid and a higher fatty acid amine, said recording layer being capable of undergoing repeated recording and erasing of visible states by heat through reversible visible chemical change.

5,837,648
THERMAL TRANSFER SHEET, THERMAL TRANSFER METHOD USING THE SAME, AND THERMALLY TRANSFERRED PRODUCT

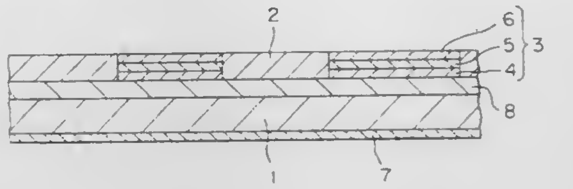
Atsushi Tatehana; Jiro Onishi, and Katsuyuki Oshima, all of Tokyo-To, Japan, assignors to Dai Nippon Printing Co., Ltd., Japan

Filed May 16, 1996, Ser. No. 649,004

Claims priority, application Japan, May 18, 1995, 7-143888

Int. Cl.^{6} B41M *5/035;5/38*

U.S. Cl. 503—227 **10 Claims**



8. A thermal transfer method comprising the steps of: superposing an image receiving sheet with a thermal transfer sheet comprising a substrate film and a sublimable black dye layer and a transferable protective layer provided side by side on the substrate film so that the surface of the sublimable black dye layer faces the image-receiving sheet; applying heat based on image information through the back surface of the thermal transfer sheet to form an image on the image-receiving sheet; superposing the thermal transfer sheet with the surface of the image so that the surface of the image faces the surface of the transferable protective layer; and applying heat to the back surface of the thermal transfer sheet to transfer the transferable protective layer onto the surface of the image.

5,837,649
THERMAL TRANSFER MATERIAL AND IMAGE-FORMING METHOD USING THE SAME

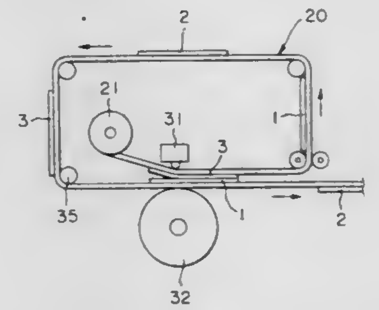
Takeshi Nozaki, Tokyo-to, Japan, assignor to Dai Nippon Printing Co., Ltd., Japan

Filed Jul. 31, 1996, Ser. No. 691,811

Claims priority, application Japan, Aug. 2, 1995, 7-215503

Int. Cl.^{6} B41M *5/035;5/38*

U.S. Cl. 503—227 **7 Claims**



7. An image-forming method comprising the steps of: putting a thermal transfer material, comprising a substrate and a receptive layer separably provided on one surface of the substrate, on a dye layer so that the receptive layer comes into contact with the dye layer; heating the laminate to form an image on the receptive layer; and transferring the receptive layer with an image formed thereon onto an object,

wherein the receptive layer contains a metal ion-containing compound and the dye layer contains a thermal diffusible dye capable of forming a chelate.

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5,837,650

PREPARATION OF WATER-DISPERSED FORMULATION BY NUCLEATION AND CRYSTALLIZATION OF LOW-MELTING POINT PESTICIDE ACTIVE INGREDIENT

James Franklin Essinger, Jr., Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 785,250, Jan. 17, 1997, Pat. No. 5,688,743, which is a continuation of Ser. No. 223,334, Apr. 15, 1994, abandoned. This application Oct. 23, 1997, Ser. No. 956,544

Int. Cl.^{6} A01N *25/08*

U.S. Cl. 504—116 **16 Claims**

1. A method for preparing an enhanced agriculturally acceptable stable water dispersible formulation of a low-melting temperature pesticide active in which a nucleating agent selected from the group consisting of carboxylic acids, esters, and amides or mixtures thereof, having a melting point range of about 30° to about 130° C. and having a chain length in the range from about 3 to about 30 carbon atoms and mixtures thereof, is formulated to provide an enhanced dispersible agricultural formulation containing said pesticide active which comprises the steps of:

a. admixing a low melt pesticide active ingredient with a porous carrier which has been warmed to a temperature in the range from about 30° C. to about 130° C., preferably from about 30° C. to about 90° C. to form a dry intermediate powder wherein the pesticide active has been absorbed as a liquid,

b. admixing with said dry intermediate powder with a nucleating agent selected from the above group to form a dry, powder formulation intermediate,

c. cooling said dry powder formulation intermediate and admixing therewith various functional ingredients as desired to provide a dry or liquid formulation having commercial formulation characteristics and thereafter

d. grinding said dry or liquid formulation to achieve desired dispersion particle size whereby a formulation of this invention is prepared.

5,837,651

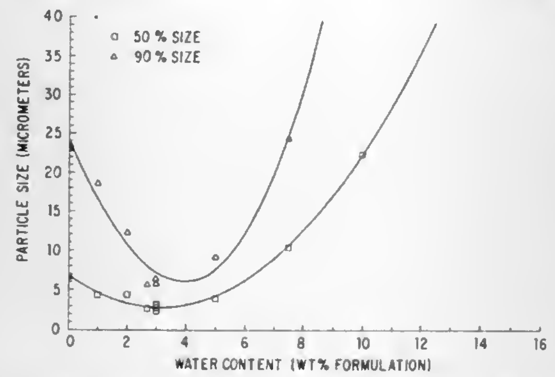
SOLID FORMULATION

Alister Christie Hill, Kent, England, assignor to American Cyanamid Company, Madison, N.J.

Continuation of Ser. No. 286,724, Aug. 5, 1994, Pat. No. 5,709,871. This application Oct. 29, 1996, Ser. No. 739,694

Int. Cl.^{6} A01N *33/26*

U.S. Cl. 504—116 **15 Claims**



1. A water dispersible solid formulation comprising an active ingredient selected from the group consisting of alachlor, aldicarb, alpha-cypermethrin, amitraz, cymoxanil, dimethomorph, flamprop-M, flurenol-butyl, flusilazole, pirimicarb, propoxur, tetrachlorvinphos, and a mixture thereof, the active ingredient having an average particle size by volume of less than about 50 μm;

at least about 10 wt % of a surfactant of non-ionic type selected from the group consisting of an alcohol and an ester;

at least about 4 wt % of a surfactant of an anionic type;

at least about 1 wt % of water; and

at least 30 wt % of urea whereby, when the water dispersible solid formulation is added to water, the average particle size of the active ingredient can decrease as the amount of the surfactant of the anionic type increases.

5,837,652

HERBICIDAL COMPOSITIONS

Gordon Anderson-Taylor, Ongar, England; Stephen Malcolm Irons, Lincoln, Nebr.; Brian Malcolm Luscombe, and Alan Gamblin, both of Ongar, England, assignors to Rhone-Poulenc Agriculture Limited, Essex, England

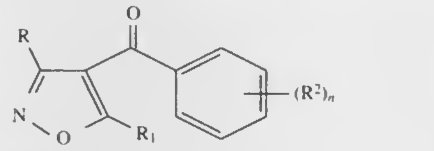
Filed Dec. 12, 1996, Ser. No. 766,182

Int. Cl.^{6} A01N *37/34;43/36*

U.S. Cl. 504—138 **18 Claims**

1. A method for controlling the growth of weeds at a locus which comprises applying to said locus a synergistic herbicidally effective amount of:

(a) a 4-benzoylisoxazole herbicide having the formula:



(I)

wherein:

R is hydrogen or $—CO_2R^3$;

R^1 is cyclopropyl;

R^2 is selected from the group consisting of halogen, $—S(O)_pMe$, C_{1-6} alkyl and C_{1-6} haloalkyl;

n is two or three;

p is zero, one or two; and

R^3 is C_{1-4} alkyl; and

(b) bromoxynil, which is 3,5-dibromo-4-hydroxybenzonitrile, or an agriculturally acceptable salt or ester thereof.

5,837,653

ENCAPSULATED PLANT GROWTH REGULATOR FORMULATIONS

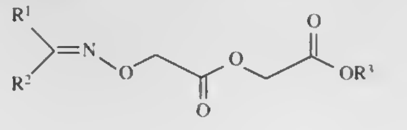
Charles W. Finch, Garner, N.C., assignor to BASF Corporation, Mount Olive, N.J.

Filed Dec. 20, 1996, Ser. No. 771,319

Int. Cl.^{6} A01N *37/00;37/02;37/14;25/00*

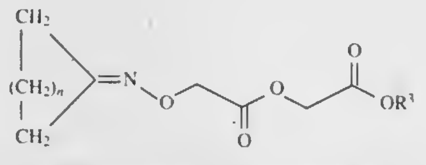
U.S. Cl. 504—319 **5 Claims**

1. An emulsion comprising an aqueous dispersion of polyvinyl alcohol encapsulated plant growth regulator particles wherein said particles have a mean volume diameter of greater than about 1 micron to about 80 microns and said emulsion is provided in the substantial absence of a salt and in the substantial absence of a thickener, and wherein the plant growth regulator comprises a substituted oxime-ether of the formula:



(I)

or



(II)

where R^1 and R^2 independent of one another are C_1 to C_6 alkyl, n is 2 or 3 and R^3 is hydrogen or C_1 to C_6 alkyl.

5,837,654

HIGH TEMPERATURE ENVIRONMENTALLY BENIGN DRILLING FLUID, AND VISCOSIFYING ADDITIVES FOR USE THEREWITH

Paul W. Carroll; David Hugh Durham, and Thomas C. Farrow, all of Gonzales, Tex., assignors to Southern Clay Products, Inc., Gonzales, Tex.

Filed May 6, 1997, Ser. No. 851,677

Int. Cl.^{6} C09K *7/06*

U.S. Cl. 507—100 **24 Claims**

1. An oil base environmentally benign drilling fluid composition having a stable high viscosity and high gel strength under high temperature drilling use at temperatures of ranging from around 300° F. up to at least 450° F., comprising a low toxicity biodegradable oil vehicle, and as a viscosifying agent, from an organoclay which is the reaction product of a mineral clay mixture and an alkyl quaternary ammonium salt, said mixture comprising:

60 to 98% by weight of a mineral clay (a) selected from the group consisting of sepiolite, palygorskite and mixtures of sepiolite and palygorskite; aid

substantially the balance of said mixture being a mineral clay (b) comprising a smectite selected from the group consisting of hectorite, montmorillonite, bentonite, beidelite, saponite, stevensite and mixtures thereof.

5,837,655

PURIFIED PARAFFINS AS LUBRICANTS, RATE OF PENETRATION ENHANCERS, AND SPOTTING FLUID ADDITIVES FOR WATER-BASED DRILLING FLUIDS

William S. Halliday, 12923 Lemur, Cypress, Tex. 77429, and Dennis K. Clapper, 10555 Turtlewood, No. 2708, Houston, Tex. 77072

Filed May 1, 1996, Ser. No. 641,595

Int. Cl.^{6} C09K *7/02*

U.S. Cl. 507—103 **25 Claims**

1. A method comprising

drilling a bore through a formation using a drilling fluid comprising water as a continuous phase; and

adding to said drilling fluid during said drilling a quantity of an additive comprising an amount of purified paraffins selected from the group consisting of white oils and food grade paraffins, said quantity being effective to perform a function selected from the group consisting of preventing a drill bit from sticking in a formation, enhancing penetration of a drill bit through a formation, and freeing a drill bit lodged in a formation.

5,837,656

WELL TREATMENT FLUID COMPATIBLE SELF-CONSOLIDATING PARTICLES

A. Richard Sinclair; Richard L. Johnson, II, both of Houston, Tex.; Richard A. Rediger, Newark, Ohio, and Van T. Smith, Houston, Tex., assignors to Santrol, Inc., Houston, Tex., and Georgia-Pacific Resins, Inc., Atlanta, Ga.

Continuation of Ser. No. 278,388, Jul. 21, 1994, abandoned. This application Mar. 5, 1996, Ser. No. 611,170

Int. Cl.^{6} C09K *7/00;* **B05D** *7/00;* **E21B** *43/26*

U.S. Cl. 507—220 **19 Claims**

1. A self-consolidating proppant for well treatment fluids comprising:

a particulate substrate, having a size between about 6 mesh and about 200 mesh, coated with an inner coating of a fusible curable resin; and

an outer coating of a substantially heat-cured resin, where:

the resin of the inner coating is selected from the group consisting of phenol-aldehyde resins, urea-aldehyde resins, melamine-aldehyde resins, epoxy resins, furfuryl alcohol resins, and copolymers of such resins;

the resin of the outer coating is selected from the group consisting of phenol-aldehyde resins, urea-aldehyde resins, melamine-aldehyde resins, epoxy resins, furfuryl alcohol resins, and copolymers of such resins, and

the resin of the outer coating is heat-curable at conditions that leave the resin of the inner coating uncured.

5,837,657

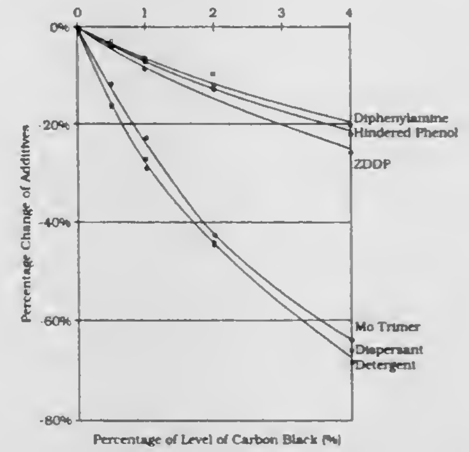
METHOD FOR REDUCING VISCOSITY INCREASE IN SOOTED DIESEL OILS

Howard L. Fang, 518 Glen Ridge South, Bridgewater, N.J. 08807; Jonathan M. McConnachie, 2 Prospects Hills, Apt. 1B, Flemington, N.J. 08822, and Edward Ira Stiefel, 3 Glen Eagles Dr., Bridgewater, N.J. 08807

Filed Dec. 2, 1997, Ser. No. 982,681

Int. Cl.^{6} C10M *135/00;139/00*

U.S. Cl. 508—363 **18 Claims**



1. A method for improving the performance of a sooted diesel oil and controlling soot induced viscosity increase and wear and extending diesel engine oil drain intervals comprising adding to a major amount of a diesel oil a minor amount of a composition comprising at least one compound having the formula $Mo_3S_kL_nQ_z$ and mixtures thereof wherein the L are independently selected ligands having organo groups with a sufficient number of carbon atoms to render the compound soluble or dispersible in the oil, n is from 1 to 4, k varies from 4 through 10, Q is a neutral electron donating compound selected from the group consisting of water, amines, alcohols, phosphines and ethers, and z ranges from 0 to 5 and includes non-stoichiometric values.

5,837,658

METAL FORMING LUBRICANT WITH DIFFERENTIAL SOLID LUBRICANTS

David J. Stork, P.O. Box 90298, Burton, Mich. 48509-0298

Filed Mar. 26, 1997, Ser. No. 824,320

Int. Cl.^{6} C10M *137/00*

U.S. Cl. 508—421 **19 Claims**

1. An aqueous metal working lubricant composition suitable for extreme condition lubrication in metal forming operations, comprising:

an organic phosphate ester lubricant; and dispersed therein one or more finely divided, high melt temperature, substantially halogen-free thermoplastics having a T_m of about 200° C. or greater, said aqueous metal lubricant composition being borate-free.

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5,837,659

PROCESS FOR PRODUCING C_9 C_{11} AND C_{13} ALKANOLS AND MICROORGANISM CAPABLE OF THE SAME

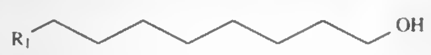
Mohamad I. Farbood, Holmdel; Laura E. Kizer, Sea Bright; Lynda B. McLean, Matawan, and Mark A. Sprecker, Sea Bright, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Aug. 21, 1997, Ser. No. 915,934

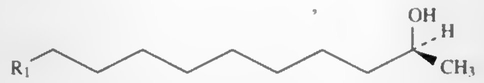
Int. Cl.^{6} C11D *9/44;3/50;* **A61K** *7/46*

U.S. Cl. 510—101 **5 Claims**

1. A process for augmenting, enhancing or imparting an aroma in or to a consumable material selected from the group consisting of perfume compositions and perfumed articles comprising the step of intimately admixing with said consumable material an aroma augmenting, enhancing or imparting quantity and concentration of a mixture of compounds having the structures:



and



wherein R_1 is selected from the group consisting of methyl and n-propyl; and wherein the mixture has an optical rotation of between about +0.2 and about +0.9°.

5,837,660

Patent Not Issued For This Number

5,837,661

CONDITIONING SHAMPOOS CONTAINING POLYALKYLENE GLYCOL

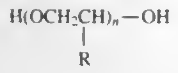
Mark David Evans, Cincinnati; Timothy Woodrow Coffindaffer, Loveland; Everett Junior Inman, Cincinnati; Susan Marie Guskey, Montgomery, all of Ohio, and Hirotaka Uchiyama, Kobe, Japan, assignors to Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 543,665, Oct. 16, 1995, abandoned. This application Sep. 29, 1997, Ser. No. 939,956

Int. Cl.^{6} C11D *1/02;1/94;3/37*

U.S. Cl. 510—122 **6 Claims**

1. A hair conditioning shampoo composition comprising:
- (a) from about 5% to about 50% by weight of a detersive surfactant selected from the group consisting of anionic surfactant, nonionic surfactant, amphoteric surfactant, zwitterionic surfactant, and mixtures thereof;
- (b) from about 0.05% to about 10% by weight of a dispersed silicone conditioning agent;
- (c) from about 0.1% to about 5% by weight of ethylene glycol distearate;
- (d) from about 0.025% to about 1.5% by weight of polyalkylene glycol corresponding to the formula:



$$H(OCH_2\underset{\displaystyle R}{\underset{|}{C}}H)_n-OH$$

wherein R is selected from the group consisting of hydrogen, methyl and mixtures thereof, and n is an integer having an average value of from about 1,500 to about 25,000; and
- (e) from about 20% to about 94.8% by weight of water.

5,837,662

POST-LAPPING CLEANING PROCESS FOR SILICON WAFERS

Jing Chai, St. Charles; Henry F. Erk, St. Louis; Judith Ann Schmidt, St. John, and Thomas Eugene Doane, St. Charles, all of Mo., assignors to MEMC Electronic Materials, Inc., St. Peters, Mo.

Filed Dec. 12, 1997, Ser. No. 990,123

Int. Cl.^{6} B08B *3/12;* **C23G** *1/02;1/14;* **H01L** *21/02*

U.S. Cl. 510—175 **23 Claims**

1. A process for cleaning contaminants from the surface of a semiconductor wafer after the semiconductor wafer has been lapped, the process comprising:
- (a) contacting the lapped wafer with an oxidizing agent to oxidize organic contaminants which may be present on the surface of the wafer;
- (b) after step (a), immersing the wafer in an aqueous bath comprising citric acid into which sonic energy is being directed to remove metallic contaminants which may be present on the surface of the wafer;
- (c) after step (b), contacting the wafer with hydrofluoric acid to remove a layer of silicon dioxide which may be present on the surface of the wafer; and,
- (d) after step (c), immersing the wafer in an aqueous bath into which sonic energy is being directed, the bath comprising an alkaline component and a surfactant.

5,837,663

MACHINE DISHWASHING TABLETS CONTAINING A PERACID

John Richard Nicholson, Ramsey; Bozena Marianna Piatek, Cedar Grove, both of N.J.; David John Lang, Ossining, N.Y., and Isaac Israel Secemski, Teaneck, N.J., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed Dec. 23, 1996, Ser. No. 780,062

Int. Cl.^{6} C11D *17/00;3/395*

U.S. Cl. 510—226 **19 Claims**

1. A detergent composition in solid form useful for machine dishwashing comprising
- a) a first layer comprising
  - (i) a buffering system,
  - (ii) about 5 wt. % to about 90 wt. % of a builder,
  - (iii) an effective amount up to 10 wt. % of an enzyme used to facilitate the removal of soils,

  wherein the first layer dissolves to deliver a pH of about 9.0 to about 11 in wash water; and
- b) a second layer comprising
  - (i) an effective amount of a peracid to bleach the soils in a machine dishwasher,
  - (ii) 1–40 wt. % of an acidity agent, and
  - (iii) an effective amount of a material to form a continuous medium as a carrier for the peracid and acidity agent, the material having a melting point in the range of from about 35° to about 50°.

  wherein the second layer dissolves in the wash water to deliver a pH of from about 6.5 to about 9.

5,837,664

AQUEOUS SHOWER RINSING COMPOSITION AND A METHOD FOR KEEPING SHOWERS CLEAN

Robert H. Black, 4858 Mariner Point, Jacksonville, Fla. 32225

Filed Jul. 16, 1996, Ser. No. 683,052

Int. Cl.^{6} C11D *1/08;3/08;3/44*

U.S. Cl. 510—238 **12 Claims**

1. An aqueous rinsing solution for keeping showers and tub surfaces clean, comprising:
- 0.5 to 3% by volume of an anionic surfactant capable of chelating metal ions which is N-acyl-N,N',N'-ethylene diamine triacetic acid or a diammonium salt thereof;

- 1 to 8% by volume of an alcohol selected from the group consisting of isopropyl alcohol, ethyl alcohol, n-propyl alcohol, n-butyl alcohol, isobutyl alcohol, ethylene glycol, propylene glycol isopropyl ether of ethylene glycol, ethyl ether of ethylene glycol, glycerol, and mixtures thereof; and
- water, wherein said aqueous rinsing solution has a pH in a range of 4 to 6.

5,837,665

SPOT CLEANER FOR CARPETS

Robert Young, 8601 Roland St., Suite A, Buena Park, Calif. 90621

Continuation-in-part of Ser. No. 644,665, May 2, 1996, abandoned. This application Jun. 9, 1997, Ser. No. 871,459

Int. Cl.^{6} C11D *3/06;3/20;* **B08B** *3/00*

U.S. Cl. 510—278 **4 Claims**

1. An aqueous liquid detergent composition used for the cleaning of fabrics, consisting of three to eight percent by weight of an alkali metal polyphosphate, or tripolyphosphate; one to four percent by weight of an alkali metal alkylaryl sulfonate; and eight to twenty percent by weight of a mono-alkyl ether of ethylene glycol; said weight percentages being of a total aqueous composition.

3. A process of cleaning a carpet comprising contacting said carpet with an aqueous liquid detergent composition consisting essentially of three to eight percent by weight of an alkali metal polyphosphate, or tripolyphosphate; one to four percent by weight of an alkali metal alkylaryl sulfonate; and eight to twenty percent by weight of a mono-alkyl ether of ethylene glycol; said weight percentages being of a total aqueous composition.

5,837,666

DETERGENT COMPOSITIONS COMPRISING METHYL CELLULOSE ETHER

Susumu Murata, Amagasaki; David Johnathan Kitko, Nishinomiya; Kiyomi Shimamura, Higashisumiyoshi-ku, and Allen David Clauss, Higashinada, all of Japan, assignors to The Procter & Gamble Company, Cincinnati, Ohio

PCT No. PCT/US95/07785, § 371 Date Dec. 16, 1996, § 102(e) Date Dec. 16, 1996, PCT Pub. No. WO96/00770, PCT Pub. Date Jan. 11, 1996

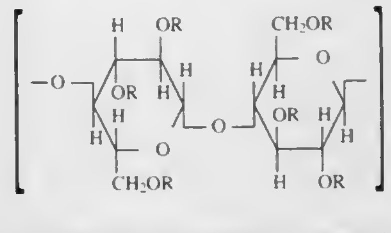
PCT Filed Jun. 19, 1995, Ser. No. 765,851

Claims priority, application Japan, Jun. 30, 1994, 6-148881

Int. Cl.^{6} C11D *3/22;3/395;3/60*

U.S. Cl. 510—299 **20 Claims**

1. A detergent composition, comprising:
- (i) from 0.05 to 2% by weight of methyl cellulose ether having a solution viscosity measured at a temperature of 20° C. as a 2% wt % aqueous solution of from 80 to 120 centipoises (cps) and an average degree of methyl substitution (DS methyl) per anhydroglucose of from about 1.6 to about 2.3, the methyl cellulose ether being of the formula



wherein each R individually represents a hydrogen atom or a methyl group, and n represents a degree of polymerization and is a value sufficient to provide said solution viscosity:
- (ii) from 25 to 65% by weight of detergent surfactant;
- (iii) from 0 to 20% by weight of bleaching component; and
- (iv) from 30 to 70% by weight of builder and alkaline material.

13. A method of washing polyester fabric in cold water, comprising adding a detergent composition according to claim 1 to washing water at a temperature of not more than 30° C. and contacting the washing water with soiled polyester fabric.

5,837,667

ENVIRONMENTALLY SAFE DETERGENT COMPOSITION AND METHOD OF USE

Garth E. Stabley, 5055 S. Lindell Rd. No. 1104, Las Vegas, Nev. 89118

Filed Jun. 17, 1997, Ser. No. 877,573

Int. Cl.^{6} C11D *1/825;3/30*

U.S. Cl. 510—365 **12 Claims**

1. A cleaning composition for use essentially on solid surfaces, the cleaning composition comprising water, a linear primary alcohol ethoxylate mixture, an acid phosphate ester of an ethoxylated alcohol, a chelating agent and a mixture of monoethanolamine and triethanolamine in approximately equal amounts.

5,837,668

ACYLOXYALKANE SULFONATE AND AMPHOTERIC SURFACTANT BLEND COMPOSITIONS AND METHODS FOR PREPARING SAME

David James Tracy, Plainsboro, and Paul Frank D'Angelo, Princeton, both of N.J., assignors to Rhodia Inc., Cranbury, N.J.

Filed Apr. 30, 1996, Ser. No. 641,124

Int. Cl.^{6} B01F *17/00;* **C11D** *1/12*

U.S. Cl. 510—418 **22 Claims**

1. A process for preparing blends or slurries of acyloxyalkane sulfonate salts of the formula:

$$R_1C(O)O(CH_2)_nSO_3Y$$

wherein R_1 is a hydrocarbyl radical having from 6 to 26 carbon atoms, n is an integer of from 2 to 4 and Y is an alkali metal or alkaline earth metal with amphoteric surfactants comprising
- (a) acylating hydroxylkane sulfonic acid with a fatty acid at a temperature above about 180° C. forming a molten reaction mass of acyloxyalkane sulfonate salts,
- (b) quenching said molten mass in an aqueous quench liquid comprising an amphoteric and/or anionic surfactant, and
- (c) recovering the blend comprising acyloxyalkane sulfonate and amphoteric and/or anionic surfactant.

5,837,669

PHOSPHORIC ESTERS OF ALKYL OR ACYL DIANHYDRO-1,4:3,6-D-GLUCITOL, PREPARATION PROCESS AND USES THEREOF

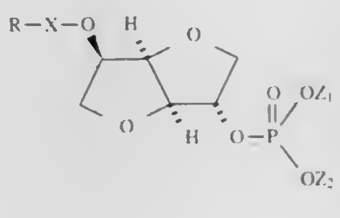
Serge Petit, Cusy; Stephane Fouquay, Mont-Saint-Aignan, and Daniel Bernard, Courbevoie, all of France, assignors to Ceca S.A., France

Filed Mar. 26, 1997, Ser. No. 824,728

Int. Cl.^{6} C11D *1/34;* **C07H** *11/04*

U.S. Cl. 510—467 **17 Claims**

1. A compound of formula:



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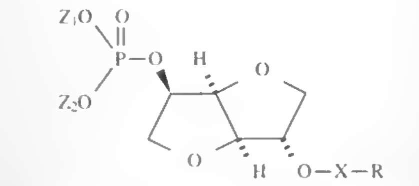
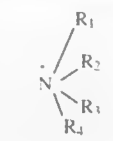

(II)

wherein

R is a saturated or unsaturated linear or branched C_{5-21}-alkyl radical,

X is -CO- or $-CH_2-$,

Z_1 and, Z_2 are independently, a hydrogen atom, an alkali metal, an alkaline earth metal or a quaternary ammonium of formula:



wherein R_1, R_2, R_3 and R_4, are, independently, a hydrogen atom, or a C_{1-6}-alkyl or -hydroxyalkyl radical or a basic amino acid residue.

5,837,670

DETERGENT COMPOSITIONS HAVING SUDS SUPPRESSING PROPERTIES

Richard Timothy Hartshorn, 8 Hersham Close, Kingston Park, Newcastle upon Tyne, NE3 2TN, Great Britain

PCT No. PCT/US95/04758, § 371 Date Nov. 21, 1996, § 102(e) Date Nov. 21, 1996, PCT Pub. No. WO95/32268, PCT Pub. Date Nov. 30, 1995

PCT Filed Apr. 18, 1995, Ser. No. 737,943

Int. Cl.⁶ C11D *3/32;3/395;1/10*

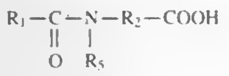
U.S. Cl. 510—490 **7 Claims**

1. An aqueous wash liquor comprising:

(a) a detersive surfactant comprising a C_{10}–C_{20} alkyl sulphate;

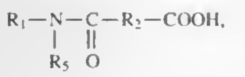
(b) an ingredient selected from the group consisting of sulfonated zinc phthalocyanines, sulfonated aluminum phthalocyanines and mixtures thereof; and

(c) a suds suppressor compound of the formula:



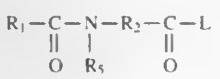
$$R_1-\underset{\underset{\displaystyle O}{\|}}{C}-\underset{\underset{\displaystyle R_5}{|}}{N}-R_2-COOH$$

or



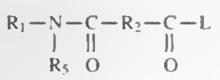
$$R_1-\underset{\underset{\displaystyle R_5}{|}}{N}-\underset{\underset{\displaystyle O}{\|}}{C}-R_2-COOH,$$

wherein said suds suppressor is formed from a suds suppressor precursor of formula:



$$R_1-\underset{\underset{\displaystyle O}{\|}}{C}-\underset{\underset{\displaystyle R_5}{|}}{N}-R_2-\underset{\underset{\displaystyle O}{\|}}{C}-L$$

or



$$R_1-\underset{\underset{\displaystyle R_5}{|}}{N}-\underset{\underset{\displaystyle O}{\|}}{C}-R_2-\underset{\underset{\displaystyle O}{\|}}{C}-L$$

wherein R_1 is an allyl, aryl or alkaryl group containing from 1 to 14 carbon atoms, R_2 is an alkaline, arylene or alkarylene group containing from 1 to 14 carbon atoms, and R_5 is H or an alkyl, aryl, or alkaryl group containing from 1 to 10 carbon atoms and L is a leaving group.

5,837,671

ORGANOLEPTIC COMPOUND AND COMPOSITION

Roman Kaiser, Uster, Switzerland, assignor to Givaudan-Roure (International) SA, Vernier-Geneve, Switzerland

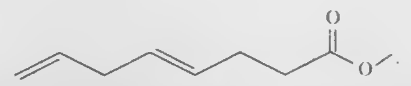
Filed Oct. 31, 1996, Ser. No. 741,438

Claims priority, application Switzerland, Nov. 10, 1995, 3191/95

Int. Cl.⁶ A61K *7/46*

U.S. Cl. 512—26 **7 Claims**

1. The olfactive compound methyl (E)-4,7-octadienoate of formula: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2. A method for enhancing organoleptic properties of an odorant and/or flavorant composition comprising including in said composition an organoleptically effective amount of methyl (E)-4,7-octadienoate (1).

5,837,672

METHODS AND COMPOSITIONS FOR THE DETECTION OF SOLUBLE β-AMYLOID PEPTIDE

Dale B. Schenk, Pacifica, Calif.; Michael G. Schlossmacher, Vienna, Austria; Dennis J. Selkoe, Jamaica Plain, Mass.; Peter A. Seubert, South San Francisco, and Carmen Vigo-Pelfrey, Mountain View, both of Calif., assignors to Athena Neurosciences, Inc., So. San Francisco, Calif.; Eli Lilly and Company, Indianapolis, Ind., and Brigham and Women's Hospital, Boston, Mass.

Division of Ser. No. 437,067, May 9, 1995, Pat. No. 5,593,846, and a continuation-in-part of Ser. No. 911,647, Jul. 10, 1992, abandoned. This application Jun. 1, 1995, Ser. No. 456,347

Int. Cl.⁶ A61K *31/00;38/00*

U.S. Cl. 514—2 **14 Claims**

1. A method for reducing the production of soluble β-amyloid protein (βAP) in a mammalian host which expresses one or more APP isotypes and/or naturally occurring variants, said method comprising administering to the host an amount of a small molecule effective to reduce the amount of a soluble βAP present in a body fluid of the host.

5,837,673

CAMPTOTHECIN DERIVATIVES

Kenji Tsujihara, Urawa; Takayuki Kawaguchi, Toshima-ku; Satoshi Okuno, Misato, and Toshiro Yano, Urawa, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

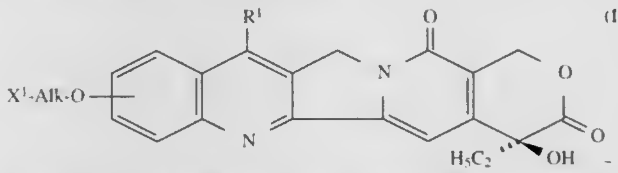
Filed Jul. 30, 1996, Ser. No. 689,018

Claims priority, application Japan, Aug. 2, 1995, 7-197391; Dec. 27, 1995, 7-340619; Jul. 3, 1996, 8-173372

Int. Cl.⁶ A61K *31/00;38/14;* **C07K** *9/00*

U.S. Cl. 814—2 **47 Claims**

1. A camptothecin-polysaccharide complex comprising (A) a camptothecin compound of the formula


(I)

wherein R^1 is a lower alkyl group, which may optionally be substituted by groups selected from the group consisting of a protected or unprotected hydroxy, mercapto and amino group. X^1 is a group of the formula: $-NHR^2$ (R^2 is a hydrogen atom or a lower alkyl group) or a group of the formula: —OH, and Alk is a straight chain or branched chain alkylene group having optionally an oxygen atom in the chain thereof, (B) a polysaccharide having carboxyl groups bonded to (C) an amino acid or a peptide, said amino acid or peptide being bonded to X^1 of the camptothecin compound (I), or a pharmaceutically acceptable salt thereof.

5,837,674

PHOSPHOPEPTIDES AND METHODS OF TREATING BONE DISEASES

Yoshinari Kumagai, Foster City, Calif., and Akira Otaka, Hirakata, Japan, assignors to Big Bear Bio, Inc., San Mateo, Calif.

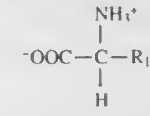
Filed Jul. 3, 1996, Ser. No. 675,031

Int. Cl.⁶ A61K *38/00;38/04;* **A01N** *57/10;* **C07K** *5/00*

U.S. Cl. 514—7 **11 Claims**

1. A non-natural, synthetic polypeptide comprising monomer units selected from the group consisting of:

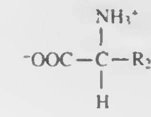
(a) a unit (I) selected from the group consisting of any naturally occurring amino acid and an amino acid residue of the general structural formula (I'):



$$^{-}OOC-\overset{\overset{\displaystyle NH_3^+}{|}}{\underset{\underset{\displaystyle H}{|}}{C}}-R_1$$

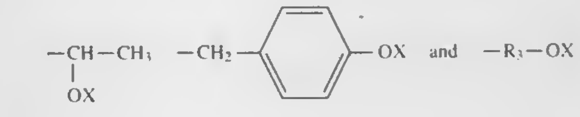
wherein R_1 is selected from the group consisting of D- and L-amino acid side chains, ornithine, and γ-carboxyl glutamic acid; and

(b) an amino acid residue of the general structural formula (II):

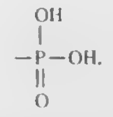


$$^{-}OOC-\overset{\overset{\displaystyle NH_3^+}{|}}{\underset{\underset{\displaystyle H}{|}}{C}}-R_2$$

wherein R_2 is selected from the group consisting of



wherein X is



$$-\overset{\overset{\displaystyle OH}{|}}{\underset{\underset{\displaystyle O}{\|}}{P}}-OH.$$

wherein R_3 is an alkyl containing 1 to 7 carbon atoms, I and II are not the same, and the polypeptide has from two to fourteen monomer units, and I and II are present in alternating positions $(I-II)_n$ where n is an integer of from 1 to 7.

5,837,675

SYNERGISTIC EFFECT OF INSULIN-LIKE GROWTH FACTOR-I AND ERYTHROPOIETIN

Alan G. Brox, 3547 Vendome, Montreal, Quebec, Canada, H4A 3M6

Filed Feb. 3, 1995, Ser. No. 383,012

Int. Cl.⁶ A61K *38/30;38/42;38/00;* **C07K** *14/00*

U.S. Cl. 514—8 **11 Claims**

1. Method of increasing hemoglobin level in an anemic mammal having a low level of erythropoietin, comprising an administration to said mammal an effective, physiologically acceptable amount of insulin-like growth factor.

5,837,676

USE OF SCATTER FACTOR TO ENHANCE ANGIOGENESIS

Itzhak D. Goldberg, Englewood, N.J., and Eliot M. Rosen, Port Washington, N.Y., assignors to Long Island Jewish Medical Center, New Hyde Park, N.Y.

Continuation of Ser. No. 138,667, Oct. 18, 1993, abandoned. This application Nov. 13, 1996, Ser. No. 746,636

Int. Cl.⁶ A61K *38/18*

U.S. Cl. 514—8 **10 Claims**

1. A method for promoting angiogenesis in a mammal comprising administering to said mammal an amount of scatter factor effective to promote angiogenesis in said mammal.

5,837,677

METHOD FOR THE TREATMENT OF CANCER WITH EXOCHELINS OF *MYCOBACTERIUM TUBERCULOSIS*

Lawrence D. Horwitz, and Kathryn B. Horwitz, both of Englewood, Colo., assignors to Keystone Biomedical, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 383,180, Feb. 3, 1995, Pat. No. 5,721,209. This application Jun. 25, 1997, Ser. No. 882,122

Int. Cl.⁶ A61K *38/12*

U.S. Cl. 514—11 **5 Claims**

1. A method of treating cancer in a patient in need of such treatment, comprising administering to said patient a composition comprising a solution containing an amount of a desferri-Exochelin effective to inhibit the growth of and/or kill cancer cells.

5,837,678

THERAPEUTIC USES OF BACTERICIDAL/PERMEABILITY INCREASING PROTEIN PRODUCTS

Roger G. Little, II, Benicia, Calif., assignor to XOMA Corporation, Berkeley, Calif.

Continuation of Ser. No. 415,158, Mar. 31, 1995, which is a continuation-in-part of Ser. No. 30,644, Mar. 12, 1993, Pat. No. 5,348,942. This application Jun. 6, 1995, Ser. No. 466,624

Int. Cl.⁶ A61K *38/00;* **C07K** *1/00*

U.S. Cl. 514—12 **7 Claims**

1. A method of inhibiting angiogenesis comprising administering to a subject an amount of a bactericidal/permeability-increasing (BPI) protein product effective to inhibit angiogenesis.

5,837,679

AGENTS AFFECTING THROMBOSIS AND HEMOSTASIS

David L. Wolf, Palo Alto, and Uma Sinha, San Francisco, both of Calif., assignors to COR Therapeutics, Inc., South San Francisco, Calif.

Division of Ser. No. 268,003, Jun. 29, 1994, Pat. No. 5,583,107, which is a continuation-in-part of Ser. No. 249,777, May 26, 1994, Pat. No. 5,597,799, which is a continuation of Ser. No. 808,329, Dec. 16, 1991, abandoned, which is a continuation-in-part of Ser. No. 578,646, Sep. 4, 1990, Pat. No. 5,278,144. This application Jun. 6, 1995, Ser. No. 469,301

Int. Cl.⁶ A61K *38/36;35/14;* **C07K** *14/475;1/06*

U.S. Cl. 514—12 **46 Claims**

1. A procoagulant composition comprising a blood factor selected from the group consisting of Factor IXa, Factor VIIa, and biologically active polypeptide fragments thereof, which blood factor has been transiently modified to have little or no enzymatic activity with the proviso that said transient modification is not

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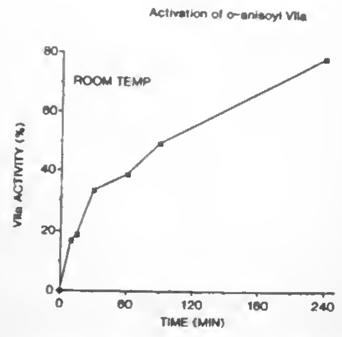


accomplished with an acylating agent that releases substantially all of the bound enzyme in active form as a result of exposure to light.

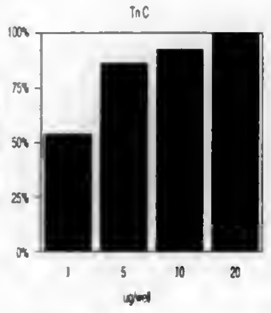
5,837,680
PHARMACEUTICAL COMPOSITIONS COMPRISING TROPONIN SUBUNITS, FRAGMENTS AND ANALOGS THEREOF AND METHODS OF THEIR USE TO INHIBIT ANGIOGENESIS

Marsha A. Moses, Brookline; Robert S. Langer, Newton; Dimitri G. Wiederschain, Brookline; Inmin Wu, Boston, and Arthur Sytkowski, Arlington, all of Mass., assignors to Children's Medical Center Corporation, Boston, Mass.

Filed Feb. 16, 1996, Ser. No. 602,941

Int. Cl.^{6} C07K *14/47;14/435;* **A61K** *38/00;38/04*

U.S. Cl. 514—12 **5 Claims**



1. A method of inhibiting atopic angiogenesis in a subject, having a disease or disorder causing atopic angiogenesis comprising applying to a site of atopic angiogenesis an amount of a peptide that is effective to inhibit angiogenesis, in which the peptide is:

- a. an inhibitor of bFGF-stimulated bovine endothelial cell proliferation having an IC_{50} of at least 10 μM;
- b. greater than 75 amino acids in length; and
- c. greater than 80% homologous with a subunit selected from the group consisting of human fast-twitch troponin I subunit (SEQ. ID. NO:2), human fast-twitch troponin C subunit (SEQ. ID. NO:1) and human fast-twitch troponin T subunit (SEQ. ID. NO:3).

5,837,681
METHOD FOR TREATING SENSORINEURAL HEARING LOSS USING GLIAL CELL LINE-DERIVED NEUROTROPHIC FACTOR (GDNF) PROTEIN PRODUCT

Ella Magal, Thousand Oaks, Calif., assignor to Amgen Inc., Thousand Oaks, Calif.

Filed Feb. 23, 1996, Ser. No. 606,176

Int. Cl.^{6} C12N *15/12;* **A61K** *38/18*

U.S. Cl. 514—12 **8 Claims**

1. A method for treating injury or degeneration of cells of the inner ear, comprising administering a glial cell line-derived neurotrophic factor (GDNF) protein product comprising an amino acid sequence set forth in SEQ ID NO:1, wherein said GDNF protein product promotes the survival or function of cochlear hair cells and auditory neurons of the inner ear.

5,837,682
ANGIOSTATIN FRAGMENTS AND METHOD OF USE

M. Judah Folkman, Brookline; Michael S. O'Reilly, Winchester, both of Mass.; Yihai Cao, Stockholm, Sweden, and Kim Lee Sim, Gaithersburg, Md., assignors to The Children's Medical Center Corporation, Boston, Mass.

Filed Mar. 8, 1996, Ser. No. 612,788

Int. Cl.^{6} C07K *14/00*

U.S. Cl. 514—12 **10 Claims**

1. A pharmaceutical composition comprising an angiostatin fragment having endothelial cell proliferation inhibiting activity, said angiostatin fragment being a kringle 2–3 region or a kringle 1–2 region.

5,837,683

Patent Not Issued For This Number

5,837,684
PEPTIDES

Lars Orning; Beate Arbo; Peter Fischer, and Kjell S. Sakariassen, all of Oslo, Norway, assignors to Nycomed Imaging AS, Oslo, Norway

Filed Jun. 7, 1995, Ser. No. 479,223

Int. Cl.^{6} A61K *38/04;* **C07K** *16/00;17/00;5/00*

U.S. Cl. 514—15 **6 Claims**

1. The peptides having the amino acid sequences Thr—Leu—Tyr—Tyr—Trp—Arg—Ala—Ser—Ser—Thr (SEQ. ID. NO: 3) and Ile—Ile—Thr—Tyr—Arg—Lys—Gly—Ser—Ser—Thr (SEQ. ID. NO: 2).

5,837,685
PEPTIDES FROM *PSEUDOMONAS SYRINGAE* POSSESSING BROAD-SPECTRUM ANTIBIOTIC ACTIVITY

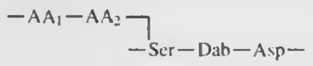
Gary A. Strobel, Bozeman, Mont.; Leslie A. Harrison, Chesterfield, Mo., and David B. Teplow, Waban, Mass., assignors to Research and Development Institute Inc. at Montana State University, Bozeman, Mont.

Continuation of Ser. No. 305,943, Sep. 15, 1994, Pat. No. 5,576,298, which is a continuation-in-part of Ser. No. 982,687, Nov. 30, 1992, abandoned. This application Jun. 27, 1996, Ser. No. 673,775

Int. Cl.^{6} A61K *38/12*

U.S. Cl. 514—15 **19 Claims**

1. A substantially pure pseudomycin obtained from a pseudomonas bacteria comprising the amino acid sequence:



$$-AA_1-AA_2\neg\ \ -Ser-Dab-Asp-$$

wherein

AA_1 is L-3-hydroxy-aspartyl;

AA_2 is L-4-chlorothreonyl;

Ser is L-serinyl;

Dab is D-diaminobutyryl; and

Asp is L-aspartyl:

and wherein the carboxyl group of AA_2 is bonded to the serinyl hydroxyl group via an ester linkage.

5,837,686
PEPTIDES AND ANTIBODIES FOR TREATMENT OF RHEUMATOID ARTHRITIS

Julian Kirby; Ian V. Lewin, both of Staffordshire; Sarita Maman, West Midlands, and Denis R. Stanworth, Birmingham, all of United Kingdom, assignors to Peptide Therapeutics Limited, Cambridgeshire, England

PCT No. PCT/GB92/02174, § 371 Date Jul. 28, 1994, § 102(e) Date Jul. 28, 1994, PCT Pub. No. WO93/11153, PCT Pub. Date Jun. 10, 1993

Continuation-in-part of Ser. No. 70,117, Jun. 1, 1993, abandoned. This PCT application Nov. 25, 1992, Ser. No. 244,496

Claims priority, application United Kingdom, Nov. 25, 1991, 9125024

Int. Cl.^{6} A61K *38/03;* **C07K** *4/00*

U.S. Cl. 514—17 **12 Claims**

1. A pharmaceutical composition comprising a prophylactically or therapeutically effective amount of a synthetic peptide consisting of from 3 to 7 amino acid residues or analogue thereof wherein the analogue is at least partly non-peptide in nature comprising a single theol-active cysteine residue and having the following formula:

$$Z^1_a\text{-}B^1_c\text{-Cys-}B^2_d\text{-Lys-Lys-}Z^2_b$$

wherein Z^1, Z^2, B^1 and B^2 represent sequences of positively charged, negatively charged or neutral amino acid residues (other than Ser adjacent Cys) or sequences of any mixture of positively charged, negatively charged or neutral amino acid residues (other than Ser adjacent Cys); or B^1 and B^2 represent non-peptide spacer arms of a length equivalent to that determined by the length of d and c residues of amino acids

c=0 to 4, d=0 to 4; and

a=0 to 4 and b=0 to 4;

and wherein a positively charged amino acid residue is located on the peptide's N-terminal or C-terminal; the peptide or analogue thereof being capable of preventing the formation of or dissociating already formed 1 ga-α_1AT complex, and with the proviso that the peptide does not include the sequences Cys-Ala-Lys-Lys-Ile and Cys-Lys-Lys-Thr-Glu.

5,837,687
AZAPEPTIDE DERIVATIVE

Yoshiharu Nakashima; Michiyo Hizuka; Yasushi Higashide; Tetsuaki Yamaura, and Hiroshi Ikawa, all of Tokyo, Japan, assignors to Fujirebio Inc., Tokyo, Japan

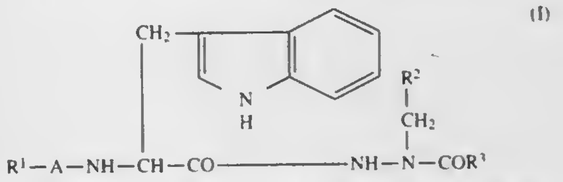
Filed Mar. 17, 1995, Ser. No. 406,053

Claims priority, application Japan, Mar. 17, 1994, 6-047206; Apr. 19, 1994, 6-080547

Int. Cl.^{6} A61K *38/07;* **C07K** *5/04*

U.S. Cl. 514—18 **17 Claims**

1. An azapeptide compound represented by the formula (I):



(I)

wherein A represents a direct bond, an α-amino acid or a residue of a dipeptide; R^1 represents a hydrogen atom or a protective group for a terminal amino group;

R^2 represents a phenyl group or a phenyl group substituted by one or two substituents selected from the group consisting of a lower alkyl group, halogen atom, hydroxyl group which may be protected, nitro group, amino group which may be protected and perhalo lower alkyl group; and R^3 represents a hydroxyl group or a protective group for a terminal carboxyl group, and a salt thereof.

5,837,688
USE OF THROMBOLYTIC REAGENTS FOR PREVENTION OF VASCULAR DISEASE

Mathew I. Gelfand, 245 Fairway Rd., Lido Beach, N.Y. 11561

Filed Nov. 27, 1996, Ser. No. 758,615

Int. Cl.^{6} A61K *38/00*

U.S. Cl. 514—21 **17 Claims**

1. A method for prevention of thrombotic vascular disease in a mammal, comprising the chronic administration to a patient in need thereof of an effective dose of a thrombolytic reagent to a mammal.

5,837,689
SIALYL LEWIS-X MIMETICS CONTAINING NAPHTHYL BACKBONES

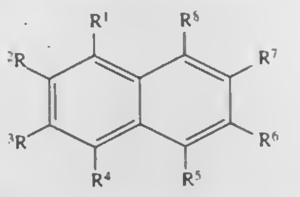
Mark B. Anderson, Orinda; Daniel E. Levy, Oakland; Peng Cho Tang, Moraga; John H. Musser, San Carlos, and Narasinga Rao, Alameda, all of Calif., assignors to Glycomed Incorporated, Alameda, Calif.

Continuation-in-part of Ser. No. 446,185, May 19, 1995, and Ser. No. 289,715, Aug. 12, 1994, Pat. No. 5,658,880, which is a continuation-in-part of Ser. No. 78,949, Jun. 16, 1993, abandoned. This application Feb. 21, 1996, Ser. No. 604,160

Int. Cl.^{6} A61K *31/70;* **C07H** *15/00*

U.S. Cl. 514—25 **33 Claims**

1. A compound of the formula I:



(I)

wherein

R^1, R^2, R^3, R^4, R^5, R^6, R^7, and R^8 are independently selected from the group consisting of

(a) —H, Y—B, alkyl of 1 to 4 carbon atoms optionally substituted with 1 to 2 lower alkyl groups,

$-W((CH_2)_n-B)_r$, $-W((CH_2)_m-(CHR^9)_q-(CH_2)_m-A)_r$;

—OH, lower alkoxy, lower aryloxy, lower aralkoxy, lower alkoxyaryl, amino,

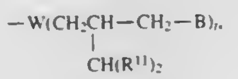
$-W((CH_2)_n-A)_r$, $-O-CH_2-C\equiv C-B$, $-N(Ac)-CH_2-C\equiv C-B$, $-NH-CH_2-C\equiv C-B$, $-N(CH_2-C\equiv C-B)_2$, $-N(Ac)CH_2Ar-B$, $-NHCH_2Ar-B$, $-N(CH_2Ar-B)_2$, $-OCH_2Ar-B$, $-(C{=}O)(CH_2)_m-B$, and

(b) A and B; wherein:

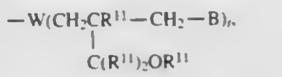
Y—B is selected from the group consisting of

$$-W(CH_2(C{=}O)CH_2-B)_t,$$

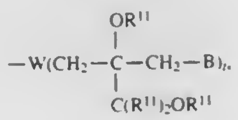
$$-W(CH_2(C{=}C(R^{15})_2)-CH_2-B)_t,$$



$$-W(CH_2\underset{CH(R^{11})_2}{CH}-CH_2-B)_n,$$

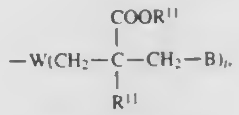


$$-W(CH_2\underset{C(R^{11})_2OR^{11}}{CR^{11}}-CH_2-B)_n,$$

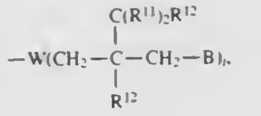


$$-W(CH_2-\overset{OR^{11}}{\underset{C(R^{11})_2OR^{11}}{C}}-CH_2-B)_n,$$

$$-W(CH_2C(R^{11})_2-CH_2-B)_n,$$



$$-W(CH_2-\overset{COOR^{11}}{\underset{R^{11}}{C}}-CH_2-B)_n,$$



$$-W(CH_2-\overset{C(R^{11})_2R^{12}}{\underset{R^{12}}{C}}-CH_2-B)_n,$$

$$-W(CH_2CR^{11}(OR^{11})CH_2-B)_t;$$

A is selected from the group consisting of $-(C{=}O)R^{11}$, sialic acid, Kemp's acid, quinic acid, —B, $-SO_3M$, $-OSO_3M$, $-SO_2NH_2$, $-PO_3M'_2$, $-OPO_3M'_2$, $-NO_2$,

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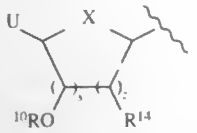
saturated or unsaturated carboxylic acids of 1 to 4 carbon atoms, optionally substituted with 1 to 2 hydroxyl groups, and esters, and amides of the carboxylic acid substitutents;

W is selected from the group consisting of a covalent bond, —O—, —N, —S—, —NH—, and —NAc—;

B is



wherein

U is selected from the group consisting of -R^9, —CH$_2$OR^{10}, —CH$_2$O-protecting group, —COOR^{11}, —CON(R^{11})$_2$, and —COOM;

R^9 is lower alkyl;

each n is independently selected from the group 0, 1, 2, and 3;

each m is independently selected from the group 0, 1, 2, 3, and 4;

each q is independently selected from the group 0, 1, and 2;

each s is independently selected from the group 1, 2, and 3;

each z is independently selected from the group 1 and 2;

each t is independently selected from the group 1 and 2, with the proviso that when W is —N<, then t is 2, and for all other definitions of W, t is 1;

R^{10} is selected from the group consisting of —H, —R^{11}, —SO$_3$M, —(C═O)R^{11}, —SO$_2$NH$_2$, —PO$_3$M'$_2$, -alk—COOR^{13}, alk—CON(R^{11})$_2$ and —O-carbohydrate;

R^{11} is independently selected from the group consisting of —H, lower alkyl, cyclic alkyl of 5 to 6 carbon atoms, heterocyclic alkyl of 4 to 5 carbon atoms and 1 to 2 heteroatoms, lower aryl and lower aralkyl:

R^{12} is selected from the group consisting of —N(R^{11})$_2$, and —SR^{11};

R^{13} is selected from the group consisting of R^{11}, and M;

R^{14} is selected from the group consisting of —H, and —OR^{10}, with the proviso that when z is 2, then the two R^{14} groups taken together with the carbon atoms to which each R^{14} group is attached may form a double bond;

R^{15} is independently selected from the group consisting of —R^{11} and —COOH;

M is selected from the group consisting of Na$^+$, K$^+$, Mg^{2+}, and Ca^{2+};

M' is selected from the group consisting of —H, —M, and R^9; and

X is selected from the group consisting of —O—, —S—, —C(R^{11})$_2$—, and —N(R^{11})—; and pharmaceutically acceptable salts thereof with the provisos that:

(a) when any of R^1, R^2, R^3, R^4, R^5, R^6, R^7, and R^8 are —Y—B and W is a covalent bond, then at least one adjacent position must be —OH or an ether moiety;

(b) no more than two of R^1, R^2, R^3, R^4, R^5, R^6, R^7, and R^8 may be Y—B when W is a covalent bond;

(c) no more than three of R^1, R^2, R^3, R^4, R^5, R^6, R^7, and R^8 may be a covalent bond to A;

(d) only one of R^1, R^4, R^5, and R^8 may be a covalent bond to B;

(e) when one of R^1, R^4, R^5, or R^8 is a covalent bond to B, then no more than two other naphthyl substituents can be a covalent bond to A when A is not B;

(f) at most three of R^1, R^2, R^3, R^4, R^5, R^6, R^7, and R^8 may be independently selected from the group consisting of —OH and ether moieties;

(g) at least one of R^1, R^2, R^3, R^4, R^5, R^6, R^7, and R^8 is —H;

(h) when any of R^1, R^4, R^5, and R^8 is a covalent bond to B, then the adjacent position must be —OH or an ether moiety;

(i) at least one of R^1, R^2, R^3, R^4, R^5, R^6, R^7, and R^8 is a substituent containing a B group, and at least one is a substituent containing an A group where A is not B; and

(j) only when A is covalent bound to the naphthyl structure may A be —(C═O)R^{11}, and when A is —(C═O)R^{11}, at least one adjacent position must be —OH.

5,837,690

DERIVATIVES OF TRITERPENOID ACIDS AND USES THEREOF.

Narasinga Rao, Alameda; Mark Brian Anderson, Orinda, and John Henry Musser, San Carlos, all of Calif., assignors to Glycomed Incorporated, Alameda, Calif.

Division of Ser. No. 049,018, Apr. 16, 1993, Pat. No. 5,527,980. This application Jun. 6, 1995, Ser. No. 465,893

The portion of the term of this patent subsequent to Aug. 9, 2013, has been disclaimed.

Int. Cl.^{6} A61K *31/705;51/04;* **G01N** *33/53*

U.S. Cl. 514—26 **20 Claims**

1. A method for assaying for the presence of a selectin in a sample, comprising the steps of:

contacting the sample with a triterpenoid acid derivative which is linked to a glycoside moiety at the C-3 position of the aglycon by a three carbon linker; and

determining the presence or absence of selectin bound to said triterpenoid acid derivative.

5,837,691

ACTINOMADURA VULGARIS SUBSP *VULGARIS* AND ANTIMICROBIAL COMPLEX AND ANTIMICROBIAL

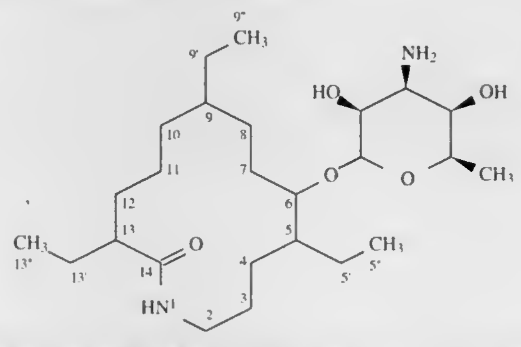
Vinod R. Hegde, Parsippany; Ann C. Horan, Summit; Mahesh G. Patel, Verona, and Ingrid-Agneta Gunnarsson, Hackettstown, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation of Ser. No. 590,315, Sep. 28, 1990, abandoned, which is a continuation of Ser. No. 227,968, Aug. 3, 1988, abandoned. This application Aug. 12, 1991, Ser. No. 747,456

Int. Cl.^{6} A61K *31/71;* **C07H** *17/08*

U.S. Cl. 514—29 **9 Claims**

1. A macrolactam monosaccharide antimicrobial compound which is represented by the formula 1



1

wherein the sugar attached to C-6 of the compound of formula 1 is a 3-amino-3,6-dideoxytalopyranoside,

(a) is a white solid, basic in nature and gives a positive color reaction with ninhydrin;

(b) soluble in methanol, dimethyl sulfoxide and insoluble in water;

(c) has an optical rotation: $[a]_D^{26}$=−5.8 (CH$_3$OH, c 0.5);

(d) has only end absorption in the UV;

(e) has an infraed Spectrum: 3420, 3300, 2920, 1640, 1555, 1385, and 1050 cm ^{1} (KBr);

(f) has a FAB Mass Spectrum: 457(M+H), 312, 294, 163, and 146;

(g) has PMR ∂ values (ppm): (DC$_3$OD+CDCl$_3$): 0.85(t, 3-CH$_3$), 1.25(d, —CH$_3$), 1.0–1.7(CH$_2$ & CH), 2.05(m, 1H), 3.03(dd, CH), 3.3(m, CH), 3.4–3.7(several CH), 4.9(d, 1H); and

(h) has a Molecular Formula: C$_{25}$H$_{48}$N$_2$O$_5$; in substantially chemically pure form, or a pharmaceutically acceptable salt thereof.

6. A method for treating a bacterial infection in a host having a susceptible bacterial infection which comprises administering to said host an antibacterially effective amount of the compound of claim **1** or a pharmaceutical composition thereof.

5,837,692

INHIBITION OF THE MITOGENIC ACTIVITY OF PDGF BY MAMMALIAN EGR

Dan Mercola, and Eileen Adamson, both of P.O. Box 3752, Rancho Santa Fe, Calif. 92067

Filed Apr. 7, 1994, Ser. No. 224,482

Int. Cl.^{6} A61K *48/00*

U.S. Cl. 514—44 **9 Claims**

1. A method for inhibiting the growth of a tumor in a mammal, wherein said growth is induced by the mitogenic activity of PDGF, comprising directly administering to said tumor a retroviral vector comprising an expression control sequence operatively linked to a nucleic acid sequence encoding a mammalian EGR-1 polypeptide, a nucleic acid sequence encoding a fragment of a mammalian EGR-1 polypeptide comprising the zinc finger domain or a nucleic acid sequence that both hybridizes to any of the foregoing nucleic acid sequences under standard hybridization conditions and also encodes a polypeptide that inhibits the mitogenic activity of PDGF, wherein the nucleic acid sequence is expressed in the cells of said tumor in an amount sufficient to inhibit the growth of said cells.

5,837,693

INTRAVENOUS HORMONE POLYPEPTIDE DELIVERY BY SALIVARY GLAND EXPRESSION

Michael German, San Francisco; Ira D. Goldfine, Kentfield, and Stephen S. Rothman, Berkeley, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Mar. 24, 1995, Ser. No. 410,660

Int. Cl.^{6} A01N *43/04*

U.S. Cl. 514—44 **5 Claims**

1. A method of delivering a functionally active insulin polypeptide to the bloodstream of a mammal, the method comprising the steps of:

introducing intraductally into a salivary gland of a mammal an isolated genetic construct not contained within a viral particle, the construct comprising a DNA sequence that encodes a functionally active insulin polypeptide and a eukaryotic promoter operably linked to said DNA sequence, allowing the introduced isolated genetic construct to be expressed in a salivary gland cell in a manner such that said insulin polypeptide is delivered to the bloodstream of the mammal.

5,837,694

METHOD FOR ENHANCING NEURONE SURVIVAL AND AGENTS USEFUL FOR SAME

Graham Leslie Barrett, Northcote, Australia, assignor to The Walter and Eliza Hall Institute of Medical Research

PCT No. PCT/AU94/00631, § 371 Date Jul. 1, 1996, § 102(e) Date Jul. 1, 1996, PCT Pub. No. WO95/11253, PCT Pub. Date Apr. 27, 1995

PCT Filed Oct. 18, 1994, Ser. No. 633,792

Claims priority, application Australia, Oct. 18, 1993, PM 1870

Int. Cl.^{6} A61K *48/00;* **C07H** *71/04;* **C12Q** *1/68;* **C12N** *15/85*

U.S. Cl. 514—44 **14 Claims**

1. A method of down regulating expression of the low affinity nerve growth factor (NGF) receptor, p75^{NGFR} on a neurone, which comprises contacting said neurone with an effective amount of an antisense oligonucleotide to a portion of the gene encoding p75^{NGFR}, wherein said antisense oligonucleotide is about 17 to 26 nucleotides in length and comprises SEQ ID NO:1 or SEQ ID NO:4.

5,837,695

FLUORESCENT CHLAMYDIA ANTIGEN SUBSTRATE

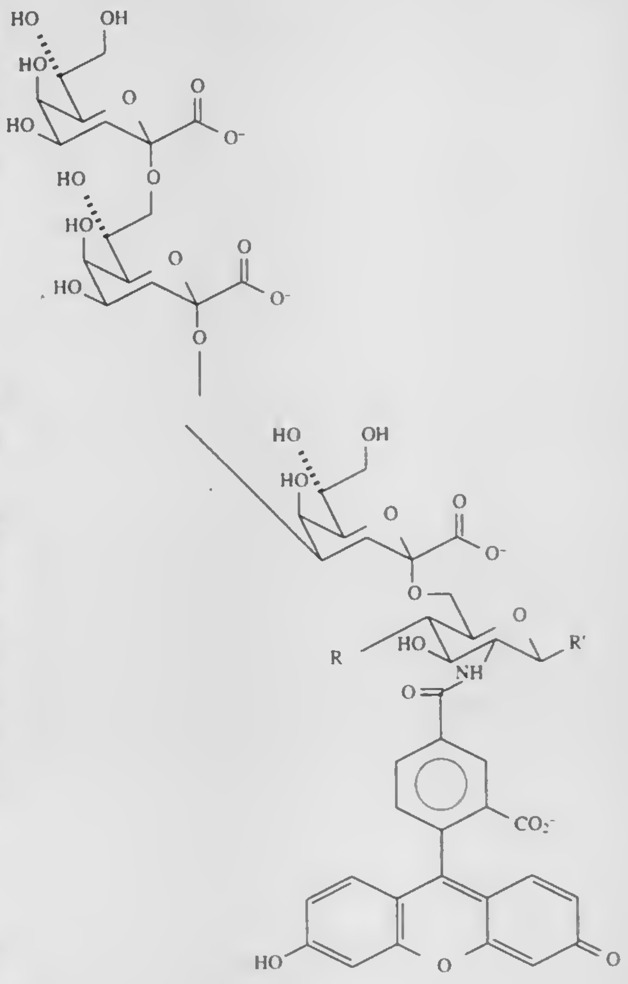
J. Bruce Pitner, Durham, N.C., assignor to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed Aug. 22, 1996, Ser. No. 701,340

Int. Cl.^{6} C07H *15/24;* **A61K** *31/70*

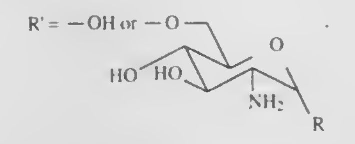
U.S. Cl. 514—61 **3 Claims**

1. A compound of the formula:



R=—OH or —OPO$_3$H$_2$

and



3. A composition comprising the compound of claim **1** and the compound of the formula:

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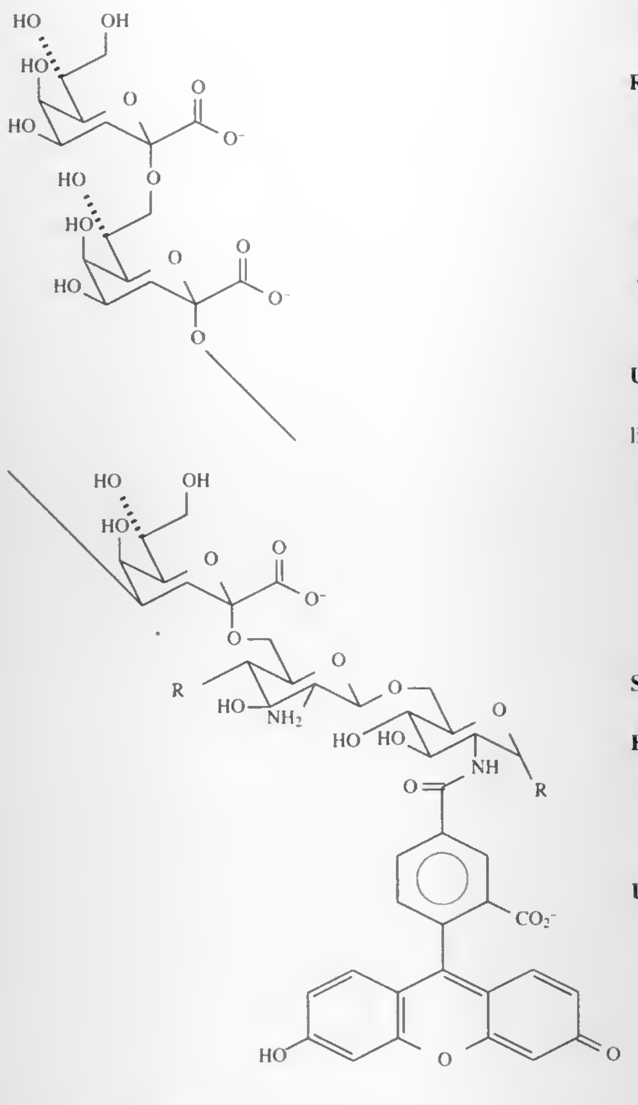


R=—OH or —OPO$_3$H$_2$.

5,837,696

METHOD OF INHIBITING CANCER GROWTH

Lorne M. Golub, Smithtown; Thomas F. McNamara, Port Jefferson; Nungavaram S. Ramamurthy, Smithtown; Hsi-Ming Lee, Setauket; Sanford Simon, Stony Brook, all of N.Y.; Balakrishna L. Lokeshwar, Miami, Fla.; Marie G. Selzer, Fort Lauderdale, Fla., and Norman L. Block, Miami, Fla., assignors to The Research Foundation of State University of New York, Albany, N.Y., and University of Miami, Miami, Fla.

Filed Jan. 15, 1997, Ser. No. 783,655
Int. Cl.^{6} A01N *37/18;* **A61K** *31/65*

U.S. Cl. 514—152 **13 Claims**

1. The method of inhibiting cancer growth in a mammal having a cancer, comprising administering to said mammal a cancer-inhibitory amount of 6-demethyl-6-deoxy-4-dedimethylaminotetracycline (CMT-3), wherein said cancer is selected from the group consisting of prostrate, breast, colon, lung and lymph cancers.

5,837,697

COMPOSITIONS FOR REGULATING SKIN WRINKLES AND/OR SKIN ATROPHY

Roy Lonnie Blank, Spring Valley, N.Y.; Darrell Gene Doughty, Orange, and Carlos Gabriel Linares, Stamford, both of Conn., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 342,673, Nov. 21, 1994, Pat. No. 5,605,894, which is a continuation of Ser. No. 047,602, Apr. 14, 1993, abandoned, which is a continuation of Ser. No. 796,749, Nov. 25, 1991, abandoned. This application Dec. 16, 1996, Ser. No. 767,551
Int. Cl.^{6} A61K *31/60;7/42;7/40*

U.S. Cl. 514—159 **10 Claims**

1. A composition for regulating wrinkles or atrophy in mammalian skin comprising:

(a) a safe and effective amount of salicylic acid;
(b) a sunscreen agent; and
(c) a pharmaceutically-acceptable carrier.

5,837,698

STEROID NITRITE AND NITRATE ESTER DERIVATIVES USEFUL AS ANTI-INFLAMMATORY DRUGS

Foe S. Tjoeng, Manchester; Mark G. Currie, St. Charles, both of Mo., and Mark E. Zupec, O'Fallon, Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed May 2, 1996, Ser. No. 643,018
Int. Cl.^{6} A61K *31/57;31/58;* **C07J** *17/00;71/00*

U.S. Cl. 514—169 **11 Claims**

1. A compound having the formula:

A—B—C 1

wherein;
A is a hydroxyl containing steroidal moiety;
C is an nitrite or nitrate containing moiety; and
B is a linking group comprising a lower alkyl, lower alkenyl, or lower alkynyl, wherein A is linked to C via the linking group B, and wherein the linking group B is attached to the hydroxyl of said A at the 11- or 21-position.

5,837,699

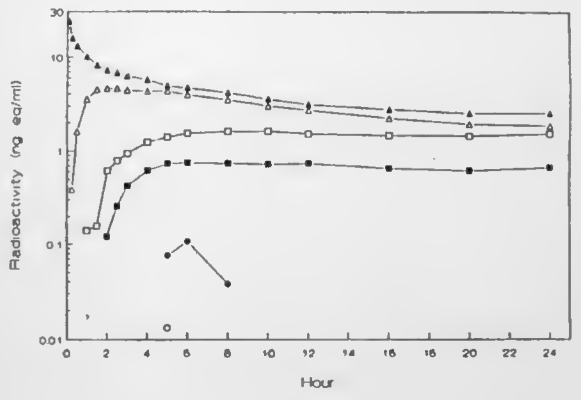
USE OF MOMETASONE FUROATE FOR TREATING UPPER AIRWAY PASSAGE DISEASES

Joel A. Sequeira, Scotch Plains; Francis M. Cuss, Basking Ridge; Keith B. Nolop, Millburn; Imtiaz A. Chaudry, North Caldwell; Nagamani Nagabhushan, Parsippany; James E. Patrick, Belle Meade, and Mitchell Cayen, Bedminster, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation of Ser. No. 701,536, Aug. 22, 1996, abandoned, which is a continuation of Ser. No. 376,506, Jan. 23, 1995, abandoned, which is a continuation-in-part of Ser. No. 188,372, Jan. 27, 1994, abandoned, and a continuation of Ser. No. 700,664, Aug. 22, 1996, abandoned, which is a continuation of Ser. No. 444,582, May 19, 1995, abandoned, which is a continuation of Ser. No. 376,506, Jan. 23, 1995, abandoned. This application Mar. 20, 1997, Ser. No. 821,135
Int. Cl.^{6} A61K *31/56;31/58*

U.S. Cl. 514—169 **21 Claims**

1. A method of treating a corticosteroid-responsive disease of the upper airway passages in patients afflicted with said disease, which



comprises administering once-a-day to the surfaces of said passages of said patients a substantially non-systematically bioavailable amount of aerosolized particles of mometasone furoate effective for treating said disease.

5,837,700

THERAPEUTIC METHODS AND DELIVERY SYSTEMS UTILIZING SEX STEROID PRECURSORS

Fernand Labrie, Quebec, Canada, assignor to Endorecherche, Inc., Quebec, Canada

Division of Ser. No. 180,361, Jan. 18, 1994, which is a continuation-in-part of Ser. No. 5,619, Jan. 19, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 485,750
Int. Cl.^{6} A61K *31/56*

U.S. Cl. 514—178 **5 Claims**

1. A method for inhibiting the development of, or treating, physical symptoms of menopause comprising administering to a patient in need of such treatment at least one sex steroid precursor selected from the group consisting of dehydroepiandrosterone, dehydroepiandrosterone-sulfate, and compounds converted in vivo to either of the foregoing in an amount suitable for achieving and maintaining a DHEA blood serum level of about 4 to about 13 micrograms per liter and further comprising administration of a progestin.

5,837,701

COMPOSITION AND METHOD FOR TREATING CONDITIONS ASSOCIATED WITH SYMPTOMS OF UNSPECIFIED RETARDED MATURATION

Eduardo Samuel Bleiweiss; Daniel Gustavo Bleiweiss, and Herman Bleiweiss, all of AV. Santa Fe 931, Buenos Aires, Argentina, 1059

Filed Feb. 9, 1996, Ser. No. 599,294
Claims priority, application Argentina, Oct. 2, 1995, 330996
Int. Cl.^{6} A61K *31/55;31/495;31/44;31/135*

U.S. Cl. 514—217 **7 Claims**

1. A composition for treating a human subject having a disease associated with symptoms of unspecified retarded maturation which comprises

a. in the amount indicated at least one member selected from the group consisting of 0.01 to 3 mg haloperidol, 3 to 8 mg imipramine and 0.1 to 0.5 mg trifluoperazine;
b. 0.05 to 200 mg gamma amino butyric acid;
c. 1 to 10 mg phenylalanine;
d. 50 to 30 mg of an antioxidant selected from the group consisting of Vitamin E, ascorbic acid and mixtures thereof;
e. 100 to 300 mg folic acid;
f. 0.05 to 0.5 mg of a member selected from the group consisting of nicotinamide and its pharmaceutically acceptable salts; and
g. 25 to 100 mg lithium salt; in a pharmaceutically acceptable carrier therefor.

5,837,702

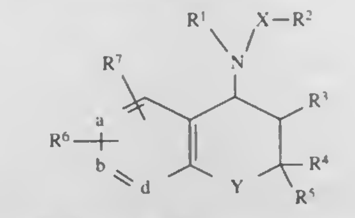
4-ARYLAMINO-BENZOPYRAN AND RELATED COMPOUNDS

George C. Rovnyak, Hopewell, N.J.; Karnail S. Atwal, Newton, Pa.; Dinos P. Santafianos, Maplewood, and Charles Z. Ding, Plainsboro, both of N.J., assignors to Bristol-Meyers Squibb Co., Princeton, N.J.

Continuation-in-part of Ser. No. 134,034, Oct. 7, 1993, abandoned. This application Aug. 30, 1994, Ser. No. 296,341
Int. Cl.^{6} A01N *43/16;31/535;43/64;43/40*

U.S. Cl. 514—218 **8 Claims**

1. A compound of the formula



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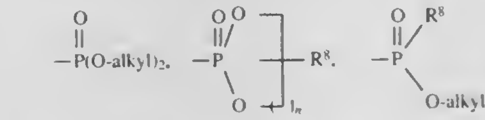
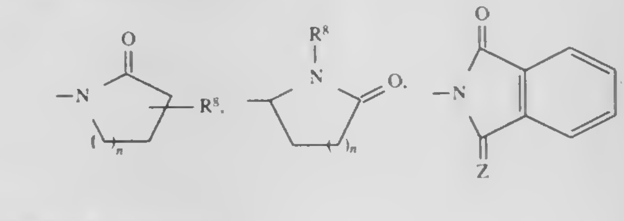
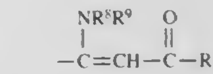
or pharmaceutically acceptable salts thereof wherein
a, b and d are all carbon atoms;
Y is a single bond, —O— or —S—;
R^1 is aryl or heterocyclo;
R^2 is —COOR^8, —CO-amino, —CO-substituted amino, amino, substituted amino, —NR^{8}CO-amino, —NR^{8}CO-substituted amino, —NR^{8}COR^9, —NR^{8}SO$_2$R^9, —NR^8(C═NCN)-amino, —NR^8(C═NCN)-substituted amino,



—SR^8, —SOR^8, —SO$_2$R^8, —OR^8, cyano, heterocyclo, pyridine-N-oxide, —CH(OR^8)$_2$,

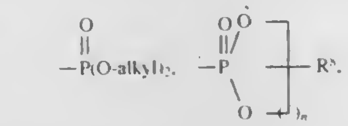


(where Z is O or H$_2$) or



$$-\overset{NR^8R^9}{\overset{|}{C}}=CH-\overset{O}{\overset{\|}{C}}-R^8;$$

R^3 is hydrogen, hydroxy or —OC(O)R^8;
R^4 and R^5 are each independently hydrogen, alkyl or arylalkyl, or R^4 and R^5 taken together with the carbon atom to which they are attached form a 5- to 7-membered carbocyclic ring;
R^6 is hydrogen, alkyl, haloalkyl, alkenyl, alkynyl, cycloalkyl, arylalkyl, (cycloalkyl)alkyl, —CN, —NO$_2$, —COR^8, —COOR^8, —CONHR^8, —CONR^{8}R^9, —CF$_3$, —S-alkyl, —SOalkyl, —SO$_2$alkyl,



halogen, amino, substituted amino, —O-alkyl, —OCF$_3$, —OCH$_2$CF$_3$, —OCOalkyl, —OCONR^{8}alkyl, —NR^{8}COalkyl, —NR^{8}COOalkyl or —NR^{8}CONR^9, tetrazolyl, imidazole, oxazole or triazole;
R^7 is hydrogen, alkyl, hydroxy, —O-alkyl, amino, substituted amino, —NHCOR^8, —CN or —NO$_2$;

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- R^8 and R^9 are independently hydrogen, alkyl, haloalkyl, aryl, arylalkyl, cycloalkyl or (cycloalkyl)alkyl;
- X is alkyl; or X-R^2 together can be aryl or heterocyclo when R^1 is heterocyclo; and
- n is an integer of 1 to 3; provided that when R^1 is aryl, then R^2 is other than —COOR^8, amino, substituted amino, —OR^8 and cyano.

5,837,703
AMINO-ALCOHOL SUBSTITUTED CYCLIC COMPOUNDS

Anil M. Kumar; John Michnick, both of Seattle; Gail E. Underiner, Brier; J. Peter Klein, Vashon Island, and Glenn C. Rice, Seattle, all of Wash., assignors to Cell Therapeutics, Inc., Seattle, Wash.

Continuation-in-part of Ser. No. 40,820, Mar. 31, 1993, abandoned. This application Nov. 12, 1993, Ser. No. 152,650

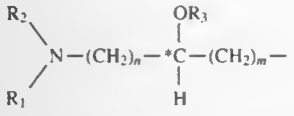
Int. Cl.^{6} A61K *31/55;31/515;31/445;31/52*

U.S. Cl. 514—183 **9 Claims**

1. A compound having the formula:

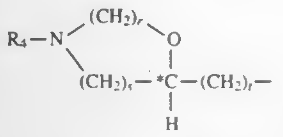
(X)j–(core moiety),

wherein j is an integer from one to three, the core moiety comprises a nitrogen-containing ring structure comprising one five- to six-membered ring or two five- to six-membered rings; and X, being attached to a carbon atom of the ring structure, has a structure of:



$$(R_2)(R_1)N-(CH_2)_n-{}^*C(OR_3)(H)-(CH_2)_m-$$

wherein *C is chiral carbon atom; n is an integer from one to four; one or more carbon atoms of $(CH_2)_n$ may be substituted by a keto or hydroxy group; m is an integer from four to fourteen; independently, R_1 and R_2 are hydrogen, a straight or branched chain alkyl or alkenyl of up to twelve carbon atoms in length, or $—(CH_2)_wR_5$, w being an integer from two to fourteen and R_5 being mono-, di-, or tri-substituted or unsubstituted aryl group, substituents on R_5 being selected from the group consisting of hydroxy, chloro, fluoro, bromo, or C_{1-6} alkoxyl; or jointly, R_1 and R_2 form a substituted or unsubstituted, saturated or unsaturated heterocyclic group having from four to eight carbon atoms, N being a hetero atom; and R_3 is hydrogen or C_{1-3} or:



wherein R_4 is a hydrogen, a straight or branched chain alkyl or alkenyl of up to eight carbon atoms in length, $—(CH_2)_wR_5$, w being an integer from two to fourteen and R_5 being mono-, di-, or tri-substituted or unsubstituted aryl group, substituents on R_5 being selected from the group consisting of hydroxyl, chloro, fluoro, bromo, or C_{1-6} alkoxyl, or a substituted or unsubstituted, saturated or unsaturated heterocyclic group having from four to eight carbon atoms, r and s are independently integers from one to four; the sum (r+s) is not greater than five; t is an integer from one to fourteen; and one or more carbons atoms of $(CH_2)_s$ or $(CH_2)_r$ may be substituted by a keto or hydroxy group.

5,837,704
2-HETEROARYL-5,11-DIHYDRO-6H-DIPYRIDO[3,2-B:2',3'-E][1,4]DIAZEPINES AND THEIR USE IN THE PREVENTION OR TREATMENT OF HIV INFECTION

Karl Hargrave, Brookfield; John Proudfoot, Newtown; Usha Patel, Brookfield; Suresh Kapadia, Danbury; Terence Kelly, Ridgefield; Daniel McNeil, New Fairfield, and Mario Cardozo, Brookfield, all of Conn., assignors to Boehringer Ingelheim Pharmaceuticals, Inc., Ridgefield, Conn.

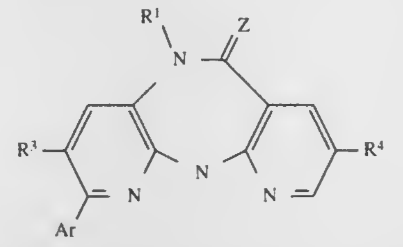
PCT No. PCT/US95/01993, § 371 Date Aug. 1, 1996, § 102(e) Date Aug. 1, 1996, PCT Pub. No. WO95/22545, PCT Pub. Date Aug. 24, 1995

PCT Filed Feb. 17, 1995, Ser. No. 663,162

Int. Cl.^{6} A61K *31/55;243/10;487/12;513/00*

U.S. Cl. 514—220 **7 Claims**

1. A compound of the formula 1



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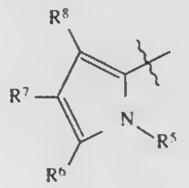
wherein,

- Z is an oxygen or sulfur atom, =NCN or a group of the formula =NOR^{10} wherein R^{10} is alkyl of 1 to 3 carbon atoms;
- R^1 is a hydrogen atom, alkyl of 1 to 3 carbon atoms, fluoroalkyl of 1 to 3 carbon atoms and 1 to 3 fluorine atoms, cyclopropyl, allyl, propargyl, 2-halo-2-propen-1-yl, mono- or dihalovinyl, alkanoyl or alkyl(thiocarbonyl) of 2 to 3 carbon atoms, alkylsulfonyl of 1 to 2 carbon atoms, mono- or di-alkylaminocarbonyl wherein the alkyl moiety contains 1 to 2 carbon atoms, aminoethyl, mono- or di-alkylaminoethyl wherein the alkyl moiety contains 1 to 2 carbon atoms, alkyloxyalkyl or alkylthioalkyl of 2 to 3 carbon atoms, or cyanoalkyl wherein the alkyl moiety contains 1 to 2 carbon atoms;
- R^2 is a hydrogen atom, alkyl of 1 to 4 carbon atoms, fluoroalkyl of 1 to 4 carbon atoms and 1 to 3 fluorine atoms, cycloalkyl of 3 to 6 carbon atoms, oxetanyl, thietanyl, tetrahydrofuranyl, tetrahydrothienyl, tetrahydropyranyl, tetrahydrothiopyranyl, alkenylmethyl or alkynylmethyl of 3 to 4 carbon atoms, alkyloxyalkyl or alkylthioalkyl of 2 to 3 carbon atoms, alkanoyl or alkyl(thiocarbonyl) of 2 to 5 carbon atoms, or cyanoalkyl of 2 to 3 carbon atoms;
- R^3 is a hydrogen atom, methyl or a halogen atom;
- R^4 is a hydrogen atom, hydroxy, amino, hydroxymethyl, or aminomethyl; and,
- Ar is a group of the formula I, II, III, IV or V



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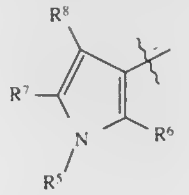

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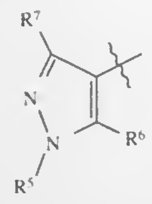

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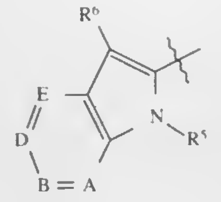

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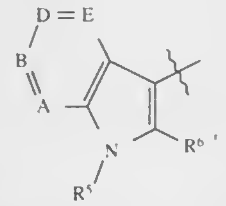


V

wherein,

- R^5 is hydrogen, methyl, ethyl, acetyl, aminocarbonyl, (N-alkyl)aminocarbonyl, or (N,N-dialkyl)aminocarbonyl, wherein the alkyl moieties each contain one to two carbon atoms;
- R^6, R^7 and R^8 are each hydrogen; or, one of R^6, R^7 and R^8 is methyl, ethyl, hydroxymethyl, hydroxyethyl, trifluoromethyl, halogen, acetyl, methoxycarbonyl, ethoxycarbonyl, carboxy, mono- or dimethylaminosulfonyl, aminosulfonyl, mono- or dimethylaminocarbonyl, aminocarbonyl, methyl- or ethylsulfinyl, methyl- or ethylsulfonyl, cyano, or nitro, and the remaining two substituents are both hydrogen;
- A, B, D, and E are each methine groups, one of which may optionally be substituted with R^9; or,
- one of A, B, D, and E is a nitrogen atom, and the remaining three of A, B, D, and E are each methine groups, one of which methine groups may optionally be substituted with R^9; and,
- R^9 is alkyl or alkyloxy of 1 to 3 carbon atoms, amino, mono- or dimethylamino, hydroxyl, methylsulfonylamino, acetylamino, acetyloxy, aminocarbonyl, mono- or dimethylaminocarbonyl, or halogen;

or a pharmaceutically acceptable salt thereof.

5,837,705
ALPHA-SUBSTITUTED PYRIDAZINO QUINOLINE COMPOUNDS

Thomas Michael Bare, West Chester, Pa.; James Roy Empfield, Bear, Del.; Janet Marie Forst; Keith John Herzog, both of Wilmington, Del., and Richard Bruce Sparks, Linwood, Pa., assignors to Zeneca Limited, London, United Kingdom

Filed Apr. 1, 1996, Ser. No. 617,728

Claims priority, application United Kingdom, Apr. 7, 1995, 9507318

Int. Cl.^{6} A61K *31/50;* **C07D** *471/04;471/14;491/14*

U.S. Cl. 514—248 **3 Claims**

1. A compound selected from the group consisting of:
   - 7-chloro-4-hydroxy-2-[1-(N-phenylcarbamoyl)ethyl]-1,2,5,10-tetrahydropyridazino-[4,5-b]quinoline-1,10-dione,
   - 7-chloro-4-hydroxy-2-cyclohexyl-1,2,5,10-tetrahydropyridazino[4,5-b]-quinoline-1,10-dione,
   - 7-chloro-4-hydroxy-2-(1-methylbenzyl)-1,2,5,10-tetrahydropyridazino[4,5-b]-quinoline-1,10-dione,
   - 7-chloro-4-hydroxy-2-(1-methylbutyl)-1,2,5,10-tetrahydropyridazino[4,5-b]-quinoline-1,10-dione,
   - 7-chloro-4-hydroxy-2-(1-methyl-2-phenylethyl)-1,2,5,10-tetrahydropyridazino[4,5-b]-quinoline-1,10-dione, and
   - 7-chloro-4-hydroxy-2-(1,3-dimethylbutyl)-1,2,5,10-tetrahydropyridazino[4,5-b]-quinoline-1,10-dione

   or a pharmaceutically acceptable salt thereof and/or a tautomer thereof, and/or a hydrate thereof, and/or a solvate thereof, and/or a stereoisomer thereof.

5,837,706
DRUG FOR NEUROPROTECTION

Yasufumi Shirasaki, and Hitoshi Yamaguchi, both of Tokyo, Japan, assignors to Daiichi Pharmaceutical Co., Ltd., Tokyo, Japan

Division of Ser. No. 249,249, May 25, 1994, Pat. No. 5,661,150. This application Mar. 24, 1997, Ser. No. 822,759

Claims priority, application Japan, May 25, 1993, 5-122933

Int. Cl.^{6} A61K *31/415;31/495*

U.S. Cl. 514—252 **18 Claims**

1. A method of neuroprotection comprising administering to a subject in need of treatment a pharmaceutical composition comprising a compound which inhibits binding of calmodulin to a cytoskeletal protein in a neuroprotective amount and a pharmaceutically acceptable carrier, excipient or diluent.

5,837,707
DIMERIC PIPERIDINE, TETRAHYDROPYRIDINE AND PIPERAZINE DERIVATIVES

Jens Perregaard, Jægerspris; John W. Stenberg, Copenhagen-Valby, and Ejner K. Moltzen, Frederiksberg C, all of Denmark, assignors to H. Lundbeck A/S, Copenhagen-Valby, Denmark

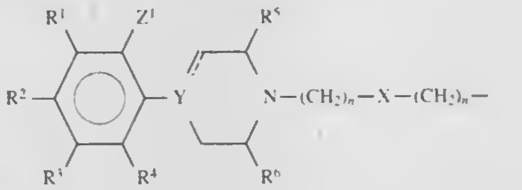
Division of Ser. No. 354,280, Dec. 12, 1994. This application Jun. 6, 1995, Ser. No. 467,760

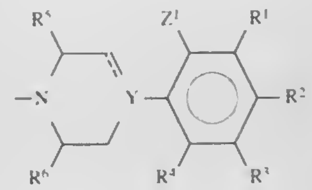
Claims priority, application Denmark, Jun. 12, 1992, 0786/92

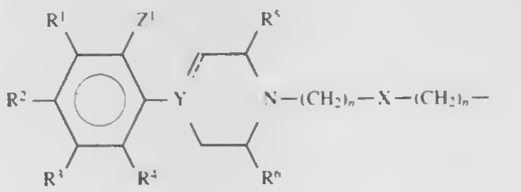
Int. Cl.^{6} C07D *401/12;401/06;403/12;403/06*

U.S. Cl. 514—255 **7 Claims**

1. A dimeric 4-phenylpiperidine, 4-phenyl-1,2,3,6-tetrahydropyridine, or 4-phenylpiperazine compound having the formula:







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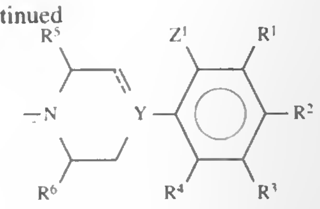


wherein

n is 1–5;

R^1 to R^4 are independently selected from the group consisting of hydrogen, C_{1-6}-alkyl, C_{1-6} alkoxy, hydroxy, C_{1-6} alkylthio, C_{1-6} alkylsulfonyl, C_{1-6} alkylamino, di-(C_{1-6}-alkyl)amino, cyano, trifluoromethyl, nitro, trifluoromethylthio and trifluoromethylsulfonyloxy;

R^5 and R^6 are C_{2-3} alkyl linked together to form an ethylene or propylene bridge;

X is O, S, SO_2, CO or $(CH_2)_m$, m being 0 or 1, X is NR^7, R^7 being H, C_{1-6} alkyl, cycloalkyl, cycloalkylalkyl, phenyl, or phenylalkyl, or X is CR^8R^9, wherein R^8 and R^9 are independently selected from the group consisting of hydroxy and the substituents defined under R^7, any phenyl group being optionally substituted with one or more substituents selected from the group consisting of [hydrogen] halogen, C_{1-6}-alkyl, C_{1-6} alkoxy, hydroxy, C_{1-6} alkylthio, C_{1-6} alkylsulfonyl, C_{1-6} alkylamino, di(C_{1-6}-alkyl)amino, cyano, trifluoromethyl, and trifluoromethylthio; and

Z^1 is defined as R^1 to R^4; and

Y is N, CH, or C; and the dotted line indicates an optional bond, i.e., represents a bond when Y is C;

or an acid addition salt thereof.

5,837,708
SULPHONAMIDES

Volker Breu, Schliengen, Germany; Kaspar Burri, Binningen, Switzerland; Jean-Marie Cassal, Mulhouse, France; Martine Clozel, St. Louis, France; Georges Hirth, Huningue, France; Bernd-Michael Löffler, Oberrimsingen, Germany; Marcel Müller, Frenkendorf, Switzerland; Werner Neidhart, Hagenthal le Bas, France, and Henri Ramuz, Birsfelden, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

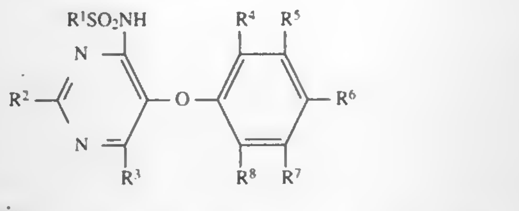
Continuation-in-part of Ser. No. 676,313, Jul. 18, 1996. This application Oct. 15, 1996, Ser. No. 730,422

Claims priority, application Switzerland, Nov. 25, 1994, 3559/94; WIPO, Jun. 6, 1995, PCT/CH95/00131

Int. Cl.^{6} C07D *239/69;401/12;403/12;* **A61K** *31/505*

U.S. Cl. 514—274 **39 Claims**

1. A compound of the formula:



I

wherein

R^1 is a heterocyclyl selected from the group consisting of unsubstituted 2-furyl, 3-furyl, pyrimidinyl, 2- pyridyl, 3-pyridyl, 4-pyridyl, 1,2-diazinyl, 1,4-diazinyl, morpholino, 2-thienyl, 3-thienyl, isoxazolyl, oxazolyl, thiazolyl, imidazolyl, pyrrolyl, benzofuranyl, benzothienyl, indolyl, purinyl, thiomorpholino, piperidino, quinolyl, isoquinolyl and quinazolyl; or heterocyclyl mentioned above mono- or disubstituted with C_{1-7} -alkyl, Cl-$_{1-7}$-alkanoyl, halogen, amino, mono- C_{1-7}-alkyl amino, or di-C_{1-7}-alkyl amino;

R^2 is selected from the group consisting of hydrogen, C_{1-7}-alkyl, C_{1-7}-alkoxy, C_{1-7}-alkylthio, C_{1-7}-alkoxy-C_{1-7}-alkyl, C_{1-7} -alkylsulphonyl-C_{1-7}-alkoxy, phenyl, C_{1-7}-alkoxy-phenyl, C_{1-7}-alkylenedioxyphenyl, and a heterocyclyl selected from the group consisting of unsubstituted 2-furyl, 3-furyl, pyrimidinyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, 1,2-diazinyl, 1,4-diazinyl, morpholino, 2-thienyl, 3-thienyl, isoxazolyl, oxazolyl, thiazolyl, imidazolyl, pyrrolyl, benzofuranyl, benzothienyl, indolyl, purinyl, thiomorpholino, piperidino, quinolyl, isoquinolyl and quinazolyl; or heterocyclyl mentioned above mono- or disubstituted with C_{1-7} -alkyl, C_{1-7}-alkanoyl, halogen, amino, mono-C_{1-7}-alkylamino, or di-C_{1-7}-alkylamino;

R^3 is selected from the group consisting of C_{1-7}-alkyl, C_{1-7}-alkoxy, formyl, halo-C_{1-7}-alkyl, hydroxy-C_{1-7}-alkyl, amino-C_{1-7}-alkyl, $—CH_2O—A—C_{1-7}$-alkyl, $—(CH_2)_m—O—(CR^aR^b)_nOH$, $—(CH_2)_m$ $—O—(CR^aR^b)_nNH_2$ and $—(CH_2)_m—O—(CR^a{}_R{}^b)_n—Y—R^9$;

R^4–R^8 each are selected from the group consisting of hydrogen, C_{1-7}-alkoxy and halogen;

R^9 is a heterocyclyl selected from the group consisting of unsubstituted 2-furyl, 3-furyl, pyrimidinyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, 1,2-diazinyl, 1,4-diazinyl, morpholino, 2-thienyl, 3-thienyl, isoxazolyl, oxazolyl, thiazolyl, imidazolyl, pyrrolyl, benzofuranyl, benzothienyl, indolyl, purinyl, thiomorpholino, piperidino, quinolyl, isoquinolyl, and quinazolyl; or heterocyclyl mentioned above mono- or disubstituted with C_{1-7} -alkyl, C_{1-7}-alkanoyl, halogen, amino, mono- C_{1-7}-alkylamino, or di-C_{1-7}; and phenyl substituted with the group selected from the group consisting of C_{1-7}-alkyl, C_{1-7}-alkoxy, halogen and C_{1-7}-alkyl;

R^a and R^b each are hydrogen or C_{1-7}-alkyl;

A is a ketalized 1,2-dihydroxy-ethylene group;

Y is selected from the group consisting of —OC(O)O—, —O(C(O)NH—, —NH(C(O)NH— and —NHC(O)O—;

n is 2, 3 or 4; and

m is 0 or 1.

5,837,709
USE OF CASTANOSPERMINE AS AN ANTI-INFLAMMATORY AND IMMUNOSUPRESSANT AGENT

David Otto Willenborg, Sterling; William Butler Cowden, Crozier Circuit Kambah, and Christopher Richard Parish, Campbell, all of Australia, assignors to The Australian National University, Acton, Australia

Continuation-in-part of Ser. No. 38,050, Mar. 29, 1993, which is a continuation of Ser. No. 656,073, Mar. 6, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 482,083

Claims priority, application Australia, Aug. 10, 1988, PI 9759/88

Int. Cl.^{6} A61K *31/44*

U.S. Cl. 514—299 **14 Claims**

1. A method of anti-inflammatory treatment of a warm-blooded animal patient in need of said treatment, which comprises administration to the patient of an anti-inflammatory-effective amount of castanospermine.

5,837,710
HIV PROTEASE INHIBITORS

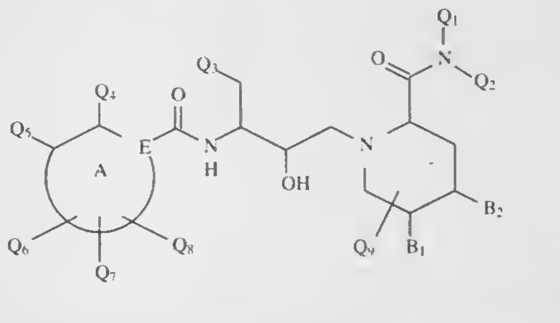
William J. Hornback, Indianapolis, Ind.; Vincent J. Kalish, San Diego, Calif.; John E. Munroe, Indianapolis, Ind.; Siegfried Heinz Reich, San Diego; John H. Tatlock, Poway, both of Calif.; Timothy A. Shepherd, and Michael J. Rodriguez, both of Indianapolis, Ind., assignors to Agouron Pharmaceuticals, Inc.

Division of Ser. No. 190,764, Feb. 2, 1994, Pat. No. 5,484,926, which is a continuation-in-part of Ser. No. 133,543, Oct. 7, 1993, abandoned, Ser. No. 133,696, Oct. 7, 1993, abandoned, and Ser. No. 137,254, Oct. 18, 1993, abandoned, which is a continuation-in-part of Ser. No. 995,621, Dec. 22, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 479,765

Int. Cl.^{6} A61K *31/435;31/38*

U.S. Cl. 514—301 **18 Claims**

1. A compound of the formula:



wherein:

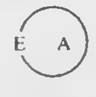
Q_1 and Q_2 are each independently selected from hydrogen and substituted and unsubstituted alkyl and aryl;

Q_3 is selected from mercapto and substituted and unsubstituted alkoxyl, aryloxyl, thioether, amino, alkyl, cycloalkyl, saturated and partially saturated heterocycle, and aryl;

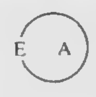
Q_4, Q_5, Q_6, Q_7, and Q_8 are each independently selected from hydrogen, hydroxyl, mercapto, nitro, halogen, —O—J, where J is a substituted or unsubstituted hydrolyzable group, and substituted and unsubstituted alkoxyl, aryloxyl, thioether, sulfinyl, sulfonyl, amino, alkyl, cycloalkyl, saturated and partially saturated heterocycle, aryl, and $L_6C(O)L_4$, where L_6 is a single bond, —O or —N, and further where L_4 is alkyl, hydroxyl, alkoxyl or hydrogen; and further wherein any one or more of Q_4, Q_5, Q_6, Q_7, and Q_8 may be a member of a spiro ring, and any two of Q_4, Q_5, Q_6, Q_7, and Q_8 may together be members of a ring;

E is carbon or nitrogen;

Q_9 is selected from hydrogen, halogen, hydroxyl, mercapto, and substituted and unsubstituted alkoxyl, aryloxyl, thioether, amino, alkyl, and aryl, where Q_9 may form part of a ring;



is a monocyclic or polycyclic carbocycle or heterocycle, which is optionally further substituted, and when



is heterocycle, each heterocyclic ring has one to three heteroatoms independently selected from nitrogen, oxygen, and sulfur; and

B_1 and B_2 form part of a ring having from 3 to 5 members, which ring is optionally further substituted and optionally has from one to three heteroatoms independently selected from nitrogen, oxygen, and sulfur;

or a prodrug or pharmaceutically acceptable salt of said compound.

5,837,711
SUBSTITUTED QUINUCLIDINES AS SUBSTANCE P ANTAGONISTS

Fumitaka Ito, Chita-gun; Toshihide Kokura, Handa; Masami Nakane, Nagoya; Kunio Satake, Handa, and Hiroaki Wakabayashi, Kariya, all of Japan, assignors to Pfizer Inc., New York, N.Y.

PCT No. PCT/US93/09169, § 371 Date Apr. 28, 1995, § 102(e) Date Apr. 28, 1995, PCT Pub. No. WO94/10170, PCT Pub. Date May 11, 1994

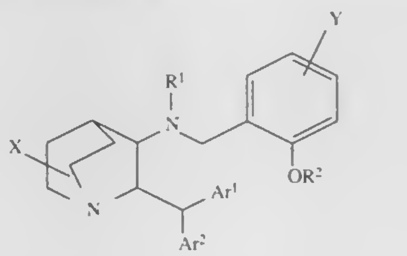
PCT Filed Sep. 30, 1993, Ser. No. 428,240

Claims priority, application Japan, Oct. 28, 1992, 4-290569

Int. Cl.^{6} C07D *453/02;* **A61K** *31/44*

U.S. Cl. 514—305 **12 Claims**

1. A compound of the following chemical formula and its pharmaceutically acceptable salt:



wherein Ar^1 and Ar^2 are each, independently, thienyl, phenyl, fluorophenyl, chlorophenyl or bromophenyl;

X is $—CONR^3R^4$, $—CO_2R^3$, $—CH_2OR^3$, $—CH_2NR^3R^4$ or $—CONR^3OR^4$;

R^1, R^3 and R^4 are each, independently, hydrogen or alkyl having 1 to 4 carbon atoms;

R^2 is alkyl having 1 to 4 carbon atoms;

Y is alkylsulfonyl having 1 to 4 carbon atoms, N-alkyl-N-alkanoylamino (which may be substituted by halogen in the alkanoyl moiety) having 1 to 4 carbon atoms in the alkyl and the alkanoyl moieties, N-alkyl-N-alkylsulfonylamino (which may be substituted by halogen in the alkylsulfonyl moiety) having 1 to 4 carbon atoms in the alkyl and the alkyl sulfonyl moieties, alkenyl having 2 to 4 carbon atoms, alkynyl having 2 to 4 carbon atoms, halosubstituted alkyl having 1 to 4 carbon atoms, alkylamino having 1 to 4 carbon atoms, alkanoylamino (which may be substituted by halogen) having 1 to 4 carbon atoms or alkylsulfonylamino (which may be substituted by halogen) having 1 to 4 carbon atoms.

5,837,712
ANNELATED DIHYDROPYRIDINES AND THE USE THEREOF FOR PREPARING PHARMACEUTICAL PREPARATIONS

Walter Lösel, Gau-Algesheim; Otto Roos, Schwabenheim, and Dietrich Arndts, Appenheim, all of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Germany

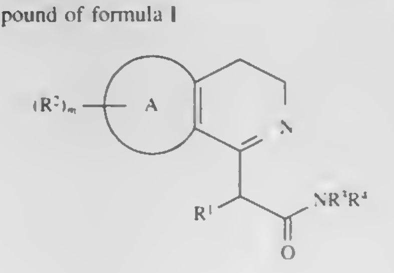
Continuation of Ser. No. 360,524, Dec. 21, 1994, Pat. No. 5,607,943. This application Jun. 5, 1995, Ser. No. 465,637

Claims priority, application Germany, Dec. 21, 1993, 43 43 684.6; Dec. 21, 1993, 43 43 641.2

Int. Cl.^{6} C07D *217/16;409/06;* **A61K** *31/47*

U.S. Cl. 514—307 **7 Claims**

4. A compound of formula I



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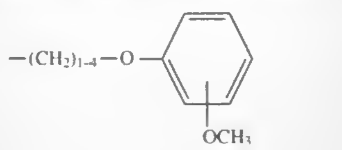
wherein:

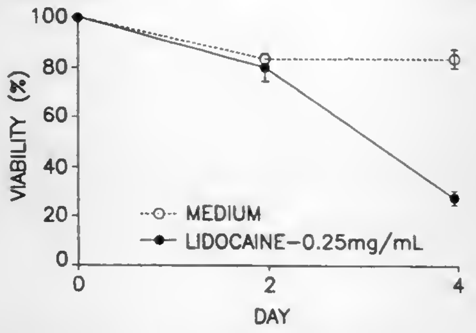
A represents benzo;
m represents 2 or 3;
R^1 represents thienyl;
each R^2 independently represents hydroxy, C_{1-4} alkoxy, benzyloxy, F, Cl, Br, I, C_{1-4} alkyl, methanesulfonyloxy or methanesulfonamido, or two adjacent substituents; R^2 may represent —O—CH$_2$—O— or —O—CH$_2$—CH$_2$—O—;
R^3 and R^4 independently represent
  (a) hydrogen, or
  (b) branched or unbranched C_{3-6} alkenyl, or
  (c) branched or unbranched C_{3-6} alkynyl, or
  (d) branched or unbranched C_{1-12} alkyl which may be optionally mono- or Di-substituted by:
    hydroxy, or
    (C_{1-4}) alkoxy, or
    Di(C_{1-4})alkoxy, or
    Di(C_{1-4})alkylamino, or
    furyl, or
    pyridyl, or
    pyrrolidinyl or N-methylpyrrolidinyl, or
    morpholinyl, or
    indolyl, or
    nitrilo, or
    thienyl, or
    adamantyl, or
    cyclohexyl, or
    naphthyloxy, or
    phenoxy or phenyl wherein the phenyl group may be optionally mono, Di- or trisubstituted by hydroxy, (C_{1-4})alkyl, (C_{1-4})alkoxy, benzyloxy, F, Cl, Br, I, CF_3, N_3, adamantyl, —SO$_2$NH$_2$, NHCOCH$_3$, or by the bridge —O—CH$_2$—O; or
R^3 represents hydrogen and R^4 represents phenyl, fluorophenyl, cyclohexyl, pyridyl or N-benzylpyridyl; or
R^3 and R^4 together with the nitrogen atom to which they are bonded represent pyrrolidinyl, piperidinyl, morpholinyl, thiomorpholinyl or piperazinyl, whilst the piperazinyl ring may optionally be N-substituted by methyl, unsubstituted phenyl, mono- or Di(C_{1-4})alkoxyphenyl, cyano-substituted phenyl, pyrimidinyl, phenyl(C_{1-4})alkyl, (C_{1-4})alkylphenyl or



or the salts thereof with physiologically acceptable acids.

5,837,713
TREATMENT OF EOSINOPHIL-ASSOCIATED PATHOLOGIES BY ADMINISTRATION OF TOPICAL ANESTHETICS AND GLUCOCORTICOIDS

Gerald J. Gleich, Rochester, Minn., assignor to Mayo Foundation for Medical Education and Research, Rochester, Minn.
Filed Feb. 26, 1997, Ser. No. 805,623
Int. Cl.^{6} A01N *43/40*
U.S. Cl. 514—312 23 Claims



1. A method for treating an eosinophil-associated pathology comprising co-administering to a mammal in need of such treatment an amount of a topical anesthetic and an amount of a glucocorticoid, wherein said amounts are effective to counteract at least one of the symptoms of said pathology.

5,837,714
SOLID PHARMACEUTICAL DISPERSIONS

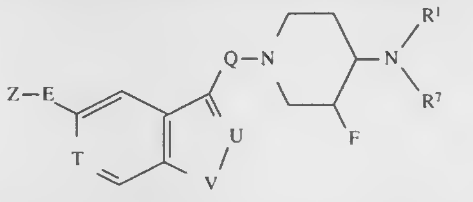
William Rocco, Reading, and Sharon Laughlin, Phoenixville, both of Pa., assignors to Sanofi, Paris Cedex, France
Filed Mar. 3, 1997, Ser. No. 813,946
Int. Cl.^{6} A61K *31/47;31/19;31/08;31/045*
U.S. Cl. 514—313 7 Claims

1. A solid dispersion comprising:
a) a poorly soluble drug substance selected from the group consisting of SR48692 and naproxyn:
b) xylitol and
c) Transcutol.

5,837,715
3-FLUORO-4-AMINOPIPERIDINE DERIVATIVES AS 5-HT RECEPTOR AGONISTS

J. L. Castro Pineiro, and M. G. Russell, both of Hertfordshire, England, assignors to Merck Sharp & Dohme Ltd., Hoddesdon, England
Filed Jul. 17, 1997, Ser. No. 896,559
Int. Cl.^{6} A61K *31/445;* **C07D** *401/14*
U.S. Cl. 514—323 18 Claims

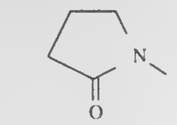
1. A compound of formula I, or a salt or prodrug thereof:



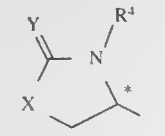
(1)

wherein

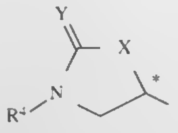
Z represents hydrogen halogen, cyano, nitro, trifluoromethyl, —OR^5; —OCOR^5, —OCONR^{5}R^6, —OCH$_2$CN, —OCH$_2$CONR^{5}R^6, —SR^5, —SOR^5, —SO$_2$R^5, —SO$_2$NR^{5}R^6, —NR^{5}R^6, —NR^{5}COR^6, —NR^{5}CO$_2$R^6, —NR^{5}SO$_2$R^6, —COR^5, —CO$_2$R^5, —CONR^{5}R^6, or a group of formula (Za), (Zb), (Zc) or (Zd):



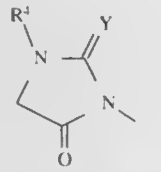
(Za)



(Zb)



(Zc)

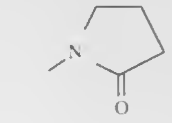


(Zd)

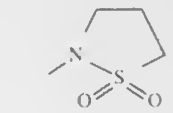
in which the asterisk * denotes a chiral center; or

Z represents an optionally substituted five-membered heteroaromatic ring selected from furan, thiophene, pyrrole, oxazole, thiazole, isoxazole, isothiazole, imidazole, pyrazole, oxadiazole, thiadiazole, triazole and tetrazole wherein the optional substituents are selected from C_{1-6} alkyl, C_{2-6} alkylenyl, C_{2-6} alkynyl, C_{3-7} cycloalkyl, aryl, aryl (C_{1-6})alkyl, C_{3-7} heterocycloalkyl, heteroaryl, heteroaryl(C_{1-6})alkyl, C_{1-6} alkoxy, C_{1-6} alkylthio, amino, C_{1-6} alkylamino, di (C_{1-6})alkylamino, halogen, cyano and trifluoromethyl; or

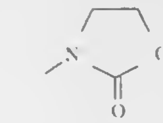
Z represents an optionally substituted six-membered heteroaromatic ring selected from pyridine, pyrazine, pyrimidine and pyridazine wherein the optional substituents are selected from C_{1-6} alkyl, C_{2-6} alkyenyl, C_{2-6} alkyenyl, C_{2-6} alkynyl, C_{3-7} cycloalkyl, aryl, aryl (C_{1-6})alkyl, C_{3-7} heterocycloalkyl, heteroaryl, heteroaryl(C_{1-6})alkyl, halogen, halo C_{1-6} alkyl, cyano, cyano C_{1-6} alkyl, trifluoromethyl and —(CH$_2$)$_a$—R^8, in which a is zero, 1, 2 or 3 (preferably zero or 1) and R^8 represents —OR^a, —OCOR^c, —OCO$_2$R^a, —SR^a, —SOR^a, —SO$_2$R^c, —CH=CHSO$_2$ R^c, —SO$_2$NR^{a}R^b, —CH=CHSO$_2$NR^{a}R^b, —NR^{a}R^b, —NR^{a}COR^c, —NR^{a}CO(CH$_2$)$_b$ORd (in which b is 1 or 2, preferably 1), —NR^{a}CO$_2$R^d, —NR^{a}SO$_2$R^c, —NR^{d}CONR^{a}R^b, —NR^d SO$_2$NR^{a}R^b, —COR^c, —CH=CHCOR^c, —CO$_2$R^a, —CONR^{a}R^b, —CH=CHCONR^{a}R^b, or CONR^{d}NR^{a}R ^{b}, or R^8 represents a group of formula (a), (b), (c), (d) or e):



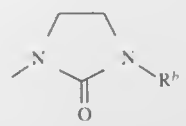
(a)



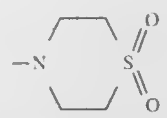
(b)



(c)



(d)



(e)

wherein R^a and R^d independently represent hydrogen, C_{1-6} alkyl, trifluoromethyl, phenyl, fluorophenyl or tetrahydropyranyl; R^b represents hydrogen,, C_{1-6} alkyl, trifluoromethyl, phenyl or fluorophenyl; and R$_c$ represents hydrogen, C_{1-6} alkyl, trifluoromethyl, phenyl, fluorophenyl, tetrahydropyranyl, azetidinyl, pyrrolidinyl, piperidinyl or morpholinyl:

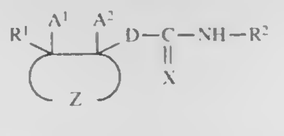
X represents oxygen, sulphur, —NH— or methylene;
Y represents oxygen or sulphur;
E represents a chemical bond or a straight or branched alkylene chain containing from 1 to 4 carbon atoms;
Q represents a straight or branched alkylene chain containing from 1 to 6 carbon atoms, optionally substituted in any position by one or more substituents selected from fluoro and hydroxy;
T represents nitrogen or CH;
U represents nitrogen or C—R^2;
V represents oxygen, sulphur or N—R^3;
R^1 represents aryl(C_{1-6})alkyl or heteroaryl(C_{1-6})alkyl, either of which groups may be optionally substituted;
R^2, R^3, R^4 and R^7 independently represent hydrogen or C_{1-6} alkyl; and
R^5 and R^6 independently represent hydrogen, C_{1-6} alkyl, trifluoromethyl, phenyl methylphenyl, or an optionally substituted aryl(C_{1-6})alkyl or heteroaryl(C_{1-6})alkyl group; or R^5 and R^6, when linked through a nitrogen atom, together represent the residue of an optionally substituted azetidine, pyrrolidine, piperidine, morpholine or piperazine ring wherein the optional substituents are selected from methyl, benzyl, methoxy, methoxycarbonyl, ethoxycarbonyl and methylaminocarbonyl;

and wherein in the foregoing, "aryl" includes phenyl and naphthyl; "heterocycloalkyl" includes azetidinyl, pyrrolidinyl, piperidinyl, piperazinyl and morpholinyl; and heteroaryl includes pyridinyl, quinolinyl, isoquinolinyl, pyridazinyl, pyrimidinyl, pyrazinyl, furyl, benzofuryl, dibenzofuryl, thienyl, benzthienyl, pyrrolyl, indolyl, pyrazolyl indazolyl, oxazolyl, isoxazolyl, thiazolyl, isothiazolyl, imidazolyl, benzimidazolyl, oxadiazolyl, thiadiazolyl, triazolyl and tetrazolyl.

5,837,716
ANALGESIC HETEROCYCLIC COMPOUNDS

Lindsay B. Hough, Slingerlands, N.Y., assignor to Albany Medical College, Albany, N.Y.
Filed Nov. 8, 1996, Ser. No. 748,467
Int. Cl.^{6} A61K *31/445;31/415*
U.S. Cl. 514—326 56 Claims

1. A method for inhibiting pain in a subject comprising:
providing a compound having the formula:



wherein

Z represents the atoms necessary to complete a five-membered or six-membered heterocyclic ring;
D is a 1-piperid-4-yl moiety, a —Q—NH— moiety, or a —Q—S— moiety;
Q has the formula —(CH$_2$)$_m$—(Y)$_s$—(CH$_2$)$_n$, wherein Y is O, S, Se or NH, m is an integer from 0 to 5, n is an integer from 0 to 5, and s is 0 or 1;
R^1 is H, R^3 or R^4;
R^2 is R^3;
each of A^1 and A^2 is H or A^1 and A^2 taken together form a second bond between the carbon atoms bearing A^1 and A^2;
X is S, N—CN, CHNO$_2$, O, or NH, provided that when D is a —Q—S— moiety, X is NH;
R^3 is selected from the group consisting of substituted or unsubstituted alkyls; substituted or unsubstituted 4-8-membered homocyclic rings; substituted or unsubstituted 4-8-membered heterocyclic rings; substituted or unsubstituted fused multicyclic rings;
R^4 is a moiety having the formula:

—W—T

—W— is —O—, —S—, —S—S—, —C (O) —O—, —C (O)—S—, —C(O)—N (R^5)—, —N (R^5)—, or CH=N—;
T is selected from the group consisting of substituted or unsubstituted alkyls, substituted or unsubstituted 4-8-membered homocyclic rings, substituted or unsubstituted 4-8-membered heterocyclic rings, substituted or unsubstituted fused multicyclic rings, and proteinaceous transport vectors; and
R^5 is H, substituted alkyl, or an unsubstituted alkyl,

provided that when A^1 and A^2 taken together form a second bond between the carbon atoms bearing A^1 and A^2, X is N—CN or S, and Z is —NH—CH=N—, Q is not —CH$_2$SCH$_2$CH$_2$—

or a pharmaceutically acceptable salt thereof; and
administering to said subject an amount of the compound effective to inhibit pain.

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5,837,717
HYDROXAMIC ACID ANESTHETIC COMPOUNDS

Fumitaka Ito, Aichi-ken, Japan, assignor to Pfizer Inc., New York, N.Y.

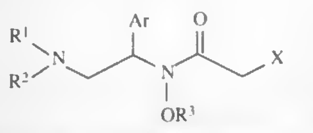
Filed Jan. 28, 1997, Ser. No. 790,246

Claims priority, application WIPO, Feb. 7, 1996, PCT/IB96/00099

Int. Cl.⁶ A61K *31/445;31/44;* **C07D** *401/12;* **C07C** *291/02*

U.S. Cl. 514—326 **9 Claims**

1. A compound of the following formula:



(I)

and its pharmaceutically acceptable salt thereof, wherein

R^1 and R^2 are independently hydrogen, C_{1-4} alkyl, C_{3-7} cycloalkyl, C_{2-4} alkenyl, C_{1-4} alkoxy, C_{1-4} alkylthio, phenyl or phenyl-C_{1-4}alkyl; or R^1 and R^2 are taken together with the nitrogen to which they are attached and form an optionally substituted, saturated or unsaturated 3-, 4-, 5-, 6- or 7-membered mono-heterocyclic ring system optionally containing an additional heteroatom selected from nitrogen, oxygen or sulfur, provided that the heterocyclic is not pyrrolidinyl;

R^3 is hydrogen, C_{1-4} alkyl or a hydroxy protecting group;

Ar is phenyl optionally substituted with one or more substituents selected from halo, hydroxy, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkoxy-C_{1-4} alkyloxy, CF_3 and carboxy-C_{1-4} alkyloxy; and

X is phenyl, naphthyl, biphenyl, indanyl, benzofuranyl, benzothiophenyl, 1-tetralone-6-yl, C_{1-4} alkylenedioxy, pyridyl, furyl or thienyl, these groups being optionally substituted with up to three substituents selected from halo, C_{1-4} alkyl, C_{1-4} alkoxy, hydroxy, NO_2 CF_3 and SO_2CH_3.

5,837,718
IMIDAZOLE-DERIVATIVES HAVING AGONISTIC OR ANTAGONISTIC ACTIVITY ON THE HISTAMINE H3-RECEPTOR

Hendrik Timmerman, Voorschoten, and Henderikus Van Der Goot, Hoofddorp, both of Netherlands, assignors to Seed Capital Investment (SCI) B.V., GA Utrecht, Netherlands

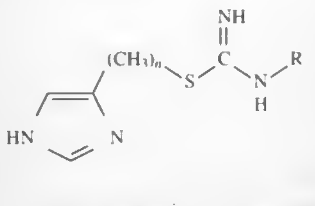
Continuation of Ser. No. 108,621, Oct. 6, 1993, abandoned.

This application Jun. 7, 1995, Ser. No. 476,032

Int. Cl.⁶ A61K *31/415;* **C07D** *233/60;233/90;233/94*

U.S. Cl. 514—341 **18 Claims**

1. A compound of the formula:



wherein, n is 3, and R is selected from the group consisting of (4-fluorobenzyl), [2-(4-chlorophenyl)ethyl], (4-bromobenzyl), [2-(4-bromophenyl)ethyl], (4-iodobenzyl), [2-(4-iodophenyl)ethyl], [2-(4-methoxybenzyl)], [2(4-methoxyphenyl)ethyl] and (3,4-dichlorobenzyl) and a salt, selected from the group consisting of 2HBr and dipicrate.

5,837,719
2,5-SUBSTITUTED ARYL PYRROLES, COMPOSITIONS CONTAINING SUCH COMPOUNDS AND METHODS OF USE

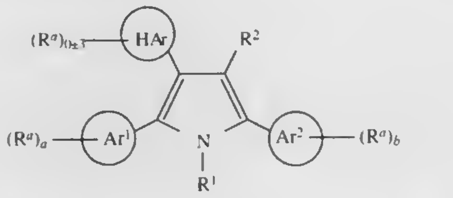
Stephen E. de Laszlo, Rumson, N.J.; Nigel J. Liverton, Harleysville, Pa.; Gerald S. Ponticello, Lansdale, Pa.; Harold G. Selnick, Ambler, Pa., and Nathan B. Mantlo, Lafayette, Colo., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 8, 1996, Ser. No. 694,143

Int. Cl.⁶ A01N *43/40;* **C07D** *401/00*

U.S. Cl. 514—343 **25 Claims**

1. A compound represented by formula I:



I

or a pharmaceutically acceptable salt thereof, wherein:

Ar^1

and

Ar^2

represent phenyl;

a and b represents integers, 0, 1, 2 or 3, such that the sum of a plus b is 1, 2, 3 or 4;

HAr

represents pyridyl, unsubstituted or substituted with 0–3 R^a groups;

each R^a independently represents a member selected from the group consisting of: halo; CN, NO_2, R^{21}; OR^{23}; SR^{23}; $S(O)R^{21}$; SO_2R^{21}; $NR^{20}R^{23}$; $NR^{20}COR^{21}$; $NR^{20}CO_2R^{21}$; $NR^{20}CONR^{20}R^{23}$; $NR^{20}SO_2R^{21}$; $NR^{20}C(NR^{20})NHR^{20}$, CO_2R^{23}; $CONR^{20}R^{23}$; $SO_2NR^{20}R^{23}$; $SO_2NR^{20}COR^{21}$; $SO_2NR^{20}CONR^{20}R^{23}$; $SO_2NR^{20}CO_2R^{21}$; $OCONR^{20}R^{23}$; $OCONR^{20}SO_2R^{20}$; $C(O)OCH_2OC(O)R^{20}$; $C(NR^{20})NR^{20}R^{23}$ and $CONR^{20}SO_2R^{21}$;

R^1 is selected from the group consisting of: H, aryl, C_{1-15} alkyl, C_{3-15} alkenyl and C_{3-15} alkynyl, said alkyl, aryl, alkenyl and alkynyl being optionally substituted with from one to three members selected from the group consisting of: aryl, OR^{20}, SR^{20}, $N(R^{20})_2$, $S(O)R^{21}$, SO_2R^{21}, $SO_2NR^{20}R^{23}$, $SO_2NR^{20}COR^{21}$, $SO_2NR^{20}CONR^{20}R^{23}$, $NR^{20}COR^{21}$, $NR^{20}CO_2R^{21}$, $NR^{20}CONR^{20}R^{23}$, $N(R^{20})C(NR^{20})NHR^{20}$, CO_2R^{20}, $CONR^{20}R^{23}$, $CONR^{20}SO_2R^{21}$, $NR^{20}SO_2R^{21}$, $SO_2NR^{20}CO_2R^{21}$, $OCONR^{20}R^{23}$, $OCONR^{20}SO_2R^{21}$; $OCONR^{20}R^{23}$ and $C(O)OCH_2OC(O)R^{20}$;

R^2 is selected from the group consisting of: H, C_{1-15} alkyl, C_{2-15} alkenyl, C_{2-15} alkynyl, halo, NO_2, CN, $S(O)R^{21}$, SO_2R^{21}, $SO_2N(R^{20})_2$, $SO_2NR^{20}COR^{21}$, $SO_2NR^{20}CON(R^{20})_2$, COR^{20}, CO_2R^{20}, $CONR^{20}R^{23}$, $CONR^{20}SO_2R^{21}$ and $SO_2NR^{20}CO_2R^{21}$, said alkyl, alkenyl and alkynyl being optionally substituted with from one to three members selected from the group consisting of: halo, CN, aryl, R^{20}, OR^{20}, SR^{20}, $NR^{20}R^{23}$, $S(O)R^{21}$, SO_2R^{21}, $SO_2NR^{20}R^{23}$, $SO_2NR^{20}COR^{21}$, $SO_2NR^{20}CONR^{20}R^{23}$, $NR^{20}COR^{21}$, $NR^{20}CO_2R^{21}$, $NR^{20}CONR^{20}R^{23}$, $NR^{20}C(NR^{20})NHR^{20}$, CO_2R^{20}, $CONR^{20}R^{23}$, $CONR^{20}SO_2R^{22}$, $NR^{20}SO_2R^{21}$, $SO_2NR^{20}CO_2R^{22}$, $OCONR^{20}SO_2R^{21}$ and $OCONR^{20}R^{23}$;

R^{20} represents a member selected from the group consisting of: H, C_{1-15} alkyl, C_{2-15} alkenyl, C_{2-15} alkynyl and aryl, said alkyl, alkenyl, alkynyl and aryl being optionally substituted with 1–3 groups selected from halo and aryl;

R^{21} represents a member selected from the group consisting of: C_{1-15} alkyl, C_{2-15} alkenyl, C_{2-15} alkynyl, and aryl,

such alkyl, alkenyl and alkynyl being optionally interrupted with oxo and/or 1–2 heteroatoms selected from O, S, S(O), SO_2 and NR^{20}, said alkyl, alkenyl, alkynyl and aryl being optionally substituted with from 1–3 of halo, aryl, CN, OR^{20}, $O((CH_2)_nO)_mR^{20}$, $NR^{20}((CH_2)_nO)_mR^{20}$ wherein n represents an integer of from 2 to 4, and m represents an integer of from 1 to 3; SR^{20}, $N(R^{20})_2$, $S(O)R^{22}$, SO_2R^{22}, $SO_2N(R^{20})_2$, $SO_2NR^{20}COR^{22}$, $SO_2NR^{20}CON(R^{20})_2$, $NR^{20}COR^{22}$, $NR^{20}CO_2R^{22}$, $NR^{20}CON(R^{20})_2$, $NR^{22}C(NR^{22})NHR^{22}$, CO_2R^{20}, $CON(R^{20})_2$, $CONR^{20}SO_2R^{22}$, $NR^{20}SO_2R^{22}$, $SO_2NR^{20}CO_2R^{22}$, $OCONR^{20}SO_2R^{22}OC(O)R^{20}$, $C(O)OCH_2OC(O)R^{20}$ and $OCON(R^{20})_2$;

R^{22} is selected from the group consisting of: C_{1-15} alkyl, C_{2-15} alkenyl, C_{2-15} alkynyl and aryl, said alkyl, alkenyl, and alkynyl being optionally substituted with 1–3 halo or aryl groups;

R^{23} is R^{21} or H, and

R^{24} is selected from COR^{22}, CO_2R^{22}, $CON(R^{20})_2$, SO_2R^{22} and R^{23}.

5,837,720
N-2-(PYRROLIDINYL-1)-1-PHENETHYL) ACETAMIDES AS KAPPA RECEPTOR ANTAGONISTS

Fumitaka Ito, Chita-gun, Japan, assignor to Pfizer Inc., New York, N.Y.

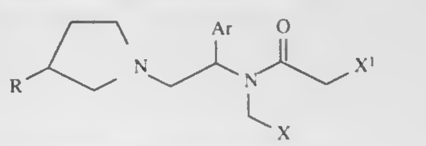
PCT No. PCT/IB95/00374, § 371 Date Apr. 17, 1997, § 102(e) Date Apr. 17, 1997, PCT Pub. No. WO96/06077, PCT Pub. Date Feb. 29, 1996

PCT Filed May 18, 1995, Ser. No. 793,225

Int. Cl.⁶ A61K *31/40;* **C07D** *207/12;* **C07C** *233/13;233/31*

U.S. Cl. 514—343 **11 Claims**

1. A compound of the following formula:



(I)

and its pharmaceutically acceptable salt, wherein

R is hydroxy;

Ar is phenyl or phenyl substituted with one to three substituents selected from halo C_1–C_4alkyl, C_{1-4} alkoxy;

X is phenyl or heterocyclic; phenyl or heterocyclic substituted with one to three substituents selected from halo, C_{1-4} alkyl, C_{1-4} alkoxy and methoxycarbonyl; mono-, di- or trihalomethyl; cyano; COR^1, $CH{=}NOR^2$, OR^2, SR^2, CH_2CN, CH_2OR^2, CH_2SR^2, $CH_2S(O)R^2$, $CH_2S(O)_2R^2$, $CH_2N(R^2)R^3$, CH_2NR^2OH, $CH_2N(COR^2)OH$, $CH_2NR^2COR^3$, $CH_2NR^2S(O)_2R^3$ or CH_2OCOR^2, wherein R^1 is hydrogen, hydroxy, amino, NHOH, $NHOCH_3$, pyridylamino, $NHN(CH_3)_2$, C_{1-4} alkoxy, benzyloxy, C_{1-4} alkylamino, di-C_{1-4} alkylamino, C_{1-4} alkyl or C_{1-4} alkylthio; and R^2 and R^3 are each hydrogen, C_{1-4} alkyl, C_{1-4} alkoxy or C_{7-11} phenylalkyl; and

X^1 is phenyl, naphthyl, furyl, thienyl, pyridyl, thiazolyl, benzofuryl or benzothienyl; phenyl, naphthyl, furyl, thienyl, pyridyl, thiazolyl, benzofuryl or benzothienyl, substituted with one to three substituents selected from halo, C_{1-4} alkyl, C_{1-4} alkoxy, amino, hydroxy, nitro, trifluoromethyl and mesyl.

5,837,721
THIFLUZAMIDE WITH STABILIZED EFFICACY

Norihito Hayakawa; Masatoshi Baba, both of Funabashi; Norihiro Suwa, Narashino, and Kazuhiro Yamagishi, Tokyo, all of Japan, assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Feb. 20, 1997, Ser. No. 804,160

Int. Cl.⁶ C07D *277/56;* **A01N** *43/78*

U.S. Cl. 514—365 **5 Claims**

1. A process for preparing β-crystalline thifluzamide, comprising the steps of:

a) heat-melting α-crystalline thifluzamide at a temperature above the melting point until molten and

b) cooling the melted thifluzamide to a temperature below the melting point until recrystallized.

5,837,722

Patent Not Issued For This Number

5,837,723
PHARMACEUTICAL COMPOSITION USEFUL FOR TREATING OPHTHALMOLOGICAL DISEASES

Toshiaki Watanabe, Yokohama, Japan, assignor to Mitsubishi Chemical Corporation, Tokyo, Japan

Filed Jul. 5, 1994, Ser. No. 270,589

Claims priority, application Japan, Jul. 7, 1993, 5-192753

Int. Cl.⁶ A01N *43/56*

U.S. Cl. 514—404 **3 Claims**

1. A method of prophylactic or therapeutic treatment of an ophthalmological disease caused by an increase in lipid peroxide in the eyeball in mammals, characterized by administering an effective amount of 3-methyl-1 -phenyl-2-pyrazolin-5-one or a pharmaceutically acceptable salt thereof to said mammals susceptible to or suffering from said diseases.

5,837,724
METHOD OF ENHANCING COGNITION

Michael John Allen, Sandwich, United Kingdom; Brian Frank Johnson, Groton, Conn.; Brian Robert Leaker, and Robert Michael Wallis, both of Sandwich, United Kingdom, assignors to Pfizer Inc., New York, N.Y.

Filed Jun. 11, 1997, Ser. No. 872,891

Claims priority, application United Kingdom, Jun. 18, 1996, 9612710

Int. Cl.⁶ A61K *31/40*

U.S. Cl. 514—422 **8 Claims**

1. A pharmaceutical formulation comprising darifenacin, or a pharmaceutically acceptable salt thereof, and an acetylcholinesterase inhibitor, together with a pharmaceutically acceptable adjuvant, diluent or carrier.

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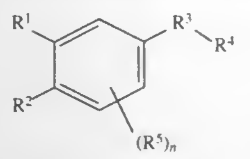
5,837,725
BRIDGED BICYCLIC AROMATIC COMPOUNDS AND THEIR USE IN MODULATING GENE EXPRESSION OF RETINOID RECEPTORS

Marcia I. Dawson, Menlo Park; James F. Cameron, Palo Alto; Peter D. Hobbs, Moss Beach; Ling Jong, Sunnyvale; Magnus Pfahl, Solana Beach; Xiao-kun Zhang, La Jolla, and Jürgen M. Lehmann, Solana Beach, all of Calif., assignors to SRI International, Menlo Park, and La Jolla Cancer Research Foundation, La Jolla, both of Calif.

Division of Ser. No. 982,305, Nov. 25, 1992, Pat. No. 5,466,861. This application May 24, 1995, Ser. No. 448,991
Int. Cl.^{6} A61K *31/335;31/38;* **C07D** *317/00;339/02*
U.S. Cl. 514—467 **32 Claims**

1. A bicyclic aromatic compound having the structural formula



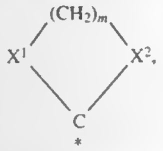
(I)

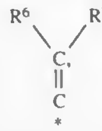
and the pharmaceutically acceptable esters, amides and salts thereof, wherein:

R^1 is selected from the group consisting of lower alkyl and adamantyl;

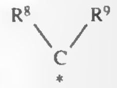
R^2 is —O—R^{13} or —S—R^{13} where R^{13} is lower alkyl; or when R^1 is ortho to R^2, R^1 and R^2 may be linked together to form a 5- or 6-membered cycloalkylene ring, either unsubstituted or substituted with 1 to 4 lower alkyl groups, and optionally containing 1 or 2 heterocyclic atoms selected from the group consisting of O, S and NR where R is hydrogen or lower alkyl;

R^3 is selected from the group consisting of carbonyl,



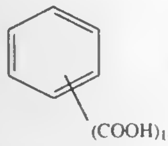


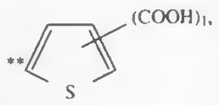
and

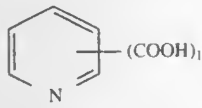


in which X^1 and X^2 are independently selected from the group consisting of O, S and methylene, wherein at least one of X^1 and X^2 is O or S, or wherein one of X^1 and X^2 is NR and the other is methylene, m is 2 or 3, R^6, R^7, R^8 and R^9 are independently hydrogen or lower alkyl, or R^8 and R^9 may be linked together to form a cycloalkylene ring containing 3 to 6 carbon atoms, and * represents the point of attachment of the R^3 substituent to the remainder of the molecule;

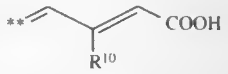
R^4 is selected from the group consisting of







and

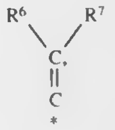


in which R^{10} is hydrogen or methyl, l is 0 or 1, and ** represents the point of attachment of the R^4 substituent to the remainder of the molecule;

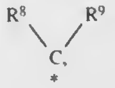
the R^5 are independently selected from the group consisting of lower alkyl and lower alkoxy; and

n is 0, 1, 2 or 3,

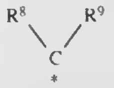
with the provisos that: (a) when n is 0, R^3 is other than carbonyl, $*C{=}CH_2$ or CH_2; (b) when n is 0, and R^3 is



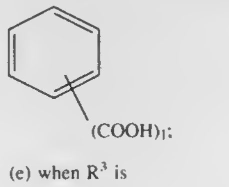
then R^6 and R^7 are not both hydrogen; (c) when n is 0, and R^3 is



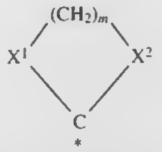
then R^8 and R^9 are not both hydrogen; (d) when R^3 is



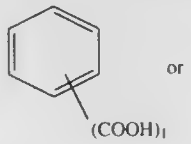
in which one of R^8 and R^9 is hydrogen or lower alkyl and the other is lower alkyl, either (i) R^1 and R^2 are such that they are not linked together to form a cycloalkyl ring, or (ii) R^4 is other than



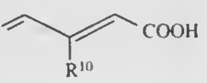
(e) when R^3 is



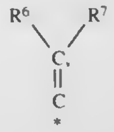
and X^1 and X^2 are both methylene, R^4 is other than



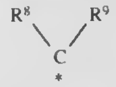
or



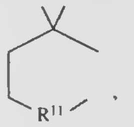
and (f) when R^3 is carbonyl,



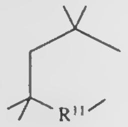
with R^6 and R^7 being hydrogen, C_1 to C_4 alkyl, or



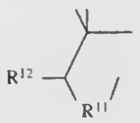
with R^8 and R^9 being hydrogen or C_1 to C_4 alkyl, and when R^1 is ortho to and linked to R^2 to form a five-to six-membered cycloalkylene ring



,



or



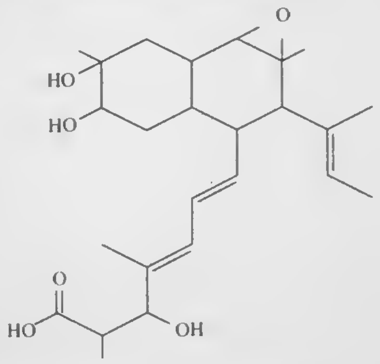
in which R^{11} is O, S, $(CH_3)_2C$, CH_2 or NR wherein R is hydrogen or lower alkyl and R^{12} is hydrogen or methyl, then R^5 cannot be C_1 to C_4 alkyl when n is 1 and when R^5 is ortho to R^3.

5,837,726
ANTIFUNGAL AGENTS DERIVED FROM ASPERGILLUS FUMIGATUS

David Qin Liu, Suffern, N.Y.; Zhi-Dong Jiang, Watertown, Mass.; Rex T. Gallagher, Beverly, Mass., and T. Vance Morgan, Natick, Mass., assignors to Millennium Pharmaceuticals, Inc., Cambridge, Mass.

Filed Nov. 1, 1995, Ser. No. 551,420
Int. Cl.^{6} A01N *43/20;* **C07D** *303/00*
U.S. Cl. 514—475 **6 Claims**

1. A compound having the formula:



or a pharmaceutically acceptable salt thereof.

5,837,727
METHOD FOR ALTERING BLOOD LIPID LEVELS

Carl-Axel Wilhelm Edvard Bauer, and Leif Åke Svensson, both of Lund, Sweden, assignors to Astra Aktiebolag, Sodertalje, Sweden

Filed Mar. 15, 1991, Ser. No. 670,053
Claims priority, application Sweden, Mar. 16, 1990, 9000948
Int. Cl.^{6} A61K *31/27*
U.S. Cl. 514—483 **7 Claims**

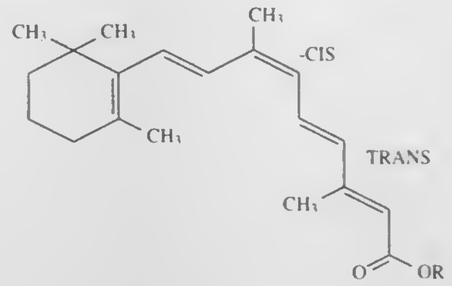
1. A method of treating a human subject having diabetes melllitus so as to lower the subjects blood lipid levels which comprises orally administering to the subject an amount of bambuterol or a pharmaceutically acceptable salt thereof sufficient to lower the subjects blood lipid levels.

5,837,728
9-CIS RETINOIC ACID ESTERS AND AMIDES AND USES THEREOF

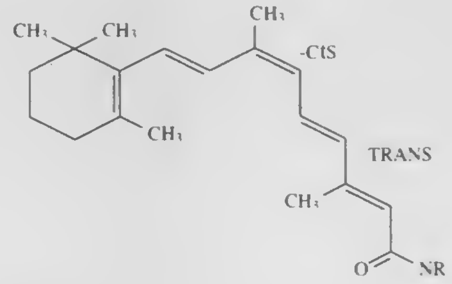
William P. Purcell, Memphis, Tenn., assignor to Molecular Design International, Memphis, Tenn.

Filed Jan. 27, 1995, Ser. No. 380,011
Int. Cl.^{6} A62K *31/215*
U.S. Cl. 514—529 **40 Claims**

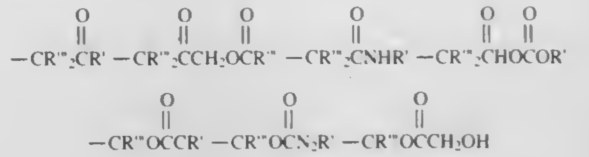
1. A compound selected from the group consisting of:



and

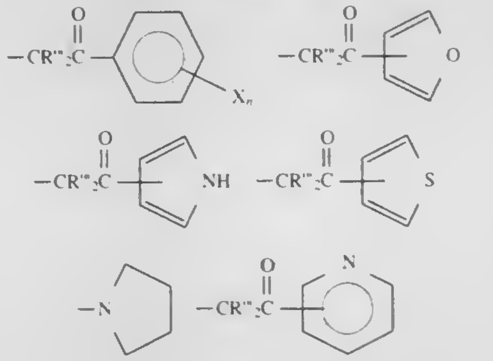


wherein R is

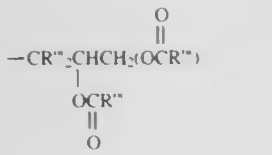


$$-CR'''_2\overset{\mathrm{O}}{\overset{\|}{\mathrm{C}}}R' \quad -CR'''_2\overset{\mathrm{O}}{\overset{\|}{\mathrm{C}}}CH_2O\overset{\mathrm{O}}{\overset{\|}{\mathrm{C}}}R''' \quad -CR'''_2\overset{\mathrm{O}}{\overset{\|}{\mathrm{C}}}NHR' \quad -CR'''_2\overset{\mathrm{O}}{\overset{\|}{\mathrm{C}}}HO\overset{\mathrm{O}}{\overset{\|}{\mathrm{C}}}OR'$$

$$-CR'''O\overset{\mathrm{O}}{\overset{\|}{\mathrm{C}}}CR' \quad -CR'''O\overset{\mathrm{O}}{\overset{\|}{\mathrm{C}}}N_2R' \quad -CR'''O\overset{\mathrm{O}}{\overset{\|}{\mathrm{C}}}CH_2OH$$



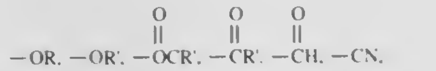
and



$$-CR'''_2\underset{\underset{\underset{\mathrm{O}}{\|}}{OCR'''}}{\underset{|}{C}}HCH_2(O\overset{\mathrm{O}}{\overset{\|}{\mathrm{C}}}R''')$$

wherein X is

−H, −F, −Cl, −I, −OH,



$$-OR,\ -OR',\ -O\overset{\mathrm{O}}{\overset{\|}{\mathrm{C}}}R',\ -\overset{\mathrm{O}}{\overset{\|}{\mathrm{C}}}R',\ -\overset{\mathrm{O}}{\overset{\|}{\mathrm{C}}}H,\ -CN,$$

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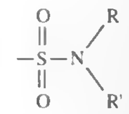
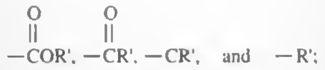
$-NO_2$ $-NH_2$, $-NHR'$, $-NR'_2$ and



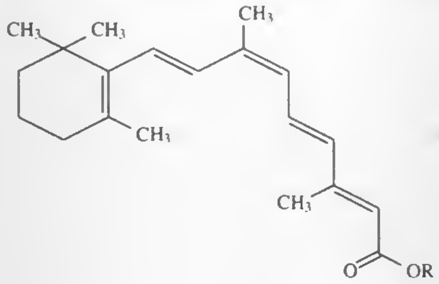
wherein n is a number from 1 to 5;
wherein R' is H or any of the lower alkyls ranging from C_1 to C_6;
wherein R" is



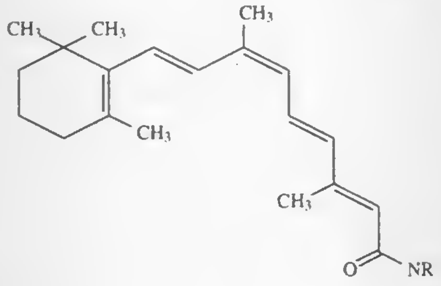
$$-\overset{\substack{O\\ \|}}{C}OR',\ -\overset{\substack{O\\ \|}}{C}R',\ -CR',\ \text{and}\ -R';$$

wherein R"' is R" or the hydrocarbon backbone of fatty acids;
wherein R"" is R" or the hydrocarbon backbone of fatty acids;
wherein R""' is the lower alkyls ranging from C_1 to C_6; and further,
when there are two or more R', R", R"', R"", or R""' groups attached to the same carbon, each R", R", R"', R"", or R""' group may be the same as or different from the other R', R", R"', R"", or R""' groups attached to that carbon.

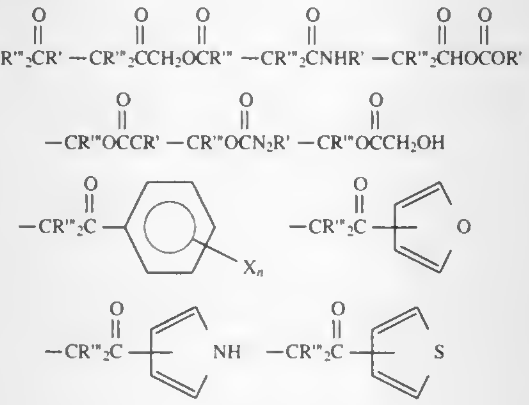
12. A pharmaceutical composition for the treatment of the skin for a condition responsive to retinoids which comprises an effective amount of a 9-cis retinoid compound of the formula:



and



wherein R is



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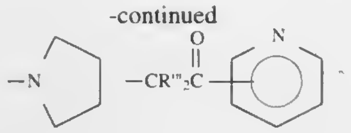
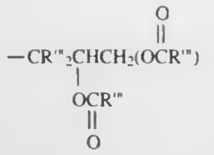


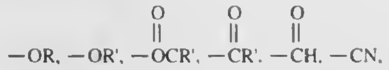
and



$$-CR'''_2\underset{\substack{|\\ O\underset{\substack{\|\\ O}}{C}R'''}}{C}HCH_2(O\overset{\substack{O\\ \|}}{C}R''')$$

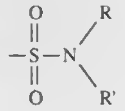
wherein X is

$-H$, $-F$, $-Cl$, $-I$, $-OH$,

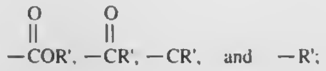


$$-OR,\ -OR',\ -O\overset{\substack{O\\ \|}}{C}R',\ -\overset{\substack{O\\ \|}}{C}R',\ -\overset{\substack{O\\ \|}}{C}H,\ -CN,$$

$-NO_2$ $-NH_2$, $-NHR'$, $-NR'_2$ and



wherein n is a number from 1 to 5;
wherein R' is H or any of the lower alkyls ranging from C_1 to C_6;
wherein R" is



$$-\overset{\substack{O\\ \|}}{C}OR',\ -\overset{\substack{O\\ \|}}{C}R',\ -CR',\ \text{and}\ -R';$$

wherein R"' is R" or the hydrocarbon backbone of fatty acids;
wherein R"" is R" or the hydrocarbon backbone of fatty acids;
wherein R""' is the lower alkyls ranging from C_1 to C_6; and further,
when there are two or more R', R", R"', R"", or R""' groups attached to the same carbon, each R", R", R"', R"", or R""' group may be the same as or different from the other R', R", R"', R"", or R""' groups attached to that carbon,
admixed with a pharmaceutically acceptable vehicle.

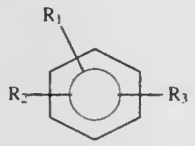
5,837,729
METHODS FOR TREATING AND PREVENTING HIV INFECTION USING ACETAMINOPHEN AND DERIVATIVES THEREOF

Aldar S. Bourinbaiar, New York, N.Y., assignor to Metatron, Inc., Deer Park, N.Y.

Filed Apr. 26, 1996, Ser. No. 638,098
Int. Cl.⁶ A61K ***31/24***

U.S. Cl. 514—535 **15 Claims**

1. A method for treating an HIV infection in a human comprising administering to said human an anti-HIV effective amount of a compound having the formula:



where any one or more of R^1, R^2 and R^3 are substituted in the ortho- (o-), meta (m-) and/or para (p-) positions of the aromatic (phenyl) core and where R^1 is a straight or branched chain C_1–C_8 alkyl, H, F, Cl, Br, I, trihalomethyl, hydroxy, alkoxy, carboalkoxy, carboxamido, ester, aldehyde, ketone, amino, nitro or cyano;

R^2 may be the same substituent as R^1, a sulfate, phosphate or glucuronide, or a substituted sulfate, phosphate or glucuronide; and

R^3 may be the same substituent as R^1 or R^2 and can be present with R^1 or R^2 or both R^1 and R^2, with the proviso that R^1, R^2 and R^3 are not all H, said compound being administered for a period of time sufficient to exert an inhibitory effect on said HIV infection.

5,837,730
TREATMENT OF NEGATIVE AND COGNITIVE SYMPTOMS OF SCHIZOPHRENIA WITH GLYCINE UPTAKE ANTAGONISTS

Daniel C. Javitt, 3043 Johnson Ave., Riverdale, N.Y. 10463

Filed Dec. 6, 1996, Ser. No. 759,681
Int. Cl.⁶ A61K ***31/22;31/195***

U.S. Cl. 514—551 **12 Claims**

7. A process for treating schizophrenia in a human patient which comprises administering to said patient a glycine uptake antagonist in an amount sufficient for augmenting NMDA receptor-mediated neurotransmission.

5,837,731
FATTY ACID TREATMENT

Krishna S Vaddadi, Clayton, Australia, assignor to Scotia Holdings Plc, United Kingdom

Filed Sep. 26, 1996, Ser. No. 721,329
Claims priority, application United Kingdom, Sep. 27, 1995, 9519661
Int. Cl.⁶ A61K ***31/20***

U.S. Cl. 514—560 **4 Claims**

1. A method of treating the symptoms of Huntington's Chorea comprising administering to a patient in need of same an effective amount of gamma-linolenic acid (GLA) or dihomogammalinolenic acid (DGLA).

5,837,732
ANTIMYCOBACTERIAL COMPOUNDS AND METHOD OF USING SAME

James Sacchettini, College Station, Tex.; John Blanchard, Pelham Manor, N.Y.; William R. Jacobs, City Island, N.Y., and Robert Bittman, Roslyn Heights, N.Y., assignors to Albert Einstein College of Medicine of Yeshiva University, New York, and The Research Foundation of the City University of New York, Bronx, both of N.Y.

Continuation of Ser. No. 598,085, Feb. 7, 1996, abandoned, which is a continuation-in-part of Ser. No. 386,917, Feb. 7, 1995, Pat. No. 5,648,392, which is a continuation-in-part of Ser. No. 234,011, Apr. 28, 1994, Pat. No. 5,702,935, and Ser. No. 307,376, Sep. 16, 1994, abandoned. This application Dec. 13, 1996, Ser. No. 766,273
Int. Cl.⁶ A61K ***31/20***

U.S. Cl. 514—560 **2 Claims**

1. A method for treating *M. avium* infection in a subject in need of said treatment which comprises administering to the subject an effective amount of a compound having the structure: $RC{\equiv}CCO_2H$, wherein R is an unbranched C9–C30 alkyl, to treat *M. avium* infection in the subject.

5,837,733
METHOD FOR REDUCING SECETION OF APOLIPOPROTEIN B IN ANIMALS BY ADMINISTERING CONJUGATED LINOLEIC ACID

Michael W. Pariza, Madison, Wis., and Kisun N. Lee, Seoul, Rep. of Korea, assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Feb. 26, 1997, Ser. No. 805,486
Int. Cl.⁶ A61K ***31/20***

U.S. Cl. 514—560 **10 Claims**

1. A method of reducing secretion of Apolipoprotein B from an animal cell, the method comprising the step of exposing the cell to a compound selected from the group consisting of 9,11-octadecadienoic acid, 10,12-octadecadienoic acid, mixtures thereof, active esters and non-toxic salts thereof, in an amount effective to reduce the secretion of Apolipoprotein B from the cell.

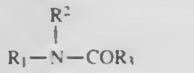
5,837,734
METHOD FOR THE TREATMENT OF COCCIDIOIDOMYCOSIS IN WARM-BLOODED ANIMALS

Robert C. Bartsch, and Russell T. Greene, both of Phoenix, Ariz., assignors to Novartis Corporation, Summit, N.J.

Filed May 1, 1996, Ser. No. 640,606
Int. Cl.⁶ A61K ***31/17***

U.S. Cl. 514—594 **20 Claims**

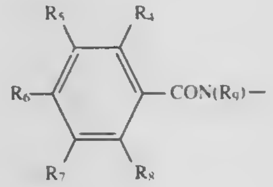
1. A method for the treatment or prophylaxis of *C.immitis* infections in warm-blooded animals which comprises administering to an animal in need of such treatment a therapeutic effective amount of an acyl urea represented by the following formula:



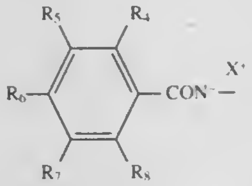
$$R_1-\overset{\substack{R^2\\ |}}{N}-COR_3$$

(I)

wherein
R_1 is unsubstituted or substituted phenyl, naphthyl, pyridyl, pyridazinyl, pyrimidinyl or pyrazinyl.
R_2 is hydrogen or C_1–C_6alkyl.
$R_3$is



or



R_4 to R_8 are each independently hydrogen, halogen, C_1–C_6-alkyl, C_1–C_6haloalkyl,
C_1–C_6alkoxy, C_1–C_6-haloalkoxy or C_1–C_6alkylthio,
R_9 is hydrogen or C_1–C_6aLkyl, and
$X^+$is a pharmaceutically or agronomically acceptable inorganic or organic cation; and pharmaceutically or agronomicaUy acceptable salts thereof.

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5,837,735
ANTIINFLAMMATORY AGENT FOR EXTERNAL USE

Satoru Miyata; Yasuaki Taniguchi; Kenji Masuda, and Yoichi Kawamura, all of Tosu, Japan, assignors to Helsinn Healthcare S.A., Pazzallo, Switzerland

PCT No. PCT/JP95/02045, § 371 Date Jul. 10, 1997, § 102(e) Date Jul. 10, 1997, PCT Pub. No. WO96/11002, PCT Pub. Date Apr. 18, 1996

PCT Filed Oct. 5, 1995, Ser. No. 809,936

Claims priority, application Japan, Oct. 5, 1994, 6-268293

Int. Cl.^{6} A61K *31/18*

U.S. Cl. 514—605 **8 Claims**

1. An antiinflammatory cream preparation for external use comprising nimesulide in a dispersed phase having a mean particle diameter of from 0.01 to 75 μm in an amount of from 0.1 to 5% by weight mixed in a gel-like cream base comprising a carboxyvinyl polymer in an amount of from 0.2 to 3% by weight, an oily substance comprising diisopropyl sebacate and isopropyl myristate in an amount of from 2 to 20% by weight, a nonionic surface active agent in an amount of from 0.5 to 7% by weight, a basic substance in an amount of from 0.01 to 5% by weight, and water in an amount of from 50 to 90% by weight.

5,837,736
NITRIC OXIDE-RELEASING COMPOUNDS TO SENSITIVE CANCEROUS CELLS TO CHEMOTHERAPEUTIC AGENTS

James B. Mitchell, Damascus; Angelo Russo, Bethesda; Murali C. Krishna, Derwood; David A. Wink, Jr., Hagerstown, all of Md., and James E. Liebmann, Albuquerque, N. Mex., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Division of Ser. No. 319,888, Oct. 7, 1994, Pat. No. 5,650,442, which is a continuation-in-part of Ser. No. 133,574, Oct. 8, 1993, abandoned. This application Mar. 11, 1997, Ser. No. 814,228

Int. Cl.^{6} A61K *31/13;31/44;31/495;31/445*

U.S. Cl. 514—610 **14 Claims**

1. A method of sensitizing cancerous cells in a mammal to a chemotherapeutic agent, which method comprises administering to a mammal in need of chemotherapy a chemotherapy-sensitizing effective amount of a nitric oxide-containing compound, which spontaneously releases nitric oxide under physiological conditions without requiring the presence of oxygen, in conjunction with chemotherapy.

5,837,737
HYDRAZINEDICARBOXIMIDAMIDE COMPOUNDS AND PHARMACEUTICAL COMPOSITION COMPRISING SAME

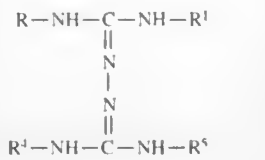
Stanley M. Goldin, Lexington; Subbarao Katragadda, Belmont; Lain-Yen Hu, Bedford; N. Laxma Reddy, Malden; James B. Fischer, Cambridge; Andrew Gannett Knapp, Salem, and Lee David Margolin, Belmont, all of Mass., assignors to Cambridge NeuroScience, Inc., Cambridge, Mass.

Continuation of Ser. No. 343,829, Nov. 22, 1994, which is a division of Ser. No. 833,421, Feb. 10, 1992, Pat. No. 5,403,861, which is a continuation of Ser. No. 652,104, Feb. 8, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 485,566

Int. Cl.^{6} A01N *37/52;* **C07C** *281/00*

U.S. Cl. 514—632 **22 Claims**

1. A compound of the following formula:



$$\begin{array}{c} R{-}NH{-}\underset{\Large\|}{C}{-}NH{-}R^1 \\ N \\ | \\ N \\ \| \\ R^4{-}NH{-}C{-}NH{-}R^5 \end{array}$$

or a tautomer thereof,

wherein R, R^1, R^4 and R^5 are the same or different and are cycloalkyl of 3 to 12 carbon atoms, carbocyclic aryl, alkaryl, aralkyl or heterocyclic of 6 to 18 carbon atoms and containing 1–3

separate or fused rings, and 0–5O, N and/or S ring atoms in an aryl, alicyclic or mixed ring system;

wherein R, R^1, R^4 or R^5 is optionally substituted hydroxy, acetate, oxo, amino, lower C_{1-6} alkyl, lower C_{1-6} alkyl amino, alkoxy of 1–6 carbon atoms, di-lower C_{2-12} alkyl amino, nitro, azido, sulfhydryl, cyano, isocyanato, halogen, amido, sulfonato or carbamido, with the exclusion of N,N',N",N"'-tetracyclohexylhydrazinedicarboximidamide and N,N',N",N"'-tetraphenylhydrazinedicarboximidamide .

5,837,738
METHOD OF INHIBITING NITRIC OXIDE FORMATION

Joseph R. Williamson; John A. Corbett; Michael L. McDaniel, all of St. Louis, Mo., and Ronald G. Tilton, Sugarland, Tex., assignors to Washington University, St. Louis, Mo.

Continuation of Ser. No. 328,925, Oct. 25, 1994, abandoned, which is a continuation-in-part of Ser. No. 110,915, Aug. 24, 1993, Pat. No. 5,358,969, which is a continuation-in-part of Ser. No. 843,387, Feb. 28, 1992, Pat. No. 5,246,971, and a continuation-in-part of Ser. No. 906,632, Jun. 30, 1992, Pat. No. 5,246,970, said Ser. No. 843,387 , said Ser. No. 906,632 is a continuation-in-part of Ser. No. 807,912, Dec. 16, 1991, abandoned. This application Feb. 5, 1997, Ser. No. 796,654

Int. Cl.^{6} A61K *31/155*

U.S. Cl. 514—634 **3 Claims**

1. A method of inhibiting nitric oxide production in a warm blooded mammal afflicted with the physiological conditions manifested by an acute or chronic inflammatory disease or condition said method comprising administering topically to said mammal a nitric oxide inhibitory effective amount of aminoguanidine wherein the inflammatory disease or condition is a member selected from the group consisting of acute and chronic vaginitis; insect bites; thermal burns; chemical burns; electrical burns; sunburn; acute and delayed hypersensitivity; acute or chronic psoriasis; eczema; contact dermatitis; poison ivy; poison oak; and poison sumac.

5,837,739
LOADED SYNTACTIC FOAM-CORE MATERIAL

Gregory P. Nowak, Belleville, Ill.; Alan F. Tegeler, O'Fallon, and Tracy L. Timmons, Maryland Heights, both of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 480,778, Jun. 7, 1995. This application Dec. 12, 1996, Ser. No. 766,417

Int. Cl.^{6} C08J *9/28;9/32;9/35*

U.S. Cl. 521—54 **24 Claims**

1. A method for preparing a readily conformable, B-staged, low density syntactic foam-core composite comprising the steps of:

a) combining a resin, a first portion of a solvent for the resin, and a plurality of microspheres to form a slurry in which the resin, solvent, and microspheres are substantially uniformly dispersed;

b) forming a measured amount of the slurry into a sheet;

c) heating the sheet to a temperature between about T_{vmin} −20° F. and T_{vmin} for a period of time between about t_{vmin} −15 minutes and t_{vmin} to partially cure the resin to a point approaching but not beyond minimum viscosity, where T_{vmin} and t_{vmin} represent a point at which the resin reaches a minimum viscosity as a function of time and temperature; and

d) cooling the sheet by placing it in an environment having a temperature not greater than room temperature.

5,837,740
EXPANDABLE ABS RESIN BEADS AND PROCESS FOR PRODUCING THE SAME

Kenji Haraguchi; Takanori Suzuki, and Yoshinari Itoh, all of Mie, Japan, assignors to Mitsubishi Chemical BASF Company, Limited, Yokkaichi, Japan

Filed Sep. 21, 1995, Ser. No. 531,603

Claims priority, application Japan, Sep. 28, 1994, 6-232857

Int. Cl.^{6} C08G *9/18*

U.S. Cl. 521—60 **6 Claims**

1. Expandable ABS resin beads containing a volatile blowing agent, said expandable ABS resin beads having an internal-water content of 5% by weight or lower and, when expanded in an expansion ratio of 30, giving expanded beads which each has a non-expanded surface layer having a thickness of not more than 50 μm.

5,837,741
COMPOSITE MICROPOROUS CARBONS FOR FUEL GAS STORAGE

James A. Schwarz, Fayetteville; Karol Putyera, Syracuse; Teresa J. Bandosz, Ridgefield, all of N.Y.; Jacek Jagiello, Charleston, S.C., and Kwabena A. G. Amankwah, Syracuse, N.Y., assignors to Syracuse University, Syracuse, N.Y.

Filed Aug. 19, 1996, Ser. No. 699,487

Int. Cl.^{6} C08J *9/00;* **B01J** *20/20*

U.S. Cl. 521—124 **13 Claims**

1. A microporous carbon adsorbent material which is the product of the pyrolysis of an organic precursor which contains a metal component, said material being suitable for use as a storage media for light gases, and having a uniform pore size distribution of micropores in the range of about 4 to 15 Å A, and a total specific surface area greater than about 600 m^2/gm.

5,837,742
METHOD OF MAKING A POLYURETHANE FOAM HAVING IMPROVED FLAME RETARDANCE AND AGED K-FACTORS

Thomas L. Fishback, Gibraltar, Mich., assignor to BASF Corporation, Mt. Olive, N.J.

Filed Oct. 27, 1995, Ser. No. 549,581

Int. Cl.^{6} C08J *9/04*

U.S. Cl. 521—172 **23 Claims**

1. A method of making a polyisocyanate based closed cell rigid foam comprising reacting an organic isocyanate and a polyol composition in the presence of a blowing agent comprising an aliphatic or cycloaliphatic C_4–C_7 hydrocarbon, wherein said polyol composition comprises:

a) a polyol having polyester linkages and a number average molecular weight of 400 or more; and

b) about 8 parts per hundred of polyol (php) of a silicone-containing surfactant polymer.

5,837,743
METHOD FOR PRODUCING FOAMS FROM HIGH ACID POLYESTER POLYOLS

Michael Edward Londrigan, Clearwater; Judy Ann Godbey, Tampa, and Gregory W. Lynn, Clearwater, all of Fla., assignors to Celotex Corporation, Tampa, Fla.

Division of Ser. No. 873,435, Jun. 12, 1997. This application Apr. 10, 1998, Ser. No. 58,140

Int. Cl.^{6} G08G *18/42*

U.S. Cl. 521—172 **18 Claims**

1. A closed cell, rigid polymer foam which comprises the reaction product prepared by

(a) continuously conveying a carrier along a production line,

(b) supplying on top of the carrier a foam-forming mixture comprising a polyisocyanate, an isocyanate-reactive component, a catalyst and a hydrogen-containing blowing agent or a mixture of a hydrogen-containing blowing agent and at least one co-blowing agent, the isocyanate-reactive component comprising (i) a high acid polyester polyol having an acid number greater than 1, or (ii) a mixture of the high acid polyester polyol and at least one other isocyanate-reactive compound,

(c) passing the carrier and mixture between two spaced opposed constricting members which lie one above the other and form therebetween a metering gap for distributing the mixture over the carrier and

(d) allowing the mixture after passing through the gap to freely expand to form a plastic foam, wherein the acid number of the high acid polyester polyol and the amount thereof in the mixture are sufficiently high to result in an improved resistance to cold temperature shrinkage vis-à-vis that of a comparable foam having the same density and prepared from the same foam-forming mixture except that the high acid polyester polyol is replaced by a conventional polyester polyol having the same equivalent weight but a lower acid number.

5,837,744
POLYOXYMETHYLENE ARTICLES HAVING PRINTABLE SURFACE METHOD OF IMPARTING PRINTABILITY TO POLYOXYMETHYLENE

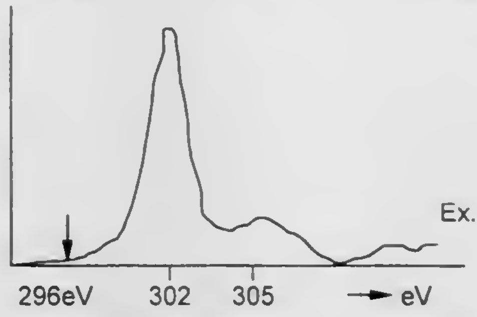
Naoyuki Nagashima; Hitoshi Azegami, both of Nagano-Ken, and Yasufumi Takasugi, Saku, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Continuation of Ser. No. 144,812, Oct. 28, 1993, abandoned. This application Jul. 1, 1996, Ser. No. 674,083

Claims priority, application Japan, Oct. 29, 1992, 4-312641

Int. Cl.^{6} C08F *2/46*

U.S. Cl. 522—4 **6 Claims**



1. A polyoxymethylene article having a surface printed with an ultraviolet curing isocyanate free ink, said surface having an X-ray photoelectron spectrum in which the ratio of the $(C{-}O)_n$ bond peak at 302 eV to the C—C bond peak at 305 eV, i.e., the $(C{-}O)_n$ bond peak/C—C bond peak ratio, is at least 2.5.

5,837,745
UV CURABLE POLISH AND METHOD OF USE

Eugen Safta, Winston Salem; James V. Mirante, Archdale; Danny R. Linthicum, Lexington, and Greg Muselman, Greensboro, all of N.C., assignors to Lilly Industries, Inc., Indianapolis, Ind.

Filed Apr. 10, 1997, Ser. No. 838,569

Int. Cl.^{6} C08J *3/07;3/28;* **C08L** *83/04;83/07*

U.S. Cl. 522—8 **47 Claims**

1. Method for improving mar resistance and chemical resistance of a nitrocellulose lacquer finish on a wood surface, said method comprising the steps of

wetting the lacquer finished surface with a polish composition comprising, as an aqueous emulsion,

an olefin functional polymer having a glass transition temperature of less than 30° C. or an olefin functional prepolymer.

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a water-dispersible silicone or silicone copolymer,
a free-radical initiator,
a water miscible organic solvent,
a water immiscible organic solvent, water, and
an emulsifier in an amount effective to stabilize the emulsion,
wiping the polish-wet surface to remove excess polish composition from the surface and provide a substantially uniform polish coating on the surface, and
exposing the coated surface to free-radical initiating conditions to initiate free-radical propagated polymerization of the polish coating.

5,837,746
COREACTIVE PHOTOINITIATORS

Manfred Köhler, Darmstadt; Jörg Ohngemach, Reinheim; Eike Poetsch; Rudolf Eidenschink, both of Mühtal, all of Germany; Gerhard Greber, Vöslau, Austria; Dieter Dorsch, Darmstadt, Germany; Jürgen Gehlhaus, Lautertal, Germany; Konrad Dorfner, Darmstadt, Germany, and Hans Ludwig Hirsch, Reinheim, Germany, assignors to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

Continuation of Ser. No. 703,494, Aug. 27, 1996, abandoned, which is a division of Ser. No. 618,701, Mar. 20, 1996, Pat. No. 5,744,512, which is a division of Ser. No. 252,729, Jun. 2, 1994, Pat. No. 5,532,112, which is a continuation of Ser. No. 951,299, Sep. 24, 1992, abandoned, Ser. No. 720,141, Jun. 24, 1991, abandoned, and Ser. No. 167,060, Mar. 11, 1988, abandoned. This application Jun. 23, 1997, Ser. No. 880,384

Claims priority, application Germany, Mar. 12, 1987, 37 07 891.7; Nov. 13, 1987, 37 38 567.4

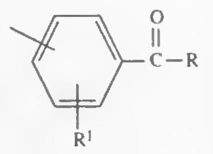
Int. Cl.^{6} C08F *2/50;* **C08K** *3/22;* **C08L** *63/10;75/16*

U.S. Cl. 522—8 **17 Claims**

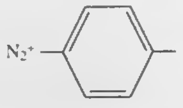
1. In a process for photopolymerizing an ethylenically unsaturated compound in the presence of an admixture of said compound and photoinitiator, the improvement wherein the photoinitiator is a coreactive compound of the formula:

RG—A—IN

in which
IN is of the formula



wherein
R is —CR^{3}R^{4}R^5 or —P(=O)(R^6)$_2$,.
each R^1 independently is H, C$_{1-12}$-alkyl, halogen, an RG—A— group or two R^1 radicals in the position ortho to the carbonyl group together are —S—.
R^3 and R^4 are in each case independently of one another H, C$_{1-12}$-alkyl, C$_{1-12}$-alkenyl, C$_{1-12}$-alkoxy, phenyl or together with the C-atom to which they are bonded form a C$_3$-C$_7$-cyclo-alkylene ring,
R^5 is —OR^7, —N(R^7)$_2$, piperidino, 1-piperazinyl, morpholino or —SO$_2$R^7,
R^6 is C$_{1-6}$-alkyl, C$_{1-6}$-alkanoyl, phenyl or benzoyl, each of which is optionally substituted by halogen, C$_{1-6}$-alkyl or C$_{1-6}$-alkoxy,
R^7 is H, C$_{1-6}$-alkyl or C$_{1-6}$-alkanoyl,
A is a spacer group $Z[(CH_2)_nY]_o\text{-}[(CH_2)_mX]_l$
wherein X, Y and Z are independently of one another a single bond, —O—, —S—, —NH—, —CO—, —COO—, —CONH—, —O—CO—, —NH—CO—or —NH—COO—,
l and m are the integers from 1 to 4,
n and o are the integers from 0 to 4,
RG is one of the functional reactive groups halogen, NH$_2$—CO—, O=C=N—, S=C=N—, N$_3$—, —SO$_2$Cl or R^{c}R^{b}C=CR^a- wherein
R^a, R^b and R^c are independently of each other H or methyl, and with the proviso that Z is not —COO—when n is 0, and R^5 is —OR^7, or
RG is halogen, cyclopropyl, oxiranyl, O=C=N—R^d,



or (R^e)$_3$Si,

R^d is C$_{1-6}$-alkylene or phenylene, and
R^e is halogen, C$_{1-12}$-alkyl, C$_{1-12}$-alkoxy or C$_{1-12}$-alkanoyloxy.

5,837,747
CROSSLINKABLE POLYSACCHARIDES, POLYCATIONS AND LIPIDS USEFUL FOR ENCAPSULATION AND DRUG RELEASE

Patrick Soon-Shiong; Neil P. Desai; Paul A. Sandford; Roswitha A. Heintz, all of Los Angeles, and Soebianto Sojomihardjo, Pasadena, all of Calif., assignors to VivoRx, Inc., Santa Monica, Calif.

PCT No. PCT/US92/09364, § 371 Date Apr. 28, 1994, § 102(e) Date Apr. 28, 1994, PCT Pub. No. WO93/09176, PCT Pub. Date May 13, 1993

Continuation-in-part of Ser. No. 784,267, Oct. 29, 1991, abandoned. This PCT application Oct. 29, 1992, Ser. No. 232,054

Claims priority, application WIPO, Oct. 29, 1992, PCT/US92/09364

Int. Cl.^{6} C08F *2/50;* **C08L** *5/00;5/04;5/08*

U.S. Cl. 522—26 **29 Claims**

1. A modified biocompatible material having the formula:

A—X

wherein:
a) A is a biocompatible starting material selected from a polysaccharide, polycation, or lipid;
b) X is a moiety containing a carbon—carbon double bond or triple bond capable of undergoing free radical polymerization;
c) A and X are linked covalently through linkages selected from ester, ether, thioether, disulfide, amide, secondary amines, tertiary amines, direct C—C linkages, sulfate esters, sulfonate esters, phosphate esters, urethanes, or carbonates;
d) said modified biocompatible material forms covalent crosslinks when subjected to biocompatible, free radical polymerization producing conditions in aqueous media consisting essentially of water and solutes, or consisting essentially of water, solutes, and a biocompatible oil; and
e) A—X is produced in aqueous media consisting essentially of water and solutes.

5,837,748
PHOTOPOLYMERIZABLE COMPOSITION

Tadahiro Sorori, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 590,138, Jan. 23, 1996, abandoned. This application Aug. 8, 1997, Ser. No. 908,611

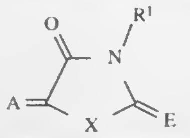
Claims priority, application Japan, Feb. 10, 1995, 7-023133

Int. Cl.^{6} C08F *2/50*

U.S. Cl. 522—26 **8 Claims**

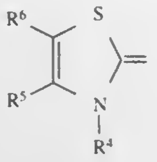
1. A photopolymerizable composition comprising the following is components (i), (ii) and (iii):
(i) a compound having at least one addition-polymerizable, ethylenically unsaturated bond;

(ii) a compound represented by formula (I):

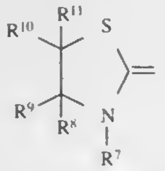


(I)

wherein A=represents formula (A-1) or (A-2):



(A-1)



(A-2)

wherein R^4, R^5, R^6, R^7, R^8, R^9, R^{10} and R^{11} each independently represents a monovalent nonmetallic atom group, and R^5 and R^6, R^8 and R^9, R^8 and R^{10}, R^9 and R^{11}, or R^{10} and R^{11} may be combined with each other to form a saturated or unsaturated aliphatic ring;
—X— represents —O—, —S—, —NR^2— or —CONR^3—, in which R^1, R^2 and R^3 each independently represents a hydrogen atom, an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group, an alkenyl group, a substituted alkenyl group, an alkynyl group or a substituted alkynyl group, and =E represents a substituted or unsubstituted 1,3-dihydro-1-oxo-2H-inden-2-ylidene group; and
(iii) a compound which generates an active radical upon light irradiation in the co-presence of component (ii).

5,837,749
NON-AQUEOUS SOLVENT FREE PROCESS FOR MAKING UV CURABLE ADHESIVES AND SEALANTS FROM EPOXIDIZED MONOHYDROXYLATED DIENE POLYMERS (III)

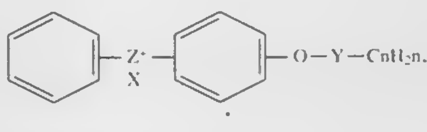
James Robert Erickson, Katy, Tex., and James Crivello, Clifton Park, N.Y., assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 15, 1997, Ser. No. 839,700

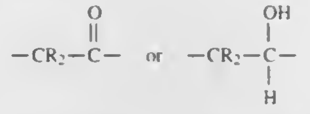
Int. Cl.^{6} C08L *53/00;63/08*

U.S. Cl. 522—31 **20 Claims**

1. A process for producing a UV curable adhesive or sealant composition which does not utilize a non-aqueous solvent comprising a monohydroxylated epoxidized polydiene polymer comprised of at least two different polymerizable ethylenically unsaturated hydrocarbon monomers wherein at least one is a diene monomer which yields unsaturation suitable for epoxidation, and wherein the polymer contains from 0.1 to 7.0 milliequivalents of epoxy per gram of polymer, a low molecular weight polydiene mono-ol, a photoinitiator, and a tackifying resin which is compatible with the photoinitiator, said process comprising mixing the polymer, mono-ol, and tackifying resin together with a photoinitiator selected from the group consisting of diaryl salts characterized by the general formula:



where Y is



$$-CR_2-\overset{\overset{\displaystyle O}{\|}}{C}- \quad \text{or} \quad -CR_2-\underset{\underset{\displaystyle H}{|}}{\overset{\overset{\displaystyle OH}{|}}{C}}-$$

where R is hydrogen, aryl, alkyl, or an alkylhalide; n is an integer of at least 1, Z is I, Cl, or Br, and X is a complex metal halide anion or a complex halide anion of a strong protonic acid.

5,837,750
RADIATION CURABLE OPTICAL FIBER COATING COMPOSITION

David M. Szum, Elmhurst; Timothy E. Bishop, Algonquin, and Steven R. Schmid, Long Grove, all of Ill., assignors to DSM N.V., Heerlen, Netherlands

Continuation-in-part of Ser. No. 403,521, Mar. 13, 1995, abandoned. This application Mar. 12, 1996, Ser. No. 615,857

Int. Cl.^{6} C08F *2/48;* **C08L** *63/10;75/08;75/16*

U.S. Cl. 522—81 **18 Claims**

1. A radiation-curable, glass optical fiber outer primary coating composition comprising as premixture components, the combination of:
about 20 to about 40% by weight of a polyether urethane oligomer comprising ethylenically unsaturated groups;
from about 5 to about 20% by weight of a reactive diluent;
from 0 to about 40% by weight of a photoinitiator;
from 0 to about 10% by weight of a pigment; and
about 40 to about 80% by weight of a radiation-curable oligomer represented by the following formula:

$$R^1\text{-}L^1\text{-}C^1\text{-}L^2\text{-}R^2 \qquad (1)$$

where:
R^1 and R^2, independently, each represent a radiation-curable ethylenically unsaturated functional group;
L^1 and L^2, independently, each represent an alkyleneoxy chain having from about 2 to about 40 carbon atoms, wherein L^1 and L^2 are linked to C^1 through an oxygen atom;
C^1 comprises a hydrocarbon having from about 5 to about 40 carbon atoms and containing at least one cyclic group;
wherein said composition, after radiation-cure, has:
a peak water absorption of no more than 1.5%.

5,837,751
NORBORNENYL AZLACTONES

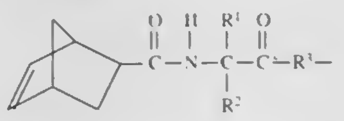
Anthony F. Jacobine, Meridan, and Steven T. Nakos, Andover, both of Conn., assignors to Loctite Corporation, Hartford, Conn.

Filed Nov. 28, 1990, Ser. No. 619,068

Int. Cl.^{6} C08G *75/04;* **C08L** *79/00;* **C08F** *2/50*

U.S. Cl. 522—167 **6 Claims**

1. A curable thiol-ene composition comprising a polyene, a polythiol and an initiator of thiol-ene addition reactions wherein the polyene component comprises a compound having a plurality of groups of the formula:



wherein R^1 and R^2 are independently monovalent hydrocarbon groups or R^1 and R^2, together with the carbon atom to which they are attached comprise a cyclic hydrocarbon group R^3 is —NR^4—, —S—, or —O— and R^4 is H or alkyl.

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5,837,752
SEMI-INTERPENETRATING POLYMER NETWORKS

Venkatram R. Shastri, Allston; Robert S. Langer, Newton, both of Mass., and Peter J. Tarcha, Lake Villa, Ill., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jul. 17, 1997, Ser. No. 895,762

Int. Cl.^{6} A61F *2/28;* **C08F** *283/00;283/02*

U.S. Cl. 523—116 **32 Claims**

1. A composition which forms a semi-interpenetrating polymer network following exposure to active species comprising

a) a linear polymer selected from the group consisting of linear, hydrophobic biodegradable polymers and linear non-degradable hydrophilic polymers; and

b) at least one monomer or macromer containing at least one free radical polymerizable group, wherein at least one of the monomers or macromers includes an anhydride linkage and a polymerizable group selected from the group consisting of acrylate or methacrylate.

5,837,753
STABLE OIL-IN-WATER INK EMULSIONS BASED UPON WATER-REDUCIBLE SOLVENT DYES FOR INK-JET PRINTERS AND FELT-TIP AND ROLLER-BALL PENS

Peter A. Caputo, South Orange, N.J., assignor to Morton International, Inc., Chicago, Ill.

Filed Jul. 31, 1996, Ser. No. 690,713

Int. Cl.^{6} C09D *5/00*

U.S. Cl. 523—161 **20 Claims**

1. A stable aqueous ink emulsion based on a water-immiscible solvent dye, which comprises:

- between about 1 and about 15 wt. % based on said emulsion of a water-reducible solvent dye-containing solution, said water-reducible solvent dye-containing solution comprising:
  - between about 30 and about 75 wt. % based on said dye-containing solution of at least one water-immiscible solvent dye selected from the group consisting of azo dyes, phthalocyanine dyes, and anthraquinone dyes;
  - between about 10 and about 50 wt. % based on said dye-containing solution of a solvent system, said solvent system comprising:
    - between about 0 and about 100 wt. % based on said solvent system of at least one citrus solvent; and,
    - between about 0 and about 100 wt. % based on said solvent system of at least one first organic solvent; and,
  - between about 10 and about 45 wt. % based on said dye-containing solution of at least one non-ionic surfactant;
- between about 25 and about 90 wt. % based on said emulsion of water;
- between about 0 and about 25 wt. % based on said emulsion of at least one second organic solvent; and,
- between about 1 and about 55 wt. % based on said emulsion of at least one water-soluble resin, wherein after said aqueous ink emulsion is dried, said water-soluble resin is resoluble with respect to said aqueous ink emulsion.

5,837,754
INK FOR INK JET PRINTER

Tetsuo Shimomura; Satoshi Maeda, and Yozo Yamada, all of Ohtsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 369,669, Jan. 6, 1995, abandoned. This application Oct. 3, 1996, Ser. No. 726,338

Claims priority, application Japan, Jan. 6, 1994, 6-000244; Mar. 28, 1994, 6-057176

Int. Cl.^{6} C09D *11/10*

U.S. Cl. 523—161 **2 Claims**

1. Ink for an ink-jet printer comprising polyester particles colored with a colorant and dispersed in an aqueous medium, wherein:

(a) the polyester particles are made of a polyester containing an ionic group on a main chain or a side chain of the polyester in the range of 20 to 1000 equivalents/10^6 g;

(b) the polyester particles have an average particle size in the range of 0.1 to 1.0 μm;

(c) the colorant is a dye which is insoluble in water at room temperature;

(d) the content of the dye in the polyester particles is in the range of 2 to 20% by weight; and

(e) the ink for the ink-jet printer has a surface tension in a range of 25 to 40 dyne/cm.

5,837,755
BIODEGRADABLE THERMOSETTING UREA-RESIN COMPOSITIONS

Eiichiro Takiyama, Kamakura, and Yoshitaka Hatano, Higashikanbara-gun, both of Japan, assignors to Showa Highpolymer Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1996, Ser. No. 623,538

Claims priority, application Japan, Mar. 29, 1995, 7-094146; Apr. 8, 1995, 7-199860; Apr. 8, 1995, 7-199861; Aug. 23, 1995, 7-215021; Aug. 28, 1995, 7-218992; Aug. 28, 1995, 7-218993

Int. Cl.^{6} C08G *71/02;* **C08L** *75/02;1/00*

U.S. Cl. 524—18 **3 Claims**

1. A urea-resin composition comprising (a) a urea-formaldehyde reaction product resulting from reaction between urea and formaldehyde, (b) cellulose material, and (c) at least one substance selected from the group consisting of α-amino acid, powdered collagen and gelatin,

wherein 15 to 80 parts by weight of (b) cellulose material relative to 100 parts by weight of (a) urea-formaldehyde reaction product and 0.1 to 30 parts by weight of (c) at least one substance selected from the group consisting of α-amino acid, powdered collagen and gelatin relative to 100 parts by weight of the total of the (a) and (b) components are used.

5,837,756
POLYMER FOR ASPHALT CEMENT MODIFICATION

Jean Steininger Clites, North Canton; Howard Allen Colvin, and Daniel Frederick Klemmensen, both of Tallmadge, all of Ohio, assignors to The GoodYear Tire & Rubber Company, Akron, Ohio

Filed May 28, 1997, Ser. No. 864,098

Int. Cl.^{6} C08L *95/00*

U.S. Cl. 524—68 **16 Claims**

1. An asphalt concrete which is comprised of (A) from about 90 weight percent to about 99 weight percent of an aggregate and (B) from about 1 weight percent to about 10 weight percent of a modified asphalt cement which is comprised of (1) from about 90 weight percent to about 99 weight percent asphalt, (2) from about 1 weight percent to about 10 weight percent of a styrene-butadiene polymer which is made by a process comprising the steps of: (a) continuously charging 1,3-butadiene monomer, an organomonolithium compound, a polar modifier and an organic solvent into a first polymerization zone, (b) allowing the 1,3-butadiene monomer to polymerize in said first polymerization zone to a conversion of at least about 90 percent to produce a living polymer solution which is comprised of said organic solvent and living polybutadiene chains having a number average molecular weight which is within the range of about 20,000 to about 60,000, (c) continuously withdrawing said living polymer solution from said first reaction zone, (d) continuously charging styrene monomer, divinyl benzene and the living polymer solution being withdrawn from the first polymerization zone into a second polymerization zone, (e) allowing the styrene monomer and divinyl benzene monomer to polymerize in said second polymerization zone to produce a solution of styrene-butadiene polymer having a number average molecular weight which is within the range of about 30,000 to about 85,000 and (f) continuously withdrawing the solution of said styrene-butadiene polymer from the second polymerization zone and (3) from about 0.1 weight percent to about 5 weight percent sulfur, based upon the weight of the styrene-butadiene polymer.

5,837,757
FLAME-RETARDANT POLYCARBONATE COMPOSITIONS

Akio Nodera, and Hiroshi Itagaki, both of Ichihara, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Filed Jun. 3, 1997, Ser. No. 868,150

Claims priority, application Japan, Jun. 18, 1996, 8-156536; Jul. 25, 1996, 8-195937

Int. Cl.^{6} C08K *5/353*

U.S. Cl. 524—87 **17 Claims**

1. A flame retardant polycarbonate resin composition comprising (A) a polycarbonate resin and (B) a titanium oxide powder in a ratio by weight of from 70/30 to 90/10, and containing (C) a compound containing the stilbene-bisbenzoxazole group, which compound functions to increase the light reflectance of the polycarbonate resin composition, in an amount of from 1 to 1000 ppm by weight relative to the total weight of the component (A) and the component (B).

5,837,758
COMPOSITIONS OF POLY (PHENYLENE ETHER), POLY (ARYLENE SULFIDE) AND ORTHO ESTER COMPOUNDS

Sterling Bruce Brown, Schenectady, N.Y.; Chorng-Fure Robin Hwang, Cary, N.C.; Steven Thomas Rice, Scotia, N.Y.; James Joseph Scobbo, Jr., Slingerland, N.Y.; John Bennie Yates, III, Glenmont, N.Y., and Farid F. Khouri, Clifton Park, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 485,759, Jun. 7, 1995, abandoned. This application Jul. 25, 1996, Ser. No. 687,263

Int. Cl.^{6} C08L *71/12;81/02*

U.S. Cl. 524—108 **32 Claims**

1. A composition consisting of:

(a) a poly(phenylene ether) resin;

(b) a poly(arylene sulfide) resin; and

(c) an ortho ester compound.

5,837,759
STABILIZER MIXTURE OF CHROMAN DERIVATIVES AND INERT ORGANIC SOLVENTS, AND MICROCAPSULES CONTAINING THIS STABILIZER MIXTURE

Hubert Trauth, Dudenhofen; Jürgen Krockenberger, Stuttgart; Ekkehard Jahns, Weinheim, and Ralf Biastoch, Speyer, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP96/00058, § 371 Date Jul. 16, 1997, § 102(e) Date Jul. 16, 1997, PCT Pub. No. WO96/22325, PCT Pub. Date Jul. 25, 1996

PCT Filed Jan. 9, 1996, Ser. No. 875,094

Claims priority, application Germany, Jan. 16, 1995, 195 01 053

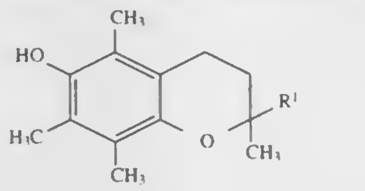
Int. Cl.^{6} C08K *5/15;5/53;* **C09K** *15/32*

U.S. Cl. 524—110 **13 Claims**

1. A microcapsule, comprising:

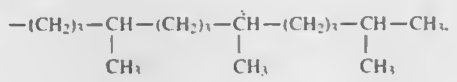
a stabilizer mixture comprising

(a) one or more chroman derivatives of the formula I

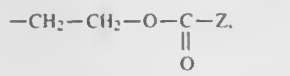


(I)

where R^1 is



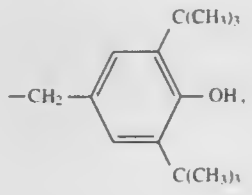
$$-(CH_2)_3-\underset{CH_3}{\underset{|}{CH}}-(CH_2)_3-\underset{CH_3}{\underset{|}{CH}}-(CH_2)_3-\underset{CH_3}{\underset{|}{CH}}-CH_3,$$



$$-CH_2-CH_2-O-\underset{O}{\underset{\|}{C}}-Z,$$

in which Z is C_7- to C_{30}-alkyl

$-CH_2CH_2-S-(C_1$- to C_{30}-alkyl) or



and

(b) an inert organic solvent for the chroman derivatives I selected from the group consisting of aliphatic hydrocarbons, cycloaliphatic hydrocarbons, aromatic hydrocarbons, halogenated hydrocarbons, silicone oils, vegetable fats, and animal fats,

where components (a) and (b) are in a weight ratio of from 99:1 to 1:99.

5,837,760
SELF-EXTINGUISHING THERMOPLASTIC POLYURETHANES AND THEIR PREPARATION

Christa Hackl, Bad Essen; Friedhelm Lehrich, Lemfoerde, and Gerhard Bittner, Diepholz, all of Germany, assignors to Elastogran GmbH, Germany

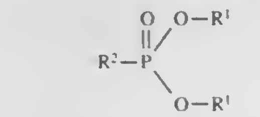
Continuation of Ser. No. 651,124, May 21, 1996, abandoned, which is a continuation of Ser. No. 213,660, Mar. 16, 1994, abandoned. This application Jul. 21, 1997, Ser. No. 897,183

Int. Cl.^{6} C08K *5/523*

U.S. Cl. 524—127 **16 Claims**

1. A self-extinguishing thermoplastic polyurethane, comprising a halogen-free flameproofing agent comprising a mixture of

a) at least one compound selected from the group consisting of organic phosphates, organic phosphonates, and mixtures thereof, said phosphonates having the general formula:



wherein each R^1 is independently an unsubstituted or substituted alkyl, cycloalkyl, or phenyl group or wherein the two radicals R^1 are bonded to one another to form a cyclic structure, and further wherein R^2 is an unsubstituted or substituted alkyl, cycloalkyl, or phenyl radical; and

b) melamine cyanurate.

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5,837,761
PIGMENTED PLASTICS COMPOSITIONS

Ian Alexander MacPherson, Renfrewshire; Iain Frank Fraser, Kilbirnie, and Alison MacLennan, Renfrewshire, all of Scotland, assignors to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

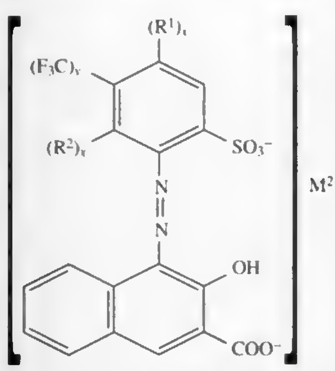
Filed Sep. 30, 1996, Ser. No. 723,729

Claims priority, application United Kingdom, Oct. 7, 1995, 9520493

Int. Cl.^{6} C08K *5/23;* **C07C** *245/00*

U.S. Cl. 524—190 **20 Claims**

1. A plastics composition comprising a high molecular weight material having incorporated therein an effective colouring amount of an azo pigment of formula



(1)

where M is Mg, Ca, Sr, Ba or Mn or a mixture of two or more thereof, R^1 and R^2 are chlorine or methyl, x is zero or 1, y is zero or 1 and the sum of x and y is 1, with the proviso that when the high molecular weight material is polyvinyl chloride y is zero.

5,837,762
LATEX-BASED COATING COMPOSITION

Friederike Theresia Stollmaier, Rheinmuenster; Dominik Martin Elsaesser, Lauf, both of Germany, and Pekka Johannes Salminen, Siebuen, Switzerland, assignors to The Dow Chemical Company, Midland, Mich.

PCT No. PCT/US94/07622, § 371 Date Jan. 4, 1996, § 102(e) Date Jan. 4, 1996, PCT Pub. No. WO95/02087, PCT Pub. Date Jan. 19, 1995

PCT Filed Jul. 8, 1994, Ser. No. 578,597

Claims priority, application United Kingdom, Jul. 8, 1993, 9314149

Int. Cl.^{6} C08J *5/24*

U.S. Cl. 524—274 **19 Claims**

1. A polymer latex composition having a glass transition temperature between −10° C. and 70° C. prepared with a chain transfer agent, comprising, in polymerized form, (A) from 10 weight percent to 80 weight percent of monovinylidene aromatic monomer(s); (B) from 20 weight percent to 65 weight percent of conjugated diene monomer(s); (C) from 0 weight percent to 70 weight percent of acrylate monomer(s); and (D) the remaining amount of polymerizable comonomer(s); wherein the chain transfer agent consists of a sulfur- and halogen-free abietic acid-containing rosin.

5,837,763
COMPOSITIONS AND METHODS FOR MANUFACTURING WAXES FILLED WITH INTERCALATES AND EXFOLIATES FORMED WITH OLIGOMERS AND POLYMERS

Robert Matthew Ferraro, Arlington Heights; Charles Randolph Landis, Lake in the Hills; Gary W. Beall, McHenry; Semeon Tsipursky, Lincolnwood; Anatoliy Sorokin, Buffalo Grove, and Anatoliy Goldman, Palatine, all of Ill., assignors to AMCOL International Corporation, Arlington Heights, Ill.

Continuation-in-part of Ser. No. 525,416, Sep. 8, 1995, Pat. No. 5,721,306, which is a continuation-in-part of Ser. No. 488,264, Jun. 7, 1995, Pat. No. 5,552,469, and a continuation-in-part of Ser. No. 488,263, Jun. 7, 1995, Pat. No. 5,698,624, and a continuation-in-part of Ser. No. 480,080, Jun. 7, 1995, Pat. No. 5,578,672. This application Jan. 3, 1996, Ser. No. 582,480

Int. Cl.^{6} C08J *5/10;* **C08K** *3/34;* **C08L** *29/00*

U.S. Cl. 524—449 **50 Claims**

1. A composition consisting essentially of exfoliated platelets of a layered material formed from an intercalate, together with a wax composition, said intercalate formed by contacting a layered material, having a moisture content of at least about 4% by weight, with an intercalant polymer to form an intercalating composition containing at least about 16% by weight intercalant polymer based on the dry weight of the layered material, said intercalate having a weight ratio of polymer to layered material of about 16–90 grams of polymer per 100 grams of dry layered material to achieve sorption and complexing of the polymer between adjacent spaced layers of the layered silicate material, without prior sorption of an onium ion or silane coupling agent, to expand the spacing between a predominance of the adjacent platelets of said layered silicate material to at least about 5 Å, when measured after sorption of the intercalant polymer and drying to a maximum of 5% by weight water, and delaminating at least about 80% of the intercalated material into platelet particles having less than five platelet layers.

5,837,764
POLYPROPLYLENE RESIN COMPOSITION

Tomohiko Akagawa; Ikunori Sakai, both of Sakai; Saburo Hinenoya, Izumisano; Kaoru Inoue; Takao Nomura, both of Toyota, and Takeyoshi Nishio, Okazaki, all of Japan, assignors to UBE Industries, Ltd., Ube, and Toyota Jidosha Kabushiki Kaisha, Toyota, both of Japan

Filed Nov. 29, 1996, Ser. No. 757,607

Claims priority, application Japan, Dec. 1, 1995, 7-314407; Sep. 10, 1996, 8-238783

Int. Cl.^{6} C08K *3/34*

U.S. Cl. 524—451 **7 Claims**

1. A polypropylene resin composition comprising the following components (A), (B), (C) and (D):

(A) a crystalline ethylene-propylene block copolymer containing a room-temperature-p-xylene-soluble fraction Ac having an ethylene content of 15–26% by weight and an intrinsic viscosity (measured at 135° C. in decalin) of 6 dl/g or more,

(B) a crystalline ethylene-propylene block copolymer containing a room-temperature-p-xylene-soluble fraction Bc having an ethylene content of 27–50% by weight and an intrinsic viscosity (measured at 135° C. in decalin) of 4 dl/g or less,

(C) an ethylene-α-olefin copolymer obtained by polymerization using a single-site catalyst, having a molecular weight distribution (Mw/Mn) of 2.5 or less, a melt flow ratio ($MI_{10}/MI_{2.16}$) of 6–15 (wherein MI_{10} is a melt index measured at 190° C. under a load of 10 kg and $MI_{2.16}$ is a melt index measured at 190° C. under a load of 2.16 kg) and an α-olefin proportion of 70 mole % or less, and

(D) a talc having an average particle diameter of 3–7 μm as measured by laser diffraction,

in which composition

(a) the weight ratios As and Bs of the room-temperature-p-xylene-soluble fractions Ac and Bc to the total weight of the components (A) and (B) satisfy the following formulas (1) and (2):

$$As+Bs=7\text{–}15\%\ \text{by weight} \quad (1)$$

$$As/(As+Bs)=0.1\text{–}0.6 \quad (2)$$

(b) the polypropylene component contained in each of the components (A) and (B) has an isotactic pentad fraction (mmmm) of 96% or more, and the mixture of the components (A) and (B) has a melt flow rate (measured at 230° C. under a load of 2,160 g) of 30–70 g/10-min,

(c) the total content of the components (A) and (B) is 50–80% by weight, the content of the component (C) is 5–20% by weight, and the content of the component (D) is 15–30% by weight, and

(d) the composition comprising the components (A), (B), (C) and (D) has a melt flow rate (measured at 230° C. under a load of 2,160 g) of 25 g/10-min or more.

5,837,765
PHENOL RESIN MOLDING COMPOUND

Yuji Kudoh, Fukushima, Japan, assignor to NOK, Corporation, Tokyo, Japan

Filed Nov. 4, 1996, Ser. No. 743,556

Int. Cl.^{6} C08K *3/40*

U.S. Cl. 524—494 **14 Claims**

1. A phenol resin molding compound which comprises a novolak phenol resin having a weight average molecular weight of 1,000 to 5,000, a curing agent for the novolak phenol resin, hydrogenated NBR, chopped strands of glass fibers and powdery glass fibers having a length of about 10 μm to about 200 μm.

5,837,766
COMPOSITION FOR ELECTRODEPOSITING MULTIPLE COATINGS ONTO A CONDUCTIVE SUBSTRATE

James N. Metro, Riverdale, and Ronald Mattiuz, Downers Grove, both of Ill., assignors to The Sherwin-Williams Company, Cleveland, Ohio

Filed May 14, 1997, Ser. No. 855,692

Int. Cl.^{6} C08K *3/04;* **H01B** *1/24*

U.S. Cl. 524—495 **3 Claims**

1. An electrodepositable aqueous coating composition comprising:

(a) at least one cationic hydroxy functional acrylic polymer;

(b) a crosslinking agent comprising a blocked isocyanate; and

(c) conductive carbon black having an average particle size of about 20 nm or less, a surface area (BET) of about 240 to 300 m^2/g, and an oil absorption (DBP) of about 100 to 150 ml/100 g in an amount of 4.5 to 6.5% by weight based on total solids of the coating composition.

5,837,767
STRIPPING FINGERS

Takumi Shimokusuzuno, Inabe-gun; Tomomi Nakamichi, Yokkaichi, and Hiroshi Niwa, Kuwana, all of Japan, assignors to NTN Corporation, Osaka, Japan

Continuation of Ser. No. 502,421, Jul. 14, 1995, abandoned. This application Apr. 21, 1997, Ser. No. 845,032

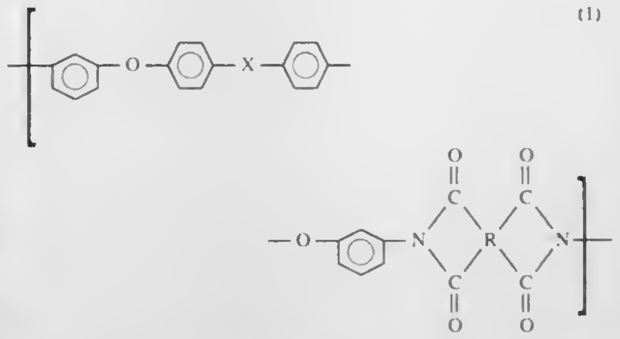
Claims priority, application Japan, Oct. 31, 1994, 6-267254; Dec. 27, 1994, 6-325712; Feb. 28, 1995, 7-040603

Int. Cl.^{6} C08G *73/10;* **C08K** *3/22*

U.S. Cl. 524—497 **15 Claims**

1. Stripping fingers comprising:

a resin composition comprising 50–95% by weight of a thermoplastic polyimide resin comprising repeating units represented by the following formula (1):



(1)

(where X indicates a direct bond or a bivalent group selected from the group consisting of a bivalent hydrocarbon group having 1–10 carbon atoms, a hexafluorinated isopropylidene group, a carbonyl group, a thio group, and a sulfonic group; and

R indicates a tetravalent group selected from the group consisting of an aliphatic group having two or more carbon atoms, a cyclic aliphatic group, a monocyclic aromatic group, a condensed polycyclic aromatic group, and a non-condensed polycyclic aromatic group made up of aromatic groups coupled together directly or through crosslinking agents), and

5–50% by weight of titanium oxide whiskers, said whiskers having an average fiber diameter in the range of from 0.05 μm to 3 μm and an average fiber length in the range of from 1 μm to 100 μm.

5,837,768
CREPING ADHESIVES CONTAINING OXAZOLINE POLYMERS AND METHODS OF USE THEREOF

Joseph F. Warchol, West Norriton, and Cynthia D. Walton, Kennett Square, both of Pa., assignors to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 595,939, Feb. 6, 1996, Pat. No. 5,633,309, which is a continuation of Ser. No. 352,371, Dec. 8, 1994, abandoned. This application Feb. 5, 1997, Ser. No. 795,911

Int. Cl.^{6} C08L *29/04;51/08*

U.S. Cl. 524—503 **13 Claims**

1. A creping adhesive concentrate comprising about 1 percent to about 25 percent by weight of solids and water, said solids consisting of a blend comprising an oxazoline polymer, a first polyethyleneimine, and a second modified polyethyleneimine.

5,837,769
FREE FLOWING ELASTOMER POWDER

Tenunis Graafland, and Peter Migchels, both of Louvain-La-Neuve, Belgium, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 363,439, Dec. 22, 1994, abandoned. This application Dec. 4, 1995, Ser. No. 566,651

Claims priority, application European Pat. Off., Dec. 22, 1993, 93203636.1

Int. Cl.^{6} C08L *53/00*

U.S. Cl. 524—505 **5 Claims**

1. A process for the preparation of a carpet backing composition, comprising the steps of:

melt blending 100 parts by weight based on the total weight of blending components of a block copolymer, from 50 to 200 parts by weight based on the total weight of blending components of plasticizing oil, and from 50 to 200 parts by weight based on the total weight of blending components of a poly-(monovinyl aromatic hydrocarbon) block compatible resin, wherein the block copolymer comprises at least one poly-

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(monovinyl aromatic hydrocarbon) block, at least one hydrogenated or unhydrogenated poly(conjugated diene) block, and a monovinyl aromatic hydrocarbon content in the range of from 10 to 60% by weight based on the total weight of the block copolymer;

granulating or pelletizing the blended components;

cryogenically milling the granules or pellets into a powder; and

dry-blending a dusting agent and optionally a blowing agent with the powder.

5,837,770
PROCESS FOR PRODUCING FLAME RETARDANT THERMOPLASTIC POLYESTER RESIN COMPOSITION

Noboru Yamaguchi, Ichihara, and Tohru Fujiki, Sodegaura, both of Japan, assignors to Sumitomo Chemicial Company, Limited, Osaka, Japan

Filed Feb. 13, 1996, Ser. No. 600,873

Claims priority, application Japan, Feb. 22, 1995, 7-033480

Int. Cl.^{6} C08L *67/00*

U.S. Cl. 524—513 **11 Claims**

1. A process for producing a flame retardant thermoplastic polyester resin composition comprising a first step (i) and second step (ii);

wherein

(i) the first step comprises melt-kneading the following components (A) and (B) to obtain a melt-kneaded composition (AB); and

(ii) the second step comprises melt-kneading the melt-kneaded composition (AB) and the following component (C) to obtain the flame retardant thermoplastic polyester resin composition; wherein component (A), component (B), and component (C) are as follows:

component (A): an impact resistance improver comprising at least one epoxy group-containing ethylene copolymer,

component (B): a flame retarder, and

component (C): a thermoplastic polyester resin.

5,837,771
FLAME RETARDANT REACTION RESIN SYSTEM

Ernst Wipfelder, Munich, and Winfried Plundrich, Germering, both of Germany, assignors to Lemens Aktiengesellschaft, Munich, Germany

Filed Jan. 11, 1996, Ser. No. 583,778

Claims priority, application Germany, Jan. 10, 1995, 195 00 496.5; Feb. 17, 1995, 195 06 010.5

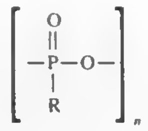
Int. Cl.^{6} C08K *3/32*

U.S. Cl. 524—786 **12 Claims**

1. A reaction resin system comprising an unreacted admixture of:

an epoxy resin component, and

a hardener component comprising a solution of a phosphonic acid anhydride in a di- or tetracarbonic acid anhydride that is liquid at least at a processing temperature of the reaction resin system, the phosphonic acid anhydride having the following general formula:



$$\left[-\overset{\overset{\displaystyle O}{\|}}{\underset{\underset{\displaystyle R}{|}}{P}}-O-\right]_n$$

wherein:

R is an alkyl or alkenyl radical having 1 to 40 carbon atoms independently of one another, a cycloaliphatic or an aryl radical; and n is a whole number, and

wherein upon exclusion of moisture the unreacted admixture remains unreacted during storage.

5,837,772
DULLED THERMOPLASTIC MOLDING MATERIALS

Graham Edmund Mc Kee, Neustadt; Jürgen Koch, Neuhofen; Wolfgang Fischer, Ludwigshafen; Axel Gottschalk, Neustadt; Norbert Güntherberg, Speyer, and Bernhard Rosenau, Neustadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Continuation of Ser. No. 596,889, Mar. 11, 1996, abandoned. This application May 6, 1997, Ser. No. 851,613

Claims priority, application Germany, Mar. 16, 1995, 195 09 514.6

Int. Cl.^{6} C08L *77/00*

U.S. Cl. 525—66 **1 Claim**

1. A dulled molding material comprising

A) an AES or ASA polymer and

B) as a dulling agent from 1 to 10% by weight, based on the total weight of the molding material, of a blend of

B_1) a copolymer comprising polymerized units which are derived from a polymerizable carboxylic acid or derivatives thereof selected from the group consisting of carboxylic acids, carboxylic anhydrides, carboxamides, N-phenylcarboximides, carboxylates, and mixtures thereof and

B_2) a polyamide.

5,837,773
SHEARED POLYMER BLENDS AND PROCESS FOR THEIR PREPARATION

Errol J. Olivier; Robert T. Patterson, and Peter N. Nugara, all of Baton Rouge, La., assignors to DSM Copolymer, Inc., Baton Rouge, La.

Continuation of Ser. No. 529,524, Sep. 18, 1995, abandoned, which is a continuation-in-part of Ser. No. 336,420, Nov. 9, 1994, Pat. No. 5,451,636, which is a division of Ser. No. 100,303, Aug. 2, 1993, Pat. No. 5,391,617. This application Mar. 12, 1997, Ser. No. 816,213

Int. Cl.^{6} C08L *23/16;51/04;51/06*

U.S. Cl. 525—72 **53 Claims**

1. An ethylene-propylene polymer blend having a number average molecular weight within the range of about 300 to about 5,000 and a molecular weight distribution within the range of about 1.5 to about 5 prepared by the process of simultaneously, in the absence of solvent, blending and shearing:

(a) an essentially amorphous low ethylene content ethylene-propylene polymer containing an ethylene to propylene mole ratio within the range of 35/65 to 65/35, having a number average molecular weight within the range of about 20,000 to about 150,000 and a molecular weight distribution within the range of about 2 to 7;

(b) a partially crystalline higher ethylene content ethylene-propylene polymer containing an ethylene to propylene molar ratio within the range of about 65/35 to about 85/15, having a number average molecular weight within the range of about 20,000 to about 150,000 and a molecular weight distribution within the range of about 2 to 7;

whereby the blending and shearing is carried out under conditions of heat and mechanical work sufficient to create high shear conditions for a time sufficient to reduce the molecular weight and molecular weight distribution of the blend of (a) and (b), wherein the weight ratio of low ethylene content ethylene-propylene polymer (a) to the higher ethylene-propylene polymer (b) is within the range of about 80/20 to about 50/50.

5,837,774
CURABLE FLUOROPOLYETHER RUBBER COMPOSITION

Yasuo Tarumi, and Kenichi Fukuda, both of Takasaki, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Feb. 2, 1996, Ser. No. 594,671

Claims priority, application Japan, Feb. 3, 1995, 7-039173; Mar. 27, 1995, 7-092989

Int. Cl.^{6} C08L *27/18;83/05*

U.S. Cl. 525—104 **11 Claims**

1. A curable fluoropolyether rubber composition comprising:

(A) a straight chain fluoropolyether compound having at least two alkenyl groups in its molecule and having a divalent perfluoropolyether structure in its backbone chain,

(B) a polytetrafluoroethylene,

(C) an organohydrogenpolysiloxane having at least two hydrogen atoms bonded to silicon atoms in its molecule, and

(D) a hydrosilylation reaction catalyst.

5,837,775
GOLF BALL COMPOSITION

Dean A. Snell, Oceanside, Calif., and Barbara Stefani Levitt, Lakeville, Mass., assignors to Acushnet Company, Fairhaven, Mass.

Continuation-in-part of Ser. No. 603,796, Feb. 20, 1996, Pat. No. 5,670,579, which is a continuation of Ser. No. 56,046, Apr. 30, 1993, Pat. No. 5,492,972, which is a continuation-in-part of Ser. No. 625,225, Dec. 10, 1990, abandoned. This application Nov. 7, 1996, Ser. No. 745,138

Int. Cl.^{6} A63B *37/00;37/06;37/12*

U.S. Cl. 525—221 **15 Claims**

9. A golf ball comprising:

a core having a diameter between 1.55 and 1.6 inches and a compression of about 90 points or less; and

a cover that surrounds the core, the cover comprised of a blend of less than 50% of a first lithium ionomer resin having a first flexural modulus and more than 50% of a second ionomer resin having a softening butyl acrylate termonomer and a second flexural modulus that is less than about 10,000 psi.

5,837,776
PROCESS FOR PRODUCING WATER SOLUBLE ANIONIC DISPERSION POLYMERS

Radhakrishnan Selvarajan, Downers Grove, and John R. Hurlock, Hickory Hills, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Continuation-in-part of Ser. No. 620,051, Mar. 20, 1996, Pat. No. 5,605,970. This application Jan. 10, 1997, Ser. No. 781,646

Int. Cl.^{6} C08F *2/16*

U.S. Cl. 525—244 **18 Claims**

1. An aqueous dispersion of a particulate water soluble polymer comprising:

a) from about 5 to about 50 weight percent of a water soluble polymer having been prepared by polymerizing under free radical forming conditions at a pH value of from about 2 to about 5:

i. 0–100 mole percent of at least one anionically charged water soluble vinyl monomer; and,

ii. 100–0 mole percent of at least one nonionic vinyl monomer

b) from about 0.1 to about 5 weight percent based on the total weight of the dispersion of a stabilizer selected from the group consisting of an anionically charged water soluble polymer having an intrinsic viscosity in 1M $NaNO_3$ of from about 0.1–10;

c) from about 5 to about 40 weight percent based on the weight of the dispersion of a water soluble salt selected from the group consisting of ammonium, alkali metal and alkaline earth metal halides, sulfates, and phosphates; and

d) balance water, said dispersion being characterized as having a bulk Brookfield viscosity of from about 10 to about 25,000 cps at 25 degrees C.

5,837,777
PREPARATION OF RUBBER-MODIFIED MOLDING MATERIALS USING PEROXY-CONTAINING COMPOUNDS

Graham Edmund McKee, Neustadt; Rainer Moors, Germersheim; Walter Heckmann, Weinheim; Harald Larbig, Ludwigshafen, and Bernhard Rosenau, Neustadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP95/04476, § 371 Date May 12, 1997, § 102(e) Date May 12, 1997, PCT Pub. No. WO96/15164, PCT Pub. Date May 23, 1996

PCT Filed Nov. 14, 1995, Ser. No. 836,312

Claims priority, application Germany, Nov. 14, 1994, 44 40 674.6

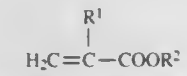
Int. Cl.^{6} C08F *8/00*

U.S. Cl. 525—263 **15 Claims**

1. A process for the preparation of a rubber-modified molding material, wherein

in a first stage, a first mixture (A) which contains

i) at least one alkyl acrylate or methacrylate (a) of the formula (I)



$$H_2C=\overset{\overset{\displaystyle R^1}{|}}{C}-COOR^2 \qquad (I)$$

where R^1 is hydrogen or methyl and R^2 is alkyl of 1 to 32 carbon atoms,

ii) optionally a first monomer (b) having two or more double bonds, and

iii) optionally a second monomer (c) or a plurality thereof is polymerized to give a rubber (B),

in a second stage, the rubber (B) is dissolved or swollen in a third monomer (d) or a plurality thereof with or without the addition of a solvent to form a second mixture (C), and

in a third stage, the second mixture (C) is polymerized with free radicals to give the rubber-modified molding material (D), and the mixture is reacted at >120° C., during or after this polymerization, with a compound (e) which contains at least two peroxy groups.

5,837,778
MULTIFUNCTIONAL INTITIATOR FOR OBTAINING STAR-SHAPED POLYMERS BY AN ANIONIC ROUTE, PROCESS FOR ITS MANUFACTURE AND CORRESPONDING STAR-SHAPED POLYMERS, PROCESS FOR THEIR MANUFACTURE AND THEIR APPLICATIONS

Pierre Lutz, Bischeim, France; Paul Rempp, Strasbourg, France; David Rein, Providence, R.I.; Philippe Heim, Pau, France; Pascal Nicol, Pau, France, and Bruno Vuillemin, Pau, France, assignors to Elf Atochem S.A., Puteaux, France

Division of Ser. No. 798,475, Feb. 10, 1997, Pat. No. 5,708,091, which is a division of Ser. No. 519,616, Aug. 25, 1995, Pat. No. 5,633,323. This application Sep. 29, 1997, Ser. No. 939,919

Claims priority, application France, Aug. 25, 1994, 94 10287

Int. Cl.^{6} C08F *297/02;4/46*

U.S. Cl. 525—271 **8 Claims**

1. A star-shaped polymer having formula (V):

$$[PA]_n N[PB\text{-}PC^-]_r Li^+ \qquad (V)$$

or formula (Va):

$$[PA]_n N[PB\text{-}PC]_r \qquad (Va)$$

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in which:

PA denotes a polymer block originating from at least one monomer A chosen from vinylaromatic or diene monomers;

a denotes the number of arms of the PA block and is between 3 and 15;

N denotes a crosslinked core substantially free of residual double bonds, which has formula:

(PMc) $(RLi)_p$

in which:

Mc is a monomer containing at least two polymerizable double bonds per molecule;

PMc is a core comprising a crosslinked polymerized monomer Mc, and containing 3 to 30% of residual double bonds in relation to the initial double bonds originating from the monomer Mc;

R is an alkyl radical with a linear or branched chain having 1 to 6 carbon atoms, an aryl radical with one or a number of ring(s), an arylalkyl or alkylaryl radical in which the alkyl group has from 1 to 6 carbon atoms, a cycloalkyl radical or a C_2–C_6 alkenyl radical substituted by an aryl or alkylaryl group; and

p is the number of anionic sites resulting from the neutralization of the residual double bonds in PMc by RLi, and

PB denotes a polymer block originating from at least one monomer B chosen from vinylaromatic monomers or diene monomers, PB denoting a block of a second-generation polymer arm;

PC, optionally present, denotes a polymer block originating from at least one monomer C, other than B, chosen from vinylaromatic or (meth)acrylic monomers or vinylpyridine; and

r is the number of [PB-PC] arms and ranges from 3 to 30.

5,837,779

PROCESS FOR PRODUCING IONOMERS EMPLOYING ETHYLENE TERPOLYMERS

Steven P. Current, Novato, Calif., and Leslie P. Theard, Houston, Tex., assignors to Chevron Chemical Company, San Ramon, Calif.

Continuation of Ser. No. 274,446, Jul. 13, 1994, abandoned. This application May 13, 1996, Ser. No. 645,157

Int. Cl.^{6} C08F *8/42*

U.S. Cl. 525—369 **14 Claims**

1. A process for the production of an ionomer having enhanced processability and which is produced from ethylenically-unsaturated monomeric structural units comprising contacting:

(a) a terpolymer containing structural units produced from (i) at least one α-olefin having from 2 to 8 carbon atoms; (ii) at least one ester of alpha, beta-ethylenically unsaturated carboxylic acids; and (iii) at least one carboxylic acid with;

(b) an inorganic metal-containing base under conditions effective to form a polymer which includes an effective amount of inorganic metal salts of the acid functionalities to provide an ionomer with enhanced processability,

with the temperature of the conditions during the contacting being sufficient to melt the terpolymer.

5,837,780

POLY (METH) ACRYLAMIDES WITH IMPROVED COLOR STABILITY UNDER THERMAL STRESS

Klaus Albrecht, Mainz; Werner Hoess, Heusenstamm, and Hartmut Schikowsky, Darmstadt, all of Germany, assignors to Roehm GmbH Chemische Fabrik, Darmstadt, Germany

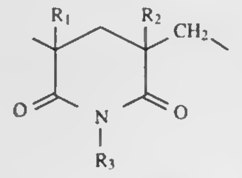
Filed Dec. 2, 1996, Ser. No. 759,131

Claims priority, application Germany, Dec. 1, 1995, 195 44 562.7

Int. Cl.^{6} C08F *8/32*

U.S. Cl. 525—379 **8 Claims**

1. A method for the production of molding compositions MC having a reduced tendency to yellow with thermal stress, said molding composition consisting of a polymer PM containing units of formula I:



wherein R_1 and R_2 are hydrogen and methyl, and R_3 denotes hydrogen, C_1–C_{18} alkyl, C_5–C_8 cycloalkyl, C_6–C_{10} aryl, C_6–C_{10} aryl-C_1–C_4 alkyl, wherein these groups can be substituted up to three times with groups selected from the group consisting of C_1–C_4 alkyl, C_1–C_4 alkoxy and halogen, comprising:

imidizing a (meth)acrylate ester with a primary amine in a reaction extruder thereby preparing the polymer PM; and

blending from 0.005–1 wt % of at least one reducing inorganic phosphorus compound IP, selected from the group consisting of phosphinic and phosphonic acid and its alkali metal, alkaline-earth metal, aluminum and ammonium salts, wherein the ammonium ion can be substituted with up to four C_1–C_4 alkyl and/or C_5–C_8 cycloalkyl groups, with the polymer PM after conclusion of the imidation reaction.

5,837,781

THERMALLY STABLE POLYOXYMETHYLENE COPOLYMER

Noritaka Tanimura, and Yukio Tanigawa, both of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

Filed Feb. 24, 1997, Ser. No. 804,507

Claims priority, application Japan, Mar. 12, 1996, 8-0544442

Int. Cl.^{6} C08L *61/02;* **C08G** *4/00;6/00*

U.S. Cl. 525—398 **4 Claims**

1. A polyoxymethylene copolymer prepared by copolymerizing a mixture comprising trioxane and 1,3-dioxolane in the presence of at least one polymerization catalyst selected from the group consisting of boron trifluoride, a boron trifluoride hydrate and a coordination complex compound of an organic compound containing an oxygen atom or a sulfur atom with boron trifluoride,

wherein said 1,3-dioxolane has a 2-methyl- 1,3-dioxolane content of not more than 500 ppm by weight and a 1,3-dioxolane peroxide content of not more than 15 ppm by weight in terms of hydrogen peroxide, and contains at least one hindered phenol in an amount of from 10 to 500 ppm by weight, each based on the weight of said 1,3-dioxolane.

5,837,782

BIS(MONO-AND-DIPEROXYOXALATES) DERIVED FROM DIHYDROPEROXIDES AND ALKYL AND ALKYLPEROXY HALOOXALATES

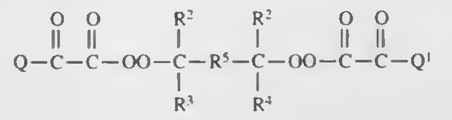
Jose Sanchez, Grand Island, N.Y., assignor to Elf Atochem North America, Inc., Philadelphia, Pa.

Filed Oct. 10, 1997, Ser. No. 947,533

Int. Cl.^{6} C08F *20/22;* **C07C** *69/67;331/04;* **C07G** *63/91*

U.S. Cl. 525—447 **12 Claims**

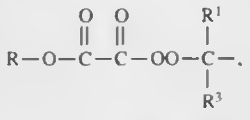
1. A novel bis(mono- or diperoxyoxalate) of Structure A:



$$Q-\overset{O}{\overset{\|}{C}}-\overset{O}{\overset{\|}{C}}-OO-\underset{\underset{R^3}{|}}{\overset{\overset{R^2}{|}}{C}}-R^5-\underset{\underset{R^4}{|}}{\overset{\overset{R^2}{|}}{C}}-OO-\overset{O}{\overset{\|}{C}}-\overset{O}{\overset{\|}{C}}-Q^1$$

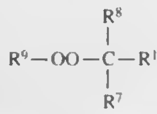
where R^1, R^2, R^3 and R^4 are the same or different and are alkyl groups of 1 to 4 carbons,

R^5 is a group selected from —$(CH_2)_n$—, where n is 1 to 6, —C≡C—, —C≡C—C≡C—, 1,4-phenylene, substituted or unsubstituted 1,3-phenylene, the substituent being the structure,



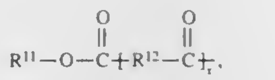
$$R-O-\overset{O}{\overset{\|}{C}}-\overset{O}{\overset{\|}{C}}-OO-\underset{\underset{R^3}{|}}{\overset{\overset{R^1}{|}}{C}}-,$$

Q and Q^1 are independently selected from the group consisting of chloro, bromo, R—O, and R^6—OO, where R is selected from the group consisting of H, a substituted or unsubstituted alkyl group of 1 to 24 carbons, substituents being one or more alkyl groups of 1 to 6 carbons, alkoxy groups of 1 to 6 carbons, aryloxy groups of 6 to 10 carbons, fluoro, chloro, bromo, carboxy and cyano, a substituted or unsubstituted alkenyl group of 3 to 12 carbons, substituents being one or more lower alkyl groups of 1 to 4 carbons, a substituted or unsubstituted aryl group of 6 to 10 carbons, substituents being one or more alkyl groups of 1 to 6 carbons, alkoxy groups of 1 to 6 carbons, aryloxy groups of 6 to 10 carbons, chloro, bromo and cyano, a substituted or unsubstituted aralkyl group of 7 to 13 carbons, substituents being one or more alkyl groups of 1 to 6 carbons, a substituted or unsubstituted cycloalkyl group of 5 to 12 carbons, a substituted or unsubstituted cycloalkyl group of 5 to 12 carbons having one or more oxygen or nitrogen atoms in the cycloalkane ring, with substituents for the cycloalkyl group being one or more lower alkyl groups of 1 to 4 carbons, a substituted or unsubstituted bicycloalkyl group of 6 to 14 carbons, with substituents being one or more lower alkyl groups of 1 to 4 carbons, a substituted or unsubstituted tricycloalkyl group of 7 to 16 carbons, with substituents being one or more lower alkyl groups of 1 to 4 carbons, and, R can additionally be structure (a).

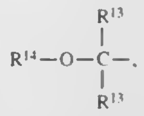


$$R^9-OO-\underset{\underset{R^7}{|}}{\overset{\overset{R^8}{|}}{C}}-R^{10}- \qquad (a)$$

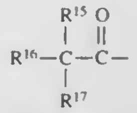
where R^{10} is an unsubstituted alkylene group of 1 to 3 carbons or a substituted alkylene group of 1 to 3 carbons, substituents being one or more lower alkyl groups of 1 to 4 carbons, R^7 and R^8 are alkyl groups of 1 to 4 carbons, R^9 is selected from unsubstituted t-alkyl groups of 4 to 12 carbons, substituted t-alkyl groups of 4 to 12 carbons, t-cycloalkyl groups of 6 to 13 carbons, t-alkynyl groups of 5 to 9 carbons, t-aralkyl groups of 9 to 13 carbons, unsubstituted aroyl groups of 7 to 11 carbons, substituted aroyl groups of 7 to 11 carbons, where the substituent for the t-alkyl groups is a t-alkylperoxy group of 4 to 8 carbons and the substituents for the aroyl groups are one or more lower alkyl groups of 1 to 4 carbons, alkoxy groups of 1 to 4 carbons, phenyl groups, acyloxy groups of 2 to 8 carbons, t-alkylperoxycarbonyl groups of 5 to 9 carbons, fluoro, chloro or bromo, and R^9 can also be structures (b), (c) and (d)



$$R^{11}-O-\overset{O}{\overset{\|}{C}}\left(R^{12}-\overset{O}{\overset{\|}{C}}\right)_x, \qquad (b)$$



$$R^{14}-O-\underset{\underset{R^{13}}{|}}{\overset{\overset{R^{13}}{|}}{C}}-, \qquad (c)$$



$$R^{16}-\underset{\underset{R^{17}}{|}}{\overset{\overset{R^{15}}{|}}{C}}-\overset{O}{\overset{\|}{C}}- \qquad (d)$$

where x is 0 or 1, R^{11} is a substituted or unsubstituted alkyl group of 1 to 18 carbons, substituents being one or more alkyl groups of 1 to 6 carbons, t-alkylperoxy groups of 4 to 8 carbons, alkoxy groups of 1 to 6 carbons, aryloxy groups of 6 to 10 carbons, hydroxy, chloro, bromo or cyano or a substituted or unsubstituted cycloalkyl group of 5 to 12 carbons or substituted or unsubstituted cycloalkyl groups of 5 to 12 carbons having one or more oxygen or nitrogen atoms in the cycloalkane ring, with substituents for the cycloalkyl groups being one or more lower alkyl groups of 1 to 4 carbons, and,

R^{12} is selected from a substituted or unsubstituted alkylene group of 2 to 3 carbons, substituents being one or more lower alkyl groups of 1 to 4 carbons, or a substituted or unsubstituted 1,2-, 1,3- or 1,4-phenylene group, substituents being one or more lower alkyl groups of 1 to 4 carbons, chloro, bromo, nitro or carboxy, and,

R^{13} is a lower alkyl group of 1 to 4 carbons, and, additionally, the two R^{13} groups may be concatenated to form an alkylene group of 4 to 5 carbons, R^{14} is a lower alkyl group of 1 to 4 carbons, R^{15}, R^{16} and R^{17} are selected from hydrogens, alkyl groups of 1 to 8 carbons, aryl groups of 6 to 10 carbons, alkoxy groups of 1 to 8 carbons and aryloxy groups of 6 to 10 carbons, and,

R^6 is selected from an unsubstituted t-alkyl group of 4 to 12 carbons, a substituted t-alkyl group of 4 to 12 carbons, a t-cycloalkyl group of 6 to 13 carbons, a t-alkynyl group of 5 to 9 carbons, and a t-aralkyl group of 9 to 13 carbons, where the substituent for the t-alkyl group is a t-alkylperoxy group of 4 to 8 carbons.

5,837,783

SULFO-PENDENT ARYLETHERKETONE POLYMER FILM CONTAINING NLO CHROMOPHORE

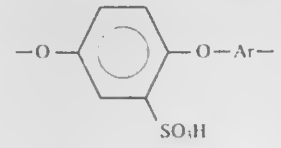
Fred E. Arnold, Centerville, and Narayanan Venkatasubramanian, Bellbrook, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 8, 1997, Ser. No. 848,444

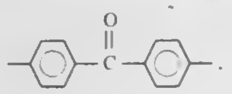
Int. Cl.^{6} C08G *8/02*

U.S. Cl. 525—471 **5 Claims**

1. A NLO film consisting essentially of an aryletherketone polymer having repeating units of the formula:



wherein Ar is selected from the group consisting of:



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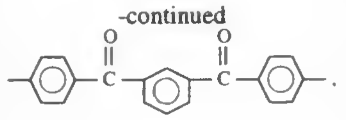
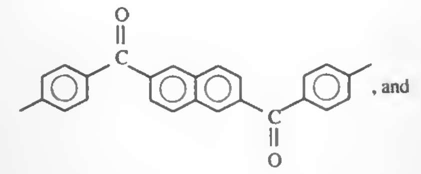
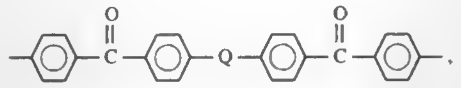
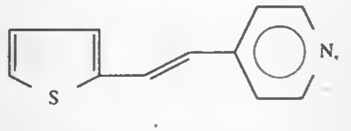


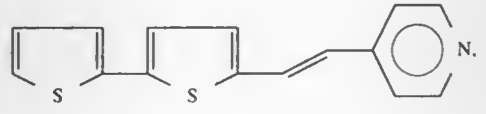


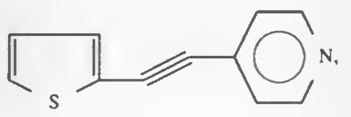
, and

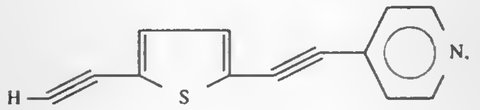


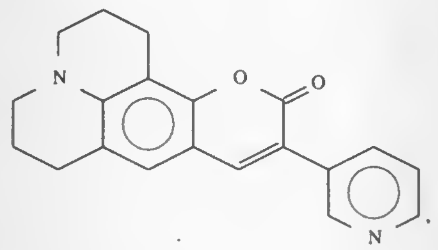
wherein Q is —O—, —CH₂— or —CO—;
and a chromophore selected from the group consisting of

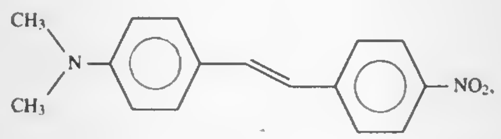


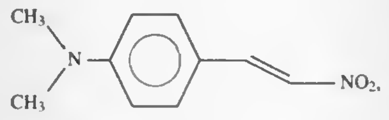


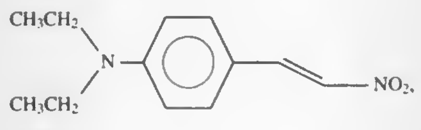


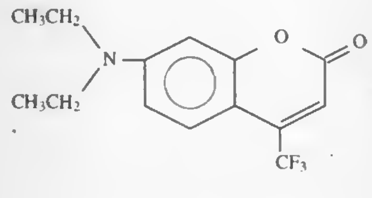












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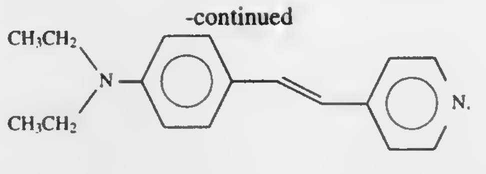


5,837,784
METHOD OF MAKING ALKOXYLATED ORGANOSILICONE RESINS AND THE RESINS PRODUCED THEREBY

Gary Allen Vincent, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jun. 12, 1996, Ser. No. 662,895

Int. Cl.⁶ C08F *283/00*

U.S. Cl. 525—477 **21 Claims**

1. A method of producing an alkoxylated organosilicone resin, said method comprising the steps of:

(I) reacting

(A) an MQ organosilicone resin of the empirical formula

$$(R_3SiO_{1/2})_a(R_2SiO_{2/2})_b(RSiO_{3/2})_c(SiO_{4/2})_d$$

wherein: each R is independently a methyl or hydroxyl group and a, b, c and d are zero or positive numerical values with the provisos that a+b+c+d=1, 0≦(b+c)≦0.2 and the ratio of a:(b+c+d) is between about 0.3 and 1.0; and

(B) at least one alkoxy silane selected from the group consisting of silanes having the empirical formula

$$R_xSi(OR')_{(4-x)}$$

wherein x is 1, 2 or 3, R is a monovalent radical selected from the group consisting of alkyl, alkenyl, aryl, arylalkyl, epoxy, ether, alkylamide, alkylamine radicals and each OR' is an alkoxy group;

in the presence of

(C) a catalytic amount of a basic catalyst so as to produce an alkoxylated organosilicone resin; and

(II) thereafter neutralizing the basic catalyst (C).

5,837,785
EPOXY CURING AGENT AND ONE-COMPONENT (TYPE) EPOXY RESIN COMPOSITION

Toshihiko Kinsho; Munekazu Satake, and Tadakazu Miyazaki, all of Kyoto, Japan, assignors to Sanyo Chemical Industries Ltd., Kyoto, Japan

Filed Jul. 12, 1996, Ser. No. 683,564

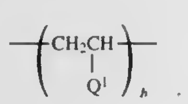
Claims priority, application Japan, Jul. 12, 1995, 7-200551; Nov. 8, 1995, 7-315996

Int. Cl.⁶ C08F *283/00*

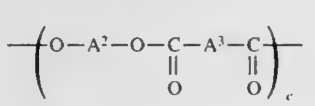
U.S. Cl. 525—527 **5 Claims**

1. An epoxy curing agent comprising a heterocycle-containing compound having a structure represented by any of the following formulae (2) through (9)

$$+A^1-O+_a \tag{2}$$

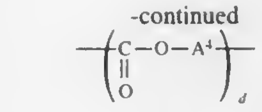


$$-\!\left(\mathrm{CH_2}\underset{\substack{|\\ \mathrm{Q^1}}}{\mathrm{CH}}\right)_b\!- \tag{3}$$

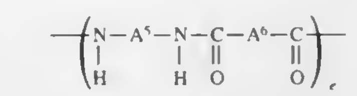


$$-\!\left(\mathrm{O-A^2-O-}\underset{\substack{\|\\ \mathrm{O}}}{\mathrm{C}}\mathrm{-A^3-}\underset{\substack{\|\\ \mathrm{O}}}{\mathrm{C}}\right)_c\!- \tag{4}$$

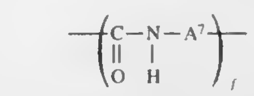
-continued



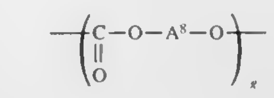
$$-\!\left(\underset{\substack{\|\\ \mathrm{O}}}{\mathrm{C}}\mathrm{-O-A^4}\right)_d\!- \tag{5}$$



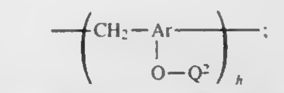
$$-\!\left(\underset{\substack{|\\ \mathrm{H}}}{\mathrm{N}}\mathrm{-A^5-}\underset{\substack{|\\ \mathrm{H}}}{\mathrm{N}}\mathrm{-}\underset{\substack{\|\\ \mathrm{O}}}{\mathrm{C}}\mathrm{-A^6-}\underset{\substack{\|\\ \mathrm{O}}}{\mathrm{C}}\right)_e\!- \tag{6}$$



$$-\!\left(\underset{\substack{\|\\ \mathrm{O}}}{\mathrm{C}}\mathrm{-}\underset{\substack{|\\ \mathrm{H}}}{\mathrm{N}}\mathrm{-A^7}\right)_f\!- \tag{7}$$

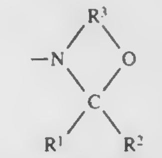


$$-\!\left(\underset{\substack{\|\\ \mathrm{O}}}{\mathrm{C}}\mathrm{-O-A^8-O}\right)_g\!- \tag{8}$$



$$-\!\left(\mathrm{CH_2-}\underset{\substack{|\\ \mathrm{O-Q^2}}}{\mathrm{Ar}}\right)_h\!-; \tag{9}$$

wherein in formula (2), "a" represents an integer of 3 to 200, A^1 represents at least one member selected from the group consisting of alkylene group which is either substituted by —X—Z or unsubstituted, arylene group, arylalkylene group, haloalkylene group and a residue available on ring-opening polymerization of a glycidyl ether; wherein in formula —X—Z, X represents a divalent hydrocarbon group which may optionally have one or more linkages selected from the group consisting of ether, imino, amide, urethane, urea and sulfide linkages and Z represents a heterocyclic group of the formula (1):



(1)

wherein R^1 and R^2 may be the same or different and each represents hydrogen atom, straight-chain or branched C_1 to C_6 alkyl or alkenyl, or C_6 to C_8 aryl; or R^1 and R^2, taken together with the adjacent carbon atom, represents C_5 to C_7 cycloalkyl; R^3 represents C_1 to C_{10} alkylene;

wherein at least three of A^1 in formula (2) represent alkylene group substituted by —X—Z,

wherein in formula (3), "b" represents an integer of 3 to 200, and Q^1 represents at least one member selected from the group consisting of hydrogen atom, alkyl group, aryl group, haloalkyl group, haloaryl group, alkoxycarbonyl group, acetoxy group and —X—Z;

wherein at least three of Q^1 in formula (3) represent —X—Z;

wherein in formula (4), "c" represents an integer of 2 to 200, and A^2 and A^3 may be the same or different and each represents at least one member selected from the group consisting of alkylene group which is either substituted by —X—Z or unsubstituted, arylene group which is either substituted by —X—Z or unsubstituted, aralkylene group and haloalkylene group;

wherein at least three of A^2 and A^3 in formula (4) represent at least one species selected from the group consisting of alkylene group substituted by —X—Z and arylene group substituted by —X—Z;

wherein in formula (5), "d" represents an integer of 3 to 200, and A^4 represents at least one selected from the group consisting of alkylene group which is either substituted by —X—Z or unsubstituted, arylene group which is either substituted by —X—Z or unsubstituted, aralkylene group and haloalkylene group;

wherein at least three of A^4 in formula (5) represent at least one species selected from the group consisting of alkylene group substituted by —X—Z and arylene group substituted by —X—Z;

wherein in formula (6), "e" represents an integer of 2 to 200, and A^5 and A^6 may be the same or different and each represents at least one selected from the group consisting of alkylene group which is either substituted by —X—Z or unsubstituted, arylene group which is either substituted by —X—Z or unsubstituted, aralkylene group and haloalkylene group;

wherein at least three of A^5 and A^6 in formula (6) represent at least one species selected from the group consisting of alkylene group substituted by —X—Z and arylene group substituted by —X—Z;

wherein in formula (7), "f" represents an integer of 2 to 200, and A^7 represents at least one selected from the group consisting of alkylene group which is either substituted by —X—Z or unsubstituted, arylene group which is either substituted by —X—Z or unsubstituted, aralkylene group and haloalkylene group;

wherein at least three of A^7 in formula (7) represent at least one species selected from the group consisting of alkylene group substituted by —X—Z and arylene group substituted by —X—Z;

wherein in formula (8), "g" represents an integer of 3 to 200, and A^8 represents at least one selected from the group consisting of alkylene group which is either substituted by —X—Z or unsubstituted, arylene group which is either substituted by—X—Z or unsubstituted, aralkylene group and haloalkylene group;

wherein at least three of A^8 in formula (8) represent at least one species selected from the group consisting of alkylene group substituted by —X—Z and arylene group substituted by —X—Z;

wherein in formula (9), "h" represents an integer of 3 to 200, Ar represents at least one selected from the group consisting of aryl group, and Q^2 represents at least one species selected from the group consisting of hydrogen atom, epoxy group and —X—Z; and wherein

at least three of Q^2 in formula (9) represent —X—Z.

5,837,786
PROCESS FOR PRODUCING POLYESTER

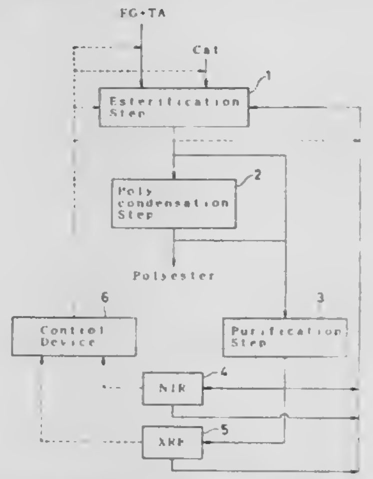
Yasuo Miyoshi, Iwakuni; Yasuaki Urabe, and Toshiharu Mitani, both of Kuga-gun, all of Japan, assignors to Mitsui Chemicals, Inc., Tokyo, Japan

Filed Oct. 31, 1997, Ser. No. 962,928

Claims priority, application Japan, Nov. 1, 1996, 8-291769

Int. Cl.⁶ C08F *2/00;* **C08G** *85/00*

U.S. Cl. 526—68 **6 Claims**



1. A process for producing a polyester by preparing a slurry of powdery aromatic dicarboxylic acid in a liquid diol and processing the resulting slurry through an esterification step and a polycondensation step in the presence of a catalyst, comprising

recycling a liquid containing the unreacted diol and the catalyst separated from the reaction mixture in the polycondensation step back to the esterification step as recycling liquor,

detecting the concentrations of diol, diol condensation products, catalyst and water in the recycling liquor in the course of being recycled back to the esterification step by a near infrared spectrophotometer of a noise level of at the highest

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50×10^{-6} Abs with a wave length repeatability of 0.01 nm or less as well as by an X-ray fluorescence analyzer and controlling the operation of the reactor based on the detected analytical values in such a manner that the totalized composition of the starting materials supplied to the reaction system and the recycling liquor will be maintained in a predetermined range.

5,837,787
PROCESS FOR PRODUCING ELASTIC THERMOPLASTIC α-OLEFIN/CYCLIC OLEFIN COPOLYMERS

Bruce Allan Harrington, Houston, Tex., assignor to Exxon Chemical Patents, Inc., Houston, Tex.

Filed Jan. 19, 1993, Ser. No. 5,676

Int. Cl.^{6} C08F *4/642;232/04*

U.S. Cl. 526—160 **6 Claims**

1. A process for producing elastic thermoplastic α-olefin/cyclic olefin copolymers, essentially free of dienes, comprising at least 5 mole % of cyclic olefin and having a Tg of less than 50° C., said polymer being elastic between temperatures from the copolymer's Tg to about 100° C., said process comprising contacting one or more α-olefins with one or more cyclic olefins under polymerization conditions in the presence of an activated cyclopentadienyl group-4 transition-metal catalyst system.

5,837,788
THERMOSETTING ACRYLIC GEL COAT

Larry Scott Crump, Gladstone, Mo.; Laurent Gerard Suspene, Bilboa Vizcaya, Spain; Gregory Scott Karr, Americus, Kans., and Kerry R. Williams, Summit, Mo., assignors to Cook Composites and Polymers Company, North Kansas City, Mo.

Filed Nov. 1, 1996, Ser. No. 741,785

Int. Cl.^{6} C08F *2/38*

U.S. Cl. 526—222 **8 Claims**

1. A polymer represented by the formula:

$$W-(X)_n-\underset{\displaystyle Z}{(Y)_m}-H \qquad (I)$$

wherein

X is an ethylene group having a pendent ester group without any polymerizable double bonds represented by the formula $-C(O)-O-R^9$ in which R^9 is an aliphatic group having from 1 to 20 carbon atoms;

Y is a divalent saturated aliphatic group having a pendant group Z;

Z is a group of the formula:

$$-CO-O-R^1-O-CO-R^2$$

in which R^1 is a divalent, aliphatic, saturated hydroxyl-containing group and R^2 is a hydrocarbyl group with at least one polymerizable carbon—carbon double bond;

W is a group of the formula R^3-S- in which R^3 is a hydrocarbyl group having 2 to 14 carbon atoms and not having a polymerizable carbon—carbon double bond;

m is a number in the range from 1 to 10;

n is a number in the range from 1 to 10;

n/m is in the range from about 1 to 5; and

the polymer has a number average molecular weight of at least 2,500.

5,837,789
FLUID-ABSORBING POLYMERS, PROCESSES USED IN THEIR PRODUCTION AND THEIR APPLICATION

Dolf Stockhausen, Krefeld; Hans-Georg Hartan, Kevelaer; Helmut Brehm, Krefeld; Gerd Jonas, Kempen, all of Germany; Bernfried Messner, Greensboro, N.C., and Klaus Pflueger, Krefeld, Germany, assignors to Stockhausen GmbH & Co. KG, Krefeld, Germany

Filed Nov. 20, 1996, Ser. No. 752,889

Claims priority, application Germany, Nov. 21, 1995, 195 43 369.6; Nov. 11, 1996, 196 46 484.6

Int. Cl.^{6} C08F *220/28;220/18;220/56;226/02*

U.S. Cl. 526—320 **23 Claims**

1. A cross-linked polymer useful for absorbing watery liquids, built-up of partially neutralized monomers having monoethylenically unsaturated acid groups and optionally further monomers copolymerizable therewith, wherein the polymer is manufactured with use of a combination of components

$$CH_2{=}CR^6-Co-(OCHR^3-CHR^3)_zO-CH_2-CR^{6}{=}CH_2,$$

$$CH_2{=}CR^6-R^5-(OCHR^3-CHR^3)_vOR^4, \text{ and}$$

$$R^1-[O(CHR^3-CHR^3O)_u-CO-R^2]_x,$$ and/or di- or triallylamine and/or bisacrylamide; wherein

R^1 is a multivalent C_{2-10}-alkyl,
R^2 is a linear or branched C_{2-10}-alkenyl,
R^3 is H, CH_3 , or C_2H_5,
R^4 is H, or linear or branched C_{1-10}-alkyl,
R^5 is CO or CH_2,
R^6 is H or CH_3,
x is 2–6,
u is 0–15,
v is 1–45, and
z is 3–20,

wherein the polymer contains 0.05–1.0% by weight of component I, 0.1–10% by weight of component II, and 0.01–1.0% by weight of component III, relative to the total weight of monomers in the polymer.

5,837,790
PRECIPITATION POLYMERIZATION PROCESS FOR PRODUCING AN OIL ADSORBENT POLYMER CAPABLE OF ENTRAPPING SOLID PARTICLES AND LIQUIDS AND THE PRODUCT THEREOF

Milan F. Sojka, Algonquin, Ill., assignor to Amcol International Corporation, Arlington Heights, Ill.

Continuation-in-part of Ser. No. 486,107, Jun. 7, 1995, abandoned, and Ser. No. 486,455, Jun. 7, 1995, Pat. No. 5,618,877, which is a continuation-in-part of Ser. No. 327,580, Oct. 24, 1994, abandoned. This application Mar. 3, 1997, Ser. No. 811,126

Int. Cl.^{6} C08F *20/10*

U.S. Cl. 526—323.2 **17 Claims**

1. A microporous and oil sorbent micro-particle comprising a polymer of allyl methacrylate and an ethylene glycol dimethacrylate, in a mole ratio of about 1:1 to about 1:2, said particle characterized by having a mean unit diameter of less than about 80 microns, a bulk density of about 0.02 to about 0.1 g/cm^3, and a total adsorption capacity for mineral oil that is 80% by weight or greater, based on the total weight of polymer and adsorbed oil.

5,837,791
UNSATURATED COPOLYMER OF ETHYLENE AND PROCESS FOR PREPARING THE SAME

Toshihiro Sagane, Tokyo; Masaaki Kawasaki; Hidenari Nakahama, both of Ichihara; Tatsuyoshi Ishida, Kuga-gun; Katsuya Takahashi, Ichihara; Toshiyuki Tsutsui, Kuga-gun; Hitoshi Onishi, Kuga-gun; Masaaki Yasuda, Kuga-gun, and Noriaki Kihara, Kuga-gun, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

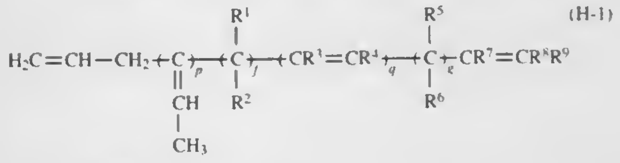
Continuation of Ser. No. 499,553, Jul. 6, 1995, abandoned. This application Aug. 21, 1997, Ser. No. 915,914

Claims priority, application Japan, Jul. 6, 1994, 6-154952; Jul. 14, 1994, 6-162475; Mar. 28, 1995, 7-069986; Mar. 31, 1995, 7-075289

Int. Cl.^{6} G08F *236/20*

U.S. Cl. 526—336 **13 Claims**

1. An unsaturated copolymer of ethylene wherein
(A) said copolymer is a random copolymer of:
  - (i) ethylene,
  - (ii) an α-olefin of 3 to 20 carbon atoms, and
  - (iii) at least one straight chain or branched chain nonconjugated triene or tetraene having one vinyl group in the molecule represented by the following formula (H-1)



(H-1)

wherein

p and q are each 0 or 1, with the proviso that each of p and q is not 0 at the same time,

f is an integer of 0 to 5, with the proviso that when p and q are each 1, f is not 0,

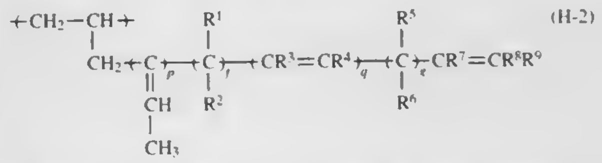
g is an integer of 2 to 6,

R^1, R^2, R^3, R^4, R^5, R^6 and R^7 are each hydrogen or an alkyl group of 1 to 5 carbon atoms,

R^8 is an alkyl group of 1 to 5 carbon atoms, and

R^9 is hydrogen, an alkyl group of 1 to 5 carbon atoms or a group represented by the formula $-(CH_2)_n-CR^{10}{=}CR^{11}R^{12}$, where n is an integer of 1 to 5, R^{10} and R^{11} are each hydrogen or an alkyl group of 1 to 5 carbon atoms, and R^{12} is alkyl group of 1 to 5 carbon atoms, with the proviso that when p and q are each 1, R^9 is hydrogen or an alkyl group of 1 to 5 carbon atoms;

(B) said copolymer comprises:
  - (i) constituent units from said ethylene in an amount of 30 to 92% by mol,
  - (ii) constituent units from said α-olefin of 3 to 20 carbon atoms in an amount of 6 to 70% by mol, and
  - (iii) constituent units from said nonconjugated triene or tetraene, represented by the following formula (H-2)



(H-2)

wherein p, q, f, g and R^1 to R^9 have the same meanings as described for said formula (H-1), in an amount of 0.1 to 30% by mol, in which
  - (iv) a molar ratio of said constituent units from said ethylene (i) to said constituent units from said α-olefin of 3 to 20 carbon atoms (ii) is in the range of 40/60 to 92/8; and

(C) said copolymer has an intrinsic viscosity (η), as measured in decahydronaphthalene at 135° C., of 0.05 to 10 dl/g.

5,837,792
POLYSILOXANE LIGHT STABILIZERS

Roger Meuwly, Cournillens, Switzerland, and Andreas Valet, Binzen, Germany, assignors to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

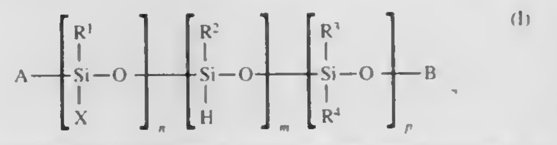
Filed Jun. 13, 1996, Ser. No. 662,578

Claims priority, application Switzerland, Jun. 23, 1995, 01 1854/95

Int. Cl.^{6} C08G *77/26*

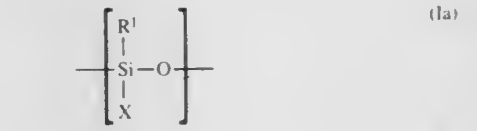
U.S. Cl. 528—27 **5 Claims**

1. An oligomeric or polymeric compound of the formula I

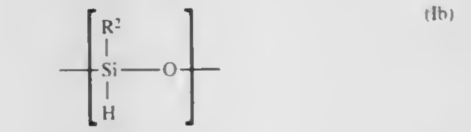


$$A-\left[\underset{\displaystyle X}{\overset{\displaystyle R^1}{Si}}-O\right]_n\left[\underset{\displaystyle H}{\overset{\displaystyle R^2}{Si}}-O\right]_m\left[\underset{\displaystyle R^4}{\overset{\displaystyle R^3}{Si}}-O\right]_p-B \qquad (I)$$

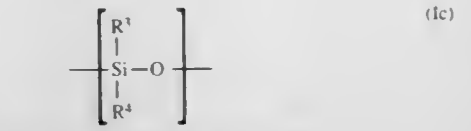
or correspondingly crosslinked compound, in which the units of the formulae Ia, Ib and/or Ic



$$\left[\underset{\displaystyle X}{\overset{\displaystyle R^1}{Si}}-O\right] \qquad (Ia)$$

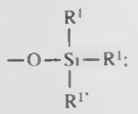


$$\left[\underset{\displaystyle H}{\overset{\displaystyle R^2}{Si}}-O\right] \qquad (Ib)$$



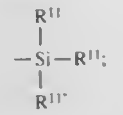
$$\left[\underset{\displaystyle R^4}{\overset{\displaystyle R^3}{Si}}-O\right] \qquad (Ic)$$

are arranged randomly or in blocks, and in which
n is a number from the range 1–100;
m is a number from the range 0–100;
p is a number from the range 0–100;
A is a radical of the formula



$$-O-\underset{\displaystyle R^{1''}}{\overset{\displaystyle R^1}{Si}}-R^{1'};$$

B is a radical of the formula

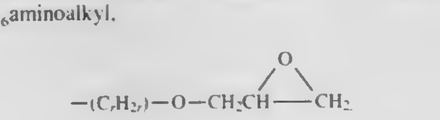


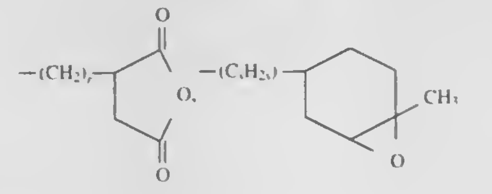
$$-\underset{\displaystyle R^{11''}}{\overset{\displaystyle R^{11}}{Si}}-R^{11'};$$

or A and B together are a direct bond when the sum n+m+p is a number from the range 3–10 and the sum m+p is greater than 0;

R^1, $R^{1'}$, $R^{1''}$, R^{11}, $R^{11'}$, $R^{11''}$, R^2 and R^3, independently of one another, are C_1–C_{18}alkyl, C_5–C_7cycloalkyl or phenyl;

R^4 is C_1–C_{18}alkyl, phenyl, C_2–C_6hydroxyalkyl, C_2–C_6aminoalkyl,





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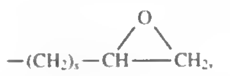
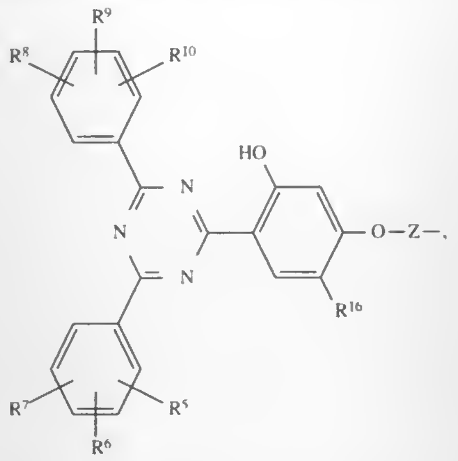


$$-(CH_2)_s-CH\overset{O}{-\!-\!-}CH_2,$$

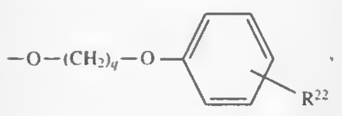
where r is a number from the range 2–6 and s is 2 or 3;
X is a mono- or divalent radical of the formula II

(II)

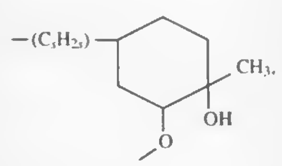


where

- R^5 and R^7, independently of one another, are hydrogen, C_1—C_{12}alkyl, C_3–C_6alkenyl, halogen or CN;
- R^6 is hydrogen, C_1–C_{12}alkyl, C_3–C_6alkenyl, halogen, CN, a cycloaliphatic, saturated hydrocarbon radical containing 5–12 carbon atoms, or is phenyl; or
- R^5 is OH, C_1–C18alkoxy or C_3—C_6alkenoxy; R^7 is hydrogen; and R^6 as a monovalent radical is OH, C_1–C_{18}alkoxy, C_3–C_6alkenoxy or —O—CH_2—$CH(OR^{12})$—CH_2—O—R^{17}. or R^6 is a divalent radical of the formula —O—Z— which is attached to the phenyl ring by the oxygen atom;
- R^8 is as defined for R^5;
- R^9 is as defined for R^6; and
- R^{10} is as defined for R^7;
- R^{12} is hydrogen or C_1–C_{18}alkyl;
- R^{16} is hydrogen, C_1–C_{24}alkyl, C_5–C_{12}cycloalkyl or C_7–C_{15}phenylalkyl;
- R^{17} is C_1–C_{18}alkyl;
- —O—Z— is a radical which is attached to the phenyl ring by the oxygen atom and is of the formula —O—$(CH_2)_q$—O—R^{21}–,



—O—CH_2—$CH(OR^{12})$—CH_2—O—$(CH_2)_t$—,



—O—CO—$(CH_2)_w$— or —O—$CH(R^{12})$—CO—O—$(CH_2)_w$—, or is —O—C_3—C_{18}alkylene;

- R^{21} is C_3–C_{12}alkylene or cyclohexylene; and
- R^{22} is C_2–C_{12}alkylene;
- q being a number from the range 2–4, t a number from the range 3–4 and w a number from the range 3–12.

5,837,793

SILICONE RUBBER POWDER AND METHOD FOR THE PREPARATION THEREOF

Asao Harashima, Tokyo; Yoshitsugu Morita, and Ryuji Tachibana, both of Chiba Prefecture, all of Japan, assignors to Dow Corning Toray Silicone Co., Ltd., Tokyo, Japan

Filed Mar. 17, 1997, Ser. No. 819,244

Claims priority, application Japan, Mar. 22, 1996, 8-093287; Mar. 22, 1996, 8-093288

Int. Cl.^{6} C08G *77/08;77/14*

U.S. Cl. 528—29 18 Claims

1. A cured silicone rubber powder prepared from a curable silicone composition, said powder comprising a polyorganosiloxane chain having at least one silicon-bonded polyoxyalkylene group of the formula

$$-R^1(OR^2)_mOR^3$$

wherein R^1 is an alkylene radical having 1 to 20 carbon atoms, R^2 is an alkylene radical having 1 to 20 carbon atoms, R^3 is selected from the group consisting of hydrogen and alkyl radicals having 1 to 10 carbon atoms and m is an integer having a value of 2 to 100.

5,837,794

TOLUENE DIISOCYANATE RESIDUE-BASED COMPOSITIONS HAVING REDUCED ACID VALUES

William E. Slack; Scott A. Kane, and James W. Rosthauser, all of Pittsburgh, Pa., assignors to Bayer Corporation, Pittsburgh, Pa.

Filed Oct. 27, 1997, Ser. No. 958,282

Int. Cl.^{6} C08G *18/30*

U.S. Cl. 528—49 20 Claims

1. A process for the production of a urethane-filled, diisocyanate or polyisocyanate having a reduced acid value comprising

- a) reacting
  - 1) a toluene diisocyanate residue from the phosgenation of toluene diamine having an ortho-toluenediamine content of less than 0.5% which toluene diisocyanate residue contains at least 10% by weight monomeric toluene diisocyanate and has a total isocyanate group content of at least 20% with
  - 2) a monofunctional alcohol in amounts such that the equivalent ratio of isocyanate groups in 1) to hydroxyl groups in 2) is from about 0.9:1.0 to about 1.0:0.9,
- b) dissolving the product of a) in a diisocyanate or polyisocyanate, and
- c) reacting from 0.5 to 20% by weight, based on the weight of a), of an epoxide having an epoxide equivalent weight of from about 44 to about 400 with the product of either a) or b) at a temperature of up to 120° C.

5,837,795

SOLVENT-FREE HEAT-CURING ONE-COMPONENT COATING MATERIALS

Rainer Lomoelder, Muenster, and Peter Speier, Marl, both of Germany, assignors to Huels Aktiengesellschaft, Marl, Germany

Filed Aug. 25, 1997, Ser. No. 917,194

Claims priority, application Germany, Sep. 4, 1996, 196 35 771.3

Int. Cl.^{6} C08G *18/10*

U.S. Cl. 528—62 10 Claims

1. A heat-curing coating material having a viscosity at 60° C. of 1000–50,000 mPas, comprising

- A) 85–96% by weight of at least one isocyanate prepolymer containing isocyanurate groups and urethane groups,
- B) 4–12% by weight of finely divided melamine having a mean particle diameter of 1–30 μm, and
- C) 0–3% by weight of one or more auxiliaries.

5,837,796

POLYISCOYANATES CONTAINING ISOCYANURATE GROUPS AND PREPARED BY TRIMERIZING ALKYL-SUBSTITUTED CYCLOALIPHATIC DIISOCYANATES

Hans-Joachim Scholl; Bernhard Jansen, both of Köln, and Rolf-Volker Meyer, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jun. 25, 1997, Ser. No. 883,477

Claims priority, application Germany, Jul. 10, 1996, 196 27 825.2

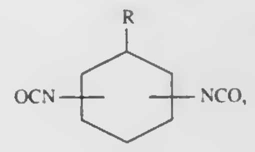
Int. Cl.^{6} C08G *18/79*

U.S. Cl. 528—73 11 Claims

1. A process for preparing a polyisocyanate containing isocyanurate groups by trimerizing a portion of the isocyanate groups of an organic polyisocyanate component comprising:

a) one or more diisocyanates corresponding to formula (1)

(1)



wherein:

R represents a saturated, straight-chain, aliphatic hydrocarbon group having 8 to 15 carbon atoms and

b) up to 95 NCO equivalent-%, based on the total equivalents a) and b), of one or more organic polyisocyanates other than a), in the presence of a trimerization catalyst and terminating the trimerization reaction at the desired degree of trimerization.

5,837,797

PROCESS FOR PREPARING A SULFUR-CONTAINING URETHANE-BASED PLASTIC LENS AND THE LENS PREPARED THEREBY

Koju Okazaki; Yoshinobu Kanemura, and Teruyuki Nagata, all of Fukuoka-ken, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Division of Ser. No. 373,083, Jan. 17, 1995, Pat. No. 5,608,115. This application Nov. 25, 1996, Ser. No. 753,436

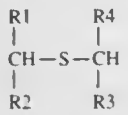
Claims priority, application Japan, Jan. 26, 1994, 6-006792

Int. Cl.^{6} G02B *1/04;* **C08G** *18/38;18/52*

U.S. Cl. 528—76 17 Claims

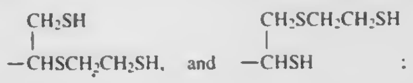
1. A process for preparing a sulfur-containing urethane-based plastic lens which comprises polymerizing a sulfur-containing urethane-based resin composition comprising a polythiol having four or more functional groups represented by any of the following formula (1):

(1)



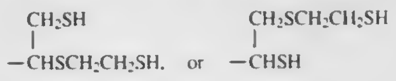
$$\begin{array}{ccc} R1 & & R4 \\ | & & | \\ CH & -S- & CH \\ | & & | \\ R2 & & R3 \end{array}$$

wherein R1, R2, R3 and R4 are each selected from the group consisting of H, —CH_2SH, —$CH_2SCH_2CH_2SH$,



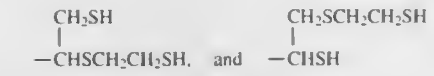
$$\begin{array}{l} CH_2SH \\ | \\ -CHSCH_2CH_2SH, \end{array} \text{ and } \begin{array}{l} CH_2SCH_2CH_2SH \\ | \\ -CHSH \end{array} ;$$

provided that where any one of R1, R2, R3 and R4 is H, at least one of the other three radicals represents



$$\begin{array}{l} CH_2SH \\ | \\ -CHSCH_2CH_2SH. \end{array} \text{ or } \begin{array}{l} CH_2SCH_2CH_2SH \\ | \\ -CHSH \end{array}$$

where any two of R1,R2, R3 and R4 are H, two others are independently selected from



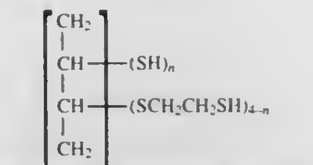
$$\begin{array}{l} CH_2SH \\ | \\ -CHSCH_2CH_2SH. \end{array} \text{ and } \begin{array}{l} CH_2SCH_2CH_2SH \\ | \\ -CHSH \end{array}$$

and any three or all of R1, R2, R3 and R4 are not H simultaneously; formula (2):

$$(HSCH_2)_{4-m}C(CH_2SCH_2CH_2SH)_m \qquad (2)$$

wherein m denotes an integer of 1 to 3; and formula (3):

(3)



$$\left[\begin{array}{l} CH_2 \\ | \\ CH \\ | \\ CH \\ | \\ CH_2 \end{array}\right]\begin{array}{l} \\ \\ -(SH)_n \\ \\ -(SCH_2CH_2SH)_{4-n} \\ \\ \end{array}$$

wherein n denotes an integer of 0 to 3;

and at least one isocyanate selected from the group consisting of polyisocyanate compounds, polyisothiocyanate compounds and isocyanato group-containing polyisothiocyanate compounds;

said polymerizing being conducted in a lens mold and then releasing the lens from the mold.

5,837,798

PHENOLIC POLYMERS MADE BY ARALKYLATION REACTIONS

David A. Hutchings; Jeffrey L. Mills, and Kenneth Bourlier, all of Tucker, Ga., assignors to Georgia-Pacific Resins, Atlanta, Ga.

Continuation-in-part of Ser. No. 728,028, Oct. 9, 1996, Pat. No. 5,772,269, which is a continuation-in-part of Ser. No. 501,516, Jul. 12, 1995, Pat. No. 5,674,970. This application Mar. 18, 1997, Ser. No. 820,690

Int. Cl.^{6} C08G *59/00*

U.S. Cl. 528—86 49 Claims

1. A phenol aralkylation polymer produced by reaction among a phenolic monomer having at least three free reactive aromatic ring positions, at least one styrene derivative and an aryl diolefin, in the presence of an acid catalyst, wherein the reaction is conducted with an amount of aryl diolefin sufficient to obtain a mole ratio of aryl diolefin to said phenolic monomer having at least three free reactive aromatic ring positions of from 0.2:1 to 1.1:1 and with a sufficient amount of the at least one styrene derivative to obtain a degree of styrenation of from 40 to 95%.

5,837,799

FIRE-RETARDANT COMPOUND, A PROCESS FOR PRODUCING SAID FIRE-RETARDANT COMPOUND AND A FIRE-RETARDED THERMOPLASTIC RESIN COMPOSITION INCLUDING SAID FIRE-RETARDANT COMPOUND

Toshihiko Chen; Yoshiaki Nakamura; Tetsunori Sato, and Yoshiyuki Morikawa, all of Tokyo, Japan, assignors to Tohto Kasei Co., Inc., Tokyo, Japan

Filed Aug. 23, 1996, Ser. No. 697,457

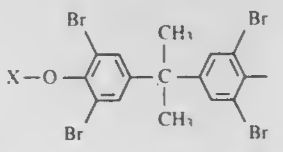
Claims priority, application Japan, Aug. 25, 1995, 7-217664

Int. Cl.^{6} C08G *59/00*

U.S. Cl. 528—102 8 Claims

1. A fire retardant agent having the general formula (1)

(1)



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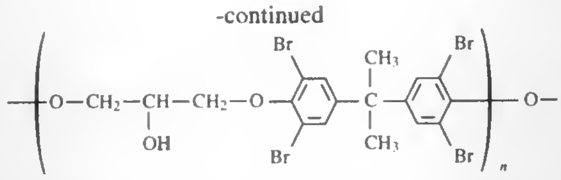
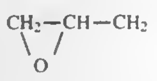
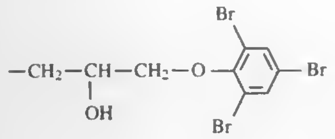


wherein

X and Y are independently selected from the group consisting of A and B shown in formula (2)

A: 

$\underset{\diagdown\;O\;\diagup}{CH_2-CH}-CH_2$ (2)

B: 

and

n is the mean degree of polymerization and is from 0 to 30;

said fire retardant agent being a mixture including 15 to 30% of X=Y=A, 40 to 60% of X=A and Y=B and 20 to 35% of X=Y=B;

said fire retardant agent having been produced by a process selected from the group consisting of:

- (i) reacting tetrabromo bisphenol A, tribromo phenol and epichlorohydrine in the presence of an alkali metal hydroxide,
- (ii) reacting tetrabromo bisphenol A, tribromo phenyl glycidyl ether and epichlorohydrine in the presence of an alkali metal hydroxide,
- (iii) reacting tetrabromo bisphenol A epoxy resin having an epoxy equivalent of 350 to 700 g/eq, a softening point of 50° to 105° C. and a bromine content of 46 to 52%, tetrabromo bisphenol A and tribromo phenol in the presence of a catalyst selected from the group consisting of a phosphine and a phosphonium compound,
- (iv) reacting tetrabromo bisphenol A epoxy resin having an epoxy equivalent of 600 to 1300 g/eq, a softening point of 95° to 140° C. and a bromine phenol in the presence of a catalyst selected from the group consisting of a phosphine and a phosphonium compound, and
- (v) reacting tetrabromo bisphenol A epoxy resin having an epoxy equivalent of 350 to 700 g/eq, a softening point of 50° to 105° C. and a bromine content of 46 to 52%, tetrabromo bisphenol A and tribromo phenyl glycidyl ether in the presence of a catalyst selected from the group consisting of a phosphine and a phosphonium compound.

5,837,800

POLYETHYLENE-2,6-NAPHTHALENE DICARBOXYLATE RESIN AND PREFORM AND BOTTLE MOLDED THEREOF

Minoru Suzuki; Kimihiko Sato, and Masami Umeda, all of Matsuyama, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Jan. 30, 1998, Ser. No. 16,280
Int. Cl.^{6} C08G *63/02*

U.S. Cl. 528—193 **12 Claims**

1. A polyethylene-2,6-naphthalene dicarboxylate resin for molding a bottle, which comprises 2,6-naphthalenedicarboxylic acid as a main acid component and ethylene glycol as a main glycol component and contains a germanium compound as a polycondensation catalyst, and has an intrinsic viscosity of 0.55 to 0.75 dl/g, a terminal carboxyl group content of 32 eq/ton or less, an acetaldehyde content of 8 ppm or less and a diethylene glycol component content of 0.8 to 3.0 wt %.

5,837,801

METHOD FOR PREPARING CROSSLINKED POLYCARBODIIMIDES

Ken Yahata; Hiroshi Miyoshi; Yasuyuki Takiguchi; Yasuyoshi Komoto, and Akira Hayashida, all of Kawasaki, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Dec. 4, 1996, Ser. No. 759,381
Claims priority, application Japan, Dec. 5, 1995, 7-316325
Int. Cl.^{6} C08G *73/10;95/04*

U.S. Cl. 528—310 **7 Claims**

1. A method for preparing a crosslinked polycarbodiimide, comprising reacting a polycarbodiimide compound with a compound, which has in a molecule thereof two or more hydroxy or mercapto groups, in the presence of an alcoholate of an alkali metal or of an alkaline earth metal.

5,837,802

FAST SETTING WATER SENSITIVE POLYAMIDES HAVING A HIGH T_G

Gregory J. Van Lith, Fridley; Mark S. Kroll, Arden Hills, and Leslie J. Clapp, Wyoming, all of Minn., assignors to H. B. Fuller Licensing & Financing, Inc., St. Paul, Minn.

Filed Aug. 29, 1997, Ser. No. 920,748
Int. Cl.^{6} C08G *69/08;73/10;69/40;* **C09J** *5/02*

U.S. Cl. 528—310 **26 Claims**

1. A water sensitive polyamide composition which is the reaction product of at least one reactant which is a dicarboxylic acid, ester or anhydride thereof and at least one reactant is a diamine wherein at least one of said diamines is polyoxyalkylene diamine and at least one of said other reactant is aromatic and said polyamide composition has a T_g greater than about 15° C. and a ΔH from about 1 to about 30 Joules/gram.

5,837,803

METHOD OF PRODUCING POLYAMIDE RESIN

Seiko Nakano, Tsu, Japan, assignor to M & S Research and Development Co., Ltd., Japan

Filed Mar. 31, 1997, Ser. No. 825,500
Claims priority, application Japan, Apr. 4, 1996, 8-082372
Int. Cl.^{6} C08G *73/10;69/00*

U.S. Cl. 528—332 **15 Claims**

1. A method of producing a polyamide resin by reacting 1 mol of linear polyester resin based upon the repeating unit of said linear polyester resin consisting of at least one dicarboxylic acid component and at least one diol component and having an intrinsic viscosity of not less than 0.2 dl/g when measured at 30° C. using hexafluorisopropanol as the solvent with 0.5–1.5 mol of at least one diamine compound in a reaction medium comprising at least one solvent selected from the group consisting of hydrocarbons, halogenated hydrocarbons, ethers and acetals, so that said at least one diol component of said linear polyester resin is substituted by said diamine compound resulting in said polyamide resin as a reaction product.

5,837,804

POLYIMIDES AND OPTICAL PARTS OBTAINED BY USING THE SAME

Chiaki Yamagishi; Nori Sasaki, both of Hitachi; Shigeo Nara, Mito; Hidetaka Sato, Hitachi; Shigeru Hayashida, Hitachi, and Masato Taya, Hitachi, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Jul. 24, 1996, Ser. No. 685,470
Claims priority, application Japan, Jul. 27, 1995, 7-191324
Int. Cl.^{6} C08G *73/10;* **G02B** *6/10*

U.S. Cl. 528—353 **19 Claims**

1. An optical waveguide comprising a core layer and a clad layer, in which one of the core and clad layers comprises a polyimide having

- (a) a difference between the refractive index in TE mode and that in TM mode of 0.02 or less.
- (b) a glass transition temperature (Tg) of 250° C. or higher, and
- (c) an optical transmission loss of 1 dB/cm or less at a wavelength of 0.7 to 1.6 μm.

5,837,805

Patent Not Issued For This Number

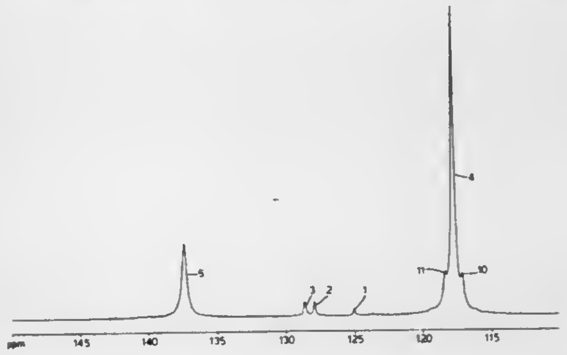
5,837,806

POLYANILINES AND THEIR MANUFACTURE

Phillip Norman Adams, Durham, and Andrew Paul Monkman, Stanhope, both of United Kingdom, assignors to BICC Public Limited Company, London, England

Filed Feb. 22, 1996, Ser. No. 605,793
Claims priority, application United Kingdom, Mar. 4, 1994, 9404182; Nov. 17, 1994, 9423173
Int. Cl.^{6} C08G *73/02*

U.S. Cl. 528—422 **10 Claims**



1. An unsubstituted aniline homopolymer characterised by a nuclear magnetic resonance spectrum in its leuco form showing only two ^{13}C peaks, indicating the substantal absence of chain branching.

5,837,807

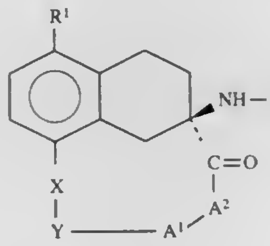
TETRAHYDRONAPHTHALENE COMPOUNDS

Christine Abrecht, Lengnau; Alfred Grieder, Sissach; Klaus Müller, Münchenstein, and Daniel Obrecht, Basel, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Feb. 27, 1996, Ser. No. 607,734
Claims priority, application Switzerland, Feb. 28, 1995, 00 567/95
Int. Cl.^{6} C07K *4/00;5/12;* **C07D** *285/00*

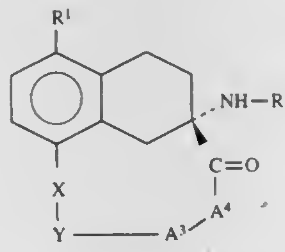
U.S. Cl. 530—317 **47 Claims**

1. A tetrahydronaphthalene compound of the formula



Ia

or



Ib

wherein

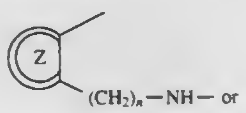
R^1 is hydrogen, bromine, cyano, formyl, hydroxy, lower alkyl, lower alkenyl, lower alkynyl, lower alkoxy, aryloxy, lower aralkoxy or aryl;

R^2 is an amino acid residue or a chain of 2 to 20 amino acid residues wherein reactive moieties in the side chains of the amino acid residue(s) is/are protected or unprotected, and wherein the amino group of the N-terminal amino acid is a free or protected amino group;

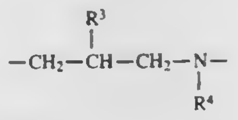
A^1, A^2, A^3 and A^4 each are α-amino acid residues wherein A^1 and A^2 are in the L configuration and A^3 and A^4 are in the D configuration when the α-C atom of said α-amino acid residue is asymmetric;

X is oxygen or sulphur;

Y is a residue of the formula



(a)



$-CH_2-\overset{R^3}{\overset{|}{CH}}-CH_2-\underset{R^4}{\underset{|}{N}}-$ (b)

n is 0 or 1;

R^3 is hydrogen or lower alkyl;

R^4 is hydrogen or lower alkyl; and

Z and the two C atoms together are an aromatic ring selected from the group consisting of benzene, furan, thiophene, pyridine or pyrimidine, wherein said aromatic ring is substituted or unsubstituted; and salts thereof.

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5,837,808
ANALOGS OF HIRUDIN

Cecilia S. L. Ku, Lake Forest; Richard Johnson, and Julian P. Breillatt, Jr., both of Mundelein, all of Ill., assignors to Baxter International Inc., Deerfield, Ill.

Continuation of Ser. No. 116,939, Sep. 7, 1993, abandoned, which is a continuation-in-part of Ser. No. 747,565, Aug. 20, 1991, abandoned. This application Jun. 19, 1995, Ser. No. 492,343

Int. Cl.^{6} C07K *14/00*

U.S. Cl. 530—324 1 Claim

1. An antithrombogenic molecule having the amino acid sequence of (SEQ ID NO: 2).

5,837,809
MAMMALIAN OPIOID RECEPTOR LIGAND AND USES

David K. Grandy; James R. Bunzow, both of Portland, Oreg.; Olivier Civelli, Aesch, Switzerland; Rainer Klaus Reinscheid, Eimeldingen; Hans-Peter Nothacker, Schliengen, both of Germany, and Frederick James Monsma, Riehen, Switzerland, assignors to Oregon Health Sciences University, Portland, Oreg.

Filed Aug. 11, 1995, Ser. No. 514,451

Int. Cl.^{6} C07K *7/08;14/705*

U.S. Cl. 530—326 4 Claims

1. A purified peptide comprising the formula Phe-Gly-Gly-Phe-Thr-Gly-Ala-Arg-Lys-Ser-Ala-Arg-Lys-Leu-Ala-Asn-Gln (SEQ. ID No.5), wherein the amino acids are each individually in either the D or L stereochemical configuration, and the peptide binds to a receptor having an amino acid sequence identified as Seq. ID No. 4.

5,837,810
POLYPEPTIDES OF LIPOPOLYSACCHARIDE BINDING PROTEIN

Jiahuai Han, La Jolla; Richard J. Ulevitch, Del Mar, and Peter S. Tobias, San Diego, all of Calif., assignors to The Scripps Research Institute, La Jolla, Calif.

Filed Mar. 15, 1994, Ser. No. 215,089

Int. Cl.^{6} C07K *14/47*

U.S. Cl. 530—350 1 Claim

1. An isolated polypeptide having the amino acid sequence of SEQ ID NO:2 and fragments thereof that bind LPS but do not form a complex with LPS and CD 14, or having the amino acid sequence of SEQ ID NO:7 and fragments thereof that bind with CD14 but do not form a complex with LPS and CD 14.

5,837,811
PROTEINS ACTIVE IN LYMPHOCYTE-MEDIATED CYTOTOXICITY

Paul J. Anderson, Watertown; Michel Streuli, Brookline, and Stuart F. Schlossman, Newton Centre, all of Mass., assignors to Dana-Farber Cancer Institute, Inc., Boston, Mass.

Division of Ser. No. 843,949, Feb. 19, 1992, Pat. No. 5,340,935, which is a continuation-in-part of Ser. No. 726,607, Jul. 10, 1991, Pat. No. 5,298,407, which is a continuation-in-part of Ser. No. 460,678, Jan. 5, 1990, Pat. No. 5,079,343. This application Mar. 28, 1994, Ser. No. 218,978

Int. Cl.^{6} C07K *14/00*

U.S. Cl. 530—350 17 Claims

1. A substantially purified preparation of a polypeptide that is immunologically reactive with the monoclonal antibody produced by the hybridoma designated ATCC # HB 10319, wherein said polypeptide is encoded by a DNA sequence which hybridizes under the following conditions to a nucleic acid probe complementary to a 20-nucleotide segment of SEQ ID NO: 1 or 2: 50% formamide, 5× SSC, 42° C.

5,837,812
HUMAN ISLET, HUMAN BRAIN AND MOUSE BRAIN GLUTAMIC ACID DECARBOXYLASE GAD POLYPEPTIDES

Leonard Harrison; Margot Honeyman, both of St. Kilda West; David Cram, Blackburn South, and Henry De Aizpurua, Blackburn, all of Australia, assignors to Amrad Corporation Limited, Richmond, Australia

Continuation of Ser. No. 839,805, Feb. 21, 1992, abandoned. This application Sep. 20, 1994, Ser. No. 308,952

Claims priority, application Australia, Feb. 22, 1991, PK 4773; Sep. 27, 1991, PK 8620

Int. Cl.^{6} C07K *14/435;* **A61K** *39/00*

U.S. Cl. 530—350 9 Claims

1. A polypeptide having the amino acid sequence of SEQ ID NO:3.

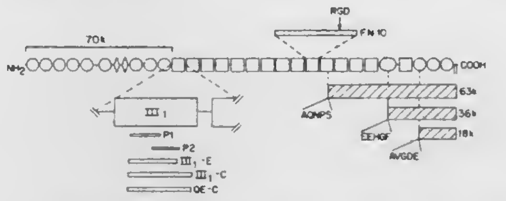
5,837,813
FIBRONECTIN TYPE III POLYPEPTIDES

Erkki I. Ruoslahti, Rancho Santa Fe, and Alex Morla, Carlsbad, both of Calif., assignors to La Jolla Cancer Research Foundation, La Jolla, Calif.

Continuation of Ser. No. 340,812, Nov. 17, 1994, Pat. No. 5,629,291, which is a continuation of Ser. No. 21,626, Feb. 16, 1993, abandoned, which is a continuation-in-part of Ser. No. 829,462, Jan. 31, 1992, Pat. No. 5,453,489. This application Jun. 1, 1995, Ser. No. 460,421

Int. Cl.^{6} A61K *38/39;* **C07K** *14/78*

U.S. Cl. 530—350 4 Claims



1. A substantially purified recombinantly produced polypeptide fragment of the III$_1$ repeat (Sequence ID NO:1) of fibronectin having the ability to bind fibronectin.

5,837,814
CELLULOSE BINDING DOMAIN PROTEINS

Oded Shoseyov, Karmey Yosef; Itai Shpiegl, Rehovot, both of Israel; Marc Goldstein, and Roy Doi, both of Davis, Calif., assignors to Yissum Research Development Co. of Hebrew University Of Jeruslame, Israel, and University of CA, Calif.

Division of Ser. No. 48,164, Apr. 14, 1993, Pat. No. 5,496,934. This application Jun. 2, 1995, Ser. No. 460,455

Int. Cl.^{6} C07K *14/00;1/13*

U.S. Cl. 530—350 15 Claims

1. An isolated cellulose binding domain (CBD) having the amino acid sequence depicted in SEQ ID NO:2.

5,837,815
PYK2 RELATED POLYPEPTIDE PRODUCTS

Sima Lev, San Francisco, Calif., and Joseph Schlessinger, New York, N.Y., assignors to Sugen, Inc., Redwood City, Calif.

Continuation-in-part of Ser. No. 357,642, Dec. 15, 1994. This application Jun. 2, 1995, Ser. No. 460,626

Int. Cl.^{6} C12P *12/06;* **C07K** *14/00;* **A23J** *1/00*

U.S. Cl. 530—350 8 Claims

1. An isolated or purified proline-rich tyrosine kinase 2 (PYK2) polypeptide having a phosphorylation activity, said polypeptide comprising at least thirty-five contiguous amino acids of the amino acid sequence of SEQ ID NO: 1.

5,837,816
INTERLEUKIN-2 RECEPTOR SUBUNIT ECTODOMAIN FUSION PROTEIN COMPRISING A LEUCINE ZIPPER DOMAIN

Thomas L. Ciardelli, Sharon, Vt., and Kirk Johnson, Moraga, Calif., assignors to Chiron Corporation, Emeryville, Calif., and Trustee of Dartmouth College, Hanover, N.H.

Continuation-in-part of Ser. No. 438,259, May 10, 1995, abandoned. This application Jun. 7, 1995, Ser. No. 474,741

Int. Cl.^{6} C07K *14/435;14/705;14/715;* **C12N** *15/12*

U.S. Cl. 530—350 11 Claims

1. A hetero-oligomeric high affinity binding complex comprising at least three separate fusion proteins of which at least two are different, each fusion protein comprising a leucine zipper domain of the sequence LEALKEK (SEQ ID NO: 1) or LKALEKE (SEQ ID NO: 4) and an alpha or beta IL-2 receptor subunit ectodomain, the leucine zipper domains of said at least three separate fusion proteins non-covalently binding to one another, and said receptor subunit ectodomains forming a high affinity binding complex for the ligand for a native IL-2 receptor.

5,837,817
TUMOR NECROSIS FACTOR RECEPTOR-II-ASSOCIATED PROTEIN KINASE AND METHODS FOR ITS USE

Bharat B. Aggarwal, and Bryant G. Darnay, both of Houston, Tex., assignors to Research Development Foundation, Carson City, Nev.

Continuation-in-part of Ser. No. 272,005, Jul. 7, 1994, abandoned. This application Jan. 18, 1996, Ser. No. 588,604

Int. Cl.^{6} C07K *14/705*

U.S. Cl. 530—350 1 Claim

1. An enriched and isolated protein kinase that associates with amino acid residues 354–397 of the cytoplasmic domain of the p80 form of the tumor necrosis factor receptor, said kinase phosphorylates both the p80 and p60 forms of the tumor necrosis factor receptor, said kinase phosphorylates a 59 kDa molecular weight protein associated with the cytoplasmic domain of the p80 form of the tumor necrosis factor receptor, and said kinase is partially inhibited by casein kinase 1-specific kinase inhibitor.

5,837,818
CONSTRUCTION AND EXPRESSION OF SYNTHETIC GENES ENCODING ENVELOPE EPITOPES OF THE HUMAN T CELL LEUKEMIA VIRUS TYPE I

Deborah A. Buonagurio, Mamaroneck, N.Y., and Mathew Longiaru, West Orange, N.J., assignors to Roche Diagnostic Systems, Inc., Branchburg, N.J.

Division of Ser. No. 327,129, Oct. 21, 1994, Pat. No. 5,693,755, which is a continuation of Ser. No. 997,153, Dec. 22, 1992, abandoned, which is a continuation of Ser. No. 876,822, Apr. 29, 1992, abandoned, which is a continuation of Ser. No. 425,252, Oct. 23, 1989, abandoned. This application Aug. 2, 1996, Ser. No. 691,989

Int. Cl.^{6} C07K *14/16;* **C12P** *21/02;* **C12N** *7/00;* **A61K** *39/21*

U.S. Cl. 530—350 7 Claims

1. A hybrid polypeptide comprising a first amino acid sequence fused at its carboxy terminus to a second amino acid sequence, wherein the first sequence consists of amino acids 342–434 of HTLV-I env which has the formula:

Ser Gly Lys Ser Leu Leu His Glu Val Asp Lys Asp Ile Ser Gln Leu Thr
342 345 350 355

Gln Ala Ile Val Lys Asn His Lys Asn Leu Leu Lys Ile Ala Gln Tyr Ala
360 365 370 375

-continued

Ala Gln Asn Arg Arg Gly Leu Asp Leu Leu Phe Trp Glu Gln Gly Gly Leu
380 385 390

Cys Lys Ala Leu Gln Glu Gln Cys Arg Phe Pro Asn Ile Thr Asn Ser His
395 400 405

Val Pro Ile Leu Gln Glu Arg Pro Pro Leu Glu Asn Arg Val Leu Thr Gly
410 415 420 425

Trp Gly Leu Asn Trp Asp Leu Gly
430 434

and the second amino acid sequence contains at least one epitope selected from the group consisting of epitopes from HTLV-I env gp46, gp21, or both HTLV-I env gp46 and gp21, and wherein when the second amino acid sequence is from gp21 alone, the second sequence contains said amino acids 342–434 of HTLV-I env.

5,837,819
TAB1 PROTEIN

Kunihiro Matsuomoto, Nagoya, and Eisuke Nishida, Kyoto, both of Japan, assignors to Naoto Ueno, Sapporo, Japan

Filed Nov. 20, 1996, Ser. No. 752,891

Claims priority, application Japan, Apr. 24, 1996, 8-126282; Oct. 28, 1996, 8-300856

Int. Cl.^{6} C07K *2/00;14/00*

U.S. Cl. 530—350 7 Claims

1. An isolated TAB1 protein having the amino acid sequence shown in SEQ ID NO: 2.

5,837,820
SEED SPECIFIC BIOTINYLATED PROTEIN, SBP65, FROM LEGUMINOUS PLANTS

Richard De Rose, Lyons; Roland Douce, Grenoble; Manuel Duval, Lyons; Claudette Job, Lyons, and Dominique Job, Lyons, all of France, assignors to Rhone-Poulenc Agrochimie, Lyons, France

Filed Nov. 29, 1994, Ser. No. 346,429

Claims priority, application France, Nov. 29, 1993, 93 14482; Feb. 14, 1994, 94 01901

Int. Cl.^{6} C07K *14/415*

U.S. Cl. 530—370 5 Claims

1. An isolated, biotinylated protein obtainable from the seed of a leguminous plant which comprises at least one subunit of about 50–85 kDa, wherein said subunit is expressed in the seed and in no other organ of the plant and wherein said subunit decreases rapidly as germination of said seed progresses.

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5,837,821
ANTIBODY CONSTRUCT

Anna M. Wu, Sherman Oaks, Calif., assignor to City of Hope, Duarte, Calif.

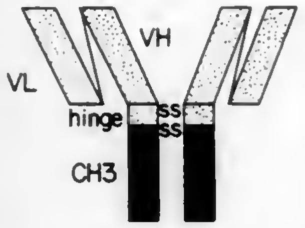
PCT No. PCT/US92/09347, § 371 Date Jun. 24, 1994, § 102(e) Date Jun. 24, 1994, PCT Pub. No. WO94/09817, PCT Pub. Date May 11, 1994

PCT Filed Nov. 4, 1992, Ser. No. 256,156

Claims priority, application WIPO, Nov. 4, 1992, PCT/7S92/09347

Int. Cl.^{6} C07K *16/46;* **C12N** *15/10;* **C07H** *21/04*

U.S. Cl. 530—387.3 **19 Claims**



1. A minibody dimer as depicted by FIG. 2.

5,837,822
HUMANIZED ANTIBODIES SPECIFIC FOR ICAM RELATED PROTEIN

W. Michael Gallatin, and Rosemay Vazeux, both of Seattle, Wash., assignors to ICOS Corporation, Bothell, Wash.

Continuation-in-part of Ser. No. 102,852, Aug. 5, 1993, abandoned, which is a continuation-in-part of Ser. No. 009,266, Jan. 22, 1993, abandoned, which is a continuation-in-part of Ser. No. 894,061, Jun. 5, 1992, abandoned, which is a continuation-in-part of Ser. No. 889,724, May 26, 1992, abandoned, which is a continuation-in-part of Ser. No. 827,689, Jan. 27, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 487,113

Int. Cl.^{6} C12P *21/08*

U.S. Cl. 530—387.3 **3 Claims**

1. A humanized ICR 1.1 antibody.

5,837,823
ANTIBODIES TO ADRENOMEDULLIN

Kazuo Kitamura, Miyazaki; Kenji Kangawa, Suita; Hisayuki Matsuo, Kobe, and Tanenao Eto, Miyazaki, all of Japan, assignors to Shinonogi & Co., Ltd., Osaka, and Kenji Kanagawa, Suita, both of Japan

Division of Ser. No. 233,389, Apr. 26, 1994, Pat. No. 5,639,855. This application Jun. 7, 1995, Ser. No. 486,596

Claims priority, application Japan, Apr. 26, 1993, 5-99856; Jul. 23, 1993, 5-183107; Nov. 29, 1993, 5-298736; Apr. 18, 1994, 6-79035

Int. Cl.^{6} C07K *16/00;* **A61K** *38/00;38/24;39/395*

U.S. Cl. 530—387.9 **24 Claims**

1. An isolated antibody recognizing a peptide comprising an amino acid sequence from Ser in the 13 position to Tyr in the 52 position of SEQ ID No. 1.

5,837,824
EPITOPE WHICH BINDS TO MONOCLONAL ANTIBODY

Klaus Bosslet; Peter Pfleiderer, both of Marburg, and Gerhard Seemann, Marburg-Einhausen, all of Germany, assignors to Behring Diagnostics GmbH, Marburg, Germany

Division of Ser. No. 957,827, Oct. 8, 1992, abandoned. This application Jun. 6, 1995, Ser. No. 471,771

Claims priority, application Germany, Oct. 11, 1991, 41 33 791.3

Int. Cl.^{6} C07K *9/00*

U.S. Cl. 530—395 **1 Claim**

1. An epitope which binds to the monoclonal antibody BW 835,DSM ACC2022.

5,837,825
CAMPYLOBACTER JEJUNI FLAGELLIN/ *ESCHERICHIA COLI* LT-B FUSION PROTEIN

Richard J. Meinersmann, Lithonia, Ga., and Christian A. Khoury, Philadelphia, Pa., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 150,305, Nov. 12, 1993, abandoned. This application Mar. 31, 1997, Ser. No. 829,026

Int. Cl.^{6} C07K *14/205;14/245*

U.S. Cl. 530—403 **1 Claim**

1. A recombinant fusion protein consisting of the amino acid sequence encoded by the fusion gene of FIG. 3 (SEQ ID NO: 5).

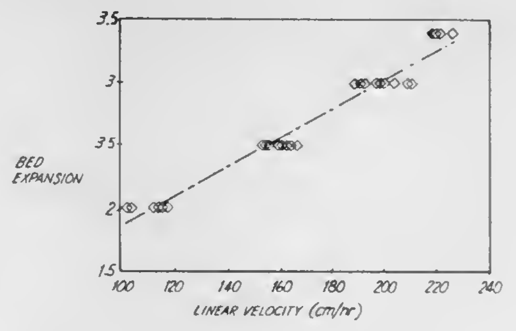
5,837,826
PROTEIN ADSORPTION BY VERY DENSE POROUS ZIRCONIUM OXIDE PARTICLES IN EXPANDED BEDS

Michael C. Flickinger, St. Paul; Michael J. Robichaud; John E. Morris, both of Minneapolis; Colleen M. Griffith, St. Paul, all of Minn.; Michael J. Annen, Monroeville, Pa.; Peter W. Carr, Minneapolis, and Christopher Dunlap, St. Paul, both of Minn., assignors to Regents of The University of Minnesota, Minneapolis, Minn.

Filed Feb. 27, 1995, Ser. No. 394,714

Int. Cl.^{6} B01J *47/10;* **C07K** *1/16;1/18;1/22*

U.S. Cl. 530—413 **32 Claims**



1. A method of separating a target protein from a feedstock in an expanded bed comprising:

(a) expanding a bed of surface-modified zirconium oxide particles;

wherein the surface-modified zirconium oxide particles have a capacity factor greater than about 10 and comprise a core zirconium oxide particle having a particle size of about 30–400 μm and a specific gravity of about 2.5–3.5 g/cm^3;

(b) eluting the feedstock through the expanded bed to adsorb the target protein to the surface-modified zirconium oxide particles; and

(c) removing the target protein from the surface-modified zirconium oxide particles.

5,837,827
FIBRE-REACTIVE DYES, THEIR PREPARATION AND THEIR USE

Hans Reichert, Rheinfelden, and Herbert Klier, Efringen-Kirchen, both of Germany, assignors to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

Filed Nov. 12, 1996, Ser. No. 744,161

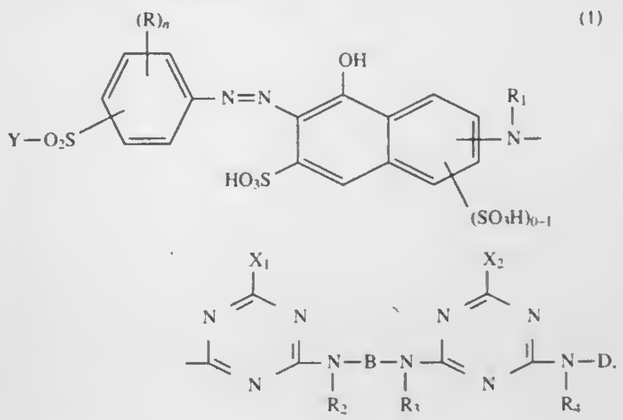
Claims priority, application Switzerland, Nov. 16, 1995, 3253/95

Int. Cl.^{6} C09B *62/04;62/503;* **D06P** *1/38*

U.S. Cl. 534—618 **12 Claims**

1. A compound of the formula

(1)



in which B is 1,2-propylene, 1,3-propylene, 2-hydroxy-1,3-propylene, 1,4-butylene, 2-methyl-1,5-pentylene or 1,6-hexylene,

D is the radical of a monoazo, polyazo, metal complex azo, anthraquinone, phthalocyanine, formazan or dioxazine chromophore,

$(R)_n$ is n identical or different radicals from the group consisting of C_1–C_4alkyl, C_1–C_4alkoxy, halogen and sulfo,

n is the number 0, 1 or 2,

R_1, R_2, R_3 and R_4 independently of one another are each hydrogen or substituted or unsubstituted C_1–C_4alkyl,

one of the radicals X_1 and X_2 is chlorine and the other is fluorine,

Y is vinyl or a radical $—CH_2—CH_2—U$ and

U is a leaving group.

5,837,828
PRADIMICIN DERIVATIVES

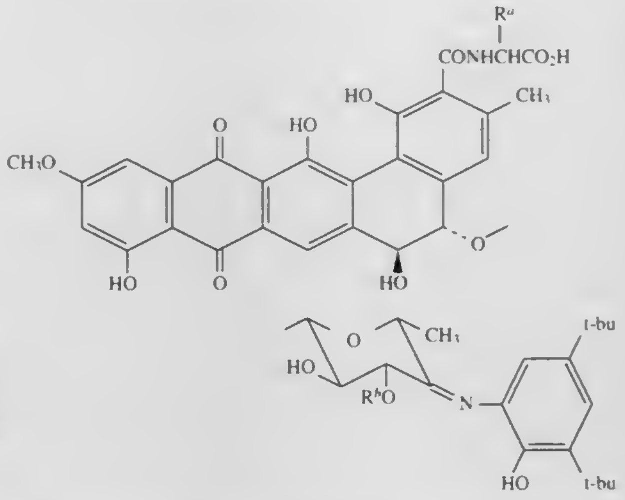
Shimpei Aburaki, Kawasaki; Tetsuro Yamasaki; Toshikazu Oki, both of Yokohama; Seiji Iimura, Tokyo; Hajime Kamachi, Urayasu; Hideo Kamei, Tokyo, and Takayuki Naito, Kawasaki, all of Japan, assignors to Bristol-Myers Squibb Co., Princeton, N.J.

Division of Ser. No. 866,131, Apr. 8, 1992, abandoned. This application May 2, 1995, Ser. No. 378,201

Int. Cl.^{6} C07H *1/00;15/24*

U.S. Cl. 536—6.4 **3 Claims**

1. A compound having the formula



wherein R^a is H, methyl, or hydroxymethyl, and when R^a is methyl or hydroxymethyl, the resulting amino acid has the D-configuration; R^b is H or β-D-xylosyl; or a salt thereof; or an ester thereof.

5,837,829
9-OXIMESILYL ERYTHROMYCIN A DERIVATIVES

Yi-Yin Ku, Buffalo Grove, Ill., assignor to Abbott Laboratories, Abbott Park, Ill.

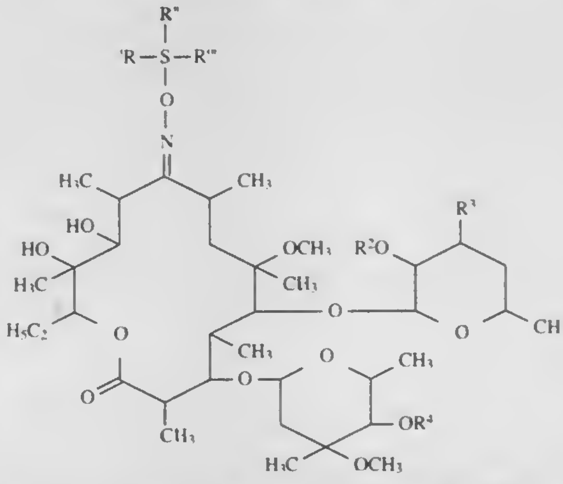
Filed Apr. 2, 1996, Ser. No. 626,524

Int. Cl.^{6} C07H *1/00;17/08*

U.S. Cl. 536—7.4 **9 Claims**

7. A compound having the structure II below:

II



where R', R" and R'" are each independently hydrogen, lower alkyl, aryl, phenyl, phenyl substituted lower alkyl, cycloalkyl or

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alkenyl; R^2 and R^4 are each independently hydrogen, silyl, alkoxycarbonyl, alkylcarbonyl, acyl, lower alkenyl monocarbonyl, lower alkoxycarbonylalkylcarbonyl or arylcarbonyl; and R^3 is $—NR^5(CH_3)_2$, where R^5 is methyl (CH_3) or a N-protecting group or $—N^+(CH_3)_2R^6X$, where R^6 is 2-alkenyl, benzyl or substituted benzyl, and X is Br, Cl or l.

5,837,830

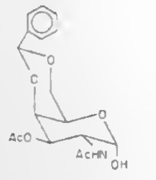
STEREODIRECTED PROCESS FOR SYNTHESIS OF α-N-ACETYLGALACTOSAMINIDES

Rao R. Koganty, and Sham Gandhi, both of Edmonton, Canada, assignors to Biomira, Inc., Edmonton, Canada

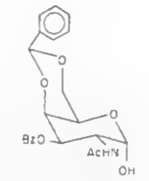
Division of Ser. No. 208,268, Mar. 9, 1994, Pat. No. 5,527,891. This application Feb. 8, 1996, Ser. No. 598,515

Int. Cl.^{6} C07H *5/04;5/06;15/04;15/20*

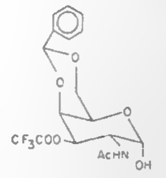
U.S. Cl. 536—17.9 **5 Claims**



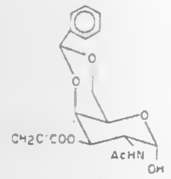
3c



3b

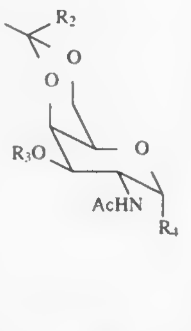


3c



3d

1. A compound of the formula A below



wherein

R_1 is $C_6H_5—$,

R_2 is $H—$,

R_3 is $C_6H_5C(=O)—$, $CH_2ClC(=O)—$, or $CF_3C(=O)$,

R_4 is hydroxyl, a protected hydroxy group, a leaving group, a sugar or sugar derivative, or an amino acid or amino acid derivative.

5,837,831

METHOD FOR SEPARATING ALKYL GLYCOSIDES

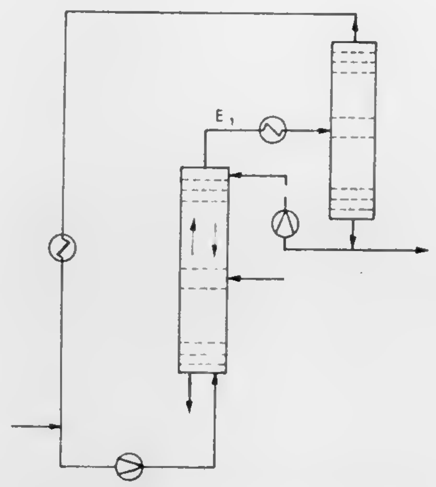
Burghard Grüning, Essen; Siegfried Peter, Uttenreuth-Weiher; Eckhard Weidner, Erlangen, and Zhengfeng Zhang, Tutzing, all of Germany, assignors to Th. Goldschmidt AG, Essen, Germany

Filed Sep. 23, 1996, Ser. No. 717,950

Claims priority, application Germany, Sep. 21, 1996, 195 35 031.6

Int. Cl.^{6} C07G *3/00;* **C07H** *1/06*

U.S. Cl. 536—18.5 **32 Claims**



1. A method for separating alkyl glycoside mixtures into fractions of different degrees of polymerization by extraction, with an almost critical or supercritical extraction agent, which is at a reduced temperature ranging from 0.9 to 1.2, and at pressures, wherein the density of the extraction agent is at least 180 kg/m^3.

5,837,832

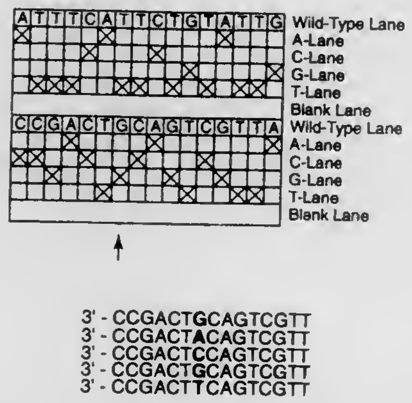
ARRAYS OF NUCLEIC ACID PROBES ON BIOLOGICAL CHIPS

Mark Chee, Palo Alto; Maureen T. Cronin, Los Altos; Stephen P. A. Fodor, Palo Alto; Xiaohua X. Huang; Earl A. Hubbell, both of Mt. View; Robert J. Lipshutz; Peter E. Lobban, both of Palo Alto; MacDonald S. Morris, San Jose, and Edward L. Sheldon, Menlo Park, all of Calif., assignors to Affymetrix, Inc., Santa Clara, Calif.

Continuation of Ser. No. 143,312, Oct. 26, 1993, abandoned, which is a continuation-in-part of Ser. No. 82,937, Jun. 25, 1993, abandoned. This application May 16, 1995, Ser. No. 441,887

Int. Cl.^{6} C12Q *1/68*

U.S. Cl. 536—22.1 **18 Claims**



1. An array of oligonucleotide probes immobilized on a solid support, said array having at least 100 probes and no more than 100,000 different oligonucleotide probes 9 to 20 nucleotides in length occupying separate known sites in said array, said oligonucleotide probes comprising at least four sets of probes: (1) a first set that is exactly complementary to a reference sequence and comprises probes that completely span the reference sequence and, relative to the reference sequence, overlap one another in sequence; and (2) three additional sets of probes, each of which is identical to said first set of probes but for at least one different nucleotide, which different nucleotide is located in the same position in each of the three additional sets but which is a different nucleotide in each set.

5,837,833

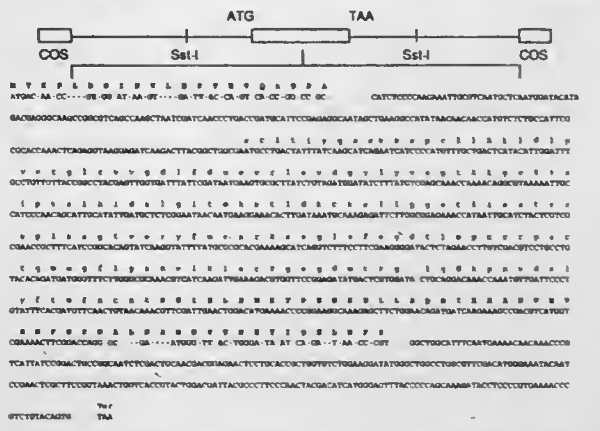
MATERIALS AND METHODS FOR DETECTION OF OXALATE

Ammon B. Peck, Gainesville, Fla., assignor to University of Florida Research Foundation, Inc., Gainesville, Fla.

Continuation-in-part of Ser. No. 262,424, Jun. 20, 1994. This application Jun. 20, 1995, Ser. No. 493,197

Int. Cl.^{6} C12Q *1/68;* **C12P** *19/34;* **C07H** *19/00;21/04*

U.S. Cl. 536—22.1 **5 Claims**



1. A method for detecting *Oxalobacter formigenes* in a sample, comprising the steps of:

(a) amplifying by PCR a DNA fragment of the *Oxalobacter formigenes* genome in said sample using a polynucleotide PCR primer, said PCR primer comprising a nucleotide sequence that is complementary with a polynucleotide sequence of a formyl-CoA transferase gene of *Oxalobacter formigenes,* said formyl-CoA transferase gene comprising a polynucleotide sequence selected from the group consisting of SEQ ID. NO. 1, SEQ ID NO. 2 and SEQ ID NO. 3, wherein said PCR primer is capable of specifically priming PCR amplification of said polynucleotide sequence of said formyl-CoA transferase gene;

(b) contacting said amplified DNA fragment with a polynucleotide probe under conditions sufficient for selective hybridizaiton of said polynucleotide probe with said amplified DNA fragment, wherein said polynucleotide probe comprises a nucleotide sequence that is complementary with a polynucleotide sequence of said amplified DNA fragment, said polynucleotide probe comprising a sufficient number of nucleotides to hybridize under high stringency conditions with said polynucleotide sequence of said amplified DNA fragment; and

(c) detecting said polynucleotide probe hybridized to said amplified DNA fragment.

5,837,834

HIGH AFFINITY HKGF NUCLEIC ACID LIGANDS AND INHIBITORS

Nikos Pagratis, and Larry Gold, both of Boulder, Colo., assignors to NeXstar Pharmaceuticals, Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 714,131, Jun. 10, 1991, Pat. No. 5,475,096, and a continuation-in-part of Ser. No. 931,473, Aug. 17, 1992, Pat. No. 5,270,163, and a continuation-in-part of Ser. No. 964,624, Oct. 21, 1992, Pat. No. 5,496,938, and a continuation-in-part of Ser. No. 117,991, Sep. 8, 1993, abandoned, said Ser. No. 714,131 is a continuation-in-part of Ser. No. 536,428, Jun. 11, 1990, abandoned. This application Jun. 5, 1995, Ser. No. 465,591

Int. Cl.^{6} C07H *21/02;21/04;* **C12P** *19/34;* **C12Q** *1/68*

U.S. Cl. 536—23.1 **13 Claims**

1. A nucleic acid ligand to Human Keratinocyte Growth Factor (hKGF) identified according to the method comprising:

a) preparing a candidate mixture of nucleic acids;

b) contacting the candidate mixture of nucleic acids with hKGF, wherein nucleic acids having an increased affinity to hKGF relative to the candidate mixture may be partitioned from the remainder of the candidate mixture;

c) partitioning the increased affinity nucleic acids from the remainder of the candidate mixture; and

d) amplifying the increased affinity nucleic acids to yield a mixture of nucleic acids enriched for nucleic acids with relatively higher affinity and specificity for binding to hKGF, whereby a nucleic acid ligand of hKGF may be identified.

5,837,835

OLIGONUCLEOTIDE N3'-P5' PHOSPHORAMIDATES: HYBRIDIZATION AND NUCLEASE RESISTANCE PROPERTIES

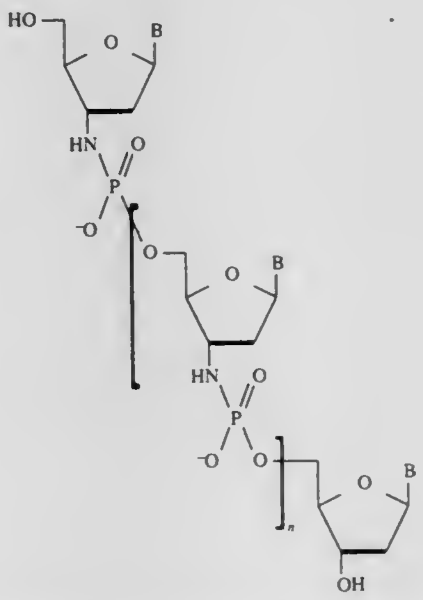
Sergei M. Gryaznov, San Mateo; Ronald G. Schultz, Fremont, and Jer-kang Chen, Palo Alto, all of Calif., assignors to Lynx Therapeutics, Inc., Hayward, Calif.

Division of Ser. No. 214,599, Mar. 18, 1994, Pat. No. 5,599,922. This application Jun. 6, 1995, Ser. No. 477,306

Int. Cl.^{6} C07H *21/04;* **C12Q** *1/68;* **A61K** *31/33*

U.S. Cl. 536—23.1 **7 Claims**

1. An oligodeoxyribonucleotide comprising a defined sequence of nucleoside subunits joined by inter-subunit linkages and defined by the formula:



wherein B is a purine or pyrimidine or an analog thereof and n is between 2 and 48.

5,837,836

BOVINE β-MANNOSIDASE NUCLEIC ACID SEQUENCE

Karen Friderici, Bath; Margaret Z. Jones, East Lansing, both of Mich.; Hong Chen, Chapel Hill, N.C., and Kevin T. Cavanagh, Okemos, Mich., assignors to Board Of Trustees Operating Michigan State University, East Lansing, Mich.

Division of Ser. No. 306,546, Sep. 15, 1994, Pat. No. 5,605,797. This application Sep. 19, 1995, Ser. No. 530,524

Int. Cl.^{6} C07H *21/02;21/04;* **C12Q** *1/68;* **C12P** *19/34*

U.S. Cl. 536—23.1 **7 Claims**

1. An isolated and purified nucleic acid molecule comprising a nucleotide sequence encoding the amino acid sequence shown in SEQ ID No. 2.

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5,837,837

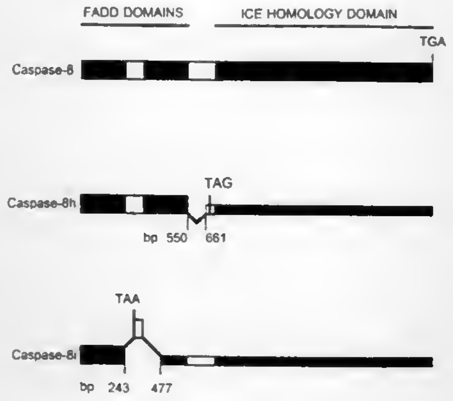
NUCLEIC ACIDS MOLECULES ENCODING CASPASE-8H AND CASPASE-8I

John J. Hunter, Cambridge; Andrew W. Shyjan, Nahant, and Grace H. W. Wong, Brookline, all of Mass., assignors to Millennium Pharmaceuticals, Inc., Cambridge, Mass.

Filed Feb. 27, 1997, Ser. No. 807,200

Int. Cl.^{6} C07H *21/02;* **A61K** *38/00;* **C07K** *1/00*

U.S. Cl. 536—23.1 **18 Claims**



1. An isolated nucleic acid molecule comprising a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:2.

5,837,838

BAX INHIBITOR PROTEINS

John C. Reed, Rancho Santa Fe, and Qunli Xu, La Jolla, both of Calif., assignors to The Burnham Institute, La Jolla, Calif.

Filed Mar. 14, 1997, Ser. No. 818,514

Int. Cl.^{6} C07H *21/04*

U.S. Cl. 536—23.1 **17 Claims**

1. A substantially purified nucleic acid molecule, comprising a nucleotide sequence encoding Bax inhibitor protein-1 having the amino acid sequence shown in SEQ ID NO: 3, or a nucleotide sequence complementary thereto.

4. A substantially purified nucleic acid molecule, comprising a nucleotide sequence encoding Bax inhibitor protein-2 having the amino acid sequence shown in SEQ ID NO: 6, or a nucleotide sequence complementary thereto.

5,837,839

DNA CODING SEQUENCES FOR MEVALONATE PYROPHOSPHATE DECARBOXYLASE

Matthew John Toth, Iselin, and Leslie Robin Huwyler, West Orange, both of N.J., assignors to Novartis Finance Corporation, New York, N.Y.

Filed Oct. 18, 1996, Ser. No. 733,825

Int. Cl.^{6} C12N *15/60;15/70;9/88;* **G01N** *33/53*

U.S. Cl. 536—23.2 **12 Claims**

1. An isolated DNA segment encoding a human mevalonate pyrophosphate decarbloxylase comprising a nucleotide sequence which, when expressed in a host cell, results in the production of an enzyme having human mevalonate pyrophosphate decarboxylase activity.

5,837,840

NF-AT POLYPEPTIDES AND POLYNUCLEOTIDES

Gerald R. Crabtree, Woodside, and Jeffrey P. Northrop, Campbell, both of Calif., assignors to Board of Trustees of Leland Stanford Jr. University, Stanford, Calif.

Filed Sep. 20, 1993, Ser. No. 124,981

Int. Cl.^{6} C07H *21/04*

U.S. Cl. 536—23.4 **9 Claims**

5. An isolated polynucleotide comprising a nucleotide sequence that encodes human NF-AT$_c$ (SEQ ID NO:2), wherein the human NF-AT$_c$ regulates the transcription of IL-2 in T lymphocytes.

5,837,841

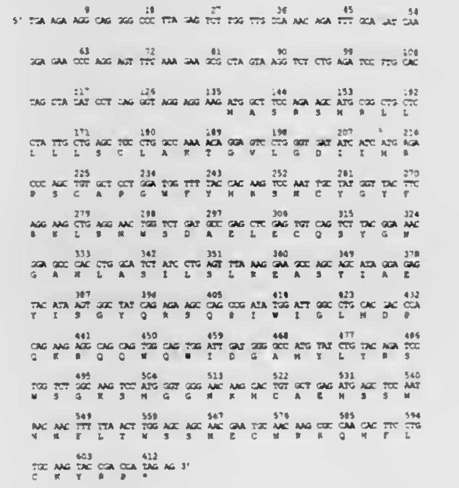
HUMAN REG PROTEIN

Olga Bandman, Mountain View, and Surya K. Goli, Sunnyvale, both of Calif., assignors to Incyte Pharmaceuticals, Inc., Palo Alto, Calif.

Filed Oct. 11, 1996, Ser. No. 729,103

Int. Cl.^{6} C07H *21/04;* **C12Q** *1/68;* **C12P** *21/06;* **C12N** *15/00*

U.S. Cl. 536—23.5 **11 Claims**



1. An isolated polynucleotide sequence of SEQ ID NO:2.

5,837,842

VASCULAR ANTICOAGULANT PROTEINS DNA WHICH CODES THEM, PROCESSER FOR PREPARING THEM AND THEIR USE

Rudolf Hauptmann, Ebreichsdorf; Ingrid Maurer-Fogy, Vienna; Gerhard Bodo, Vienna; Peter Swetly, Vienna; Christian Stratowa, Vienna; Edgar Falkner, Kritzendorf; Gunther Adolf, Vienna, all of Austria, and Christiaan Maria Peter Reutelingsperger, Maastricht, Netherlands, assignors to Boehringer Ingelheim International Gmbh, Ingelheim am Rhein, Germany

Division of Ser. No. 230,875, Apr. 20, 1994, abandoned, which is a continuation of Ser. No. 868,337, Apr. 7, 1992, abandoned, which is a division of Ser. No. 294,602, Jan. 30, 1989, abandoned. This application Jan. 23, 1995, Ser. No. 376,050

Claims priority, application Germany, Mar. 28, 1987, 37 10 364.4; Mar. 28, 1987, 37 10 309.1; Mar. 28, 1987, 37 10 430.6; Nov. 4, 1987, 37 37 367.6; WIPO, Mar. 26, 1988, PCT/EP88/00266

Int. Cl.^{6} C07H *21/04*

U.S. Cl. 536—23.5 **4 Claims**

1. An isolated DNA molecule which contains a nucleic acid sequence encoding a polypeptide having the amino acid sequence according to FIG. 7.

5,837,843

MODIFIED PROTEIN C

Mikhail D. Smirnov, and Charles T. Esmon, both of Oklahoma City, Okla., assignors to Oklahoma Medical Research Foundation, Oklahoma City, Okla.

Filed Nov. 8, 1996, Ser. No. 745,254

Int. Cl.^{6} C07H *21/04*

U.S. Cl. 536—23.5 **7 Claims**

1. A nucleic acid molecule encoding a protein C chimeric protein wherein the gamma carboxylglutamic acid region of the protein C has been replaced with the gamma carboxylglutamic acid region of prothrombin.

5,837,844

CAIP-LIKE GENE FAMILY

Yen-Ming Hsu, Lexington, Mass., assignor to Biogen, Inc., Cambridge, Mass.

Filed Jun. 7, 1995, Ser. No. 484,709

Int. Cl.^{6} C12N *15/12;15/11;5/10;* **C07K** *14/435*

U.S. Cl. 536—23.5 **27 Claims**

1. An isolated nucleic acid comprising a nucleotide sequence which encodes a CD2 associated intracellular protein (CAIP) polypeptide, said polypeptide having at least 95% homology with the polypeptide of SEQ ID NO:2, the polypeptide of SEQ ID NO:4, or the polypeptide of SEQ ID NO:6, wherein said polypeptide binds to the intracellular domain of CD2.

5,837,845

HUMAN MONOCLONAL ANTIBODY SPECIFICALLY BINDING TO SURFACE ANTIGEN OF CANCER CELL MEMBRANE

Saiko Hosokawa, Kawasaki; Toshiaki Tagawa, Yokohama; Yoko Hirakawa, Yokohama; Norihiko Ito, Yokohama, and Kazuhiro Nagaike, Sagamihara, all of Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Division of Ser. No. 360,125, Dec. 20, 1994, which is a continuation of Ser. No. 905,534, Jun. 29, 1992, abandoned. This application May 25, 1995, Ser. No. 450,578

Claims priority, application Japan, Jun. 28, 1991, 3-158859; Jun. 28, 1991, 3-158860; Jun. 28, 1991, 3-158861

Int. Cl.^{6} C07H *21/00;21/02;21/04*

U.S. Cl. 536—23.53 **2 Claims**

1. An isolated DNA encoding a human monoclonal antibody which specifically binds to a surface antigen of a stomach cancer cell MKN 45, said antibody belonging to IgG class, and said antibody having a variable region of the heavy chain which is the amino acid sequence shown in SEQ ID No. 5 and a variable region of the light chain which is the amino acid sequence shown in SEQ ID No. 6.

5,837,846

BIOSYNTHETIC BINDING PROTEINS FOR IMMUNO-TARGETING

James S. Huston, Chestnut Hill, Mass.; L. L. Houston, Oakland; David B. Ring, Redwood City, both of Calif., and Hermann Oppermann, Medway, Mass., assignors to Creative BioMolecules, Inc., Hopkinton, Mass., and Chiron Corporation, Emeryville, Calif.

Division of Ser. No. 133,804, Oct. 7, 1993, Pat. No. 5,534,254, which is a continuation-in-part of Ser. No. 831,967, Feb. 6, 1992, abandoned. This application Jun. 5, 1995, Ser. No. 461,386

Int. Cl.^{6} C07H *21/04;* **C12N** *5/10*

U.S. Cl. 536—23.53 **12 Claims**

1. An isolated nucleic acid sequence encoding a polypeptide chain that binds preferentially to a preselected antigen, the polypeptide chain comprising: an amino acid sequence defining,

(a) an sFv comprising two polypeptide domains connected by a polypeptide linker spanning the distance between the C-terminus of one domain and the N-terminus of the other, the amino acid sequence of each said domain comprising complementarity determining regions (CDRs) interposed between framework regions (FRs), the CDRs and FRs of said sFv together defining a binding site that binds preferentially to said preselected antigen, and

(b) a C-terminal tail peptide bonded to the C-terminus of the sFv and having an amino acid sequence selected from the group consisting of Ser-Cys, (Gly)$_4$-Cys, and (His)$_6$-(Gly)$_4$-Cys.

5,837,847

NON-TOXIC, NON-TOXIGENIC, NON-PATHOGENIC FUSARIUM EXPRESSION SYSTEM AND PROMOTERS AND TERMINATORS FOR USE THEREIN

John C. Royer, El Cerrito; Donna L. Moyer, Davis; Yoder T. Wendy, Winters, and Jeffrey R. Shuster, Davis, all of Calif., assignors to Novo Nordisk Biotech, Inc., Davis, Calif.

Continuation of Ser. No. 456,433, Jun. 1, 1995, abandoned, which is a division of Ser. No. 404,678, Mar. 15, 1995, abandoned, which is a continuation-in-part of Ser. No. 269,449, Jun. 30, 1994, abandoned. This application Aug. 29, 1997, Ser. No. 921,426

Int. Cl.^{6} C12N *15/11*

U.S. Cl. 536—24.1 **4 Claims**

1. A fungal promoter which is derived from a gene encoding a *Fusarium oxysporum* trypsin-like protease or a fragment thereof having the same promoter activity as the promoter sequence shown in SEQ ID NO:5, in which the general sequence encoding said protease is shown in SEQ ID NO:3.

5,837,848

ROOT-SPECIFIC PROMOTER

Susan Ely, Groton, N.Y.; Ian Jeffrey Evans, Reading, and Wolfgang Walter Schuch, Heathlake Park, both of England, assignors to Zeneca Limited, London, England

Continuation-in-part of Ser. No. 111,590, Aug. 25, 1993, abandoned, which is a continuation of Ser. No. 669,433, Mar. 15, 1991, abandoned. This application Aug. 10, 1994, Ser. No. 288,630

Claims priority, application United Kingdom, Mar. 16, 1990, 9006017

Int. Cl.^{6} C12N *15/29;15/64;15/82;15/33*

U.S. Cl. 536—24.1 **16 Claims**

1. An isolated DNA sequence which codes for a promoter of a root-expressed plant gene, said gene having the sequence of FIGS. 5A–F (SEQ ID NO:3).

5,837,849

OCS ELEMENT

Jeff G. Ellis, Macquarie; Daniel J. Llewellyn, O'Connor; W. James Peacock, Deakin; Elizabeth Dennis, Yarralumla, all of Australia, and David Bouchez, Versaille, France, assignors to Agrigenetics, L.P., San Diego, Calif., and Commonwealth Scientific and Industrial Research Organization, Australia

Division of Ser. No. 525,897, May 18, 1990, Pat. No. 5,573,932, which is a continuation-in-part of Ser. No. 11,614, Feb. 6, 1987, abandoned. This application Jun. 2, 1995, Ser. No. 459,178

Int. Cl.^{6} C12N *15/29;15/11;15/67;15/82*

U.S. Cl. 536—24.1 **7 Claims**

1. An isolated DNA fragment which is a plant enhancer capable of activating or enhancing the transcription level of a plant-expressible gene, said enhancer element comprising a consensus

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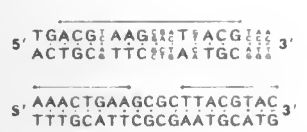


sequence selected from the group consisting of

5'-T-G-A-C-G-T-A-A-G-C-G-A-T-G-A-C-G-T-A-A-3'
C GAC T CCC

and its reverse sequence.

5,837,850
REGULATORY ELEMENT CONFERRING TAPETUM SPECIFICITY

Gary A. Huffman, Des Moines, Iowa, assignor to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Continuation-in-part of Ser. No. 230,929, Apr. 21, 1994, Pat. No. 5,470,359. This application Jun. 7, 1995, Ser. No. 477,978

Int. Cl.^{6} C12N *15/29;15/00;* A01H *5/00;1/00*

U.S. Cl. 536—24.1 **31 Claims**

1. An isolated DNA molecule that is a tapetum-specific regulatory element, wherein said tapetum-specific regulatory element is either (a) a fragment of a DNA molecule having the nucleotide sequence of SEQ ID NO:1, or (b) a DNA molecule having the nucleotide sequence selected from the group consisting of SEQ ID NO: 2, SEQ ID NO: 3, SEQ ID NO: 4 and SEQ ID NO: 5.

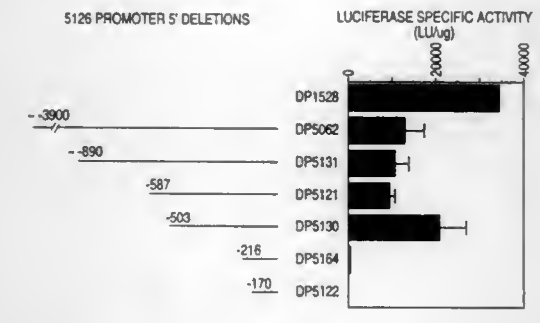
5,837,851
DNA PROMOTER 5126 AND CONSTRUCTS USEFUL IN A REVERSIBLE NUCLEAR GENETIC SYSTEM FOR MALE STERILITY IN TRANSGENIC PLANTS

Andrew M. Cigan, and Marc C. Albertsen, both of Des Moines, Iowa, assignors to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Continuation of Ser. No. 474,556, Jun. 7, 1995, Pat. No. 5,689,051, which is a continuation-in-part of Ser. No. 351,899, Dec. 8, 1994, Pat. No. 5,750,868. This application Jun. 7, 1995, Ser. No. 479,041

Int. Cl.^{6} C07H *21/04;* C12N *15/63*

U.S. Cl. 536—24.1 **10 Claims**



1. An isolated 5126 promoter, and variants, mutants, or derivatives thereof, operatively linked to a DNA sequence encoding a gene product.

5,837,852
CAPPED NUCLEIC ACID OLIGOMERS THAT INHIBIT CAP-DEPENDENT TRANSCRIPTION OF THE INFLUENZA VIRUS ENDONUCLEASE

Thomas D. Y. Chung, Lambertville, N.J.; Christopher W. Cianci, Morrisville, Pa.; Moira Hagen; Mark Krystal, both of Cranbury, N.J., and Richard J. Colonno, Buckingham, Pa., assignors to Bristol-Myers Squibb Company, Princeton, N.J.

Filed Oct. 14, 1993, Ser. No. 136,214

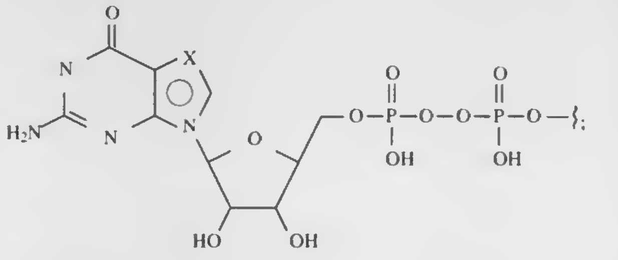
Int. Cl.^{6} C12N *5/00;15/00;* C07N *14/00;* A61K *48/00*

U.S. Cl. 536—24.5 **14 Claims**

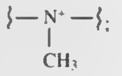
1. A compound of the formula

$$R—N^1—N^2—N^3—N^a—R^1$$

or pharmaceutically acceptable salts thereof, wherein:
R is



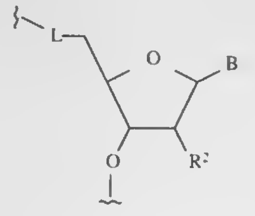
X is N or



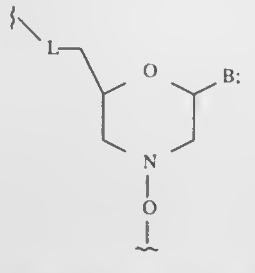
$$—N^{+}(CH_3)—;$$

N^a is $—N^4$, $—N^4—N^5$, $—N^4—N^5—N^6$, $—N^4—N^5—N^6—N^7$, or $—N^4—N^5—N^6—N^7—N^8$, $—N^4—N^5—N^6—N^7—N^8—N^9$, $—N^4—N^5—N^6—N^7—N^8—N^9—N^{10}$, or $—N^4—N^5—N^6—N^7—N^8—N^9—N^{10}—N^{11}$;

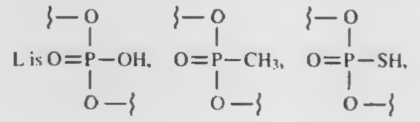
N^1, N^2, N^3, N^4, N^5, N^6, N^7, N^8, N^9, N^{10}, and N^{11} are each independently



or

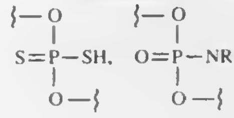


B is adenine, cytosine, guanine, thymine (provided R^2 is hydrogen), uracil (provided R^2 is hydroxy or methoxy), 6-methyladenine, 5-methylcytosine, or 2-methylguanine;



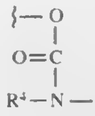
$$L \text{ is } —O—P(=O)(OH)—O—,\quad —O—P(=O)(CH_3)—O—,\quad —O—P(=O)(SH)—O—,$$

-continued



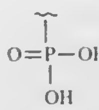
$$—O—P(=S)(SH)—O—,\quad —O—P(=O)(NR^3)—O—,$$

or



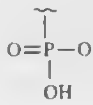
$$—O—C(=O)—N(R^4)—;$$

1R^1 is hydrogen or



$$—P(=O)(OH)OH$$

1provided that R^1 is



$$—P(=O)(OH)OH$$

1when N^a is $—N^4—N^5—N^6—N^7—N^8—N^9—N^{10}$ or $—N^4—N^5—N^6—N^7—N^8—N^9—N^{10}—N^{11}$;

1R^2 is hydrogen for each of N^1 to N^{11} or hydroxy or methoxy for each of N^1 to N^{11};

1R^3 is alkyl of 1 to 4 carbon atoms; and

1R^4 is hydrogen or methyl.

5,837,853
PREVENTIVE OR THERAPEUTIC AGENTS FOR ALZHEIMERS DISEASE A SCREENING METHOD OF ALZHEIMERS DISEASE AND TAU-PROTEIN KINASE I ORIGINATED FROM HUMAN BEING

Akihiko Takashima; Toshimitsu Hoshino, both of Machida; Kazutomo Imahori, Meguro-ku; Ken-ichi Saito, Asao-ku; Akiko Shiratsuchi, Sagamihara, and Showbu Sato, Machida, all of Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Continuation of Ser. No. 204,091, Mar. 2, 1994, abandoned. This application Feb. 20, 1996, Ser. No. 602,264

Claims priority, application Japan, Mar. 20, 1993, 5-041160; Mar. 22, 1993, 5-085143; Aug. 2, 1993, 5-191246

Int. Cl.^{6} C07H *21/02;21/04*

U.S. Cl. 536—24.5 **8 Claims**

1. An antisense oligonucleotide which inhibits expression of mRNA encoding tau-protein kinase 1, which oligonucleotide binds specifically to said mRNA in such a manner that it binds to at least one nucleotide of the portion of said mRNA which is complementary to SEQ. I.D. NO: 5 or 7.

5,837,854
OLIGONUCLEOTIDES WITH ANTI-EPSTEIN-BARR VIRUS ACTIVITY

Carel Mulder, Worcester, Mass., assignor to University of Massachusetts, Boston, Mass.

Filed Apr. 5, 1996, Ser. No. 628,422

Int. Cl.^{6} C07H *21/00;* A61K *31/70;* C12N *5/10*

U.S. Cl. 536—24.5 **21 Claims**

1. An antisense oligonucleotide complementary to a portion of the Epstein-Barr Virus (EBV) BZLF1 gene, the oligonucleotide comprising an 8 nucleotide core region consisting of nucleotides 1–8 of SEQ. ID. NO: 5, nucleotides 6–13 of SEQ. ID. NO: 7, nucleotides 7–14 of SEQ. ID. NO: 9, nucleotides 7–14 of SEQ. ID. NO: 11, nucleotides 7–14 of SEQ. ID. NO: 13, nucleotides 7–14 of SEQ. ID. NO: 14, nucleotides 7–14 of SEQ. ID. NO: 16, nucleotides 7–14 of SEQ. ID. NO: 17, or nucleotides 7–14 of SEQ. ID. NO: 18; or comprising a counterpart core region complementary to a portion of a BZLF1 gene from a different strain of Epstein-Barr Virus (EBV), wherein the oligonucleotide inhibits Epstein Barr Virus (EBV) gene expression.

5,837,855
HAIRPIN RIBOZYMES

Bharat Chowrira, and James McSwiggen, both of Boulder, Colo., assignors to Ribozyme Pharmaceutical, Inc., Boulder, Colo.

Continuation of Ser. No. 321,993, Oct. 11, 1994, Pat. No. 5,631,359. This application Dec. 23, 1996, Ser. No. 773,297

Int. Cl.^{6} C07H *21/04;* C12N *5/06;15/63*

U.S. Cl. 536—24.5 **27 Claims**

1. A hairpin ribozyme comprising ribonucleotides which cleaves a separate RNA molecule, wherein said hairpin ribozyme comprises:

1a helix 1 region comprising greater than or equal to three nucleotides inclusive, wherein said helix 1 region base-pairs with said separate RNA molecule;

1a helix 2 region comprising between six and eight nucleotides inclusive, wherein said helix 2 region base-pairs with said separate RNA molecule;

1a helix 3 region comprising nucleotides which form at least four base-pairs; and

1a helix 4 region comprising nucleotides which form at least two base-pairs.

5,837,856
CHIRALLY ENRICHED SYNTHETIC PHOSPHONATE OLIGOMERS

Lyle J. Arnold, Jr., Poway; Mark A. Reynolds, San Diego; Timothy A. Riley, Nipomo, and David A. Schwartz, Encinitas, all of Calif., assignors to Genta, Incorporated, San Diego, Calif.

Continuation of Ser. No. 154,013, Nov. 16, 1993, abandoned. This application Mar. 6, 1997, Ser. No. 814,053

Int. Cl.^{6} C07H *21/04*

U.S. Cl. 536—24.5 **22 Claims**

1. A method of making a Oligomer having phosphonate internucleosidyl linkages which hybridizes to an RNA target sequence said method comprising the steps of

1(a) identifying a single stranded RNA target sequence; and

1(b) synthesizing a synthetic Oligomer enriched for phosphonate internucleosidyl linkages wherein at most three out of every four adjacent linkages can have a preselected chirality and wherein the Oligomer is substantially complementary to said identified RNA target sequence.

5,837,857
MAMMALIAN TELOMERASE

Bryant Villeponteau; Junli Feng, both of San Carlos; Walter Funk, Union City, and William H. Andrews, Richmond, all of Calif., assignors to Geron Corporation, Menlo Park, Calif.

Continuation of Ser. No. 330,123, Oct. 27, 1994, Pat. No. 5,583,016, which is a continuation-in-part of Ser. No. 272,102, Jul. 7, 1994, abandoned. This application Jun. 5, 1996, Ser. No. 660,678

Int. Cl.^{6} C07H *21/04*

U.S. Cl. 536—24.31 **48 Claims**

1. An oligonucleotide in substantially pure form that is 10 to 500 nucleotides in length and that comprises 10 to 500 nucleotides in a sequence identical or exactly complementary to a contiguous sequence of human telomerase RNA component, the oligonucleotide characterized by the ability to specifically hybridize in a cell or tissue sample or extract only to human telomerase RNA component or its complement, wherein the oligonucleotide does not hybridize to telomeric DNA.

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5,837,858

METHOD FOR POLYMER SYNTHESIS USING ARRAYS

Thomas M. Brennan, San Francisco, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Division of Ser. No. 142,593, Oct. 22, 1993, Pat. No. 5,472,672. This application May 30, 1995, Ser. No. 452,967

Int. Cl.^{6} C07H *1/00;1/02*

U.S. Cl. 536—25.3 **5 Claims**

1. A method of synthesis of a polymer chain in a synthesis apparatus by sequentially adding polymer units thereto, said synthesis apparatus including a head assembly having a plurality of nozzles mounted thereto in generally spaced-apart relation, each nozzle being coupled to a reservoir of liquid reagent for controlled delivery therethrough, a base assembly having at least one reaction well, and a sliding seal positioned between said head assembly and said base assembly to permit relative movement therebetween, and enclosing both said reaction well and said nozzles therein to form a common chamber, said method comprising the steps of:

1A) aligning said reaction well and a selected one nozzle through a transport mechanism coupled to at least one of said head assembly and said base assembly to produce relative movement therebetween;

1B) depositing a liquid reagent into said well from said reagent reservoir through said one nozzle to enable synthesis of a polymer chain;

1C) sweeping toxic fumes, emitted by said reagents, from said common chamber through passage of a gas from a pressurized gas source, coupled to an inlet into said common chamber and positioned upstream from said nozzles, and out of said chamber through an outlet out from said common chamber and positioned downstream from said nozzles.

5,837,859

PREPARATION OF A ELECTRONICALLY CONDUCTIVE POLYMER/NUCLEOTIDE COPOLYMER

Robert Teoule, Grenoble; André Roget, Saint Egreve; Thierry Livache, Grenoble; Christelle Barthet, Grenoble, and Gérard Bidan, Grenoble, all of France, assignors to Cis Bio International, Saclay, France

PCT No. PCT/FR94/00354, § 371 Date Sep. 22, 1995, § 102(e) Date Sep. 22, 1995, PCT Pub. No. WO94/22889, PCT Pub. Date Oct. 13, 1994

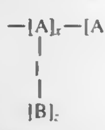
PCT Filed Mar. 30, 1994, Ser. No. 525,506

Claims priority, application France, Mar. 31, 1993, 93 03732

Int. Cl.^{6} C07H *1/02;* **H05F** *3/00*

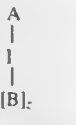
U.S. Cl. 536—25.3 **9 Claims**

1. A process for preparing an electrically conductive copolymer represented by general formula (1):



$$\begin{array}{l} -[A]_x-[A]_y- \\ \quad | \\ \quad l \\ \quad | \\ \quad [B]_z \end{array} \qquad (I)$$

1comprising copolymerizing a monomer represented by formula (IV):



$$\begin{array}{l} A \\ | \\ l \\ | \\ [B]_z \end{array} \qquad (IV)$$

1with a polymerizable monomer represented by the formula A, wherein

1said monomer A produces an electrically conductive polymer when polymerized, and represents a polymerized unit of said monomer A in the electrically conductive copolymer,

1represents either (1) a nucleotide unit or an analog thereof, or (2) an oligonucleotide unit or an analog thereof,

1x, y and z each, independently, represents an integer equal to or greater than 1, and l represents a covalent bond or a spacer arm.

5,837,860

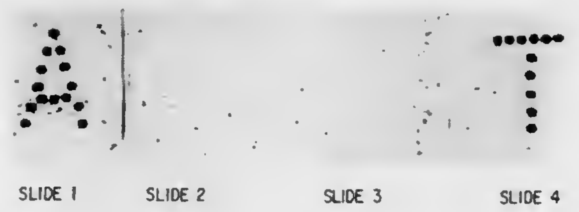
COVALENT ATTACHMENT OF NUCLEIC ACID MOLECULES ONTO SOLID-PHASES VIA DISULFIDE BONDS

Stephen Anderson, Princeton, N.J., and Yu-Hui Rogers, Damascus, Md., assignors to Molecular Tool, Inc., Baltimore, Md.

Filed Mar. 5, 1997, Ser. No. 812,010

Int. Cl.^{6} C07H *21/04;21/00*

U.S. Cl. 536—25.3 **27 Claims**



1. A method for the covalent attachment of nucleic acid molecules to a solid-phase, which comprises the steps of:

1A) coating a solid-phase surface with a mercaptosilane wherein said mercaptosilane comprises sulfhydryl groups; and

1B) coupling a sulfhydryl or disulfide modified nucleic acid molecule to the sulfhydryl groups of said mercaptosilane by means of a covalent disulfide bond.

5,837,861

DINUCLEOTDIDES AND THEIR USE AS MODULATORS OF MUCOCILIARY CLEARANCE AND CILIARY BEAT FREQUENCY

William Pendergast, Durham; Benjamin R. Yerxa, Raleigh; Janet L. Rideout, Raleigh, and Suhaib M. Siddiqi, Raleigh, all of N.C., assignors to Inspire Pharmaceuticals, Inc., Durham, N.C.

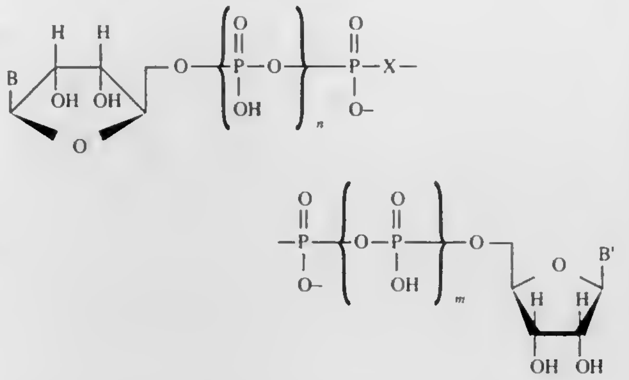
Filed Feb. 10, 1997, Ser. No. 798,508

Int. Cl.^{6} C07H *21/00;21/02*

U.S. Cl. 536—25.6 **9 Claims**

1. A compound of general Formula I:

Formula I



1or the pharmaceutically acceptable non-toxic salts thereof wherein:

1X is oxygen methylene, difluoromethylene or imido;

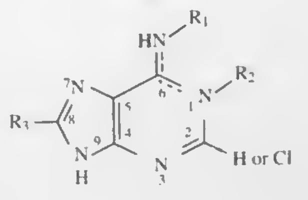
1n=0 or 1 or 2;

1m=0 or 1 or 2;

1the total number of phosphate groups is between 2 and 6; and

1B and B' are each independently a purine residue, as in Formula II, or a pyrimidine residue, as in Formula III, linked through the 9- or 1- position respectively:

Formula II



1wherein:

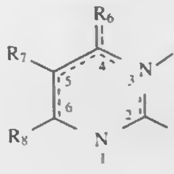
1R_2 is O or is absent; or

1R_1 and R_2 taken together may form optionally substituted 5-membered raised imidazole ring, or

1R_1 of the 6-HNR$_1$ group or R_3 of the 8-HNR$_3$ group is chosen from the group consisting of:

- 1(a) arylalkyl (C_{1-6}) groups with the aryl moiety optionally substituted,
- 1(b) alkyl,
- 1(c) ([6-aminohexyl]carbamoylmethyl),
- 1(d) ω-amino alkyl (C_{2-10}),
- 1(e) ω-hydroxy alkyl (C_{2-10}),
- 1(f) ω-thiol alkyl (C_{2-10}),
- 1(g) ω-carboxy alkyl (C_{2-10}),
- 1(h) the ω-acylated derivatives of (b), (c) or (d) wherein the acyl group is either acetyl, trifluroroacetyl, benzoyl, or substituted-benzoyl alkyl (C_{2-10}), and
- 1(i) ω-carboxy alkyl (C_{2-10}) as in (e) above wherein the carboxylic moiety is an ester or an amide;

Formula III



1wherein:

1R_4 is hydroxy, mercapto, amino, cyano, aralkoxy, C_{1-6} alkylthio, C_{1-6} alkoxy, C_{1-6} alkylamino or dialkylamino, wherein the alkyl groups of said dialkylamino are optionally linked to form a heterocycle;

1R_5 is hydrogen, acyl, C_{1-6} alkyl, aroyl C_{1-5} alkanoyl, benzoyl, or sulphonate,

1R_6 is hydroxy, mercapto, alkoxy, aralkoxy, C_{1-6}-alkylthio, C_{1-5} disubstituted amino, triazolyl, alkylamino or diamino, wherein the alkyl groups of said dialkylamino are optionally linked to form a heterocycle or linked to N^3 to form am optionally substituted ring;

1R_5–R_6 together forms a 5 or 6-membered saturated or unsaturated ring bonded through N or O at R_6, wherein said ring is optionally substituted;

1R_7 is selected from the group consisting of:

- 1(a) hydrogen,
- 1(b) hydroxy,
- 1(c) cyano,
- 1(d) nitro,
- 1(e) alkenyl, wherein the alkenyl moiety is optionally linked through oxygen to form a ring optionally substituted with alkyl or aryl groups on the carbon adjacent to the oxygen,
- 1(f) substituted alkynyl
- (g) hydrogen
- 1(h) halogen,
- 1(i) alkyl,
- 1(j) substituted alkyl,
- 1(k) perhalomethyl,
- 1(l) C_{2-6} alkyl,
- 1(m) C_{2-3} alkenyl,
- 1(n) substituted ethenyl,
- 1(o) C_{2-3} alkynyl and
- 1(p) substituted alkynyl when R_6 is other than amino or substituted amino;

1R_8 is selected from the group consisting of:

- 1(a) hydrogen,
- 1(b) alkoxy,
- 1(c) arylalkoxy,
- 1(d) alkylthio,
- 1(e) arylalkylthio,
- 1(f) carboxamidomethyl,
- 1(g) carboxymethyl,
- 1(h) methoxy,
- 1(i) methylthio,
- 1(j) phenoxy and
- 1(k) phenylthio.

5,837,862

SIALYL LEWIS X MIMETICS INCORPORATING MANNOPEPTIDES

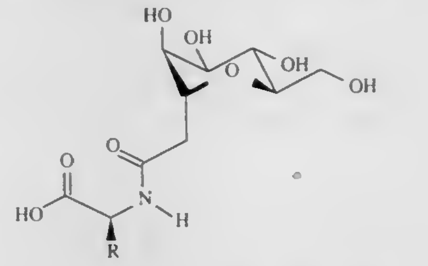
Chi-Huey Wong, Rancho Santa Fe, Calif.; Thomas G. Marron, Grayslake, Ill.; Thomas J. Woltering, Weil am Rhein, and Gabriele Weitz-Schmidt, Bad Krozingen, both of Germany, assignors to The Scripps Research Institute, La Jolla, Calif.

Filed Dec. 12, 1996, Ser. No. 764,315

Int. Cl.^{6} C07H *7/02;7/06;* **A61K** *31/70*

U.S. Cl. 536—53 **4 Claims**

1. A compound represented by the following formula:



1wherein R is a side chain of an amino acid selected from the group consisting of Ala, Val, Leu, Ile, Pro, Phe, Trp, Met, Gly, Ser, Thr, Cys, Tyr, Asn, Gln, Asp, Glu, Lys, Arg and His.

5,837,863

Patent Not Issued For This Number

5,837,864

METHOD FOR PRODUCING A SUSPENSION IN WATER OF A CELLULOSE ETHER, AND DRY MIXTURE SUITABLE FOR USE IN THE PRODUCTION OF THE SUSPENSION

Lars Andersson, Stenungsund, and Peter Boström, Kungälv, both of Sweden, assignors to Akzo Nobel NV, Arnhem, Netherlands

PCT No. PCT/SE95/01362, § 371 Date Jun. 10, 1997, § 102(e) Date Jun. 10, 1997, PCT Pub. No. WO96/18676, PCT Pub. Date Jun. 20, 1996

PCT Filed Nov. 16, 1995, Ser. No. 860,242

Claims priority, application Sweden, Dec. 15, 1994, 9404373

Int. Cl.^{6} C08B *11/00;11/08;11/193;1/00*

U.S. Cl. 536—124 **14 Claims**

1. A method for producing an aqueous suspension of a water-soluble nonionic cellulose ether having no turbidity point in water, wherein said method comprises preparing a dry mixture which contains the nonionic cellulose ether cross-linked with glyoxal and an electrolyte salt consisting of a salt or a mixture of salts which, in water and at the concentration used in the suspension, results in a pH value below 8.0; and mixing the water forming part of the suspension with the dry mixture in such an amount that the cellulose ether comprises 8–25% by weight of the suspension and the electrolyte salt comprises 20–45% by weight of the suspension.

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5,837,865

PHOSPHORESCENT DENDRITIC MACROMOLECULAR COMPOUNDS FOR IMAGING TISSUE OXYGEN

Sergei A. Vinogradov, and David F. Wilson, both of Philadelphia, Pa., assignors to Trustees of the University of Pennsylvania, Philadelphia, Pa.

Continuation-in-part of Ser. No. 137,624, Oct. 15, 1993. This application Dec. 16, 1996, Ser. No. 767,158

Int. Cl.^{6} A61B *5/00;* **C07D** *478/22*

U.S. Cl. 540—145 **18 Claims**

1. A phosphorescent probe effective for oxygen measurement in human or animal tissue comprising a porphyrin chromophore capable of releasing absorbed energy as phosphorescent light and a dendrimer, wherein said porphyrin chromophore comprises the core of the dendrimer.

5,837,866

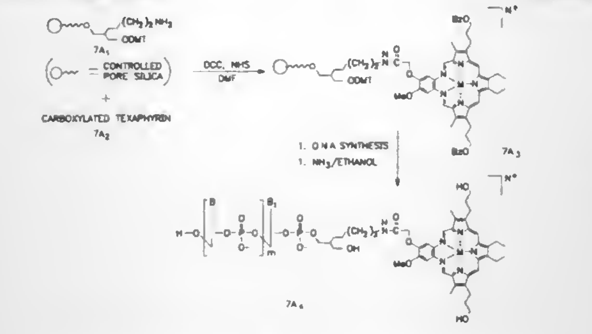
PHOSPHORAMIDITE DERIVATIVES OF MACROCYCLES

Darren Magda, Cupertino, Calif.; Jonathan L. Sessler, Austin, Tex., and Shaun P. Crofts, Campbell, Calif., assignors to Board of Regents, The University of Texas, Austin, Tex., and Pharmacyclics, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 614,638, Mar. 13, 1996, Pat. No. 5,633,354, which is a continuation of Ser. No. 487,722, Jun. 7, 1995, Pat. No. 5,565,552, which is a continuation-in-part of Ser. No. 310,501, Sep. 21, 1994, Pat. No. 5,567,587. This application May 23, 1997, Ser. No. 862,778

Int. Cl.^{6} C07D *187/22;* **C07F** *7/00;9/6524*

U.S. Cl. 540—145 **12 Claims**



1. A phosphoramidite derivative of an expanded porphyrin.

5,837,867

FUEL COMPOSITIONS

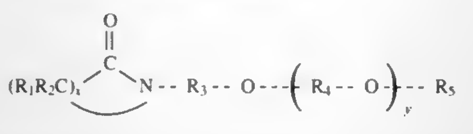
Jiang-Jen Lin; Charles Lee Edwards; Pen-Chung Wang, and Garo Garbis Vaporciyan, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 303,116, Sep. 8, 1994, abandoned, which is a continuation of Ser. No. 40,245, Mar. 30, 1993, Pat. No. 5,352,251. This application Aug. 6, 1996, Ser. No. 692,561

Int. Cl.^{6} C07D *205/08;207/12;211/32*

U.S. Cl. 540—200 **7 Claims**

1. A compound having the formula:



$$(R_1R_2C)_x\overset{\overset{O}{\|}}{C}N\text{-}\text{-}R_3\text{-}\text{-}O\text{-}\text{-}\text{-}(R_4\text{-}\text{-}O)_y\text{-}\text{-}R_5$$

1wherein x is from 2 to 4; y is from 1 to 50; R_1 and R_2 are independently hydrogen or hydrocarbyl of 1 to 100 carbon atoms; R_3 is hydrocarbyl of 1 to 100 carbon atoms; R_4 is hydrocarbyl of 2 to 100 carbon atoms with the proviso that when y is greater than 1, each R_4 may be the same or different but at least R_3 or one R_4 must be hydrocarbyl of at least four carbon atoms; and R_5 is hydrogen, hydrocarbyl of 1 to 100 carbon atoms or acyl of 1 to 20 carbon atoms.

5,837,868

PROCESS FOR PREPARATION OF CHIRAL 3-AMINO-PYRROLIDINE AND ANALOGOUS BICYCLIC COMPOUNDS

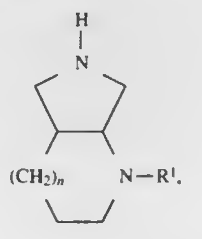
Qun Li, Libertyville; Wei-Bo Wang, Grayslake, both of Ill.; Daniel T. Chu, Santa Clara, Calif., and Lisa Anne Hasvold, Grayslake, Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Division of Ser. No. 754,641, Nov. 21, 1996, Pat. No. 5,703,244. This application Nov. 19, 1997, Ser. No. 974,206

Int. Cl.^{6} C07D *471/02;487/02*

U.S. Cl. 540—580 **9 Claims**

1. A process for the preparation of chiral compounds having the formula:



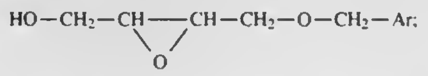
wherein n is 0, 1 or 2, and R^1 is hydrogen, C_1–C_6-alkyl or an amino-protecting group;

1(a) protecting a single hydroxyl group of selected positional isomer of 2-butene-1,4-diol, by stepwise treatment with a base, an arylmethyl halide, and a tetraalkylammonium halide, and isolating a monoprotected hydroxy-olefin having the formula:

$$HO—CH_2—CH{=}CH—CH_2—O—CH_2—Ar,$$

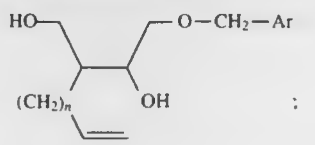
wherein Ar represents the aryl moiety;

1(b) chirally oxidizing the monoprotected hydroxy-olefin with titanium isopropoxide, an optically active chiral tartrate ester and t-butyl hydroperoxide, and isolating an epoxy compound having the formula:

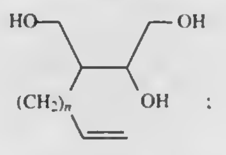


$$HO-CH_2-\underset{\diagdown\,O\,\diagup}{CH\text{——}CH}-CH_2-O-CH_2-Ar;$$

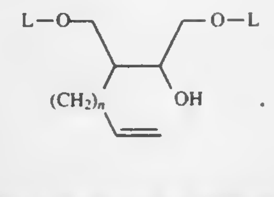
(c) reacting the epoxy compound with an R^2—Mg—X compound, wherein R^2 is vinyl, allyl or 3-butenyl, and X is bromine, chlorine or iodine, under Grignard Reaction conditions, and isolating the chiral third intermediate compound having the formula:



(d) removing the protecting group from the chiral third intermediate compound, and isolating the chiral fourth intermediate compound having the formula:

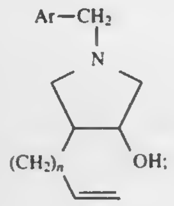


(e) sulfonylating the chiral fourth intermediate compound by treatment with a substituted sulfonyl chloride, and isolating the chiral diprotected triol compound having the formula:

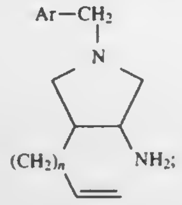


wherein L represents the substituted sulfonyl moiety;

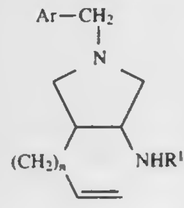
(f) cyclizing the chiral diprotected triol compound by treatment with an arylmethylamine compound, and isolating the chiral pyrrolidine intermediate having the formula:



(g) replacing the hydroxyl group of the chiral pyrrolidine intermediate with an amino group by an amination reaction that inverts the chiral center, and isolating the chiral aminopyrrolidine compound having the formula:

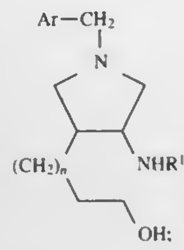


(h) derivatizing the amino group of the chiral aminopyrrolidine compound, and isolating the chiral substituted-aminopyrrolidine compound having the formula:

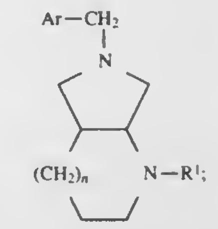


wherein R^1 is as defined above;

(i) oxidizing the chiral substituted-aminopyrrolidine compound with a hydroboration reagent, and isolating the chiral hydroxyalkyl compound having the formula:



(j) reacting the chiral hydroxyalkyl compound with triphenylphosphine and diethylazobicarboxylate under Mitsunobu Reaction conditions in an aprotic solvent to obtain the compound having the formula:



(k) deprotecting the ring nitrogen of the chiral bicyclic compound, and isolating the desired product.

5,837,869

ASYMMETRIC DIOXAZINE COMPOUNDS, INTERMEDIATE COMPOUNDS THEREFOR AND APPLICATION OF THE ASYMMETRIC DIOXAZINE COMPOUNDS

Masato Inoue; Junya Hada, both of Toyonaka, and Toshiyuki Araki, Hirakata, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

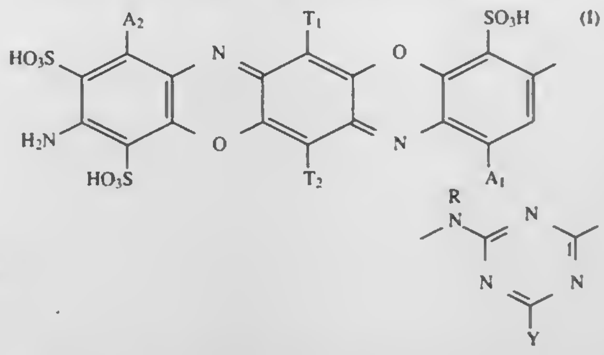
Filed Jan. 23, 1997, Ser. No. 788,816

Claims priority, application Japan, Jan. 24, 1996, 8-010425

Int. Cl.^{6} C09B *19/00;* **C07D** *265/38*

U.S. Cl. 544—113 **7 Claims**

1. An asymmetric dioxazine compound represented, when shown in free acid form, by the general formula (I):



(I)

wherein T_1 and T_2 are the same or different and represent each a hydrogen atom, a chlorine atom, a bromine atom, a C_1–C_4 alkyl group, a C_1–C_4 alkoxy group or a phenoxy group, A_1 represents a C_1–C_4 alkyl group, a C_1–C_4 alkoxy group, a chlorine atom, a bromine atom or a carboxyl group, A_2 represents a hydrogen atom, a C_1–C_4 alkyl group, a C_1–C_4 alkoxy group, a chlorine atom, a bromine atom or a carboxyl group, R represents a hydrogen atom or a lower alkyl group which may be substituted, X represents a halogen atom, a lower alkoxy group which may be substituted, an amino group which may be substituted or a group represented by the formula (II):

$$—N(R_1)—W_1—Z_1 \qquad (II)$$

wherein R_1 represents a hydrogen atom or a lower alkyl group which may be substituted, W_1 represents an alkylene group which may be substituted, a phenylene group which may be substituted or a naphthylene group which may be substituted and Z_1 represents a group of the formula:

$$—SO_2—CH{=}CH_2 \text{ or } —SO_2CH_2CH_2Z'$$

wherein Z' represents a group removable by the action of an alkali, Y represents a halogen atom, a lower alkoxy group which may be substituted, an amino group which may be substituted or a group represented by the formula (III):

$$—N(R_2)—W_2—Z_2 \qquad (III)$$

wherein R_2 represents a hydrogen atom or a lower alkyl group which may be substituted, W_2 represents an alkylene group which

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may be substituted, a phenylene group which may be substituted or a naphthylene group which may be substituted and Z_2 represents a group of the formula:

$$-SO_2-CH=CH_2 \text{ or } -SO_2CH_2CH_2Z''$$

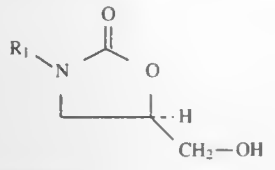
wherein Z" represents a group removable by the action of an alkali, with the proviso that at least one of X and Y is a halogen atom, a group represented by the formula (II) or a group represented by the formula (III).

5,837,870
PROCESS TO PREPARE OXAZOLIDINONES

Bruce A. Pearlman; William R. Perrault; Michael R. Barbachyn, all of Kalamazoo; Peter R. Manninen, Portage; Dana S. Toops, Kalamazoo; David J. Houser, Portage, and Thomas J. Fleck, Scotts, all of Mich., assignors to Pharmacia & Upjohn Company, Kalamazoo, Mich.

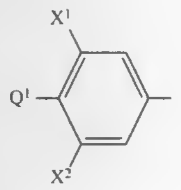
Filed Mar. 28, 1997, Ser. No. 828,923
Int. Cl.⁶ C07D *413/04;249/16*
U.S. Cl. 544—137 **37 Claims**

1. A process to prepare 5-hydroxymethyl substituted oxazolidinones of formula (III)

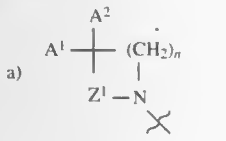


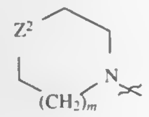
(III)

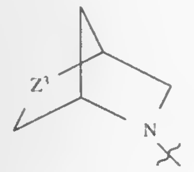
where R_1 is

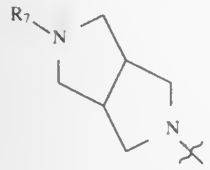


where X^1 is —H or —F;
where X^2 is —H or —F;
where Q^1 is:

a)


b)


c)


d)


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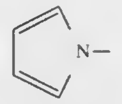
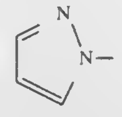
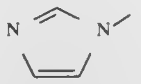
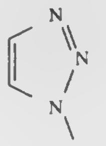
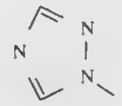
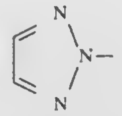
f)


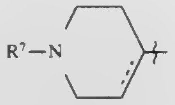
g)


h)


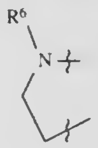
i)


j)


k)


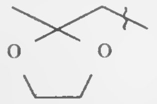
m)


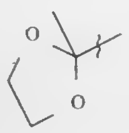
Q^1 and X^2 taken together are:



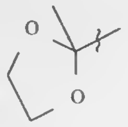
where Z^1 is:
a) $—CH_2—$,
b) $—CH(R^4)—CH_2—$,
c) —C(O)—, or
d) $—CH_2CH_2CH_2—$;
where Z^2 is:
a) $—O_2S—$,
b) —O—,
c) $—N(R^7)—$,
d) —OS—, or
e) —S—;
where Z^3 is:
a) $—O_2S—$,
b) —O—,
c) —OS—, or
d) —S—;
where A^1 is:
a) H— or
b) CH_3;
where A^2 is:
a) H—,
b) HO—,
c) $CH_3—$,
d) $CH_3O—$,
e) $R^2O—CH_2—C(O)—NH—$
f) $R^3O—C(O)—NH—$,
g) $(C_1–C_2)$alkyl-O—C(O)—,
h) $HO—CH_2—$,
i) $CH_3O—NH—$,

j) $(C_1–C_3)$alkyl-O_2C—
k) $CH_3—C(O)—$,
l) $CH_3—C(O)—CH_2—$,

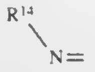
m)


n)


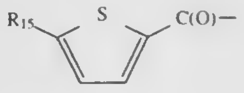
A^1 and A^2 taken together are:

a)


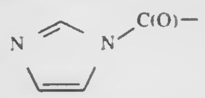
b) O=

c)


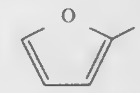
where R^1 is:
a) —CHO,
b) $—COCH_3$,
c) $—COCHCl_2$,
d) $—COCHF_2$,
e) $—CO_2CH_3$,
f) $—SO_2CH_3$, or
g) $—COCH_2OH$;
where R^2 is:
a) H—,
b) $CH_3—$,
c) phenyl-CH_2—, or
d) $CH_3C(O)—$;
where R^3 is:
a) $(C_1–C_3)$alkyl-, or
b) phenyl-;
where R^4 is:
a) H—, or
b) HO—;
where R^5 is:
a) H—,
b) $(C_1–C_3)$alkyl-,
c) $CH_2=CH—CH_2—$ or
d) $CH_3—O—(CH_2)_2—$;
where R^6 is:
a) $CH_3—C(O)—$,
b) H—C(O)—,
c) $Cl_2CH—C(O)—$,
d) $HOCH_2—C(O)—$,
e) $CH_3SO_2—$,

f)


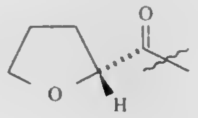
g) $F_2CHC(O)—$,

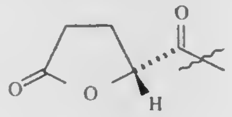
h)


i) $H_3C—C(O)—O—CH_2—C(O)—$,
j) $H—C(O)—O—CH_2—C(O)—$,

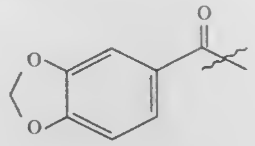
k)


l) $HC\equiv CH—CH_2O—CH_2—C(O)—$ or
m) phenyl-$CH_2—O—CH_2—C(O)—$;
where R^7 is:
a) $R^2O—C(R^{10})(R^{11})—C(O)—$,
b) $R^3O—C(O)—$,
c) $R^8—C(O)—$

d)


e)


f) $H_3C—C(O)—(CH_2)_2—C(O)—$,
g) $R^9—SO_2—$,

h)


i) $HO—CH_2—C(O)—$,
j) $R^{16}—(CH_2)_2—$,
k) $R^{13}—C(O)—O—CH_2—C(O)—$,
l) $(CH_3)_2N—CH_2—C(O)—NH—$,
m) $NC—CH_2—$ or
n) $F_2—CH—CH_2—$;
where R^8 is:
a) H—,
b) $(C_1–C_4)$alkyl,
c) aryl $—(CH_2)_p$,
d) $ClH_2C—$,
e) $Cl_2HC—$,
f) $FH_2C—$,
g) $F_2HC—$ or
h) $(C_3–C_6)$cycloalkyl;
where R^9 is:
a) $—CH_3$,
b) $—CH_2Cl$,
c) $—CH_2CH=CH_2$,
d) aryl or
e) $—CH_2CN$;
where R^{10} is H— or $CH_3—$;
where R^{11} is H— or $CH_3—$;
where R^{12} is:
a) H—,
b) $CH_3O—CH_2O—CH_2—$ or
c) $HOCH_2—$;
where R^{13} is:
a) $CH_3—$,
b) $HOCH_2—$,
c) $(CH_3)_2N$-phenyl, or
d) $(CH_3)_2N—CH_2—$;
where R^{14} is:
a) HO—,
b) $CH_3O—$,
c) $H_2N—$,
d) $CH_3O—C(O)—O—$,
e) $CH_3—C(O)—O—CH_2—C(O)—O—$,
f) phenyl-$CH_2—O—CH_2—C(O)—O—$,
g) $HO—(CH_2)_2—O—$,
h) $CH_3O—CH_2—O—(CH_2)_2—O—$, or

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i) $CH_3O—CH_2—O—$;
where R^{15} is:
a) H— or
b) Cl—;
where R^{16} is:
a) HO—
b) $CH_3O—$, or
c) F;
where m is 0 or 1;
where n is 1 thru 3;
where p is 0 or 1;
where aryl is phenyl substituted with zero (0) or one (1) of the following:
a) —F,
b) —Cl,
c) $—OCH_3$,
d) —OH,
e) $—NH_2$,
f) $—(C_1–C_4)$alkyl,
g) $—O—C(O)—OCH_3$, or
h) $—NO_2$ and protected forms thereof,

which comprises contacting a hydroxy compound selected from the group consisting of:

(a) (S)-, (R)-dihydroxy compound of formula (I)

$$M_1—CH_2—CH(OH)—CH_2—OH \qquad \text{(I)}$$

or any mixture thereof where M_1 is —Cl, —Br or $—O—SO_2$-ϕ-CH_3, or

(b) (S)-, (R)- glycidol (IV)

$$C^*H_2—C^*H—CH_2—OH \qquad \text{(IV)}$$

or any mixture thereof where the carbon atoms designated by an * are each bonded to the same oxygen atom (—O—) to form a three member ring, with a carbamate of formula (IIA)

$$R_1—NH—CO—O—M_2 \qquad \text{(IIA)}$$

or a trifluoroacetamide of formula (IIB)

$$R_1—NH—CO—CF_3 \qquad \text{(IIB)}$$

in the presence of a lithium cation and a base whose conjugate acid has a pK_a of greater than about 8 where $—O—M_2$ is a base whose acid has a pk_a of between about 8 and about 24, and where R_1 is as defined above.

5,837,871
NUCLEOSIDE ANALOGS

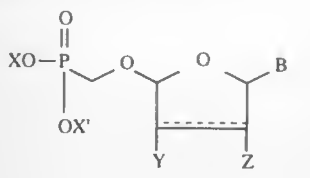
Choung Un Kim, Madison, Conn.; John C. Martin, San Carlos, Calif.; Bing Uh Luh, Killingworth, and Peter F. Misco, Durham, both of Conn., assignors to Institute of Organic Chemistry and Biochemistry of the Academy of Sciences of the Czech Republic, Czech Rep., and Rega Stichting, v.z.w., Belgium

Division of Ser. No. 391,312, Feb. 17, 1995, which is a continuation of Ser. No. 765,774, Sep. 26, 1991, abandoned, which is a continuation-in-part of Ser. No. 481,569, Feb. 22, 1990, abandoned, which is a continuation-in-part of Ser. No. 352,303, May 15, 1989, abandoned. This application Jun. 7, 1995, Ser. No. 486,991

Int. Cl.⁶ C07F *9/6561;9/6512·* **A61K** *31/675;* **C07D** *473/18*

U.S. Cl. 544—243 **17 Claims**

1. A compound of formula (II) or (VIII)


(II)

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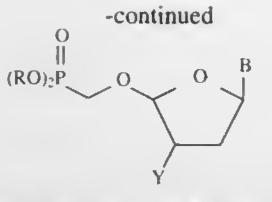
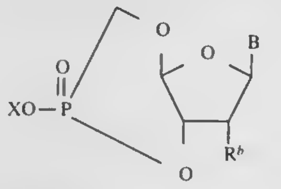

(VIII)

wherein the broken line is an optional bond; X, R and X' are the same or different and are H or alkyl with 1 to 6 carbon atoms; and B is cytosine, 5-ethylcytosine, 5-methylcytosine, thymine, uracil, 5-chlorouracil, 5-bromouracil, 5-ethyluracil, 5-iodouracil, 5-propyluracil or 5-vinyluracil, any one of which is substituted at the 1-position;
wherein in the compound of formula (II), Y and Z are the same or different and are H; OH; alkyl having 1 to 6 carbon atoms; alkyl having 1 to 6 carbon atoms which is substituted with halogen, hydroxy, amino or azido; or are taken together to form an oxygen atom or a methylene group; or are taken together with X' to complete a cyclic phosphonate having the structure of formula (III)


(III)

wherein R^b is H or OH;
wherein in the compound of formula (VIII), Y is halogen, phenylthio or phenylseleno; and the pharmaceutically acceptable salts thereof.

5,837,872
PROCESS FOR PREPARATION OF N-ACYL-AMINODIACIDS

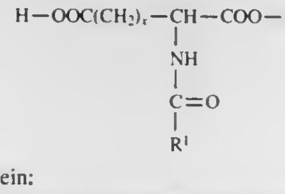
David M. Brown, Charlotte; Mohammad A. Khadim, Huntersville; Narayan D. Sadanani, Charlotte, and April Yeager, Stanley, all of N.C., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Nov. 13, 1995, Ser. No. 554,946

Int. Cl.⁶ C07C *227/18*

U.S. Cl. 562—571 **6 Claims**

1. A process for making N-acyl-aminodiacids of Formula I:



$$H—OOC(CH_2)_x—\underset{\substack{|\\NH\\|\\C{=}O\\|\\R^1}}{CH}—COO—H \qquad \text{Formula I}$$

wherein:
R^1 is selected from the group consisting of $C_1–C_{20}$ alkyl, $C_2–C_{20}$ alkenyl, and $C_2–C_{20}$ alkynyl, wherein the alkenyl and alkynyl groups may contain up to three unsaturations and wherein all of the groups may optionally contain branching; and

$$X{=}0–10;$$

wherein said process comprises
(a) a reacting an excess of a compound of Formula II:

$$M^1—OOC—CH—(NH_2)—(CH_2)_x—COOM^2 \qquad \text{Formula II}$$

wherein:
M^1 and M^2 are each independently selected from the group consisting of hydrogen, sodium, potassium and ammonium with a chloride of Formula III:

$$H_3C—(CH_2)_y—C(O)Cl \qquad \text{Formula III}$$

wherein:
y=0–18, in the presence of a water/solvent mixture with a sufficient amount of base to form a reaction mixture from

which a disalt form of the compound of Formula I may be obtained. the solvent mixture including water and an alcohol selected from the group of ethanol, n-propanol, isopropanol; and (b) adding the disalt form of Formula I to an HCl solution to form the compound of Formula I; provided that the compound of Formula III is added in an amount such that:
(a) it does not exceed 95% of the molar equivalent amount of the compound of Formula II added initially;
(b) the pH value of the reaction mixture is maintained in the range of 9–13; and
(C) the temperature of the reaction mixture is maintained in the range of 0–10 degrees C.

5,837,873
INTERMEDIATES OF RETROVIRAL PROTEASE INHIBITING COMPOUNDS

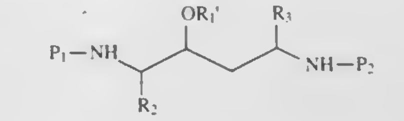
Daniel W. Norbeck, Lindenhurst; Lynn M. Codacovi, Antioch, and Steven J. Wittenberger, Mundelein, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Division of Ser. No. 270,210, Aug. 23, 1994, abandoned, which is a division of Ser. No. 121,673, Sep. 14, 1993, Pat. No. 5,354,866, which is a continuation of Ser. No. 777,626, Oct. 23, 1991, which is a continuation-in-part of Ser. No. 746,020, Aug. 15, 1991, abandoned, which is a continuation-in-part of Ser. No. 616,170, Nov. 20, 1990, abandoned, which is a continuation-in-part of Ser. No. 518,730, May 9, 1990, Pat. No. 5,142,056, which is a continuation-in-part of Ser. No. 456,124, Dec. 22, 1989, abandoned, which is a continuation-in-part of Ser. No. 405,604, Sep. 8, 1989, abandoned, which is a continuation-in-part of Ser. No. 355,945, May 23, 1989, abandoned. This application Mar. 24, 1995, Ser. No. 410,162

Int. Cl.⁶ C07C *271/12;211/14*

U.S. Cl. 560—27 **8 Claims**

1. A compound of the formula:



wherein P_1 and P_2 are independently selected from hydrogen and an N-protecting group selected from the group consisting of (a) —C(O)OR^a wherein R^a is methyl, isopropyl, cyclopropylmethyl, 1-methyl-1-cyclopropylmethyl, diisopropylmethyl, 9-fluorenylmethyl, 9-(2-sulfo)fluorenylmethyl, 2.2.2-trichloroethyl, 2-haloethyl, 2-trimethylsilylethyl, 2-methylthioethyl, 2-methylsulfonylethyl, 2-(p-toluenesulfonyl)ethyl, 2-phosphonioethyl, 1,1-dimethylpropynyl, 1,1-dimethyl-3-(N,N-dimethylcarboxamido)propyl, 1,1-diphenyl-3-(N,N-diethylamino)propyl, 1-methyl-1-(1-adamantyl)ethyl, 1-methyl-1-phenylethyl, 1-methyl-1-(3.5-dimethoxyphenyl)ethyl, 1-methyl-1-(4-biphenylyl)ethyl, 1-methyl-1-(p-phenylazophenyl)ethyl, 1,1-dimethyl-2-haloethyl, 1,1-dimethyl-2.2.2-trichloroethyl, 1,1-dimethyl-2-cyanoethyl, Isobutyl, t-butyl, t-amyl, cyclobutyl, 1-methylcyclobutyl, cyclopentyl, cyclohexyl, 1-methyicyclohexyl, 1-adamantyl, Isobornyl, vinyl, allyl, cinnamyl, phenyl, 2,4,6-trl-t-butylphenyl, m-nitrophenyl, p-nitrophenyl, benzyl, 2,4,6-trimethylbenzyl, p-methoxybenzyl, 3,5-dimethoxybenzyl, p-decyloxybenzyl, p-nitrobenzyl, o-nitrobenzyl, 3,4-dimethoxy-6-nitrobenzyl, p-bromobenzyl, chlorobenzyl, 2,4-dichlorobenzyl, p-cyanobenzyl, o-(N,N-dimethylcarboxamido)benzyl, p-(dihydroxyboryl)benzyl, p-(phenylazo)benzyl, p-(p'-methoxyphenylazo)benzyl, 9-anthrylmethyl, diphenylmethyl or phenyl(o-nitrophenyl)methyl, (b) —C(O)SR^a wherein R^a is phenyl or benzyl, (c) formyl, (d) acetyl, (e) chloroacetyl, (f) trichloroacetyl, (g) trifluoroacetyl, (h) o-nitrophenylacetyl, (i) o-nitrophenoxyacetyl, (j) acetoacetyl, (k) t-butylacetyl, (l) (N'-dithiobenzyloxycarbonylamino)acetyl, (m) 3-phenylpropionyl, (n) 3-(D-hydroxyphenyl)propionyl, (o) 3-(o-nitrophenoxy)propionyl, (p) 2-methyl-2-(o-nitrophenoxy)propionyl, (q) 2-methyl-2-(o-phenylazophenoxy)propionyl, (r) 4-chlorobutyryl, (s) Isobutyryl, (t) isovaleryl, (u) o-nitrocinnamoyl, (v) benzoyl, (w) p-phenylbenzoyl, (x) p-methoxybenzoyl, (y) o-nitrobenzoyl, (z) o-(benzoyloxymethyl)benzoyl, (aa) phthaloyl, (bb) 2,3-diphenylmaleoyl, (cc) dithiasuccinoyl, (dd) allyl, (ee) phenacyl, (ff) 3-acetoxypropyl, (gg) benzyl, (hh) 3,4-dimethoxybenzyl, (ii) o-nitrobenzyl, (jj) di-(p-methoxyphenyl)methyl, (kk) triphenylmethyl, (ll) (p-methoxyphenyl)diphenylmethyl, (mm) dibenzosuberyl, (nn) N',N'-dimethylaminomethylene, (oo) isopropylidene, (pp) benzylidene, (qq) p-methoxybenzylidene, (rr) p-nitrobenzylidene, (ss) salicylidene, (tt) 5-chlorosalicylidene, (uu) diphenylmethylene, (vv) (5-chloro-2-hydroxyphenyl)phenylmethylene, (ww) trimethylsilyl, (xx) benzenesulfonyl, (yy) p-methoxybenzenesulfonyl, (zz) 2,4,6-trimethylbenzenesulfonyl, (aaa) toluenesulfonyl, (bbb) benzylsulfonyl, (ccc) p-methylbenzylsulfonyl, (ddd) trifluoromethylsulfonyl and (eee) phenacylsulfonyl; R_1' is hydrogen, C_1-to-C_6-loweralkyl, C_1-to-C_6-alkoxy-C_1-to-C_6-alkyl or an O-protecting group selected from the group consisting of methoxymethyl, methylthiomethyl, benzyloxymethyl, t-butoxymethyl, 2-methoxyethoxymethyl, 2.2.2-trichloroethoxymethyl, bis-(2-chloroethoxy)methyl, 2-(trimethylsilyl)ethoxymethyl, tetrahydropyranyl, 3-bromotetrahydropyranyl, tetrahydrothiopyranyl, 4-methoxytetrahydropyranyl, 4-methoxytetrahydrothiopyranyl, 4-methoxytetrahydrothiopyranyi-S.S-dioxo, tetrahydrofuranyl, tetrahydrothiofuranyl, 1-ethoxyethyl, 1-methyl-1-methoxyethyl, 1-(isopropoxy)ethyl, 2,2.2-trichloroethyl, 2-(phenylselenyl)ethyl, t-butyl, allyl, cinnamyl, p-chlorophenyl, benzyl, p-methoxybenzyl, o-nitrobenzyl, p-nitrobenzyl, p-halobenzyl, p-cyanobenzyl, diphenylmethyl, 5-dibenzosuberyl, triphenylmethyl, α-naphthyidiphenylmethyl, p-methoxyphenyidiphenylmethyl, p-(p'-bromophenacyloxy)phenyidiphenylmethyl, 9-anthryl, 9-(9-phenyl)xanthenyl, 9-(9-phenyl-10-oxo)anthryl, trimethylsilyi, triethylsilyi, isopropyidimethylsilyl, t-butyidimethylsilyi, (triphenylmethyl)dimethylsilyi, t-butyidiphenylsilyl, methyidiisopropylsilyl, methyl-di-t-butylsilyl, tribenzylsilyl, tri-p-xylylsilyl, triisopropylsilyl, triphenylsilyl, formyl, benzoylformyle, acetyl, chloroacetyl, dichloroacetyl, trichloroacetyl, trifluoroacetyl, methoxyacetyl, triphenylmethoxyacetyl, phenoxyacetyl, p-chlorophenoxyacetyl, 2,6-dichloro-4-methylphenoxyacetyl, 2.6-dichloro-4-(1,1,3,3-tetramethylbutyl)phenoxyacetyl, 2,4-bis(1,1-dimethylpropyl)phenoxyacetyl, chlorodiphenylacetyl, 3-phenylproplonyl, 3-benzoylproplonyl, isobutyryl, monosuccinyl, 4-oxopentanoyl, pivaloyl, adamantoyl, crotonyl, 4-methoxycrotonyl, (E)-2-methyl-2-butenoyl, benzoyl, o-(dibromomethyl)benzoyl, o-(methoxycarbonyi)benzoyl, p-phenylbenzoyl, 2.4.6-trimethylbenzoyl and α-naphthoyl; and R_2 and R_3 are independently selected from (a) aryl-C_1-to-C_6-alkyl wherein aryl is selected from phenyl, naphthyl, tetrahydronaphthyl, indanyl, indenyl and substituted phenyl, substituted naphthyl, substituted tetrahydronaphthyl, substituted indanyl and substituted indenyl wherein the substituted aryl groups are substituted with one, two or three substituents independently selected from C_1-to-C_6-loweralkyl, halo-C_1-to-C_6-alkyl, C_1-to-C_6-alkoxy, C_1-to-C_6-thioalkoxy, C_1-to-C_6-alkoxycarbonyl, C_1-to-C_6-alkanoyl, hydroxy, halo, mercapto, nitro, amino, C_1-to-C_6-alkylamino, C_1-to-C_6-alkylamino, carboxaldehyde, carboxy, carboxamide, unsubstituted aryl-C_1-to-C_6-alkyl, unsubstituted aryl-C_1-to-C_6-alkoxy, amino-C_1-to-C_6-alkyl, amino-C_1-to-C_6-alkoxy, C_1-to-C_6-alkylamino-C_1-to-C_6-alkyl, C_1-to-C_6-alkylamino-C_1-to-C_6-alkoxy, di-C_1-to-C_6-alkylamino-C_1-to-C_6-alkyl, di-C_1-to-C_6-alkylamino-C_1-to-C_6-alkoxy, (C_1-to-C_6-alkoxy-C_1-to-C_6-alkyl)amino-C_1-to-C_6-alkyl, (C_1-to-C_6-alkoxy-C_1-to-C_6-alkyl)amino-C_1-to-C_6-alkoxy, di-C_1-to-C_6-alkoxy-C_1-to-C_6-alkyl)amino-C_1-to-C_6-alkyl, di(C_1-to-C_6-alkoxy-C_1-to-C_6-alkyl)amino-C_1-to-C_6-alkoxy, (C_1-to-C_6-alkoxy-C_1-to-C_6-alkyl)(C_1-to-C_6-alkyl)amino-C_1-to-C_6-alkyl, (C_1-to-C_6-alkoxy-C_1-to-C_6-alkyl)(C_1-to-C_6-alkyl)amino-C_1-to-C_6-alkoxy, hydroxy-C_1-to-C_6-alkyl, hydroxy-C_1-to-C_6-alkoxy, carboxy-C_1-to-C_6-alkyl, carboxy-C_1-to-C_6-alkoxy, C_1-to-C_6-alkoxy-C_1-to-C_6-alkyl, C_1-to-C_6-thioalkoxy-C_1-to-C_6-alkyl, poly-C_1-to-C_6-alkoxy-C_1-to-C_6-alkyl and di-C_1-to-C_6-alkoxy-C_1-to-C_6-alkyl and (b) C_3-to-C_7 cycloalkyl-C_1-to-C_6-alkyl; or a salt thereof.

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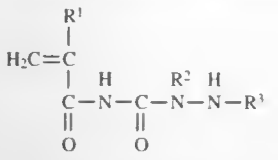
5,837,874
HYDRAZIDE INTERMEDIATES

Otohiko Tsuge, Fukuoka; Taizo Hatta, Kumamoto; Satoshi Urano, Tsuzuki-gun; Noriyuki Tsuboniwa, Higashi Osaka, and Ryuzo Mizuguchi, Tokyo-to, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Division of Ser. No. 217,106, Mar. 24, 1994, Pat. No. 5,532,376. This application Apr. 15, 1996, Ser. No. 631,260
Claims priority, application Japan, Mar. 24, 1993, 5-066040
Int. Cl.^{6} C07C *243/24*

U.S. Cl. 560—159 **1 Claim**

1. A hydrazide compound represented by the formula (3):


(3)

$$H_2C{=}C(R^1)-C(=O)-N(H)-C(=O)-N(R^2)-N(H)-R^3$$

in which R^1 represents a lower alkyl group which may have a substituent selected from the group consisting of an alkyl group having 1–6 carbon atoms; R^2 and R^3 represent respectively hydrogen, an aryl group, a benzoyl group, a tosyl group, a lower alkoxy carbonyl group, or an aryl sulfonyl group, each of which except for hydrogen may have a substituent selected from the group consisting of methyl, ethyl, propylbutyl, 2-ethyl hexyl, methoxyethyl, ethoxyethyl, butoxyethyl, hexyloxyethyl, methoxy, nitro, chloro and bromo.

5,837,875
TRANSGENIC MOUSE CONTAINING AN IGF-1 TRANSGENE

Fatima Bosch, and Alfons Valera, both of Bellaterra, Spain, assignors to The Autonomous University of Barcelona, Bellaterra, Spain

Filed Dec. 26, 1995, Ser. No. 578,245
Int. Cl.^{6} C12N *5/00;15/00;15/09*

U.S. Cl. 800—2 **7 Claims**

1. A transgenic mouse whose germ cells and somatic cells comprise an insulin growth factor-1 (IGF-1) transgene comprising DNA encoding IGF-1 operably linked to a promoter sequence effective for expression of IGF-1 in the pancreas of said mouse, wherein with respect to the corresponding wild-type mouse, expression of said IGF-1 results in said transgenic mouse exhibiting no elevated level of circulating IGF-1, a greater than 5-fold level of IGF-1 mRNA expression in the pancreas, and at least one diabetic complication selected from the group consisting of increased plasma glucose levels upon glucose inducibility, retinopathy, cataracts, glaucoma, and microvascular changes in the eye of said mouse.

5,837,876
ROOT CORTEX SPECIFIC GENE PROMOTER

Mark A. Conkling, Fuquay-Varina; Nandini Mendu, Durham, and Wen Song, Raleigh, all of N.C., assignors to North Carolina State University, Raleigh, N.C.

Filed Jul. 28, 1995, Ser. No. 508,786
Int. Cl.^{6} C12N *15/29;15/82;15/32;* **A01H** *5/00*

U.S. Cl. 800—205 **22 Claims**

15. A transformed plant comprising transformed plant cells, said transformed plant cells containing a heterologous DNA construct, which construct comprises in the 5' to 3' direction, a Tobacco RD2 root cortex specific promoter and a heterologous DNA segment positioned downstream from said promoter and operatively associated therewith, said promoter directing root cortex specific transcription of said heterologous DNA segment.

16. A transformed plant according to claim **15**, wherein said promoter has a sequence selected from the group consisting of:

(a) SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8 and SEQ ID NO:9 , and

(b) DNA sequences which hybridize to isolated DNA having a sequence of (a) above, under conditions represented by a wash stringency of 0.3M NaCl, 0.03M sodium citrate, 0.1% SDS at 60°, and which direct root cortex specific transcription of a downstream heterologous DNA segment in a plant cell.

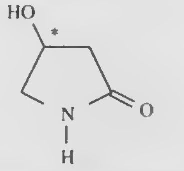
5,837,877
PROCESS FOR PREPARING OPTICALLY ACTIVE 4-HYDROXY-2-PYRROLIDONE

Shigeru Mitsuhashi, and Hidenori Kumobayashi, both of Hiratsuka, Japan, assignors to Takasago International Corporation, Tokyo, Japan

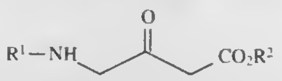
Filed Jan. 29, 1997, Ser. No. 790,931
Claims priority, application Japan, Feb. 2, 1996, 8-039065
Int. Cl.^{6} C07D *207/273*

U.S. Cl. 548—544 **4 Claims**

1. A process for preparing optically active 4-hydroxy-2-pyrrolidone represented by formula (III):

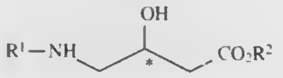

(III)

comprising asymmetrically hydrogenating an N-substituted-4-amino-3-oxobutanoic ester represented by formula (I):


(I)

wherein R^1 represents a benzyloxycarbonyl group, the benzene ring of which may be substituted; and R^2 represents a lower alkyl group having 1 to 4 carbon atoms,

in the presence of a ruthenium-optically active phosphine complex as a catalyst to obtain an optically active N-substituted-4-amino-3-hydroxybutanoic ester represented by formula (II):


(II)

wherein R^1 and R^2 are as defined above; and * indicates an asymmetric carbon atom,

deblocking, and cyclizing the ester.

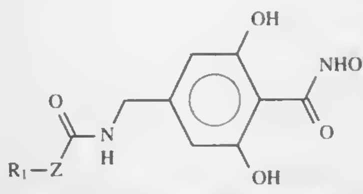
5,837,878
BORONIC COMPOUND COMPLEXING REAGENTS AND HIGHLY STABLE COMPLEXES

Mark L. Stolowitz, Woodinville; Robert J. Kaiser, Bothell, and Kevin P. Lund, Lynnwood, all of Wash., assignors to Prolinx, Inc., Bothell, Wash.

Continuation-in-part of Ser. No. 188,531, Jan. 28, 1994, Pat. No. 5,594,151. This application Aug. 5, 1996, Ser. No. 689,283
Int. Cl.^{6} C07C *259/10*

U.S. Cl. 558—315 **5 Claims**

1. A reagent having the general formula of General Formula CIII:


General Formula CIII

wherein group Z comprises a spacer selected from a saturated or unsaturated chain up to about 6 carbon equivalents in length, an unbranched saturated or unsaturated chain of from about 6 to 18 carbon equivalents in length with at least one of intermediate amide and disulfide moieties, and a polyethylene glycol chain of from about 3 to 12 carbon equivalents in length;

wherein group R_3 is selected from one of an H, an alkyl, and a methylene or ethylene moiety with an electronegative substitutent; and

wherein group R_1 is a electrophilic or nucleophilic moiety suitable for reaction of the reagent with a bioactive species.

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5,837,879

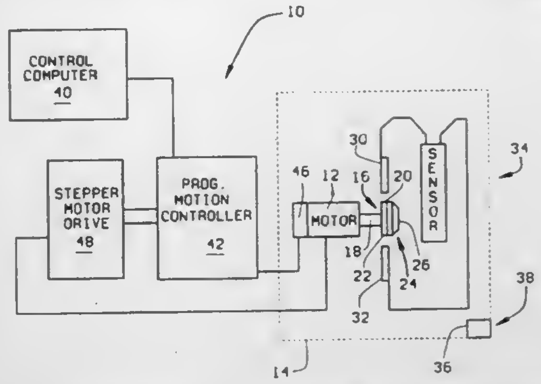
METHODS AND APPARATUS FOR TESTING CENTRIFUGAL START MECHANISMS

Kenneth Edward Zick, Ft. Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed Jan. 7, 1997, Ser. No. 779,534

Int. Cl.^{6} G01L *5/00*

U.S. Cl. 73—1.37 **34 Claims**



1. Apparatus for testing a centrifugal start mechanism including a movable push collar, said apparatus comprising:
   a motor including a rotatable shaft for carrying the start mechanism;
   an optical sensor for detecting movement of the push collar as the motor shaft rotates; and
   a controller coupled to said motor and to said sensor for obtaining data indicative of the motor shaft speed when movement of the push collar is detected.

5,837,880

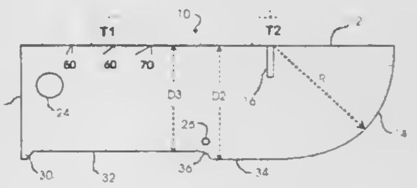
COMPACT ULTRASONIC CALIBRATION BLOCK

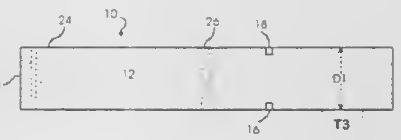
Michael L. Shakinovsky, Southbury, and Robert E. Lucas, Brookfield, both of Conn., assignors to Sperry Rail Service, Inc., Danbury, Conn.

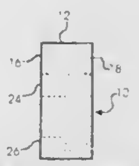
Filed Aug. 20, 1997, Ser. No. 915,401

Int. Cl.^{6} G01D *18/00*

U.S. Cl. 73—1.86 **9 Claims**







1. An ultrasonic test block comprising:
(a) a flat top surface;
(b) first and second parallel flat side surfaces having a predetermined distance therebetween;
(c) a flat end and an arcuate end;
(d) opposed notches formed in said first and second parallel flat side surfaces at the base of the radius defining said arcuate end;
(e) a bottom surface comprising (i) a first flat bottom segment extending from said flat end, (ii) a second flat bottom segment extending from said arcuate end, and a curved portion joining said first flat bottom segment and said second flat bottom segment, said first and second flat bottom segments being parallel to said flat top surface;
(f) a first hole extending between said first and second parallel flat side surfaces perpendicularly thereto;
(g) a second hole extending between said first and second parallel flat side surfaces and parallel to said first hole, and positioned in proximity to said curved portion between said first flat bottom segment and said second flat bottom segment; and
(h) a plurality of sets of indicia on each of said first and second parallel flat side surfaces to aid in measuring an ultrasonic test head.

5,837,881

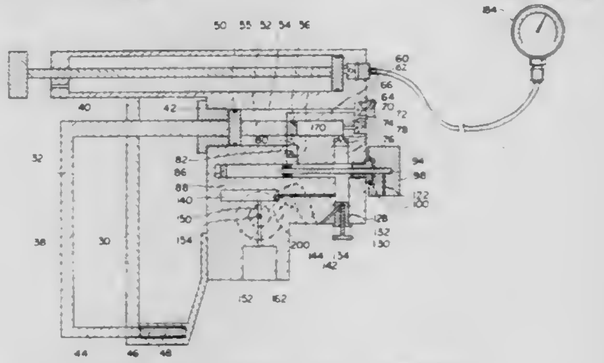
PRESSURE GAUGE CALIBRATING DEVICE

Scott Martin, 110 Kimble St., Belle Chasse, La. 70037

Filed Dec. 23, 1996, Ser. No. 772,599

Int. Cl.^{6} G01L *27/00*

U.S. Cl. 73—1.68 **22 Claims**



1. A pressure gauge calibrating device, comprising:
a calibrator body;
a means for connecting the calibrator body to an external source of pressurized fluid;
a variable pressure chamber formed in the calibrator body, said variable pressure chamber being in fluid communication with the external source of pressurized fluid;
a means mounted in said variable pressure chamber for regulating pressure buildup in the variable pressure chamber;
a means carried by said calibrator body connecting said variable pressure chamber to a master pressure gauge and to a device to be calibrated; and
a means for pressurizing said variable pressure chamber with ambient air prior to admitting a pressurized fluid from the external source of pressurized fluid.

5,837,882

STATIONARY ELEMENT ROLLING CONTACT FATIGUE TESTER

Nelson Bacigalupo, Ann Arbor; Douglas Glover, Suttons Bay; Mary-Jo Liston, Whitmore Lake; Robert W. Frayer, Jr., Gregory; James Tisch, Brighton; Leontios Res, Ann Arbor, and James Fidler, Grass Lake, all of Mich., assignors to NTN Corporation, Osaka, Japan

Filed Jun. 5, 1997, Ser. No. 869,767

Int. Cl.^{6} G01N *3/56*

U.S. Cl. 73—7 **21 Claims**

1. An assembly for measuring rolling contact fatigue characteristics of a test element by subjecting the test element to a cyclic contact stress during a test phase, said assembly comprising:

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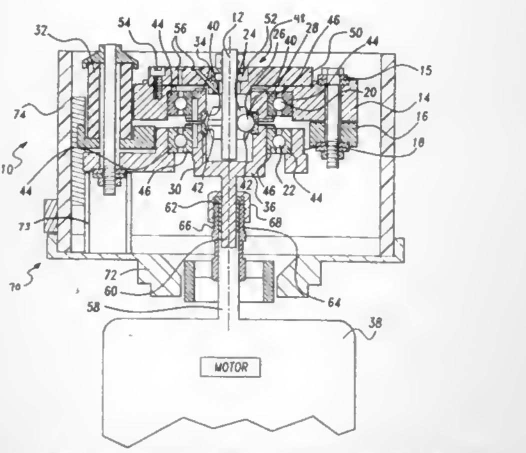


mounting means for holding the test element in said assembly, wherein the test element is held stationary during the test phase;
bearing means configured for rotation around the test element during the test phase for placing the cyclic contact stress upon the test element;
loading means for urging said bearing means against a test track portion of the test element during the test phase at a known pressure placing said bearing means in rotatable engagement with the test element, said loading means having a wedge member disposed adjacent to said bearing means, said wedge member including a first bearing cup member having an inclined surface in rolling engagement with said bearing means a second bearing cup member having an inclined surface in opposed wedging engagement to said first bearing cup member and in rolling engagement with said bearing means,
a force-applying means for forcing said inclined surfaces into said bearing means thereby applying a determinable load between said bearing means and the test element wherein said force-applying means forces said first and second bearing cup members together against said bearing means, and said force-applying means further including a first positioning bearing coupled to said first bearing cup member and a second positioning bearing coupled to said second bearing cup member and a load spring acting between said positioning bearings to place a load on said bearing cup members, said positioning bearings coupled to said load spring with said load spring non-rotatable with respect to said mounting means, and
rotation means for rotating said bearing means around said test element.

5,837,883
GAS CHROMATOGRAPH/MASS SPECTROMETER

Hiroto Itoi, Kita-ku, Japan, assignor to Shimadzu Corporation, Kyoto, Japan

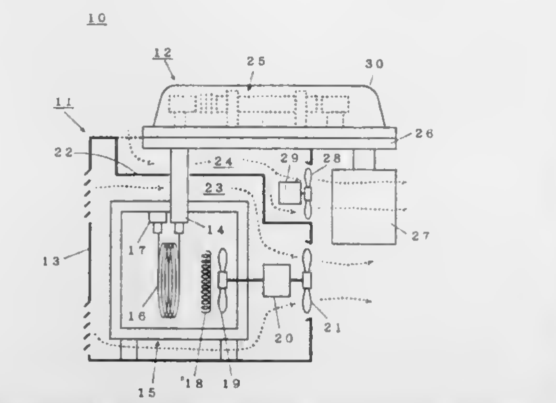
Filed Jun. 25, 1997, Ser. No. 882,290

Claims priority, application Japan, Jun. 27, 1996, 8-188909

Int. Cl.⁶ G01N *30/02;* G01D *11/24;* B01D *59/44*

U.S. Cl. 73—23.37 **9 Claims**

1. A gas chromatograph/mass spectrometer comprising:
a gas chromatograph unit including an oven for heating a gas chromatographic column;
a mass spectrometer unit mounted on a top of the gas chromatograph unit;
a shield disposed between the gas chromatograph unit and the mass spectrometer unit; and



ventilating means for ventilating a space between the gas chromatograph unit and the shield and a space between the mass spectrometer and the shield.

5,837,884
HUMIDITY SENSOR USING TEMPERATURE SENSING RESISTOR CONTROLLED TO BE AT CONSTANT TEMPERATURE OF MORE THAN 150° C.

Mitsuteru Kimura, 2-56 3-chome, Shichigahama-machi, Miyagi-gun Miyagi 985; Mituyuki Takeda, and Hiroyuki Sato, both of Sendai, all of Japan, assignors to Tokin Corporation, and Mitsuteru Kimura, both of Miyagi, Japan

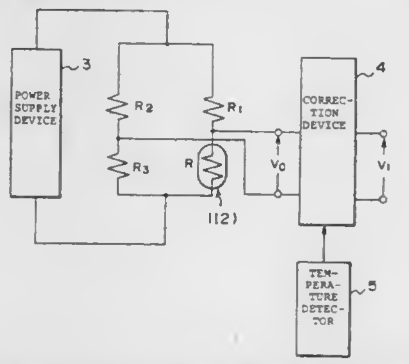
PCT No. PCT/JP95/02727, § 371 Date Aug. 23, 1996, § 102(e) Date Aug. 23, 1996, PCT Pub. No. WO96/21146, PCT Pub. Date Jul. 11, 1996

PCT Filed Dec. 27, 1995, Ser. No. 702,602

Claims priority, application Japan, Dec. 29, 1994, 6-338974; Dec. 29, 1994, 6-338975

Int. Cl.⁶ G01N *25/56*

U.S. Cl. 73—25.4 **12 Claims**



1. A humidity sensor for measuring humidity by utilizing the fact that the heat dissipation of a temperature sensing resistor changes depending on the humidity, said humidity sensor comprising:
a heating control unit which includes a heat generator for self-radiation of Joule heat and being arranged to heat said temperature sensing resistor, said heat generator being controlled by said heating control unit to heat said temperature sensing resistor to control the temperature of said temperature sensing resistor to be at a constant temperature as a constant first temperature, wherein said constant first temperature is more than 150° C.;
an electrical circuit for producing an output voltage relating to voltage drop across said temperature sensing resistor at said first temperature; and
correcting means for correcting the output voltage value of the output voltage of said electrical circuit with reference to a variation in output voltage value of the output of said electrical circuit depending on the ambient temperature of said temperature sensing resistor.

5,837,885
METHOD AND DEVICE FOR MEASURING THE CHARACTERISTICS OF AN OSCILLATING SYSTEM

Joseph Goodbread, 1020 SW. Broadway Dr., Portland, Oreg. 97201; Mahir Sayir, Im Straler 7, 8047 Zurich, Switzerland; Klaus Hausler, Zurichstrasse 101, 8700 Kusnacht, Switzerland, and Jurg Dual, Waldegg 10a, 8126 Zumikon, Switzerland

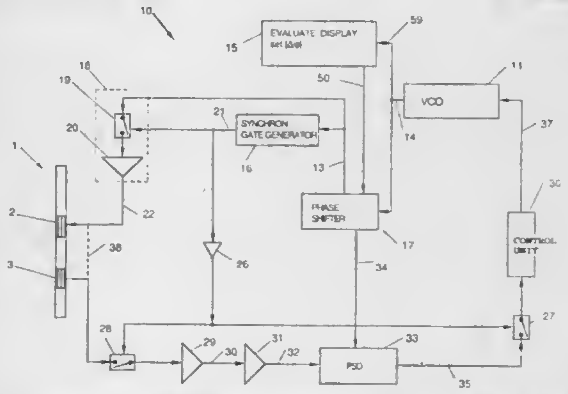
PCT No. PCT/EP95/00761, § 371 Date Aug. 26, 1996, § 102(e) Date Aug. 26, 1996, PCT Pub. No. WO95/24630, PCT Pub. Date Sep. 14, 1995

PCT Filed Mar. 2, 1995, Ser. No. 605,203

Claims priority, application Switzerland, Mar. 7, 1994, 657/94

Int. Cl.⁶ G01N *9/32;29/02;29/24*

U.S. Cl. 73—32 A **17 Claims**



1. A method to measure the characteristics of a vibrating system in a vicinity of a resonance frequency of a resonator, said method comprising the steps of:
providing a measuring device including said resonator (**1**), said measuring device further comprising
a transducer (**2**,**3**) coupled to said resonator and
a feedback loop to stabilize a vibration of said resonator in the vicinity of said resonance frequency, said feedback loop comprising a switch (**19**,**27**,**28**), an oscillator (**11**), a frequency-control unit (**36**) further comprising a an integrator, and a gate generator (**16**) acting on said switch;
exciting said transducer by said oscillator during a finite first time interval, said first time interval including a number of cycles of the vibration of said resonator;
during said first time interval, interrupting the feedback loop between said transducer to said frequency-control unit by opening said switch;
measuring said vibration by said transducer during a second time interval, said second time interval not overlapping said first time interval;
updating said frequency-control unit during said second time interval; whereby
said frequency-control unit controls said oscillator.

5,837,886
GAS SENSOR

Takeshi Nakahara, Osaka; Tomohiro Inoue, Hyogo, and Hironobu Machida, Osaka, all of Japan, assignors to Figaro Engineering Inc., Osaka, Japan

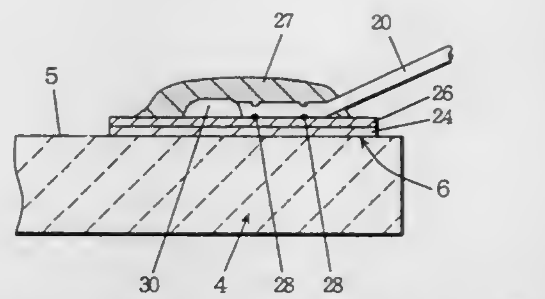
Continuation of Ser. No. 610,880, Mar. 5, 1996, abandoned. This application Jun. 27, 1997, Ser. No. 884,507

Claims priority, application Japan, Jun. 19, 1995, 7-176620

Int. Cl.⁶ G01N *7/00;* H01R *9/09;* H01C *7/00*

U.S. Cl. 73—31.06 **6 Claims**

1. A gas sensor comprising
a heat-resistant insulating substrate:
a metal oxide semiconductor film that changes its electrical resistance according to the presence of gas,
a film heater.



a plurality of thick-film electrode pads, each provided on the heat-resistant insulating substrate: and precious metal alloy leads
wherein said metal oxide semiconductor film, said film heater and leads are connected to said plurality of thick-film electrode pads,
wherein said plurality of thick-film electrode pads are made of a precious metal alloy containing gold, and wherein the connections between said leads and said thick-film electrode pads are covered by thick films of precious metal.

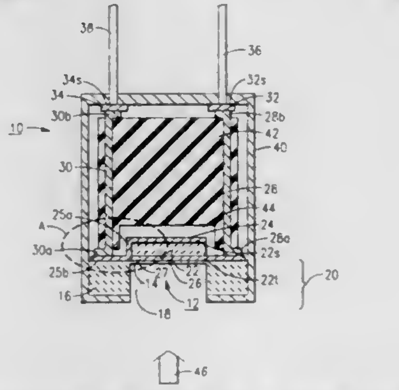
5,837,887
MISFIRE SENSOR

Kazuyoshi Shibata, Nagoya; Yukihisa Takeuchi, Nishikamo, both of Japan; Eric J. Shrader, Belmont, and Joseph S. Eckerle, Redwood City, both of Calif., assignors to NGK Insulators, Ltd., Japan

Continuation of Ser. No. 426,932, Apr. 21, 1995, abandoned, which is a continuation of Ser. No. 221,016, Apr. 1, 1994, abandoned. This application Mar. 6, 1996, Ser. No. 611,508

Int. Cl.⁶ G01L *23/22*

U.S. Cl. 73—35.11 **6 Claims**



1. A sensor for detecting misfire in an internal combustion engine, comprising:
a detecting unit including a piezoelectric film consisting essentially of a first ceramic material, a first electrode coated onto at least a portion of an outer surface of said piezoelectric film, and a second electrode coated onto at least a portion of an inner surface of said piezoelectric film;
a substrate having a top surface, a bottom surface, and a cavity formed through the bottom surface and into the substrate thereby providing a relatively thin vibrating portion supported by a relatively thick fixing portion such that said vibrating portion is adapted to vibrate with respect to said fixing portion, said vibrating portion consisting essentially of a second ceramic material and supporting said detecting unit such that said second electrode is coated onto said vibrating portion, wherein said cavity is open externally to said sensor to receive a sound generated by combustion explosion from an internal combustion engine;
first and second leads respectively electrically connected to said first and second electrodes:
an electric insulator having a depression complementary in shape to said detecting unit, said first and second leads

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extending through said electric insulator and being electrically connected to said first and second electrodes, respectively; and

a housing containing said detecting unit, said substrate, said electrical insulator, and said first and second leads;

wherein said piezoelectric film converts such a sound generated by combustion explosion in an internal combustion engine into an electrical signal.

5,837,888

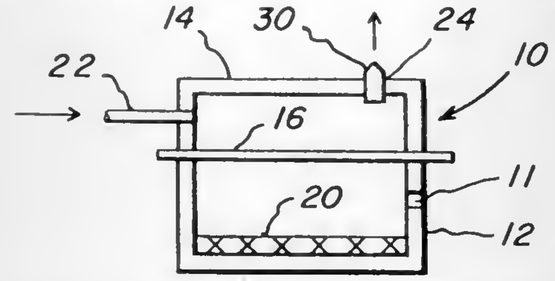
PROCESS FOR MEASURING VAPOR TRANSMISSION THROUGH MATERIALS

William N. Mayer, White Bear Lake; Stephen D. Tuomela, Oakdale, and Guss L. Krake, Richfield, all of Minn., assignors to Modern Controls, Inc., Minneapolis, Minn.

Filed May 14, 1997, Ser. No. 856,441

Int. Cl.⁶ G01N *15/08*

U.S. Cl. 73—38 **7 Claims**



1. A process for measuring the vapor transmission rate through a test material under controlled ambient pressure and temperature conditions, comprising the steps of:

a) forming a two-chamber device having a sample material as a barrier wall between the two chambers, and a liquid vapor-producing source having a liquid surface and a known vapor pressure in one chamber and a carrier gas inlet and outlet in the second chamber with a vapor detector positioned to detect vapors passing through the outlet;

b) measuring the carrier gas flow rate and the percentage vapor detected by the vapor detector;

c) calculating the vapor flow rate at said outlet;

d) calculating the vapor pressure drop between the liquid surface and said outlet;

e) calculating a first total vapor transmission rate (T_{RA}) through said device by dividing the vapor flow rate by the vapor pressure drop between the liquid surface and said outlet;

f) applying a test material adjacent the sample material in said two-chamber device;

g) repeating steps b) through d);

h) calculating a second total vapor transmission rate (T_{TOT}) through said device by dividing the second calculated vapor flow rate by the second calculated vapor pressure drop; and

i) calculating the vapor transmission rate (T_{RT}) through said test material by the equation:

$$1/T_{RT}=1/T_{TOT}-1/T_{RA}.$$

5,837,889

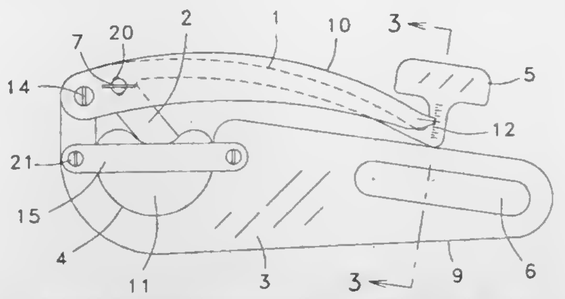
PRESSURE GAUGE FOR PNEUMATIC BALLS

Stephen Amram Slenker, 10 Crabapple Ln., Chelmsford, Mass. 01824

Filed Feb. 11, 1997, Ser. No. 798,877

Int. Cl.⁶ G01N *3/42;3/48;3/68*

U.S. Cl. 73—81 **10 Claims**



1. A pressure gauge for pneumatic balls, comprising a rigid clamp arm, a flexible clamp arm pivotally connected to said rigid clamp arm at a mutual fulcrum, the two clamp arms capable of compressing a ball between them, and scale means for indicating the amount of deflection in said flexible clamp arm caused by the ball compression, whereby an indication of gas pressure in a pneumatic ball is obtained by placing the ball between the two clamp arms, compressing the ball by pivoting the two arms toward each other, and observing the amount of deflection in said flexible clamp arm as shown by said scale means.

5,837,890

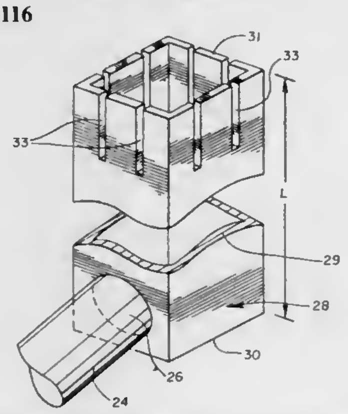
JET ENGINE TEST CELL STRUCTURE

Dean F. Long, Minnetonka, Minn., assignor to Aero Systems Engineering, Inc., St. Paul, Minn.

Filed Dec. 12, 1994, Ser. No. 353,701

Int. Cl.⁶ F02K *1/06*

U.S. Cl. 73—116 **20 Claims**



1. An infrasound reducing exhaust stack for an engine test cell comprising;

a closed end;

an open end;

a tubular exhaust stack wall extending between said closed and open ends and defining an elongated exhaust stack chamber having a direction of elongation, a stack height measured in the said direction of elongation and a stack width measured in a direction perpendicular to said stack height;

an exhaust inlet in said exhaust stack wall for receiving exhaust from said test cell; and

said exhaust stack wall provided with an open area near said open end for dissipating infrasound within said exhaust stack, said open area formed by at least one opening in said stack wall, said at least one opening having a length measured in the direction of elongation of said exhaust stack chamber wherein the length of said opening is at least 33% of said stack width whereby said open area and its defined length relative to said stack width functions to reduce the formation of infrasound.

5,837,891

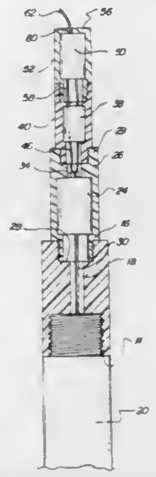
TIRE AIR PRESSURE MEASURING DEVICE

David Bridge, 1706-2004 Fullerton Avenue, North Vancouver, Canada, V7P-3G8

Filed Nov. 18, 1996, Ser. No. 751,236

Int. Cl.⁶ B60C *23/04*

U.S. Cl. 73—146.8 **1 Claim**



1. A tire air pressure measuring device for detecting the release of air from a tire and notifying a driver of such an occurrence comprising, in combination:

a plurality of transmitters each coupled to an associated tire, each transmitter including:

a water proof housing having an internally threaded open first end for engaging a valve of a tire, the housing having a cylindrical configuration, the housing having a length of 4 cm, a diameter of 2 cm, and a thickness of 1 mm, wherein each housing has a weight of less than 50 grams;

a valve pressure indicator means secured within the housing, the valve pressure indicator having a needle extending outwardly therefrom to engage a contact point of the valve of the tire, the valve pressure indicator means adapted to determine the amount of pressure within the tire and further generate a specific pressure value of the tire, wherein the valve pressure indicator means comprises a silicon piezoresistive pressure sensor adapted to measure between 0 to 100 PSI and provide a linear voltage output directly proportional to the specific pressure value;

analog circuit means including amplification means for amplifying the linear voltage output by a magnitude of forty, filter means for attenuating undesired voltage spikes, biasing means for clipping the linear voltage output above 3 volts and below 0 volts;

a temperature sensor means secured within the housing for determining a current temperature of a surrounding area, wherein an output voltage of the temperature sensor means is a function of the temperature of the surrounding area;

a transmitter means secured within the housing and connected to the temperature sensor means and valve pressure indicator means, the transmitter means adapted to transmit a compensated specific pressure value consecutively for 30 seconds only upon the triggering thereof, the compensated specific pressure value being a function of both the current temperature of a surrounding area and the specific pressure value of the tire, the compensated specific pressure value being transmitted with six pre-amble bits followed by a start bit, address byte, pressure data byte, five cyclic redundancy check bits, and two stop bits at a bit rate of about 30–100 kbits per second, wherein the transmission means transmits the compensated specific pressure value at under 50 mV/m;

an antenna connected to the transmission means with a length of less than 1.94 cm;

microcontroller means connected to the valve pressure indicator means, analog circuit means, and transmitter means, the microcontroller means adapted to trigger the transmitter means once every 20 minutes and further if the specific pressure value is less than a specific pressure value;

an 8 bit switch situated on the housing to send with each transmission of the specific pressure value a unique identification address;

a 3 volt lithium battery electrically coupled to the valve pressure indicator means, the temperature sensor means, analog circuit means, microcontroller means and the transmitter means, wherein the transmission means is adapted to provide an indication upon the detection of power delivered by the battery falling below a predetermined amount;

a receiver secured within an interior of a rectangular housing, the housing having a flashing light mechanism secured within a front wall thereof, a speaker secured within the front wall thereof adjacent to the flashing light mechanism, the receiver being in communication with the transmitter means, the receiver having wiring extending to electrically couple with the flashing light mechanism, the speaker, and display, the receiver adapted to depict on the display the compensated specific pressure value of one tire at a time with an associated source tire number corresponding to the identification address for several seconds and then switch to a next one, the receiver means further adapted to immediately display the compensated specific pressure value of a tire that has experienced a major change, the receiver means and further adapted to actuate the flashing light mechanism and the speaker upon a change in the compensated specific pressure value of one of the tires which is greater than a predetermined amount.

5,837,892

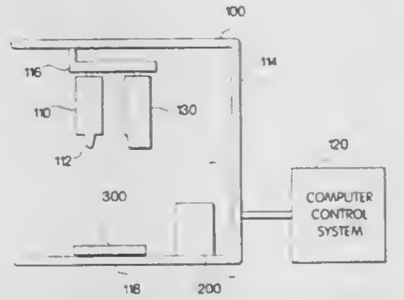
METHOD AND APPARATUS FOR MEASURING THE SIZE OF DROPS OF A VISCOUS MATERIAL DISPENSED FROM A DISPENSING SYSTEM

William A. Cavallaro, Bradford; Steven P. Bibeault, and Jules Gordon, both of Methuen, all of Mass., assignors to Camelot Systems, Inc., Haverhill, Mass.

Filed Oct. 25, 1996, Ser. No. 738,093

Int. Cl.⁶ G01F *13/00;25/00;* **G01B** *11/08*

U.S. Cl. 73—149 **24 Claims**



1. A dispensing system for dispensing material onto a substrate, the dispensing system comprising:

a housing;

an arm coupled to the housing and movable in two orthogonal directions;

a dispensing apparatus, coupled to the arm, that dispenses a metered quantity of material;

a measuring apparatus, coupled to the housing, including,

a bottom plate having a top surface to receive the material dispensed from the dispensing apparatus,

a top plate positionable over the bottom plate after the material has been dispensed, and

a compressing apparatus, coupled to the top plate and the bottom plate, that compresses the material between the top and bottom plates;

a viewing system, coupled to the arm, that views the compressed material in the measuring apparatus to provide information from which the quantity of material dispensed may be determined.

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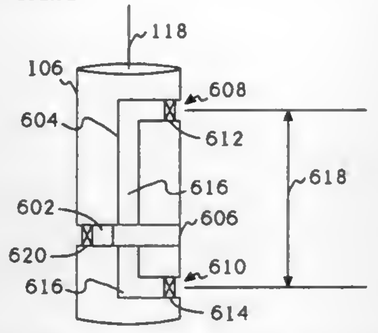
5,837,893
METHOD FOR DETECTING PRESSURE MEASUREMENT DISCONTINUITIES CAUSED BY FLUID BOUNDARY CHANGES

Wei-Chun Chu, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Jul. 14, 1994, Ser. No. 275,214

Int. Cl.^{6} E21B *47/06*

U.S. Cl. 73—152.52 **8 Claims**



1. A method for validating pressure test data obtained from a well, said method comprising the steps of:

(a) extending a pressure measurement instrument into said well to a predetermined depth in said well, said pressure measurement instrument having a pair of gauges, a first gauge for measuring absolute pressure, and a second gauge for measuring a differential pressure over a predefined differential measurement distance;

(b) periodically sending a signal to said pressure measurement instrument to initiate a measurement of pressure inside said well;

(c) receiving a set of measurements resulting from said signal sent in step (b), said set comprising an absolute pressure measurement from said first gauge and a differential pressure measurement from said second gauge;

(d) for each of said set of measurements obtained in step (c), displaying said absolute pressure measurement on a display device;

(e) for each of said set of measurements obtained in step (c), using said differential pressure to determine a type of fluid surrounding said pressure measurement instrument;

(f) when said type of fluid obtained in step (e) differs from a type of fluid determined from an immediately previous set of measurements, indicating a fluid boundary on said display device; and

(g) validating any discontinuities which may occur in said absolute pressure measurements by reference to said fluid boundary.

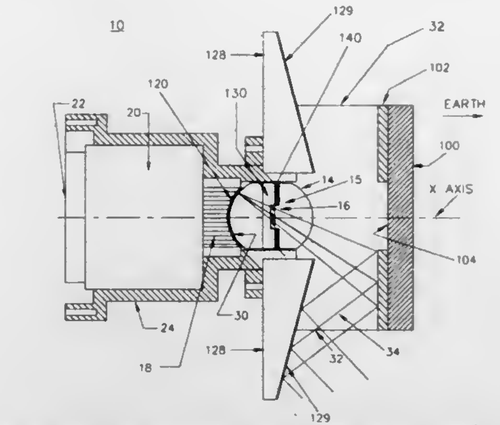
5,837,894
WIDE FIELD OF VIEW SENSOR WITH DIFFRACTIVE OPTIC CORRECTOR

Teresa A. Fritz, Eagan; James C. Lee, Minneapolis, both of Minn., and Douglas B. Pledger, Medford, Wis., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 9, 1995, Ser. No. 385,621

Int. Cl.^{6} G01C *21/02*

U.S. Cl. 73—178 R **19 Claims**



1. A three-axis attitude determination system for a spacecraft orbiting earth comprising:

a detector mounted on the spacecraft;

a diffractive optical sensor assembly coupled to said detector for focusing light from a wide field of view onto said detector, wherein the wide field of view includes the entirety of earth's ultraviolet limb and one of earth's terminator crossing and at least one background star, said attitude determination system determining rotation around pitch and roll axes of the spacecraft through imaging of the earth's ultraviolet limb, and rotation about a yaw axis of the spacecraft through comparison of the actual location and the predicted location from ephemeral data of one of the terminator crossing and the at least one background star, said diffractive optical sensor assembly, including:

a spherical lens having a diffractive element defined by a substrate having a diffractive pattern etched thereon.

5,837,895
VIBRATING GYROSCOPE INCLUDING A PIEZOELECTRIC SUBSTRATE POLARIZED BY A POLARIZATION INVERSION PHENOMENON

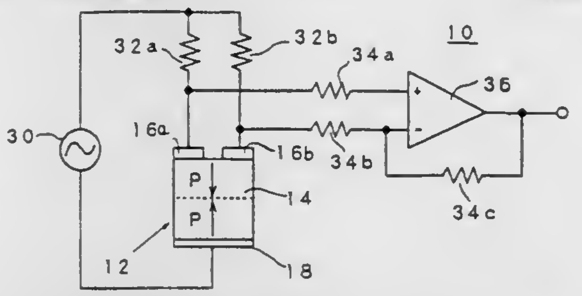
Katsumi Fujimoto, Toyama-ken, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Jun. 25, 1996, Ser. No. 670,346

Claims priority, application Japan, Jun. 27, 1995, 7-161096

Int. Cl.^{6} G01P *9/04*

U.S. Cl. 73—504.12 **13 Claims**



1. A vibrating gyroscope comprising:

a piezoelectric substrate polarized oppositely in a thickness direction, said piezoelectric substrate having first and second main surfaces, said piezoelectric substrate including a single layer having an upper portion and a lower portion, and the polarization directions of said upper and lower portions oppose each other;

two divided electrodes provided at said first main surface of said piezoelectric substrate;

a common electrode provided at said second main surface of said piezoelectric substrate;

drive means for applying a drive signal between said two divided electrodes and said common electrode to vibrate said piezoelectric substrate under a bending mode; and

detection means for detecting a signal generated between said two divided electrodes.

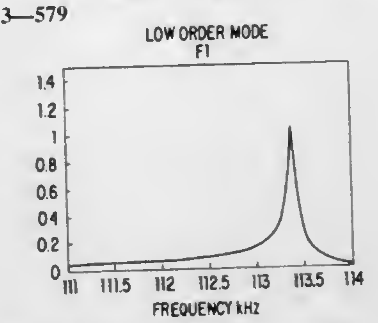
5,837,896
DETECTION OF DEFECTS USING RESONANT ULTRASOUND SPECTROSCOPY AT PREDICTED HIGH ORDER MODES

George Rhodes; James J. Schwarz, both of Albuquerque; David E. Thomas, Peralta, and Ming Lei, Albuquerque, all of N. Mex., assignors to Quasar International, Albuquerque, N. Mex.

Filed Aug. 23, 1995, Ser. No. 520,009

Int. Cl.^{6} G01N *29/12*

U.S. Cl. 73—579 **13 Claims**



2. A method of RUS (Resonant Ultrasound Spectroscopy) measurement comprising the steps of:

measuring resonant frequencies (f_n) of a plurality of parts having no defects which affect measured resonant frequencies (f_n) at low-order frequency modes;

determining relationships between the measured resonant frequencies (f_n), and dimensions of the parts having no defects;

predicting expected frequency of a high-frequency (f_h) resonant mode by calculating coefficients of said determined relationships from said measured resonant frequencies (f_n) at low-order frequency modes;

measuring by RUS the response of an unknown part at said high-frequency (f_h) mode;

accepting and rejecting said unknown part based upon criterion applied to said measured RUS response at the high-frequency (f_h) mode; and

wherein one of said relationships is in the mathematical form of:

$$f_h=F(D_1, D_2, \ldots f_1, f_2 \ldots)$$

where D is a dimension, f is frequency and F is the mathematical term denoting any function of.

5,837,897
TESTING VEHICLE TIRES

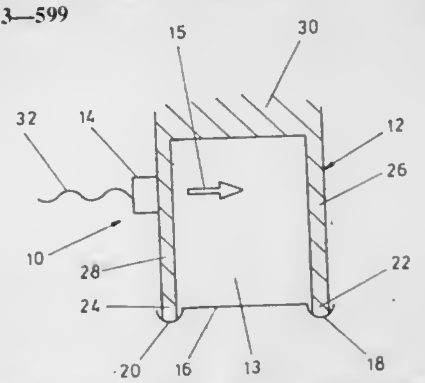
Barbara L. Jones, King'Lynn, and Thomas F. Wylie, March, both of United Kingdom, assignors to Sun Electric U.K. Limited, King's Lynn, England

Filed Jul. 25, 1996, Ser. No. 686,964

Claims priority, application United Kingdom, Jul. 27, 1995, 9515454

Int. Cl.^{6} G01N *29/20*

U.S. Cl. 73—599 **5 Claims**



1. A method of testing inflated vehicle tires to determine an internal physical characteristic thereof, comprising:

(a) transmitting an ultrasonic waveform from an external location with respect to the tire;

(b) subjecting the tire to be tested to said waveform;

(c) receiving a waveform from the tire at a location external to the tire;

(d) interpreting the received waveform by reference to the attenuation of the amplitude of said received waveform with time, to provide a measure of said internal physical characteristic; and

(e) calculating the air pressure in the tire on the basis of the characteristics of said received waveform.

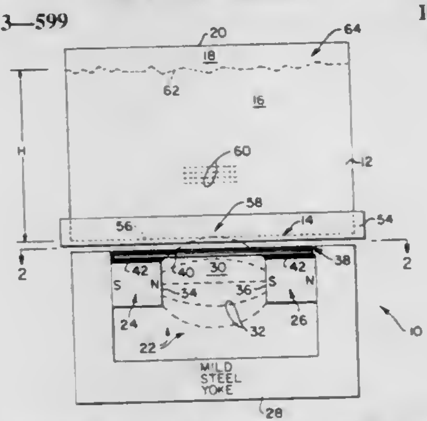
5,837,898
ELECTROMAGNETIC ACOUSTIC TRANSDUCER (EMAT) FOR ULTRASONIC INSPECTION OF LIQUIDS IN CONTAINERS

Daniel T. MacLauchlan, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New Orleans, La.

Division of Ser. No. 508,172, Jul. 27, 1995, Pat. No. 5,608,164. This application Aug. 29, 1996, Ser. No. 704,967

Int. Cl.^{6} G01N *29/20*

U.S. Cl. 73—599 **10 Claims**



1. An electromagnetic acoustic transducer (EMAT) assembly for ultrasonically inspecting liquid contents in a container to determine their condition, the container having a thin metal wall forming at least one wall of the container, comprising:

magnet means for producing a strong magnetic field across an air gap between portions of the magnet means, the magnet means causing a magnetic field to exist in the thin metal wall when the EMAT assembly is located proximate thereto;

U-shaped mild steel yoke means for providing a low reluctance magnetic field return path for the magnetic field;

flexible eddy current coil means, placed above and spaced from the magnet means by spacer means, for receiving an RF toneburst signal of known amplitude and frequency to generate a Lorentz force in the thin metal wall causing it to vibrate and launch ultrasonic compressional waves into the liquid contents, the flexible eddy current coil means having an arrangement of conductors such that electrical currents flowing through central conductors thereof all flow in a same direction, while electrical currents in outer conductors flow in an opposite direction with respect to those electrical currents flowing in the central conductors, to create ultrasonic compressional waves with uniform polarity, returning ultrasonic compressional waves striking the thin metal wall causing it to vibrate in the presence of the magnetic field produced by the EMAT transducer assembly and inducing a voltage in the eddy current coil of the EMAT transducer assembly; and

means for comparing an amplitude of the induced voltage in the eddy current coil representative of a degree to which the ultrasonic compressional waves were attenuated during their passage through the liquid contents against preestablished values of attenuation representative of known conditions of the liquid contents, the degree of attenuation being an indication of the condition of the liquid contents.

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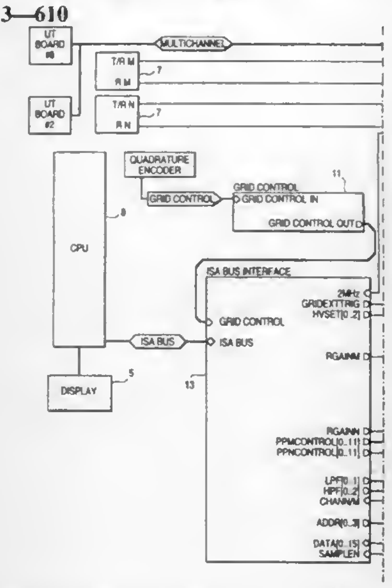
5,837,899
ULTRASONIC TESTING (UT) SYSTEM HAVING IMPROVED SIGNAL PROCESSING

Robert L. Dickerman, Northfield; Marc A. Camerlin, Westfield, both of Mass.; Stanley Klein, Cromwell, Conn.; Michel St. Martin, Springfield, and David S. Leonard, Feeding Hills, both of Mass., assignors to Combustion Enginineering, Inc., Windsor, Conn.

Filed Sep. 13, 1996, Ser. No. 714,926

Int. Cl.^{6} G01N *29/04*

U.S. Cl. 73—610 **25 Claims**



1. An ultrasonic testing system for compressing digital data, comprising:
- a pulsing circuit for stimulating an ultrasonic transducer with a voltage signal and for receiving an analog data signal from said transducer;
- a timing circuit for defining acquisition intervals;
- an analog-to-digital converter for converting said analog data signal into digital data at said acquisition intervals;
- a counter circuit for defining user-selected groups of digital data samples;
- a peak detector circuit for acquiring a peak value of said digital data within each of said groups of digital data samples; and
- a memory for storing only the peak values of said digital data one from each of said groups of digital data samples, whereby said digital data is compressed to said peak values.

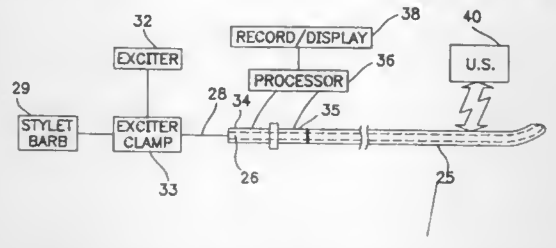
5,837,900
SYSTEM AND METHOD FOR DETECTING METAL ION OXIDATION IN PACING LEAD

David Lipson, Shoreview, Minn., assignor to Medtronic Inc, Minneapolis, Minn.

Filed Jun. 21, 1996, Ser. No. 670,793

Int. Cl.^{6} G01H *11/06;* **A61N** *1/00;1/362*

U.S. Cl. 73—661 **16 Claims**



1. A system for detecting MIO degradation in a bipolar pacing lead, said lead having two conductors and a lumen extending substantially therethrough, comprising:
- a stylet of predetermined length, at least a portion of said stylet being inserted within said lumen and a proximal portion remaining outside of said lead lumen;
- vibration driving means for vibrating said lead, said vibration means further comprising connecting means for connecting to said stylet proximal portion so as to vibrate said stylet; and
- sensing means for sensing signals across said two conductors, whereby noise attributable to MIO degradation can be determined from said sensed signals.

5,837,901
RECONFIGURABLE SUPPORTING FIXTURE, PARTICULARLY FOR A MEASURING MACHINE, AND RELATIVE CONFIGURATION METHOD

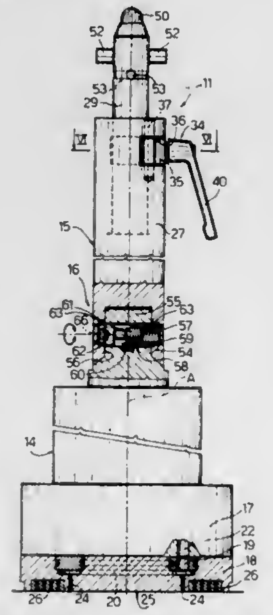
Domenico Sola, Rivalta, and Pasqualino Poggi, Moncalieri, both of Italy, assignors to Dea-Brown & Sharpe S.p.A., Italy

Filed Mar. 5, 1997, Ser. No. 811,216

Claims priority, application Italy, Mar. 5, 1996, TO96A0161

Int. Cl.^{6} G01B *5/20*

U.S. Cl. 73—856 **10 Claims**



1. A reconfigurable fixture (**10**) for positioning and supporting parts on a machine (**1**) comprising a reference surface (**5**) and a movable unit (**3**), particularly a measuring machine; said fixture (**10**) comprising:
- at least one reconfigurable supporting element (**11**) comprising a first portion (**14**) positionable on said reference surface (**5**), and a second portion (**29**) positionable with respect to said first portion (**14**) in a direction (A) perpendicular to said reference surface (**5**) to adjust the overall height of said supporting element (**11**); and
- a positioning tool (**13**) movable by said movable unit (**3**), and cooperating with said first portion (**14**) of said supporting element (**11**) to position the first portion (**14**) on said reference surface (**5**);
- characterized in that said supporting element (**11**) comprises at least one intermediate body (**27**) supporting said second portion (**29**) and forming, with the second portion (**29**), a column (**15**) adjustable in height; releasable connecting means (**54**) interposed between said first portion (**14**) and said intermediate body (**27**) for connecting and disconnecting said intermediate body (**27**) from said first portion (**14**); and adjusting means (**34**) for adjusting the position of said second portion (**29**) with respect to said intermediate body (**27**).

5,837,902
CROSS CORRELATION FLUID FLOW METER

Anthony Frank Veneruso, Ville D'Avray, France, and Songming Huang, Hardwick, England, assignors to Schlumberger Technology Corporation, Sugar Land, Tex.

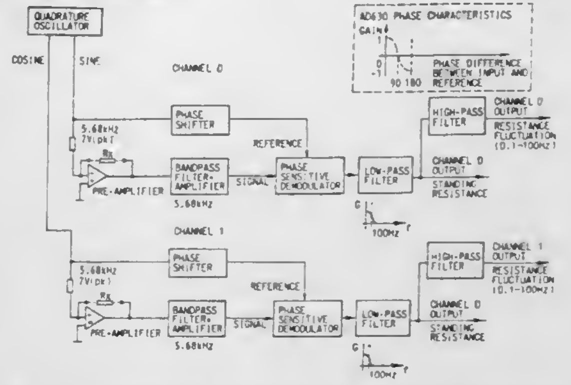
PCT No. PCT/GB93/02599, § 371 Date Aug. 29, 1995, § 102(e) Date Aug. 29, 1995, PCT Pub. No. WO94/17374, PCT Pub. Date Aug. 4, 1994

PCT Filed Dec. 20, 1993, Ser. No. 495,536

Claims priority, application United Kingdom, Jan. 29, 1993, 9301763

Int. Cl.^{6} G01F *1/712*

U.S. Cl. 73—861.06 **19 Claims**



10. A cross correlation fluid flow meter for measuring the rate of flow of a fluid in an upstream to downstream direction, comprising:
- a body having a first sensor means and a second sensor means spaced a known distance in the upstream to downstream direction from said first sensor means,
- said first sensor means having a first transmitter means for transmitting a first electrical signal having a first phase and first frequency, as transmitted, and a first receiver means for receiving said first electrical signal and for providing a first indication of a first fluid property, and
- said second sensor means having a second transmitter means for transmitting a second electrical signal having a second phase and a second frequency, as transmitted, and a second receiver means for receiving said second electrical signal and for providing a second indication of a second fluid property, wherein said second phase is out-of-phase with said first phase,
- said first receiver means not being responsive to said second electrical signal, and said second receiver not being responsive to said first electrical signal,
- wherein a cross correlation of said first and second indications provides an indication of the rate of the fluid flow the fluid.

5,837,903
DEVICE FOR MEASURING EXHAUST FLOWRATE USING LAMINAR FLOW ELEMENT

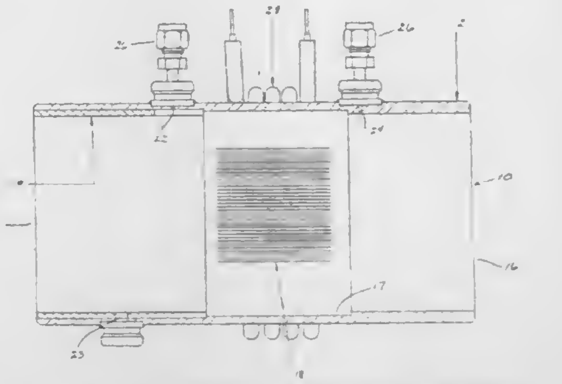
Jack Weigand, Lakewood, Ohio, assignor to The Scott Fetzer Company Inc., Westlake, Ohio

Filed Sep. 22, 1995, Ser. No. 532,440

Int. Cl.^{6} G01F *1/34*

U.S. Cl. 73—861.42 **33 Claims**

1. An apparatus for measuring the exhaust gas flowrate from an internal combustion engine comprising:
- a body in fluid communication with said engine, wherein exhaust gas is enabled to flow therethrough;
- a capillary section housed within said body, wherein pressure of said exhaust gas is reduced as it flows through said capillary section;
- a pressure differential sensor operatively connected across said capillary section, wherein said pressure sensor outputs at least one pressure signal responsive to said pressure reduction, whereby said pressure signal is usable to calculate said exhaust gas flowrate;



- a temperature sensor positioned in said exhaust gas adjacent to said capillary section, and wherein said temperature sensor outputs at least one temperature signal responsive to a temperature of said exhaust gas;
- a computer, wherein said computer is in operative connection with said temperature sensor;
- a clock in operative connection with said engine and said computer, wherein said clock is operative to measure an elapsed time from a start of said engine; and
- a memory in operative connection with said computer, wherein said memory contains data representative of said exhaust gas composition as a function of said elapsed time, and wherein said computer is operative to calculate a value corresponding to a viscosity of said exhaust gas as a function of said memory data and said temperature signal.

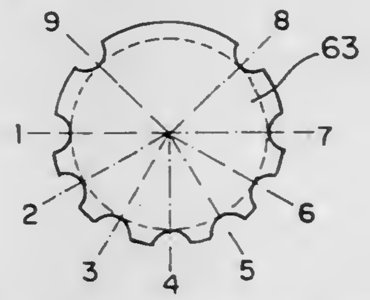
5,837,904
FLOWMETER TUBES AND METHOD OF INSTALLING THEM

Gary K. Porter, Warrington, Pa., assignor to Porter Instrument Company, Inc., Hatfield, Pa.

Filed Mar. 28, 1996, Ser. No. 623,418

Int. Cl.^{6} G01F *1/24*

U.S. Cl. 73—861.56 **8 Claims**



1. A method of preventing the inserting of a wrong flowmeter tube into an anesthesia machine comprising
- taking an elongated glass tube,
- forming it into a flowmeter tube with an upper end portion connected to a lower end portion by a middle portion with an inside surface,
- forming the upper end portion and the lower end portion into a bell shape,
- forming a taper (**59**) on the inside surface (**43***d*) of the middle portion (**43***c*) so that the inside surface (**43***d*) of the middle portion (**43***c*) is wider at the upper end portion than at the lower end portion,
- placing a float (**45**) inside the tube (**43**),
- placing graduated markings (**61**) on or adjacent to the tube (**43**) which measure the position of the float (**45**) in the tube (**43**),
- forming a selected number of longitudinal ridges at selected places on the inside surface of an end portion of the tube to form a ridged end portion,
- attempting to insert said ridged end portion of the tube onto a socket pin mounted on a housing of the anesthesia machine,

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seating the tube on the socket pin if the socket pin exterior surface has grooves corresponding to the number and placement of said tube ridges,

and rejecting the tube by the socket pin if the socket pin exterior surface does not have grooves corresponding to the number and placement of said ridges on the flowmeter tube since the lack of said correspondence indicates that the tube is the wrong tube for the socket pin.

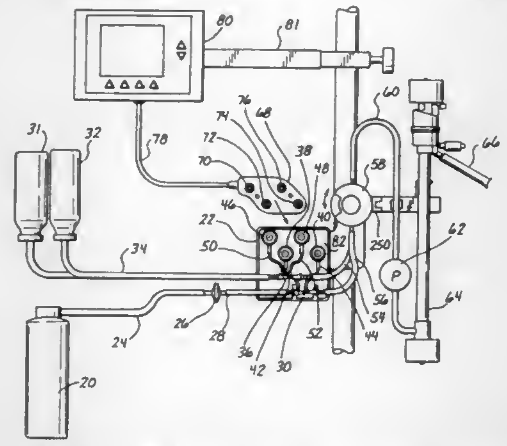
5,837,905
CARDIOPLEGIA MONITORING SYSTEM, FLOW CELL CASSETTE, VARIABLE RATIO VALVE, AND METHOD

Brian Strauss, Mission Viejo; George W. White, Lake Forest, and Kenneth M. Galt, Seal Beach, all of Calif., assignors to Gish Biomedical, Inc., Irvine, Calif.

Filed Jul. 24, 1996, Ser. No. 690,259

Int. Cl.^{6} A61M *37/00*

U.S. Cl. 73—861.63 **8 Claims**



1. An assembly for administering cardioplegia comprising in combination:

at least one venturi flow cell for blood;

at least one venturi flow cell for crystalloid solution;

at least one means for connecting a crystalloid solution for flow through said at least one venturi flow cell for crystalloid solution;

at least one means for connecting a source of blood for flow through said at least one venturi flow cell for blood;

each said at least one venturi flow cell for blood and said at least one venturi flow cell for crystalloid solution comprising:

a tubular member;

a constriction formed within said tubular member to divide said tubular member into a convergent portion and a divergent portion;

a first port in communication with said convergent portion of said tubular member;

a second port in communication with said constriction;

at least one transducer connected to said first port and to said second port for detecting a pressure drop between said first port and said second port respectively when crystalloid solution is caused to flow through said at least one venturi flow cell for crystalloid solution and when blood is caused to flow through said at least one venturi flow cell for blood; and,

means for self-venting of gases from said transducers comprising:

at least one second chamber;

at least one gas permeable membrane dividing said at least one second chamber into at least one upper cavity and at least one lower cavity;

at least one opening within said at least one upper cavity for self-venting gases to ambient;

at least one conduit means disposed between said at least one lower cavity of said at least one second chamber and said at least one first compartment of said at least one first chamber; and,

at least one one-way valve disposed within said conduit means for passage of gases from said at least one first compartment of said at least one first chamber, through said at least one one-way valve into said at least one lower cavity of said at least one second chamber for self-venting through said at least one gas permeable membrane.

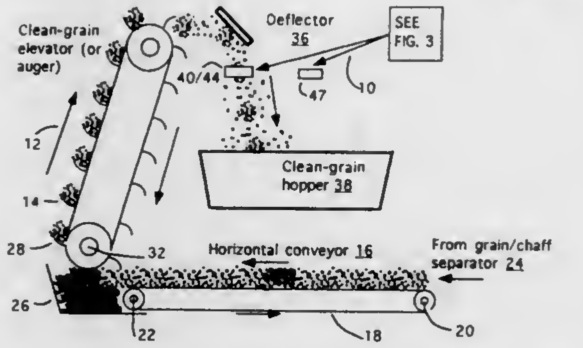
5,837,906
APPARATUS AND METHOD FOR MEASURING THE REAL-TIME VOLUMETRIC FLOW RATE OF GRAIN IN A FIELD HARVESTER USING ACOUSTICAL TRANSDUCERS

John P. Palmer, Pomona, Calif., assignor to Ludwig Kipp, Palm Beach, Fla.

Filed Jun. 9, 1997, Ser. No. 871,443

Int. Cl.^{6} G01F *1/30*

U.S. Cl. 73—861.73 **10 Claims**



1. An apparatus for measuring the real-time volumetric flow rate of grain in a field harvester, comprising:

a transmitting acoustical transducer for transmitting acoustic signals at a selected frequency, said transmitting acoustical transducer being disposed with respect to a flow path of an airborne stream of grain during operation of said harvester so as to transmit said acoustic signals through said airborne stream of grain, whereby said transmitted acoustic signals are attenuated when passing through said airborne stream of grain;

a receiving acoustical transducer for receiving said attenuated acoustic signals after passing through said flow path of said airborne stream of grain; and

computing means in communication with said transmitting acoustical transducer and said receiving acoustical transducer for measuring the real-time volumetric flow rate of said airborne stream of grain as a function of said attenuation of said transmitted acoustic signals and a flow rate calibration characteristic dependent upon the moisture content of said airborne stream of grain, whereby the real-time volumetric flow rate f is determined in accordance with the equation: $A=100*(1-e^{-f/f_o})$, where A is the percent attenuation and fo is a constant dependent upon said calibration characteristic.

5,837,907
METHOD OF TIGHTENING THREADED MEMBERS

Tadahiro Ohmi, Sendai; Eiji Ideta, Osaka; Hiroyuki Fukuda, Osaka; Keiji Hirao, Osaka; Tsutomu Shinohara, Osaka; Michio Yamaji, Osaka; Hiroshi Morokoshi, Osaka, and Tetsuya Kojima, Osaka, all of Japan, assignors to Fujikin Incorporated, Osaka, Japan

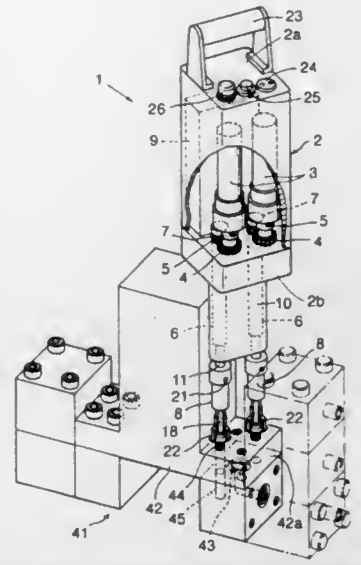
Filed May 22, 1997, Ser. No. 862,292

Int. Cl.^{6} G01L *3/06*

U.S. Cl. 73—862.23 **11 Claims**

1. A threaded member tightening method for tightening a plurality of threaded members by drive means, comprising the steps of:

tightening each of the threaded members while detecting the amount of tightening of each respective threaded member and the tightening torque thereof,



stopping tightening upon the amount of tightening of each threaded member reaching a specified value based on the time when the tightening torque reaches a predetermined value, and

considering each threaded member to be properly tightened when the tightening torque of the threaded member is within a predetermined range and the difference in tightening torque between the threaded members is within a predetermined range.

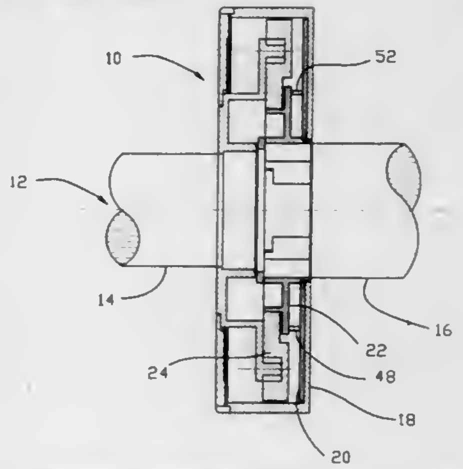
5,837,908
TORQUE AND POSITION SENSOR

Harris Ng, Royal Oak, Mich.; Lawrence T. Rupert, Carthage, and Mohan J. Devsam, Hamilton, both of Ill., assignors to Methode Electronics, Inc., Chicago, Ill.

Filed Aug. 22, 1996, Ser. No. 701,280

Int. Cl.^{6} G02L *3/02*

U.S. Cl. 73—862.326 **15 Claims**



12. A combination torque and position sensor for measuring the torque applied to, and the position of, a rotatable shaft, said combination sensor comprising:

a fixed disc formed of a non-conducting insulating material;

a circular resistive position track and a circular resistive torque track disposed around a surface of said disc;

a first input voltage supply contact and a first ground contact in fixed relation to one another held in rotatable contact with said torque track; and

a torque signal output contact held in rotatable contact with said torque track and being disposed between said first voltage supply contact and said first ground contact such that torque applied to said shaft alters the relative position between said torque output contact and said first voltage supply and first ground contacts, said torque output contact providing an output voltage signal proportional to the amount of torque applied to said shaft;

a second input voltage supply contact and a second ground contact held in rotatable contact with said position track; and

at least one position signal output contact electrically connected said position track, said position signal output providing an output voltage signal proportional to the angular position of said shaft.

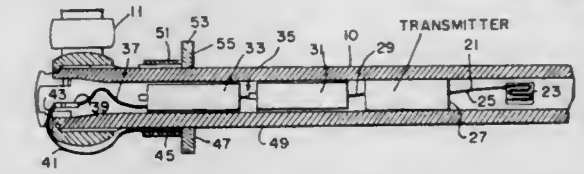
5,837,909
TELEMETRY BASED SHAFT TORQUE MEASUREMENT SYSTEM FOR HOLLOW SHAFTS

Stephen L. Bill, Brookline, N.H.; Wayne A. Pittman, Milpitas, Calif.; David P. Swartz, San Jose, Calif., and Allen A. Sweet, Alameda, Calif., assignors to Wireless Data Corporation, Mountain View, Calif.

Filed Feb. 6, 1997, Ser. No. 796,120

Int. Cl.^{6} G01L *3/10;* **G08C** *17/02*

U.S. Cl. 73—862.338 **26 Claims**



1. A method of sensing and telemetering torque on a hollow shaft comprising sensing torque strain inside a hollow shaft, providing power from a power supply within the hollow shaft, producing a torque signal proportional to sensed torque strain within the hollow shaft, producing a radio frequency signal within the hollow shaft, modulating the radio frequency signal with the torque signal within the hollow shaft, conducting the modulated signal to a rotating antenna mounted on the hollow shaft, broadcasting the modulated signal from the rotating antenna, receiving the modulated signal on a stationary antenna, directing the modulated signal to a stationary receiver, recovering the torque strain signal from the modulated signal in the receiver and providing an output from the receiver which is proportional to the sensed torque strain inside the hollow shaft.

5,837,910
METHOD AND A DEVICE FOR TWO-SHAFT FORCE MEASUREMENT AND ITS APPLICATION TO THE DETERMINATION OF TENSILE FORCE IN A CONTINUOUS WEB

Jan Beijbom, and Jarl Sobel, both of Västerås, Sweden, assignors to Asea Brown Boveri AB, Västerås, Sweden

PCT No. PCT/SE95/01422, § 371 Date May 16, 1997, § 102(e) Date May 16, 1997, PCT Pub. No. WO96/17233, PCT Pub. Date Jun. 6, 1996

PCT Filed Nov. 28, 1995, Ser. No. 836,107

Claims priority, application Sweden, Nov. 29, 1994, 9404108

Int. Cl.^{6} G01L *5/10*

U.S. Cl. 73—862.473 **7 Claims**

1. A device for two-shaft measurement of a force comprising: a force-introducing part (4) with two force-measuring parts A and B for determining forces F_A and F_B, the force being applied in a torque-free manner around a centre of force via a deflector roll (2) journalled in bearing brackets (3) placed on the force-introducing part, and wherein the force-measuring parts, due to their built-in design, measure forces F_A and F_B in directions directed through angles $\pm\phi$ from a mean measurement direction midway between measurement directions $+\phi$ and $-\phi$ with ϕ being different from zero, wherein the force-measuring parts A and B are placed at a distance L on different sides of a plane parallel to the mean measurement direction and through said centre of force, wherein

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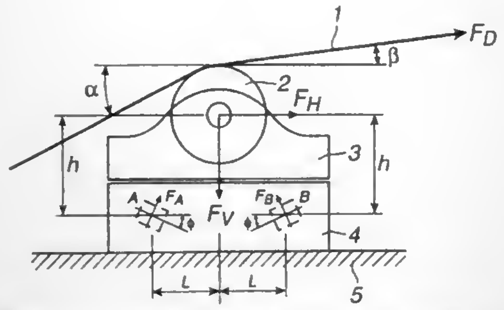


the force-measuring parts A and B are placed at a distance h on the same side of a plane perpendicular to the mean measurement direction and through said centre of force, and wherein the maximum value of the quotient between a force F_{VMM} perpendicular to the mean measurement direction and a force F_{MM} along the mean measurement direction is greater than L/h, the angle ϕ satisfying the relationship

$$\phi = \arctan\left(\frac{L}{h}\right).$$

5,837,911
ROTARY DAMPER FOR GENERATING DAMPING FORCE VARIABLE IN DEPENDENCE ON ANGULAR POSITION OF FALL BOARD OF KEYBOARD MUSICAL INSTRUMENT

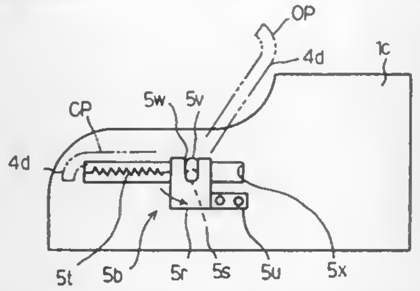
Satoshi Inoue, Hamamatsu, Japan, assignor to Yamaha Corporation, Shizuoka-ken, Japan

Filed May 21, 1997, Ser. No. 859,713

Claims priority, application Japan, May 30, 1996, 8-136411

Int. Cl.⁶ G10C ***3/02***

U.S. Cl. 84—179 **7 Claims**



1. A damper for a musical instrument, said instrument having a case structure and a fall board, the fall board rotatable in a first direction between a closed position and an open position and a second direction between the open position to the closed position, an intermediate position being located between said closed and open positions, said damper comprising:

a damper means connected to said fall board, for providing a first damping force as said fall board rotates in the first direction and a second damping force as the fall board rotates in the second direction opposite to said first direction, said first damping force being smaller than said second damping force, said damper means further including a first member and a second member, said first member being rotatably mounted relative to said second member; and

a change over means mounted to said case structure and to said damper means for permitting rotation between the first and second members of the damper means as said fall board travels between the closed position to the intermediate position in said first direction thereby providing said first damping force, and for permitting rotation between the first and second members of the damper means as said fall board travels between the intermediate position and the closed position in said second direction thereby providing said second damping force, and for locking said first and second members relative to each other between said intermediate position and said open position in both said first and second directions and causing said damper means to rotate relative to said change-over means thereby providing a third damping force, wherein said third damping force is larger than said first damping force and smaller than said second damping force.

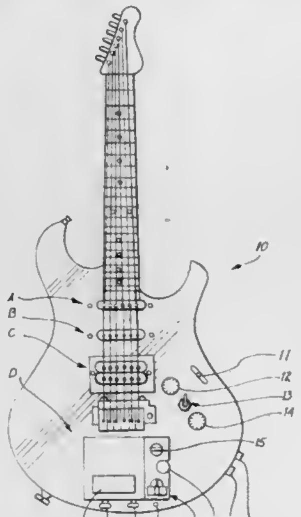
5,837,912
APPARATUS AND METHOD FOR RECORDING MUSIC FROM A GUITAR HAVING A DIGITAL RECORDED AND PLAYBACK UNIT LOCATED WITHIN THE GUITAR

Chris S. Eagen, 670 Eldorado Ln., Las Vegas, Nev. 89123

Filed Jul. 28, 1997, Ser. No. 901,714

Int. Cl.⁶ G10D ***1/08;3/00;*** **G10H** ***1/32***

U.S. Cl. 84—267 **20 Claims**



1. An apparatus for recording long lasting, high quality, noise-free musical sounds generated by a hand-held, portable musical instrument selected from a class of guitars including electric, acoustic and classical guitars comprising in combination:

a guitar selected from a class of guitars including electric, acoustic and classical guitars and having means for generating analog type musical sounds that are created by a user of said guitar; and

digital recording and playback means located on and part of said guitar and electronically connected directly to said means for generating analog type musical sounds for converting said analog type musical sounds of said guitar to digital type musical sounds of said guitar to produce long lasting, high quality, noise-free digitally recorded musical sounds of only said guitar and for playback of the digitally recorded musical sounds of only said guitar.

5,837,913
PLECTRUM HOLDER AND METHOD FOR USING THE SAME

John E. Newman, 358 Union St., Ashland, Mass. 01721

Filed Aug. 16, 1996, Ser. No. 698,974

Int. Cl.⁶ G10D ***3/00***

U.S. Cl. 84—329 **1 Claim**

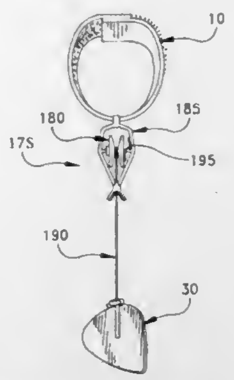
1. Apparatus for holding a plectrum in graspable relation to a hand, comprising:

means for engaging a portion of said hand;

a resilient member having a distal end and a proximal end wherein said resilient member comprises a spring-biased reel disposed on a yoke, having a tether line fastened to said spring-biased reel and said plectrum,

said proximal end of said resilient member including means for fastening said resilient member to said hand engaging means so that said resilient member projects outwardly from said hand whereby said distal end of said resilient member is positioned in spaced-relation to said hand; and

means for fastening said distal end of said resilient member to said plectrum.



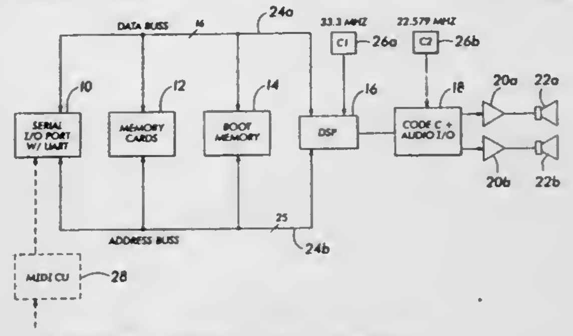
5,837,914
ELECTRONIC CARILLON SYSTEM UTILIZING INTERPOLATED FRACTIONAL ADDRESS DSP ALGORITHM

Gregory L. Schwartz, Spinnerstown, and Mark Hofmeister, Collegeville, both of Pa., assignors to Schulmerich Carillons, Inc., Sellersville, Pa.

Filed Aug. 22, 1996, Ser. No. 701,696

Int. Cl.⁶ G01H ***1/06;7/00***

U.S. Cl. 84—622 **12 Claims**



1. An electronic carillon system, comprising:

(A) a digital signal processor (DSP);

(B) memory means, operatively coupled to said DSP, for memorizing program code for controlling the operation of the DSP in carrying out pre-programmed algorithms; and

(C) output means, operatively coupled to said DSP, for converting the output of the DSP into audible sound;

wherein said system is programmed, via said DSP and program code, to construct bell sounds spanning all notes within a prescribed number of octaves on the basis of a limited number of pre-recorded samples of notes within a single octave.

5,837,915
ELECTRONIC DRUM HAVING FLAT SOUND PRODUCING CHARACTERISTICS

Yuichiro Suenaga, Shizuoka, Japan, assignor to Yamaha Corporation, Japan

Filed Mar. 11, 1997, Ser. No. 816,062

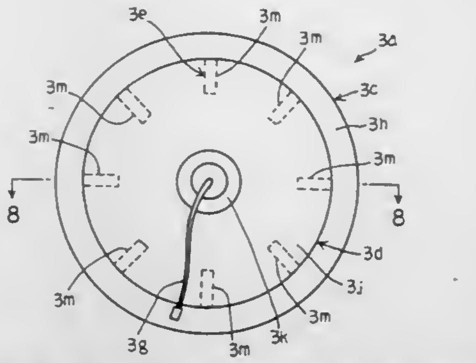
Claims priority, application Japan, Mar. 12, 1996, 8-054700

Int. Cl.⁶ G10H ***1/057;3/14***

U.S. Cl. 84—738 **6 Claims**

1. An electronic drum comprising:

a pad structure having a surface beaten by a player so as to generate vibrations therein;



a sensor unit including a sensor board formed of a material having a tangent delta representative of internal loss equal to or greater than 0.02 and a vibration sensor attached to said sensor board so as to convert said vibrations to an electric signal;

a vibration absorbing member provided between said pad structure and said sensor unit for propagating said vibrations to said sensor board; and

an electric sound generating system connected to said vibration sensor for producing an electric drum sound on the basis of said electric signal.

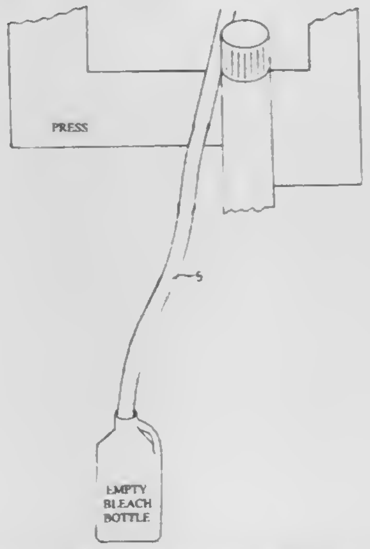
5,837,916
NOAKES SPENT PRIMER DISCHARGE HOLE APPARATUS

Everett Noakes, Jr., 3216 Upper Fords Crk Rd., Orofino, Id. 83544

Filed Oct. 30, 1996, Ser. No. 688,947

Int. Cl.⁶ F42B ***33/10;33/02***

U.S. Cl. 86—37 **1 Claim**



1. The method for facilitating the removal of spent primers from a press having a ram, the method comprising the steps of:

punching a primer hole at a location that is ¼ inch from the front of the location of a ram hole of the press;

drilling the primer hole to a diameter of ⅜ inch by using a drill bit, angling said drill bit at an angle of eight degrees, said angle being measured from the base of the press to the front of the press, and drilling entirely through the press at said angle,

drilling the primer hole to a larger diameter of ½ inch, said larger diameter extending downwards to a depth of ¾ inch as measured from the top of the primer hole, leaving the remainder of the primer hole at the ⅜ inch diameter;

inserting a piece of thin wall tubing into the primer hole from the bottom of the press upwards towards the top of the primer hole;

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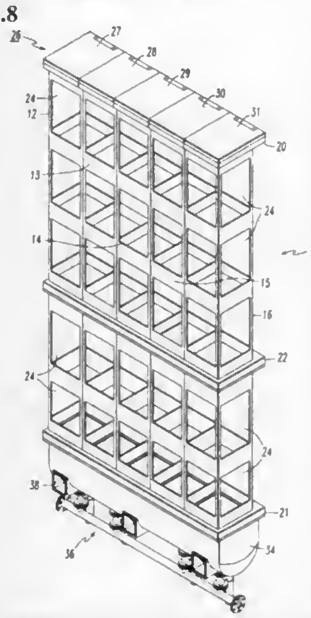
attaching a length of plastic tubing to said thin wall tubing; and extending a lower end of said plastic tubing into a receptacle.

5,837,917
COOLING APPARATUS FOR A MISSILE LAUNCHER SYSTEM

Donald A. Macnab, San Jose, and James P. Wei, Fremont, both of Calif., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Jun. 24, 1997, Ser. No. 881,641
Int. Cl.⁶ F41F *3/04*

U.S. Cl. 89—1.8 **14 Claims**



1. Cooling apparatus for a missile launcher system which has a plurality of cells, some or all of which have a respective missile to be launched, said cells having their lower ends connected to a plenum, comprising:

(A) a plurality of impingement plates each respectively located in the path of exhaust gas of a missile to be launched;
(B) a water injection nozzle disposed beneath each said impingement plate and operable to spray water into said plenum during a launch of said missile to cool said exhaust gas and said plenum; and
(C) water supply means for supplying water to said water injection nozzles.

5,837,918
WEAPONS SYSTEM FOR A LASER

Gunther Sepp, Ottobrunn, Germany, assignor to Daimler-Benz Aerospace AG, Ottobrunn, Germany

PCT No. PCT/EP95/04588, § 371 Date Oct. 29, 1996, § 102(e) Date Oct. 29, 1996, PCT Pub. No. WO96/18912, PCT Pub. Date Jun. 20, 1996

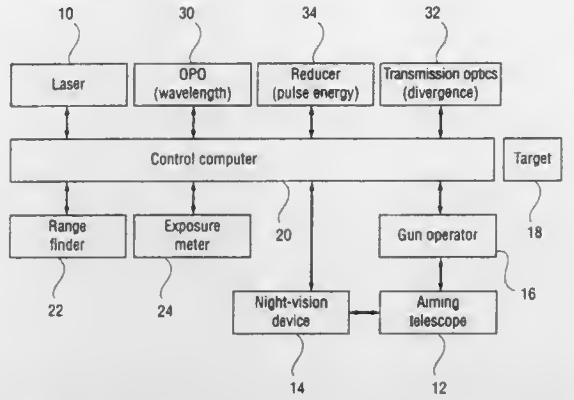
PCT Filed Nov. 22, 1995, Ser. No. 696,863

Claims priority, application Germany, Dec. 15, 1994, 44 44 636.5

Int. Cl.⁶ B64D *1/04;* F41C *27/00*

U.S. Cl. 89—1.11 **19 Claims**

1. A weapons system, comprising:
a dazzling laser with directed laser radiation operating in the visible range, which is integrated in a carrier;
an aiming device connected to the carrier;
a range finder;
a portable power supply unit;
measuring means for determining target reconnaissance parameters;
adjustment means for adjusting the laser in terms of beam divergence, energy to be emitted, and irradiation time; and



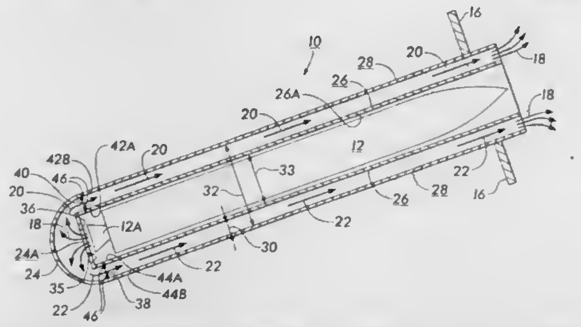
a control computer for receiving target reconnaissance parameters with respect to a target subject and the environment, the control computer calculating the laser parameters of beam divergence, number of pulses or single pulse, pulse energy necessary for the reversible dazzling of the eye on the basis of the target reconnaissance parameters and automatically presetting and regulating the resulting laser power and the exposure time of the continuous laser.

5,837,919
PORTABLE LAUNCHER

Jon J. Yagla, King George; Richard E. Miller, Jr., Fredericksburg; Robert W. Lowery, King George, and John W. Powers, Falls Church, all of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 5, 1996, Ser. No. 772,054
Int. Cl.⁶ F41F *3/052*

U.S. Cl. 89—1.816 **2 Claims**



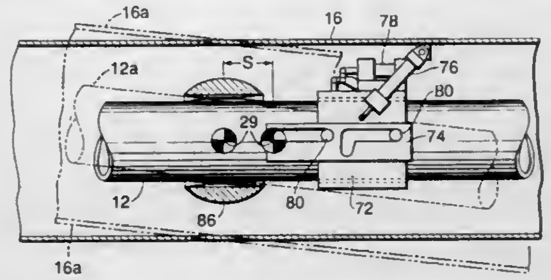
1. A launcher having means for collecting and dispersing exhaust gases of a launchable device having an exhaust outlet, said means comprising:
a first enclosure having a wall that extends longitudinally and has interior and exterior surfaces with the interior surface encompassing and housing said launchable device;
support means comprising a plurality of slats each of which has an I-beam cross section and which serves as an I-beam member for mating with exterior and interior surfaces, said support means having first and second faces separated from each other by a first predetermined distance with one face thereof being affixed to said exterior surface of said first enclosure;
a second enclosure having a wall that extends longitudinally and has interior and exterior surfaces with the interior surface affixed to the other face of said support means; and
a cup having means for arranging a port at its central portion that is in operative relationship with said exhaust outlet, said cup having a rim that mates with said wall of said second enclosure.

5,837,920
BREAK ACTION CANNON

Richard W. Staiert, Coon Rapids, and James E. Wildman, Plymouth, both of Minn., assignors to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 485,167, Jun. 7, 1995, abandoned, which is a division of Ser. No. 239,779, May 9, 1994, Pat. No. 5,591,932. This application Oct. 24, 1996, Ser. No. 736,304
Int. Cl.⁶ F41A *9/45*

U.S. Cl. 89—7 **12 Claims**



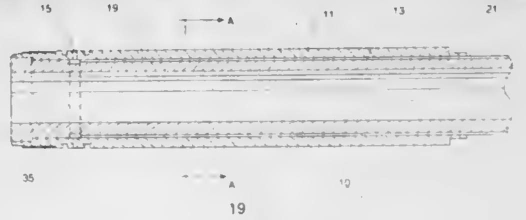
1. A gun system comprising a propellant charge in conjunction with a combuster housing to accelerate a projectile in a gun tube further comprising:
a breech end of said gun tube integrated with the combuster housing;
an internal propellant charge supply system contained in the combuster housing;
an external propellant charge supply in communication with said internal propellant charge supply system and disposed outside the combuster housing; and
the breech end of the gun tube being angularly and detachably integrated with said combuster housing and in communication therewith.

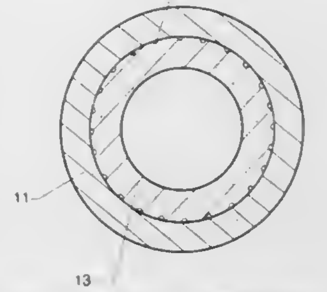
5,837,921
GUN BARREL WITH INTEGRAL MIDWALL COOLING

Christopher S. Rinaldi, Arlington, Va.; Jeffrey W. Haas, Troy, N.Y.; Edward J. Hyland, Clifton Park, N.Y., and James A. Neese, Albany, N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 761,155, Dec. 6, 1996, abandoned, which is a continuation of Ser. No. 441,551, May 18, 1995, abandoned, which is a continuation of Ser. No. 332,861, Oct. 11, 1994, abandoned. This application Mar. 17, 1997, Ser. No. 819,409
Int. Cl.⁶ F41A *13/12:21/24*

U.S. Cl. 89—14.1 **27 Claims**





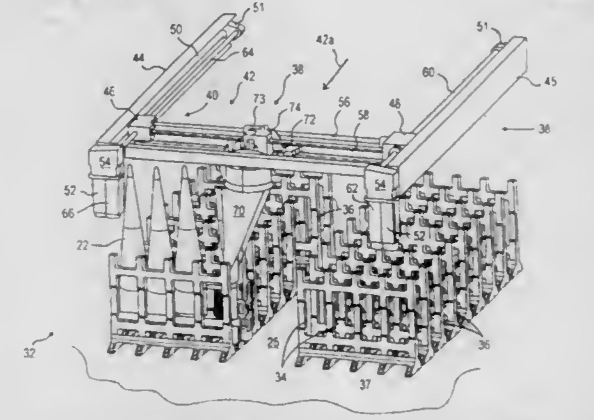
19. A gun barrel comprising in combination:
a cylindrically shaped jacket including a breech end, a discharge end, and a plurality of radial ports, said plurality of radial ports being disposed proximate to said breech end;
a hollow, cylindrically shaped liner fitting tightly within said jacket and extending beyond said jacket discharge end;
said liner including a circumferential annular space in communication with said radial ports;
a plurality of circumferentially spaced, longitudinal channels formed on an outer periphery of said liner, and extending underneath said jacket from said annual space of said liner toward said jacket discharge end;
said channels being in communication with said annular space and said plurality of radial ports, for allowing a cooling fluid to flow therethrough; and
said channels being stressed subsequent to assembling said jacket and said liner, for significantly enhancing the strength and fatigue life of said liner and ultimately the gun barrel.

5,837,922
AMMUNITION STORAGE AND RETRIEVAL SYSTEM

David Lord Maher, Burlington; Derek Albert Rodriguez, Milton, and Stephen Austin Jarvis, Colchester, all of Vt., assignors to General Dynamics Armament Systems, Inc., Falls Church, Va.

Filed Dec. 16, 1996, Ser. No. 768,063
Int. Cl.⁶ F41A *9/39*

U.S. Cl. 89—46 **35 Claims**



1. An ammunition storage and retrieval system comprising:
a magazine including a plurality of rows of cells, each row including plural cells, and each cell for storing a projectile in base-down vertical orientation;
a traverse mechanism including:
  a pair of elongated rails mounted in parallel, spaced relation above the magazine, and
  an elongated beam mounted at opposed ends by the rails for movement in first opposite directions;
a projectile loading head mounted by the beam for movement in second opposite directions along the beam, the loading head rotatably mounting a projectile receiver in suspended relation, the projectile receiver including projectile gripping arms; and
motors coupled to introduce input drive through the rails and the beam, to propel the beam in the first opposite directions to position the loading head into alignment with a selected one of the cell rows and to propel the loading head in the second opposite directions along the selected row and into and out of a projectile downloading position relative to a selected one of the cells in the selected row and coupled to introduce input drive to the loading head, to rotate the projectile receiver about a vertical axis and to articulate the gripper arms between projectile gripping and releasing positions.

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5,837,923

TRANSFER DEVICE FOR TRANSFERRING MODULES CONSTITUTING PROPELLANT CHARGES BETWEEN A STORAGE MAGAZINE AND A SYSTEM FOR LOADING THE MODULES INTO THE CHAMBER OF A LARGE-CALIBER GUN BARREL

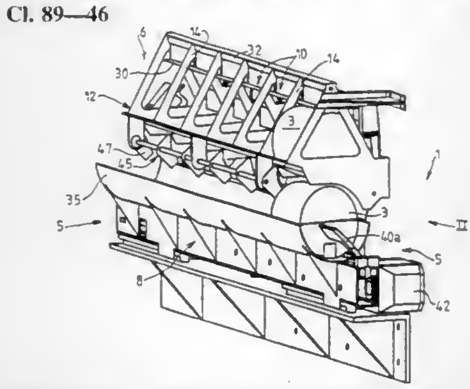
Christian Gay, La-Chapelle-Saint-Ursin; Christophe Nicolas, Bourges; François Roger, Le Subdray; Laurent Le Grand, Mehun-Sur-Yevre; Bernard Petit, Bourges; Didier Thebault, Bourges, and Jean-Luc Pelissier, Bourges, all of France, assignors to Giat Industries, Versailles, France

Filed Jan. 3, 1997, Ser. No. 778,476

Claims priority, application France, Jan. 5, 1996, 96 00072

Int. Cl.⁶ F41A *9/48*

U.S. Cl. 89—46 **18 Claims**



1. Apparatus for transferring modules that make up propellant charges from a storage magazine to a loading system for loading the modules into a chamber of a large-caliber gun barrel said apparatus including:

- first means for receiving n modules taken from said magazine, said first means comprising n compartments, with each compartment being delimited by two vertical end partitions, which partitions separate the modules from one another;
- second means for transferring each of the n modules to a conveyor; and
- control apparatus for controlling the second means so as to select transferal of a determined number of modules to the conveyor as a function of the quantity of modules making up the desired propellant charge for firing a projectile.

5,837,924

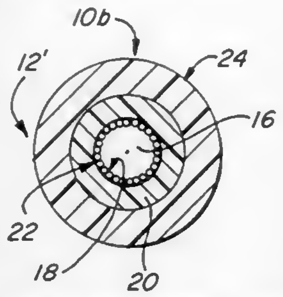
SIGNAL TRANSMISSION TUBE USING RECLAIM MATERIAL AND METHOD OF MANUFACTURE

Dennis K. Austin, Simsbury, Conn., assignor to The Ensign-Bickford Company, Simsbury, Conn.

Filed Nov. 21, 1995, Ser. No. 561,615

Int. Cl.⁶ C06C *5/04;* F42B *3/00*

U.S. Cl. 102—275.8 **14 Claims**



1. A method for manufacturing a signal transmission tube comprising:

- forming a hollow tube from a polymeric material that comprises reclaim polymeric material obtained by deactivating a preexisting signal transmission tube, the hollow tube having an interior surface, the method further comprising disposing a layer of reactive material on the interior surface of the hollow tube.

5,837,925

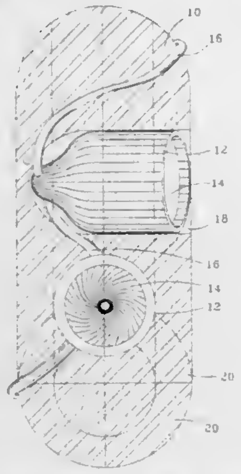
SHAPED CHARGE RETAINER SYSTEM

Sidney B. Nice, Olney, Ill., assignor to Western Atlas International, Inc., Houston, Tex.

Filed Dec. 13, 1995, Ser. No. 571,510

Int. Cl.⁶ F42B *1/02;* F42D *3/00;* C06C *5/04*

U.S. Cl. 102—310 **20 Claims**



1. An apparatus for retaining a shaped charge, ignitable by a detonator cord, within a housing which can be lowered into a well, comprising:

- a foam core insertable within the housing;
- a recess within said foam core for retaining the shaped charge in a selected position within the housing; and
- a hole in said foam core for permitting engagement between the detonator cord and the shaped charge.

5,837,926

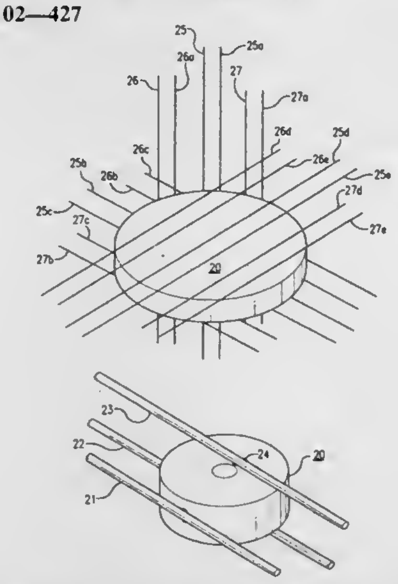
MINES HAVING TUNED PASSIVE ELECTROMAGNETIC REFLECTORS TO ENHANCE RADAR DETECTION

Donald E. Franklin, Springfield, Va., assignor to United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 7, 1996, Ser. No. 689,215

Int. Cl.⁶ F42C *22/02*

U.S. Cl. 102—427 **20 Claims**



1. A mine formed of explosive material surrounded by a case that is not resonant to electromagnetic waves with wavelengths within a given spectrum, further comprising:

- a first reflector set including at least a first resonant conducting structure tuned to reflect substantially all electromagnetic energy incident thereon at a first frequency within said spectrum and attached to said case.

5,837,927

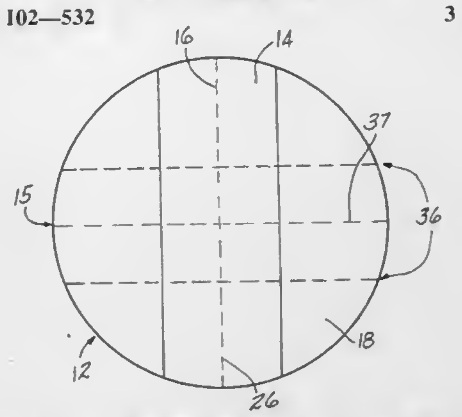
REVERSIBLE PELLET ORIENTING WAD FOR SHOTSHELL

Morris C. Buenemann, Jr., Florissant, Mo., assignor to Olin Corporation, East Alton, Ill.

Division of Ser. No. 798,081, Feb. 12, 1997. This application Jan. 26, 1998, Ser. No. 13,340

Int. Cl.⁶ F42B *7/08*

U.S. Cl. 102—532 **3 Claims**



1. A pellet orienting member having on a first side thereof a first groove arcuate in shape for supporting a first layer of shot pellets extending entirely across a first radial diameter with a radius of curvature at least equal to a radius of curvature of one shot pellet of said plurality of shot pellets; and

- having a second groove on a second side thereof extending along a second diameter.

5,837,928

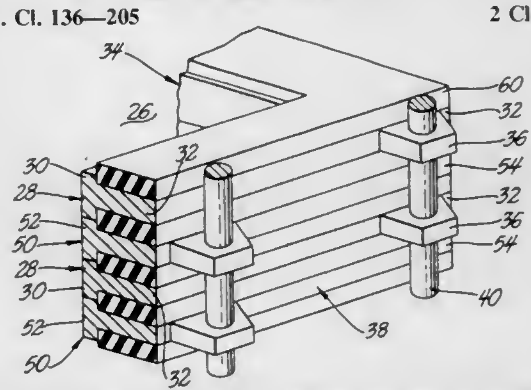
THERMOELECTRIC RADIATOR

Robert D. Zinke, 12374 Greenway, Sterling Heights, Macomb County, Mich. 48312

Filed Sep. 27, 1996, Ser. No. 725,221

Int. Cl.⁶ H01L *35/02;35/32*

U.S. Cl. 136—205 **2 Claims**



1. An improved thermoelectric radiator structure for converting a portion of heat generated by a prime mover into useful direct current including:

- a first plurality of spaced lamella, the first plurality of lamella formed of a first thermoelectric material;
- a second plurality of spaced lamella, the second plurality of lamella formed of a second thermoelectric material, the second plurality of lamella being interleaved with the first plurality of lamella, the first plurality of lamella and the second plurality of lamella being electrically bonded at junctures where the first plurality and second plurality of lamella are juxtaposed;
- a first electrical buss electrically connecting the first lamella of thermoelectric material, said first buss being connected to a positive electrical portion of the prime mover system; and
- a second buss electrically connecting the second plurality of thermoelectric material, said second buss being electrically connected to a negative portion of the prime mover electrical system; where the passage of a hot fluid over the junctures of the first and second lamella provides a current to the electrical system and extracts heat from the fluid flow.

5,837,929

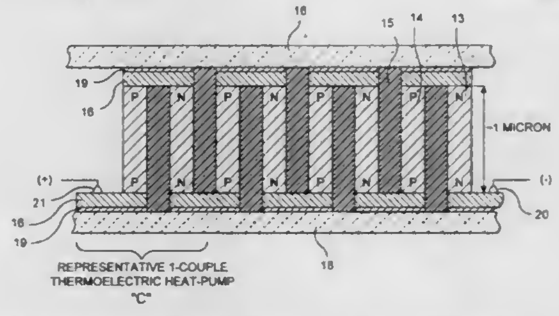
MICROELECTRONIC THERMOELECTRIC DEVICE AND SYSTEMS INCORPORATING SUCH DEVICE

Lonnie W. Adelman, San Diego, Calif., assignor to Mantron, Inc., San Diego, Calif.

Continuation of Ser. No. 270,432, Jul. 5, 1994, abandoned. This application Apr. 4, 1996, Ser. No. 627,347

Int. Cl.⁶ H01L *35/02;35/34*

U.S. Cl. 136—225 **37 Claims**



36. A microelectronic thermoelectric device comprising:

- a plurality of sections of semiconductor material of a first conductivity type and a plurality of second conductivity type, said sections being arranged so as to alternate from one another;
- said sections having cavities therebetween which are filled with an insulating material;
- a plurality of metal bridges interconnecting each opposite end of a section to an end of an adjacent different section of opposite conductivity type;
- sections of opposite conductivity type at free ends of said arrangement having metal leads attached thereto for the application of electrical energy; and
- wherein said sections have a height in the range approximately 1 micron.

5,837,930

PROPELLANTS, IN PARTICULAR FOR THE PROPULSION OF VEHICLES SUCH AS ROCKETS, AND PROCESS FOR THEIR PREPARATION

Johannes Maria Mul, Haarlem; Herman Feddle Rein Schöyer, Zoetermeer, and Ared Jean-Louis Schnorhk, Oegstgeest, all of Netherlands, assignors to Agence Spatiale Europeene, Paris, France, and Nederlandse Organisatile Voor Toegepastnatuurwetenschappelijk Onderzoek TNO, The Hague, Netherlands

PCT No. PCT/FR92/00628, § 371 Date Oct. 6, 1995, § 102(e) Date Oct. 6, 1995, PCT Pub. No. WO93/01151, PCT Pub. Date Jan. 21, 1993

PCT Filed Jul. 3, 1992, Ser. No. 347,349

Claims priority, application France, Jul. 4, 1991, 91 08382; Jul. 4, 1991, 91 08383; Jul. 4, 1991, 91 08384

Int. Cl.⁶ C06B *45/10*

U.S. Cl. 149—19.6 **5 Claims**

1. A solid propellant for the propulsion of aerospace vehicles comprising at least an oxidizer, a fuel and an energetic binder:

- wherein the oxidizer is ammonium nitroformate;
- wherein the fuel is selected from the group consisting of boron, aluminum and aluminum hydride; and
- wherein the energetic binder is selected from the group consisting of polyglycidyl nitrate, and polynitromethoxymethyloxetane.

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5,837,931

LIQUID OXIDIZER COMPOSITION PERPARATION

Rolf Sylvester Bruenner, Orangevale; Adolf Eduard Oberth, Fair Oaks; George Merrill Clark, Orangevale, and Arthur Katzakian, Jr., Elk Grove, all of Calif., assignors to Aerojet-General Corporation, Rancho Cordova, Calif.

Division of Ser. No. 616,571, Nov. 5, 1990, which is a continuation of Ser. No. 287,188, Dec. 20, 1988, abandoned. This application Jun. 22, 1992, Ser. No. 902,370

Int. Cl.^{6} C06B *21/00*

U.S. Cl. 149—109.6 **25 Claims**

1. A process for the preparation of an energetic formulation, said process comprising:

(a) combining oxidizers selected from the group consisting of ammonium nitrate, hydrazinium nitrate, hydroxylammonium nitrate and lithium nitrate to form a liquid oxidizer mixture selected from the group consisting of:

(i) ammonium nitrate and hydroxylammonium nitrate;

(ii) hydrazinium nitrate and hydroxylammonium nitrate;

(iii) ammonium nitrate, hydrazinium nitrate and hydroxylammonium nitrate; and

(iv) ammonium nitrate, hydrazinium nitrate and lithium nitrate; the components of each said mixture being in relative amounts such that the lowest temperature at which each said mixture is entirely liquid is within the range of about 30° C. or below;

(b) combining said liquid oxidizer mixture while in liquid form at a temperature within the range of about 30° C. or below with a fuel and a binder curable at a temperature within the range of about 30° C. or below, to form a curable liquid energetic composition; and

(c) casting and curing said curable liquid energetic composition at a temperature within the range of about 30° C. or below.

5,837,932

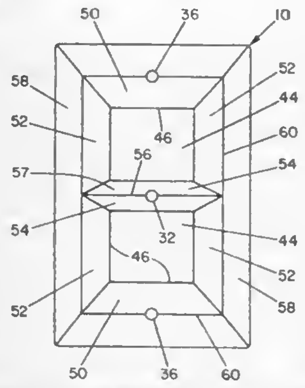
COVER PANEL FOR ELECTRICAL RECEPTACLES

Kent P. Carswell, Midland, and Chris E. Leitch, Victoria Harbor, both of Canada, assignors to Plug_EZE, Canada

Filed Nov. 24, 1997, Ser. No. 977,471

Int. Cl.^{6} H05K *5/03*

U.S. Cl. 174—66 **17 Claims**



1. A guide panel for attachment to a wall mounted, dual plug receiving electrical outlet, comprising:

a rectilinear body member having a wall face and a room face spaced from each other,

an outer peripheral wall around said body member and having opposed sides and ends, said peripheral wall forming a lip for engagement with a building wall,

an inner peripheral wall merging with said outer peripheral wall to form a border ridge portion and having a wall surface extending from said border ridge portion to engage said electrical outlet, a partition wall between said opposed ends, said partition wall having a ridge portion coextensive with and merging with said border ridge portion associated with said sides and forming diverging wall surfaces extending into engagement with the electrical outlet, and

a pair of plug receiving cavities defined by said inner peripheral wall and diverging wall surfaces and extending from said ridge portion and from said border ridge portion to said electrical outlet for receiving and guiding a plug into mating relationship with said electrical outlet.

5,837,933

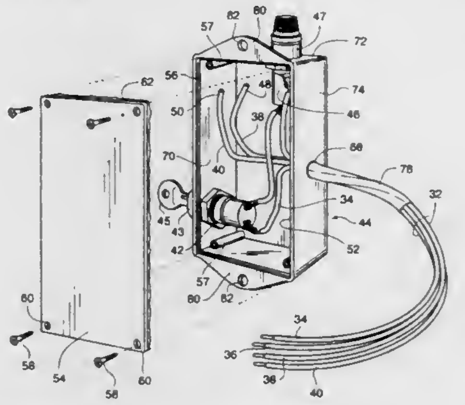
CORROSION PROOF KILL SWITCH

Kenneth H. Fligelman, 6556 NW. Highway, Chicago, Ill. 60631

Filed Aug. 7, 1997, Ser. No. 908,483

Int. Cl.^{6} H02G *3/08*

U.S. Cl. 174—50 **15 Claims**



1. A corrosion proof kill switch comprising:

a box-shaped container having an open side;

a switch mounted in a sealed manner in the container and having an operating portion extending outside the container;

a wire harness comprising at least two wires, extending into the container in a sealed manner;

a cover for the open side of the container, the cover being fixed to the container in said sealed manner over the open side of the container; and,

a fuse holder mounted in said container and having a fuse receiving portion extending out of said container.

5,837,934

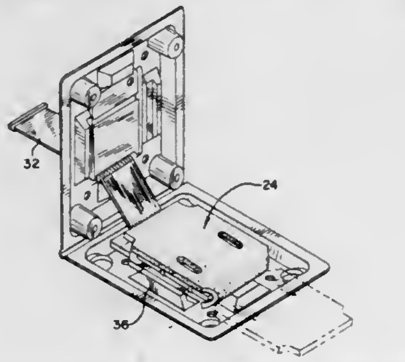
SHOCK INSULATFD CONTAINER FOR HARD DISK DRIVES

Theodore N. Valavanis, Waukegan, and Keith A. Novak, Cicero, both of Ill., assignors to Midway Games Inc., Chicago, Ill.

Filed Dec. 2, 1996, Ser. No. 759,071

Int. Cl.^{6} H02G *3/08*

U.S. Cl. 174—52.1 **2 Claims**



1. A shock resistant enclosure for mounting a hard disk drive comprising:

a) an insert formed of a shock absorbing foam sheet dimensioned to be folded about said hard disk drive on the top and bottom thereof;

b) a tray and lid formed of lightweight semi-rigid material configured to receive said hard disk drive and foam insert therein;

c) means for securing said lid to said tray to encapsulate the hard disk drive and foam insert, said means for securing said lid to said tray including a recessed leg socket formed in said tray and a corresponding leg formed in said lid so that said recessed leg socket and said corresponding leg frictionally engage when said tray and lid snap together; and

d) means for mounting the enclosure.

5,837,935

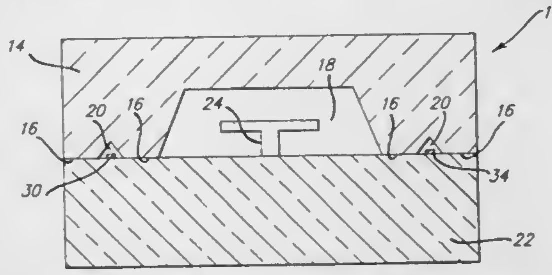
HERMETIC SEAL FOR AN ELECTRONIC COMPONENT HAVING A SECONDARY CHAMBER

Judd S. Carper, Colorado Springs, and David G. McIntyre, Monument, both of Colo., assignors to Ford Motor Company, Dearborn, Mich.

Filed Feb. 26, 1996, Ser. No. 606,929

Int. Cl.^{6} H01L *23/02*

U.S. Cl. 174—52.4 **12 Claims**



1. An encapsulating structure for a component comprising:

a cap having a base portion with a laterally extending wall, said wall having a thickness and an end, said wall defining a main chamber for housing the component therein;

a cavity formed in said end of said laterally extending wall defining a secondary chamber thereby dividing said end into a first area and a second area;

a base;

said first area and said second area each forming a hermetic seal with said base; and

detection means disposed within said cavity for detecting a failure of one of said seals.

5,837,936

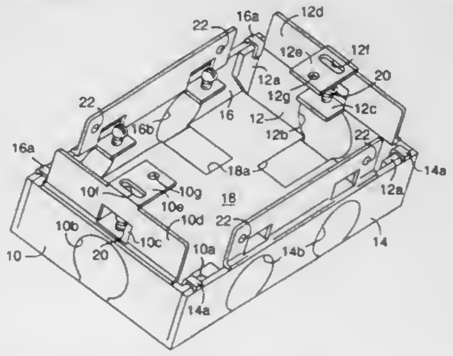
ELECTRICAL OUTLET BOX WITH BASE AND SNAP-ON COVER FOR USE WITH ELECTRICAL METAL TUBE (EMT)

Wilfred R. Rogers, Bristol, and Salvatore A. Cancellieri, Plainville, both of Conn., assignors to The Wiremold Company, West Hartford, Conn.

Filed May 28, 1997, Ser. No. 864,345

Int. Cl.^{6} H02G *3/18*

U.S. Cl. 174—65 R **20 Claims**



1. An electrical outlet box comprising:

a metal base having an upwardly open rectangular box configuration with opposed side and opposed end walls, and with a bottom wall integrally connected to said opposed side and end walls, said bottom wall having knock-out slots provided therein,

said side and end walls having knock-out openings aligned with said knock-out slots for receiving electrical tubing therein,

said side and end walls also having inwardly offset panels integrally connected to said opposed side and end walls,

said panels having inwardly projecting integrally formed lands spaced above said slots in said bottom wall,

said lands having threaded openings to receive set screws for securing the electrical tubing in said knock-out openings and slots.

5,837,937

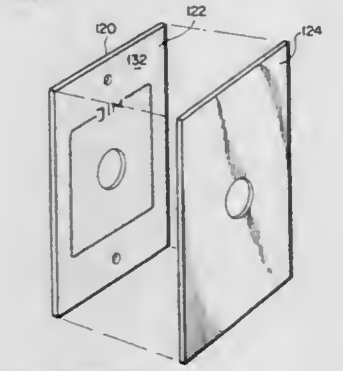
ELECTRICAL COVER PLATE

Michael J. Reese; G. Bruce Meisner, and John C. Conger, all of Phoenix, Ariz., assignors to Ultimate Presentation Systems, Inc., Tempe, Ariz.

Filed Mar. 24, 1997, Ser. No. 823,103

Int. Cl.^{6} H05K *5/03*

U.S. Cl. 174—66 **12 Claims**



1. A cover plate comprising:

a first layer of a transparent plastic material, said first layer having a top surface and a bottom surface; and

a second layer of material having a color, said second layer being laminated to said bottom surface of said first layer, said second layer having a portion selectively removed, said removed portion being filled with paint.

5,837,938

ELECTRIC CONNECTION BOX

Masami Sakamoto, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Jul. 18, 1997, Ser. No. 896,965

Claims priority, application Japan, Jul. 19, 1996, 8-190963

Int. Cl.^{6} H02G *3/14*

U.S. Cl. 174—66 **12 Claims**

1. An electric connection box, comprising:

a box body including a body base plate portion for mounting desired parts thereon and a body side wall portion provided around an outer periphery of said body base plate portion;

a cover including a cover base plate portion covering said body base plate portion of said box body and a cover side wall portion closely fitted on said body side wall portion;

a plurality of first T-shaped ribs projecting from said body side wall portion of said box body, each of said T-shape first ribs including a base portion connected to said body side wall portion, an interconnecting portion extending outwardly from

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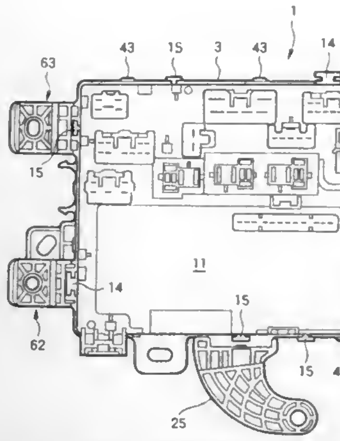


said base portion, and a plate portion formed on a distal end of said interconnecting portion in opposed relation to said base portion, said base portion and said plate portion defining fitting grooves formed therebetween on opposite sides of said interconnecting portion:

a plurality of second T-shaped ribs projecting from said body side wall portion, said second T-shaped ribs each including an interconnecting portion projecting from said body side wall portion, and a plate portion formed on a distal end of said interconnecting portion in opposed relation to said body side wall portion, said plate portion and said body side wall portion defining fitting grooves therebetween on opposite sides of said interconnecting portion;

a first fitting portion formed in said cover and being engageable with one of said plurality of first T-shaped ribs such that an other of said first T-shaped ribs is kept in an empty condition; and

a second fitting portion formed in said cover and being engageable with one of said plurality of second T-shaped ribs.

5,837,939
TREE RESISTANT CABLE

Gary S. Cieloszyk, Somerville, and Jinder Jow, Branchburg, both of N.J., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.
Filed Oct. 17, 1996, Ser. No. 733,689
Int. Cl.^{6} H01B *7/28*
U.S. Cl. 174—110 PM **8 Claims**

1. A cable comprising one or more electrical conductors or a core of electrical conductors, each electrical conductor or core being surrounded by an insulating composition, essentially free from any water tree growth inhibitors, comprising

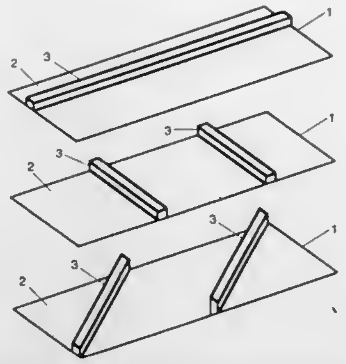
(i) a polyethylene having a density in the range of 0.860 to 0.940 gram per cubic centimeter; and, based on 100 parts by weight of component (i),

(ii) about 0.2 to about 1 part by weight of a homopolymer of propylene with the proviso that the insulating composition is extruded at a temperature below the melting point of the homopolymer of propylene.

5,837,940
CONDUCTIVE SURFACE AND METHOD WITH NONUNIFORM DIELECTRIC

J. Peter Moncrieff, 408 Mason Rd., Vista, Calif. 92084
Continuation of Ser. No. 441,523, May 15, 1995, abandoned. This application May 12, 1997, Ser. No. 854,583
Int. Cl.^{6} H01B *7/08*
U.S. Cl. 174—117 F **5 Claims**

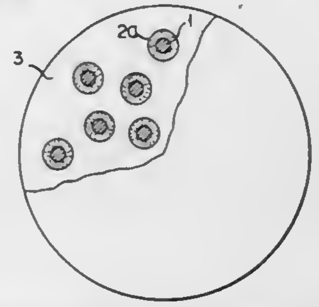
4. An electrical device comprising
a first conductor having a conductive surface,
and a further structure,



said further structure being selected from the group consisting of a first substructure and a second substructure,
said first substructure comprising a dielectric,
said conductive surface having a first portion proximate to a portion of said dielectric, said first portion having a first surface area,
said portion of said dielectric being substantially nonuniform with respect to said first surface area by virtue of having a characteristic selected from the group consisting of,
being less than 100 molecules thick in a direction substantially perpendicular to said first surface area,
and being present in a thickness wherein a first resistance measured through said thickness is less than one tenth a second resistance, of a substantially same substance as constitutes said dielectric, measured in bulk,
and any combination thereof;
said second substructure comprising a second conductor and a dielectric,
said second conductor comprising an electrode of a capacitor,
said second conductor being closely spaced to said first conductor,
said conductive surface having a first portion proximate to a portion of said dielectric, said first portion having a first surface area,
said portion of said dielectric being situated substantially outside the space between said first and second conductors,
said portion of said dielectric being substantially nonuniform with respect to said first surface area by virtue of having a characteristic selected from the group consisting of:
being present at a first substantial location with respect to said first surface area and absent at a second substantial location with respect to said first surface area,
and having a substantially different shape at plural distinct locations with respect to said first surface area,
and having a substantially different thickness at distinct locations with respect to said first surface area,
and being employed with substantially different dimensions at plural distinct locations with respect to said first surface area,
and having varying proximity to said first surface area at different substantial locations with respect to said first surface area,
and employing different material composition at distinct substantial locations with respect to said first surface area,
and being less than 100 molecules thick in a direction substantially perpendicular to said first surface area,
and being present in a thickness wherein a first resistance measured through said thickness is less than one tenth a second resistance, of a substantially same substance as constitutes said dielectric, measured in bulk,
and any combination thereof.

5,837,941
SUPERCONDUCTOR WIRE

Kyoji Tachikawa; Yasuzo Tanaka; Kaname Matsumoto, and Hisaki Sakamoto, all of Tokyo, Japan, assignors to Tokai University, and The Furukawa Electric Co., Ltd., both of Tokyo, Japan
Continuation of Ser. No. 651,257, Apr. 3, 1991, abandoned. This application Aug. 16, 1994, Ser. No. 291,355
Claims priority, application Japan, Aug. 9, 1989, 1-206292
Int. Cl.^{6} H01B *12/00*
U.S. Cl. 174—125.1 **12 Claims**

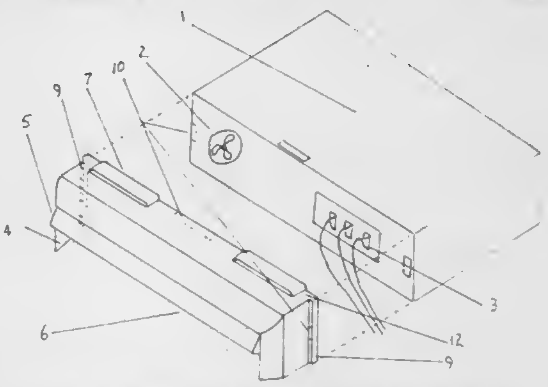


1. A superconductor wire for an AC magnetic field or a pulsed magnetic field comprising:

a plurality of Nb—Ti superconductor filaments embedded in a copper matrix made of a Cu—Si—Mn—Fe alloy, the alloy being workable to a fine wire of a diameter of at least as small as 0.1 mm, the copper matrix having a resistivity (Z) of 2×10^{-8} Ωm to 65×10^{-8} Ωm, and a distance between the Nb—Ti superconductor filaments being not less than $0.0625\times1/\sqrt{Z}$ nm, wherein the copper matrix contains 1 weight % Mn, 1 weight % Si and 0.5 weight % Fe.

5,837,942
COMPUTER CPU PLUG PROTECTOR AND COVER

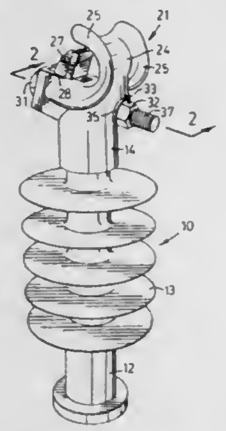
Paul R. Becker, 11 Lopez Key, Bellevue, Wash. 98006
Filed Oct. 4, 1995, Ser. No. 538,641
Int. Cl.^{6} H01B *17/00*
U.S. Cl. 174—138 F **1 Claim**



1. A cover for the back of a computer casing comprising:
a. a molded piece of a structural opaque material,
b. solid top and side panels, without holes, to create a shadow area beneath said cover at the back of said computer casing,
c. a conformal shape of said cover to said computer casing to provide vertical shoulders areas on each side of said cover for attachment and force transfer to said computer casing,
d. a simple means of attachment to the computer casing, requiring little or no modification, to said computer casing which is easily detached and reattached,
e. the bottom of said cover being open,
f. a longitudinal flap, defining a vent in a back portion of said cover, said flap creating a shadow, blocking sight of said back of said computer casing from a slight elevation, when exposed to an overhead light source.
g. the top of said cover having at least one vent which overlaps the vertical plane of the back of said computer casing shadowing incident overhead light on the back of said computer casing.
h. the depth of said cover being sufficient to extend beyond plugs emanating from the back of the computer casing and to block sight of the back of said computer casing from a slight elevation.

5,837,943
ELECTRICAL POWER LINE INSULATOR WITH UNIVERSAL END CLAMP

E. Glenn Kellett, P.O. Box 914, Hamilton, Bermuda
Continuation of Ser. No. 865,947, Apr. 9, 1992, abandoned. This application Nov. 19, 1993, Ser. No. 154,721
Int. Cl.^{6} H01B *17/16*
U.S. Cl. 174—169 **9 Claims**



1. A one piece electrical power line insulator and universal end clamp device, comprising:

an electrical insulator having first and second ends; and

a fixed position conductor clamp permanently attached to the second end of the insulator, said clamp being in a fixed position relative to the insulator and having a body defining a saddle for receiving a conductor when the insulator is extending either substantially horizontally or substantially vertically from a line post, the saddle of the clamp extending transversely of a central axis extending longitudinally of the device, the saddle being offset at a downward tilting angle from the perpendicular to the central axis so that the saddle may receive and hold a conductor when the device is oriented either substantially vertically or substantially horizontally, and having a bolt extending through and being held by the body upon which a keeper is movable along a track defined in the body away from and toward the saddle, said keeper being securable about a conductor seated in the saddle by locking means coacting with the bolt; and said bolt defines the angle of tilt for the saddle relative to the longitudinal central axis.

5,837,944
BEVERAGE MEASURING SYSTEM

Michael R. Herot, 9 Oaklyn Ave., Norristown, Pa. 19403
Filed Aug. 19, 1996, Ser. No. 699,415
Int. Cl.^{6} G01G *19/22;19/00;* **G01K** *1/08*
U.S. Cl. 177—245 **4 Claims**

1. A beverage measuring system comprising:
an electronic scale with a beverage keg containing a beverage positioned on the electronic scale;
a beverage dispensing hose for coupling to a opening on the beverage keg;
a T-coupler positioned in the beverage dispensing hose,

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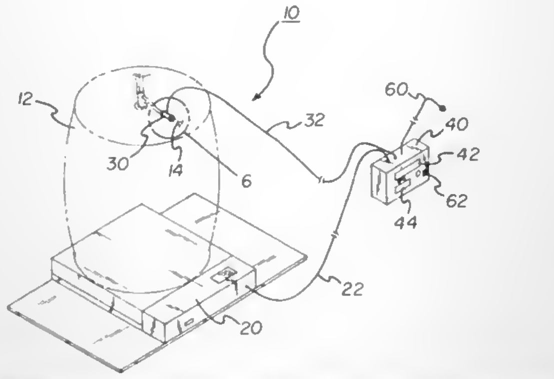


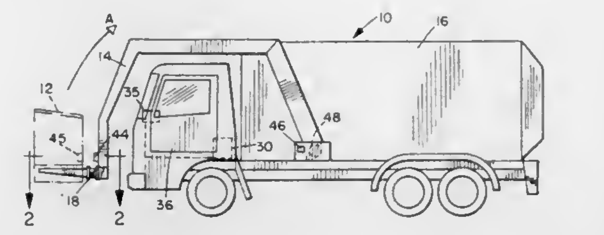
a beverage thermometer inserted in the T-coupler for contacting the beverage as the beverage flows through the beverage dispensing hose for measuring the temperature of the beverage within the beverage dispensing hose as the beverage is dispensed through the beverage dispensing hose;
a digital display means electronically connected to the electronic scale and the beverage thermometer, the digital display means being for displaying the temperature of the beverage and the amount of beverage remaining in the beverage keg; and
a power cable electronically connected to the digital display;
wherein the digital display means includes:
- a digital display housing;
- a servings remaining display located in the digital display housing for processing data received by the servings remaining display and calculating and generating a visible output indicating the number of servings remaining in the beverage keg, wherein the servings remaining display is electronically connected to the electronic scale by a scale connecting cable, wherein the servings remaining display is adapted to adjust for the weight of the particular beverage keg size thereby displaying a total number of servings of beverage in fluid ounces remaining within the beverage keg;
- a first selection switch located in the digital display housing and being electronically connected to the servings remaining display, wherein the first selection switch is manually adjustable to select a desired serving size for adjusting the calculation by the servings remaining display to compensate for the size of the servings to be drawn from the beverage keg;
- a second selection switch located in the digital display housing and being electronically connected to the servings remaining display, wherein the second selection switch is manually adjustable to select the particular size of the beverage keg placed on the electronic scale for adjusting the calculation by the servings remaining display to compensate for the weight of various beverage keg sizes; and
- a temperature display located in the digital display housing for processing data received by the servings remaining display and calculating and generating a visible output indicating the temperature of the beverage in the beverage dispensing hose, wherein said temperature display is electronically connected to the beverage thermometer by a thermometer cable and wherein the temperature display is adapted to disclose the temperature of the beverage in both Celsius and Fahrenheit degree measurements.

5,837,945
REFUSE WEIGHING SYSTEM AND METHOD

David M. Cornwell, Escondido, and David A. Ness, San Diego, both of Calif., assignors to Hardy Instruments, Inc., San Diego, Calif.

Filed Apr. 24, 1996, Ser. No. 639,904
Int. Cl.^{6} G01G *19/08;19/40;23/18*
U.S. Cl. 177—136 36 Claims

1. A weighing system for a refuse or recycling truck, comprising:

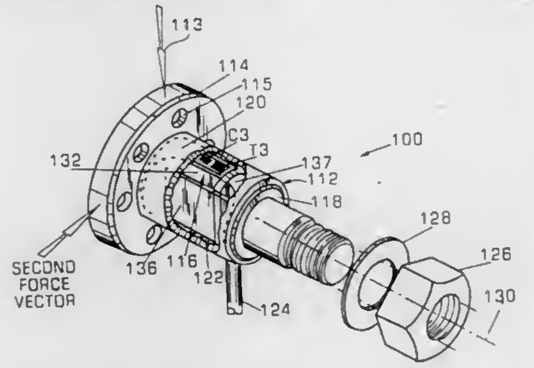


a lifting arm movably secured to the truck at one end and having lifting forks at an opposite end having lifting portions for engaging a container, the lifting arm being movable between a lower position for engaging a container, a raised position for depositing material from the container into the truck, and back to the lowered position to release the emptied container;
a load cell incorporated into each lifting fork for detecting the load carried by the lifting fork and providing an output signal proportional to the load;
each fork comprising an elongate member and the associated load cell being installed along the length of the elongate member in line with the fork at a location spaced rearwardly from said lifting portion whereby a container does not directly engage said load cells;
at least one acceleration sensor on the lifting arm for sensing G level on the arm and producing an output proportional to the sensed forces;
a processing unit connected to the load cell and acceleration sensor outputs for receiving the output signals of the load cells and acceleration sensor at least for a predetermined time period as the arm is raised and for the same time period as the arm is lowered; and
the processing unit including means for compensating the load cell output signals for acceleration forces and inclination of the lifting arm, means for calculating the dynamic gross weight carried by the lifting forks as a container is raised and means for calculating the tare weight as the same container is lowered after emptying for each set of sensor outputs, and means for calculating the net weight of material deposited into the truck from the container based on the calculated dynamic weights.

5,837,946
FORCE SENSITIVE SCALE AND DUAL LOAD SENSOR CELL FOR USE THEREWITH

Thomas H. Johnson, Winnebago; Roger A. Younger, Fairmont; Gene L. Justice, Fairmont, and Kevin M. Fruechte, Fairmont, all of Minn., assignors to Weigh-Tronix, Inc., Fairmont, Minn.

Filed Jun. 16, 1995, Ser. No. 491,034
Int. Cl.^{6} G01G *19/08*
U.S. Cl. 177—136 38 Claims

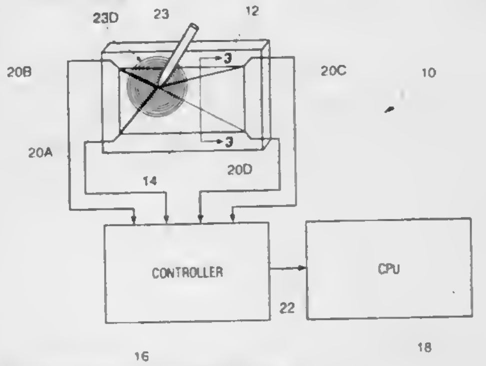


1. A load cell, comprising:
(a) a load cell body;
(b) a first force sensor positioned on the load cell body to sense a load force applied to the load cell body along a first force vector, and provide a first output representative of the load force applied to the load cell;
(c) a second force sensor positioned on the load cell body to sense non-load forces applied to the load cell body along a second force vector, and provide a second output representative of forces other than a load force applied to the load cell; and
(d) means, coupled to receive the first and second outputs, for adjusting the first output based on the second output to reject residual rejected effects due to the non-load forces and generating a third output representative of a load force applied to the load cell.

5,837,947
METHOD AND APPARATUS FOR REDUCING NOISE IN AN ELECTROSTATIC DIGITIZING TABLE

Jerzy A. Teterwak, Colorado Springs, Colo., assignor to Symbios, Inc., Fort Collins, Colo.

Filed Feb. 9, 1996, Ser. No. 599,574
Int. Cl.^{6} G08C *21/00;* **G09G** *5/00*
U.S. Cl. 178—18.07 23 Claims



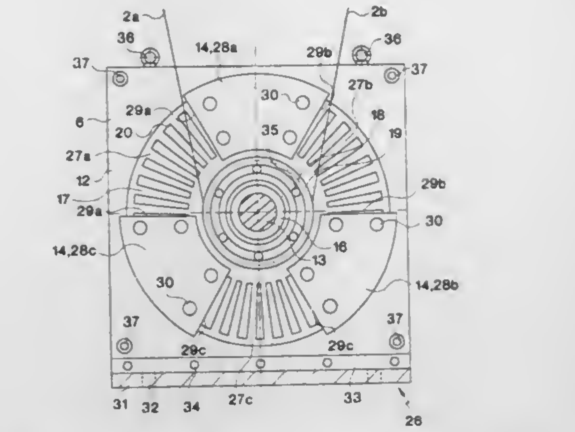
1. A digitizing panel comprising:
means for determining a velocity of a stylus relative to the digitizing panel;
a filter for filtering said stylus position data, said filter having a bandwidth characteristic;
means for varying said bandwidth characteristic based on said velocity of said stylus; and
means for generating said stylus position data at a first predetermined rate,
wherein said means for determining includes (i) means for sampling said stylus position data at a second predetermined rate to generate present position data and previous position data, and (ii) means for determining a distance between said presently sampled coordinate data and said previously sampled coordinate data.

5,837,948
ELEVATOR MACHINERY

Esko Aulanko, Kerava, and Harri Hakala, Hyvinkää, both of Finland, assignors to Kone Oy, Helsinki, Finland

Continuation of Ser. No. 266,696, Jun. 28, 1994, Pat. No. 5,665,944. This application Mar. 6, 1997, Ser. No. 811,723
Claims priority, application Finland, Jun. 28, 1993, 932976; Dec. 28, 1993, 935908
Int. Cl.^{6} B66B *1/00;* **H02K** *7/00;11/00*
U.S. Cl. 187—277 25 Claims

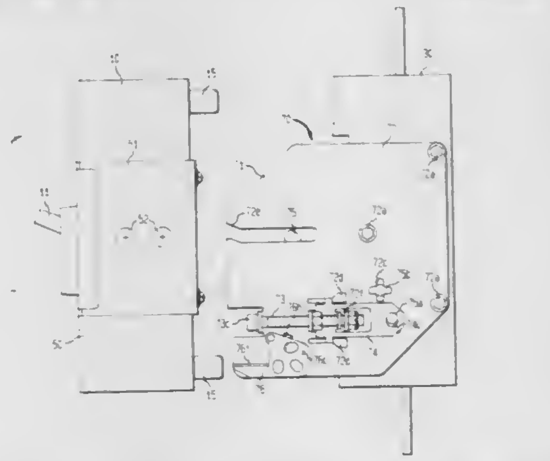
1. Elevator machinery comprising:
a motor provided with at least one stator with a winding and a rotating disc-shaped rotor with an air gap therebetween, the stator forming a non-continuous ring-shaped sector and being supported by a support structure, the rotor and stator both having a diameter; and
at least one traction sheave for moving elevator ropes, the traction sheave being provided with a surface for receiving the elevator ropes, the traction sheave being joined with the rotor and extending from the rotor toward the support structure and having a diameter that is smaller than the diameter of the rotor and smaller than the diameter of the stator.



5,837,949
CIRCUIT BREAKER DRAW APPARATUS AND SYSTEM WITH A SLIDER FLANGE ATTACHED TO THE ACTIVE DRAW BRACKET

Russell B. Green, Douglasville; Pavel N. Lichtman, Roswell, and W. Dale Robbins, Lithonia, all of Ga., assignors to Siemens Energy & Automation, Inc., Alpharetta, Ga.

Filed Jun. 28, 1996, Ser. No. 673,658
Int. Cl.^{6} H01H *9/22;9/00*
U.S. Cl. 200—50.21 28 Claims



1. A circuit breaker movement apparatus for use with a circuit breaker assembly, where the circuit breaker assembly has a circuit breaker unit that may be connected or disconnected from a circuit breaker connecting apparatus, comprising:
- a movement bracket assembly for mounting to the circuit breaker connecting apparatus;
- a guide assembly for mounting to the circuit breaker unit; and
- a drive assembly for mounting to said bracket assembly that causes said guide assembly to move with respect to said bracket assembly, wherein said drive assembly is mounted to the movement bracket assembly by inserting at least one slider flange in at least one draw bracket aperture.

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5,837,950

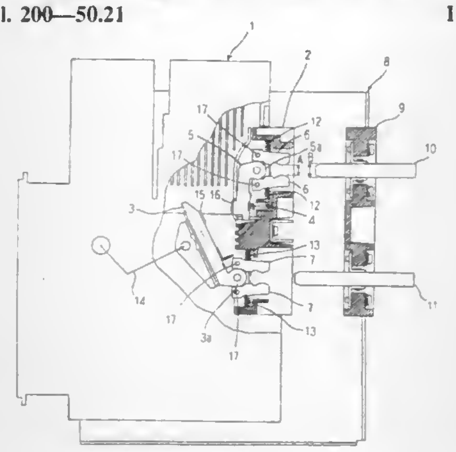
DRAWER TYPE CIRCUIT BREAKER WITH DRAWER CONTACTS BIASED AGAINST CONTACT ARCUATE PORTIONS AND EXTERNAL CONNECTION TERMINALS

Masao Horikawa, Nara, Japan, assignor to Terasaki Denki Sangyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 15, 1997, Ser. No. 892,997

Int. Cl.^{6} H02B ***11/00;*** **H01H** ***1/58;9/00***

U.S. Cl. 200—50.21 **10 Claims**



1. A drawer type circuit breaker including a frame having an external connection terminal and a circuit breaker main unit which is movable between a connected position and a disconnected position along the frame,

the circuit breaker main unit comprising:

- a first movable contact having a first contact tip at one end thereof;
- a second contact pivotally supported at its one end and terminated in an outer circumferential arc portion centered on the pivot axis at the one end, the second contact having at the other end thereof a second contact tip to be contacted with and separated from the first contact tip of the first contact:
- a drawer movable contact to be contacted with and separated from the external connection terminal in response to the movement of the circuit breaker main unit;
- first bias means for biasing the drawer contact to be in contact with both the outer circumferential arc portion of the second contact and the external connection terminal when the circuit breaker main unit is in the connected position;
- second bias means for biasing the other end of the second contact toward the first contact; and
- a switching mechanism for moving the first contact so that the first contact tip is contacted with and separated from the second contact tip.

5,837,951

INERTIA SWITCHING DEVICE, ACCELERATION RESPONSIVE DEVICE AND METHOD OF MAKING ACCELERATION RESPONSIVE DEVICE

Harunori Kato, Mie-ken; Yasukazu Mizutani, Midori-ku; Shigekazu Shibata, Nishi-ku; Katsuhiro Kimura, Moriyama-ku; Hideki Koseki, Aichi-ken; Mitsuhiro Urano, Toyota, and Masayuki Watanabe, Minato-ku, all of Japan, assignors to Ubukata Industries Co., Ltd., Nagoya, Japan

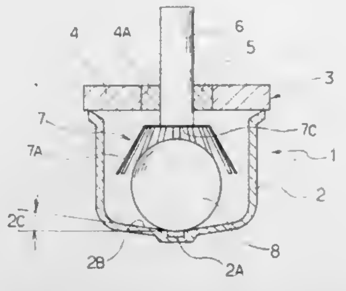
Continuation-in-part of Ser. No. 121,522, Sep. 16, 1993, abandoned, and Ser. No. 310,390, Sep. 22, 1994, Pat. No. 5,600,109. This application Jul. 25, 1996, Ser. No. 682,340

Claims priority, application Japan, Sep. 16, 1992, 4-272387; Oct. 29, 1992, 4-316363; Jan. 20, 1993, 5-26308; Oct. 1, 1993, 5-269981; Oct. 6, 1993, 5-276230; Dec. 15, 1993, 5-342860

Int. Cl.^{6} H01H ***35/14***

U.S. Cl. 200—61.45 R **31 Claims**

1. An acceleration responsive device which includes a seismo-sensitive element comprising:



- a) a housing formed from an electrically conductive material and having a bottom and an open end, the housing having an inclined face formed on the bottom thereof to gently rise concentrically outwardly substantially from a center of the bottom thereof;
- b) a header fixed to the housing to close the open end thereof and having a through-aperture in which an electrically conductive terminal pin is fixed in an insulated relation with the header;
- c) a contact member formed from an electrically conductive material and fixed to an end of the terminal pin located inside the housing, the contact member having a plurality of feather portions including respective contact portions disposed concentrically with the terminal pin, the feather portions having a predetermined elasticity; and
- d) an inertia ball enclosed in the housing to be located substantially at the center in the housing in a normal attitude thereof in a stationary state, the inertia ball moving when subjected to oscillation, so that the inertia ball slides on the feather portions of the contact member except for distal ends of the feather portions such that the inertia ball electrically conducts between the contact member and the housing and such that the feather portions are elastically deformed, thereby receiving a force causing the same to be pushed against the bottom of the housing.

5,837,952

MAT SWITCH

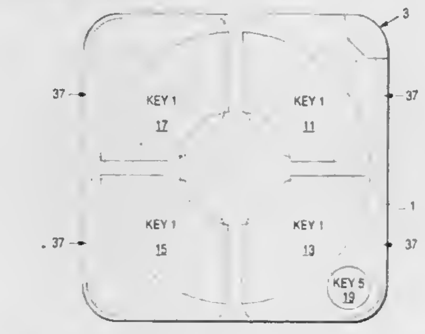
Kazuhisa Oshiro; Toyomi Yoshida, and Hiroyuki Keino, all of Saitama, Japan, assignors to Combi Corporation, Tokyo, Japan

Filed May 30, 1997, Ser. No. 865,833

Claims priority, application Japan, Jun. 4, 1996, 8-142028

Int. Cl.^{6} H01H ***3/02;13/16;13/70;*** **G06F** ***3/02***

U.S. Cl. 200—86 R **2 Claims**



1. A mat switch which inputs a plurality of data to an apparatus to operate a video terminal connected to said apparatus, comprising:

- a plurality of switch regions for inputting said plurality of data:
- a laminate structure of each of said switch regions which is formed by laminating a cover sheet in common to all of said switch regions, an upper electrode sheet, a spacer, and a lower electrode sheet in the stated order, said upper electrode sheet being operative to come into contact with said lower electrode sheet when pressure is applied thereby performing a bridging contact function; and

- a separate and discrete, non-foldable back board provided below said lower electrode sheet in each of said switch regions, thereby permitting said mat switch to be folded down for storage such that none of said switch regions is folded down.

5,837,953

DC CIRCUIT BREAKING DEVICE

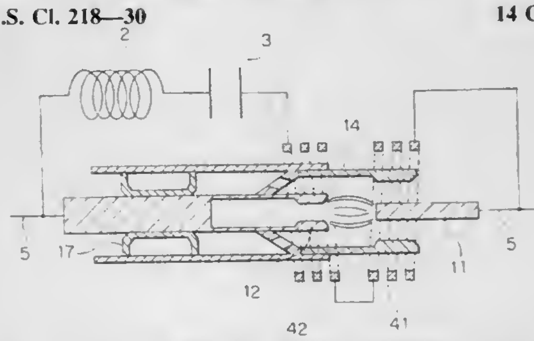
Hiroki Ito; Takashi Moriyama; Kenji Kamei; Minoru Kimura; Suenobu Hamano; Takashi Yonezawa; Etsuo Nitta; Kazuhiko Arai; Hiroyuki Sasao, all of Tokyo; Naoaki Takeji, Osaka; Takateru Hashimoto, Kagawa-ken, and Masayuki Hatano, Tokyo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Chiyoda-ku; The Kansai Electric Power Co., Inc., Kita-ku; Shikoku Electric Power Co., Inc., Takamatsu, and Electric Power Development Co., Ltd., Chuo-ku, all of Japan

Filed Aug. 6, 1996, Ser. No. 693,367

Claims priority, application Japan, Aug. 8, 1995, 7-202256

Int. Cl.^{6} H01H ***33/18***

U.S. Cl. 218—30 **14 Claims**



1. A DC circuit breaking device comprising: a DC circuit breaker having a fixed and a movable contacts to interrupt the transmission of direct currents to an electric power system; a commutation circuit connected in parallel to the DC circuit breaker including a condenser and a reactor; a surge absorber connected to parallel across the commutation circuit for absorbing a surged voltage applied to the parallel condenser; and a coil means disposed around the outer circumference of the at least one of the fixed and movable contacts when the fixed and movable contacts are fully parted so as to apply magnetic fields to an arc generating area formed upon separation of the contacts.

5,837,954

CIRCUIT BREAKER

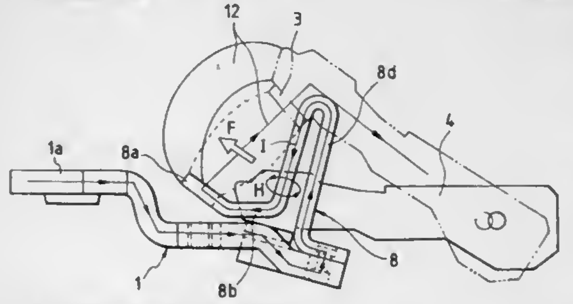
Koji Asakawa; Naoshi Uchida, and Kyoji Hama, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Jul. 31, 1996, Ser. No. 688,982

Claims priority, application Japan, Aug. 3, 1995, 7-218150

Int. Cl.^{6} H01H ***33/20***

U.S. Cl. 218—40 **20 Claims**



1. A circuit breaker comprising:

- a stationary contact piece formed of flat-plate conductor and having a terminal portion formed at one end side and a stationary contact at another end side;
- a movable contact piece having a movable contact, said movable contact piece being movable with respect to said stationary contact piece so that said movable contact is removable from said stationary contact along a moving path; and
- an arcing horn provided on said stationary contact piece, wherein:
- said arcing horn has a horn portion extending in a width direction of said stationary contact piece and a pair of arm portions extending from lateral ends of said horn portion to present a U-shape in a plane view, and further has at least one bent roundabout current path formed between said horn portion and each of leading end portions of said arm portions so as to present an inverted-U-shape in a side view; and,
- said leading end portions of said arm portions are coupled to said stationary contact piece so that said at least one roundabout current path is located opposite to an arc-extinguishing grid with respect to said moving path so that an electromagnetic force caused by current flowing through said roundabout current path pushes an arc toward the arc-extinguishing grid.

5,837,955

GAS CIRCUIT BREAKER

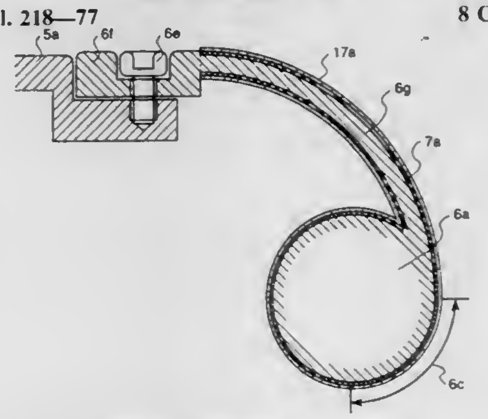
Tomoaki Utsumi, Hitachi; Jun Nukaga, Tomobe-machi; Youichi Ohshita, Hitachinaka; Goro Daimon, Hitachi; Kenji Tsuchiya, Hitachi, and Hiroshi Yoshimoto, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 10, 1997, Ser. No. 781,187

Claims priority, application Japan, Feb. 9, 1996, 8-023956

Int. Cl.^{6} H01H ***33/70***

U.S. Cl. 218—77 **8 Claims**



1. A gas circuit breaker comprising:

- a metal container filled with an insulating gas:
- first and second contact disposed opposite each other in the metal container so that they can be brought into and out of engagement with each other; and
- a metal shield arranged in the metal container to enclose the two contacts;
- wherein a part or a whole of a surface of the shield is oxidized and covered with a fluororesin layer.

5,837,956

METHOD OF FABRICATING HIGH STRENGTH AND HIGH TOUGHNESS LARGE-DIAMETER WELDED STEEL PIPE

Takatoshi Okabe, Aichi, and Koichi Yasuda, Okayama, both of Japan, assignors to Kawasaki Steel Corporation, Japan

PCT No. PCT/JP96/03693, § 371 Date Aug. 7, 1997, § 102(e) Date Aug. 7, 1997, PCT Pub. No. WO97/25522, PCT Pub. Date Jul. 17, 1997

PCT Filed Dec. 18, 1996, Ser. No. 875,884

Claims priority, application Japan, Dec. 28, 1995, 7-342241

Int. Cl.^{6} B23K ***9/18***

U.S. Cl. 219—61 **2 Claims**

1. A method of fabricating a high strength and high toughness large-diameter welded steel pipe comprising the steps of:

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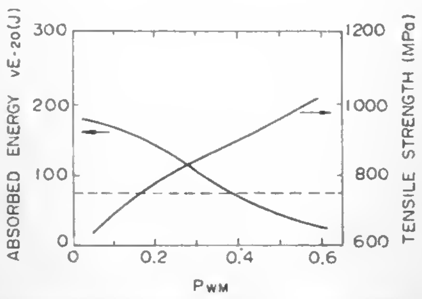


performing UO forming processing of a steel plate, said steel plate comprising: by weight %, 0.05 to 0.10% of C; 0.1 to 0.5% of Si; 1.2 to 2.5% of Mn; not more than 0.010% of P; not more than 0.008% of S; not more than 0.1% of Al; 0.008 to 0.055% of Ti; not more than 0.1% of Nb; not more than 0.1% of V; not more than 0.010% of N; not more than 0.0035% of O; one or more elements selected from the group consisting of not more than 0.2 to 2.0% of Cu, 0.2 to 2.0% of Ni, 0.2 to 2.0% of Cr, and 0.05 to 2.0% of Mo; and the balance being Fe and unavoidable impurities;

performing one-pass submerged arc welding conducted from the inner side and then from the outer side using a low-oxygen welding flux and a low carbon welding wire; and

expanding the diameter of said steel pipe;

wherein weld metal obtained by said 1-pass submerged arc welding contains: by weight %, 0.02 to 0.10% of C; 0.1 to 0.6% of Si; 1.0 to 2.7% of Mn; not more than 0.02% of P; not more than 0.02% of S; not more than 0.02% of Al; 0.007 to 0.028% of Ti; not more than 0.1% of V; not more than 0.06% of Nb; not more than 0.01% of N; 0.011 to 0.038% of O; one or more elements selected from the group consisting of not more than 1.0% of Cu, not more than 2.01 of Ni, not more than 1.0% of Cr, not more than 1.0% of Mo, and not more than 0.01% of B; a P_{WM} value as set below ranging from 0.18 to 0.33; and the balance being Fe and unavoidable impurities; and

said weld metal has a micro-structure containing acicular ferrite not less than 55% by area ratio:

$$P_{WM}=P_{cm}+3.19Ti-1.020, \text{ and}$$

$$P_{cm}=C+Si/30+(Mn+Cu+Cr)/20+Ni/60+Mo/15+V/10+5B.$$

5,837,957

ELECTRIC DISCHARGE MACHINING APPARATUS

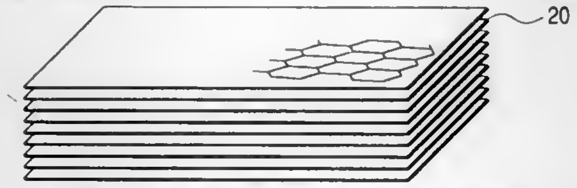
Tatsushi Sato; Yoshihito Imai; Tomoko Sendai; Hidetaka Miyake; Takashi Yuzawa, and Takuji Magara, all of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 26, 1997, Ser. No. 807,866

Claims priority, application Japan, Feb. 27, 1996, 8-039320; Jan. 16, 1997, 9-065393

Int. Cl.^{6} B23H *1/06*

U.S. Cl. 219—69.15 **13 Claims**



1. An electric discharge machining apparatus, comprising:

a tool electrode made of an anisotropic conductive material; and

an isotropic conductive member;

wherein said isotropic conductive member is connected to a conductive surface of said anisotropic conductive material.

5,837,958

METHODS AND APPARATUS FOR TREATING THE SURFACE OF A WORKPEICE BY PLASMA DISCHARGE

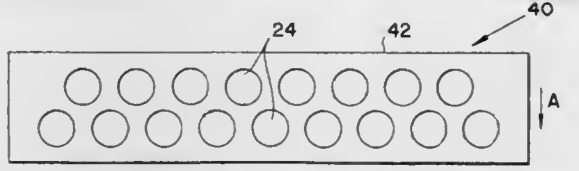
Peter Förnsel, Spenge, Germany, assignor to Agrodyn Hochspannungstechnik GmbH, Steinhagan, Germany

Filed Sep. 3, 1996, Ser. No. 707,075

Claims priority, application Germany, Sep. 1, 1995, 195 32 412.9

Int. Cl.^{6} B23K *10/00*

U.S. Cl. 219—121.5 **9 Claims**



1. A jet generator for treating a surface of a workpiece, comprising:

an electrically insulative nozzle pipe having an internal diameter forming a flow channel for working gas, the flow channel having a center axis;

a pin electrode disposed within the nozzle pipe adjacent a rear end of the flow channel; and

a ring electrode extending across a froward end of the flow channel and forming a nozzle opening arranged substantially coaxially with the pin electrode, the nozzle opening being spaced forwardly from a tip of the pin electrode by a distance which is at least two times the internal diameter of the nozzle pipe, the pin electrode and the ring electrode arranged to form an arc within the flow channel;

the flow channel being communicable with a source of working gas and configured to cause the gas to flow in a vortex-shaped path through the nozzle pipe and the nozzle opening from an inlet located adjacent the rear of the flow channel, to constrain the arc to extend along the center axis while passing through the nozzle pipe, the arc generating from the working gas a plasma discharge which forms a concentrated jet of a reactive medium extending from the nozzle opening.

5,837,959

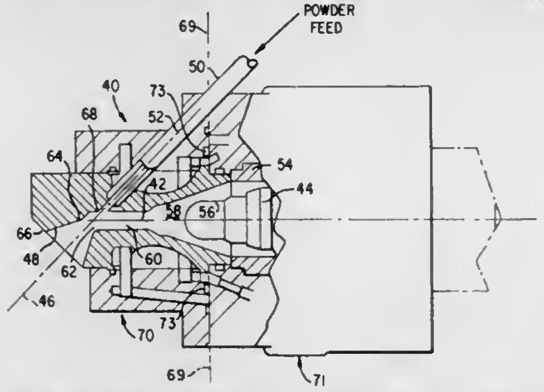
SINGLE CATHODE PLASMA GUN WITH POWDER FEED ALONG CENTRAL AXIS OF EXIT BARREL

Erich Muehlberger, San Clemente, Calif., and William P. Rusch, Ronkonkoma, N.Y., assignors to Sulzer Metco (US) Inc., Westbury, N.Y.

Filed Sep. 28, 1995, Ser. No. 536,622

Int. Cl.^{6} B23K *10/00*

U.S. Cl. 219—121.47 **12 Claims**



1. A single cathode plasma gun in which injected powder exits generally along a central axis of an exit barrel of the gun, comprising the combination of:

an exit barrel having a central axis extending along a length thereof;

an anode having a central axis;

a single cathode centrally disposed within the anode and having a central axis which generally coincides with the central axis of the anode, the central axis of the anode extending through a plasma arc passage adjacent the single cathode and intersecting the central axis of the exit barrel at a first angle greater than 0° but substantially less than 90° at a location adjacent where the plasma arc passage couples to the exit barrel; and

a powder feed passage which extends to a region adjacent the location where the plasma arc passage couples to the exit barrel and has a central axis intersecting the central axis of the single cathode at a second angle at least as large as the first angle, the powder feed passage terminating substantially at the central axis of the exit barrel and introducing a stream of powder substantially along the central axis of the exit barrel and in a manner so that the stream of powder is concentrated at the central axis of the exit barrel along at least a substantial portion of the length of the exit barrel;

the single cathode being positioned at a location along the central axis of the anode and the plasma gun being operated to produce a charged plasma which extends to at least the powder feed passage so that the stream of powder is concentrated at the central axis of the exit barrel through the charged plasma and at least a substantial portion of the stream of powder flows through the charged plasma.

5,837,960

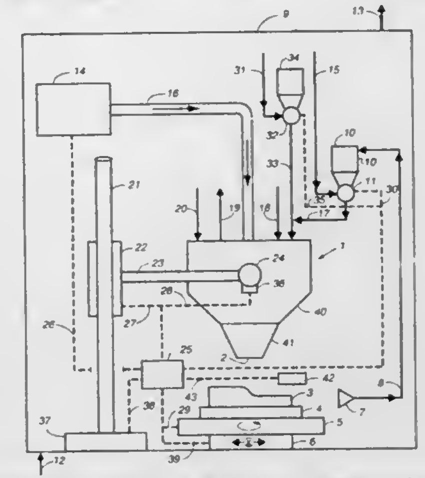
LASER PRODUCTION OF ARTICLES FROM POWDERS

Gary K. Lewis, Los Alamos; John O. Milewski, Santa Fe; David A. Cremers, Los Alamos; Ronald B. Nemec, and Michael R. Barbe, both of White Rock, all of N. Mex., assignors to The Regents of the University of California, Oakland, Calif.

Filed Nov. 30, 1995, Ser. No. 566,430

Int. Cl.^{6} B23K *26/00*

U.S. Cl. 219—121.63 **30 Claims**



1. A method of forming an article from materials in particulate form, said method comprising:

a. defining shape and dimensions of an article and creating a tool path and control commands effective to form said article by deposition of molten material;

b. focusing a laser beam at a location within a deposition zone:

c. providing powder to said deposition zone along a plurality of paths which are disposed about the laser beam and converge within the deposition zone;

d. forming a pool of molten material in the deposition zone by melting a portion of an article support and said powder by means of energy provided by said laser beam;

e. depositing molten material from the deposition zone on said article support at points along a first portion of said tool path by moving the deposition zone along the tool path, where said molten material solidifies after leaving the deposition zone, in order to form a portion of said article which is adjacent to the article support;

f. forming a pool of molten material in the deposition zone by melting a portion of said partially formed article and said powder by means of energy provided by the laser beam;

g. depositing molten material from the deposition zone at points along a second portion of the tool path by moving the deposition zone along the tool path, where the molten material solidifies after leaving the deposition zone, in order to complete formation of the article; and

h. controlling flow of powder into the deposition zone, energy density of the laser beam, and speed of movement of the deposition zone along the tool path by means of said control commands as deposition takes place.

5,837,961

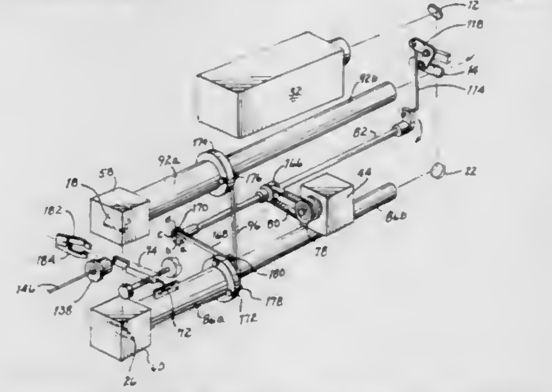
LASER WIRE STRIPPING APPARATUS HAVING MULTIPLE SYNCHRONOUS MIRRORS AND A METHOD THEREFOR

Richard T. Miller, 3210 E. Corrine Dr., Phoenix, Ariz. 85032

Filed Nov. 24, 1995, Ser. No. 562,618

Int. Cl.^{6} B23K *26/10*

U.S. Cl. 219—121.68 **26 Claims**



1. A laser wire stripping apparatus comprising, in combination:

means for generating a laser beam;

a plurality of mirror means for alternatively directing said laser beam over a first portion of an insulated wire and an opposite portion of said insulated wire to permit removal of an end segment of insulation from said insulated wire; and

means coupled to said plurality of mirror means for synchronizing motion of said plurality of mirror means in order to direct said laser beam over said first portion and said opposite portion of said insulated wire, said synchronizing means comprises a single motor.

5,837,962

FASTER LASER MARKER EMPLOYING ACOUSTO-OPTIC DEFLECTION

James W. Overbeck, 112 Martins La., Hingham, Mass. 02043

Filed Jul. 15, 1996, Ser. No. 680,484

Int. Cl.^{6} B23K *26/08*

U.S. Cl. 219—121.68 **28 Claims**

1. An improved apparatus for heating, melting, vaporizing, or cutting a workpiece, of the type which comprises:

a laser generating a laser beam possessing sufficient energy per pulse to accomplish heating, melting, vaporizing or cutting of said workpiece;

a moveable mirror assembly for deflecting said laser beam over said workpiece interposed in the laser beam following said laser;

a lens focusing said laser beam on said workpiece, said lens interposed in the laser beam either before or after said moveable mirror assembly; and

a controller controlling said moveable mirror assembly and said laser;

wherein the improvement comprises:

(a) a high diffraction efficiency two-dimensional acousto-optic deflector interposed in said laser beam following said laser and having an angular range of deflection smaller than that of

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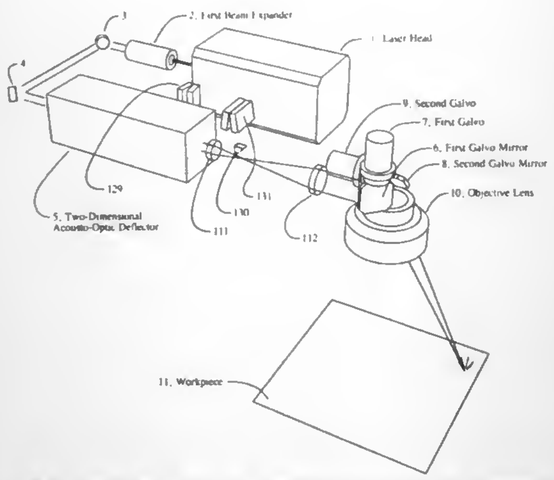


said moveable mirror assembly, said two-dimensional acousto-optic deflector comprising

first and second one dimensional acousto-optic deflectors arranged in series and oriented at substantially right angles to one another, and

anamorphic optical elements which substantially focus said two-dimensional acousto-optic deflector on said moveable mirror assembly;

(b) an absorber absorbing that fraction of laser light which is not diffracted by said two-dimensional acousto-optic deflector; and

(c) a deflector controller controlling a deflection by said two-dimensional acousto-optic deflector, such that the laser beam can be moved over a small angular range more rapidly than said moveable mirror assembly alone would permit, and over a larger angular range than said two-dimensional acousto-optic deflector alone would permit.

5,837,963

METHOD OF MANUFACTURING A THIN FILM MAGNETIC HEAD WITH IDENTIFICATION MARKS

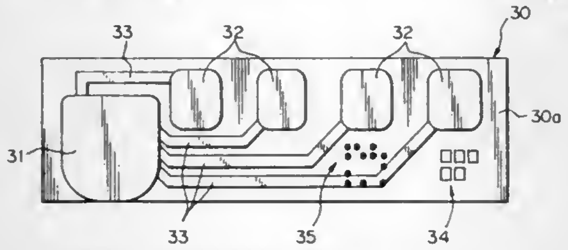
Yoshimi Kitahara, Saku, Japan, assignor to TDK Corporation, Tokyo, Japan

Division of Ser. No. 680,621, Jul. 17, 1996, Pat. No. 5,721,651. This application May 23, 1997, Ser. No. 862,440

Claims priority, application Japan, Aug. 2, 1995, 7-215461

Int. Cl.⁶ B23K *26/00;* **G11B** *5/60*

U.S. Cl. 219—121.69 **10 Claims**



1. A method of manufacturing thin film magnetic heads, comprising the steps of:

forming, on one surface of a substrate, a plurality of electromagnetic transducer elements and a plurality of input and output terminals electrically connected to said transducer elements;

forming a protection layer on said surface of the substrate to cover at least said transducer elements;

forming terminal cover layers and a seed layer thereof on said surface in order to cover said input and output terminals, respectively; and

forming identification marks for identifying said respective magnetic head, on said protection layer on said surface of the substrate by laser beam machining, said identification mark forming step being performed during said terminal cover layer forming step.

5,837,964

LASER DRILLING HOLES IN COMPONENTS BY COMBINED PERCUSSION AND TREPAN DRILLING

George Emer, Cresskill, N.J.; Dwight Edlund, Stony Point, N.Y.; Steve Vanasse, Carmel, N.Y., and Michael L. Dizzine, Nyack, N.Y., assignors to Chromalloy Gas Turbine Corporation, Orangeburg, N.Y.

Filed Jan. 16, 1998, Ser. No. 8,092

Int. Cl.⁶ B23K *26/00;26/08*

U.S. Cl. 219—121.71 **11 Claims**

1. A process of laser drilling a hole through nickel, cobalt or nickel and cobalt based superalloy component said hole having a predetermined diameter of at least about 0.030 inches, a hole depth of at least about 0.4 inches and a depth/diameter ratio of at least about 10:1, comprising:

percussion laser drilling a central hole through the component to a diameter less than the predetermined diameter; then

trepanning laser drilling around the central hole to expand the diameter of said hole to the predetermined diameter, and then repeating the above percussion laser drilling and trepanning laser drilling steps to drill said hole.

5,837,965

FOCUSING HEAD OF A LASER BEAM PROVIDED WITH A FOCUSING LENS FOR A MACHINE FOR WORKING METAL AND NON-METAL PARTS

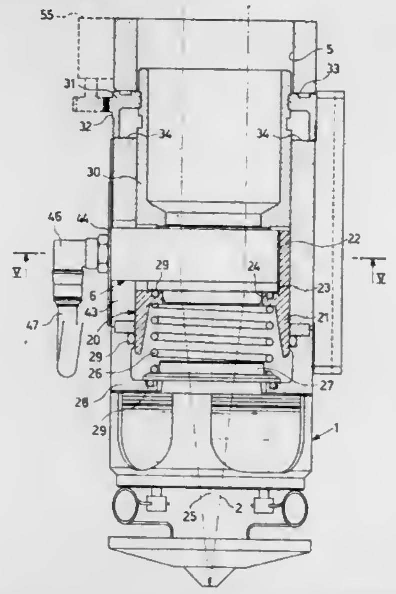
Claudio Mosca, Tenna, and Stefano Perini, Trento, both of Italy, assignors to Salvagnini Italia S.p.A., Sarego, Italy

Filed Dec. 12, 1996, Ser. No. 766,590

Claims priority, application Italy, Dec. 14, 1995, M195 A 002621

Int. Cl.⁶ B23K *26/00*

U.S. Cl. 219—121.75 **9 Claims**



1. A laser beam focusing head for use in a machine for working metal and non-metal parts, the head having a focusing lens, comprising an extractable lens-holding frame for supporting the focusing lens, supporting and centering means mounting said lens-holding frame for disengagement therefrom, elastic means in engagement with said supporting and centering means for urging said lens-holding frame into abutment against a stopping means. said lens-holding frame being disengageable from said supporting and centering means by compression of said elastic means enabling the lens-holding frame and focusing lens carried thereby to be extracted from and reassembled in the focusing head without modifying centering and positioning of a focal point of said lens.

5,837,966

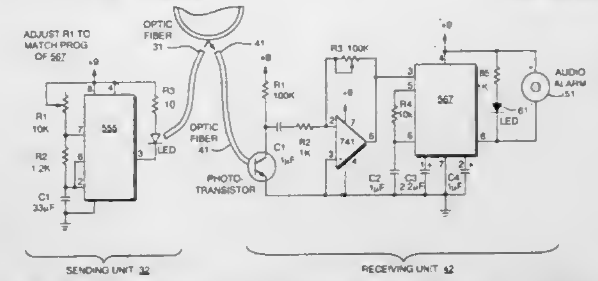
APPARATUS FOR WELD HEAD TO PIPE JOINT ALIGNMENT FOR WELDING

John E. Timmons, Jr., 85B W. Rosemont Ave., Manchester. N.H. 03103

Filed Jul. 23, 1997, Ser. No. 899,350

Int. Cl.⁶ B23K *9/10*

U.S. Cl. 219—124.34 **20 Claims**



20. An improvement to an orbital welding system for aligning the orbital weld head of said system with a square cut pipe end butt joint, said system comprising an alignment module and a port in said weld head for insertion and removal of said module, said module comprising electronic means for sensing a condition of alignment with said butt joint as said module is moved longitudinally along a pipe and configured to indicate said condition of alignment by means of an indicator light and an audible sound generator mounted so as to be seen and heard by an operator when said module is inserted in said port.

5,837,967

BURNER HOLDER FOR MECHANIZED OR AUTOMATED ARC WELDING OR CUTTING TORCHES, ESPECIALLY MACHINE AND/OR ROBOT TORCHES

Hermann Sperling, Gau-Bischhofsheim, Germany, assignor to Alexander Binzel GmbH & Co. KG, Germany

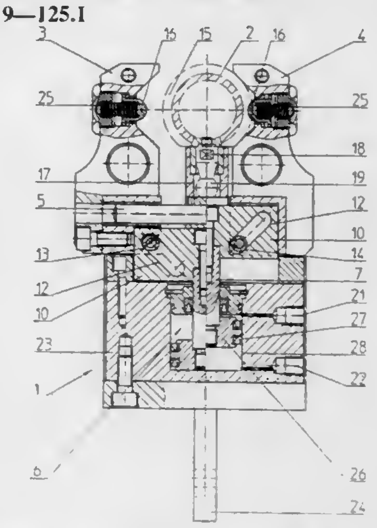
PCT No. PCT/EP94/03090, § 371 Date Jul. 19, 1996, § 102(e) Date Jul. 19, 1996, PCT Pub. No. WO95/07790, PCT Pub. Date Mar. 23, 1996

PCT Filed Sep. 14, 1994, Ser. No. 617,746

Claims priority, application Germany, Sep. 14, 1993, 43 31 095.8

Int. Cl.⁶ B23K *9/00*

U.S. Cl. 219—125.1 **16 Claims**



1. A system consisting of a burner and a burner holder for a mechanized, automated welding or cutting device, wherein the burner is retained to be releasable between at least two clamping jaws which encompass the burner circumferentially, and wherein the clamping jaws are laterally displaceable in a direction relative to each other along a guide between an opened and a closed position, characterized in that the lateral displacement of the clamping jaws is effected by a pneumatic piston and cylinder arrangement in which the piston acts on a sliding member which is displaceable in a direction perpendicular to the direction of displacement of the clamping jaws, the sliding member defining first and second elongated slots extending along an angle oblique to the direction of displacement of the sliding member. each of the elongated slots being associated with one of the clamping jaws. the sliding member being operably connected to the clamping jaws by first and second linkage arms. each linkage arm including a roller bearing engaging an associated one of the elongated slots and being linked to an associated one of the clamping jaws. whereby movement of the piston causes movement of the sliding member. which effects movement of the clamping jaws.

5,837,968

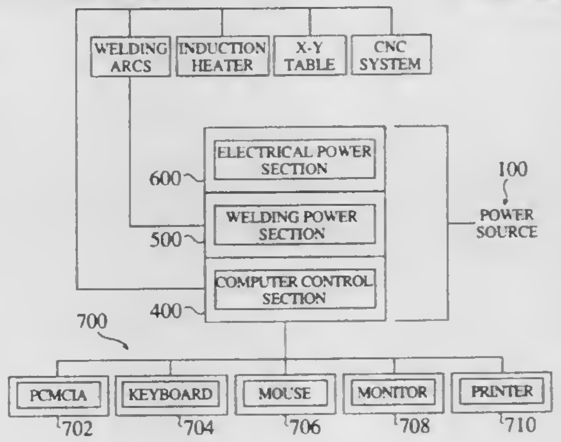
COMPUTER-CONTROLLED MODULAR POWER SUPPLY FOR PRECISION WELDING

Roderick G. Rohrberg; Timothy K. Rohrberg, both of Torrance; Charles E. Nourrcier, Lakewood. and Eugene S. Yung, Simi Valley, all of Calif., assignors to Creative Pathways, Inc., Torrance, Calif.

Filed Jul. 15, 1996, Ser. No. 680,764

Int. Cl.⁶ B23K *9/10*

U.S. Cl. 219—130.1 **18 Claims**



1. An apparatus for providing electrical power comprising:

an enclosure (**100**); said enclosure (**100**) having an interior (**106**);

said interior (**106**) being partitioned into a plurality of bays (**110**);

a Computer Control Module (**400**) which is inserted into one of said plurality of bays (**110**); said Computer Control Module (**400**) including a programmable micro-processor (**406**) and a non-volatile memory (**408**);

a Welding Power Module (**500**) which is inserted into one of said plurality of bays (**110**); said Welding Power Module (**500**) including a plurality of drawers (**504**) containing individual power units; each of said drawers (**502**) having a plurality of heat-dissipating fins (**504**) for cooling said drawers (**502**) without vents or fans to keep said interior (**106**) free from outside contamination;

an Electrical Power Module (**600**) which is inserted into one of said plurality of bays (**110**); and

a display (**300**) mounted on said enclosure (**100**) for monitoring the operation of said Computer Control Module (**400**) and said Welding Power Module (**500**).

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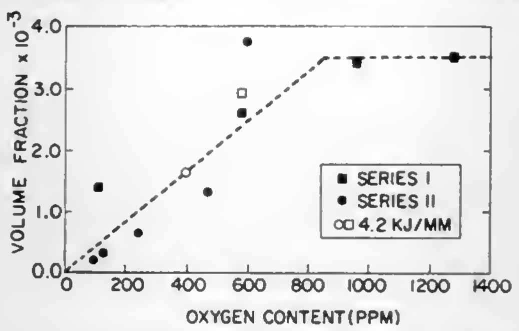
5,837,969
METHOD FOR WELDING CRYOGENIC ALLOYS

Thomas A. Siewert, and Christopher N. McCowan, both of Boulder, Colo., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Division of Ser. No. 86,531, Jul. 1, 1993, Pat. No. 5,474,737. This application Sep. 20, 1995, Ser. No. 531,254

Int. Cl.^{6} B23K *9/16;9/00*

U.S. Cl. 219—137 WM **21 Claims**



1. A method for welding a metal part comprising welding the metal part using a welding electrode to provide a weld metal, the welding electrode comprising an austenitic steel alloy comprising nickel at a concentration ranging from about 12 wt. % to about 20 wt. %, manganese at a concentration ranging from about 3 wt. % to about 7 wt. %, nitrogen at a concentration ranging from about 0.15 wt. % to about 0.2 wt. %, chromium at a concentration ranging from about 15 wt. % to about 25 wt. %, molybdenum at a concentration ranging from about 3 wt. % to about 10 wt. %, copper, and iron, wherein the nickel, nitrogen, chromium, and molybdenum are present in effective amounts such that the alloy is austenitic, wherein the total oxygen content in the weld metal is less than about 0.06 wt. %.

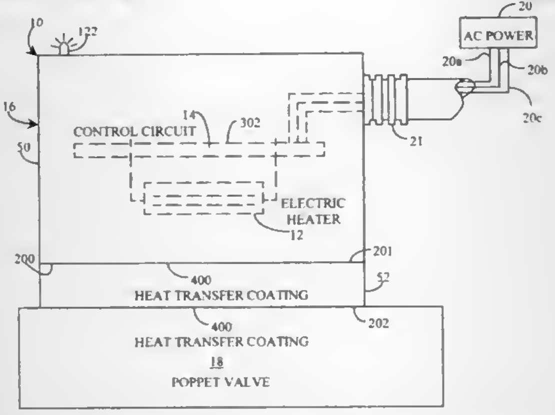
5,837,970
METHOD AND APPARATUS FOR CONTROLLED DELIVERY OF HEAT ENERGY INTO A MECHANICAL DEVICE

Gerard T. Jilek, 775 Oak Knoll Dr., Ashland, Oreg. 97520-1446

Filed Apr. 20, 1995, Ser. No. 425,799

Int. Cl.^{6} F16K *49/00*

U.S. Cl. 219—201 **2 Claims**



1. A valve heater for delivering heat energy into a separate valve, the valve having a mounting site, the heater comprising:

a heat conducting body, said body including at least an adapter block portion and an enclosure portion selectively attachable and detachable relative to the other, said adapter block portion of said body including a mounting surface adapted to be matingly corresponding in shape to a mounting site of a valve, said enclosure portion including a heat dissipation surface, said adapter block portion including a heat collecting surface, said heat dissipation surface and said heat collecting surface being held in face-to-face relation, said heat dissipation surface comprising a first coating forcing heat transfer thereat away from said enclosure portion, said heat collecting surface comprising a second coating forcing heat transfer thereat into said adaptor block portion;

a heating element bearing against said body, said enclosure portion containing said heating element; and

a control element selectively activating said heating element to deliver heat energy into said body and into a valve when said valve heater is mounted to a valve.

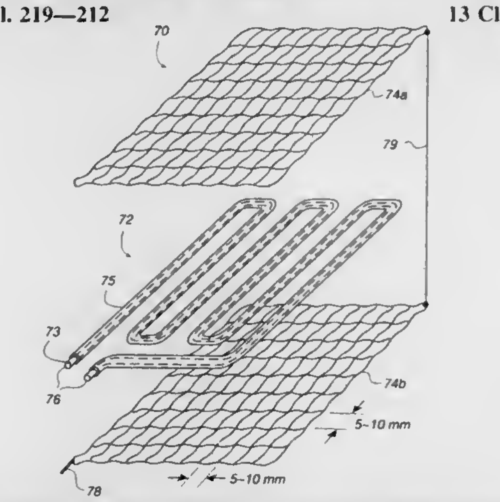
5,837,971
ELECTRIC BLANKET HAVING REDUCED ELECTROMAGNETIC FIELD

Myoung Jun Lee, 16124 Rosecrans Ave., No. 16C, La Mirada, Calif. 90638

Filed Jan. 21, 1997, Ser. No. 785,981

Int. Cl.^{6} H05B *1/00*

U.S. Cl. 219—212 **13 Claims**



1. An electric blanket adapted for use with alternating electrical current and a ground, the electric blanket comprising:

a heating element having a conductor disposed and enclosed between a first planar shield mesh and a second planar shield mesh, the first and second planar shield meshes substantially aligned to form a blanket layer, wherein the conductor is arranged to planarly meander between the first and second planar shield meshes which are coupled to the ground;

a control device for use with the alternating electrical current, having a temperature control circuit for outputting the alternating electrical current in relation to a predetermined temperature setting; and

a converter device electrically connected to the control device, wherein the converter device comprises

a rectifier circuit connected to the control device and having output terminals to generate rectified current from the alternating electrical current; and

a filter circuit connected across the output terminals of the rectifier circuit to provide direct electrical current to the conductor of the heating element.

5,837,972
HAIR CURLING IRON WITH LENGTH AND DIAMETER ADAPTATION

Richard P. Padilla, 3501 Ruth Pl., Orange, Calif. 92669

Filed Apr. 1, 1996, Ser. No. 627,318

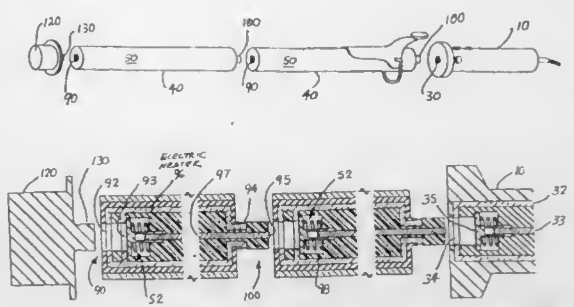
Int. Cl.^{6} A45D *1/04*

U.S. Cl. 219—225 **7 Claims**

1. A curling iron apparatus comprising:

a handle providing a gripping surface, a handle socket means for receiving a cylindrical heating unit, and an electrical circuit including a power cord providing an electrical voltage to the handle, a power switch for making and defeating the circuit, a current limiting means, and a means for providing the voltage to the handle socket means from the power cord;

a plurality of cylindrical heating units, each of the heating units including a heater socket means within one end of the heating unit and a plug means adapted for press-in engagement within the handle socket means of the handle or the heater socket means of any one of the other heating units of the plurality of heating units, the plug means extending outwardly from the other end of the heating unit and providing means for mechanical interlocking and electrical interconnection with the handle socket means of the handle or the heater socket means of any one of the other heating units of the plurality of heating units that are electrically interconnected with the handle, for receiving the voltage therefrom.



5,837,973
ASSEMBLY OF THERMOCOUPLE SENSOR FITTED TO IRON TIP

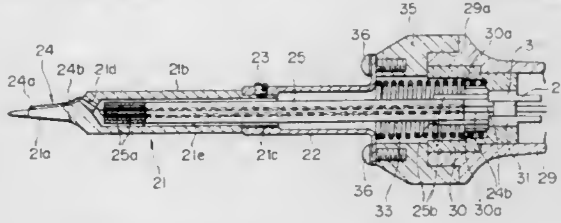
Toshiharu Tamura, Tomobe-machi, Japan, assignor to Japan Bonkote Company Limited, Mito, Japan

Filed Jul. 21, 1995, Ser. No. 505,816

Claims priority, application Japan, Feb. 15, 1995, 7-051910

Int. Cl.^{6} G01K *7/02;* **H05B** *1/02;* **B23K** *3/02;3/03*

U.S. Cl. 219—241 **11 Claims**



1. An assembly comprising:

an iron tip including a nose having a forward end and a rearward end and a columnar base extending from said rearward end, said columnar base having a hollow interior; and

a thermocouple sensor operable to detect a temperature of said nose, said sensor including a contact point mounted on an outer surface of said nose adjacent said forward end thereof and a pair of uncovered sensor wires connected to said contact point and extending rearwardly therefrom along said outer surface of said nose, said pair of wires extending into said hollow interior of said columnar base without being forced into strong contact with each other and without being brought into forceful contact with a conductive element including said iron tip.

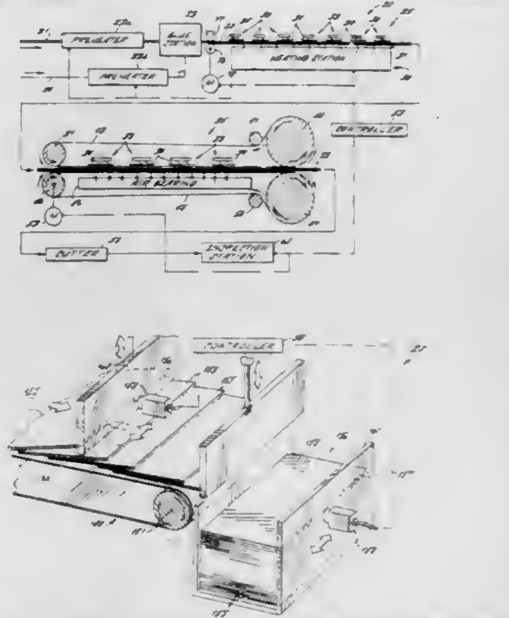
5,837,974
CORRUGATED PAPERBOARD MANUFACTURING APPARATUS WITH BOARD PROFILE MONITORING AND RELATED METHODS

Anthony J. Sissons, and David Alan Thomas, both of Gastonia, N.C., assignors to Interfic, Inc., Dallas, N.C.

Filed Oct. 16, 1996, Ser. No. 731,534

Int. Cl.^{6} F26B *13/00;13/10;* **B31F** *1/28;* **B32B** *31/00*

U.S. Cl. 219—388 **53 Claims**



1. An apparatus for manufacturing corrugated paperboard, said apparatus comprising:

a double-facer for heating a corrugated paperboard sheet to set adhesive therein;

a cutter downstream from said double-facer for cutting the corrugated paperboard sheet into a plurality of cut panels;

board edge profile sensing means downstream from said cutter and positioned in spaced relation to an edge to be sensed for sensing a side profile of a cut edge of cut panel; and

a controller for controlling said double-facer responsive to said board edge profile sensing means to thereby reduce warp in the cut panels.

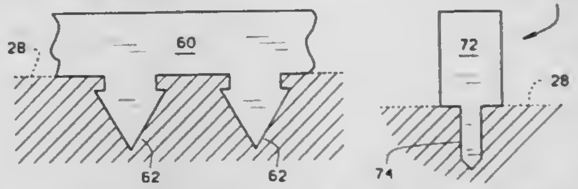
5,837,975
CORRUGATED STRIP, RADIANT HEATER ELEMENT

Richard J. Dillard, Vernon, and William W. Holmes, Decatur, both of Ala., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Jul. 29, 1996, Ser. No. 681,861

Int. Cl.^{6} H05B *3/68*

U.S. Cl. 219—456 **11 Claims**



1. A radiant heating unit for use on a stove, the heating unit being mounted beneath a glasstop type cooking surface for radiating heat at the surface to heat the surface for cooking food thereon, the unit comprising:

pan means installed adjacent an underside of the cooking surface;

liner means installed in the pan means, the liner means being formed of an insulation material;

an electrical heating element supported atop the liner means and being formed of a strip of an electrically resistant material to

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which an electrical current is supplied, the strip being a corrugated strip of material laid upon an upper surface of the liner in a predetermined pattern for heat generated by the heating element to be radiated directly at the cooking surface;

means securing the heating element to said liner means and including a plurality of spaced tabs integrally formed with said heating element, said tabs being inserted in said liner means to secure said heating element in place, each of said tabs having a tapered, pointed end for ease of installing said heating element in said liner means and a broad, base end opposite said tapered pointed end, said heating element having an extension connecting the broad, base end of said tab to said heating element; and,

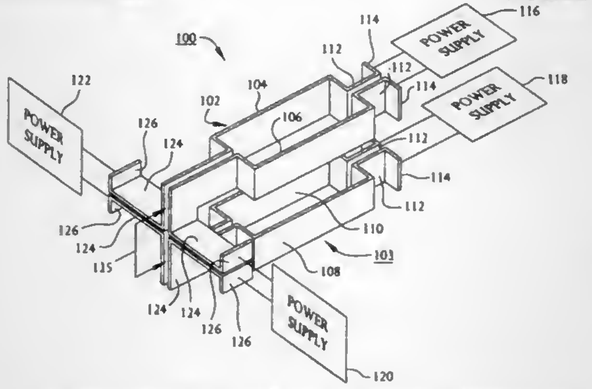
temperature sensitive means for controlling current flow to the heating element.

5,837,976
STRIP HEATING COIL APPARATUS WITH SERIES POWER SUPPLIES

Don L. Loveless, Sterling Heights, Mich., and Jean Lovens, Limbourg, Belgium, assignors to Inductotherm Corp., Rancocas, N.J.

Filed Sep. 11, 1997, Ser. No. 928,774
Int. Cl.⁶ H05B *6/10;6/40*

U.S. Cl. 219—645 **6 Claims**



1. An induction heating apparatus for heating continuous strip material comprising:

a solenoidal coil apparatus for induction heating comprising first and second coil sections, each coil section comprising first and second complementary half-turns that form an effective full-turn coil through which strip material may pass, wherein the coil sections are arranged longitudinally separated from each other in the direction of the path of the strip material through the apparatus, the first half-turn of the first coil section and the first half-turn of the second coil section being connected at one end of the apparatus by a first shunt conductor, the second half-turn of the first coil section being likewise connected at the same one end of the apparatus to the second half-turn of the second coil section by a second shunt conductor, said shunt conductors being separated from each other by a gap of sufficient dimension to permit the strip material be positioned in and removed from the apparatus edgewise through the gap thus formed in said one end of the apparatus;

said apparatus further comprising first and second alternating current power supplies each with two terminals for connection to the coil apparatus, the first power supply being connected at its first terminal to the first half-turn of the first coil section and at the other terminal to the second half-turn of the first coil section, said connection being made at the end of the apparatus opposite to the end having the shunt conductors, said second power supply likewise being connected at its first terminal to the first half-turn of the second coil section and at the other terminal to the second half-turn of the second coil section,

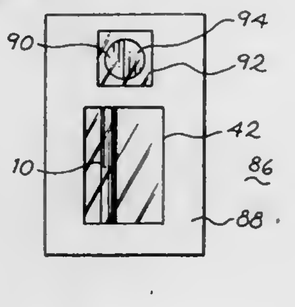
said connection of the two power supplies to the coil apparatus forming a series electrical circuit for current passing through the coil apparatus at a given instant from the first power supply through the first half-turn of the first coil section, through a shunt conductor and the first half-turn of the second coil section into the second power supply, then from the second power supply into the second half-turn of the second coil section through a shunt conductor to the second half-turn of the first coil section and returning to the first power supply, said current reversing its direction at another instant corresponding to an opposite cycle of the alternating current power supplies.

5,837,977
MICROWAVE HEATING CONTAINER WITH MICROWAVE REFLECTIVE DUMMY LOAD

Robert Frank Schiffmann, New York, N.Y., and Jeffery Scott Held, Chicago, Ill., assignors to Quiclave, L.L.C., Chicago, Ill.

Division of Ser. No. 486,208, Jun. 7, 1995, Pat. No. 5,645,748.
This application Jul. 7, 1997, Ser. No. 888,839
Int. Cl.⁶ H05B *6/80*

U.S. Cl. 219—694 **11 Claims**



1. A container for containing a dummy load while being subjected to microwave radiation, said container comprising:

a first surface comprising an exterior surface and an inner surface, wherein said first surface comprises an optically transparent material;

a second surface comprising an exterior surface and an inner surface facing said inner surface of said first surface, said second surface attached to said first surface wherein both of said inner surfaces define a volume of space into which said dummy load is placed; and

said dummy load is supported on said second surface and positioned to be subjected to microwave radiation that passes through said optically transparent material, wherein said dummy load is not heated by said microwave radiation that passes through said optically transparent material.

5,837,978
RADIATION CONTROL SYSTEM

Michael Hatzakis, Jr., Chappaqua; David Andrew Lewis, Carmel, both of N.Y., and Jane Margaret Shaw, Ridgefield, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 155,071, Nov. 18, 1993, abandoned, which is a continuation of Ser. No. 782,841, Oct. 29, 1991, abandoned, which is a continuation-in-part of Ser. No. 551,716, Jul. 11, 1990, Pat. No. 5,241,040. This application Dec. 19, 1996, Ser. No. 770,213
Int. Cl.⁶ H05B *6/66*

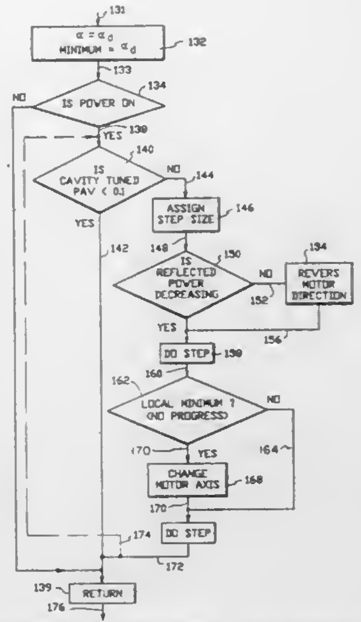
U.S. Cl. 219—702 **22 Claims**

1. A system for controlling an application of radiation to a workpiece in a cavity comprising:

time tracking means for tracking current time;

means for receiving an applied power signal indicative of a magnitude of an applied intensity of said radiation;

means for receiving a reflected power signal indicative of a magnitude of a reflected intensity of said radiation;



means for receiving a temperature signal indicative of a magnitude of a temperature of said workpiece;

minimizing means coupled to said time tracking means, for causing α to be less than a predetermined value, α is a ratio of said magnitude of said reflected intensity over said magnitude of said applied intensity and to provide a signal corresponding to signal a current value of α signal corresponding to said current time;

said minimizing means being coupled to said time tracking means, to said means for receiving said applied power signal indicative of said magnitude of said applied intensity, to said means for receiving said reflected power signal indicative of said magnitude of said reflected intensity and to said means for receiving said temperature signal indicative of said magnitude of said temperature of said workpiece;

temperature control means coupled to said time tracking means, for producing an intensity signal indicative of said magnitude of said applied intensity of said radiation to control said temperature of said workpiece to be substantially equal to a predetermined temperature;

means for determining when said workpiece has achieved a final predetermined physical condition; said means for determining is coupled to said time tracking means; and

means for producing an end signal to end operation of said system when said workpiece has achieved said final predetermined physical condition; said means for producing is coupled to said time tracking means.

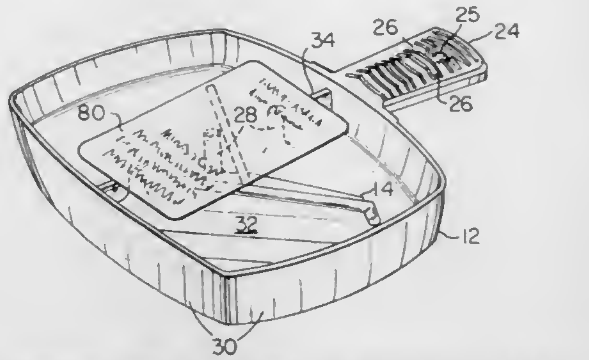
5,837,979
MICROWAVE COOKING VESSEL WITH REMOVABLE FOOD SUPPORTS AND STORAGE CLIP

Jonathan E. Fleck, and Abigail M. Fleck, both of St. Paul, Minn., assignors to A de F Ltd., St. Paul, Minn.

Division of Ser. No. 319,303, Oct. 6, 1994, Pat. No. 5,525,585, which is a continuation-in-part of Ser. No. 14,674, Oct. 27, 1993, Pat. No. Des. 366,807. This application Sep. 3, 1996, Ser. No. 706,788
Int. Cl.⁶ H05B *6/80*

U.S. Cl. 219—732 **17 Claims**

1. A combination microwavable dish and bacon support means sold as a unit, the dish having an internal liquid receiving volume, means for attaching the support means to the dish upright to hold bacon substantially above the internal liquid receiving volume of the dish when said dish and said support means are being used to cook bacon in a microwave oven, and a means for holding the support means in said dish such that the support means are substantially contained within the volume, whereby the dish, the support means and the means for holding form one compact unit for convenient transport and storage, and wherein said means for holding is attached to said dish by said means for attaching.

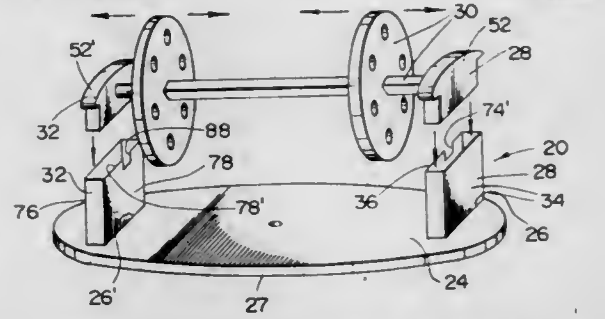


5,837,980
MICROWAVE OVEN ROTISSERIE AND STIRRING APPARATUS

Jeffrey D. Henning, 4609 Penzance Pl., Upper Marlboro, Md. 20772

Filed Jul. 18, 1995, Ser. No. 503,476
Int. Cl.⁶ H05B *6/78*

U.S. Cl. 219—753 **17 Claims**



1. Apparatus for removably supporting and rotating a food treatment attachment simultaneously about first and second substantially orthogonally related axes within a microwave oven having a turntable drive mechanism and defining a floor, said apparatus comprising:

a base in the form of a substantially circular disk defining first and second openings therein, said base removably positionable within said microwave oven to be rotated about said first axis by said drive mechanism;

a first removable support attachable to said base and within said first opening in predetermined contacting relationship with said floor removably supporting and rotating said food treatment attachment about said second axis as said base and said first support are rotated together about said first axis by said drive mechanism;

said first removable support having first and second opposed supports connected together and defining upper portions;

a first axle rotatable extending between said first and second opposed supports;

a first wheel rigidly mounted on said first axle and extending through said first opening in contacting engagement with said floor when said first removable support is removably attached to said base;

first and second bearing elements extending between said first and second opposed supports above said first axle and in substantially side-by-side, spaced-apart relationship with each other; and

a belt extending around and engaging said first axle and said first and second bearing elements, whereby rotation of said first axle caused by rotation of said first wheel in contact with said floor as said base is rotated about said first axis by said drive mechanism causes rotational movement of said belt over said first axle and over said first and second bearing elements; and

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a second removable support attachable to said base within said second openings in predetermined contacting relationship with said floor and removably supporting said food treatment attachment as said food treatment attachment is rotated about said second axis and as said base is rotated about said first axis by said drive mechanism.

5,837,981

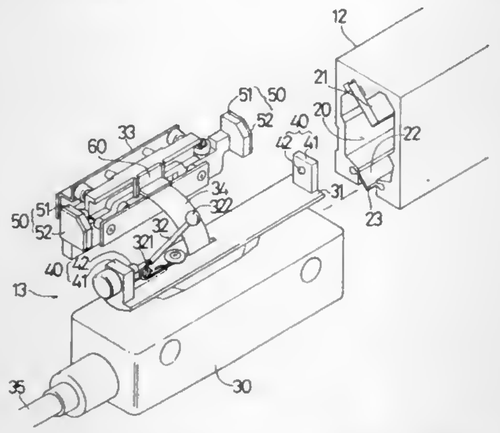
SIGNAL OUTPUTTING DEVICE OF OPTICAL RULER

Chin-Yuan Wang, P. O. Box 2103, Taichung, Taiwan

Filed Jul. 24, 1997, Ser. No. 899,705

Int. Cl.⁶ G06G *1/02*

U.S. Cl. 235—70 R **1 Claim**



1. A signal outputting device of optical ruler, comprising:

a first guide seat formed with an internal axial chamber, a reflecting plate being disposed in the chamber, an elongated channel axially extending through the first guide seat to communicate the chamber with an outer edge of the first guide seat;

a second guide seat including a slide block axially movable within the chamber and a resilient lever having a fixed end disposed on the slide block; and

a sensor disposed on outer side of the slide block, an inner side of the sensor abutting against a free end of the resilient lever,

wherein the slide block is disposed with two first stopper sections spaced from each other by a certain distance, each first stopper section having a first stopper block and an engaging member disposed thereon, a rear end of each engaging member having an arch shape, one of the engaging members being pushed by a resilient member, the sensor being positioned between the first stopper sections and disposed with two second stopper sections spaced from each other by a certain distance, each second stopper section being disposed with a plane face abutting against the rear end of the engaging member, the second stopper sections being such restricted by the first stopper sections as to only move in a direction perpendicular to the moving direction of the slide block, a section of the sensor contacting with the free end of the resilient lever being formed with a guide channel axially parallel to the moving direction of the slide block; and

wherein the plane face is perpendicular to the moving direction of the slide block.

5,837,982

ANTENNA FOR NON-CONTACT IC CARD GATE FACILITY

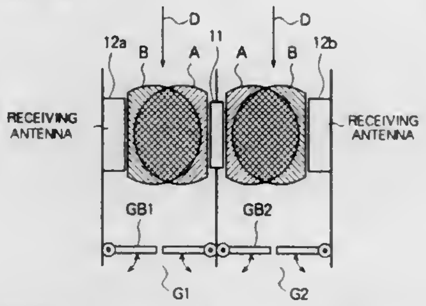
Shuzo Fujioka, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, and Mitsubishi Electric Semiconductor Software Co., Ltd., Hyogo, both of Japan

Division of Ser. No. 541,449, Oct. 10, 1995, Pat. No. 5,661,286. This application Apr. 21, 1997, Ser. No. 845,141

Claims priority, application Japan, Nov. 15, 1994, 6-280544

Int. Cl.⁶ G06K *5/00*

U.S. Cl. 235—382 **8 Claims**



1. An antenna mechanism for a non-contact IC card system for communication with a non-contact IC card passing a gate, said antenna mechanism comprising:

an antenna; and

a conductive shielding body located on an outer side of a gate to eliminate a communication area outside the gate by shielding electromagnetic waves from said antenna, wherein said conductive shielding body comprises a box covering back and side surfaces of said antenna.

5,837,983

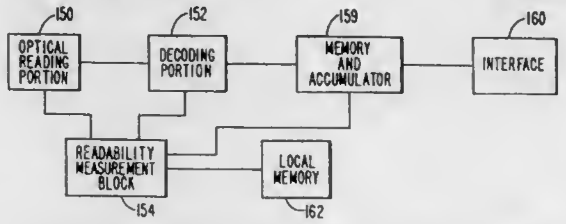
READABILITY MONITORING SYSTEM FOR OPTICAL CODES

Robert J. Actis; Craig D. Cherry; Alan C. Bradley, all of Eugene, Oreg., and Donald D. Dieball, San Diego, Calif., assignors to PSC, Inc., Eugene, Oreg.

Filed Jun. 10, 1996, Ser. No. 661,129

Int. Cl.⁶ G06K *5/00*

U.S. Cl. 235—437 **28 Claims**



1. Apparatus for monitoring readability of symbols, comprising:

an optical code reader comprising

an optical data collector;

a decoder connected to said optical data collector;

a memory;

a readability measurement block connected to at least one of said optical data collector and said decoder, whereby information relating to an attempt to read an optical code is recorded in said memory; and

a measurement data accumulator connected to said optical code reader, said measurement data accumulator receiving said information from said optical code reader and generating statistical information based on attempts by said optical code reader to read a plurality of different optical codes.

5,837,984

SMT READER FOR SIM-CARD AND STANDARD CARDS

Robert Bleier, Untergruppenbach, and Manfred Reichardt, Weinsberg, both of Germany, assignors to Amphenol-Tuchel Electronics GmbH, Heilbronn, Germany

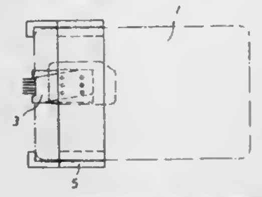
PCT No. PCT/EP94/01581, § 371 Date Nov. 14, 1995, § 102(e) Date Nov. 14, 1995, PCT Pub. No. WO94/27244, PCT Pub. Date Nov. 24, 1994

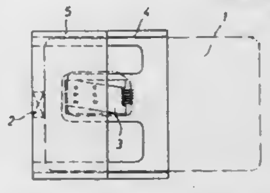
PCT Filed May 16, 1994, Ser. No. 537,746

Claims priority, application Germany, May 14, 1993, 43 16 306.8

Int. Cl.⁶ G06K *7/00;18/06*

U.S. Cl. 235—441 **12 Claims**





1. A contacting apparatus for a chip card or a SIM card, said contacting apparatus comprising:

a printed circuit board,

a contact block mounted by means of soldering to the circuit board and contacting said circuit board in accordance with surface mounted technology (SMT) and

card guide means disposed separate from the contact block and adapted to guide the chip card or the SIM card,

wherein said card guide means is mounted to the circuit board, and

wherein further guide and mounting means for the mounting of the contact block to the circuit board and for the mounting of the card guide means to the circuit board are each formed by pins which are manufactured integrally together with the contact block and the card guide means, respectively, of plastic material.

5,837,985

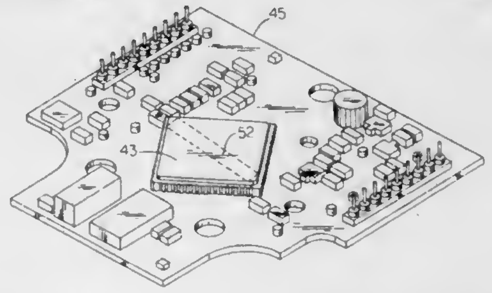
OPTICAL IMAGING ASSEMBLY HAVING IMPROVED IMAGE SENSOR ORIENTATION

Thomas W. Karpen, Skaneateles, N.Y., assignor to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Continuation of Ser. No. 649,126, May 14, 1994. This application Jul. 31, 1996, Ser. No. 692,807

Int. Cl.⁶ G06K *7/10*

U.S. Cl. 235—462 **30 Claims**



1. In a reading apparatus of the type including an image sensor having a generally planar rectangular array of photosensitive elements, an imaging optics assembly for imaging a bar code symbol on said array, and a mounting member for mounting said image sensor so that the plane of said array is generally parallel to and approximately in the focal plane of said imaging optics assembly, the improvement comprising:

mounting said image sensor on said mounting member so that, when the reading apparatus has its normal orientation with respect to the reading axis of a 1D bar code symbol, a diagonal of said array is approximately aligned with said reading axis.

5,837,986

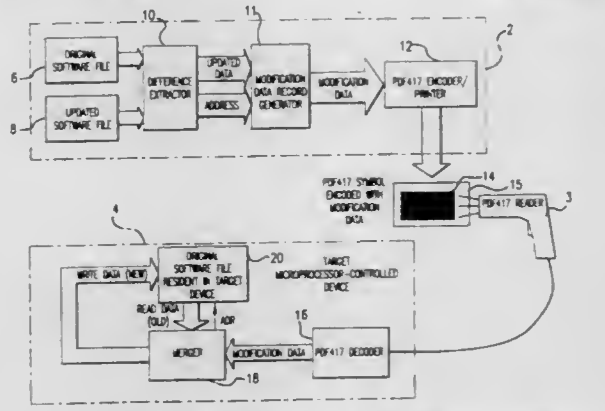
MODIFICATION OF SOFTWARE FILES IN A MICROPROCESSOR-CONTROLLED DEVICE VIA TWO-DIMENSIONAL BAR CODE SYMBOLS

John Barile, Holbrook; Steven Chew, Northport, and Jerome Swartz, Old Field, all of N.Y., assignors to Symbol Technologies, Inc., Holtsville, N.Y.

Continuation of Ser. No. 268,075, Jun. 28, 1994, abandoned, which is a continuation-in-part of Ser. No. 126,965, Sep. 27, 1993, Pat. No. 5,399,846, which is a division of Ser. No. 461,881, Jan. 5, 1990, Pat. No. 5,304,786. This application Oct. 9, 1996, Ser. No. 728,397

Int. Cl.⁶ G06K *7/10*

U.S. Cl. 235—462 **10 Claims**



1. A system for modifying an original software file resident in a microprocessor-controlled device comprising:

a) a modification data generator for generating file modification data representative of the differences between the original software file and an updated software file including:

(i) a difference extractor for comparing the original file with the updated file and for providing a list of addresses where the original file differs from the updated file and the updated bytes of data located at said addresses, and

(ii) a record assembler for assembling a list of records representative of the updated byes, the addresses associated with the updated bytes, and an operation function indicative of one of several available modes of merging said updated bytes with the original file;

b) an encoder for encoding the file modification data into a two-dimensional bar code symbol;

c) a printer for printing the two-dimensional symbol onto a substrate,

d) a bar code reader coupled to the microprocessor-controlled device for reading the encoded two-dimensional bar code symbol from the substrate and for decoding said symbol into the file modification data;

e) an update controller for providing software update identification and control,

f) a merger for merging the file modification data with the original software file resident in the microprocessor-controlled device so as to generate updated portions representative of the differences between the original software file and the updated software file: and

g) a replacer for replacing those portions of the original software file resident in the microprocessor-controlled device with the updated portions;

whereby the available modes of merging said updated bytes with the original file comprise an assignement operation in which the original byte is completely replaced with the updated byte, an AND operation in which selected bits of the original byte are set to zero, an OR operation in which selected bits of the original by te are set to one, and an EXCLUSIVE OR operation in which selected bits of the original byte are inverted.

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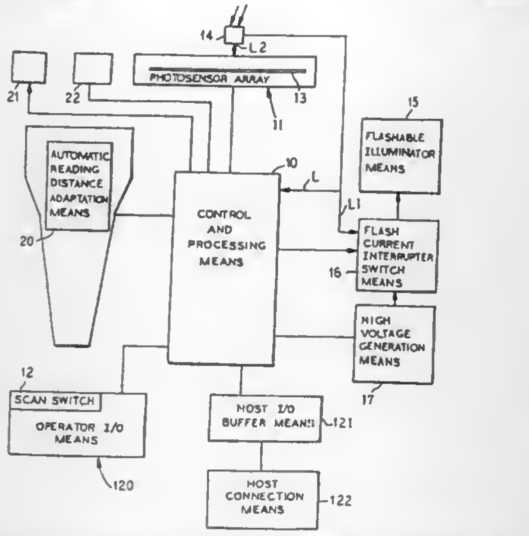
5,837,987
HAND-HELD OPTICALLY READABLE CHARACTER SET READER HAVING AUTOMATIC FOCUS CONTROL FOR OPERATING OVER A RANGE OF DISTANCES

Steven E. Koenck; Jonathan R. White; Phillip Miller, all of Cedar Rapids, Iowa; George E. Hanson, Andover, Kans.; Arvin D. Danielson, Solon, and Dennis A. Durbin, Cedar Rapids, both of Iowa, assignors to Norand Technology Corporation, Wilmington, Del.

Continuation of Ser. No. 309,334, Sep. 19, 1994, Pat. No. 5,576,529, which is a continuation of Ser. No. 215,112, Mar. 17, 1994, Pat. No. 5,640,001, which is a continuation-in-part of Ser. No. 947,036, Sep. 16, 1992, Pat. No. 5,308,966, which is a continuation of Ser. No. 875,791, Apr. 27, 1992, abandoned, which is a continuation-in-part of Ser. No. 422,052, Oct. 16, 1989, abandoned, which is a division of Ser. No. 894,689, Oct. 8, 1986, Pat. No. 4,877,949. This application Nov. 19, 1996, Ser. No. 751,382

Int. Cl.^{6} G06K *7/10*

U.S. Cl. 235—462 **19 Claims**


14
L2
21
22
PHOTOSENSOR ARRAY
13
11
15
FLASHABLE ILLUMINATOR MEANS
AUTOMATIC READING DISTANCE ADAPTATION MEANS
20
10
L
L1
CONTROL AND PROCESSING MEANS
FLASH CURRENT INTERRUPTER SWITCH MEANS
16
HIGH VOLTAGE GENERATION MEANS
17
12
SCAN SWITCH
OPERATOR I/O MEANS
120
HOST I/O BUFFER MEANS
121
HOST CONNECTION MEANS
122

1. A hand-held optical indicia reader operational at a plurality of distances from optical indicia to be read, said reader comprising:
   - (a) an indicia sensor capable of outputting a signal in response to sensed optical indicia;
   - (b) a distance measurement device to determine the distance of the optical indicia from said reader; and
   - (c) an adjustment system to configure said reader to read the optical indicia at the distance determined by said distance measurement device.

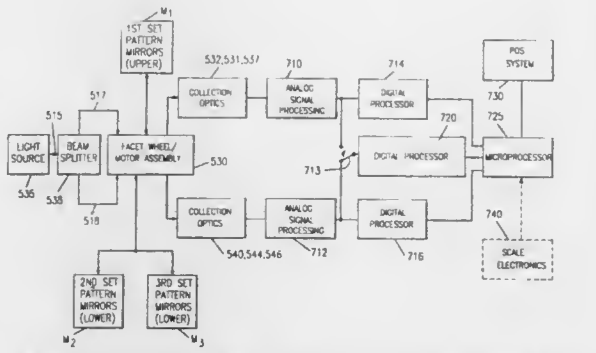
5,837,988
MULTIPLE PLANE SCANNING SYSTEM FOR DATA READING APPLICATIONS

Mohan LeeLaRama Bobba; Jorge Luis Acosta, both of Eugene, Oreg.; Timothy Joseph Eusterman, Plano, Tex.; James W. Ring, and Alexander McQueen, both of Eugene, Oreg., assignors to Spectra-Physica Scanning Systems, Inc., Eugene, Oreg.

Division of Ser. No. 554,819, Nov. 7, 1995, Pat. No. 5,705,802, which is a division of Ser. No. 155,122, Nov. 19, 1993, Pat. No. 5,495,207, which is a continuation-in-part of Ser. No. 913,580, Jul. 14, 1992, abandoned. This application Feb. 26, 1997, Ser. No. 806,194

Int. Cl.^{6} G06K *7/10*

U.S. Cl. 235—467 **9 Claims**



1. A scanner for reading symbols on an object being passed through a scan volume, comprising:
   - a housing including
     - a first housing section having a first window which is oriented horizontally below the scan volume,
     - a second housing section connected to the first housing section, the second housing section having a second window which is oriented generally vertically to a lateral side of the scan volume,
     - a third housing section having a third window which is oriented obliquely to a lateral side of the scan volume;
   - an optical scanning element within the housing;
   - at least first and second optical beams which are directed from different directions onto the optical scanning element to produce (a) a first set of scanning beams being directed out the first window, (b) a second set of scanning beams being directed out the second window and (c) a third set of scanning beams being directed out the third window.

5,837,989
PORTABLE DATA COLLECTION DEVICE FOR COLLECTING AND TRANSMITTING BAR CODE SYMBOL CHARACTER DATA

George Rockstein, Auburn; David Wilz, Sr., Sewell; Robert Blake, Woodbury Hts., and C. Harry Knowles, Morestown, all of N.J., assignors to Metrologic Instruments, Inc., Blackwood, N.J.

Continuation of Ser. No. 554,534, Nov. 6, 1995, abandoned, which is a continuation of Ser. No. 342,761, Nov. 21, 1994, abandoned, which is a continuation of Ser. No. 293,493, Aug. 19, 1994, Pat. No. 5,525,789, which is a continuation of Ser. No. 761,123, Sep. 17, 1991, Pat. No. 5,340,971. This application Sep. 5, 1996, Ser. No. 708,914

Int. Cl.^{6} G06K *7/10*

U.S. Cl. 235—472 **9 Claims**

1. A portable data collection device for selectably (1) receiving and collecting bar code symbol character data from the data-output communication port or a hand-holdable bar code symbol reader, and (ii) transmitting said collected bar code symbol character data through the data-input communication port of a data-receiving host device, said portable data collection device comprising:
   - data storage means capable of storing data, including bar code symbol character data, received from the hand-holdable bar code symbol reader;
   - data input communication means operably associated with said data storage means, and for receiving bar code symbol character data from the hand-held bar code reader and storing said received bar code symbol data in said data storage means;
   - data-output communication means, operably associated with said data storage means, and interfaceable with the data-input communication port of said data-receiving host device, for transmitting bar code symbol character data from said data storage means to said data receiving host device;
   - a programmed microprocessor for controlling the operation of said data storage means, said data communication means, and said data output communication means, wherein said microprocessor does not require data uploading routines, said data uploading routines being programmed into a data transmission circuit of said hand-holdable bar code symbol reader;
   - battery-power storage means for providing electrical power to said data storage means, said data input communication means, said data output communication means, said programmed microprocessor, and said hand-holdable bar code symbol reader; and
   - a hand-holdable housing for housing said data storage means, said data input communication means, said data output communication means, said programmed microprocessor and said battery power storage means.

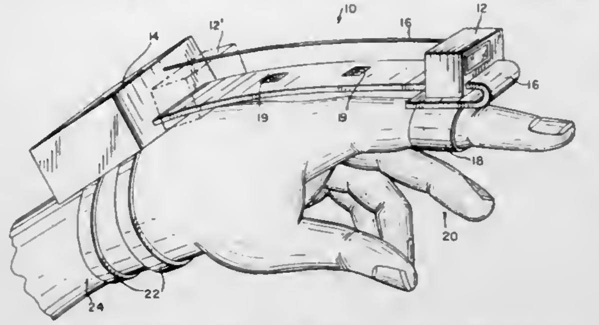
5,837,990
PORTABLE OPTICAL SCANNING SYSTEM INCLUDING RING AND TRACK

Howard Shepard, Great River, N.Y., assignor to Symbol Technologies, Inc., Holtsville, N.Y.

Filed Nov. 25, 1996, Ser. No. 755,983

Int. Cl.^{6} G06K *7/10*

U.S. Cl. 235—472 **17 Claims**



1. A portable optical reader comprising a reader element and a reader element guide arranged to be supported on person of a user, the reader element being mounted on the guide for movement thereon relative to the person of the user.

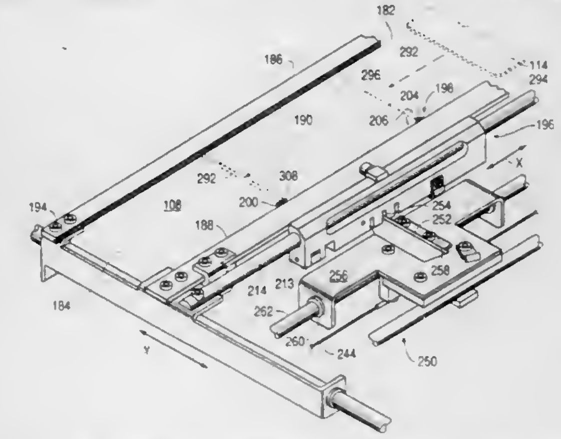
5,837,991
CARD TRANSPORT MECHANISM AND METHOD OF OPERATION

Richard J. LaManna, Morristown; Keith R. Ashley, Clark; Igor Pankiw, Linden; Philip M. Roth, Wallington, and Edward W. Hague, Hawthorne, all of N.J., assignors to Card Technology Corporation, Paramus, N.J.

Filed Mar. 8, 1996, Ser. No. 613,095

Int. Cl.^{6} G06F *17/00;3/12;* **G06K** *13/00*

U.S. Cl. 235—475 **68 Claims**



1. A card transport mechanism for transporting cards along a transport path comprising:
   - a pair of spaced apart channels, each channel engaging a different one of a pair of opposed edges of the cards:
   - a carriage for holding the cards at a fixed position relative to the carriage during motion along the transport path, the carriage having first and second card contacting elements spaced apart at different positions along the transport path and projecting into the transport path for contacting and holding a card in the fixed position during motion along the transport path, the first card contacting element being compliant to move orthogonally from within the transport path to permit movement of the card along the channels while the carriage is stationary prior to contact of the card by the second card contacting element and the second card contacting element being compliant along the transport path in response to contact with the card to produce contact and holding of the opposed edges of the card with the first and second card contacting elements in the fixed position; and
   - a carriage support, connected to the carriage, for guiding the carriage along the transport path.

5,837,992
MEMORY CARD AND ITS MANUFACTURING METHOD

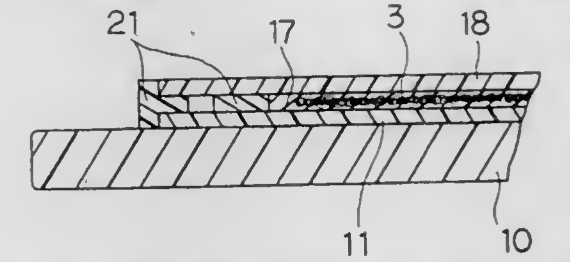
Tetsuya Onozawa, Kanagawa, Japan, assignor to Shinko Nameplate Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 353,518, Dec. 9, 1994, abandoned. This application Aug. 31, 1995, Ser. No. 521,824

Claims priority, application Japan, Jul. 15, 1994, 6-186349; Aug. 30, 1994, 6-228724

Int. Cl.^{6} G06K *19/00*

U.S. Cl. 235—488 **11 Claims**



1. A memory card having a spacer and circuit elements including a semiconductor device and a transmitting/receiving device sealed within a synthetic resin substrate in the form of a substantially flat plate;
   - a pair of substantially parallel synthetic resin sheet members spaced from each other a distance substantially corresponding to the thickness of said synthetic resin substrate plate; and
   - at least one glue-printed section provided between said spacer and each circuit element and at least one of said synthetic resin sheet members for fixing said spacer and circuit elements to said at least one synthetic resin sheet member,
   - said glue-printed sections fixing said spacer and circuit elements and being substantially surrounded by said synthetic resin substrate.

5,837,993
NETWORK OF PHOTOSENSITIVE CELLS AND IMAGE SENSOR INCLUDING SUCH A NETWORK

Venier Philippe, Cordast, and Arreguit Xavier, Le Mont, both of Switzerland, assignors to CSEM-Centre Suisse D'Electroniuqe et de Microtechnique SA, Neuchatel, Switzerland

Filed Feb. 21, 1997, Ser. No. 804,067

Claims priority, application France, Feb. 23, 1996, 96 02268

Int. Cl.^{6} H01L *27/00*

U.S. Cl. 250—208.1 **17 Claims**

1. A network of photosensitive cells (C_n C_{n+1}, C_{n-1}: k, k−1; k+1) each cell of which is intended to provide an output signal (S_n) representative of the local contrast in the zone in which this cell is situated within the network, wherein each cell comprises:

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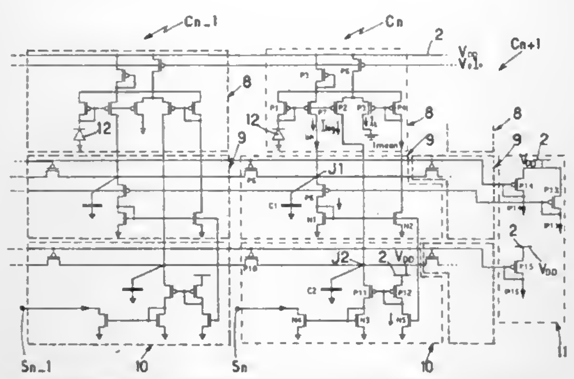


a photosensitive element (**12**; **1***a*) delivering a current (I_{ph}; $I_{ph}(k)$) representative of local illumination in said zone;

a calculating circuit (**9**; N3*a*, N4*a*, P3*a*) which, from said representative current (I_{ph}; $I_{ph}(k)$) and from predetermined quotas of the representative currents developed in at least some of the neighboring cells in the network of the relevant cell, generates a mean current (I_{mean}; $I_{mean}(k)$);

a second calculating circuit which, on the basis of said representative current (I_{ph}; $I_{ph}(k)$) and of said mean current (I_{mean}; $I_{mean}(k)$), generates a measurement current (I_{log}; $I_{out}(k)$) which depends in a monotonic increasing and saturating manner on the ratio of the representative current to the mean current, the said ratio representing the local contrast of the relevant cell, and

means (**10**) for generating said output signal (S_n) as a function of said measurement current (I_{log}; $I_{out}(k)$).

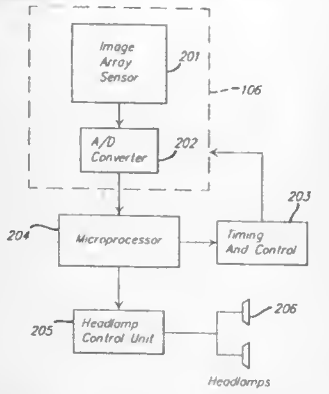
5,837,994
CONTROL SYSTEM TO AUTOMATICALLY DIM VEHICLE HEAD LAMPS

Joseph Scott Stam; Jon Harold Bechtel, both of Holland, and John King Roberts, East Grand Rapids, all of Mich., assignors to Gentex Corporation, Zeeland, Mich.

Filed Apr. 2, 1997, Ser. No. 831,232

Int. Cl.^{6} B60Q *1/115;1/14;* **H05B** *37/00*

U.S. Cl. 250—208.1 **53 Claims**



1. A control system for automatically controlling the state of the head lamps of a controlled vehicle, said control system comprising:

an optical system for imaging external sources of light within a predetermined field of view; and

an image processing system for processing images from said optical system and providing a control signal for controlling the state of the head lamps as a function of the relative output of pixels imaging the same spectral band of light.

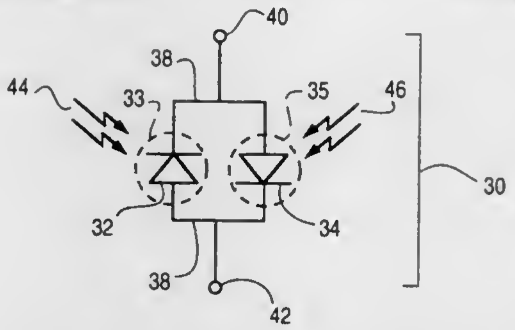
5,837,995
WAVELENGTH-CONTROLLABLE VOLTAGE-PHASE PHOTODIODE OPTOELECTRONIC SWITCH ("OPSISTOR")

Alan Y. Chow, 191 Palomino Pl., Wheaton, Ill. 60187, and Vincent Y. Chow, Hanover Park, Ill., assignors to Alan Y. Chow, Wheaton, Ill.

Filed Nov. 25, 1996, Ser. No. 755,729

Int. Cl.^{6} H01J *40/14*

U.S. Cl. 250—214 LS **19 Claims**



1. An optoelectronic switch, comprising: two photodiodes such that the anode of one photodiode is electrically connected via a first conductor to the cathode of the second photodiode, and the cathode of the first photodiode is electrically connected via a second conductor to the anode of the second photodiode, wherein the voltage-phase of the first conductor and the second conductor of the optoelectronic switch is a function of which of the photodiodes of the optoelectronic switch receives a greater amount of light illumination.

5,837,996
EYE PROTECTION SYSTEM WHEREIN A LOW POWER LASER CONTROLS A HIGH POWER LASER

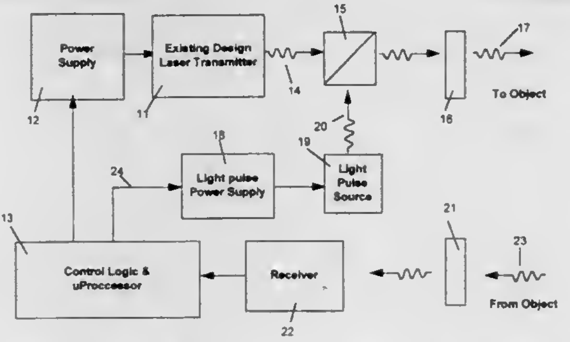
Eytan Keydar, 4 Hatekuma Street, Rehovot 76217, Israel

Continuation of Ser. No. 561,802, Nov. 22, 1995, abandoned. This application Jul. 2, 1997, Ser. No. 887,146

Claims priority, application Israel, Dec. 2, 1994, 11852

Int. Cl.^{6} G05D *25/00*

U.S. Cl. 250—221 **12 Claims**



1. An eye-safe laser comprising proximity range-measurement sensing means utilizing a low power light source for ascertaining whether a person is present up to the range at which the laser beam will cause eye damage, and means for actuating a high power laser only if no person is present within such a range.

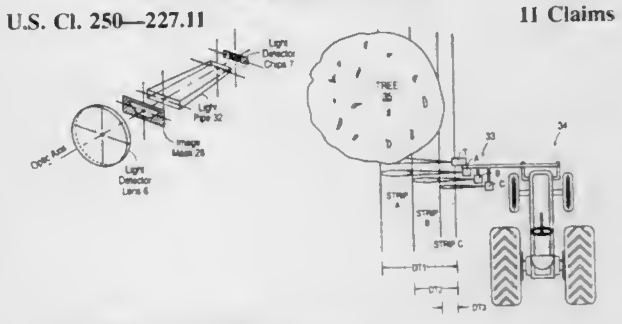
5,837,997
STRUCTURE AND METHOD FOR DETECTING PLANTS IN A FIELD USING A LIGHT PIPE

James L. Beck, Los Gatos, and Malcolm L. Kinter, Sunnyvale, both of Calif., assignors to Patchen, Inc., Los Gatos, Calif.

Division of Ser. No. 276,002, Jul. 15, 1994, Pat. No. 5,585,626, which is a continuation-in-part of Ser. No. 149,867, Nov. 10, 1993, Pat. No. 5,389,781, which is a continuation of Ser. No. 920,942, Jul. 28, 1992, Pat. No. 5,296,702. This application Mar. 4, 1996, Ser. No. 613,445

Int. Cl.^{6} G01J *1/04;1/42;5/08;3/50*

U.S. Cl. 250—227.11 **11 Claims**



1. A method, comprising:

emitting substantially monochromatic light of a first wavelength from a first light source and transmitting said light of said first wavelength toward a surface area of a field;

emitting substantially monochromatic light of a second wavelength from a second light source and transmitting said light of said second wavelength toward said surface area of said field;

using a light pipe to concentrate a portion of said light of said first and second wavelengths that has reflected off said surface area onto a photodetector, said light pipe having two opposing non-parallel surfaces; and

moving said first and second light sources, said light pipe and said photodetector with respect to said field such that said surface area is scanned across said field.

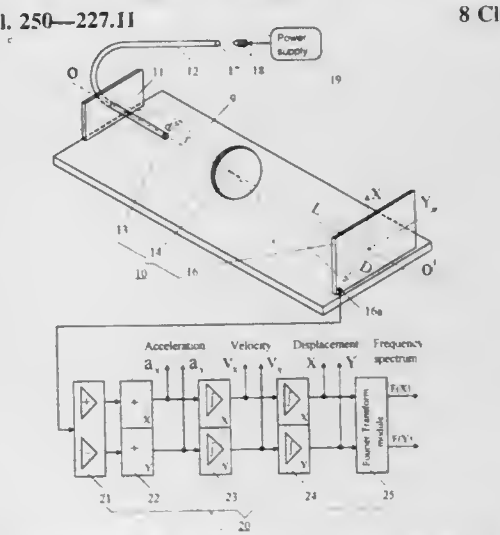
5,837,998
TWO-DIMENSIONAL FIBER OPTIC ACCELERATION AND VIBRATION SENSOR

Petko D. Dinev, and Tamara S. Dinev, both of 460 NW. 20-th str., apt. #D112, Boca Raton, Fla. 33431

Filed Jun. 24, 1996, Ser. No. 668,730

Int. Cl.^{6} H01J *5/16*

U.S. Cl. 250—227.11 **8 Claims**



1. A two-dimensional optical acceleration and vibration sensor comprising:

(a) a rigid support structure;

(b) at least one lengthy light conducting elastic member having a first and a second end, said elastic member being cantilevered from a fixed mounting point on said support structure to said second end, said elastic member flexing only in response to an applied external linear acceleration and causing a linear displacement of said second end, said elastic member being at rest if said external acceleration is absent;

(c) a light source optically coupled with said first end of said elastic member to supply light thereto;

(d) electro-optical processing means for detecting said linear displacement in two mutually perpendicular directions, which receives the light from said second end of said elastic member; and generates signals substantially proportional to said linear acceleration and its frequency spectrum, said electro-optical processing means being fixedly mounted on said support structure and spaced apart from said second end of said elastic member.

(e) at least one optical lens, provided to focus the light from said second end of said elastic member onto said electro-optical processing means, and to magnify said linear displacement, said optical lens being fixedly mounted on said support structure intermediate said second end of said elastic member and said electro-optical processing means.

5,837,999
POSITION DETECTING DEVICE HAVING A LINE SENSOR WHOSE LENGTH IS SHORTER THAN A DISTANCE BETWEEN TWO LIGHT BEAMS SIMULTANEOUSLY GENERATED BY AN ENCODING MEMBER

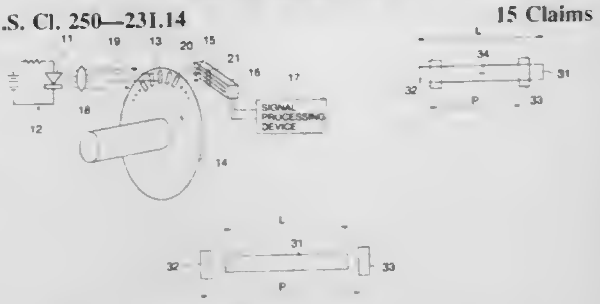
Tatsumi Horiuchi, Hachioji, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Nov. 19, 1996, Ser. No. 751,813

Claims priority, application Japan, Nov. 22, 1995, 7-304584

Int. Cl.^{6} G01D *5/34*

U.S. Cl. 250—231.14 **15 Claims**



1. An apparatus comprising:

an encoding member which is capable of simultaneously producing two light beams which are spaced with a predetermined distance therebetween and which move in synchronization with a movement of the encoding member;

a line sensor facing the encoding member so that the two light beams move alternately on the line sensor, the line sensor having a length shorter than the predetermined distance between the two light beams so that the line sensor receives only one of the two light beams and outputs position information corresponding to a moving position of the received one of the two light beams on the line sensor; and

a detector for detecting the movement of the encoding member based on the position information output by the line sensor.

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5,838,000
METHOD DEVICE AND SYSTEM FOR OPTICAL NEAR-FIELD SCANNING MICROSCOPY OF TEST SPECIMENS IN LIQUIDS

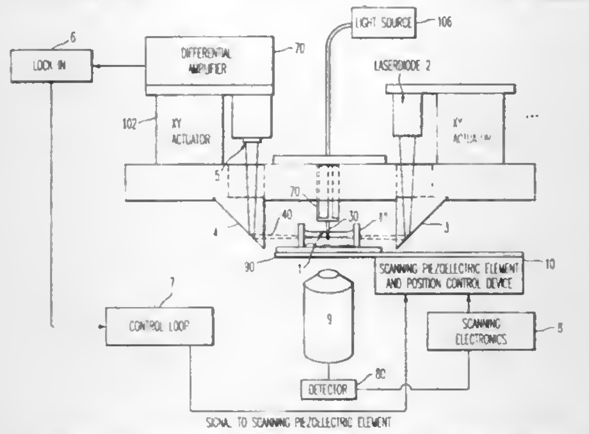
Michael Mertesdorf; Stefan Kirstein, both of Berlin, Germany; Monika Schoenhoff, Lund, Sweden, and Frauke Lohr, Recklinghausen, Germany, assignors to Huels Aktiengesellschaft, Marl, Germany

Filed May 9, 1997, Ser. No. 854,168

Claims priority, application Germany, Aug. 3, 1996, 196 31 498.4

Int. Cl.^{6} H01J *3/14*

U.S. Cl. 250—234 **19 Claims**



1. A method for performing optical near-field scanning microscopy on a test specimen in a liquid, comprising the steps of;
- disposing an optical fiber tip in the liquid proximate the test specimen;
- vibrating the optical fiber tip;
- controlling a distance between said optical fiber tip and said test specimen, said controlling step comprising,
  - focusing a light beam from a light source through said vessel and said liquid on said optical fiber tip without reflection at a surface of the specimen, said liquid and said vessel being transparent at a wavelength of the light beam,
  - forming a diffraction pattern from a portion of said light beam diffracted by said optical fiber tip, said diffraction pattern formed downstream of said light source and said optical fiber tip, and
  - detecting the diffraction pattern with a light detector and producing a detection signal; and
- observing said specimen in said liquid with said optical fiber tip via optical near-field scanning microscopy.

5,838,001
SCANNING OPTICAL DEVICE AND POLYGON MIRROR COVER

Tadashi Minakuchi; Masahiro Oono; Mitsunori Iima, and Hiroshi Kanazawa, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

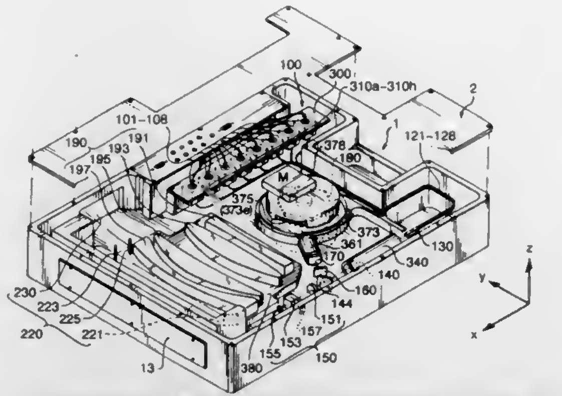
Filed Jan. 31, 1997, Ser. No. 791,964

Claims priority, application Japan, Jan. 31, 1996, 8-037266; Feb. 2, 1996, 8-040604

Int. Cl.^{6} H01J *3/14*

U.S. Cl. 250—236 **9 Claims**

1. A scanning optical device, comprising:
- a light source that emits a light flux;
- a polygon mirror that includes a plurality of reflecting surfaces for deflecting said light flux to form a scanning beam spot on an image surface, said polygon mirror including a mark on a top surface of said polygon mirror eccentric from a rotation axis of said polygon mirror;
- a polygon mirror cover that covers said polygon mirror, said polygon mirror cover comprising a cylindrical wall that surrounds said reflecting surfaces, a top wall that closes one end of said cylindrical wall to cover said top surface of said polygon mirror, and a cylindrical rib having a smaller diameter than said cylindrical wall formed on an inner surface of said top wall projecting toward said polygon mirror; and
- an optical sensor that detects said mark, said optical sensor being fixed to said top wall and projecting toward said polygon mirror from said inner surface of said top wall, through said cylindrical rib, such that said optical sensor forms a part of said cylindrical rib.



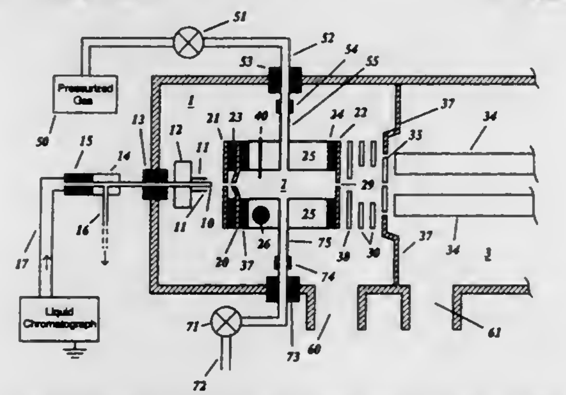
5,838,002
METHOD AND APPARATUS FOR IMPROVED ELECTROSPRAY ANALYSIS

Edward W. Sheehan, Pittsburgh, Pa., assignor to Chem-Space Associates, Inc, Pittsburgh, Pa.

Filed Aug. 21, 1996, Ser. No. 701,050

Int. Cl.^{6} H01J *49/10*

U.S. Cl. 250—288 **33 Claims**



1. An apparatus for low pressure electrospray to deliver analyte to a detection device, comprising:
- a) a capillary means for introducing a liquid sample;
- b) a first chamber for receiving said liquid sample, said chamber includes at least a first wall in which said capillary means is situated and at least a second wall, said chamber is maintained at a pressure substantially less than atmospheric pressure;
- c) a means for maintaining a high electric potential difference between said liquid sample within the capillary means and said second wall, whereby the surface of said liquid sample is distorted at the outlet of said capillary means into a single electrospray cone-jet;
- d) a heating means for heating the liquid sample within the capillary means to prevent the freezing of electrospray cone-jet exiting said outlet of capillary means;
- e) at least one steering means to direct said cone-jet in a well defined path;
- f) an aperture disposed in said second wall of said first chamber so that the liquid jet and any resulting highly charged droplets from the breakup of the liquid jet are emitted from said first chamber;
- g) a second chamber adjacent to said first chamber maintained at a pressure substantially less than atmospheric pressure and at a higher pressure than that of said first chamber, said second chamber includes said second wall of said first chamber, said aperture through which sample is emitted; and in which liquid and analyte evaporate into the gas phase so that the analyte is received by a detection device; and
- h) a heating means for heating said second chamber to facilitate the evaporation of said highly charged droplets.

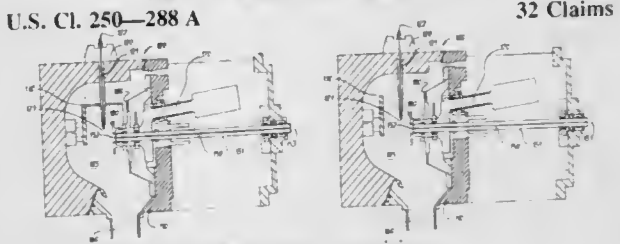
5,838,003
IONIZATION CHAMBER AND MASS SPECTROMETRY SYSTEM CONTAINING AN ASYMMETRIC ELECTRODE

James L. Bertsch, Palo Alto; Steven M. Fischer, Hayward; Kent D. Henry, Newark, and Eugene M. Wong, Campbell, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 27, 1996, Ser. No. 723,201

Int. Cl.^{6} B01D *59/44;* **H01J** *49/00*

U.S. Cl. 250—288 A **32 Claims**



1. A mass spectrometer system comprising:
- (a) a housing containing an ionization region;
- (b) an electrospray assembly at a low voltage with respect to the housing;
- (c) ion sampling means for receiving ions from the ionization region, wherein the ion sampling means is at a first high voltage with respect to the housing, the first high voltage having an absolute value;
- (d) a counter electrode for attracting ions in the ionization region towards the ion sampling means, wherein the counter electrode is at a second high voltage having an absolute value with respect to the housing, the absolute value of the second high voltage being less than the absolute value of the first high voltage; and
- (e) an asymmetric electrode disposed in radial asymmetry with respect to the counter electrode and positioned relative to the electrospray assembly such that electrospray can be initiated and sustained, wherein the asymmetric electrode is at a third high voltage with respect to the housing, the third high voltage being substantially equal to the second high voltage.

5,838,004
PARTICLE-OPTICAL APPARATUS COMPRISING A FIXED DIAPHRAGM FOR THE MONOCHROMATOR FILTER

Peter Christiaan Tiemeijer; John Chmelik, and Pieter Kruit, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

PCT No. PCT/IB96/01029, § 371 Date Jun. 2, 1997, § 102(e) Date Jun. 2, 1997, PCT Pub. No. WO97/13268, PCT Pub. Date Apr. 10, 1997

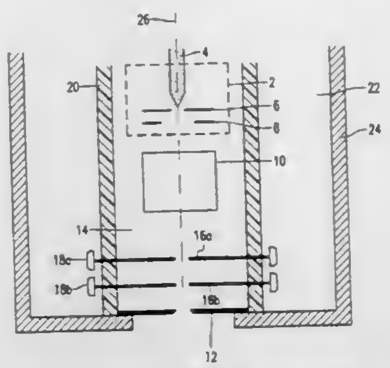
PCT Filed Oct. 1, 1996, Ser. No. 849,205

Claims priority, application European Pat. Off., Oct. 3, 1995, 95202649

Int. Cl.^{6} H01J *37/05;37/04*

U.S. Cl. 250—305 **5 Claims**

1. A particle-optical apparatus, comprising a particle source (**2**) for producing a primary beam (**31**) of electrically charged particles, which particle source comprises high-voltage means (**16***a*, **16***b*) for establishing within the particle source an accelerating high-voltage field which is to be traversed by the particles, and a monochromator filter assembly (**10**) which is situated substantially completely ahead of the high-voltage field within the source so as to select from the primary beam a sub-beam with an energy dispersion which is less than that of the primary beam, characterized in that there is provided a diaphragm (**30**) which is situated at the entrance side of the monochromator filter assembly (**10**) and is rigidly connected to a part (**48***a*) of the monochromator filter assembly in normal operating conditions.



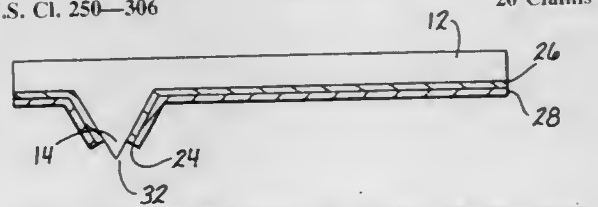
5,838,005
USE OF FOCUSED ION AND ELECTRON BEAMS FOR FABRICATING A SENSOR ON A PROBE TIP USED FOR SCANNING MULTIPROBE MICROSCOPY AND THE LIKE

Arunava Majumdar, Santa Barbara; Jie Lai, and Ke Luo, both of Goleta, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Continuation-in-part of Ser. No. 439,425, May 11, 1995, Pat. No. 5,581,083. This application Oct. 16, 1996, Ser. No. 732,068

Int. Cl.^{6} H01J *37/26*

U.S. Cl. 250—306 **20 Claims**



1. An improvement in a method for forming a sensor comprising:
- providing a probe with a pointed tip having an apex;
- disposing a first layer on said probe and on said tip of said probe;
- disposing a second layer on said first layer;
- focusing a charged beam on said tip of said probe to define a hole through said second layer to expose said first layer over said apex; and
- disposing a third layer over said second layer and said exposed portion of said first layer over said apex to form a junction between said third and first layers over said apex, said junction forming a sensing device,

whereby a probe with a dual sensing device is fabricated.

5,838,006
CONICAL BAFFLE FOR REDUCING CHARGING DRIFT IN A PARTICLE BEAM SYSTEM

Lee H. Veneklasen, Castro Valley, and Lydia J. Young, Palo Alto, both of Calif., assignors to Etec Systems, Inc., Hayward, Calif.

Filed Oct. 17, 1996, Ser. No. 733,673

Int. Cl.^{6} H01J *37/09*

U.S. Cl. 250—310 **18 Claims**

1. A particle beam system having a primary particle source providing a beam of charged particles, a deflector for deflecting the beam, comprising a conical baffle structure arranged concentric to the beam and spaced apart from the primary particle source, the baffle structure being open near its apex, the apex being closer to a source of secondary particles generated by the primary beam than is the base of the cone, wherein an angle of a cone defined by the

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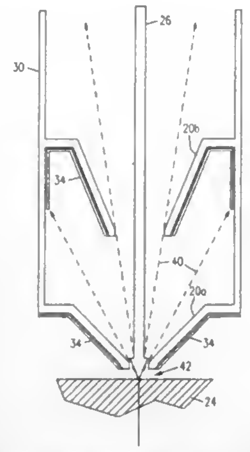


baffle structure prevents a secondary particle from passing into the opening to an interior surface of the baffle structure, wherein the baffle structure is disposed inside the deflector.

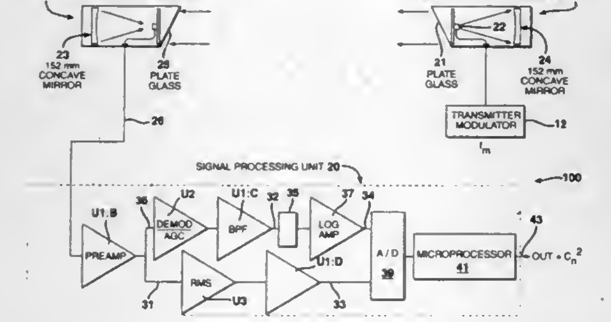
5,838,007
OPTICAL SCINTILLOMETER WAKE VORTEX DETECTION SYSTEM

Ting-I Wang, Gaithersburg, Md., assignor to Scientific Technology, Inc., Gaithersburg, Md.

Continuation-in-part of Ser. No. 709,159, Sep. 6, 1996. This application Jun. 23, 1997, Ser. No. 880,709

Int. Cl.^{6} G01N *21/41*

U.S. Cl. 250—338.5 **16 Claims**



1. A method of determining temporally and spatially averaged aircraft generated wake vortex turbulence in real time comprising:
generating an infrared optical signal,
partially collimating said infrared optical signal utilizing an optical collimator,
transmitting said collimated optical signal through atmosphere up to a distance of ten kilometers,
receiving said transmitted optical signal and focusing said transmitted optical signal onto a photodetector utilizing a focusing device, thereby generating received analog signals,
converting said received analog signals to digital form to produce received digital signals,
comparing each of said received digital signals with a predetermined digital threshold level to produce data output signals for only those of said received digital signals that are at least as great as said predetermined digital threshold level, and
calculating the path averaged log amplitude variance of said data output signals to provide a wake vortex dynamic impulse.

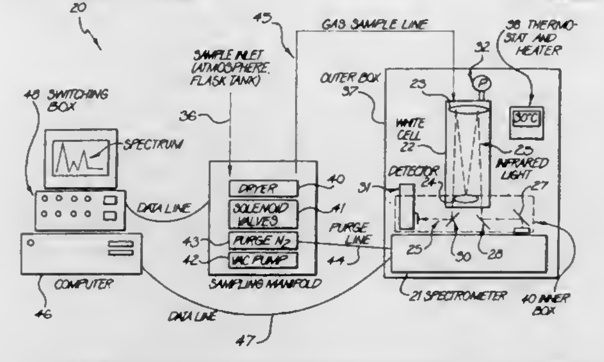
5,838,008
METHOD AND APPARATUS FOR MEASURING GAS CONCENTRATIONS AND ISOTOPE RATIOS IN GASES

Michael Brian Esler, Wollongong, and David William Tracy Griffith, Mangerton, both of Australia, assignors to University of Wollongong, Wollongong, Australia

Filed Dec. 18, 1996, Ser. No. 770,739

Int. Cl.^{6} G01J *5/02*

U.S. Cl. 250—339.08 **23 Claims**



1. A method of performing a primary calibration of a spectrometer device comprising the steps of:
calculating a theoretical spectral response function for a series of candidate chemical substances;
convolving said theoretical spectral response function with a spectrometer instrument response function corresponding to said spectrometer device so as to produce an expected response function for said series of candidate chemical substances; and
utilising said expected response function as the calibration of said spectrometer device in the subsequent measurement of chemical substances.

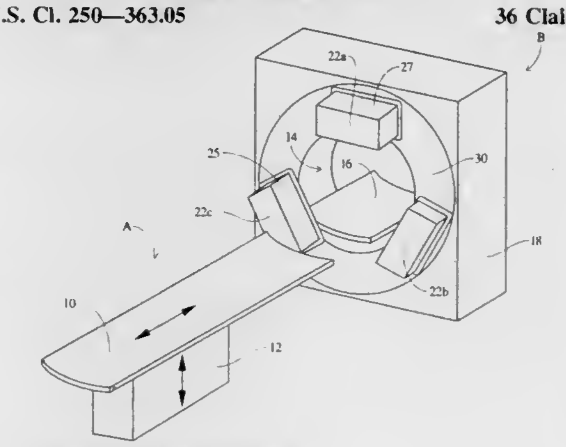
5,838,009
VARIABLE ANGLE MULTIPLE DETECTOR NUCLEAR MEDICINE GANTRY

Steven J. Plummer, Hudson, and Jacin C. Barnes, Willowick, both of Ohio, assignors to Picker International, Inc., Highland Heights, Ohio

Filed Nov. 27, 1996, Ser. No. 757,874

Int. Cl.^{6} G01T *1/166*

U.S. Cl. 250—363.05 **36 Claims**



1. A gamma camera comprising:
a first member;
a rotating gantry;
two or more detectors;
means for rotating the rotating gantry with respect to the first member; and
means for selectively coupling at least one of the detectors to the to the first member and the rotating gantry such that the rotating gantry may be rotated with respect to the detector when the detector is coupled to the first member and the detector rotates with the rotating gantry when coupled to the rotating gantry.

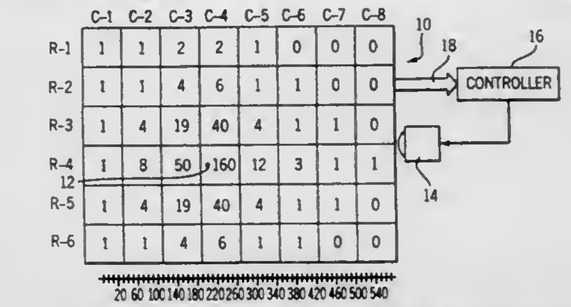
5,838,010
SPATIAL RESOLUTION IMPROVEMENT FOR GAMMA CAMERA

Lars M. Pedersen, Horsholm, Denmark, assignor to General Electric Company, Waukesha, Wis.

Filed Jul. 14, 1997, Ser. No. 891,792

Int. Cl.^{6} G01T *1/161;1/208*

U.S. Cl. 250—369 **17 Claims**



	C-1	C-2	C-3	C-4	C-5	C-6	C-7	C-8
R-1	1	1	2	2	1	0	0	0
R-2	1	1	4	6	1	1	0	0
R-3	1	4	19	40	4	1	1	0
R-4	1	8	50	160	12	3	1	1
R-5	1	4	19	40	4	1	1	0
R-6	1	1	4	6	1	1	0	0

1. A method to be used with a gamma camera, the camera including a scintillation crystal having opposite impact and emitter sides and a plurality of light detecting photo multiplier tubes (PMTs), each PMT having a width and a length and arranged end to end along their widths in Y rows forming X columns on the emitter side, the crystal positionable adjacent an imaging area such that photons from within the imaging area impact the impact side, each photon which impacts the impact side impacting the side at a specific impact point adjacent a specific impact location on an event PMT, when a photon impacts the crystal, the crystal emitting light from the emitter side adjacent the impact point, the PMTs sensing emitted light and generating intensity signals related to each impacting photon, the method for determining where an impact location occurs along an event PMT's width, the method comprising the steps of, when a photon impacts the crystal:
(a) determining the event PMT;
(b) determining an event column, the event column being the column in which the event PMT is located;
(c) mathematically combining the intensity signals of all PMTs to a first side of the event column providing a first composite signal;
(d) mathematically combining the intensity signals of all PMTs to a second side of the event column providing a second composite signal; and
(e) comparing the first and second composite signals to determine the impact location along the width of he event PMT.

5,838,011
CORRECTION DEVICE FOR THE CORRECTION OF LENS ABERRATIONS IN PARTICLE-OPTICAL APPARATUS

Marcellinus P.C.M. Krijn; Alexander Henstra, and Karel D. Van Den Mast, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

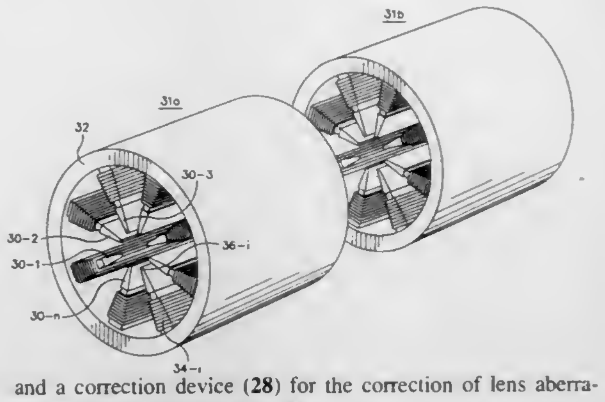
Filed May 21, 1997, Ser. No. 861,345

Claims priority, application European Pat. Off., May 21, 1996, 96201381

Int. Cl.^{6} H01J *37/153*

U.S. Cl. 250—396 R **12 Claims**

1. A particle-optical apparatus, including
a particle source for producing a beam of electrically charged particles which travel along an optical axis (**4**) of the apparatus in order to expose an object (**14**) to be irradiated in the apparatus to the particle beam,
a focusing lens (**8**) for focusing the beam of electrically charged particles,



and a correction device (**28**) for the correction of lens aberrations of the focusing lens (**8**),
which correction device (**28**) includes pole faces for producing a uniform electric field and a uniform magnetic field which extends perpendicularly thereto, both dipole fields also extending perpendicularly to the optical axis (**4**) of the apparatus,
which correction device also includes pole faces for producing electric and magnetic quadrupole fields, hexapole fields and an electric and/or a magnetic octupole field, said pole faces (**30**-*i*) extending substantially parallel to the optical axis (**4**) of the apparatus,
and which correction device is also arranged to produce at least two additional hexapole fields which form part of said hexapole field and have been rotated 180° about the optical axis relative to one another, characterized in that
the pole faces (**30**-*i*) which determine the additional hexapole fields are arranged adjacent one another without other particle-optical elements being arranged therebetween.

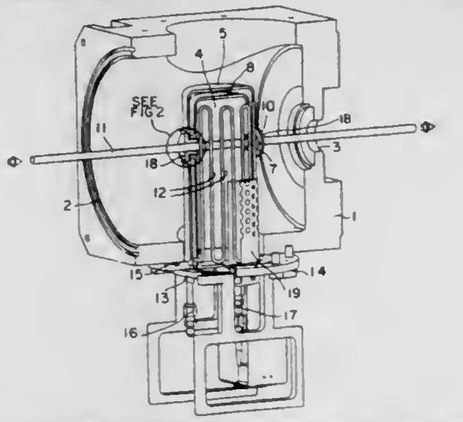
5,838,012
CHARGE EXCHANGE CELL

Marvin LaFontaine, Kingston, N.H.; Nobuhiro Tokoro, West Newbury, Mass.; Victor Quattrini, Haverhill, Mass.; Daniel Bissonnette, Leominster, Mass., and Takao Sakase, North Reading, Mass., assignors to Genus, Inc., Sunnyvale, Calif.

Filed Mar. 19, 1997, Ser. No. 822,543

Int. Cl.^{6} H01J *27/00*

U.S. Cl. 250—423 R **11 Claims**



1. Apparatus for generating negative ions for injection into tandem accelerators such as those used in ion implantation, comprising in combination
a positive ion source,
a housing having a beam-entrance aperture and a beam-exit aperture,
a target chamber having an outer cylindrical wall and an inner cylindrical wall forming a tubular space and having minimal thermal mass, said walls having beam-entrance apertures and beam-exit apertures, said target chamber being mounted within said housing so that said apertures in said walls are

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aligned with said apertures in said housing for passage of an ion beam therethrough,

a reservoir of vaporizable metal within said target chamber, said metal being of a type capable of converting positive ions from said positive ion source to negative ions by charge exchange,

a temperature-control system including a heating element mounted within said tubular space and adapted to vaporize said metal,

said target chamber having an inlet adapted to admit cooling air into said tubular space, said minimal thermal mass allowing a heatup time of about 12 minutes from 25° C. to 420° C. and a cooling time of 18 minutes from 420° C. to 100° C., and

means for directing a beam of positive ions from said positive ion source sequentially through said apertures.

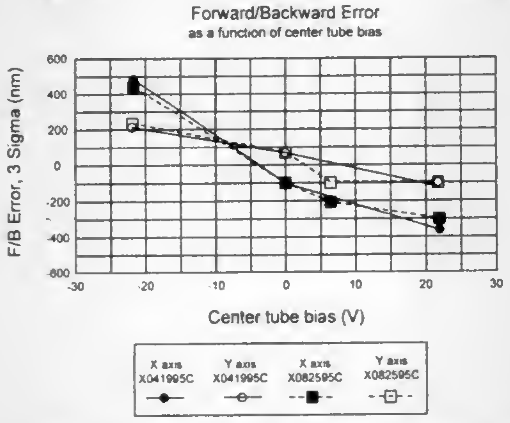
5,838,013
METHOD FOR MONITORING RESIST CHARGING IN A CHARGED PARTICLE SYSTEM

Rainer Butsch, Fairport; William A. Enichen, Poughkeepsie; Michael S. Gordon, Somers, and John G. Hartley, Fishkill, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 13, 1996, Ser. No. 746,534

Int. Cl.^{6} H01J *37/00*

U.S. Cl. 250—492.2 **26 Claims**



1. A method for monitoring resist charging in a charged particle system comprising the steps of:

providing a substrate having uncoated registration marks in a known pattern thereon;

depositing a first charge at a series of predetermined positions on the substrate;

measuring the perceived position of the uncoated registration marks;

depositing a layer of a resist material over a surface of the substrate, thereby coating the registration marks;

depositing a second charge at the series of predetermined positions on the resist-coated substrate;

measuring the perceived position of the coated registration marks; and

determining the difference in the perceived positions between the uncoated registration marks and the coated registration marks, the difference yielding an indication of charging in the layer of resist material.

5,838,014
LASER BEAM BORESIGHTING APPARATUS

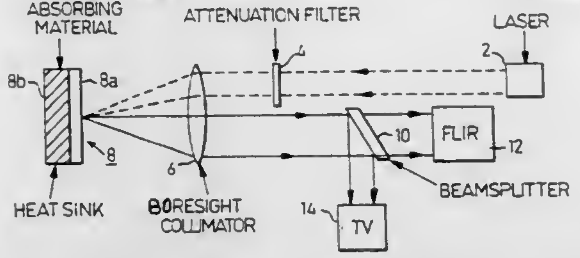
Dario Cabib; Moshe Lavi, both of Timrat; Arnold Daniels, Nof Haemek; Robert A. Buckwald, Ramat Ishay, and Kurt Weiser, Haifa, all of Israel, assignors to CI Systems (Israel) Ltd., Migdal HaEmek, Israel

Filed Nov. 16, 1989, Ser. No. 437,067

Claims priority, application Israel, Nov. 18, 1988, 88409

Int. Cl.^{6} F41J *2/02*

U.S. Cl. 250—504 R **30 Claims**



1. A system for converting laser light having a laser wavelength into infrared radiation outside the laser wavelength, comprising:

a thermal target comprising a substrate of high thermal conductivity and a layer of low thermal conductivity target material applied to a surface of said substrate;

means for allowing the impingement of laser light of said laser wavelength onto said target; and

means for utilizing the resultant radiation of infrared radiation outside the laser wavelength emitted by the target.

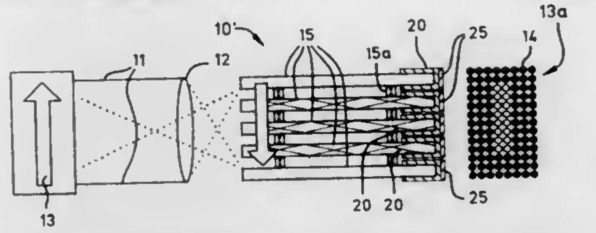
5,838,015
INFRARED SCENE PROJECTOR

David L. Burdick, and Robert Z. Dalbey, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Mar. 3, 1997, Ser. No. 806,131

Int. Cl.^{6} G01J *1/00*

U.S. Cl. 250—504 R **5 Claims**



1. A transducer of electromagnetic radiation to infrared radiation comprising:

a plurality of waveguides to transmit electromagnetic radiation, said plurality of waveguides having a separation between one another; and

a plurality of absorber structures each disposed on an end of a separate one of said plurality of waveguides to absorb said electromagnetic radiation, to convert said absorbed radiation into heat, and to emit radiation having longer wavelengths than said electromagnetic radiation;

each of said absorber structures comprising a can-shaped coating defining an absorber cavity; and

a selective emitter coating disposed on said can-shaped coating having a higher infrared emissivity than said can-shaped coating.

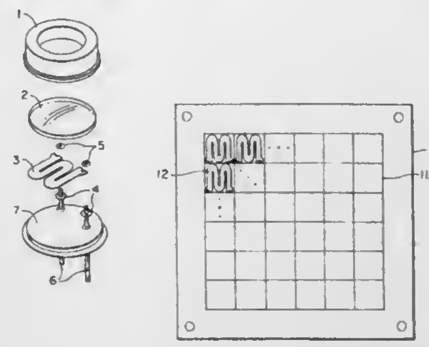
5,838,016
INFRARED RADIATION FILAMENT AND METHOD OF MANUFACTURE

Edward A. Johnson, 41 North Rd., Ste 103, Bedford, Mass. 01730

Continuation of Ser. No. 511,070, Aug. 3, 1995, abandoned. This application Aug. 4, 1997, Ser. No. 905,599

Int. Cl.^{6} H05B *3/26*

U.S. Cl. 250—504 R **25 Claims**



1. A radiation source, comprising:

a filament for producing infrared emissions tailored to a selected infrared wavelength spectrum when electrically stimulated, said filament having a textured surface with features therein that are appoximately sized to said selected infrared wavelength spectrum, and means for mounting the filament to electrical terminals.

5,838,017
CONTROL DEVICE FOR MONITORING THE PASSAGE OF TWO SUPERIMPOSED PAPER WEBS IN A PAPER PROCESSING MACHINE

Max Prassler, Augsburg, Germany, assignor to Boewe Systec AG, Augsburg, Germany

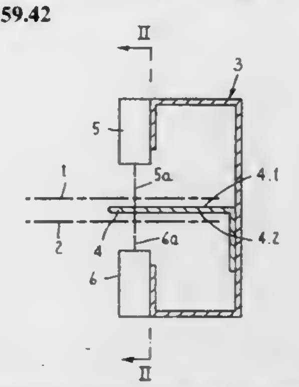
PCT No. PCT/DE95/01858, § 371 Date Aug. 8, 1997, § 102(e) Date Aug. 8, 1997, PCT Pub. No. WO96/26146, PCT Pub. Date Aug. 29, 1996

PCT Filed Dec. 21, 1995, Ser. No. 894,720

Claims priority, application Germany, Feb. 24, 1995, 195 06 456.9

Int. Cl.^{6} G01N *21/86*

U.S. Cl. 250—559.42 **6 Claims**



1. A control device for monitoring the passage of two superimposed paper webs in a paper processing machine, with photoelectric sensors, whose light beams are directed on to the surfaces of the paper webs, characterized in that a thin, stationary plate (4) is provided at the edges of the paper webs (1, 2), engaging between the two paper webs and extending in the direction (A) of passage of the paper webs and whose surface has different reflective properties than the paper webs, and in that a respective photoelectric sensor (5, 6) responding to reflection is so arranged on each of the two opposite sides of the plate (4) that the light beams (5*a*, 6*a*) of the two sensors are directed on to respective opposite sides of the corresponding paper webs (1, 2) and the plate (4) lying thereunder.

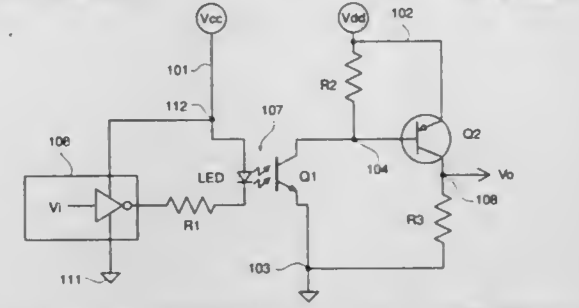
5,838,018
INTRINSICALLY SAFE OPTO-COUPLER CIRCUIT HAVING AN OPTIMUM DATA TRANSMISSION RATE

William M. Mansfield, Lafayette, Colo., assignor to Micro Motion, Inc., Boulder, Colo.

Filed Jul. 3, 1997, Ser. No. 888,194

Int. Cl.^{6} G02B *27/00*

U.S. Cl. 250—551 **10 Claims**



1. A signal processing system that provides signal isolation between input signals and output signals of said system;

said system including means for converting electrical input signals to optical signals and further comprising means for converting said optical signals to electrical output signals comprising:

a photo-transistor having a base responsive to the receipt of optical signals for, controlling the collector current of said photo-transistor;

a first resistor connecting the collector of said photo-transistor to a voltage source;

a diode comprising an emitter-base junction of a second transistor connected in parallel with said first resistor;

said diode being effective to prevent saturation of said phototransistor as well as to control the collector current of said second transistor;

a second resistor connecting the collector of said second transistor to ground;

the voltage developed across said second resistor in response the reception of said optical signals by said base of said photo transistor being said output signals.

5,838,019
ELECTRON EMITTING ELEMENT

Takeo Tsukamoto, Atsugi; Akira Shimizu, Sagamihara; Akira Suzuki; Masao Sugata, both of Yokohama; Isamu Shimoda, Zama, and Masahiko Okunuki, Nishi Tama-gun, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 266,798, Jun. 28, 1994, abandoned, which is a continuation of Ser. No. 917,532, Jul. 20, 1992, abandoned, which is a continuation of Ser. No. 602,937, Oct. 24, 1990, abandoned, which is a continuation of Ser. No. 498,494, Mar. 26, 1990, abandoned, which is a continuation of Ser. No. 366,214, Jun. 15, 1989, abandoned, which is a continuation of Ser. No. 256,255, Oct. 4, 1988, abandoned, which is a continuation of Ser. No. 49,401, May 14, 1987, abandoned. This application Apr. 3, 1995, Ser. No. 415,587

Claims priority, application Japan, May 8, 1986, 61-113520

Int. Cl.^{6} H01L *29/12*

U.S. Cl. 257—10 **5 Claims**

1. An electron emitting device comprising:

a P-type semiconductor;

an N-type semiconductor, arranged adjacent to said P-type semiconductor, wherein said N-type semiconductor and said P-type semiconductor form a PN junction;

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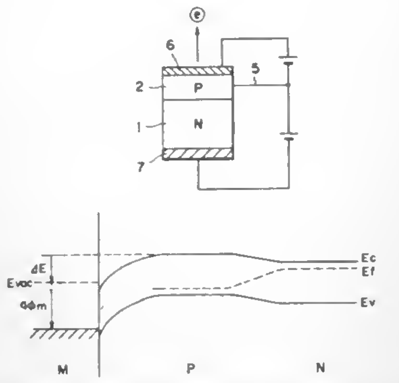


a first electrode electrically connected to said N-type semiconductor;

a second electrode connected electrically to said P-type semiconductor;

a low work function metal electrode arranged in contact with said P-type semiconductor, and forming a Schottky barrier between said low work function metal and said P-type semiconductor;

first means for applying a forward bias through said first and second electrodes to said PN junction; and

second means for applying to said Schottky barrier a reverse bias lowering a vacuum level below a level of a conduction band of said P-type semiconductor.

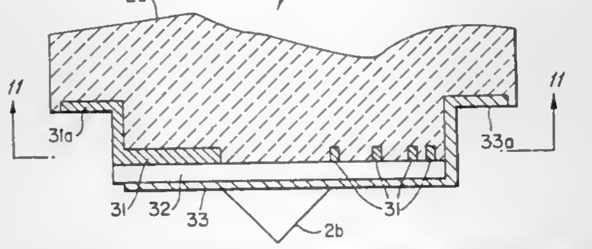
5,838,020
METHOD AND APPARATUS FOR STORING DATA USING SPIN-POLARIZED ELECTRONS

Thomas D. Hurt, Chantilly, Va., assignor to TeraStore, Inc., Chantilly, Va.

Continuation of Ser. No. 311,738, Sep. 23, 1994, Pat. No. 5,546,337, which is a continuation-in-part of Ser. No. 188,828, Jan. 31, 1994, Pat. No. 5,446,687. This application May 1, 1996, Ser. No. 641,418

Int. Cl.⁶ H01L *29/06*

U.S. Cl. 257—10 **29 Claims**



1. An electron emission device for generating and emitting spin-polarized electrons comprising:

a first conducting material;

a magnetic ultrathin film magnetically coupled to the first conducting material;

an electrically insulative and magnetically permeable medium being located between the first conducting material and the magnetic ultrathin film;

a second conducting material formed into a structure that emits electrons when impinged by an electric field and electrically coupled to the magnetic ultrathin film; and

an anode, electrically coupled to the structure that emits electrons, for generating the electric field that impinges on the structure that emits electrons.

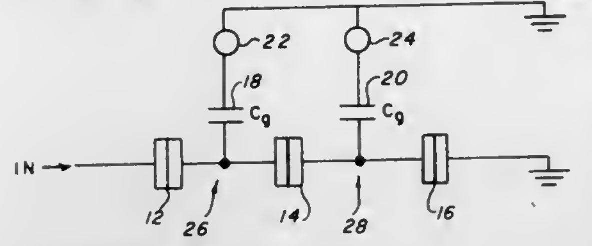
5,838,021
SINGLE ELECTRON DIGITAL CIRCUITS

Mario G. Ancona, 724 S. St. Asaph St., Alexandria, Va. 22314

Filed Dec. 26, 1996, Ser. No. 773,155

Int. Cl.⁶ H01L *29/06*

U.S. Cl. 257—30 **5 Claims**



1. A device comprising:

at least three tunnel junctions disposed in series to form three single electron coulomb blockade islands;

each said island having a respective gate capacitance C_g and a junction capacitance C_j;

wherein, for each of said islands said C_g and said C_j are chosen to cause the screening length of each said island to be between 0.5 and 1.0 islands, effective to permit bias independent occupancy of said islands.

5,838,022
EVALUATING THE LIFETIME AND RELIABILITY OF A TFT IN A STRESS TEST USING GATE VOLTAGE AND TEMPERATURE MEASUREMENTS

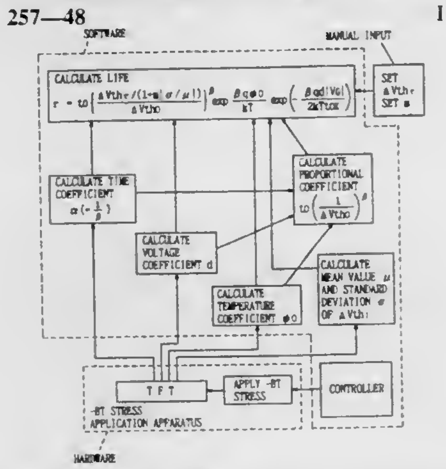
Shigenobu Maeda, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 533,659, Sep. 25, 1995, Pat. No. 5,608,338. This application Dec. 30, 1996, Ser. No. 774,777

Claims priority, application Japan, Apr. 25, 1995, 7-101179

Int. Cl.⁶ H01L *23/58;* **G01R** *31/26*

U.S. Cl. 257—48 **16 Claims**


SOFTWARE
MANUAL INPUT
CALCULATE LIFE
SET ΔVthτ SET m
CALCULATE TIME COEFFICIENT
CALCULATE PROPORTIONAL COEFFICIENT
CALCULATE VOLTAGE COEFFICIENT d
CALCULATE MEAN VALUE μ AND STANDARD DEVIATION σ OF ΔVth
CALCULATE TEMPERATURE COEFFICIENT φ0
TFT
APPLY -BT STRESS
CONTROLLER
-BT STRESS APPLICATION APPARATUS
HARDWARE

1. A machine-readable medium storing a machine executable software procedure for evaluating the reliability of TFT in a -BT stress state, the TFT having a channel layer of a polycrystalline silicon thin film and a gate insulating film of a silicon oxide film manufactured under a prescribed manufacturing condition, and in the -BT stress state the gate is supplied with an arbitrary negative constant voltage V_G and maintained at an arbitrary constant temperature T based on the following expressions:

$$\Delta V_{th} \propto t^{\alpha} \tag{2a}$$

$$\Delta V_{th} \propto \exp\frac{qd|V_G|}{2kTt_{ox}} \tag{3a}$$

$$\Delta V_{th} \propto \exp\left\{-\frac{q}{kT}\left(\phi_0-\frac{s|V_G|}{2t_{ox}}\right)\right\} \tag{4a}$$

-continued

$$\Delta V_{th} = \Delta V_{th0}\left(\frac{t}{t_0}\right)^{\alpha}\exp\left\{-\frac{q}{kT}\left(\phi_0-\frac{d|V_G|}{2t_{ox}}\right)\right\} \tag{5}$$

$$\tau_0 = t_0\left(\frac{\Delta V_{th\tau}}{\Delta V_{th0}}\right)^{\beta}\exp\frac{\beta q\phi_0}{kT}\exp\left(-\frac{\beta qd|V_G|}{2kTt_{ox}}\right) \tag{7}$$

$$\tau = t_0\left\{\frac{\Delta V_{th\tau}/(1-m|\sigma/\mu|)}{\Delta V_{th0}}\right\}^{\beta}\exp\frac{\beta q\phi_0}{kT}\exp\left(-\frac{\beta qd|V_G|}{2kTt_{ox}}\right) \tag{8}$$

where ΔV_{th} represents threshold voltage shift amount of a jumbo TFT including a plurality of TFTs connected parallel to each other and manufactured under said prescribed manufacturing condition, t time, α time coefficient, q elementary electric charge, d voltage coefficient, k Boltzman constant, t_{ox} thickness of the gate oxide film, ϕ_0 temperature coefficient, $\Delta V_{th\tau}$ tolerant threshold voltage shift amount for the TFT, μ and σ mean value and standard deviation, respectively, of threshold voltage shift amounts of the plurality of TFTs manufactured under said prescribed manufacturing condition, m a constant, and β=1/α, the machine executable software procedure comprising the steps of

determining time coefficient a in expression (2a) based on a relation between threshold voltage shift amount ΔV_{th} obtained from at least one -BT stress test and time t;

determining voltage coefficient α in expression (3a) based on a relation between gate voltage V_G and the threshold voltage shift amount ΔV_{th} obtained from at least two -BT stress tests using different gate voltages V_G;

determining temperature coefficient ϕ_0 in equation (4a) based on a relation between temperature T and the threshold voltage shift amount ΔV_{th} obtained from at least two -BT stress tests at different temperatures T;

determining proportional constant

$$\Delta V_{th0}\left(\frac{1}{t_0}\right)^{\alpha} \equiv C_2$$

in expression (5) obtained from a relation between expressions (2a), (3a) and (4a), by using determined time coefficient α, voltage coefficient d and temperature coefficient ϕ_0; and

calculating life τ of a single TFT manufactured under said prescribed manufacturing condition, by using expression (8) which is obtained by substituting $\Delta V_{th\tau}/(1+m|\sigma/\mu|)$ for $\Delta V_{th\tau}$ in expression (7) for calculating life τ_0 of the jumbo TFT, which expression is obtained by converting expression (5) based on the determined proportional constant c_2 and the tolerant threshold voltage shift amount $\Delta V_{th\tau}$ of the jumbo TFT.

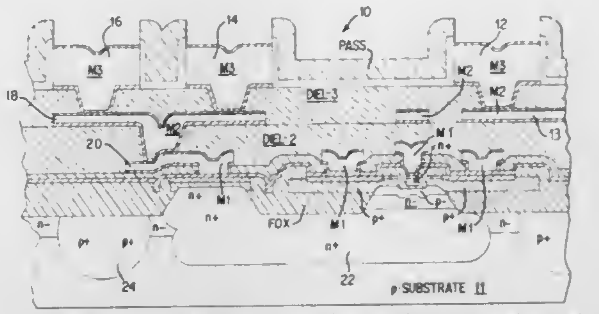
5,838,023
ANCILLARY PADS FOR ON-CIRCUIT ARRAY PROBING COMPOSED OF I/O AND TEST PADS

Atul Goel; Yaw-Hwang Chen, both of Fort Collins, and John R. Spencer, Loveland, all of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 524,598, Sep. 7, 1995, abandoned. This application Aug. 27, 1997, Ser. No. 920,337

Int. Cl.⁶ H01L *29/40*

U.S. Cl. 257—48 **2 Claims**



1. An integrated circuit device comprising:

an integrated circuit main body, said integrated circuit main body having a first surface and a second surface, said integrated circuit main body having a multitude of circuit elements formed in a first surface thereof;

more than one I/O contact area formed on various of said multitude of circuit elements on said first surface of said integrated circuit main body, said more than one I/O contact area permitting electrical contact between said multitude of circuit elements and with electrical devices external to said integrated circuit device;

more than one layer of metalization, said more than one layer of metalization being formed on said first surface of said integrated circuit main body in contact with various of said more than one I/O contact areas and forming a network of metalization between and among said multitude of circuit elements, such that said multitude of circuit elements are electrically connected to form a predetermined circuit, said more than one layer of metalization being insulated from each other by more than one layer of dielectric material, except at predetermined routing locations between said more than one layer of metalization, said predetermined routing locations providing electrical contact through said more than one layer of dielectric material between said more than one layer of metalization, said predetermined routing locations between said more than one layer of metalization forming an network of metalization for connecting said multitude of circuit elements to electrical devices external to said integrated circuit device;

more than one bonding pad formed on an upper layer of said more than one layer of metalization at predetermined locations across a top surface of said integrated circuit main body, each of said more than one bonding pads being in electrical connection with one of said more than one I/O contact areas of said various circuit elements, such that each of said more than one bonding pads is in close proximity to the corresponding circuit element that it is electrically connected to; and

more than one test pad formed on said upper layer of said more than one layer of metalization at predetermined locations across a top surface of said integrated circuit main body, each of said more than one test pads being in electrical contact with one of said more than one bonding pads, each of than more than one test pads is positioned in such a manner as to not layover any dicing areas, circuit element or metalization line that can be damaged when test pins are brought into pressure contact with each of said more than one test pad.

5,838,024
LIGHT EMITTING DIODE ARRAY AND OPTICAL IMAGE FORMING APPARATUS WITH LIGHT EMITTING DIODE ARRAY

Kouji Masuda, and Seizo Suzuki, both of Yokohama, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 7, 1996, Ser. No. 744,311

Claims priority, application Japan, Nov. 10, 1995, 7-292575

Int. Cl.⁶ H01L *33/00;31/0232;31/062;* **G02B** *9/00*

U.S. Cl. 257—98 **26 Claims**

1. An image forming system, comprising:

an LED, Light Emitting Diode, array having LEDs disposed thereon along a curved line, each of the LEDs forming the

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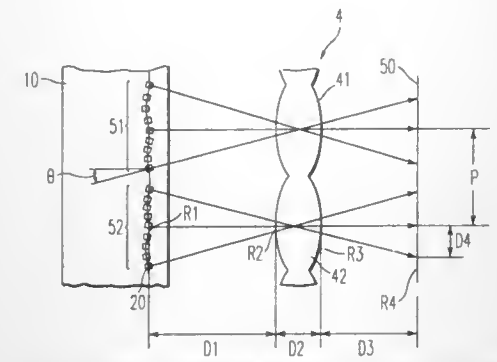


curved line, and a direction of emission of the LEDs and the curved line being generally planar;

a lens which focuses light emitted from the LEDs; and

a light receiving surface which receives the light from the LEDs which was focused by the lens.

5,838,025

ELECTRICAL BARRIER STRUCTURE FOR SEMICONDUCTOR DEVICE DOPED WITH CHROMIUM AND/OR TITANIUM

Ian Francis Lealman; Michael James Robertson; Michael John Harlow; Paul Charles Spurdens, and William James Duncan, all of Suffolk, United Kingdom, assignors to British Telecommunications public limited company, London, England

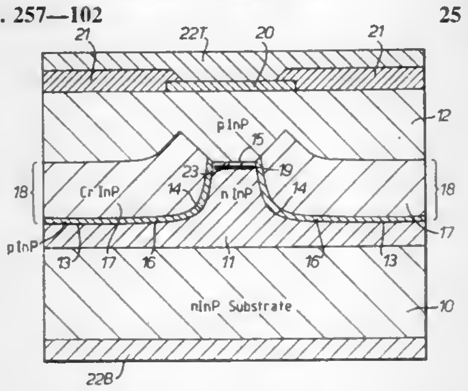
PCT No. PCT/GB94/01498, § 371 Date Jan. 29, 1996, § 102(e) Date Jan. 29, 1996, PCT Pub. No. WO95/02910, PCT Pub. Date Jan. 26, 1995

PCT Filed Jul. 11, 1994, Ser. No. 591,476

Claims priority, application European Pat. Off., Jul. 12, 1993, 93305447

Int. Cl.^{6} H01L *33/00*

U.S. Cl. 257—102 **25 Claims**



1. A III/V semiconductor device which includes a p-type region and an n-type region with an electrical barrier located between said p-type region and said n-type region characterised in that said barrier takes the form of two layers of III/V semiconductor, namely a first layer doped with chromium adapted for trapping holes and a second layer of a p-type III/V semiconductor material wherein said first layer is between and in contact with said second layer and the p-type region of the device.

5,838,026

INSULATED-GATE SEMICONDUCTOR DEVICE

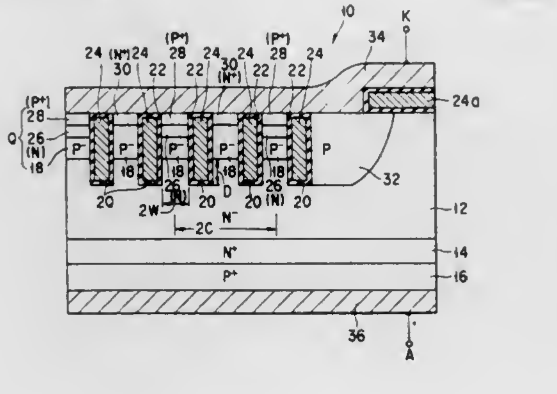
Mitsuhiko Kitagawa, Tokyo; Ichiro Omura, Yokohama; Akio Nakagawa, Hiratsuka; Norio Yasuhara, Yokohama, and Tomoki Inoue, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 480,389, Jun. 7, 1995, which is a continuation of Ser. No. 261,384, Jun. 15, 1994, Pat. No. 5,448,083, which is a continuation-in-part of Ser. No. 925,870, Aug. 8, 1992, Pat. No. 5,329,142. This application Mar. 28, 1997, Ser. No. 827,530

Claims priority, application Japan, Aug. 8, 1991, 3-199343; Dec. 20, 1991, 3-354303; Sep. 17, 1993, 50231572; Mar. 15, 1994, 6-070151

Int. Cl.^{6} H01L *21/36*

U.S. Cl. 257—139 **5 Claims**



1. A semiconductor device comprising:

a first semiconductor layer of a second conductivity type;

a second semiconductor layer of a first conductivity type connected to said first semiconductor layer, for allowing first type charge carries to be injected into said first semiconductor layer;

a third semiconductor layer of said second conductivity type connected to said first semiconductor layer, for allowing second type charge carries to be injected into said first semiconductor layer to cause a conductivity modulation to occur therein;

a fourth semiconductor layer of said first conductivity type connected to said first semiconductor layer, for allowing said first type charge carries contained in said first semiconductor layer to move externally out of said first semiconductor layer;

a MOS channel for selectively connecting said first semiconductor layer and said third semiconductor layer in order to thereby turn on and turn off said device;

a gate electrode facing said MOS channel;

an injection enhancing structure for locally controlling a flow capability of the first type charge carries in order to thereby increase an ability to inject the second type charge carries into said first semiconductor layer, said injection enhancing structure comprising a current path connecting said first semiconductor layer and said fourth semiconductor layer such that a resistance to a flow of the first type charge carries is locally increased in said current path, and being arranged such that a peak of carrier density in an ON-state of said semiconductor device appears at a position from which said current path substantially starts in said first semiconductor layer;

a first main electrode connected to said second semiconductor layer; and

a second main electrode connected to said third and fourth semiconductor layers.

5,838,027

SEMICONDUCTOR DEVICE AND A METHOD FOR MANUFACTURING THE SAME

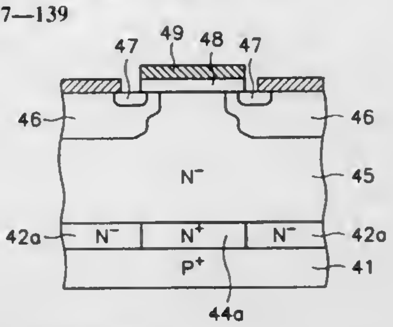
Ho-Hyun Kim, Seoul, and Jae-Hong Park, Bucheon-si, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

Continuation of Ser. No. 565,596, Nov. 30, 1995, abandoned. This application Apr. 17, 1997, Ser. No. 840,904

Claims priority, application Rep. of Korea, Nov. 30, 1994, 1994 31900

Int. Cl.^{6} H01L *29/744*

U.S. Cl. 257—139 **3 Claims**



1. An IGBT comprising:

a P^+ silicon substrate;

a first epitaxial layer of a first conductive type disposed directly on said silicon substrate, said first epitaxial layer having:

a first portion having a high density concentration of impurities of said first conductive type, and

a second portion having a low density concentration of impurities of said first conductive type;

a semiconductor substrate disposed on a top surface of said first epitaxial layer and composed of a second epitaxial layer of said first conductive type, said second epitaxial layer having a low density concentration of impurities of said first conductive type, said high density concentration of impurities of said first portion of said first epitaxial layer being distributed according to a predetermined concentration profile having a gentle slope such that the impurity concentration in said first portion of said first epitaxial layer near said top surface substantially corresponds to that of said second epitaxial layer and increases to a maximum value with a substantially uniform grade;

a P^- well disposed on a surface of said second epitaxial layer;

an active area formed in said P^- well; and

a gate electrode formed over said semiconductor substrate such that it overlaps an edge portion of said P^- well, an insulated oxidation film being disposed between said gate electrode and said semiconductor substrate,

said first and second portions of said first epitaxial layer being alternately formed in a horizontal direction such that said second portion is disposed below said P^- well, and said first portion is disposed below said gate electrode.

5,838,028

SEMICONDUCTOR DEVICE HAVING A RIDGE OR GROOVE

Hideyoshi Horie; Toshinari Fujimori; Satoru Nagao, and Hideki Gotoh, all of Ushiku, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

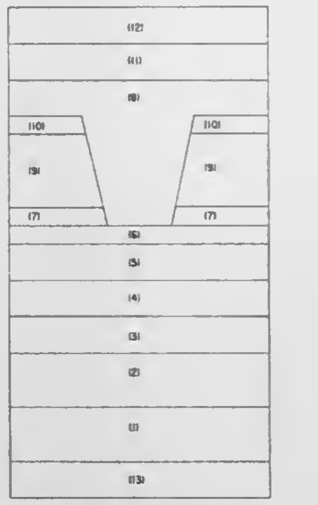
Continuation of Ser. No. 498,127, Jul. 5, 1995, abandoned. This application May 22, 1997, Ser. No. 861,640

Claims priority, application Japan, Jul. 4, 1994, 6-152126; Sep. 6, 1994, 6-212803

Int. Cl.^{6} H01S *3/19;* **H01L** *31/038;31/0336;31/072*

U.S. Cl. 257—183 **4 Claims**

1. A semiconductor device including a substrate and, on said substrate in the following described order, at least:



(a) a layer comprising at least $Al_wGa_{1-w}As$;

(b) a second etching stop layer comprising AlGaAs or GaAs;

(c) a first etching stop layer in contact with said second etching stop layer;

(d) a layer comprising $Al_xGa_{1-x}As$

wherein a portion of (c) said first etching stop layer and a portion of (d) said layer comprising at least $Al_xGa_{1-x}As$ are removed,

said device further including:

(e) a layer comprising AlGaAs at the removed portions of said layers (c) and (d);

one of said layer (d) and said layer (e) being a current blocking layer and other of said layer (d) and said layer (e) being a clad layer, the current blocking layer having a lower refractive index than the clad layer.

5,838,029

GAN-TYPE LIGHT EMITTING DEVICE FORMED ON A SILICON SUBSTRATE

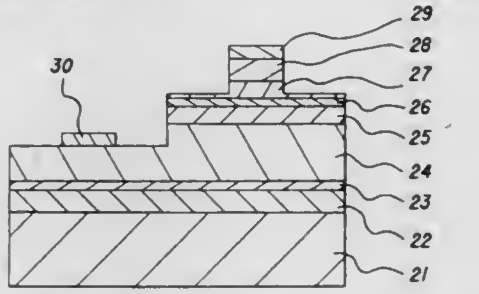
Yukio Shakuda, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Filed Aug. 21, 1995, Ser. No. 517,121

Claims priority, application Japan, Aug. 22, 1994, 6-196852; Aug. 26, 1994, 6-202478; Aug. 26, 1994, 6-202480; Aug. 26, 1994, 6-202481

Int. Cl.^{6} H01L *33/00;29/26*

U.S. Cl. 257—190 **6 Claims**



1. A semiconductor light emitting device comprising a single-crystal silicon substrate, an insulating layer of Si_3N_4 formed on the singlecrystal silicon substrate, and gallium nitride type compound semiconductor layers stacked on the insulating layer.

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5,838,030
GAINP/GAINAS/GAAS MODULATION-COMPOSITIONED CHANNEL FIELD-EFFECT TRANSISTOR

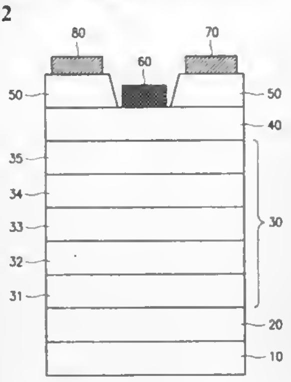
Wen-Chau Liu, and Lih-Wen Laih, both of Tainan, Taiwan, assignors to National Science Council, Taiwan

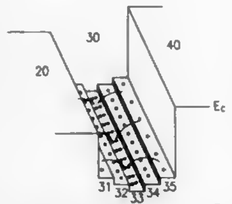
Filed Sep. 9, 1997, Ser. No. 925,863

Claims priority, application Taiwan, May 6, 1997, 86106024

Int. Cl.^{6} H01L *29/772;29/812*

U.S. Cl. 257—192 **12 Claims**





1. A GaInP/GaInAs/GaAs modulation-compositioned channel field-effect transistor, comprising:
a substrate of GaAs material;
a first layer of GaAs material, formed on said substrate;
a second layer of GaInAs material, formed on said first layer;
a third layer of GaInP material, formed on said second layer;
a fourth layer of GaAs material, formed on said third layer;
a first metal layer, formed on said third layer;
a second metal layer, formed on said fourth layer; and
wherein second layer is comprised of five layers, each with a thickness of approximately 30 Å, and the mole ratio of In of said five layers is approximately 0.1, 0.15, 0.2, 0.15, and 0.1, respectively.

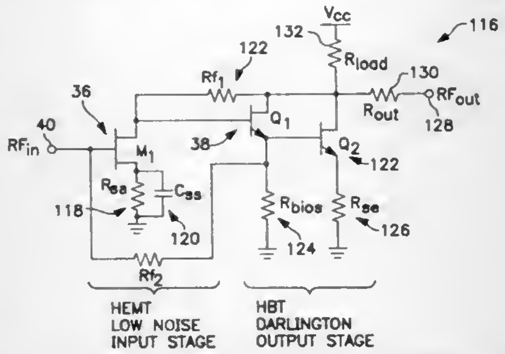
5,838,031
LOW NOISE-HIGH LINEARITY HEMT-HBT COMPOSITE

Kevin Wesley Kobayashi, Torrance; Dwight Christopher Streit, Seal Beach; Aaron Kenji Oki, Torrance, and Donald Katsu Umemto, Manhattan Beach, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Mar. 5, 1996, Ser. No. 611,265

Int. Cl.^{6} H01L *31/0328;* **H01P** *3/08*

U.S. Cl. 257—197 **33 Claims**



19. A monolithic microwave integrated circuit (MMIC) amplifier comprising:
a high electron mobility transistor (HEMT) having gate, drain and source terminals, said gate terminal of said HEMT electrically coupled to ground; and
a first heterojunction bipolar transistor (HBT) having first base, first collector and first emitter terminals, said first base terminal of said HBT being electrically coupled to said drain terminal of said HEMT, said source terminal being electrically coupled to a terminal forming an amplifier input for connection to an external circuit;
a second HBT having base, collector and emitter terminals, said second HBT having second base, second collector and second emitter terminals, said second HBT being electrically coupled to said first HBT to form a Darlington pair;
an output terminal electrical coupled to said first and said collector terminals for connection to an external electrical circuit; and
a supply terminal electrically coupled to said first and second collector terminals for connection to an external supply voltage.

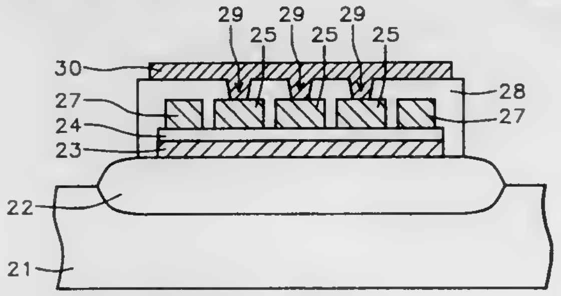
5,838,032
PRECISION CAPACITOR ARRAY

Jyh-Kang Ting, Hsin-Chu, Taiwan, assignor to Taiwan Semiconductor Manufacturing Company Ltd., Hsin-Chu, Taiwan

Division of Ser. No. 490,856, Jun. 15, 1995, Pat. No. 5,635,421. This application Feb. 18, 1997, Ser. No. 801,677

Int. Cl.^{6} H01L *27/10*

U.S. Cl. 257—211 **9 Claims**



1. A precision capacitor array comprising:
a lower electrode having a first thickness;
a dielectric layer, having a second thickness, covering said lower electrode;
an array of upper electrodes, having a third thickness and a separation, on said dielectric layer;
microload relief electrodes, having a width between about 2 and 5 microns, surrounding said array and positioned such that separation between the upper electrodes and the microload relief electrodes is the same as the separation between upper electrodes;
a passivation layer covering a surface of said upper electrodes and said microload relief electrodes;
via holes, having a bottom, etched through said passivation layer so as to expose the surface of said upper electrodes; and
a conductive layer covering said passivation layer, electrically contacting said upper electrodes at the bottom of said via holes, and patterned to form individual conductors connecting said upper electrodes.

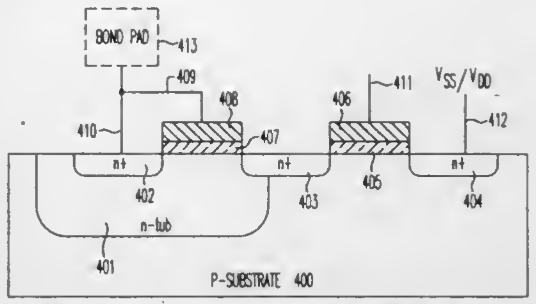
5,838,033
INTEGRATED CIRCUIT WITH GATE CONDUCTOR DEFINED RESISTOR

Yehuda Smooha, South Whitehall Township, Pa., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Sep. 8, 1993, Ser. No. 118,109

Int. Cl.^{6} H01L *29/76*

U.S. Cl. 257—213 **6 Claims**



1. An integrated circuit including a field effect transistor having a gate conductor formed from a conductor layer overlying a semiconductor body, and having a source/drain region of a given conductivity type that is coupled to a circuit conductor through a resistor,
characterized in that said resistor is formed in a tub region of said given conductivity type, with said tub region being connected to said circuit conductor by means of a heavily doped contact region of said given conductivity type that is formed in said tub region;
and wherein said resistor underlies a resistor masking conductor formed from said conductor layer, whereby the size of said resistor is defined by said resistor masking conductor.

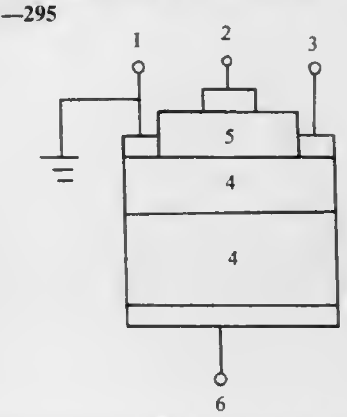
5,838,034
INFRARED OPTICAL BULK CHANNEL FIELD EFFECT TRANSISTOR FOR GREATER EFFECTIVENESS

Yean-Kuen Fang; Fu-Yuan Chen, both of Tainan, and Jiann-Ruey Chen, Hsinchu, all of Taiwan, assignors to National Science Council, Taipei, Taiwan

Filed Dec. 10, 1996, Ser. No. 762,961

Int. Cl.^{6} H01L *29/04;29/78*

U.S. Cl. 257—295 **8 Claims**



1. An infrared optical bulk channel field effect transistor, comprising:
a first semiconductor layer;
a second semiconductor layer provided on the first semiconductor layer, the first semiconductor layer and the second semiconductor layer together forming a p-n junction;
a source electrode provided on a source portion of the second semiconductor layer;
a drain electrode provided on a drain portion of the second semiconductor layer;
a layer of ferroelectric material provided on a gate portion of the second semiconductor layer, the layer of ferroelectric material having thermoelectric properties and being polarized such that the layer of ferroelectric material produces a depletion region in at least the second semiconductor layer which varies in size with a temperature of the ferroelectric material; and
a gate electrode provided on the layer of ferroelectric material.

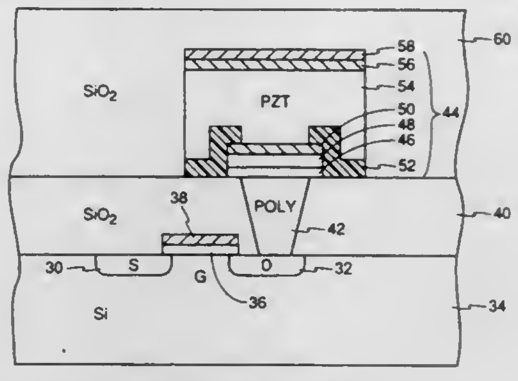
5,838,035
BARRIER LAYER FOR FERROELECTRIC CAPACITOR INTEGRATED ON SILICON

Ramamoorthy Ramesh, Burtonsville, Md., assignor to Bell Communications Research, Inc., Morristown, N.J.

Continuation of Ser. No. 497,457, Jun. 28, 1995, abandoned. This application Jun. 10, 1997, Ser. No. 896,508

Int. Cl.^{6} H01G *4/06*

U.S. Cl. 257—295 **17 Claims**



1. A multi-layer ferroelectric cell comprising:
a) a substrate providing a silicon surface;
b) an electrically-conductive barrier formed on said substrate surface for preventing the migration of oxygen to said surface, said barrier comprising a layer of a composition selected from the group consisting of
 1) metallic compositions comprising a metallic matrix having metal oxide islands formed therein,
 2) metallic compositions comprising an electrically-conductive intermetallic alloy comprising a first element selected from the group consisting of Ni, Co, Fe, and Mn and a second element selected from the group consisting of Al, Ga, Ti, and Cr, and
 3) metallic compositions comprising a composite layer comprising a first metal having a conductive perovskite of said first metal formed thereon;
c) a lower electrode formed on said barrier and comprising an electrically-conductive, chemically-templating perovskite layer;
d) a ferroelectric layer formed on and templated to said chemically-templating layer; and
e) an upper electrode formed on said ferroelectric layer.

5,838,036
SEMICONDUCTOR MEMORY DEVICE CAPABLE OF REALIZING A MINIMUM MEMORY CELL AREA APPROXIMATE TO A THEORETICAL VALUE

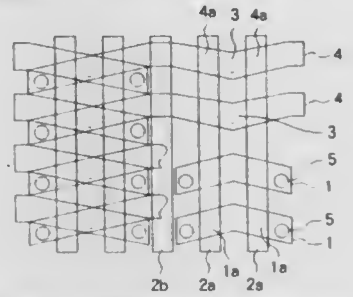
Hidemitsu Mori, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Nov. 8, 1996, Ser. No. 746,440

Claims priority, application Japan, Nov. 10, 1995, 7-293198

Int. Cl.^{6} H01L *27/108*

U.S. Cl. 257—296 **5 Claims**



1. A semiconductor memory device comprising:
a semiconductor substrate;

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device active regions separately formed on semiconductor substrate;

a memory cell array comprising a matrix of memory cell pairs, each pair of said memory cell pair being formed on each of said device active regions and comprising a pair of memory cells, each of which comprises a charge-storage capacitor and a selection MOS transistor having a gate region and first and second regions, said first region being a predetermined one of a source region and a drain region, said second region being a remaining one of said source and said drain regions that is connected to said charge-storage capacitor;

word lines connected to said gate regions of the selection MOS transistors of said memory cells and arranged in parallel to each other on said semiconductor substrate; and

bit lines connected to said first regions of the selection MOS transistors of said memory cells;

each of said device active regions having first oblique intersection portions which obliquely intersect adjacent two of said word lines in first oblique directions with a distance left between each of said device active regions and each of said adjacent two of the word lines;

each of said bit lines having second oblique intersection portions which obliquely intersect said adjacent two of the word lines in second oblique directions reverse with respect to said first oblique directions with another distance left between each of said bit lines and each of said adjacent two of the word lines;

said first oblique direction of the first oblique intersection portion of each of said device active regions being reversed at every memory cell; and

said second oblique directions of the second oblique intersection portions of each of said bit lines being reversed at every memory cell.

5,838,037

TFT-ARRAY AND MANUFACTURING METHOD THEREFOR

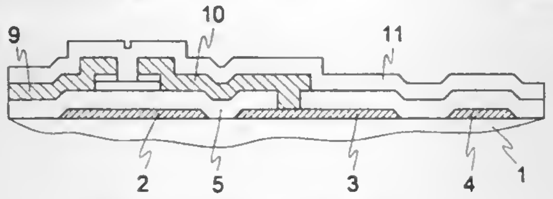
Yuichi Masutani; Yoshinori Numano, and Kazuhiro Kobayashi, all of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 19, 1997, Ser. No. 858,693

Claims priority, application Japan, Nov. 15, 1996, 8-304293

Int. Cl.⁶ H01L *27/108;27/01;27/12*

U.S. Cl. 257—296 **6 Claims**



1. A TFT-array comprising a substrate, gate electrode, a first and second electrode provided on the substrate simultaneously with the gate electrode, an insulating film formed on the gate electrode, the first and the second electrode, a semiconductor layer formed on the gate electrode in such a manner that the insulating film is interposed between the semiconductor layer and the gate electrode, a pair of electrodes, either of which is connected with the first electrode or the second electrode, said pair of electrodes defining a semiconductor element together with the semiconductor layer.

5,838,038

DYNAMIC RANDOM ACCESS MEMORY DEVICE WITH THE COMBINED OPEN/FOLDED BIT-LINE PAIR ARRANGEMENT

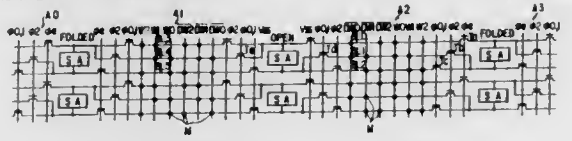
Daisaburo Takashima, Kawasaki; Shigeyoshi Watanabe, Yokohama; Tohru Ozaki, Tokyo; Takeshi Hamamoto, Kanagawa-ken, and Yukihito Oowaki, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation-in-part of Ser. No. 348,068, Nov. 23, 1994, Pat. No. 5,555,519, which is a continuation of Ser. No. 123,466, Sep. 20, 1993, Pat. No. 5,396,450. This application Jun. 7, 1995, Ser. No. 478,620

Claims priority, application Japan, Sep. 22, 1992, 4-253270; Sep. 14, 1993, 5-229215; Jun. 28, 1994, 6-146645

Int. Cl.⁶ H01L *27/108*

U.S. Cl. 257—301 **14 Claims**



1. A semiconductor memory device comprising:

a semiconductor substrate,

at least one memory cell region formed on the semiconductor substrate, the memory cell region including a trench capacitor and a MOS transistor having a source and a drain;

at least one bit line formed on the memory cell region;

at least one contact region in contact with the bit line to connect one of the source and drain of the MOS transistor to the bit line;

at least one word line transverse to the bit line;

at least one trench for the trench capacitor formed on the semiconductor substrate, a center of the trench being deviated from a longitudinal center axis of the memory cell region.

5,838,039

SEMICONDUCTOR MEMORY HAVING A TUNNELING REGION

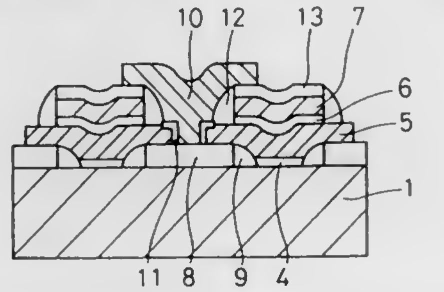
Kazuo Sato, Takatsuki; Kenji Ueda, Suita; Michio Morita, Habikino; Fumihiko Noro, Kkoma; Kyoko Miyamoto, Kyoto; Hideaki Onishi, Soraku-gun; Kazuo Umeda, Shiki-gun, and Kazuya Kubo, Yawata, all of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed Jul. 8, 1996, Ser. No. 677,651

Claims priority, application Japan, Jul. 14, 1995, 7-179124

Int. Cl.⁶ H01L *29/78;21/265*

U.S. Cl. 257—321 **12 Claims**



1. A semiconductor memory, comprising:

source and drain regions provided in a semiconductor substrate;

a first insulating film provided in a predetermined region on said semiconductor substrate;

a floating gate electrode provided on said first insulating film;

a control gate electrode provided above said floating gate electrode with a second insulating film disposed therebetween;

a side wall insulating film provided on vertical side walls of both said control gate electrode and said second insulating film; and

an erasing gate electrode separated from the floating gate electrode by a tunneling medium and from the control gate electrode by said side wall insulating film,

wherein said tunneling medium is provided only on a vertical surface of said floating gate electrode which is formed from an edge of said side wall insulating film such that said tunneling medium does not contact said second insulating film.

5,838,040

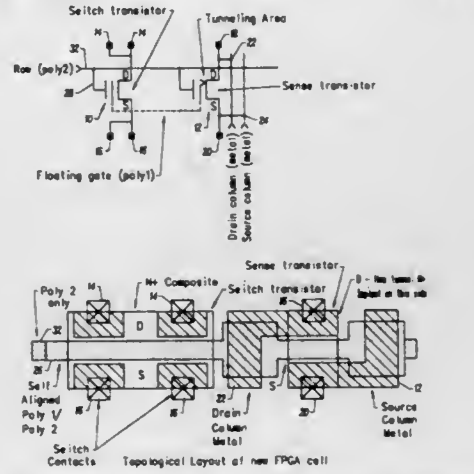
NONVOLATILE REPROGRAMMABLE INTERCONNECT CELL WITH FN TUNNELING IN SENSE

Robert M. Salter, III, Saratoga; Kyung Joon Han, Cupertino; Jack Zezhong Peng, San Jose; Victor Levchenko, San Francisco, and Robert V. Broze, Santa Cruz, all of Calif., assignors to GateField Corporation, Fremont, Calif.

Filed Mar. 31, 1997, Ser. No. 829,374

Int. Cl.⁶ H01L *29/788*

U.S. Cl. 257—321 **8 Claims**



1. A programmable interconnect for selectively connecting circuit nodes in an integrated circuit comprising

a first field effect transistor having first and second source/drains connected to a first and a second circuit node, a floating gate for storing charge, and a control gate for turning said first field effect transistor on and off responsive to charge on the floating gate,

a second field effect transistor having first and second source/drains, a floating gate separated from at least one source/drain by tunneling dioxide, and a control gate capacitively coupled to the floating gate, the floating gate of the first and second field effect transistors being interconnected, and

a first conductive line and a second conductive line connected to the first and second source/drains of the second field effect transistor, whereby programming of the interconnect is effected by applying voltages to the first and second conductive lines and to the control gate of the second field effect transistor, and the sensing of conducting and non-conducting states of a node is by selectively monitoring conduction of the second field effect transistor through the first conductive line and the second conductive line.

5,838,041

NONVOLATILE SEMICONDUCTOR MEMORY DEVICE HAVING MEMORY CELL TRANSISTOR PROVIDED WITH OFFSET REGION ACTING AS A CHARGE CARRIER INJECTING REGION

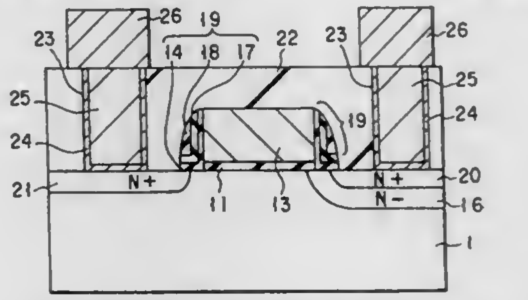
Eiji Sakagami, Yokohama, and Kiyomi Naruke, Ebina, both of Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Oct. 2, 1996, Ser. No. 720,618

Claims priority, application Japan, Oct. 2, 1995, 7-254782; Mar. 18, 1996, 8-060621

Int. Cl.⁶ H01L *29/792*

U.S. Cl. 257—324 **28 Claims**



1. A nonvolatile semiconductor memory device comprising:

a semiconductor substrate of a first conductivity type;

first and second diffusion layers of a second conductivity type formed in said semiconductor substrate and spaced apart by a channel region;

a gate electrode overlying a part of said channel region which extends to said first diffusion layer;

a first insulating film between said gate electrode and said semiconductor substrate; and

a second insulating film comprising at least two layers of different materials and overlying a part of said second diffusion layer and a part of said channel region which extends to said second diffusion layer, one of said at least two layers of said second insulating film being a charge carrier accumulating layer,

wherein potentials are applied to said first and second diffusion regions such that avalanche hot carriers are generated which do not pass through said part of said channel region beneath said gate electrode, and either electrons or holes are injected into said charge accumulating layer of said second insulating film in accordance with a potential of said gate electrode.

5,838,042

DMOS DEVICE STRUCTURE, AND RELATED MANUFACTURING PROCESS

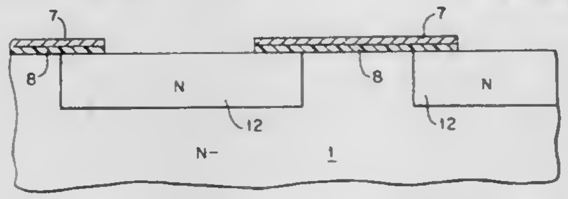
Raffaele Zambrano, San Giovanni la Punta, Italy, assignor to Consorzio per la Ricerca sulla Microelettronica nel Mezzogiorno, Catania, Italy

Filed Mar. 26, 1996, Ser. No. 622,695

Claims priority, application European Pat. Off., Mar. 31, 1995, 95830121

Int. Cl.⁶ H01L *29/78;29/90*

U.S. Cl. 257—342 **30 Claims**



1. DMOS device structure comprising a lightly doped semiconductor layer of a first conductivity type, a plurality of lightly doped semiconductor regions of a second conductivity type extending from a top surface of the lightly doped semiconductor layer thereinto, source regions of the first conductivity type contained in the lightly doped semiconductor regions and defining channel regions,

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said lightly doped semiconductor regions contained in respective enhancement regions of the lightly doped semiconductor layer of the same conductivity type as, but with a lower resistivity than, the lightly doped semiconductor layer, a polysilicon gate layer being separated from the lightly doped semiconductor layer by a gate oxide layer, the polysilicon gate layer extending between adjacent enhancement regions and having an opening over each enhancement region, wherein the enhancement regions reduce the on-state resistance of the DMOS structure, the enhancement regions being self-aligned by using the edges of the opening in the polysilicon gate layer as a mask for an implantation of a dopant for forming the enhancement regions.

5,838,043

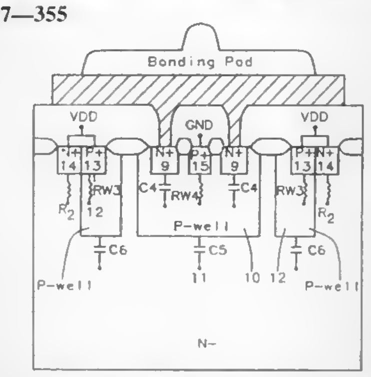
ESD PROTECTION CIRCUIT LOCATED UNDER PROTECTED BONDING PAD

Lee Chung Yuan, Chung-Li, Taiwan, assignor to United Microelectronics Corp., Taiwan

Division of Ser. No. 294,849, Aug. 29, 1994, Pat. No. 5,652,689. This application Apr. 29, 1997, Ser. No. 848,693

Int. Cl.^{6} H01L *23/62;29/74;* **H02N** *3/00;3/20*

U.S. Cl. 257—355 **3 Claims**



1. In a semiconductor device of a type having a substrate, a first bonding pad for making an external connection to the semiconductor device, a pad metal structure underlying the first bonding pad and extending on a surface of the semiconductor device to circuits that may be damaged by an ESD voltage at the first bonding pad, and other bonding pads for connection to two power supply terminals,

an improved protective device for conducting ESD voltages to the power supply terminals, comprising:

a first SCR circuit comprising first and second wells formed in the substrate and spaced apart and underlying at least part of the first bonding pad;

means connecting the pad metal structure to the first well, and means forming a connection to the substrate and establishing a resistive path through the substrate between one of the power supply terminals and the circuits that may be damaged; and

an N+ diffusion region formed in the second well and forming an emitter of a vertical NPN parasitic bipolar transistor constituting part of the first SCR circuit,

the first well forming an emitter of a lateral PNP parasitic bipolar transistor,

an intervening portion of the substrate forming a base of the PNP transistor and the substrate underlying the second well forming a collector of the NPN transistor,

the second well forming a base of the NPN transistor and a collector of the PNP transistor,

whereby the PNP and NPN transistors form the first SCR circuit with a vertical path through the second well forming a collector resistor of the PNP transistor and a path through the first well forming a resistor in an emitter circuit of the PNP transistor.

5,838,044

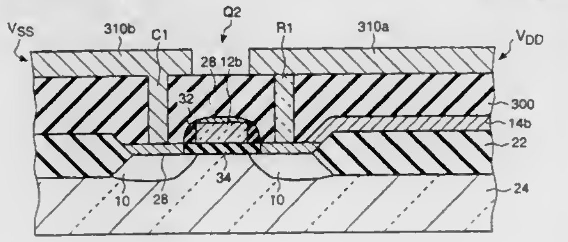
INTEGRATED CIRCUIT HAVING IMPROVED POLYSILICON RESISTOR STRUCTURES

Kuang-Yeh Chang, Los Gatos, and Yowjuang W. Liu, San Jose, both of Calif., assignors to Advanced Micro Devices, Sunnyvale, Calif.

Filed Dec. 12, 1995, Ser. No. 571,056

Int. Cl.^{6} H01L *29/00*

U.S. Cl. 257—369 **42 Claims**



1. An integrated circuit formed on a semiconductor substrate, comprising:

metal oxide semiconductor (MOS) transistors each comprising source and drain regions formed of a first impurity in the semiconductor substrate, and a conductive gate formed of a polysilicon layer overlying and insulated from said source and drain regions; and

at least one load resistor electrically connected to at least one of said MOS transistors, said at least one load resistor being formed of said polysilicon layer and comprising first and second polycide regions formed on said polysilicon layer.

5,838,045

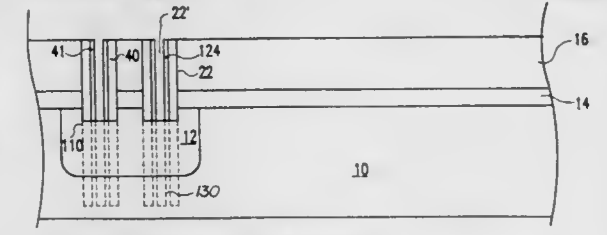
FOLDED TRENCH AND RIE/DEPOSITION PROCESS FOR HIGH-VALUE CAPACITORS

Karl Paul Ludwig Muller, Wappingers Falls, and Wesley C. Natzle, New Paltz, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 404,780, Mar. 15, 1995, Pat. No. 5,665,622. This application Mar. 5, 1997, Ser. No. 811,982

Int. Cl.^{6} H01L *27/108;29/76;29/94;31/119*

U.S. Cl. 257—301 **11 Claims**



1. A semiconductor device including

at least one trench formation extending into a substrate of monocrystalline semiconductor material, and

at least one central feature disposed within said trench, said at least one central feature including a portion comprising monocrystalline semiconductor material, wherein said at least one central feature includes a further trench formation and said further trench formation comprises a hollow pillar.

5,838,046

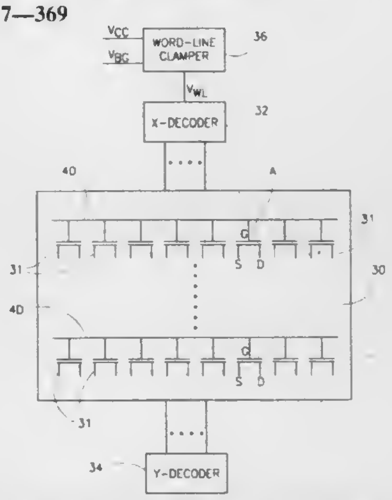
OPERATING METHOD FOR ROM ARRAY WHICH MINIMIZES BAND-TO-BAND TUNNELING

Rustom F. Irani, Santa Clara, Calif.; Boaz Eitan, Ra'anana, Israel; Mark Michael Nelson, and Larry Willis Petersen, both of Pocatello, Id., assignors to Waferscale Integration Inc., Fremont, Calif., and American Microsystems, Inc., Pocatello, Id.

Filed Jun. 13, 1996, Ser. No. 665,136

Int. Cl.^{6} H01L *29/76*

U.S. Cl. 257—369 **2 Claims**



1. A read only memory (ROM) array comprising:

a plurality of complementary metal oxide semiconductor (CMOS) peripheral deviled each having a first gate oxide whose thickness is less than 250 Å;

a voltage supply providing an operating voltage level to said peripheral devices;

a plurality of word-lines;

a multiplicity of ROM transistors, divided into a first group of turned on transistors and a second group of turned off transistors,

wherein each ROM transistor has a gate connected to one of said word-lines,

wherein each said ROM transistor has a channel and a gate oxide whose thickness is the same as that of said first gate oxide;

wherein said turned off transistors have a ROM implant in their corresponding said channel which generates no more than 0.2 pA/μm of undesired band-to-band tunneling current when said turned off transistors are activated;

wherein said ROM implant and gate oxide thickness define a threshold voltage for said turned off transistors, said threshold voltage being less than said operating voltage level; and

a word-line clamper for providing a word-line voltage to each of said word-lines, said word-line voltage being clamped to a voltage level which is not higher than said threshold voltage of said turned off transistor.

5,838,047

CMOS SUBSTRATE BIASING FOR THRESHOLD VOLTAGE CONTROL

Tadaaki Yamauchi, and Kazutami Arimoto, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 14, 1996, Ser. No. 663,955

Claims priority, application Japan, Jun. 16, 1995, 7-150362

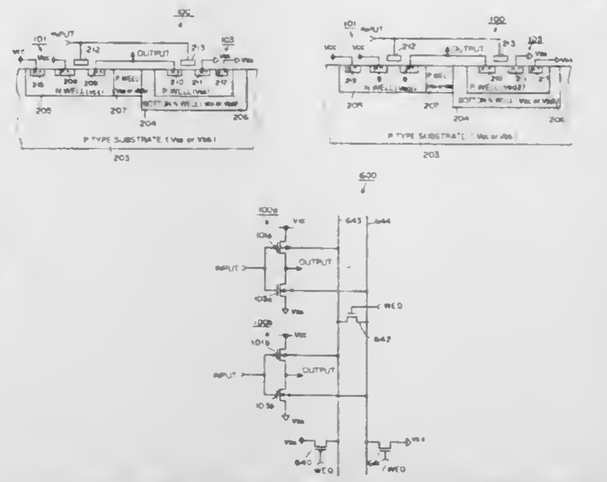
Int. Cl.^{6} H01L *27/092*

U.S. Cl. 257—372 **13 Claims**

1. A semiconductor device comprising:

a P channel MOS transistor having a standby state and an active state,

an N channel MOS transistor having a standby state and an active state,



first potential supply means for supplying to a substrate of said P channel MOS transistor a first potential equal to or higher than a potential of a source electrode of said P channel MOS transistor when said P channel MOS transistor attains a standby state,

second potential supply means for supplying to a substrate of said N channel MOS transistor a second potential equal to or lower than a potential of a source electrode of said N channel MOS transistor when said N channel MOS transistor attains a standby state, and

short circuit means for short-circuiting the substrate of said P channel MOS transistor and the substrate of said N channel MOS transistor when said P and N channel MOS transistors attain an active state.

5,838,048

SEMICONDUCTOR BI-MIS DEVICE

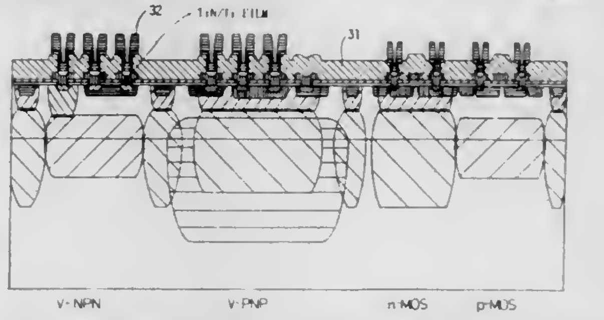
Takehiro Hirai, Osaka; Masahiro Nakatani, Ishikawa; Mitsuo Tanaka, and Akihiro Kanda, both of Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 691,341, Aug. 2, 1996, Pat. No. 5,696,006, which is a continuation-in-part of Ser. No. 505,639, Jul. 21, 1995, abandoned, which is a continuation of Ser. No. 311,327, Sep. 23, 1994, abandoned, which is a continuation of Ser. No. 76,838, Jun. 15, 1993, Pat. No. 5,406,106. This application Aug. 20, 1997, Ser. No. 915,327

Claims priority, application Japan, Jun. 24, 1992, 4-165845

Int. Cl.^{6} H01L *27/02;29/68*

U.S. Cl. 257—378 **8 Claims**



1. A semiconductor device in which a MIS transistor and a bipolar transistor are arranged on a semiconductor substrate, comprising:

a) the MIS transistor having:

a gate insulator film formed on the semiconductor substrate;

a gate electrode formed on the gate insulator film and made of first and second conductor films which are doped with a first conductivity type impurity; and

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- a source-drain diffusion layer formed in regions placed on both sides of the gate electrode of the semiconductor substrate and into which the first conductivity type impurity is introduced; and

b) the bipolar transistor having:
- an emitter diffusion layer, a base diffusion layer and a collector diffusion layer which are formed in the semiconductor substrate;
- an insulator film formed in a region of the semiconductor substrate where an emitter is to be formed, and made of the same material as that of the gate insulator film of the MIS transistor; and
- an emitter electrode formed on the insulator film and made of the same material as those of the first and second conductor films of the MIS transistor;

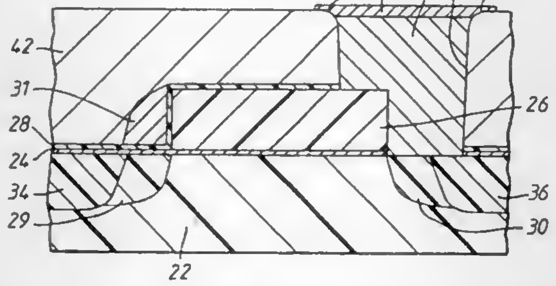
wherein the second conductor film of the emitter electrode buries a contact hole formed on the insulator film and the first conductor film to come in contact with the emitter diffusion layer; and

the emitter diffusion layer is doped with the first conductivity type impurity diffused from the first and second conductor films forming the emitter electrode.

5,838,049

SEMICONDUCTOR DEVICE INCORPORATING A CONTACT AND MANUFACTURE THEREOF

Howard Charles Nicholls, Cardiff, and Michael John Norrington, Clacton on Sea, both of United Kingdom, assignors to SGS-Thomson Microelectronics, Ltd., United Kingdom
Continuation of Ser. No. 119,519, Sep. 10, 1993, Pat. No. 5,541,434. This application May 31, 1996, Ser. No. 658,885
Claims priority, application United Kingdom, Sep. 11, 1992, 9219268
Int. Cl.^{6} H01L *29/76*
U.S. Cl. 257—383 **8 Claims**

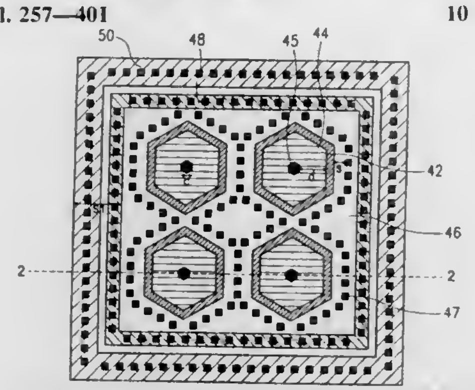


1. A semiconductor device comprising a silicon substrate, an oxide layer on the silicon substrate, a doped polysilicon region on the oxide layer, a dielectric layer over the doped polysilicon region and the oxide layer, a contact hole which is formed in the dielectric layer and extends over respective laterally adjacent portions of the doped polysilicon region and the silicon substrate, the doped polysilicon region and the portion of the silicon substrate being doped with dopants of opposite polarity, a tungsten contact which electrically connects the said portions together, a side wall spacer which is disposed adjacent a side of the doped polysilicon region in opposed relation to the contact, and a silicon nitride layer which covers the side wall spacer, and those parts of the doped polysilicon region and of the silicon substrate other that said portions.

5,838,050

HEXAGON CMOS DEVICE

Ming-Dou Ker, Tainan Hsien; Chung-Yu Wu, Hsinchu; Chien-Chang Huang, Changhua Hsien; Chau-Neng Wu, Kaohsiung Hsien, and Ta-Lee Yu, Hsinchu Hsien, all of Taiwan, assignors to Winbond Electronics Corp., Hsinchu, Taiwan
Continuation of Ser. No. 665,853, Jun. 19, 1996, abandoned. This application Sep. 17, 1997, Ser. No. 932,010
Int. Cl.^{6} H01L *27/72*
U.S. Cl. 257—401 **10 Claims**



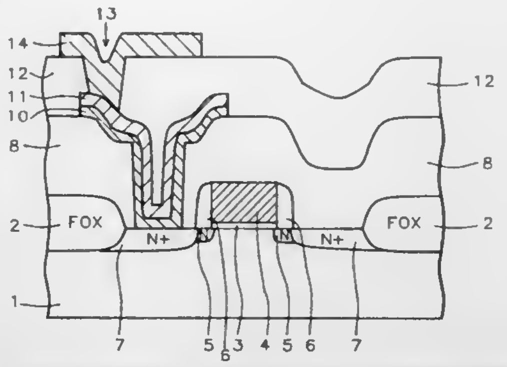
1. A complementary metal-oxide-semiconductor (CMOS) device comprising:
- a semiconductor substrate; and a plurality of MOS transistor cells, each cell including:
  - a hexagonal ring gate formed over the semiconductor substrate;
  - a drain region in the semiconductor substrate and having an outer perimeter;
  - a source region in the semiconductor substrate and having an inner perimeter;
  - a drain contact formed over and electrically contacting the center of the drain region;
  - a plurality of source contacts disposed around the hexagonal ring gate, the source contacts formed over and electrically contacting the source region;
  - a channel region under the ring gate and having a generally hexagonal ring shape, wherein the channel region has an inner side that is bounded by the outer perimeter of the drain region and it has an outer side that is bounded by the inner perimeter of the source region; and
  - a first guard ring surrounding the MOS transistor cells in the semiconductor substrate to which bias is applied to the semiconductor substrate, each MOS transistor cell being equally spaced from the first guard ring.

5,838,051

TUNGSTEN POLICIDE CONTACTS FOR SEMICONDUCTOR DEVICES

Haw Yen, Hsin Chu, and Shaw-Tseng Hsia, Taipei, both of Taiwan, assignors to Vanguard International Semiconductor Corporation, Hsin-Chu, Taiwan
Division of Ser. No. 429,727, Apr. 27, 1995, Pat. No. 5,510,296. This application Feb. 2, 1996, Ser. No. 597,528
Int. Cl.^{6} H01L *29/76*
U.S. Cl. 257—412 **2 Claims**

1. A MOSFET device structure, on a semiconductor substrate, comprising:
- field oxide regions in said semiconductor substrate;
- a device region between said field oxide regions;
- a gate insulator layer on said semiconductor substrate;
- a polysilicon gate structure on said gate insulator layer, in center of said device region;
- a source/drain region in said semiconductor substrate, between said polysilicon gate structure, and said field oxide region;
- a first insulator layer, comprised of a first portion of said first insulator layer, located on said source/drain region, and a second portion of said first insulator layer, located on said polysilicon gate structure, and on said field oxide region, and



with the top surface of said first portion of said first insulator layer, lower than the top surface of said second portion of said first insulator layer;
- a straight walled contact hole in said first portion of said first insulator layer, exposing top surface of said source/drain region;
- a layer of amorphous silicon, between about 300 to 700 Angstroms in thickness, contacting the top surface of one source/drain region, at the bottom of said straight walled contact hole, coating the sides of said straight walled contact hole, but not completely filling said straight walled contact hole, and extending from said straight walled contact hole, with a portion of said amorphous silicon layer overlying top surface of said first portion of said first insulator layer, and with a portion of said amorphous silicon layer overlying the top surface of said second portion of said first insulator layer;
- a layer of tungsten silicide, between 1000 to 2000 Angstroms in thickness, on said amorphous silicon layer, in said straight walled contact hole, not completely filling said straight walled contact hole, and overlying the portion of said amorphous silicon layer, which overlays the top surface of said portion of said first insulator layer, and overlying the portion of said amorphous silicon layer which overlays said second portion of said first insulator layer;
- a second insulator layer, with a first portion of said second insulator layer, completely filling said straight walled contact hole, and with a second portion of said second insulator layer, overlying the portion of said tungsten silicide, which in turn overlays said second portion of said first insulator layer, and with said second portion of said second insulator layer, overlaying said second portion of said first insulator layer;
- a via hole in said second portion of said second insulator layer, exposing the top surface of said tungsten silicide layer, where said tungsten silicide layer lies on underlying amorphous silicon layer, in the region directly over the top surface of said second portion of said first insulator layer; and
- a metal structure, completely filling said via hole, and contacting said tungsten silicide layer, at the bottom of said via hole, in the region in which said tungsten silicide layer, lies directly over the top surface of said second portion of said first insulator layer.

5,838,052

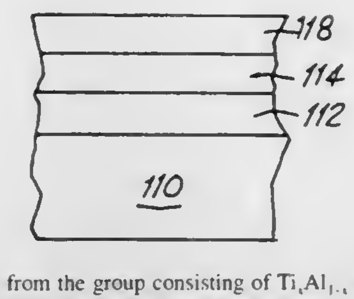
REDUCING REFLECTIVITY ON A SEMICONDUCTOR WAFER BY ANNEALING TITANIUM AND ALUMINUM

Allen McTeer, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.
Filed Mar. 7, 1996, Ser. No. 610,595
Int. Cl.^{6} H01L *31/0232*
U.S. Cl. 257—437 **8 Claims**

1. A semiconductor device comprising:

a) a layer of aluminum located above a substrate;

b) an anti-reflective layer above the aluminum layer, the anti-reflective layer comprising one or more titanium compounds

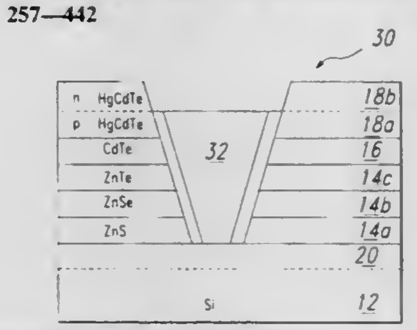


selected from the group consisting of Ti_xAl_{1-x} and $Ti_xAl_{1-x}N_y$ where x and y can be the same or different.

5,838,053

METHOD OF FORMING A CADMIUM TELLURIDE/SILICON STRUCTURE

Malcolm J. Bevan, and Hung-Dah Shih, both of Garland, Tex., assignors to Raytheon TI Systems, Inc., Lewisville, Tex.
Filed Sep. 19, 1996, Ser. No. 724,267
Int. Cl.^{6} H01L *31/00;31/0328;31/0336;31/072*
U.S. Cl. 257—442 **11 Claims**

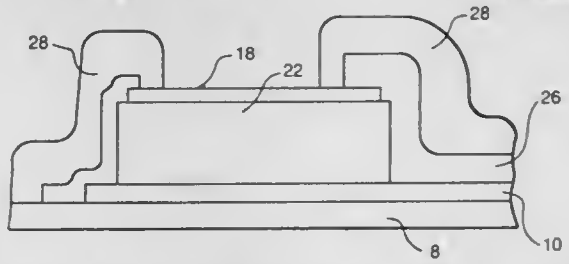


1. A semiconductor structure comprising:
- a silicon layer having a first lattice constant;
- a zinc sulfide layer disposed on said silicon layer and having a second lattice constant which is greater than said first lattice constant;
- a cadmium telluride layer having a third lattice constant; and
- a plurality of buffer layers formed between said zinc sulfide layer and said cadmium telluride layer, each of said buffer layers having a lattice constant which is greater than a lattice constant of the layer below it and which is less than a lattice constant of the layer above it.

5,838,054

CONTACT PADS FOR RADIATION IMAGERS

Robert Forrest Kwasnick, Niskayuna; Brian William Giambattista, Scotia; George Edward Possin, Niskayuna, and Jianqiang Liu, Clifton Park, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Dec. 23, 1996, Ser. No. 772,453
Int. Cl.^{6} H01L *31/062;31/113;31/00*
U.S. Cl. 257—457 **10 Claims**



1. A contact pad for a radiation imager, said imager comprising an array of photodiodes which are fabricated of a photodiode material and a conductive oxide, the contact pad comprising:
- a body comprising said photodiode material;

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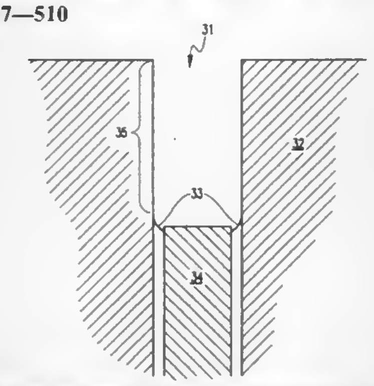
said body being positioned proximate an edge of said array; and
a contact layer comprising said conductive oxide; said contact layer being disposed over at least part of said body to provide a contact region, said conductive oxide in said contact region being at least partially exposed to form a top contact surface to enable coupling an external electrical connection to said array via said top surface.

5,838,055
TRENCH SIDEWALL PATTERNED BY VAPOR PHASE ETCHING

Richard L. Kleinhenz, Wappingers Falls; Wesley C. Natzle, New Paltz, and Chienfan Yu, Highland Mills, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 29, 1997, Ser. No. 865,261
Int. Cl.⁶ H01L *27/108*

U.S. Cl. 257—510 **2 Claims**



1. A patterned substrate for integrated circuits, comprising:
a substrate with a trench, said substrate having a top surface, said trench extending to at least a first point below said top surface of said substrate;
an insulator layer positioned on sidewalls of said trench, said insulator layer extending from said first point up said sidewalls of said trench to a second point above said first point and below said top surface of said substrate, said insulator layer including a dopant; and
a masking material positioned in said trench adjacent said insulator layer, said masking material extending from at or below said first point to a third point between said first point and said second point.

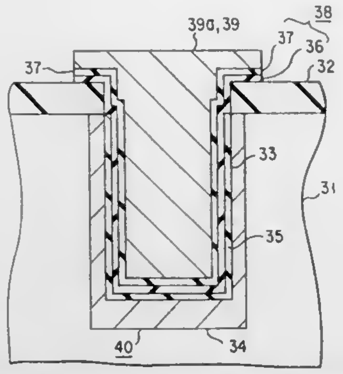
5,838,056
SEMICONDUCTOR DEVICE APPLIED TO COMPOSITE INSULATIVE FILM AND MANUFACTURING METHOD THEREOF

Yoshio Kasai, Yokohama; Takashi Suzuki, Yokkaichi; Takanori Tsuda, Kawasaki; Yuuichi Mikata, Yokohama; Hiroshi Akahori, and Akihito Yamamoto, both of Yokkaichi, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 450,656, May 25, 1995, abandoned. This application Dec. 30, 1996, Ser. No. 777,100
Claims priority, application Japan, May 27, 1994, 6-115293; May 19, 1995, 7-121030
Int. Cl.⁶ H01L *23/58*

U.S. Cl. 257—640 **21 Claims**

16. A semiconductor device comprising:
a semiconductor substrate;
a trench formed in said semiconductor substrate;
an impurity diffusion layer formed in an inner surface area of said trench;
a thermal nitride film including oxygen formed directly on a surface of said trench, a concentration of oxygen contained in said thermal nitride film being not higher than 1.36×10^{15} (atom/cm^2);



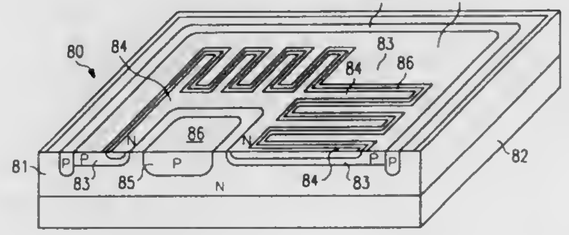
a CVD-silicon nitride film formed on said thermal nitride film; and
a silicon oxide film formed on said CVD-silicon film.

5,838,057
TRANSISTOR SWITCHES

Michael Maytum, Willington, and David Garnham, Shainbrook, both of England, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 3, 1994, Ser. No. 285,479
Int. Cl.⁶ H01L *27/082;* **H01H** *47/00*

U.S. Cl. 257—577 **12 Claims**



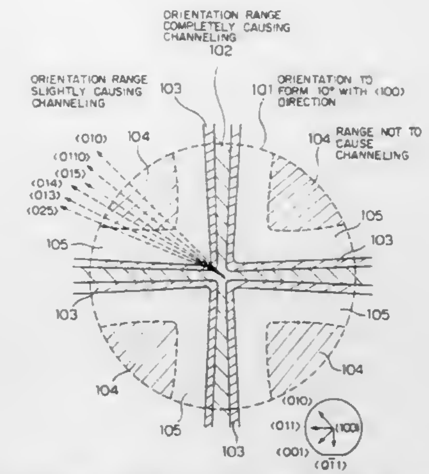
1. An electronic switch comprising a transistor and a diode formed on a substrate having an outer surface, the electronic switch comprising:
a common transistor collector and diode cathode region of a first conductivity type formed in the substrate;
a transistor base region of a second conductivity type formed in a first section of the collector region;
a transistor emitter region of the first conductivity type formed in a section of the base region;
a diode anode region formed of the second conductivity type and in a second section of the collector region, and wherein at least a portion of the anode region is selectively doped with a metallic dopant to provide centers for charge carrier recombination so as to decrease the recovery time of the diode; and
a field spreader region formed of the second conductivity type in the collector region and encircling the transistor and diode.

5,838,058
SEMICONDUCTOR SUBSTRATE AND SEMICONDUCTOR DEVICE EMPLOYING THE SAME

Hiroshi Kitajima, and Akiyoshi Kobayashi, both of Tokyo, Japan, assignors to NEC Corp., Japan

Continuation of Ser. No. 358,325, Dec. 19, 1994, abandoned. This application Dec. 11, 1996, Ser. No. 767,039
Claims priority, application Japan, Dec. 20, 1993, 5-344941
Int. Cl.⁶ H01L *29/93*

U.S. Cl. 257—628 **8 Claims**


ORIENTATION RANGE COMPLETELY CAUSING CHANNELING
102
ORIENTATION RANGE SLIGHTLY CAUSING CHANNELING
103
101
ORIENTATION TO FORM 10° WITH (100) DIRECTION
(010)
104
104
RANGE NOT TO CAUSE CHANNELING
(0110)
(015)
(014)
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(025)
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(010)
(011)
(100)
(001)
(0̄11)

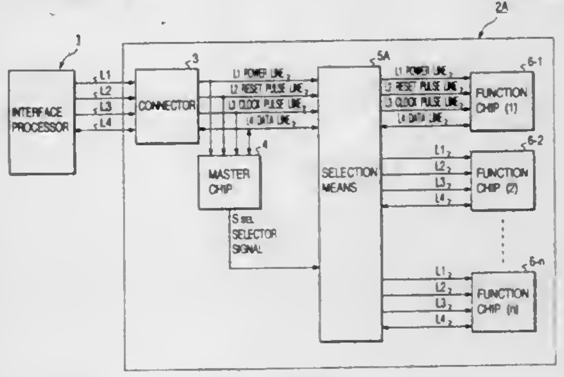
1. A semiconductor substrate having a surface substantially resistive to channeling when a high energy ion implantation greater than 300 keV is applied thereto, the semiconductor substrate comprising: one major surface of the semiconductor substrate at a plane forming an angle less than or equal to 10° with **<100>** direction perpendicular to (**100**) plane and forming angles greater than or equal to 3.5° with respective to (**0$\bar{1}$1**) plane and (**011**) plane perpendicular to said (**100**) plane, and said one major surface substantially resistant to channeling by the application thereto of the high energy ion implantation.

5,838,059
MULTICHIP IC CARD AND IC CARD SYSTEM USING IT

Masayuki Inoue, Yokohama; Shigeyuki Itoh, Kawasaki; Yutaka Takami; Kenji Matsumoto, both of Yokohama, and Kotaro Yamashita, Machida, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 3, 1996, Ser. No. 758,349
Claims priority, application Japan, Dec. 14, 1995, 7-326002
Int. Cl.⁶ H01L *23/02*

U.S. Cl. 257—679 **15 Claims**



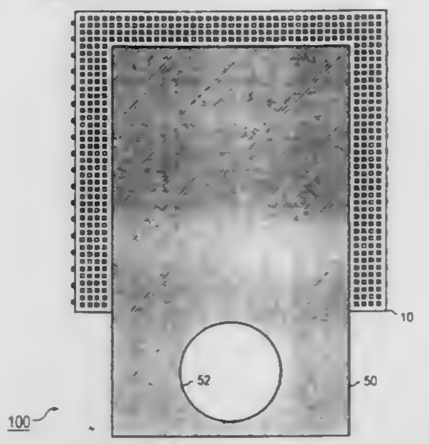
1. A multichip IC card connected to an external device having a microprocessor, the multichip IC card comprising:
a connector for connecting the card to the external device;
a master chip connected to said connector for controlling a system in the card;
at least one function chip connected to the connector and the master chip; and
selection means, connected to the connector, the master chip, and the at least one function chip, for selecting one of the function chips based on an instruction from said master chip and sending/receiving information stored in the selected function chip to/from the external device via said connector, the instruction for selecting the one function chip being based upon a designation of the function chip received by the master chip from the external device, the master chip ceasing to control the system after the function chip is selected.

5,838,060
STACKED ASSEMBLIES OF SEMICONDUCTOR PACKAGES CONTAINING PROGRAMMABLE INTERCONNECT

Alan E. Comer, 6505 153rd Ave. E., Sumner, Wash. 98390

Filed Dec. 12, 1995, Ser. No. 571,290
Int. Cl.⁶ H01L *23/02*

U.S. Cl. 257—685 **8 Claims**



1. A stackable, configurable substantially rectangular semiconductor package, said package having a plurality of exterior surfaces including a top surface and a bottom surface, comprising:
a plurality of external electrical contact points disposed on the exterior surfaces of said package, said plurality of external electrical contact points comprising at least a first array of first terminals disposed on said top surface of said package and a second array of second terminals disposed on said bottom surface, said package having a cavity for receiving a semiconductor chip, or die, mounted within said package; and a third array of third terminals about the cavity to which the semiconductor chip is connected to the package;
a first electrically nonconducting layer in which are located a plurality of parallel first conducting traces substantially parallel with a first package side, one of each trace electrically connected between one of said third terminals and one of said first array of first terminals;
a second electrically nonconducting layer in which are located a plurality of parallel second conducting traces substantially orthogonal to said first conducting traces and parallel to a second package side, one of each trace electrically connected to one of said second array of second terminals;
a third electrically nonconducting layer between the first and the second electrically nonconducting layers;
a configurable interconnect means for selectively connecting ones of said plurality of external electrical contact points to said semiconductor chip and to other ones of said plurality of external electrical contact points comprising
  a plurality of first programmable interconnection elements electrically linking said first conductive traces to said second conductive traces, wherein each interconnection element is located near one of said intersections, whereby said first conductive traces may be selectively connected to said second conductive traces,
  a plurality of second programmable interconnection elements electrically linking said second conductive traces to said second array of second terminals or to said first array of first terminals, or both;
  a plurality of intersections formed where ones of said first conductive traces overlay ones of said second conductive traces;
  a plurality of interconnection elements electrically connecting at selective intersections one of said first conductive traces to one of said second conductive traces; and
wherein each said trace is electrically sectionable therein enabling desired electrical circuits within the collective traces.

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5,838,061

SEMICONDUCTOR PACKAGE INCLUDING A SEMICONDUCTOR CHIP ADHESIVELY BONDED THERETO

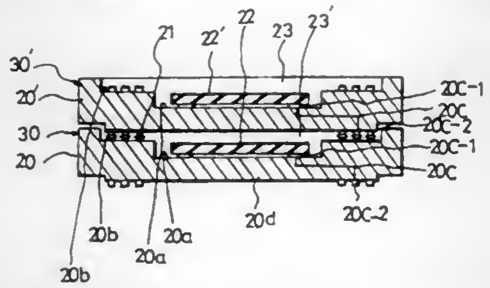
Jin Sung Kim, Cheongju, Rep. of Korea, assignor to LG Semicon Co., Ltd., Cheongju, Rep. of Korea

Filed Nov. 18, 1996, Ser. No. 751,615

Claims priority, application Rep. of Korea, Mar. 11, 1996, 1996 6372

Int. Cl.^{6} H01L *23/02;23/34;23/48*

U.S. Cl. 257—686 **15 Claims**



1. A semiconductor package comprising:

(a) a first semiconductor package having a substrate having an upper surface with a stepped cavity formed therein, the stepped cavity having a bottom surface and a stepped surface, a stepped lower surface, and a plurality of leads formed internally in said substrate, said substrate including:

a plurality of first terminals formed on said bottom surface of said stepped cavity, each first terminal being connected with corresponding ones of the internal leads,

a plurality of second terminals formed on said lower stepped surface of said substrate, each second terminal being connected with a corresponding first terminal via a corresponding internal lead,

a plurality of third terminals formed on said stepped surface of said stepped cavity, and

a conductive adhesive material applied on a surface of each of said plurality of first terminals;

(b) an integrated chip having a plurality of bonding pads, said integrated chip being placed on said conductive adhesive material such that corresponding bond pads therefor are coupled to corresponding ones of the first terminals; and

(c) a molding compound filling said stepped cavity to a predetermined height.

5,838,062

CORROSION-RESISTANT LEAD FRAME

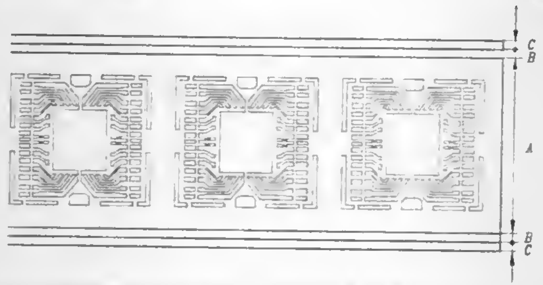
Ki Youn Hwang; Hee Suck Kim, and Jae Won Lee, all of Asan-gun, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Mar. 26, 1996, Ser. No. 625,517

Claims priority, application Rep. of Korea, Oct. 12, 1995, 1995-35095

Int. Cl.^{6} H01L *23/495;23/48;23/52;29/40*

U.S. Cl. 257—666 **6 Claims**



1. A lead frame for a semiconductor chip package, comprising:

a die pad configured to have a semiconductor chip attached thereto;

a plurality of leads configured to be electrically connected to the chip;

two laterally opposite side rails supporting said leads and said die pad;

said die pad, leads and side rails being integrally provided on a body of a first metal having a first, given standard electrode potential; and

a second metal provided on said side rails in effective galvanic contact with the said side rails and having a higher standard electrode potential than that of said first metal.

5,838,063

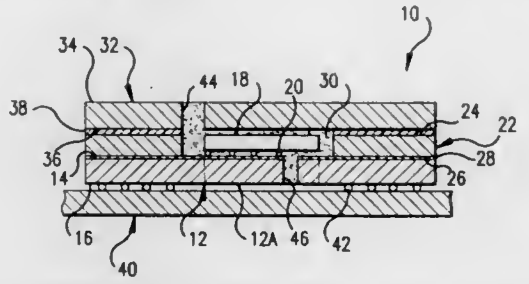
METHOD OF INCREASING PACKAGE RELIABILITY USING PACKAGE LIDS WITH PLANE CTE GRADIENTS

Mark F. Sylvester, Eau Claire, Wis., assignor to W. L. Gore & Associates, Newark, Del.

Filed Nov. 8, 1996, Ser. No. 744,843

Int. Cl.^{6} H01L *23/12;23/06;23/10;23/02*

U.S. Cl. 257—704 **25 Claims**



1. In combination with a chip package having an integrated circuit chip and a substrate for mounting said integrated circuit chip, a lid comprising:

a body sized to fit over an integrated circuit chip and being connectable to said chip package:

the body having at least two regions exhibiting different coefficients of thermal expansion;

wherein a first region of the body has a coefficient of thermal expansion that substantially matches an in plane coefficient of thermal expansion of said integrated circuit chip; and

wherein a second region of the body has a coefficient of thermal expansion that substantially matches an in plane coefficient of thermal expansion of said substrate.

5,838,064

SUPPORTING MEMBER FOR COOLING MEANS AND ELECTRONIC PACKAGE USING THE SAME

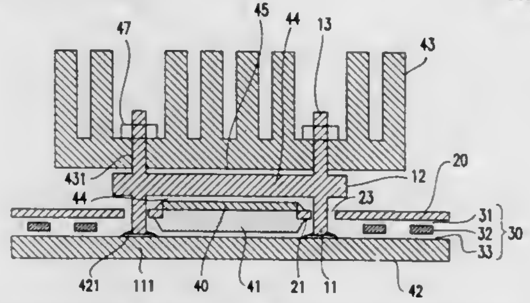
Yuzo Shimada; Takayuki Suyama, and Yoshimasa Tanaka, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Apr. 19, 1995, Ser. No. 423,455

Claims priority, application Japan, Apr. 22, 1994, 6-083548; Jun. 20, 1994, 6-137581; Jul. 13, 1994, 6-161092; Jul. 22, 1994, 6-170628

Int. Cl.^{6} H01L *23/10;23/34*

U.S. Cl. 257—718 **29 Claims**



1. A supporting member for supporting cooling means for cooling an electronic device, comprising:

a plate having first and second surfaces, said cooling means being placed on said first surface of said plate, said electronic device being attached to said second surface of said plate; and

a bottom leg integrally joined to said second surface of said plate,

wherein said plate comprises one of a heat sink and a heat radiating plate for preventing deformation of the electronic package, said electronic device being mounted on a film carrier and said film carrier being mounted on a substrate, and

wherein said supporting member fixedly separates said electronic device from said cooling means and said substrate such that said electronic device is out of thermal contact with said substrate and said supporting member prevents pressure being imposed on said electronic device by said cooling means.

5,838,065

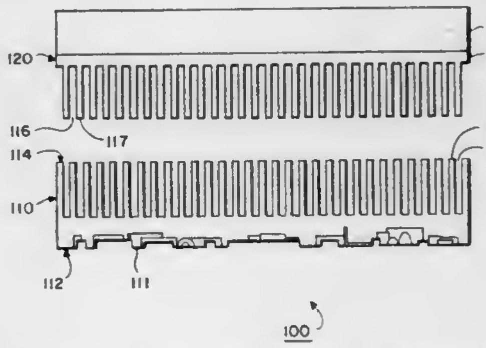
INTEGRATED THERMAL COUPLING FOR HEAT GENERATING DEVICE

William R. Hamburgen, Palo Alto, and John S. Fitch, Newark, both of Calif., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jul. 1, 1996, Ser. No. 673,976

Int. Cl.^{6} H01L *23/34;* **H05K** *7/20*

U.S. Cl. 257—722 **9 Claims**



1. An apparatus for thermally coupling a heat source to a heat sink, comprising:

a first substrate including a first side surface and a second side surface, a plurality of heat generating devices formed in the first side surface, and a plurality of first channels etched in the second side surface to form a plurality of first fins;

a second substrate having a plurality of second channels etched therein to form a plurality of second fins and a base for thermally engaging with a heat sink, the first and second fins providing a thermally conductive path from the heat generating device to the heat sink when interleaved with each other.

5,838,066

MINIATURIZED COOLING FAN TYPE HEATSINK FOR A SEMICONDUCTIOR DEVICE

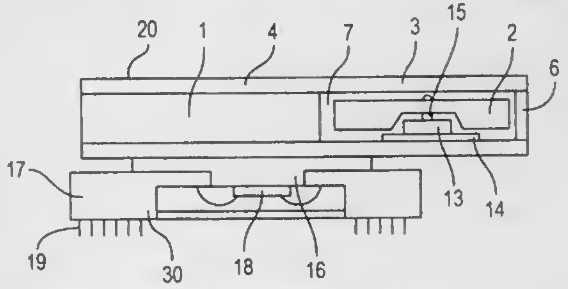
Sakae Kitajo, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 16, 1996, Ser. No. 766,990

Claims priority, application Japan, Dec. 18, 1995, 7-328815

Int. Cl.^{6} H05K *7/20;* **H01L** *23/46*

U.S. Cl. 257—722 **9 Claims**



1. A semiconductor device heatsink comprising:

a flat plate having a first end and a second end:

a plurality of one of pins and fins protecting from said flat plate, said plurality of one of pins and fins having free ends spaced apart from said flat plate:

a cover mounted on said free ends to form an air flow path having an air intake at said first end of said flat plate and an air exhaust at said second end of said flat plate;

a fan housing defining a chamber in communication with said air flow path via said air intake, said housing having an air intake aperture;

a centrifugal fan mounted in said housing:

wherein, during operation, said centrifugal fan draws a cooling air through said air intake aperture, and whirls said cooling air around so that it acquires sufficient momentum to discharge perpendicularly from a rotational axis of said centrifugal fan, thereby forcing said cooling air into said chamber, through said air flow path, and through said air exhaust.

5,838,067

CONNECTING DEVICE FOR CONNECTING A SEMICONDUCTOR CHIP TO A CONDUCTOR

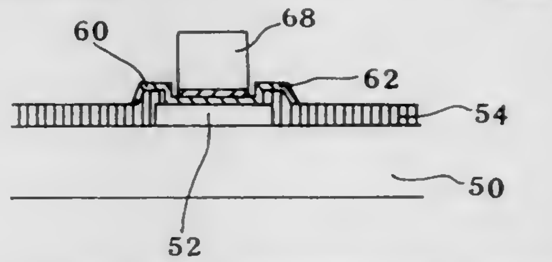
Young Sang Baek, Kunpo-Shi, Rep. of Korea, assignor to LG Electronics Inc., Seoul, Rep. of Korea

Filed May 16, 1996, Ser. No. 649,022

Claims priority, application Rep. of Korea, Dec. 30, 1996, 1995-69079

Int. Cl.^{6} H01L *23/48;23/52;29/40*

U.S. Cl. 257—737 **19 Claims**



1. A connecting device for connecting a semiconductor chip and a conductor, the connecting device comprising:

a pad formed on the chip;

a passivation layer formed around the pad thereby defining an aperture in the passivation layer;

a pad-to-bump connecting structure formed at least in the aperture, the pad-to-bump connection structure including a first base layer and a second base layer, a lateral dimension of the first base layer being greater than a lateral dimension of the second base layer, and the second base layer not extending laterally over the passivation layer: and

a bump, formed on the pad-to-bump connecting structure, a lateral dimension of a lower surface of the bump being substantially equal to the lateral dimension of the second base layer.

5,838,068

INTEGRATED CIRCUITRY WITH INTERCONNECTION PILLAR

Sanh Tang, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Continuation of Ser. No. 672,305, Jun. 27, 1996, abandoned, which is a continuation of Ser. No. 447,218, May 22, 1995, abandoned, which is a division of Ser. No. 298,209, Aug. 29, 1994, Pat. No. 5,506,172. This application Jul. 15, 1997, Ser. No. 903,198

Int. Cl.^{6} H01L *23/48;23/52;29/40;23/62*

U.S. Cl. 257—750 **12 Claims**

1. An integrated circuit comprising:

a semiconductor substrate;

a base region within the semiconductor substrate to which electrical interconnection is made;

a first insulative layer over the base region;

an electrically conductive pillar extending through the first insulative layer and into the base region; the pillar having a

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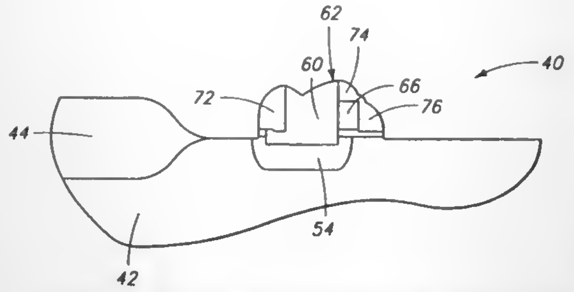


portion extending elevationally above the first insulative layer and an elevationally uppermost surface at a top of the portion extending elevationally above the first insulative layer; the portion extending elevationally above the first insulative layer comprising, in cross-section, a pair of laterally opposing sidewalls; the pair of laterally opposing sidewalls being a first sidewall and a second sidewall;

an electrically conductive line extending from the first sidewall; the line having a joining elevationally uppermost surface where it joins with the first sidewall; the pillar elevationally uppermost surface being elevationally above the line joining uppermost surface; the pillar elevationally uppermost surface not extending laterally to over the electrically conductive line; the pillar constituting a uniform composition of material at least from a location elevationally below the line through a location elevationally above the line joining uppermost surface;

a first insulative spacer along an entirety of the second sidewall; and

a second insulative spacer along the first sidewall and over the conductive line joining elevationally uppermost surface.

5,838,069
CERAMIC SUBSTRATE HAVING PADS TO BE ATTACHED TO TERMINAL MEMBERS WITH PB-SN SOLDER AND METHOD OF PRODUCING THE SAME

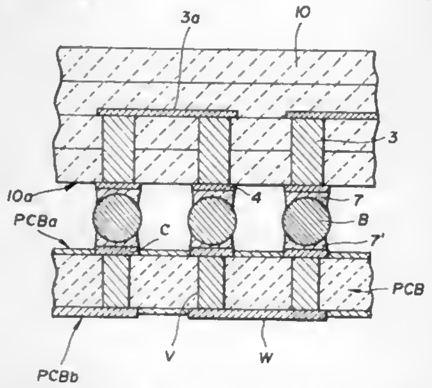
Motohiko Itai, Gifu; Hiroyuki Hashimoto, and Kazuo Kimura, both of Aichi, all of Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Mar. 26, 1997, Ser. No. 827,314

Claims priority, application Japan, Apr. 11, 1996, 8-114283

Int. Cl.^{6} H01L *23/48;23/52*

U.S. Cl. 257—766 **13 Claims**



1. A ceramic substrate having on a surface thereof a pad to be attached to a terminal member with Pb-Sn solder, wherein said pad includes a metallic layer formed on the surface of the substrate and a connecting layer formed on said metallic layer and made of a nickel base alloy, and wherein a gold-nickel layer made of a gold base alloy containing nickel and of the thickness in the range of 0.01 μm to 0.5 μm is formed directly on said connecting layer.

5,838,070
APPARATUS HAVING A SUBSTRATE AND ELECTRONIC CIRCUIT SOLDER-CONNECTED WITH THE SUBSTRATE

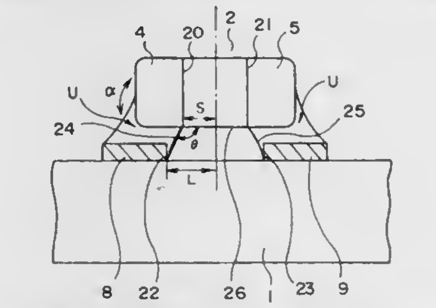
Toshimichi Naruse, Oura-gun, and Noriaki Sakamoto, Yamada-gun, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Dec. 20, 1996, Ser. No. 770,406

Claims priority, application Japan, Dec. 28, 1995, 7-343404; Apr. 26, 1996, 8-107810

Int. Cl.^{6} H01L *23/48;23/52*

U.S. Cl. 257—779 **20 Claims**



1. An electronic circuit apparatus, comprising:

a first pad electrode arranged on a main surface of a substrate;

a second pad electrode arranged on the main surface of the substrate so that the first and second pad electrodes are separated by a first interval, wherein the first interval is measured between an inside edge of the first pad electrode and an inside end of the second pad electrode;

a chip having a first chip electrode and a second chip electrode where the first and second chip electrodes are separated by a second interval, wherein the second interval is measured along a face of the chip between an inside edge of the first chip electrode and an inside edge of the second chip electrode, the first interval being longer than the second interval;

a first solder for fixedly attaching the first chip electrode to the first pad electrode; and

a second solder for fixedly attaching the second chip electrode to the second pad electrode.

5,838,071
WIRE BONDING METHOD, WIRE BONDING APPARATUS AND SEMICONDUCTOR DEVICE PRODUCED BY THE SAME

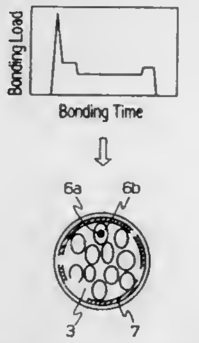
Hiroshi Horibe; Kazuko Nakamura, and Shinji Toyosaki, all of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 16, 1997, Ser. No. 835,802

Claims priority, application Japan, Oct. 17, 1996, 8-297146

Int. Cl.^{6} H01L *23/48;23/52*

U.S. Cl. 257—784 **4 Claims**



1. A semiconductor device comprising a semiconductor element, a lead frame connected to the semiconductor element with a die bond material, and a metal wire for electrically connecting the semiconductor element and the lead frame, wherein a joint between a bonding pad disposed on the semiconductor element and the metal wire comprises a central area having a plurality of contact portions extending between the wire and the bonding pad separated by plural gaps between the wire and bonding pad, said central area being surrounded by a further peripheral contact portion extending between the wire and the bonding pad.

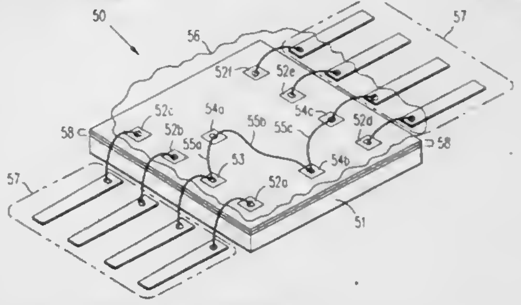
5,838,072
INTRACHIP POWER DISTRIBUTION PACKAGE AND METHOD FOR SEMICONDUCTORS HAVING A SUPPLY NODE ELECTRICALLY INTERCONNECTED WITH ONE OR MORE INTERMEDIATE NODES

Li-Chun Li, Los Gatos; Lawrence C. Liu, Menlo Park, both of Calif., and Michael A. Murray, Bellevue, Wash., assignors to Mosel Vitalic Corporation, San Jose, Calif.

Filed Feb. 24, 1997, Ser. No. 805,391

Int. Cl.^{6} H01L *23/28;23/48*

U.S. Cl. 257—786 **8 Claims**



1. An integrated circuit comprising:

a semiconductor die;

a supply node electrically connected to a power source, wherein said supply node comprises a bond pad;

first, second, and third intermediate nodes;

a first conductive lead lying external to and within the periphery of said semiconductor die, said first conductive lead having first and second ends, wherein said first end of said first conductive lead is electrically connected to said supply node and said second end of said first conductive lead is electrically connected to said first intermediate node;

a second conductive lead lying external to and within the periphery of said semiconductor die, said second conductive lead having first and second ends, wherein said first end of said second conductive lead is electrically connected to said supply node and said second end of said second conductive lead is electrically connected to said second intermediate node, wherein power from said power source is available at said first and second intermediate nodes; and

a third conductive lead lying external to and within said periphery of said semiconductor die, said third conductive lead comprising a first end and a second end, wherein said first end of said third conductive lead is electrically connected to said second intermediate node and said second end of said third conductive lead is electrically connected to said third intermediate node, wherein power from said power source is available at said third intermediate node through said second intermediate node.

5,838,073
SIDEBAND COMMUNICATION ON THE STANDARD PARALLEL SCSI BUS

Farzad Khosrowpour, Longmont, Colo., and Erik Schuchmann, Austin, Tex., assignors to Dell USA, L.P., Round Rock, Tex.

Filed Jan. 21, 1997, Ser. No. 786,154

Int. Cl.^{6} H02J *3/02*

U.S. Cl. 307—2 **30 Claims**

1. In an interface including signaling lines and a power supply line which is specified to operate within a first voltage range, and wherein the power supply line normally operates at a first voltage within a second voltage range, the second voltage range being within the first voltage range, a method of communicating from a first device to another device over the power supply line, comprising the steps of:

causing the power supply line to be at a second voltage within the first voltage range and outside the second voltage range, for a predetermined interval, according to a control signal;

determining if the power supply line voltage is at the second voltage in a voltage comparator; and

providing an indication signal when the power supply line is at the second voltage.

5,838,074
ANTI-THEFT SYSTEM FOR A MOTOR VEHICLE

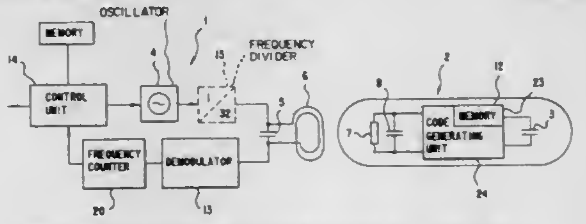
Maximilian Loeffler, Bernhardswald, and Herbert Zimmer, Regensburg, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 11, 1996, Ser. No. 763,906

Claims priority, application Germany, Dec. 11, 1995, 195 46 171.1

Int. Cl.^{6} G01S *13/74*

U.S. Cl. 307—10.2 **7 Claims**



1. An anti-theft system for a motor vehicle, comprising:

a transceiver disposed in a motor vehicle; and

a portable transponder;

said transceiver having an oscillator, an oscillating circuit excited to oscillate at a predetermined first frequency by said oscillator, causing energy signals to be transmitted at a first frequency to said transponder when said transponder is disposed in the immediate vicinity of said transceiver;

said transponder having a transponder oscillating circuit and an energy storing device, said energy storing device receiving the energy signals from said transceiver and is charged by the energy signals, said charged energy storage device causing said transponder oscillating circuit to oscillate at its resonant frequency and transmit data signals at a resonant frequency back to said transceiver;

said transceiver having a frequency counter receiving the data signals and measuring the resonant frequency of said transponder; and

said transceiver having a control unit connected to said frequency counter and to said oscillator for controlling said oscillator to excite said oscillating circuit with a second frequency approximately matching the measured resonant frequency of said transponder.

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5,838,075
ANTI-THEFT DEVICE FOR A VEHICLE

Takeshi Yamasaki, Kobe, Japan, assignor to Fujitsu Ten Limited, Kobe, Japan

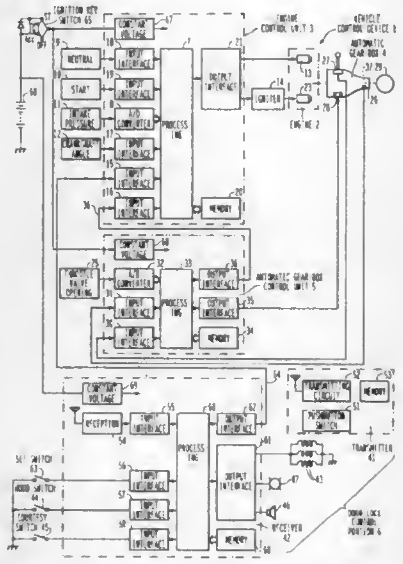
PCT No. PCT/JP95/00737, § 371 Date Dec. 16, 1996, § 102(e) Date Dec. 16, 1996, PCT Pub. No. WO95/28301, PCT Pub. Date Oct. 26, 1995

PCT Filed Apr. 14, 1995, Ser. No. 727,401

Claims priority, application Japan, Apr. 14, 1994, 6-076077; Jun. 2, 1994, 6-121503

Int. Cl.^{6} B60R *25/04*

U.S. Cl. 307—10.3 **21 Claims**



1. An anti-theft device for a vehicle, comprising:

control means for controlling at least one of either a fuel injection quantity or an ignition timing of an internal-combustion engine; and

detection means for making the control means stop outputting of at least either of an injection signal and an ignition signal to the internal-combustion engine, when a theft of a vehicle is detected.

5,838,076
DIGITALLY CONTROLLED TRIM CIRCUIT

Morteza Zarrabian, Mountain View, and Kenneth J. Carroll, Los Altos, both of Calif., assignors to Pacesetter, Inc., Sunnyvale, Calif.

Filed Nov. 21, 1996, Ser. No. 749,351

Int. Cl.^{6} H03K *3/01;* **H01H** *19/14*

U.S. Cl. 307—115 **12 Claims**

1. A digitally controlled trim circuit, including:

a plurality of resistors connected in series between a circuit node and a reference voltage;

a plurality of first solid-state switches connected in series across respective ones of said resistors;

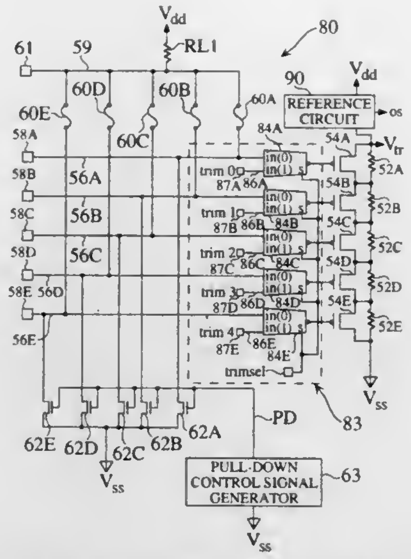
a plurality of multiplexers each having an output coupled to a control electrode of a respective one of said first solid-state switches, each of said multiplexers having a first input, a second input, and a select input;

a plurality of first control lines coupled to said first input of respective ones of said multiplexers;

a plurality of second control lines coupled to said second input of respective ones of said multiplexers;

a plurality of fuses coupled to respective ones of said first control lines; and,

wherein the trim circuit is operable in a trim test mode in response to a first logic level of a select control signal coupled to said select input of each of said multiplexers, and is operable in a fuse-program mode in response to a second logic level of said select control signal.



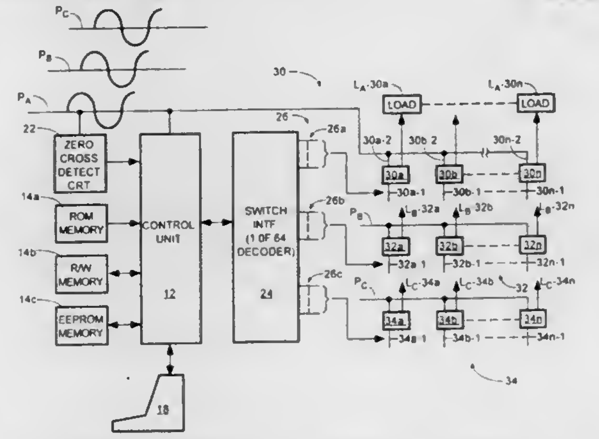
5,838,077
CONTROL SYSTEM FOR SWITCHING LOADS ON ZERO CROSSING

Darrell N. Chelcun, Buffalo Grove, and James H. Gu, Wheeling, both of Ill., assignors to Pittway Corporation, Chicago, Ill.

Filed Jul. 12, 1995, Ser. No. 501,396

Int. Cl.^{6} H01H *35/00*

U.S. Cl. 307—130 **18 Claims**



1. A system for switching varying voltage and current to at least one load comprising:

an electro-mechanical switching element for coupling a periodic, varying voltage and a varying current to a load;

a control unit coupled to said switching element;

a first circuit coupled to said control unit for storing at least a first parameter of said switching element;

a second circuit, coupled to said control unit, for detecting when one of the varying voltage and the varying current exhibits a zero crossing, wherein said control unit establishes a substantially constant coupling signal at said switching element, to cause same to couple the periodic, varying voltage to the load, and wherein said coupling signal is delayed an amount determined, at least in part, by said stored parameter such that said switching element couples the periodic, varying voltage to the load when that voltage exhibits a subsequent zero crossing.

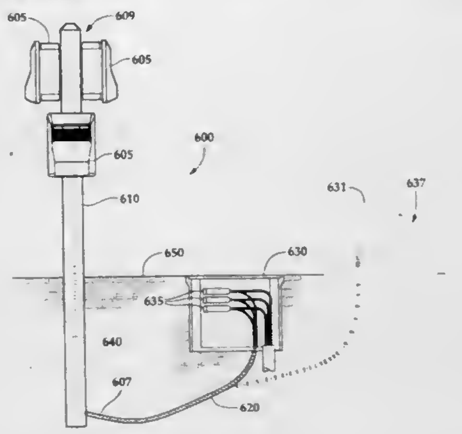
5,838,078
APPARATUS AND SYSTEMS THAT INTERFACE TO FACILITIES AND EQUIPMENT THAT PROVIDE TEMPORARY ELECTRIC UTILITIES TO CONSTRUCTION SITES

James D. Tipton, Mansfield, Tex., assignor to Basic Resources, Inc., Dallas, Tex.

Filed Nov. 25, 1996, Ser. No. 756,206

Int. Cl.^{6} H02B *1/26*

U.S. Cl. 307—147 **35 Claims**



1. An electrical interface, comprising:

(a) permanent electrical facilities that provide electrical power; and

(b) a temporary electrical facility electrically connected to said permanent electrical facilities, said temporary electrical facility provides electrical utilities to construction sites, said temporary electrical facility comprising

(b1) a non-conductive housing;

(b2) at least one electrical breaker;

(b3) at least one electrical plug, said at least one electrical breaker and said at least one electrical plug positioned in and enclosed within said non-conductive housing in such a manner that said at least one electrical breaker and said at least one electrical plug can be accessed from a position exterior to said non-conductive housing, said at least one electrical breaker electrically coupled to said permanent electrical facilities and to said at least one electrical plug in such a manner to selectively switch power to and from said at least one electrical plug;

(b4) a hollow pole having an exterior surface, said non-conductive housing is positioned on said exterior surface of said hollow pole, said hollow pole having a hollow cavity; and

(b5) electrical wiring to electrically couple said at least one electrical breaker to said permanent electrical facilities, said electrical wiring extending from said at least one electrical breaker in said non-conductive housing to said permanent electrical facilities, said electrical wiring extending from at least one electrical breaker through said exterior surface of said hollow pole and into said hollow cavity of said hollow pole and through said hollow cavity of said hollow pole.

5,838,079
SYNCHRONOUS LINEAR MOTOR USING PERMANENT MAGNET

Nobutaka Morohashi, and Susumu Kato, both of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 25, 1996, Ser. No. 756,248

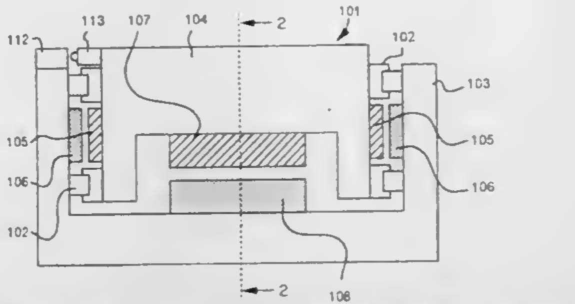
Claims priority, application Japan, May 28, 1996, 8-133911

Int. Cl.^{6} H02K *41/00*

U.S. Cl. 310—12 **7 Claims**

1. A synchronous linear motor comprising:

a stationary member and a movable member that moves along said stationary member;



an armature coil provided on said stationary member or said movable member, and a permanent magnet provided on the other one of said stationary member and said movable member, in opposition to said armature coil, said permanent magnet having alternating poles arranged in a direction of relative movement between said stationary member and said movable member; and

a heater for heating iron powder from the environment that is attracted to said permanent magnet up to a temperature at which the iron powder is made non-magnetic.

5,838,080
STEPPER MOTOR FOR CLOCKWORK IN WHICH THE STATOR CONSISTS OF A SOFT MAGNETIC ALLOY AND SOFT MAGNETIC ALLOY

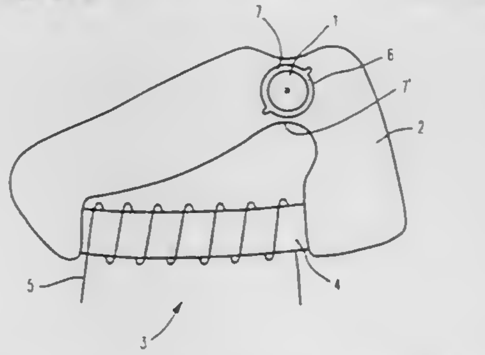
Georges Couderchon; Laurent Chaput; Lucien Coutu, all of Sauvigny lés Bois, and Dominique Gautard, Varennes Vauzelles, all of France, assignors to Imphy S.A., Puteaux, France

Filed Aug. 6, 1997, Ser. No. 908,667

Claims priority, application France, Aug. 29, 1996, 96 10554

Int. Cl.^{6} H02K *37/00;* **C22F** *1/10*

U.S. Cl. 310—49 R **13 Claims**



1. A stepper motor of the type comprising a rotor (**1**), a stator (**2**) and a coil (**3**) consisting of a magnetic core (**4**) and of a winding (**5**), wherein the stator (**2**) consists of a soft magnetic alloy of the FeNiCr type, the chemical composition of which includes, by weight:

$$40\% \leqq Ni + Co \leqq 60\%$$

$$0\% \leqq Co \leqq 7\%$$

$$8\% \leqq Cr \leqq 13.5\%$$

$$8\% \leqq Cr + Mn + Si + Mo + Nb + V + W \leqq 13.5\%,$$

the remainder being iron and impurities resulting from the manufacture.

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5,838,081

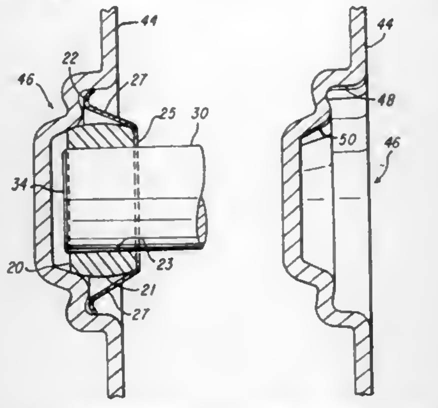
MOTOR HAVING RECESSED AREA IN MOTOR CASE FOR RETAINING MOTOR SHAFT BEARING THEREIN

Lowell T. Greentaner, Tipp City; David J. Hemmert, Dayton, both of Ohio, and Günter Kiehnle, Eppingen, Germany, assignors to ITT Automotive Electrical Systems, Inc., Auburn Hills, Mich.

Continuation of Ser. No. 563,480, Nov. 28, 1995, abandoned. This application Aug. 22, 1997, Ser. No. 916,551

Int. Cl.^{6} H02K *5/16;7/08*

U.S. Cl. 310—90 **18 Claims**



1. A motor which includes a shaft having an end portion, comprising:

a case having a wall having an inner side and an outer side, said wall defining an inner annular recessed area on said inner side and an outer annular recessed area on said outer side; said inner and outer sides being situated opposite each other;

a bearing which supports the end portion of the shaft, a portion of said bearing being positioned in the inner annular recessed area; and

said end portion being situated in said inner annular recessed area when said bearing is situated in said motor said inner and outer annular recessed areas being located on opposite sides of said wall.

5,838,082

SUPERCONDUCTING BEARING DEVICE

Norio Ito; Junichiro Shinozaki, and Hiroshi Imaizumi, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Feb. 16, 1996, Ser. No. 602,654

Claims priority, application Japan, Feb. 17, 1995, 7-029490; Mar. 15, 1995, 7-056208; Mar. 30, 1995, 7-074066; Apr. 6, 1995, 7-081446; Nov. 30, 1995, 7-313219

Int. Cl.^{6} H02K *7/09*

U.S. Cl. 310—90.5 **45 Claims**

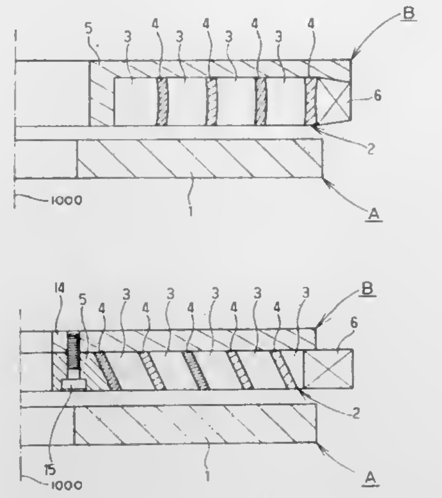
1. A superconducting bearing device, comprising:

a superconductor mounted on a stationary member; and

an opposing magnet section mounted on a rotating member spaced a gap distance away from said superconductor, said magnet section comprising:

first and second annular permanent magnets arranged concentrically about a central axis of rotation of said rotating member; and

a malleable magnetic yoke member radially interposing said annular permanent magnets, said yoke member engaging a radial outer joint surface of said first permanent magnet and a radial inner joint surface of said second permanent magnet, said joint surfaces being curved with respect to the central axis of rotation of said rotating member to provide an interlocking arrangement between said first and second permanent magnets and said yoke member.



5,838,083

DEVICE FOR BREAKING EDDIES AT A SURFACE SUBMERGED BY A TURBULENT FLOW

Johan K. Fremerey, Bonn; Stephan Polachowski, Linnich, and Heinrich Reiff, Niederzier, all of Germany, assignors to Forschungszentrum Jülich GmbH, Jülich, Germany

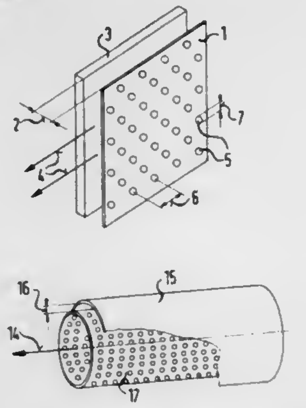
PCT No. PCT/DE95/01258, § 371 Date Mar. 4, 1997, § 102(e) Date Mar. 4, 1997, PCT Pub. No. WO96/08658, PCT Pub. Date Mar. 21, 1996

PCT Filed Sep. 13, 1995, Ser. No. 809,530

Claims priority, application Germany, Sep. 16, 1994, 43 33 021.9

Int. Cl.^{6} F22B *1/16;* **F16K** *47/02*

U.S. Cl. 310—90.5 **9 Claims**



1. A device for breaking flow eddies created by flow across a surface, comprising:

a wall disposed at a predetermined distance from said surface such that flow occurs in a space therebetween, and

a plurality of structural elements provided in said wall and in communication with the flow in said space, wherein a uniform spacing is provided between adjacent ones of said structural elements, and wherein said uniform spacing and dimensions of said structural elements are based on said predetermined distance.

5,838,084

VEHICLE TRANSMISSION SYSTEM FITTED WITH AN ELECTRICAL RETARDER

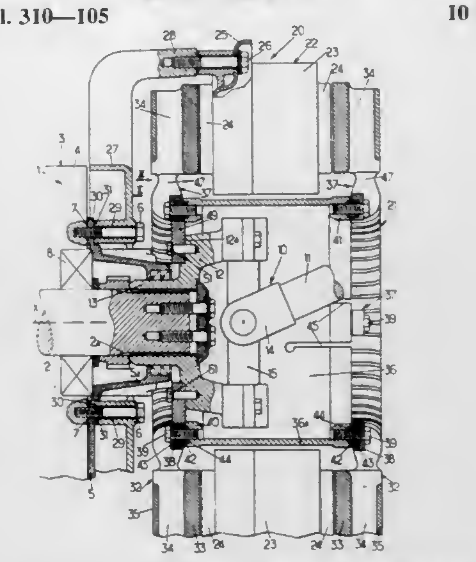
Guy Rugraff, Pantin, France, assignor to Labavia SGE, Montigny le Bretonneux, France

Filed Feb. 11, 1997, Ser. No. 802,336

Claims priority, application France, Feb. 12, 1996, 96 01688

Int. Cl.^{6} H02K *49/04*

U.S. Cl. 310—105 **10 Claims**



1. A transmission system for self-propelled land vehicles, the transmission system comprising:

a transmission mechanism driven by the engine of the vehicle and having an outlet shaft rotatable about an axis, said mechanism including a case itself comprising a main body on which a closure plate is fixed by means of screws, said closure plate extending in a mean plane perpendicular to the axis of rotation, and the outlet shaft being supported by at least one end bearing in the vicinity of the closure plate;

a universal joint fork which is directly fixed to the outlet shaft of the transmission mechanism through the closure plate and itself driving a link shaft, said universal joint fork having at least one outside shoulder which forms a rear face directed towards the closure plate, which rear face is axially offset from the closure plate leaving a certain amount of annular space free between itself and said closure plate; and

an electrical eddy current retarder comprising both a stationary annular inductor stator cantilevered out from the case by means of a framework, and a rotor including at least one core disk of ferromagnetic material disposed facing the inductor stator and secured to the outlet shaft of the transmission mechanism by means of a support member,

wherein the framework is fixed to the case by at least some of the above-mentioned screws which also serve to fix the closure plate to the case, said screws passing through the closure plate, thereby clamping it between the framework and the main body of the case,

the support member of the rotor being fixed solely to the rear face of the universal joint fork in the annular space between the closure plate and rear face of the universal joint fork.

5,838,085

VERSATILE AC DYNAMO-ELECTRIC MACHINE

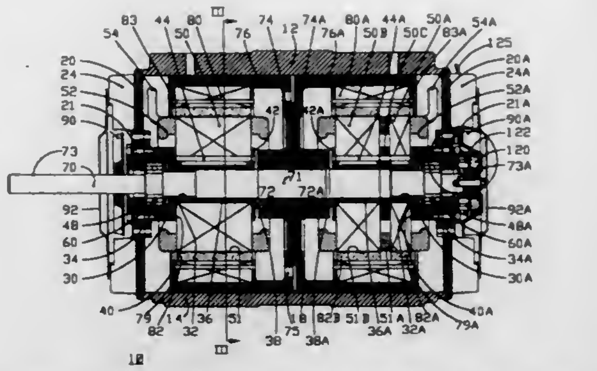
John F. Roesel, Jr., and Ronnie J. Barber, both of Bradenton, Fla., assignors to Precise Power Corporation, Bradenton, Fla.

PCT No. PCT/US94/06364, § 371 Date Sep. 10, 1996, § 102(e) Date Sep. 10, 1996, PCT Pub. No. WO95/34117, PCT Pub. Date Dec. 14, 1995

PCT Filed Jun. 8, 1994, Ser. No. 648,120

Int. Cl.^{6} H02K *16/00*

U.S. Cl. 310—113 **15 Claims**



1. A versatile dynamo-electric machine comprising dual electrically isolated stators and a single rotor assembly unit having two independent electrical rotor elements, one for each of the stators, the two electrical rotor elements being attached to a single drive plate member mounted on a shaft, the dual stators and their electrical rotor elements capable of operating together either as an AC motor, or as an electrical AC generator, or as an AC motor-generator, comprising

a) a solid metal outer casing having a smooth-surfaced internal circular cylindrical inner bore extending from one end to the other of the casing, the walls of the cylindrical inner bore and the ends thereof forming an enclosing housing,

b) two annular ring shaped independent stators, each stator having one inner end affixed to and supported by the casing walls at an inner end of the bore, whereby heat generated in each stator can flow to the walls of the casing, each stator having an end extending inwardly from the inner ends into the cylindrical bore and toward each other with an axial separation space between their ends, each stator having a central axial aperture extending therethrough, each stator having an annular core of low-loss magnetic material having an outer circular cylindrical surface coaxial with the bore axis with axially disposed slots in the surface, and having main electrical windings in most of the slots, and at least one core containing at least one pair of adjacent slots with a concentrated winding in the pair of adjacent slots, electrical leads to the main windings and to the concentrated windings passing through the walls of the casing, the concentrated windings being connectable to a source of single-phase AC through its leads by a control switch, and the leads to the main windings can be connected to either a source of AC power or to a load, the main windings being arranged in the core slots to produce a rotating magnetic field when energized by AC current,

c) the rotor assembly comprising a rotor shaft disposed within and coaxially of the circular cylindrical bore and extending from one end to the other end of the bore, bearings for rotatably supporting the rotor shaft, the bearings being affixed to the casing walls at the ends of the bore, at least one end of the shaft extending to the exterior of the casing, the rotor shaft passing through the central axial aperture of both stator cores with a clearance space therebetween, a circular metal drive place member being affixed to the shaft and extending radially outwardly at the axial separation space between the stators, the drive plate member having an outer periphery close to the cylindrical inner bore of the casing and with a clearance space therebetween, two circular cylindrical sleeves, one sleeve being attached to each side of the periphery of the drive plate member, with a small clearance space between the inner bore of the casing and the outer surfaces of the sleeves, each sleeve extending over and surrounding one of the stator cores, the inner surface of each sleeve having affixed thereto an annular cylindrical layer of a low coercive force magnetic material, each layer having an inner surface of circular cylindrical shape on which is affixed a layer of magnetizable permanent magnetic material having an exposed innermost circular cylindrical surface substantially coextensive with and closely parallel to the outer cylindrical surface of the adjacent stator core with a small rotational clearance therebetween, each of the stators being electrically and magnetically isolated from the other stator by the assembly of the circular metal drive plate, the cylindrical sleeves and the shaft, and the assembly comprises a body of high rotational inertia, and

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d) the versatile dynamo-electric machine being characterized that either or both of the stator cores and its adjacent rotor are operable as
   (1) an AC motor when the leads to the main windings are connected to a source of AC power and produce a rotating magnetic field in the stator, and the leads to the concentrated windings are connected to a source of single-phase AC of the same frequency as the AC power and with the AC current flowing through the concentrated windings being sufficient to strongly magnetize the portion of the core between the adjacent slots in which the concentrated windings are placed to alternate north and south polarity of sufficient strength to magnetize the layer of magnetizable permanent magnetic material that rotates closely thereto into alternate and successive north and south magnetic poles that will react with the rotating magnetic field in the adjacent stator to cause the rotor to rapidly reach and maintain synchronous speed from stand-still or at speeds below synchronous speed of rotation, or
   (2) either or both stators and their associated rotors operate as an AC generator when the leads to the concentrated windings are connected through the controlled switch to a source of single-phase AC of the same frequency as desired by a load, the concentrated winding being supplied single-phase AC current of sufficient strength to magnetize the portion of the stator core between the adjacent slots to alternate north and south magnetic polarity of sufficient strength to magnetize the layer of magnetizable material on the rotor that rotates closely thereto into alternate successive north and south magnetic poles so that during rotation of the rotor it will produce an AC potential of the same frequency as in the excitation winding in the main electrical windings in the stator whereby the AC potential will be conveyed by the leads from these windings to the load, and
   (3) the machine being operable as a motor-generator, with one stator-rotor pair being operated as an AC motor for driving the rotor of the other stator-rotor pair for operation as an AC generator, the high rotational inertia of the rotor assembly enabling the AC generator pair to generate AC of a desired frequency for a prolonged period of time to a load when outside AC power to the motor-stator is interrupted.

5,838,086
SYNCHRONOUS MOTOR WITH PERMANENT MAGNETS INCLUDED IN A ROTOR

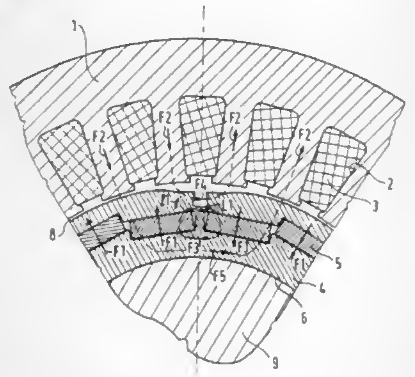
Alain Cuenot, and Alain Petitboulanger, both of Dijon, France, assignors to Parvex, Dijon, France

Filed Jul. 11, 1995, Ser. No. 499,913

Claims priority, application France, Jul. 27, 1994, 94 09306

Int. Cl.^{6} H02K *1/24;21/14*

U.S. Cl. 310—156 **5 Claims**



1. A synchronous motor comprising:

a rotor;

a stator defined by poles and cooperating with said rotor to define an air gap;

permanent magnets arranged in said rotor, said permanent magnets having azimuth positions within said rotor and having radial magnetization;

said rotor being defined by poles and each rotor pole containing one or several of said permanent magnets, wherein flux is produced between each pair of adjacent poles of said rotor, and wherein said flux propagates within said rotor along a first magnetic path (F3) situated between said poles of said rotor, said first magnetic path (F3) having a reluctance lying in a range 0.5 times to 10 times the reluctance offered to the flux produced by said permanent magnets and propagating via said air gap.

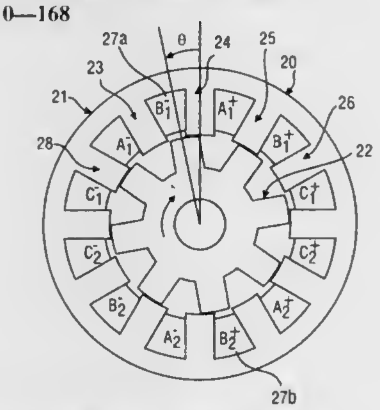
5,838,087
RELUCTANCE MACHINE

Yifan Tang, St. Louis, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Aug. 30, 1996, Ser. No. 705,792

Int. Cl.^{6} H02K *19/02;19/12*

U.S. Cl. 310—168 **9 Claims**



1. A reluctance machine comprising:

a stator defining a plurality of stator poles and a plurality of stator slots;

a rotor positioned to rotate with respect to the stator; and

at least three phase windings, where each phase winding comprises a plurality of coils, where each coil is wound about more than one stator pole, where each coil comprises two coilsides, and where only one coil side is positioned in each stator slot;

wherein the number of stator poles encircled by each coil of at least two of the phase windings is less than the total number of phase windings such that the self-inductance of each phase winding varies as a function of the angular position of the rotor with respect to the stator.

5,838,088
SURFACE ACOUSTIC WAVE DEVICE FOR SENSING A TOUCH-POSITION

Kohji Toda, 1-49-18 Futaba, 239, Yokosuka, Japan

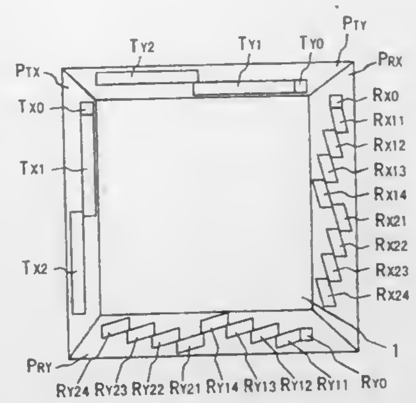
Filed Mar. 6, 1997, Ser. No. 812,707

Int. Cl.^{6} H01L *41/04*

U.S. Cl. 310—313 R **19 Claims**

1. A surface acoustic wave position-sensing device comprising:

two surface acoustic wave transducing units X and Y, each thereof consisting of
   a piezoelectric substrate P_T having two end surfaces running perpendicular to the direction of the thickness d thereof,
   a piezoelectric substrate P_R having two end surfaces running perpendicular to the direction of the thickness d thereof,
   an input interdigital transducer T_o formed on one end surface of said piezoelectric substrate P_T,
   N input interdigital transducers T_i (i=1, 2, . . . , N) formed on said one end surface of said piezoelectric substrate P_T,
   an output interdigital transducer R_o opposed to said interdigital transducer T_o, said interdigital transducer R_o being



formed on one end surface of said piezoelectric substrate P_R and placed such that the finger direction of said interdigital transducer R_o runs parallel with that of said interdigital transducer T_o, said thickness d of said piezoelectric substrates P_T and P_R being smaller than an interdigital periodicity P of said interdigital transducers T_o, T_i and R_o, and

   at least two output interdigital transducers R_{i1} and R_{i2} (i=1, 2, . . . , N) opposed to each interdigital transducer T_i, said interdigital transducers R_{i1} and R_{i2} being formed on said one end surface of said piezoelectric substrate P_R such that the finger direction of said interdigital transducers R_{i1} and R_{i2} is slanting to that of said interdigital transducer T_i by an angle α, respectively, an interdigital periodicity P_N along the vertical direction to the finger direction of said interdigital transducers R_{i1} and R_{i2} being equal to the product of said interdigital periodicity P and cos α;

a nonpiezoelectric plate having an upper- and a lower end surfaces running perpendicular to the thickness direction thereof, the thickness of said nonpiezoelectric plate being larger than three times said interdigital periodicity P, said piezoelectric substrates P_T and P_R being mounted on said upper end surface of said nonpiezoelectric plate; and

a controlling system connected with said surface acoustic wave transducing units X and Y,
   each of said interdigital transducers T_o and T_i receiving an electric signal with a frequency approximately corresponding to said interdigital periodicity P, exciting a surface acoustic wave of the first mode and the higher order modes in said piezoelectric substrate P_T, and transmitting said surface acoustic wave having the wavelength approximately equal to said interdigital periodicity P to said piezoelectric substrate P_R through said upper end surface of said nonpiezoelectric plate, the phase velocity of said surface acoustic wave of said first mode and said higher order modes being approximately equal to the phase velocity of the Rayleigh wave traveling on said nonpiezoelectric plate alone,
   said interdigital transducer R_o transducing said surface acoustic wave excited by said interdigital transducer T_o to an electric signal with a phase θ_{base} and delivering said electric signal,
   each of said interdigital transducers R_{i1} and R_{i2} transducing said surface acoustic wave excited by each interdigital transducer T_i to electric signals E_j (j=1, 2, . . . , X) with phases θ_j (j=1, 2, . . . , X), respectively, said phases θ_j corresponding to positions F_j (j=1, 2, . . . X) on said upper end surface of said nonpiezoelectric plate, respectively, each electric signal E_j having a frequency approximately corresponding to said interdigital periodicity P, the total phase $\Sigma\theta_j$ made by said phases θ_j being zero, the total electric signal ΣE_j made by said electric signals E_j being zero and not able to be detected at each of said interdigital transducers R_{i1} and R_{i2},
   said nonpiezoelectric plate being made of a material such that the phase velocity of the surface acoustic wave traveling on said nonpiezoelectric plate alone is higher than that traveling on said piezoelectric substrates P_T and P_R alone,
   said interdigital transducers T_i and R_{i1} forming N propagation lanes D_{i1} (i=1, 2, . . . , N) of the surface acoustic wave on said upper end surface of said nonpiezoelectric plate, each propagation lane D_{i1} consisting of minute propagation lanes Z_j (j=1, 2, ... X) corresponding to said positions F_j,
   said interdigital transducers T_i and R_{i2} forming N propagation lanes D_{i2} (i=1, 2, . . . , N) of the surface acoustic wave on said upper end surface of said nonpiezoelectric plate, each propagation lane D_{i2} consisting of minute propagation lanes Z_j (j=1, 2, . . . , X) corresponding to said positions F_j,
   one of said interdigital transducers R_{i1} and R_{i2} delivering an electric signal E with a phase θ only when touching a position F_x out of said positions F_j, on a minute propagation lane Z_x out of said minute propagation lanes Z_j, said position F_x corresponding to an electric signal E_x with a phase θ_x, said total electric signal ΣE_j minus said electric signal E_x being equal to said electric signal E, said total phase $\Sigma\theta_j$ minus said phase θ_x being equal to said phase θ,
   said controlling system sensing a touch with a finger or others on said position F_x by an appearance of said electric signal E at said one of said interdigital transducers R_{i1} and R_{i2}, and finding said position F_x by detecting said one, delivering said electric signal E, of said interdigital transducers R_{11} and R_{12}, and by evaluating a difference between said phases θ and θ_{base}.

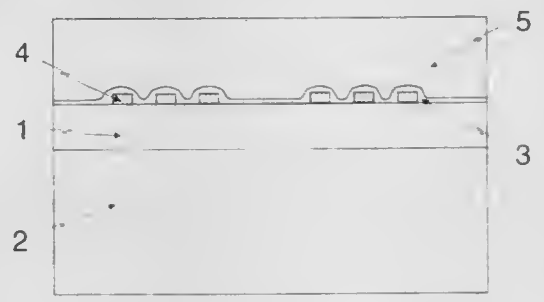
5,838,089
ACOUSTIC WAVE DEVICES ON DIAMOND WITH AN INTERLAYER

David L. Dreifus, Durham, and Joseph S. Holmes, Sanford, both of N.C., assignors to Kobe Steel USA Inc., Research Triangle Park, N.C.

Filed Feb. 18, 1997, Ser. No. 802,272

Int. Cl.^{6} H03H *9/25;* **H01L** *41/18*

U.S. Cl. 310—313 A **28 Claims**



1. An acoustic wave device for propagating surface acoustic waves, comprising:

a substrate;

a diamond layer formed on said substrate;

a lower interlayer formed on said diamond layer;

interdigitated transducer electrodes formed on said lower interlayer;

an upper interlayer covering said lower interlayer and said interdigitated transducer electrodes, whereby said interdigitated transducer electrodes are essentially embedded; and a piezoelectric layer on said upper interlayer.

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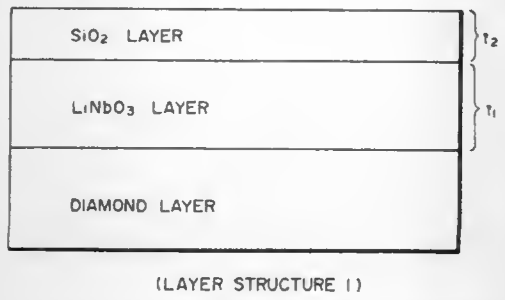
5,838,090
SURFACE ACOUSTIC WAVE DEVICE

Hideaki Nakahata; Kenjiro Higaki; Satoshi Fujii; Hiroyuki Kitabayashi, and Shin-ichi Shikata, all of Itami, Japan, assignors to Sumitomo Electric Industries, ltd., Japan
Continuation of Ser. No. 581,972, Jan. 2, 1996, abandoned.
This application Nov. 17, 1997, Ser. No. 972,162
Claims priority, application Japan, Feb. 9, 1995, 7-021598
Int. Cl.^{6} 1103H *9/00*
U.S. Cl. 310—313 A **21 Claims**

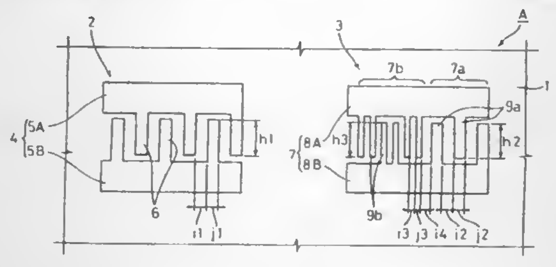


(LAYER STRUCTURE I)

1. A surface acoustic wave device operated at a wavelength of λ, comprising:
- a diamond,
- a c-axis oriented polycrystalline LiNbO$_3$ layer having a thickness of t$_1$ and being arranged on said diamond, said LiNbO$_3$ laver thickness being represented by kh$_1$, and kh$_1$ being defined as $2\pi(t_1/\lambda)$.
- an interdigital transducer arranged on said LiNbo$_3$ layer, and
- an SiO$_2$ layer having a thickness of t$_2$ and being arranged on said interdigital transducer, said SiO$_2$ layer thickness being represented by kh$_2$. and kh$_1$ being defined as $2\pi(_2/\lambda)$,
- wherein said surface acoustic wave device is used in the 1st mode.

5,838,091
SURFACE ACOUSTIC WAVE DEVICE INCLUDING IDT ELECTRODE HAVING SOLID ELECTRODE PORTION AND SPLIT ELECTRODE PORTION

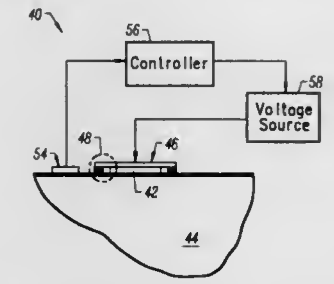
Toru Watanabe, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Kyoto-fu, Japan
Filed Apr. 3, 1996, Ser. No. 625,592
Claims priority, application Japan, Apr. 4, 1995, 7-078882
Int. Cl.^{6} H01L *41/08*
U.S. Cl. 310—313 C **8 Claims**



1. A surface acoustic wave device comprising:
- a piezoelectric substrate;
- an interdigital transducer electrode disposed on said piezoelectric substrate and including a solid electrode portion and a split electrode portion, said split electrode portion being continuously formed at an end of said solid electrode portion in a propagating direction of a surface acoustic wave generated on said piezoelectric substrate, said split electrode portion comprising a plurality of interdigitating electrode fingers which are meshed alternatively two by two, wherein an electrode interval between said split electrode portion and said solid electrode portion is about λ/8 and an electrode finger at an end of said solid electrode portion closest to said electrode interval has an electrode finger width of about 5λ/16, where λ is a wavelength of the surface acoustic wave.

5,838,092
APPARATUS AND METHOD FOR VIBRATION CONTROL USING ACTIVE CONSTRAINED LAYER EDGE ELEMENTS

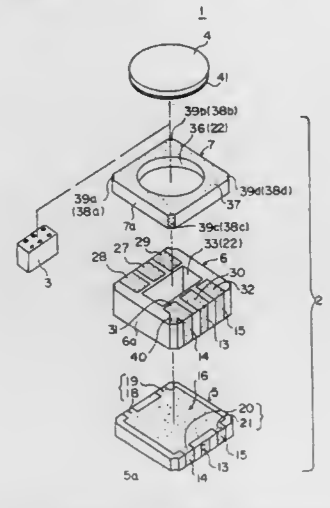
Kon-Well Wang, and Wei-Hsin Liao, both of Centre County, Pa., assignors to The Penn State Research Foundation, University Park, Pa.
Filed Aug. 29, 1996, Ser. No. 705,111
Int. Cl.^{6} H01L *41/08*
U.S. Cl. 310—326 **12 Claims**



1. An apparatus for reducing vibrations of a substrate, comprising:
- a passive viscoelastic damping material positioned on top of said substrate;
- an active piezoelectric layer positioned on top of said passive viscoelastic damping material; and
- a set of edge elements physically connecting said active piezoelectric layer to said substrate to transmit active forces and moments from said piezoelectric layer to said substrate.

5,838,093
PIEZOELECTRIC ELEMENT PACKAGE IN WHICH A PIEZOELECTRIC ELEMENT ON A CHIP CARRIER IS RELIABLY SHIELDED BY USING A CAP

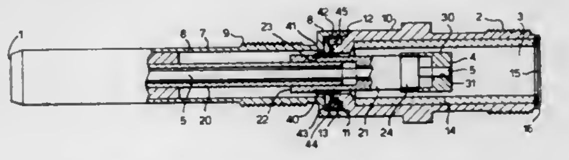
Yoshimi Sakai, and Takumi Kooriike, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Feb. 20, 1997, Ser. No. 803,308
Claims priority, application Japan, Feb. 23, 1996, 8-036838
Int. Cl.^{6} H01L *41/08;* **H03H** *9/15*
U.S. Cl. 310—348 **7 Claims**



1. A piezoelectric element package comprising:
- a chip carrier having a shielding surface and a cavity for enclosing a piezoelectric element therein; and
- a cap having a central axis and a shielding material on a bottom surface of the cap, said cap shielding the piezoelectric element, enclosed in the cavity of the chip carrier. with said shielding material bonded to the shielding surface of the chip carrier,
- said cap being in a substantially circular shape and the shielding material of the cap and the shielding surface of the chip carrier being bonded to each other such that a bonding area between the shielding material and the shielding surface is unchanged upon an angular deviation of said cap relative to said central axis, and
- wherein at least the shielding surface of the chip carrier is in a non-circular shape, the shielding surface includes a non-bonded area not covered with the cap, the non-bonded area holding an amount of the shielding material not used to bond the cap to the chip carrier.

5,838,094
SEALS AND IGNITERS

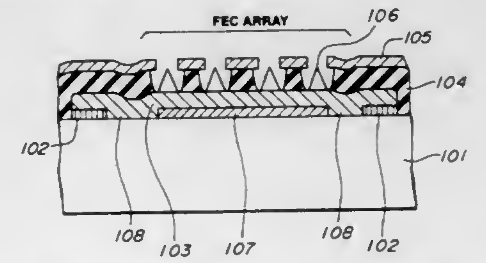
Jagdevinder Singh Hanspal, Stoke Poges, England, assignor to Smiths Industries PLC, London, England
Filed Oct. 11, 1996, Ser. No. 728,976
Claims priority, application United Kingdom, Oct. 21, 1995, 9521605
Int. Cl.^{6} H01T *13/02*
U.S. Cl. 313—141 **8 Claims**



1. A seal between an inner metal component and a concentric outer tubular metal component, wherein the seal comprises: a tubular sleeve of electrically-insulative material extending coaxially between said inner and outer components, a rigid seal between an outer surface of said tubular sleeve and said inner component, a metallized layer on the outer surface of the tubular sleeve; and a metal flange member, said flange member including an inner neck portion of circular shape embracing the outer surface of said tubular sleeve, an outer collar portion in contact with an inner surface of said outer component and a flexible shoulder portion extending between said neck portion and said collar portion, and wherein said flange member is joined with the inner surface of said outer component and with said metallized layer on said tubular sleeve.

5,838,095
FIELD EMISSION DISPLAY

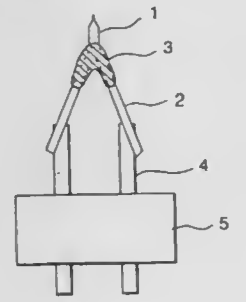
Mitsuru Tanaka, and Kazuyuki Yano, both of Mobara, Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, Japan
Filed Sep. 25, 1996, Ser. No. 719,874
Claims priority, application Japan, Sep. 26, 1995, 7-270737
Int. Cl.^{6} H01J *1/02*
U.S. Cl. 313—309 **3 Claims**



1. A field emission display wherein a plurality of field emission cathodes having cathode wirings, groups of emitter cones for emitting electrons, and resistance layers each formed in series between a respective of one of said cathode wirings and a respective one group of said emitter cones arc formed on the cathode area of a cathode substrate, the resistance value of each respective resistance layer between said one respective cathode wiring and said one respective group of emitter cones being dependent on the position of said one respective group of emitter cones in said cathode area.

5,838,096
CATHODE HAVING A RESERVOIR AND METHOD OF MANUFACTURING THE SAME

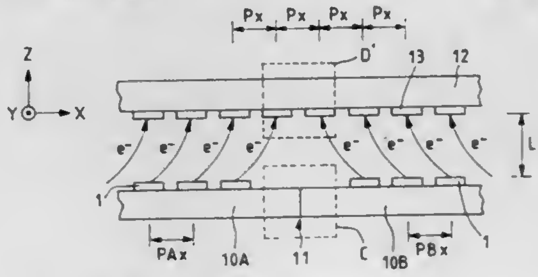
Hiroyuki Shinada, Choufu; Satoru Fukuhara, Hitachinaka, and Katsuhiro Kuroda, Hachiouji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jul. 12, 1996, Ser. No. 679,727
Claims priority, application Japan, Jul. 17, 1995, 7-179802
Int. Cl.^{6} H01J *1/15*
U.S. Cl. 313—336 **8 Claims**



1. A cathode comprising:
- a filament made of a first refractory metal;
- a single crystal needle made of a second refractory metal joined to said filament; and
- a reservoir disposed on at least one of said single crystal needle, said filament and a junction between said single crystal needle and said filament,
- said reservoir being formed by applying a slurry of (a) a powder selected from the group consisting of metal powder and metal compound powder, and (b) an organic solvent containing nitrocellulose.

5,838,097
IMAGE DISPLAY APPARATUS

Yuji Kasanuki, Isehara; Osamu Takamatsu, Atsugi; Tetsuya Kaneko, Yokohama; Masahito Niibe, Atsugi; Mitsutoshi Hasegawa, Yokohama, and Hidetoshi Suzuki, Fujisawa, all of Japan, assignors to Canon Kabushiki Kaisha
Filed Nov. 9, 1994, Ser. No. 338,089
Claims priority, application Japan, Nov. 9, 1993, 5-279364; Nov. 11, 1993, 5-282421; Nov. 8, 1994, 6-273606
Int. Cl.^{6} H01J *1/02*
U.S. Cl. 313—495 **20 Claims**



1. An image display apparatus comprising:
- a plurality of electron-emitting devices arrayed on a plurality of substrates that are arranged side by side;
- an image-forming member for forming an image upon irradiation of electron beams emitted from said electron-emitting devices; and

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deviating means for deviating the electron beams emitted from said electron-emitting devices, said deviating means deviating said electron beams toward boundaries between said substrates,

wherein the plurality of substrates arranged side by side are combined at the boundaries and the distance between the electron devices sandwiching the boundaries is larger than an array pitch of the electron-emitting devices within each of the substrates.

5,838,098

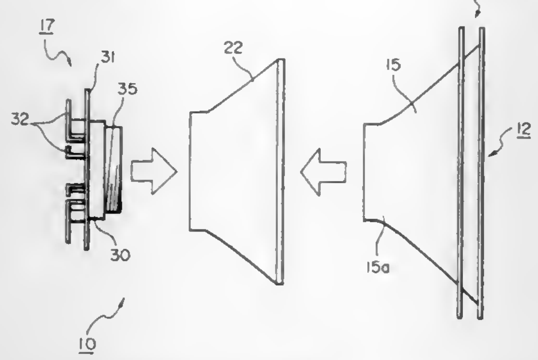
DEFLECTING APPARATUS WITH ONE PIECE CORE AND ONE PIECE COIL BOBBIN

Toshiya Takagishi, Kanagawa, Japan, assignor to Sony Corporation, Japan

Filed Jul. 15, 1996, Ser. No. 679,794

Int. Cl.^{6} H01F *7/00*

U.S. Cl. 313—440 **5 Claims**



1. A deflecting apparatus comprising:

a coil bobbin having an inner peripheral surface on which horizontal deflection coils are wound, said coil bobbin having a bobbin body and an attachable rear bend member, upon which said coils are partially wound, firmly attached to a rear side of the bobbin body; and

a bell shaped core having a one-piece structure, wherein said core is fitted on an outer peripheral surface of the bobbin body.

5,838,099

DEFLECTION YOKE HAVING FIRST COIL PARTS FOR CORRECTION OF CROSS-MISCONVERGE AND RED/BLUE VERTICAL MISCONVERGE

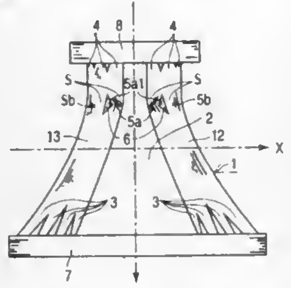
Tsutomu Hichiwa, Koga; Masayuki Shimada, Koshigaya; Masahiko Nakagawa, Syouma-machi, and Masaaki Itoh, Iwai, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Feb. 25, 1997, Ser. No. 805,431

Claims priority, application Japan, Feb. 26, 1996, 8-065384

Int. Cl.^{6} H01J *29/70*

U.S. Cl. 313—440 **8 Claims**



5. Deflection yoke of a self-convergence system for deflecting electron beams of a color CRT containing in-line electron guns disposed in a direction of an X axis perpendicular to a longitudinal axis (Z axis) of the color CRT for emitting the electron beams, the deflection yoke comprising a pair of saddle type horizontal deflection coils, and a pair of saddle type vertical deflection coils, each of the saddle type horizontal deflection coils having two main coil sections divided by a window at a center thereof, each extended along the Z axis to make a truncated cone shape, a front coil rim forming a front mouth with a large semicircle extended in a direction of a Y axis perpendicular to the X axis at a front end of the deflection yoke, a rear coil rim forming a rear mouth with a small semicircle extended in the direction of the Y axis at a rear end of the deflection yoke, a first split-winding section provided nearby the front coil rim and a second split-winding section provided nearby the rear coil rim, the improvement comprising:

a third split-winding section being provided in the respective two main coil sections in a rear half of the respective two main coil sections, the third split-winding section being divided into a first coil part positioned close to the window and a second coil part remote from the window by a small opening defined in each of the respective main coil sections, the first coil part having a bent part so as to form the small opening being bent toward the window in the direction of the X axis viewed in the direction of the Y axis.

5,838,100

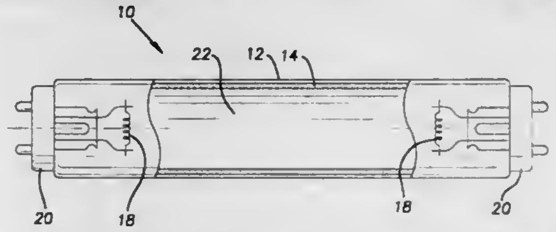
FLUORESCENT LAMP HAVING PHOSPHOR LAYER WITH ADDITIVE

Jon Bennett Jansma, Pepper Pike, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 540,893, Oct. 11, 1995, abandoned. This application Jul. 14, 1997, Ser. No. 903,202

Int. Cl.^{6} H01J *1/62;63/04;17/16;61/35*

U.S. Cl. 313—485 **14 Claims**



1. A mercury vapor discharge lamp comprising a clear glass envelope, means for providing a discharge, a discharge-sustaining fill of mercury and an inert gas sealed inside said envelope, and a phosphor-containing layer coated inside said glass envelope, said phosphor-containing layer being at least 20 weight percent alumina, said alumina in said phosphor-containing layer being 5–50 weight percent gamma alumina, said lamp having no more than one layer inside said glass envelope, said one layer being said phosphor-containing layer, said phosphor-containing layer comprising a phosphor blend comprising red, blue, and green color-emitting phosphors.

5,838,101

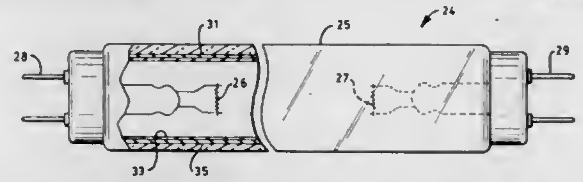
FLUORESCENT LAMP WITH IMPROVED CRI AND BRIGHTNESS

Romano G. Pappalardo, Sudbury, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Filed Oct. 28, 1992, Ser. No. 967,607

Int. Cl.^{6} H01J *1/62*

U.S. Cl. 313—487 **20 Claims**



1. A fluorescent lamp comprising a glass envelope having electrodes at its ends, a mercury and inert gas filling within said

envelope which produces ultraviolet radiation, a coating on the interior surface of the glass envelope comprising a blend of alkaline earth metal halophosphate phosphors and a quad-phosphor blend for converting a substantial portion of said ultraviolet radiation to visible illumination having a white color wherein the combination of phosphors result in a predetermined color point from about 2700 to about 4200K on or near the Planckian locus, said quad-phosphor blend comprising a red color emitting phosphor component having a visible emission spectrum principally in the 590 to 630 nm wavelength range, blue color emitting phosphor component having an emission spectrum principally in the 430 to 490 nm wavelength range, and a green color emitting phosphor component having an emission spectrum principally in the 500 to 570 nm wavelength range, said quad-phosphor blend additionally includes an europium activated aluminate green emitting phosphor component wherein both the quad-blend and said blend of alkaline earth metal halophosphate phosphors substantially match the desired predetermined color point.

5,838,102

METHOD OF FIXING A STACK OF PLATES A STACK OF PLATES A THINTYPE DISPLAY DEVICE PROVIDED WITH A STACK OF PLATES

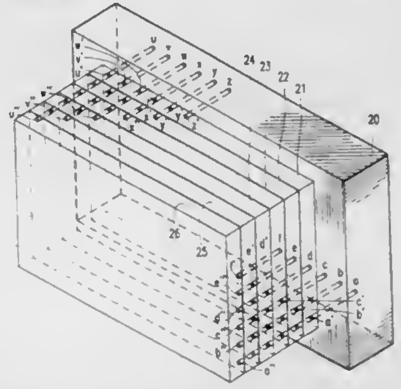
Jan A. Bijloo, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 4, 1997, Ser. No. 832,639

Claims priority, application European Pat. Off., May 10, 1996, 962012803

Int. Cl.^{6} H01T *9/18*

U.S. Cl. 313—495 **12 Claims**



1. A method of forming an electron-propogation means comprising successively positioning and fixing n plates forming a stack (**21–26**) relative to a mounting face (**20**) having at least a set of n vacuum apertures (**201–206**), which vacuum apertures are connected to a selectively switchable vacuum system, comprising the following steps:

a) positioning a first plate (**21**) having at least a set of n−1 apertures (**211–215**) against or immediately in front of the mounting face (**20**), n−1 of the vacuum apertures (**201–205**) in the mounting face (**20**) corresponding to the n−1 apertures (**211–215**) of the first plate (**21**), and one vacuum aperture (**206**) in the mounting face (**20**) not corresponding to one of the n−1 apertures in the first plate (**21**);

b) retaining the first plate (**21**) in position relative to the mounting face (**20**) by energizing the vacuum system connected to the vacuum aperture (**206**) in the mounting face (**20**) which does not correspond to one of the n−1 apertures in the first plate (**21**);

c) positioning a plate i (i=2,3, . . . , n) (**22–26**), which is provided with at least a set of n−i apertures (**221–224**; **231–233**; **241–242**; **251**), against or immediately in front of plate i−1 (**21–25**), n−i of the vacuum apertures (**211–214**; **221–223**; **231–232**; **241**) in the plate i−1 (**21–25**) corresponding to the n−i apertures (**221–224**; **231–233**; **241–242**; **251**) of the plate i (**22–26**) and one aperture (**215**; **224**; **233**; **242**; **251**) in the plate i−1 (**21–25**) not corresponding to one of the n−i apertures in the plate i (**22–26**);

d) retaining the plate i (i=2,3, . . . , n) (**22–26**) relative to the plate i−1 (**21–25**) by energizing the vacuum system connected to the aperture (**215**; **224**; **233**; **242**; **251**) in the plate i−1 which does not correspond to one of the n−i apertures in the plate i (**22–26**), and

e) fixing the successive plates i (i=2,3, . . . , n) (**22–26**) and the first plate (**21**) relative to each other to form the stack of n plates (**21–26**).

5,838,103

FIELD EMISSION DISPLAY WITH INCREASED EMISSION EFFICIENCY AND TIP-ADHESION

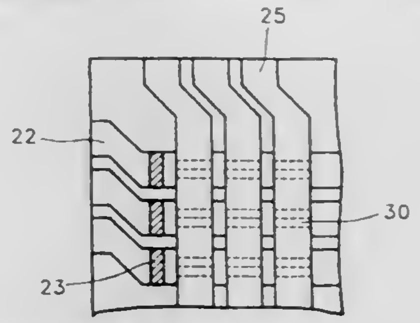
Nam-sin Park, Suwon, Rep. of Korea, assignor to Samsung Display Devices Co., Ltd., Suwon, Rep. of Korea

Continuation of Ser. No. 487,446, Jun. 7, 1995. This application May 29, 1997, Ser. No. 865,179

Claims priority, application Rep. of Korea, Jan. 27, 1995, 95-1583

Int. Cl.^{6} H01J *1/62;63/04;1/02;1/16*

U.S. Cl. 313—495 **16 Claims**



1. A field emission display, comprising:

a front substrate and a rear substrate, each having inner surfaces disposed opposite to each other at a predetermined distance;

an anode and a cathode disposed on the inner surfaces of said front substrate and said rear substrate, respectively;

a micro-tip disposed on said cathode;

an insulation layer having a hole therein surrounding said micro-tip; and

a resistance portion having a predetermined resistivity disposed on a predetermined portion of said cathode in a longitudinal direction along only one edge of the micro-tip.

5,838,104

SHIELD FOR HIGH PRESSURE DISCHARGE LAMPS

Douglas M. Rutan, Cleveland; Curtis E. Scott, Mentor; Jeannine A. Woyansky, Westlake, and Katherine L. McGinnis, Kirtland, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 806,803, Dec. 6, 1991, abandoned, which is a continuation of Ser. No. 539,638, Jun. 18, 1990, abandoned. This application Nov. 4, 1993, Ser. No. 148,020

Int. Cl.^{6} H01J *17/24*

U.S. Cl. 313—560 **20 Claims**

1. A high pressure sodium vapor arc discharge lamp which comprises a hermetically sealed, light transmissive, vitreous outer envelope containing (i) a light transmissive, hermetically sealed ceramic arc tube enclosing within an amalgam of sodium and mercury, an inert starting gas and a pair of electrodes in spaced apart relationship, (ii) a getter sensitive to radiation emitted by said arc tube, said getter having been flashed from a getter containing ring onto said envelope by means of RF flashing, and (iii) an optically opaque, heat-resistant and electrically insulative alumina shield located within said outer envelope between said arc tube and said getter which shields said getter from radiation emitted by said arc tube and which is located close enough to said getter ring and in a manner such that it would have interfered with said RF

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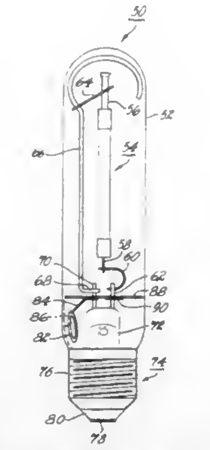


flashing of said getter if it had been electrically conductive, said lamp also having means for providing electricity to said electrodes.

5,838,105

PLASMA DISPLAY PANEL INCLUDING COLOR FILTERS

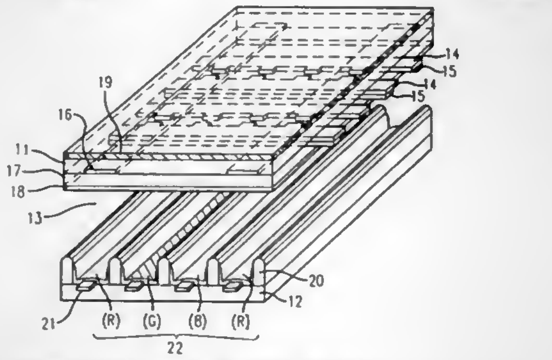
Hiroyuki Mitomo, Koufu, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 29, 1997, Ser. No. 848,257

Claims priority, application Japan, May 9, 1996, 8-139533; Oct. 30, 1996, 8-303878

Int. Cl.^{6} H01J *5/16*

U.S. Cl. 313—582 **8 Claims**



1. A plasma display panel, the panel having:

a pair of substrates on a display surface side and a back surface side which are arranged so as to face each other through a discharge space, the panel further having fluorescent material layers of three colors of red, green, and blue provided on an inner surface of the substrate on said back surface side, and in which said fluorescent material layers are allowed to emit light by a discharge,

wherein a green light absorbing filter is provided on an outer surface of the substrate on said display surface side and a monochromatic light transmitting filter corresponding to at least one of the red and blue fluorescent material layers which face each other through said discharge space is provided on the inner surface of the substrate on said display surface side.

5,838,106

PLASMA DISPLAY PANEL WITH COLOR FILTER

Hiroshi Funada, Tokyo-To, Japan, assignor to Dai Nippon Printing Co., Ltd., Japan

Filed Aug. 26, 1996, Ser. No. 703,351

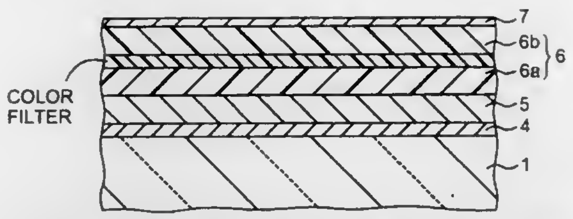
Claims priority, application Japan, Aug. 28, 1995, 7-218631

Int. Cl.^{6} H01J *61/35*

U.S. Cl. 313—587 **13 Claims**

1. A plasma display panel comprising:

a front plate; and



a back plate disposed parallel and opposite to the front plate,

the front plate comprising a transparent substrate for the front plate, electrodes provided at a given interval on the transparent substrate, a dielectric layer provided so as to cover the electrodes, and a protective layer provided on the dielectric layer, said dielectric layer having a two layer structure formed of a first dielectric layer and a second dielectric layer, the first dielectric layer being formed of a paste having a smaller shrinkage on firing than the paste used to form the second dielectric layer,

the back plate comprising a transparent substrate for the back plate and barrier ribs provided at given intervals on the transparent substrate, the barrier ribs defining a plurality of cells as a display element, and

a color filter being provided between the first dielectric layer and the second dielectric layer of the front plate.

5,838,107

MULTIPLE-BEAM ELECTRON TUBE WITH CAVITY/ BEAM COUPLING VIA DRIFT TUBES HAVING FACING LIPS

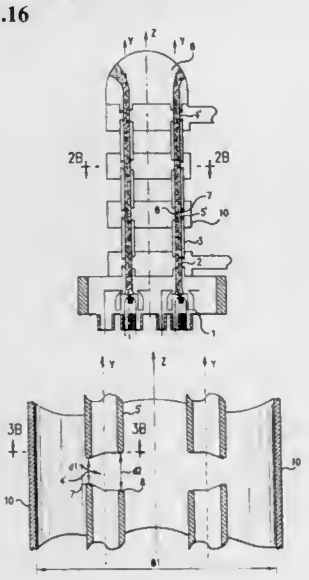
Armel Beunas, Boulogne Billancourt, and Georges Faillon, Meudon, both of France, assignors to Thomson Tubes Electroniques, Meudon la Foret, France

Filed Jul. 26, 1996, Ser. No. 686,719

Claims priority, application France, Jul. 28, 1995, 95 09226

Int. Cl.^{6} H01J *25/10*

U.S. Cl. 315—5.16 **12 Claims**



1. An electron tube comprising several electron beams substantially parallel to an axis Z, the electron beams going through at least one resonant cavity coaxial with and aligned along the Z axis and being contained in a plurality of drift tubes that end inside respective ones of said at least one cavities, said plurality of drift tubes inside said respective cavities having respective lips that face each other and that define an interaction space wherein, in order to homogenize the respective couplings between the cavity and the beams, a spacing between two facing lips varies in azimuth and is the maximum spacing in a zone of the interaction space close to the Z axis of the electron tube and is the minimum spacing in a zone of the interaction space that is distant from the Z axis of the electron tube.

5,838,108

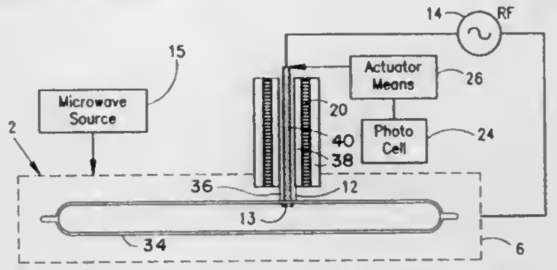
METHOD AND APPARATUS FOR STARTING DIFFICULT TO START ELECTRODELESS LAMPS USING A FIELD EMISSION SOURCE

Jerome D. Frank, Silver Spring; Charles H. Wood, Rockville, and Miodrag Cekic, Silver Spring, all of Md., assignors to Fusion UV Systems, Inc., Gaithersburg, Md.

Filed Aug. 14, 1996, Ser. No. 696,706

Int. Cl.^{6} H01J *65/04*

U.S. Cl. 315—39 **33 Claims**



19. A microwave powered electrodeless lamp, comprising:

a) a microwave cavity;

b) an envelope disposed in said cavity and containing a discharge forming fill;

c) a metallic probe movable from a first position where said probe is in contact with said envelope at a given region to a second position where said probe is away from said envelope, said probe being in said first position when said lamp is started, said probe being in said second position when said lamp is operating;

d) a substance contained on an interior surface of said envelope at said given region for facilitating the starting of the lamp;

e) starting power source coupled to said probe in said first position to cause application of an electric field to said substance, said substance being responsive to said electric field to initiate electron emission therefrom to thereby cause discharge within said fill;

f) microwave power source coupled to said cavity to sustain the discharge; and

g) dielectric disposed between said probe and said cavity, said dielectric having a dielectric strength greater than the dielectric strength of air.

5,838,109

DISCHARGE LAMP LIGHTING DEVICE

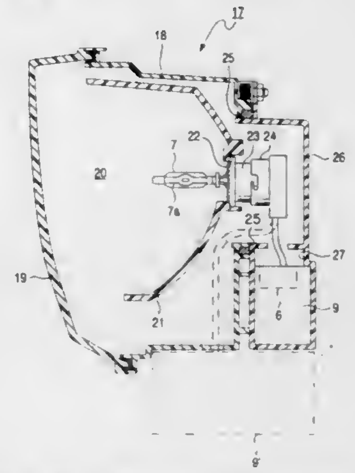
Shoji Kobayashi, and Akiyosi Ozaki, both of Shizuoka, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Nov. 6, 1996, Ser. No. 744,930

Claims priority, application Japan, Nov. 6, 1995, 7-309701

Int. Cl.^{6} F21K *7/00;* **H05B** *37/00*

U.S. Cl. 315—58 **12 Claims**



1. A discharge lamp lighting device comprising:

a starter circuit for generating a starting signal for a discharge lamp and applying the starting signal to said discharge lamp, a mounting member, and a noise filter circuit interposed between the starter circuit and the discharge lamp, said starter circuit and said noise filter circuit being directly secured to said mounting member.

5,838,110

APPARATUS AND METHOD FOR STARTING AND CONTROLLING A FLUORESCENT TUBE

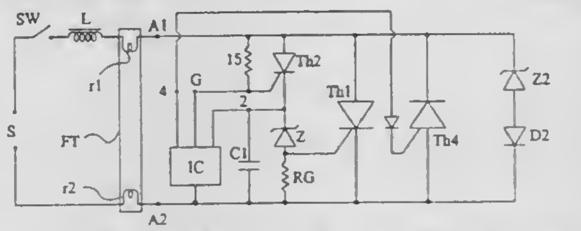
Robert Pezzani, Vouvray, France, assignor to SGS-Thomson Microelectronics S.A., Saint Genis, France

Filed May 17, 1996, Ser. No. 650,018

Claims priority, application France, May 19, 1995, 95 06265

Int. Cl.^{6} H05B *39/00*

U.S. Cl. 315—105 **35 Claims**



1. A starter unit for a fluorescent tube powered by an AC supply source in series with a ballast inductance, the fluorescent tube having a first control terminal and a second control terminal, the starter unit comprising:

a first thyristor having an anode coupled to the first control terminal, a cathode coupled to the second control terminal, and a gate;

a second thyristor having an anode coupled to the second control terminal, and a cathode coupled to the first terminal;

a series connection of a diode and a first zener diode coupled between the first control terminal and the second control terminal;

a first resistor coupled between the second control terminal and the gate of the first thyristor;

a control integrated circuit for controlling an on state and off state of the first thyristor, the control integrated circuit having a first control terminal that is coupled to the gate of the first thyristor, a second control terminal, and a supply terminal;

a series connection of an auxiliary thyristor and a second zener diode, coupled between the gate of the first thyristor and the anode of the first thyristor, the auxiliary thyristor having a gate that is coupled to the second control terminal of the integrated circuit and a cathode that is coupled to the supply terminal of the control integrated circuit.

5,838,111

PLASMA GENERATOR WITH ANTENNAS ATTACHED TO TOP ELECTRODES

Shigenori Hayashi, Nara, and Hideo Nakagawa, Kanagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Feb. 27, 1997, Ser. No. 807,396

Claims priority, application Japan, Feb. 27, 1996, 8-039435

Int. Cl.^{6} H05H *1/46*

U.S. Cl. 315—111.21 **22 Claims**

1. A plasma generator comprising:

a plasma chamber;

a substrate electrode located in said plasma chamber, wherein a surface of any substrate placed on said substrate electrode is exposed to plasma;

a top electrode facing said substrate electrode, said top electrode comprising more than two concentric circular electrodes on a single plane;

antennas attached to each of said circular electrodes, wherein the antennas attached to one of said plurality of circular elec-

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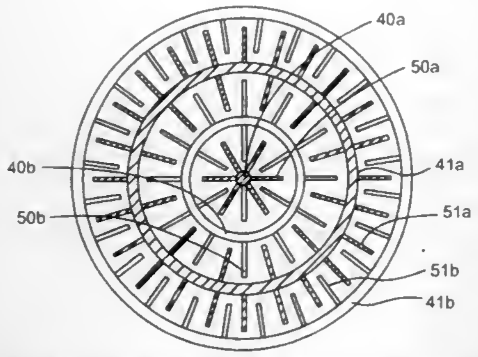


trodes are alternately arranged substantially parallel to the antennas attached to another of said circular electrodes; and

a power supply for supplying a high frequency signal to at least one of said circular electrodes.

5,838,112

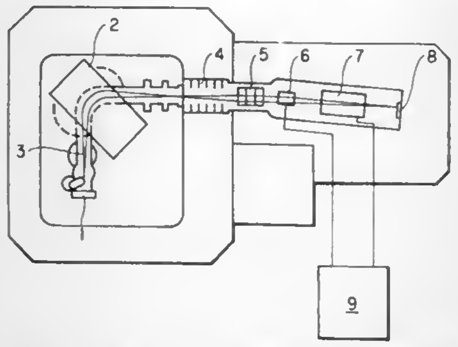
PARALLEL SCAN TYPE ION IMPLANTER

Osamu Tsukakoshi; Yuzo Sakurada; Kouichi Niikura, and Yasuo Mihara, all of Chigasaki, Japan, assignors to Nihon Shinku Gijutsu Kabushiki Kaisha, Kanagawa-Ken, Japan

Continuation-in-part of Ser. No. 340,900, Nov. 15, 1994, abandoned. This application Mar. 13, 1996, Ser. No. 614,865

Int. Cl.^{6} H01J *7/24*

U.S. Cl. 315—111.81 **4 Claims**



1. A parallel scan type ion implanter designed to operate to analyze and sort out a pure ion beam from a beam produced by an ion source and to implant a substrate, said implanter comprising:

means for producing a focused ion beam,

a first multipole electrostatic deflector, into which the focused ion beam is introduced with an incident angle equal to a half of a given offset deflection angle relative to the central axis of the deflector, for deflecting the ion beam further by an offset angle substantially equal to a half of the given offset deflection angle relative to the central axis of the first multipole electrostatic deflector and for rasterwise deflecting the ion beam around the axis of the offset deflected ion beam, said first deflector having a length L_1, and

a second multipole electrostatic deflector, having a configuration geometrically similar to that of the first multipole electrostatic deflector, for rasterwise deflecting the ion beam back in order to sweep the ion beam and make the ion beam strike a substrate always with the same incident angle, said second deflector having a length L_2, the distance between the center of the outlet port of the second deflector and the substrate is L_D and the distance between said first and second deflectors is L,

wherein L_1, L_2, L_D, and L are determined so as to minimize a constant C relating to a variation in a dose distribution, said dose distribution being obtained from a dose function

$$D(X, Y)=1+\lambda_1X+\lambda_2Y+\lambda_3X^2+\lambda_4Y^2,$$

where

$$\lambda_1 = 0,$$

$$\lambda_2 = \tan\alpha\,\frac{3+\dfrac{3((L_2/2)+L_D)}{(L_1/2)+L+(L_2/2)}}{(L_1/2)+L+(L_2/2)}$$

$$\lambda_3 = \frac{4((L_2/2)+L_D)}{((L_1/2)+L+(L_2/2))^3\cos^2\alpha}$$

$$\lambda_4 = \frac{4((L_2/2)+L_D)}{((L_1/2)+L+(L_2/2))^3}$$

where the rate of changing the deflection voltage stepwise in the vertical direction (Y-direction) of the substrate and the rate of changing the deflection voltage in the horizontal direction (X-direction) of the substrate are constant and a dose is equal to 1 at the time the beam spot passes the center of the substrate.

and where

$$C=\frac{\sqrt{[(1/4(\lambda_1^2+\lambda_2^2)+1/16((\lambda_3^2+\lambda_4^2)-1/24(\lambda_3\times\lambda_4))r_1^2]}\quad\times r_1^2}{(1+1/4(\lambda_3+\lambda_4)r_1^2}$$

where r_1 is an outer diameter of the substrate.

5,838,113

POWER SUPPLY CIRCUIT EMPLOYING A DIFFERENTIAL AMPLIFIER CONNECTED TO AN AND GATE THAT IS IN TURN CONNECTED TO FLIP-FLOP

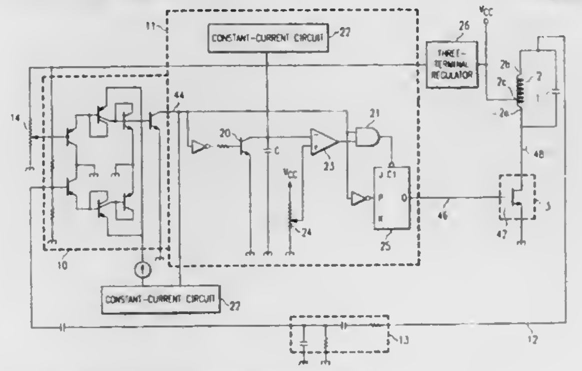
Masaaki Mihara, Chiba, Japan, assignor to SGS-Thomson Microelectronics K.K., Tokyo, Japan

Filed Feb. 28, 1996, Ser. No. 608,183

Claims priority, application Japan, Feb. 28, 1995, 7-040294

Int. Cl.^{6} H05B *37/02*

U.S. Cl. 315—169.3 **7 Claims**



1. A power supply circuit comprising:

a power supply terminal connected to a DC power supply;

an autotransformer that has first and second terminals and a tap positioned between the first and second terminals, the tap being connected to the power supply terminal;

a capacitive load connected between the first and second terminals;

a driving pulse generation circuit for generating a driving pulse with a frequency that is substantially equal to a resonance frequency determined by capacitance of said capacitive load and inductance of said autotransformer, the driving pulse generation circuit including a duty factor conversion circuit having an input and an output, the input being coupled by a feedback path to the inductor coil and the electroluminescent panel, the duty factor conversion circuit being structured to provide at its output the driving pulse with a duty factor and a frequency that both automatically changes in accordance with the resonance frequency wherein the duty factor correction circuit includes:

a capacitor coupled between a constant current circuit and a first reference potential such that the capacitor has a capacitor voltage waveform that is triangular:

a first differential amplifier having a first input coupled to the capacitor a second input coupled to a second reference potential, and an output at which an output signal is proportional to a difference between the capacitor voltage waveform and the second reference potential;

an AND gate having a first input coupled by the feedback path to the capacitive load, a second input coupled to the output of the first differential amplifier, and an output; and

a flip-flop having an input and an output, the input being coupled to the output of the AND gate; and

a single drive circuit having a switching element with an output terminal connected to one of the first and second terminals of said autotransformer and an input terminal coupled to the output of the flip-flop, said single drive circuit alternately performing an on/off operation responsive to the driving pulse supplied from said driving pulse generation circuit.

5,838,114

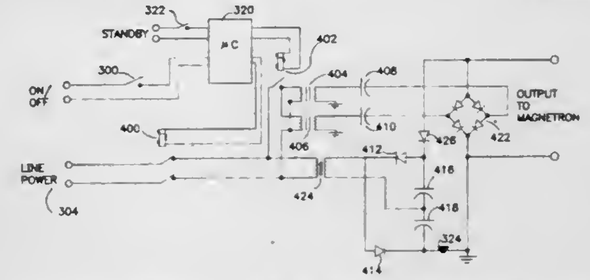
PLURAL FERRO-RESONANT POWER SUPPLIES FOR POWERING A MAGNETRON WHERE THE ARAY LIES IN THESE POWER SUPPLIES BEING INDEPENDENT FROM EACH OTHER AND NOT UTILIZING ANY COMMON COMPONENTS

Ernest G. Penzenstadler, Herndon, Va., and Gungor Aktas, Rockville, Md., assignors to Fusion Systems Corporation, Rockville, Md.

Filed Mar. 8, 1996, Ser. No. 613,149

Int. Cl.^{6} H05B *37/02*

U.S. Cl. 315—277 **5 Claims**



1. A power supplying system for an electrodeless lamp excited by a magnetron, comprising,

a high power, power supply for supplying relatively high DC current and relatively high D.C. voltage to said magnetron,

a low power, power supply for supplying relatively low DC current and substantially the same relatively high DC voltage to said magnetron, said high power and low power, power supplies being independent from each other and not utilizing any common components,

means for utilizing both said high power, power supply and said low power, power supply and combining the currents therefrom for supply to said magnetron when said electrodeless lamp is operated in a full power mode, and

means for disconnecting said high power, power supply from said magnetron when said electrodeless lamp is switched to a reduced power mode, while leaving said low power, power supply connected to said magnetron, whereby only said relatively low current from said low power, power supply continues to be fed to said magnetron in said reduced power mode, which is sufficient to enable said magnetron to generate enough microwave power to maintain said electrodeless lamp in an ignited condition to eliminate a cool down delay and enable quick restarting of said lamp when switched back to said full power mode.

5,838,115

GAS DISCHARGE DEVICE

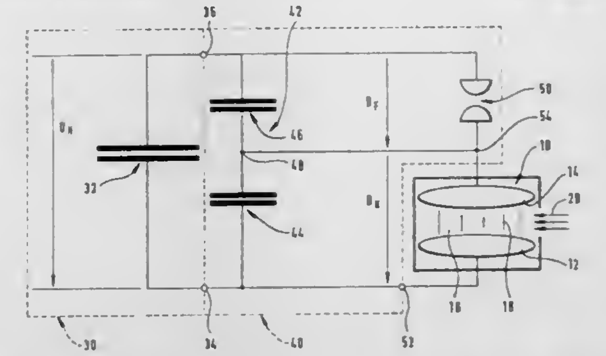
Markus Jung, Bruchsal; Eberhard Zeyfang, Reichenbach, and Guenther Renz, Ostfildern, all of Germany, assignors to Deutsche Forschungsanstalt fuer Luft- und Raumfahrt e.V., Bonn, Germany

Filed Mar. 25, 1997, Ser. No. 826,396

Claims priority, application Germany, Mar. 25, 1996, 196 11 679.1

Int. Cl.^{6} H05B *37/00*

U.S. Cl. 315—237 **8 Claims**



1. A gas discharge device having a gas discharge channel, which comprises two gas discharge electrodes and a gas discharge volume lying between said electrodes, having an energy storage circuit connected by a switching device to the gas discharge electrodes for producing a current surge flowing between a first output terminal and a second output terminal for operating a gas discharge, and having an ignition device for separate ignition of the gas discharge, wherein:

the switching device comprises a voltage divider lying between the output terminals and comprising a first and a second impedance,

the gas discharge electrodes are connected in parallel to the first impedance and a spark gap is connected in parallel to the second impedance,

the first impedance is so dimensioned that, in the absence of a gas discharge, a voltage lying below the breakdown voltage of the gas discharge electrodes is applied to the latter, and

the spark gap is so designed that its breakdown voltage is exceeded after separate ignition of the gas discharge so that the current surge flows from the energy storage circuit through the spark gap to the gas discharge electrodes.

5,838,116

FLUORESCENT LIGHT BALLAST WITH INFORMATION TRANSMISSION CIRCUITRY

Robert H. Katyl, Vestal; Robert M. Murcko, Binghamton, and David W. Dranchak, Endwell, all of N.Y., assignors to JRS Technology, Inc., Endicott, N.Y.

Filed Apr. 15, 1996, Ser. No. 632,297

Int. Cl.^{6} G05F *1/00*

U.S. Cl. 315—307 **30 Claims**

1. An electronic ballast for gas discharge lighting which is energized with a periodic waveform, said electronic ballast being coupled to a plurality of gas discharge lamps that provide a gas discharge light output, means for operating upon said gas discharge light output such that at least a portion of said light output from said gas discharge lamps is substantially proportional to an absolute value of an instantaneous waveform of lamp current, photodetection means for detecting said at least a portion of said light output at a remote distance from said electronic ballast, said ballast containing modulation means for modulating said light output, said ballast containing at least one input port for entry of input signals from an external source into said modulation means, and means for introducing information to said input port so that the discharge

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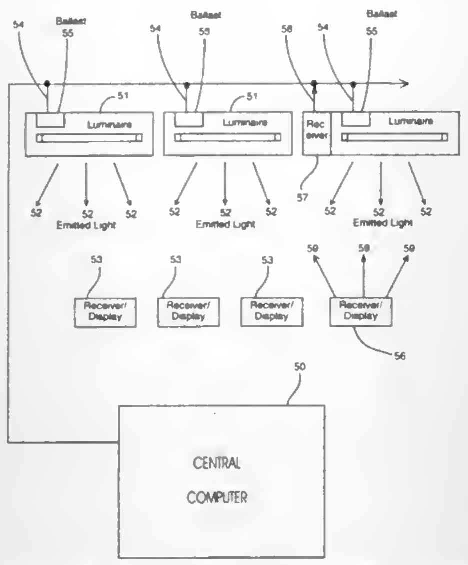


light output of the gas discharge lamps can carry the introduced information.

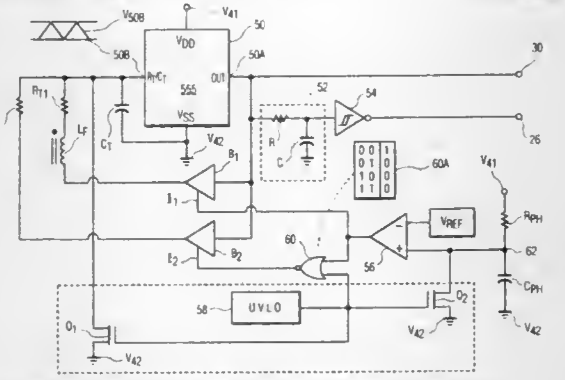
5,838,117
BALLAST CIRCUIT WITH SYNCHRONIZATION AND PREHEAT FUNCTIONS

Louis R. Nerone, Brecksville, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 28, 1997, Ser. No. 810,495

Int. Cl.^{6} H05B *37/02*

U.S. Cl. 315—307 **17 Claims**



1. A ballast circuit for a gas discharge lamp, comprising:
- (a) a resonant load circuit incorporating the gas discharge lamp and including a resonant inductance and a resonant capacitance;
- (b) a d.c.-to-a.c. converter circuit coupled to said resonant load circuit for inducing an a.c. current in said resonant load circuit, said converter circuit comprising:
  - (i) first and second converter switches serially connected in the foregoing order between a bus conductor at a d.c. voltage and a reference conductor, and being connected together at a common node through which said a.c. load current flows;
  - (ii) said first and second converter switches each comprising a control node and a reference node, the voltage between such nodes determining the conduction state of the associated switch;
  - (iii) the respective control nodes of said first and second converter switches being interconnected; and
  - (iv) the respective reference nodes of said first and second converter switches being connected together at said common node;
- (c) a bridge network connected between first and second nodes and having:
  - (i) first and second input nodes on which respective first and second input signals are applied; and
  - (ii) first and second output nodes respectively connected to said common and control nodes so as to control the switching state of said converter switches;
- (d) an oscillator for providing said first and second input signals; said oscillator having a timing input and an output; and
- (e) a first resistor and a serially connected feedback winding coupled to said timing input; said feedback winding being coupled to said resonant inductance so as to increase frequency of said oscillator when current in said resonant inductance from said common node lags the voltage between said common node and said reference conductor, and to decrease said frequency when said current leads said voltage.

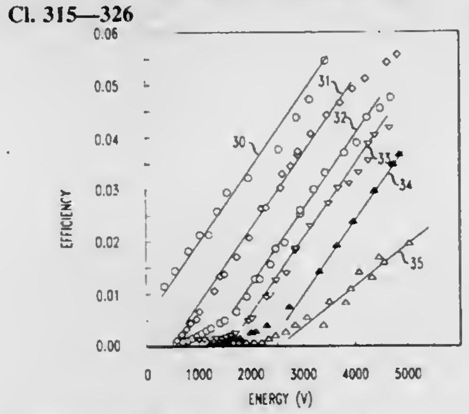
5,838,118
DISPLAY APPARATUS WITH COATED PHOSPHOR, AND METHOD OF MAKING SAME

Gregory Peter Kochanski, Dunellen; Cherry Ann Murray, Murray Hill; Michael Louis Steigerwald, Martinsville; Pierre Wiltzius, Millington, all of N.J., and Alfons van Blaaderen, Utrecht, Netherlands, assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Mar. 28, 1996, Ser. No. 623,201

Int. Cl.^{6} H01J *31/20;* B05D *5/06*

U.S. Cl. 315—326 **9 Claims**



1. Light-emitting apparatus comprising luminescent material, and means adapted for causing impingement of actinic radiation on said luminescent material;

CHARACTERIZED IN THAT

on said luminescent material is disposed an X-containing material, said luminescent material comprises particles of the luminescent material, said particles being substantially coated with said X-containing material of average thickness selected such that at least a substantial portion of said actinic radiation can penetrate through said X-containing material, wherein X is a single member of the group consisting of Si, Ti, Al, Zr, In and Sn.

5,838,119
ELECTRONIC CHARGE STORE MECHANISM

Craig D. Engle, 336 Cline Ave., Griffith, Ind. 46319

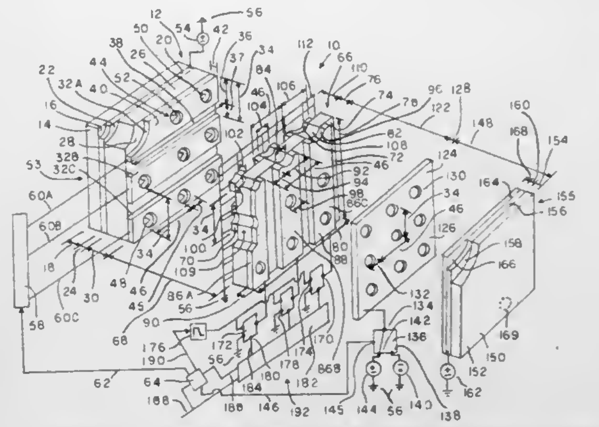
Continuation-in-part of Ser. No. 183,037, Jan. 18, 1994, Pat. No. 5,557,177. This application Jun. 17, 1996, Ser. No. 664,417

Int. Cl.^{6} G09G *1/04;3/22;* H01J *29/56;* H04N *5/70*

U.S. Cl. 315—366 **19 Claims**

1. An electron beam addressed storage target comprising:

target means comprising:
- electron collector means,
- a substrate,
- a plurality of pixel elements arranged into a plurality of rows and columns,
- each said pixel element comprising:



- conductor means overlapping said substrate to form a beam landing area located on said target means,

electron source means enabling said beam landing areas of said pixel elements in one or more of said rows to be simultaneously bombarded for a respective addressing interval with a plurality of electrons emitted from corresponding ones of a plurality of electron row sources,

control means for applying a respective potential difference between said collector means and said conductor means of said pixel elements in the one or more of said rows during said respective addressing interval,

whereby bombarding said beam landing areas of said pixel elements in said one or more of said rows with said plurality of electrons enables a second respective potential difference to be established between said beam landing areas and said conductor means of said pixel elements dependent on said respective potential difference applied between said collector means and said conductor means of said pixel elements during said respective addressing interval.

5,838,120
ACCELERATOR WITH CLOSED ELECTRON DRIFT

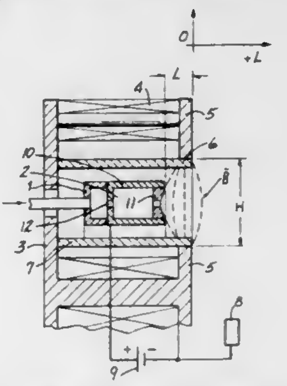
Alexander V. Semenkin; Valerii I. Garkusha, both of Kaliningrad; Sergey O. Tverdokhlebov, Ivanteevka, and Nadezhda A. Lyapina, Kaliningrad, all of Russian Federation, assignors to Central Research Institute of Machine Building, Russian Federation

Filed Jul. 12, 1996, Ser. No. 678,871

Claims priority, application Russian Federation, Jul. 14, 1995, 95113152

Int. Cl.^{6} H01J *1/52;* H05H *1/00*

U.S. Cl. 315—505 **17 Claims**



1. An accelerator with a closed electron drift, comprising:

an annular magnetic circuit having a first magnetic pole tip and a second magnetic pole tip, said first magnetic tip and said second magnetic tip separated by a gap, said gap defining a discharge chamber;

an external ring cathode and an internal ring cathode, said external ring cathode positioned adjacent to said first magnetic tip in said gap and said internal ring cathode positioned adjacent to said second magnetic tip in said gap;

an anode positioned between said ring cathodes in said gap and comprising
- a first annular section having a first axis;
- a second annular section adjacent to said first annular section along said first axis;
- a tube mounted to said first annular section along said axis to provide gas to said discharge chamber, said tube permitting said anode to be positioned along said axis a distance L, wherein said distance L satisfies the equation

$$-L_1<L<L_2,$$

where

L_1 is a displacement with respect to an outermost edge of said external cathode ring; and represented by the equation:

$$L_1=1/\omega_e\sqrt{2(e/m)V_p(V_e/V_i)}\ .$$

where:

e is electron charge;

m is electron mass;

V_p is applied voltage;

ω_c is cyclotron electron frequency;

V_e is electron scattering frequency;

V_i is ionizing collision frequency; and

L_2 is the distance of said gap;

an electron source in electrical communication with said magnetic circuit;

a power source in electrical communication with said magnetic circuit; and

a magnetomotive force source in communication with said magnetic circuit.

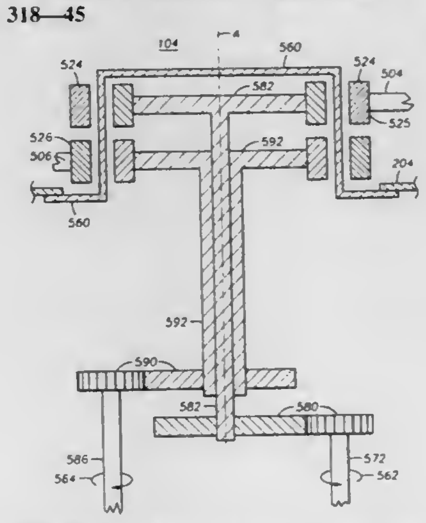
5,838,121
DUAL BLADE ROBOT

Kevin Fairbairn, Saratoga; Christopher Lane, Sunnyvale; Kelly Colborne, San Jose, and Satish Sundar, Mountain View, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Nov. 18, 1996, Ser. No. 752,471

Int. Cl.^{6} B25J *18/00;* B65G *49/07*

U.S. Cl. 318—45 **20 Claims**



1. An apparatus for transferring wafers, comprising:
- (a) a first rotating member magnetically coupled to a first actuating member to rotate the first rotating member;
- (b) a second rotating member magnetically coupled to a second actuating member to rotate the second rotating member;
- (c) a blade assembly having at least first and second wafer blades wherein the wafer blades are co-planar; and
- (d) an arm assembly having first and second pivot ends pivotally connecting the first and second rotating members to the blade

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assembly, wherein the first and second pivot ends are interlocked to maintain alignment of the blade assembly.

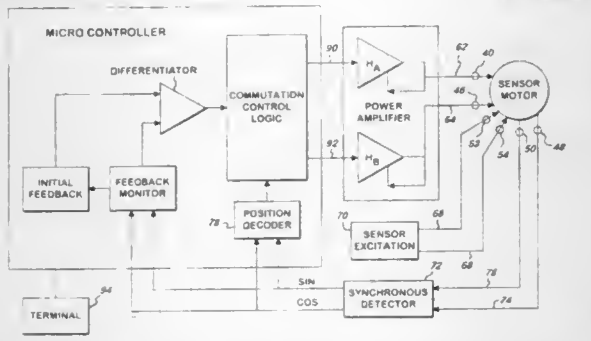
5,838,122
MOTOR INITIALIZATION METHOD AND APPARATUS

Hung D. Vu, Pembroke, Mass., assignor to Seiberco Incorporated, Braintree, Mass.

Filed Feb. 8, 1996, Ser. No. 582,080

Int. Cl.⁶ H02P *5/40*

U.S. Cl. 318—254 **6 Claims**



1. A polyphase direct current electric motor or the like, comprising: a stator of magnetic material having an array of mutually spaced pole elements thereon, a plurality of phase coils wound separately from one another on at least certain of said pole elements, and a plurality of sensor coils wound separately from one another on at least certain of said pole elements, first connecting means interconnecting said phase coils to enable at least two motor phases, and second connecting means interconnecting said sensor coils to enable at least two sensor circuits, each of said sensor coils being magnetically coupled through said stator to at least one of said phase coils; an armature having an array of mutually spaced pole elements thereon that are at least temporarily magnetizable so as to afford positive and negative polarities to poles in alternating positions in said array, said armature being mounted for movement relative to said stator with said pole elements of said armature moving in physical and magnetic proximity past said stator pole elements; at least one power supply electrically connected to said first and second connecting means for providing direct current thereto; and control means operatively connected to said at least one power supply and said second connecting means for controlling the electrical current supplied by said at least one power supply to at least said first connecting means, said control means being constructed to carry out the following steps:

(a) effecting the delivery of electrical current from said at least one power supply for excitation of said feedback coils so as to produce feedback signals from said two sensor circuits indicative of the position of said armature;

(b) detecting said feedback signals;

(c) utilizing said detected feedback signals to determine the position of said armature;

(d) effecting the delivery of electrical current from said at least one power supply for excitation of said phase coils at such a commutation angle as to maintain said motor in torque equilibrium and said armature substantially fixed in said position;

(e) determining changes in said feedback signals during said phase coil excitation step (d); and

(f) utilizing said determined feedback signal changes to determine the actual value of said commutation angle.

5,838,123
AUTOMATIC PHASE ADJUSTER FOR A BRUSHLESS MOTOR DRIVING SIGNAL

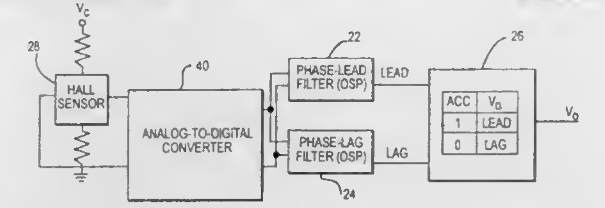
Chi-Mou Zhao, Taipei Hsien, Taiwan, assignor to Industrial Technology Research Institute, Taiwan

Filed Feb. 19, 1997, Ser. No. 802,564

Claims priority, application Taiwan, Nov. 22, 1996, 85114436

Int. Cl.⁶ H02P *6/00*

U.S. Cl. 318—254 **18 Claims**



1. An automatic phase adjuster for a brushless motor, comprising:

means for sensing the speed of the motor;

a plurality of phase-lead filters, coupled to said motor speed sensing means, for generating a phase-lead driving signal; and

multiplexer means, coupled to said phase-lead filters, for selectively connecting an output of one of said phase-lead filters as an output of said multiplexer means.

10. An automatic phase adjuster for a brushless motor, comprising:

means for sensing the speed of the motor;

at least one phase-lead filter, coupled to said motor speed sensing means, for generating a phase-lead driving signal;

at least one phase-lag filter, coupled to said motor speed sensing means, for generating a phase-lag driving signal; and

multiplexer means for selectively connecting one of the phase-lead driving signal and the phase-lag driving signal as output.

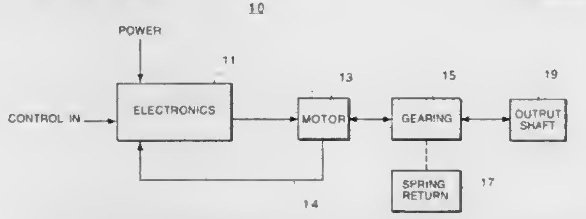
5,838,124
SYSTEMS AND METHODS FOR BRAKING OF ACTUATOR AND BRUSHLESS DC MOTOR THEREIN

Michael L. Hill, Rockton, Ill., assignor to Barber Colman, Loves Park, Ill.

Filed Aug. 28, 1997, Ser. No. 920,053

Int. Cl.⁶ H02P *1/00*

U.S. Cl. 318—269 **38 Claims**



1. A method for stopping rotation of a brushless DC motor, said method comprising:

(a) operating said motor as a loaded generator;

(b) during said operating (a), monitoring a motion profile of said motor;

(c) when said motion profile of said motor reaches a predetermined characteristic, engaging an active deceleration mode, wherein said active deceleration mode includes operating said motor to actively decelerate said motor by driving said motor in a direction opposite of rotation thereof; and

(d) upon detection of reversal of direction of said motor, engaging a holding mode to hold said motor position static.

5,838,125
CONTROL METHOD FOR AN AUTOMATIC DOOR OPENING/CLOSING APPARATUS IN A WASHING MACHINE

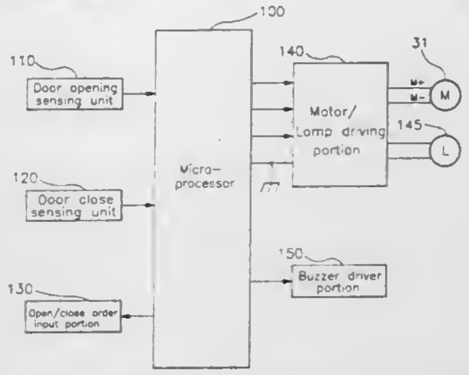
Ssi Chol Choi, Kyungki-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Nov. 6, 1996, Ser. No. 746,143

Claims priority, application Rep. of Korea, Nov. 9, 1995, 1995-40474

Int. Cl.⁶ H02D *1/00*

U.S. Cl. 318—285 **8 Claims**



1. A method for controlling an automatic door opening/closing apparatus of a clothes washing machine, the washing machine including a casing, a door mounted on said casing for manual movement between open and closed positions, and a motor operably connected to said door for automatically moving said door between said open and closed positions, the motor being operable in a forward direction for opening the door and operable in a reverse direction for closing the door, the method comprising the steps of:

A) operating said motor in said reverse direction if said washing machine door is in an open position when a command for closing said door is entered;

B) stopping operation of said motor if said door reaches a closed position within a predetermined time interval from the initiation of the reverse-direction operation of said motor;

C) operating said motor in said forward direction for returning said door to said open position if said door leaves said open position but does not reach said closed position within said predetermined time interval;

D) operating said motor in said forward direction if said door is in said closed position when a command for opening said door is entered;

E) stopping operation of said motor if said door reaches said open position within said predetermined time interval from the initiation of the forward-direction operation of the motor; and

F) operating said motor in said reverse direction for returning said door to said closed position if said door leaves said closed position but does not reach said open position within said predetermined time interval.

5,838,126
METHOD AND APPARATUS FOR OPENING OR CLOSING A DOOR BY MEASURING THE INSTANTANEOUS VOLTAGE AND CURRENT IN AN ASSOCIATED MOTOR

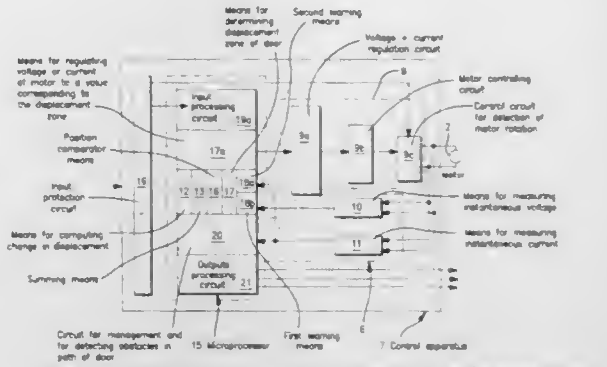
Laurent Pierre Edouard Llerena, Saint Avertin, France, assignor to Faiveley Transport, Saint Denis, France

Filed May 22, 1996, Ser. No. 651,493

Claims priority, application France, May 22, 1995, 95 06034

Int. Cl.⁶ H02P *3/00*

U.S. Cl. 318—286 **11 Claims**


Means for determining displacement zone of door
Second warning means
Voltage + current regulation circuit
Means for regulating voltage or current of motor to a value corresponding to the displacement zone
Input processing circuit
19a
Position comparator means
17a
9a
9b
9c
8
Motor controlling circuit
Control circuit for detection of motor rotation
2
Motor
Input protection circuit
16
12
13
16
17
19c
19b
10
Means for measuring instantaneous voltage
11
Means for measuring instantaneous current
Means for computing change in displacement
20
Summing means
Outputs processing circuit
21
Circuit for management and for detecting obstacles in path of door
15 Microprocessor
First warning means
6
7 Control apparatus

1. A method of electronically controlling displacement of a door using a DC motor, the method comprising the steps of:

determining an instantaneous position of the door at an end of a present time interval by measuring an instantaneous voltage across terminals of the motor, measuring an instantaneous current through windings of the motor, computing displacement of the door during the present time interval as a function of the measured instantaneous voltage, the measured instantaneous current, back-emf and internal resistance constants of the motor, and adding the computed displacement to an instantaneous position determined during a preceding time interval;

regulating one of voltage across the terminals of the motor and current through the windings of the motor as a function of the determined instantaneous position of the door; and

repeating said determining and regulating steps at time intervals to control the displacement of the door.

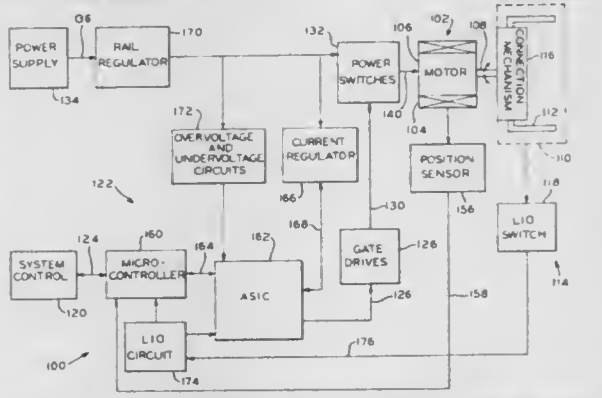
5,838,127
SINGLE PHASE MOTOR FOR LAUNDERING APPARATUS

Glen C. Young; Brian L. Beifus; Robert K. Hollenbeck, all of Fort Wayne, Ind.; Austars R. Schnore, Scotia, N.Y.; Charles M. Stephens, Pattersonville, N.Y.; Paul M. Szczesny, Ballston, N.Y.; Thomas M. Jahns, Schenectady, N.Y., and Eric R. Benedict, Madison, Wis., assignors to General Electric Company, Fort Wayne, Ind.

Filed Dec. 5, 1996, Ser. No. 760,470

Int. Cl.⁶ H02P *1/22;6/08;* D06F *39/14*

U.S. Cl. 318—293 **41 Claims**



1. A motor and control for use in a laundering apparatus, said laundering apparatus including a tub having a lid movable by a user between an open position and a closed position and including a lid switch that provides a signal representative of the position of the lid, said motor and control comprising:

a stationary assembly including a winding;

a rotatable assembly in magnetic coupling relation to the stationary assembly;

a power supply link for providing power to the winding, said power supply link having upper and lower rails supplied by a power supply and power switches responsive to a motor control signal for selectively connecting the rails to the winding to energize the winding with a motor current whereby an electromagnetic field is produced for rotating the rotatable assembly, said power switches comprising a set of upper

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power switches and a set of lower power switches, each of said power switches having a conducting state and a nonconducting state;
a lid detection circuit responsive to the lid position signal for generating a disable signal when the lid is in its open position; and
a control circuit for generating the motor control signal to control the power switches, said control circuit being responsive to the disable signal for controlling the power switches so that the lower power switches become conducting and the upper power switches become nonconducting, or vice-versa, thereby de-energizing the winding to disable the motor.

5,838,128
RECONSTRUCTION OF BEMF SIGNALS FOR SYNCHRONIZING THE DRIVING OF BRUSHLESS-SENSORLESS MOTORS BY MEANS OF PREDEFINED DRIVING SIGNALS

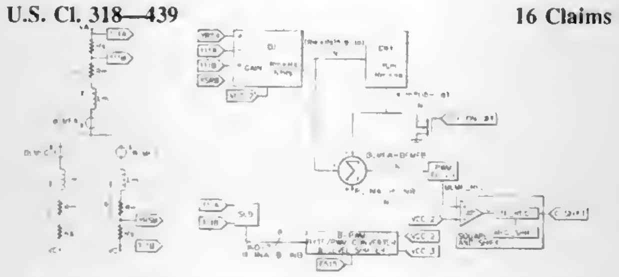
Giuseppe Maiocchi, Villa Guardia, and Marco Viti, Sesto S. Giovanni, both of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Filed Jul. 28, 1997, Ser. No. 901,611

Claims priority, application European Pat. Off., Aug. 1, 1996, 96830440

Int. Cl.^{6} H02P *6/18*

U.S. Cl. 318—439 **16 Claims**



8. A circuit for reconstructing a BEMF signal induced on the phase windings of a motor driven with constant values or predefined profiles of current or voltage, the circuit comprising:
a digital differentiator circuit having inputs for receiving pairs of bytes corresponding to the constant values or instantaneous samples of the pre-defined profiles of the drive signals of two distinct phase windings of the motor and an output for a byte representing a difference of the two input bytes;
a byte/PWM converter circuit having an input connectable to the output of said digital differentiator circuit and an output for a PWM signal whose modulation corresponds to the value of the input byte difference;
first and second sensing resistors in respective first and second phase windings of the two phase windings;
an analog differential stage having differential inputs connected to the first sensing resistor and to the second sensing resistor, and an output for a difference signal of the currents flowing in the two phase windings;
an analog differentiator having an input connected to the output of said analog differential stage; and
a summing stage having three distinct inputs coupled to the respective outputs of said analog differential stage, said byte/PWM converter circuit and said analog differentiator, said summing stage having an output for a difference signal between a BEMF induced on the first phase winding and a BEMF induced on the second phase winding.

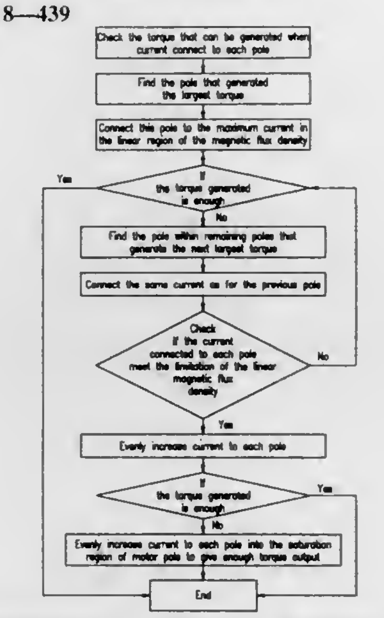
5,838,129
DRIVING METHOD FOR MULTIPLE-POLE MOTORS WITH OPTIMUM DRIVING WAVEFORM

Yih-Ping Luh, 7 th Fl., No. 23, Alley 137, Gin Shin Road, Taipei, Taiwan

Filed Aug. 13, 1997, Ser. No. 910,198

Int. Cl.^{6} H02P *7/00*

U.S. Cl. 318—439 **5 Claims**


Check the torque that can be generated when current connect to each pole
Find the pole that generated the largest torque
Connect this pole to the maximum current in the linear region of the magnetic flux density
Yes
If the torque generated is enough
No
Find the pole within remaining poles that generate the next largest torque
Connect the same current as for the previous pole
Check if the current connected to each pole meet the limitation of the linear magnetic flux density
No
Yes
Evenly increase current to each pole
If the torque generated is enough
Yes
No
Evenly increase current to each pole into the saturation region of motor pole to give enough torque output
End

1. A driving method for a motor which has multiple poles (rotors and stators), includes the following procedure:
(1) Check the torque that can be generated when current connects to each pole
(2) Find the pole that generated the largest torque; connect this pole to the maximum current in the linear region of the magnetic flux density
(3) If the torque generated is not enough, find the pole within remaining poles that generate the next largest torque; connect the same current as for the previous pole
(4) If the total torque is still not enough, then evenly increase current to each pole into the saturation region of motor pole to give higher torque output
(5) Divide magnetic poles of the motor into 3N parts (N is an integer) so that poles at opposite corners has the same driving waveform and the same torque—a paired torque.

5,838,130
LOCOMOTION CONTROL SYSTEM OF LEGGED MOBILE ROBOT

Nobuaki Ozawa, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

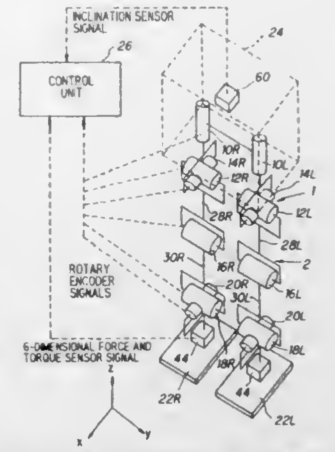
Filed Jan. 24, 1997, Ser. No. 787,708

Claims priority, application Japan, Jan. 25, 1996, 8-031365

Int. Cl.^{6} B62D *57/02*

U.S. Cl. 318—568.2 **14 Claims**

1. A system for controlling locomotion of a legged mobile robot having at least a body and a plurality of articulated legs each connected to the body through a joint and each including a foot connected to the leg through a joint, the robot being configured to walk in an environment including stairs, comprising:
gait parameter generating means for generating gait parameters of the robot such that the robot descends the stairs by landing a heel of a first foot on a stair step;
posture parameter determining means for determining posture parameters of the robot based on the generated gait parameters;
joint angle determining means for determining desired angles of the joints based on the determined posture parameters by inverse kinematic solution; and



servo control means for controlling an actuator of each joint in response to the determined desired angles of the joints;
wherein the robot is a biped robot having two articulated legs each connected to the body through a hip joint and each including a foot connected to the leg through an ankle joint, such that the robot walks alternating between a single-leg support phase in which one of the two legs supports the weight of the robot, and a double-leg support phase in which both legs support the weight of the robot, and said gait generating means generates gait parameters which throughout the entire single-leg support phase, cause the foot supporting the weight of the robot to make at least three-point contact with the stair step.

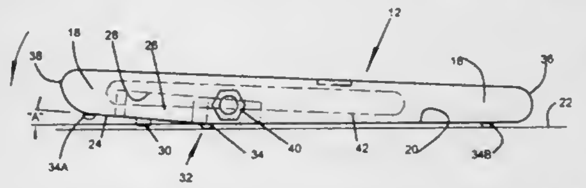
5,838,131
FOOT OPERATED CONTROL FOR ELECTRICAL CIRCUITS

Timothy D. Telymonde, 75 Manchester Ave., Keyport, N.J. 07735

Filed Dec. 2, 1997, Ser. No. 982,961

Int. Cl.^{6} G05B *11/01*

U.S. Cl. 318—560 **20 Claims**



1. A foot operated control for electrical circuits including: a foot rest, and at least one switch means, said foot rest having at least one longitudinal axis and a predetermined cross-sectional profile, said cross-sectional profile defining a substantially horizontal portion, and at least one inclined portion, an underside portion of said horizontal portion being substantially parallel to a supporting surface, said at least one inclined portion being formed with at least one predetermined angle with respect to the horizontal portion, at least one pivot axis being formed on the underside portion of the horizontal portion near the intersection of the horizontal portion and the inclined portion adjacent thereto, each pivot axis being transverse to its associated longitudinal axis, each of said switch means being seated in at least one recess formed into said foot rest, wherein each switch is actuated as and when an actuator associated with said switch comes into contact with said supporting surface by tilting the inclined portion of the foot rest in a selected direction about its associated pivot axis by the foot of an operator.

5,838,132
STEPPER-MOTOR CONTROL METHOD

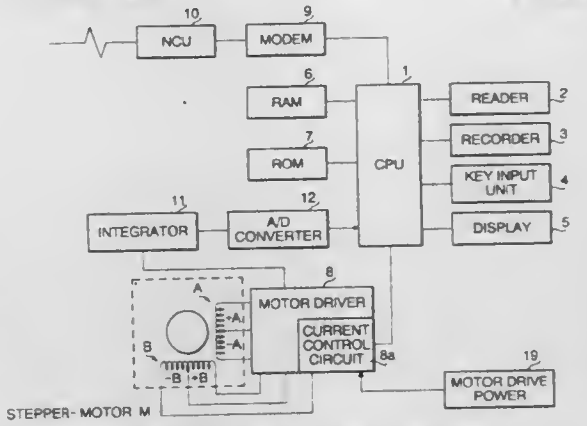
Makoto Tanaka, Nagaokakyo, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Continuation of Ser. No. 612,447, Mar. 7, 1996, abandoned. This application Oct. 20, 1997, Ser. No. 954,027

Claims priority, application Japan, Mar. 10, 1995, 7-050900

Int. Cl.^{6} G05B *19/40*

U.S. Cl. 318—685 **1 Claim**



1. A control method for a stepper-motor, comprising:
(a) determining a present integrated value of a current supplied to the stepper motor;
(b) determining a present load torque applied to the stepper-motor from said present integrated value determined in step (a) using a first table which stores a relationship between plurality of load torques of the stepper-motor and a plurality of integrated values of current supplied to the stepper-motor;
(c) calculating a torque difference between a preset rotational torque of the stepper-motor and the present load torque determined in step (b);
(d) determining one of a feed current or a pulse speed from said torque difference calculated in step (c) using a second table which stores a relationship between a plurality of rotational torques of the stepper-motor and one of a plurality of feed currents of the stepper-motor or a plurality of pulse speeds of the stepper-motor; and
(e) controlling an output torque in response to one of the feed current and the pulse speed determined in step (d).

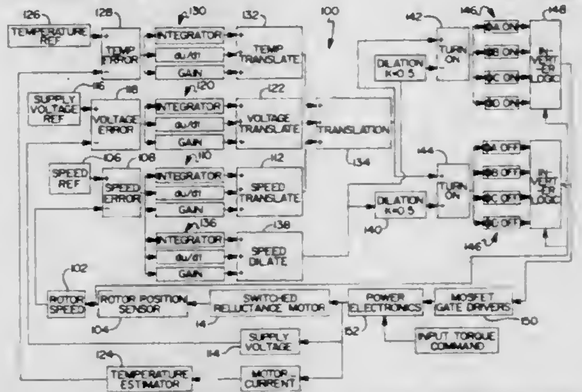
5,838,133
SWITCHED RELUCTANCE MOTOR CONTROLLER

Roy A. McCann, 3517 Kingswood, Kettering, Ohio 45420

Filed May 14, 1997, Ser. No. 856,370

Int. Cl.^{6} H02P *5/05*

U.S. Cl. 318—701 **30 Claims**



1. A method of selectively energizing a motor winding, comprising the steps of:
providing a speed sensor that generates a speed signal representing the angular speed of a rotating member;
determining translation and dilation parameters based upon said speed signal;

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- providing circuitry that outputs a conduction angle signal representing the substantially optimal angular position of said rotating member at which to selectively control the delivery of energy to said winding based upon said translation and dilation parameters; and
- controlling selectively the delivery of energy to said winding based upon said conduction angle signal.

19. An apparatus for selectively energizing a motor winding to spin a rotating member, comprising:

- a speed sensor for generating a speed signal representing the angular speed of said rotating member; and
- processing circuitry, in communication with said speed sensor, for determining translation and dilation parameters based upon said speed signal and outputting a conduction angle signal representing the substantially optimal angular position of said rotating member at which to selectively control the delivery of energy to said winding.

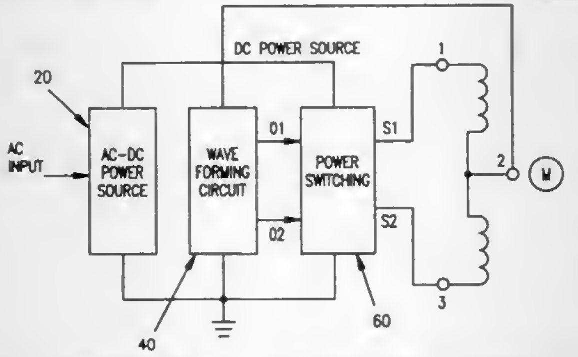
5,838,134
UNIVERSAL COMMUTATOR FOR A.C. MOTORS

Michael D. Cummins, 846 Raymond St. Parkview Island, Miami Beach, Fla. 33141

Filed Nov. 10, 1997, Ser. No. 966,961

Int. Cl.^{6} H02P *7/628*

U.S. Cl. 318—750 **3 Claims**



1. A commutator for an A.C. shaded pole motor, comprising:

a) a D.C. power source;

b) a waveforming circuit connected to said D.C. power source and said waveforming circuit includes first and second outputs that provide interrupted complementary D.C. voltage triggering signals and one of said triggering signals having a duty cycle slightly smaller than the duty cycle of the other triggering signal so that the rising and falling edges of said triggering signals do not coincide in time with each other;

c) power switching means including first and second power switch circuits controlled by said first and second triggering signals and further including third and fourth outputs; and

d) a winding assembly on the stator of said motor having two ends and a centrally connected tap, said ends being connected to said third and fourth outputs so that opposite magnetic fields are included in said stator and alternate according to said triggering signals.

5,838,135
DRIVING MEANS FORMED BY INDUCTION MOTOR AND METHOD FOR STARTING THE SAME

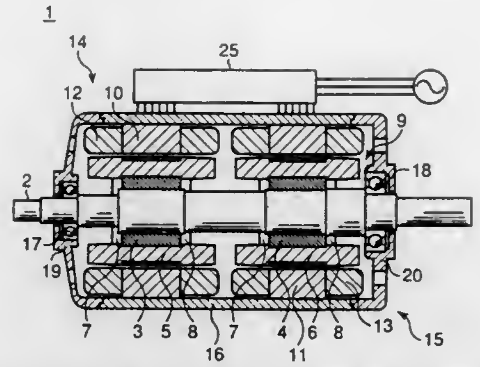
Satoru Satake, Tokyo; Manabu Hidaka, Hiroshima; Kazuo Kumamoto, Hiroshima, and Tadashi Masaki, Hiroshima, all of Japan, assignors to Satake Corporation, Japan

Filed Dec. 17, 1996, Ser. No. 767,785

Claims priority, application Japan, Dec. 22, 1995, 7-350555

Int. Cl.^{6} H02K *16/00;17/12*

U.S. Cl. 318—771 **3 Claims**



1. A method for supplying power to an induction motor having a first power generation means constituted by a first rotor and a first stator which surrounds said first rotor and on which a first stator winding is wound and a second power generation means constituted by a second rotor and a second stator which surrounds said second rotor and on which a second stator winding is wound, said first and second power generation means being connected to a common load, said method comprising the following sequential steps:

- a first step of supplying power to said first and second stator windings after both the windings are respectively connected in a star-form;
- a second step of supplying power to said first and second stator windings after a connection of said second stator winding is changed into a delta-form while a connection of said first stator winding remains as the star-form; and
- a third step of supplying power to said first and second stator windings after the connection of said first stator winding is changed into a delta-form while the connection of said second stator winding remains as the delta-form.

5,838,136
3-POLE BATTERY SWITCHES

Iain Wallace Waugh, Hamilton, New Zealand, assignor to GloryWin International Group Limited, Central, Hong Kong

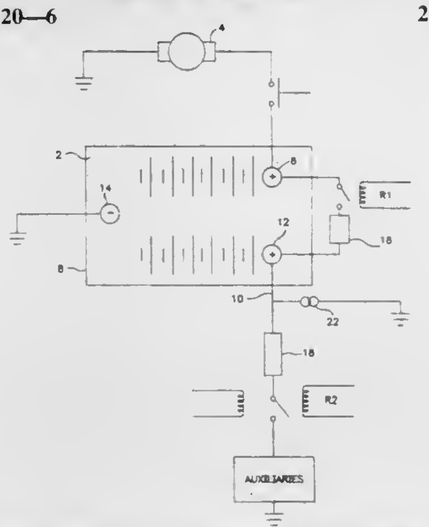
PCT No. PCT/NZ93/00067, § 371 Date Feb. 3, 1995, § 102(e) Date Feb. 3, 1995, PCT Pub. No. WO94/04394, PCT Pub. Date Mar. 3, 1994

PCT Filed Aug. 16, 1993, Ser. No. 379,631

Claims priority, application New Zealand, Aug. 18, 1992, 244007; Apr. 27, 1993, 247509

Int. Cl.^{6} H01M *10/46*

U.S. Cl. 320—6 **23 Claims**



8. In a vehicle electrical system having a 3-Pole battery containing an AUX battery for supplying electrical auxiliaries and a CRA battery, a device for connection between the like poles of the battery having

- (a) a normally open switch connecting said CRA and AUX batteries,
- (b) a normally closed switch connecting the AUX battery to the electrical auxiliaries, and

- (c) sensing means which detects the state of charge of the AUX battery and any current from the AUX battery to the CRA battery and which
  - (i) connects and disconnects the CRA battery and the AUX battery, and
  - (ii) connects and disconnects the AUX battery to and from the electrical auxiliaries so as to enable a generator to charge both the CRA and AUX batteries and to meet fluctuating loads,

  and wherein the sensing means comprises:
  - data storage means suitable for storing data representing battery current, battery voltage and current from the CRA battery to the AUX battery,
  - data entry means suitable for entering data concerning AUX battery current, AUX battery voltage, and current from the CRA battery to the AUX battery, and
  - comparing means which compares the entered data with the corresponding stored data and generates signals which control the operation of the normally closed switch and signals which operate the normally open switch.

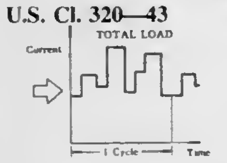
5,838,137
METHOD FOR DETERMINING OPTIMAL CAPACITY OF AUXILIARY ELECTRIC SOURCE SYSTEM FOR AN ELECTRIC VEHICLE

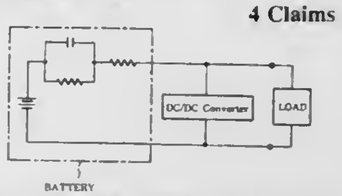
Chun-ho Kim, Kwangmyung, Rep. of Korea, assignor to KIA Motors Corporation, Seoul, Rep. of Korea

Filed Jul. 31, 1996, Ser. No. 688,886

Int. Cl.^{6} H02J *7/04*

U.S. Cl. 320—43 **4 Claims**





1. A method for determining an optimal capacity of a DC/DC converter for an electric vehicle, comprising the steps of:

- statistically modelling firm loads and instantaneous loads with frequency and duty-on ratio;
- summing up firm loads;
- arranging instantaneous loads in a way in which a turn-ON time of each instantaneous load does not occur simultaneously during a cycle in which another instantaneous load occurs;
- obtaining a total load by summing up the instantaneous loads and the firm loads during a Particular cycle; and
- determining a capacity of the DC/DC converter such that, during the cycle, the amount of a charged capacity and the amount of a discharged capacity of an auxiliary battery are approximately the same.

5,838,138
ELECTRONIC DEVICE WHICH IS POWERED BY ACTUATION OF MANUAL INPUTS

David L. Henty, 1232 Polaris Dr., Newport Beach, Calif. 92660

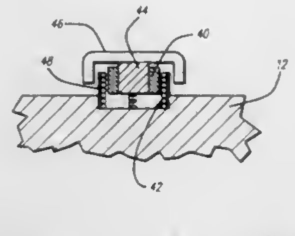
Filed May 2, 1994, Ser. No. 237,254

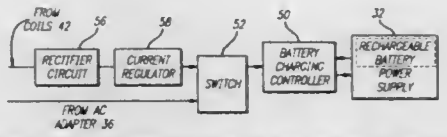
Int. Cl.^{6} H01M *10/44*

U.S. Cl. 320—107 **20 Claims**

1. A portable computer power supply system for use with a portable computer having a keyboard, and a plurality of keys therein, a CPU, a memory and a display, comprising:

- a rechargeable battery;
- means, coupled to the keys in the keyboard, for converting mechanical energy due to activation of the keys by an operator into electrical energy; and





- a charging circuit, coupled between the means for mechanically generating electrical energy and said rechargeable battery, and supplying charging current to said rechargeable battery.

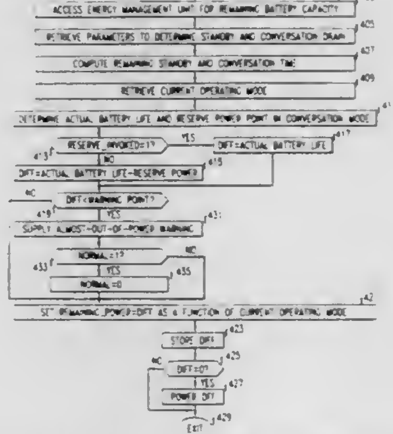
5,838,139
PORTABLE DEVICE BATTERY TECHNIQUE

Michael Roy Greene, Long Valley, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jan. 17, 1997, Ser. No. 785,267

Int. Cl.^{6} H02J *7/04;* **G08B** *21/00;* **G01N** *27/415*

U.S. Cl. 320—133 **38 Claims**


ENTER
401
ACCESS ENERGY MANAGEMENT UNIT FOR REMAINING BATTERY CAPACITY
403
RETRIEVE PARAMETERS TO DETERMINE STANDBY AND CONVERSATION DRAIN
405
COMPUTE REMAINING STANDBY AND CONVERSATION TIME
407
RETRIEVE CURRENT OPERATING MODE
409
DETERMINE ACTUAL BATTERY LIFE AND RESERVE POWER POINT IN CONVERSATION MODE
411
RESERVE_INVOKED=1?
YES
DIFF=ACTUAL BATTERY LIFE
417
413
NO
DIFF=ACTUAL BATTERY LIFE-RESERVE POWER
415
NO
DIFF<WARNING POINT?
419
YES
SUPPLY ALMOST-OUT-OF-POWER WARNING
431
NORMAL=1?
NO
433
YES
NORMAL=0
435
SET REMAINING POWER=DIFF AS A FUNCTION OF CURRENT OPERATING MODE
421
STORE DIFF
423
NO
DIFF=0?
425
YES
427
POWER OFF
EXIT
429

1. A method for use in a portable device powered by a battery, comprising the steps of:

- at a point at which the battery is depleted to a predetermined power level, developing a signal which indicates that the battery will be completely depleted within a predetermined amount of time even though there actually remains sufficient power in the battery to power said portable device for a further period of time in addition to the predetermined amount of time; and
- powering off said portable device upon the passing of the predetermined amount of time unless a user performs a predetermined action prior thereto.

5,838,140
PORTABLE DEVICE BATTERY TECHNIQUE

Eugene J. Rosenthal, Edison, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jan. 17, 1997, Ser. No. 785,268

Int. Cl.^{6} H02J *7/04;* **G08B** *21/00;* **G01N** *27/415*

U.S. Cl. 320—133 **14 Claims**

1. A method for use in a portable device powered by a battery, comprising the steps of:

- at a point at which the battery is depleted to a predetermined power level, developing a signal which indicates that the battery will be completely depleted within a predetermined amount of time even though there actually remains sufficient

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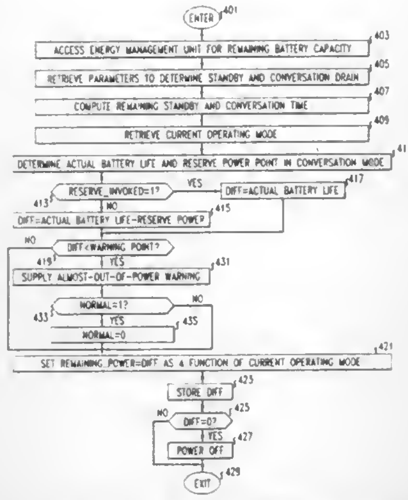
ENTER
401
ACCESS ENERGY MANAGEMENT UNIT FOR REMAINING BATTERY CAPACITY
403
RETRIEVE PARAMETERS TO DETERMINE STANDBY AND CONVERSATION DRAIN
405
COMPUTE REMAINING STANDBY AND CONVERSATION TIME
407
RETRIEVE CURRENT OPERATING MODE
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DETERMINE ACTUAL BATTERY LIFE AND RESERVE POWER POINT IN CONVERSATION MODE
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RESERVE_INVOKED=1?
413
YES
DIFF=ACTUAL BATTERY LIFE
417
NO
DIFF=ACTUAL BATTERY LIFE-RESERVE POWER
415
NO
DIFF<WARNING POINT?
419
YES
SUPPLY ALMOST-OUT-OF-POWER WARNING
431
NORMAL=1?
433
NO
YES
NORMAL=0
435
SET REMAINING_POWER=DIFF AS A FUNCTION OF CURRENT OPERATING MODE
421
STORE DIFF
423
NO
DIFF=0?
425
YES
POWER OFF
427
EXIT
429

power in the battery to power said portable device for a further period of time in addition to the predetermined amount of time; and

powering off said portable device upon the passing of the predetermined amount of time unless a user performs a predetermined action prior thereto:

wherein said portable device has at least first and second operating modes, said first mode being a standby mode and said second mode being an active mode, and wherein said predetermined and further periods of time are computed on a basis selected from one of the following bases
- (i) as if said portable communication device is only operated in said first mode,
- (ii) as if said portable communication device is only operated in said second mode, and
- (iii) as if said portable communication device is operated in a combination of said first mode and said second mode.

5,838,141
METHOD FOR GENERATING A CONTINUOUSLY VARIABLE REFERENCE SIGNAL FOR CONTROLLING BATTERY CELL CHARGING

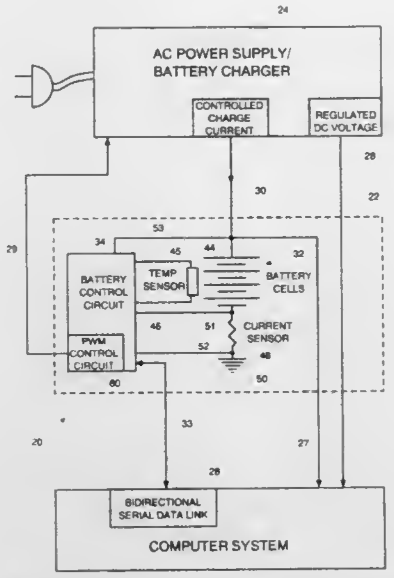
Upal Sengupta, St. Joseph; Robert R. Turnbull, Buchanan; Rajesh A. Shah, and Brian Carl Fritz, both of St. Joseph, all of Mich., assignors to Packard Bell Nec, Sacremento, Calif.

Continuation of Ser. No. 475,756, Jun. 5, 1995, which is a division of Ser. No. 245,004, May 18, 1994, Pat. No. 5,541,490, which is a division of Ser. No. 975,879, Nov. 13, 1992, Pat. No. 5,629,604. This application May 14, 1997, Ser. No. 856,488

Int. Cl.^{6} H01M *10/44*

U.S. Cl. 320—145 **4 Claims**

1. A method for charging one or more battery cells, comprising the steps of:
- (a) sensing predetermined battery parameters; and
- (b) charging said one or more battery cells with a continuously and automatically variable charging current from a predetermined minimum to a predetermined maximum level during all operating conditions as a function of said predetermined battery parameters and as a function of a load placed on said one or more battery cells, said charging current controlled by a continuously variable reference signal that varies as a predetermined function of said charging current supplied to said one or more battery cells, the amount of charge in said one or more battery cells and the temperature of said one or more battery cells.



5,838,142
BATTERY CHARGER AND A PROCESS FOR AUTOMATIC ADJUSTING OPERATION OF A BATTERY CHARGER

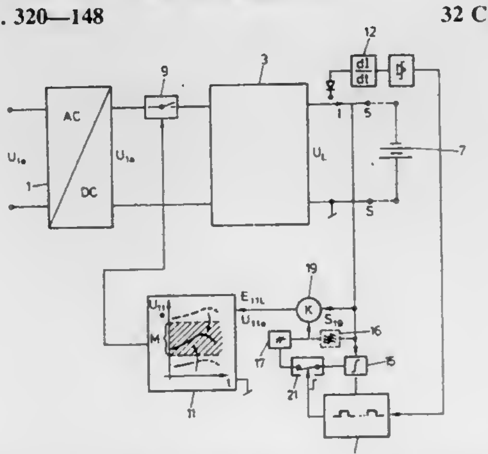
Patrick Wyss, Starrkiach; Anton Fessler, Wohlen, and Christian Meyer, Walliswil-Bipp, all of Switzerland, assignors to Impex Patrick Wyss, Morchaltorf, Switzerland

Continuation of Ser. No. 594,650, Feb. 2, 1996, abandoned. This application Oct. 16, 1997, Ser. No. 951,382

Claims priority, application European Pat. Off., Oct. 2, 1995, 95115527

Int. Cl.^{6} H02J *7/00*

U.S. Cl. 320—148 **32 Claims**



1. A process for automatically adjusting a battery charger according to an accumulator battery being charged, comprising the steps of:
- supplying a charging current to said battery;
- sensing a terminal voltage of said battery to generate a sense signal;
- amplifying said sense signal by an amplification factor to generate a control signal;
- checking time behavior of said control signal and generating a check-result signal as soon as a predetermined criterion is fulfilled by said time behavior of said control signal;
- controlling said charging current as a function of said check-result signal; and
- automatically adjusting said amplification factor as a function of said sense signal so as to set said control signal being checked within a predetermined range of magnitude.

5,838,143
AUTOMATIC BATTERY POLARITY IDENTIFICATION CIRCUIT HAVING ELECTRODE PLATES, CAPACITOR AND RELAYS

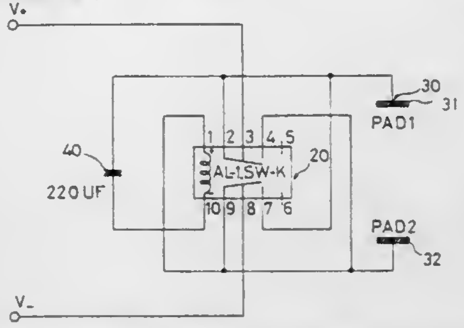
Te-Yu Lo, 8F, No. 45, Pao Chung Rd., Hsin Tien, Taipei Hsien, Taiwan

Filed Jul. 28, 1997, Ser. No. 901,793

Claims priority, application Taiwan, Oct. 8, 1996, 84217398A01

Int. Cl.^{6} H01M *10/46*

U.S. Cl. 320—16 J **3 Claims**



1. An automatic battery polarity identification circuit comprising:
- a first electrode plate and a second electrode plate adapted for receiving two opposite ends of a battery;
- a capacitor having a first end and a second end; and
- at least one relay, each of said at least one relay having a coil, said coil having a first end connected to the first end of said capacitor and a second end, a second fixed contact and a third fixed contact connected between said first electrode plate and the second end of said coil, a first fixed contact and a fourth fixed contact connected to said second electrode.

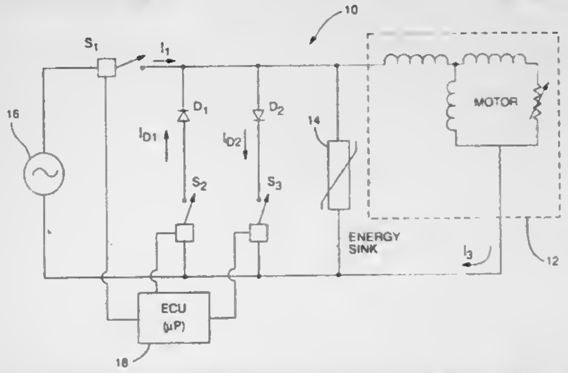
5,838,144
SOLID STATE, REDUCED VOLTAGE MOTOR STARTER ENABLING EQUALIZED INPUT/OUTPUT VOLT-AMP RATINGS

Frank E. Wills, and Harold R. Schnetzka, both of York, Pa., assignors to York International Corporation, Pa.

Filed May 7, 1997, Ser. No. 852,502

Int. Cl.^{6} G05F *1/10;* H02P *1/26*

U.S. Cl. 323—238 **16 Claims**



1. For use with a multi-phase power source providing positive and negative voltage alternations resulting in positive and negative current alternations and a multi-phase motor, a starter circuit for the motor for minimizing the amount of current drawn by the motor from the power source during starting of the motor, the motor starter circuit comprising:
- a first switch through which bidirectional line current from the power source is provided to the motor;
- a pair of switch-diode combinations electrically configured to carry current in the motor when the first switch is in an open position; and
- a controller for controlling the first switch to cycle between an open and a closed position, and for controlling the pair of switch-diode combinations to alternately carry the current in the motor when the first switch is open based on the polarity of the motor current alternation, thereby effecting a current transformation wherein the starting current drawn is reduced from the available line current in proportion to the duty cycle of the first switch so as to minimize the current drawn by the motor during starting.

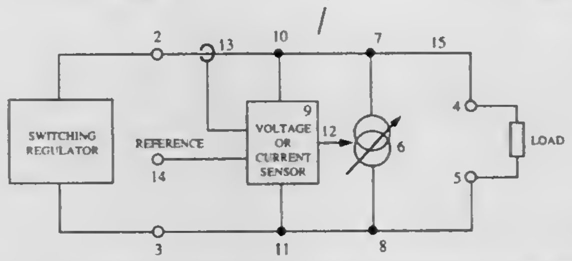
5,838,145
TRANSIENT LOAD CORRECTOR FOR SWITCHING CONVERTERS

Franki Ngai Kit Poon, and Chi Kong Tse, both of Flat G, 13/F, Block 1, Greenwood Terrace, Chai Wan, Hong Kong

Filed May 30, 1996, Ser. No. 655,416

Int. Cl.^{6} G05F *1/40*

U.S. Cl. 323—266 **22 Claims**



1. A circuit for providing fast transient response for a switching regulator, the circuit being unconnected to any pulse-width modulator of the switching regulator and comprising:
- a first input terminal and a second input terminal for connection to a switching regulator;
- a first output terminal and a second output terminal for connection to a load;
- a third input terminal for connection to a DC voltage reference or a programmable voltage reference;
- a voltage sensor for detecting the value of the output voltage of the switching regulator;
- a bi-directional controlled current source for supplying transient current to the load connected to the first and second output terminals, with the bi-directional controlled current source dissipating negligible power in the steady state;
- a control circuit for controlling the bi-directional controlled current source according to the amount of deviation of the output voltage from the DC reference or the programmed voltage reference, thereby ensuring the right amount of transient current to be supplied to or sunk from the load.

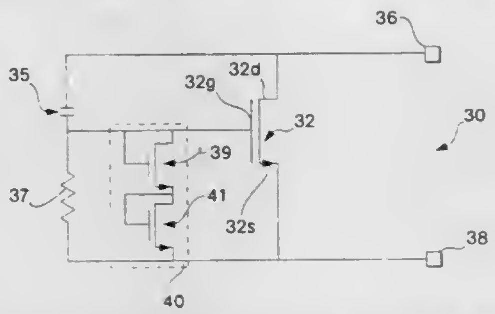
5,838,146
METHOD AND APPARATUS FOR PROVIDING ESD/EOS PROTECTION FOR IC POWER SUPPLY PINS

Lawrence A. Singer, Bedford, Mass., assignor to Analog Devices, Inc., Norwood, Mass.

Filed Nov. 12, 1996, Ser. No. 747,217

Int. Cl.^{6} G05F *1/40;* H02H *3/20;9/00*

U.S. Cl. 323—270 **34 Claims**



1. An EOS/ESD protection circuit for protecting an integrated circuit from an EOS/ESD event occurring across first and second pads of the integrated circuit, the EOS/ESD protection circuit comprising:

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- an EOS/ESD protection device having a first input to couple to the first pad, having an output to couple to the second pad, and having a second input, the EOS/ESD protection device being constructed to conduct current from the first input to the output upon occurrence of the EOS/ESD event;
- a capacitor coupled between the first input and the second input of the EOS/ESD protection device; and
- a clamping circuit having an input coupled to the second input of the EOS/ESD protection device and having an output coupled to the output of the EOS/ESD protection device, the clamping circuit being constructed to clamp a voltage across the second input and the output of the EOS/ESD protection device to a predetermined non-zero value upon occurrence of the EOS/ESD event.

5,838,147
IC WHEREIN A CHOPPER-TYPE BUCK REGULATOR PNP SWITCH SUPPLIES BASE CURRENT TO THE LOAD

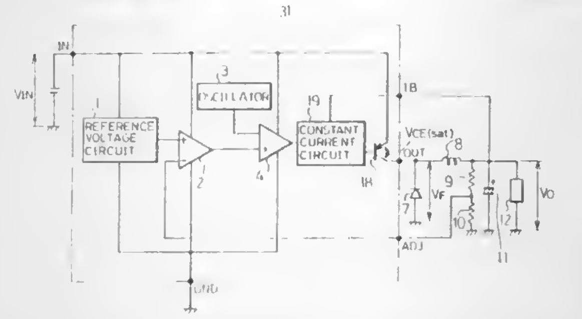
Tomohiro Suzuki, Kitakatsuragi-gun, and Kenji Hachimura, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 563,766, Nov. 28, 1995, Pat. No. 5,670,866. This application May 13, 1997, Ser. No. 855,145

Claims priority, application Japan, Nov. 28, 1994, 6-293009; Sep. 18, 1995, 7-237985

Int. Cl.^{6} G05F *1/40*

U.S. Cl. 323—289 **14 Claims**



1. A chopper-type regulator circuit for stabilizing an output voltage, comprising:

- a single-structure output transistor composed of a PNP-type transistor for switching an input current to a first output terminal; and
- a control section for controlling the switching of said output transistor between ON and OFF states based upon a voltage difference between a reference voltage and the output voltage, such that said control section controls a duty ratio of the output voltage,
- wherein said control section includes a base current output terminal for supplying a base current of said output transistor to a load connected to said chopper-type regulator circuit, the base current being supplied to the load whenever said output transistor is in an ON state.

5,838,148
POWER CONTROL METHOD AND APPARATUS FOR BATTERY POWER SUPPLY AND BATTERY POWER SUPPLY SYSTEM

Seiji Kurokami, Tsuzuki-gun; Kimitoshi Fukae, Nara, and Nobuyoshi Takehara, Souraku-gun, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

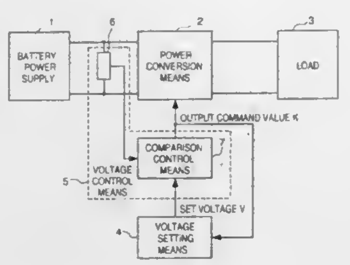
Filed Aug. 28, 1996, Ser. No. 703,800

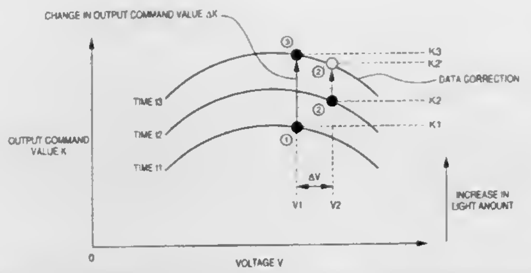
Claims priority, application Japan, Aug. 29, 1995, 7-242313

Int. Cl.^{6} G05F *5/00*

U.S. Cl. 323—299 **44 Claims**

1. A power control method for an apparatus having power conversion means for converting power from a battery power





supply and supplying the power to a load, voltage setting means for setting an output voltage from said battery power supply, and voltage control means for controlling an output command value to said power conversion means such that a voltage value of said battery power supply becomes a set voltage, comprising

- calculating the set voltage to be subsequently set on the basis of the output command value for a first period and/or the set voltage for the first period.

5,838,149
VOLTAGE CONTROL MEANS HAVING A REDUCED SENSITIVITY TO TEMPERATURE VARIATIONS

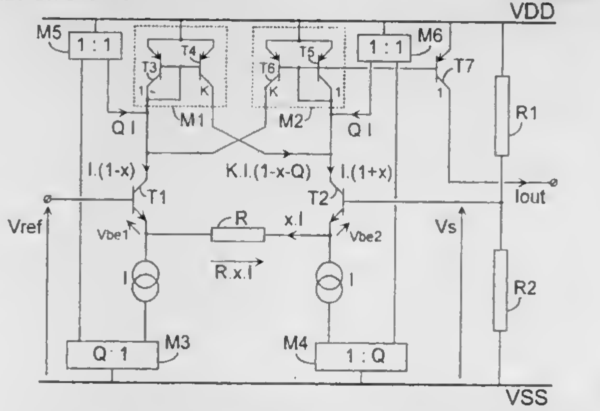
Jean-Claude Perraud, Saint Aubin/Mer, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 27, 1997, Ser. No. 918,969

Claims priority, application France, Aug. 30, 1996, 96 10645

Int. Cl.^{6} G05F *3/00*

U.S. Cl. 323—315 **6 Claims**



1. A voltage control means having a first and a second power supply terminal and an output terminal, provided with a first and a second transistor constituting a differential pair, whose emitters are connected by means of a connection, the base of the first transistor being intended to receive a reference voltage, the base of the second transistor being intended to receive a predetermined fraction of a voltage applied to the first power supply terminal, said voltage control means being also provided with a first and a second current mirror each having a power supply point connected to the first power supply terminal, an input branch intended to receive an input current and an output branch intended to supply an output current, each current mirror being constructed in such a way that its output current is equal to K times its input current, in which K is a predetermined real number, the input branches of the first and second current mirrors being connected to the collectors of the first and second transistors, respectively, the output branches of the first

and second current mirrors being connected to the collectors of the second and first transistors, respectively, characterized in that a resistor is inserted in the connection between the emitters of the first and second transistors, which emitters are connected to the second power supply terminal via current sources each supplying a bias current, in that said voltage control means is provided with injection means for injecting into the collector of each first and second transistor a current equal to Q times said bias current, in which Q is a predetermined real number, and in that said voltage control means is provided with signalization means allowing supply of a current at said output terminal, which current is proportional to the input current of one of the first or second current mirrors.

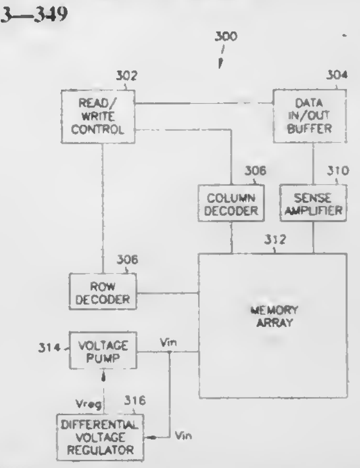
5,838,150
DIFFERENTIAL VOLTAGE REGULATOR

Brent Keeth, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Continuation of Ser. No. 668,347, Jun. 26, 1996, abandoned. This application Oct. 10, 1997, Ser. No. 948,386

Int. Cl.^{6} H02N *7/219*

U.S. Cl. 323—349 **20 Claims**



1. A voltage regulator that regulates an input voltage at a first voltage level with respect to a second, different voltage, the voltage regulator comprising:

- a current source that generates a bias current;
- a voltage translation circuit, coupled to and responsive to the bias current, that increases the input voltage and that translates a reference voltage so as to generate a differential voltage signal that tracks variances of the input voltage from the first voltage level; and
- a differential comparator circuit coupled to the voltage translation circuit that generates a control signal based on the differential voltage signal from the voltage translation circuit to indicate when the input voltage should be adjusted.

5,838,151
WIRELESS LOAD SHARING FOR PARALLEL POWER CONVERTERS AND METHOD

Ronald Gene Myers, Scottsdale, and Paul Herbert Rogers, Chandler, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

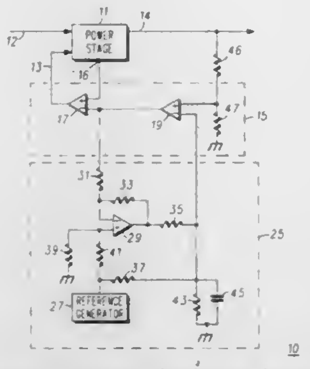
Filed Mar. 3, 1997, Ser. No. 810,386

Int. Cl.^{6} G05B *24/02*

U.S. Cl. 323—353 **17 Claims**

1. A power supply including a virtual resistor said power supply comprising:

- a power stage having an input for accepting unregulated power, an output for providing regulated power, a control input and a current sense output;
- a control circuit including an error amplifier having an inverting input coupled to said for providing regulated power output and an output coupled to said control input;



- a virtual resistance generator having an input coupled to said output of said error amplifier and an output coupled to a non inverting input of said error amplifier, said virtual resistance generator for supplying a reference voltage to said control circuit such that a voltage present at said output for providing regulated power as a function of current leaving said output for providing regulated power provides an output virtual resistance, said virtual resistance generator comprising a first resistor having a first end coupled to said input of said virtual resistance generator and a second end coupled to an inverting input of an operational amplifier; and
- a second resistor having a first end coupled to said inverting input of said operational amplifier and a second end coupled to an output of said operational amplifier, said first and second resistors setting a gain for said operational amplifier, said output of said operational amplifier being coupled to said non inverting input of said error amplifier via a third resistor.

5,838,152
PULSE TIMER CIRCUIT

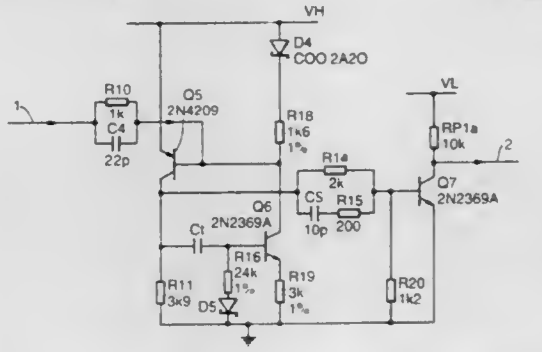
Geoffrey Smith, Bristol, Great Britain, and Jiapal S. Brar, Chandigarh (U-T), India, assignors to Matra Bae Dynamics, (UK) Ltd., Hertfordshire, United Kingdom

Filed Jul. 16, 1996, Ser. No. 680,970

Claims priority, application United Kingdom, Jul. 17, 1995, 9514618

Int. Cl.^{6} H03K *3/284*

U.S. Cl. 323—907 **8 Claims**



1. A temperature-compensated pulse timer circuit comprising a monostable multivibrator including a pair of complementary transistors and a first device, connected across the base and emitter of a first of said pair of transistors, whose temperature coefficient is closely matched to that of said first of the transistor pair.

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5,838,153

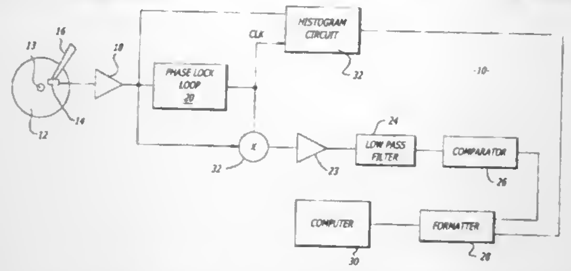
MAGNETIC MEDIA TESTER WHICH INCLUDES A FILTER THAT FILTERS THE PRODUCT OF A READ SIGNAL AND AN OUTPUT OF A PHASE LOCK LOOP CIRCUIT

Michael Inbar, Santa Barbara, Calif., assignor to Phase Metrics, Inc., San Diego, Calif.

Filed Dec. 13, 1996, Ser. No. 766,901

Int. Cl.^{6} G01R *33/12;* G11B *5/09;* G01N *27/72*

U.S. Cl. 324—212 **14 Claims**



1. A test apparatus that analyzes a read signal generated from a disk of a hard disk drive, comprising:

a phase lock loop circuit that receives the read signal and provides a multiplier read signal;

a multiplier that multiplies the read signal by the multiplier read signal to provide a multiplied read signal;

a low pass filter that filters the multiplied read signal to provide a filtered multiplied read signal; and,

a comparator that compares the filtered multiplied read signal with a threshold value to provide a pulse detection signal.

5,838,154

MULTILAYERED MAGNETIC SENSOR HAVING CONDUCTIVE LAYER WITHIN MEGNETIC LAYER

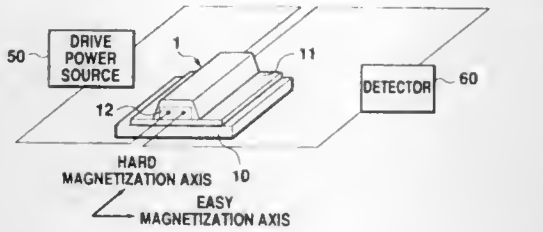
Takeshi Morikawa, Kasugai; Yuji Nishibe, Toki; Hideya Yamadera, Nagoya; Yutaka Nonomura, Nagoya; Masaharu Takeuchi, Owariasahi, and Jiro Sakata, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi-ken, Japan

Filed Mar. 14, 1996, Ser. No. 615,954

Claims priority, application Japan, Mar. 17, 1995, 7-058839; Feb. 28, 1996, 8-041766

Int. Cl.^{6} G01R *33/02*

U.S. Cl. 324—249 **21 Claims**



1. A magnetic sensor energized by a high frequency current from a high frequency power source for detecting an electrical characteristic change in a conductive layer and a magnetic layer corresponding to an external magnetic field, comprising:

a substrate;

a magnetic layer formed on the substrate and containing a magnetic material; and

a conductive layer energized by the high frequency power source and positioned within the magnetic layer and containing a conductive material,

wherein the magnetic layer is anisotropic with an easy magnetization axis directed in its width direction orthogonal to the direction of energization by the high frequency current from the high frequency power source, and

wherein a magnetic flux surrounding said conductive layer is generated by said high frequency current in a direction of said easy magnetization axis.

5,838,155

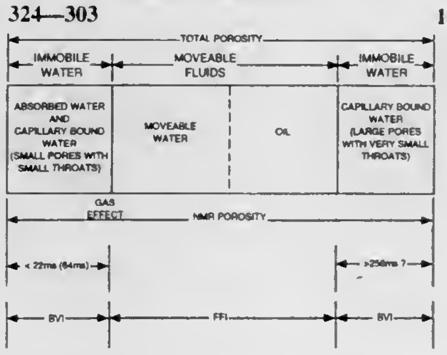
UNDERGROUND FORMATION PRODUCIBILITY AND WATER CUT FROM NUCLEAR MAGNETIC RESONANCE DATA USING AN ISOLATED PORE

Mark C. Bowers, Houston, Tex., assignor to Conoco Inc., Ponca City, Okla.

Filed Oct. 31, 1996, Ser. No. 739,665

Int. Cl.^{6} G01R *33/20*

U.S. Cl. 324—303 **10 Claims**


TOTAL POROSITY
IMMOBILE WATER
MOVEABLE FLUIDS
IMMOBILE WATER
ABSORBED WATER AND CAPILLARY BOUND WATER (SMALL PORES WITH SMALL THROATS)
MOVEABLE WATER
OIL
CAPILLARY BOUND WATER (LARGE PORES WITH VERY SMALL THROATS)
GAS EFFECT
NMR POROSITY
< 22ms (64ms)
>256ms ?
BVI
FFI
BVI

1. A method for determining the porosity of a formation in an underground reservoir where the reservoir rock is determined to have large pores with small throats and where the porosity is associated with the bulk volume irreducible (BVI) and free fluid index (FFI) of the formation comprising;

establishing first and second predetermined values of time T_2 taken from a relaxation curve on a reservoir material, which first predetermined value represents the maximum T_2 relaxation time for small pores that will not permit the flow of fluids therefrom under expected reservoir conditions and which second predetermined value represents the lowest number for large pores in the material having a small throat size that prevents fluids from migrating from said pores under expected reservoir conditions;

determining the distribution of small pores in the reservoir material based on pore distributions having a T_2 relaxation time less than the first predetermined value;

determining the distribution of large pores with small throats in said reservoir material based on pore distributions having a T_2 relaxation time greater than the second predetermined value; and

summing the small pore distribution and large pore with small throat distributions to determine an accurate BVI/FFI of the formation.

5,838,156

METHOD AND APPARATUS FOR AUTOMATIC PHASE CORRECTION OF NMR SPECTRA

Nobuyoshi Miyabayashi, Tokyo, Japan, assignor to Jeol Ltd., Tokyo, Japan

Filed Jun. 21, 1996, Ser. No. 703,572

Claims priority, application Japan, Jun. 23, 1995, 7-157308

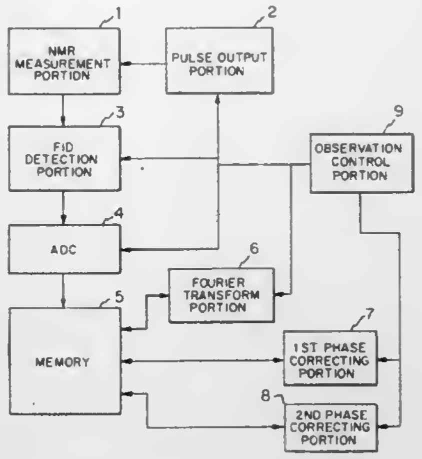
Int. Cl.^{6} G01R *33/46*

U.S. Cl. 324—307 **13 Claims**

1. A method of automatically correcting phase shifts contained in a nuclear magnetic resonance (NMR) spectrum, said method comprising the steps of:

obtaining data S(ω) about an NMR spectrum of a specimen, by nuclear magnetic resonance measurements, wherein frequency ω is a variable;

correcting said data S(ω) about phase shifts ϕ_d due to delay of the measurements, phase shifts ϕ_f due to a frequency filter, and phase shifts ϕ_o due to off-resonance effects; and


1
NMR MEASUREMENT PORTION
2
PULSE OUTPUT PORTION
3
FID DETECTION PORTION
9
OBSERVATION CONTROL PORTION
4
ADC
6
FOURIER TRANSFORM PORTION
5
MEMORY
7
1ST PHASE CORRECTING PORTION
8
2ND PHASE CORRECTING PORTION

correcting the corrected data about phase shifts ϕ_c due to a phase difference between an RF carrier and a reference in said NMR measurements.

5,838,157

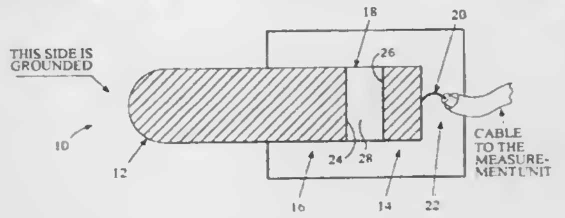
DEVICE FOR MEASURING ELECTRICAL FIELD GRADIENT COMPONETS OF THE SOIL

Michail Balbachan, 5 Sherbakovskaya Street., Apt. 10, Moscow, Russian Federation, 105318

Filed Oct. 24, 1996, Ser. No. 736,134

Int. Cl.^{6} G01V *3/08;3/38;* G01R *29/00*

U.S. Cl. 324—348 **5 Claims**



1. A device for measuring the vertical component U_h of the electrical field gradient of the soil, said device comprising:

at least two electrodes; wherein each said electrode further comprises:

a first conductive element connected to the soil;

a second conductive element adapted for connection to a measuring and control device; and

a capacitor element connected to said first conductive element and connected to said second conductive element; wherein said capacitor element further comprises:

a layer of dielectric between said first conductive element and said second conductive element, wherein said first conductive element includes a first conductive ending element connected to said dielectric, and wherein said second conductive element includes a second conductive ending element connected to said dielectric;

wherein said capacitor element has a finite resistance to d. c. current; and wherein said capacitor element has a substantially large effective electrical capacitance.

5,838,158

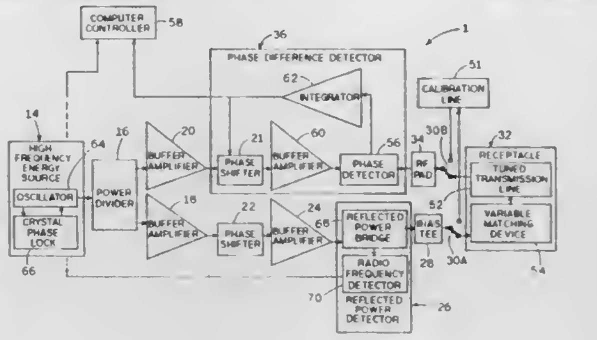
MEASURING SYSTEM FOR MEASURING THE AMOUNT OF DIELECTRIC IN A WEB

David A. Beck, Appleton, Wis., and Wayne L. Miller, Stanhope, N.J., assignors to Appleton Mills, Appleton, Wis.

Filed Aug. 8, 1995, Ser. No. 512,716

Int. Cl.^{6} G01N *22/00*

U.S. Cl. 324—636 **27 Claims**



1. A measuring system for measuring the amount of dielectric in a web, said measuring system including a measuring instrument having an electric circuit, including a plurality of circuit elements, said electric circuit comprising:

(a) an electric energy source, for emitting a constant frequency signal;

(b) a power divider for dividing the constant frequency signal into a reference signal at a reference terminal, for travelling along a reference path, and a measuring signal at a measuring terminal, for travelling along a measurement path;

(c) a receptacle comprising a resonant cavity having at least one resonant frequency, said receptacle being electrically connected to said electric energy source such that a first traversing fraction of the measuring signal, corresponding to the at least one resonant frequency, traverses along the measurement path, through said resonant cavity, and wherein a second fraction of the measuring signal is reflected from said resonant cavity, said receptacle being positioned in said measuring instrument to accommodate placing said resonant cavity proximate the web, said resonant cavity being adapted to cause a phase shift in the traversing fraction in response to the dielectric in the web, such that the phase of the traversing fraction of the measuring signal is shifted relative to the phase of the reference signal, the magnitude of the phase shift in the traversing fraction of the measuring signal being a function of the amount of dielectric in the web;

(d) a phase difference detector for receiving the reference signal and the traversing fraction of the measuring signal after the traversing fraction traverses said resonant cavity, said phase difference detector being adapted to detect the difference between the phase of the reference signal and the phase of the traversing fraction of the measuring signal and to provide a first output signal, the magnitude of the first output signal depending on the magnitude of the difference in phase so detected, the first output signal providing a first representation of the amount of dielectric in the web; and

(e) a reflected power detector electrically connected in the electric circuit between said receptacle, and with said measuring terminal of said power divider, for providing a second output signal, the magnitude of the second output signal depending on the magnitude of the reflected second fraction of the measuring signal, the second output signal thus comprising a second representation of the amount of dielectric in the web.

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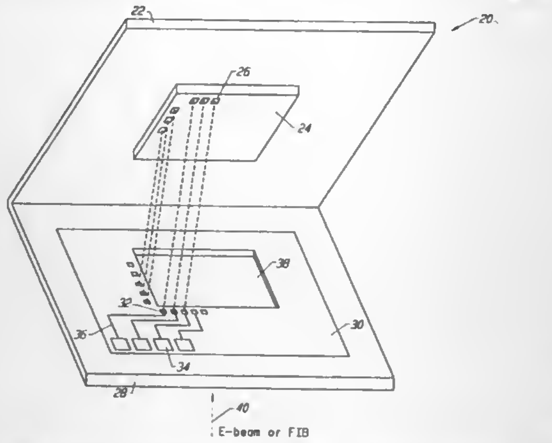
5,838,159
CHIP CARRIER TO ALLOW ELECTRON BEAM PROBING AND FIB MODIFICATIONS

Douglas S. Johnson, Palo Alto, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Filed Mar. 22, 1996, Ser. No. 620,274

Int. Cl.^{6} G01R ***31/308***

U.S. Cl. 324—751 **8 Claims**



1. A method for probing an active region of a die including one or more peripheral input/output bump pads located about the periphery of the active region of said die, the method comprising the steps of:

supporting said die in a die carrier such that said peripheral bump pads are electrically connected to an external test circuit; and

accessing the active region with a probe beam directed onto the active region of the die through a probe access region,

wherein the die carrier includes

(a) a membrane having (i) said probe access region for allowing the probe beam to access substantially all of the die's active region, (ii) a plurality of peripheral bump contacts adjacent to the probe access region and arranged to make electrical contact with said peripheral bump pads of the die, and (iii) a plurality of socket contacts electrically connected to said peripheral bump contacts; and

(b) a membrane carrier supporting said membrane and having an opening corresponding, at least in part, to the location of said probe access region of the membrane.

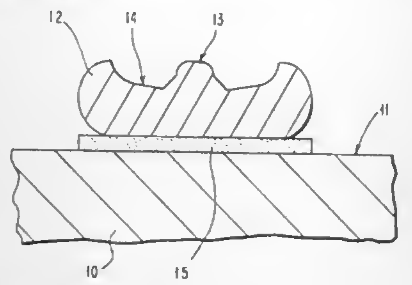
5,838,160
INTEGRAL RIGID CHIP TEST PROBE

Brian Samuel Beaman, Hyde Park; Keith Edward Fogel, Bardonia; Paul Alfred Lauro, Nanuet; Maurice Heathcote Norcott, Fishkill; Da-Yuan Shih, Poughkeepsie, and George Frederick Walker, New York, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 224,383, Apr. 7, 1994, abandoned. This application Nov. 8, 1996, Ser. No. 744,903

Int. Cl.^{6} G01R ***31/02***

U.S. Cl. 324—754 **5 Claims**



1. A structure comprising:

a substrate having a surface;

said surface has a plurality of electrically conductive bumps disposed on said surface

each of said electrically conductive bumps has an electrically conductive perimeter which is raised above said surface and an electrically conductive portion within the boundaries of said perimeter which is raised above said surface, there being a region of said electrically conductive bump between said electrically conductive perimeter and said electrically conductive portion, said electrically conductive perimeter and said electrically conductive portion are raised above said region; and

said electrically conductive bump remains substantially stationary with respect to said surface when said structure is disposed to press said bumps in contact with a workpiece.

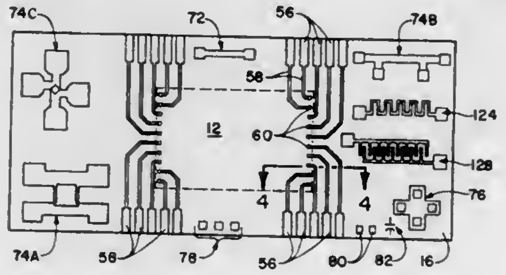
5,838,161
SEMICONDUCTOR INTERCONNECT HAVING TEST STRUCTURES FOR EVALUATING ELECTRICAL CHARACTERISTICS OF THE INTERCONNECT

Salman Akram, and David R. Hembree, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed May 1, 1996, Ser. No. 640,472

Int. Cl.^{6} G01R ***31/02***

U.S. Cl. 324—755 **33 Claims**



1. An interconnect for a semiconductor die comprising:

a substrate;

a contact member on the substrate, the contact member comprising a conductive layer configured to electrically contact a contact location on the die;

a test structure on the substrate, the test structure comprising a resistor comprising a same material as the conductive layer;

the test structure further comprising a first contact and a second contact on the substrate in electrical communication with the resistors;

the test structure configured to evaluate a resistivity of the conductive layer, by applying a current and measuring a voltage across the first contact and the second contact.

5,838,162
TEST APPARATUS AND METHOD FOR TESTING INTEGRATED CIRCUIT MODULES HAVING VISUAL DISPLAY

Wen-Szu Chung, Hsinchu, and Wei-Kay Chiu, Hsin-Chu County, both of Taiwan, assignors to Taiwan Semiconductor Manufacturing Company Ltd., Hsin-Chu, Taiwan

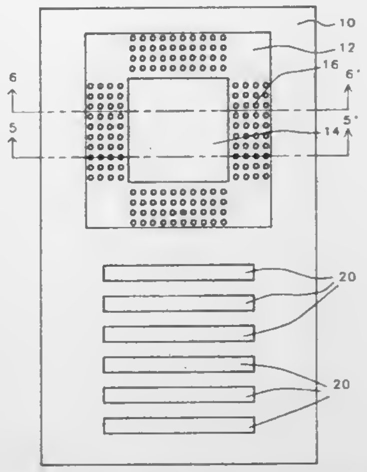
Filed Jun. 13, 1996, Ser. No. 663,578

Int. Cl.^{6} G01R ***31/02***

U.S. Cl. 324—755 **19 Claims**

1. A test apparatus, comprising:

a first number of first cable sockets wherein each of said first cable sockets has a second number of first cable contacts;



a third number of second cable sockets wherein each of said second cable sockets has fourth number of second cable contacts;

a fifth number of jumper sockets wherein each of said jumper sockets has a sixth number of first jumper contacts, a sixth number of second jumper contacts, and a sixth number of third jumper contacts;

an integrated circuit socket having a seventh number of integrated circuit contacts;

an eighth number of input connectors wherein each said input connector has a first input contact and a second input contact;

a first circuit board having a display opening wherein said first number of first cable sockets are attached to said first circuit board, said integrated circuit socket is attached to said first circuit board at said display opening so that an integrated circuit connected to said integrated circuit socket is directly over said display opening, and each of said integrated circuit contacts is electrically connected to one of said first cable contacts;

a second circuit board wherein said third number of said second cable sockets are attached to said second circuit board, said fifth number of said jumper sockets are attached to said second circuit board, said eighth number of said input connectors are attached to said second circuit board, each of said second jumper contacts is electrically connected to one of said second cable contacts, each of said first jumper contacts in each of said jumper sockets are electrically connected to every other said first jumper contact of the same said jumper socket, each of said third jumper contacts in each of said jumper sockets are electrically connected to every other said third jumper contact of the same said jumper socket, said first input contact of each of said input connectors is electrically connected to said first jumper contacts of one of said jumper sockets, and said second input contact of the same said input connector is electrically connected to said third jumper contacts of the same said jumper socket so that said first input contact and said second input contact of each said input connector are electrically connected to said first jumper contacts and said third jumper contacts of the same said jumper socket;

means to connect said first jumper contacts of each said jumper socket to one of said second jumper contacts of the same said jumper socket;

means to connect said third jumper contacts of each said jumper socket to one of said second jumper contacts of the same said jumper socket; and

means to connect each of said second cable contacts to one of said first cable contacts.

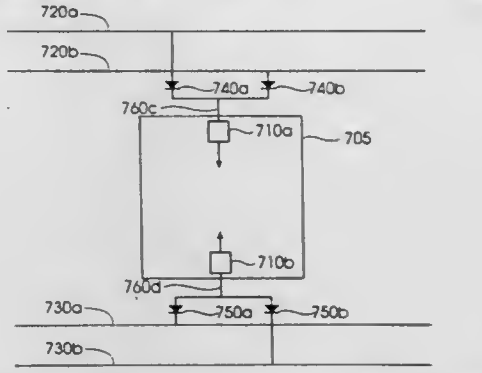
5,838,163
TESTING AND EXERCISING INDIVIDUAL, UNSINGULATED DIES ON A WAFER

Michael D. Rostoker, Boulder Creek; Carlos Dangelo, Los Gatos, and James Koford, San Jose, all of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Continuation of Ser. No. 385,341, Feb. 8, 1995, Pat. No. 5,539,325, which is a division of Ser. No. 908,687, Jul. 2, 1992, Pat. No. 5,442,282. This application Dec. 26, 1995, Ser. No. 578,742

Int. Cl.^{6} G01R ***31/28***

U.S. Cl. 324—763 **7 Claims**



1. A fault-tolerant method of providing signals from a common external source to individual, unsingulated dies on a semiconductor wafer, comprising:

defining a plurality of individual dies on a semiconductor wafer. said dies ultimately being processed into integrated circuit devices;

providing an electronic selection mechanism, on the wafer, for providing signals to selected individual dies; and

providing a first conductive path between said electronic selection mechanism and a first of said dies, said first conductive path comprising:

a first signal carrying line;

a second signal carrying line;

a first diode having an anode and a cathode, said first diode anode being connected to said first signal carrying line;

a second diode having an anode and a cathode, said second diode anode being connected to said second signal line; and

a first internal conductor connected to the first die, said first internal conductor being additionally connected to said first diode cathode and to said second diode cathode.

5,838,164
METHOD OF MEASURING THE THRESHOLD VOLTAGE OF METAL-OXIDE SEMICONDUCTOR FIELD-EFFECT TRANSISTORS

Shen-Li Chen, Chang-Hwa, Taiwan, assignor to United Microelectronics Corporation, Taiwan

Filed Aug. 16, 1996, Ser. No. 689,995

Claims priority, application Taiwan, Jun. 7, 1996, 85106828

Int. Cl.^{6} G01R ***31/26***

U.S. Cl. 324—769 **7 Claims**

1. A method for measuring the threshold voltage of a MOSFET device having a source, a drain, and a gate, all formed on a substrate, the method comprising the steps of:

(1) applying a variable DC voltage between the drain and the source, and grounding the source and the substrate;

(2) varying the drain-to-source voltage among a first predetermined number of levels in a first range;

(3) repeating the following steps for each level of the drain-to-source voltage:

(i) applying a variable DC voltage between the gate and the source, and varying the gate-to-source voltage among a second predetermined number of levels in a second range.

(ii) measuring the current flowing between the drain and the source for each level of the gate-to-source voltage.

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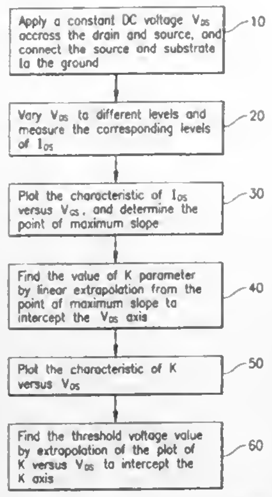
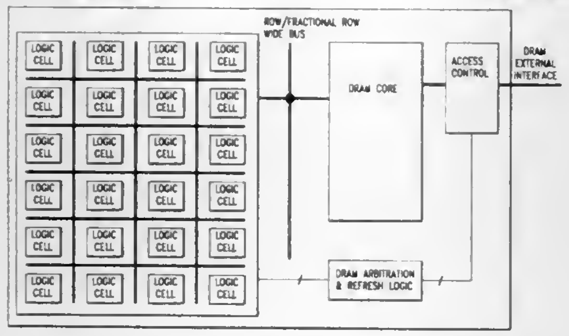

Apply a constant DC voltage V_{DS} accross the drain and source, and connect the source and substrate to the ground
10
Vary V_{GS} to different levels and measure the corresponding levels of I_{DS}
20
Plot the characteristic of I_{DS} versus V_{GS}, and determine the point of maximum slope
30
Find the value of K parameter by linear extrapolation from the point of maximum slope to intercept the V_{GS} axis
40
Plot the characteristic of K versus V_{DS}
50
Find the threshold voltage value by extrapolation of the plot of K versus V_{DS} to intercept the K axis
60

(iii) plotting a first curve which represents a drain-to-source current versus gate-to-source voltage characteristic,
(iv) determining the position of a point on the plot for which a line tangential to the point has a slope that is maximum for the plot, and
(v) linearly extrapolating the maximum slope line to obtain one K parameter value which is the intercept of the maximum slope line with the gate-to-source axis;
(4) plotting a second curve which represents the K parameter versus drain-to-source voltage characteristic; and
(5) extrapolating the second curve to obtain the intercept of the second curve with the K parameter axis, the intercept representing the threshold voltage of the MOSFET device.

5,838,165

HIGH PERFORMANCE SELF MODIFYING ON-THE-FLY ALTERABLE LOGIC FPGA, ARCHITECTURE AND METHOD

Mukesh Chatter, 6 Gina Dr., Hopkinton, Mass. 01748
Filed Aug. 21, 1996, Ser. No. 700,966
Int. Cl.^{6} H03K *19/173;7/38*
U.S. Cl. 326—38 **24 Claims**

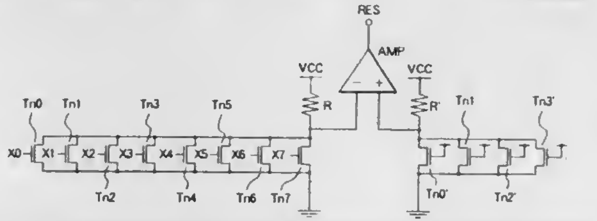


1. A method of configuring an array of programmable logic cells each having logic functions controlled by an associated configuration bit memory that comprises, storing bit information defining multiple program configurations in a DRAM core; connecting a bus to the array to enable a DRAM row wide loading of the configuration bit memories of the cells with bit information defining a desired configuration; and, upon a configuration command, retrieving from the DRAM core, at least a row at a time, the configuration bit information, and loading such information in the bit memories of the cells to control the corresponding cell logic functions to achieve the desired configuration programming, and in which, upon completion of a function by the array of logic cells, a bit command is generated to indicate a new desired functionality of the array; and a supplemental memory core is provided containing the bit address of a DRAM row and connected to be responsive to the next functionality bit command and correspondingly to drive the DRAM, retrieving and loading the configuration bit information representing said next functionality in the bit memories of the cells, controlling the corresponding cell logic functions and thereby self-reconfiguring the array to perform the next functionality.

5,838,166

COMPACT AND HIGH-SPEED JUDGING CIRCUIT USING MISFETS

Kazuyuki Nakamura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed May 31, 1996, Ser. No. 657,768
Int. Cl.^{6} H03K *19/23*
U.S. Cl. 326—36 **19 Claims**



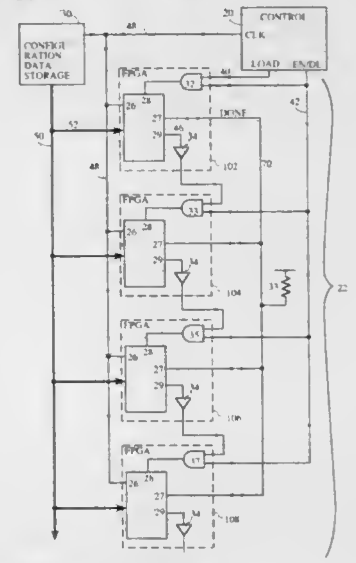
1. A judging circuit which has a judgment result output terminal and which is supplied with a digital input signal comprising first through N-th bits (N being an integer not smaller than two), each being any one of a high-level bit having a high level and a low-level bit having a low level, said judging circuit judging whether or not the number of the high-level bits among said first through said N-th bits is greater than a predetermined number M (M being an integer satisfying $1 \leqq M < N$), said judging circuit thereby producing, when said number exceeds said predetermined number M, a judgment result which represents that said number exceeds said predetermined number M and which is delivered to said judgment result output terminal, said judging circuit comprising:

a differential amplifier having an inverted input terminal, a non-inverted input terminal, and an amplifier output terminal;
first through N-th primary MISFETs (metal insulator semiconductor field effect transistors), each having a source, a drain, and a gate;
first through M-th secondary MISFETs, each having a source, a drain, and a gate;
a primary resistor element; and
a secondary resistor element having a resistance equal to that of said primary resistor element;
the sources of said first through said N-th primary MISFETs being connected to the ground in common, the drains of said first through said N-th primary MISFETs being connected to one end of said primary resistor element in common, the other end of said primary resistor element being supplied with a power-supply voltage, the gates of said first through said N-th primary MISFETs being supplied with said first through said N-th bits, respectively, said first through said N-th primary MISFETs having on-currents, respectively, which are equal to one another, the inverted input terminal of said differential amplifier being connected to said one end of the primary resistor element;
the sources of said first through said M-th secondary MISFETs being connected to the ground in common, the drains of said first through said M-th secondary MISFETs being connected to one end of said secondary resistor element in common, the other end of said secondary resistor element being supplied with said power-supply voltage, the gates of said first through said M-th secondary MISFETs being supplied with a gate voltage in common so that said first through said M-th secondary MISFETs are constantly kept in an on-state, said first through said M-th secondary MISFETs having on-currents, respectively, which are equal to one another and equal to the on-currents of said first through said N-th primary MISFETs, the non-inverted input terminal of said differential amplifier being connected to said one end of the secondary resistor element;
said amplifier output terminal being connected to said judgment result output terminal.

5,838,167

METHOD AND STRUCTURE FOR LOADING DATA INTO SEVERAL IC DEVICES

Charles R. Erickson, Fremont, and Lawrence Cy-Wei Hung, Los Gatos, both of Calif., assignors to Xilinx, Inc., San Jose, Calif.
Division of Ser. No. 451,781, May 26, 1995, Pat. No. 5,640,106. This application May 13, 1997, Ser. No. 855,029
Int. Cl.^{6} H03K *19/177*
U.S. Cl. 326—38 **2 Claims**



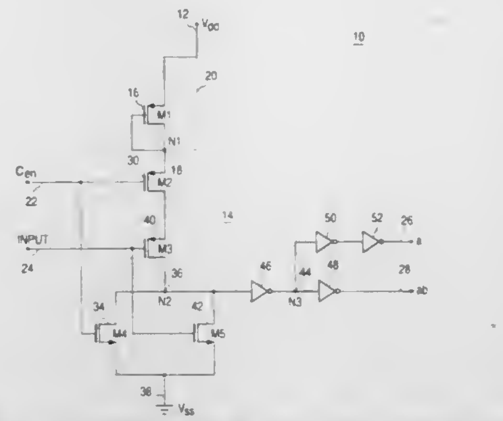
1. An FPGA structure comprising:
an array of FPGAs; and
a common data bus having access to each such FPGA for downloading configuration data into each such FPGA without passing said configuration data through another FPGA in said array;
wherein each such FPGA comprises:
a first means for enabling and disabling configuration of said FPGA from said data bus; and
a second means for enabling and disabling configuration of said FPGA from said data bus.

5,838,168

3V/5V INPUT BUFFER

Larry W. Petersen, Pocatello, Id., assignor to American Microsystems, Inc., Pocatello, Id.
Filed Sep. 5, 1996, Ser. No. 708,595
Int. Cl.^{6} H03K *19/092*
U.S. Cl. 326—81 **28 Claims**

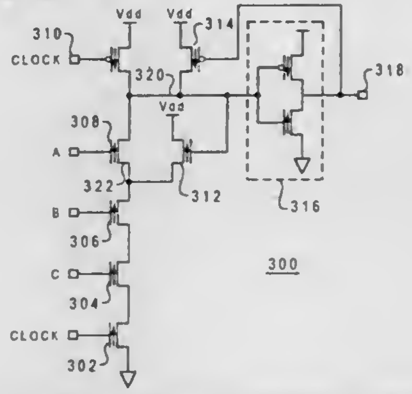
1. An input buffer capable of operating at a first supply voltage or a second supply voltage with the operating voltage level selectable during manufacture, comprising:
a power supply voltage input terminal;
a buffer circuit connected between a signal input terminal and a signal output terminal; and
at least one transistor connected between the power supply voltage input terminal and the buffer circuit, wherein a direct electrical connection is formed between the source and drain terminals of at least one of said transistor so as to short the at least one transistor when the first supply voltage is the intended operating voltage.



5,838,169

NMOS CHARGE-SHARING PREVENTION DEVICE FOR DYNAMIC LOGIC CIRCUITS

Eric Bernard Schorn, Austin, Tex., assignor to International Business Machines Corporatoin, Armonk, N.Y.
Filed Sep. 17, 1996, Ser. No. 713,881
Int. Cl.^{6} H03K *19/096;19/084*
U.S. Cl. 326—98 **8 Claims**



1. A device for preventing charge redistribution in a logic circuit, comprising:
a logic block having a plurality of inputs and an output, the logic block including a plurality of transistors;
a precharge device, wherein said precharge device is a clock application device having a clock input and wherein said precharge device is connected to the output of the logic block, wherein the clock application device holds the output of the logic block at a fixed voltage level when the clock input is at a first voltage level and wherein the clock application device allows a result of a logic operation performed within the logic block to be communicated at the output of the logic block when the clock input is at a second voltage level;
a charge redistribution prevention device connected to at least one of the transistors in the logic block and controlled by the output of the logic block for applying a voltage to the logic block to reduce charge flowing from the output of the logic block to nodes internal to the logic block when the at least one transistor in the logic block becomes conducting, and
an inverting stage having an input connected to the output of the logic block, and having an output; and
a bias device, connected to the output of the logic block and controlled by the output of the inverting stage, for maintaining the output of the logic block at a constant voltage when the clock input is at the second voltage level, until the output of the logic block changes to a different voltage level.

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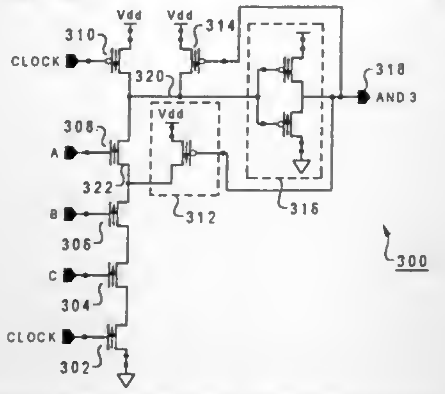
5,838,170
PMOS CHARGE-SHARING PREVENTION DEVICE FOR DYNAMIC LOGIC CIRCUITS

Eric Bernard Schorn, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 17, 1996, Ser. No. 713,883

Int. Cl.⁶ H03K *19/096;19/084*

U.S. Cl. 326—98 **6 Claims**



1. A device for preventing charge redistribution in a logic circuit, comprising:

a logic block having a plurality of inputs and an output, the logic block including a plurality of transistors;

a precharge device, being connected to the output of the logic block, wherein the precharge device is a clock application device having a clock input which alternates between a first voltage level and a second voltage level and wherein said precharged device holds the output of the logic block at a fixed voltage level during a first period of time, when said clock input is at a first voltage level, and wherein the precharge device allows a result of a logic operation performed within the logic block to be communicated at the output of the logic block during a second period of time;

an inverting stage having an input connected to the output of the logic block, and having an output;

a charge redistribution prevention device connected to at least one of the transistors in the logic block and controlled by the output of the inverting stage for applying a voltage to the logic block to reduce charge flowing from the output of the logic block to nodes internal to the logic block when the at least one transistor in the logic block becomes conducting;

a bias device, connected to the output of the logic block and controlled by the output of the inverting stage, for maintaining the output of the logic block at a constant voltage when the clock input is at the second voltage level, until this output of the logic block changes to a different voltage level.

5,838,171
LOW POWER REAL-TIME CLOCK CIRCUIT HAVING SYSTEM AND BATTERY POWER ARBITRATION

Timothy Don Davis, Arlington, Tex., assignor to National Semiconductor Corporation, Santa Clara, Calif.

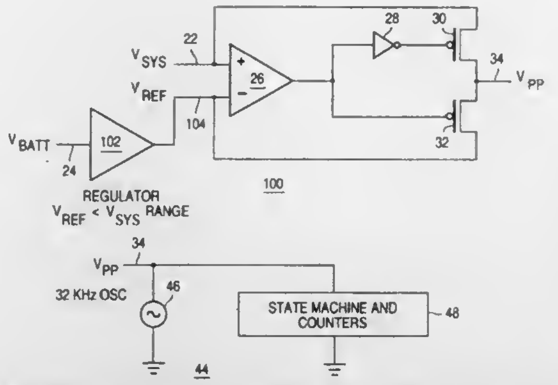
Filed Nov. 22, 1996, Ser. No. 755,279

Int. Cl.⁶ H03K *5/24*

U.S. Cl. 327—19 **11 Claims**

6. A low power clock circuit, comprising:

a power arbitration circuit for determining which one of a first voltage source and a second voltage source is provided as an output voltage source, wherein the first and second voltage sources produce first and second voltage signals, respectively, having overlapping voltage ranges, the power arbitration circuit producing an output which is the greater of the second voltage signal and a reference voltage signal derived from the first voltage signal, and further, wherein the reference voltage signal is not within the range of the second voltage signal;



an oscillator configured to have the output of the power arbitration circuit as an input and producing a clock signal as an output; and

a power supply detection circuit having as inputs the reference voltage signal and the first voltage signal, and producing a low supply detection signal as an output when the first voltage signal is less than the reference voltage signal.

5,838,172
TIMING ERROR DETECTING CIRCUIT

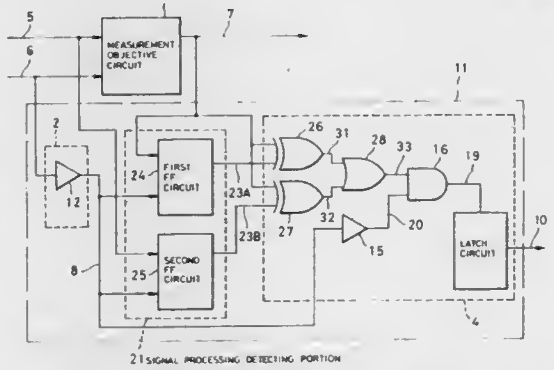
Hiroshi Ito, Kawasaki, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 17, 1996, Ser. No. 767,871

Claims priority, application Japan, Dec. 27, 1995, 7-341635

Int. Cl.⁶ H03K *5/13*

U.S. Cl. 327—20 **10 Claims**



1. A timing error detecting circuit for detecting a timing error of a measurement objective circuit by reading an input data in synchronism with rising or falling of a timing signal and outputting a first output data as a result of the process, comprising:

a specification insertion circuit for providing an allowable specification value of a delay period relative to said timing signal;

a signal processing detecting portion reading said first output data of said measurement objective circuit in synchronism with rising or falling of output of said specification insertion circuit and performing similar process to said measurement objective circuit for outputting a second output data; and

a judgement circuit inputting said first output data of said measurement objective circuit and the second output data of said signal processing detecting portion and making judgement of the timing error of said measurement objective circuit following a rising or falling edge of said output of said specification insertion circuit.

5,838,173
DEVICE AND METHOD FOR DETECTING A LOW VOLTAGE IN A SYSTEM

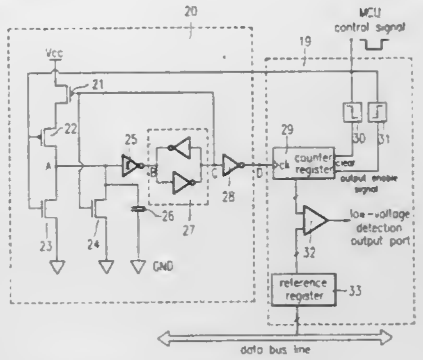
Hyung Seog Oh, Chungcheoungbuk-do, Rep. of Korea, assignor to LG Semicon Co., Ltd., Chungcheongbuk-do, Rep. of Korea

Filed May 30, 1997, Ser. No. 866,239

Claims priority, application Rep. of Korea, Oct. 24, 1996, 1996/48007

Int. Cl.⁶ H03K *5/22*

U.S. Cl. 327—77 **28 Claims**



1. A low-voltage detecting circuit comprising:

oscillating means for generating a waveform proportional to a supply voltage according to a control signal input thereto; and

low-voltage detecting signal generating means for generating a detection signal based on the waveform generated by said oscillating means for indicating when the supply voltage is low.

5,838,174
PHOTOCOUPLER HAVING ELEMENT ISOLATION LAYERS FOR LOW CROSS-TALK LOW STRESS AND HIGH BREAK DOWN VOLTAGE

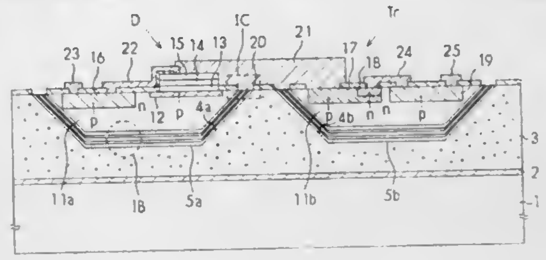
Tsuyoshi Nakagawa, Nagoya; Yoshiaki Nakatsugawa, Anjo, and Hajime Inuzuka, Nishio, all of Japan, assignors to Denso Corporation, Kariya, Japan

Filed Nov. 25, 1996, Ser. No. 760,179

Claims priority, application Japan, Nov. 24, 1995, 7-305975; Nov. 15, 1996, 8-304975

Int. Cl.⁶ H01L *27/15*

U.S. Cl. 257—83 **14 Claims**



1. A semiconductor device, comprising:

a substrate;

a plurality of isolation films, having an end portion thereof facing a surface of said substrate, formed within said substrate;

a plurality of islands each made up of a region surrounded by said isolation films in said substrate;

a light-emitting element, for emitting light, formed in one of said islands;

a light-receiving element, for receiving light emitted by said light-emitting element, formed in an island different from said island wherein said light-emitting element is formed;

a surface insulation film formed on a portion of said substrate other than a portion proximate said isolation-film end portion; and

a waveguide path formed on said surface insulation film at said end portion of said isolation film on said substrate, said waveguide path being composed of a material having, a predetermined refractive index, for optically coupling said light-emitting element and said light-receiving element, wherein:

said plurality of isolation films includes first insulation films composed of a first material having a refractive index smaller than a refractive index of said material making up said waveguide path, and second insulation films composed of a second material having a refractive index equal to or greater than a refractive index of said material making up said waveguide path and having a film thickness smaller than a wavelength of said light in said waveguide path, structured in a plurality of laminations.

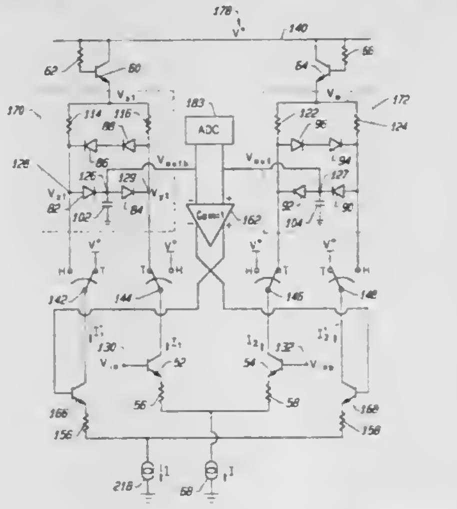
5,838,175
LOW DISTORTION TRACK AND HOLD CIRCUIT

Kuo-Chiang Hsieh, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 5, 1997, Ser. No. 795,222

Int. Cl.⁶ G11C *27/02*

U.S. Cl. 327—94 **16 Claims**



1. A track and hold circuit responsive to an input voltage, the circuit comprising:

a diode bridge having a first node, a second node, and a third node, the first node being opposite the second node;

a sampling capacitor connected to the third node of the diode bridge;

a first resistor connected between the first node of the diode bridge and a supply voltage;

a second resistor connected between the second node of the diode bridge and the supply voltage, the second resistor being equal in value to the first resistor;

voltage-to-current converting means for generating a first current and a second current in response to the input voltage, the first current, when fed to the first node of the diode bridge generating on the capacitor an output voltage that linearly tracks the input voltage;

switch means, having a track state and a hold state, for selectively connecting the first current and the second current from the voltage-to-current converting means to the diode bridge, the switch means connecting the first current to the first node and dumping the second current in the track state, the switch means dumping the first current and connecting the second current to the second node in the hold state, the second current being equal to the first current during the track mode; and

operational amplifier means, coupled to the output voltage, for generating a buffered offset voltage;

wherein said voltage to current converting means operates in response to the buffered offset voltage for generating the second current.

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5,838,176

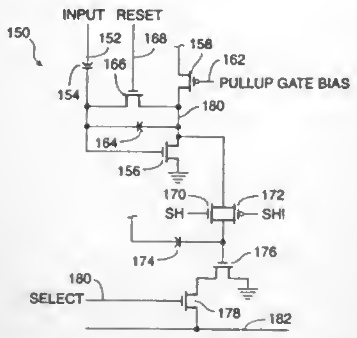
CORRELATED DOUBLE SAMPLING CIRCUIT

Tobias Delbruck, Pasadena, and Carver A. Mead, Cupertino, both of Calif., assignors to Foveonics, Inc., Cupertino, Calif.

Continuation-in-part of Ser. No. 679,686, Jul. 11, 1996. This application Jun. 2, 1997, Ser. No. 867,472

Int. Cl.⁶ G11C *27/02*

U.S. Cl. 327—95 **1 Claim**



1. A correlated double sampling circuit comprising:
an input node comprising a first plate of input capacitor;
an output node;
a feedback capacitor having a first plate connected to said output node and a second plate connected to a second plate of said input capacitor;
an input transistor having a gate connected to said second plate of said input capacitor, a source connected to a first supply voltage rail, and a drain connected to said output node;
a load transistor having a gate connected to a bias node, a drain connected to said output node, and a source connected to a second supply voltage rail; and
a reset transistor connected between output node and said second plate of the input capacitor, and having a gate connected to a reset signal line.

5,838,177

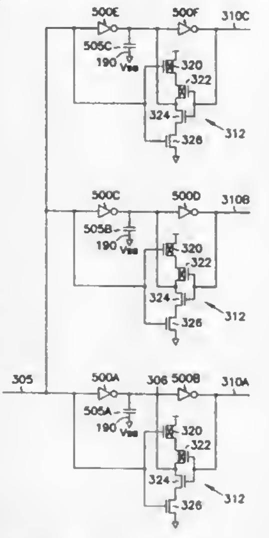
ADJUSTABLE OUTPUT DRIVER CIRCUIT HAVING PARALLEL PULL-UP AND PULL-DOWN ELEMENTS

Brent Keeth, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Jan. 6, 1997, Ser. No. 779,344

Int. Cl.⁶ H03K *3/00*

U.S. Cl. 327—108 **15 Claims**



1. An output driver circuit comprising:
a first plurality of output transistors, each having a control terminal, electrically coupling an output node to a first voltage; and
a control circuit coupled to the control terminal of each output transistor in the first plurality of output transistors for sequentially turning on or off the output transistors in the first plurality of output transistors in response to a transition in a first input signal received by the control circuit;
the control circuit comprising:
a first inverter having an output coupled to the control terminal of one of the first plurality of output transistors,
a second inverter having an output connected to an input of the first inverter,
a capacitor connected between the output of the second inverter and a reference voltage, and
forcing circuitry coupled to the first and second inverters to selectively force the output of the second inverter to either the first voltage or second voltage based upon an input of the second inverter and an output of the first inverter.

5,838,178

PHASE-LOCKED LOOP AND RESULTING FREQUENCY MULTIPLIER

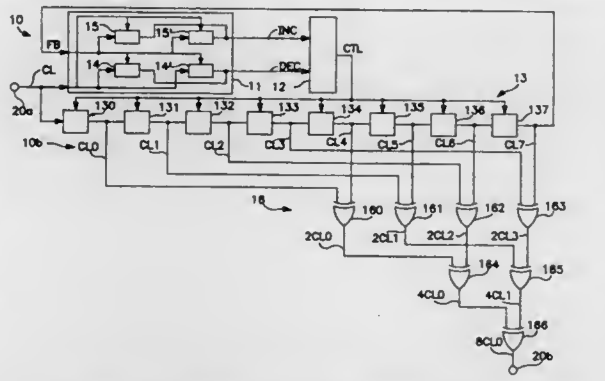
Roland Marbot, Versailles, France, assignor to Bull S.A., Paris, France

Continuation of Ser. No. 642,652, May 3, 1996, abandoned, which is a continuation of Ser. No. 312,981, Oct. 3, 1994, Pat. No. 5,548,235, which is a continuation of Ser. No. 46,179, Apr. 14, 1993, which is a continuation of Ser. No. 762,018, Sep. 18, 1991, Pat. No. 5,260,608. This application Aug. 29, 1997, Ser. No. 921,334

Claims priority, application France, Feb. 6, 1990, 90 01366

Int. Cl.⁶ H03K *5/00*

U.S. Cl. 327—116 **13 Claims**



1. A frequency multiplier system comprising equally phase-shifted input signals of an identical frequency and a tree of gates each of the Exclusive-OR type and each having two inputs and one output, said tree having at least three levels of gates including an input level of gates for receiving said phase shifted input signals on respective inputs thereof, an intermediate level of gates for receiving first output signals of the input level of gates on respective inputs thereof, which first output signals are a frequency multiple of said identical frequency of said phase shifted input signals, and providing second output signals which are a frequency multiple of the first output signals, and an output level of one gate receiving the second output signals of said intermediate level of gates and providing a third output signal which constitutes the output of said frequency multiplier system and which is a frequency multiple of said second output signals, two of said outputs of said gates of said input level of gates, being connected to the inputs of one of said gates in the intermediate level, said outputs of said intermediate level of gates being connected to the inputs of said output level gate, and each of said phase shifted input signals to said input level of gates flowing through an equal number of said gates at each level to provide said output signal of said frequency multiplier.

5,838,179

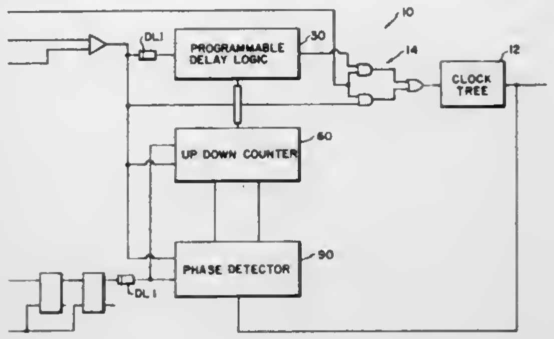
CLOCK COMPENSATION CIRCUIT

Steven G. Schmidt, Mount Holly, N.J., assignor to General Signal Corporation, Stamford, Conn.

Filed Feb. 11, 1997, Ser. No. 798,939

Int. Cl.⁶ H03K *5/13;* **H03L** *7/06*

U.S. Cl. 327—156 **2 Claims**



1. A clock compensation circuit for connection to a clock buffer, the clock buffer generating a clock buffer output signal (TRECLK) from an intermediate clock signal (CLKOUT), said clock compensation circuit comprising:
a programmable delay logic for receiving a reference clock signal(REFCLK) and generating said intermediate clock signal, said programmable delay logic including a plurality of delay elements coupled in series to form a string of delay elements participating in a delay string for delaying said reference clock signal to provide a phase relationship between said clock buffer output signal and said reference clock signal;
a phase detector for generating phase comparison signals related to phase differences between said clock buffer output signal and said reference clock signal; and
a controller, responsive to said phase comparison signals, for selecting a first delay element from said string of delay elements to start said delay string, said delay elements prior to said selected first delay element being excluded from participating in said delay string and said delay elements subsequent to said selected first element participating in said delay string, wherein any delay element from said string of delay elements can be selected by said controller to start said delay string to provide a selected phase relationship between said clock buffer output signal and said reference clock signal.

5,838,180

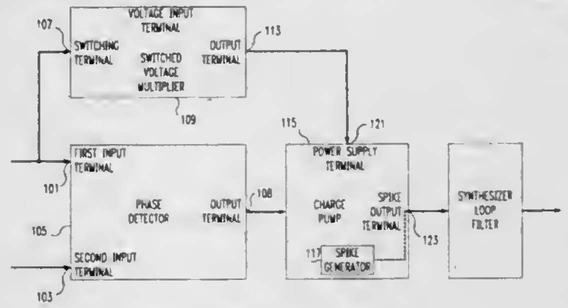
LOW-VOLTAGE FREQUENCY SYNTHESIZER

Andrzej Partyka, Bedminster, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Sep. 12, 1996, Ser. No. 713,051

Int. Cl.⁶ H03L *7/099;* **H03B** *5/04*

U.S. Cl. 327—157 **5 Claims**



1. A control voltage generator including:
(a) a phase comparator for measuring the phase difference between a reference waveform and an input waveform and for generating a voltage proportional to the phase difference on a phase comparator output terminal;
(b) a charge pump having a charge pump input terminal, a power supply port, and a charge pump output terminal, the charge pump input terminal being coupled to the phase comparator output terminal, wherein, in response to signals received at the charge pump input terminal, the charge pump uses power applied to the power supply port to generate a VCO control voltage at the charge pump output terminal;
(c) a switched voltage multiplier having a first input coupled to the reference waveform, a second input coupled to a DC power source, and an output port coupled to the power supply port of the charge pump, wherein, in response to signals received at the first input, the switched voltage multiplier uses the DC power source at the second input to generate a multiplied voltage at the output port.

5,838,181

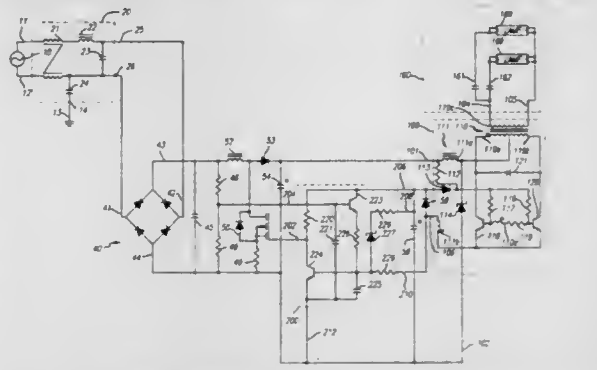
PULSE-WIDTH MODULATOR CIRCUIT FOR USE IN LOW-COST POWER FACTOR CORRECTION CIRCUIT

Bryce L. Hesterman, Fort Wayne, Ind., assignor to MagneTek, Inc., Nashville, Tenn.

Division of Ser. No. 385,906, Feb. 9, 1995, Pat. No. 5,568,041. This application May 3, 1996, Ser. No. 642,562

Int. Cl.⁶ H03R *3/017*

U.S. Cl. 327—175 **13 Claims**



1. A pulse-width modulator circuit comprising:
means for receiving as an input a reference waveform signal;
means for combining the reference waveform signal with a second signal to form a composite waveform signal;
comparator means for comparing the composite waveform signal with a reference voltage, the pulse width modulator including an output terminal that provides an "off" or "on" output depending upon the results of the comparison, such that a change in the level of the second signal causes an adjustment in the duty cycle of the output.

5,838,182

Patent Not Issued For This Number

5,838,183

CLOCK SIGNAL GENERATOR HAVING VOLTAGE LEVEL CONVERTING CIRCUIT

Yasuhiro Ishizaka, Gunma, Japan, assignor to NEC Corporation, Japan

Filed Jan. 27, 1997, Ser. No. 789,658

Claims priority, application Japan, Jan. 29, 1996, 8-012644

Int. Cl.⁶ H03L *7/06*

U.S. Cl. 327—299 **6 Claims**

1. A clock signal generator comprising:
a phase locked loop circuit supplied with a control base clock signal and an input clock signal which has a first frequency for converting said input clock signal to generate a PLL

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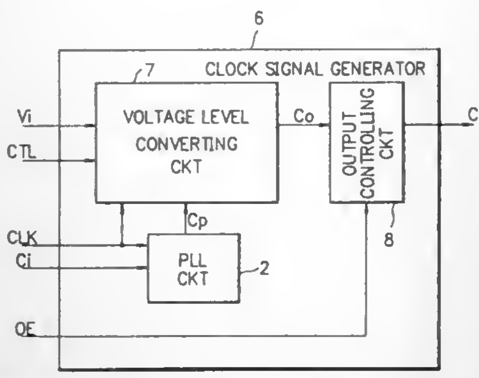


output clock signal which has a second frequency, said input clock signal having one of binary values that has a voltage level which is similar to a reference voltage level of a reference voltage; and

a voltage level converting circuit supplied with said PLL output clock signal, said control base clock signal, said reference voltage, and a voltage level control signal for converting, in response to said control base clock signal, said reference voltage, and said voltage level control signal, said PLL output clock signal to generate an output clock signal which has an output voltage level which is different from said reference voltage levels;

wherein said voltage level converting circuit comprises:
- an input voltage level detecting circuit supplied with said reference voltage for detecting said reference voltage to generate a converted reference signal;
- a voltage level setting counter supplied with said control base clock signal and said voltage level control signal for generating, in response to said control base clock signal and said voltage level control signal, a counted voltage level setting signal;
- an input output voltage level comparing circuit connected to said input voltage level detecting circuit and said voltage level setting counter, said input output voltage level comparing circuit for comparing said converted reference signal with said counted voltage level setting signal to generate a voltage compared result signal; and
- a voltage decreasing circuit supplied with said control base clock signal and connected to said phase locked loop circuit and said input output voltage level comparing circuit for decreasing said PLL output clock signal, in response to said voltage compared result signal, to generate said output clock signal.

5,838,184
EQUIVALENT VARIABLE RESISTOR CIRCUITS

Hitoshi Tomiyama, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 21, 1997, Ser. No. 861,198
Claims priority, application Japan, May 24, 1996, 8-129695
Int. Cl.^{6} H03L *5/00*
U.S. Cl. 327—308 **10 Claims**

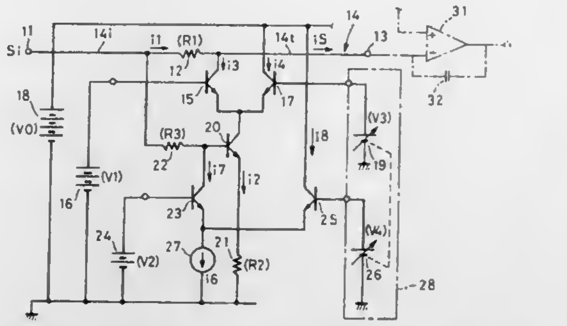
1. An equivalent variable resistor circuit comprising:

a signal path extending from a signal input terminal through a first resistor to a signal output terminal;

a first transistor having a first electrode connected with a signal output portion of said signal path between the first resistor and the signal output terminal;

a second transistor having a first electrode connected with a DC voltage source and a second electrode connected with a second electrode of said first transistor for forming a differential pair with said first transistor;

a third transistor having a first electrode connected with the second electrodes of said first and second transistors and a second electrode connected through a second resistor to a



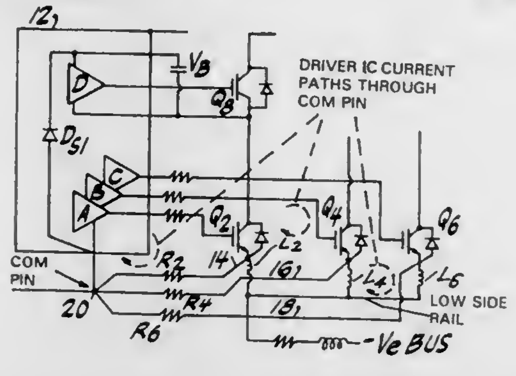
reference potential point to form a voltage to current converting portion with the second resistor; and

a voltage controlling portion provided for varying a DC voltage supplied between a third electrode of said first transistor and a third electrode of said second transistor, whereby an equivalent resistance of said signal path between the signal input terminal and the signal output terminal is varied.

5,838,185
MULTIPLE INDIVIDUAL KELVIN EMITTER CONNECTIONS TO REDUCE CURRENT FLOW THROUGH PARASITIC DIODE

Ajit Dubhashi, El Segundo, and Tyler Fure, Hermosa Beach, both of Calif., assignors to International Rectifier Corporation, El Segundo, Calif.

Filed Feb. 3, 1997, Ser. No. 794,658
Int. Cl.^{6} H03K *17/92*
U.S. Cl. 327—382 **6 Claims**



1. A driving circuit for driving a load, comprising:

a top rail and a bottom rail and at least one transistor arranged along the bottom rail;

an integrated circuit driver coupled to and serving for turning the at least one switching transistor at the bottom rail on and off, wherein the integrated circuit driver has a COM pin and includes at least one parasitic diode;

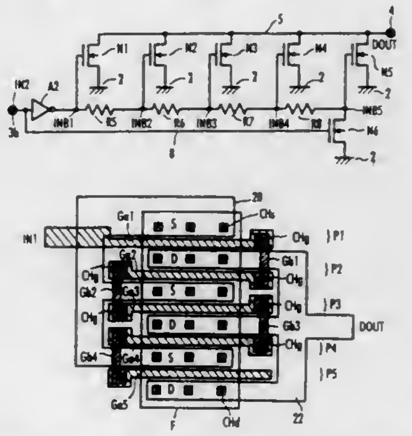
and wherein each of at least one switching transistor at the bottom rail has an emitter connected to the bottom rail by a trace and has associated therewith a respective parasitic inductance relating to the length of the trace; and

wherein the at least one switching transistor at the bottom rail is provided with an individual Kelvin emitter connection from the COM pin of the integrated circuit driver to the emitter of the transistor to reduce the parasitic inductance, as seen by the integrated circuit driver, which is associated with the at least one bottom rail switching transistor and which relates to the length of the trace of the connection between the emitter and the bottom rail.

5,838,186
SIGNAL OUTPUT CIRCUIT WITH REDUCED NOISE IN OUTPUT SIGNAL

Osamu Inoue, and Osamu Ara, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 726,737, Oct. 7, 1996, abandoned, which is a continuation of Ser. No. 487,209, Jun. 7, 1995, abandoned. This application Jun. 20, 1997, Ser. No. 880,071
Claims priority, application Japan, Sep. 21, 1994, 6-226139
Int. Cl.^{6} H03K *5/01*
U.S. Cl. 327—389 **10 Claims**



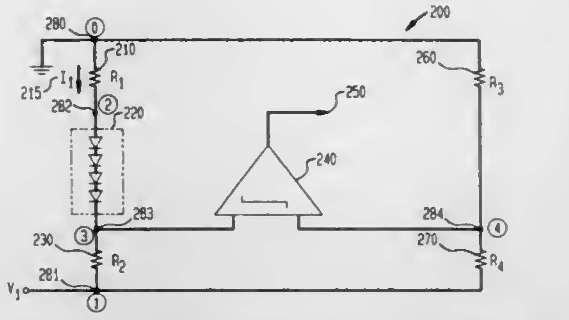
1. A semiconductor circuit responsive to an input signal for driving an output node to a logic level corresponding to said input signal, comprising an output stage having:
- a plurality of first transistors connected in parallel with each other between a reference node for supplying a first reference potential and an output signal line connected to said output node, and each rendered conductive when a signal of a first logic level is applied to a control electrode thereof;
- a control electrode line interconnecting respective control electrodes of said plurality of first transistors;
- a second transistor provided between said reference node and said control electrode line and rendered conductive when a signal of the first logic level is applied to a control electrode thereof; and
- means for providing a signal complementary to said input signal and applying one of the input signal and the complementary signal to the control electrode line of said plurality of first transistors and the other of the input signal and the complementary signal to the control electrode of said second transistor, respectively, wherein
  - said plurality of first transistors include
    - a plurality of control electrode layers each being elongated in configuration and having a predetermined resistance between opposite ends thereof and provided for respective control electrodes of said plurality of first transistors; and
    - a plurality of interconnection layers interconnecting the plurality of control electrodes of the plurality of first transistors at the ends such that resistances thereof are in series, each of said plurality of interconnection layers being of a resistance between opposite ends thereof greater than that of each of said plurality of control electrode layers.

5,838,187
INTEGRATED CIRCUIT THERMAL SHUTDOWN SYSTEM UTILIZING A THERMAL SENSOR

Milton Luther Embree, Reading, Pa., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Feb. 10, 1997, Ser. No. 797,149
Int. Cl.^{6} H03K *5/24*
U.S. Cl. 327—512 **20 Claims**

1. An integrated circuit incorporating a thermal shutdown circuit protecting an integrated circuit component, comprising:



a thermal sensing device for determining a first voltage corresponding to an integrated circuit ambient temperature;

a first thermal sensing resistor located proximate to said integrated circuit component so that said first thermal sensing resistor temperature approximates said integrated circuit component temperature;

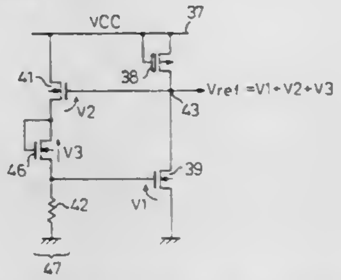
a second thermal sensing resistor located within said integrated circuit such that said second thermal sensing resistor temperature approximates said integrated circuit ambient temperature, said first and second thermal sensing resistors configured to generate a second voltage corresponding to a temperature differential between said integrated circuit ambient temperature and said integrated circuit component temperature; and

a comparator comparing the algebraic sum of said first voltage and said second voltage with a reference voltage, said reference voltage corresponding to a temperature limit for said integrated circuit component, and said comparator providing a system shutdown signal when said temperature limit is exceeded.

5,838,188
REFERENCE VOLTAGE GENERATION CIRCUIT

Masao Taguchi, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 462,594, Jun. 5, 1995, abandoned, which is a division of Ser. No. 278,236, Jul. 21, 1994, abandoned. This application Feb. 3, 1997, Ser. No. 794,773
Claims priority, application Japan, Aug. 31, 1993, 5-215535
Int. Cl.^{6} G05F *1/10*
U.S. Cl. 327—530 **8 Claims**



1. A reference voltage generation circuit comprising:

load means acting as a constant current source having a first end thereof connected to a power supply voltage, said constant current source supplying a constant current regardless of a change in said power supply voltage;

a first enhancement type n-channel MIS transistor having a drain thereof connected to a second end of said load means, and a source thereof connected to a specific lower voltage potential:

a resistance means provided between a gate of said first enhancement type n-channel type n-channel MIS transistor and said specific lower voltage potential;

a source follower circuit comprising a second enhancement type n-channel MIS transistor having a drain thereof connected directly to said power supply voltage Vcc and a gate thereof connected to the drain of said first enhancement type n-channel MIS transistor; and

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level shift means connected between the source of said second enhancement type n-channel MIS transistor and the gate of said first enhancement type n-channel MIS transistor.

5,838,189
SUBSTRATE VOLTAGE GENERATING CIRCUIT OF SEMICONDUCTOR MEMORY DEVICE

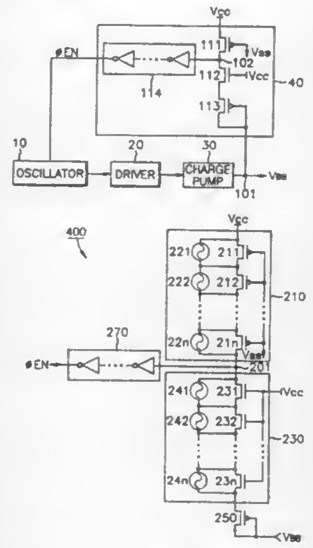
Jun-Young Jeon, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 18, 1995, Ser. No. 574,020

Claims priority, application Rep. of Korea, Dec. 21, 1994, 1996 35776

Int. Cl.^{6} G05F *1/10*

U.S. Cl. 327—537 **6 Claims**



1. A substrate voltage generating circuit for a semiconductor memory device provided with first and second operating supply terminals for application of direct operating supply voltage therebetween to cause respective potentials at said first and second operating supply terminals which said respective potentials differ from each other, said semiconductor memory device constructed in integrated-circuit form on a substrate of semiconductive material having capacitance with respect to said first operating supply terminal, said substrate voltage generating circuit comprising:

- an oscillator for selectively generating an oscillating signal, the generation of said oscillating signal being enabled or disabled in accordance with respective first and second states of an oscillating control signal;
- a charge pump responsive to said oscillating signal for charge-pumping said substrate to a potential that differs from potential at said first operating supply terminal in opposite sense of polarity that the potential at said second operating supply terminal differs from potential at said first operating supply terminal; and
- a detector for detecting whether or not the potential of said substrate differs from the potential at said first operating supply terminal by less than a prescribed substrate voltage value in order to generate said first and second states of said oscillating control signal, respectively, said detector comprising:
  - a plurality of insulated-gate field effect transistors, having respective channels in serial connection between said second and first operating supply terminals, having respective source and drain electrodes at opposite ends of their respective channels, and having respective gate electrodes connected for conditioning said insulated-gate field effect transistors to be conductive;
  - a respective severable connection between the drain and source electrodes of at least one of said insulated-gate field effect transistors; and
  - amplifier circuitry having an input connection from the connection of the channels of two of said insulated-gate field effect transistors, and having an output connection for supplying the first state of said oscillating control signal when voltage at said input connection differs from the potential at said second operating supply terminal by more than a toggle voltage value and for supplying the second state of said oscillating control signal when voltage at said amplifier circuitry input connection does not differ from the potential at said second operating supply terminal by more than said toggle voltage value, said toggle value voltage differing from the potential at said second operating supply terminal by less than the potential at said first operating supply terminal; wherein the potential of said substrate is applied to a gate electrode of a first of said insulated-gate field effect transistors with the channel thereof in a portion of said serial connection between said second and first operating operating supply terminals, which portion is between said amplifier circuitry input connection and said first operating supply terminal, which said first insulated-gate field effect transistor is of a first conductivity type, wherein said plurality of insulated-gate field effect transistors includes a first smaller plurality of said insulated-gate field effect transistors of said first conductivity type connected as a first adjustable conductance element with their channels connected between said second operating supply terminal and said amplifier circuitry input connection so the source electrode of each of said first smaller plurality of said insulated-gate field effect transistors is closer to said second operating voltage terminal than the drain electrode thereof, with their gate electrodes biased from said first operating supply terminal, and with said respective severable connection between the drain and source electrodes of at least one of said insulated-gate field effect transistors in said first smaller plurality.

5,838,190
NEGATIVE VOLTAGE DRIVE CIRCUIT

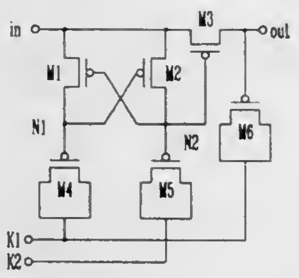
Jong Sang Lee, Ichon, Rep. of Korea, assignor to Hyundai Electronics Industries, Co., Ltd., Kyungki-Do, Rep. of Korea

Filed Oct. 15, 1996, Ser. No. 731,419

Claims priority, application Rep. of Korea, Oct. 14, 1995, 1995 35435

Int. Cl.^{6} G05F *3/02*

U.S. Cl. 327—537 **10 Claims**



1. A negative voltage drive circuit comprising:

- switching element coupled between an input terminal adapted for coupling to a charge pump and an output terminal;
- a cross latch pumping circuit for controlling said switching element according to a first clock signal and a second clock signal and for maintaining an output voltage of said negative voltage drive circuit to be lower than an output voltage of said charge pump; and
- a capacitor for performing pumping operation according to said first clock signal when the output terminal is isolated from the input terminal, said capacitor being formed from a PMOS transistor.

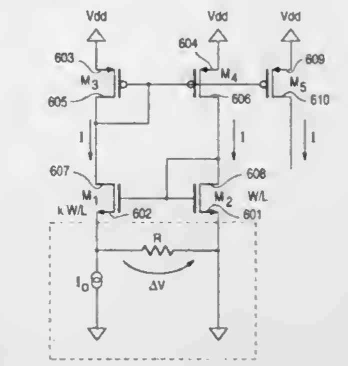
5,838,191
BIAS CIRCUIT FOR SWITCHED CAPACITOR APPLICATIONS

Ion E. Opris, Stanford, and Laurence D. Lewicki, Sunnyvale, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Feb. 21, 1997, Ser. No. 804,169

Int. Cl.^{6} G05F *1/10*

U.S. Cl. 327—539 **17 Claims**



1. An adaptive bias circuit for conducting a bias current over variations in operating conditions, said adaptive bias circuit comprising:

- a first transistor having first, second, and third terminals;
- a second transistor having fourth, fifth, and sixth terminals said fourth and sixth terminals coupled to said third terminal;
- a first current source coupled to said first and fourth terminals and configured to provide first and second substantially constant bias currents thereto wherein said first transistor operates at a first effective current density and said second transistor operates at a second effective current density;
- a second current source coupled to said second terminal and configured to draw a third substantially constant bias current; and
- a resistance coupled between said second and fifth terminals;
  - wherein a voltage develops across said resistance in accordance with said first and second transistors operating at said first and second effective current densities.

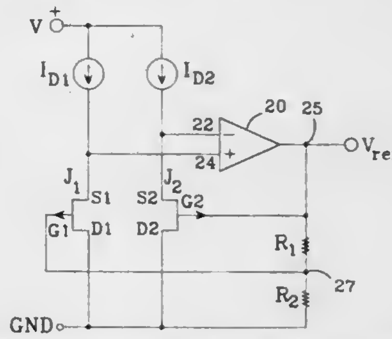
5,838,192
JUNCTION FIELD EFFECT VOLTAGE REFERENCE

Derek F. Bowers, Sunnyvale, and Larry C. Tippie, Santa Clara, both of Calif., assignors to Analog Devices, Inc., Norwood, Mass.

Filed Jan. 17, 1996, Ser. No. 587,548

Int. Cl.^{6} G05F *1/10*

U.S. Cl. 327—541 **10 Claims**



1. A JFET voltage reference which provides a positive output voltage, comprising:

- a pair of JFETs having source, drain and gate terminals, different channel doping densities which result in unequal pinchoff voltages, and equal channel width-to-length ratios, each JFET characterized by a source-drain current path between its respective source and drain terminals,
- an operational amplifier having inverting and noninverting inputs and an output, and
- a pair of equal current current sources,
- the source-drain current paths of said JFETs connected to opposite respective ones of said operational amplifier inputs and also to receive equal currents from said current sources and to establish respective current flow paths between said current sources and a ground reference through respective ones of said JFET source-drain current paths, said current source currents being sufficient to maintain said JFETs in saturation, and the gates of said JFETs connected across a resistor, said resistor being part of a resistance circuit that is connected to the operational amplifier output to reproduce the difference in pinchoff voltages between said JFETs across said resistor and to establish a voltage reference output as a function of the voltage across said resistor.

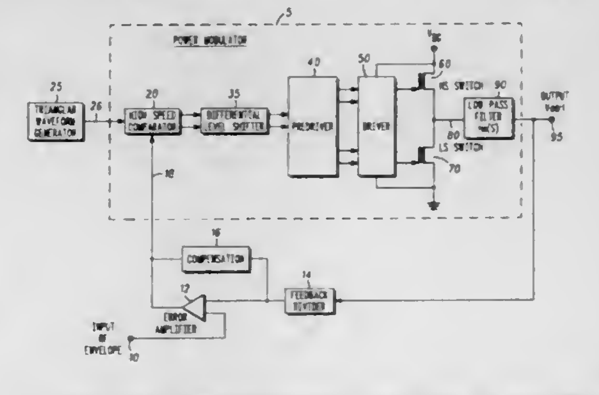
5,838,193
TIME-DELAY COMPENSATING WIDEBAND CLASS-S MODULATOR AND METHOD THEREFOR

Ronald Gene Myers, Scottsdale, and Bernard Eugene Sigmon, Gilbert, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 26, 1996, Ser. No. 757,001

Int. Cl.^{6} H03F *3/38*

U.S. Cl. 330—10 **22 Claims**



1. A time-delay compensating class-S modulator for amplifying an input signal having envelope information to an output signal having said envelope, comprising:

- an error amplifier having a first input to receive said input signal, a second input, and an output for conveying a delay error signal representing a phase delay error between said input signal and said output signal;
- a comparator having a first input to receive said delay error signal, a second input to receive a reference waveform, and a compared output;
- a driver including at least one input coupled to said compared output, a first differential output, and a second differential output;
- a switching stage including a high-side switch controlled by said first differential output, and a low-side switch controlled by said second differential output, said high-side and said low-side switches being configured in a totem-pole arrangement to generate a switch output; and
- a low-pass filter coupled to said switch output to restore an amplified envelope of said input signal.

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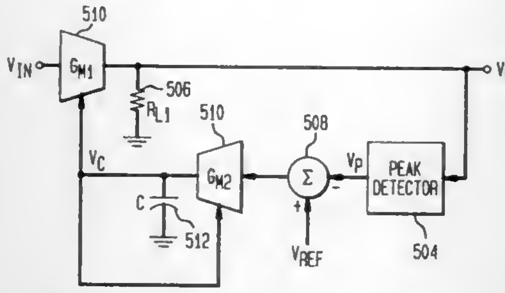
5,838,194
CONSTANT SETTLING TIME AUTOMATIC GAIN CONTROL CIRCUITS

John M. Khoury, New Providence, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Oct. 17, 1996, Ser. No. 732,958

Int. Cl.^{6} H03G *3/30*

U.S. Cl. 330—139 **12 Claims**



1. An automatic gain control (AGC) circuit having a substantially constant settling time, comprising:

a variable gain amplifier (VGA) wherein gain of the VGA is non-exponentially controlled by a control signal; and

a feedback loop providing the control signal to control the gain of the VGA, the feedback loop having a signal magnitude detector coupled to detect the magnitude of an output of the VGA, a summation node configured to generate a difference signal based on an output of the signal magnitude detector and a reference signal, and a non-linear loop filter configured to generate the control signal based on the difference signal.

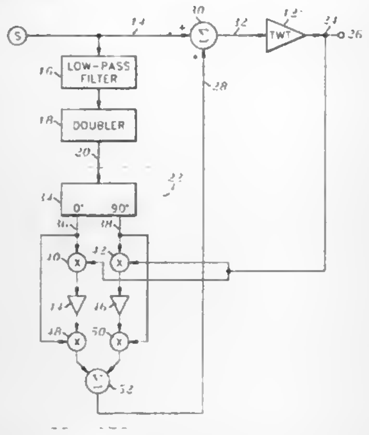
5,838,195
REDUCTION OF SECOND ORDER HARMONIC DISTORTION IN HIGH POWER TWT AMPLIFIERS

Thomas E. Szmurlo; Mitchell F. Radich, both of Palatine, and Warren E. Guthrie, Glen Ellyn, all of Ill., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Aug. 6, 1996, Ser. No. 693,384

Int. Cl.^{6} H03F *1/26;3/58*

U.S. Cl. 330—149 **6 Claims**



1. A method of minimizing harmonic distortion in a nonlinear amplifier having a bandwidth greater than one octave, comprising the steps of:

a) generating a harmonic signal which is a harmonic of a fundamental frequency signal to be amplified;

b) applying said harmonic signal to an adaptive filter;

c) deriving from the output of said amplifier a signal representative of said output;

d) so applying said representative signal to said adaptive filter as to cause said filter to modify said harmonic signal to produce a modified harmonic signal; and

e) adding said modified harmonic signal to said fundamental frequency signal;

f) said harmonic signal being so modified by applying said representative signal to said adaptive filter that the amplitude of said harmonic in said amplifier output is minimized; and

g) said modification being accomplished by:

  i) splitting said harmonic signal into first and second signal portions in quadrature with each other;

  ii) multiplying each of said portions by said representative signal;

  iii) integrating and inverting each of said multiplied portions to form first and second integrated and inverted portions;

  iv) multiplying said first integrated and inverted portion by said first portion, and said second integrated and inverted portion by said second portion; and

  v) summing said so multiplied portions to form said modified harmonic signal.

5,838,196
TRANSFORMER-COUPLED AMPLIFIER

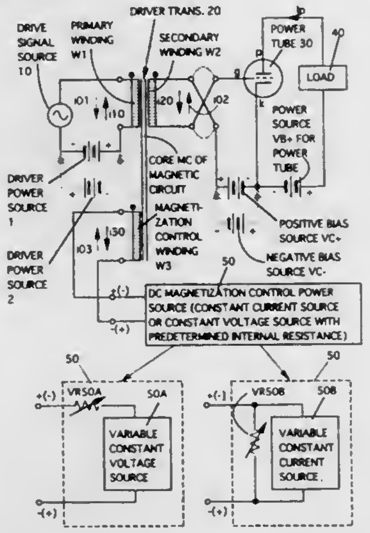
Yasuo Yoshizawa, Yamagata-ken, Japan, assignor to Yoshiki Industrial Co., Ltd., Yamagata-Ken, Japan

Filed Apr. 23, 1997, Ser. No. 847,769

Claims priority, application Japan, Apr. 26, 1996, 8-106610

Int. Cl.^{6} H03F *3/30*

U.S. Cl. 330—188 **18 Claims**


DRIVER TRANS. 20
DRIVE SIGNAL SOURCE 10
PRIMARY WINDING W1
SECONDARY WINDING W2
POWER TUBE 30
40
LOAD
POWER SOURCE VB+ FOR POWER TUBE
CORE MC OF MAGNETIC CIRCUIT
MAGNETIZATION CONTROL WINDING W3
DRIVER POWER SOURCE 1
DRIVER POWER SOURCE 2
POSITIVE BIAS SOURCE VC+
NEGATIVE BIAS SOURCE VC-
DC MAGNETIZATION CONTROL POWER SOURCE (CONSTANT CURRENT SOURCE OR CONSTANT VOLTAGE SOURCE WITH PREDETERMINED INTERNAL RESISTANCE)
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VR50A
50A
VARIABLE CONSTANT VOLTAGE SOURCE
VR50B
50B
VARIABLE CONSTANT CURRENT SOURCE

1. A transformer-coupled amplifier comprising:

a driver transformer in which a primary winding, a secondary winding, and a tertiary winding are wound on a core of a magnetic circuit;

a drive signal source for supplying an AC drive signal superposed with a drive-stage DC current to said primary winding of said driver transformer;

output means for extracting, from said secondary winding of said driver transformer, an AC signal corresponding to the AC drive signal supplied to said primary winding of said driver transformer, and for amplifying the AC signal from said secondary winding; and

DC magnetization control means for supplying a predetermined magnetization control current to said tertiary winding of said driver transformer so as to change a degree of DC magnetization of said core of said magnetic circuit of said driver transformer,

wherein a DC magnetized state of said core of said magnetic circuit of said driver transformer magnetized by the drive-stage DC current is changed by the magnetization control current so as to obtain a predetermined state.

5,838,197
HIGH-GAIN AMPLIFIER CIRCUIT HAVING VOLTAGE/CURRENT CONVERTER

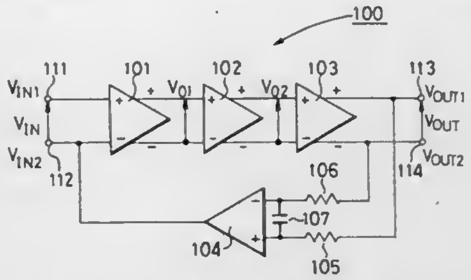
Naoki Tsukuda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 13, 1996, Ser. No. 696,061

Claims priority, application Japan, Aug. 14, 1995, 7-228565

Int. Cl.^{6} H03F *3/45*

U.S. Cl. 330—252 **19 Claims**



1. A high-gain amplifier circuit comprising:

first to n-th differential amplifiers cascade-connected at first to n-th stages, where n is an integer greater than unity;

a first input terminal to which a first input signal is applied:

a second input terminal to which a second input signal is applied:

said first input signal and said second input signal being inputted into said first differential amplifier at said first stage through said first input terminal and said second input terminal, respectively;

a first output terminal from which a first output signal is derived:

a second output terminal from which a second output signal is derived;

said first output signal and said second output signal being outputted from said n-th differential amplifier at said n-th stage through said first output terminal and said second output terminal, respectively;

a voltage/current converter having a first input terminal to which said first output signal is applied and a second input terminal to which said second output signal is applied and producing an output current corresponding to an offset between bias components of said first output signal and said second output signal;

said output current of said voltage/current converter being fed back to said first differential amplifier at said first stage, thereby cancelling said offset between said bias components of said first output signal and said second output signal; and

a low-pass filter having a first resistor, a second resistor and a capacitor;

wherein said first output signal is inputted into said first input terminal of said voltage/current converter through said first resistor, and said second output signal is inputted into said second input terminal of said voltage/current converter through said second resistor;

and wherein said capacitor is connected to link said first input terminal of said voltage/current converter and said second input terminal of said voltage/current converter.

5,838,198
GAIN CONTROL FOR PARALLEL-ARRANGED DIFFERENTIAL PAIRS

Roeland J. Heijna, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 9, 1997, Ser. No. 854,047

Claims priority, application European Pat. Off., May 15, 1996, 96201332

Int. Cl.^{6} H03G *3/30*

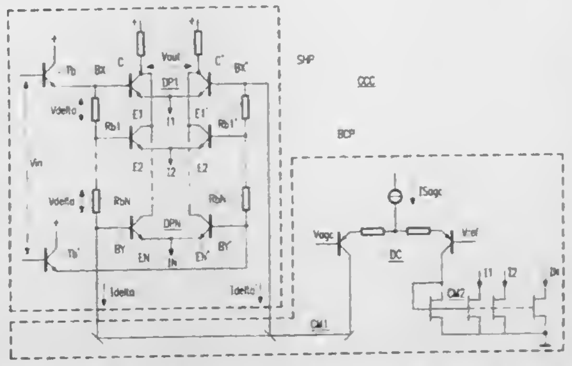
U.S. Cl. 330—254 **4 Claims**

3. A method for effecting gain control employing a plurality of parallel-arranged differential pairs which have mutually coupled control terminals for receiving an input signal and mutually coupled main current terminals for furnishing an output signal, the method comprising the step:

unbalancing the differential pairs as a function of a gain control signal,

characterized in that said method further comprises the step:

increasing or decreasing the gain of individual differential pairs when the unbalance of these pairs is decreased or increased, respectively.



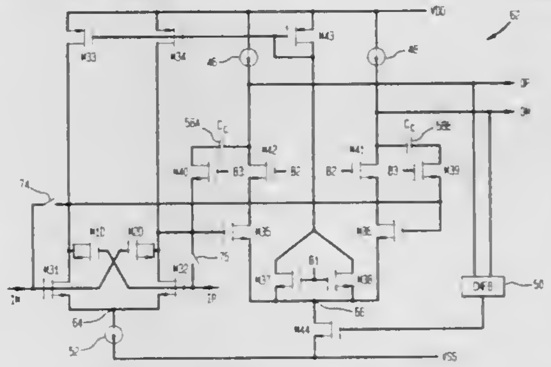
5,838,199
MULTI-STAGE HIGH-PERFORMANCE AMPLIFIER

Katsufumi Nakamura, Cambridge, Mass., assignor to Analog Devices, Inc., Norwood, Mass.

Filed May 28, 1996, Ser. No. 654,349

Int. Cl.^{6} H03F *3/45*

U.S. Cl. 330—258 **23 Claims**



21. A method for controlling a common-mode level of a multi-stage amplifier comprising the steps of:

using a first portion of a current generated by a current source to drive a differential pair of input transistors included in a particular stage of a multi-stage amplifier, the particular stage including at least one load driven by an output of the particular stage; and using a second portion of the current generated by the current source to drive a control input of a current-controlled current source arranged to alter a common-mode level of a stage preceding the particular stage responsive to changes in an amount of the second portion of the current.

5,838,200
DIFFERENTIAL AMPLIFIER WITH SWITCHED CAPACITOR COMMON MODE FEEDBACK

Ion E. Opris, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 6, 1997, Ser. No. 870,845

Int. Cl.^{6} H03F *3/45*

U.S. Cl. 330—258 **20 Claims**

17. A method of generating a differential signal using switched capacitor common mode feedback, said method comprising the steps of:

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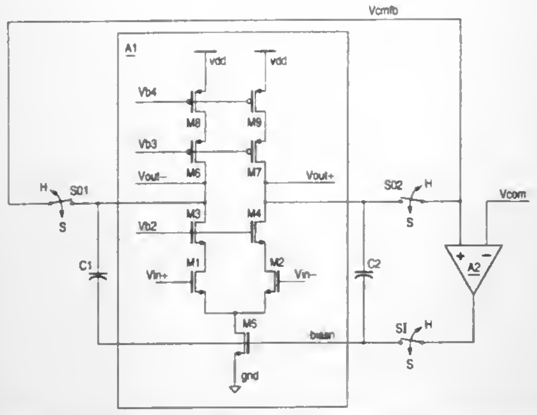


receiving a common mode input voltage via a common mode input terminal during a first time period;

receiving a differential input signal;

outputting via first and second differential output terminals together during said first time period a common mode output voltage in accordance with said common mode input voltage;

outputting via said first and second differential output terminals during a second time period a differential output voltage in accordance with said differential input signal;

capacitively coupling said common mode input terminal and said first differential output terminal;

capacitively coupling said common mode input terminal and said second differential output terminal;

receiving a reference voltage;

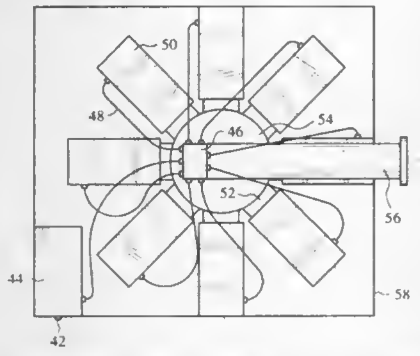
generating said common mode input voltage in accordance with a difference between said reference voltage and said common mode output voltage;

coupling said common mode input voltage to said common mode input terminal during said first time period and decoupling said common mode input voltage from said common mode input terminal during said second time period; and

coupling said first and second differential output terminals together during said first time period and decoupling said first and second differential output terminals from each other during said second time period.

5,838,201
SOLID STATE POWER AMPLIFIER WITH PLANAR STRUCTURE

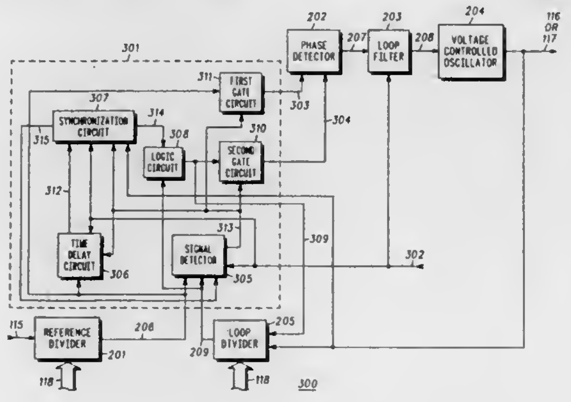
Franco Nicola Sechi, Palo Alto, Calif., assignor to Microwave Power Inc., Santa Clara, Calif.
Filed May 1, 1995, Ser. No. 434,582
Int. Cl.^{6} H03F *3/60;3/68*
U.S. Cl. 330—286 **4 Claims**



1. A microwave SSPA combining the power output of several power modules, each housed in an independent metal housing with at least one dimension larger than the largest wavelength of operation, by means of a waveguide radial combiner at the output and a divider with coaxial output connections to the modules at the input, said SSPA having a planar structure whereby the power modules lay on a flat metal plate, and said power modules being field replaceable using simple mechanical tools.

5,838,202
ERROR SUPPRESSING CIRCUIT AND METHOD THEREFOR FOR A PHASE LOCKED LOOP

Jeannie Han Kosiec, Schaumburg, and Steven Frederick Gillig, Roselle, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Continuation of Ser. No. 436,547, May 8, 1995, abandoned, which is a continuation of Ser. No. 149,684, Nov. 9, 1993, abandoned. This application Aug. 1, 1996, Ser. No. 691,437
Int. Cl.^{6} H03L *7/18*
U.S. Cl. 331—1 A **7 Claims**



1. In a phase locked loop (PLL) that generates an output frequency signal responsive to a reference frequency signal, the output frequency signal and the reference frequency signal each being characterized by phase and frequency, the PLL having a loop bandwidth, the PLL being susceptible to generating a phase or a frequency error in the output frequency signal responsive to a change in the loop bandwidth of the PLL, a method for suppressing the phase or the frequency error generated in the output frequency signal responsive to the change in the loop bandwidth of the PLL, the method comprising the steps of:

receiving a request to lock the frequency of the output frequency signal to a predetermined frequency;

adjusting the loop bandwidth of the PLL to a first loop bandwidth responsive to the step of receiving;

locking the frequency of the output frequency signal to substantially the predetermined frequency responsive to the step of adjusting the loop bandwidth of the PLL to the first bandwidth;

adjusting the loop bandwidth of the PLL to a second loop bandwidth, narrower than the first loop bandwidth, responsive to the step of locking;

opening the PLL for a period of time responsive to one of the step of locking and the step of adjusting the loop bandwidth of the PLL to the second loop bandwidth to permit the frequency error in the output frequency signal to reach a favorable level;

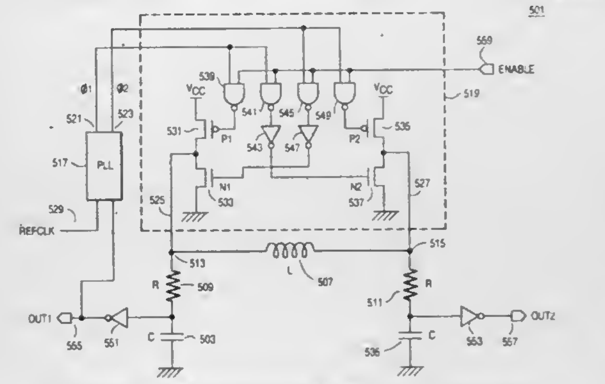
synchronizing the phase of the reference frequency signal and the phase of the output frequency signal after a lapse of the period of time to substantially eliminate the phase error in the output frequency signal; and

closing the PLL responsive to the phase of the reference frequency signal and the phase of the output frequency signal being synchronized;

wherein the predetermined frequency of the output frequency signal before the PLL is opened is substantially the same frequency as the predetermined frequency of the output frequency signal after the PLL is closed.

5,838,203
METHOD AND APPARATUS FOR GENERATING WAVEFORMS USING ADIABATIC CIRCUITRY

Georgios Stamoulis, Fremont, Calif., and Yibin Ye, West Lafayette, Ind., assignors to Intel Corporation, Santa Clara, Calif.
Filed Dec. 6, 1996, Ser. No. 760,905
Int. Cl.^{6} H03L *7/06;* **H03B** *28/00*
U.S. Cl. 331—1 A **12 Claims**



1. An adiabatic waveform generation circuit, comprising:

an oscillating circuit generating first and second oscillating outputs:

a replenishing circuit generating first and second replenishing outputs coupled to the oscillating circuit, the replenishing circuit comprising:

a first pull-up device coupled between a first potential and a first node of the oscillating circuit,

a first pull-down device coupled between a second potential and the first node,

a second pull-up device coupled between the first potential and a second node of the oscillating circuit,

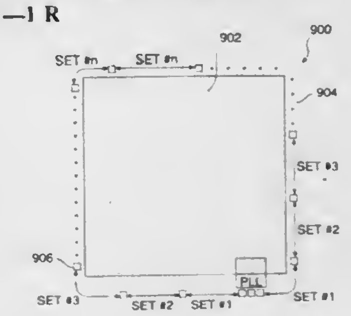
a second pull-down device coupled between the second potential and the second node;

a control circuit generating first and second control signals coupled to the replenishing circuit, the control circuit further coupled to one of the first and second oscillating outputs, the control circuit controlling a frequency of oscillation of the oscillating circuit; and

an enable input, the oscillating circuit generating the first and second oscillating outputs in response to the enable input.

5,838,204
PHASE LOCKED LOOP WITH MULTIPLE, PROGRAMMABLE, OPERATING FREQUENCIES, AND AN EFFICIENT PHASE LOCKED LOOP LAYOUT METHOD

Chingchi Yao, Saratoga, Calif., assignor to Oki America, Inc., Hackensack, N.J.
Filed Sep. 11, 1996, Ser. No. 712,337
Int. Cl.^{6} H03L *7/00*
U.S. Cl. 331—1 R **10 Claims**



1. A method for setting a simultaneous switching operating (SSO) limits for an application specific integrated circuit (ASIC) comprising a phase-locked loop (PLL) therein, said method comprising:

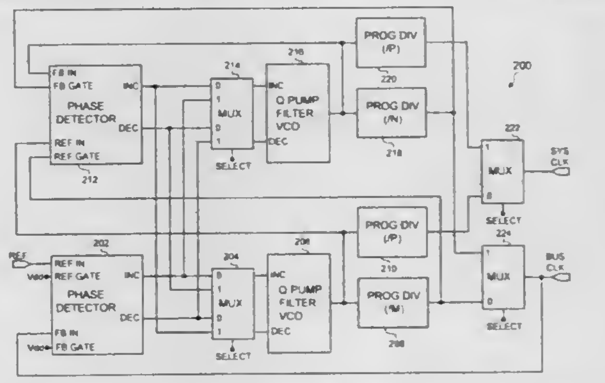
defining a first set of pins adjacent to a PLL circuit in an ASIC and defining a second set of pins adjacent to said first set of pins; and

setting a first SSO current limit for each of said first set of pins and setting a second SSO current limit for each of said second set of pins;

wherein said first SSO current limit is less than said second SSO current limit.

5,838,205
VARIABLE-SPEED PHASE-LOCKED LOOP SYSTEM WITH ON-THE-FLY SWITCHING AND METHOD THEREFOR

Frank David Ferraiolo, Essex Junction; John Edwin Gersbach, Burlington, and Charles Joseph Masenas, Essex Junction, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Feb. 18, 1997, Ser. No. 801,546
Int. Cl.^{6} H03L *7/07*
U.S. Cl. 331—2 **14 Claims**



1. A phase-locked loop system, said phase-locked loop system providing a system output signal having a frequency and capable of switching said frequency without disrupting the phase lock of said system output signal, said phase-locked loop system comprising:

a first phase-locked loop, said first phase lock-loop receiving a reference signal and outputting a first phase-locked loop output signal with a first frequency, wherein said first phase-locked loop includes a first oscillator and a first phase detector comparing the phase of said reference signal and a second system output, said first phase detector outputting a first phase difference signal in proportion to a first detected phase difference;

a second phase-locked loop, said second phase-locked loop output signal receiving said first phase lock-loop output signal and outputting a second phase lock loop signal with a second frequency, wherein said second phase-locked loop includes a second oscillator and a second phase detector comparing the phase of said first oscillator output with the phase of said second oscillator output, said second phase detector outputting a second phase difference signal in proportion to a second detected phase difference; and

a switching mechanism, said switching mechanism selecting said system output signal from said first phase-locked loop output signal and said second phase-locked loop output signal wherein said system output signal frequency is switched from said first frequency to a second frequency without said disruption in the phase lock of said system output signal.

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5,838,206
ACTIVE HYDROGEN MASER ATOMIC FREQUENCY STANDARD

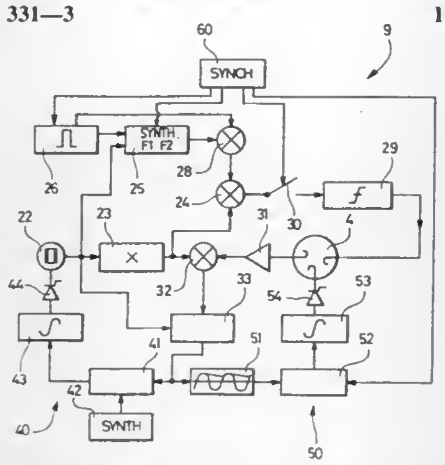
Giovanni Busca, Neuchâtel; Laurent-Guy Bernier, Villiers, and Pascal Rochat, Marin, all of Switzerland, assignors to Observatoire Cantonal de Neuchatel, Neuchatel, Switzerland

Filed Sep. 19, 1996, Ser. No. 715,819

Claims priority, application European Pat. Off., Sep. 29, 1995, 95115412

Int. Cl.^{6} H03L *7/26*

U.S. Cl. 331—3 **10 Claims**



1. Atomic maser comprising:

a resonant cavity (**4**) containing a medium capable of stimulated emission,

means (**22,23,24,29**) for injecting into said cavity (**4**) a signal with a frequency (f_1, f_2) centred on the natural frequency (f_R) of said stimulated emission,

means (**25**) for effecting a shift in the frequency of said injected signal so as to generate alternatively a first signal portion having a frequency (f_1) greater than the natural frequency (f_R) of said stimulated emission and a second signal portion having a frequency (f_2) less than the natural frequency (f_R) of said stimulated emission, said first and second signal portions having a periodicity (τ) corresponding to a predetermined interrogation period,

means (**31,32,33,51,52**) responsive to a signal detected in said cavity (**4**) to produce an error signal representing the difference between the amplitude of said detected signal (**R1**) in response to the injection of said first signal portion and the amplitude of said detected signal (**R2**) in response to the injection of said second signal portion, and

means (**53,54**) responsive to said error signal for adjusting the resonant frequency (f_C) of said cavity, characterised in that said atomic maser further comprises

means (**26,28**) for periodically applying both said first and second signal portions for a limited duration only (τ_{ON}) during said interrogation period.

5,838,207
VOLTAGE CONTROLLED OSCILLATOR WITH PARTIAL LOAD-PULL TUNING

Xue-Song Zhou, Chapel Hill, and Scott Richard Justice, Durham, both of N.C., assignors to Ericsson Inc., Research Triangle Park, N.C.

Filed Dec. 20, 1996, Ser. No. 770,889

Int. Cl.^{6} H03B *5/12*

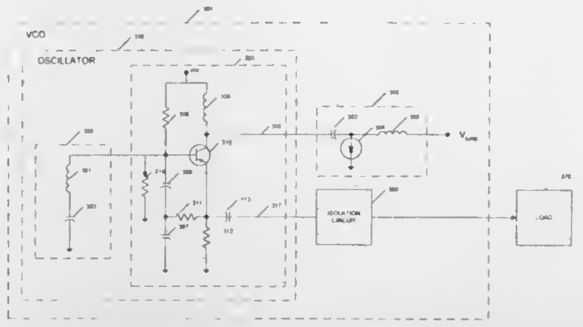
U.S. Cl. 331—36 C **11 Claims**

11. A voltage controlled oscillator for generating an oscillatory output signal having a characteristic frequency of oscillation, comprising:

an active circuit having an input node and first and second output nodes;

a resonant circuit coupled to the input node of said active circuit, said resonant circuit being characterized by a quality factor Q defining the ratio of the maximum energy stored per cycle to the energy dissipated per cycle for said resonant circuit; and

a circuit having an adjustable impedance coupled to the first output node of said active circuit, wherein said adjustable impedance circuit is operative to selectively alter the frequency of oscillation of said voltage controlled oscillator, and wherein the Q of said resonant circuit is unaffected by changes in the impedance of said adjustable impedance circuit, wherein said active circuit includes a transistor having a collector, a base and an emitter, and wherein the emitter of said transistor is coupled to the second output node of said active circuit.



5,838,208
MODULATION OF TRANSMISSION DATA SIGNAL IN SYCHRONOUS WITH TRANSMISSION CLOCK SIGNAL

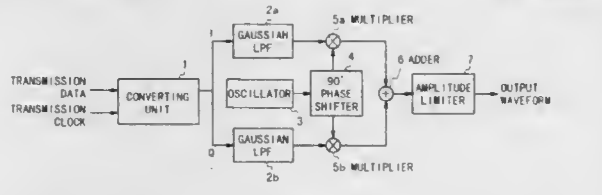
Mikio Fukushi, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Aug. 28, 1997, Ser. No. 920,046

Claims priority, application Japan, Sep. 3, 1996, 8-232997

Int. Cl.^{6} H03C *3/00;* **H04L** *27/12*

U.S. Cl. 332—101 **14 Claims**



1. A modulating system comprising:

a converting unit for generating first and second quadrature signals based on a transmission data signal in synchronous with a transmission clock signal;

first and second filters for performing band limitation to said first and second quadrature signals to generate first and second band-limited quadrature signals;

an oscillator for generating a sine wave signal;

a phase shifter for phase-shifting said sine wave signal from said oscillator to generate first and second phase-shifted sine wave signals, between which a phase is deviated by $\pi/2$, said first phase-shifted sine wave signal preceding said second phase-shifted sine wave signal in the phase;

first and second multipliers for multiplying said first and second phase-shifted sine wave signals by said first and second band-limited quadrature signals to generate first and second multiplied signals, respectively;

an adder for synthesizing said first and second multiplied signals to generate an synthesis signal; and

a limiter for limiting an amplitude of said synthesis signal to a predetermined level.

5,838,209
NONRECIPROCAL JUNCTION CIRCUIT ELEMENT HAVING DIFFERENT CONDUCTOR INTERSECTING ANGLES

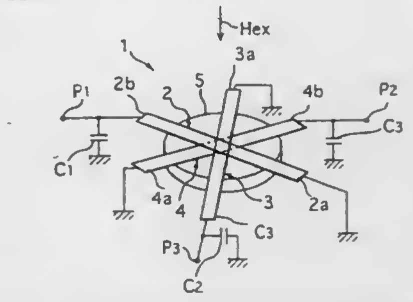
Takekazu Okada, Ishikawa-ken; Takashi Hasegawa, and Hiromu Tokudera, both of Nagaokakyo, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Continuation of Ser. No. 681,849, Jul. 29, 1996, Pat. No. 5,745,014. This application Nov. 21, 1997, Ser. No. 975,773

Claims priority, application Japan, Jul. 31, 1995, 7-195030; Dec. 27, 1995, 7-341374

Int. Cl.^{6} H01P *1/36;1/383*

U.S. Cl. 333—1.1 **10 Claims**



1. A method of producing a nonreciprocal circuit element comprising the steps of:

providing a ferrite body;

providing three central conductors such that said conductors intersect each other at predetermined angles in an electrically isolated condition, wherein all three of the intersection angles formed by the intersection of said three central conductors have different values;

providing a terminating resistor electrically connected to at least one of said three central conductors thereby providing an isolator, and setting the resistance of said terminating resistor to greater than 50 ohms so as to provide isolation; and

applying a DC magnetic field to the ferrite body.

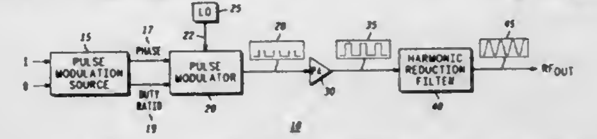
5,838,210
METHOD AND APPARATUS FOR GENERATING A MODULATED SIGNAL

Pallab Midya, Schaumburg, Ill.; Robert Michael Jackson, Gilbert, Ariz., and Dale Anderson, Ft. Worth, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 1, 1997, Ser. No. 980,566

Int. Cl.^{6} H03C *5/00;* **H03K** *7/08;7/10;* **H04L** *27/36*

U.S. Cl. 332—109 **24 Claims**



1. A method of producing a modulated signal, said method comprising the steps of:

determining a phase of a baseband signal;

determining an amplitude of said baseband signal;

phase modulating a pulsed signal as a function of said phase of said baseband signal to produce a phase modulated pulsed signal;

pulsewidth modulating said phase modulated pulsed signal as a function of said amplitude of said baseband signal to produce a pulsewidth modulated pulsed signal;

amplifying said pulsewidth modulated pulsed signal to produce an amplified signal; and

filtering said amplified signal.

5,838,211

Patent Not Issued For This Number

5,838,212
HIGH FREQUENCY TRANSITION ARRANGEMENT

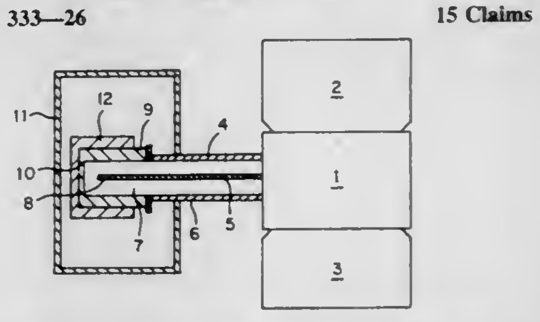
Hugh Richard Pettit, Ipswich, and Neil John Holloway, Chelmsford, both of Great Britain, assignors to EEV Limited, Chelmsford, England

Filed Jan. 10, 1997, Ser. No. 783,296

Claims priority, application United Kingdom, Jan. 11, 1996, 9600491

Int. Cl.^{6} H01P *5/03;1/08*

U.S. Cl. 333—26 **15 Claims**



1. A transition arrangement for the transmission of high frequency energy comprising: a probe projecting into a waveguide having an outer surface and having a metal conductor; ceramic

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material carried by said probe surrounding at least a portion of said metal conductor; and non-ceramic dielectric material carried by said ceramic material.

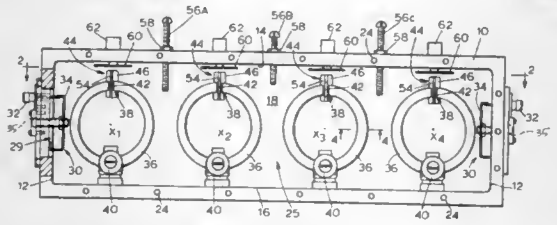
5,838,213
ELECTROMAGNETIC FILTER HAVING SIDE-COUPLED RESONATOR EACH LOCATED IN A PLANE

Qiang Huang, Sunnyvale, Calif., assignor to Illinois Superconductor Corporation, Mt. Prospect, Ill.

Filed Sep. 16, 1996, Ser. No. 714,336

Int. Cl.^{6} H01P *1/201*

U.S. Cl. 333—99.005 **6 Claims**



4. An electromagnetic filter comprising:

a filter housing having a pair of end walls and first through third side walls;

a cover engagable with the filter housing to collectively define an interior cavity;

a plurality of split-ring resonators disposed in the interior cavity, each split-ring resonator having a respective gap therein and a respective major curve about a corresponding axis wherein the respective major curves of each of the split-ring resonators generally lie in a plane generally orthogonal to each of the corresponding axes;

a pair of couplers mounted in the pair of end walls, respectively, in electromagnetic communication with the plurality of split-ring resonators;

a plurality of tuners mounted in the first side wall, each tuner extending into the interior cavity near the gap of each split-ring resonator, respectively, to be in electromagnetic communication therewith to adjust a resonant frequency thereof; and

a plurality of coupling screws disposed in the first side wall of the filter housing, each coupling screw extending into the interior cavity generally within the plane orthogonal to each of the respective axes of the corresponding split-ring resonators and between adjacent split-ring resonators of the plurality of split-ring resonators to be in electromagnetic communication therewith to adjust coupling therebetween;

wherein the plurality of split-ring resonators are mounted on the second side wall of the filter housing.

5,838,214
UNITARY PACKAGING SYSTEM FOR A CAPACITOR AND INDUCTOR

Sanjay Goel, Schaumburg; Darioush Keyvani, Chicago; Girish R. Harshe, Wheeling; John E. Nerz, Hawthorn Woods, and Marc Chason, Schaumburg, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 8, 1996, Ser. No. 676,611

Int. Cl.^{6} H03H *7/09*

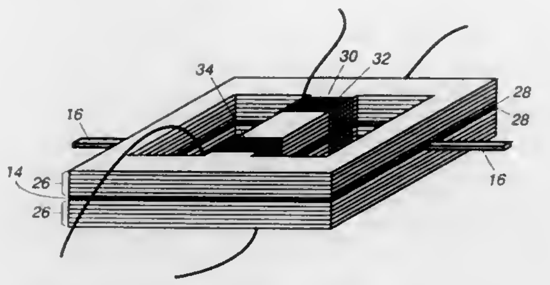
U.S. Cl. 333—177 **18 Claims**

1. A unitary packaging system for a capacitor and an inductive component, comprising:

a capacitor having electrical contacts;

means for holding said capacitor, said electrical contacts extending beyond said means for holding outside said unitary packaging system; and

at least one electric current carrying member having at least one turn around said means for holding to form an inductor, said inductor having electrical contacts distinct from the electrical contacts of the capacitor and extending outside said unitary packaging system.



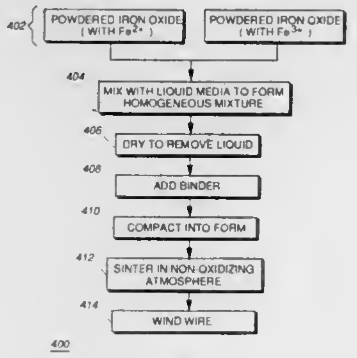
5,838,215
RF CHOKE WITH A LOW Q CORE FORMED BY SINTERING FERROUS AND FERRIC OXIDES

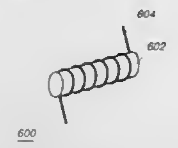
Wang-Chang Albert Gu; Ernest S. Ramakrishnan, both of Coral Springs, Fla.; Robert A. Burr, Albuquerque, and Adam D. Moya, Peralta, both of N. Mex., assignors to Motorola, Inc., Schaumhurg, Ill.

Filed Feb. 5, 1996, Ser. No. 598,830

Int. Cl.^{6} H01F *27/24*

U.S. Cl. 333—181 **10 Claims**


402
POWDERED IRON OXIDE (WITH Fe^{2+})
POWDERED IRON OXIDE (WITH Fe^{3+})
404
MIX WITH LIQUID MEDIA TO FORM HOMOGENEOUS MIXTURE
406
DRY TO REMOVE LIQUID
408
ADD BINDER
410
COMPACT INTO FORM
412
SINTER IN NON-OXIDIZING ATMOSPHERE
414
WIND WIRE
400



1. A radio frequency (RF) choke, comprising:

a magnetic core having a quality factor (Q) less than 1 formed by:

mixing at least two powdered iron oxide compounds, at least one compound being characterized by a ferrous valence state (Fe^{2+}) and at least one compound being characterized by a ferric valence state (Fe^{3+}), into a liquid media to form a homogeneous mixture;

drying the homogeneous mixture at a temperature sufficient to remove the liquid media;

compacting the dried homogeneous mixture into a form; and

sintering the form in a non-oxidizing atmosphere sufficient to convert a portion of the Fe^{3+} to Fe^{2+};

a wire wrapped about said magnetic core; and

the magnetic core providing a

substantially resistive impedance at RF frequencies.

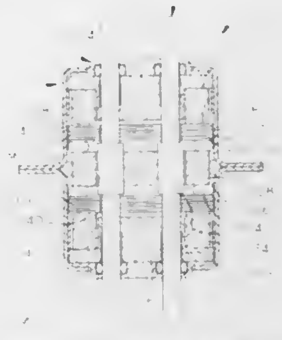
5,838,216
COMMON-MODE EMI FILTER

Curtis B. White; W. Kyle Anderson, and Frank W. Allen, III, all of Rockford, Ill., assignors to Sunstrand Corporation, Rockford, Ill.

Filed Sep. 6, 1996, Ser. No. 711,432

Int. Cl.^{6} H03H *7/02*

U.S. Cl. 333—182 **26 Claims**



26. A filter assembly for providing at least common-mode filtering comprising:

a plurality of spaced apart electrical conductors for carrying at least common-mode electrical current;

a housing electrically isolated from the a plurality of electrical conductors and containing a length of the plurality of electrical conductors, the housing having an interior cavity defined by a wall having at least a partially electrically conductive section, the wall extending outward from two longitudinally spaced apart locations on the length of the plurality of electrical conductors and between the plurality of electrical conductors at a position spaced from the a plurality of electrical conductors to form the cavity; and

at least one capacitive element providing common filtering of the common mode electrical current flowing in the plurality of spaced apart electrical conductors, each capacitive element having an electrical contact with the electrically conductive section of the wall and the plurality of electrical conductors to provide capacitance between the plurality of electrical conductors and the electrically conductive section of the wall.

5,838,217
LONGITUDINALLY COUPLING ACOUSTIC SURFACE WAVE DOUBLE MODE FILTER UTILIZING END-FACE REFLECTING WAVES

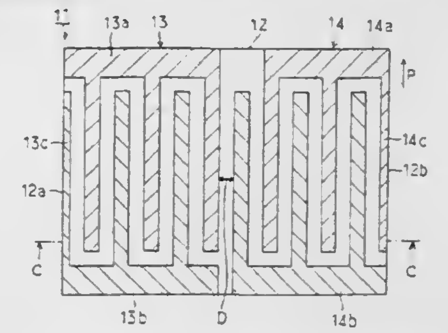
Michio Kadota, Kyoto, and Kazuhiko Morozumi, Ishikawa-ken, both of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Aug. 30, 1996, Ser. No. 704,942

Claims priority, application Japan, Aug. 30, 1995, 7-222139

Int. Cl.^{6} H03H *9/64*

U.S. Cl. 333—193 **11 Claims**



1. An acoustic surface wave filter of a longitudinally coupling type utilizing an end-face reflecting SH-type surface wave, said filter comprising:

a piezoelectric substrate having opposite end faces;

first and second interdigital transducers formed on said piezoelectric substrate and having electrode digits extending parallel to said end faces in such a manner that an SH-type surface wave generated when an input signal is applied to said transducers is caused to be reflected between said opposite two end faces and that said acoustic surface wave filter operates as a double-mode SAW filter having a basic mode and a higher order mode.

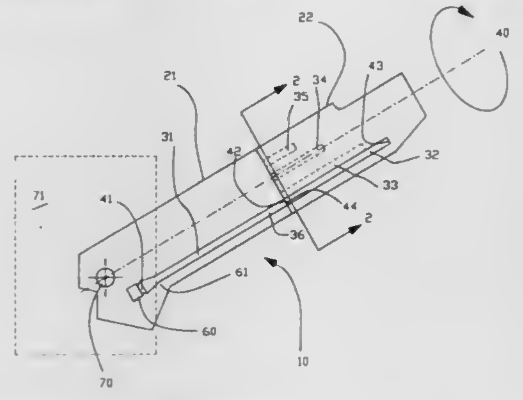
5,838,218
WAVEGUIDE SWITCH

Lawrence T. Rupert; William F. Swisher, both of Carthage, Ill., and Theodore P. Kill, Troy, Mich., assignors to Methode Electronics, Inc., Chicago, Ill.

Filed Nov. 25, 1996, Ser. No. 758,162

Int. Cl.^{6} H01H *53/00*

U.S. Cl. 335—4 **9 Claims**



1. A waveguide switch comprising:

a first waveguide having a uniform length formed in a first member of the switch;

a plurality of second waveguides of varied lengths formed in a second member of the switch, wherein the first and second member pivotally mount to one another and combine thereto to align the first waveguide and one of the second waveguides into an enlarged waveguide;

a transmitter mounted at a first end of the enlarged waveguide;

a receiver mounted at said first end of the enlarged waveguide; and

a detector connected to the transmitter and receiver for detecting the amount of change in the length of the enlarged waveguide.

5,838,219
ELECTRICAL CIRCUIT BREAKER WITH MANUAL AND REMOTE ACTUATORS

Kebo Du, Delmar, and Stefan Gabrielson, Rehoboth Beach, both of Del., assignors to Eaton Corporation, Cleveland, Ohio

Filed May 29, 1997, Ser. No. 864,997

Int. Cl.^{6} H01H *75/00*

U.S. Cl. 335—14 **20 Claims**

1. A remotely controllable operator for a circuit breaker having a control handle moveable between two positions, said remotely controllable operator comprising:

a remote operator housing for mounting adjacent the circuit breaker;

an operator handle pivotally mounted to the remote operator housing and accessible for manual operation by a person;

a handle lever coupled to the operator handle;

a tie member for coupling one of the operator handle and the handle lever to the control handle, wherein movement of one of the control handle and the operator handle produces movement of the other of the control handle and the operator handle;

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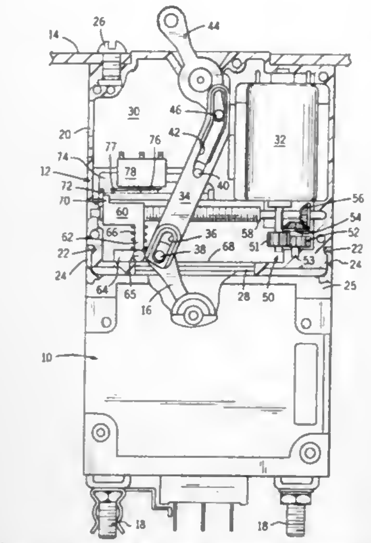


an electrically powered actuator attached to said remote operator housing and;

a handle actuator driven by the electrically powered actuator for exerting force on the handle lever which results in movement of the operator handle and for exerting force which moves the control handle between the two positions, wherein upon moving the control handle into one of the two positions the handle actuator moves from one side of the handle lever to another side.

5,838,220

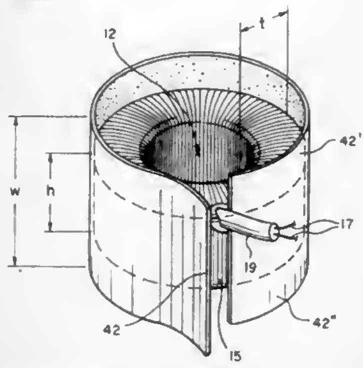
TOROIDAL TRANSFORMER WITH SPACE SAVING INSULATION AND METHOD FOR INSULATING A WINDING OF A TOROIDAL TRANSFORMER

Christer Hagberg, Katunayake, Sri Lanka, assignor to Toroids International Hong Kong Ltd, King's Road, Hong Kong

Filed Jul. 16, 1997, Ser. No. 895,577

Int. Cl.^{6} H01F *27/28;27/30*

U.S. Cl. 336—206 8 Claims



5. A toroidal transformer comprising:

(a) a winding with a center hole, an outer periphery, an axial extension, and upper and lower radial extensions between said outer periphery and said center hole; and

(b) electrical insulation applied on said winding, wherein said insulation includes

  (i) a sheet of insulating material having edges defining a width larger than said axial extension wrapped around said outer periphery and with edges folded onto said upper and lower radial extensions and

  (ii) a narrow strip of insulating material wrapped through said center hole and covering said winding and said sheet of insulating material.

5,838,221

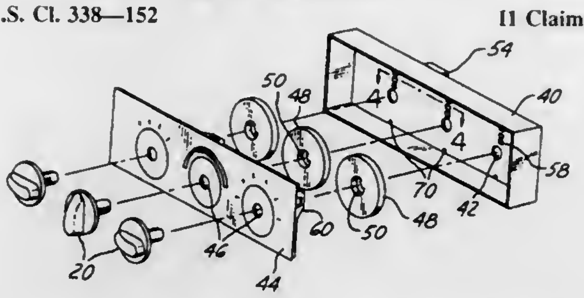
MOTOR CONTROL SYSTEM AND CONTROL HEAD

Barry M. Jones, Jr., Logansport; Michael Louis Molinari, Kokomo, and Duane Eugene Whitson, Amboy, all of Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Jan. 29, 1996, Ser. No. 593,780

Int. Cl.^{6} H01C *10/26*

U.S. Cl. 338—152 11 Claims



1. A control head for producing a variable control voltage comprising:

a control housing;

a first conductor in the housing for carrying the control voltage and second conductors in the housing for carrying supply voltage, the second conductors extending from a connector on the housing to first control means on the housing;

a face plate attached to the housing;

a manually rotatable controlled knob mounted for movement on the face plate and having a second control means engaging the first control means;

the second control means having an elongated resistive film, the film having ends coupled via the first control means to the second conductors to receive the supply voltage; and

the first control means having first wiper means connected to the first conductor and engaging the resistive film whereby movement of the knob effects movement of the resistive film across the first wiper means to vary the voltage on the first conductor.

5,838,222

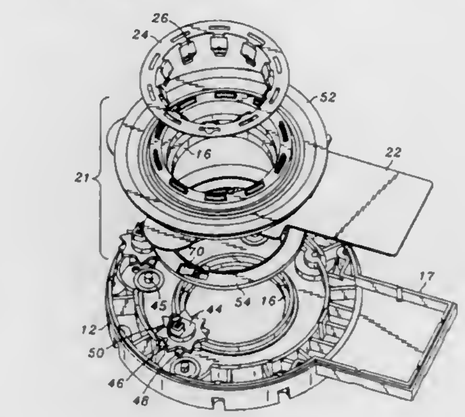
MILTITURN POTENTIOMETER

Steven Al-Rawi, Brea, Calif., assignor to BI Technologies Corporation, Fullerton, Calif.

Continuation of Ser. No. 587,155, Jan. 16, 1996, abandoned. This application Sep. 16, 1997, Ser. No. 931,629

Int. Cl.^{6} H01C *10/32*

U.S. Cl. 338—198 14 Claims



1. A multiturn potentiometer comprising:

a. a housing defining an interior;

b. circuit means including an output terminal and a first resistance element electrically connected to said output terminal, at least one other resistive element in electrical contact with a source of electrical potential;

c. a rotor assembly rotatably mounted in said housing interior, a wiper carried by said rotor assembly in electrical contact with said output terminal and said first resistance element and movable along said first resistance element as said rotor assembly is rotated in said housing;

d. at least one switch in said housing in electrical contact with said first resistance element and said are other resistive element, said switch including a contact for movement on said other resistive element to modify the magnitude of potential to said first resistance element responsive to the rotation of said rotor assembly;

e. means for rotating said rotor assembly; and

f. means carried by said rotor assembly and rotatable therewith for engaging said switch to move the contact thereof;

whereby said first resistance element is maintained within a potential range at a selected potential point and rotation of said rotor assembly in one direction moves said wiper along said first resistance element to provide a succession of increasing increments of said potential to said output terminal and movement in the opposite direction provides a succession of decreasing increments of said potential and said switch is activated by rotation of said rotor assembly to modify the magnitude of said potential point.

5,838,223

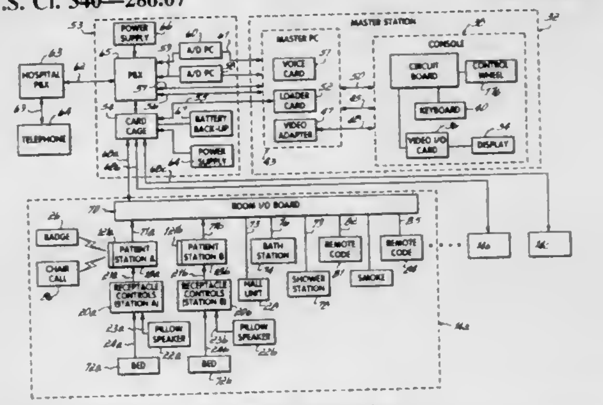
PATIENT/NURSE CALL SYSTEM

Dennis Gallant, Harrison, Ohio; James C. Harnden, Brookfield, Wis.; Julie E. Myers, Indianapolis, Ind., and Daniel J. Ulrich, Cincinnati, Ohio, assignors to Hill-Rom, Inc., Batesville, Ind.

Continuation-in-part of Ser. No. 90,804, Jul. 12, 1993, Pat. No. 5,561,412. This application Aug. 23, 1996, Ser. No. 701,245

Int. Cl.^{6} H04Q *1/00*

U.S. Cl. 340—286.07 16 Claims



1. A patient/nurse call system comprising:

a plurality of transmitters adapted to be carried by hospital personnel, each transmitter periodically transmitting an identification signal unique to that transmitter;

a plurality of patient locations, each of the plurality of patient locations being associated with a patient and including

  a microprocessor,

  a receiver for receiving the identification signals from the plurality of transmitters, and

  a microphone and speaker for audio communications;

a master station location remote from the patient locations, the master station location having

  a microprocessor, and

  a microphone and speaker for audio communications;

a first PBX operatively connected between the microprocessor at the master station location and each of the microprocessors at the plurality of patient locations for providing all data communications between any of the plurality of patient locations and the master station location and further providing all audio communications between the plurality of patient locations and the master station location;

a telephone; and

a second PBX connected between the telephone and the first PBX for providing a data and voice communications link between the telephone and the master station location and the plurality of patient locations.

5,838,224

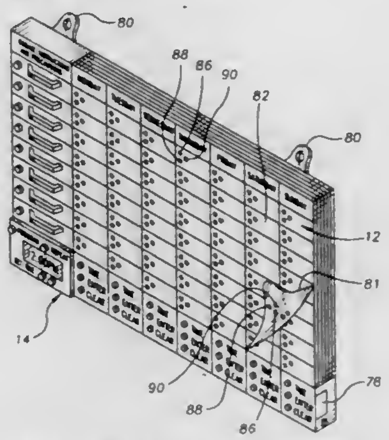
MEDICATION ORGANIZER ASSEMBLY

Joan L. Andrews, 2508 Wellston Rd., Avon Park, Fla. 33825

Filed Jun. 12, 1997, Ser. No. 873,680

Int. Cl.^{6} G08B *1/00*

U.S. Cl. 640—309.15 1 Claim



1. A medication organizer assembly comprising:

a base frame unit including:

  a housing having a first plurality of medication drawers, a circuit compartment formed therein for receiving a time keeping, alarm and central processing circuit, a second plurality of medication drawer LED apertures, a liquid crystal display aperture, an hour time-set button aperture, a minute time-set button aperture, a master program button aperture, a repeat button aperture, and seven day/column sections, each day/column section including a third plurality of alarm segment aperture groupings and one day program aperture grouping, each of said third plurality of alarm segment aperture groupings having a red LED aperture, a green LED aperture, and an alarm acknowledge push-button aperture, said day program aperture grouping including a time push-button aperture, an enter push-button aperture and a clear push-button aperture; and

  a multiple sheet note/instruction pad secured to said base frame unit, each sheet of said multiple sheet note/instruction pad including multiple LED and alarm acknowledge push-button holes provided therethrough, said multiple LED and alarm acknowledge push-button holes being positioned on each said sheet in a manner such that such multiple LED and alarm acknowledge push-button holes are positionable in registration with said red LED aperture, said green LED aperture, and said alarm acknowledge push-button aperture of each of said third plurality of alarm segment aperture groupings, said first, second and third pluralities being equal in number.

5,838,225

ANTI-THEFT ALARM FOR ELECTRICALLY OPERATED DEVICES

John Todd, Toronto, Canada, assignor to Micro Switch Corporation, Waterloo, Canada

Filed Aug. 9, 1996, Ser. No. 694,525

Int. Cl.^{6} G08B *13/14*

U.S. Cl. 340—571 8 Claims

1. An anti-theft alarm for an externally powered electrically operated device, said device having a case and an openable cover, said case and cover containing internal components, said alarm comprising:

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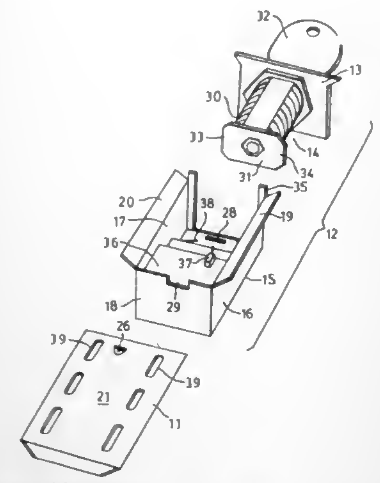


(a) a rechargeable battery;
(b) a motion sensor to detect movement of the device;
(c) a key switch which in a first position is able to disarm the alarm when the DC power is off and in a second position is able to arm the alarm:
(d) a housing which contains at least a tamper switch and the key switch, which housing has a base and a shroud selected from the group consisting of i) said base being attachable to the case for the electrically operated device, said key switch being attached to the shroud, and said key switch and base having means such that when the key switch is locked, the shroud cannot be removed from the base and, when the key switch is unlocked, the shroud is detachable from the base and ii) said base being attachable to the case for the electrically operated device, said key switch being attached to the base, and said key switch and base having means such that, when the key switch is locked, the shroud cannot be removed from the base and, when the key switch is unlocked the shroud is detachable from the base; said base being attached to the device by securing means which also secures the openable cover to the case, wherein at least part of the securing means is accessible only from inside the housing to release the openable cover from the case:
e) a DC power supply for providing said DC power, and being connected to a circuit for recharging the battery, said DC power supply being dependent on an external power supply for the device,
f) controller means, for activating a warning means, powered by the battery, said controller means being activated by a condition selected from the group consisting of i) no DC power and activation of the motion sensor and ii) activation of the tamper switch;
g) an arming latch which keeps the warning means activated when either of the conditions in f) is satisfied.

5,838,226

COMMUNICATION PROTOCOL FOR TRANSMISSION SYSTEM FOR CONTROLLING AND DETERMINING THE STATUS OF ELECTRICAL DEVICES FROM REMOTE LOCATIONS

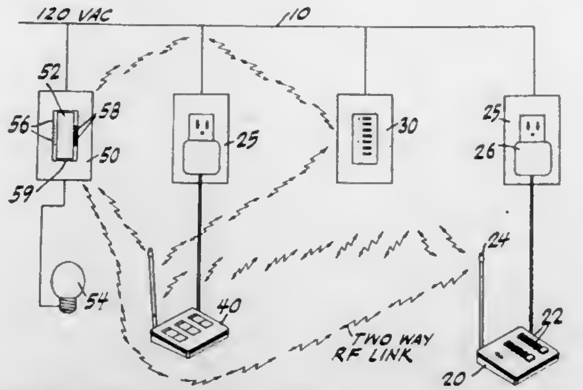
David E. Houggy, Allentown; Donald R. Mosebrook, Bethlehem, and Robert G. Palmer, Jr., Allentown, all of Pa., assignors to Lutron Electronics Co.Inc., Coopersburg, Pa.

Filed Feb. 7, 1996, Ser. No. 597,706

Int. Cl.⁶ H04B *1/00*

U.S. Cl. 340—310.01 **34 Claims**

1. A method of communication for a two way transmission system having at least one first transmitter/receiver device, at least one second transmitter/receiver device and at least one repeater for relaying signals between the first and second devices comprising the steps of:
transmitting a first signal comprising a first command from the first device;



repeating the first command with each repeater in a respective repeater time slot;
receiving the first command at the second device;
transmitting status information regarding the status of each second device from each second device in a respective status time slot;
forming a status bit map comprising all status information regarding each second device in the at least one repeater; and
transmitting the status bit map with the repeater so that the at least one first device has received the status bit map.

5,838,227

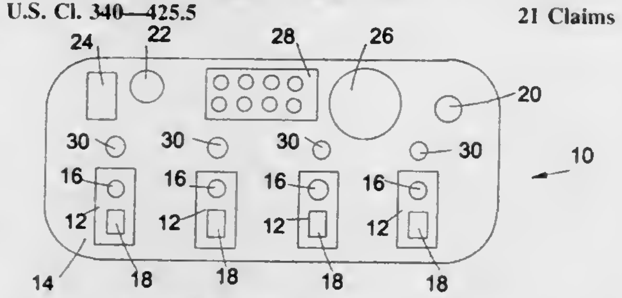
RADIO CONTROLLED ENGINE KILL SWITCH

Steve Murray, 300 Panorama Rd., Earlysville, Va. 22936

Filed Apr. 24, 1997, Ser. No. 845,431

Int. Cl.⁶ B60Q *1/00*

U.S. Cl. 340—425.5 **21 Claims**



21. A signal transmission device having:
at least one waterproof transmitter, each of said at least one transmitters being a portable device transmitting a constant individually identifiable signal powered by an independent power supply, said signal having a low transmission through water; on/off means, said on/off means controlling said independent supply;
a waterproof receiver, said receiver receiving and recognizing said identifiable signal from each of said transmitters, and having:
cut-off means, said cut-off means being connected to an engine and having a run mode and a deactivation mode, said deactivation mode deactivating said engine,
on-off means, said on-off means deactivating said receiver,
coding means, said coding means taking said individually identifiable signal from each of said at least one transmitter and coding said receiver to recognize said signal;
over ride means, said over ride means allowing said cut-off means to be in said run mode without receiving said signal;
at least one indicator light, said indicator light designating the power status of said receiver and said at least one transmitter, said at least one indicator light being color coded to designate at least one of recharging, transmitting or low battery status checks;
distance control means, said distance control means varying the maximum transmission distance between said transmitter and said receiver;
audio alarm means, said audio alarm means being activated by said deactivation mode;

visual alarm means, said visual alarm means being activated by said deactivation mode;
an antenna, said antenna transmitting said signal between said transmitter and said receiver;
said transmitter being proximate said receiver when not in use, and initiating transmission of said signal upon separation of said transmitter from said receiver and ceasing transmission when proximate said receiver
wherein receipt of said signal from all separated transmitters by said receiver maintains said cut-off means in a run mode and interruption of said constant signal by said transmitter entering the water, or being taken beyond transmission range, from any one of said transmitters initiates said deactivation mode, and either reinstatement of transmission of said signal or activation of said over ride means places said cut-off means in said run mode.

5,838,228

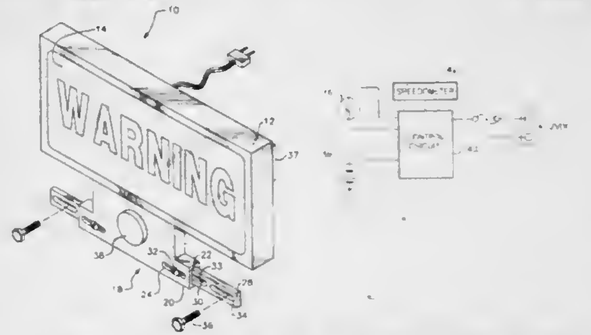
SYSTEM FOR PREVENTING REAR END COLLISIONS

Dennis D. Clark, 2412 Lakeshore Dr., Sagle, Id. 83860

Filed Sep. 18, 1997, Ser. No. 933,064

Int. Cl.⁶ B60Q *1/00*

U.S. Cl. 340—436 **5 Claims**



1. A system for preventing rear end collisions comprising, in combination:
a warning light housing with a rectangular configuration having a front face, a rear face, a bottom face, a top face, and a pair of side faces thereby defining an interior space, the front face having a cutout formed therein over which a transparent panel is coupled;
a mounting assembly including a sleeve connected to the bottom face of the warning light housing with a channel having a square cross-section and two pairs of oval cutouts formed in a front face and a rear face of the sleeve, the channel having a pair of side openings situated about an axis parallel and offset from the bottom face of the mounting assembly, the mounting assembly further including a pair of mounting arms each having a square cross-section and slidably situated within the channel and extending from an associated one of the side openings, each mounting arm having a pair of oval bores formed therein in a side-by-side relationship, whereby a pair of bolts may each be situated through a first one of the oval bores of the corresponding mounting arm and fixedly coupled between a corresponding pair of the oval cutouts thereby limiting the extent to which the mounting sleeve extends from the associated side opening:
whereby a second one of the oval bores of each mounting arm receives a bolt which in turn is threadedly engaged with a threaded aperture employed to couple a license plate to a rear of a vehicle;
a distance detector situated on the mounting sleeve and directed toward a rear of the vehicle, the distance detector adapted to detect a distance from a following car;
a bulb situated within the warning light housing for illuminating upon the actuation thereof: and
control circuitry situated within the warning light housing and connected between the distance detector, bulb, a speedometer, and a battery of the vehicle, the control circuitry adapted for receiving a speed of the vehicle from the speedometer and further to calculate a distance per speed value, whereby the control circuitry intermittently actuates the bulb only upon the distance per speed value being lower than one foot per mile/hour.

5,838,229

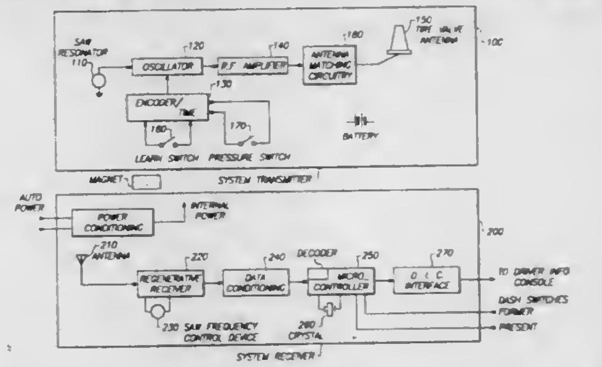
REMOTE TIRE PRESSURE MONITORING SYSTEM EMPLOYING CODED TIRE IDENTIFICATION AND RADIO FREQUENCY TRANSMISSION AND ENABLING RECALIBRATION UPON TIRE ROTATION OR REPLACEMENT

Jerry H. Robinson, III, Matthews, N.C., assignor to Schrader-Bridgeport International, Inc., Chicago, Ill.

Continuation of Ser. No. 491,890, Jul. 18, 1995, Pat. No. 5,600,301. This application Jan. 30, 1997, Ser. No. 791,389

Int. Cl.⁶ B60C *23/00*

U.S. Cl. 340—442 **53 Claims**



1. In a vehicle having a plurality of wheels, each of said wheels having at least one tire mounted thereon, a tire pressure monitoring system including a display interface inside said vehicle for providing an indication of abnormal tire pressure, said system further comprising, for each of said tires, sensing transmitting means which comprise:
means for sensing pressure;
means for producing signals indicative of temperature-compensated pressure of a respective one of said tires;
means for encoding said signals so as to provide encoded signals, identifying said each of said tires, and location thereof on said vehicle uniquely; and
means for transmitting said encoded signals;
said system further comprising:
means for receiving said encoded signals;
means for decoding said encoded signals, and providing display signals accordingly; and
means for providing a display indicative of low pressure and location of said each of said tires in accordance with said display signals;
characterized in that the sensing/transmitting means are mounted internally of the tire, and in that the system comprises means for recalibrating said system such that, in the event of rotation of tires on said vehicle, said system reacquires information on said location of each of said tires, said means for recalibrating said system comprising a magnetically-activated switch, responsive to a magnetic field in a vicinity thereof, wherein activation of said switch causes transmission of a location of a respective one of said tires on said vehicle.

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5,838,230
METHOD OF DETECTING A DEFLATED TIRE ON A VEHICLE

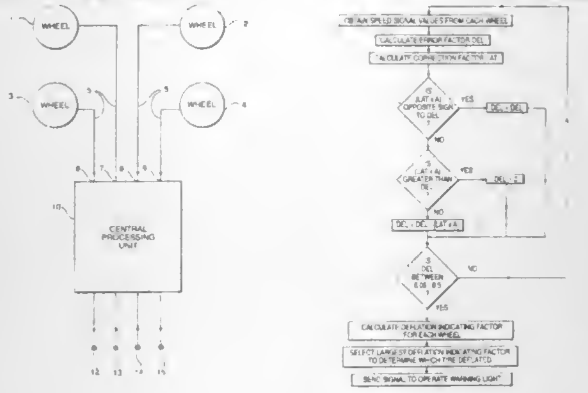
David Jones, Staffs, England, assignor to Sumitomo Rubber Industries, Ltd., Hyogo-ken, Japan

Filed Jul. 2, 1993, Ser. No. 84,967

Claims priority, application United Kingdom, Jul. 11, 1992, 9214951; Apr. 1, 1993, 9306847

Int. Cl.^{6} B60C *23/00*

U.S. Cl. 340—444 **19 Claims**


WHEEL
WHEEL
WHEEL
WHEEL
1
2
3
4
5
5
6
7
8
9
10
CENTRAL PROCESSING UNIT
12
13
14
15
OBTAIN SPEED SIGNAL VALUES FROM EACH WHEEL
CALCULATE ERROR FACTOR DEL
CALCULATE CORRECTION FACTOR LAT
IS (LAT x A) OPPOSITE SIGN TO DEL ?
YES
NO
DEL = DEL
IS (LAT x A) GREATER THAN DEL ?
YES
NO
DEL = 0
DEL = DEL - (LAT x A)
IS DEL BETWEEN 0.05 0.5 ?
YES
NO
CALCULATE DEFLATION INDICATING FACTOR FOR EACH WHEEL
SELECT LARGEST DEFLATION INDICATING FACTOR TO DETERMINE WHICH TIRE DEFLATED
SEND SIGNAL TO OPERATE WARNING LIGHT

1. A method of detecting a deflated tire on a vehicle comprising the steps of:

rotating each tire of the vehicle;

providing one wheel speed sensor for each of the tires;

detecting the angular velocity speed of the tires by the wheel speed sensors;

comparing the rolling radii of the tires by means of comparing angular velocity speed signals from the wheel speed sensors characterized by calculating an error value DEL' where

$$DEL' = \frac{[(C1 + C4)/2 - (C2 + C3)/2]}{(C1 + C2 + C3 + C4)/4} \times 100$$

where C1, C2, C3 and C4 are angular velocity values for left-hand front, right-hand front, left-hand rear and right-hand rear wheels of the vehicle, respectively,

determining a correction factor LAT,

calculating a corrected error value DEL wherein in the case that the sign of product LAT×A or the correction factor LAT and a vehicle related constant A is opposite to the sign of the error value DEL' then the corrected error value DEL is given by

$$DEL=DEL'$$

and in the case that the product LAT×A and the error value DEL' have the same sign but the product LAT×A is greater in absolute magnitude than the error value DEL' then the corrected error value DEL is given by

$$DEL=0$$

otherwise the corrected error value DEL is given by

$$DEL=DEL'-(LAT\times A)$$

and a tire warning indicator is operated in the vehicle to indicate that at least one tire is deflected when the magnitude of the corrected error value DEL is sensed in the range of 0.05 to 0.5.

5,838,231
DEVICE FOR MONITORING OPEN TERRAIN AND FOR PROTECTING OBJECTS

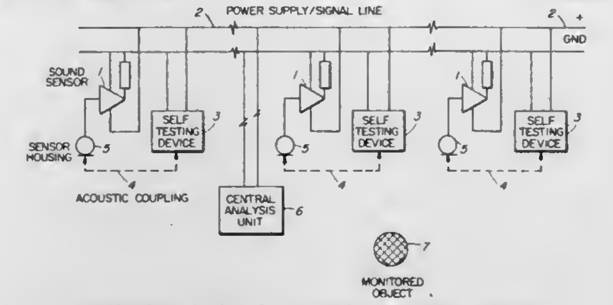
Stefan Scherbarth, Kanata, Canada, assignor to Senstar-Stellar Corporation

Continuation of Ser. No. 731,135, Oct. 10, 1996, abandoned. This application Aug. 8, 1997, Ser. No. 907,626

Claims priority, application German Dem. Rep., Oct. 10, 1995, 195376323

Int. Cl.^{6} G08B *1/08*

U.S. Cl. 340—538 **6 Claims**



1. A monitoring device for detecting acoustic vibrations in a monitored object, comprising:

a central electronic analysis unit;

a plurality of sound sensors which are mounted in acoustic communication with said monitored object, each of which is connected to said central electronic analysis unit; and

a plurality of self testing units connected to said central electronic analysis unit, each such self testing unit being acoustically coupled with a respective corresponding one of said sound sensors;

wherein

(i) said self testing units are activated by said electronic analysis unit by modulation of an operating voltage applied thereto;

(ii) said sound sensors are connected to the analysis unit by way of a common current supply/signal line;

(iii) delay devices are assigned to the individual self testing units whereby testing structure-borne-sound excitation is generated only after a preselectable delay time following an activation of the self testing unit; and

(iv) the delay time differs for each of the self-testing units.

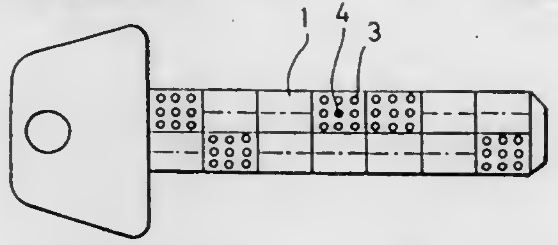
5,838,232
MULTI-PURPOSE LOCKING DEVICE USING LASER AND OPTICAL FIBERS

Won Suk Kim, 77-23, Hwagok-dong, Kangseo-ku, and Jung Hoon Rhe, 1-1068, Yongsan-dong 2-Ga, Yongsan-ku, both of Seoul, Rep. of Korea

Filed Aug. 13, 1997, Ser. No. 910,819

Int. Cl.^{6} E05B *45/06;47/00*

U.S. Cl. 340—542 **9 Claims**



1. A multi-purpose locking device comprising a locking device body having a keyhole and a key having a key insert portion selectively inserted into the keyhole to unlock a locked state of the locking device, further comprising:

a plurality of apertures formed in the key insert portion of the key;

at least one block member fitted in a selected one of the apertures and adapted to close the selected aperture;

a light emitting unit exposed at an output thereof to the keyhole of the locking device body;

a light receiving unit adapted to receive light emitted from the light emitting unit through the apertures, not closed, of the key insert portion under the condition in which the key is inserted into the keyhole, the light receiving unit including a plurality of photo transistors grouped into a turn-on transistor group and a turn-off transistor group, the photo transistors in the turn-on transistor grouped being for receiving light from the light emitting unit, light from the light emitting unit being blocked from the photo transistors in the turn-off transistor group by the at least one block member;

a logic unit adapted to determine the level of an output from the light receiving unit;

a solenoid adapted to unlock the locked state of the locking device;

a drive unit coupled to the logic unit and adapted to drive the solenoid based on a first output signal from the logic unit; and

an alarming unit activated by a second output signal from the logic unit and adapted to generate an alarm through a speaker coupled thereto.

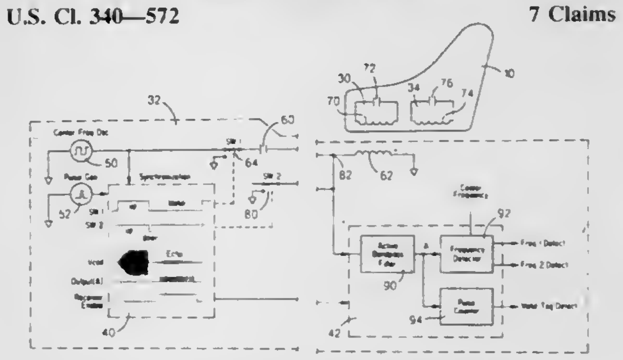
5,838,233
OBJECT ORIENTATION SENSOR DEVICE

Kevin Joseph Hawes, Greentown; Frank Bruce Wiloch, Russiaville, and Jon Paul Kelley, Kokomo, all of Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Aug. 16, 1996, Ser. No. 699,006

Int. Cl.^{6} G08B *13/14*

U.S. Cl. 340—572 **7 Claims**



1. An object orientation sensor device, comprising:

(a) a first LC tag disposed at a first selected location in said object;

(b) a driver/reader circuit disposed so as to detect the presence of said first LC tag when said object is in a first orientation and to not detect the presence of said first LC tag when said object is not in said first orientation; and

(c) said driver/reader circuit including a tank circuit including an inductor and capacitor joined at a first node and having a second node, an oscillator, a receiver circuit coupled to said tank circuit at said first node, and a synchronization circuit for (1) connecting said oscillator to said second node for energizing said tank circuit with alternating electrical current to produce a magnetic field for energizing said first LC tag, (2) disconnecting said oscillator from said second node, (3) momentarily shorting said inductor to discharge said tank circuit, and (4) enabling said receiver circuit to detect a first resonant frequency echo produced by said first LC tag when said oscillator is disconnected from said second node and said tank circuit is discharged.

5,838,234
METHOD AND DEVICE FOR SENSING, IDENTIFYING AND PROTECTING GOODS, PARTICULARLY FROM THEFT

Véronique Roulleaux-Robin, 21, rue des Sablons Chandelles 28130, Villiers Le Morhier, France

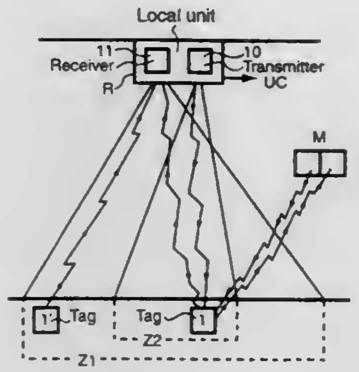
PCT No. PCT/FR95/01713, § 371 Date Aug. 27, 1996, § 102(e) Date Aug. 27, 1996, PCT Pub. No. WO96/20463, PCT Pub. Date Jul. 4, 1996

PCT Filed Dec. 21, 1995, Ser. No. 702,604

Claims priority, application France, Dec. 28, 1994, 94 15765

Int. Cl.^{6} G08B *13/14*

U.S. Cl. 340—572 **13 Claims**



1. A system for sensing, identifying and protecting goods against theft, comprising:

at least one local unit placed in an appropriate place in a controlled area, comprising:

(i) a local receiver having a long range for receiving messages transmitted by a transmitter circuit located anywhere in said controlled area, and comprising means for transmitting the received alarm messages to a central processing unit, and

(ii) a local transmitter having a short range for transmitting permanently an activating signal in a narrow transit area in the controlled area; and

autonomous tags of at least a first and a second type, respectively fitted with objects to be protected in said controlled area, each tag comprising:

(i) an electric power source,

(ii) a transmitter circuit connected to said power source via a controlled switch, said transmitter circuit when powered by said power source transmitting an alarm message containing an identification signal to said local receiver when said tag is placed in said controlled area,

(iii) a sensor for sensing a parameter representative of an unauthorized use of the object fitted with the tag,

(iv) a receiver circuit for receiving said activating signal when said tag is placed in said transit area, and

(v) a logic control circuit connected to said power source, said transmitter and receiver circuits, said controlled switch and said sensor, for controlling said controlled switch and for switching the tag from a disabled state to an enabled state when said sensor detects said parameter, the logic control circuit of the tags of said first type comprising means for switching the transmitter on to transmit an alarm message if both said tag is in said enabled state and said receiver circuit receives said activating signal from said local transmitter, the logic control circuit of the tags of said second type comprising means for switching the transmitter on to transmit an alarm message if said tag is in said enabled state.

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5,838,235

STATION, A PASSIVE PORTABLE OBJECT AND APPARATUS FOR THE REMOTE EXCHANGE OF INFORMATION BETWEEN THE PASSIVE PORTABLE OBJECT AND THE STATION

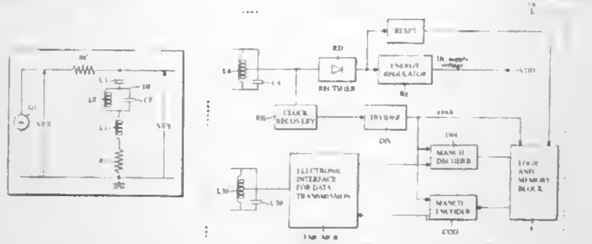
Yves Thorigne, Verson, France, assignor to France Telecom, Paris, and La Poste, Boulogne Billancourt, both of France

Filed Sep. 5, 1996, Ser. No. 708,578

Claims priority, application France, Sep. 6, 1995, 9510445

Int. Cl.^{6} G08B *13/14*

U.S. Cl. 340—572 **17 Claims**



1. An apparatus for the exchange of information by electromagnetic coupling between a portable object and a station, in which said station comprises:

- a first generator of a first alternating voltage with a first selected frequency,
- a first resistive station element with a first terminal linked to the first generator and a second terminal,
- a series arrangement linked to the second terminal and having at least a first inductive station element, a first capacitive station element and a second resistive station element, said arrangement having a pair of terminals and being able to create a second alternating voltage at said terminals,
- station processing means connected to the first and second terminals of the first resistive station element and able to process phase variations between the first and second alternating voltages, and
- in which said portable object comprises:
  - an electronic circuit comprising a first inductive object element and a first capacitive object element, said circuit being switchable between an inactive state and an active state in which it forms a resonant circuit with the first inductive station element,
  - object processing means able to switch the electronic circuit as a function of information to be transmitted to the station, the phase variation between the first and second alternating voltages induced by this switching enabling the station processing means to deduce therefrom said information,
  - wherein said station further comprises:
    - a second generator of a third alternating voltage of a second selected frequency different from the first frequency,
    - wherein the portable object also comprises:
      - a second inductive object element independent of the first inductive object element and having terminals,
      - a second capacitive object element linked to the terminals of the second inductive object element, said second inductive object element being able to form a tuned loop with the second inductive station element in order to generate at the terminals of the second inductive object element an inducted alternating supply voltage in the presence of the magnetic field created by the second inductive station element, and
      - wherein the station also comprises a filtering circuit of dipole type interposed between one of the electrodes of the first capacitive station element and one of the terminals of the first inductive station element, said filtering circuit being able to behave essentially as an inductance at the first frequency and an impedance of high value at the second frequency.

5,838,236

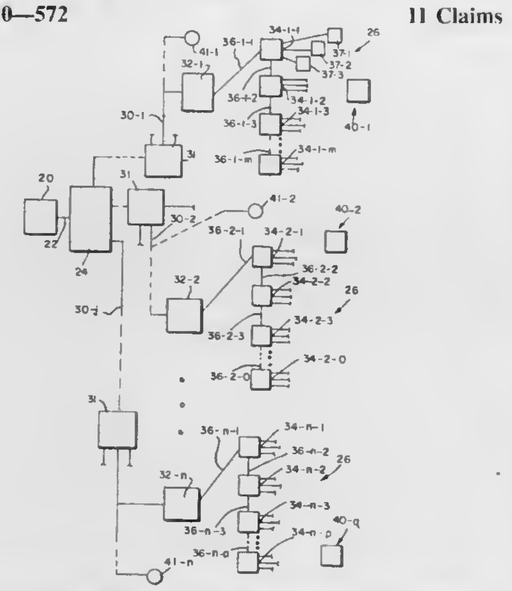
MANUFACTURING METHOD AND APPARATUS

Stanley L. Bentley, Indianapolis; Gene R. Carey, Oaklandon; Patrick A. Heinzman, Cicero, and Julie E. Myers, Indianapolis, all of Ind., assignors to Diversified Systems Incorporated, Indianapolis, Ind.

Filed May 27, 1997, Ser. No. 863,744

Int. Cl.^{6} G08G *13/14*

U.S. Cl. 340—572 **11 Claims**



1. A method of manufacturing comprising steps of providing a batch of articles containing at least one article in a step in a process of being manufactured with a machine detectable tag, providing at least one station in the manufacturing process with a detector for detecting the tag, providing a link between the at least one station and a controller, signaling detection by the detector of the presence of the tag to the controller over the link, and assigning a highest priority for processing through the at least one station to the batch.

5,838,237

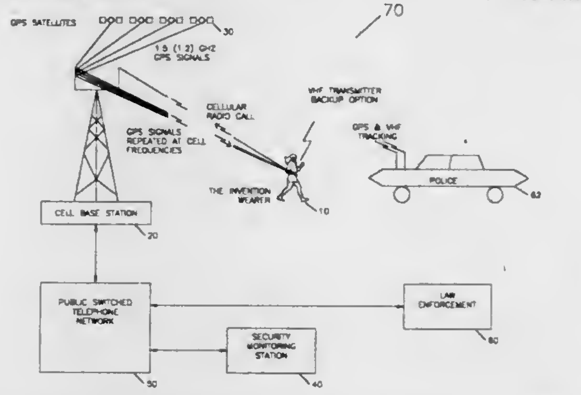
PERSONAL ALARM DEVICE

Graeme Charles Revell, and Ashley Mark Revell, both of 5093 N. Parkway Calabasas, Calabasas, Calif. 91302

Filed May 22, 1996, Ser. No. 651,341

Int. Cl.^{6} G01S *3/02*

U.S. Cl. 340—573 **37 Claims**


70
GPS SATELLITES
30
1.5 (1.2) GHZ GPS SIGNALS
CELLULAR RADIO CALL
VHF TRANSMITTER BACKUP OPTION
GPS & VHF TRACKING
GPS SIGNALS REPEATED AT CELL FREQUENCIES
POLICE
62
THE INVENTION WEARER
10
CELL BASE STATION
20
PUBLIC SWITCHED TELEPHONE NETWORK
LAW ENFORCEMENT
60
SECURITY MONITORING STATION
50
40

1. A method of providing the location of a device to a remote site, wherein the device includes a transmitter and a receiver, comprising the steps of:

- (a) establishing a connection with the remote site using the transmitter, wherein the connection is established on a cellular frequency;
- (b) receiving position location signals with the receiver, the signals being GPS signals modified for transmission at a cellular frequency and combined with cellular communication control data from a cellular signal and from a cellular site controller;
- (c) communicating device location data to the remote site over the cellular frequency connection, wherein the device location data is derived from the position location signals;
- (d) terminating the cellular connection after step (d); and
- (e) periodically repeating steps (a)–(e), such that the connection is discontinuous and the device location data is intermittently communicated to the remote site.

5,838,238

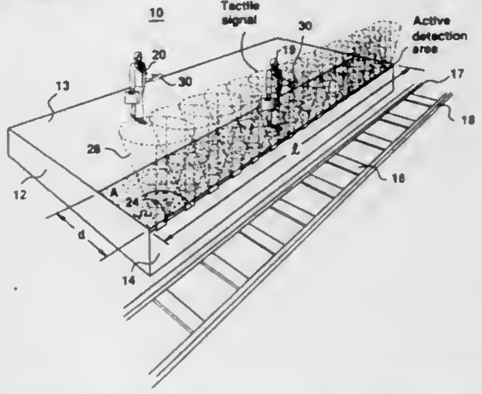
ALARM SYSTEM FOR BLIND AND VISUALLY IMPAIRED INDIVIDUALS

Joseph L. Abita, Boyds; Ronald L. Stanford, Elkridge, and Bliss G. Carkhuff, Laurel, all of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed Mar. 13, 1997, Ser. No. 818,470

Int. Cl.^{6} G08B *23/00*

U.S. Cl. 340—573 **41 Claims**



8. In a transportation system of the class wherein a passenger-carrying vehicle is scheduled to stop in proximity to the edge of a passenger-boarding platform frequented by vision impaired individuals who during the course of boarding the vehicle without human assistance may compromise their safety if their approach to a boarding area on said platform succeeds in placing them in the path of a vehicle moving past the platform, apparatus dedicated to the protection of said individuals comprising:

- a plurality of means mounted on said platform each for generating an optical signal, said signals being directed upwardly toward a boarding area on said platform, said boarding area being configured to demarcate a hazard zone having a predetermined length extending parallel to the edge of said platform and having a predetermined width perpendicular to and extending in a direction inboard of the edge of said platform; and
- means, mounted on or carried by said individuals having a reception spectrum tuned to said optical signals, for issuing a warning to said individuals when said individuals enter said hazard zone.

5,838,239

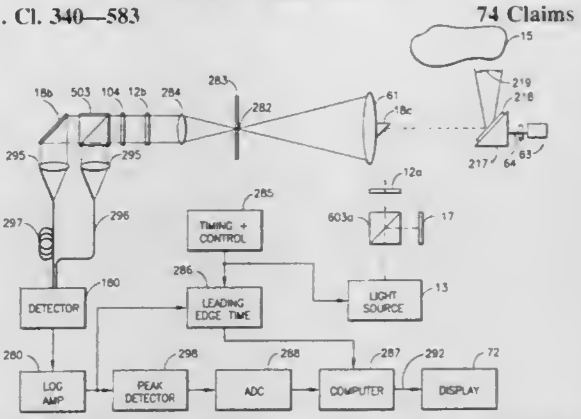
SYSTEM FOR DETECTING ICE OR SNOW ON SURFACE WHICH SPECULARLY REFLECTS LIGHT

Howard Stern, Greenlawn; John Schaefer, Coram, and Fereydoun Maali, New York, all of N.Y., assignors to Robotic Vision Systems, Inc., Hauppauge, N.Y.

Continuation-in-part of Ser. No. 357,875, Dec. 16, 1994, Pat. No. 5,589,822, which is a continuation-in-part of Ser. No. 963,840, Oct. 20, 1992, Pat. No. 5,475,370. This application Sep. 10, 1996, Ser. No. 712,059

Int. Cl.^{6} G08B *19/02*

U.S. Cl. 340—583 **74 Claims**



1. Apparatus for detecting, on a surface which specularly reflects light, the presence of a polarization altering substance on said surface comprising:

- means for transmitting a pulse of light over a transmitting path to said surface;
- means for receiving transmitted light;
- a receiving path for said transmitted light from said surface and from said substance to said means for receiving;
- means for splitting said transmitted light into a non-isolated portion and an isolated portion;
- means for delaying one of said non-isolated portion and said isolated portion relative to another thereof to produce a first-to-arrive signal and a second-to-arrive signal;
- said first-to-arrive signal being completed at an output of said means for delaying before said second-to-arrive signal arrives at said output;
- means for measuring a first intensity of said first-to-arrive signal and outputting a first signal;
- means for measuring a second intensity of light of said second-to-arrive signal and outputting a second signal; and
- means for comparing said first and second intensities of light to reference data to detect the presence of said substance on said surface.

5,838,240

WET DIAPER DETECTOR

Lonnie G. Johnson, Smyrna, Ga., assignor to Johnson Research & Development Company, Inc., Smyrna, Ga.

Continuation-in-part of Ser. No. 158,612, Nov. 29, 1993, Pat. No. 5,469,145, which is a continuation of Ser. No. 890,162, May 29, 1992, Pat. No. 5,266,928. This application May 8, 1995, Ser. No. 438,090

Int. Cl.^{6} G08B *21/00*

U.S. Cl. 340—604 **7 Claims**

1. A wet diaper detector comprising a diaper having a liquid impermeable exterior surface, a housing for containing operative components of said detector with said housing having a surface configured to be positioned against the impermeable exterior surface of the diaper, an adhesive patch for removably mounting said housing to said exterior surface of said diaper with said surface of said housing held against said diaper impermeable exterior surface, sensor means located on said surface of said housing for sensing a wet condition on the inside of said diaper while being located outside the diaper where said sensor means does not contact wetness within the diaper, and electronic means in said housing

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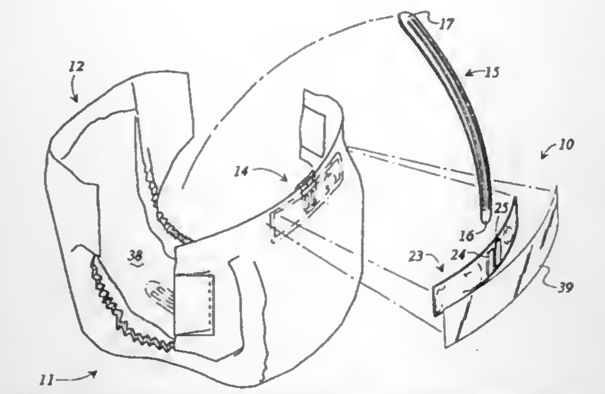


operatively coupled to said sensor means for producing an alarm upon the sensing of a wet condition inside the diaper.

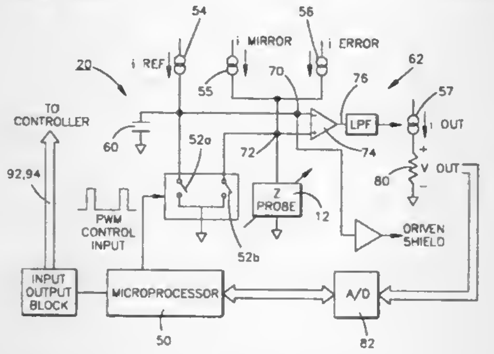
5,838,241
LIQUID LEVEL TRANSMITTER

Benjamin N. Lease, and Otis P. Pierson, both of Knoxville, Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Dec. 18, 1996, Ser. No. 768,528

Int. Cl.⁶ G08B *21/00*

U.S. Cl. 340—618 **13 Claims**



1. A level detector circuit for determining a level of immersion of an elongated probe within a liquid comprising:

a) a first current source for charging an elongated probe with a charging current that depends upon a length of the elongated probe immersed within a liquid;

b) a sensing circuit for monitoring a voltage on the elongated probe as the first current source charges the probe and providing a control output based on the voltage on the elongated probe;

c) a second current source coupled to the control output from the sensing circuit for providing an output current based on a charging of the elongated probe by the first current source;

d) monitoring circuitry for developing an analog level signal based on the output current provided by the second current source; and

e) conversion circuitry coupled to the monitoring circuitry for providing a frequency modulated communications signal corresponding to the analog level signal related to the length of the probe immersed within the liquid.

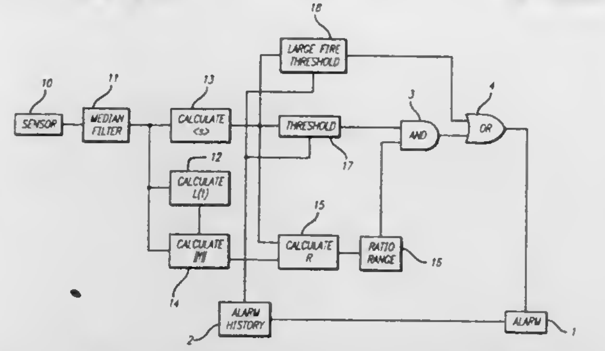
5,838,242
FIRE DETECTION SYSTEM USING MODULATION RATIOMETRICS

Gary C. Marsden, Austin, Tex., assignor to Whittaker Corporation, Simi Valley, Calif.

Filed Oct. 10, 1997, Ser. No. 947,501

Int. Cl.⁶ G08B *17/10*

U.S. Cl. 340—628 **28 Claims**



1. A method of establishing a detected fire condition from a source of incident radiation, said method comprising the steps of:

generating a sensor signal from a sensor responsive to incident radiation;

generating an absolute signal from said sensor signal;

determining an absolute signal average from said absolute signal;

generating a flicker signal from said absolute signal;

determining a flicker value from said flicker signal;

calculating a modulation ratio from said flicker value and said absolute signal average; and

providing an indication of a detected fire condition when said absolute signal average exceeds a predetermined threshold value and said modulation ratio is within a selected range of values.

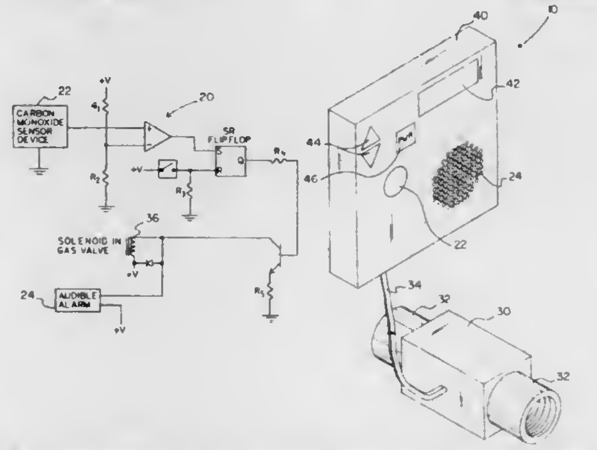
5,838,243
COMBINATION CARBON MONOXIDE SENSOR AND COMBUSTION HEATING DEVICE SHUT-OFF SYSTEM

Eugene Gallo, 5 Judge St., Brooklyn, N.Y. 11211

Filed Apr. 10, 1997, Ser. No. 833,905

Int. Cl.⁶ G08B *17/10*

U.S. Cl. 340—632 **6 Claims**



1. A combination carbon monoxide sensor and combustion heating device shut-off system kit for control of carbon monoxide danger, said kit comprising:

a control valve connected in a gas pipe supplying gas to a combustion heating device employing a flame to burn gas, wherein said control valve controls a flow of gas to said combustion heating device; and

a carbon monoxide detecting means for detecting carbon monoxide levels in an air space, said carbon monoxide detecting means being electrically connected to said control valve for controlling the closing of said control valve, said carbon monoxide detecting means being adapted to close said control valve for stopping said flow of gas to said heating device upon detection by said detecting means of the presence of a pre-determined level of carbon monoxide, said carbon monoxide detecting means being adapted to sound an audible alarm upon detection by said detecting means of the presence of a pre-determined level of carbon monoxide.

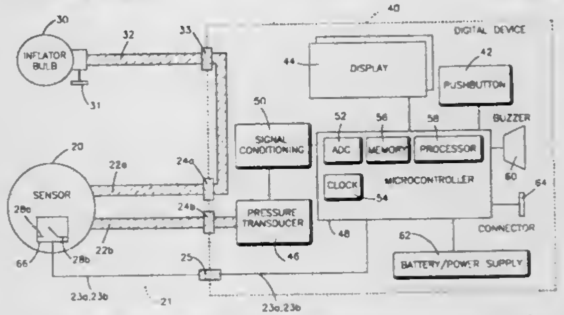
5,838,244
INTERFACE PRESSURE MEASUREMENT DEVICE

Robert N. Schmidt, Cleveland, and Steven P. Hendrix, Sagamore Hills, both of Ohio, assignors to Cleveland Medical Devices Inc., Cleveland, Ohio

Filed Oct. 8, 1996, Ser. No. 727,240

Int. Cl.⁶ G08B *21/00*

U.S. Cl. 340—635 **15 Claims**



1. An interface pressure measurement device for measuring the pressure applied upon a body, comprising:

a) A sensor comprising two sensor sheets formed from thin flexible plastic material and said sensor having sensor tubing;

b) A digital device connected to said sensor by said sensor tubing and further comprising an enclosure, a push button, pressure transducer, signal conditioning means, microcontroller with processor means, analog-to-digital converter, memory means, clock, display, and battery/power supply wherein said processor means interrupts said battery/power supply current flow to shut off said digital device after a preset time; and

c) an inflator bulb having inflator tubing and connected to said digital device by said inflator tubing such that said inflator bulb is used to manually pump air through said digital device to said sensor whereby the pressure from the air in said sensor between said sensor sheets is sensed by said pressure transducer and whereby said microcontroller through said processor means transmits a signal to said display to provide a visual indication corresponding to the pressure in said sensor, said pressure transducer located downstream of said sensor such that the effects of the pressure transients from said inflator bulb are minimized.

5,838,245
CLEANING TIME DETERMINING DEVICE FOR DRUG STORAGE/DISCHARGE APPARATUS

Takaaki Murakami, and Kunihiko Kano, both of Toyonaka, Japan, assignors to Kabushiki Kaisha Yuyama Seisakusho, Toyonaka, Japan

Filed Jan. 24, 1997, Ser. No. 787,293

Claims priority, application Japan, Jan. 26, 1996, 8-011606

Int. Cl.⁶ G08B *21/00*

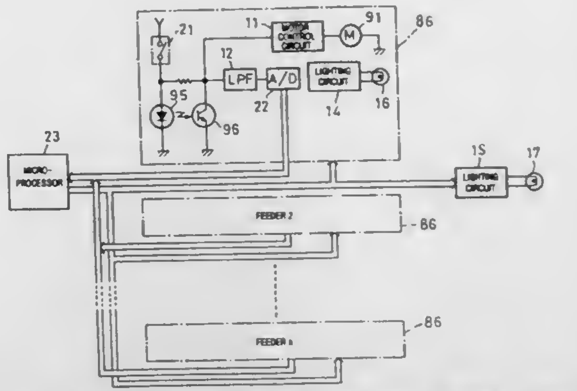
U.S. Cl. 340—674 **4 Claims**

1. A drug storage/discharge apparatus comprising:

a plurality of drug feeders for storing and feeding drugs;

a plurality of drug guide paths extending along said drug feeders for guiding drugs discharged therefrom, wherein said drug discharge paths are exposable to permit cleaning and visual inspection thereof;

a drug collecting station for receiving drugs fed from said drug feeders through said drug guide paths;



a dirt detector, provided in each said drug discharge paths leading from said drug feeders to said drug collecting station, for detecting dirt present in said drug discharge paths; and

a display device for displaying detection results from said dirt detector.

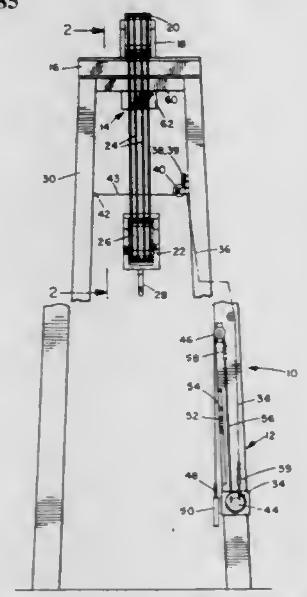
5,838,246
SAFETY APPARATUS FOR OIL DRILLING DERRICK

Ronald J. Voorhees, La Jolla, Calif., assignor to Luz Marie Vorhees, La Jolla, Calif.

Filed May 13, 1997, Ser. No. 855,062

Int. Cl.⁶ G09B *21/00*

U.S. Cl. 340—685 **28 Claims**



1. A safety apparatus for a hoist unit, comprising:

a cable of predetermined length sufficient to extend from a first position adjacent a crown of a hoist unit and a second position adiacent a lower end of the unit, the cable having a first end for connection to a hoist unit adjacent the crown of the unit and a second end, a series of pulleys for securing to the unit to define a predetermined cable path extending into a travel path of a traveling block traveling up the unit at a predetermined spacing below the crown of the unit and down one side of the unit to a location adjacent a lower end of the hoist unit at a surface on which the unit is mounted;

the cable being adapted to be located in the path of a traveling block moving up the hoist unit towards the crown; and

an alarm device for mounting at the lower end of the hoist unit linked to the second end of the cable for actuation by the cable to produce an output alarm signal if the cable is pulled up by the traveling block as it approaches the top of the unit.

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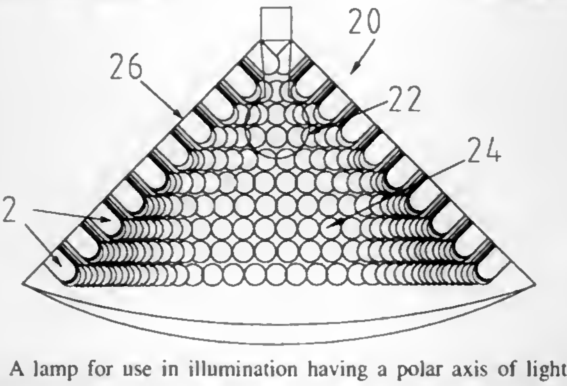
5,838,247
SOLID STATE LIGHT SYSTEM

Witold S. Bladowski, 11 Wilson Court, Barrie, Ont., Canada, L4N 5K8

Filed Apr. 1, 1997, Ser. No. 831,385

Int. Cl.^{6} G08B *5/22*

U.S. Cl. 340—815.45 **14 Claims**



1. A lamp for use in illumination having a polar axis of light propagation, and a projected frontal zone of light emission on substantially normal to said polar axis; a mass of solid state lights arranged in close mutual proximity as a strip lamp of predetermined width, the strip lamp being positioned at an angle to the plane of said frontal zone, the face area of said strip lamp exceeding the face area of said frontal zone, wherein said frontal zone cannot accomodate said mass of solid state lights of said strip lamp; said strip lamp providing a light source the intensity of which when energized exceeds the intensity of a Lamp comprising said solid state lights, lying in the plane of, and occupying said frontal zone.

5,838,248
ELECTRONIC ARRANGEMENT AND COMMUNICATION CONTROL METHOD THEREFOR

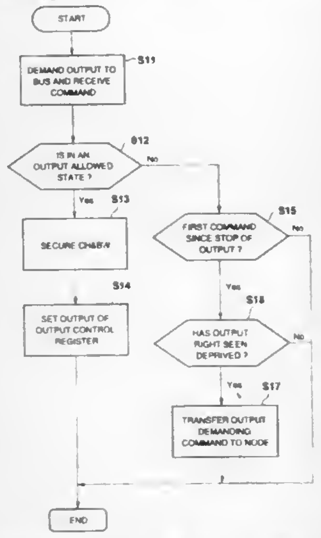
Susumu Nagano, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 18, 1996, Ser. No. 634,204

Claims priority, application Japan, Apr. 21, 1995, 7-120881

Int. Cl.^{6} H04Q *9/00;3/00*

U.S. Cl. 340—825.03 **7 Claims**


START
DEMAND OUTPUT TO BUS AND RECEIVE COMMAND
S11
S12
IS IN AN OUTPUT ALLOWED STATE ?
No
Yes
S13
SECURE CH&BW
S14
SET OUTPUT OF OUTPUT CONTROL REGISTER
S15
FIRST COMMAND SINCE STOP OF OUTPUT ?
No
Yes
S16
HAS OUTPUT RIGHT BEEN DEPRIVED ?
No
Yes
S17
TRANSFER OUTPUT DEMANDING COMMAND TO NODE
END

1. A communication system having a plurality of electronic devices connected to each other through a bus supporting multiple communication channels for data communication, said communication system comprising:

monitoring means for monitoring data to determine whether any of the electronic devices is using a preselected communication channel on said bus;

internal state detecting means for detecting an internal status of each of the electronic devices, said internal status including an output-enabled state and an output-disabled state; and

control means for supplying control data for causing an electronic device to start transmitting the data to said bus using said preselected communication channel if no other electronic device is using said preselected communication channel for a predetermined period of time as determined by said monitoring means and if said electronic device is in said output-enabled state as determined by said internal state detecting means.

5,838,249
CONTROL/SUPERVISORY SIGNAL TRANSMISSION/RECEPTION SYSTEM

Yoshitane Saito; Kazuo Itani, both of Nagaokakyo; Yuji Watanabe, and Takeharu Katsuno, both of Kawasaki, all of Japan, assignors to NKE Co., Ltd., Kyoto, and Kuroda Precision Industries Ltd., Kawasaki, both of Japan

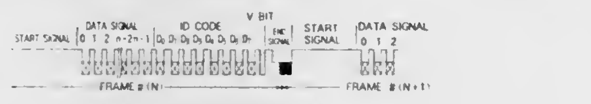
Filed Sep. 13, 1996, Ser. No. 713,789

Claims priority, application Japan, Sep. 14, 1995, 7-236848

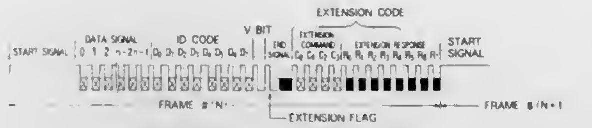
Int. Cl.^{6} H04Q *1/00*

U.S. Cl. 340—825.06 **10 Claims**

FRAME STRUCTURE (EMBODIMENT 2)



ORDINARY FRAME (NON EXTENSION MODE)



EXTENDED FRAME CONTAING EXTENSION CODE

1. A control/supervisory signal transmission/reception system for controlling and supervising operations and operating states of a plurality of units to be controlled and supervised, said system including a central station and a plurality of local stations which are interconnected by way of a common data signal line, said units to be controlled/supervised being operatively connected to said local stations, respectively, to be controlled and supervised through said central station, said central station including signal generating means for generating a voltage signal containing a series of pulse-like signals, said pulse-like signals including those having a first voltage level of a first predetermined duration for representing non-data state and those having a second voltage level corresponding substantially to a half of said first voltage level and having a second predetermined duration for representing a data state, clock means for generating a clock signal for controlling a timing at which said pulse-like signals are generated in said central station, wherein data to be sent from said central station to said local stations, data to be sent from said local station to said central station and data to be sent from a given one of said local stations to another local station are transmitted at said second voltage level in combination with a ground potential level,

wherein-said central station comprises:

transmitting means for sending out sequentially and repetitively ordinary frames each of which contains a start signal having a first constant duration transmitted at said first voltage level, a data signal containing a plurality of voltage pulses which can selectively assume combinations of said first voltage level and one of said second voltage level and said ground potential level in correspondence to data to be transmitted from said central station to said local stations, an identifier signal representing an identifier code of each of said local stations and an end signal having a waveform differing from that of said data signal, said identifier code having information for identifying each of said local stations; and

wherein each of said plurality of local stations comprises:

identifying number setting means for setting an own identifying number assigned previously to each of said local stations;

address setting means for setting a count value indicating an own address of said local station for enabling reception and transmission of said data signal;

data receiving/sending means responding to reception of said frame for fetching a predetermined number of said voltage pulses contained in said data signal, said predetermined number being determined on the basis of the count value indicating said address assigned to said local station;

identifier code extracting means for extracting said identifier code contained in said frame and received by said local station in precedence to said end signal;

comparison means for comparing said extracted identifier code with said own identifying number of said local station; and

end response means responding to coincidence between said identifier code and said own identifying number assigned to said local station, said end response means sending a response to said central station by modulating the level of said end signal which level represents said data state.

5,838,250
REMOTE-CONTROL APPARATUS AND IMAGE INPUT APPARATUS

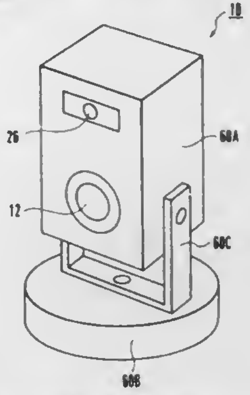
Yoshito Maekawa, Kanagawa-ken, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 345,478, Nov. 28, 1994, abandoned. This application Jun. 2, 1997, Ser. No. 867,176

Claims priority, application Japan, Dec. 2, 1993, 5-302908

Int. Cl.^{6} H04Q *1/00*

U.S. Cl. 340—825.07 **11 Claims**



1. A remote-control apparatus for remotely controlling a plurality of controlled apparatuses, comprising:

(a) image input means for inputting images of said controlled apparatuses;

(b) control means for controlling each controlled apparatus the image of which has been input by said image input means, said control means including a signal transmitting section for transmitting an optical signal for controlling the to-be-controlled apparatuses, the transmitting direction of the optical signal being the same as an image pickup direction of the image input means;

(c) means for changing the image pickup direction of the image input means; and

(d) image transmitting means for outputting the images input by said image input means to outside the remote-control apparatus.

5,838,251
METHOD AND DEVICE FOR PROGRAMMING OPERATING DATA INTO VEHICLE COMPONENTS

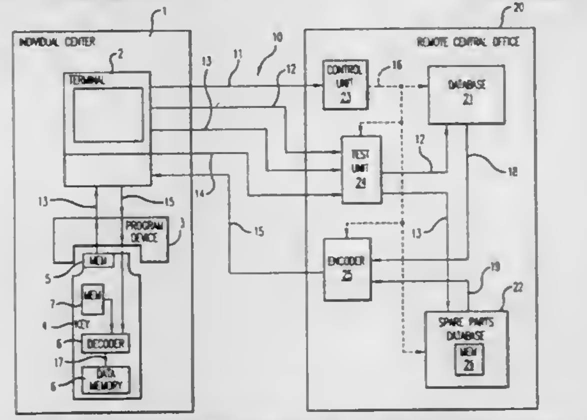
Horst Brinkmeyer, Waiblingen; Guenter Schwegler, Weinstadt; Brigitte Althen; Bertolt Krueger, both of Bonn; Konrad Klein, Ostfildern; Thomas Krehbiehl, Winterbach, and Guenther Metsch, Moeglingen, all of Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany

Filed Sep. 3, 1996, Ser. No. 706,938

Claims priority, application Germany, Aug. 31, 1995, 195 32 067.0

Int. Cl.^{6} H04Q *1/00*

U.S. Cl. 340—825.31 **20 Claims**



1. A method for programming data into a vehicle component, the method comprising the steps of:

requesting data from a central office;

transmitting data from the central office in an encoded form as encoded data to the requesting location at least with an individual vehicle-component-related code; and

decoding only in said vehicle component itself said encoded data that was encoded at the central office and was received by the requesting location with a code that is related to the vehicle component.

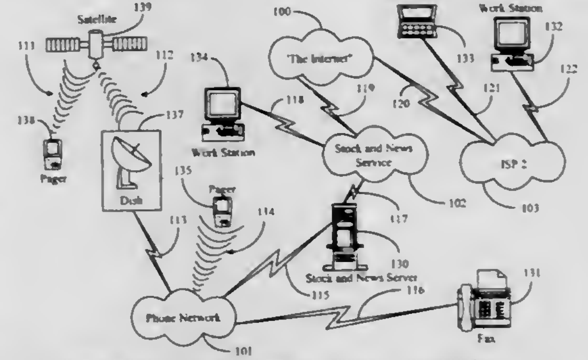
5,838,252
INTERACTIVE TWO-WAY PAGER SYSTEMS

Dan Kikinis, Saratoga, Calif., assignor to Datalink Systems, Inc., San Jose, Calif.

Filed Sep. 9, 1996, Ser. No. 708,817

Int. Cl.^{6} H04Q *7/12*

U.S. Cl. 340—825.44 **9 Claims**



1. An interactive two-way pager system, comprising:

a pager server adapted to send first and second related pager messages;

a two-way pager device having a display for displaying messages sent by the server and having also two or more return buttons adapted for sending specific incremental signals to the pager server; and

a negotiator application executing on the pager server and adapted to send the first pager message and to receive an incremental signal initiated by a user pressing one of the return buttons in response to the first pager message;

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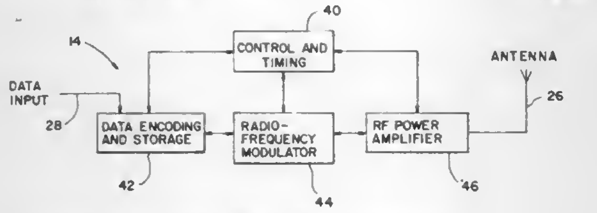
wherein the pager server is adapted to translate the meaning of the incremental signal according to the first message and to select and transmit the second message related to the first message according to the meaning of the incremental signal returned.

5,838,253
RADIO FREQUENCY IDENTIFICATION LABEL

Albert Wurz, Doylestown, and Richard J. Skokowski, Jr., Green Lane, both of Pa., assignors to Accu-Sort Systems, Inc., Telford, Pa.

Filed May 17, 1995, Ser. No. 442,695
Int. Cl.^{6} H04Q *1/00*

U.S. Cl. 340—825.54 **13 Claims**



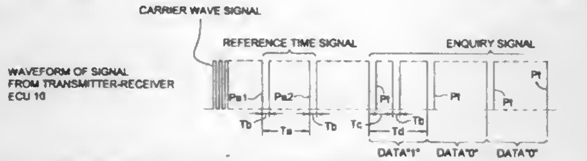
1. An active RF identification label comprising:
a memory for storing data;
means for generating a RF identification signal which requires a power source;
an activatable battery connected to said RF generating means for providing the required power;
said battery comprising at least a first component and a separate second component, said first and second components being physically isolated such that said battery is activated when said first component comes in operative physical contact with said second component;
means for permanently maintaining said first and second battery components in operative contact with each other after activation of the battery whereby an RF identification signal is producible on demand by activation of said battery; and
a control unit, coupled to said battery, said RF signal generating means and said memory, for controlling the generation of said RF identification signal to selectively output data from said memory into said RF identification signal for transmission,
said control unit being programmable to output data from said memory having a hither priority more frequently than data having a lower priority for transmission.

5,838,254
TRANSMISSION-RECEPTION TIME CORRECTION SYSTEM

Sadao Kokubu; Hisashi Aoki; Takashi Mizuno, and Shinichi Koga, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Japan

Filed Nov. 21, 1996, Ser. No. 754,799
Claims priority, application Japan, Nov. 22, 1995, 7-304133
Int. Cl.^{6} H04Q *1/00*

U.S. Cl. 340—825.54 **9 Claims**



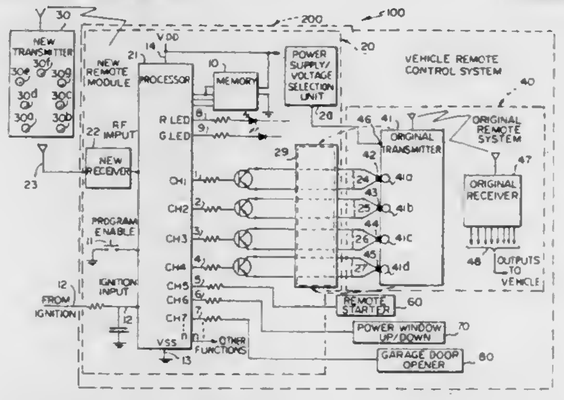
1. A transmission-reception system comprising:
a transmitter-receiver device transmitting an enquiry signal comprising a time signal including time information and a power signal, the transmitter-receiver device transmitting a reference time signal of a fixed time length together with the power signal prior to an operation of transmitting the enquiry signal; and
a transponder that is switchable to an active state by the power signal from the transmitter-receiver device, for decoding content of the received enquiry signal on the basis of the time information, and sending back to the transmitter-receiver device an answer signal in accordance with the result of decoding, the transponder measuring the time length of the reference time signal, calculating a correction value based on a ratio between the measured time length and the reference time length, and, while decoding the enquiry signal, correcting the time information included in the time signal forming the received enquiry signal using the correction value.

5,838,255
ENHANCED REMOTE CONTROL DEVICE

John Di Croce, Hauppauge, N.Y., assignor to Audiovox Corp., Hauppauge, N.Y.

Filed Apr. 19, 1996, Ser. No. 634,975
Int. Cl.^{6} G08C *19/00;* **B60R** *25/04*

U.S. Cl. 340—825.69 **6 Claims**



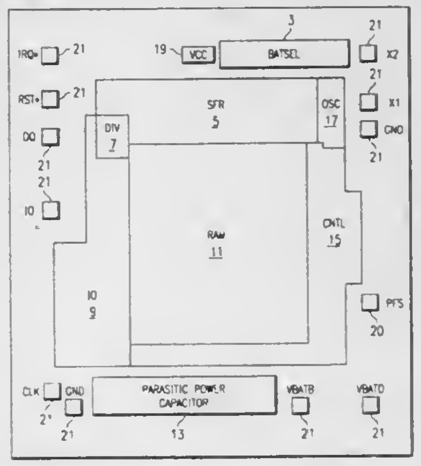
1. A remote control system comprising:
an original remote control system;
said original remote control system including an original transmitter and an original receiver;
said original receiver being connected to enable at least a first function in response to first signals from said original transmitter;
a new transmitter;
a new receiver;
said new receiver including means for producing second and third signals in response to said new transmitter;
means for operating said original transmitter to produce said first signals in response to second signals from said new receiver, whereby said original receiver is operated to enable said at least a first function; and
means for enabling at least a second function, not enabled by said original receiver, in response to said third signal, whereby the ability to enable said second function is added to functions of said original remote control system.

5,838,256
ELECTRONIC KEY WITH THREE MODES OF AUTOMATIC SELF-DISABLEMENT

Ronald W. Pearson, Denton, and Michael L. Bolan, Dallas, both of Tex., assignors to Dallas Semiconductor Corporation, Dallas, Tex.

Continuation of Ser. No. 103,724, Aug. 9, 1993, abandoned, which is a continuation of Ser. No. 727,255, Jul. 10, 1991, abandoned, which is a continuation-in-part of Ser. No. 690,205, Apr. 23, 1991, abandoned, and Ser. No. 556,059, Jul. 18, 1990, abandoned, which is a continuation of Ser. No. 412,767, Sep. 26, 1989, Pat. No. 4,943,804, which is a continuation of Ser. No. 163,281, Mar. 2, 1988, Pat. No. 4,870,401, said Ser. No. 690,205 is a continuation of Ser. No. 437,012, Nov. 14, 1989, Pat. No. 5,010,331, which is a continuation-in-part of Ser. No. 412,767, which is a continuation-in-part of Ser. No. 163,279, Mar. 2, 1988, Pat. No. 4,897,860, which is a continuation-in-part of Ser. No. 163,082, Mar. 2, 1988, Pat. No. 4,935,645. This application Jun. 20, 1995, Ser. No. 492,660
Int. Cl.^{6} H04Q *1/00*

U.S. Cl. 340—825.31 **15 Claims**



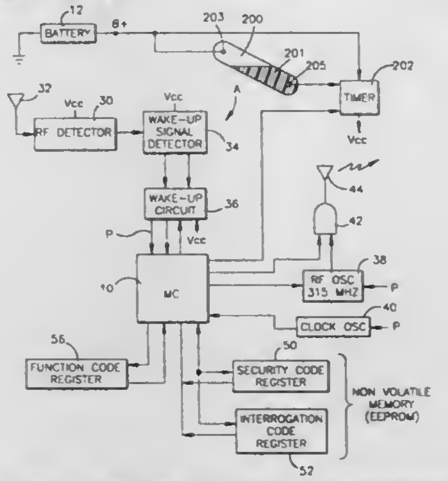
1. A system, comprising:
(a) an electronic key, comprising
  (i) a battery;
  (ii) a memory coupled to said battery;
  (iii) a detector for detecting a power supply voltage of said system;
  (iv) a crystal-based oscillator coupled to and powered by said battery, said crystal-based oscillator generates at least one tick signal at a frequency;
  (v) a first counter coupled to and powered by said battery and with a first alarm value, said first counter counts said at least one tick signal of said crystal-based oscillator to provide a date and time of day data;
  (vi) a second counter coupled to said detector and coupled to and powered by said battery and with a second alarm value, said second counter counts said at least one tick signal of said crystal-based oscillator only when said detector indicates that said power supply voltage of said system is active;
  (vii) a third counter coupled to and powered by said battery and with a third alarm value, said third counter is incremented each time said detector indicates said system becomes active after having been inactive; and
  (viii) access control circuitry which provides access to said memory only if said first counter has not counted to said first alarm value, said second counter has not counted to said second alarm value, or said third counter has not counted to said third alarm value; and
(b) a central processing unit (CPU), said CPU programmed to read said memory through said access control circuitry and to prevent said CPU from operating at least one program when said CPU is unable to read said memory.

5,838,257
KEYLESS VEHICLE ENTRY SYSTEM EMPLOYING PORTABLE TRANSCEIVER HAVING LOW POWER CONSUMPTION

George P. Lambropoulos, Grosse Pointe Woods, Mich., assignor to TRW Inc., Lyndhurst, Ohio

Filed May 24, 1996, Ser. No. 653,417
Int. Cl.^{6} H04Q *9/14*

U.S. Cl. 340—825.54 **8 Claims**



1. A portable transceiver for use in a remote keyless entry system for controlling the locking-unlocking functions of a motor vehicle door lock and wherein said system includes a vehicle transceiver for periodically transmitting an interrogation signal and receiving a coded reply signal and responding thereto for causing performance of a vehicle function, said portable transceiver comprising:
transmitter/receiver means for, when turned on, receiving a said interrogation signal and responding thereto by transmitting a said coded reply signal requesting performance of a vehicle function;
power supply means carried by said portable transceiver for supplying operating power for use by said transmitter/receiver;
timer means for receiving said operating power and having a first mode of operation for periodically supplying power pulses for each turning on of said transmitter/receiver means for a given period of time corresponding with that of a said power pulse;
said timer means having a second mode of operation for providing continuous power to said transmitter/receiver means; and
control means for controllably switching said timer means between said first and second modes of operation;
said control means including means for switching said timer means from said first mode of operation to said second mode of operation for a predetermined period of time when said transmitter/receiver means concurrently receives a said interrogation signal and a said power pulse so that said transmitter/receiver means is then turned on for said predetermined period of time and wherein said predetermined period of time is of a duration corresponding with that for said transmitter/receiver means to receive said interrogation signal and for transmitting a said coded reply signal.

5,838,258
SYSTEM FOR MONITORING THE USE OF HEAT ENERGY IN WATER DEVICES IN AN INDIVIDUAL UNIT OF A MULTI-UNIT BUILDING

David A. Saar, 8 Bennington Dr., Lawrenceville, N.J. 08648

Filed Nov. 8, 1996, Ser. No. 745,300
Int. Cl.^{6} G08C *19/04*

U.S. Cl. 340—870.11 **10 Claims**

1. A system for monitoring the use of heat energy in a plurality of energy consuming water devices in an individual unit of a

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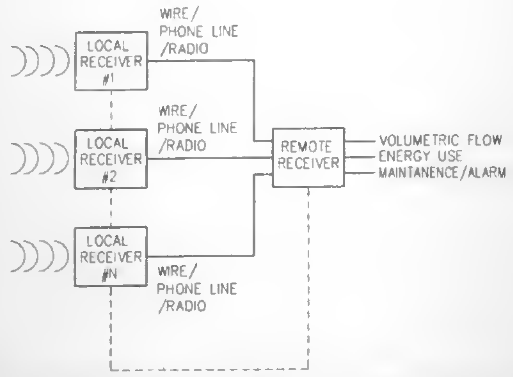


multi-unit building wherein each energy consuming water device is supplied by a water pipe comprising

at least one monitor for monitoring the flow through each of the plurality of water pipes, each of said monitors including

meter means for determining that successive volumetric flow units have flowed through the pipe,

temperature sensing means for sensing the temperature of the water flowing through the water pipe,

multiplying means for defining the heat energy of each of said successive volumetric flow units by multiplying the temperature times the increment of flow,

totalizator means for computing a total heat energy for said successive volumetric flow units, and

a transmitter for periodically transmitting said total heat energy for said successive volumetric flow units, and

a first remote receiver for receiving the total heat energy transmitted by the transmitter of each of said plurality of monitors and periodically retransmitting the total heat energy received from each of the monitors, and

a second remote receiver for receiving the total heat energy for each of said monitors retransmitted from said first remote receiver and for periodically computing the total heat energy of the water for said Plurality of monitors.

5,838,259
MOTOR VEHICLE DISPLAY SYSTEM AND RANGING DEVICE

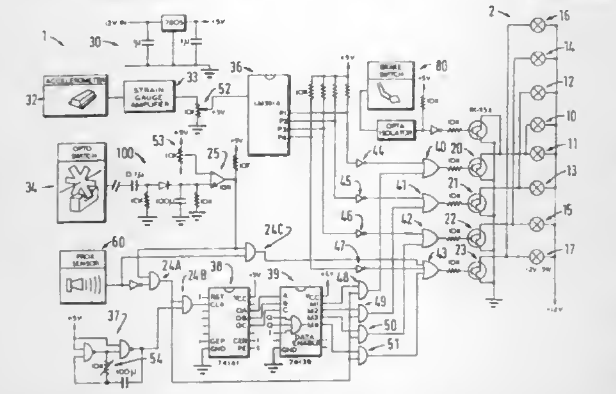
Mark Christopher Tonkin, Lewes, United Kingdom, assignor to Design Technology & Innovation Ltd.

Continuation-in-part of Ser. No. 284,540, Aug. 5, 1994. This application Nov. 22, 1996, Ser. No. 754,415

Claims priority, application United Kingdom, Feb. 5, 1992, 9202472; WIPO, Feb. 5, 1992, PCT/GB93/00251

Int. Cl.^{6} B60Q *1/00*

U.S. Cl. 340—903 **44 Claims**



1. A vehicle display system for indicating the state of motion of a subject vehicle to a driver of a following vehicle; the system comprising;

deceleration determining means operable to determine whether the state of motion of the subject vehicle is one of deceleration and to determine a measure of deceleration of the subject vehicle;

vehicle motion measuring means operable to sense a measure of velocity of the subject vehicle;

a processor operable to compare the measure of deceleration with a first set of deceleration thresholds defining a first set of distinct ranges of deceleration and to select a level of warning from a corresponding set of levels of warning according to the range of deceleration in which the measure of deceleration is determined to lie;

indicating means comprising an array of lamps controlled by the processor and operable to provide an indication of the state of motion as being one of deceleration by illuminating selected lamps of the array of lamps to provide a pattern of illumination representative of the selected level of warning such that the number of lamps illuminated is proportionate to the level of warning;

and wherein the processor is operable to determine the values of the first set of deceleration thresholds dependent upon the measure of velocity over an entire velocity range of the subject vehicle.

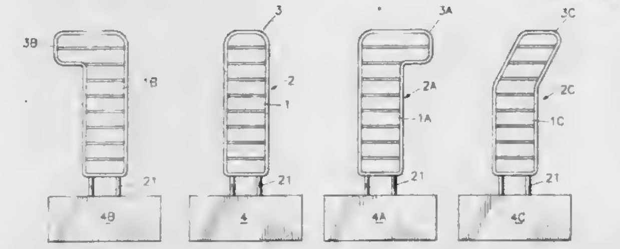
5,838,260
TRAFFIC SIGNALING DEVICE HAVING SEQUENTIALLY CONTROLLED LIGHT BARS

Shu Lien Liu, 2FL. 33, Lane 52, Szu-Wei Road, Taipei, Taiwan

Filed Oct. 24, 1997, Ser. No. 957,037

Int. Cl.^{6} G08G *1/95*

U.S. Cl. 340—907 **11 Claims**



1. A traffic signaling system to be installed in the proximity of a pedestrian crossing, said signaling system comprising at least one signaling device characterized in that said signaling device is configured by a plurality of horizontally-arranged light bars which can be converted to different colors to indicate a signal to proceed and a signal to stop the traffic, said light bars being sequentially and separately switched on and off to provide a dynamic traffic signal, said light bars forming a top section of said signaling device said top section having a direction-pointing shape to indicate the traffic flow being directed to the right left or straight-forward direction.

5,838,261
DEVICE FOR MONITORING A COMPLEX SYSTEM SUCH AS AN AIRCRAFT

Raymond Lauta, Toulouse, and Lydie Lejarre Tatham, La Salvetat Saint Gilles, both of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Dec. 18, 1996, Ser. No. 768,989

Claims priority, application France, Dec. 22, 1995, 95 15351

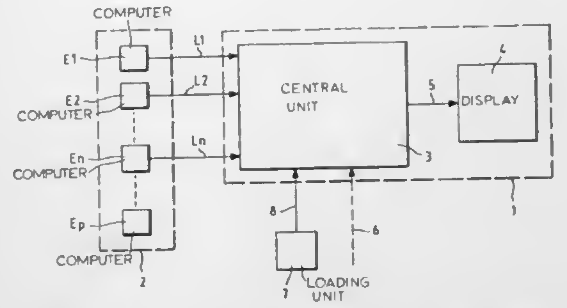
Int. Cl.^{6} G08B *21/00*

U.S. Cl. 340—945 **6 Claims**

1. A device for monitoring a complex system, for an aircraft, that includes a plurality of interconnected units, said monitoring device comprising:

a display device;

a central unit connected to at least some of said interconnected units of said complex system and adapted to transmit to said display device monitoring information including fault information relating to the complex system, either automatically or at the request of an operator of the complex system;



said display device being connected to said central unit and being adapted to display, each time monitoring information is received from said central unit, a message relating to said monitoring information,

wherein said central unit is loaded with a database that can be updated with additional information associated with at least some of said monitoring information,

wherein said central unit is adapted to verify if said database includes updated information before transmitting said monitoring information to said display device, and

wherein said central unit indicates to the operator the existence of said updated information at the time of transmitting said monitoring information to said display device.

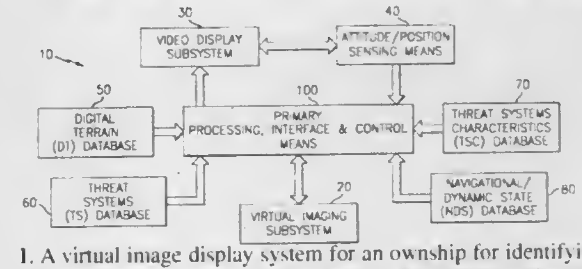
5,838,262
AIRCRAFT VIRTUAL IMAGE DISPLAY SYSTEM AND METHOD FOR PROVIDING A REAL-TIME PERSPECTIVE THREAT COVERAGE DISPLAY

Stuart D. Kershner, Naugatuck, and Frank W. Warburton, Newton, both of Conn., assignors to Sikorsky Aircraft Corporation, Stratford, Conn.

Filed Dec. 19, 1996, Ser. No. 769,909

Int. Cl.^{6} G08B *21/00*

U.S. Cl. 340—945 **24 Claims**


10
30
VIDEO DISPLAY SUBSYSTEM
40
ATTITUDE/POSITION SENSING MEANS
50
DIGITAL TERRAIN (DT) DATABASE
100
PRIMARY PROCESSING, INTERFACE & CONTROL MEANS
70
THREAT SYSTEMS CHARACTERISTICS (TSC) DATABASE
60
THREAT SYSTEMS (TS) DATABASE
20
VIRTUAL IMAGING SUBSYSTEM
80
NAVIGATIONAL/ DYNAMIC STATE (NDS) DATABASE

1. A virtual image display system for an ownship for identifying each threat system nearby a flight path of the ownship when the ownship is within a threat range of such threat system, for generating a three-dimensional threat envelope for each identified threat system, and for displaying real-time perspective video images of such three-dimensional threat envelope for viewing by a pilot of the ownship, comprising:

a video display subsystem for generating and displaying video images to the ownship pilot;

means for sensing the attitude and position of the head of the ownship pilot in relation to an ownship cockpit coordinate system;

a digital terrain database for providing topographical data and information with respect to terrain proximal the flight path of the ownship;

database means for providing geographical coordinate, elevation, and characteristics data with respect to threat systems proximal the flight path of the ownship;

database means for providing navigational data and dynamic state information with respect to the ownship; and

computer processing means functionally intereconnected to said threat systems database means and said navigational data/dynamic state information database means and operative for identifying each threat system nearby the flight path of the ownship when the ownship is within a threat range of the threat system, wherein said computer processing means is operative to identify the threat system by determining a current position and a short-term projected flight path of the ownship, by correlating said current position and said short-term projected flight path of the ownship with geographical coordinates of the threat system to determine whether the threat system is proximal said current position and said short-term projected flight path of the ownship, and determining whether the ownship is within the threat range of the threat system;

said computer processing means being functionally interconnected to said video display subsystem, said attitude/position sensing means, said digital terrain database, said threat systems database means, and said navigational data/dynamic state database means and operative for generating a three-dimensional threat envelope for said identified threat system, wherein said computer processing means is operative to generate said three-dimensional threat envelope for said identified threat system by defining a two-dimensional plan view of said three-dimensional threat envelope, by defining terrain profiles for said two-dimensional plan view, by identifying a terrain profile grazing line for each of said terrain profiles, by defining an endpoint for each said terrain grazing profile, and by connecting said endpoints of adjacent ones of said terrain grazing lines by a boundary line wherein said terrain grazing lines and said boundary lines in combination form a set of interconnected polygons emanating from said identified threat system that define said three-dimensional threat envelope;

said computer processing means being functionally interconnected to said video display subsystem, said attitude/position sensing means, said digital terrain database, said threat systems database means, and said navigational data/dynamic state database means and operative for displaying real-time perspective video images of each said generated three-dimensional threat envelope for viewing by the ownship pilot.

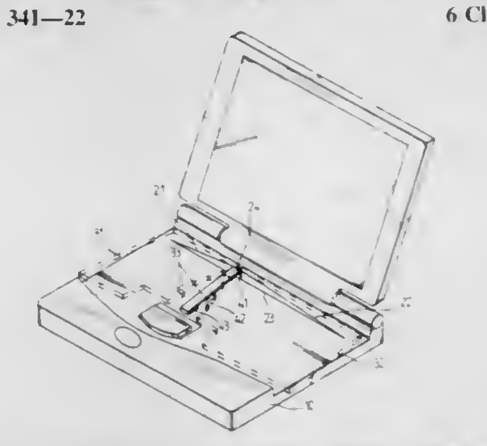
5,838,263
KEYBOARD STRUCTURE OF A PORTABLE COMPUTER

Chih-Ching Chang, Taipei, Taiwan, assignor to Compal Electronics, Inc., Taipei, Taiwan

Filed Mar. 13, 1997, Ser. No. 816,246

Int. Cl.^{6} G06F *1/16*

U.S. Cl. 341—22 **6 Claims**



1. A keyboard structure of a portable computer, comprising a keyboard adjusting/retaining device mounted on a main body of the computer and a keyboard device, the main body being formed with a keyboard receptacle division for receiving the keyboard device, the keyboard adjusting/supporting device being disposed between the keyboard receptacle division and the keyboard device, the keyboard adjusting/supporting device being disposed with a top pivot point pivotally connected with a position near a rear edge of bottom face of the keyboard device and two lateral bottom pivot points respectively pivotally connected with two lateral rear edges near thee front edge of the keyboard receptacle division, the

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keyboard being substantially divided into two lateral keyboard divisions on the basis of the corresponding position of the top pivot point, whereby when a force is exerted onto the rear edge of the keyboard device toward the operator, by means of the lateral keyboard divisions and the cooperative keyboard adjusting/supporting device, the lateral keyboard divisions are respectively biased and stretched toward two sides and are upward inclined forward and outward by a certain angle.

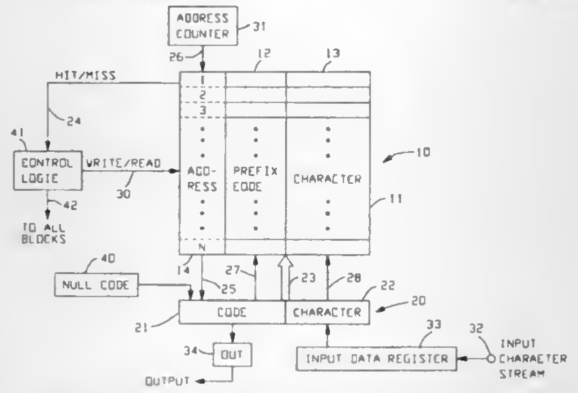
5,838,264
METHOD AND APPARATUS FOR PERFORMING LZW DATA COMPRESSION UTILIZING AN ASSOCIATIVE MEMORY

Albert B. Cooper, New York City, N.Y., assignor to Unisys Corporation, Blue Bell, Pa.

Continuation of Ser. No. 366,356, Dec. 29, 1994, Pat. No. 5,642,112. This application May 29, 1997, Ser. No. 864,753

Int. Cl.^{6} H03M *7/00*

U.S. Cl. 341—106 **30 Claims**



1. A data compression method for compressing an input stream of data character signals into a stream of compressed code signals, said data character signals belonging to an alphabet of data character signals containing (A) characters, comprising:

(a) utilizing an associative memory having a plurality of locations for storing string of data character signals, each location having a prefix code field and a character field, each location having an address associated therewith, the address providing a compressed code signal for a stored string,
(b) initializing said memory to contain (A) single character strings of said alphabet by nulling the prefix code fields of (A) locations of said memory and inserting the data character signals of said alphabet into the character fields of said (A) locations, respectively,
(c) utilizing a register having a code field and a character field,
(d) nulling said code field of said register and inserting a data character signal of said input stream into said character field of said register,
(e) associatively comparing the contents of said register with the contents of the locations of said memory to determine a match therewith,
(f) if a match is determined, inserting the address associated with the matched location into said code field of said register and inserting a next data character signal of said input stream into said character field of said register,
(g) repeating steps (e) and (f) until no match is determined, thereby finding the longest stored string in said memory matching said input stream,
(h) when no match is determined in step (e), providing the contents of said code field of said register as a compressed code signal, thereby providing the compressed code signal of said longest matched stored string,
(i) writing the contents of said code field and said character field of said register into the prefix code field and the character field, respectively, of a next empty location in said memory, thereby inserting into said memory an extended string comprising said longest matched stored string extended by the next following data character signal in said input stream, the address of said next empty location providing the compressed code signal for said extended string inserted into said memory,
(j) nulling said code field of said register after inserting said extended string into said memory, and
(k) repeating steps (e) through (j) until no further input stream of data character signals is available to be compressed.

5,838,265
METHOD, ENCODER AND DECODER FOR RESYNCHRONIZATION TO A DATA STREAM WHICH CONTAINS ERRORS

Dirk Adolph, Ronnenberg, Germany, assignor to Deutsche Thomson Brandt GmbH, Villingen Schwenningen, Germany

Filed May 23, 1996, Ser. No. 652,237

Claims priority, application Germany, Jul. 7, 1995, 195 24 808.2

Int. Cl.^{6} H04J *3/06;* **H04L** *1/00*

U.S. Cl. 341—50 **13 Claims**

slice syntax

slice ( ) {	bits	Mnemonic
slice_start_code	32	bslbf
if (vertical_size > 2800)		
slice_vertical_position_extension	3	uimsbf
if (< *sequence_scalable_extension ( ) is present in the bitstream >*)		
if (scalable_mode == "data partitioning")		
priority_breakpoint	7	uimsbf
quantiser_scale_code	5	uimsbf
if (nextbits ( ) == '1') {		
intra_slice_flag	1	bslbf
intra_slice	1	uimsbf
reserved_bits	7	uimsbf
while (nextbits ( ) == '1') {		
extra_bit_slice /* with the value "1" */	1	uimsbf
extra_information_slice	8	
}		
}		
extra_bit_slice /* with the value "0" */	1	uimsbf
do {		
macroblock ( )		
} while (nextbits ( ) != '000 0000 0000 0000 0000 0000')		
next_start_code ( )		
}		

1. Method for enabling resynchronization of a data stream which contains errors and is encoded, for the purpose of data compression, in the form of a hierarchical organization of various layers comprising the steps of:

decoding of the data information in a selected one of the layers when relevant data of at least one of the superordinate layers to the selected layer has been correctly decoded, and
additional information from at least one superordinate layer or about the composition of at least one superordinate layer is inserted into the selected one subordinate layer, the relevant data being usable for the resynchronization.

5,838,266
DATA PROCESSING APPARATUS AND METHOD USING DATA COMPRESSION

Paul S. Houle, Costa Mesa; Alfred C. Yu, Irvine, and David Dvorman, Orange, all of Calif., assignors to Universal Video Communications Corp., Irvine, Calif.

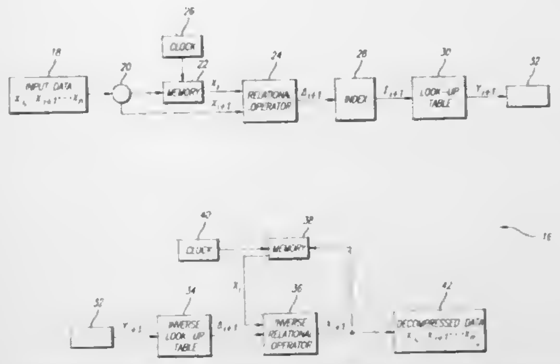
Filed Dec. 12, 1990, Ser. No. 611,142

Int. Cl.^{6} H03M *7/42;7/36*

U.S. Cl. 341—51 **15 Claims**

1. A method for processing data, the method comprising the steps of:

receiving a previous data word having a plurality of bits:
receiving a next data word having a plurality of bits:
determining a relationship between the previous data word and the next data word;



providing a relationship word representative of said determined relationship;
encoding the relationship word into an encoded relationship word having fewer bits than either the previous data word or the next data word;
storing the previous data word;
decoding the encoded relationship word to result in the relationship word; and
relating the decoded relationship word to the stored previous data word to provide the next data word.

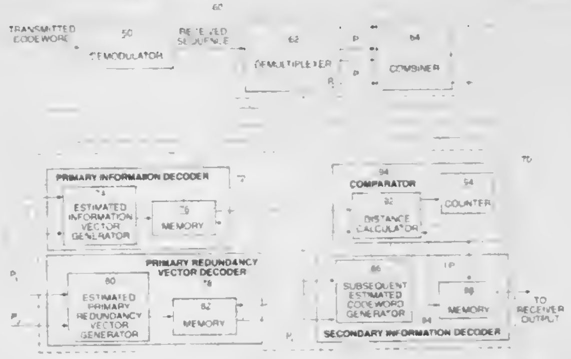
5,838,267
METHOD AND APPARATUS FOR ENCODING AND DECODING DIGITAL INFORMATION

Yi-Pin Eric Wang, Raleigh; Sandeep Chennakeshu, Cary; Paul W. Dent, Pittsboro, and Kumar Balachandran, Cary, all of N.C., assignors to Ericsson, Inc., Research Triangle Park, N.C.

Filed Oct. 9, 1996, Ser. No. 728,158

Int. Cl.^{6} G06F *11/00;* **H03M** *13/00*

U.S. Cl. 341—94 **27 Claims**


60
TRANSMITTED CODEWORD
50
DEMODULATOR
RECEIVED SEQUENCE
62
DEMULTIPLEXER
64
COMBINER
70
PRIMARY INFORMATION DECODER
ESTIMATED INFORMATION VECTOR GENERATOR
MEMORY
COMPARATOR
COUNTER
DISTANCE CALCULATOR
PRIMARY REDUNDANCY VECTOR DECODER
80
ESTIMATED PRIMARY REDUNDANCY VECTOR GENERATOR
82
MEMORY
86
SUBSEQUENT ESTIMATED CODEWORD GENERATOR
88
MEMORY
84
SECONDARY INFORMATION DECODER
TO RECEIVER OUTPUT

1. A method for decoding a received code word comprising:

(a) decoding said received code word in a first stage of a decoder to obtain a first estimate of the code word;
(b) decoding said first estimate of the code word in a second stage of said decoder to obtain a second estimate of the code word;
(c) evaluating the distance between said first and second estimates; and
(d) erasing said received code word if the evaluated distance between said first and second estimates exceeds a predetermined reference distance.

5,838,268
APPARATUS AND METHODS FOR MODULATION AND DEMODULATION OF DATA

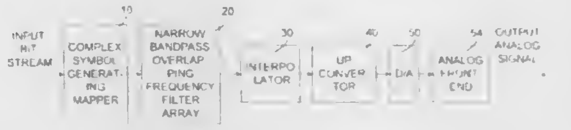
Liron Frenkel, Ramat Gan, Israel, assignor to Orckit Communications Ltd., Tel Aviv, Israel

Filed Mar. 14, 1997, Ser. No. 818,388

Int. Cl.^{6} H03M *1/00*

U.S. Cl. 341—11 **30 Claims**

1. A signal modulation method comprising:



receiving at least first and second synchronized incoming streams of complex symbols, thereby to define a plurality of incoming vectors each including at least first and second synchronized complex symbols;
mapping each complex symbol into a signal component comprising a linear combination of an in-phase signal and a quadrature signal, the quadrature signal comprising a Hilbert transform of said in-phase signal,
wherein all of the signal components are substantially mutually orthogonal,
and wherein the frequency spectrums of all signal components mapped from a single incoming stream are centered around a common frequency location which is unique to said single incoming stream and wherein the frequency spectrums of signal components mapped from different incoming streams having adjacent common frequency locations are partially overlapping;
and wherein signal components mapped from sequential incoming symbols partially overlap in time; and
combining all of the signal components into a representation of an output signal.

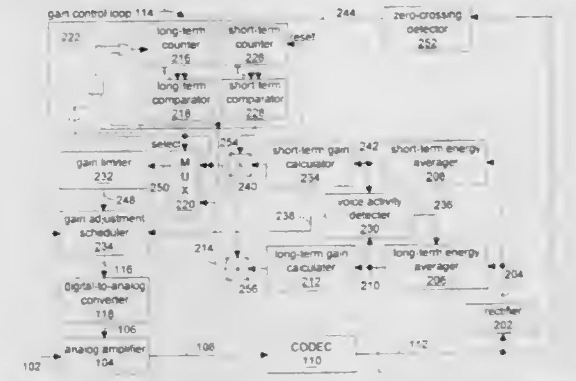
5,838,269
SYSTEM AND METHOD FOR PERFORMING AUTOMATIC GAIN CONTROL WITH GAIN SCHEDULING AND ADJUSTMENT AT ZERO CROSSINGS FOR REDUCING DISTORTION

Zheng-Yi Xie, Richardson, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Sep. 12, 1996, Ser. No. 712,870

Int. Cl.^{6} H03M *1/62*

U.S. Cl. 341—139 **12 Claims**


gain control loop 114
244
zero-crossing detector 252
222
long-term counter 216
short-term counter 226
reset
long term comparator 218
short term comparator 228
select
254
short-term gain calculator 234
242
short-term energy averager 208
gain limiter 232
M U X
250
248
220
240
gain adjustment scheduler 234
voice activity detector 230
236
238
214
long-term gain calculater 212
long-term energy averager 206
210
204
256
116
digital-to-analog converter 118
106
rectifier 202
analog amplifier 104
102
108
CODEC 110
112

8. A method for performing automatic gain control on a received audio input signal, comprising:

receiving a gain input signal;
amplifying said audio input signal to generate an audio output signal according to said gain input signal;
detecting a zero crossing of said audio output signal;
calculating a number of gain adjustment steps by dividing a gain adjustment signal by a gain step;
for each of said number of gain adjustment steps waiting a gain adjustment interval, generating a gain output: signal, and providing said gain output signal to said gain input signal.

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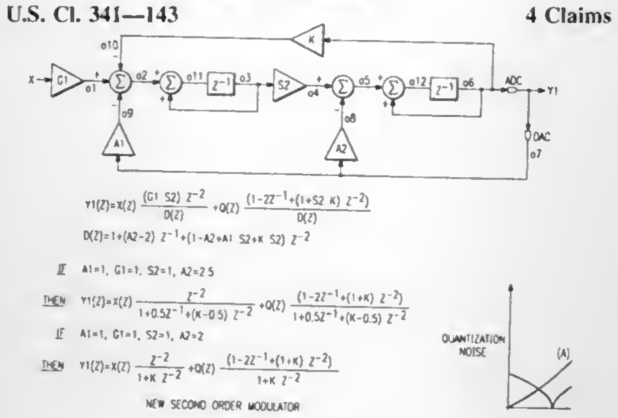
SECOND ORDER AND CASCADED 2-1 OVERSAMPLED MODULATORS WITH IMPROVED DYNAMIC RANGE

Sami Kiriaki, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 12, 1995, Ser. No. 371,635

Int. Cl.^{6} H03M *3/00*

U.S. Cl. 341—143 **4 Claims**


o10
K
X
G1
o1
o2
o11
Z^{-1}
o3
S2
o4
o5
o12
o6
ADC
Y1
o9
A1
o8
A2
DAC
o7
$Y1(Z)=X(Z)\frac{(G1\ S2)\ Z^{-2}}{D(Z)}+Q(Z)\frac{(1-2Z^{-1}+(1+S2\ K)\ Z^{-2})}{D(Z)}$
$D(Z)=1+(A2-2)\ Z^{-1}+(1-A2+A1\ S2+K\ S2)\ Z^{-2}$
IF A1=1, G1=1, S2=1, A2=2.5
THEN $Y1(Z)=X(Z)\frac{Z^{-2}}{1+0.5Z^{-1}+(K-0.5)\ Z^{-2}}+Q(Z)\frac{(1-2Z^{-1}+(1+K)\ Z^{-2})}{1+0.5Z^{-1}+(K-0.5)\ Z^{-2}}$
IF A1=1, G1=1, S2=1, A2=2
THEN $Y1(Z)=X(Z)\frac{Z^{-2}}{1+K\ Z^{-2}}+Q(Z)\frac{(1-2Z^{-1}+(1+K)\ Z^{-2})}{1+K\ Z^{-2}}$
NEW SECOND ORDER MODULATOR
QUANTIZATION NOISE
(A)

1. An oversampled modulator for operation in a frequency band from DC to a finite frequency, said modulator having the transfer function:

$$Y1(Z)=X(Z)\frac{(G1S2)\,Z^{-2}}{D(Z)}+Q(Z)\frac{(1-2Z^{-1}+(1+S2K)Z^{-2})}{D(Z)}$$

where

$D(Z)=1+(A2-2)Z^{-1}+(1-A2+A1\ S2+K\ S2)Z^{-2}$

$X(Z)$=input signal

$Q(Z)$=ADC quantization noise;

said transfer function containing a plurality of zeros, at least one of said zeros being disposed in said frequency band at a location other than at DC.

5,838,271

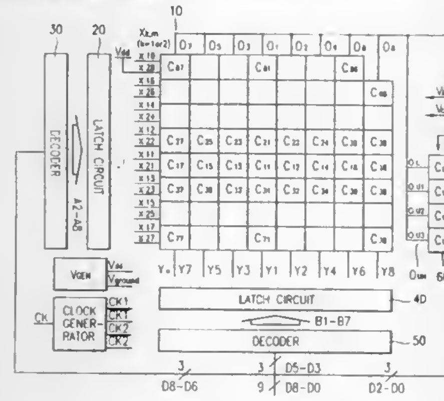
DIGITAL TO ANALOG CONVERTER AND BIAS CIRCUIT THEREFOR FOR PROVIDING WEIGHED CURRENTS

Yong In Park, Seoul, Rep. of Korea, assignor to LG Semicon Co., Ltd., Cheongju, Rep. of Korea

Filed Jan. 31, 1997, Ser. No. 791,574

Int. Cl.^{6} H03M *1/66*

U.S. Cl. 341—144 **56 Claims**



1. A circuit for converting a digital signal of b-bits to an analog signal, where b is a positive integer, comprising:

a first array of first current cells;

a second array having at least one second current cell;

a selection circuit coupled to said first and second arrays such that a first predetermined number of first current cells and a second predetermined number of second current cells are activated in accordance with the digital signal; and

means for generating at least one of voltages and clock signals coupled to at least one of said first and second arrays and said selection circuit,

wherein each selected first current cell generates a predetermined first current and each selected second current cell generates a predetermined second current to an output line, said predetermined first current having a magnitude different from said predetermined second current and wherein the magnitude of said first and second predetermined currents has a prescribed ratio of $I_1:I_2$;

wherein said second array includes at least one third current cell which is coupled to said selection circuit such that a selected third current cell outputs a third predetermined current having a magnitude which is different from the second predetermined current; and

wherein the magnitude of said first, second, and third predetermined currents has a prescribed ratio of $I_1:I_2:I_3$.

5,838,272

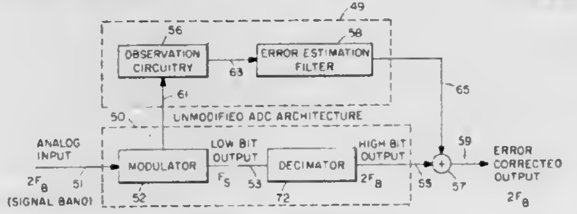
ERROR CORRECTING SIGMA-DELTA MODULATION DECODING

Philip Steiner, and Woodward Yang, both of Cambridge, Mass., assignors to President and Fellows of Harvard College, Cambridge, Mass.

Filed Apr. 17, 1997, Ser. No. 838,056

Int. Cl.^{6} H03M *3/00*

U.S. Cl. 341—143 **51 Claims**



1. An analog/digital converter comprising:

a modulator which converts an analog input into a high frequency bit stream, said modulator comprising at least one delay stage, and each delay stage having a state value;

a decimator which receives the high frequency bit stream to produce a first reduced frequency multibit signal output;

a state value quantizer which quantizes said state value;

a state value processor which receives the quantized state value to produce a state value processor output which is used to provide a reduced error reduced frequency multibit signal output from the first reduced frequency multibit signal.

5,838,273

FULLY DIFFERENTIAL DIGITAL-TO-ANALOG CONVERTER WITH A LOW NUMBER OF RESISTORS

Jens Sauerbrey, and Oliver Klehl, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 8, 1997, Ser. No. 907,526

Claims priority, application Germany, Aug. 8, 1996, 196 32 093.3

Int. Cl.^{6} H03M *1/66*

U.S. Cl. 341—145 **8 Claims**

1. A fully differential digital-to-analog converter, comprising:

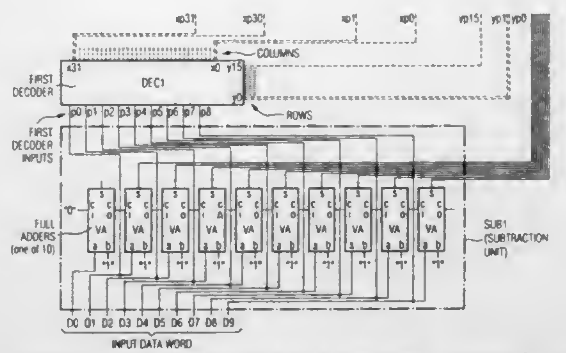
a first matrix-shaped resistor network;

a second matrix-shaped resistor network;

a first decoder;

a second decoder; and

a subtraction unit;



wherein an input data word with k data bits is supplied to the first decoder directly and supplied to the second decoder via the subtraction unit where the subtraction unit decrements the data word by the number 1; wherein the first resistor network and the second resistor network comprise a series circuit of 2^{k-1} resistors; wherein center taps of resistors in the first resistor network are connectable to first coarse selection lines via switches driven by the first decoder and center taps of resistors in the second resistor network are connectable to second coarse selection lines via switches driven by the second decoder; wherein incrementing column numbers are addressed at one of either the first decoder or the second decoder with increasing bit significance and decrementing column numbers are addressed at the other of either the first decoder or the second decoder with increasing bit significance of an appertaining decoder input signal; and wherein the first coarse selection lines are connectable to a first analog difference output via additional switches driven by the first decoder and the second coarse selection lines are connectable to a second analog difference output via additional switches driven by the second decoder.

5,838,274

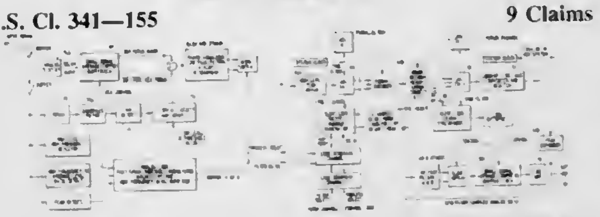
SYSTEMS FOR ACHIEVING ENHANCED AMPLITUDE RESOLUTION

Keith O. Johnson, Pacifica, and Michael W. Pflaumer, Berkeley, both of Calif., assignors to Pacific Microsonics, Inc., Berkeley, Calif.

Continuation of Ser. No. 456,236, May 31, 1995, abandoned, which is a division of Ser. No. 110,335, Aug. 20, 1993, Pat. No. 5,479,168, which is a continuation of Ser. No. 957,631, Oct. 6, 1992, abandoned, which is a continuation of Ser. No. 707,073, May 29, 1991, abandoned. This application Jan. 13, 1997, Ser. No. 782,834

Int. Cl.^{6} H03M *1/00*

U.S. Cl. 341—155 **9 Claims**



1. A system for converting and encoding an analog signal to a standardized digital format and subsequently decoding and converting said digital format to recover the analog signal, comprising:

means for monitoring the physical characteristics of an analog waveform to be converted to a digital format;

means for compatible amplitude resolution enhancement;

means for converting said analog waveform to said digital format;

means for encoding as compatible hidden code within said standardized digital format control information indicative of the physical characteristics of said analog waveform to facilitate said analog waveform being subsequently more accurately reconstructed from said digital format;

means for decoding from said digital format said control information indicative of certain specified physical characteristics of said analog waveform;

means for converting said digital format signal to said analog waveform; and

means for introducing compatible signal reconstruction compensation, in accordance with said control information during said converting process, said information facilitating subsequent more accurate reconstruction of said analog waveform from said standardized digital format.

5,838,275

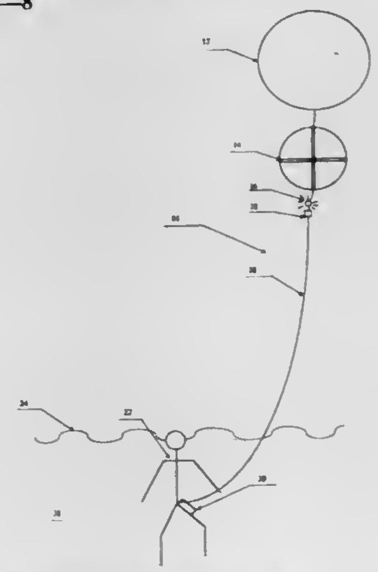
MARINE PERSONAL LOCATOR AND AUTOMATIC OPENING OMNIDIRECTIONAL RADAR RETROREFLECTOR INCORPORATED THEREIN

Ariel Carmi, Bnei-Efraim 211/3, Tel-Aviv, 69984, Israel

Filed Oct. 3, 1996, Ser. No. 725,619

Int. Cl.^{6} H01Q *15/00*

U.S. Cl. 342—8 **4 Claims**



1. A marine personal locator comprising:

a portable, user-wearable housing;

a tether connected to said housing;

a source of pressurized gas in said housing;

a balloon attached to said tether;

an omnidirectional radar retroreflector attached to said tether and including two resiliently deformable radar reflective discs connected along their respective diameters and including a plurality of collapsible, radar reflective web sections spanning between said discs;

said resiliently deformable discs being secured together substantially perpendicularly such that, when unconstrained, the discs spontaneously open and align perpendicular to one another without any external supporting structure;

upon the opening thereof, said collapsible, radar reflective web sections spanning between said discs form, with the discs, mutually perpendicular radar reflective surfaces;

said discs of said retroreflector being collapsible in a spiral configuration for storage within said housing.

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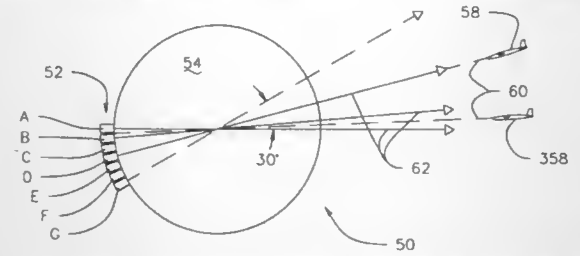
5,838,276
MICROWAVE ENERGY IMPLEMENTED AIRCRAFT LANDING SYSTEM

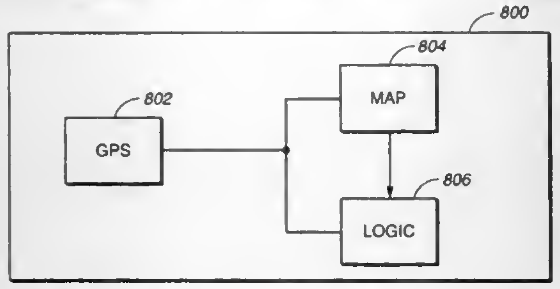
Aubrey I. Chapman, 6024 Longley Ct. Dr., Dallas, Tex. 75252, and George F. Ridpath, 1908 Sherrye La., Plano, Tex. 75074
Continuation-in-part of Ser. No. 366,831, Dec. 30, 1994, abandoned. This application Sep. 3, 1996, Ser. No. 709,466
Int. Cl.^{6} G01S *1/38;13/75*
U.S. Cl. 342—35 **9 Claims**



1. A method of providing guidance information to an aircraft comprising the steps of:
- illuminating a dielectric material lens with pulsed signals from an aircraft;
- said lens focusing received pulsed signals from the aircraft onto a transponder module or transponder modules of a transponder module array which is in working relation to said dielectric material lens;
- broadcasting continuous wave microwave carrier signals to the aircraft from each transponder module which received pulsed signals from said aircraft,
- said continuous wave microwave carrier signals carry an azimuth reference tone a glide slope reference tone, a phase shifted azimuth tone and a phase shifted glide slope tone;
- combining received signals sent from the transponder module array to form a resultant phase shifted azimuth tone and a resultant phase shifted glide slope tone;
- determining azimuthal position of the aircraft by determining phase between the resultant phase shifted azimuth tone and the azimuth reference tone in the aircraft, and
- determining glide slope of the aircraft by determining phase between the resultant phase shifted glide slope tone and the glide slope reference tone in the aircraft.

5,838,277
GPS-BASED CONTROLLER MODULE

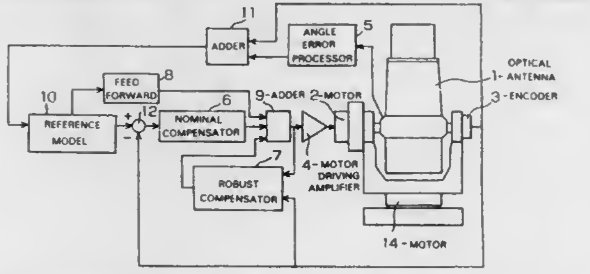
Peter Van Wyck Loomis, Sunnyvale, and Kevin McKenzie Reeds, Palo Alto, both of Calif., assignors to Trimble Navigation Limited, Sunnyvale, Calif.
Continuation of Ser. No. 245,609, May 20, 1994. This application Feb. 13, 1997, Ser. No. 800,158
Int. Cl.^{6} G01S *5/02;* **H04B** *7/185;* **E01C** *23/07*
U.S. Cl. 342—357 **1 Claim**



1. An intergral GPS controller module provided in a single module, comprising:
- a global positioning system (GPS) receiver for providing at an output terminal thereof geographic information corresponding to a respective geographic position of a user;
- map means, having an input terminal, connected to the output terminal of the GPS receiver, for receiving geographic position information data from the output terminal of the GPS receiver and for providing output map information;
- wherein the map means provides a predetermined functional representation of a characteristic as a function of geographic position;
- wherein the map means uses zones defined by a route specific by a distance along the centerline of a track and maximum distance across the track relative to said centerline;
- logic means, having a first input terminal connected to the output terminal of the GPS receiver and having an output terminal for providing predetermined logic output values corresponding to geographic position information;
- wherein said map means has as output terminal, connected to a second input terminal of the logic means, for providing the logic means with output map information; and
- wherein said GPS receiver, said map means, and said logic means are combined as an intergral unit in a single module.

5,838,278
ANTENNA POINTING APPARATUS MOUNTED ON SATELLITE USING FEED FORWARD WITH REFERENCE MODEL

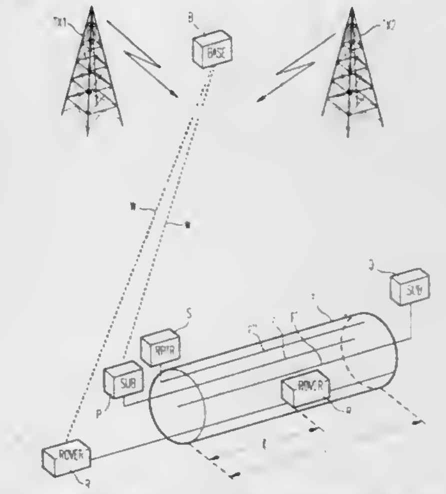
Takahiko Tsujisawa, and Toshiaki Yamashita, both of Tokyo, Japan, assignors to NEC Corp., Japan
Filed Oct. 23, 1996, Ser. No. 735,882
Claims priority, application Japan, Oct. 25, 1995, 7-277335
Int. Cl.^{6} H01Q *3/00*
U.S. Cl. 342—377 **10 Claims**



1. An antenna pointing controller for an antenna driving system having an antenna, a biaxial gimbal mechanism coupled to said antenna, a motor for driving said antenna, a motor driving amplifier for feeding a current to said motor, an encoder for measuring a rotation angle of said antenna driven by said motor, and an angle error processor for generating an output of a pointing angle error of said antenna from a beam received by said antenna, said antenna pointing controller comprising:
- a first adder for calculating a pointing angle target value for said antenna using an output of said encoder and the output of said angle error processor;
- a reference model having at least a first and a second integral elements for receiving an output from said first adder to control the motion of said antenna;
- a subtracter for calculating the difference between the output of said encoder and an output of said reference, model;
- a nominal compensator for stabilizing a feedback control system of said optical antenna pointing controller which includes said antenna, said subtracter and said encoder, in response to an output from said subtracter;
- a robust compensator for compensating for external forces and disturbances loaded on said antenna by receiving the output of said encoder and an output of said motor driving amplifier;
- a feedforward element for reciprocally multiplying a gain in the zero frequency of the transfer function of the antenna driving system defined by a gain of said encoder, an inertia of said antenna, a gain of said motor driving amplifier, and parameters of said motor; and
- a second adder for adding an output of said nominal compensator, an output of said robust compensator and an output of said feedforward element, to provide an output to said motor driving amplifier.

5,838,279
NAVIGATION AND TRACKING SYSTEM FOR SHIELDED SPACES

Peter James Duffett-Smith, and Graham Woan, both of Cambridge, United Kingdom, assignors to Cambridge Positioning Systems Limited, Cambridge, United Kingdom
PCT No. PCT/GB94/01145, § 371 Date Nov. 20, 1995, § 102(e) Date Nov. 20, 1995, PCT Pub. No. WO94/28432, PCT Pub. Date Dec. 8, 1994
PCT Filed May 26, 1994, Ser. No. 553,492
Claims priority, application United Kingdom, May 27, 1993, 9310976
Int. Cl.^{6} G01S *3/02*
U.S. Cl. 342—459 **19 Claims**

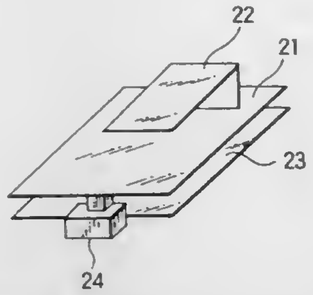


1. Apparatus for use with a navigation and/or tracking system having a base station and a roving receiver both of which are capable of receiving signals from a plurality of transmission sources, and between which a link signal is passed to enable the relative location of the roving receiver to be determined, the apparatus enabling the determination of the position of the roving receiver within a space shielded from direct receipt of signals from the transmission sources and comprising means for producing substitute signals, each signal being either locked in phase with a signal from a respective one of the transmission sources or a replica of it; a curvilinear transmission element or elements extending within the shielded space for generating fields in the shielded space; means for propagating at least two of the substitute signals in opposite directions along the curvilinear transmission element or elements for receipt by the roving receiver; and means for passing the link signal between the roving receiver and the base station.

5,838,280
MICROSTRIP TYPE ANTENNA HAVING SMALL SIZE AND CAPABLE OF CHANGING GAIN

Toshikazu Miyashita, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Dec. 2, 1996, Ser. No. 753,899
Claims priority, application Japan, Dec. 1, 1995, 7-313886
Int. Cl.^{6} H01Q *3/02;1/24;1/48*
U.S. Cl. 343—700 MS **4 Claims**

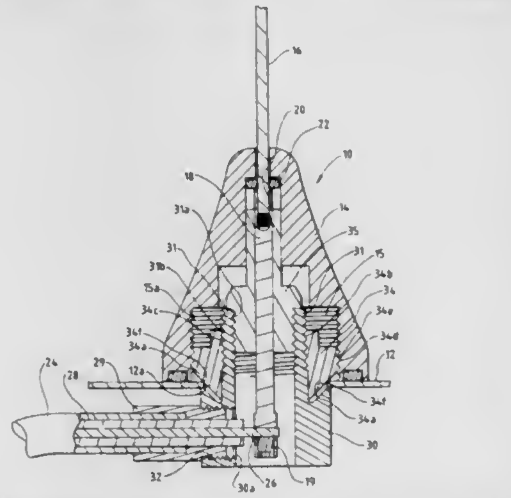
1. A microstrip antenna used in a radio, transceiver, said microstrip antenna comprising;
- a dielectric plate having first and second surfaces which are parallel to each other;
- a planar antenna element having a principal part located in parallel with said dielectric plate and a supporting part connected to said first surface and contiguous to said principal part to support said principal part;
- a ground plate located in parallel with said dielectric plate with a space interval left between said second surface and said ground plate; and



- interval adjusting means coupled to said dielectric plate for moving said dielectric plate relative to said ground plate to adjust said space interval.

5,838,281
BODY PANEL MOUNT ANTENNA

Herbert R. Blaese, 3314 Olcott Ave., Chicago, Ill. 60634
Filed Sep. 16, 1996, Ser. No. 714,375
Int. Cl.^{6} H01Q *1/32*
U.S. Cl. 343—715 **11 Claims**



1. A body panel mount antenna, for mounting in a metal panel, comprising:
- a radiator whip;
- a mounting assembly supporting said radiator whip, said mounting assembly also comprising an electrically conductive conically shaped member;
- a base for anchoring said body panel mount antenna to a metal panel;
- said base and mounting assembly being attachable to said metal panel having a wall defining an opening such that said conically shaped member is in continuous positive contact with said wall in said metal panel and said metal panel acts as a ground plane for said antenna.

5,838,282
MULTI-FREQUENCY ANTENNA

Farzin Lalezari, Louisville; J. Mark Rogers, Golden, and Ajay I. Sreenivas, Niwot, all of Colo., assignors to Ball Aerospace and Technologies Corp., Broomfield, Colo.
Filed Mar. 22, 1996, Ser. No. 621,069
Int. Cl.^{6} H01Q *21/28*
U.S. Cl. 343—727 **41 Claims**

1. A multi-frequency antenna apparatus, comprising:
- a first array of antenna elements that includes a first group of antenna elements and a second group of antenna elements, said first group of antenna elements having a first central element located in substantially the center of said first array of elements and a first antenna aperture, said first group of said

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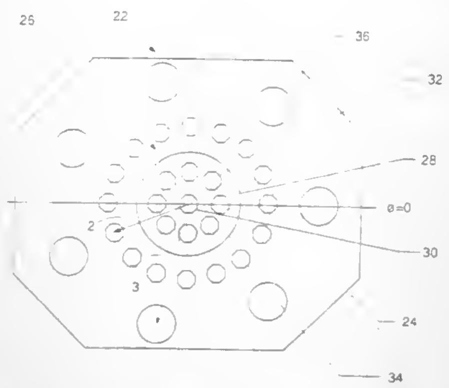


first array includes said first central element that is a first type of antenna element and each of said antenna elements of said second group of said first array is a second type of antenna element that is different from said first type and with said first central element being substantially greater in size than each of said second group of antenna elements of said first array and wherein each of said first and second groups of antenna elements of said first array operate in a first frequency range; and

a second array of antenna elements having a second central element located in substantially the center of said second array of antenna elements and a second antenna aperture, said second array of antenna elements including a first group of antenna elements and a second group of antenna elements, said first group of said second array including said second central element, said second group of said second array including a plurality of antenna elements and with each spaced from said first group of said second array, each of said antenna elements of said first group and said second group of said second array, respectively, being mounted on and extending outwardly of said first central element such that a line defined normal to the plane of one antenna element of said second group of said second array and normal to the plane of said first central element passes through both said one antenna element and said first central element, each of said antenna elements of said first and second groups of antenna elements of said second array operating in a second frequency range, different from said first frequency range,

wherein said first central element is substantially coaxially aligned with said second central element and said first antenna aperture and said second antenna aperture are at least partially overlapping.

5,838,283
LOOP ANTENNA FOR RADIATING CIRCULARLY POLARIZED WAVES

Hisamatsu Nakano, Tokyo, Japan, assignor to Nippon Antenna Kabushiki Kaishya, Tokyo, Japan

PCT No. PCT/JP96/00071, § 371 Date Sep. 17, 1996, § 102(e) Date Sep. 17, 1996, PCT Pub. No. WO96/22618, PCT Pub. Date Jul. 25, 1996

PCT Filed Jan. 18, 1996, Ser. No. 704,696

Claims priority, application Japan, Jan. 18, 1995, 7-022362

Int. Cl.^{6} H01Q *11/12*

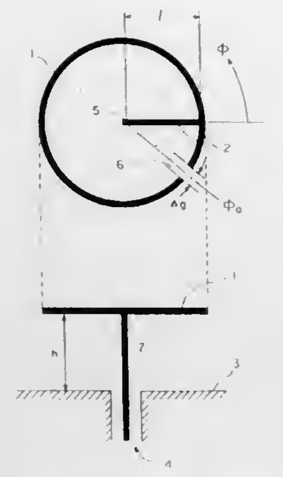
U.S. Cl. 343—741 **8 Claims**

1. A loop antenna for radiating a circularly polarized wave comprising:

a ground plane;

a C-type loop element having a cutoff part; and

an I-shape conductor having one end connected to the C-type loop element and another end served as a feeding point, said I-shape conductor extending in a radial direction of the C-type loop element, said C-type loop element being located in a plane that is parallel to said ground plane with a predetermined space being provided between said ground plane and the parallel plane in which said C-type loop antenna is located, the I-shaped conductor being at an angle to the cutoff part on the C-type loop element which angle is about ±35°~±45°° or about ±135°~±145°.



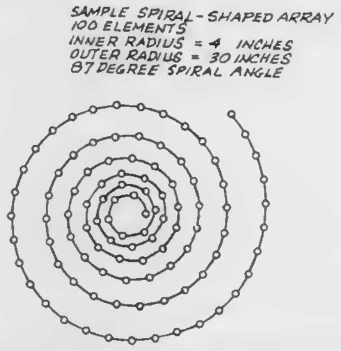
5,838,284
SPIRAL-SHAPED ARRAY FOR BROADBAND IMAGING

Robert P. Dougherty, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 649,398, May 17, 1996, abandoned. This application Mar. 6, 1997, Ser. No. 812,818

Int. Cl.^{6} H01Q *21/00*

U.S. Cl. 343—893 **2 Claims**



1. A phased array having a plurality of elements disposed along a logarithmic spiral curve.

5,838,285
WIDE BEAMWIDTH ANTENNA SYSTEM AND METHOD FOR MAKING THE SAME

Roger Yew-Siow Tay, Sunrise; Oscar M. Garay, Coral Springs, and Quirino Balzano, Plantation, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 567,698, Dec. 5, 1995, abandoned. This application Apr. 29, 1997, Ser. No. 841,022

Int. Cl.^{6} H01Q *11/08*

U.S. Cl. 343—895 **19 Claims**

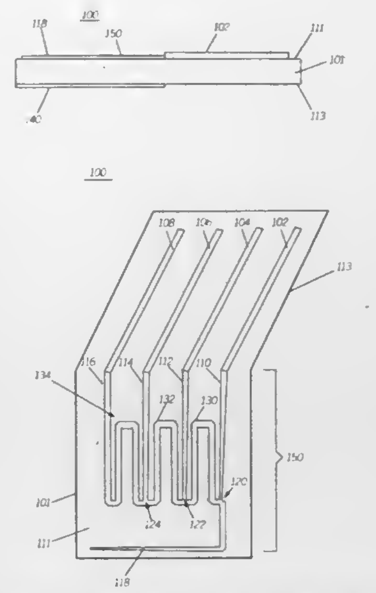
1. A wide beamwidth antenna system for communicating signals to and receiving signals from a communications device, said wide beamwidth antenna system comprising:

a single flexible dielectric substrate having a first and a second surface and presenting an elongated, tubular portion;

a plurality of monopole antennae, without short circuit connection, disposed on a surface of the dielectric substrate;

an antenna feed system, disposed on the first surface of the dielectric substrate for feeding the antenna system with an RF power signal; and

a ground plane disposed on the second surface of the single dielectric substrate and juxtaposed to the antenna feed system.



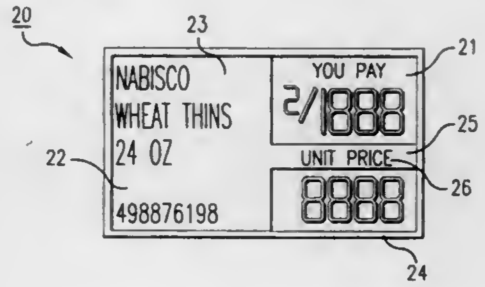
5,838,286
DISPLAY MODULE

James W. Pfeiffer, Los Gatos, and Gary R. Cantu, San Jose, both of Calif., assignors to Pricepoint, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 538,196, Oct. 3, 1995, which is a continuation of Ser. No. 363,969, Dec. 23, 1994, which is a continuation of Ser. No. 219,666, Mar. 29, 1994. This application Jun. 17, 1997, Ser. No. 876,685

Int. Cl.^{6} G09G *3/00;3/04;5/00;* G06F *7/04*

U.S. Cl. 345—30 **21 Claims**



1. A module for displaying information, some of which is electronically changeable and some of which is not, said module comprising:

electronically controllable means having a face on which said electronically changeable information can be viewed;

photovoltaic means having a face for receiving external illumination and positioned so that it can be viewed simultaneously with said face of said electronically controllable means; and

an external overlay made of a substantially transparent material positioned over at least a portion of said face of said photovoltaic means, said overlay being adapted to have applied to it information which is not electronically changeable and said overlay being readily removable from said face of said photovoltaic means.

5,838,287
LIQUID CRYSTAL DISPLAY PANEL HAVING CIRCUITRY FOR REDUCING THE MUTUAL INFLUENCE OF PIXELS CONNECTED TO SELECTION ADDRESS CONDUCTORS

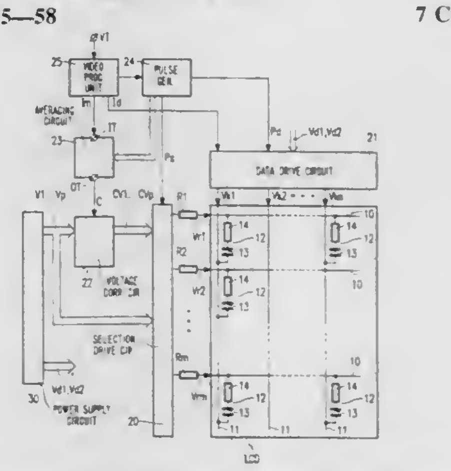
Karel E. Kuijk, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 519,559, Aug. 25, 1995, abandoned. This application Oct. 31, 1996, Ser. No. 742,283

Claims priority, application European Pat. Off., Sep. 1, 1994, 94202499.3

Int. Cl.^{6} G09G *3/20*

U.S. Cl. 345—58 **7 Claims**



1. A display device provided with a liquid crystal display panel having sets of row address conductors and column address conductors coupled to liquid crystal pixels in a matrix of rows and columns, and a drive circuit for driving the liquid crystal display panel, the drive circuit comprising:

a pixel drive circuit comprising a selection drive circuit for presenting selection voltages to a first set of address conductors, and a data drive circuit for presenting data voltages to a second set of address conductors in dependence upon a received data signal to be displayed;

an averaging circuit having an input for receiving an information signal which is in conformity with the received data signal to be displayed, said averaging circuit supplying an averaged value of the information signal during an averaging period which is related to one line period of the information signal; and

a voltage correction circuit coupled to receive the averaged value and at least one power supply voltage for supplying at least one corrected power supply voltage to the pixel drive circuit, wherein said voltage correction circuit directly modulates said at least one power supply voltage with said averaged value thereby forming said at least one corrected power supply voltage varying in accordance with said averaged value.

5,838,288
COLOR DISPLAY DEVICE HAVING COLOR SELECTION TIME DIVISIONS

Nicolaas Lambert, and Edwin A. Montie, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

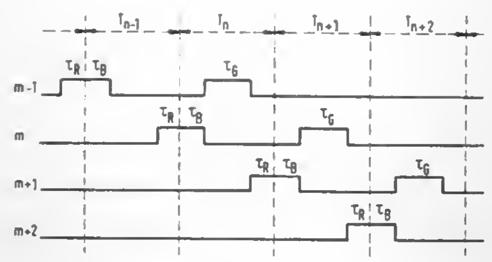
Filed Sep. 7, 1995, Ser. No. 524,980

Claims priority, application European Pat. Off., Sep. 7, 1994, 94202569

Int. Cl.^{6} G09G *5/02;* H04N *9/22*

U.S. Cl. 345—74 **3 Claims**

1. A color display device provided with a luminescent screen having different color pixels (R, G, B), electron sources for generating electron currents modulated with video information and a selection structure for sequentially directing each electron current to the different color pixels during color selection time fractions (τ_B, τ_G, τ_R) determined by color selection pulses applied to the



selection structure, characterized in that in order to reduce a maximum electron current requirement, the color selection time fractions (τ_B, τ_G, τ_R) for the different color pixels are mutually essentially different in such a way that the color selection time fraction for the color pixels which require the largest quantity of electrons for displaying maximum white is longer than the color selection time fraction for the color pixels which require the smallest quantity of electrons for displaying maximum white.

5,838,289
EL DISPLAY DRIVER AND SYSTEM USING FLOATING CHARGE TRANSFERS TO REDUCE POWER CONSUMPTION

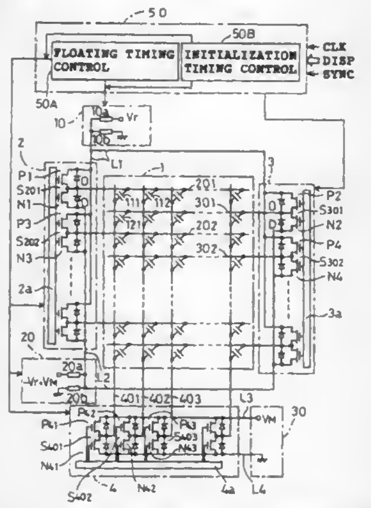
Hideki Saito, Kariya; Minoru Yokota, Nagoya, and Masahiko Osada, Hekinan, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 26, 1995, Ser. No. 534,172

Claims priority, application Japan, Oct. 4, 1994, 6-240384

Int. Cl.⁶ G09G *3/30*

U.S. Cl. 345—79 **14 Claims**



1. A driver for an EL display, said EL display having an EL layer, a plurality of scanning electrodes on one side of said EL layer in parallel, at least one data electrode on an opposite side of said EL layer in a direction orthogonally crossing said scanning electrodes and EL elements constituting pixels formed at intersections of said at least one data electrode and said scanning electrodes, for displaying an image on said EL display by applying driving voltages to said at least one data electrode and said scanning electrodes, said driver comprising:

scanning voltage impressing means for successively applying scanning voltages to said plurality of scanning electrodes at a prescribed scanning timing, the scanning voltage impressing means including push-pull switching drivers connected between a first voltage supplying line and a second voltage supplying line, each of said push-pull switching drivers having a first switching circuit having a parasitic diode and a second switching circuit having a parasitic diode connected to said first switching circuit in series, said scanning voltages being provided from a connecting point between said first switching circuit and said second switching circuit;

display voltage impressing means for successively applying display voltages corresponding to display data to said at least one data electrode synchronously with said scanning timing;

scanning voltage reversing means for reversing a polarity of said scanning voltages every field for which said scanning voltage impressing means completes application of said scanning voltages to all of said scanning electrodes by changing a polarity of voltages applied to said first voltage supplying line and said second voltage supplying line:

electric charge moving means, in said scanning voltage impressing means, for connecting a first scanning electrode to which a scanning voltage has been applied to a next scanning electrode to which a scanning voltage is to be applied next by turning off one of said first switching circuit and said second switching circuit of said push-pull switching drivers connected to said first scanning electrode, and by turning on one of said first switching circuit and said second switching circuit of said push-pull switching drivers connected to said next scanning electrode, finishing applying said scanning voltage to said first scanning electrode before applying said scanning voltage to said next scanning electrode, and moving part of an electric charge stored in an EL element formed by said first scanning electrode to an EL element formed by said next scanning electrode via said parasitic diode of said one of said first switching circuit and said second switching circuit of said push-pull switching drivers connected to said first scanning electrode and via said one of said first switching circuit and said second switching circuit of said push-pull switching drivers connected to said next scanning electrode.

5,838,290
DISPLAY DEVICE WITH PHOTOVOLTAIC CONVERTER

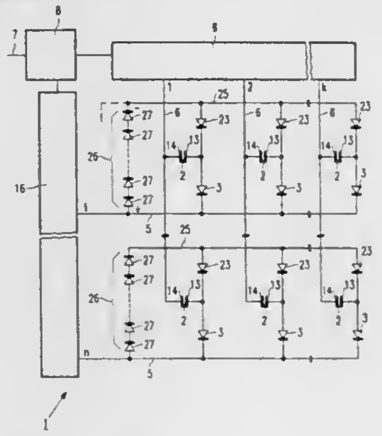
Karel E. Kuijk, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 6, 1997, Ser. No. 812,186

Claims priority, application European Pat. Off., Mar. 18, 1996, 96200745

Int. Cl.⁶ G09G *1/28*

U.S. Cl. 345—91 **9 Claims**



1. A display device comprising
a first supporting plate
a second supporting plate
an electro-optical medium between said plates,
a plurality of pixels arranged in an array of rows and columns, each pixel comprising a pair of picture electrodes facing each other on respective supporting plates, said picture electrodes being arranged in rows on said first supporting plate and in columns on said second supporting plate,
a row electrode connected to each row of picture electrodes on said first supporting plate,
a switching element electrically connected between each picture electrode on said first supporting plate and said row electrode,
a column electrode connected to each column of picture electrodes on said second supporting plate,

an auxiliary voltage electrode corresponding to each row electrode, and
a photovoltaic converter electrically connected between each row electrode and the corresponding auxiliary voltage electrode, said photovoltaic converter having a photovoltaic voltage which is high enough to keep the switching element either conductive or non-conductive.

5,838,291
DISPLAY CONTROL METHOD AND APPARATUS

Masamichi Ohshima, Tokyo; Kenzoh Ina; Toshiyuki Nobutani, both of Yokohama; Masami Shimakura, Tokyo; Junichi Tanahashi, Yokohama; Kenichiro Ono, Kawasaki; Hajime Morimoto, Tokyo; Tatsuya Sakashita, Yokohama, and Eiichi Matsuzaki, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

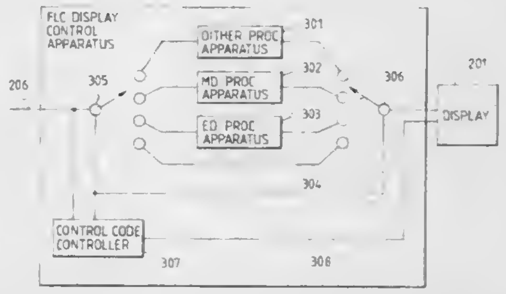
Continuation of Ser. No. 62,344, May 17, 1993, abandoned.

This application Mar. 2, 1995, Ser. No. 397,714

Claims priority, application Japan, May 19, 1992, 4-126143; May 19, 1992, 4-126164; May 19, 1992, 4-126168

Int. Cl.⁶ G09G *3/36*

U.S. Cl. 345—97 **8 Claims**



1. An apparatus for controlling a display capable of displaying m-level image data for each pixel, comprising:

display means for displaying image data:

memory means for storing image data having n-level for each pixel, with n being greater than m;

processing means for processing the image data readout from said memory means and generating processed image data having m-level for each pixel; and

supplying means for supplying the processed image data generated by said processing means to said display means as display data,

wherein said processing means includes,

a first converting circuit for converting the image data having n-level for each pixel into first processed image data having m-level for each pixel by using a first converting method.

a second converting circuit for converting the image data having n-level for each pixel into second processed image data having m-level for each pixel by using a second converting method different from the first converting method, and

a switching circuit for selectively outputting the first or the second processed image data in accordance with a characteristic of an image represented by the image data stored in said memory means, and wherein said first and second converting circuits are independently arranged and are connected in parallel so that both the first and second converting circuits are capable of inputting the image data readout from said memory means.

5,838,292
TEMPERATURE COMPENSATION IN GREYSCALE ADDRESSING

Neil Lockmuller, Hayes, United Kingdom, assignor to Central Research Laboratories, Ltd., England

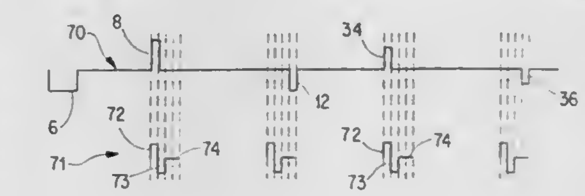
PCT No. PCT/GB94/02444, § 371 Date May 9, 1996, § 102(e) Date May 9, 1996, PCT Pub. No. WO95/13602, PCT Pub. Date May 18, 1995

PCT Filed Nov. 8, 1994, Ser. No. 640,964

Claims priority, application United Kingdom, Nov. 11, 1993, 9323242

Int. Cl.⁶ G09G *3/36*

U.S. Cl. 345—97 **4 Claims**



1. A method of addressing an optical cell in an array of similar cells, the optical cell including a material disposed between first and second electrodes, which receive respective first and second voltage waveforms, the first waveforms having data-carrying portions, and the second waveforms having strobing portions; the material being capable of assuming a first condition or a second condition in response to switching voltages developed across said optical cell by coincident application of said voltage waveforms to said electrodes, said first and second conditions being stable and optically distinguishable from one another; the first waveform comprising a repeated waveform sequence, each sequence occupying a plurality of time-slots, some time-slots having voltage pulses indicative of data to be applied to the optical cell, or other cells in the array, and other time-slots having no such voltage pulses; the second waveform comprising a sequence of time spaced voltage pulses, each being arranged to coincide with at least part of the waveform having data-carrying portions; the magnitude of the voltage pulses required to switch the optical cell between said stable conditions being subject to different thresholds for different parts of the total area of the optical cell, which thresholds vary with temperature, said data-carrying portion of the first waveform being applied to said first electrode in coincidence with:

a) a first voltage pulse of the second waveform, applied to the second electrode, said first voltage pulse having a first polarity, and a magnitude and duration which ensure that said material assumes said first condition over the whole area of the optical cell irrespective of the data carried by the waveform having data-carrying portions;

b) a second voltage pulse of the second waveform, applied to the second electrode, said second voltage pulse being timed to coincide with one of said voltage pulses indicative of data to be applied to the optical cell, said second voltage pulse having a polarity opposite to said first polarity, and a magnitude and duration which cause a region of the material to switch to said second condition or to remain in said first condition, depending on the data applied to the optical cell; and

c) a third voltage pulse of the second waveform, applied to the second electrode; wherein

the third voltage pulse is timed to coincide with a portion of the first waveform being applied to the first electrode having data-carrying portions intended for a different cell in the array, and thus having no voltage pulses in the corresponding time slot; and

the third voltage pulse has said first polarity, and a magnitude and duration which, at a given temperature and where the aforesaid switching has occurred, cause the material to switch back to the first condition over only a part of any region of the material which was switched into the second condition by said second voltage pulse, whereby the area of the optical cell having material in the first condition and the area of the optical cell having material in the second condition vary less with changing temperature than in the absence of said third pulse.

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5,838,293
DRIVING METHOD AND SYSTEM FOR ANTIFERROELECTRIC LIQUID-CRYSTAL DISPLAY DEVICE

Shinya Kondoh, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

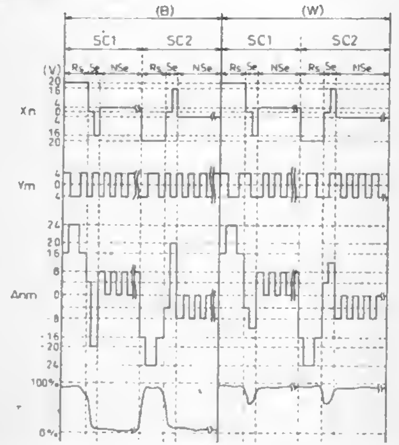
PCT No. PCT/JP96/01144, § 371 Date Dec. 19, 1996, § 102(e) Date Dec. 19, 1996, PCT Pub. No. WO96/34311, PCT Pub. Date Oct. 31, 1996

PCT Filed Apr. 25, 1996, Ser. No. 750,840

Claims priority, application Japan, Apr. 25, 1995, 7-099095

Int. Cl.^{6} G09G *3/36*

U.S. Cl. 345—97 **30 Claims**



1. A driving method for an antiferroelectric liquid-crystal display device including pixels in the form of a matrix and having an antiferroelectric liquid crystal interposed between a pair of substrates, characterized in that:

- said antiferroelectric liquid crystal assumes a first ferroelectric state, a second ferroelectric state that is a ferroelectric state to be set with application of a voltage which is opposite in polarity to a voltage to be applied to set the first ferroelectric state, and an antiferroelectric state;
- one writing of pixels is carried out during at least one scanning period;
- said scanning period includes a selection period during which a select pulse for determining an amount of light transmitted by pixels is applied, a reset period during which a reset pulse for bringing said antiferroelectric liquid crystal to a certain state is applied prior to the selection period, and a non-selection period during which the amount of transmitted light determined during the selection period is retained;
- said antiferroelectric liquid crystal is brought to said first or second ferroelectric state during said reset period;
- said select pulse is set to 0 V or a pulse that is opposite in polarity to said reset pulse; and
- said antiferroelectric liquid crystal is brought to said antiferroelectric state during said non-selection period or a ferroelectric state that is the same as a ferroelectric state to be set during said reset period.

5,838,294
VERY LOW DUTY CYCLE PULSE WIDTH MODULATOR

Michael Ross Praiswater, Albuquerque, N. Mex., assignor to Honeywell Inc., Minneapolis, Minn.

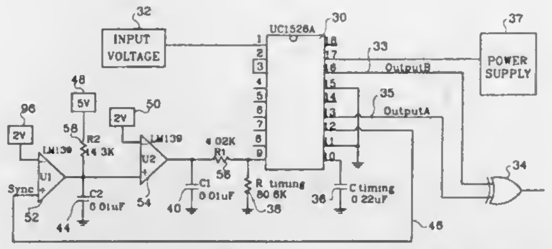
Filed Dec. 15, 1996, Ser. No. 760,548

Int. Cl.^{6} G09G *3/36*

U.S. Cl. 345—102 **13 Claims**

1. An apparatus for generating very low/duty cycle pulses for controlling the dimming of a fluorescent lamp comprising:

- a pulse width modulating means which outputs pulses on a periodic basis, where the width of the pulses is controlled by the magnitude of an input voltage, said pulse width modulating means further comprising:
  - means for generating a sync pulse at predetermined intervals;



- a timing resistor connected between a voltage source and ground where a reference current is drawn through the timing resistor; and
- a timing capacitor which receives a charging current, where said charging current is a function of the reference current, said timing capacitor provides a ramping voltage which is compared with the input voltage the ramping voltage being characterized by a waveform having at least two slopes; and
- means which receives the sync pulse from the pulse width modulating means and increases the current through the timing resistor which in turn increases the rate in which the timing capacitor charges for a period of time which is a function of the sync pulse.

5,838,295
METHOD FOR SCROLLING IMAGES ON A SCREEN

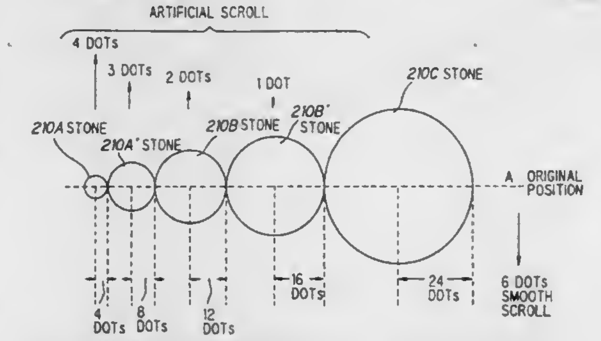
Koji Aoyama, Hokkaido, Japan, assignor to Hudson Soft Co Ltd., Hokkaido, Japan

Continuation of Ser. No. 300,071, Sep. 2, 1994, abandoned, which is a continuation of Ser. No. 940,038, Sep. 3, 1992, abandoned. This application Oct. 9, 1996, Ser. No. 727,284

Claims priority, application Japan, Mar. 19, 1992, 4-093850

Int. Cl.^{6} G09G *5/34*

U.S. Cl. 345—124 **4 Claims**



1. A method for scrolling images on a screen, comprising; displaying background images on a screen,

- defining a predetermined number of sprite positions on said screen for displaying movable sprite characters against said background, each of said characters being formed by a predetermined number of dots;
- displaying said characters at said positions on said screen, at least one of said characters having a displaying pattern;
- means wherein said displaying pattern enables the sprite to move in substantially any selected predetermined direction for said at least one of said characters in accordance with information stored in a memory, said information being stored in said memory at addresses designated by said positioned on said screen for displaying said at least one of said characters;
- said at least one of said characters comprising a plurality of characters extending from a small to a large display of patterns which are selected and displayed to provide small and large size patterns in accordance with perspective representation and depth perception in order to provide apparent three dimensional images of said characters as they appear to move toward or away from the viewer.

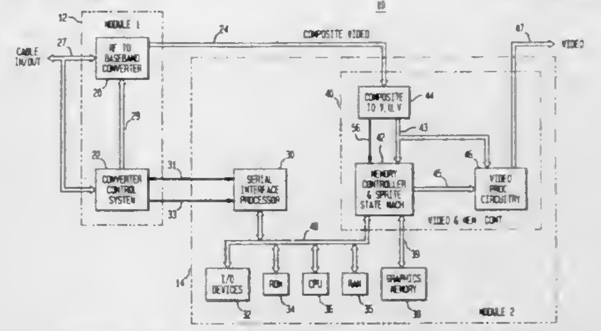
5,838,296
APPARATUS FOR CHANGING THE MAGNIFICATION OF VIDEO GRAPHICS PRIOR TO DISPLAY THEREFOR ON A TV SCREEN

Donald S. Butler, and Richard S. Amano, both of Scottsdale, Ariz., assignors to General Instrument Corporation, Horsham, Pa.

Filed Aug. 31, 1995, Ser. No. 523,789

Int. Cl.^{6} G09G *5/00*

U.S. Cl. 345—127 **18 Claims**



1. Apparatus for modifying the magnification of a graphic prior to displaying the graphic image on a television receiver comprising:

- first magnification modifying means for modifying the magnification of a graphic by a first independent predetermined magnification factor in a vertical direction by generating graphic line address output signals for selectively preventing a transmission of predetermined horizontal lines of the graphic upon the reception of a vertical magnification factor that is less than unity, and for selectively repeating a transmission of predetermined horizontal lines of the graphic upon the reception of a vertical magnification factor that is greater than unity; and
- second magnification modifying means responsive to the transmissions of the horizontal lines of the graphic indicated for transmission by the graphic line address output signals of the first magnification modifying means for modifying the magnification of the graphic in a horizontal direction by a second independent predetermined horizontal magnification factor, the second magnification modifying means selecting N predetermined pixels of each received group of X pixels that are multiplexed into a transmitting group of X pixels for transmission in each output signal of the apparatus for a horizontal magnification factor equal to or less than unity, where $N \leqq X$, and for repeating pixels of each received group of X pixels by a predetermined integer amount corresponding to a horizontal integer magnification factor that is greater than unity for transmission in each output signal of the apparatus.

5,838,297
METHOD FOR COLOR IMAGE SCALING AND OTHER GEOMETRICAL TRANSFORMATIONS

Albert Z. Zhao, Markham, Canada, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 7, 1994, Ser. No. 350,782

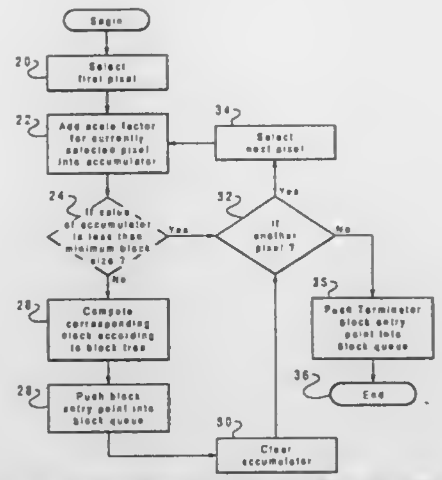
Claims priority, application Canada, May 20, 1994, 2124030

Int. Cl.^{6} G09G *5/00*

U.S. Cl. 345—127 **9 Claims**

1. A method for effecting geometric transformation of pixel image data from a source buffer in a processor environment, said method comprising the steps of:

- (a) generating a queue of software code blocks for an image line of the pixel image data, each software code block in said queue having at least one factor determined by the geometric transformation, wherein the step of generating a queue of software code blocks for an image line comprises selecting software code blocks from a cache of pre-defined software code blocks and arranging said selected software code blocks in sequence for generating an image line for the geometric transformation;


Begin
20
Select first pixel
22
Add scale factor for currently selected pixel into accumulator
34
Select next pixel
24
If value of accumulator is less than minimum block size ?
Yes
No
32
If another pixel ?
Yes
No
26
Compute corresponding block according to block tree
35
Push Terminator block entry point into block queue
28
Push block entry point into block queue
36
End
30
Clear accumulator

- (b) executing the software code blocks from the queue for an image line of the pixel image data into a destination buffer in the processor; and
- (c) repeating step (b) for each remaining image line from the pixel image data.

5,838,298
IMAGE PROCESSING APPARATUS AND METHOD FOR SMOOTHING STAIRWAY-LIKE PORTIONS OF A CONTOUR LINE OF AN IMAGE

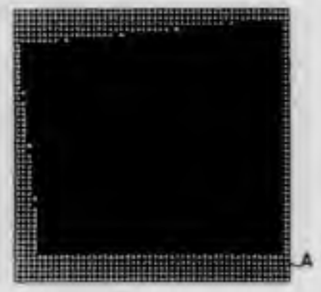
Akifumi Shirasaka, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 825,769, Jan. 21, 1992, abandoned, which is a continuation of Ser. No. 492,439, Mar. 14, 1990, abandoned, which is a continuation of Ser. No. 151,298, Feb. 1, 1988, abandoned. This application May 31, 1994, Ser. No. 250,944

Claims priority, application Japan, Feb. 13, 1987, 62-31194; Feb. 19, 1987, 62-36144

Int. Cl.^{6} G09G *5/28*

U.S. Cl. 345—136 **19 Claims**



1. An image processing apparatus comprising:

- memory means for storing digital data representing an image of first dots and second dots. in positions corresponding to respective coordinate positions of a pattern to be output;
- first detecting means for detecting, based on coordinate data, an oblique line in a contour line image formed by the first dots stored in said memory means, the oblique line being within a predetermined angle of a horizontal or of a vertical line;
- second detecting means for detecting stairway-like change portions of the oblique line detected by said first detecting means by testing corresponding digital data indicative of the oblique line to determine whether that line is continuous or not; and
- contour line correcting means for correcting two adjacent dots, including one first dot and one second dot, at the stairway-like change portions detected by said second detecting means by overwriting a plurality of the digital data which represent the image, which are adjacent to each other and which are within a predetermined distance of the oblique line portion which is noncontinuous, said contour line correcting means performing

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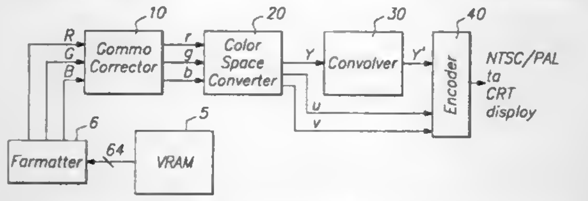
such correction by inverting the one first dot and one second dot appearing in the stairway-like change portions, the inversion of dots being performed in such manner that the number of first dots forming the image remains the same after dot inversion as before dot inversion.

5,838,299
RGB/YUV VIDEO CONVOLUTION SYSTEM

R. Steven Smith, and Laurence A. Thompson, both of Saratoga, Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed May 3, 1995, Ser. No. 433,096
Int. Cl.⁶ G09G *5/36;* H04N *9/77*

U.S. Cl. 345—137 **20 Claims**



1. A method for producing an interlaced display of computer generated data including the steps of:

generating video data of n bits;

converting the video data of n bits into luminance-chrominance (YUV) data of n bits;

separating the YUV data into Y, U, and V components of m bits each;

convolving the Y component; and

displaying the convolved Y component and the U and V components, wherein the Y component contains several scan lines, and the step of convolving is performed according to the formula:

$$\frac{1}{4}a+\frac{1}{2}b+\frac{1}{4}c$$

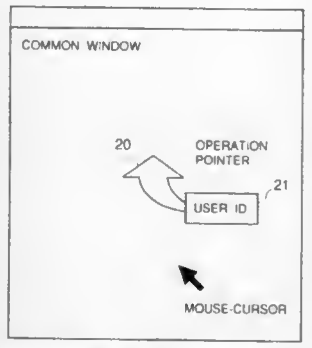
wherein b is a current scan line of the Y component, a is a scan line immediately above the current scan line, and c is a scan line immediately below the current scan line.

5,838,300
WINDOW SHARING SYSTEM

Tsuneyoshi Takagi, Kawasaki; Yuichi Bannai, Koganei, and Takeshi Kawazome, Utsunomiya, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 13, 1996, Ser. No. 663,361
Claims priority, application Japan, Jun. 19, 1995, 7-175460
Int. Cl.⁶ G09G *5/08*

U.S. Cl. 345—145 **26 Claims**



4. A display control apparatus comprising:

window display means for displaying a same window to a plurality of displays;

judging means for judging which one of the input devices corresponding to the plurality of displays has an access right to the window and for producing a judgment result, wherein cursors corresponding to respective input devices are displayed on the plurality of displays; and

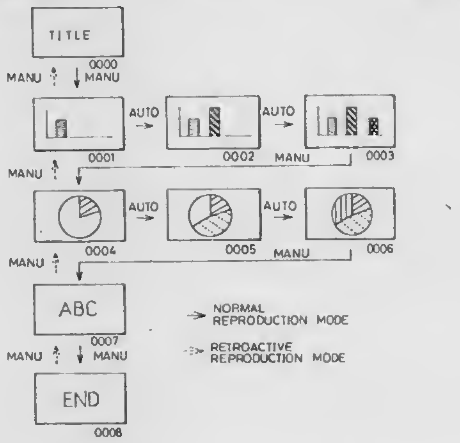
control means for changing a display condition of the cursor for one of the input devices which has the access right so as to display the access right on the basis of the judgment result of said judging means.

5,838,301
STILL PICTURE REPRODUCTION SYSTEM THAT ALLOWS SKIP

Hiroshi Okamoto, Hashima, and Youji Sugiura, Motosu-gun, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Continuation of Ser. No. 361,850, Dec. 21, 1994, Pat. No. 5,604,512, and a continuation of Ser. No. 66,461, May 24, 1993, abandoned. This application Oct. 30, 1996, Ser. No. 741,034
Claims priority, application Japan, May 28, 1992, 4-136901
Int. Cl.⁶ H04N *5/781*

U.S. Cl. 345—146 **20 Claims**



1. A still picture reproduction system for displaying a plurality of still pictures recorded on a recording medium, said system comprising:

an order designator for designating an order in which said still pictures are to be displayed so as to form a predetermined picture order and for organizing said pictures into a plurality of separate series of pictures in which each one of said series contains a different pre-defined ordered set of said pictures, thereby forming a succession of adjacent series;

a selector having

a series selection mode in which the selector, in response to an external request, selects one of said plurality of series adjacent to a current one of said plurality of series wherein only one still picture in said one adjacent series is chosen to produce a single designated picture, and

a picture selection mode in which the selector selects a next successive one of the still pictures in said one series as the designated picture;

a reproducer for reproducing the designated picture from said recording medium so as to generate a reproduced picture; and

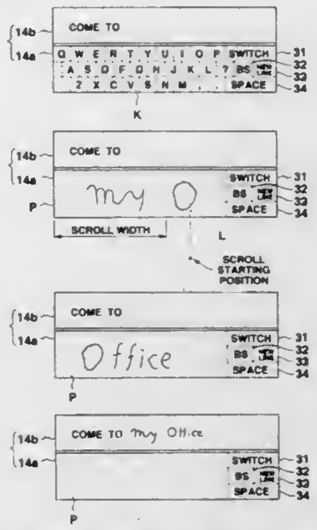
a display, responsive to said reproducing means, for displaying the reproduced picture.

5,838,302
DATA INPUTTING DEVICES FOR INPUTTING TYPED AND HANDWRITTEN DATA IN A MIXED MANNER

Yuji Kuriyama, Ome; Masaki Sugihara, Akishima; Koji Moriya, Higashiyamato; Katsuyoshi Kaneko, Hamura, and Motoyuki Kashiwagi, Fussa, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Feb. 21, 1996, Ser. No. 604,176
Claims priority, application Japan, Feb. 24, 1995, 7-037085; Feb. 27, 1995, 7-038504
Int. Cl.⁶ G09G *5/00*

U.S. Cl. 345—173 **5 Claims**



1. A data input device having a tablet-type coordinate input unit disposed on a display screen, the data input device comprising:

an input board display device for displaying on the display screen a keyboard by which code data is input and a handwriting board by which image data is input;

a first memory device for storing the code data input by the keyboard and the image data input by the handwriting board;

a second memory device for storing the order and kinds of input data; and

a data output device for reading the code and image data stored in said first memory device on the basis of the order and kinds of input data stored in said second memory device and for displaying the read code data and image data in accordance with the order input data on the display screen.

5,838,303
CONTINUOUS LOOP MOUSE

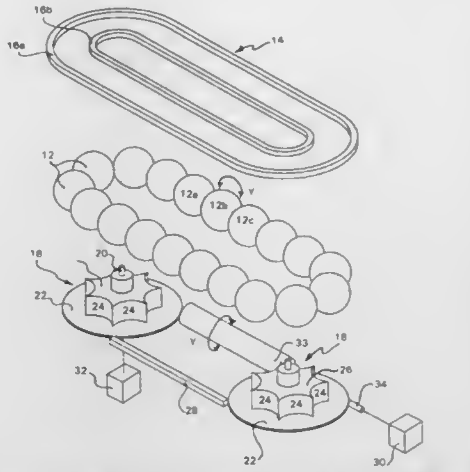
David G. Rowe, 12901 Ceder St., Leawood, Kans. 66209

Filed Sep. 19, 1996, Ser. No. 716,023
Int. Cl.⁶ G09G *5/08*

U.S. Cl. 345—157 **9 Claims**

1. An improvement in a position control device for a graphical user interface pointing device, the control device of the type having a plurality of spheres in a housing for supporting the spheres in adjacent annular array, the housing having a window therein to permit a user to apply lateral force on at least one of the spheres for communication of the force to the plurality of spheres to accomplish lateral movement of the spheres the improvement comprising:

a carousel wheel rotatable about a central axis said wheel having sphere-accepting indents to receive a sphere forced by a user against said wheel orthogonally to said wheel central axis, said indents receiving and communicating said user force from said sphere to said wheel to rotate said wheel about said axis to direct the movement of said indent-received sphere about the arc of a curve defined by the rotation of said wheel



on said axis and to deposit said sphere at an opposite end of said arc from where said sphere was received by said indent.

5,838,304
PACKET-BASED MOUSE DATA PROTOCOL

John C. Hall, Redmond, Wash., assignor to Microsoft Corporation, Redmond, Wash.

Continuation of Ser. No. 825,652, Jan. 23, 1992, which is a division of Ser. No. 626,393, Dec. 10, 1990, Pat. No. 5,125,077, which is a continuation of Ser. No. 568,057, Aug. 16, 1990, abandoned, which is a continuation of Ser. No. 371,529, Jun. 26, 1989, abandoned, which is a division of Ser. No. 119,314, Nov. 9, 1987, Pat. No. 4,866,602, which is a continuation of Ser. No. 548,122, Nov. 2, 1983, abandoned. This application Oct. 8, 1997, Ser. No. 947,044
Int. Cl.⁶ G06F *3/033*

U.S. Cl. 345—157 **29 Claims**

	B6	B5	B4	B3	B2	B1	B0
Byte 1	1	LEFT	RIGHT	Y7	Y6	X7	X6
Byte 2	0	X5	X4	X3	X2	X1	X0
Byte 3	0	Y5	Y4	Y3	Y2	Y1	Y0

1. In a method of operating a cursor control device having plural buttons, at least one position sensor, and circuitry for encoding data from said buttons and sensor into plural byte packets for transmission to an associated computer, an improvement comprising formatting each byte of the packet to include plural data bits, with a sync bit at an end thereof, the sync bit in the first byte having a value of "1" and the sync bit in succeeding bytes having a value of "0," wherein the first byte of the packet can be unambiguously distinguished from later bytes of the packet.

5,838,305
FOOT-OPERATED CONTROL MECHANISM FOR COMPUTERS

Kenneth H. Bookstein, New Orleans, La., assignor to Administrators of the Tulane Education Fund, New Orleans, La.

Filed Mar. 5, 1997, Ser. No. 812,378
Int. Cl.⁶ G09G *5/08*

U.S. Cl. 345—163 **13 Claims**

1. A foot-operated apparatus, for use by an operator, for computer control, comprising:

(a) a base;

(b) a pair of parallel rails mounted on the base;

(c) a frame slidably or rollably mounted on the rails for movement of the frame along the rails;

(d) a housing disposed within and slidably or rollably engaged with the frame, the housing being moveable within the frame

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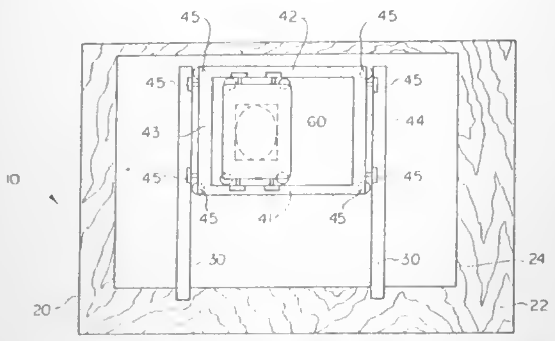


in a direction perpendicular to the direction of movement of the frame along the rails, the housing having an upper surface adapted for receiving an operator's foot; and

(e) a mouse, received within the housing such that the mouse slidably or rollably engages the base during movement of the housing for controlling the position of a cursor of a computer.

5,838,306

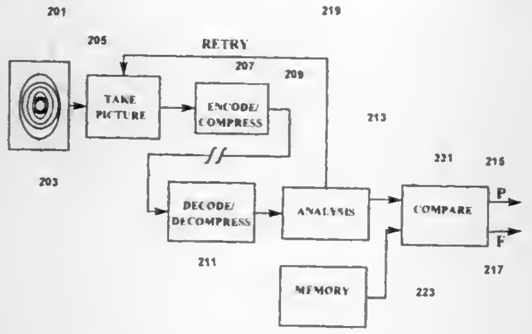
MOUSE WITH SECURITY FEATURE

Clint O'Connor, and Erica Scholder, both of Austin, Tex., assignors to Dell U.S.A., L.P., Round Rock, Tex.

Continuation of Ser. No. 435,318, May 5, 1995, abandoned. This application Aug. 20, 1997, Ser. No. 914,948

Int. Cl.^{6} G09G *5/08*

U.S. Cl. 345—163 **8 Claims**



1. A peripheral device for inputting information and allowing access to a computer system by a user, the computer system including a main housing for housing computer processing circuitry, the device comprising:

- a peripheral housing separate from the main housing, said peripheral housing being arranged to contain at least one switching device for generating input information;
- fingerprint acquisition means selectively operable for providing a user fingerprint signal representative of the fingerprint of a user;
- peripheral processing circuitry disposed within said peripheral housing for processing said user fingerprint signal; and
- comparison circuitry disposed within said peripheral housing and coupled to said peripheral processing circuitry for comparing said processed user fingerprint signal with authorized fingerprint signals to allow access to computer system by the user when predetermined criteria are satisfied.

5,838,307

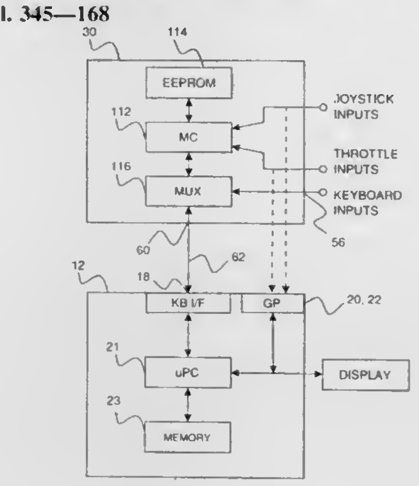
COMPUTER SYSTEM WITH RECONFIGURABLE CONTROLLER

Frank M. Bouton, Beaverton, Oreg., assignor to Thrustmaster, Inc., Hillshoro, Oreg.

Continuation of Ser. No. 272,680, Jul. 8, 1994, abandoned, which is a division of Ser. No. 2,828, Jan. 7, 1993, Pat. No. 5,396,267, which is a continuation-in-part of Ser. No. 932,501, Aug. 19, 1992, Pat. No. 5,245,320, which is a continuation-in-part of Ser. No. 911,765, Jul. 9, 1992, abandoned. This application May 30, 1995, Ser. No. 440,296

Int. Cl.^{6} G09G *5/00*

U.S. Cl. 345—168 **23 Claims**



1. A reconfigurable video game/simulator system comprising:

- a personal computer having a microprocessor operable under control of a system reconfiguration program during a reconfiguration mode and under control of a video game/simulator program during a functional mode, and a keyboard interface port;
- a display coupled to the personal computer for displaying images produced by the reconfiguration and video game programs;
- a video game/simulator controller having a plurality of input devices, a keyboard input port, and a keyboard input/output port coupled to the computer keyboard interface port;
- a computer keyboard coupled to the controller keyboard input port for inputting reconfiguration keycodes and input keycodes;
- means within the controller for transmitting from the controller to the computer predetermined reconfiguration keycodes responsive to actuation of corresponding controller input devices during the functional mode;
- means within the computer for receiving the keycodes transmitted from the controller;
- means within the computer for transmitting reconfiguration keycodes from the computer to the controller via the keyboard interface port during the reconfiguration mode;
- means within the controller for receiving the reconfiguration keycodes from the computer during the reconfiguration mode via the keyboard interface port; and
- means within the controller for reconfiguring the controller responsive to receiving the reconfiguration keycodes such that the controller transmits a reconfiguration keycode when a corresponding controller input device is actuated.

5,838,308

OPTICAL TOUCH INPUT DEVICE

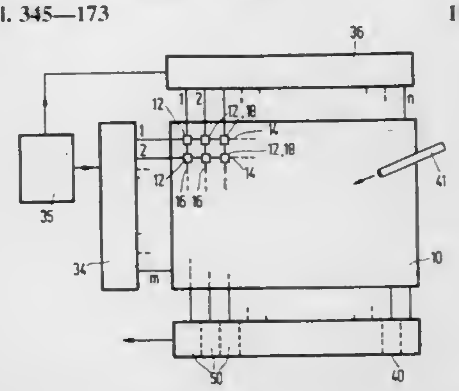
Alan G. Knapp, Crawley, and John M. Shannon, Whyteleafe, both of United Kingdom, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 15, 1992, Ser. No. 869,276

Claims priority, application United Kingdom, Apr. 17, 1991, 9108226

Int. Cl.^{6} G09G *3/28*

U.S. Cl. 345—173 **10 Claims**



1. An optical touch input device comprising an array of sensing elements. each of which sensing elements comprises a photosensitive device responsive to a light input from a light source, a switching device, and a charge storage means which is charred periodically by operation of the switching device, and detection means connected to the sensing elements for detecting periodically the state of charge of their charge storage means, characterised in that the photosensitive device comprises part of a discharge circuit connected to the charge storage means for discharging the charge storage means in response to a light input from a light source which discharge circuit has a light intensity dependent operational threshold characteristic such that in response to light falling on the photosensitive device which is at or above a predetermined intensity level it is operable to discharge the charge storage means and such that in response to light falling on the photosensitive device which is below said predetermined intensity level the charge storage means is not discharged, characterised in that the discharge circuit comprises a switch circuit which switches to discharge the charge storage means in response to the photosensitive element being subjected to light which is at or above the predetermined intensity level.

5,838,309

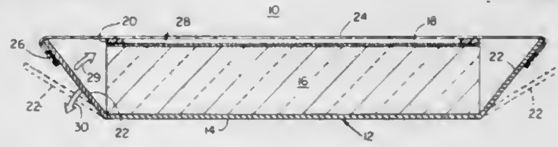
SELF-TENSIONING MEMBRANE TOUCH SCREEN

Stephen Richard Robsky, Sutton, Mass.; Bernard O. Geaghan, Salem, N.H.; Stephen Atwood, Worcester, Mass., and Michael Woolstrum, Round Rock, Tex., assignors to MicroTouch Systems, Inc., Methuen, Mass.

Filed Oct. 4, 1996, Ser. No. 725,877

Int. Cl.^{6} G08C *21/00*; G09G *5/00*

U.S. Cl. 345—173 **25 Claims**



1. A self-tensioning membrane digitizer comprising:

- a support structure defining a digitizer area and including spacer means;
- a tensioned membrane disposed in spaced relationship to said support structure on said spacer means; and
- a peripheral flexible member extending from said support structure and including at least two independently flexible sections attached to said membrane and pretensioned counter to the tension of said tensioned membrane for deflecting to maintain tension on said membrane to sustain the spaced relationship with the membrane relative to the structure.

5,838,310

CHROMA-KEY SIGNAL GENERATOR

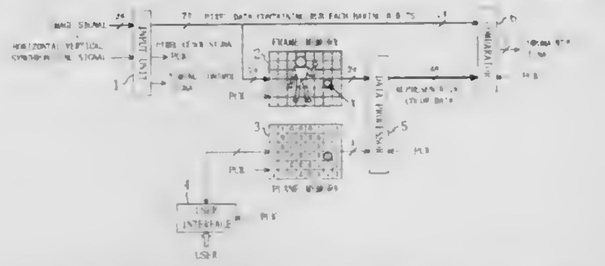
Masaru Uya, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 16, 1997, Ser. No. 857,601

Claims priority, application Japan, May 17, 1996, 8-122959

Int. Cl.^{6} G09G *5/04*

U.S. Cl. 345—186 **5 Claims**



1. A chroma-key signal generator comprising:

- an input unit for receiving an image signal and supplying a pixel clock signal synchronous to said image signal and items of pixel data each expressed in a digital value indicative of a color of each pixel composing an image;
- a plane memory for storing 1-bit digital values for one frame corresponding in one-to-one relation to the individual items of pixel data supplied from said input unit;
- a user interface for allowing a user to determine a content of said plane memory by setting desired values to the plane memory;
- a data processor for reading the values stored in said plane memory, receiving the items of pixel data indicative of the pixels corresponding to specified ones of said read values, and calculating representative color data for a key color in a finite range from one or more items of pixel data obtained; and
- a comparator for comparing the items of pixel data supplied from said input unit with the representative color data calculated by said data processor and outputting a chroma-key signal in synchronism with said pixel clock signal, said chroma-key signal being asserted only when said items of pixel data are contained in said representative color data,
- said data processor having the function of receiving new items of pixel data in a specified cycle, periodically recalculating and updating the representative color data, and supplying the updated representative color data to said comparator.

5,838,311

METHOD OF SAMPLING COLOR SIGNAL

Shiro Hayano; Masamitsu Toda, and Kazuyoshi Nishiyama, all of Osaka, Japan, assignors to Contec Co., Ltd., Osaka, Japan

Filed Mar. 1, 1996, Ser. No. 609,544

Claims priority, application Japan, Mar. 6, 1995, 7-45452

Int. Cl.^{6} G09G *5/04*

U.S. Cl. 345—213 **7 Claims**

1. A color signal sampling method for sampling a color signal of an analog form, using a sampling clock having a frequency f, said color signal sampling method comprising the steps of:

(a) inputting a horizontal synchronizing signal which is activated during a predetermined cycle T_H and inputting said color signal;

(b) counting the number N of activations of said sampling clock per said cycle T_H;

(c) comparing said number N of activations with a predetermined number K;

(d) setting said frequency f to a specific frequency by performing:

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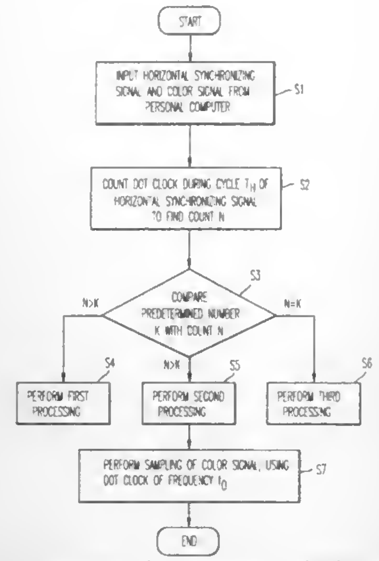

START
INPUT HORIZONTAL SYNCHRONIZING SIGNAL AND COLOR SIGNAL FROM PERSONAL COMPUTER
S1
COUNT DOT CLOCK DURING CYCLE T_H OF HORIZONTAL SYNCHRONIZING SIGNAL TO FIND COUNT N
S2
S3
COMPARE PREDETERMINED NUMBER K WITH COUNT N
N>K
N=K
N>K
S4
S5
S6
PERFORM FIRST PROCESSING
PERFORM SECOND PROCESSING
PERFORM THIRD PROCESSING
PERFORM SAMPLING OF COLOR SIGNAL, USING DOT CLOCK OF FREQUENCY f_0
S7
END

(d-1) first processing for decreasing said frequency f when N>K, and

(d-2) second processing for increasing said frequency f when N<K;

(d-3) third processing for first increasing said frequency f and then decreasing said frequency f when N=K; and

(e) sampling said color signal using said sampling clock at said specific frequency.

5,838,312

SYNCHRONIZATION SIGNAL PROCESSING CIRCUIT FOR A MONITOR FOR PROTECTING THE CATHODE RAY TUBE

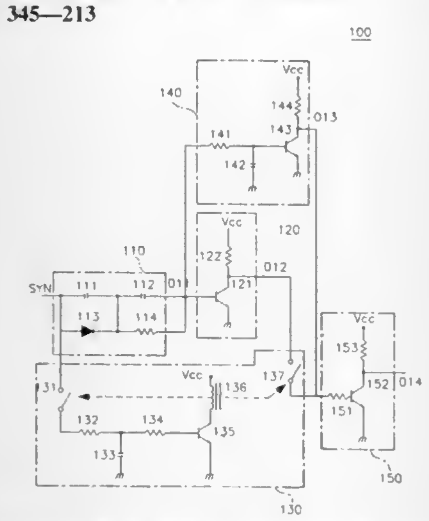
Young-Min Kim, Seoul, Rep. of Korea, assignor to Daewoo Electronics co., Ltd., Seoul, Rep. of Korea

Filed Sep. 27, 1996, Ser. No. 720,058

Claims priority, application Rep. of Korea, Sep. 28, 1995, 1995-32305

Int. Cl.^{6} G09G *5/00;* H04N *3/20*

U.S. Cl. 345—213 **12 Claims**



1. A synchronization signal processing circuit of a monitor for protecting the cathode ray tube comprising:

a rectifying means for rectifying a synchronization signal supplied from the outside;

a first inverting means for inverting the rectified signal and generating a first inverted signal and controlling an output of the first inverted signal according to the synchronization signal;

a second inverting means for delaying the rectified signal for a predetermined time period and generating a second inverted signal by inverting the delayed rectified signal; and

a synchronization signal outputting means for buffering the first and second inverted signals and applying the buffer signal to a microprocessor, a video signal processor and a deflection circuit respectively.

5,838,313

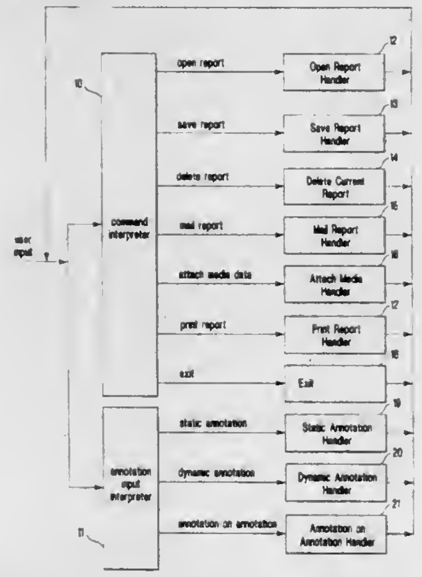
MULTIMEDIA-BASED REPORTING SYSTEM WITH RECORDING AND PLAYBACK OF DYNAMIC ANNOTATION

Tai-Yuan Hou, Robbinsville; Wei-Kwan Vincent Su, Princeton, both of N.J.; Thomas Meissner, Herzogenausrach, Germany, and Arding Hsu, Kendall Park, N.J., assignors to Siemens Corporate Research, Inc., Princeton, N.J., and Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 20, 1995, Ser. No. 560,566

Int. Cl.^{6} G06T *11/00*

U.S. Cl. 345—302 **18 Claims**



18. A multimedia-based reporting system comprising:

a command interpreter for receiving user command inputs;

an attach media handler connected to said command interpreter and a multimedia report for receiving external media from an external media source;

a mail report handler connected to said command interpreter and said multimedia report;

a print report handler connected to said command interpreter and said multimedia report;

a save report handler connected to said command interpreter and said multimedia report for saving said multimedia report to an external media storage;

an open report handler connected to said command interpreter and said multimedia report for receiving external reports from an external report source;

an annotation input interpreter for receiving user annotation inputs;

a static annotation handler connected to said annotation input interpreter and said multimedia report;

an annotation on annotation handler connected to said annotation input interpreter and said multimedia report;

a dynamic annotation handler connected to said annotation input interpreter and said multimedia report; and,

a report viewer for displaying content of said multimedia report wherein said dynamic annotation handler comprises:

adaptive synchronization means for synchronizing actions and voice; and

continuous multichannel presentation means.

5,838,314

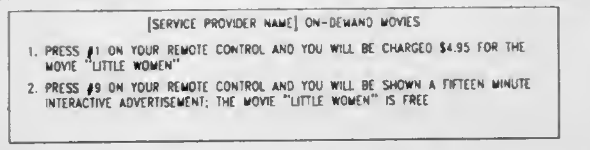
DIGITAL VIDEO SERVICES SYSTEM WITH OPTIONAL INTERACTIVE ADVERTISEMENT CAPABILITIES

Douglas E. Neel, and Joel A. Pugh, both of Dallas, Tex., assignors to Message Partners, Dallas, Tex.

Filed Feb. 21, 1996, Ser. No. 604,173

Int. Cl.^{6} H04N *7/167*

U.S. Cl. 345—327 **20 Claims**



[SERVICE PROVIDER NAME] ON-DEMAND MOVIES

1. PRESS #1 ON YOUR REMOTE CONTROL AND YOU WILL BE CHARGED $4.95 FOR THE MOVIE "LITTLE WOMEN"
2. PRESS #9 ON YOUR REMOTE CONTROL AND YOU WILL BE SHOWN A FIFTEEN MINUTE INTERACTIVE ADVERTISEMENT; THE MOVIE "LITTLE WOMEN" IS FREE

1. A method for interactive presentation of video programming choices and payment options on a television, the method comprising:

storing a plurality of video programs for presentation on said television, said video programs being accessed for said presentation via a video server;

offering a menu of said video program choices on said television;

offering a menu of said payment options for said video programs on said television, wherein one of said payment options comprises viewing by the viewer of an advertisement program in lieu of direct payment by the viewer;

accessing a control computer, said control computer accessing a data base and using data stored in said data base to select an advertisement program to be presented to the viewer;

confirming validity of a selected one of said payment options for said selected video program;

authorizing presentation of said selected video program upon said confirmation;

presenting said selected video program on said television upon said authorization.

5,838,315

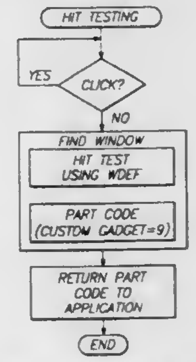
SUPPORT FOR CUSTOM USER-INTERACTION ELEMENTS IN A GRAPHICAL, EVENT-DRIVEN COMPUTER SYSTEM

Timothy J. Craycroft, and Robert R. Ulrich, both of Mountain View, Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Continuation of Ser. No. 593,171, Feb. 1, 1996, Pat. No. 5,692,142. This application Nov. 24, 1997, Ser. No. 977,059

Int. Cl.^{6} G06F *3/14*

U.S. Cl. 345—333 **17 Claims**



1. For use in a graphical, event-driven computer system having a computer display and a graphical user interface, a method of providing a customer interactive user-interface element in a frame of a window of an application program, in addition to system-defined elements provided in each window displayed by said computer system, said method comprising the steps of:

storing information referring to an icon, stored as part of said application program and used to visually represent the custom interactive user-interface element, in a location accessible to a window manager; and

the window manager drawing on the computer display a frame of the window including drawing, at a size and location determined by the window manager, the icon used to visually represent the custom interactive user-interface element;

wherein clicking on the custom interface user-interface element causes the application to perform a function that is in addition to functions defined as part of the graphical user interface.

5,838,316

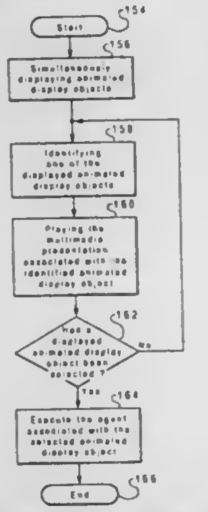
METHOD AND SYSTEM FOR PRESENTING A PLURALITY OF ANIMATED DISPLAY OBJECTS TO A USER FOR SELECTION ON A GRAPHICAL USER INTERFACE IN A DATA PROCESSING SYSTEM

Bernabe J. Arruza, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 26, 1996, Ser. No. 592,147

Int. Cl.^{6} G06F *15/00*

U.S. Cl. 345—334 **24 Claims**


Start
154
Simultaneously displaying animated display objects
156
158
Identifying one of the displayed animated display objects
160
Playing the multimedia presentation associated with the identified animated display object
162
Has a displayed animated display object been selected ?
No
Yes
164
Execute the agent associated with the selected animated display object
166
End

1. A method for presenting animated display objects to a user for selection on a graphical user interface of a data processing system, wherein the graphical user interface is displayed on a display device of the data processing system, the method comprising the steps of:

simultaneously displaying a plurality of animated display objects that each represent a configuration of the graphical user interface, thus allowing the user to view all of the plurality of animated display objects and make a selection of one of the plurality of animated display objects, wherein each one of the plurality of animated display objects is associated with a multimedia presentation;

identifying one of the displayed animated display objects;

playing the associated multimedia presentation for the identified animated display object;

selecting one of the displayed animated display objects; and

executing a software agent associated with the selected animated display object to configure the graphical user interface into the configuration represented by the selected animated display object.

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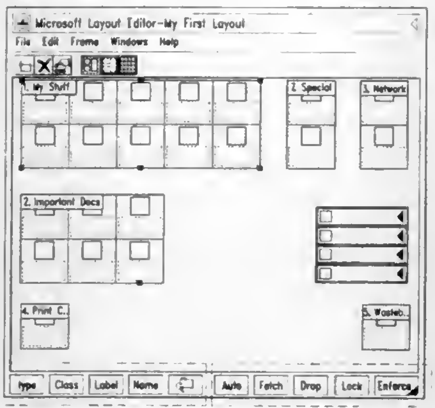
5,838,317
METHOD AND APPARATUS FOR ARRANGING DISPLAYED GRAPHICAL REPRESENTATIONS ON A COMPUTER INTERFACE

David A. Bolnick; Hugh V. Rubin, and Mark A. Malamud, all of Seattle, Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Jun. 30, 1995, Ser. No. 497,405
Int. Cl.⁶ G06F *15/00*
U.S. Cl. 345—339 **49 Claims**


Microsoft Layout Editor–My First Layout
File Edit Frame Windows Help
1. My Stuff
2. Special
3. Network
2. Important Docs
4. Print C.
5. Wastebasket
Type Class Label Name Auto Fetch Drop Lock Inference

1. A display arrangement system for a computer system having a graphical user interface providing a user convenient access to a set of computer resources associated with repositionable graphical representations displayed by the graphical user interface, the display arrangement system comprising:

an arrangement criterion for positioning the repositionable graphical representations within the graphical user interface based at least upon the contents of the computer resources associated with the repositionable graphical representations wherein the arrangement criterion comprises a window including at least two frames, and wherein each frame comprises an area on the graphical user interface and a set of frame-specific arrangement rules, the set of frame-specific arrangement rules including a frame filtering criterion specifying at least one filtering property for limiting association of computer resources with a frame; and

a graphical display arrangement processor for positioning the repositionable graphical representations by applying the arrangement criterion to the set of computer resources wherein the graphical display arrangement processor includes means for applying the at least one filtering property to the computer resources and associating, with the frame, computer resources meeting the frame filtering criterion.

5,838,318
METHOD AND APPARATUS FOR AUTOMATICALLY AND INTELLIGENTLY ARRANGING WINDOWS ON A DISPLAY DEVICE

Daniel R. Porter; Anthony C. Salvador, both of Portland, and Rune A. Skarbo, Hillsboro, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

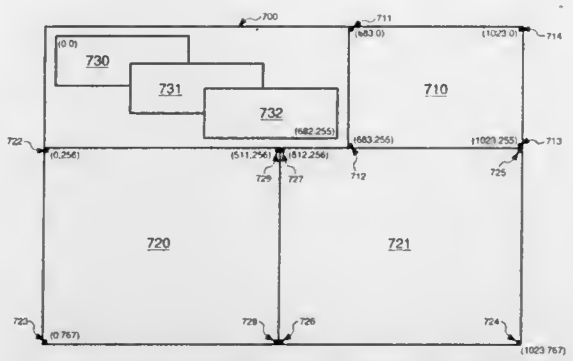
Filed Nov. 10, 1995, Ser. No. 556,026
Int. Cl.⁶ G06F *3/00*
U.S. Cl. 345—342 **24 Claims**

1. A method comprising:

recognizing a domain of one or more windows among a plurality of windows on a display;

identifying a class designation for each window of the domain of windows, wherein one or more windows of the domain of windows have a same class designation; and

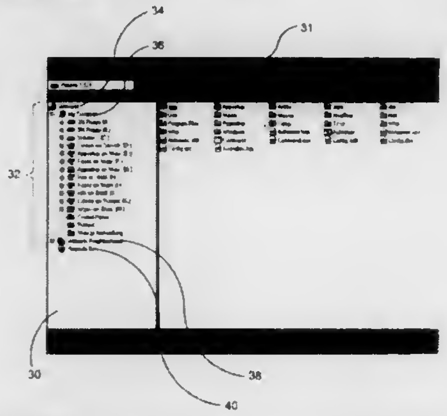
re-arranging automatically the plurality of windows on the display according to the domain and the class designation, wherein windows of the domain having the same class designation are treated equally in the re-arranging.



5,838,319
SYSTEM PROVIDED CHILD WINDOW CONTROL FOR DISPLAYING ITEMS IN A HIERARCHICAL FASHION

Christopher J. Guzak; Jeffrey L. Bogdan, both of Kirkland; George H. Pitt, III, and Chee Heng Chew, both of Redmond, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Continuation of Ser. No. 355,408, Dec. 13, 1994, abandoned. This application Jul. 1, 1997, Ser. No. 886,777
Int. Cl.⁶ G06F *3/00*
U.S. Cl. 345—340 **27 Claims**



1. In a computer system having a processor for running a first and a second application program and an output device, a method comprising the steps of:

providing a child window control as a system resource that may be used by the first and the second application program to display a list of items as a hierarchical tree on the output device;

using the child window control by the first application program to display at least a portion of a list of items as a hierarchical tree on the output device; and

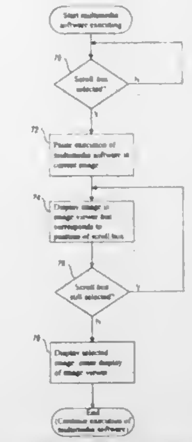
using the child window control by the second application program to display at least a portion of another list of items as a hierarchical tree on the output device.

5,838,320
METHOD AND SYSTEM FOR SCROLLING THROUGH DATA

Joseph Howard Matthews III, Redmond, and James C. Gallant, Seattle, both of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Continuation of Ser. No. 265,381, Jun. 24, 1994, abandoned. This application May 2, 1997, Ser. No. 848,856
Int. Cl.⁶ C09G *5/34;* G06F *3/14*
U.S. Cl. 345—341 **25 Claims**

1. A method in a computer system for controlling the display of a sequence of images on an image area of a display device, the method comprising:



simultaneously with displaying the sequence of images on the image area, displaying a scroll bar with a scroll box on the display device, the relative position of the scroll box within the scroll bar corresponding to the relative position of the currently displayed image within the sequence of images;

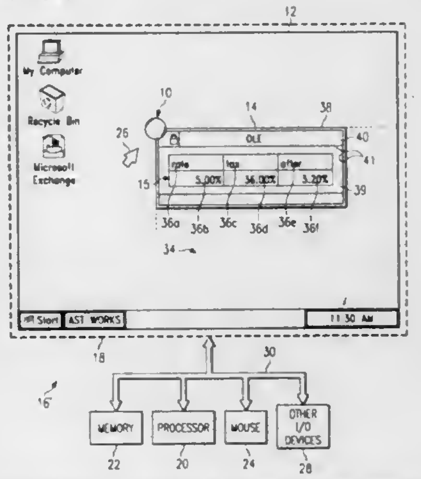
in response to a user dragging the scroll box, suspending the display of the sequence of images on the image area of the display device and sequentially displaying reduced-sized images having a relative position within the sequence of images corresponding to the position of the scroll box within the scroll bar; and

when the user stops dragging the scroll box, resuming display of the sequence of images on the image area of the display device starting with the image having a relative position within the sequence of images corresponding to the position of the scroll box within the scroll bar.

5,838,321
USER INTERFACE WITH EMBEDDED OBJECTS FOR PERSONAL COMPUTERS AND THE LIKE

Richard James Wolf, Crowley, Tex., assignor to AST Research, Inc., Irvine, Calif.

Filed May 6, 1996, Ser. No. 643,577
Int. Cl.⁶ G06F *3/00*
U.S. Cl. 345—343 **31 Claims**



1. In a computer comprising a graphical user interface with a graphical display element and a container with a frame, and object linking and embedding capabilities, a computer program enabling an object from a first application program to be linked or embedded into the container, the object comprising controls and adornments the computer program comprising:

instructions for determining a size of an object that is linked or embedded into a container having an adjustable frame, the object comprising information content;

instructions for determining whether the object is in an active mode;

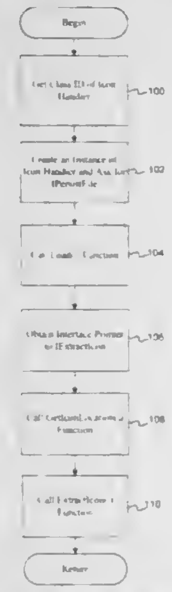
instructions for determining a first frame size for the adjustable frame so that the adjustable frame fits tightly around an inactive-mode visual appearance of the information content if the object is not in the active mode; and

instructions for determining a second frame size for the adjustable frame so that the adjustable frame fits tightly around an active-mode visual appearance of the information content while including controls and adornments of the object if the object is in the active mode.

5,838,322
SHELL EXTENSIONS FOR AN OPERATING SYSTEM

Satoshi Nakajima, Bellevue; George H. Pitt, III; Joseph D. Belfiore, both of Redwood, and Christopher J. Guzak, Kirkland, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Division of Ser. No. 355,410, Dec. 13, 1994. This application Aug. 20, 1997, Ser. No. 915,443
Int. Cl.⁶ G06F *15/00*
U.S. Cl. 345—348 **19 Claims**



1. In a data processing system having a video display, a memory means and a processing means running an operating system that includes a shell that provides functionality, an application program installed under the operating system, and a file having a file type associated with the application, the file having an associated file identifier, a method comprising the steps of:

providing a database of registration information that is stored in the memory means;

storing a representation of a per-instance icon for the file in the memory means;

registering the representation of the per-instance icon in the database in association with the file identifier;

providing and registering in the database, a per-instance icon handler for the file type to extend the functionality of the shell relative to the file type, said per-instance icon handler provide by the application program and being independent of the operating system,

wherein the per-instance icon handler is for finding the representation of the per-instance icon and providing the representation of the per-instance icon to the operating system to display the icon on the video display; and

in response to a request to display an icon for the file, accessing the database to locate the per-instance icon handler and using the per-instance icon handler to display the per-instance icon as the icon for the file on the video display.

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5,838,323

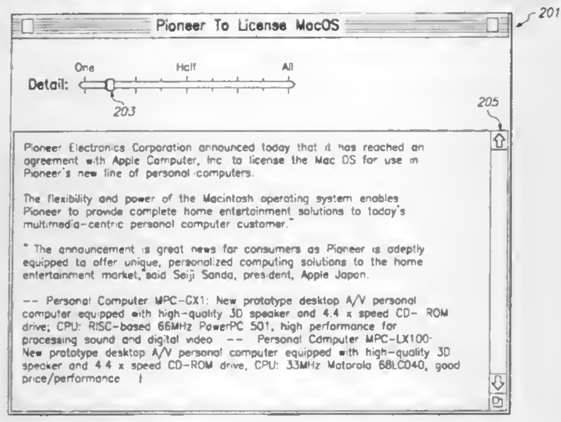
DOCUMENT SUMMARY COMPUTER SYSTEM USER INTERFACE

Daniel E. Rose, Cupertino; Jeremy J. Bornstein, Menlo Park; Douglass R. Cutting, Oakland, and John D. Hatton, Mt. Hermon, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Sep. 29, 1995, Ser. No. 536,903

Int. Cl.⁶ G06F *17/00*

U.S. Cl. 345—349 **36 Claims**



Pioneer Electronics Corporation announced today that it has reached an agreement with Apple Computer, Inc to license the Mac OS for use in Pioneer's new line of personal computers.

The flexibility and power of the Macintosh operating system enables Pioneer to provide complete home entertainment solutions to today's multimedia-centric personal computer customer."

" The announcement is great news for consumers as Pioneer is adeptly equipped to offer unique, personalized computing solutions to the home entertainment market," said Seiji Sanda, president, Apple Japan.

-- Personal Computer MPC-GX1: New prototype desktop A/V personal computer equipped with high-quality 3D speaker and 4.4 x speed CD- ROM drive; CPU: RISC-based 66MHz PowerPC 601, high performance for processing sound and digital video -- Personal Computer MPC-LX100- New prototype desktop A/V personal computer equipped with high-quality 3D speaker and 4.4 x speed CD-ROM drive, CPU: 33MHz Motorola 68LC040, good price/performance

1. An automatic method for presenting a document summary comprising the following steps:

- a. presenting a number of segments of a relevance ranked list of segments of a document to a user on a display;
- b. presenting a summary detail control on said display;
- c. allowing a user to modify said summary detail control; and
- d. varying said number of said segments of said relevance ranked list of segments of said document presented to said user on said display according to said summary detail control.

5,838,324

INFORMATION PROCESSING APPARATUS FOR DISPLAYING A PLURALITY OF MODES OF OPERATION THEREOF

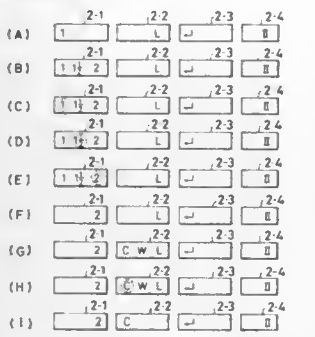
Tomohiro Maekawa, Yokohama, and Kaoru Kumagai, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 927,799, Aug. 10, 1992, abandoned, which is a continuation of Ser. No. 794,858, Nov. 21, 1991, abandoned, which is a continuation of Ser. No. 270,456, Nov. 7, 1988, abandoned, which is a continuation of Ser. No. 14,180, Feb. 11, 1987, abandoned, which is a continuation of Ser. No. 694,845, Jan. 25, 1985, abandoned. This application Dec. 15, 1994, Ser. No. 357,154

Claims priority, application Japan, Jan. 31, 1984, 59-16287; Jan. 31, 1984, 59-16290

Int. Cl.⁶ G06F *17/21*

U.S. Cl. 345—352 **40 Claims**



1. An electric typewriter comprising:

- a keyboard including character keys for inputting characters, a cursor key for shifting a cursor to designate a position of a character to be input by a character key, and a printing mode key for directing the setting of modes;
- display means for displaying on a display screen the cursor, input characters and a plurality of types of the printing modes, said plurality of types of printing modes being displayed as a plurality of blocks, each block representing one said type of printing mode, and being displayed simultaneously;
- cursor designating means, responsive to an operation of the cursor key, for designating a position on said display means at which the input character will be displayed when said printing mode key does not direct the setting of the printing modes, and for, alternately, sequentially designating each of said plurality of types of printing modes included in said plurality of blocks displayed by said display means when said printing mode key directs the setting of the printing modes;
- printing mode selection means for selecting the types of the printing modes of all said blocks according to a shift of the cursor through all said blocks by said cursor designating means, said printing mode selection means causing one of said plurality of types of printing modes included in a block to be selected as the type of printing mode to be set when said cursor designating means designates one of said plurality of types of printing modes included in the same block, and for establishing a finally selected type of a block when a designation by said cursor designating means is shifted from said block to the next block in response to the operation of the cursor key; and
- display control means for controlling said display means to cause said display means to turn off the displaying of the types of printing modes in a block except for a type of mode which is established as a finally selected type of printing mode of the block by said printing mode selection means,
- wherein when said printing mode key is depressed, said display control means controls said display means to display the names of all the printing modes in a first block and to visually distinguish a first printing mode name in said first block from the other printing mode names in said first block because said first printing mode name is the current selected printing mode name in the first block,
- wherein when said cursor key is depressed for moving the cursor in one direction after said printing mode key is depressed, said display control means determines whether the first printing mode name is at the boundary between said first block and a second block, adjacent to said first block in said one direction,
- wherein when said display control means determines that the first printing mode name in said first block is at the boundary between the first and second blocks:
- said display control means controls said display means to display only the first printing mode name in said first block;
- said printing mode selection means designates a first printing mode corresponding to the first printing mode name in the first block as the current printing mode of the type of printing mode displayed in the first block; and
- said display control means controls said display means to display all printing mode names in said second block and to visually distinguish the printing mode name in said second block at the boundary of said first and second blocks from the other printing mode names in said second block.

5,838,325

STAR SYMBOL INTERFACE FOR A COPYING/ PRINTING APPARATUS

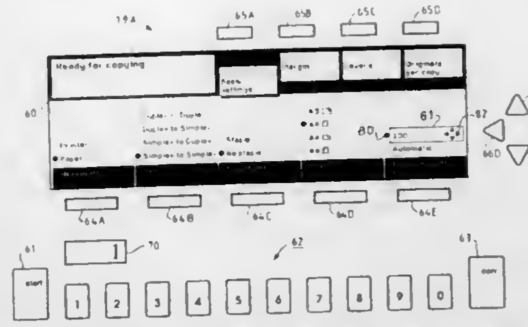
Jurek Nikolaj Deen; Eduardus Josephus Willibrordus Van Vliembergen; Henricus Robertus Leo Nicholaas Schliekelmann, all of Venlo, and Petrus Cornelus Adrianus Vogels, Eindhoven, all of Netherlands, assignors to Oce-Nederland B.V., Ma Venlo, Netherlands

Filed Feb. 15, 1996, Ser. No. 602,092

Claims priority, application Netherlands, Feb. 15, 1995, 9500280

Int. Cl.⁶ G06F *3/00*

U.S. Cl. 345—353 **38 Claims**



1. An interface in an apparatus for reproducing images, the interface enabling selection of a value for a parameter from among one of a plurality of subsets to a set of all possible values of the parameter, the parameter defining at least in part how at least one image is to be reproduced, the interface comprising:

- manipulation means, physically configured to be manipulable in ways corresponding to a plurality of intersecting lines, respectively, for converting manipulation into a signal that indentifies one of two possible directions of a line;
- a memory for storing said plurality of subsets to said set of all possible values for said parameter, each subset corresponding to one of the lines; and
- parameter-value means, operatively interconnected to the manipulation means and the memory, for enabling selection of a value within one of said subsets to said set of possible value of the parameter in response to the way in which the manipulation means is manipulated along one of said plurality of intersecting lines independent of manipulation along other ones of said plurality of intersecting lines, as indicated by the signal from said manipulation means.

5,838,326

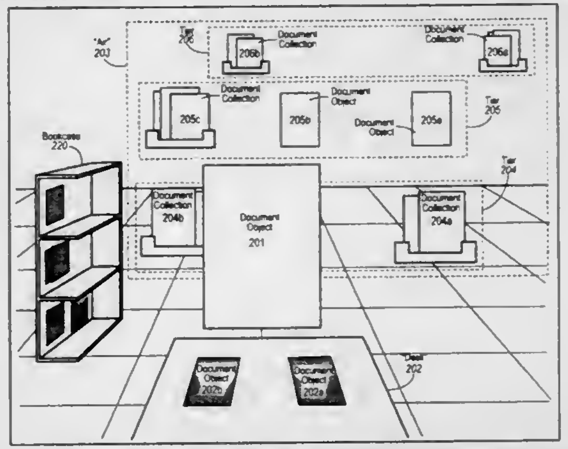
SYSTEM FOR MOVING DOCUMENT OBJECTS IN A 3-D WORKSPACE

Stuart K. Card, Los Altos Hills; William M. York, Los Altos, both of Calif., and George G. Robertson, Redmond, Wash., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 26, 1996, Ser. No. 721,302

Int. Cl.⁶ G06F *3/00*

U.S. Cl. 345—355 **16 Claims**



1. A computer controlled display system for displaying document objects in a three-dimensional document workspace on a display, said computer controlled display system comprising:

- document retrieval means for retrieving document objects;
- a pointer device for pointing a cursor at document objects, said pointer device having a switch with a first up position and a second down position;
- positioning means for receiving user input for positioning document objects within said three-dimensional document workspace, said positioning means further comprising:
  - means for detecting that said cursor is pointing at a selected document object and said switch associated with said pointer device is in said second down position;
  - circuitry for detecting that said cursor is moved and drawing a line corresponding to the movement of said cursor;
  - circuitry for detecting that said cursor is pointing at a destination document object and said switch associated with said cursor is in said second up position;
  - circuitry for performing a context sensitive operation based on said destination document object;
- workspace display circuitry for generating display information for displaying said three-dimensional document workspace and said document objects, said workspace display circuitry comprising:
  - circuitry for displaying a focus space, said focus space for detail display of a document object;
  - circuitry for displaying an immediate space, said immediate space for ephemeral positioning of document objects that are in use but not in focus; and
  - circuitry for displaying a tertiary space, said tertiary space for positioning document objects that are not in use.

5,838,327

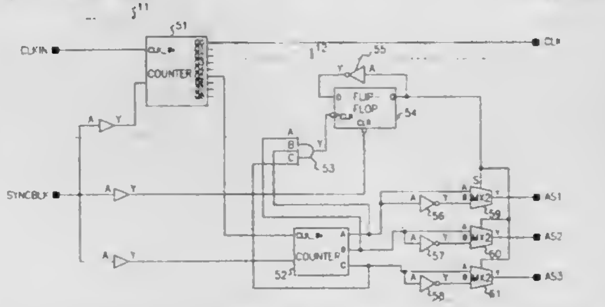
CONTROLLER FOR CONVERTING DIGITAL PLANE IMAGE DATA TO VIRTUAL THREE-DIMENSIONAL IMAGE DATA

Phil Moon Seong, Seoul, Rep. of Korea, assignor to Woo Bo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Nov. 1, 1996, Ser. No. 742,900

Int. Cl.⁶ G09G *5/00*

U.S. Cl. 345—425 **3 Claims**



1. A controller for converting digital plane image data to virtual 3-dimensional image data, said controller comprising:

- a frequency counting means for counting frequency after receiving a horizontal synchronous frequency signal and an image frequency clock signal; and
- an image control signal generating means for outputting a signal to control image digital data having a fixed bit number by receiving an output from said frequency counting means and said horizontal synchronous frequency signal;
- wherein said image control signal generating means comprises:
  - a second counter for sequentially counting in line with said horizontal synchronous signal, and then outputting the result by weight, after receiving an output pulse from said frequency counting means as a clock signal;
  - a toggling means, which receives said horizontal synchronous signal as a clear signal, for toggling its output under the control of said second counter; and
  - a plurality of multiplexers, which are connected to said second counter, for generating a plurality of image control signals by either transmitting the output of said second counter as it is or inverting the output of said second counter under the control of the output of said toggling means.

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5,838,328
METHOD FOR GENERATING GRAPHICAL MODELS AND COMPUTER AIDED DESIGN SYSTEM

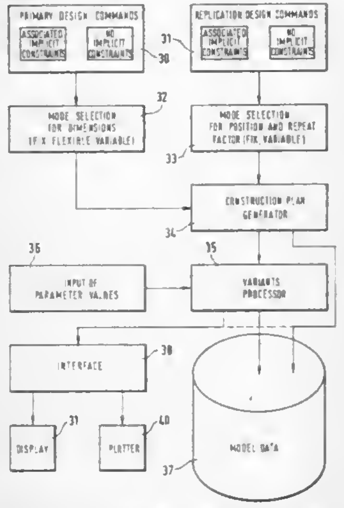
Dieter Roller, Schönaich, Germany, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 525,101, May 17, 1990, abandoned, which is a continuation-in-part of Ser. No. 360,494, Jun. 2, 1989, abandoned. This application Jun. 11, 1993, Ser. No. 76,285

Claims priority, application European Pat. Off., May 19, 1989, 89108990

Int. Cl.⁶ G06T *17/00;* G06F *17/50*

U.S. Cl. 345—420 **1 Claim**


PRIMARY DESIGN COMMANDS
ASSOCIATED IMPLICIT CONSTRAINTS
NO IMPLICIT CONSTRAINTS
REPLICATION DESIGN COMMANDS
ASSOCIATED IMPLICIT CONSTRAINTS
NO IMPLICIT CONSTRAINTS
31
30
32
MODE SELECTION FOR DIMENSIONS (FIX FLEXIBLE VARIABLE)
MODE SELECTION FOR POSITION AND REPEAT FACTOR (FIX, VARIABLE)
33
CONSTRUCTION PLAN GENERATOR
34
36
35
INPUT OF PARAMETER VALUES
VARIANTS PROCESSOR
INTERFACE
38
31
40
DISPLAY
PLOTTER
MODEL DATA
37

1. A method for generating a generic program of a graphical model of a 2- or 3-dimensional object with at least partially variable dimensions, in a computer aided design system, said design system having design commands, said method comprising the steps of:

selecting a sub-group of geometric elements corresponding to a structural element of said object, wherein said geometric elements are defined by a set of said design commands;

generating a replication command having replication parameters defined as variables, said replication parameters being generated in relation to said sub-group of geometric elements, wherein said step of generating said replication command comprises matrix mapping said set of design commands;

incorporating said replication command and said replication parameters into a design program thereby generating a generic design program and storing said generic design program, wherein said replication command is stored in an unexecuted form so that when it is desired to replicate said set of said design commands to generate a model having a number of said structural element, said number is variable.

5,838,329
FAST PERSPECTIVE TEXTURE MAPPING FOR 3-D COMPUTER GRAPHICS

Michael R. Day, London, England, assignor to Argonaut Technologies Limited, London, England

PCT No. PCT/GB95/00751, § 371 Date Dec. 26, 1996, § 102(e) Date Dec. 26, 1996, PCT Pub. No. WO95/27266, PCT Pub. Date Oct. 12, 1995

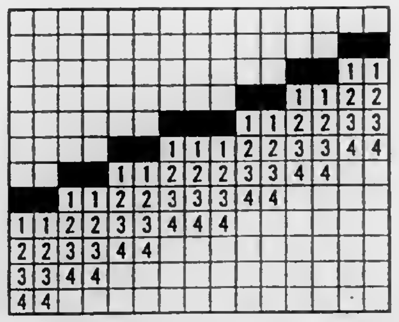
PCT Filed Mar. 31, 1995, Ser. No. 702,462

Claims priority, application United Kingdom, Mar. 31, 1994, 9406515

Int. Cl.⁶ G06T *15/70*

U.S. Cl. 345—426 **7 Claims**

1. A method of rendering an image on a display, comprising texture mapping of a pre-prepared texture map to flat surfaces of an object which is to be viewed in perspective on the display, characterised by scanning each surface to be texture mapped along notional lines of constant z (depth) coordinate (z-lines); and for each line of constant z, determining the object end coordinates of the lines, determining the texture values for the end coordinates, determining the texture values for the coordinates between end coordinates by interpolation, and mapping the texture values of the pre-prepared texture map to each line of constant z and thereby without modification for perspective.



5,838,330
SCENERY DISPLAYING SYSTEM FOR DISPLAYING A SCENERY FROM AN ARBITRARY POSITION

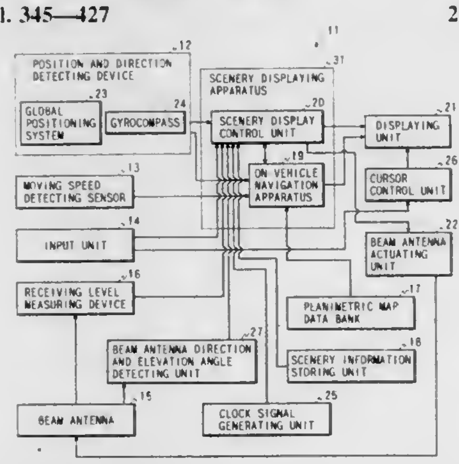
Takumi Ajima, Zama, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 19, 1996, Ser. No. 588,892

Claims priority, application Japan, Jan. 23, 1995, 7-007792

Int. Cl.⁶ G06T *15/20*

U.S. Cl. 345—427 **28 Claims**


11
12
POSITION AND DIRECTION DETECTING DEVICE
23
GLOBAL POSITIONING SYSTEM
24
GYROCOMPASS
31
SCENERY DISPLAYING APPARATUS
20
SCENERY DISPLAY CONTROL UNIT
21
DISPLAYING UNIT
19
ON VEHICLE NAVIGATION APPARATUS
26
CURSOR CONTROL UNIT
13
MOVING SPEED DETECTING SENSOR
14
INPUT UNIT
22
BEAM ANTENNA ACTUATING UNIT
16
RECEIVING LEVEL MEASURING DEVICE
17
PLANIMETRIC MAP DATA BANK
27
BEAM ANTENNA DIRECTION AND ELEVATION ANGLE DETECTING UNIT
18
SCENERY INFORMATION STORING UNIT
15
BEAM ANTENNA
25
CLOCK SIGNAL GENERATING UNIT

1. A scenery displaying system, comprising:

first position receiving means for receiving a first position placed on the earth;

scenery information storing means for storing various types of scenery information including shapes of natural objects, data derived from the natural objects, shapes of artificial objects and data derived from the artificial objects;

scenery preparing means for reading a specific type of scenery information of a specific object placed in a specific area viewing from the first position received by the first position receiving means from the scenery information storing means and preparing a scenery from the first position according to the specific type of scenery information, a shape of the specific object and data derived from the specific object being included in the specific type of scenery information; and

scenery displaying means for displaying the scenery prepared by the scenery preparing means.

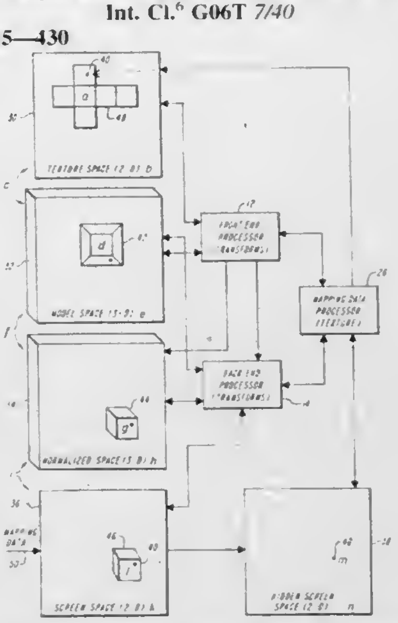
5,838,331
COMPUTER GRAPHICS SYSTEM FOR CREATING AND ENHANCING TEXTURE MAPS

David Franklyn DeBry, Salt Lake City, Utah, assignor to Parametric Technology Corporation, Waltham, Mass.

Continuation of Ser. No. 398,168, Mar. 2, 1995, abandoned. This application Aug. 18, 1997, Ser. No. 912,769

Int. Cl.⁶ G06T *7/40*

U.S. Cl. 345—430 **11 Claims**



1. A method for updating texture maps on a computer system corresponding to a textured, three-dimensional object, the method comprising the steps of:

providing a first set of texture naps corresponding to said textures, three-dimensional object;

selecting a first orientation of said textured, three-dimensional object;

displaying in a first perspective view in a computer display said oriented, three-dimensional object;

applying supplemental data to said first perspective view of said oriented, three-dimensional object on said computer display;

merging said first set of corresponding texture maps for said three-dimensional object with said supplemental data to provide an second set of corresponding texture maps for said three-dimensional object.

5,838,332
GRAPHIC IMAGE RENDERING

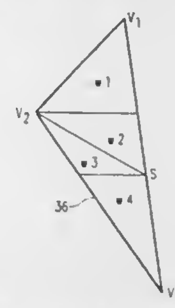
David E. Penna, Redhill, and Karl J. Wood, Crawley, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 29, 1996, Ser. No. 705,547

Claims priority, application United Kingdom, Sep. 13, 1995, 9518695

Int. Cl.⁶ G06T *11/40*

U.S. Cl. 345—430 **8 Claims**



1. An image processing method for rendering a two dimensional image wherein a polygon is defined in two dimensional screen space and pixel texture values (texels) from a two dimensional texture map are mapped onto pixels within said two dimensional polygon, the method comprising, for the or each polygon the steps of:

a) defining a texture rendering window covering a number of said pixels requiring, in total, less than or equal to the number of texels in said texture map for rendering;

b) determining the vertical height of the uppermost vertex of said polygon within said two dimensional screen space and positioning said rendering window such that it overlies at least a part of said polygon and the uppermost extent of said window is at or above said vertical height of said uppermost vertex of said polygon;

c) rendering that part of said polygon lying within said rendering window by mapping texels from said texture map; and

d) moving said rendering window to a further position within said two dimensional screen space overlying at least a part of said polygon and abutting a previous rendering window position;

wherein steps c) and d) are sequentially repeated until all of said polygon has been rendered; wherein said texture map holds fewer texels than are required to render a full screen and said first rendering window overlies a vertex of said polygon and slope values for the polygon edges to said vertex are calculated and stored, an intercept point on the or each said edge is identified to sub-pixel accuracy and stored, and for each further rendering operation where a rendering window overlies a part of one or other of the said polygon edges, the previously calculated slope values and intercept point locations are recalled from storage.

5,838,333
IMAGE PROCESSING DEVICE AND IMAGE PROCESSING METHOD

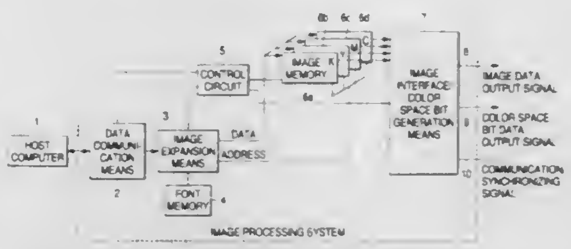
Yasuhiro Matsuo, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1996, Ser. No. 608,311

Claims priority, application Japan, Mar. 1, 1995, 7-041641

Int. Cl.⁶ G06F *15/00*

U.S. Cl. 345—431 **15 Claims**



1. An image processing device comprising:

means for expanding code image data to bit map image data to be used for image formation;

means for storing the bit map image data to which the code image data is expanded by said expansion means;

means for generating a signal indicating a color space attribute representing the bit map image data stored in said storage means for each pixel and indicating a type of color space; and

means for making color conversion of said each pixel from the color space indicated by the signal generated by said means for generating to a color space dependent on an image formation device,

wherein the means for making color conversion provides conversion for a plurality of different bit map color space/image formation device color space pairs.

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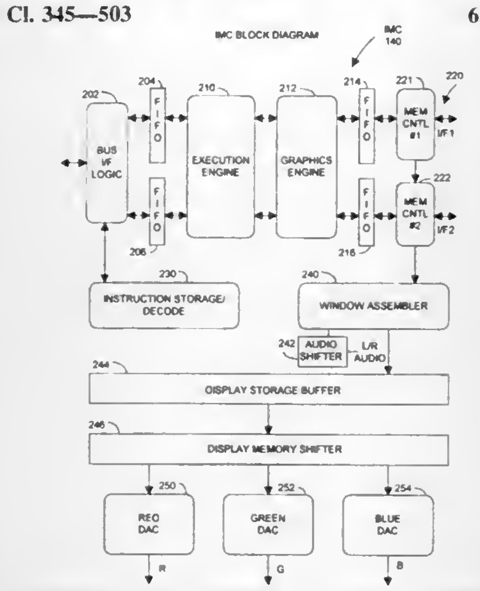
5,838,334
MEMORY AND GRAPHICS CONTROLLER WHICH PERFORMS POINTER-BASED DISPLAY LIST VIDEO REFRESH OPERATIONS

Thomas A. Dye, 6621 Candle Ridge Cove, Austin, Tex. 78731

Continuation of Ser. No. 522,129, Aug. 31, 1995, abandoned, Continuation-in-part of Ser. No. 340,667, Nov. 16, 1994. This application Nov. 30, 1995, Ser. No. 565,103

Int. Cl.⁶ G06F *15/16*

U.S. Cl. 345—503 **65 Claims**



1. A computer system including a graphics controller which performs video functions, comprising:

a CPU;

a video monitor including one or more video inputs for receiving video signals and including a display screen for displaying video output, wherein the display screen of the video monitor displays video output in response to video signals received at said one or more video inputs;

memory coupled to the CPU which stores video data, wherein the memory stores video data in a plurality of memory areas; and

a graphics controller coupled to said CPU, said memory, and said video monitor, wherein said graphics controller obtains portions of said video data from said plurality of memory areas in said memory and in response provides video signals to said video monitor;

wherein said graphics controller maintains a display list comprising a plurality of pointers which point to at least portions of said video data in one or more of said plurality of memory areas in said memory;

wherein said graphics controller uses said plurality of pointers comprised in said display list to obtain said at least portions of said video data from said one or more of said plurality of memory areas in said memory;

wherein said graphics controller provides said video signals to said video monitor in response to said graphics controller obtaining said at least portions of said video data from said one or more of said plurality of memory areas in said memory.

5,838,335
GRAPHIC DATA PROCESSING METHOD AND DEVICE

Takeshi Hamamoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

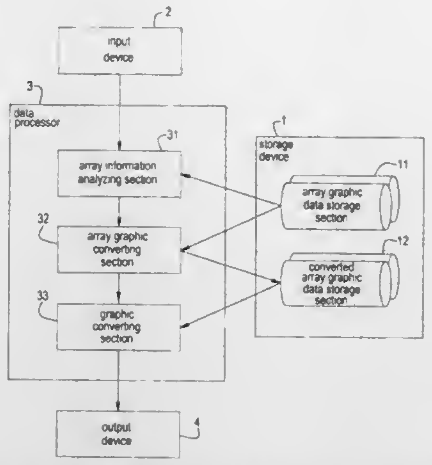
Filed Apr. 21, 1997, Ser. No. 844,633

Claims priority, application Japan, Apr. 22, 1996, 8-100221

Int. Cl.⁶ G06T *1/60*

U.S. Cl. 345—507 **2 Claims**

2. A graphic data processing device comprising:


2
input device
3
data processor
31
array information analyzing section
32
array graphic converting section
33
graphic converting section
1
storage device
11
array graphic data storage section
12
converted array graphic data storage section
output device
4

an input device that inputs array graphic data of first, second. . . . and nth (n≧2) arrays that are arranged in overlapping positions and that have identical grid width, number of array rows, and number of array columns, but have differing grid origin and unit graphics;

an array graphic data storage device that stores said array graphic data;

a data processing device that comprises array information analyzing means that reads array widths of said first to nth arrays from said array graphic data storage device and confirms that these array widths are equal; array graphic converting means that determines grid origin of a common array which is a systematic array graphic in which said first to nth arrays are synthesized, determines grid width as a value equal to grid widths of first to nth arrays, divides said first to nth unit graphics at grid lines of said common array, and determines new array graphic data; and graphic processing means that determines areas in which first to nth arrays overlap in said common array as areas to be subjected to graphic processing, executes logical OR processing of said determined array graphic data within a grid frame of any corner of said areas to be subjected to graphic processing, and finds unit graphics of said common array; and

an output device that outputs determined array graphic data of areas besides those to be subjected to graphic processing, and unit graphics of said common array.

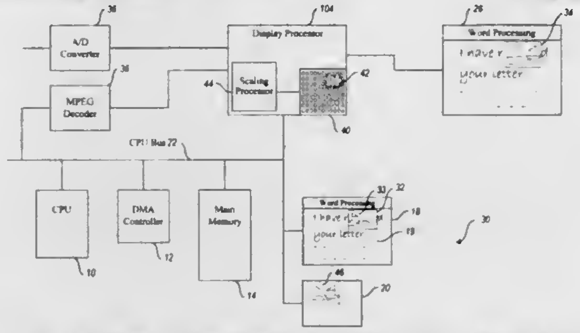
5,838,336
METHOD AND SYSTEM FOR DISPLAYING IMAGES ON A DISPLAY DEVICE

Jonathan P. Ross, Seattle, Wash., assignor to Microsoft Corporation, Redmond, Wash.

Continuation of Ser. No. 641,051, Apr. 29, 1996, abandoned. This application Nov. 19, 1996, Ser. No. 752,074

Int. Cl.⁶ G06F *13/00*

U.S. Cl. 345—508 **15 Claims**



1. In a display system having a display screen, an on-screen memory, a cursor memory, and a display processor having a normal mode for displaying the on-screen memory on the display screen, and an overlay mode for displaying the on-screen memory and the cursor memory over a selected portion of the on-screen memory, a method of displaying images on the display screen, the method comprising the steps of:

storing a first image in the on-screen memory;

storing a second image in the cursor memory;

setting the display processor to the overlay mode, wherein the display processor displays on the display screen the stored first image simultaneously with the stored second image over a selected portion of the stored first image in the on-screen memory;

while the display processor is in the overlay mode, storing a third image in the selected portion of the stored first image, wherein the third image overwrites the selected portion of the stored first image in the on-screen memory; and

setting the display processor to the normal mode, wherein the display processor displays on the display screen the stored first image simultaneously with the stored third image.

5,838,337
GRAPHIC SYSTEM INCLUDING A PLURALITY OF ONE CHIP SEMICONDUCTOR INTEGRATED CIRCUIT DEVICES FOR DISPLAYING PIXEL DATA ON A GRAPHIC DISPLAY

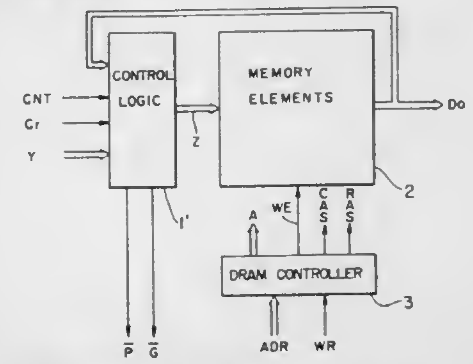
Koichi Kimura, Yokohama; Toshihiko Ogura, Ebina; Hiroaki Aotsu, Yokohama; Mitsuru Ikegami, Kanagawa-ken; Tadashi Kuwabara, Yokohama; Hiromichi Enomoto, and Tadashi Kyoda, both of Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 855,843, Mar. 20, 1992, Pat. No. 5,450,342, which is a continuation-in-part of Ser. No. 349,403, May 8, 1989, Pat. No. 5,175,838, which is a continuation of Ser. No. 240,380, Aug. 29, 1988, Pat. No. 4,868,781, which is a continuation of Ser. No. 779,676, Sep. 24, 1985, abandoned, said Ser. No. 855,843 is a continuation-in-part of Ser. No. 816,583, Jan. 3, 1992, abandoned, which is a continuation of Ser. No. 314,238, Feb. 22, 1989, Pat. No. 5,113,487, which is a continuation of Ser. No. 864,502, May 19, 1986, abandoned, said Ser. No. 816,583 is a continuation-in-part of Ser. No. 349,403, May 8, 1989, Pat. No. 5,175,838, which is a continuation of Ser. No. 240,380, Aug. 29, 1988, Pat. No. 4,868,781, which is a continuation of Ser. No. 779,676, Sep. 24, 1985, abandoned. This application Aug. 23, 1994, Ser. No. 294,406

Claims priority, application Japan, Oct. 5, 1984, 59-208266; May 20, 1985, 60-105844; May 20, 1985, 60-105845; May 20, 1985, 60-105847; May 20, 1985, 60-105850

Int. Cl.⁶ G06F *15/76*

U.S. Cl. 345—519 **3 Claims**



1. A display apparatus comprising:

a plurality of graphic processing LSIs, the number of graphic processing LSIs corresponding to the number of bits of a pixel;

an external device electrically coupled through a data bus to said plurality of graphic processing LSIs; and

a display for displaying graphic data from said plurality of graphic processing LSIs;

wherein each of said plurality of graphic processing LSIs includes:

a first terminal which inputs a bit of a pixel, said pixel includes a plurality of bits output by said external device,

a memory unit provided in correspondence to said first terminal and storing said graphic data by a bit which is included in a pixel,

a logical operation unit provided in correspondence to said memory unit and modifying said graphic data of a bit stored in said memory unit,

a second terminal commonly connected to each of said logical operation units, said second terminal inputs an operation control signal, which is used to control a logical operation executed by said plurality of logical operation units, into each of said logical operation units in common, and

a third terminal provided in correspondence to said logical operation unit, said third terminal outputs a bit of graphic data operated on in said logical operation unit,

wherein said operation control signal is input commonly to said second terminal of each of said plurality of graphic processing LSIS, and

wherein graphic data output from said third terminals of said plurality of graphic processing LSIs is displayed on said display.

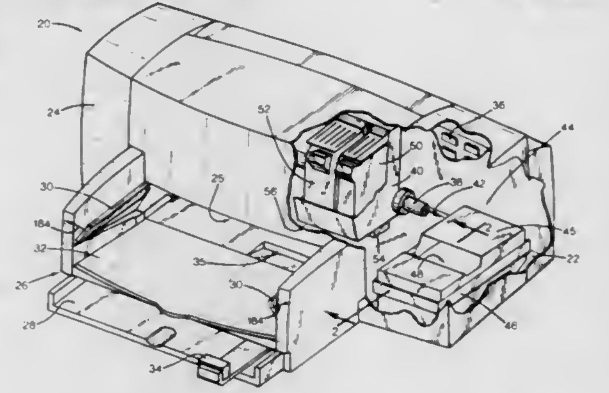
5,838,338
ADAPTIVE MEDIA HANDLING SYSTEM FOR PRINTING MECHANISMS

Allan G. Olson, Camas, Wash., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 30, 1996, Ser. No. 655,534

Int. Cl.⁶ B41J *25/308;29/38*

U.S. Cl. 347—8 **30 Claims**



1. An adaptive media handling system for an inkjet printing mechanism having a printhead that prints on media in a printzone, the media handling system comprising:

a drive motor;

a media advance mechanism having a media engaging member driven by the motor to move the media through the printzone;

a media support member that supports the media in the printzone adjacent the printhead; and

a spacing adjuster operatively engaged by the motor to position the media support member for a selected spacing between the media and the printhead.

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5,838,339

DATA DISTRIBUTION IN MONOLITHIC PRINT HEADS

Kia Silverbrook, Leichhardt, Australia, assignor to Eastman Kodak Company, Rochester, N.Y.

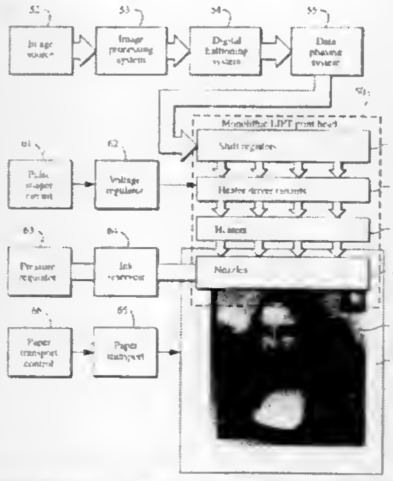
PCT No. PCT/US96/04865, § 371 Date Dec. 3, 1996, § 102(e) Date Dec. 3, 1996, PCT Pub. No. WO96/32268, PCT Pub. Date Oct. 17, 1996

PCT Filed Apr. 9, 1996, Ser. No. 750,650

Claims priority, application Australia, Apr. 12, 1995, PN95/2318

Int. Cl.^{6} B41J *2/05*

U.S. Cl. 347—9 **13 Claims**



1. A print head device having a plurality of print actuators and a plurality of driver circuits, if respective binary data so indicate, integrated thereon, said device further comprising:

(a) shift registers that transfer binary data in response to clock signals said shift being coupled to said drivers to receive enable pulses, if respective binary data so indicate, wherein the binary data is held valid in the shift registers for the duration of an enable pulse;

(b) a clock providing signals to said shift registers, the clock signals being stopped to avoid data transfer during a predetermined stable period;

(c) means for holding the binary data in the shift register valid for the duration of an enable pulse;

(d) a plurality of drop-emitter nozzles;

(e) a body of ink associated with said nozzles and forming a meniscus with an air/ink interface;

(f) drop selection apparatus operable upon the air/ink interface to select predetermined nozzles and to generate a difference in meniscus position between ink in selected and non-selected nozzles; and

(g) drop separation apparatus adapted to cause ink from selected nozzles to separate as drops from the body of ink, while allowing ink to be retained in non-selected nozzles.

5,838,340

INK-JET PRINTING METHOD AND APPARATUS THEREFOR

Junji Shimoda, Chigasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 27, 1995, Ser. No. 508,305

Claims priority, application Japan, Jul. 29, 1994, 6-179135

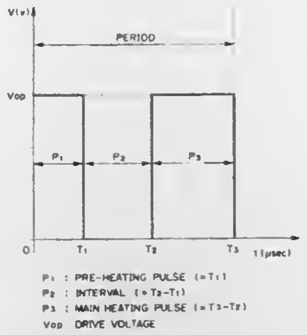
Int. Cl.^{6} B41J *2/05*

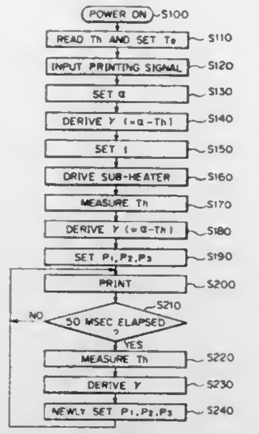
U.S. Cl. 347—14 **14 Claims**

1. An ink-jet printing method for performing printing on a recording medium by ejecting ink from an ink-jet printing head provided in an ink-jet printing apparatus, said printing head having ejection orifices utilizing thermal energy, comprising the steps of:

setting a target temperature, at which ejection of said ink-jet printing head is most stable, on the basis of an environmental temperature;

determining an actual temperature of said ink-jet printing head;





deriving a difference between the set target temperature and the actual temperature of said ink-jet printing head by subtracting the actual temperature from the target temperature, the difference including a magnitude and a sign;

determining energy supplied for said ink-jet printing head by deriving an optimum value of a drive signal which supplies at least said thermal energy so that the temperature of said ink-jet printing head may reach said target temperature corresponding to the magnitude of the difference, wherein (i) when the difference derived in said deriving step is positive, said drive signal includes a pre-heating pulse providing thermal energy which does not cause bubbling of said ink, a main heating pulse providing thermal energy which causes bubbling of said ink for ejection of ink from the ejection orifices and an interval between said pre-heating pulse and said main heating pulse, said pre-heating pulse and said main heating pulse each having a pulse width, the pulse width of each of said pre-heating pulse and said main heating pulse being greater than zero and a value of the given interval also being greater than zero, and values of the pulse widths and the given interval being optimized depending upon the difference, and (ii) when the difference derived in said deriving step is negative, said drive signal includes only a main heating pulse, the width of said main heating pulse being reduced according to increasing of the magnitude of the difference; and

supplying said drive signal to said ink-jet printing head.

5,838,341

CONTROLLER FOR AN ACTUATOR DRIVING CIRCUIT WITH ABNORMAL TEMPERATURE MONITORING CAPABILITY

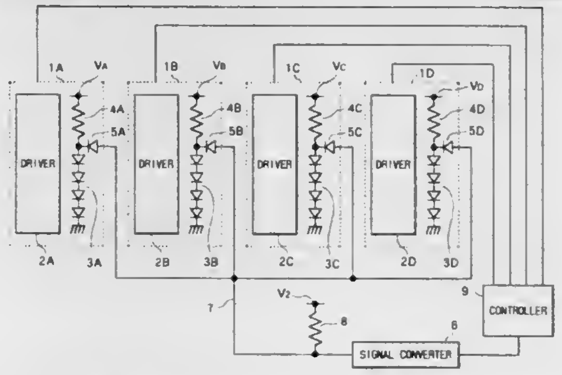
Shuhei Hiwada, Toyoake, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Mar. 14, 1996, Ser. No. 615,882

Claims priority, application Japan, Mar. 15, 1995, 7-055504

Int. Cl.^{6} B41J *29/38;* **H05B** *1/00;1/02*

U.S. Cl. 347—14 **14 Claims**



1. A driving circuit for selectively driving a plurality of actuators, comprising:

a plurality of driving units, each including a driver connected to one of the plurality of actuators, a temperature sensor sensing a temperature of said driver, and an output line outputting a temperature signal indicative of the temperature of said driver, wherein output lines of said plurality of driving units are commonly connected to form a common connection point, the common connection point outputting a combined temperature signal indicative of the temperature of said plurality of driving units, and

a controller having an input connected to said common connection point to receive the combined temperature signal, said controller determining whether or not at least one of said plurality of driving units is in a temperature abnormality condition based on the combined temperature signal.

5,838,342

IMAGE OUTPUT APPPARATUS AND IMAGE FORMATION SYSTEM FOR CORRECTING DENSITY UNEVENNESS

Kazuyoshi Takahashi, Kawasaki; Takashi Watanabe, Yokohama, and Toshiyuki Yanaka, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

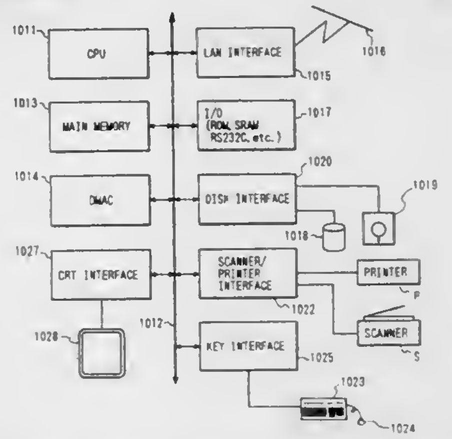
Continuation of Ser. No. 281,159, Jul. 27, 1994, abandoned.

This application Jul. 28, 1997, Ser. No. 901,558

Claims priority, application Japan, Jul. 30, 1993, 5-190052

Int. Cl.^{6} B41J *2/01*

U.S. Cl. 347—19 **23 Claims**



10. An image forming system comprising an image output apparatus which outputs an image on a printing medium by using a plurality of printing heads provided for a printing agent of one color and each having a plurality of printing elements, and an image supply apparatus for supplying image data relating to printing to said image output apparatus, said image output apparatus comprising:

image forming means for causing said printing heads to form a test image;

reading means for reading the test image formed by said image forming means; and

correcting means for performing a common correction for image signals corresponding to said printing heads based on a result of reading obtained by said reading means,

wherein said printing heads are arranged in a conveyance direction of the printing medium to allow overlap printing or non-overlap printing on the printing medium using said printing heads, the common correction being performed when the overlap printing is to be executed, and separate correction being performed when non-overlap printing is to be executed, and

wherein said image supply apparatus supplies to said image output apparatus a command for performing the overlap printing or the non-overlap printing, in addition to the image data to be printed.

5,838,343

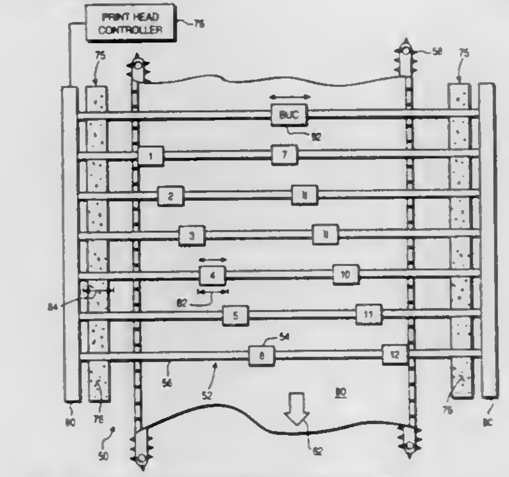
BACKUP PRINT CARTRIDGE FOR BANK OF INK-JET PRINTING CARTRIDGES

Kenneth C. Chapin; Michael A. Graziano, both of Grand Island; Henk Haan, Niagara Falls; Anthony V. Moscato, N. Tonawanda, and Roger J. Rowland, Niagara Falls, all of N.Y., assignors to Moore Business Forms, Inc., Grand Island, N.Y.

Filed May 12, 1995, Ser. No. 440,462

Int. Cl.^{6} B41J *2/155;2/145;2/15;2/165*

U.S. Cl. 347—22 **11 Claims**



1. An ink-jet printer assembly comprising:

a print cartridge rack including a plurality of cartridge rods spanning a web substrate:

a plurality of ink-jet print primary cartridges each slidably mounted on a one of the cartridge rods of the rack and said cartridges being arranged in an array across the web substrate, wherein each cartridge prints ink droplets onto the web substrate in conjunction with other cartridges simultaneously printing onto the substrate, and wherein each cartridge periodically moves along one of the cartridge rods from a printing position to a cleaning station during an ongoing printing operation by the assembly; and

an ink-jet print backup ink cartridge mounted on a rod of said rack and adapted moves into alignment with a designated primary cartridge, wherein the backup ink cartridge prints to the web substrate in substitution for and when the designated primary cartridge moves to the cleaning station, is cleaned and returns to the printing position.

5,838,344

Patent Not Issued For This Number

5,838,345

APPARATUS FOR MAINTAINING THE POSITIONAL RELATIONSHIP OF A PRINT HEAD

Roger S. Kerr, Brockport; Edward P. Furlani, Lancaster, and Svetlana Reznik, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 21, 1996, Ser. No. 667,775

Int. Cl.^{6} B41J *23/00*

U.S. Cl. 347—37 **5 Claims**

1. An apparatus for maintaining the positional relationship of a print head in a lathe bed scanner, the apparatus comprising:

(a) a frame that forms a support structure for the lathe bed scanner;

(b) a first bar which supports the print head of the lathe bed scanner, and which includes an initial curvature;

(c) a receiving receptacle integrally attached to said frame;

(d) a first plurality of magnets, disposed on said receiving receptacle, each first magnets having a surface that is substan-

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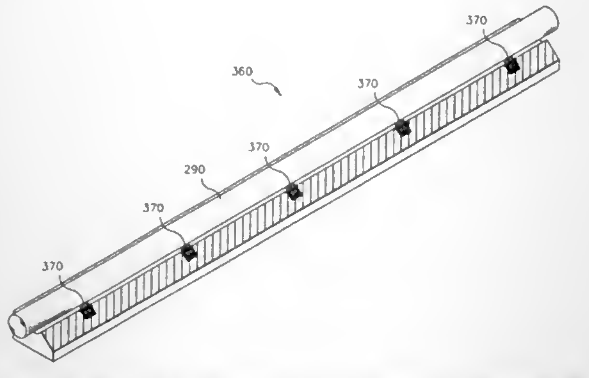
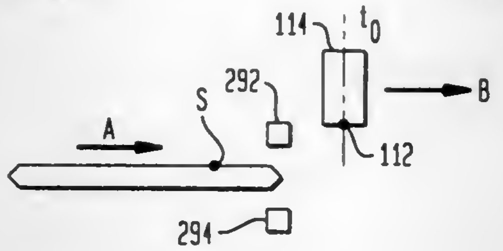


tially parallel to each other on which surfaces said first bar rests and said first plurality of magnets magnetically attracting said first bar so that the curvature is straightened due to said attraction, and so that the positional relationship of said first bar and, consequently, the print head are maintained.

5,838,346
SCANNING PRINTHEAD FOR PRINTING ON A MOVING MEDIUM

Denis J. Stemmle, Sr., Milford, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.
Filed Sep. 23, 1996, Ser. No. 717,790
Int. Cl.^{6} B41J *23/00*
U.S. Cl. 347—37 **18 Claims**

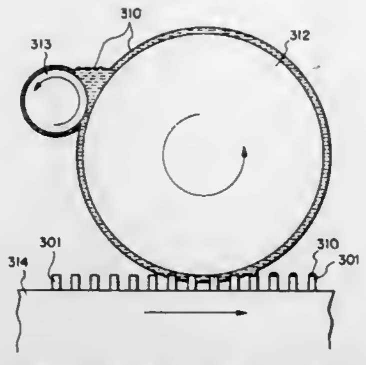


1. A method of ink jet printing comprising the steps of:
conveying a print medium in a first direction;
scanning a printhead in the first direction; and
printing on the print medium while the printhead is scanning in the first direction and the print medium is moving in the first direction.

5,838,347
COATING METHOD FOR SURFACE TREATMENT OF AN INK JET RECORDING HEAD

Tadayoshi Inamoto, Machida; Haruo Uehara, Yokohama; Hiromichi Noguchi, Atsugi; Akihiko Shimomura, Tokyo, and Eiko Moriyama, Hachioji, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 339,750, Nov. 15, 1994, abandoned, which is a continuation of Ser. No. 897,062, Jun. 11, 1992, abandoned, which is a division of Ser. No. 630,760, Dec. 21, 1990, Pat. No. 5,148,193, which is a continuation of Ser. No. 415,467, Oct. 2, 1989, abandoned, which is a continuation of Ser. No. 119,738, Nov. 12, 1987, abandoned. This application Jun. 5, 1995, Ser. No. 465,573
Claims priority, application Japan, Nov. 13, 1986, 61-268493; Nov. 13, 1986, 61-268494; Nov. 13, 1986, 61-268496
Int. Cl.^{6} B41J *2/16*
U.S. Cl. 347—45 **3 Claims**

1. A method for suface treatment of an ink jet recording head having an ink discharging opening surface with ink discharging openings each having a predetermined diameter, the method comprising the steps of:



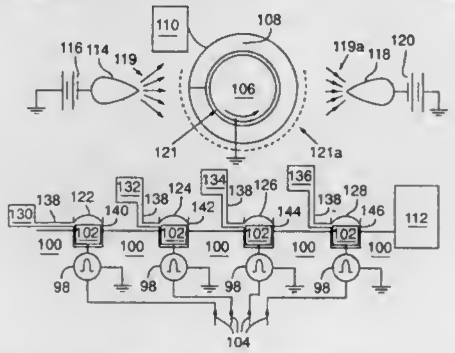
preparing a coating roll for applying a surface treating agent which is a liquid to the ink discharging opening surface;
forming on the surface of the coating roll a layer of the surface treating agent having a uniform thickness of 0.3 μm to 6 μm with a roll disposed in a vicinity of the coating roll, the thickness of the layer of the surface treating agent not being more than one third of the predetermined diameter of the ink discharge openings; and
applying the surface treating agent to the ink discharging opening surface by rotating the coating roll on the surface of which the layer of the surface treatment agent is formed.

5,838,348

Patent Not Issued For This Number

5,838,349
ELECTROHYDRODYNAMIC INK JET PRINTER AND PRINTING METHOD

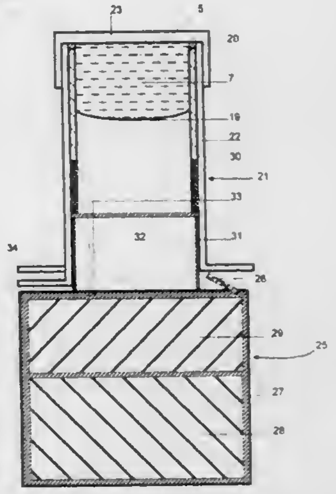
Dong Ho Choi, Palo Alto, and Ian R. Smith, Los Gatos, both of Calif., assignors to Natural Imaging Corporation, Palo Alto, Calif.
Continuation of Ser. No. 261,543, Jun. 17, 1994, abandoned. This application Jan. 21, 1997, Ser. No. 787,185
Int. Cl.^{6} B41J *2/41*
U.S. Cl. 347—55 **44 Claims**



1. A method for printing, comprising the steps of:
(a) depositing a uniform electrical charge of a polarity P1 onto a surface of a receiving medium;
(b) applying an electrical charge to a printing fluid in a nozzle, so that an electrical field is established between said printing fluid and said receiving medium which is sufficient to cause said printing fluid to be attracted to and deposited on said receiving medium;
(c) depositing a uniform electrical charge of a polarity P2 opposite to said polarity P1 onto said surface of said receiving medium;
(d) depositing a uniform electrical charge of said polarity P1 onto said surface of said receiving medium;
(e) applying an electrical charge to a printing fluid in said nozzle, so that an electrical field is established between said printing fluid and said receiving medium which is sufficient to cause said printing fluid to be attracted to and deposited on said receiving medium; and
(f) performing steps (c), (d), and (e) at least one additional time.

5,838,350
APPARATUS FOR GENERATING DROPLETS OF FLUID

Guy Charles Fernley Newcombe; Victor Carey Humberstone; Keith Gardner, and Peter John Taylor, all of Cambridge, United Kingdom, assignors to The Technology Partnership PLC, Hertfordshire, United Kingdom
PCT No. PCT/GB94/00688, § 371 Date Sep. 28, 1995, § 102(e) Date Sep. 28, 1995, PCT Pub. No. WO94/22592, PCT Pub. Date Oct. 13, 1994
PCT Filed Mar. 31, 1994, Ser. No. 530,244
Claims priority, application United Kingdom, Mar. 31, 1993, 9306680
Int. Cl.^{6} B41J *2/045*
U.S. Cl. 347—68 **26 Claims**

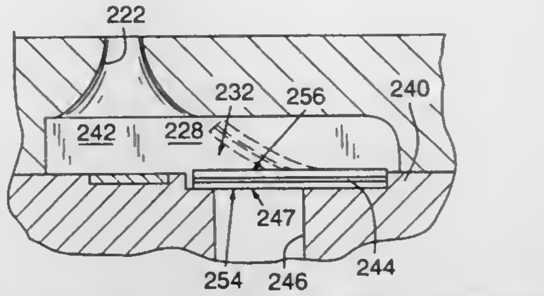


1. A device for generating droplets of fluid, the device comprising:
a fluid supply means;
an electromechanical transducer having electrodes arranged so as to operate in extensional mode to cause expansion or contraction of the transducer in a dimension perpendicular to the applied electric field; and
an element coupled for movement with the expansion/contraction of the transducer in the direction of said dimension and positioned for contact with fluid from the supply means, said fluid supply means being adapted to supply fluid to said element at a pressure at most equal to ambient pressure.

5,838,351
VALVE ASSEMBLY FOR CONTROLLING FLUID FLOW WITHIN AN INK-JET PEN

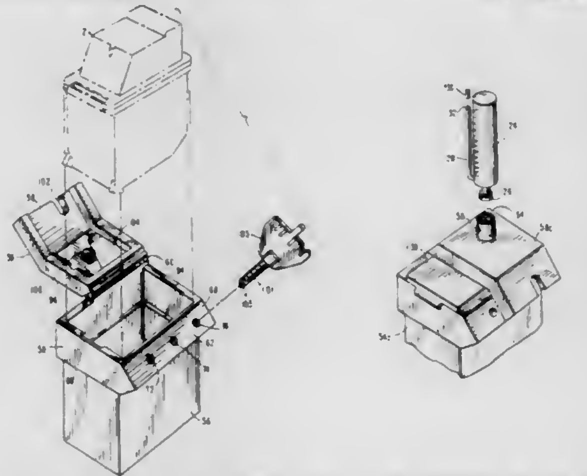
Timothy L. Weber, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Oct. 26, 1996, Ser. No. 548,837
Int. Cl.^{6} B41J *2/19;* **F16V** *31/04*
U.S. Cl. 347—85 **13 Claims**

1. A valve assembly for controlling ink flow within an ink-jet printer printhead, the valve assembly comprising:
a printhead having a base in which is formed a fluid channel wherein a portion of the channel defines a volume for storing ink adjacent to a chamber from which droplets are ejected from the printhead;
a resiliently deformable valve member that includes a first portion having a first coefficient of thermal expansion and a second portion having a second coefficient of thermal expansion, the valve member also having a first end integrally attached to a first surface of the fluid channel and a second end movable into and out of a position to substantially occlude ink flow through the fluid channel as droplets are ejected when the valve member is deformed; and
a heating element attached to the valve member which, when activated, heats the valve member causing the valve member to deform.



5,838,352
INK CARTRIDGE REFILLING DEVICE AND STATION FOR CARTRIDGES AND GRAVITY FEED INK BOTTLE

Phillip M. Martinez, Groton, N.Y., assignor to Smith Corona Corporation, Cortland, N.Y.
Filed Nov. 24, 1995, Ser. No. 562,474
Int. Cl.^{6} B41J *2/175*
U.S. Cl. 347—87 **40 Claims**



22. An ink cartridge refilling device for inserting ink in a cartridge having a single chamber comprising a housing portion for said cartridge and a hingeable cover means for securing said cartridge in said housing, and wherein a wing screw secures the hingeable cover to said housing for securing the cartridge in said housing.

5,838,353
WRITE HEAD CONTAINER FOR INK JET PRINTER

Dong-Ha Choi, Kyungki-do, Rep. of Korea, assignor to Sam-Sung Electronics Co., Ltd., Suwon, Rep. of Korea
Filed Jun. 3, 1996, Ser. No. 657,361
Claims priority, application Rep. of Korea, Jun. 1, 1995, 95-12468
Int. Cl.^{6} B41J *2/75*
U.S. Cl. 347—87 **22 Claims**

1. A write head container accommodating a write head having a first side portion, a second side portion, a central portion, a width and a nozzle having a tip projecting from said first side portion of the write head for emitting ink, said first side portion including a first sidewall and an opposing second sidewall, said second side

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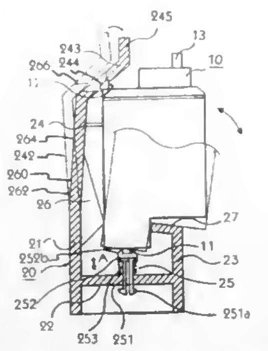


portion spaced-apart from said first side portion by said central portion, said central portion bearing ink for use with an ink jet printer, comprising:

a first sidewall exhibiting a first length and having a width greater than the width of the write head, said first sidewall being provided with a recessed opening that defines a junction;

a bottom wall extending transversely to said first sidewall;

a second sidewall exhibiting a second and lesser length than the first length of said first sidewall extending transversely across said bottom wall to define a cavity accommodating entrance of the nozzle;

a lug extending from one end of said second sidewall inwardly toward said first sidewall and terminating said one end of said second sidewall by engaging the first sidewall of the first side portion of the write head and maintaining the nozzle at a fixed distance spaced-apart from said bottom wall;

a locking portion integrally formed at said junction within said recessed opening of said first sidewall, said locking portion having a first intermediate section, a second intermediate section, a proximal end joined at said junction, and a distal end separated from said junction by said first intermediate section joined to said second intermediate section, said second intermediate section extending inwardly from said first intermediate section in a direction toward said second sidewall and having a groove formed therein retentively accommodating entry of an extreme corner of the second side portion of the write head, said distal end being manually rotatable about said junction and away from said lug in conjunction with said first intermediate section and said second intermediate section;

said first sidewall, said bottom wall, said second sidewall, and said locking portion comprising a single monolithic and integrated one-piece structure; and

a spring-loaded cap supported and movably retained within said cavity by said bottom wall of said structure, said spring-loaded cap blocking and encompassing the nozzle of the write head, said spring-loaded cap moving reciprocally through an aperture positioned within said bottom wall at a location spaced between said first sidewall and said second sidewall, to reciprocate within said fixed distance relative to said bottom wall and surround the nozzle while the nozzle protrudes into said fixed distance and said lug engages the first sidewall of the first side portion and while said second intermediate section maintains the corner of the write head within said groove.

5,838,354

IMAGE FORMING APPARATUS

Takahisa Yamada, Hachioji, and Yukitaka Kumagai, Iruma, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

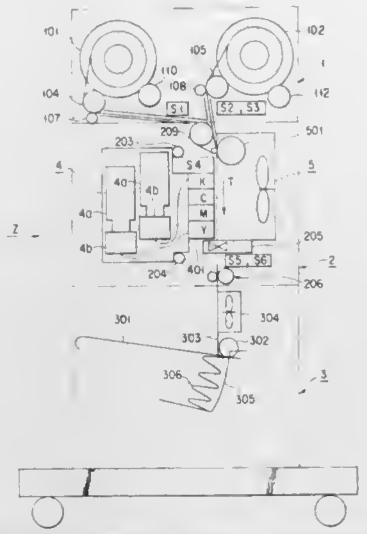
Filed May 24, 1996, Ser. No. 652,926

Claims priority, application Japan, May 19, 1995, 7-133479; Apr. 23, 1996, 8-101246

Int. Cl.^{6} B41J *2/01*

U.S. Cl. 347—101 **35 Claims**

1. An image forming apparatus comprising first and second sheet roll holding units capable of simultaneously setting a plurality of sheet rolls formed by winding a plurality of sheets having different widths into rolls on an upper surface of said apparatus,



wherein said first sheet roll holding unit rotatably holds a widest sheet roll of the plurality of sheet rolls, and said second sheet roll holding unit rotatably holds all others of the plurality of sheet rolls substantially in series with each other such that the sheet rolls held by said second sheet roll are parallel to the widest sheet roll held by said first sheet roll holding unit and at least partially overlap with said widest sheet roll in a sheet widthwise direction.

5,838,355

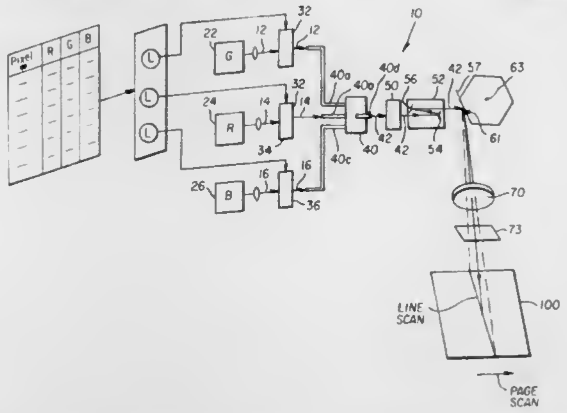
PRINTER SYSTEM UTILIZING THREE DIFFERENT DATA RATES

Badhri Narayan, and Drew D. Summers, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 22, 1997, Ser. No. 841,442

Int. Cl.^{6} B41J *2/47*

U.S. Cl. 347—115 **13 Claims**



1. A printer system for printing on an associated photosensitive medium, said printer comprising:

(a) an f-θ lens producing lateral color aberration;

(b) three laser light sources, each producing a light beam for use with said f-θ lens; and

(c) three modulators modulating these laser light beams at different data rates from one another, the ratio of the different data rates compensating for the lateral color aberration produced by the f-θ lens.

5,838,356

PRINT HEAD THERMOCONTROL

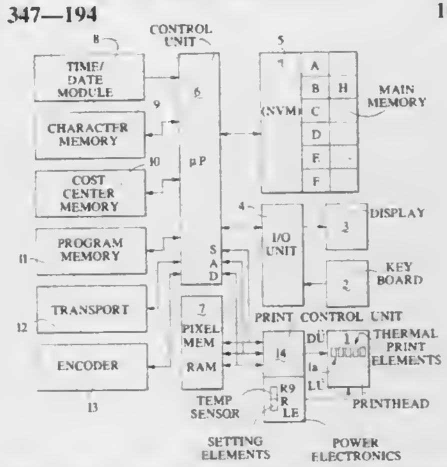
Stephan Günther, Berlin, and Dieter Wölm, Gross Schulzendorf, both of Germany, assignors to Francotyp-Postalia AG & Co., Birkenwerder, Germany

Filed Mar. 4, 1996, Ser. No. 609,950

Claims priority, application Germany, Mar. 7, 1995, 295 04 576.0

Int. Cl.^{6} B41J *2/36;2/37;2/365*

U.S. Cl. 347—194 **10 Claims**



1. A thermocontrol for a print head for use with an electrical power mains, said print head having a plurality of individually actuatable thermal print elements, said thermocontrol comprising:

print control means connectible to said print head for generating print control pulses for activating selected thermal print elements of said print head to produce an imprint;

power electronic means for connecting said electrical power mains to said print head for measuring an ambient temperature and for regulating an amplitude, dependent on said ambient temperature, of a print head voltage supplied to said print head, said power electronic means comprising a voltage divider containing a resistive temperature sensor for measuring said ambient temperature, said voltage divider having a center tap, a proportional regulator having a non-inverting input connected to said center tap of said voltage divider and having an inverting input connected to a reference potential, and at least one constant voltage module having a control input connected to an output of said proportional regulator; and

control means, connected to said power electronic means, employing a predictive method for generating pre-heating pulses and for supplying said pre-heating pulses to said print control means for controlling said power electronic means to individually pre-heat said thermal print elements according to said pre-heating pulses.

5,838,357

THERMAL PRINTER WHICH USES PLATEN TO TRANSPORT DYE DONOR WEB BETWEEN SUCCESSIVE PRINTING PASSES

Daniel Charles Maslanka; Vlade Josif Kordovich, and Terrence Lee Fisher, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 30, 1996, Ser. No. 641,128

Int. Cl.^{6} B41J *13/00*

U.S. Cl. 347—215 **10 Claims**

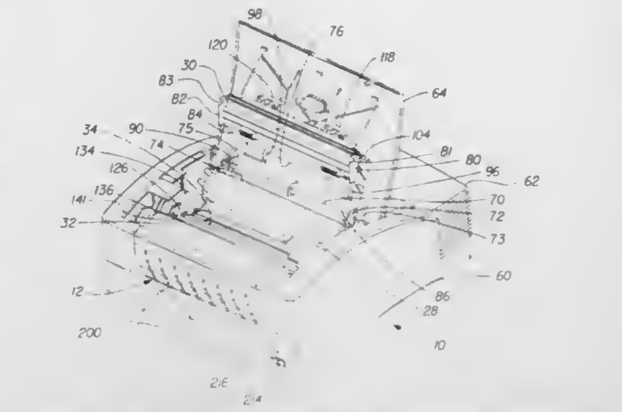
1. A thermal printer for printing onto a receiver sheet, the printer comprising:

an elongated rotatable platen;

an elongated thermal print head positioned parallel to the platen;

a supply roll of dye donor web positioned upstream of the print head;

means for pressing the print head into engagement with the dye donor web and, in an absence of a receiver sheet, for pressing the dye donor web into engagement with the platen with sufficient force, upon rotation of the platen, to enable the platen to pull the dye donor web from the supply roll; and



means for rotating the platen, while the print head is pressing the dye donor web against the platen, to move the dye donor web between the print head and the platen.

5,838,358

USED CHARACTERISTIC OF IMAGE CARTRIDGE AND CARTRIDGE THEREOF

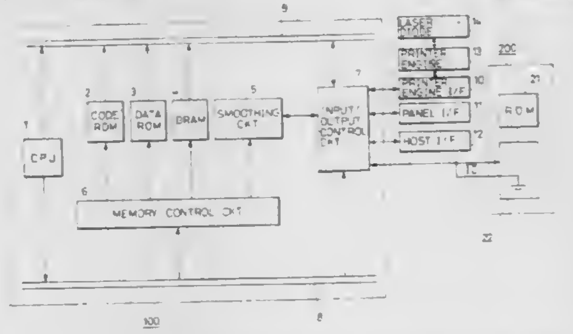
Katsunori Suzuki, Langenhagen, Germany, assignor to Minolta Co., Ltd., Osaka, Japan

Continuation of Ser. No. 277,042, Jul. 19, 1994. This application Oct. 15, 1996, Ser. No. 730,435

Claims priority, application Japan, Jul. 30, 1993, 5-190180

Int. Cl.^{6} B41J *2/47*

U.S. Cl. 347—247 **16 Claims**



1. An image forming apparatus which processes image data to form an image on an image holding member for reproduction, said image forming apparatus comprising:

a detachable cartridge having a plurality of associated elements to form an image on said image holding member, at least one of said plurality of associated elements having an electrostatic latent image formation characteristic, and a memory to store data corresponding to said latent image formation characteristic(s) for a prescribed image processing of image data;

an image processing circuit for processing image data in accordance with said electrostatic latent image formation characteristic data stored in said memory; and

image forming means for forming an image on said image holding member, using said plurality of associated elements, with image data processed by said image processing circuit.

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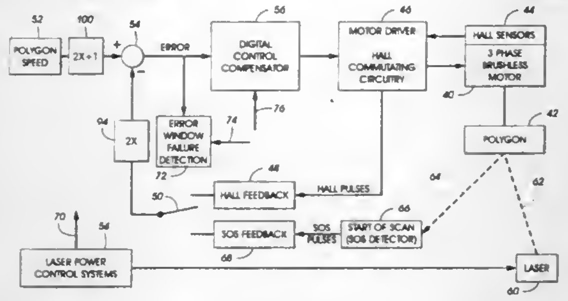
5,838,359
INTERPOLATED REFERENCE FOR IMPROVED DIGITAL FEEDBACK CONTROL REGULATION

Martin E. Hoover, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 5, 1997, Ser. No. 810,877

Int. Cl.^{6} G05B *19/02*

U.S. Cl. 347—250 **12 Claims**



1. An imaging system for forming images on a photoconductive member moving in a process direction including:

a raster output scanner including a laser forming a plurality of scanlines in a transverse direction across the width of said member by reflecting modulated beams from a plurality of facets of a rotating polygon,

a motor for rotating the polygon,

a sensor for providing a signal representing signal speed of the polygon,

a first interpolator, 2x, responsive to the signal representing the speed of the polygon wherein x is a positive integer number,

a reference signal,

a second interpolator, 2x +1, responsive to the reference signal,

a summing device connected to the first and the second interpolators for providing an error signal, and

a controller responsive to the error signal for controlling the motor to adjust the speed of the polygon.

5,838,360
METHOD OF AND APPARATUS FOR MAKING A PRINT CONTAINING PARALLAX INFORMATION

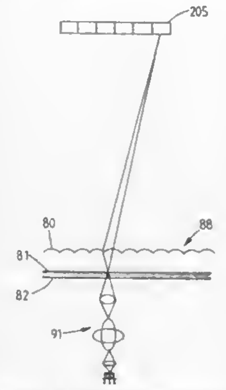
Jonathan Harrold; Graham John Woodgate, and David Ezra, all of Oxfordshire, United Kingdom, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 13, 1994, Ser. No. 355,065

Claims priority, application United Kingdom, Dec. 14, 1993, 9325596

Int. Cl.^{6} B41J *2/47;* **G01D** *15/34;* **G02B** *26/00;27/00*

U.S. Cl. 347—258 **18 Claims**



1. A method of making a print containing parallax information, comprising:

writing a plurality of picture elements, each of the plurality of picture elements comprising a plurality of interlaced image elements from respective images, onto a first substrate, wherein the first substrate is associated with a lens array or a parallax barrier, such that each of the plurality of picture elements is associated with a respective lens of the lens array or aperture of the parallax barrier,

scanning the first substrate with a beam of radiation such that at least some of the radiation passes through the first substrate and a lens of the lens array or an aperture of the parallax barrier associated with a picture element currently being written or adjacent thereto;

detecting at least some of the radiation passing through the lens array or the parallax barrier and arriving at at least one predetermined position relative to the lens or aperture; and

controlling registration of the respective lens or aperture and the picture element associated with the respective lens or aperture in response to the detection.

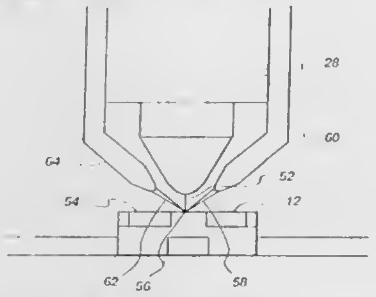
5,838,361
LASER MARKING TECHNIQUES

Tim J. Corbett, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Division of Ser. No. 584,246, Jan. 11, 1996. This application Sep. 19, 1996, Ser. No. 715,746

Int. Cl.^{6} B41J *2/47*

U.S. Cl. 347—262 **4 Claims**



1. A laser marking apparatus comprising:

a chip feeder, said chip feeder being capable of automatically feeding chips to a marking location;

a laser having a laser beam mounted proximate to said chip feeder and aligned such that said laser beam is directed toward a chip associated with said chip feeder when a chip is at said marking location;

a laser reactive material applicator mounted proximate said marking location, said applicator being capable of applying a laser reactive material to a surface of a chip for producing a mark thereon when contacted by said laser beam; and

a cooling agent injector proximate said laser.

5,838,362
IMAGE DATA READOUT TIME ADJUSTER FOR A VIDEO-ON-DEMAND SYSTEM

Shinji Furuya; Tadashi Okamoto; Ichiro Okabayashi, and Shinji Sasaki, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., LTD., Kadoma, Japan

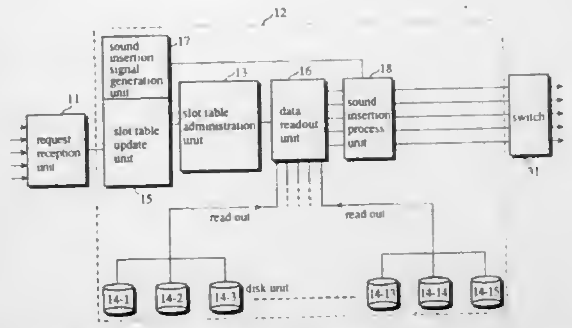
Filed Oct. 4, 1995, Ser. No. 539,106

Claims priority, application Japan, Dec. 21, 1994, 6-318384

Int. Cl.^{6} H04N *7/173*

U.S. Cl. 348—7 **41 Claims**

1. A data readout time adjuster to be used for a video-on-demand system, said video on demand system comprising a storage means for dividing each titled image data into a plurality of image data sections and storing each of the plurality of image data sections in one of a series of storage media in order of reproduction, returning to a first storage medium in the series after reaching a final storage medium in the series along a story of each titled image data; a readout administration means for assigning a slot and a readout right to each subscriber who has made a data transmission request, for designating an image data storage area for each image data section, and for assigning a waiting order to each subscriber who has not been given the readout right; an update means for updating the readout right and the readout position at a certain time interval;



a readout means for sequentially reading the plurality of image data sections from the storage media for each subscriber who has been assigned the readout right; and a transmission means for transmitting the plurality of image data sections read to each subscriber,

said data readout time adjuster comprising:

a readout time adjusting data storage means for storing image data for adjusting readout time to be provided to subscribers who have not been assigned the readout right and are waiting for a start of a readout operation, the image data for adjusting readout time causing no inconvenience even if a transmission of the image data is interrupted any time;

a readout start position check means for, in response to an additional data transmission request, judging whether a subscriber is assigned a readout right for reading a first image data section of a titled image data requested by the additional data transmission request, wherein said readout start position check means judges that the subscriber is assigned the readout right when there is a free slot in a storage media storing the first image data section of the titled image data: and

a readout control means for making at least one of said readout means and a private readout means exclusively provided for said readout time adjusting data storage means read the image data for adjusting readout time stored in said readout time adjusting data storage means until said readout start position check means judges that the subscriber is assigned the readout right, wherein

said transmission means transmits the image data for adjusting readout time to the subscriber.

5,838,363
IMAGE READING DEVICE AND IMAGE RECEIVING DEVICE

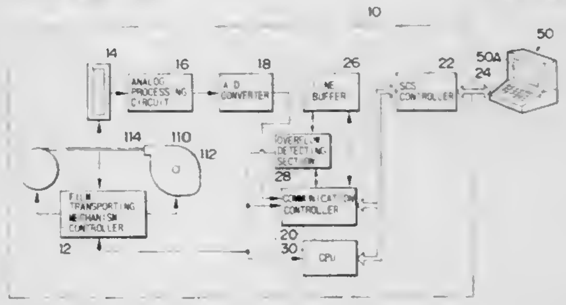
Osamu Saito, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 8, 1997, Ser. No. 780,229

Claims priority, application Japan, Jan. 9, 1996, 8-001309; Dec. 25, 1996, 8-346092

Int. Cl.^{6} H04N *5/253;3/36*

U.S. Cl. 348—96 **14 Claims**



1. An image reading device comprising:

image reading means for reading images and outputting image data indicating the read images;

a buffer for transmission and temporarily containing the image data outputted from said image reading means;

overflow detecting means for detecting overflow of said buffer;

communication controlling means including a buffer controlling section for writing, in said buffer, the image data outputted from said image reading means and sequentially reading out the image data from said buffer in an order in which said image data are written in said buffer, and communicating with an external image receiving device to transmit said image data to said image receiving device via said buffer;

image data position detecting means for detecting an image data position when said overflow is detected among all transmitted image data, when said overflow detecting means detects said overflow of said buffer;

controlling means for having said image reading means resume reading the same image as said read image, when said overflow detecting means detects said overflow of said buffer;

correspondence detecting means for detecting a corresponding point where the image data outputted from said image reading means correspond to image data at said image data position detected by said image data position detecting means; and

wherein said buffer controlling section stops writing the image data in said buffer when said overflow detecting means detects the overflow of said buffer, and resumes writing the image data in said buffer from the image data at said corresponding point detected by said correspondence detecting means when said images are read again.

5,838,364
STILL IMAGE REPRODUCING APPARATUS SAVING TIME FOR STILL IMAGE REPRODUCTIONS

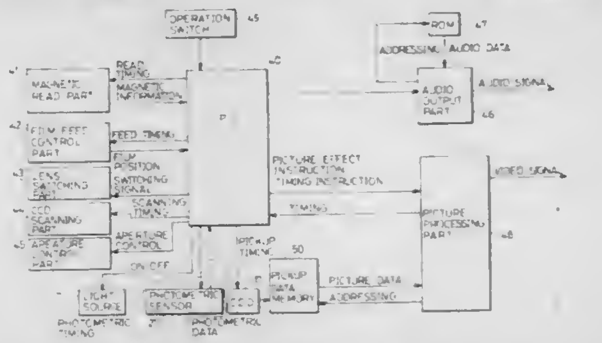
Hiroshi Ishibe, Kyoto; Manabu Inoue, Kobe; Tetsuro Kanbara, Sakai, and Katsuyuki Nanba, Osakasayama, all of Japan, assignors to Minolta Co., Ltd., Japan

Continuation of Ser. No. 430,244, Apr. 28, 1995, abandoned, which is a continuation of Ser. No. 979,783, Nov. 20, 1992, abandoned. This application Feb. 4, 1997, Ser. No. 795,362

Claims priority, application Japan, Nov. 22, 1991, 3-307854; Nov. 22, 1991, 3-308060; Nov. 22, 1991, 3-308061; Nov. 25, 1991, 3-309305; Nov. 25, 1991, 3-309306; Nov. 29, 1991, 3-317121

Int. Cl.^{6} H04N *5/253*

U.S. Cl. 348—96 **20 Claims**



1. A still image reproducing apparatus for reproducing a still image recorded on a recording medium having a plurality of still images recorded thereon, said apparatus comprising:

pickup means for reading a still image recorded on the recording medium:

first storing means for storing still image data read by said pickup means;

second storing means, connected in series to said first storing means and having a smaller storage capacity than said first storage means, for storing still image data transmitted from said first storing means;

decision means for deciding a style of reproduction of a still image;

transmitting means for retrieving still image data from said first storing means and transmitting the retrieved still image data to said second storing means, wherein the retrieved and transmitted still image data comprises only that data necessary to reproduce a still image in the reproduction style decided by said decision means:

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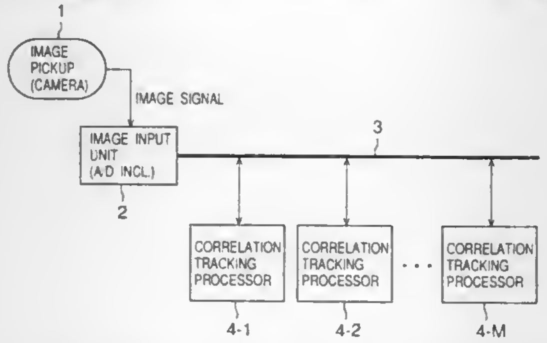
reproducing means for reproducing the still image in accordance with the still image data stored in said second storing means;
determination means for determining whether or not said reproducing means is currently reproducing a still image in accordance with the still image data stored in said second storing means; and
control means for controlling said pickup means and said storing means so as to take another still image and store still image data thereof in said first storing means when said determination means determines that said reproducing means is currently reproducing a still image in accordance with the still image data stored in said second storing means, wherein said another still image is also recorded on said recording medium and is different from said still image currently being reproduced.

5,838,365
TRACKING APPARATUS FOR TRACKING IMAGE IN LOCAL REGION

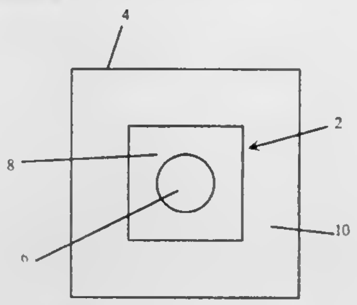
Naoyuki Sawasaki, and Masahiko Sato, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Aug. 29, 1995, Ser. No. 521,076
Claims priority, application Japan, Sep. 20, 1994, 6-225419; Jul. 5, 1995, 7-170058
Int. Cl.^{6} G01S *7/00*
U.S. Cl. 348—169 **50 Claims**


1
IMAGE PICKUP (CAMERA)
IMAGE SIGNAL
IMAGE INPUT UNIT (A/D INCL.)
2
3
CORRELATION TRACKING PROCESSOR
CORRELATION TRACKING PROCESSOR
CORRELATION TRACKING PROCESSOR
4-1
4-2
4-M

1. A local region image tracking apparatus, comprising:
an image data bus coupled to an image pickup unit and transferring therefrom input image data representing an input image; and
a plurality of correlation tracking processors, coupled in parallel to said image data bus, each correlation tracking processor capable of independently tracking a respective local region of the input image each correlation tracking processor including:
at least three image memories;
a selector that selects, from the at least three image memories, an input image memory that stores received input image data included in the input image data, a search image memory that stores search image data representing a search image included in the input image, and a reference image memory that stores reference image data, the search image including a local region to be tracked and the reference image data being related to the local region;
an address generator that generates a search image address to identify the search image memory and a reference image address to identify the reference image memory;
a correlation computing unit that computes a correlation value indicating a correlation between the reference image data and the search image data; and
a peak position detector that detects a peak position within the input image, the peak position having a correlation value indicating a highest correlation.

5,838,366
TRACKING APPARATUS FOR USE IN TRACKING AN OBJECT

Tim Snape, 4 Back St., Abbotsbury, Dorset DT3 4JP, United Kingdom, and Matthew Denner, 6 Station Road, Maiden Newton, Dorchester, Dorset DT2 0AE, United Kingdom
Filed Nov. 1, 1996, Ser. No. 742,511
Claims priority, application United Kingdom, Nov. 3, 1995, 9522596
Int. Cl.^{6} H04N *9/64*
U.S. Cl. 348—170 **8 Claims**



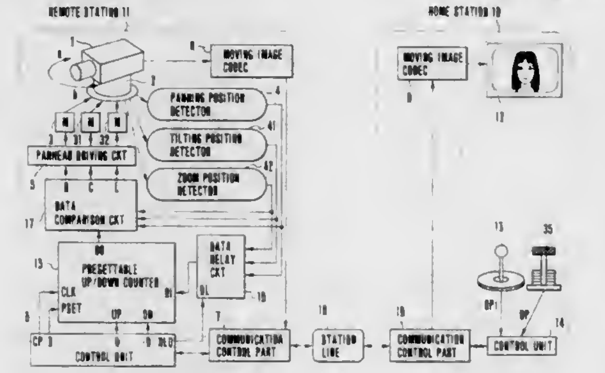
1. Tracking apparatus for use in tracking an object, which tracking apparatus comprises identification means which is for being attached to the object and which comprises at least two colours and a boundary therebetween; filter means for filtering out colours except those colours on the identification means; and detector means which includes a chromatic edge filter and which is for detecting the boundary on the identification means and thereby enabling the detected colours on the identification means to be identified from background colours that may be the same as those on the identification means.

5,838,367

Patent Not Issued For This Number

5,838,368
REMOTE CAMERA CONTROL SYSTEM WITH COMPENSATION FOR SIGNAL TRANSMISSION DELAY

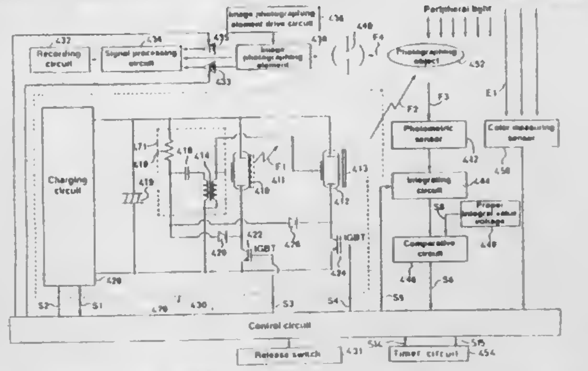
Makoto Masunaga, and Yasuyuki Ohiwa, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 18, 1993, Ser. No. 79,616
Claims priority, application Japan, Jun. 22, 1992, 4-162717; Jul. 1, 1992, 4-174450
Int. Cl.^{6} H04N *5/232*
U.S. Cl. 348—211 **20 Claims**



10. An image communication terminal unit comprising:
a) a camera arranged to pick up an image of an object of shooting and to output an image signal;
b) a display device for displaying said image signal; and
c) control means arranged to perform predetermined control over said camera and, after said predetermined control, to perform reverse control over said camera in a direction reverse to the direction of movement of said camera of said predetermined control as much as an amount of movement of said camera corresponding to a time delay of said predetermined control.

5,838,369
FILL-IN EMITTING APPARATUS AND STILL VIDEO CAMERA

Harumi Aoki, and Kimiaki Ogawa, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 551,045, Oct. 31, 1995, abandoned, which is a division of Ser. No. 113,322, Aug. 30, 1993, Pat. No. 5,485,201. This application Nov. 19, 1996, Ser. No. 718,018
Claims priority, application Japan, Aug. 28, 1992, 4-253955; Nov. 26, 1992, 4-339718; Dec. 2, 1992, 4-349789; Jan. 19, 1993, 5-23683; Jan. 19, 1993, 5-23684; Feb. 10, 1993, 5-45854; Feb. 18, 1993, 5-52958; Feb. 19, 1993, 5-55013; Feb. 22, 1993, 5-56505; Feb. 24, 1993, 5-59556
Int. Cl.^{6} H04N *9/73*
U.S. Cl. 348—223 **16 Claims**

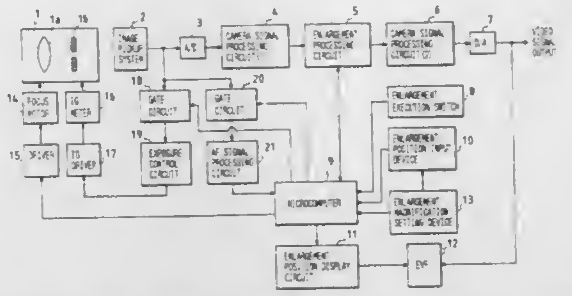


1. A strobe light emission apparatus, comprising:
at least two strobe light emitters, each light emitter emitting light having a different color temperature;
a single accumulator that accumulates charge for driving all of said light emitters;
a color temperature measuring device that measures an ambient color temperature;
a common photometric device for measuring a total combined quantity of light emitted by said at least two strobe light emitters;
an emission controller that intermittently and independently starts and stops fractional pulsed light emissions from each of said at least two strobe light emitters, in a ratio determined by a target color temperature corresponding to said ambient color temperature, until one of (i) said total combined quantity of light emitted by said at least two strobe light emitters reaches a target quantity; and (ii) an elapsed time reaches a predetermined synchronized shutter time.

5,838,370
IMAGE PICKUP APPARATUS

Toshio Kaji, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 18, 1995, Ser. No. 531,559
Claims priority, application Japan, Sep. 20, 1994, 6-224963
Int. Cl.^{6} H04N *5/232*
U.S. Cl. 348—240 **21 Claims**

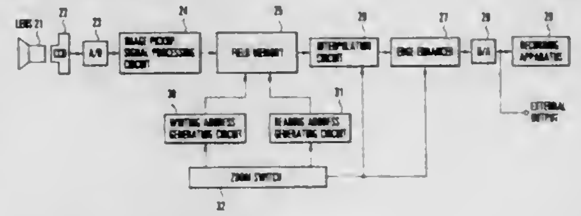
1. An image pickup apparatus comprising:
image pickup means;
enlargement means for performing enlargement processing of an image by electronically enlarging an image pickup signal output from said image pickup means;


MICROCOMPUTER
ENLARGEMENT MAGNIFICATION SETTING DEVICE
ENLARGEMENT POSITION DISPLAY CIRCUIT
EVF
11
12
13

selection means for selecting a portion, of the image in a frame, which is to be enlarged by said enlargement means;
focus detection means for detecting a focus state by extracting a predetermined signal, which changes in accordance with the focus state, from an image pickup signal corresponding to a predetermined focus detection range in the frame;
exposure control means for detecting an exposure state by extracting a signal corresponding to the exposure state from the image pickup signal corresponding to a predetermined exposure control range in the frame; and
control means for operating said focus detection means and said exposure control means in accordance with a selecting operation performed by said selection means to move positions of the focus detection range and the exposure control range to a position of an enlargement portion in the frame selected by said selection means.

5,838,371
IMAGE PICKUP APPARATUS WITH INTERPOLATION AND EDGE ENHANCEMENT OF PICKUP SIGNAL VARYING WITH ZOOM MAGNIFICATION

Hisataka Hirose; Toshiaki Kondo, both of Kanagawa-ken, and Izumi Matsui, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 204,788, Mar. 2, 1994, abandoned. This application Jul. 14, 1997, Ser. No. 892,342
Claims priority, application Japan, Mar. 5, 1993, 5-044940; Mar. 19, 1993, 5-085572; Jul. 16, 1993, 6-176778
Int. Cl.^{6} H04N *5/262*
U.S. Cl. 348—240 **6 Claims**



1. An image pickup apparatus comprising:
a) image pickup means;
b) memory means for storing an output of said image pickup means;
c) zoom magnification control means for varying zoom magnification of an output of said memory means;
d) interpolating means for interpolating the signal outputted from said memory means, said interpolating means varies interpolation of said memory means output signal on the basis of said zoom magnification controlled by said zoom magnification control means;
e) edge enhancing means for applying edge enhancing to a signal outputted from said interpolating means; and
f) controlling means for varying edge enhancement by said edge enhancing means in accordance with said zoom magnification controlled by said zoom magnification control means.

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5,838,372

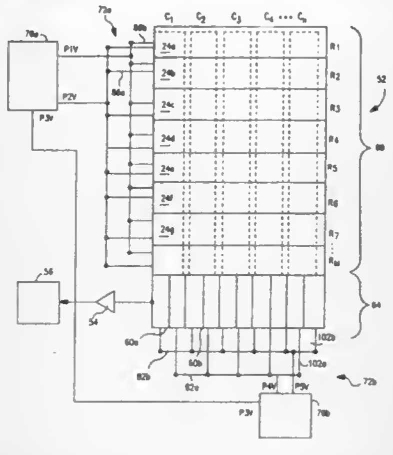
PHASE CLOCK DRIVE CIRCUIT AND METHOD FOR REDUCTION OF READOUT NOISE IN CCDS

Mark Wood, Broomfield, Colo., assignor to Ohmeda Inc., Liberty Corner, N.J.

Filed Sep. 3, 1996, Ser. No. 706,856

Int. Cl.^{6} H04N *3/14;5/217*

U.S. Cl. 348—312 **28 Claims**



1. A driving circuit for use in driving a charge coupled device (CCD) having a predetermined CCD inversion potential, said driving circuit comprising:

means for receiving a timing signal, said timing signal having a first portion and a second portion, wherein said first portion includes a train of timing pulses having a peak pulse value and a baseline value and said second portion includes a substantially constant magnitude;

means for converting said timing signal into an output waveform having a first portion that maintains a shifting potential during shifting, wherein an absolute value of said shifting potential exceeds an absolute value of said predetermined CCD inversion potential, and a second portion that has an integration potential during integration wherein an absolute value of said integration potential is less than said absolute value of said predetermined CCD inversion potential; and

coupling means for use in delivering said output waveform to said CCD, wherein said first portion of said output waveform is operative for shifting information through said CCD during a shifting interval and said second portion of said output waveform is operative for biasing said CCD during an integration interval.

5,838,373

IMAGING CIRCUIT HAVING INTERLACED AND NON-INTERLACED MODE

Takami Hasegawa, Yokohama, and Choji Umemoto, Wakayama, both of Japan, assignors to Protec Japan Corporation, Yokohama, and Noritsu Koki Co., Ltd., Wakayama, both of Japan

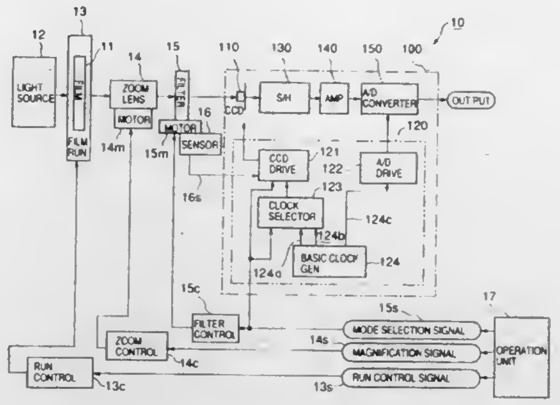
Filed Oct. 3, 1996, Ser. No. 724,837

Claims priority, application Japan, Oct. 17, 1995, 7-268134

Int. Cl.^{6} H04N *3/14;7/01;5/228*

U.S. Cl. 348—312 **2 Claims**

1. An imaging circuit comprising: a solid state imaging device in which a plurality of scanning lines each comprising a plurality of light receiving elements arranged in a predetermined first direction are arranged in a second direction intersecting the first direction, said solid state imaging device sequentially outputting in response to a predetermined first clock signal light receiving signals derived through the light receiving elements arranged on a same scanning line so that the light receiving signals are continuously outputted; and an A/D converter for converting the light receiving signals outputted from said solid state imaging device to digital signals in accordance with a predetermined second clock signal,



wherein said solid state imaging device has a first mode in which the light receiving signals of a plurality of light receiving elements on a plurality of adjacent scanning lines arranged in the second direction are added to each other and outputted on a plurality of scanning lines basis, and a second mode in which the light receiving signals of the plurality of light receiving elements arranged on one scanning line are sequentially outputted on a one-by-one scanning line basis, said first and second modes being optionally selectable in accordance with a predetermined mode selection signal, and

wherein said imaging circuit further comprises a driving unit in which when said solid state imaging device is selected in an operation mode to the first mode, a clock signal having a predetermined first repetitive frequency is transmitted as said first clock signal to said solid state imaging device and in addition another clock signal having a predetermined second repetitive frequency lower than the first repetitive frequency is transmitted as said second clock signal to said A/D converter, and when said solid state imaging device is selected in an operation mode to the second mode, a clock signal having a predetermined repetitive frequency is transmitted as said first clock signal and said second clock signal to said solid state imaging device and said A/D converter.

5,838,374

AUTOFOCUS VIDEO CAMERA THAT CAN COMPENSATE FOR VARIATION IN THE AMOUNT OF LOAD ON A MOBILE UNIT OF A LINEAR MOTOR IN A FOCUS OPERATION

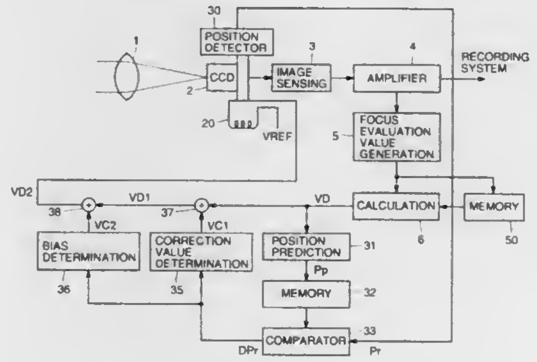
Kenichi Kikuchi, Daito, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Nov. 20, 1995, Ser. No. 559,653

Claims priority, application Japan, Nov. 25, 1994, 6-291447; Jun. 23, 1995, 7-157843

Int. Cl.^{6} H04N *5/232*

U.S. Cl. 348—351 **3 Claims**



1. An autofocus video camera comprising:

image sensing means having a lens and an image sensing device, said lens and said image sensing device being oriented along a common optical axis;

a linear motor having either said lens or said image sensing device as a mobile unit, wherein said linear motor displaces said mobile unit along said optical axis and with a driving force according to a level of a driving signal and is driven according to a potential difference between a predetermined reference level and said level of the driving signal;

focus control means for providing said driving signal so that said mobile unit moves towards an in-focus position along said axis;

mobile unit position detection means for detecting a position of said mobile unit in a direction of the optical axis;

load calculation means for determining an amount of driving load acting on said mobile unit in a direction of said optical axis, wherein said load calculation means comprises:

position prediction means for predicting the position at which the mobile unit will arrive after the driving force has been applied thereto by the linear motor for a predetermined time period; and

comparator means for determining said amount of driving load in response to comparing a detected result produced by said mobile unit position detection means and a predicted result produced by said position prediction means and in response to a value corresponding to an amount of tilt of said optical axis from a horizontal direction; and

level correction means for correcting the level of said driving signal in response to said amount of driving load, wherein said level correction means comprises potential difference reduction means for reducing said potential difference in proportion to an absolute value of the value corresponding to the amount of tilt.

5,838,375

METHOD AND APPARATUS FOR CODING AN IMAGE AND REDUCING BIT GENERATION BY HVS (HUMAN VISUAL SENSITIVITY)

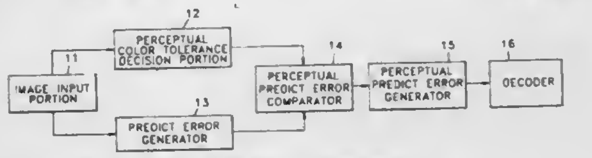
Seong-jin Kim; Sung-gul Ryoo, both of Suwon, and Seungkwon Paek, Seoul, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Nov. 1, 1996, Ser. No. 741,790

Claims priority, application Rep. of Korea, Nov. 1, 1995, 1995-39223

Int. Cl.^{6} H04N *7/32*

U.S. Cl. 348—394 **10 Claims**


12
PERCEPTUAL COLOR TOLERANCE DECISION PORTION
11
IMAGE INPUT PORTION
13
PREDICT ERROR GENERATOR
14
PERCEPTUAL PREDICT ERROR COMPARATOR
15
PERCEPTUAL PREDICT ERROR GENERATOR
16
DECODER

1. An image coding apparatus, comprising:

a image input portion having a current original frame, a forward original frame, and a forward reference frame as inputs, said image input portion generating a predict frame from the current original frame and forward reference frame by a differential pulse coded modulation (DPCM);

a perceptual color tolerance decision portion for deciding a perceptual color tolerance of a chromatic component for each pixel of the current original frame input from said image input portion;

a predict error generator for generating a predict error between the predict frame input from said image input portion and the current original frame;

a perceptual predict error comparator for comparing the predict error output from said predict error generator and the perceptual color tolerance output from said perceptual color tolerance decision portion;

a perceptual predict error generator for generating a perceptual predict error recomposed by the predict error having a perceptual chromatic difference according to a result compared in said perceptual predict error comparator; and,

a decoder for coding the current original frame by using the predict frame and the perceptual predict error output from said perceptual predict error generator and then composing a restored frame.

5,838,376

VIDEO CODER/DECODER WHICH SEPARATELY PROCESSES HIGH AND LOW FREQUENCIES

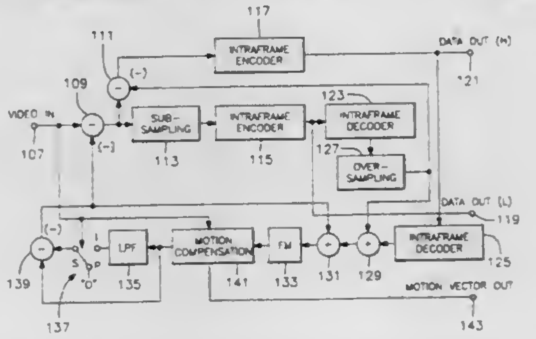
Kenji Sugiyama, Yokosuka, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Division of Ser. No. 286,205, Aug. 5, 1994, abandoned, which is a continuation of Ser. No. 967,869, Oct. 29, 1992, abandoned. This application Oct. 9, 1996, Ser. No. 731,124

Claims priority, application Japan, Oct. 29, 1991, 3-309888

Int. Cl.^{6} H04N *7/46*

U.S. Cl. 348—397 **2 Claims**



1. An apparatus for coding a video signal, comprising:

prediction means for conducting interframe or interfield coding based on an input signal with a predictive signal, the input signal being to be coded and to be stored in a storage medium, to output a predictive error signal;

subsampling means for subsampling the predictive error signal, to obtain a low frequency component of the predictive error signal;

separating means for separating a high frequency component of the predictive error signal from the predictive error signal;

first coding means for independently intraframe or intrafield coding the low frequency component only at every predetermined number of frames or fields of the input video signal;

second coding means for interframe or interfield coding the high frequency component at every frame or field of the input video signal; and

generating means for generating the predictive error signal based on the coded high and low frequency components, a low frequency component of the predictive signal for interframe or interfield coding being suppressed, the predictive error signal being applied to the prediction means.

5,838,377

VIDEO COMPRESSED CIRCUIT USING RECURSIVE WAVELET FILTERING

Richard Greene, Austin, Tex., assignor to Analog Devices, Inc., Norwood, Mass.

Filed Dec. 20, 1996, Ser. No. 777,705

Int. Cl.^{6} H04N *7/30*

U.S. Cl. 348—398 **16 Claims**

14. A method for compressing an input video signal comprising the steps of:

receiving the input video signal;

storing a portion of the input video signal;

with a single horizontal filter bank, performing analysis and synthesis by high-pass and low-pass filtering horizontal components of the input video signal; and

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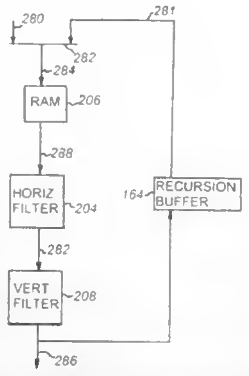


with a single vertical filter bank, performing analysis and synthesis by high-pass and low-pass filtering vertical components of the input video signal.

5,838,378
MOVING IMAGE CODING APPARATUS MOVING IMAGE DECODING APPARATUS AND MOVING CODING-DECODING APPARATUS

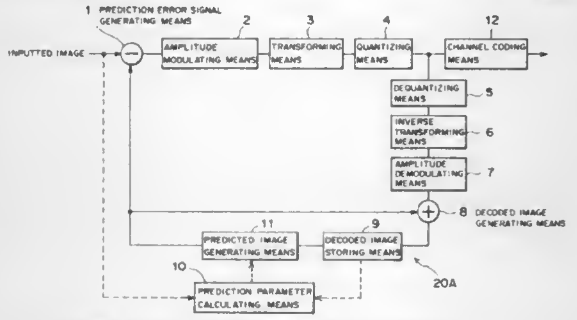
Akira Nakagawa; Kimihiko Kazui, and Eishi Morimatsu, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 10, 1996, Ser. No. 729,303

Claims priority, application Japan, Jan. 11, 1996, 8-003423

Int. Cl.^{6} H04N *7/50*

U.S. Cl. 348—401 **20 Claims**


1 PREDICTION ERROR SIGNAL GENERATING MEANS
2
3
4
12
INPUTTED IMAGE
AMPLITUDE MODULATING MEANS
TRANSFORMING MEANS
QUANTIZING MEANS
CHANNEL CODING MEANS
DEQUANTIZING MEANS
5
INVERSE TRANSFORMING MEANS
6
AMPLITUDE DEMODULATING MEANS
7
8 DECODED IMAGE GENERATING MEANS
11
9
PREDICTED IMAGE GENERATING MEANS
DECODED IMAGE STORING MEANS
10
20A
PREDICTION PARAMETER CALCULATING MEANS

1. A moving image coding apparatus comprising:

a prediction error signal generating means for dividing an inputted image into blocks each consisting of plural pixels, and computing a difference between the inputted image and a predicted image generated from a past inputted image for each block to generate a prediction error signal;

an amplitude modulating means for conduction amplitude modulation on an amplitude of each pixel of the prediction error signal generated by said prediction error signal generating means at a predetermined modulation factor;

a transforming means for transforming the prediction error signal having been undergone the amplitude modulation in said amplitude modulating means in order to remove correlation among the pixels to generate a transform coefficient;

a quantizing means for quantizing the transform coefficient from said transforming means;

a dequantizing means for dequantizing a quantized transform coefficient from said quantizing means to regenerate the transform coefficient;

an inverse transforming means for regenerating the prediction error signal having been undergone the amplitude modulation on the basis of said regenerated transform coefficient;

an amplitude demodulating means for demodulating an amplitude of each pixel of the prediction error signal from said inverse transforming means at a predetermined demodulation factor to regenerate the prediction error signal;

a decoded image generating means for adding the prediction error signal regenerated by said amplitude demodulating means to said predicted image to generate a decoded image;

a decoded image storing means for storing the decoded image from said decoded image generating means as a decoded image decoded in the past;

a prediction parameter calculating means calculating a prediction parameter used to generate said predicted image from the decoded image stored in said decoded image storing means such that an error between said decoded image and an inputted image inputted following said decoded image is decreased;

a predicted image generating means for generating said predicted image from the prediction parameter calculated by said prediction parameter calculating means and the decoded image stored in said decoded image storing means; and

a channel coding means for assigning codes to control information along with the quantized transform coefficient from said quantizing means to output the codes as moving image coded information.

5,838,379
IMAGE PROCESSING APPARATUS HAVING MEANS FOR CONTROLLING EXPOSURE USING AN ORTHOGONAL TRANSFORMATION COEFFICIENT

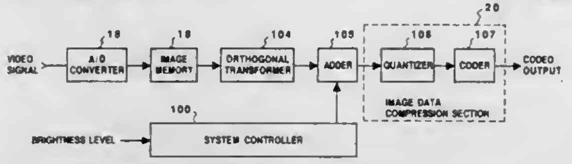
Makoto Takayama, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 881,866, May 12, 1992. This application May 23, 1995, Ser. No. 448,266

Claims priority, application Japan, May 15, 1991, 3-109999; May 15, 1991, 3-110213; May 15, 1991, 3-110214; May 15, 1991, 3-110215; May 15, 1991, 3-110216; Jun. 20, 1991, 3-148437

Int. Cl.^{6} H04N *7/30*

U.S. Cl. 348—403 **12 Claims**



1. An image processing apparatus comprising:

input means for inputting orthogonal-transformed image data;

arithmetic means for adding a predetermined value to transformation coefficients of the orthogonal-transformed image data inputted by said input means to change a brightness level of the inputted image data; and

encoding means for encoding the image data which comprises the transformation coefficients and the predetermined value added by said arithmetic means.

5,838,380
MEMORY CONTROLLER FOR DECODING A COMPRESSED/ENCODED VIDEO DATA FRAME

Yuanyuan Sun, San Jose, Calif.; Chih-Ta Sung, Princeton, N.J.; Jih-Hsien Soong, Cupertino, Calif.; Richard Chang, San Jose, Calif.; Tzoyao Chan, Saratoga, Calif., and Chia-Lun Hang, San Jose, Calif., assignors to Cirrus Logic, Inc., Fremont, Calif.

Continuation-in-part of Ser. No. 316,015, Sep. 30, 1994, Pat. No. 5,594,660. This application Dec. 23, 1994, Ser. No. 372,794

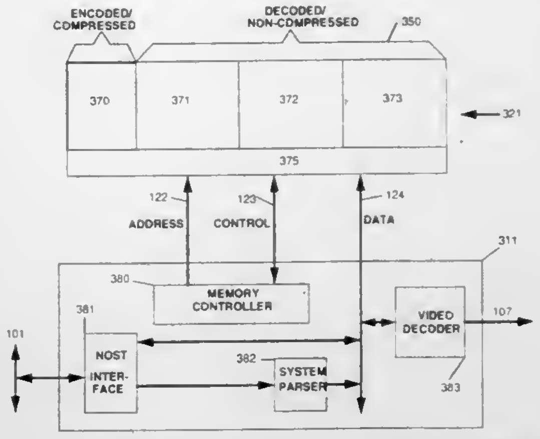
Int. Cl.^{6} H04N *7/137*

U.S. Cl. 348—412 **10 Claims**

1. A method of determining whether to store frames of video frame data to a partitioned memory comprising a plurality of slots for storing frames of decoded/decompressed video data and for outputting frames of video data to a display; said method comprising the steps of:

receiving an encoded/compressed frame of video data;

determining the type of encoded/compressed video frame data received;



determining the type of decoded/decompressed video frame data currently output from the memory to a display;

decoding the received encoded/compressed video frame data; and

retaining a currently stored B-type video frame data and dropping the received encoded/compressed video frame data when B-type decoded/decompressed video frame data is currently output from the memory to a display and the received and decoded encoded/compressed video frame data is B-type video frame data.

5,838,381
IMAGE DISPLAY APPARATUS CAPABLE OF DISPLAYING PERSONAL COMPUTER SIGNALS AND TELEVISION SIGNAL BY CONVERSION INTO A SIGNAL OF A HIGHER NUMBER OF PIXELS

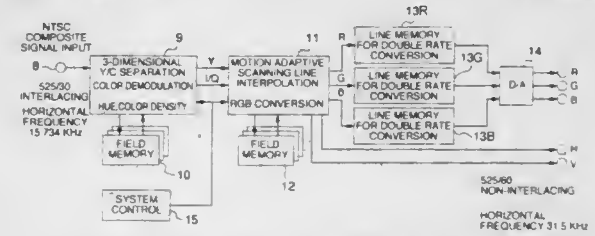
Yasuhiro Kasahara; Takaaki Matono, both of Yokohama; Koichi Sudo, Fujisawa; Makoto Kitamura, Yokohama; Yasuhiro Tomita, Yokohama; Kouichi Sugimoto, Yokohama; Toshihiko Matsuzawa, Kamakura, and Fumiyoshi Akiyama, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 20, 1996, Ser. No. 771,313

Claims prinrity, application Japan, Dec. 25, 1995, 07-336961

Int. Cl.^{6} H04N *7/01*

U.S. Cl. 348—458 **10 Claims**


13R
NTSC COMPOSITE SIGNAL INPUT
9
11
8
3-DIMENSIONAL Y/C SEPARATION
COLOR DEMODULATION
HUE.COLOR DENSITY
525/30 INTERLACING
HORIZONTAL FREQUENCY 15.734 KHz
Y
I/Q
MOTION ADAPTIVE SCANNING LINE INTERPOLATION
RGB CONVERSION
R
G
B
LINE MEMORY FOR DOUBLE RATE CONVERSION
LINE MEMORY FOR DOUBLE RATE CONVERSION
LINE MEMORY FOR DOUBLE RATE CONVERSION
13G
13B
14
D/A
R
G
B
H
V
FIELD MEMORY
10
FIELD MEMORY
12
SYSTEM CONTROL
15
525/60 NON-INTERLACING
HORIZONTAL FREQUENCY 31.5 KHz

1. An image display apparatus receiving, as inputs thereof, a standard television signal and a PC signal outputted from a personal computer and capable of displaying an image for each of said standard television signal and PC signal, said image display apparatus comprising:

display means having a number of pixels larger than the number of pixels per screen of said PC signal and said television signal;

first signal conversion means for converting said inputted standard television signal to a signal format substantially equivalent to a signal format of said inputted PC signal;

switch means for selecting and outputting either the signal outputted from said first signal conversion means or said inputted PC signal; and

second signal conversion means for converting a number of pixels of an image information signal outputted from said switch means to a signal having a number of pixels substantially equivalent to the number of said display means.

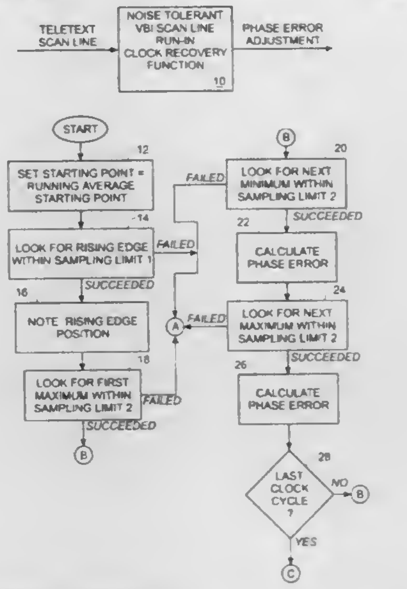
5,838,382
METHOD AND APPARATUS FOR OPTIMIZING STARTING POINT FOR RUN-IN CLOCK RECOVERY

Benjamin M. Cahill, III, Ringoes, N.J., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jun. 26, 1996, Ser. No. 670,565

Int. Cl.^{6} H04N *7/087*

U.S. Cl. 348—465 **16 Claims**


TELETEXT SCAN LINE
NOISE TOLERANT VBI SCAN LINE RUN-IN CLOCK RECOVERY FUNCTION
10
PHASE ERROR ADJUSTMENT
START
12
SET STARTING POINT = RUNNING AVERAGE STARTING POINT
14
LOOK FOR RISING EDGE WITHIN SAMPLING LIMIT 1
FAILED
SUCCEEDED
16
NOTE RISING EDGE POSITION
18
LOOK FOR FIRST MAXIMUM WITHIN SAMPLING LIMIT 2
FAILED
SUCCEEDED
B
A
B
20
LOOK FOR NEXT MINIMUM WITHIN SAMPLING LIMIT 2
FAILED
SUCCEEDED
22
CALCULATE PHASE ERROR
24
LOOK FOR NEXT MAXIMUM WITHIN SAMPLING LIMIT 2
FAILED
SUCCEEDED
26
CALCULATE PHASE ERROR
28
LAST CLOCK CYCLE ?
NO
B
YES
C

1. An apparatus comprising:

an execution unit for executing programming instructions;

a storage medium coupled to the execution unit having stored therein a plurality of programming instructions to be executed by the execution unit, the programming instructions implementing a recovery function for recovery of a synchronization clock at the beginning of a vertical blanking interval (VBI) scan line, the recovery function determining a starting point for performing the recovery based on at least one maintained average starting point.

5,838,383
MULTIMEDIA TELEVISION RECEIVER AND METHOD OF BOOTING THE SAME

Hiroyuki Chimoto; Seijiro Yasuki, and Shigeru Tashiro, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 31, 1995, Ser. No. 522,486

Claims priority, application Japan, Aug. 31, 1994, 6-207378; Sep. 29, 1994, 6-235728

Int. Cl.^{6} H04N *5/44;7/10;7/14*

U.S. Cl. 348—553 **17 Claims**

1. A television receiver comprising:

a receiving module for receiving broadcast signals;

an analog switch box for receiving signals from the receiving module;

a demodulation module for demodulating a signal selected by the analog switch box and generating demodulated data therefrom;

a first bus for carrying the demodulated data;

a converting module for receiving the demodulated data via the first bus and converting the demodulated data to a data stream;

a second bus for carrying the data stream;

a decoding module for receiving the data stream via the second bus and decoding the data stream, thereby to generate decoded data;

a third bus for carrying the decoded data;

an image-outputting module for receiving the decoded data via the third bus and outputting an image represented by the decoded data;

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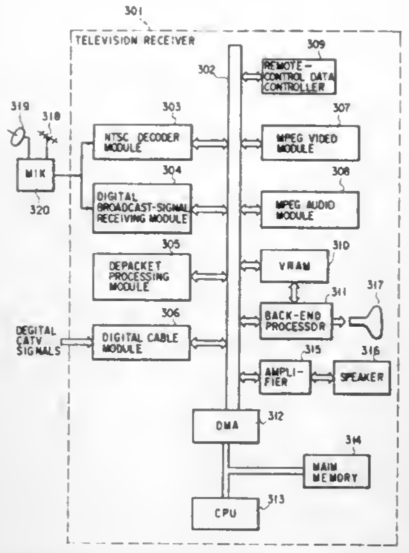


a speech-outputting module for receiving the decoded data via the third bus and outputting a speech represented by the decoded data;

a bus controller connected to the analog switch box and the first, second and third buses;

control means for controlling the receiving module, the converting module, the decoding module, the image-outputting module, and the speech-outputting module, by using the analog switch box, the first to third buses and the bus controller, thereby to change an operating mode of each module in accordance with the broadcast signals;

a video encoder section and an audio encoder section connected between the second bus and the third bus;

a packet section connected between the first bus and the second bus, for generating a packet from an output of the video encoder section and the output of the audio encoder section;

a modulating module connected between the analog switch box and the first bus, for modulating the packet generated by the packet generated by the packet section; and

a transmission module connected to the analog switch box, for transmitting an output of the modulating module in the form of the broadcast signals.

5,838,384
SYSTEM FOR ASSIGNING MULTICHANNEL AUDIO SIGNALS TO INDEPENDENT WIRELESS AUDIO OUTPUT DEVICES

Jeffrey Schindler, Sioux City, Iowa, and Bradley A. Forrest, Burnsville, Minn., assignors to Gateway 2000, Inc., North Sioux City, S. Dak.

Division of Ser. No. 624,024, Mar. 27, 1996, which is a continuation-in-part of Ser. No. 503,120, Jul. 17, 1995, Pat. No. 5,675,390. This application Nov. 18, 1996, Ser. No. 751,856

Int. Cl.^{6} H04N *9/74*

U.S. Cl. 348—563 **6 Claims**

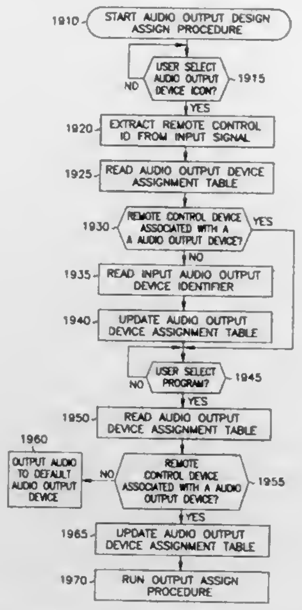
1. A method of assigning the audio portions of a plurality of distinct program outputs from a home entertainment and information system to a plurality of independent audio output devices, comprising the steps of:

displaying a plurality of windows of information generated by programs on a video display device screen;

displaying a plurality of audio output icons on the video display device screen, each corresponding to one of the plurality of audio output devices;

displaying a plurality of remote control icons on the video display device screen;

controlling the movement of the remote control icons by use of remote controls associated with the remote control icons;


1910
START AUDIO OUTPUT DESIGN ASSIGN PROCEDURE
USER SELECT AUDIO OUTPUT DEVICE ICON?
1915
NO
YES
1920
EXTRACT REMOTE CONTROL ID FROM INPUT SIGNAL
1925
READ AUDIO OUTPUT DEVICE ASSIGNMENT TABLE
1930
REMOTE CONTROL DEVICE ASSOCIATED WITH A A AUDIO OUTPUT DEVICE?
YES
NO
1935
READ INPUT AUDIO OUTPUT DEVICE IDENTIFIER
1940
UPDATE AUDIO OUTPUT DEVICE ASSIGNMENT TABLE
USER SELECT PROGRAM?
1945
NO
YES
1950
READ AUDIO OUTPUT DEVICE ASSIGNMENT TABLE
1960
OUTPUT AUDIO TO DEFAULT AUDIO OUTPUT DEVICE
NO
REMOTE CONTROL DEVICE ASSOCIATED WITH A AUDIO OUTPUT DEVICE?
1955
YES
1965
UPDATE AUDIO OUTPUT DEVICE ASSIGNMENT TABLE
1970
RUN OUTPUT ASSIGN PROCEDURE

selecting the programs to become active by use of the remote control icons; and

selecting at least one audio output device to become associated with a remote control by dragging one of the audio output icons and dropping it on one of the remote control icons associated with the remote control.

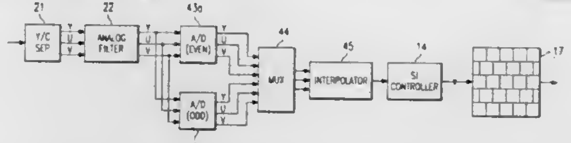
5,838,385
SAMPLING ANALOG VIDEO SIGNAL FOR SECONDARY IMAGES

John R. Reder, and Donald B. Doherty, both of Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 30, 1996, Ser. No. 706,367

Int. Cl.^{6} H04N *5/45*

U.S. Cl. 348—565 **19 Claims**



1. A method of providing pixel data from a luminance component and at least one chrominance component of an analog video signal, for a secondary image within or adjacent to a main image having a main image sample rate, said secondary image being displayed by a display device having a staggered pixel array, comprising the steps of:

sampling each of said components of said analog video signal at a rate of 2/n(h) times said main image sample rate, where 1/n(h) is the horizontal scaling factor of said secondary image and n is one-half the number of rows in said main image, thereby providing a stream of luminance samples and at least one stream of chrominance samples;

selecting, from said streams of samples, a first pattern of samples for even rows of said staggered pixel array, wherein every other sample is a luminance sample and every other sample is a chrominance sample; and

selecting, from said streams of samples, a second pattern of samples for odd rows of said staggered pixel array, wherein every other sample is a luminance sample and every other sample is a chrominance sample, and wherein said luminance samples of said first pattern and of said second pattern are offset by one sample.

5,838,386
ON SCREEN DISPLAY CIRCUIT AND POSITION DETECTOR

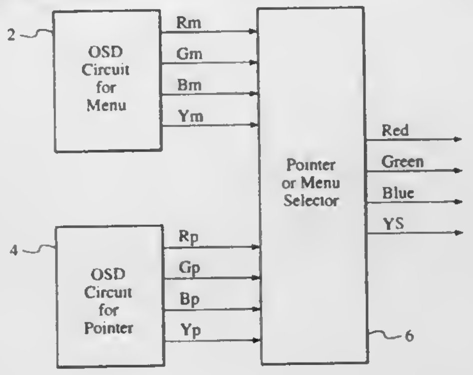
Ho-hyun Kim, Kyungsangbuk-do, Rep. of Korea, assignor to LG Semicon Co., Ltd., Chungcheongbuk-do, Rep. of Korea

Filed Jun. 21, 1996, Ser. No. 667,698

Claims priority, application Rep. of Korea, Jun. 21, 1995, 1995-16646

Int. Cl.^{6} H04N *5/445*

U.S. Cl. 348—569 **9 Claims**



9. A method of remotely controlling a display device, wherein a video signal applied to the display device is displayed on a screen, wherein the display device is controlled by a control menu and a pointer displayed on the screen, wherein the position of the pointer is moved to a desired menu by a remote controller, and wherein the desired menu is selected by a selection signal of the remote controller, wherein the display device is controlled responsive to the selected menu, the method comprising the steps of:

displaying a menu on the screen using a menu OSD circuit;

generating an indication signal for moving the pointer up and down or left and right by the remote controller;

up/down-counting a Y clock which determines the speed of moving the pointer vertically according to an up- or down-signal to set a counted value as a vertical position value;

loading the vertical position value by a vertical synchronization signal to be down-counted according to a horizontal synchronization signal and generating a vertical detection signal when the counted value is zero;

up/down-counting an X clock which determines the speed of moving the pointer horizontally according to a left- or right-signal to set the counted value as a horizontal position value;

down-counting the horizontal position value by the horizontal synchronization signal according to an OSD clock and generating a horizontal detection signal when the counted value is zero;

activating a pointer read signal when the vertical detection signal and the horizontal detection signal are simultaneously activated;

producing a shift signal responsive to the OSD clock;

counting the horizontal synchronization signal when the vertical detection signal is activated and generating a row address;

outputting pointer font data by the row address when the pointer read signal is activated;

shifting the loaded pointer font data by a shift signal to produce a serial pointer font data signal;

outputting the pointer font data signal as a pointer video signal RGB according to a given pointer color signal; and

switching the pointer video signal into the output video signals RED, GREEN and BLUE and transmitting the same upon the generation of the pointer video signal RGB during transmission of the video signal RGB generated in the menu OSD circuit as output signals RED, GREEN and BLUE.

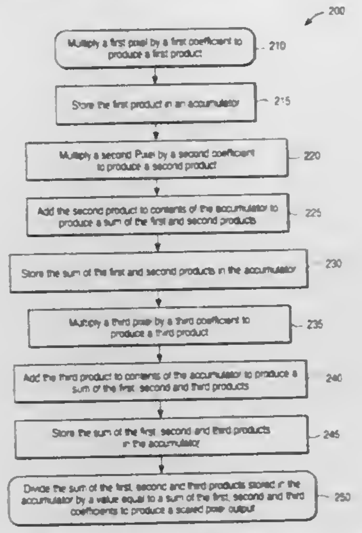
5,838,387
DIGITAL VIDEO SCALING ENGINE

John L. Allen, Hillsboro; Leonard W. Cross, Portland, and Ali S. Oztaskin, Beaverton, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Dec. 20, 1996, Ser. No. 771,300

Int. Cl.^{6} G06F *15/66;* **H04N** *5/262*

U.S. Cl. 348—581 **18 Claims**


200
Multiply a first pixel by a first coefficient to produce a first product
210
Store the first product in an accumulator
215
Multiply a second Pixel by a second coefficient to produce a second product
220
Add the second product to contents of the accumulator to produce a sum of the first and second products
225
Store the sum of the first and second products in the accumulator
230
Multiply a third pixel by a third coefficient to produce a third product
235
Add the third product to contents of the accumulator to produce a sum of the first, second and third products
240
Store the sum of the first, second and third products in the accumulator
245
Divide the sum of the first, second and third products stored in the accumulator by a value equal to a sum of the first, second and third coefficients to produce a scaled pixel output
250

1. In a video camera, a method for scaling digital video data, said method comprising:

in a first time period, performing the steps of:
multiplying a first pixel by a first coefficient to produce a first product; and
storing the first product in an accumulator;

in a second time period, performing the steps of:
multiplying a second pixel by a second coefficient to produce a second product;
adding the second product to contents of the accumulator to produce a sum including the first and second products; and
dividing the sum by a value based on at least one of the first and second coefficients to produce a scaled video data output value.

5,838,388
VIDEO PREAMPLIFIER WITH DATA INSERTION

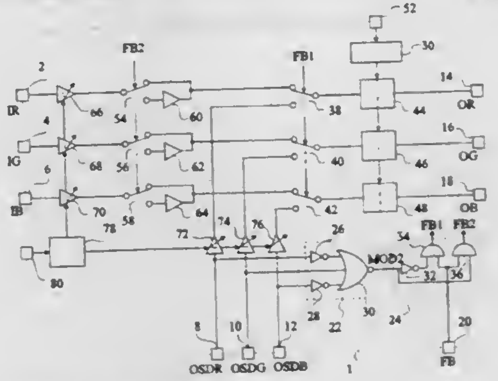
Jean-Pierre Blanc, Theys, France, assignor to SGS-Thomson Microelectronics S.A., Gentilly, France

Filed Mar. 25, 1997, Ser. No. 823,546

Claims priority, application France, Mar. 26, 1996, 96 04069

Int. Cl.^{6} H04N *9/74*

U.S. Cl. 348—589 **10 Claims**



1. A preamplifier including:

a set of data inputs for receiving input video signals representative of an image to be displayed on a screen;

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- a second set of data inputs for receiving logic signals representative of information to be displayed in superimposition on the screen;
- a set of data outputs for supplying output video signals generated based on the input video signals or the logic signals;
- a control input for receiving a logic control signal;
- a first selection means monitored by the control signal, for selecting signals used to generate the output video signals, the signals used being one from a group of the input video signals in a first display mode, and the logic signals in a second display mode;
- a decoding and control means responsive to the logic signals; and
- second selection means monitored by the decoding and control means for selecting, in the second display mode, the input video signals to generate the output video signals.

5,838,389
APPARATUS AND METHOD FOR UPDATING A CLUT DURING HORIZONTAL BLANKING

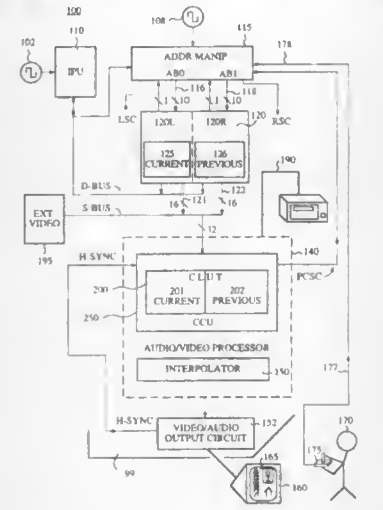
Robert J. Mical, Redwood City; David L. Needle, Alameda, and Tejo J. Khubchandani, Mountain View, all of Calif., assignors to The 3DO Company, Redwood City, Calif.

Continuation of Ser. No. 969,994, Nov. 2, 1992, abandoned.

This application Sep. 2, 1994, Ser. No. 300,867

Int. Cl.^{6} H04N *9/64*

U.S. Cl. 348—650 **61 Claims**



1. A video data color conversion apparatus for converting a first stream of color video data received from a first data source in a first format the first stream of color video data representing a first multi-line image to be displayed on a raster-type display means that uses a second different format the second format including horizontal scan periods and horizontal blanking periods, said conversion apparatus comprising:

- (a) video output circuit means for driving the display means the video output circuit means including means for supplying horizontal synch signals to the display means to define the beginnings of the horizontal scan periods;
- (b) programmable color look up table means (CLUT means), positioned upstream of the video output circuit means for converting, during a conversion time span corresponding to a horizontal scan period, an input video data signal having the first format into a converted signal having a third format according to color conversion data loaded into the CLUT means, and for forwarding the converted signal downstream to the video output circuit means;
- (c) timing means, operatively coupled to the video output circuit means and responsive to the horizontal synch signals, for generating update synchronization signals corresponding at least approximately to the start and end of each of the horizontal blanking periods of the display means; and
- (d) updating means, responsive to said update synchronization signals and operatively coupled to said CLUT means, for updating said color conversion data in said CLUT means during an update period corresponding to one of said horizontal blanking periods.

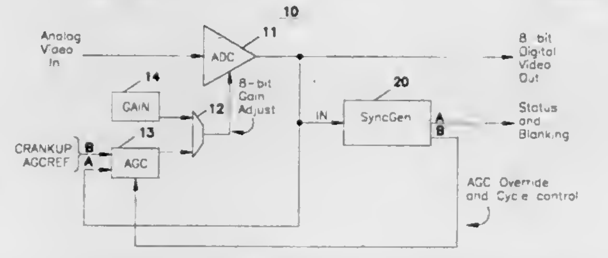
5,838,390
SYSTEM AND METHOD FOR MULTI-LEVEL GAIN CONTROL

Robert J. Hankinson, Carrollton, and Scott Curry, Coppell, both of Tex., assignors to Cirrus Logic, Inc., Fremont, Calif.

Filed Dec. 22, 1995, Ser. No. 577,652

Int. Cl.^{6} H04N *5/52*

U.S. Cl. 348—682 **15 Claims**



1. A circuit for use in controlling signals having repetitive sync signals and a known signal level during a blanking period, said circuit comprising:

- means for detecting the sync status of an input signal;
- means responsive to a detected loss of said sync status in said input signal for adjusting the gain of said input signal to a preestablished maximum level;
- means responsive to a subsequently detected regaining of sync status for readjusting said gain to a preestablished blanking level; and
- means for thereupon gradually increasing said gain of said signal until said sync status is maintained at a reference level.

5,838,391
METHOD AND APPARATUS FOR DETECTING OPTIMUM MOTION VECTORS

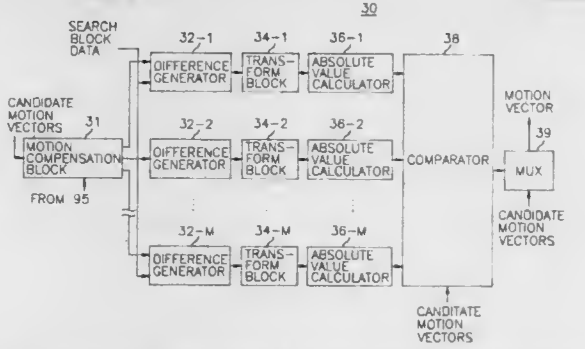
Sang-Ho Kim, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co. Ltd., Seoul, Rep. of Korea

Filed Jul. 1, 1996, Ser. No. 673,461

Claims priority, application Rep. of Korea, Jun. 30, 1995, 1995-19182

Int. Cl.^{6} H04N *7/50*

U.S. Cl. 348—699 **12 Claims**



1. A method for determining a motion vector between a current frame and its reference frame of video signals, wherein the current frame is divided into a plurality of search blocks of an identical size and the reference frame includes a corresponding number of search regions, each search region further including a multiplicity of candidate blocks of said identical size, which comprises the steps of:

- (a) motion-estimating a search block with respect to its corresponding search region to thereby select a multiple number of candidate blocks among the candidate blocks included in the corresponding search region, wherein said selected candidate blocks have error functions not larger than error functions of the unselected candidate blocks included in the corresponding search region;
- (b) generating error signals, each of which represents a difference of pixel data between the search block and each of the selected candidate blocks;
- (c) transforming each of the error signals into a set of transform coefficients, to thereby provide a multiple number of sets of transform coefficients;
- (d) selecting an optimum error signal based on the sets of transform coefficients provided in said step (c); and
- (e) determining a motion vector for the search block, the motion vector representing a displacement of pixels between the search block and a candidate block which corresponds to said optimum error signal.

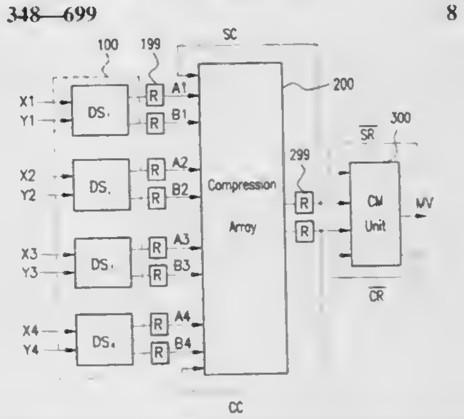
5,838,392
ADAPTIVE BLOCK-MATCHING MOTION ESTIMATOR WITH A COMPRESSION ARRAY FOR USE IN A VIDEO CODING SYSTEM

Hongyi Chen, and Qingming Shu, both of Beijing, China, assignors to United Microelectronics Corp., Hsin-chu, Taiwan

Filed Mar. 19, 1998, Ser. No. 44,570

Int. Cl.^{6} H04N *5/14*

U.S. Cl. 348—699 **8 Claims**



1. An adaptive block-matching motion estimator for use on a video coding system to process a set of pixel data from the blocks of each video frame in a video signal so as to produce a motion vector indicative of a shift between the current frame and a compared frame, said adaptive block-matching motion estimator comprising:

- a DS (data-substraction) array including a plurality of DS units for processing the pixel data of the current image block and the pixel data of the compared image block to thereby obtain a difference vector and a set of weight bits;
- a compression array coupled to said DS array, said compression array having a first output port for outputting a compressed sum vector and a second output port for outputting an associated compressed carry vector, with the difference vector and the set of weight bits from said DS array along with the compressed sum vector and the associated compressed carry vector being taken as the inputs to said compression array; and
- a CM (complexity-matching) unit, coupled to said compression array, for processing the compressed sum vector and the associated compressed carry vector from said compression array to thereby produce the desired motion vector.

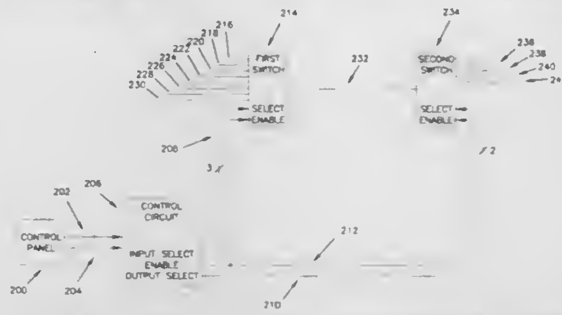
5,838,393
AUDIO/VIDEO/CONTROL REMOTE SWITCHING DEVICE

Stuart Richard Simpson, Northridge, and Leonid Abramovich Grabovetsky, Santa Monica, both of Calif., assignors to Star-Grabber LLC, Van Nuys, Calif.

Filed Apr. 12, 1996, Ser. No. 631,536

Int. Cl.^{6} H04N *5/268*

U.S. Cl. 348—705 **8 Claims**



7. A method of switching analog and digital signals, comprising the steps of selecting an input signal in a switching circuit from among a plurality of inputs to the switching circuit, selecting an output signal in the switching circuit from a plurality of outputs from the switching circuit, encoding the selected input signal, and coupling the encoded selected input signal to the selected output signal in the switching circuit, wherein each of the switching circuits handles a different one of a plurality of signal types and the signal types are selected from a group comprising composite video signals, S-video signals, audio signals, time code signals, and control signals.

5,838,394
PICTURE STORAGE DEVICE SEPARATES LUMINANCE SIGNAL INTO EVEN NUMBER AND ODD NUMBER DATA AND SEPARATES TWO CHANNEL COLOR SIGNAL INTO FORMER HALF PIXELS AND LATTER HALF PIXELS

Masato Kajimoto, Chiba, and Hirofumi Murase, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

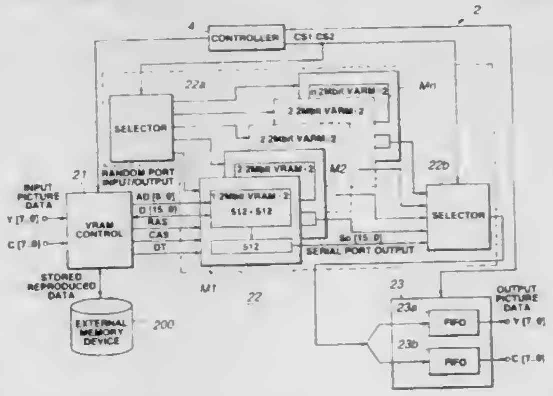
Division of Ser. No. 568,646, Dec. 7, 1995, Pat. No. 5,654,773.

This application Mar. 28, 1997, Ser. No. 828,390

Claims priority, application Japan, Dec. 13, 1994, 6-308945

Int. Cl.^{6} H04N *9/64*

U.S. Cl. 348—717 **1 Claim**



1. A picture storage device comprising:

input data converting means for separating luminance signals of input color picture data into a data string of even-numbered pixels and a data string of odd-numbered pixels and for separating the two-channel color signals of the input color picture data into a data string of former half pixels and a data string of latter half pixels, while converting the luminance signals and two-channel color signals into non-interlaced data with a sampling rate of 4:2:0, and for distributing and re-arraying the separated and converted data;

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control means;
storage means having a storage capacity of at least one frame and adapted for storing data produced by said input converting means in a data re-arraying sequence and including a plurality of two-port video frame random access memories, a first selector for selecting a memory from among said plurality of memories in which data is to be recorded, and a second selector for selecting a memory from among said plurality of memories from which stored data is to be read out, wherein said first selector and said second selector are controlled by said control means so that data corresponding to a respective plurality of pictures can be provided; and
display data converting means for converting the data stored in said storage means and selected by said second selector into picture-displaying data, wherein
said control means further controls said input converting means to be in synchronization with data writing in said storage means.

5,838,395
IF DEMODULATOR CIRCUIT WITH VARIABLE IF GAIN CONTROL

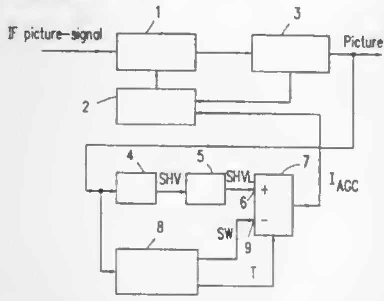
Joachim Brilka, Hamburg, Germany, assignor to U.S. Philips Corporation, NY, N.Y.

Filed Jan. 22, 1997, Ser. No. 787,598

Claims priority, application Germany, Jan. 23, 1996, 196 02 187.1

Int. Cl.^{6} H04N *5/44*

U.S. Cl. 348—726 **10 Claims**



1. An IF demodulator circuit with IF gain control at a variable time constant, said IF demodulator circuit receiving an IF carrier, comprising synchronizing pulses, a black porch and picture information with a positively modulated picture signal, and amplifying the IF picture signal to a nominal amplitude value by means of the IF gain control, said IF demodulator circuit comprising an IF demodulator for demodulating the IF picture signal and for supplying a picture signal from an output, characterized in that said IF demodulator circuit further comprises a black level detector for generating a black level signal used as a threshold value signal in conformity with an amplitude value of the black porch of the picture signal supplied by the IF demodulators; a DC offset circuit for raising a DC component of the picture signal and/or lowering a DC component of the threshold value signal in such a way that both signals are offset by a predetermined value relative to each other; and a comparator circuit for receiving the two signals which are offset relative to each other, the comparator circuit comparing a voltage value of the synchronizing pulses occurring in the picture signal with a voltage value of the threshold value signal, and supplying a comparison signal in dependence upon this comparison, the variable time constant of the gain control being changed in dependence on said comparison signal.

5,838,396
PROJECTION TYPE IMAGE DISPLAY APPARATUS WITH CIRCUIT FOR CORRECTING LUMINANCE NONUNIFORMITY

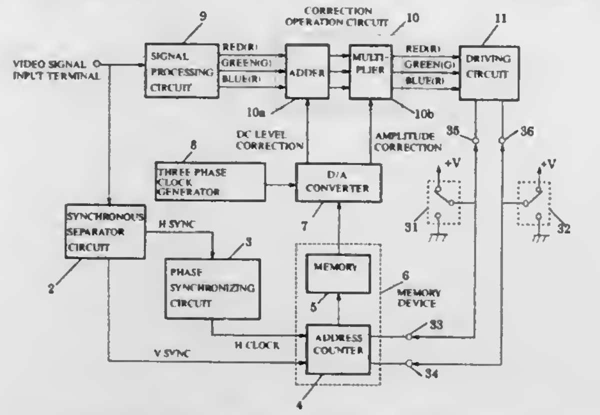
Tetsuro Shiota, Takatsuki; Hiroshi Miyai, Takarazuka, and Hitoshi Noda, Moriguchi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 13, 1995, Ser. No. 571,379

Claims priority, application Japan, Dec. 14, 1994, 6-310397

Int. Cl.^{6} H04N *9/31;9/69*

U.S. Cl. 348—745 **10 Claims**



1. A projection type image display apparatus comprising:
operation means for obtaining digital data comprising a plurality of amplitude and DC level values, each of said values obtained by a straight line approximation for correcting a nonuniformity of luminance for respective physical portions of an image appearing on a screen for at least one of red, green and blue color video signals;
a memory device for storing said digital data;
a D/A converter for converting said digital data read from said memory device to an analog signal having a DC level value and an amplitude value; and,
a correction operation means for correcting said at least one of red, green and blue video signals of said respective physical portions of said image using the DC level value and the amplitude value of the analog signal of said D/A converter;
wherein the DC level and the amplitude of the at least one of red, green, and blue video signals of said respective physical portions of said image are corrected by said correction operation means.

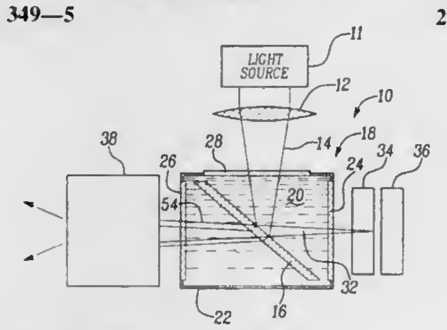
5,838,397
OPTICAL FLUID FOR PROJECTOR PRISM

Craig Stephens, Carlsbad, Calif., assignor to Hughes-JVC Technology Corporation, Carlsbad, Calif.

Filed Oct. 12, 1995, Ser. No. 542,396

Int. Cl.^{6} G07F *1/1335*

U.S. Cl. 349—5 **25 Claims**



20. An optical system comprising:
a transparent dimethyl phthalate fluid;
a container filled with said fluid having at least one window for permitting subject light to enter therein;
at least one optical element within said container for performing a predetermined optical function on said subject light,

wherein said fluid has a viscosity of between about 9 and 40 centistokes and said optical element has an index of refraction approximately the same as the transparent fluid.

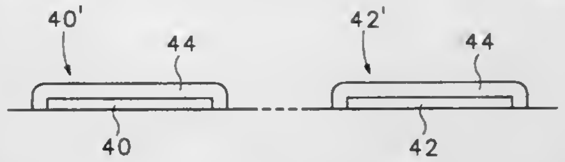
5,838,398
CATHODE STRUCTURE FOR A PLASMA ADDRESSED LIQUID CRYSTAL DISPLAY PANEL

Kevin J. Ilcisin; Thomas S. Buzak, both of Beaverton, and Paul C. Martin, Sunriver, all of Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.

Filed Sep. 9, 1997, Ser. No. 926,218

Int. Cl.^{6} G02F *1/133*

U.S. Cl. 349—32 **13 Claims**



11. A channel member for a PALC panel, said channel member having a plurality of channels in an upper surface thereof and having at least one electrode in one of said channels, wherein said one electrode has a composite structure and comprises a core that includes a metal and a surface layer of a fullerene.

5,838,399
TFT ACTIVE MATRIX LIQUID CRYSTAL DISPLAY DEVICES WITH TWO LAYER GATE LINES, THE FIRST BEING THE SAME LEVEL AS GATE ELECTRODES.

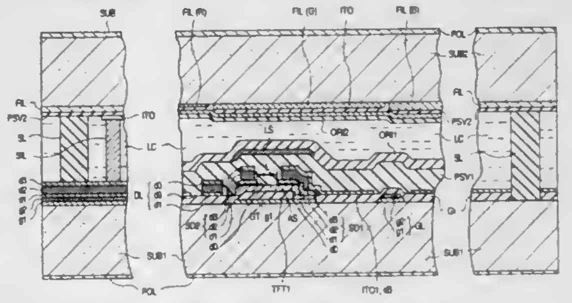
Sakae Someya, Ibaraki-ken; Ryuuzoh Nashimoto; Hirofumi Suzuki, both of Mobara; Katsuhiko Yarita, Ichihara; Shinji Matsumoto, Mobara; Akira Sasano, Nishitama-gun; Hideaki Taniguchi, Mobara, and Ryouji Oritsuki, Chiba-ken, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 610,148, Feb. 29, 1996, Pat. No. 5,708,484, which is a division of Ser. No. 457,577, Jun. 1, 1995, Pat. No. 5,532,850, which is a division of Ser. No. 277,434, Jul. 18, 1994, Pat. No. 5,528,396, which is a division of Ser. No. 910,455, Jul. 8, 1992, Pat. No. 5,331,447, which is a continuation of Ser. No. 205,185, Jun. 10, 1988, Pat. No. 5,132,820. This application Sep. 5, 1997, Ser. No. 924,737

Claims priority, application Japan, Jun. 10, 1987, 62-144913; Sep. 25, 1987, 62-242363; Dec. 9, 1987, 62-309601

Int. Cl.^{6} G02F *1/136;1/1343*

U.S. Cl. 349—46 **28 Claims**



1. A liquid crystal display device comprising:
an insulative substrate,
a scanning signal line formed on said substrate and extending in a first direction,
a gate electrode formed on said substrate and electrically connected to said scanning signal line,
an insulating film formed over said substrate and covering said scanning signal line and said gate electrode,
a semiconductor layer formed on said insulating film and disposed over said gate electrode,
a pixel electrode formed over said substrate and electrically connected to a portion of said semiconductor layer,
an image signal line formed over said insulating film, electrically connected to another portion of said semiconductor layer and extending in a second direction, crossing over said scanning signal line,
wherein said scanning signal line includes a first conductive film and a second conductive film formed on said first conductive film, said second conductive film being disposed, with respect to a plan view thereof, only in an area where said first conductive film is formed, and wherein a width of an upper surface of said second conductive film is substantially smaller than a width of an upper surface of said first conductive film at least in the crossover portion of said scanning signal line and said image signal line.

5,838,400
LIQUID CRYSTAL DISPLAY DEVICE WITH REDUCED FRAME PORTION SURROUNDING DISPLAY AREA

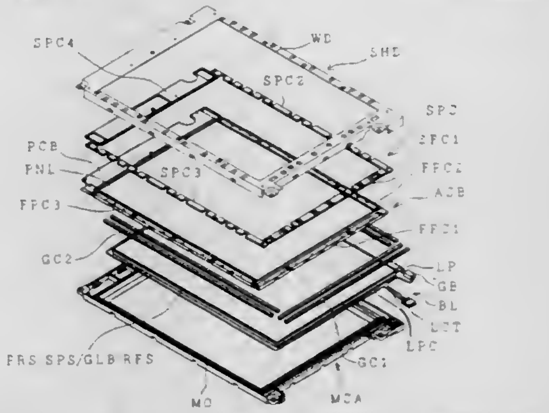
Shiro Ueda, Mobara, Japan; Shunichi Kumaoka, Cupertino, Calif.; Masumi Sasuga, Mobara, Japan; Katsuhiko Shibata, Mobara, Japan; Yoichi Igarashi, Mobara, Japan, and Naoto Kobayashi, Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Device Engineering Co., Ltd., Mobara, both of Japan

Division of Ser. No. 542,962, Oct. 13, 1995, Pat. No. 5,739,887. This application Jan. 14, 1997, Ser. No. 783,090

Claims priority, application Japan, Oct. 21, 1994, 6-256426; Oct. 21, 1994, 6-256427; Oct. 21, 1994, 6-256428

Int. Cl.^{6} G02F *1/1335*

U.S. Cl. 349—58 **4 Claims**



1. A liquid crystal display device comprising: a liquid crystal display element having two superposed transparent insulating substrates confining a liquid crystal inbetween; and a side light type back light for illuminating said liquid crystal display element from the back, wherein a fluorescent tube of said back light has a lamp cable guided along the outer periphery in parallel with the four sides of said liquid crystal display element below said liquid crystal display element.

5,838,401
IMPACT RESISTANT CRYSTAL APPARATUS

Makoto Uehara, Zama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 14, 1997, Ser. No. 816,998

Claims priority, application Japan, Mar. 15, 1996, 8-059664

Int. Cl.^{6} G02F *1/1333;1/1345*

U.S. Cl. 349—58 **12 Claims**

1. A liquid crystal apparatus, comprising:
a rectangular plate member,
a liquid crystal panel supported by the plate member,
a frame-shaped support member disposed with a prescribed gap from and so as to surround the plate member, and

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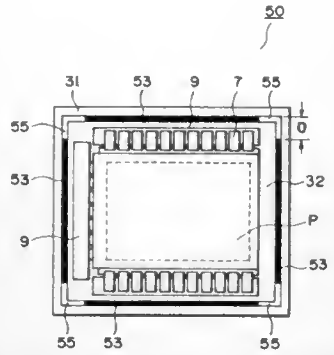


a first elastic member disposed at the prescribed gap to connect the plate member and the support member to each other,

wherein the plate member is free from connection to the support member by means of the first elastic member at corners of the plate member.

5,838,402

ELECTRIC APPLIANCE, ITS ASSEMBLING METHOD, AND ITS HOUSING STRUCTURE

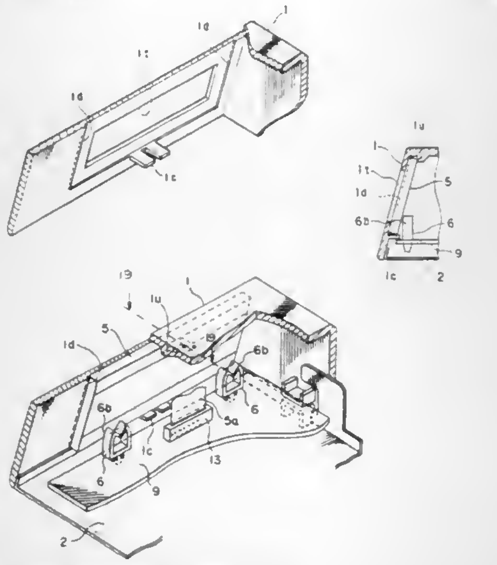
Kazun Sanpei, and Tatsuo Yamauchi, both of Fukushima-ken, Japan, assignors to Hitachi Telecom Technologies, Ltd., Japan

Division of Ser. No. 479,640, Jun. 7, 1995, Pat. No. 5,602,722, which is a division of Ser. No. 127,568, Sep. 28, 1993, Pat. No. 5,461,543. This application Aug. 28, 1996, Ser. No. 697,555

Claims priority, application Japan, Sep. 28, 1992, 4-281094; Sep. 28, 1992, 4-281095; Sep. 28, 1992, 4-281096; May 18, 1993, 5-138922

Int. Cl.^{6} G02F *1/1333*

U.S. Cl. 349—60 **2 Claims**



1. An electric appliance comprising:

a case;

an accommodation portion for accommodating a display, the accommodation portion being arranged at a front face portion of the case with a stepped portion having an opening;

upper and lower protrusions respectively arranged above and below the opening; and

a logic package enclosed by the case, the logic package including a holding member that restricts movement of the display away from the stepped portion,

wherein the display engages with the upper protrusion and mounts on the lower protrusion such that the display is positioned adjacent to the stepped portion and is visible through the opening, and

wherein the holding member has resiliency so as to press the display against the stepped portion.

5,838,403

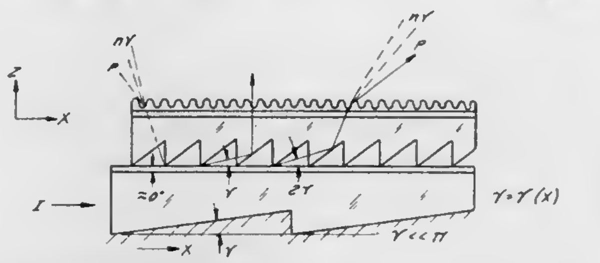
LIQUID CRYSTAL DISPLAY SYSTEM WITH INTERNALLY REFLECTING WAVEGUIDE FOR BACKLIGHTING AND NON-LAMBERTIAN DIFFUSING

Joanna L. Jannson; Tomasz P. Jannson, both of Torrance, and Jeremy M. Lerner, Culver City, all of Calif., assignors to Physical Optics Corporation, Torrance, Calif.

Filed Feb. 14, 1996, Ser. No. 601,133

Int. Cl.^{6} G02F *1/33*

U.S. Cl. 349—65 **67 Claims**



1. An apparatus, comprising:

an illumination source for producing light;

a first collimating waveguide optically connected to said illumination source, said first collimating waveguide including a top surface, an incident end and a first plurality of substantially parallel optical elements for redirecting light from said incident end to, and through, said top surface by total internal reflection, each of said first plurality of optical elements including a concave first facet that is nonparallel to said top surface and a second facet that is nonparallel to said top surface, said second facet being concave with respect to said top surface;

a second collimating waveguide optically connected to said first collimating waveguide, said second collimating waveguide including an upper surface and a second plurality of optical elements for redirecting light from said top surface through said upper surface;

a diffuser for homogenizing light optically connected to said second collimating waveguide; and

a reflector optically connected to said light source and optically connected to said first distributed wedge collimating waveguide, said reflector (1) at least partially surrounding said illumination source, and (2) reflecting light from said illumination source to said incident end by direct reflection.

5,838,404

DISPLAY DEVICE WITH OPTICAL MEMBER HAVING TWO PARTS IN OVERLAY RELATION TO REFLECT LIGHT INCIDENT AT PARTICULAR ANGLE

Masao Ozeki; Yoshinori Hirai, and Yoshiharu Ooi, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

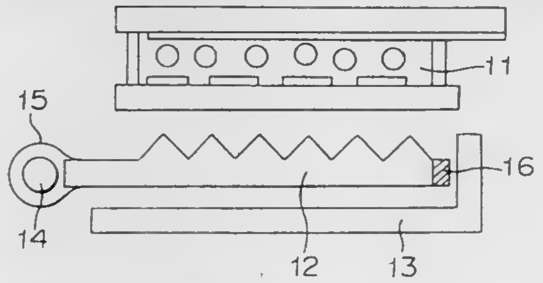
PCT No. PCT/JP95/00321, § 371 Date Nov. 1, 1995, § 102(e) Date Nov. 1, 1995, PCT Pub. No. WO95/23996, PCT Pub. Date Sep. 8, 1995

PCT Filed Mar. 1, 1995, Ser. No. 535,061

Claims priority, application Japan, Mar. 1, 1994, 6-031589

Int. Cl.^{6} G02F *1/1335;* G02B *6/10*

U.S. Cl. 349—65 **3 Claims**



1. A display device comprising:

a transparent-scattering type display element in which light scattering characteristics are changed in response to an external input;

an optical member disposed at a back side of the transparent-scattering type display element, which substantially transmits light which passes through the transparent-scattering type display element within a predetermined range of an incident angle, and substantially reflects other light; and

a light absorber disposed at the back side of the optical member;

wherein the optical member comprises two parts in an overlay relation.

5,838,405

TILED DISPLAY DEVICE

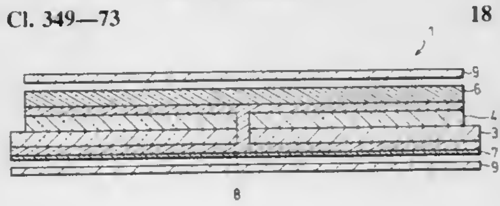
Yoshihiro Izumi, Kashihara, and Tokihiko Shinomiya, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

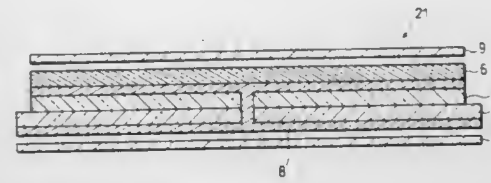
Filed Jan. 30, 1996, Ser. No. 594,033

Claims priority, application Japan, Mar. 31, 1995, 7-076779

Int. Cl.^{6} G02F *1/1333*

U.S. Cl. 349—73 **18 Claims**





1. A display device including:

a large-scaled substrate;

a flexible coat layer opposing said large-scaled substrate; and

a set of display panels aligned adjacently to each other, said set of display panels being provided between said large-scaled substrate and said coat layer;

a space between said large-scaled substrate and said coat layer being filled with an adhesive agent, said adhesive agent connecting each display panel to another and connecting said set of display panels and said large-scaled substrate and said coat layer.

5,838,406

LIGHT REFLECTANT SURFACE OF EXPANDED POLYTETRAFLUOROETHYLENE WITH NODES AND FIBRILS FOR BACKLIT LIQUID CRYSTAL DISPLAYS

Gordon L. McGregor, Landenberg, Pa.; Raymond B. Minor, Elkton, Md., and Gregory E. Hannon, Newark, Del., assignors to W. L. Gore & Associates, Inc., Newark, Del.

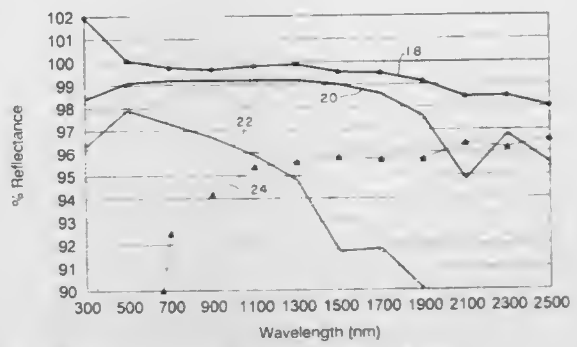
Filed Aug. 29, 1995, Ser. No. 520,633

Int. Cl.^{6} G02F *1/1335;* G02B *5/12;5/02;* F21V *7/00*

U.S. Cl. 349—113 **13 Claims**

1. A backlighted visual display comprising

at least one sheet of expanded polytetrafluoroethylene (PTFE) comprising a structure of nodes and fibrils, the sheet being conformable;



at least one light fixture mounted in the display;

a light transmitting screen;

the at least one sheet of expanded PTFE being mounted in the display so as to provide a high diffuse reflectivity of light from the light fixture through the screen.

5,838,407

LIQUID CRYSTAL DISPLAY CELLS

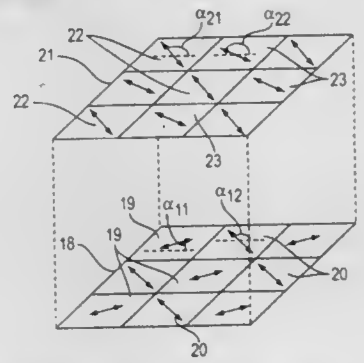
Vladimir Grigorievich Chigrinov; Vladimir Marcovich Kozenkov; Nicolic Vasilievich Novoseletsky, all of Moscow, Russian Federation; Victor Yurievich Reshetnyak; Yuriy Alexandrovich Reznikov, both of Kiev, Ukraine; Martin Schadt, Seltisberg, Switzerland, and Klaus Schmitt, Lörrach, Germany, assignors to ROLIC AG, Zug, Switzerland

Continuation of Ser. No. 373,733, Jan. 17, 1995, abandoned, which is a continuation of Ser. No. 271,550, Jul. 7, 1994, abandoned, which is a continuation of Ser. No. 125,005, Sep. 21, 1993, abandoned, which is a continuation of Ser. No. 910,066, Jul. 8, 1992, abandoned. This application Feb. 16, 1996, Ser. No. 601,310

Claims priority, application Switzerland, Jul. 26, 1991, 2246/91; Jan. 14, 1992, 100/92

Int. Cl.^{6} G02F *1/1335*

U.S. Cl. 349—187 **6 Claims**



1. A liquid crystal display cell comprising an oriented liquid crystal layer disposed between two plates which are provided with transparent electrode layers disposed on the inner sides of said plates, and orientation layers disposed on the inner sides of the electrode layers and aligning the adjacent liquid crystal molecules in predetermined directions, at least one of said orientation layers comprising an oriented linearly polarized light modified photopolymer.

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5,838,408

LIQUID CRYSTAL DEVICE AND ELECTRONIC EQUIPMENT USING THE SAME

Yasuyuki Inoue, Nerima; Chiyoaki Iijima, and Toshihiko Tsuchihashi, both of Suwa, all of Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

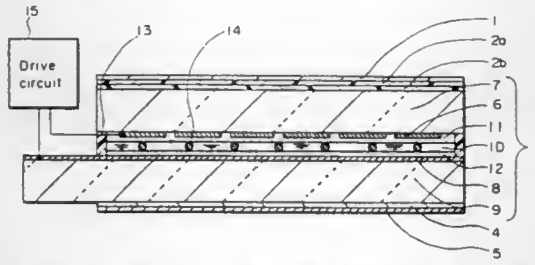
PCT No. PCT/JP95/02204, § 371 Date Jul. 8, 1996, § 102(e) Date Jul. 8, 1996, PCT Pub. No. WO96/13752, PCT Pub. Date May 9, 1996

PCT Filed Oct. 26, 1995, Ser. No. 666,284

Claims priority, application Japan, Oct. 26, 1994, 6-262529; Oct. 26, 1994, 6-262530; Jul. 24, 1995, 7-186784

Int. Cl.^{6} G02F *1/1347;1/13*

U.S. Cl. 349—118 **19 Claims**



1. A liquid crystal device comprising a liquid crystal cell having a layer of nematic liquid crystal twisted to within the range of 180° to 360° and a pair of substrates on which are formed electrodes for applying a voltage to said nematic liquid crystal layer and which are disposed in an opposing manner in a form that sandwiches said nematic liquid crystal layer therebetween;

a pair of polarizing plates disposed on either side of said liquid crystal cell in a sandwich form;

a retardation film formed of polyvinyl alcohol (PVA) and provided between said liquid crystal cell and at least one polarizing plate of said pair of polarizing plates; and

voltage application means capable of selecting at least three voltages to be applied between said pair of substrates; wherein:

said liquid crystal cell and said retardation film satisfy the relationships of Equations 1 and 2 below:

$$\Delta n \cdot d \geqq 1(\mu m) \qquad \text{Equation 1}$$

$$0.51 \leqq R - \Delta n \cdot d \leqq 1.21(\mu m) \qquad \text{Equation 2}$$

where: Δn·d is the product of the optical anisotropy Δn of said nematic liquid crystal layer and the thickness d of said nematic liquid crystal layer; and R is the sum of the products Δnj·dj of the optical anisotropy Δnj of a jth (where j is an integer) layer of said retardation film and the thickness dj of the jth layer of said retardation film, taken from a first layer to an ith layer (where i is an integer greater than or equal to j) when i layers of said retardation film are used.

5,838,409

LIQUID CRYSTAL DEVICE SUBSTRATE, LIQUID CRYSTAL DEVICE, AND METHOD AND APPARATUS FOR MANUFACTURING THE SAME

Haruo Tomono, Machida; Masaru Kamio, Sagamihara; Hiroyuki Tokunaga, Fujisawa, and Yuji Matsuo, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 1, 1996, Ser. No. 742,050

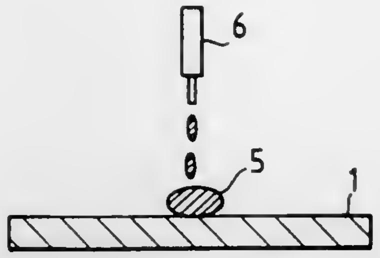
Claims priority, application Japan, Nov. 9, 1995, 7-291148; Oct. 9, 1996, 8-268238

Int. Cl.^{6} G02F *1/1333;1/1343;1/13*

U.S. Cl. 349—122 **31 Claims**

1. A liquid crystal device substrate in which conductive patterns formed on a surface of a transparent substrate are buried flat with a resin material,

wherein said resin material comprises a cured liquid resin material, and



said liquid resin material is set between a flat surface of a mold substrate and said surface of said substrate, spread when said mold substrate and said substrate are substantially linearly pressed, and a pressed portion is moved from one side of an integral structure of said mold substrate and said substrate to the other side, and then cured, thereby forming said resin material upon separating said mold substrate.

wherein said substrate comprises a glass substrate in which color filter layers are formed under said conductive patterns.

5,838,410

OPTICAL MODULATION ELEMENT

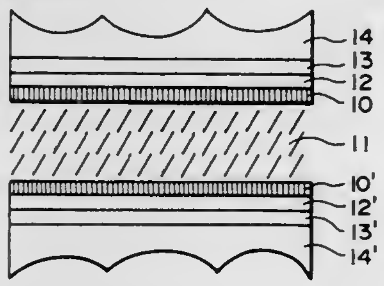
Ryoji Fujiwara, Chigasaki; Shuzo Kaneko, Yokohama; Akio Maruyama, Tokyo; Tomoko Maruyama, Isehara, and Tomoko Murakami, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 857,509, Mar. 25, 1992, Pat. No. 5,327,272. This application Apr. 7, 1994, Ser. No. 224,662

Claims priority, application Japan, Mar. 27, 1991, 3-063200; Jul. 26, 1991, 3-208930

Int. Cl.^{6} G02F *1/1335*

U.S. Cl. 349—123 **15 Claims**



1. A liquid crystal device, comprising:

a pair of substrates sandwiching a chiral smectic liquid crystal therebetween;

a matrix comprising plural transistors for applying a voltage to said liquid crystal;

a drain electrode for applying a voltage to said liquid crystal at a corresponding pixel;

an opposing electrode opposing said drain electrode through said liquid crystal, wherein said liquid crystal of said pixel is supplied with a reset voltage of one polarity and a write voltage of the other polarity, through said transistor; and

an orientation film covering at least one of said drain electrode and said opposing electrode, said orientation film containing plural conductive particles having a maximum particle diameter of about 100 Å.

5,838,411

LIQUID CRYSTAL DISPLAY DEVICE WITH UNEQUAL SIZED DUMMY SUB-ELECTRODES HAVING A SPECIFIC RELATIONSHIP

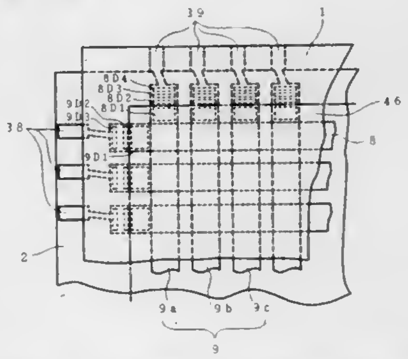
Kouji Hayakawa; Satoshi Endo; Hisashi Yoshida; Noboru Hoshino, all of Mobara, and Masayoshi Fujieda, Isumi-gun, all of Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Device Engineering Co., Ltd., Mobara, both of Japan

Division of Ser. No. 552,101, Nov. 2, 1995, abandoned. This application Dec. 10, 1997, Ser. No. 988,234

Claims priority, application Japan, Nov. 14, 1994, 6-279186; Feb. 6, 1995, 7-17407

Int. Cl.^{6} G02F *1/1343*

U.S. Cl. 349—139 **1 Claim**



1. A liquid crystal display device including a liquid crystal display panel comprising:

a first substrate having (a) plural sets of filters, each of filters of a set of said plural sets having a different color from other filters of said set and said filters being arranged in a predetermined order, (b) a patterned light blocking film disposed between said filters of said set and between said plural sets of filters so that a portion of said plural sets of filters and said light blocking film are disposed in a marginal area outside of an optically switchable useful area which is optically switchable upon application of an electric field thereto on said liquid crystal display panel, and (c) a first plurality of transparent electrodes disposed on said plural sets of filters;

a second substrate having a second plurality of transparent electrodes thereon arranged to extend transversely to said first plurality of transparent electrodes;

a liquid crystal layer sandwiched between said first and second substrates with said first and second plurality of transparent electrodes opposing each other;

spacers dispersed between said first and second substrates; and

a plurality of dummy electrodes formed in said marginal area on at least one of said first and second substrates so as to extend in a direction perpendicular to said first or second plurality of electrodes on said at least one of said first and second substrates and to oppose said first or second plurality of electrodes on said first or second substrate opposing said at least one of said first and second substrates so that each of said dummy electrodes is sub-divided into a plurality of sub-electrodes arranged in said direction perpendicular to said first or second plurality of electrodes;

wherein said sub-electrodes include a large area sub-electrode disposed in said marginal area within a display area delimited by a frame of said liquid crystal display device and a plurality of small-area sub-electrodes disposed in said marginal area outside said display area and the width of each of said dummy electrodes on said at least one of said first and second substrates is smaller than the width of each of said first and second plurality of electrodes on said first or second substrate opposing said at least one of said first and second substrates.

5,838,412

LIQUID CRYSTAL DISPLAY DEVICE ASSEMBLED BY FLIP CHIP TECHNOLOGY COMPRISING A FOLDED MULTI-LAYERED FLEXIBLE DRIVING CIRCUIT SUBSTRATE

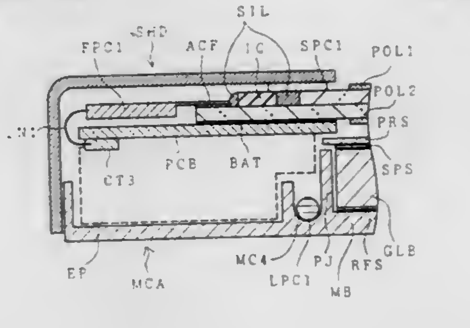
Shiro Ueda; Katsuhiko Shibata; Masumi Sasuga; Norihisa Fukayama, and Naoto Kobayashi, all of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Device Engineering Co., Ltd., Chiba-ken, both of Japan

Filed Nov. 4, 1996, Ser. No. 742,675

Claims priority, application Japan, Nov. 16, 1995, 7-297236; Nov. 16, 1995, 7-297242

Int. Cl.^{6} G02F *1/1345*

U.S. Cl. 349—150 **10 Claims**



C – C'

1. A liquid crystal display device comprising a flexible circuit board having a conductor layer, one end of which is connected to the surface of a wiring portion at an end of a liquid crystal display element, and an intermediate portion of which is folded, and whose other end is arranged on the lower or upper side of the end of said liquid crystal display element; wherein said flexible circuit board has at least said one conductor layer and two insulator film layers, and an end of one of the two insulator film layers of said flexible circuit board is formed into a repetitive pattern of waved or serrated portions having crests and troughs in the folding line direction.

5,838,413

METHOD FOR DISTRIBUTING SPACER PARTICLES ONTO THE SUBSTRATE OF A LIQUID CRYSTAL DISPLAY ELEMENT, A JIG PLATE AND DISTRIBUTING APPARATUS FOR DISTRIBUTION THEREWITH

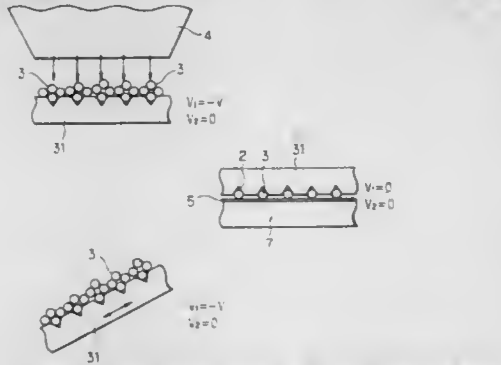
Hirotsugu Matoba, Sakurai; Susumu Hirata, Ikoma-gun; Yorishige Ishii, Yamatotakada; Shingo Abe, Tenri; Hiroshi Onda, Yamatokoriyama, and Tetsuya Inui, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 29, 1996, Ser. No. 758,427

Claims priority, application Japan, Nov. 30, 1995, 7-312916

Int. Cl.^{6} G02F *1/1339*

U.S. Cl. 349—155 **13 Claims**



1. A spacer particle distributing method for distributing spacer particles onto the substrate of a liquid crystal display element of a liquid crystal display device, comprising the steps of:

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supplying the spacer particles onto a particle distributing jig plate having a plurality of spacer particle positioning portions by placing the spacer particles into a one-to-one correspondence therewith;
allocating the spacer particles to the spacer particle positioning portions;
the step of allocating including displacing the particle distributing jig plate to remove from the jig plate spacer particles misaligned with spacer particle positioning portions of said jig plate;
registering the particle distributing jig plate in face-to-face relation with the liquid crystal display element substrate; and
transferring the spacer particles allocated to the spacer particle positioning portions, onto the liquid crystal display substrate.

5,838,414
LCD DEVICE WITH IMPROVED RESILIENT ADHESIVE SPACERS

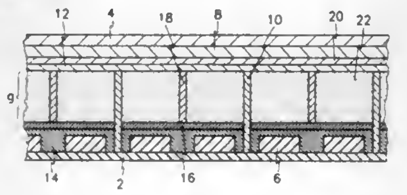
Sangrok Lee, Kyungki-do, Rep. of Korea, assignor to Samsung Display Devices Co., Ltd., Kyungki-do, Japan

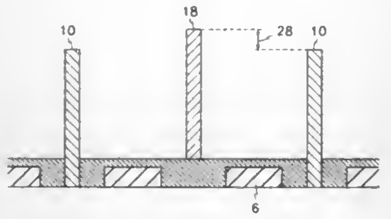
Filed Oct. 22, 1996, Ser. No. 734,885

Claims priority, application Rep. of Korea, Dec. 30, 1995, 95-68206

Int. Cl.^{6} G02F ***1/1339***

U.S. Cl. 349—157 **13 Claims**





1. A liquid crystal display device comprising:
first and second substrates disposed substantially parallel to each other;
a plurality of transparent electrodes disposed on one side of each of said first and second substrates in a predetermined pattern, wherein said predetermined pattern defines active display areas of the device and inactive display areas of the device;
spacer means for maintaining a substantially uniform predetermined cell gap for liquid crystal material between the first and second substrates, wherein said spacer means is disposed substantially only in the inactive display areas of the device;
first and second insulating layers disposed respectively on the first and second substrates to cover the transparent electrodes;
first and second alignment layers disposed respectively on the first and second insulating layers; and
shock absorbing means for absorbing shock forces between the first and second substrates, said shock absorbing means being disposed substantially only in the inactive display areas of the device;
wherein said spacer means extends substantially from the first substrate to said second alignment layer, and said shock absorbing means comprises an end spaced away from the first substrate and extending substantially from the first alignment layer to the second alignment layer.

10. A liquid crystal display device comprising:
first and second substantially planar substrates disposed substantially parallel to each other;
a plurality of transparent electrodes disposed on one side of each of the first and second substrates in a predetermined pattern, said predetermined pattern defining active display areas of the device and inactive display areas of the device;
a rigid spacer for maintaining a substantially uniform cell gap between the first and second substrates;
a resilient spacer for absorbing shock forces between the first and second substrates;
wherein said rigid and resilient spacers are disposed substantially only in the inactive display areas of the device;
first and second insulating layers disposed respectively on the first and second substrates to cover the transparent electrodes; and
first and second alignment layers disposed respectively on the first and second insulating layers;
wherein said rigid spacer extends substantially from the first substrate to said second alignment layer, and said resilient spacer comprises an end spaced away from the first substrate and extending substantially from the first alignment layer to the second alignment layer.

5,838,415
LIQUID CRYSTAL PANEL WITH REDUCED DEFECTS AND AN IMAGE PROJECTOR USING A LIQUID CRYSTAL PANEL AS AN OPTICAL SPATIAL MODULATOR

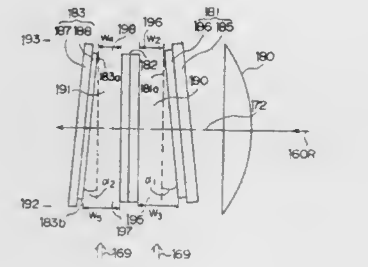
Keiji Hayashi; Tetsuya Hamada, and Takeshi Gotoh, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

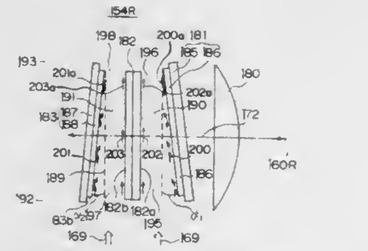
Division of Ser. No. 681,617, Jul. 29, 1996. This application Jun. 25, 1997, Ser. No. 882,523

Claims priority, application Japan, Oct. 18, 1995, 7-269606; Jan. 23, 1996, 8-009471

Int. Cl.^{6} G02F ***1/1335;1/1333***

U.S. Cl. 349—161 **8 Claims**





1. A liquid crystal projector, comprising:
a light source for producing an optical beam;
a liquid crystal panel disposed in an optical path of said optical beam;
a first polarizer disposed in said optical path of said optical beam at a first side of said liquid crystal panel closer to said light source, with a separation from said liquid crystal panel;
a second polarizer disposed in said optical path of said optical beam at a second, opposite side of said liquid crystal panel, with a separation from said liquid crystal panel;
said liquid crystal panel, said first polarizer and said second polarizer forming together an optical spatial modulator,
an optical system disposed in said optical path of said optical beam at a side away from said optical source with respect to said second polarizer; and
an air blower for cooling said optical spatial modulator, wherein the air blower induces an air flow such that said air flow enters a gap formed between said first polarizer and said liquid crystal panel and further et gap formed between said second polarizer and said liquid crystal panel;
at least one of said first and second polarizers being disposed with a tilt angle with respect to said liquid crystal panel, such that said air flow from said air blower hits said polarizer obliquely.

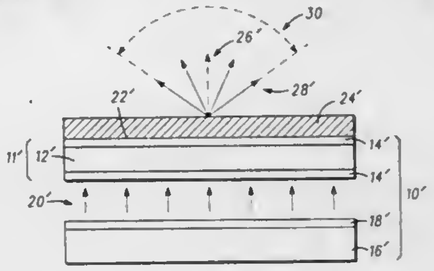
5,838,416
DEVICE AND METHOD FOR ENHANCING THE VIEWING ANGLE OF A DISPLAY

Diana Chen, Gilbert; Phil Wright, Scottsdale, and Karen E. Jachimowicz, Laveen, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 13, 1997, Ser. No. 799,316

Int. Cl.^{6} G02F ***1/13***

U.S. Cl. 349—202 **24 Claims**



1. A device for enhancing the viewing angle of a display comprising a:
a display, generating a display image viewable at a primary viewing axis; and
a liquid crystal beam deflector, positioned adjacent a surface of the display, the liquid crystal beam deflector capable of deflecting the display image incident thereon, thereby deflecting the primary viewing axis and generating at least one altered primary viewing axis.

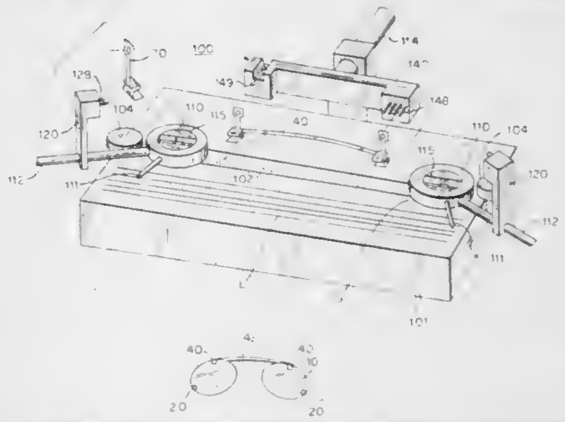
5,838,417
APPARATUS AND METHOD FOR ASSEMBLING CLIP-ON EYEGLASS ACCESSORIES

Michael Dahan, and Charles Dahan, both of Rockville, Md., assignors to Custom Optical Frames, Inc., Rockville, Md.

Filed Jun. 18, 1997, Ser. No. 877,588

Int. Cl.^{6} G02C ***13/00***

U.S. Cl. 351—42 **9 Claims**



1. An assembly jig for assembling an eyeglass accessory including a bridge, clasps, and two eyeglass accessory lenses, the jig comprising:
a base;
two lens mounts, connected to said base, each being matable with a lens holder which is capable of holding one of the eyeglass accessory lenses;
means for adjusting the distance between said lens mounts;
means, connected to said base, for removably holding the bridge in a fixed orientation with respect to said lens mounts and for moving the bridge toward and away from said lens mounts; and
a plurality of means, connected to said base, for removably holding a clasp in a fixed but adjustable orientation with respect to one of said lens mounts and for moving the clasp along a fixed but adjustable axis toward and away from said lens mount, the number of said means for holding a clasp being equal to the number of clasps in the eyeglass accessory.

5,838,418
ELASTICALLY RETRACTING TEMPLE ASSEMBLIES FOR SPECTACLES

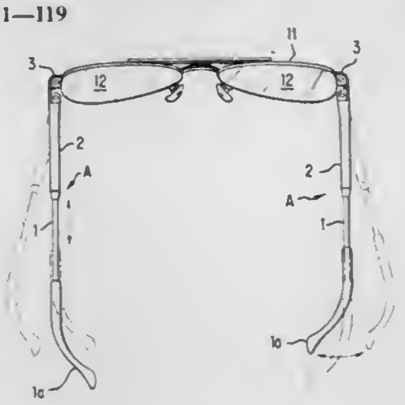
Kiyomi Kanda, Yao, Japan, assignor to World Optical Co., Ltd., Osaka, Japan

Filed Mar. 20, 1997, Ser. No. 822,584

Claims priority, application Japan, Apr. 16, 1996, 8-094480

Int. Cl.^{6} G02C ***5/14***

U.S. Cl. 351—119 **12 Claims**



1. A temple assembly for pivotable attachment to a lens holding frame of spectacles, the temple assembly comprising:
a first temple portion having a pivot means for pivotably attaching to said lens holding frame and an abutment for engaging said lens holding frame to restrict outward pivoting of said first temple portion away from said lens holding frame;
a second temple portion having a first end portion with an ear engaging section and a second end portion slidably engaging said first temple portion; and
a temple bias means for retractably biasing said first temple portion and said second temple portion to bias said ear engaging section toward said first temple portion.

5,838,419
METHOD AND APPARATUS FOR TREATING REFRACTIVE EYE ABNORMALITIES

Stephen Holland, 1108 W. Nassau Dr., Peoria, Ill. 61615-1379

Filed Feb. 22, 1996, Ser. No. 605,377

Int. Cl.^{6} G02C ***7/02;7/04;7/10;*** **A61F** ***2/16***

U.S. Cl. 351—177 **42 Claims**

1. A method for treating a refractive abnormality, comprising the steps of:

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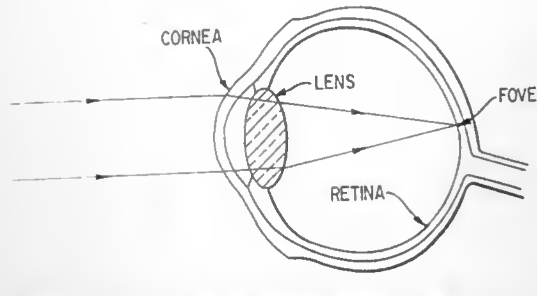


identifying a refractive abnormality of an eye; and

treating said refractive abnormality by controlling a spectral power distribution of visible light incident to the eye to effect a change in the shape of the eve over time.

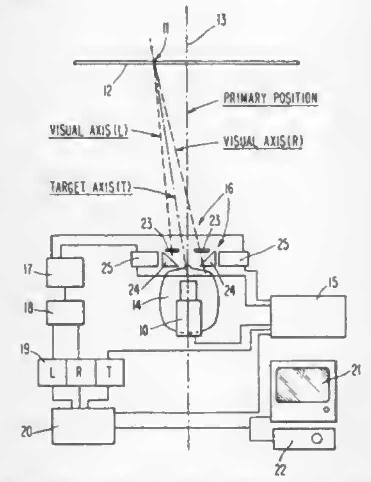
5,838,420
METHOD AND APPARATUS FOR OCULAR MOTILITY TESTING

William Blair MacGregor Donaldson, Aberdeen, United Kingdom, assignor to BID Instruments Limited, Aberdeen, United Kingdom

Continuation-in-part of Ser. No. 313,051, Sep. 30, 1994, Pat. No. 5,550,601. This application May 21, 1996, Ser. No. 651,843

Int. Cl.^{6} A61B *3/14*

U.S. Cl. 351—209 **13 Claims**



1. An apparatus for ocular motility testing comprising;

gaze-direction detection means for determining the visual axis directions of one or both eyes of an observer viewing a target in relation to a reference primary position of the one or both eyes detected by the gaze-direction means;

means for projecting a target to be viewed by the observer onto a screen remote from and at an alignment with the observer's head; the projector means being coupled to the observer's head for following movement thereof that may disturb said alignment with the screen.

5,838,421
BINOCULAR DIRECT OPTHALMOSCOPE

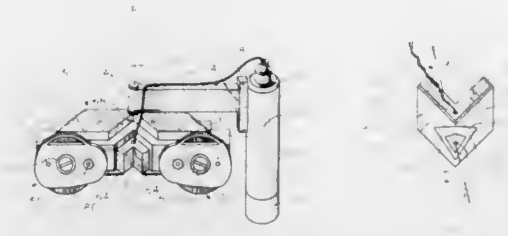
Henry Pedack, 3228 Iowa Dr., Bellingham, Wash. 98226

Filed Apr. 3, 1997, Ser. No. 825,742

Int. Cl.^{6} A61B *3/10*

U.S. Cl. 351—218 **9 Claims**

1. A hand held, binocular direct ophthalmoscope of the type in which the viewing axis is substantially coaxially-aligned with a beam of light directed into the eye under examination and equipped with a binocular optical assembly for stereoscopic viewing by an observer of light reflected from the eye, comprising:



(a) light beam generating means, including a light source for generating a beam of visible light along a first axis;

(b) a binocular optical system, including

(1) beam splitter means positioned on said first axis for receiving and splitting a portion of the reflected light into a left-directed and a right-directed beam;

(2) left beam deflecting means for deflecting light from the left-directed beam along a second axis toward the left eye of the observer;

(3) right beam deflecting means for deflecting light from the right-directed beam along a third axis toward the right eye of the observer;

(4) means for simultaneously positioning any one of a plurality of observer-selectable magnifying loupes on the second and third axes, respectively; and

(c) hand-held support means for supporting the light beam generating means and the binocular optical system; wherein the light source, the left beam deflecting means, and the right beam deflecting means are all disposed substantially within a single plane that includes the first, second and third axes, and wherein the portion of the reflected light that is split by the beam splitter means lies within a circle centered on and normal to the first axis and having a diameter of up to eight millimeters.

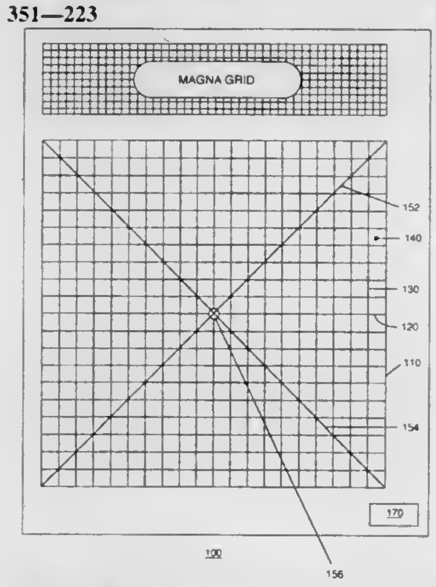
5,838,422
OPHTHALMOLOGICAL SELF-TEST UNIT FOR EVALUATING MACULAR DEGENERATION

Patrick J. Caskey, 5111 Foothill Ranch Rd., Santa Rosa, Calif. 95404

Continuation-in-part of Ser. No. 582,610, Jan. 3, 1996, Pat. No. 5,646,710. This application Dec. 23, 1996, Ser. No. 771,542

Int. Cl.^{6} A61B *3/02;3/00*

U.S. Cl. 351—223 **24 Claims**



1. An ophthalmological self test apparatus for assisting in the daily evaluation of the human eye, the apparatus comprising:

a first layer having a top rewriteable surface and a grid pattern dispósed thereon; and

a magnetic second layer fixedly attached to said first layer for attaching said self test apparatus to a magnetically permeable surface.

5,838,423
APPARATUS FOR COLLECTING DATA

Demetrius Papakostopoulos, Redland, United Kingdom, assignor to Atel Systems Limited, United Kingdom

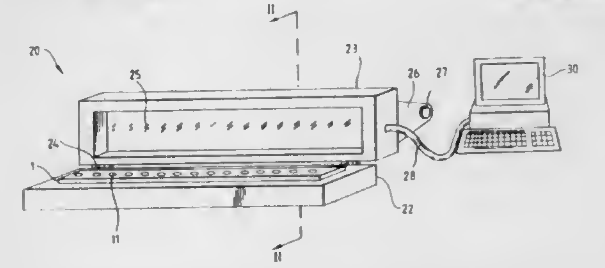
PCT No. PCT/GB94/00883, § 371 Date Apr. 4, 1996, § 102(e) Date Apr. 4, 1996, PCT Pub. No. WO94/24926, PCT Pub. Date Nov. 10, 1994

PCT Filed Apr. 26, 1994, Ser. No. 535,202

Claims priority, application United Kingdom, Apr. 29, 1993, 9308893

Int. Cl.^{6} A61B *3/02*

U.S. Cl. 351—242 **14 Claims**



1. An apparatus for collecting data comprising:

at least one rack, said at least one rack containing a plurality of counters, each counter having an associated electrical attribute of a known value, of the electrical attribute of each counter differing from that of each of the other counters of said at least one rack; and

processing means for collecting and processing data; relating to the electrical attributes said counters

the apparatus further comprising a data collecting probe having a platform including a first recess, a cover including a second recess and having hinges along one side for connecting the cover to the platform, contacts disposed in the recess of the cover and connected to said processing means, the contacts being arranged to contact respective counters when said at least one rack is received in the probe, and said at least one rack being insertable into the data collecting probe so as to be received in the first and second recesses.

5,838,424
VIEW PORT FOR EYE TEST APPARATUS

Marcia J. Wawro, Auburn, and William R. Witkowski, Marcellus, both of N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Feb. 26, 1997, Ser. No. 806,913

Int. Cl.^{6} A61B *3/00*

U.S. Cl. 351—245 **43 Claims**

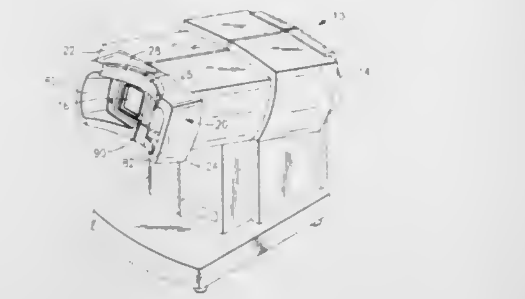
5. An eye test apparatus of the type having a single examination area, said eye test apparatus comprising:

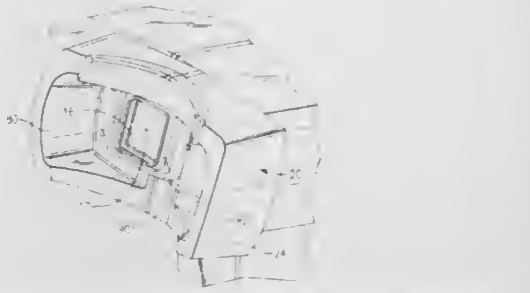
a housing;

a view port casing having a formation for receiving a patient's head;

mounting means for mounting said view port to said housing, said mounting means permitting movement of said view port casing;

a sensor system for sensing a present position of said view port casing; and





a control unit responsive to said sensor system for controlling an administration of a test to a patient.

5,838,425
EXPOSURE CONTROL FOR THE PHOTOGRAPHIC RECORDING OF A MICROSCOPE IMAGE

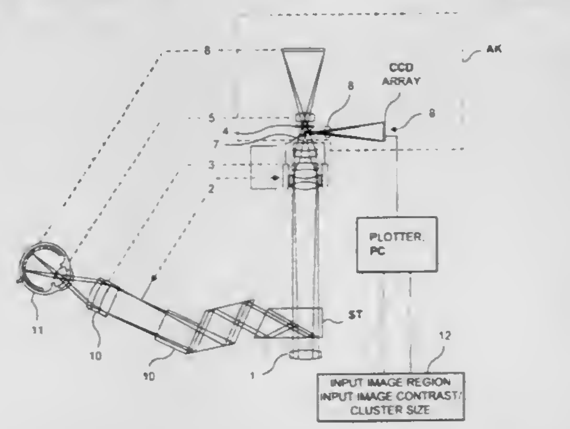
Burkhard Goetz, Jena; Dirk Kohle, Heidenheim; Johannes Knoblich; Hans Tandler, both of Jena, and Bernd Faltermeier, Aalen, all of Germany, assignors to Carl Zeiss Jena GmbH, Jena, Germany

Filed Nov. 19, 1996, Ser. No. 752,313

Claims priority, application Germany, Nov. 23, 1995, 195 43 585.0; Nov. 14, 1996, 196 46 962.7

Int. Cl.^{6} G03B *7/08*

U.S. Cl. 355—18 **27 Claims**



1. An exposure control system for the photographic recording of a microscope image comprising:

a two-dimensional photoelectric receiver arrangement for detecting the image brightness of the microscope image, said receiver arrangement being a component part of a camera system which is attachable to a standard camera port of a microscope;

said receiver arrangement having an interface for transmitting image information of a microscopic object detected by said receiver arrangement to a viewing unit; and

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a first input device to which said viewing unit is coupled operable to receive a manual selection of at least one optional image region on the receiver arrangement, said exposure control system including means for forming from the intensity value of said image region a control signal for the exposure time of the photographic recording.

5,838,426
EXPOSURE APPARATUS AND METHOD WHICH CHANGES WAVELENGTH OF ILLUMINATION LIGHT IN ACCORDANCE WITH PRESSURE CHANGES OCCURRING AROUND PROJECTION OPTICAL SYSTEM

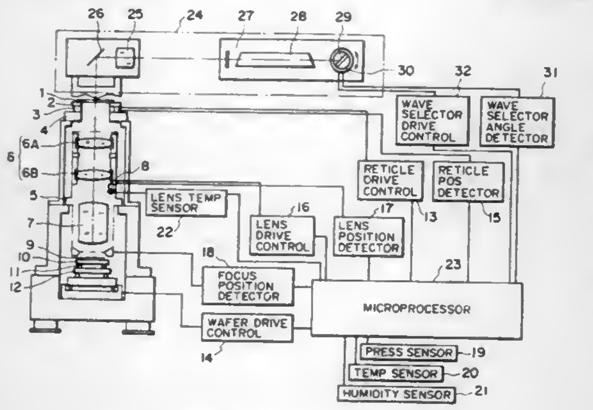
Hirohiko Shinonaga, and Hiroshi Sato, both of Utsunomiya, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 7, 1996, Ser. No. 643,924

Claims priority, application Japan, May 9, 1995, 7-135894

Int. Cl.^{6} G03B *27/68;27/42;27/72*

U.S. Cl. 355—52 **28 Claims**



1. A projection exposure apparatus, comprising:

illumination means for supplying illumination light;

a projection optical system for projecting a pattern of a first object onto a second object in cooperation with the illumination light, said projection optical system having a refraction optical element;

changing means for changing a wavelength of the illumination light;

detecting means for detecting a change in pressure around said projection optical system;

control means for controlling said changing means on the basis of an output of said detecting means so as to compensate a change in ratio of refractive index between an atmosphere and said refraction optical element due to a change in pressure; and

correcting means for correcting a change in optical characteristic of said projection optical system, due to a factor other than the pressure change, without use of said changing means.

5,838,427
IMAGE RECORDING APPARATUS AND APPLICATION DEVICE THEREOF

Hiroyuki Kohda; Astuhiro Doi, and Kohji Uchida, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

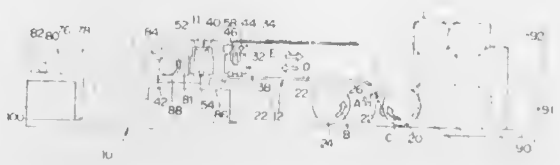
Filed Feb. 8, 1996, Ser. No. 598,336

Claims priority, application Japan, Feb. 10, 1995, 7-023214; Jan. 11, 1996, 8-003235

Int. Cl.^{6} G03B *27/30*

U.S. Cl. 355—100 **10 Claims**

1. An image recording apparatus in which an image is exposed on a photosensitive material, the photosensitive material and an image-receiving material are superposed and heat development transfer is effected so that an image is obtained on the image-receiving material, comprising:



exposure means for exposing the image onto the photosensitive material;

a stage which holds the photosensitive material;

an application unit which applies a solvent for image formation onto the photosensitive material held on said stage;

a superposing unit which superposes the image-receiving material on the photosensitive material held on said stage; and

heating means for heating the photosensitive material and the image-receiving material which are superposed together and held on said stage.

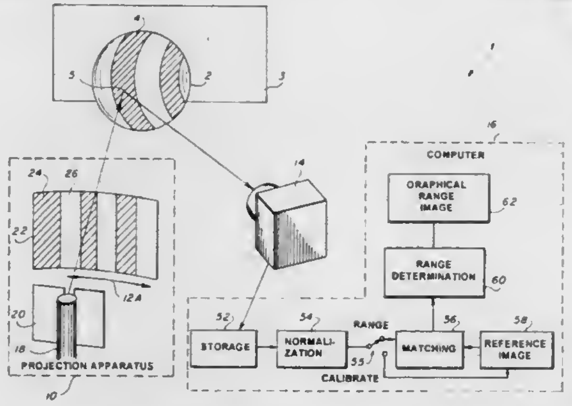
5,838,428
SYSTEM AND METHOD FOR HIGH RESOLUTION RANGE IMAGING WITH SPLIT LIGHT SOURCE AND PATTERN MASK

Frank Pipitone, Temple Hills, and Ralph L. Hartley, Rockville, both of Md., assignors to United States of America as represented by the Secretary of the Navy

Filed Feb. 28, 1997, Ser. No. 810,168

Int. Cl.^{6} G01C *3/00*

U.S. Cl. 356—3.09 **15 Claims**



1. A range imaging system for determining a distance between an object in a three-dimensional spatial scene and a detecting means, said system comprising:

means for optically projecting a single coded light pattern onto the object, the coded light pattern being a continuous function such that a position within the code can be determined from a sequence of samples, said projecting means including:

a light source for producing light which emanates from a region having a first width, said region being situated on an axis; and

a mask having a pattern of transparent and opaque portions and disposed with respect to said light source to be illuminated by the light from said light source so that the transparent portions produce the pattern of coded light, the transparent and opaque portions including a narrowest portion having a second width selected so that the first width is approximately between one and two times as great as the second width;

means for moving the coded light pattern across the object in a direction parallel to the direction in which the pattern varies;

means for detecting a portion of the pattern of coded light which is reflected from the object to produce image data; and

determining means for receiving the image data and for quantitatively determining, in accordance with the image data, range distances from said detecting means to the object.

5,838,429
APPARATUS FOR MEASURING PHYSIOLOGICAL PARAMETERS OF BLOOD GUIDED IN AN EXTRACORPOREAL CIRCULATORY SYSTEM

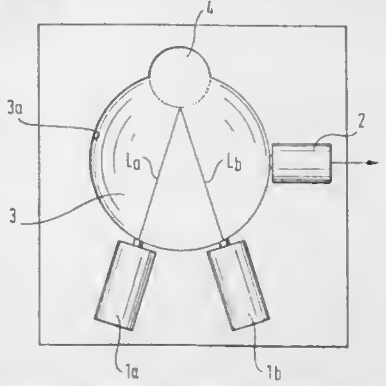
Andreas Hahn, Sauerlach, Germany, assignor to Stöckert Instrumente GmbH, Munich, Germany

Filed May 14, 1997, Ser. No. 855,918

Claims priority, application Germany, May 14, 1996, 196 19 513.6

Int. Cl.^{6} G01N *33/48;* **G01J** *1/04*

U.S. Cl. 356—39 **32 Claims**



1. An apparatus adapted to measure physiological parameters of blood conveyed within an extracorporeal circulatory system, comprising:

at least two light sources (**1***a*, **1***b*) each emitting light of a different wavelength,

at least one light sensor means (**2**),

a first, spherical cavity (**3**) having a reflective inner surface (**3***a*) and into which said light sources (**1***a*, **1***b*) emit and from which said light sensor means (**2**) receives part of the light propagating within said first cavity, and

a second cavity (**4**) into which a tube portion of said extracorporeal circulation is inserted such that the light (La, Lb) emitted by said light sources encounters the boundary surface between the blood and an inner wall of said tube and returns to said first cavity (**3**) at least to an extent by means of reflection and/or transmission.

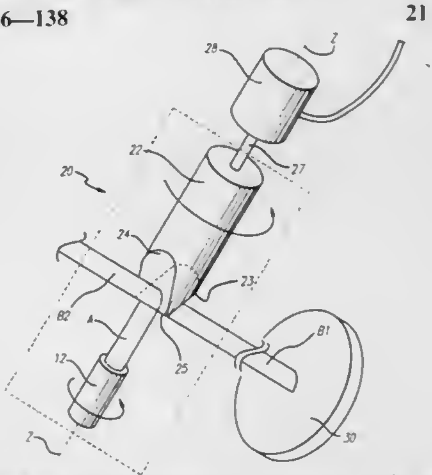
5,838,430
DUAL BEAM LASER DEVICE FOR LINEAR AND PLANAR ALIGNMENT

Dan Slater, La Habra Heights, and David M. Kramer, Palos Verdes, both of Calif., assignors to Nearfield Systems Incorporated, Carson, Calif.

Filed Jul. 3, 1996, Ser. No. 675,655

Int. Cl.^{6} G01B *11/26*

U.S. Cl. 356—138 **21 Claims**



1. An apparatus for providing a reference beam for use in an alignment system, comprising:

a collimated light source providing a light beam;

means for dividing said light beam into a first and second beam component, wherein said first and second beam components are projected outwardly from said dividing means in opposite directions;

means for detecting a common centroid of said first and second beam components that is independent of drift of said light beam; and

means for rotating said dividing means about an axis to cause the first and second beam components to sweep respective planar regions.

5,838,431
LASER MARKING DEVICE

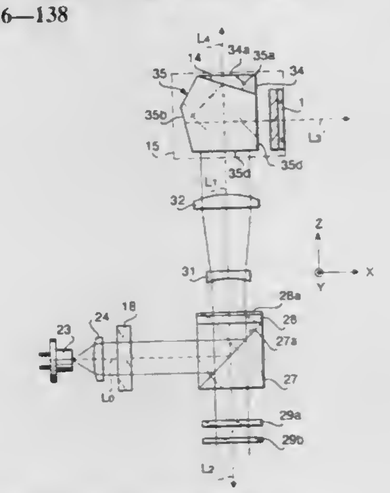
Masato Hara; Satoshi Takami; Teruo Sakai; Noriaki Takahashi, and Eiichi Ito, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 14, 1997, Ser. No. 783,006

Claims priority, application Japan, Jan. 16, 1996, 8-005118; Jan. 16, 1996, 8-005119

Int. Cl.^{6} G01B *11/26;* **G01C** *5/02*

U.S. Cl. 356—138 **32 Claims**



1. A laser marking device comprising:

a laser source;

an optical system for projecting a laser beam emitted from said laser source to form a laser spot on an object;

a light distributing element that is disposed in the optical path of said optical system, said light distributing element including at least one light distributing portion that distributes a part of said laser beam to form a static reference line on said object such that said laser spot is formed on said static reference line;

a rotating mechanism for rotating at least a part of said optical system such that a dynamic reference line is formed; and

a switch for selecting between a rotation mode in which said rotating mechanism is activated and a stationary mode in which said rotating mechanism is not activated.

5,838,432
OPTICAL ANGLE DETECTION APPARATUS

Yuki Tokuhashi; Yoichi Iba, both of Hachioji; Toshiro Okamura, and Seiichiro Tabata, both of Hino, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 7, 1996, Ser. No. 659,220

Claims priority, application Japan, Jun. 12, 1995, 7-144772

Int. Cl.^{6} G01B *11/26*

U.S. Cl. 356—139.03 **8 Claims**

1. An optical angle detection apparatus comprising:

a light source for emitting polarized light;

a liquid crystal member for changing a polarizing direction of said polarized light emitted by said light source by a predetermined angle;

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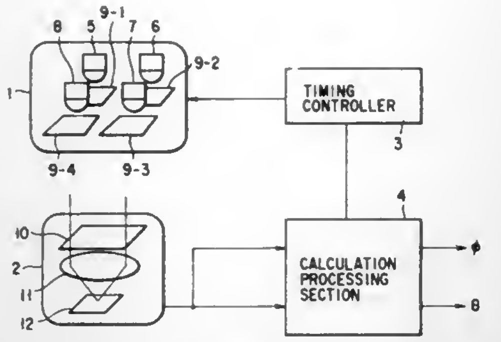


- a sensor section spaced apart from said liquid crystal member, said sensor section including a polarizing member for polarizing a light beam transmitted through said liquid crystal member, and a photosensor integrally fixed to said polarizing member; and
- a control mechanism for applying a predetermined voltage, which changes with time, to said liquid crystal member.

5,838,433
APPARATUS FOR DETECTING DEFECTS ON A MASK

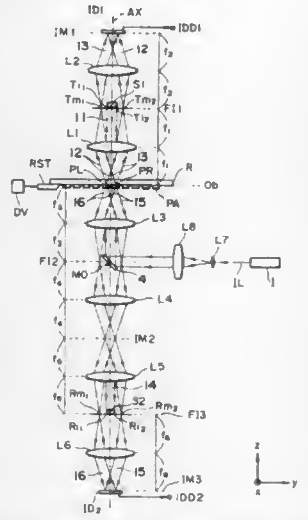
Tsuneyuki Hagiwara, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Apr. 19, 1996, Ser. No. 636,511

Claims priority, application Japan, Apr. 19, 1995, 7-094031; Sep. 19, 1995, 7-240156

Int. Cl.^{6} G01N ***21/00***

U.S. Cl. 356—237 34 Claims



1. A mask defect inspection apparatus for optically detecting a defect on a mask having a circuit pattern, comprising:
- an illumination system for illuminating said mask with inspection light;
- a first light receiving optical system for receiving said inspection light reflected by said mask;
- a second light receiving optical system for receiving said inspection light transmitted by said mask;
- a first spatial filter for shielding at least a zeroth-order diffraction light of said inspection light in a central area, wherein said central area includes at least an optical axis of said first light receiving optical system in an optical Fourier transform plane for said circuit pattern in said first light receiving optical system;
- a second spatial filter for shielding at least a zeroth-order diffraction light of said inspection light in a central area, wherein said central area includes at least an optical axis of said second light receiving optical system in an optical Fourier transform plane for said circuit pattern in said second light receiving optical system;
- a first detector for photoelectrically converting said inspection light having passed through said first spatial filter;
- a second detector for photoelectrically converting said inspection light having passed through said second spatial filter; and
- a gain adjusting circuit for adjusting a gain of a first output signal from said first detector to output a third output signal and adjusting a gain of a second output signal from said second detector to output a fourth output signal,

wherein said defect is detected based on one of a relative intensity difference and intensity ratio between said third output signal and said fourth output signal gain adjusted by said gain adjusting circuit.

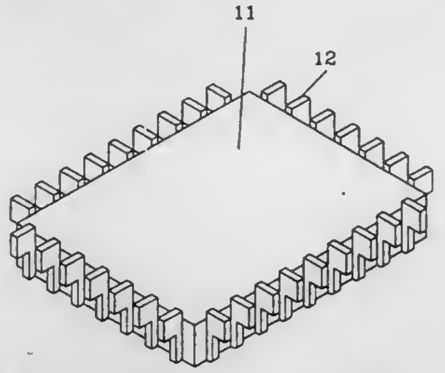
5,838,434
SEMICONDUCTOR DEVICE LEAD CALIBRATION UNIT

David A. Skramstad, Garland; Clyde M. Guest, III, Plano, and Dennis M. Botkins, Seagoville, all of Tex., assignors to Semiconductor Technologies & Instruments, Inc., Dallas, Tex.

Filed Dec. 26, 1996, Ser. No. 777,843

Int. Cl.^{6} G01J ***1/02***

U.S. Cl. 356—243 11 Claims



1. A calibration unit for use with a moveable scale reference for calibration of semiconductor package outlines, comprising:
- a monolithic rectangular block; and
- a plurality of legs formed on and integral with said block, said legs being spaced apart on said block, and said legs are oversized when compared with actual leads on a semiconductor device to add strength and to prevent bending of said legs.

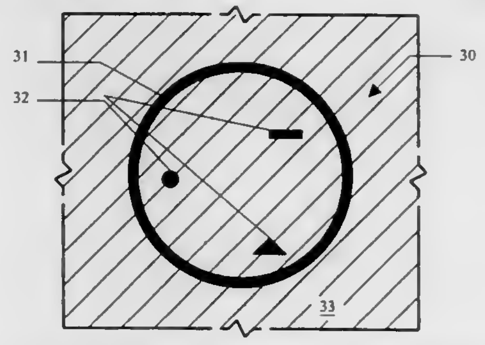
5,838,435
CALIBRATION METHOD FOR SPECTROSCOPIC SYSTEMS

David R. Sandison, Edgewood, N. Mex., assignor to Sandia Corporation, Albuquerque, N. Mex.

Filed Oct. 20, 1997, Ser. No. 953,814

Int. Cl.^{6} G01J ***1/10;3/443;*** **G01N** ***21/64***

U.S. Cl. 356—243 23 Claims



1. A method of calibrating a spectroscopic system having a field of view, comprising:

- a) mounting at least one spot of an optically characterized material with the spectroscopic system at known locations in the field of view;
- b) positioning the spectroscopic system relative to a target so that the target is at least partially within the field of view;
- c) applying excitation radiation to the field of view;
- d) collecting a response from at least part of the field of view;
- e) obtaining a calibration response signal from the response from the locations in the field of view occupied by the spots;
- f) obtaining a first target response signal from the response from the locations in the field of view occupied by the target; and
- g) obtaining a calibrated target response signal from the first target response signal and the calibration response signal.

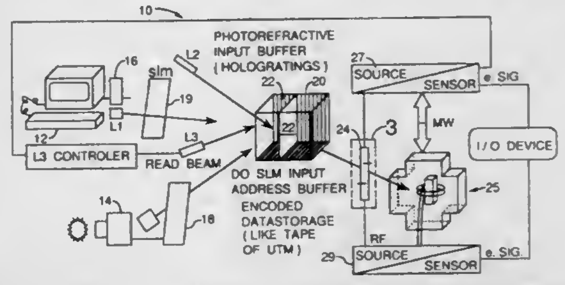
5,838,436
MULTI-PURPOSE QUANTUM COMPUTING

Stephen P. Hotaling, Cicero, and Andrew R. Pirich, Marcy, both of N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 26, 1997, Ser. No. 824,891

Int. Cl.^{6} G01B ***9/02***

U.S. Cl. 356—345 26 Claims


10
PHOTOREFRACTIVE INPUT BUFFER (HOLOGRATINGS)
16
slm
L2
22
20
27
SOURCE
SENSOR
e SIG
L1
19
12
L3
L3 CONTROLER
READ BEAM
24
3
MW
I/O DEVICE
DO SLM INPUT ADDRESS BUFFER
ENCODED DATASTORAGE (LIKE TAPE OF UTM)
14
18
25
RF
29
SOURCE
SENSOR
e SIG

1. A method for general purpose quantum computing comprising,
- a) inputting a data signal through an encoder to encode said data signal with an instruction,
- b) transmitting the encoded signal by means of an L1 laser beam to an input buffer,
- c) directing a reference laser beam L2 so it interferes with said L1 beam in said buffer to form an interference pattern therein as a hologram, IPH,
- d) directing a read laser beam L3 through said IPH and through a decoder which reads said instruction,
- e) said decoder presenting said instruction on the L3 beam to ALU spin media in a magnetic field, which respond to said instruction by flipping spins in one or more sequences to resulting data patterns and reading said patterns to derive results therefrom.

5,838,437
REFERENCE SYSTEM FOR OPTICAL DEVICES INCLUDING OPTICAL SCANNERS AND SPECTRUM ANALYZERS

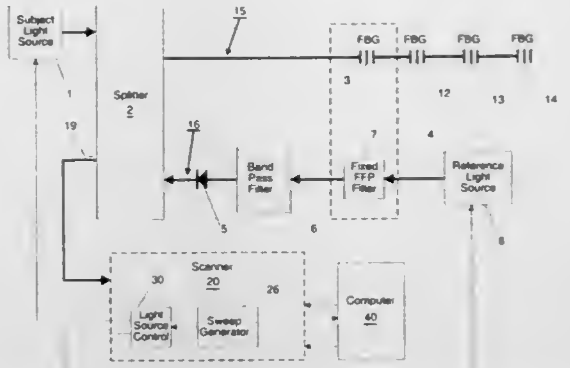
Calvin M. Miller, Naples, Fla.; Jeffrey W. Miller, Kennesaw, Ga.; Kevin Hsu; Yufei Bao, both of Roswell, Ga., and Tom Q.Y. Li, San Jose, Calif., assignors to Micron Optics, Inc., Atlanta, Ga.

Filed Apr. 9, 1997, Ser. No. 833,602

Int. Cl.^{6} G01B ***9/02***

U.S. Cl. 356—345 29 Claims

1. A reference system for measuring wavelengths of radiation from an optical device, comprising:
- an optical path having a reference branch and a measurement branch, said measurement branch for coupling to said optical device;
- a fixed FFP filter in said reference branch;



- a reference FBG in one of said measurement branch or said reference branch; and
- means for selectively illuminating said subject branch and said reference branch.

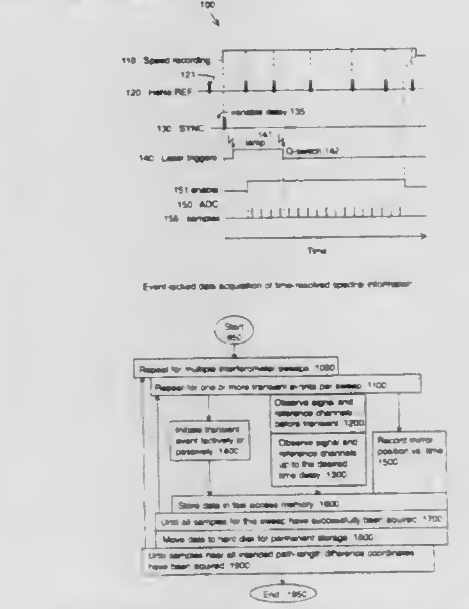
5,838,438
METHOD OF TIME-RESOLVING FOURIER-TRANSFORM SPECTROSCOPY TO ALLOW INTERFEROGRAM SAMPLING AT UNEVENLY SPACED PATH-LENGTH DIFFERENCES.

Robert E. Peale, Oviedo, and Henry Weidner, Orlando, both of Fla., assignors to University of Central Florida, Orlando, Fla.

Filed Jan. 17, 1997, Ser. No. 785,016

Int. Cl.^{6} G01B ***9/02***

U.S. Cl. 356—346 20 Claims



1. A method of time-resolving Fourier-transform spectroscopy which allows sampling an interferogram at unevenly spaced path-length differences, comprising the steps of:
- (a) generating time-varying electromagnetic radiation signals from a sample;
- (b) passing the radiation from the sample through a continuously scanning interferometer to form interferometer-modulated radiation;
- (c) receiving the interferometer-modulated radiation at a detector to form a detector signal;
- (d) recording interferogram data points from the detector signal in fixed temporal relation to the generation of the time-varying radiation signal;
- (e) avoiding noise and artifacts caused by scan speed variations in the interferometer; and
- (f) transforming a resulting interferogram into a spectrum.

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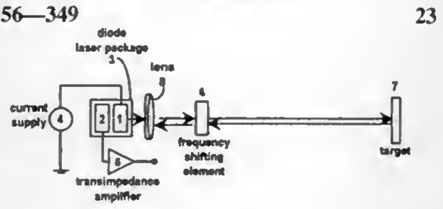
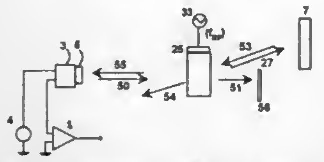
5,838,439
HETERODYNED SELF-MIXING LASER DIODE VIBROMETER

De Yu Zang, 11 Lassen, Irvine, Calif. 92612, and James E. Millerd, 65 Cottage La., Aliso Viejo, Calif. 92656
Filed Mar. 14, 1997, Ser. No. 818,310
Int. Cl.^{6} G01B *9/02*
U.S. Cl. 356—349 **23 Claims**





1. A system for remotely measuring vibration of an object using a coherent optical beam, said system comprising:

(a) means for generating a coherent optical beam by a laser, said coherent optical beam having an optical frequency, said laser including a cavity,

(b) means for modulating the optical frequency of said coherent optical beam with an optical frequency shifting element in a two-pass configuration, thereby yielding a modulating coherent optical beam,

(c) means for illuminating said object with said modulated coherent optical beam, said object scattering said modulated coherent optical beam to yield a scattered optical beam, said means for modulating the optical frequency of said coherent laser beam further modulating said scattered optical beam,

(d) means for collecting scattered optical beam from said object,

(e) means for coupling said scattered optical beam into said cavity of said laser,

(f) means for creating an optical heterodyne signal by mixing said scattered optical beam with said coherent optical beam in said cavity,

(g) means for producing an electrical signal in response to said optical heterodyne signal by using a photodetector positioned directly behind said laser,

(h) means for amplifying said electrical signal using an electronic amplifier, and

(i) means for processing said amplified electrical signal using an electronic processor to decode a signal proportional to an amplitude and a frequency of the vibration of said object.

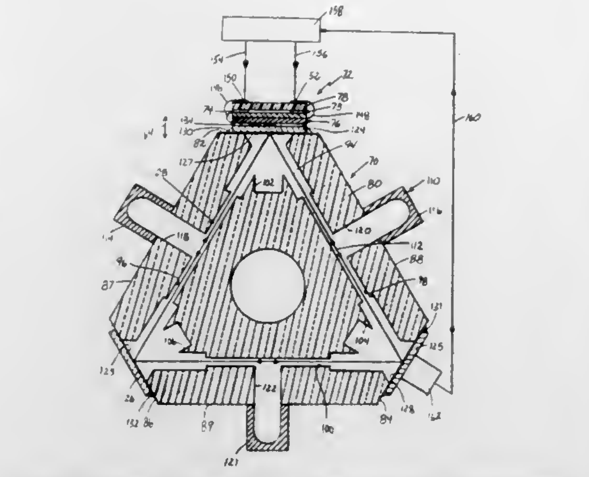
5,838,440
PATH LENGTH CONTROLLER PIEZO/WIREBOARD BONDING PATTERN

Richard G. Beaudet, Inver Grove Heights, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Oct. 20, 1997, Ser. No. 954,639
Int. Cl.^{6} G01C *19/66*
U.S. Cl. 356—350 **12 Claims**

1. A path length control apparatus for an optical device including a block having an internal optical cavity that defines a closed optical path, a light source for directing at least one light beam into the optical path and a plurality of mirrors for reflecting the at least one light beam about the optical path, the path length control apparatus comprising:

transduction means mounted to at least one mirror of the plurality of mirrors for altering, in response to a control voltage, the position of the at least one mirror relative to the block internal optical cavity to maintain a constant optical path length for the at least one light beam;

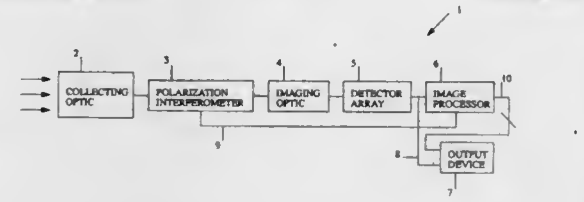
a wireboard element; and

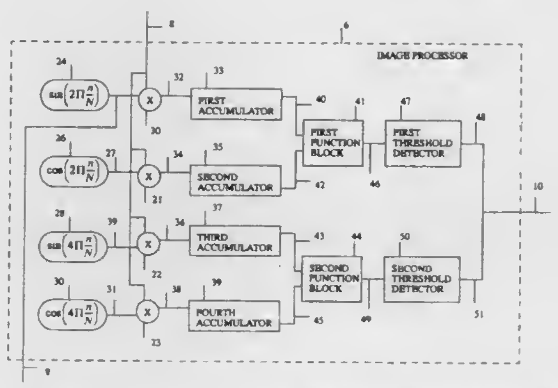


mounting means for partially securing the wireboard element to the transduction means, such that the wireboard element is only partly mechanically coupled to the transduction means so as permit operation of the transduction means substantially free of resistance from the wireboard element.

5,838,441
WIDE FIELD OF VIEW COHERENT LIGHT DETECTOR AND LOCATOR

Duane Satorius, Silver Spring, Md., and Timothy Eugene Dimmick, Glenville, Pa., assignors to The United States of America as represented by the National Security Agency, Washington, D.C.
Filed Jul. 23, 1997, Ser. No. 899,062
Int. Cl.^{6} G01B *9/02*
U.S. Cl. 356—351 **19 Claims**





1. A wide field of view coherent radiation detector and locator, comprising:

a) a collecting optic, having an optical input for receiving incoming optical radiation, having an optical output, where said collecting optic collimates incoming optical radiation;

b) an electro-optic polarization interferometer, having an optical input optically connected to the optical output of said collecting optic, having an electrical input for receiving a modulation signal, having an optical output, where said interferometer is placed at an exit pupil plane of said collecting optic;

c) an imaging optic, having an optical input optically connected to the optical output of said interferometer, and having an optical output;

d) a detector array, having an optical input optically connected to the optical output of said imaging optic, having an electrical output, where said detector array is placed one focal length away from said imaging optic;

e) an image processor, having an electrical input connected to the electrical output of said detector array, having an electrical output connected to the electrical input of said interferometer for providing the modulation signal, having an electrical output bus, where said image processor employs a down-conversion method that includes sine and cosine functions of the modulation signal; and

f) an output device, having a first electrical input connected to the electrical output of said detector array, and having a second electrical input connected to the electrical output bus of said image processor wherein, said image processor comprises:

i) a first signal source, having an output at which appears the signal $\sin(2\pi n/N)$;

ii) a first multiplier, having a first input connected to the output of said detector array, having a second input connected to the output of said first signal source, and having an output;

iii) a second signal source, having an output at which appears the signal $\cos(2\pi n/N)$;

iv) a second multiplier, having a first input connected to the output of said detector array, having a second input connected to the output of said second signal source, and having an output;

v) a third signal source, having an output at which appears the signal $\sin(4\pi n/N)$;

vi) a third multiplier, having a first input connected to the output of said detector array, having a second input connected to the output of said third signal source, and having an output;

vii) a fourth signal source, having an output at which appears the signal $\cos(4\pi n/N)$;

viii) a fourth multiplier, having a first input connected to the output of said detector array, having a second input connected to the output of said fourth signal source, and having an output;

ix) a first accumulator, having an input connected to the output of said first multiplier, and having an output;

x) a second accumulator, having an input connected to the output of said second multiplier, and having an output;

xi) a third accumulator, having an input connected to the output of said third multiplier, and having an output;

xii) a fourth accumulator, having an input connected to the output of said fourth multiplier, and having an output;

xiii) a first function block, having a first input connected to the output of said first accumulator, having a second input connected to the output of said second accumulator, and having an output;

xiv) a second function block, having a first input connected to the output of said third accumulator, having a second input connected to the output of said fourth accumulator, and having an output;

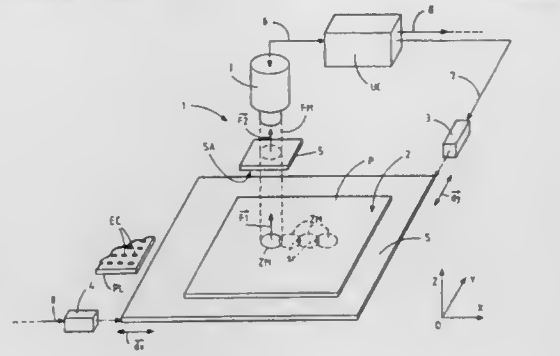
xv) a first threshold detector, having an input connected to the output of said first function block, and having an output;

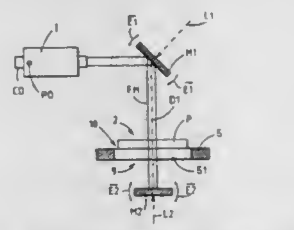
xvi) a second threshold detector, having an input connected to the output of said second function block, and having an output; and

xvii) an output device bus connected to the output of said first threshold detector and the output of said second threshold detector.

5,838,442
DEVICE FOR DETERMINING THE SHAPE OF THE WAVE SURFACE REFLECTED BY A SUBSTANTIALLY PLANE COMPONENT

Michaël Bray, Olivet, France, assignor to Compagnie Industrielle Des Lasers Cilas, Paris, France
Filed Jun. 26, 1997, Ser. No. 883,398
Claims priority, application France, Jul. 10, 1996, 96 08599
Int. Cl.^{6} G01B *9/02*
U.S. Cl. 356—359 **8 Claims**





1. A device for determining the shape of the wave surface reflected by a substantially plane component (P), said device (1) including:

a support (S) bearing said component (P)

an interferometer (1) arranged opposite the surface of reflection (2) of the component (P), capable of emitting a measurement light beam (FM) onto a measurement area (ZM) of said surface (2) and of measuring the interference fringes created by the reflections of said measurement beam (FM), respectively on said surface (2) and on a reference plate (5) arranged so as to be substantially parallel to said surface (2) over the path of said measurement beam (FM);

movement means (3, 4) enabling, by their action, said measurement beam (FM) to be scanned over the surface (2) of the component so as to enable said interferometer (1) to take measurements on a number of measurement areas (ZM) completely covering said surface (2), each of said measurement areas (ZM) being at least partially overlapped, over an overlap sector (sr), by an adjacent measurement area; and

a control unit (UC) which controls said interferometer (1) and said movement means (3, 4) and determines, from the measurements taken by said interferometer (1) on all the measurement areas (ZM), the shape of said wave surface reflected by the component (P), the measurements taken on the overlap sectors (sr) being used to fit together the measurements taken on the corresponding adjacent measurement areas (ZM).

wherein it additionally includes:

a first swivelling mirror (M1) arranged in the path of the measurement beam (FM) between the interferometer (1) and the component (P) in such a way as to direct said measurement beam (FM) orthogonally, by reflection, onto the surface (2) of said component (P); and

an optical sensor (CO) capable of determining the position of the image of a light point (PO) of the measurement beam (FM), reflected by the surface (2) of the component (P), said light point (PO) being located at a predefined reference position and the orientation of said first mirror (M1) being controlled in such a way as to bring the position of the image of the light point (PO), determined by the optical sensor (CO), back to said reference position automatically.

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5,838,443
EXPOSURE APPARATUS IMPLEMENTING PRIORITY SPEED SETTING ARRANGEMENT

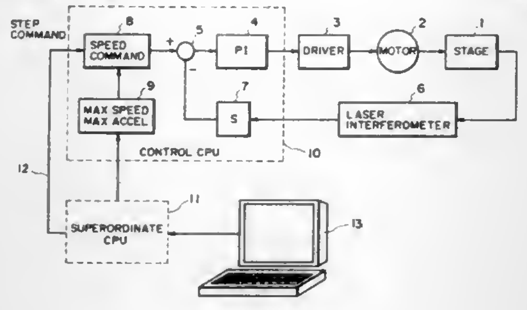
Hiroyuki Sekiguchi, Utsunomiya, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

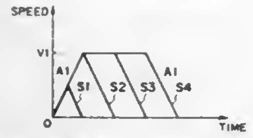
Filed Aug. 28, 1996, Ser. No. 704,248

Claims priority, application Japan, Aug. 29, 1995, 7-242316

Int. Cl.^{6} G01B *11/00*

U.S. Cl. 356—363 **7 Claims**





1. An exposure apparatus, comprising:
- a projection optical system for projecting a pattern of an original onto a substrate;
- a stage for moving the substrate;
- a speed instruction generator for producing a speed instruction;
- a movement controller for controlling movement of said stage in accordance with a speed instruction produced by said speed instruction generator; and
- speed setting means for setting a maximum speed instruction to be produced by said speed instruction generator, wherein said speed setting means is operable in association with said speed instruction generator to provide a first maximum speed instruction when alignment precision between the original and the substrate has a priority and to provide a second maximum speed instruction, different from the first maximum speed instruction, when throughput for sequential printing of the pattern of the original on different regions of the substrate has a priority.

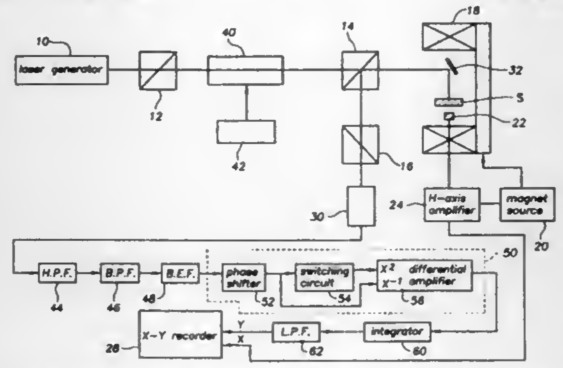
5,838,444
MAGNETO-OPTIC CHARACTERISTIC MEASURING APPARATUS

Yung Kuk Jo, Chunan-si, Rep. of Korea, assignor to SKC Limited, Kyungki-do, Rep. of Korea

Filed Nov. 25, 1996, Ser. No. 753,369

Int. Cl.^{6} G01J *4/00*

U.S. Cl. 356—369 **4 Claims**



1. A magneto-optic characteristic measuring apparatus comprising:
- a laser generator for emitting a beam of laser,
- a polarizer for polarizing the laser beam into a linearly polarized beam,
- a beam splitter for irradiating the beam from the polarizer onto a sample via a reflection mirror while receiving the reflected beam from the sample,
- an optical detector for receiving the reflected beam emerging from the beam splitter,
- an optical detector unit for receiving the beam from the optical detector, thereby generating an output signal based on the received beam,
- an electromagnet for applying a magnetic field to the sample,
- a magnet source for activating the electromagnet,
- a Hall element for detecting the magnetic field exerted on the sample, thereby outputting a voltage resulting from the detection,
- an H-axis amplifier for amplifying the voltage from the Hall element,
- an X-Y recorder for receiving an output signal from the H-axis amplifier at an X-axis thereof and receiving an output signal from the optical detector unit at a Y-axis thereof, thereby detecting a Kerr rotation angle associated with the sample,
- a polarization modulator arranged between the polarizer and the beam splitter and adapted to magneto-optically modulate the laser beam emitted from the laser generator under the control of a signal generator.

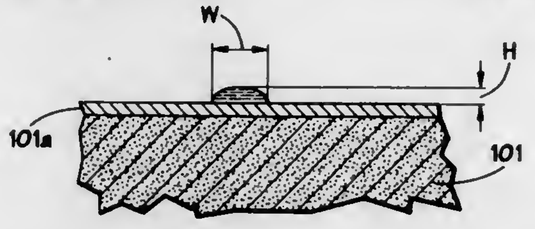
5,838,445
METHOD AND APPARATUS FOR DETERMINING SURFACE ROUGHNESS

Gurtej S. Sandhu, and Guy Hudson, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Continuation-in-part of Ser. No. 474,310, Jun. 7, 1995. This application Feb. 21, 1997, Ser. No. 804,526

Int. Cl.^{6} C01B *11/30*

U.S. Cl. 356—371 **20 Claims**



1. A method for determining surface roughness of a semiconductor substrate, said method comprising the steps of:
- (a) applying a controlled amount of liquid onto a surface of said semiconductor substrate to form a drop, said drop having an area and a contact angle;
- (b) measuring the area of the drop; and
- (c) correlating the area of the drop to roughness of said surface without determining the contact angle of the drop.

5,838,446
DETERMINATION OF COATING ADHESION

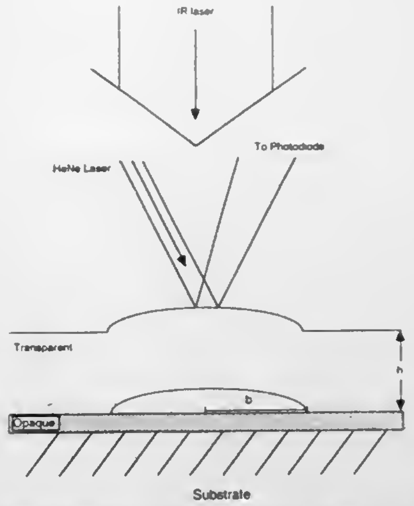
Jeffrey Scott Meth, Newark, and Stephen John Bennison, Wilmington, both of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed May 16, 1997, Ser. No. 857,838

Int. Cl.^{6} G01L *1/24*

U.S. Cl. 356—372 **14 Claims**

1. A process for determining adhesion of a film system, comprising the steps of: (a) applying a pulse of electromagnetic radiation to a film system, said pulse having sufficient intensity to ablate a portion of the film system under adiabatic conditions; (b) forming a blister in the film system with the electromagnetic radiation; (c) determining a critical pulse energy occurring when the blister is strained to the point where an interfacial crack just begins to form; (d) determining the curvature of the blister at the critical pulse energy; (e) determining a critical internal pressure of the blister at the critical pulse energy; and (f) relating the critical internal pressure of the blister to an adhesion parameter to determine the adhesion of the film system.



5,838,447
POLISHING APPARATUS INCLUDING THICKNESS OR FLATNESS DETECTOR

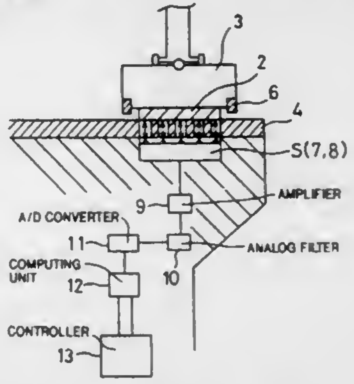
Hirokuni Hiyama, Tokyo, and Yutaka Wada, Yokohama, both of Japan, assignors to Ebara Corporation, Tokyo, Japan

Filed Jul. 19, 1996, Ser. No. 683,959

Claims priority, application Japan, Jul. 20, 1995, 7-206593

Int. Cl.^{6} G01B *11/06;11/30;* G01N *21/84*

U.S. Cl. 356—381 **39 Claims**



1. A polishing apparatus comprising:
- a turntable having thereon a polishing surface;
- a top ring disposed above said turntable for supporting a workpiece to be polished and for pressing the workpiece against said polishing surface; and
- a thickness detector operable to, during relative movement between said top ring and said turntable, detect a thickness of a surface layer of the workpiece by performing a plurality of thickness detection operations over time and thereby to detect the thickness of the entire surface layer of the workpiece, each said thickness detection operation comprising detecting thickness of the surface layer at a plurality of spots spaced radially of said turntable at one time on a real-time basis, said thickness detector including a sensor mounted in said turntable at a position within a path of relative movement between said top ring and said turntable and operable to perform said plurality of thickness detection operations over time, said sensor comprising a plurality light-emitting elements operable to emit respective light beams toward the surface layer of the workpiece and a plurality of light-detecting elements operable to detect respective of the light beams reflected from the surface layer of the workpiece, said plurality of said light-emitting elements and said plurality of said light-detecting elements being spaced radially of said turntable, said light-detecting elements generating signals representative of detected thickness at said plurality of spots, and said signals being processed together to determine the thickness of the surface layer of the workpiece.

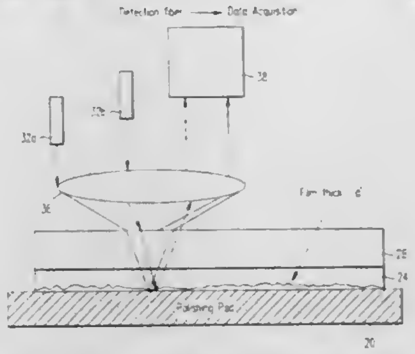
5,838,448
CMP VARIABLE ANGLE IN SITU SENSOR

Arun A. Aiyer, Fremont; Paul Derek Coon, Redwood City, and Henry K. Chau, San Francisco, all of Calif., assignors to Nikon Corporation, Japan

Filed Mar. 11, 1997, Ser. No. 814,821

Int. Cl.^{6} G01B *11/06*

U.S. Cl. 356—382 **26 Claims**



1. A method of measuring a thickness or thickness change of a film formed on a principal surface of a substrate, comprising the steps of:
- illuminating the substrate and film:
- detecting a total intensity of the illumination reflected from the substrate and film;
- measuring the total reflected illumination intensity at each of a plurality of incidence angles, and determining an incidence angle at which the total reflected illumination intensity is at a minimum or maximum, thereby to determine the thickness or thickness change of the film.

5,838,449
OPTICAL APPARATUS

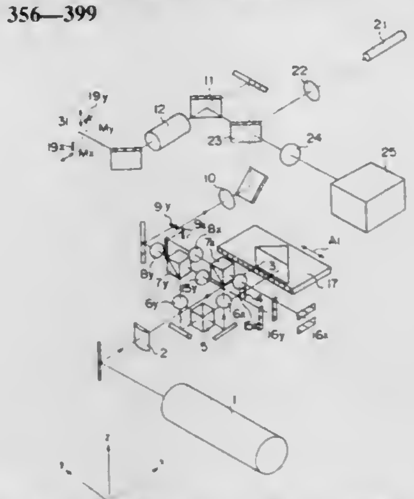
Kinya Kato; Masaki Kato, and Kei Nara, all of Yokohama, Japan, assignors to Nikon Corporation, Japan

Continuation of Ser. No. 565,805, Nov. 30, 1995, abandoned. This application Aug. 14, 1997, Ser. No. 912,954

Claims priority, application Japan, Dec. 1, 1994, 6-323924; Dec. 1, 1994, 6-323927; Dec. 1, 1994, 6-323929

Int. Cl.^{6} G01B *9/02*

U.S. Cl. 356—399 **21 Claims**



1. An optical apparatus for optically scanning a first mark formed on a first substrate and a second mark formed on a second substrate so as to measure a positional deviation between said first and second substrates, said optical apparatus comprising:

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a first optical system which is disposed between said first and second substrates and makes a position on said first substrate and a position on said second substrate conjugate with each other;

a first light source system for supplying a luminous flux;

a scan beam forming optical system which, based on the luminous flux supplied from said first light source system, forms a single line beam;

a scanning device for optically scanning said single line beam in directions different from each other, based on the beam generated in said beam forming optical system;

a dividing optical system for dividing said single line beam into a first scan beam and a second scan beam, based on the beam from said scanning device;

a deflecting optical system for deflecting said first and second scan beams divided in said dividing optical system, wherein said first and second scan beams scan simultaneously and independently;

combining optical system for spatially combining said first and second scan beams from said deflecting optical system;

a first detection device which detects a light component from said first mark generated by the optical scanning of said first substrate with said first scan beam and a light component from said second mark generated by the optical scanning of said second substrate with said first scan beam passing through said first optical system; and

a second detection device which detects a light component from said first mark generated by the optical scanning of said first substrate with said second scan beam and a light component from said second mark generated by the optical scanning of said second substrate with said second scan beam passing through said first optical system.

5,838,450

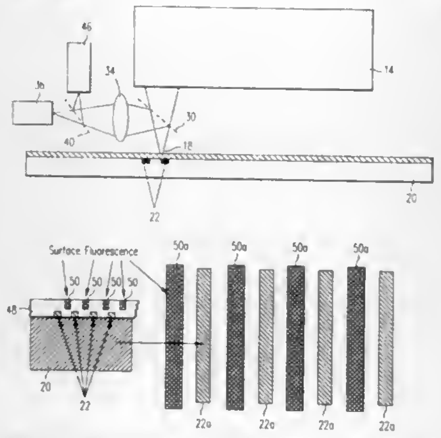
DIRECT RETICLE TO WAFER ALIGNMENT USING FLUORESCENCE FOR INTEGRATED CIRCUIT LITHOGRAPHY

John H. McCoy, San Carlos; Martin E. Lee, Saratoga, and Kyoichi Suwa, San Mateo, all of Calif., assignors to Nikon Precision Inc., Belmont, Calif.

Continuation of Ser. No. 210,968, Mar. 21, 1994, abandoned. This application Jun. 2, 1995, Ser. No. 457,710

Int. Cl.^{6} G01B *11/00*

U.S. Cl. 356—401 **30 Claims**



1. A method of determining misalignment of a photolithographic reticle to an object, the reticle and the object each having a mark formed thereon, comprising the steps of:

projecting through a projection optical system an image of the reticle mark towards a surface of the object using a first type of radiation and exposing a rectangular field on the surface of the object by moving the reticle and the object with respect to an optical field of the projection lens in a predetermined scan direction;

detecting radiation from the object mark located within the optical field of the projection optical system on the surface of the object and exterior of the rectangular field in the scan direction before or after the exposing of the rectangular field; and

detecting radiation from the reticle mark to determine the misalignment between the reticle and the object.

5,838,451

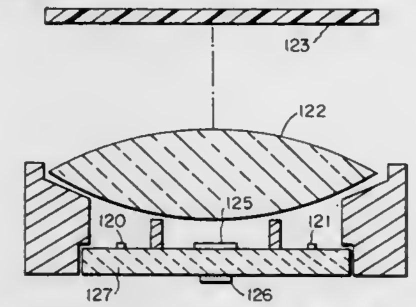
OPTOELECTRONIC SPECTRAL ANALYSIS SYSTEM

Cornelius J. McCarthy, Pittsford, N.Y., assignor to Accuracy Microsensors, Inc., Pittsford, N.Y.

Filed Aug. 15, 1996, Ser. No. 698,419

Int. Cl.^{6} G01N *21/25*

U.S. Cl. 356—406 **24 Claims**



1. Apparatus for the measurement of spectral reflectance or spectral absorbance of an object or material, said apparatus comprising

at least one substrate formed from material with good thermal conductivity,

at least one optical radiation sensing means for converting optical energy into electrical energy, in thermal contact with at least one said substrate,

optical means for directing light from said object or material to said optical radiation sensing means,

a computing means for processing said electrical energy in order to derive information regarding spectral properties of said object or material,

at least one first means for converting electrical energy to optical energy in thermal contact with at least one said substrate, which optical energy provided by said first means for converting electrical energy to optical energy has a spectral output in which the peak wavelength of its emission spectrum is in the range from 500 nm to 550 nm and in which the full width at half height of its emission spectrum is at least 40 nm,

at least one second means for converting electrical energy to optical energy in thermal contact with at least one said substrate, which optical energy provided by said first means for converting electrical energy to optical energy has a spectral output with the peak of its emission spectrum in the range from 550 nm to 700 nm and in which the full width at half height of the curve representing said emission spectrum is at least 30 nm, such that the outputs of said first and second means for converting electrical energy to optical energy partially overlap each other in the distribution with respect to the wavelength of their emissions,

a function residing in said computing means to combine using mathematics of linear algebra electrical energies generated by said optical radiation sensing means in response to the light reflected from or transmitted through said objects or materials such the combined response resulting from said combination corresponds to illumination of said object or material with light the spectral distribution of which has a peak between 525 and 570 nm and a full width at half height of the distribution curve of at least 90 nm,

means for directing optical energy from said first and second means for converting electrical energy to optical energy to said object, and

at least one temperature sensor for detecting the temperature of each said substrate.

5,838,452

Patent Not Issued For This Number

5,838,453

APPARATUS AND METHOD FOR MEASURING OPTICAL ANISOTROPY

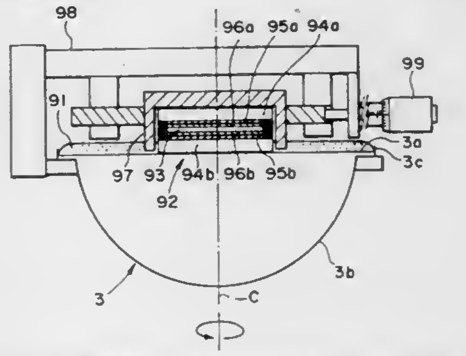
Yoshinori Ohsaki, Tokyo, and Takashi Suzuki, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 24, 1996, Ser. No. 590,814

Claims priority, application Japan, Jan. 27, 1995, 7-012103; Jan. 27, 1995, 7-012104; Aug. 9, 1995, 7-203385

Int. Cl.^{6} G01N *21/55;* G01J *4/00*

U.S. Cl. 356—445 **44 Claims**



1. An optical anisotropy measurement apparatus comprising:

a transparent member having a curved surface and a flat surface for movably mounting an object to be examined thereon, said object to be examined being a liquid crystal device comprising a pair of transparent substrates and a liquid crystal disposed therebetween,

a light source disposed opposite to a first region of the curved surface of the transparent member so as to emit a beam incident through the first region and the transparent member to an outer surface of the object to be examined,

a polarizer disposed on the emission side of the light source,

an incident optical system disposed between the light source and the first region of the curved surface of the transparent member, so as to provide a reduced diameter of the beam incident to the outer surface of the object to be examined,

a photodetector disposed opposite to a second region of the curved surface of the transparent member so as to detect a beam emitted from the light source, totally reflected at a proximity of the outer surface of the object to be examined and incident thereto through the second region,

an analyzer disposed between the photodetector and the second region of the curved surface of the transparent member,

means for moving the object to be examined in a direction parallel to the flat surface of the transparent member, and

means for monitoring a local position under examination of the object to be examined.

5,838,454

SENSOR ARRANGEMENT FOR DETECTING THE DEGREE OF WETTING OF A WINDSHIELD

Rainer Pientka, Achern, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

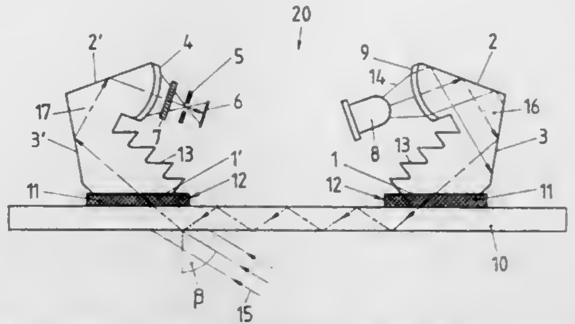
Filed Jan. 15, 1997, Ser. No. 784,134

Claims priority, application Germany, Jan. 19, 1996, 196 01 802.1

Int. Cl.^{6} G01N *21/88;* B60S *1/02*

U.S. Cl. 356—445 **9 Claims**

1. A sensor device for detecting a wetting condition on a windshield wherein: radiation emitted by a radiation transmitter is coupled with the windshield by a coupling element with a beam acceptance surface designed as a focusing lens and where, following at least one total reflection from the windshield, the radiation is decoupled to a radiation receiver via a decoupling element, which has a beam emission surface that is also a focusing lens, the axial transmitter radiation is totally reflected on a flat first limiting surface of the coupling element, said beam acceptance surface has a spherical shape, said radiation transmitter is arranged such that diverging transmitter radiation is essentially focused axis-parallel toward the first limiting surface by the beam acceptance surface, and the dimensions of the first limiting surface are at least big enough so that it receives the complete parallel-focused beam of rays.



5,838,455

IMAGE PROCESSOR WITH IMAGE DATA COMPRESSION CAPABILITY

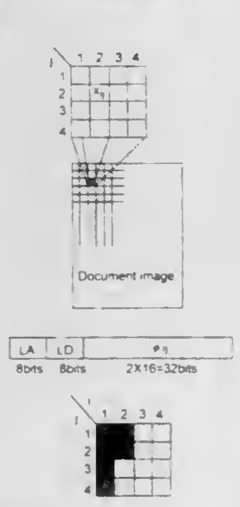
Shoji Imaizumi, Shinshiro; Shigeru Moriya, Toyokawa, and Junji Nishigaki, Aichi-Ken, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed May 7, 1996, Ser. No. 646,118

Claims priority, application Japan, May 11, 1919, 7-113050; Jun. 8, 1995, 7-141882; Jun. 13, 1995, 7-146141; Jun. 16, 1995, 7-150080

Int. Cl.^{6} G06K *9/00;9/36*

U.S. Cl. 358—298 **28 Claims**



1. An image processor comprising:

a compression device which compresses image data to data having gradation levels smaller than that of the image data: and

a decision device for deciding an attribute of an image according to the data compressed by said compression device.

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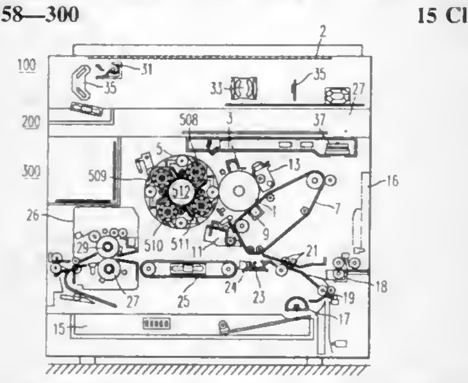
5,838,456
DESKTOP COLOR COPIER WHICH INCLUDES A REVOLVING TYPE DEVELOPING DEVICE

Susumu Wagi, Tokyo, and Kyoji Omi, Kawasaki, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 215,608, Mar. 22, 1994, Pat. No. 5,600,445. This application Jan. 2, 1996, Ser. No. 581,922
Claims priority, application Japan, Mar. 23, 1993, 5-089351
Int. Cl.⁶ H04N *1/27;1/46;* **G03G** *21/00*
U.S. Cl. 358—300 **15 Claims**



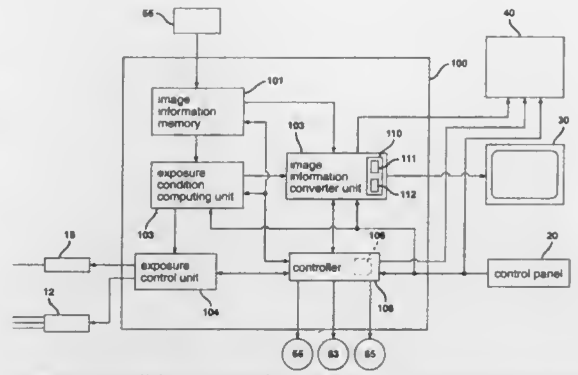
1. A color image forming apparatus for forming a toner image on a sheet of paper, comprising:

- an image carrier for sequentially forming toner images of respective colors thereon;
- a charger for charging said image carrier;
- an exposure device for exposing said image carrier which has been charged and forming electrostatic latent images of respective colors on said image carrier;
- a revolving type developing device which is rotatively supported in said color image forming apparatus, including a plurality of color developing devices, each of which includes a developing unit for developing a toner image on said image carrier when said developing unit faces said image carrier and a toner supply unit for supplying toner to said developing unit, wherein an external shape of said revolving type developing device is a cylinder;
- an intermediate transfer belt to which said toner images are sequentially transferred on top of previously transferred toner images;
- a primary transferring charger for sequentially transferring said toner images from said image carrier to said intermediate transfer belt to form a composite toner image on said intermediate transfer belt;
- at least one paper feed tray for storing sheets of paper and feeding the sheets of paper one at a time;
- a secondary image transferring charger for transferring said composite toner image from said intermediate transfer belt to one of the sheets of paper; and
- a fixing device for fixing said toner image on said sheet of paper, wherein the revolving type developing device includes a cylindrical black toner cartridge disposed along an axis of rotation of the revolving type developing device.

5,838,457
INDEX PRINTING APPARATUS INCLUDING EXPOSURE CONTROL MEANS

Choji Umemoto, Wakayama, Japan, assignor to Noritsu Koki Co., Ltd., Wakayama, Japan
Filed Jun. 14, 1995, Ser. No. 490,292
Claims priority, application Japan, Jun. 14, 1994, 6-132100; Jun. 14, 1994, 6-132101
Int. Cl.⁶ H04N *1/23*
U.S. Cl. 358—302 **9 Claims**

1. A photographic printing apparatus capable of printing, as an index print, an inlaid composite image having images of a plurality of film frames, said apparatus comprising:



- exposure means for exposing a photosensitive material for producing a photographic print;
- exposure condition computing means for computing exposure conditions to be used for printing the photosensitive material based on image information read from a film;
- exposure control means for controlling said exposure means according to the exposure conditions;
- index printing means for printing said inlaid composite image;
- correction instruction input means for providing a correction instruction to said exposure condition computing means so that an operator can correct the exposure conditions;
- a monitor for displaying the read image information; and
- image information converter means for providing a monitor image signal to display the read image information on said monitor, said image information converter means having a first function, a second function and a third function, wherein said first function provides a simulated image from the read image information which simulated image is expected to be produced on the photosensitive material when the photosensitive material is exposed under the exposure conditions, said second function provides monitoring image information for displaying said simulated image on said monitor, and said third function provides index-printing image information for printing said simulated image by said index printing means.

5,838,458
METHOD AND APPARATUS FOR LINKING DESIGNATED PORTIONS OF A RECEIVED DOCUMENT IMAGE WITH AN ELECTRONIC ADDRESS

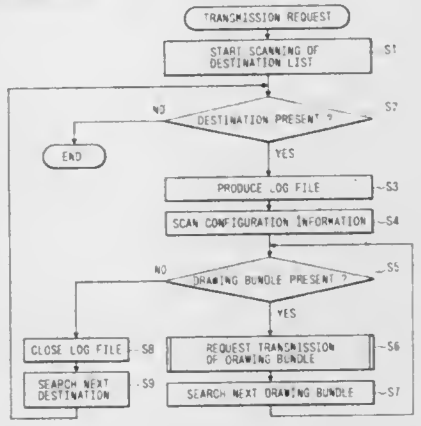
Irving Tsai, MBox-NYC, P.O. Box 699, New York, N.Y. 10021-0699
Continuation-in-part of Ser. No. 475,204, Jun. 7, 1995, which is a continuation-in-part of Ser. No. 137,718, Oct. 15, 1993, Pat. No. 5,495,581, which is a continuation-in-part of Ser. No. 124,381, Sep. 17, 1993, which is a continuation of Ser. No. 918,150, Jul. 24, 1992, abandoned, which is a continuation of Ser. No. 840,808, Feb. 25, 1992, abandoned. This application Dec. 14, 1995, Ser. No. 572,629
Int. Cl.⁶ H04N *1/00*
U.S. Cl. 358—402 **1 Claim**

1. An apparatus for retrieving Internet information using facsimile data received with a facsimile reception protocol, comprising:

- means for receiving facsimile data using a facsimile reception protocol, said facsimile data containing a portion linked to an Internet address;
- means for obtaining Internet address information from said portion of received facsimile data;
- means for automatically applying said obtained Internet address information for establishing communication with said Internet address;
- means for retrieving information from said Internet address; and
- means for displaying at least one of the received facsimile data and the retrieved Internet information.

5,838,459
FACSIMILE AUTOMATIC DELIVERY SYSTEM

Kazuhiro Hashimoto, Kawasaki, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 378,608, Jan. 26, 1995, abandoned. This application Aug. 20, 1996, Ser. No. 700,127
Claims priority, application Japan, Feb. 3, 1994, 6-031962
Int. Cl.⁶ H04N *1/00*
U.S. Cl. 358—402 **3 Claims**

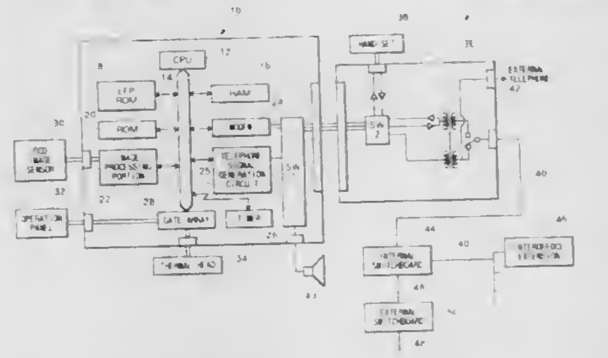


1. An automatic facsimile delivery system which uses a facsimile device to deliver documents to destinations indicated in a destination list, each document having a hierarchical structure with at least one upper level object and lower level objects belonging to the one upper level object, said system comprising:

- storage means for storing the documents;
- transmission management means for producing and managing transmission management information for document delivery in accordance with the destination list, said transmission management information being managed to provide control over transmission of each lower level object of the hierarchical structure of each document;
- retrieval means for retrieving a document to be transmitted, from said storage means, on the basis of the transmission management information supplied from said transmission management means;
- data conversion means for converting data of the document to be transmitted into a form which can be facsimiled;
- facsimile transmission means for transmitting data which have been converted by said data conversion means, to a destination indicated in the destination list;
- transmission history production means for producing a transmission history for each lower level object belonging to the one upper level object in each document, in accordance with completion or incompletion of transmission of each such lower level object conducted by said facsimile transmission means, each of said transmission histories being included in the transmission management information; and
- retransmission means for automatically retransmitting each lower level object in the hierarchial document structure which has been incompletely transmitted, to the indicated destination, on the basis of the transmission management information including the corresponding lower level object transmission history.

5,838,460
FACSIMILE MACHINE

Yutaka Nonomura, Iwakura, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed May 11, 1995, Ser. No. 439,373
Claims priority, application Japan, May 12, 1994, 6-123029
Int. Cl.⁶ H04N *1/32*
U.S. Cl. 358—407 **14 Claims**



1. A facsimile machine capable of forwarding image information received from remote facsimile machines to a desired target facsimile machine, the facsimile machine comprising:

- reception means for receiving a telephone number of a target facsimile machine, to which image information, received at the reception means, is desired to be forwarded, the reception means having a first reception means component for receiving the telephone number, a second reception means component for receiving the image information, and a third reception means component for receiving a request command for transmission of distinction image information;
- storage means for storing the received telephone number of the target facsimile machine;
- distinction image information preparation means for preparing information on a distinction image which includes an image of the received telephone number stored in the storage means when the third reception means component receives the request command for transmission of distinction image information from a remote information transmission source;
- distinction image information transmission means for transmitting the distinction image information prepared by the distinction image information preparation means to the remote information transmission source; and
- image information forwarding means for forwarding image information received from a remote facsimile machine to the target facsimile machine whose telephone number is stored in the storage means the image information forwarding means performing the forwarding operation toward the target facsimile machine after the distinction image transmission means transmits the distinction image information to the remote information transmission source.

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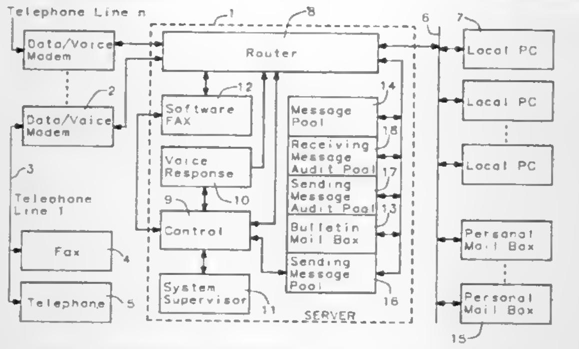
5,838,461
FAX MAIL AUTOMATIC DISTRIBUTION SYSTEM
Chen Yun Hsieh, Hsin Chu, Taiwan, assignor to Taiwan Semiconductor Manufacturing Company, Ltd., Hsin-Chu, Taiwan

Filed Jun. 17, 1996, Ser. No. 665,332
Int. Cl.^{6} H04N *1/32*
U.S. Cl. 358—442 **14 Claims**

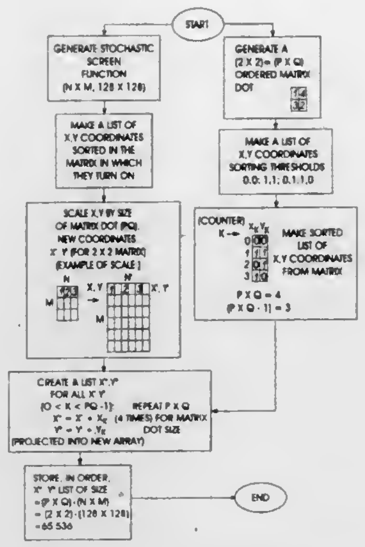


1. A fax mail automatic distribution system, comprising:
(a) data and voice modems connected between telephone lines and a computer server,
(b) said telephone lines connected to a telephone system and through this connection to remote fax machines,
(c) said remote fax machines having voice phone capability which may be a separate touch tone phone connected to the same telephone line,
(d) said voice phone capability of the remote fax machine to receive voice commands from said server requesting fax sender to enter destination identification numbers of fax receivers, to end of said destination identification numbers with a "#" sign and to start transmission of fax,
(e) said server further connected to a network of local PC's,
(f) each local PC having capability to send and receive messages and data to and from the server and other PC's,
(g) a unique personal mail box mapped to each unique individual personal ID number for receiving messages and data,
(h) fax data being sent from remote fax machine is connected to a software fax for interpretation with the output of said software fax being routed by the server to a receiving mail box with the address mapped to the personal ID of a fax receiver as provided with the fax and to a receiving message audit pool,
(i) said fax data sent to said receiving message audit pool having a privilege level set to control audits for security purposes.

5,838,462
HYBRID IMAGING SYSTEM
Fritz F. Ebner, Rochester, and Tse-Kee Chan, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 1, 1996, Ser. No. 625,324
Int. Cl.^{6} H04N *1/40:1/46*
U.S. Cl. 358—456 **14 Claims**

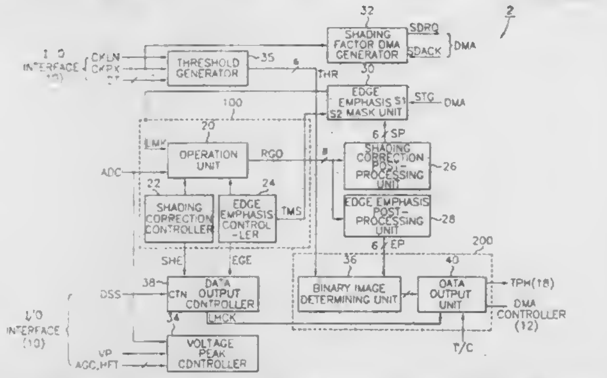
1. A method of processing a digitized image including a plurality of pixels with the digitized image being processed on a pixel-by-pixel basis to obtain a halftoned output, comprising:
a) providing a hybrid matrix function defining M×N submatrices with each of the M×N submatrices including like P×Q submatrix sections, wherein each submatrix section is activatable;
b) applying an activation order to each submatrix such that each submatrix section is turned on according to a preselected order;
c) applying a stochastic function for selective activation of the submatrix sections in each M×N submatrix such that all like submatrix sections in all submatrices in the hybrid matrix function are turned on before a next set of like submatrix sections in the preselected order are turned on; and


START
GENERATE STOCHASTIC SCREEN FUNCTION (N X M, 128 X 128)
GENERATE A (2 X 2) = (P X Q) ORDERED MATRIX DOT
MAKE A LIST OF X,Y COORDINATES SORTED IN THE MATRIX IN WHICH THEY TURN ON
MAKE A LIST OF X,Y COORDINATES SORTING THRESHOLDS 0,0; 1,1; 0,1,1,0
SCALE X,Y BY SIZE OF MATRIX DOT (PQ). NEW COORDINATES X' Y' (FOR 2 X 2 MATRIX) (EXAMPLE OF SCALE)
(COUNTER) K
MAKE SORTED LIST OF X,Y COORDINATES FROM MATRIX
P X Q = 4
(P X Q - 1) = 3
CREATE A LIST X",Y" FOR ALL X' Y' (O < K < PQ - 1): REPEAT P X Q (4 TIMES) FOR MATRIX DOT SIZE
X" = X' + X_K
Y" = Y' + Y_K
(PROJECTED INTO NEW ARRAY)
STORE, IN ORDER, X" Y" LIST OF SIZE = (P X Q)·(N X M) = (2 X 2)·(128 X 128) = 65 536
END

d) applying the hybrid matrix function with at least one activated section to the digitized image to obtain the halftoned output.

5,838,463
BINARY IMAGE PROCESSOR
Goo-Soo Gahang, Kyungki-do, Rep. of Korea, assignor to Sam-Sung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Aug. 14, 1995, Ser. No. 515,095
Claims priority, application Rep. of Korea, Aug. 12, 1994, 19901/1994
Int. Cl.^{6} H04N *1/40;* **G06K** *9/40*
U.S. Cl. 358—465 **38 Claims**

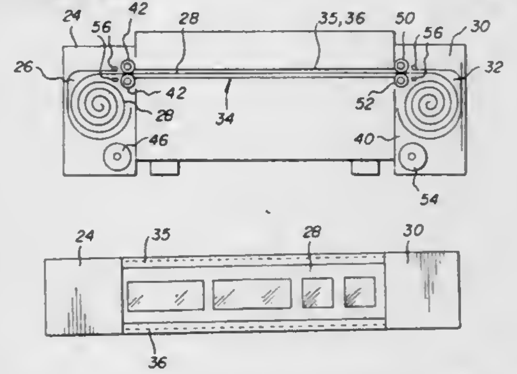


1. A binary image processor in an image processing apparatus having an image sensor for reading an image, a converter for converting an electric signal read-out from said image sensor into image data, and a memory for storing a plurality of threshold indexes corresponding to each line unit of said image data, said binary image processor comprising:
threshold generating means for generating a threshold value corresponding to each input pixel of said image data, said threshold generating means comprising first multiplexer means for multiplexing between said plurality of threshold indexes to produce a plurality of discrete values in accordance with a first selection signal, second multiplexer means for multiplexing between said plurality of discrete values to produce said threshold value corresponding to each input pixel of said image data in accordance with a second selection signal, and counter means for counting a pixel clock to produce said first selection signal and counting a line clock to produce said second selection signal;
processing means coupled to receive said image data on a line-by-line basis, for correcting shading and emphasizing edge of said image data to produce processed data having said shading corrected and edge emphasized; and

binarizing means for using half-tone processing to binarize each pixel of said processed data on a basis of said threshold value and generate binary data representing said image.

5,838,464
SYSTEM AND METHOD FOR SCANNING IMAGES CONTAINED ON A STRIP OF PHOTOSENSITIVE FILM
John Randall Fredlund; Joseph Anthony Manico, and Frank Pincelli, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 22, 1996, Ser. No. 651,423
Int. Cl.^{6} H04N *1/04*
U.S. Cl. 358—498 **20 Claims**

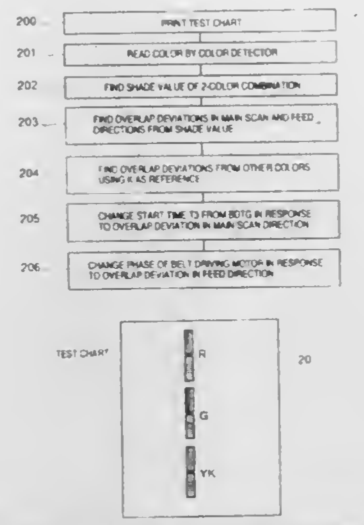


1. A system for scanning images contained on a strip of film, comprising: a) a film cartridge having a spool rotatably mounted therein, a filmstrip spirally wrapped about the spool so that said filmstrip can be thrust out or thrust back into said cartridge by rotation of sad spool; b) a scanner having a platen designed to receive a discrete item for scanning and digitizing the information scanned; c) a transport mechanism comprising a housing for retaining the cartridge and a guide for guiding said filmstrip onto said platen for scanning, said guide comprising a pair of parallel tracks which guide the filmstrip across the platen while maintaining the filmstrip flat against said platen; d) a drive mechanism for advancing of the filmstrip out of said cartridge onto said platen for scanning; and e) said scanner having means for scanning said filmstrip and for digitizing the information contained therein; wherein said housing for retaining said thrust cartridge and said guide for guiding of the filmstrip are removably mounted to said scanner.

5,838,465
COLOR COMPENSATING METHOD OF COLOR IMAGE AND COLOR IMAGE GENERATING APPARATUS
Tatsunari Satou; Taisaku Seino, both of Tsuchiura, and Takeshi Shibuya, Ibaraki-ken, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 1, 1995, Ser. No. 566,108
Claims priority, application Japan, Dec. 2, 1994, 6-299274; Mar. 14, 1995, 7-054022
Int. Cl.^{6} G03F *3/08;* **G06K** *9/00*
U.S. Cl. 358—520 **32 Claims**

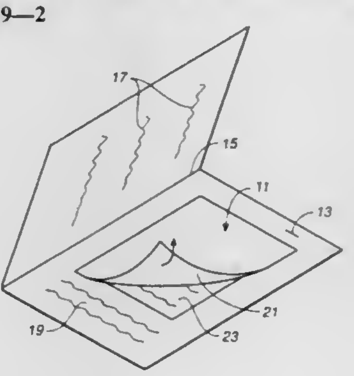
1. A color correcting method for a color image generating apparatus for overlapping materials of 3 or 4 colors to obtain a multicolor image, said method comprising steps of:
setting a predetermined relationship between a first test stripe of a first color and a second test stripe of a second color to be printed, said predetermined relationship providing a reference for determining color drift in said apparatus;
printing a test chart for determining whether color drift exists in said apparatus, said test chart including at least one 2-color combination of 2 of said 3 or 4 colors of the first test stripe of said first color and the second test stripe of said second color,
determining a relationship between the first test stripe and the second test stripe in the at least one 2-color combination; and


200
PRINT TEST CHART
201
READ COLOR BY COLOR DETECTOR
202
FIND SHADE VALUE OF 2-COLOR COMBINATION
203
FIND OVERLAP DEVIATIONS IN MAIN SCAN AND FEED DIRECTIONS FROM SHADE VALUE
204
FIND OVERLAP DEVIATIONS FROM OTHER COLORS USING K AS REFERENCE
205
CHANGE START TIME TO FROM BOTG IN RESPONSE TO OVERLAP DEVIATION IN MAIN SCAN DIRECTION
206
CHANGE PHASE OF BELT DRIVING MOTOR IN RESPONSE TO OVERLAP DEVIATION IN FEED DIRECTION
TEST CHART
R
G
YK
20

if the relationship between the first test stripe and the second test stripe in the at least one 2-color combination does not correspond to said predetermined relationship, controlling a record start position of said image generating apparatus in a main-scan direction and a record start position in a sub-scan direction to correct the relationship between the first test stripe and the second test stripe in the at least one 2-color combination to said predetermined relationship to thereby reduce color drift in said apparatus.

5,838,466
HIDDEN HOLOGRAMS AND USES THEREOF
Donald W. Mallik, Dunwoody, Ga., assignor to Printpack Illinois, Inc., Elgin, Ill.

Filed Dec. 13, 1996, Ser. No. 764,916
Int. Cl.^{6} G03H *1/02;* **B42D** *15/00:15/10;* **B32B** *3/00*
U.S. Cl. 359—2 **21 Claims**



1. An optical structure, comprising:
a relief pattern formed in one surface of an optically transparent sheet having a first refractive index, said relief pattern diffracting light incident upon it into an image visible in light reflected from the relief pattern when interfaced with air, and
a substantially optically transparent layer statically adhering to said one surface in a manner that normally fills in the relief pattern but is releasable therefrom by hand, said layer having a second refractive index substantially the same as the first refractive index, whereby the image is not visible when the layer is in place but becomes visible when the layer is removed from the surface relief pattern by hand.

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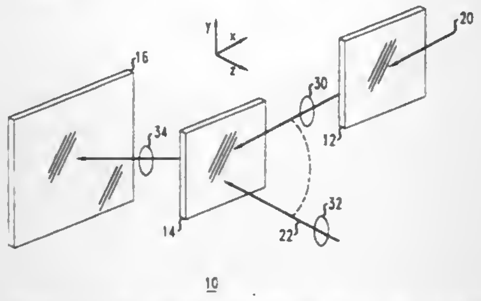
5,838,467
METHOD FOR PROCESSING INFORMATION STORED IN A HOLOGRAPHIC SYSTEM

Kevin Richard Curtis, Summit, and Michael C. Tackitt, Califon, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jun. 3, 1997, Ser. No. 868,406
Int. Cl.^{6} G03H *1/04*

U.S. Cl. 359—3 **5 Claims**



1. A method for processing information stored in a holographic system, comprising the step of:

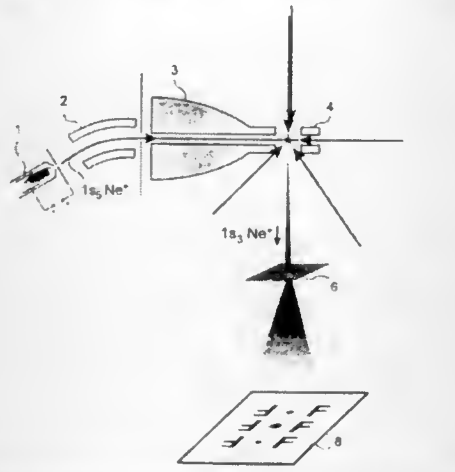
intersecting a reconstruction reference beam with a storage medium of a holographic system, the storage medium comprising a photopolymer and the storage medium exhibiting birefringence at least partially due to coherent storage of information in the medium, wherein the reconstruction reference beam has a polarization at least 5° different from the polarization exhibited by a storage reference beam during storage of information in the storage medium.

5,838,468
METHOD AND SYSTEM FOR FORMING FINE PATTERNS USING HOLOGRAM

Shoko Manako; Jun-ichi Fujita; Yukinori Ochiai, and Shinji Matsui, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Apr. 12, 1996, Ser. No. 631,237
Int. Cl.^{6} G02B *5/32;27/24;* **G03H** *1/00*

U.S. Cl. 359—15 **5 Claims**



1. A method for forming a fine pattern on a substrate, comprising the steps of:

preparing a hologram having a pattern;

irradiating material waves on said hologram, said material waves being produced as atoms of an extremely low temperature; and

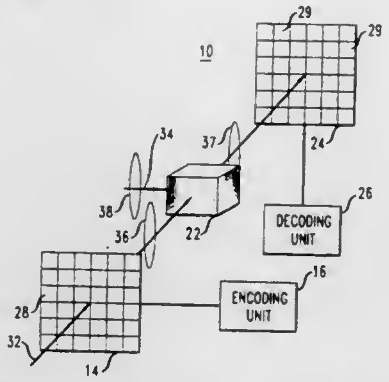
imaging said pattern on said substrate with said material waves being interfered by passing through said hologram.

5,838,469
APPARATUS AND METHOD FOR PROCESSING DATA STORED IN PAGE-WISE MEMORY

Scott Patrick Campbell, Chatham, and Kevin Richard Curtis, Summit, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 26, 1996, Ser. No. 777,155
Int. Cl.^{6} G11C *7/00;13/04;* **G03H** *1/02*

U.S. Cl. 359—21 **23 Claims**



1. Apparatus for receiving data stored in a page-wise memory device, said apparatus comprising:

a multi-dimensional array of pixel elements, at least one of said pixel elements having
  a pixel detector for detecting at least a portion of the data from said page-wise memory device, and
  a pixel circuit coupled to said pixel detector for providing a pixel value representative of the data detected by said pixel detector; and

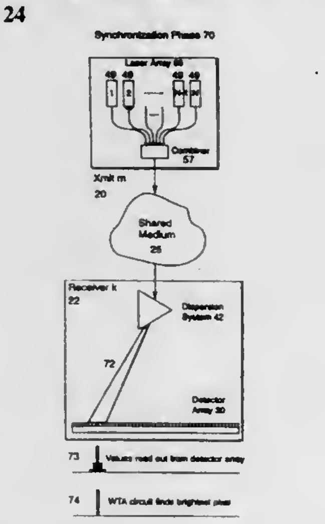
a processing circuit coupled to the pixel circuit of at least one of said pixel elements for processing the pixel values of one or more of said pixel circuits, said processing based on comparisons of pixel values with one another.

5,838,470
OPTICAL WAVELENGTH TRACKING RECEIVER

Christian Volker Radehaus, Einsiedel, Germany; Jon Robert Sauer, Superior, and Heinz Willebrand, Longmont, both of Colo., assignors to University Technology Corporation, by said Jon Robert Sauer and Christian Volker Radehaus, and Eagle Optoelectronics, LLC, both of Boulder, Colo., by said Heinz Willebrand

Continuation of Ser. No. 508,027, Jul. 27, 1995, abandoned. This application Jun. 4, 1997, Ser. No. 868,980
Int. Cl.^{6} H04J *14/02*

U.S. Cl. 359—124 **21 Claims**



1. An adaptive optical receiver comprising:

means for receiving optical signals, said optical signals including a monochromatic synchronization signal and a transmission signal;

means for dynamically determining relative wavelength of said synchronization signal, said means for determining including
  means for spectrally decomposing the received synchronization signal,
  means for detecting a location of a highest intensity portion of the decomposed signal and
  means for relating the detected location to a relative frequency of the synchronization signal; and

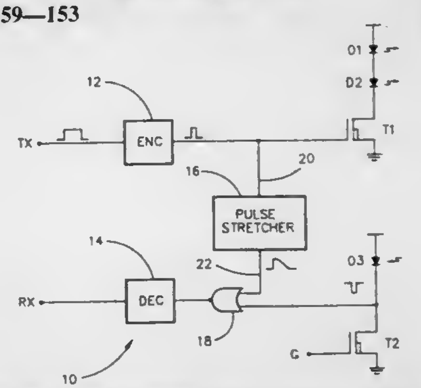
means for selectively accepting only portions of said transmission signal having wavelengths corresponding to said relative wavelength of said synchronization signal.

5,838,471
INFRARED ECHO CANCELING

Paul Beard, Milpitas, Calif., assignor to Norand Corporation, Cedar Rapids, Iowa

Filed Jun. 27, 1996, Ser. No. 671,565
Int. Cl.^{6} H04B *10/00*

U.S. Cl. 359—153 **8 Claims**



1. An infrared data communications system comprising:

(a) an infrared data communications transceiver for transmitting and receiving infrared data signals;

(b) an infrared data signal echo canceling system operatively integrated with said data communications transceiver for canceling reflections of the infrared data signals transmitted by said infrared data communications transceiver which are subsequently received by said infrared data communications transceiver, said infrared data signal echo canceling system including a pulse stretcher for increasing the pulse width of a version of the transmitted data signals for producing a pulse stretched version of the transmitted data signals; and

(c) means for subtractively combining the pulse stretched version of the transmitted infrared data signals with the received infrared data signals such that the reflections of the transmitted infrared data signals subsequently received by said infrared data communications transceiver are removed from the received infrared data communications signal.

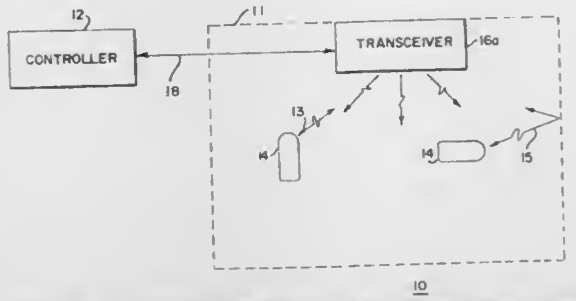
5,838,472
METHOD AND APPARATUS FOR LOCATING A TRANSMITTER OF A DIFFUSE INFRARED SIGNAL WITHIN AN ENCLOSED AREA

Jeffrey Peter Welch, Libertyville, and Ellen L. Oschmann, Winnetka, both of Ill., assignors to Spectrix Corporation, Deerfield, Ill.

Filed Jul. 3, 1996, Ser. No. 675,501
Int. Cl.^{6} H04B *10/00*

U.S. Cl. 359—155 **24 Claims**

1. A method of locating a portable remote station transceiving a diffuse infrared communicated signal within an enclosed area containing a plurality of stationary infrared transceivers interconnected with a central controller, such method comprising the steps of:



detecting a particular transmission of the diffuse infrared communicated signal from the portable remote station within the enclosed area by the plurality of stationary transceivers;

measuring a signal strength of the particular signal from the portable remote station by each stationary transceiver of the plurality of stationary transceivers;

identifying a first stationary transceiver measuring a highest relative signal strength and a second stationary transceiver measuring a second highest relative signal strength of the particular signal from the portable remote station;

determining a relative distance of the portable remote station from the first and from the second stationary transceivers on either side of a center line between the first and second stationary transceivers based upon the measured signal strength; and

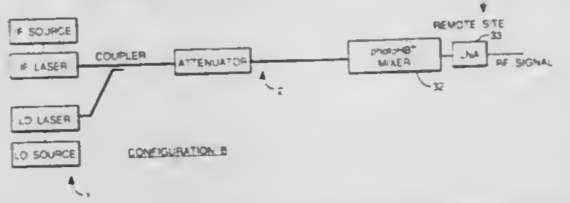
locating the portable remote station based upon differences in the signal strength measured at each stationary transceivers.

5,838,473
OPTICAL COMMUNICATIONS SYSTEM

David Wake, Levington, United Kingdom, assignor to British Telecommunications public limited company, London, England

Filed Mar. 25, 1996, Ser. No. 622,345
Claims priority, application United Kingdom, Oct. 13, 1995, 9520946; European Pat. Off., Nov. 29, 1995, 95308583
Int. Cl.^{6} H04B *10/00;10/06*

U.S. Cl. 359—168 **14 Claims**



1. An optical communications system for the distribution of a signal, said system comprising:

a central station including an optical source and arranged to output carrier frequency and intermediate frequency signals modulated on respective optical carriers:

an optical signal distribution network;

at least one remote station connected to the central station by the optical network, the at least one remote station including an integral mixer/detector arranged to receive at an input the carrier frequency and intermediate frequency signals in the optical domain and to output an electrical RF signal produced by the mixing of the carrier and intermediate frequency signals.

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5,838,474

PROCESS AND CIRCUIT ARRANGEMENT FOR TRANSMITTING RECEIVED SIGNALS FROM AN ANTENNA TO A BASE STATION OF A RADIO SYSTEM

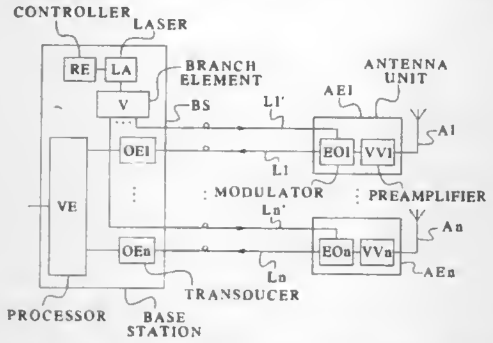
Bernd Stilling, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sep. 4, 1996, Ser. No. 708,303

Claims priority, application Germany, Sep. 8, 1995, 195 33 262.8

Int. Cl.⁶ H04B *10/00*

U.S. Cl. 359—173 **17 Claims**



1. A method for transmitting received signals from an antenna to a base station of a radio system, comprising:

providing an antenna unit connected to the antenna;

generating an optical carrier in the base station, the optical carrier being fed to the antenna unit;

modulating the optical carrier in the antenna unit using an electro-optical modulator, in a way corresponding to received signals coming from the antenna; and

returning the modulated optical signals to the base station via the light guide.

5,838,475

OPTICAL REGENERATOR AND AN OPTICAL TRANSMISSION SYSTEM

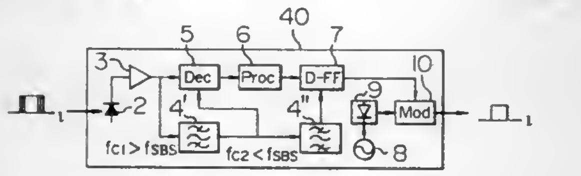
Ryoji Takeyari, Koganei; Takashi Funada, Yokosuka; Yukihiko Wakai, and Kazuo Hagimoto, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., and Nippon Telegraph and Telephone Corporation, both of Tokyo, Japan

Continuation of Ser. No. 384,838, Feb. 7, 1995, Pat. No. 5,576,876. This application Nov. 6, 1996, Ser. No. 744,762

Claims priority, application Japan, Feb. 7, 1994, 6-013307

Int. Cl.⁶ H04B *10/16*

U.S. Cl. 359—176 **8 Claims**



1. An optical regeneration repeater comprising:

a receiver for receiving an optical signal from at least one of a different optical regeneration repeater and a transmitter, said receiver regenerating data from said received optical signal;

a producer for producing a transmission optical signal on a basis of the data regenerated by said receiver;

a first clock extractor for recovering a first clock on a basis of said received optical signal; and

a second clock extractor for generating a second clock giving a timing for said transmission optical signal on a basis of a signal recovered by said first clock extractor;

wherein a cut-off frequency of a jitter transfer function of said first clock extractor is larger than a cut-off frequency of a jitter transfer function of said second clock extractor.

5,838,476

INPUT MONITORING SYSTEM FOR OPTICAL AMPLIFYING REPEATER

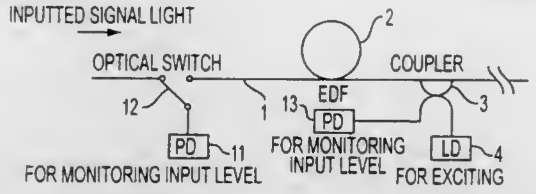
Shinichirou Harasawa; Hiroyuki Deguchi, and Masuo Suyama, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Oct. 10, 1995, Ser. No. 541,788

Claims priority, application Japan, Mar. 17, 1995, 7-059121

Int. Cl.⁶ H04B *10/02;10/00*

U.S. Cl. 359—177 **10 Claims**



1. An input monitoring system provided in an optical amplifying repeater for monitoring a level of an optical input signal, the input monitoring system comprising:

an input terminal supplied with the optical input signal; an optical fiber amplifier for amplifying the optical input signal, wherein said optical fiber is formed of an Erbium doped fiber;

a first photo diode for detecting and outputting an electric signal corresponding to a level of the optical input signal;

an optical switch operatively connected to the input terminal, the optical fiber amplifier and first photo diode for switching the optical input signal alternatively into the optical fiber amplifier and the first photo diode;

a coupler operatively connected to an output side of the optical fiber amplifier;

a laser diode for emitting and supplying an optical exciting light to the optical fiber amplifier via the coupler; and

a second photo diode operatively coupled to the coupler for detecting a part of the optical exciting light emitted from the laser diode.

5,838,477

OPTICAL SUBMARINE BRANCHING DEVICE

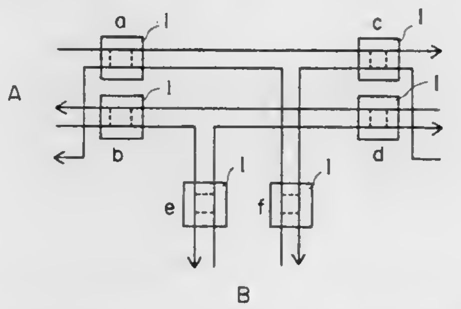
Shu Yamamoto, Shiki; Noboru Edagawa, Higashimatsuyama; Hidenori Taga, Sakado, and Tetsuyuki Miyakawa, Kawaguchi, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 8, 1996, Ser. No. 727,678

Claims priority, application Japan, Oct. 18, 1995, 7-293827

Int. Cl.⁶ H04J *14/02;* H04B *10/17*

U.S. Cl. 359—179 **5 Claims**



1. An optical submarine branching unit, in which two pairs of optical fibers provided in an optical submarine cable are connected between first and second points and are branched to another two pairs of optical fibers at a third point, to establish two-way interconnections between said first and second points, between said first and third points and between said second and third points;

said optical submarine branching unit comprising three pairs of optical four-port circulators each capable of reversing the direction of rotation of the optical input/output thereof as optical switching means, each pair of said three pairs of optical four-port circulators being respectively inserted in said two pairs of optical fibers at said first point and said second point and in said two pairs of optical fibers at said third point, by which when a failure occurs in any one of the three transmission systems between said first and second points, between said first and third points and between said second and third points, the other remaining two of said three transmission systems are interconnected directly to circumvent the failed transmission system.

5,838,478

ROTARY MIRROR ARRANGEMENT FOR THE FOCUSING OF AN INCIDENT LIGHT BEAM AND/OR CHANGING THE POSITION OF THE FOCUS OF AN ALREADY FOCUSED LIGHT BEAM

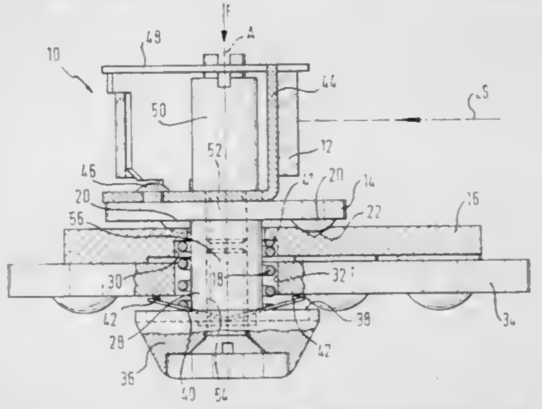
Heinrich Hippenmeyer, Freiamt, and Christoph Anselment, Waldkirch/Breisgau, both of Germany, assignors to Sick AG, Waldkirch/Breisgau, Germany

Filed Apr. 16, 1997, Ser. No. 843,654

Claims priority, application Germany, Apr. 17, 1996, 296 06 966 U

Int. Cl.⁶ G02B *26/08*

U.S. Cl. 359—198 **15 Claims**



1. Rotary mirror arrangement (**10**) for the focusing of an incident light beam and/or for the change of the position of the focus of an already focused light beam, in particular laser beam (LS), characterised in that

a plurality of deflecting mirrors (**12**) of different focal length are secured on one side of a base plate (**14**) which is rotatably mounted on a stationary latch plate (**16**) arranged on the opposite side and can be latched to the latter in various rotational positions, wherein, in a respective latched position, a relevant deflecting mirror (**12**) is pivoted into the beam path of the incident light beam (LS); in that the base plate (**14**) is displaceably mounted on the latch plate (**16**) in the direction of the axis of rotation (A) and is held against the latch plate by spring force (**18**); and in that the base plate (**14**) is supported on the latch plate (**16**) by a three-point mounting.

5,838,479

OPTICAL EXPOSURE UNIT AND IMAGE FORMING UNIT USED IN OPTICAL EXPOSURE UNIT

Takashi Shiraishi, Sagamihara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

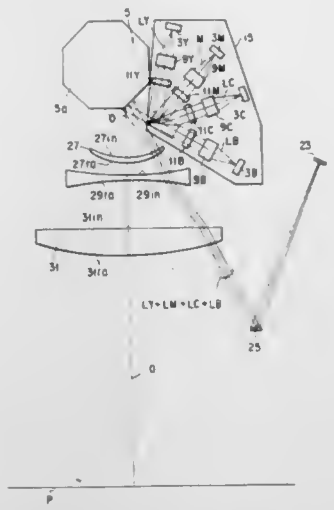
Division of Ser. No. 408,931, Mar. 22, 1995, Pat. No. 5,715,078. This application Apr. 30, 1997, Ser. No. 841,694

Claims priority, application Japan, Mar. 24, 1994, 6-079455

Int. Cl.⁶ G02B *26/08*

U.S. Cl. 359—204 **4 Claims**

1. An optical exposure unit for guiding beams to be scanned to a predetermined image plane, comprising:



a plurality of light sources for generating a plurality of beams;

first optical means for making the plurality of beams generated by said light sources close to each other to be guided;

deflecting means having a surface on which the plurality of beams made close to each other guided by said first optical means are incident so as to deflect the beams incident on said surface to a predetermined direction; and

second optical means, for guiding the beams deflected by said deflecting means to said image plane as a plurality of beams having a predetermined distance from each other;

wherein said first optical means includes a first lens having curvature in only a sub-scanning direction, a second lens having a curvature whose absolute value is equal to the curvature of said first lens and whose polarity is opposite to said first lens, the respective lenses are formed of material whose change rate of a refractive index due to a variation of temperature is different, and provided such that the surfaces having a curvature are mutually contacted, and wherein at least one of said first and second lenses of said first optical means is formed of a material which is identical to a material of which said second optical means is formed.

5,838,480

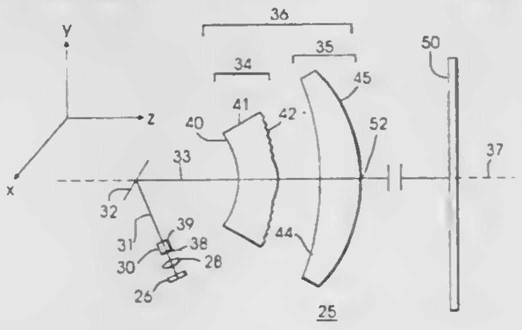
OPTICAL SCANNING SYSTEM WITH DIFFRACTIVE OPTICS

Kevin J. McIntyre, Rochester, and G. Michael Morris, Fairport, both of N.Y., assignors to The University of Rochester, Rochester, N.Y.

Filed Apr. 29, 1996, Ser. No. 639,588

Int. Cl.⁶ G02B *26/08*

U.S. Cl. 359—205 **18 Claims**



1. An optical system for scanning a beam comprising:

a laser source for emitting a beam along a first path;

a deflector intersecting said first path for translating said beam into a scanning beam which moves along a second path in a scan plane;

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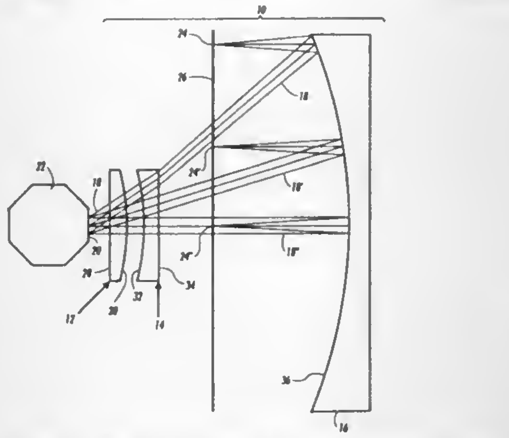
- a F-θ lens system in said second path comprising first and second elements for focusing said scanning beam onto an image plane transverse to said scan plane;
- said first and second elements each comprising at least one body having a non-toric lens; and
- the body of at least one of said first and second elements also provides a diffractive element which corrects optical aberrations of said scanning beam, wherein said diffractive element corrects optical aberrations in said scanning beam which includes at least correcting of astigmatic aberrations of said scanning beam.

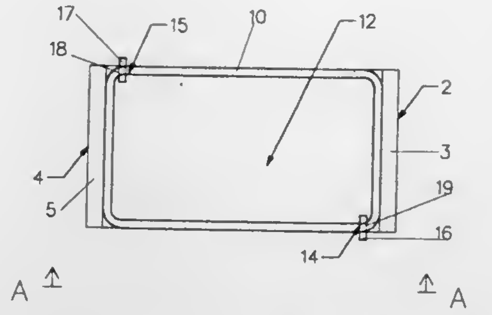
5,838,481
ACHROMATIC TELECENTRIC F-THETA SCAN LENS OPTICAL SYSTEM WITH IMPROVED LINEARITY
Anthony Ang, Long Beach, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed May 2, 1996, Ser. No. 641,769
Int. Cl.^{6} G02B *26/08*
U.S. Cl. 359—208 **1 Claim**



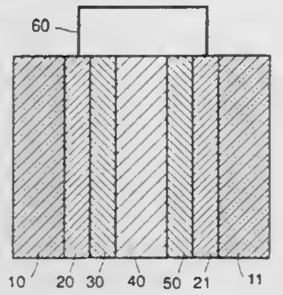
1. A f-theta scan lens optical system for a raster output scanner having a concave mirror, comprising
- a first positive lens element having a first refractive index, and
- a second negative lens element having a second refractive index, said second refractive index being sufficiently different from said first refractive index to achieve achromatization of a light beam by said first positive lens element and said second negative lens element,
- wherein said first positive lens element, said second negative lens element and said concave mirror form a telecentric optical system.

5,838,482
OPTICAL CELL
Daniel Decroupet, Fosses-la-Ville, and Pierre Laroche, Nalinnes, both of Belgium, assignors to Glaverbel, Brussels, Belgium
PCT No. PCT/BE95/00047, § 371 Date Nov. 6, 1996, § 102(e) Date Nov. 6, 1996, PCT Pub. No. WO95/32450, PCT Pub. Date Nov. 30, 1995
PCT Filed May 16, 1995, Ser. No. 737,278
Claims priority, application United Kingdom, May 20, 1994, 9410261
Int. Cl.^{6} G02F *1/03*
U.S. Cl. 359—253 **22 Claims**

1. An optical cell, comprising:
- two adjacent plates which form a space to be filled with a viscous liquid suspension of electrically-orientable particles, the space being bounded by a peripheral sealing ribbon,
- wherein the cell includes a first opening which passes through the sealing ribbon into the space to permit injection of the suspension into the cell and a second opening which passes though the sealing ribbon at or near the furthest possible distance permitted by the configuration of the cell from the first opening, so that the injection of the suspension displaces through the second opening any fluid initially present in the space, and
- wherein the surface of the sealing ribbon facing the space has a smooth profile with no sharp angles.

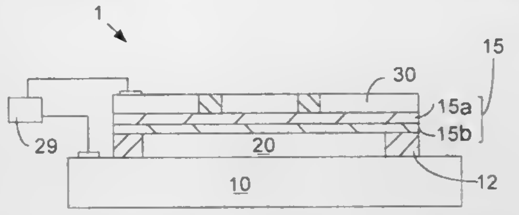


5,838,483
PHOTOCHROMIC DEVICES
Gimtong Teowee; Pierre-Marc Allemand; John P. Cronin; Juan Carlos Lopez Tonazzi, and Anoop Agrawal, all of Tucson, Ariz., assignors to Donnelly Corporation, Holland, Mich.
Continuation of Ser. No. 386,771, Feb. 10, 1995, Pat. No. 5,604,626. This application Feb. 13, 1997, Ser. No. 798,725
Int. Cl.^{6} G02F *1/15*
U.S. Cl. 359—265 **21 Claims**



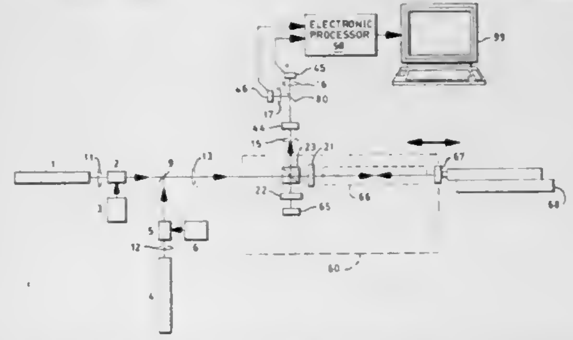
1. A photochromic device comprising (i) a first conducting electrode opposing a second conducting electrode, wherein at least one of said electrodes is transparent, (ii) a radiation sensitive electrode disposed on an opposing surface of said first conducting electrode, (iii) an interconnecting medium containing a redox promoter disposed between said second conducting electrode and said radiation sensitive electrode, (iv) an electrical connection means for electrically connecting said first conducting electrode and said second conducting electrode and at least one of:
- (a) a first ion intercalative electrode disposed between said interconnecting medium and said second conducting electrode;
- (b) a second ion intercalative electrode disposed between said radiation sensitive electrode and said interconnecting medium; and
- (c) a redox active species in said interconnecting medium.

5,838,484
MICROMECHANICAL OPTICAL MODULATOR WITH LINEAR OPERATING CHARACTERISTIC
Keith Wayne Goossen, Aberdeen, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.
Filed Aug. 19, 1996, Ser. No. 699,374
Int. Cl.^{6} G02F *1/09*
U.S. Cl. 359—282 **21 Claims**



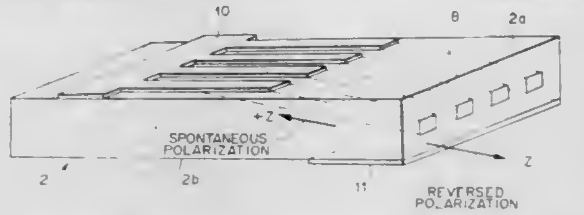
1. A micromechanical optical modulator for modulating an optical signal characterized by a wavelength, the modulator physically adapted for operating in a linear operating regime wherein there is a substantially linear change in reflectivity with a change in an applied voltage, comprising:
- a substrate; and
- a movable layer in a spaced and superposed relation to the substrate defining a gap, the movable layer having a first position and the gap having a first size in the absence of the applied voltage, wherein, movement of the movable layer results in a change in size of the gap causing the reflectivity to change; and further wherein
- the movable layer moves to and within the linear operating regime under the applied voltage, and the physical adaptations include selecting the first membrane position and the linear operating regime so that
- (a) as the movable layer moves within the linear operating regime, incremental changes in reflectivity decrease with incremental decreases in the gap size; and
- (b) as the movable layer moves from the first position to the linear operating regime, reflectivity increases.

5,838,485
SUPERHETERODYNE INTERFEROMETER AND METHOD FOR COMPENSATING THE REFRACTIVE INDEX OF AIR USING ELECTRONIC FREQUENCY MULTIPLICATION
Peter de Groot, Middletown, Conn., and Henry A. Hill, Tucson, Ariz., assignors to Zygo Corporation, Middlefield, Conn.
Filed Aug. 20, 1996, Ser. No. 700,112
Int. Cl.^{6} G01B *9/02*
U.S. Cl. 356—361 **30 Claims**



1. An apparatus for measuring fluctuations in the refractive index of a gas in a measurement path comprising:
- a source of at least two light beams having different wavelengths and a substantially harmonic relationship, said light beams each having orthogonal polarization states;
- means for introducing a frequency difference between said orthogonal polarization states of each of said light beams;
- means for aligning said light beams into a single substantially collinear light beam along said measurement path;
- means for producing phase shifted beams having phase shift magnitudes proportional to a product of the physical length of said measurement path and said refractive index of said gas in said measurement path;
- means for mixing said polarization components of each of said phase shifted beams for producing at least two mixed output beams;
- means for producing heterodyne electrical signals from the intensities of said at least two mixed output beams which comprise oscillations at heterodyne frequencies related to the frequency differences between said polarization states of said light beams and comprising heterodyne phases which are substantially inversely related in accordance with said harmonic relationship between said different wavelengths except for differences due to said refractive index of said gas in said measurement path;
- means for generating at least two modified heterodyne signals from said at least two heterodyne electrical signals which comprise modified heterodyne frequencies and modified heterodyne phases harmonically related to said heterodyne phases in accordance with the ratio of said different wavelengths;
- means for adding at least one preselected pair from said at least two of said modified heterodyne electrical signals for producing one superheterodyne electrical signal comprising a superheterodyne modulation frequency substantially equal to half the difference of said preselected pair of said modified heterodyne frequencies and a superheterodyne modulation phase substantially equal to half the difference between said heterodyne phases of said preselected pair of said modified heterodyne electrical signals; and
- means for analyzing said superheterodyne modulation phase for determining said fluctuations in said refractive index over said measurement path.

5,838,486
OPTICAL WAVELENGTH CONVERSION ELEMENT, METHOD OF MANUFACTURING THE SAME AND OPTICAL WAVELENGTH CONVERSION MODULE
Shinichiro Sonoda; Isao Tsuruma; Masami Hatori, and Kenji Matsumoto, all of Kanagawa-ken, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa-ken, Japan
Filed Dec. 4, 1996, Ser. No. 759,794
Claims priority, application Japan, Dec. 8, 1995, 7-320731; Mar. 5, 1996, 8-047591
Int. Cl.^{6} G02F *1/35*
U.S. Cl. 359—332 **14 Claims**



1. An optical wavelength conversion element comprising:
- an optical waveguide which is formed on a ferroelectric crystal substrate having a nonlinear optical effect and which extends along one surface of the substrate, and
- domain reversals which are periodically formed in the optical waveguide and arranged in a direction, an orientation of polarization of the domain reversals being parallel to an orientation of spontaneous polarization of the substrate and the orientation of polarization being reversed in the domain reversals, and the optical wavelength conversion element being for converting a wavelength of a fundamental wave travelling in the direction in which the domain reversals are arranged under the guidance of the optical waveguide.
- wherein the orientation of the spontaneous polarization of the substrate is at an angle θ larger than 0° and smaller than 90° to said one surface of the substrate in a plane normal to the direction in which the fundamental wave is guided.

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5,838,487
OPTICAL AMPLIFIERS

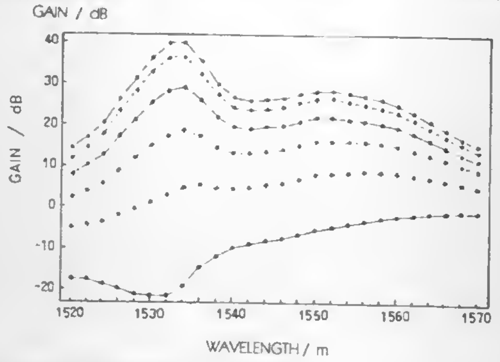
Lars Johan Albinsson Nilsson, Karlskoga, Sweden, and Yong-Woo Lee, Kyungki-do, Rep. of Korea, assignors to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Aug. 5, 1996, Ser. No. 692,205

Claims priority, application Rep. of Korea, Aug. 5, 1995, 1995/24248

Int. Cl.^{6} G02F *1/35;* **H01S** *3/06*

U.S. Cl. 359—341 **91 Claims**



1. An optical amplifier comprising:
an input means;
an output means; and
a gain medium, disposed between said input and output means and used for amplifying signals of at least two wavelengths, and having a gain characteristic arranged such that, when a gain thereof changes at one wavelength, the gain thereof at another wavelength will change by substantially the same amount and such that the gain shape is independent of the operating gain.

5,838,488
OPTICAL AMPLIFIER GAIN CONTROL CIRCUITRY USING A VARIABLE REFERENCE CORRESPONDING TO THE NUMBER OF MULTIPLEXED WAVELENGTHS

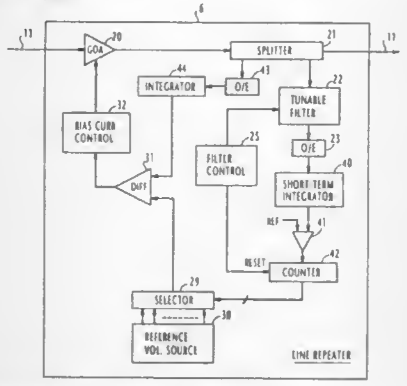
Kiyoto Kobayashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 5, 1997, Ser. No. 869,831

Claims priority, application Japan, Jun. 6, 1996, 8-144490

Int. Cl.^{6} H04B *10/16;10/17;* **H01S** *3/16*

U.S. Cl. 359—341 **5 Claims**



1. An optical line repeater comprising:
a gain-controlled optical amplifier for amplifying a wavelength division multiplex (WDM) signal from an incoming optical transmission link;
an optical splitter for splitting the amplified WDM signal into first and second replicas and forwarding the first replica onto an outgoing optical transmission link;
means for determining, from said second replica, a number of wavelength components multiplexed in said amplified WDM signal and producing a reference value corresponding to said number; and
means for detecting a difference between said reference value and intensity of said amplified WDM signal and controlling the gain of said optical amplifier according to the detected difference so that the detected difference reduces to a minimum.

5,838,489
REFRACTIVE BROAD BAND IR OBJECTIVE

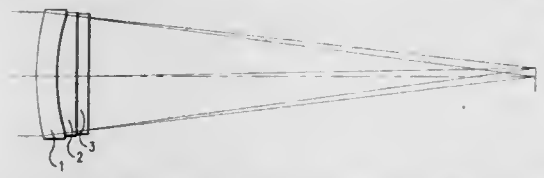
Matthias Erdmann, Munich, Germany, assignor to Britishi Aerospace, Hants, United Kingdom

Filed May 18, 1995, Ser. No. 443,700

Claims priority, application Germany, May 21, 1994, 44 17 888.3

Int. Cl.^{6} G02B *1/00;13/14*

U.S. Cl. 359—357 **11 Claims**



1. A multi-lens infrared objective with wide band chromatic correction in a spectral range of 1.4 μm to 5 μm, whose lenses consist of different materials selected from three different material groups, the lenses of negative focal length being selected from two different material groups, of which the first group consists of materials whose short wave absorption bands are close to the shortest wavelength to be corrected and the second group consists of materials whose long wave absorption bands are closer to the spectral range to be corrected than the short wave ones, and at least one lens of positive focal length being selected from a material group consisting of materials whose absorption bands are between those of the first and second material groups.

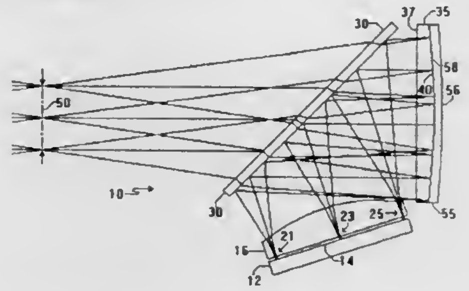
5,838,490
HEAD MOUNTED DISPLAY SYSTEM USING MANGIN MIRROR COMBINER

Bernard S. Fritz, Eagan, Minn., assignor to Hnneywell Inc., Minneapolis, Minn.

Filed Nov. 4, 1996, Ser. No. 740,741

Int. Cl.^{6} G02B *27/14*

U.S. Cl. 359—631 **13 Claims**



1. A head mounted display system for transmitting an image from a flat image source through an optical system to the eye of a viewer, comprising:
a partly reflective first member to receive and reflect light from the source;
a Mangin mirror having a curved reflecting surface to receive the light reflected from the first member and reflect it hack through the first member to the eye and a transparent element mated to the curved surface of the Mangin mirror to pass light from a remote scene through the mirror and the first member so as to be combined with the image as viewed by the eye.

5,838,491
VIEWING APPARATUS HAVING OBLIQUE ILLUMINATION

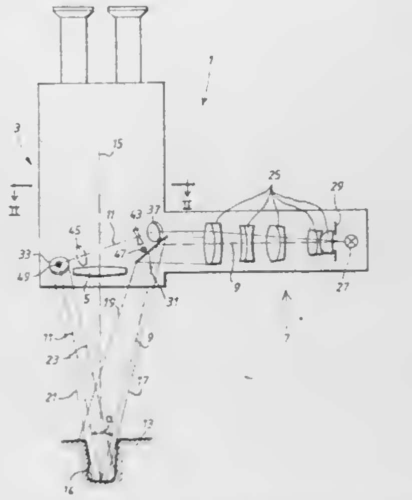
Hartmut Gärtner, Oberkochen; Ulrich Lemcke, Heidenheim; Christian Lücke, Oberkochen, and Joachim Steffen, Westhausen, all of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Germany

Filed Jul. 10, 1997, Ser. No. 890,931

Claims priority, application Germany, Jul. 15, 1996, 196 28 417.1

Int. Cl.^{6} G02B *21/06;21/00*

U.S. Cl. 359—385 **11 Claims**



1. A viewing apparatus for viewing an object comprising:
viewing optics defining an optical axis and including an objective defining an intersection distance:
a device for adjusting said intersection distance of said objective;
an illuminating assembly including a first set of optics for guiding a first illuminating beam to said object along a first illuminating beam path; and, a second set of optics for guiding a second illuminating beam to said object along a second illuminating beam path;
said first and second illuminating beam paths being inclined to each other at an angle at a location forward of said object; and,
a device for interconnecting said sets of optics and said adjusting device so as to cause said angle to be dependent upon said intersection distance.

5,838,492
METHOD AND APPARATUS FOR A BINOCULAR OPTICAL SYSTEM

Atsushi Katsunuma, Saitama-ken, and Kazuaki Sato, Tokyo, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

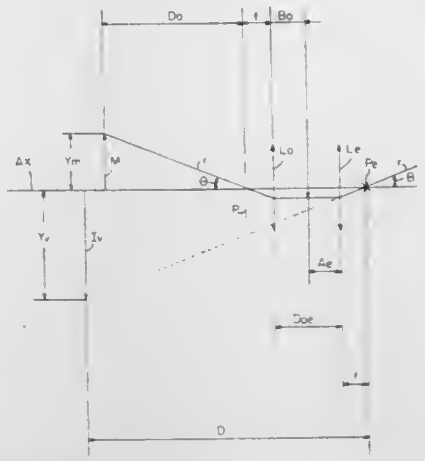
Filed Apr. 17, 1997, Ser. No. 839,381

Claims priority, application Japan, Apr. 19, 1996, 8-122517

Int. Cl.^{6} G02B *23/00*

U.S. Cl. 359—426 **16 Claims**

1. A system for obtaining a desired visual impression of an object by viewing a model of said object, said system comprising:
a model having a predetermined dimensional relationship with respect to said object;
an objective optical system substantially telecentric to an image of said model and having a preselected first focal length:
a binocular eyepiece lens having a focal length substantially equal to said first focal length; and
means for varying the distance between said objective optical system and said binocular eyepiece lens until a visual impression of the image of said model viewed through said binocular eyepiece lens becomes substantially identical to a visual impression resulting from viewing said object directly,



wherein said objective optical system has left and right incident light optical axes and which satisfies the following condition:

$$Wo=We\cdot(1/m)$$

where Wo is the distance between the left and right incident light optical axes;
We is the width between the eyes of an observer; and
m is a predetermined magnification for said model with respect to said actual object.

5,838,493
CABINET STRUCTURE OF MULTISCREEN DISPLAY

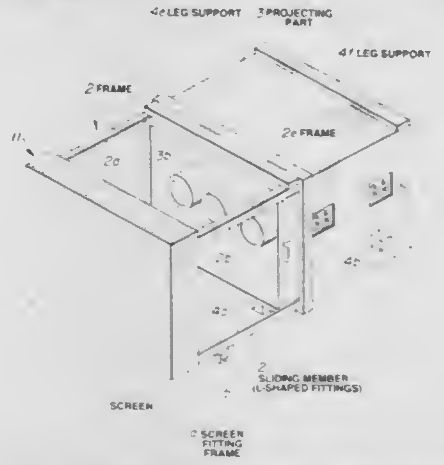
Keizo Furuya, Saitama-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 18, 1996, Ser. No. 715,464

Claims priority, application Japan, Sep. 19, 1995, 7-240095

Int. Cl.^{6} G03B *21/00*

U.S. Cl. 359—443 **8 Claims**



1. A multiscreen displaying apparatus comprising a plurality of projectors, each of said projectors comprising:
a projecting part including an optical element adapted to project images;
a screen adapted to display the images projected by said projecting part; and
a frame movably mounted on said projecting part, said frame being united with said screen and being configured to house said projecting part therein,
said frame being constructed and arranged to permit said screen to be manually moved from a retracted operating position wherein said screen is disposed adjacent said projecting part to an extended operating position wherein said screen is spaced away from said projecting part and supported by said frame.

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5,838,494

APPARATUS FOR DISPLAYING IMAGE ALLOWING OBSERVER TO RECOGNIZE STEREOSCOPIC IMAGE

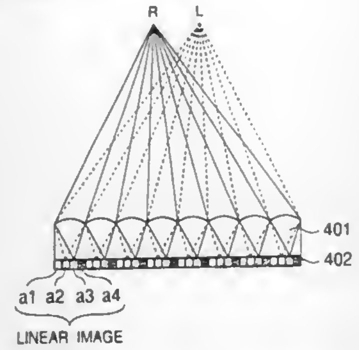
Keisuke Araki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 16, 1996, Ser. No. 585,501

Claims priority, application Japan, Jan. 19, 1995, 7-006383

Int. Cl.^{6} G09G *3/36*

U.S. Cl. 359—455 **8 Claims**



1. A stereoscopic image display apparatus which allows an observer to recognize a stereoscopic image, comprising:

a lenticular lens sheet wherein a plurality of lenticular lenses are arranged in a horizontal direction;

display means for arranging corresponding images from among images obtained by dividing each of a plurality of parallax images whose parallaxes are different in a horizontal direction by a predetermined order to obtain stripe images to arrange and display said stripe images so that each of said stripe images is disposed at the corresponding back surface of said lenticular lens;

wherein when a predetermined distance between both eyes of said observer, an optimum distance for stereoscopic observation, a thickness of said lenticular lens sheet, a radius of curvature of said lenticular lens and a width in a horizontal direction of whole of said arranged stripe images are respectively defined as K, Do, t, r and A, then, a deviation between a position of center of lenticular lens positioned at an end portion in a horizontal direction of said lenticular lens sheet and a position of center of the stripe image corresponding to said lenticular lens satisfies the following condition:

$$d=\gamma(t-r)(A/2)Do(0<\gamma<1).$$

5,838,495

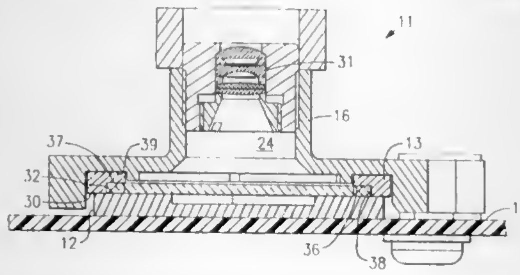
IMAGE SENSOR CONTAINMENT SYSTEM

Robert J. Hennick, Auburn, N.Y., assignor to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Mar. 25, 1996, Ser. No. 620,909

Int. Cl.^{6} G02B *7/00*

U.S. Cl. 359—507 **10 Claims**



1. In an optical reading apparatus of the type including an integrated circuit image sensor having an array of picture elements, a substrate for supporting said image sensor, an optics housing for protecting said image sensor from ambient light and for supporting a lens assembly in light focusing relationship to said array, and means for securing said image sensor and said optics housing to said substrate, at least two of said image sensor, said optics housing and said substrate together defining an opening through which air may circulate between the atmosphere and the interior of said optics housing, the improvement comprising:

a compressible barrier member which, when disposed in said opening, defines a multiplicity of pores having sizes which allow substantially particulate-free air to circulate between said interior and the atmosphere, but which filters out and traps particulates suspended in said air.

5,838,496

DIFFRACTIVE MULTI-FOCAL OBJECTIVE LENS

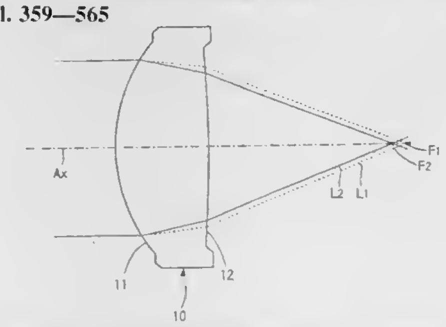
Koichi Maruyama, and Junji Kamikubo, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 27, 1996, Ser. No. 703,660

Claims priority, application Japan, Aug. 28, 1995, 7-242466

Int. Cl.^{6} G02B *27/44;5/18*

U.S. Cl. 359—565 **8 Claims**



5. A diffractive multi-focal objective lens, comprising:

means for refracting an incident light beam to converge said light beam,

said refracting means comprising a single piece positive lens; and

means for diffracting said incident light beam to divide said incident light beam into a plurality of diffractive light beams,

said diffracting means comprising a microscopic diffractive lens construction formed on a lens surface of said single piece positive lens;

whereby said incident light beam is divided into a plurality of diffractive light beams that converge at a plurality of focal points on an optical axis of said lens,

wherein a predetermined light intensity amount of said incident light beam is distributed to two of said plurality of diffractive light beams which converge, respectively, at two of said plurality of focal points, said two diffractive light beams having a diffractive order at least equal to a first order, a variation of a power of said diffractive lens construction compensating for a spherical aberration of said refracting means.

5,838,497

CHROMATIC ABERRATION CORRECTION ELEMENT AND ITS APPLICATION

Koichi Maruyama, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 630,597, Apr. 10, 1996, which is a division of Ser. No. 91,983, Jul. 16, 1993, Pat. No. 5,629,799. This application Feb. 18, 1997, Ser. No. 801,459

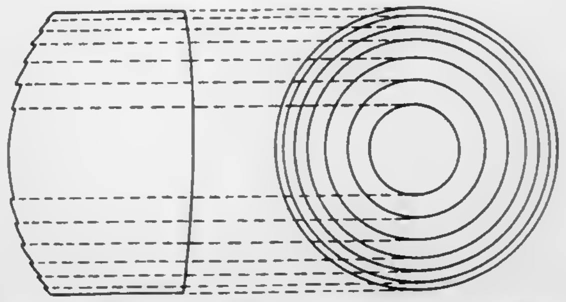
Claims priority, application Japan, Jul. 16, 1992, 4-189474; Dec. 21, 1992, 4-340562; Dec. 28, 1992, 4-348593; Jan. 14, 1993, 5-004958; Mar. 25, 1993, 5-066504; Jun. 10, 1993, 5-138300; Jun. 10, 1993, 5-138301; Jun. 10, 1993, 5-138302; Jun. 25, 1993, 5-155074

Int. Cl.^{6} G02B *3/08;5/18*

U.S. Cl. 359—565 **12 Claims**

1. A lens for use in an optical recording device which includes a light source emitting light of substantially a constant wavelength and that shifts over an operating wavelength range due to operating conditions, said lens comprising:

an objective lens element in the path of the light having a diffractive surface formed on a macroscopically aspheric surface, said diffractive surface comprising a plurality of annular steps formed to correct chromatic aberration generated by other portions of the lens, wherein each of said annular steps has an aspheric annular surface.



5,838,498

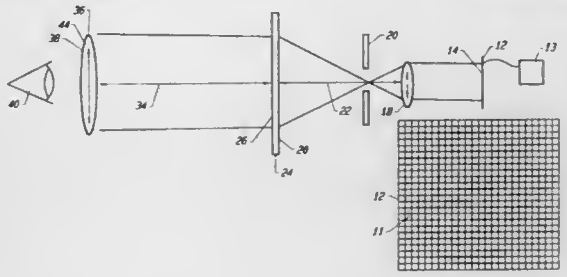
MINIATURE SYNTHESIZED VIRTUAL IMAGE ELECTRONIC DISPLAY

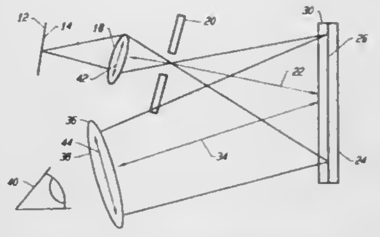
Alfred P. Hildebrand, Palo Alto, and Gregory J. Kintz, Mountain View, both of Calif., assignors to Siliscape, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 361,035, Dec. 21, 1994, Pat. No. 5,644,323. This application Dec. 31, 1996, Ser. No. 775,840

Int. Cl.^{6} G02B *27/14*

U.S. Cl. 359—630 **44 Claims**





1. A synthesized virtual image electronic display comprising:

a microdisplay for forming a source object;

a first stage magnification optic for magnifying the source object to produce a magnified real image;

an image synthesizing optic upon which the magnified real image is projected, and

a second stage magnification optic for providing a magnified virtual image of the magnified real image projected on the image synthesizing optic.

5,838,499

TELEPHOTO ZOOM LENS SYSTEM

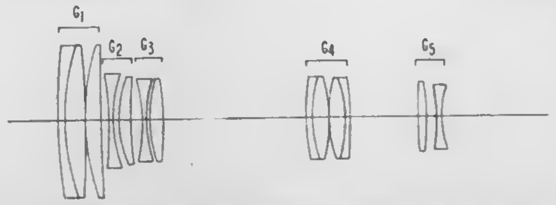
Masayuki Aoki, Oyama, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Apr. 23, 1997, Ser. No. 842,154

Claims priority, application Japan, Apr. 24, 1996, 8-129002

Int. Cl.^{6} G02B *15/14*

U.S. Cl. 359—676 **22 Claims**



1. A telephoto zoom lens system comprising, in order from an object side:

a first lens group G_1 having a positive refractive power;

a second lens group G_2 having a negative refractive power;

a third lens group G_3 having a negative refractive power;

a fourth lens group G_4 having a positive refractive power;

a fifth lens group G_5 having a negative refractive power;

wherein when zooming from the wide-angle end to the telephoto end, the distance between each of the adjacent lens groups changes;

said second lens group G_2, when zooming from the wide-angle end to the telephoto end, first moves from the wide-angle end toward the object side, then moves toward the image side, and once again moves toward the object side to reach the telephoto end; and

said second lens group G_2 is positioned closer to the image side at its telephoto end than it is at its wide-angle end.

5,838,500

HIGH-POWERED ZOOM LENS SYSTEM

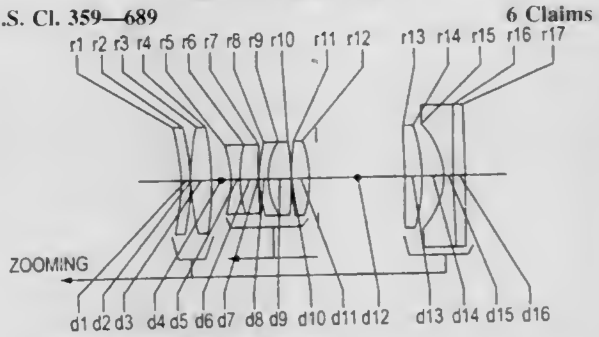
Takayuki Ito, and Sachio Hasushita, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 31, 1994, Ser. No. 298,281

Claims priority, application Japan, Aug. 31, 1993, 5-215648

Int. Cl.^{6} G02B *15/14*

U.S. Cl. 359—689 **6 Claims**


r1 r2 r3 r4 r5 r6 r7 r8 r9 r10 r11 r12 r13 r14 r15 r16 r17
ZOOMING
d1 d2 d3 d4 d5 d6 d7 d8 d9 d10 d11 d12 d13 d14 d15 d16

1. A zoom lens system comprising:

at least three lens groups including a first positive lens group, a second positive lens group, and a negative lens group, arranged in this order as viewed from a side of an object to be photographed; and

an aperture stop between said second positive lens group and said negative lens group,

said three lens groups all being moved toward the object to be photographed during a zooming operation from a wide-angle extremity to a telephoto extremity, wherein a zoom ratio of said zoom lens system is greater than three, and wherein said negative lens group satisfies the following relationships:

$3.3<m_{Tn}<6$

$2.5<m_{Tn}/m_{wn}<4$

wherein "m_{Tn}" represents a lateral magnification of said negative lens group at a long focal length position; and "m_{wn}" repre-

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sents a lateral magnification of said negative lens group at a short focal length position.

5,838,501
INDIRECT OPHTHALMOSCOPY LENS

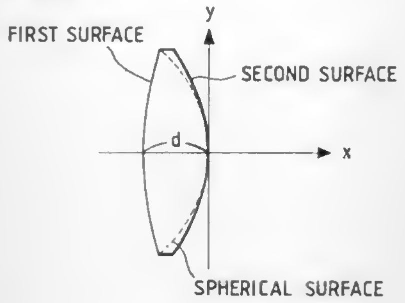
Satoshi Fukumoto, Machida, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 506,568, Jul. 25, 1995, abandoned. This application Apr. 30, 1997, Ser. No. 846,253

Claims priority, application Japan, Jul. 29, 1994, 6-197235

Int. Cl.^{6} G02B *3/02;* A61B *3/10*

U.S. Cl. 359—718 **7 Claims**



1. An indirect ophthalmoscopy lens, comprising:

a single biconvex lens, wherein an examiner-side surface of said biconvex lens is aspherical and the following conditions are satisfied:

$$65<\nu d$$

$$nd<1.67$$

where

nd: an index of refraction of said biconvex lens for the d-line; and

νd: an Abbe number of said biconvex lens for the d-line,

and further wherein the following conditions are satisfied in a range of $0<y<0.8\times|R2|$:

$$-0.70\leqq R2/f\leqq-0.5$$

$$-2.5\leqq(dx/dy)\cdot f/y\leqq-0.8$$

where R2 is a radius of curvature of a paraxial region of said aspherical surface, f is a focal length of said biconvex lens, y is an amount of displacement in a direction perpendicular to an optical axis with the origin at the vertex of said aspherical surface, and x is an amount of displacement in a direction of the optical axis of said aspherical surface with the origin at the vertex of said aspherical surface.

5,838,502
OBJECTIVE LENS FOR OPTICAL PICKUP APPARATUS

Song Chan Park, Seoul, and Jin Yong Kim, Kyungki-Do, both of Rep. of Korea, assignors to LG Electronics Inc., Seoul, Rep. of Korea

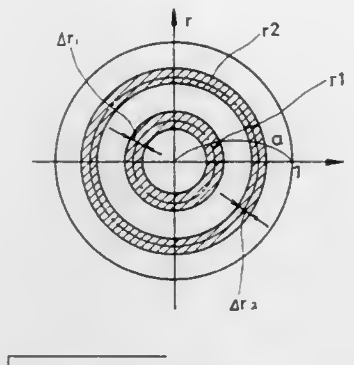
Filed Nov. 15, 1996, Ser. No. 749,548

Claims priority, application Rep. of Korea, Nov. 15, 1995, 1995 42156

Int. Cl.^{6} G02B *9/00;* G11B *7/00*

U.S. Cl. 359—738 **12 Claims**

1. An objective lens for an optical pickup apparatus, comprising a ring-shaped mask formed in a portion of the objective lens for preventing aberrations caused when reproducing data from optical discs having different thicknesses, said mask having a mask radius (r_{n+1}) and a mask width (Δr_{n+1}) which are obtained based on the following equations:



$$r_{n+1}=\sqrt[4]{\frac{4(2n+1)N^3\lambda}{(N^2-1)\Delta d}}*\left(\frac{\alpha}{NA}\right).$$

and

$$\Delta r_{n+1}=\sqrt[4]{\frac{8N^3\lambda}{(N^2-1)\Delta d}}*\left(\sqrt[4]{\frac{4n+3}{4}}-\sqrt[4]{\frac{4n+1}{4}}\right)*\left(\frac{\alpha}{NA}\right)$$

where "n" denotes 0, 1, 2, 3, . . . (0 and a positive integer), "a" denotes the radius of the objective lens, "N" denotes a diffractive ratio of an optical disc, λ denotes a wavelength of a laser beam, Δd denotes the thickness difference between optical discs, and NA denotes a numerical aperture of the objective lens.

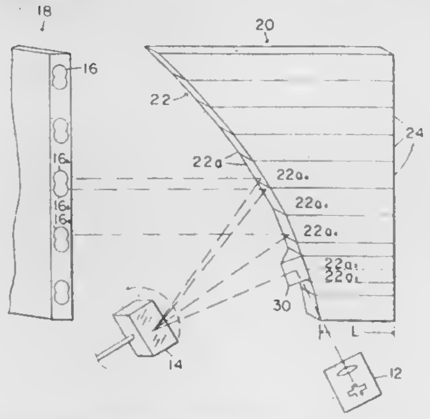
5,838,503
DEFLECTION MIRROR TOWER

Neville K. Lee, Sherbourn; Amit Jain, Marlboro, and Roy E. Martin, Westminster, all of Mass., assignors to Quantum Corporation, Milpitas, Calif.

Continuation of Ser. No. 476,722, Jun. 7, 1995, abandoned, which is a division of Ser. No. 303,895, Aug. 16, 1994, which is a continuation of Ser. No. 847,455, Mar. 6, 1992, abandoned. This application Sep. 9, 1997, Ser. No. 925,671

Int. Cl.^{6} G02B *5/04;5/08;* G11B *7/00*

U.S. Cl. 359—833 **19 Claims**



1. An optical component, comprising:

a plurality of discrete prism members vertically stacked and featured together as a block, each of said members having an angular surface oriented as a mirror facet to define an arcuate shaped side of said block; and

a relay mirror which is positioned on the arcuate side of said block.

5,838,504
PRISM AND REAL IMAGE TYPE VIEW FINDER

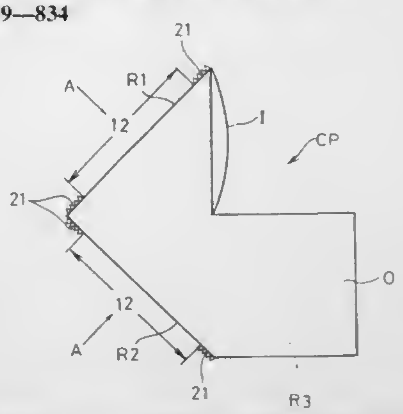
Yuichi Ichikawa; Sachio Hasushita, and Ryouzi Sekiguchi, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 233,431, Apr. 28, 1994, abandoned. This application Mar. 27, 1996, Ser. No. 624,776

Claims priority, application Japan, Apr. 27, 1993, 5-100750

Int. Cl.^{6} G02B *5/054;* G03B *13/02*

U.S. Cl. 359—834 **5 Claims**



1. A real image type viewfinder including a prism located in an optical path of said real image type viewfinder and having a surface on which light is made incident, surfaces at which light is reflected, and a surface from which light is emitted, said real image type viewfinder comprising:

an objective optical system, an image erecting optical system, and an ocular optical system, arranged in this order from an object side of said real image type viewfinder; and

an uneven surface portion provided on at least one of said surface on which said light is made incident, said surfaces at which light is reflected, and said surface from which light is emitted, said prism being molded utilizing a molding die having an uneven surface corresponding to said uneven surface portion, said uneven surface of said molding die being subjected to a shot-peening process, said uneven surface portion being completely located outside a light transmission area through which effective light of an associated optical system, in which said prism is to be incorporated, can be transmitted, wherein said prism comprises at least a part of said image erecting optical system.

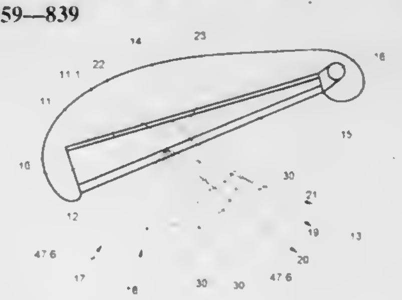
5,838,505
DIVIDED-REFLECTION METHOD OF WIDE-ANGLE OBSERVATION AND WIDE-ANGLE VIEW AUTOMOBILE MIRROR

Jose C. Palathingal, 424 Guadarrama Lane, Miradero Hills, Mayaguez, Puerto Rico, 00680

Filed Mar. 8, 1996, Ser. No. 613,266

Int. Cl.^{6} G02B *5/08;5/26;27/14;1/10*

U.S. Cl. 359—839 **7 Claims**



1. A side-view mirror assembly for use on a side of an automobile, the mirror assembly comprising:

a box (14) having an open end;

a transparent wedge-shaped plate, the plate having a front flat surface and a rear flat surface;

a silvered coating on each of the front flat surface and the rear flat surface of the transparent wedge-shaped plate; and,

a plane transparent sheet of glass;

the transparent wedge-shaped plate being secured in place by the open end of the box, and the plane transparent sheet of glass being secured to the front flat surface of the transparent wedge-shaped plate;

whereby a ray of light directed toward the wedge-shaped plate is both reflected and refracted off of the mirror assembly;

the silvered coating on the front surface of the wedge-shaped member has a reflection coefficient of approximately 0.38.

5,838,506
METHOD FOR PRODUCING REPLICA MIRROR FOR IMAGE RECORDING APPARATUS

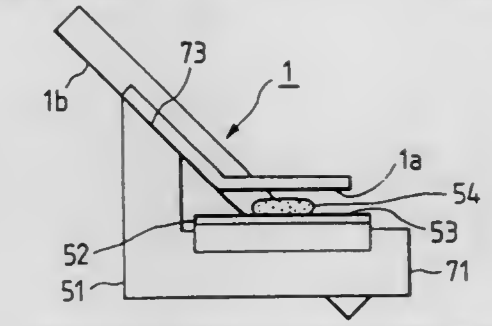
Haruo Tomono, Machida; Yukio Takemura, Kawasaki; Hiroyuki Suzuki, Yokohama; Yuji Matsuo, Kawasaki, and Kazumi Kimura, Toda, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

Continuation of Ser. No. 271,674, Jul. 7, 1994, abandoned. This application Sep. 13, 1996, Ser. No. 715,386

Claims priority, application Japan, Jul. 9, 1993, 5-194335; May 24, 1994, 6-133838

Int. Cl.^{6} G02B *5/08;7/182;5/122*

U.S. Cl. 359—871 **4 Claims**



1. A method for manufacturing a mirror to reflect and transmit an image formed of an original in an image-forming apparatus, comprising the steps of:

(a) preparing a mirror base plate which can travel along a scanning axis in the image-forming apparatus to reflect and transmit the image formed on an original plate to a photosensitive drum, and which includes a mirror surface inclined with respect to said scanning axis;

(b) adhering a reflective film layer on a master plate via a releasing agent layer;

(c) applying an adhesive material on said reflective film layer;

(d) adhering said reflective film layer onto said mirror base plate via said adhesive material by pressing said mirror base plate onto said adhesive material; and

(e) transferring said reflective film layer on said mirror base plate via said adhesive material by peeling off said releasing agent layer from said reflective film layer.

5,838,507
MIRROR ASSEMBLY WITH FRICTION DRIVE

Ian Boddy, and Keith D. Foote, both of Grand Rapids, Mich., assignors to Lowell Engineering Corporation, Alto, Mich.

Filed Dec. 19, 1996, Ser. No. 769,352

Int. Cl.^{6} G02B *7/182*

U.S. Cl. 359—877 **38 Claims**

1. A rearview mirror assembly comprising

a mirror unit having a mirror side and an opposite side.

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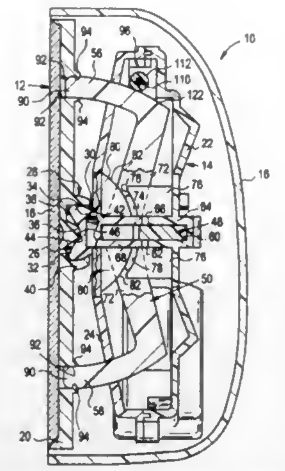


a mirror unit support disposed in facing relation to the opposite side of said mirror unit,

a central connection between the opposite side of said mirror unit and said support mounting said mirror unit on said support for pivotal movement about first and second generally intersecting perpendicular axes,

a first arm mounted on said support for pivotal movement between limits with respect to said support about said first axis and connected with the opposite side of said mirror unit for limited pivotal movement with respect to said mirror unit about said second axis at a position spaced from said first axis,

a second arm mounted on said support for pivotal movement between limits with respect to said support about said second axis and connected with the opposite side of said mirror unit for compound movement with respect to said mirror unit at a position spaced from said second axis which compound movement includes limited lateral movement with respect to said first axis and pivotal movement about an axis which is either coincident with or slightly angularly related with said first axis depending upon the position of relative lateral movement, and

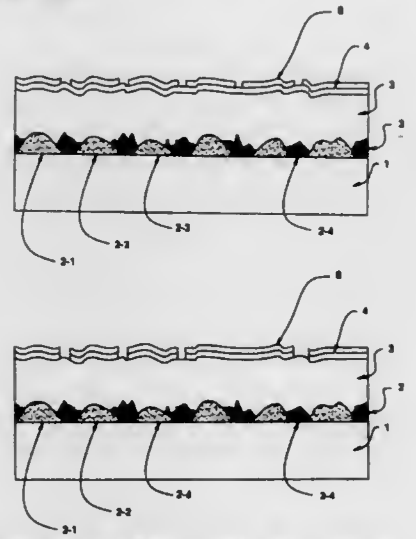
a remotely controlled power-operated mechanism carried in part by said support for effecting a desired movement of said mirror unit together with a corresponding movement of either one or both of said first and second arms with respect to said support in response to a remote manual movement by a user,

said remotely controlled power-operated mechanism including first and second power-transmitting surfaces on said first and second arms respectively arcuate about said first and second axis respectively, and first and second power-operated rotary members being annular in cross-section and engaged with said first and second power-transmitting surfaces respectively, said first and second power-transmitting surfaces being substantially smooth and said first and second power-operated rotary members having substantially smooth peripheral surfaces,

said first and second power-operated rotary members being constructed and arranged with respect to said first and second power transmitting surfaces respectively (1) to move under power in peripheral rolling contact therewith to effect movement of the first and second arms respectively and (2) to move under power in peripheral sliding relation therewith in the event that movement of the first and second arms respectively is otherwise prevented.

5,838,508
COLOR FILTER AND PROCESS FOR FABRICATING THE SAME AND ELECTRO-OPTICAL DEVICE

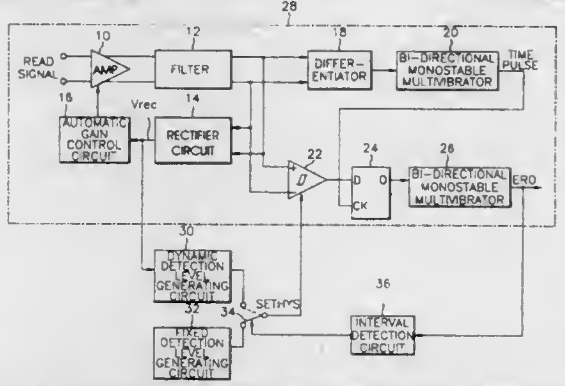
Akira Sugawara, Kanagawa, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa-ken, Japan
Continuation of Ser. No. 217,173, Mar. 24, 1994, abandoned. This application Aug. 22, 1996, Ser. No. 701,546
Claims priority, application Japan, Mar. 26, 1993, 5-092605
Int. Cl.^{6} G02B *5/22;* F21V *9/04;9/06*
U.S. Cl. 359—890 **20 Claims**



1. A process for fabricating a color filter comprising:
forming a color filter layer on a substrate;
forming a smoothing layer on said color filter layer;
forming a protective layer on said smoothing layer;
forming a transparent electrically conductive layer on said protective layer; and
patterning said transparent electrically conductive layer using a laser beam.

5,838,509
DATA DETECTION LEVEL ADJUSTING CIRCUIT FOR PROCESSING SIGNAL IN DISK DRIVING APPARATUS

Jong-Yun Yun, Suwon, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea
Filed Dec. 26, 1995, Ser. No. 589,565
Claims priority, application Rep. of Korea, Dec. 24, 1994, 1994-36630
Int. Cl.^{6} G11B *5/09*
U.S. Cl. 360—46 **22 Claims**

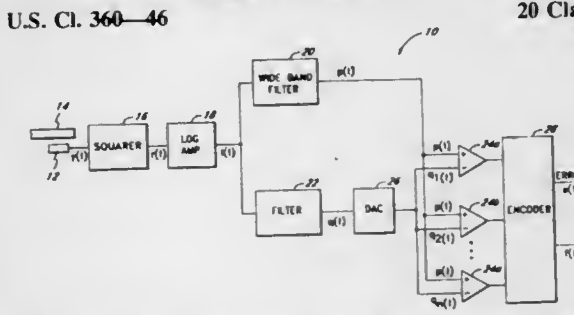

28
10
12
18
20
READ SIGNAL
AMP
FILTER
DIFFER-ENTIATOR
BI-DIRECTIONAL MONOSTABLE MULTIVIBRATOR
TIME PULSE
16
Vrec
14
AUTOMATIC GAIN CONTROL CIRCUIT
RECTIFIER CIRCUIT
22
24
26
D
Q
CK
BI-DIRECTIONAL MONOSTABLE MULTIVIBRATOR
ERO
30
DYNAMIC DETECTION LEVEL GENERATING CIRCUIT
32
34
SETHYS
36
FIXED DETECTION LEVEL GENERATING CIRCUIT
INTERVAL DETECTION CIRCUIT

1. A circuit for preventing false output when reading data recorded onto a recording medium, comprising:
transducer means for providing an electrical signal upon reading data from said recording medium;
means for providing an amplified signal by amplifying the electrical signal in dependence upon a gain control signal;
means for providing a filtered signal by filtering the amplified signal;

means for generating said gain control signal in dependence upon said filtered signal;
means for detecting peak values of said filtered signal and generating a first pulse signal in dependence upon the peak values;
differential means for differentially comparing said filtered signal with a data detection level to provide a differential signal;
means for latching the differential signal and producing a second pulse signal representative of output data; and
means for adaptively adjusting said data detection level to said differential means, said adjusting means comprising:
dynamic detection level generation means for generating a dynamic detection voltage level varying in accordance with an amplitude level of said filtered signal;
fixed detection level generation means for generating a fixed detection voltage level having a predetermined value;
interval detection means coupled to receive said output data, for detecting a servo information interval and a data information interval arranged in each track; and
switch means for alternately enabling transmission of said dynamic detection voltage level as said data detection level for the data information interval of each track and transmission of said fixed detection voltage level as said data detection level for the servo information interval of each track.

5,838,510
METHOD AND APPARATUS FOR THE MEASUREMENT OF DEFECTS IN MAGNETIC RECORDING DISKS USING A LOGARITHMIC AMPLIFIER

Michael Inbar, Santa Barbara, Calif., assignor to Phase Metrics, Inc., San Diego, Calif.
Filed Oct. 31, 1996, Ser. No. 739,877
Int. Cl.^{6} G11B *5/027*
U.S. Cl. 360—46 **20 Claims**

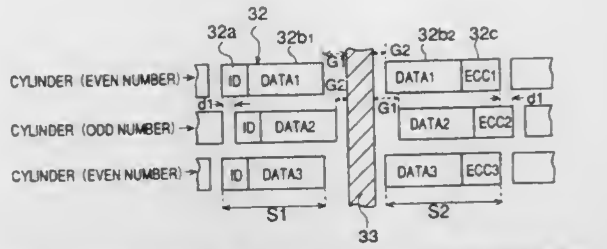


6. An apparatus for testing a read signal having a varying amplitude, generated by a magnetic head that senses a magnetic field of a magnetic disk, comprising:
a first circuit for generating a logarithmic read signal corresponding to the square of the read signal; and
a comparator having a first input and a second input, the first input being coupled to the first circuit, the second input being coupled to receive a threshold signal, the comparator providing an output signal in response to receiving a logarithmic squared read signal from the first circuit having an amplitude that is lower than the threshold signal.

5,838,511
STORAGE DEVICE AND RECORDING MEDIUM FORMATTING METHOD USING A PHASE SHIFT BETWEEN DATA SECTORS IN ADJACENT CYLINDERS

Keiichi Haraya, Higashine, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Filed Mar. 28, 1996, Ser. No. 623,919
Claims priority, application Japan, Jun. 19, 1995, 7-151910
Int. Cl.^{6} G11B *20/12*
U.S. Cl. 360—48 **35 Claims**

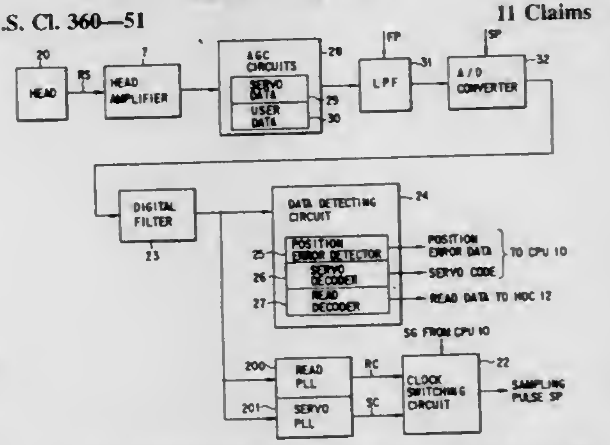
1. A storage device in which a predetermined number of sectors are formed on respective predetermined cylinders of a predetermined recording medium, and a head is moved to and positioned at an objective sector of an objective cylinder so that information recording and/or reproducing is performed on said objective sector through said head, wherein



a predetermined number of servo regions in which servo information is recorded therein are formed on said recording medium; and
positions of all said sectors formed on said predetermined cylinders are such that a phase difference within a sector length is provided at least between adjacent cylinders, and said sectors are spaced from said servo regions.

5,838,512
APPARATUS FOR REPRODUCING DIGITAL SERVO DATA AND DIGITAL USER DATA, FOR USE IN A DISK STORAGE SYSTEM

Akifumi Okazaki, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan
Filed Sep. 13, 1996, Ser. No. 713,498
Claims priority, application Japan, Sep. 20, 1995, 7-241944
Int. Cl.^{6} G11B *5/09*
U.S. Cl. 360—51 **11 Claims**



1. An apparatus for reproducing user data recorded in a plurality of user data areas provided on a disk and servo data recorded in a plurality of servo areas provided on the disk and containing servo burst data and a servo code, said apparatus comprising:
head means for reading the servo data from the servo areas of the disk and the user data from the user areas of the disk and for generating analog read signals from the servo data and the user data;
read PLL means for generating a phase-synchronizing clock signal for reproducing the user data;
servo PLL means for generating a phase-synchronizing clock signal for reproducing the servo data;
read data reproducing means for reproducing the user data which is digital data, from the analog read signals generated by said head means, at timing defined by the phase-synchronizing clock signal generated by said read PLL means; and
servo data reproducing means for reproducing the servo data which is digital data, from the analog read signals generated by said head means, at timing defined by the phase-synchronizing clock signal generated by said servo PLL means.

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5,838,513
CIRCUIT FOR DISCRIMINATING THE TAPE SPEED IN SPEED-CHANGE PLAYBACK MODE

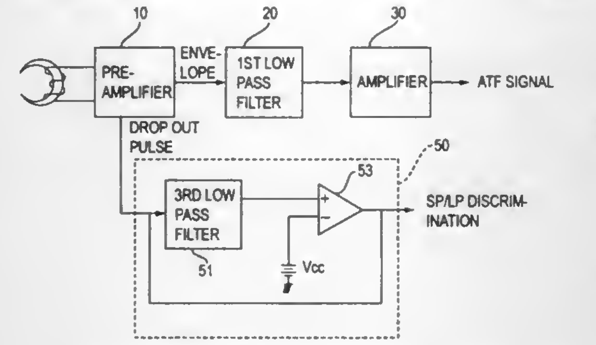
Yong Hyun Lee, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Nov. 3, 1995, Ser. No. 552,956

Claims priority, application Rep. of Korea, Nov. 4, 1994, 94-28894

Int. Cl.^{6} G11B *15/46*

U.S. Cl. 360—73.07 **5 Claims**



1. A circuit for discriminating the speed of a tape in a speed-change playback mode in a video processing system, comprising:
- filter means for filtering a drop out pulse signal; and
- comparison means for comparing the filtered drop out pulse signal with a reference voltage and discriminating in accordance with a result of the comparison whether the tape speed is standard play or long play, the drop out pulse signal having different pulse widths according to standard play and long play tape speeds.

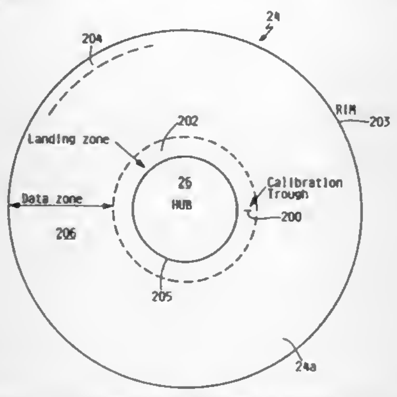
5,838,514
METHOD AND APPARATUS FOR CALIBRATING A THERMAL RESPONSE OF A MAGNETORESISTIVE TRANSDUCER

Gordon J. Smith, and Hal Hjalmar Ottesen, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 21, 1996, Ser. No. 697,217

Int. Cl.^{6} G11B *13/00*

U.S. Cl. 360—75 **20 Claims**



1. A method of calibrating a thermal response of a magnetoresistive (MR) element spaced apart from a surface of a data storage disk, the method comprising the steps of:
- providing a calibration depression on the disk surface;
- reading signals respectively from the calibration depression and a location on the disk surface other than the calibration depression;
- producing magnetic spacing signals using the signals;
- producing thermal spacing signals using the signals; and
- producing a calibrated thermal spacing signal using the magnetic spacing signals and the thermal spacing signals, such that the calibrated thermal spacing signal varies proportionally with respect to variations in spacing between the MR element and the disk surface.

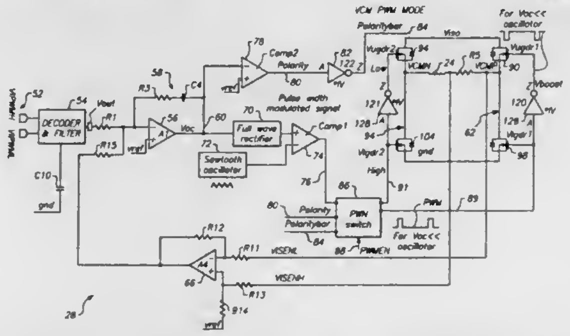
5,838,515
PWM/LINEAR DRIVER FOR DISK DRIVE VOICE COIL ACTUATOR

Sassan Mortazavi, San Jose, and Mehran Ataee, Cupertino, both of Calif., assignors to Quantum Corporation, Milpitas, Calif.

Filed Apr. 30, 1996, Ser. No. 640,272

Int. Cl.^{6} G11B *5/54*

U.S. Cl. 360—78.12 **18 Claims**



1. A voice coil actuator motor (VCM) driver circuit for driving a VCM in a linear mode and in a pulse width modulation (PWM) mode with minimized step disturbance in switching between linear and PWM modes, the VCM driver circuit comprising:
- a motor driver input for receiving a motor control signal,
- a loop compensation amplifier having an inverting input connected to receive the motor control signal from the motor driver input, having a non-inverting input connected to a reference level, and having a loop compensation output providing a maximum clamped control voltage,
- a differential amplifier pair having a common input connected to the loop compensation output during linear mode and having two outputs connected in series with the coil, and a current sense resistor, each amplifier pair including a current source transistor connected to source current from a supply voltage and a current sink transistor connected to sink current to a ground return path,
- a feedback amplifier having inputs connected across the sense resistor and having an output connected to the inverting input of the loop compensation amplifier,
- a pulse width modulation (PWM) generation circuit connected to the loop compensation output for generating variable duty cycle pulses related to the control voltage during a PWM drive mode and for applying the pulses having magnitudes not exceeding the maximum clamped control voltage to a control element of a source or sink one of the transistors, and
- polarity control means responsive to a driving current direction signal during PWM mode for applying a current direction control signal to control elements of other ones of the transistors,

wherein the maximum clamped control voltage provides a boundary for the pulses generated by the PWM generation circuit for minimizing step disturbances in switching between linear and PWM modes.

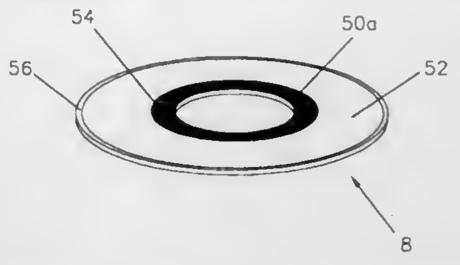
5,838,516
HIGH/FRICTION/LOWER CLAMPING FORCE MECHANISM FOR DISCS IN A DISC DRIVE

James Rex Staggers, Greeley, and Walter Wong, Boulder, both of Colo., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Jul. 21, 1997, Ser. No. 897,855

Int. Cl.^{6} G11B *17/08;17/02;5/82*

U.S. Cl. 360—98.08 **11 Claims**



1. In a disc drive including a spindle motor for mounting and rotating a disc stack, the disc stack including a least one disc and disc spacers located between adjacent discs, the spindle motor including a spindle motor hub having, near a first hub end, a radially extending disc mounting flange against which the lowermost disc in the disc stack bears, the disc drive further including a disc clamp engaging the spindle motor hub near a second hub end and engaging the topmost disc in the disc stack and exerting an axial clamping force on the disc stack, the improvement comprising the disc mounting flange having a disc contact surface with an average surface roughness of substantially twelve microinches.

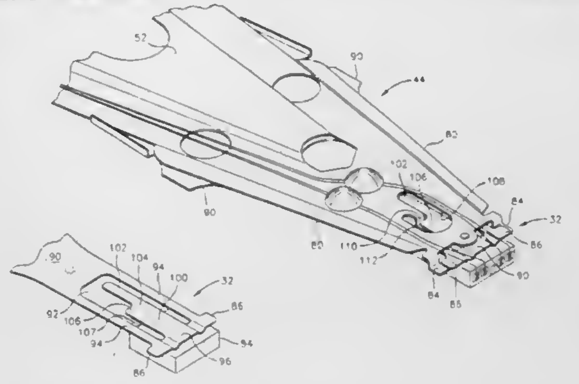
5,838,517
SHOCK PROTECTED HIGH STACK DENSITY SUSPENSION SYSTEM

Norman Kermit Frater, San Jose; Thomas Mark Hoffmann, Santa Cruz; Donald Harold Ingalls, Gilroy, and Bradley John Kriehn, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 1, 1995, Ser. No. 566,219

Int. Cl.^{6} G11B *5/48*

U.S. Cl. 360—104 **52 Claims**



1. A suspension comprising:
- a load beam; and
- a head/gimbal assembly which includes:
  - a flexure which has a secured end portion connected to the load beam and which has a suspended end portion extending from the second end portion away from the load beam;
  - the suspended end portion having a window, the window being partially bounded by a pair of legs and a suspended terminal end portion;
  - a tongue, having a length and a width W and first and second portions extending in length into said window, the first portion extending from the suspended terminal end portion and the second portion extending from the first portion;
  - a slider, which has an air bearing surface, mounted to the first portion of the tongue with the flexure between the slider and the load beam and with the second portion of the tongue extending in length from the slider in a direction away from said first portion toward the secured end portion of the flexure a distance which is greater than ¾ the width W of the tongue so that the second end portion of the tongue is engageable with a merge comb for stabilizing the air bearing surface of the slider in a desired normalized position; and
- a load dome for disengaging the legs of the flexure from the load beam to enable the slider to rotate in pitch as the legs bend.

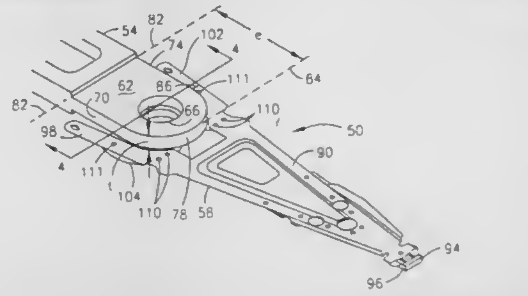
5,838,518
DISK DRIVE SUSPENSION FOR INCREASING THE ARM TO DISK CLEARANCE

Norman K. Frater, Los Gatos, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 6, 1997, Ser. No. 852,014

Int. Cl.^{6} G11B *5/48*

U.S. Cl. 360—104 **22 Claims**



1. A suspension system for use in a magnetic disk drive comprising:
- an elongated section for supporting a read/write transducer and having a first end and a second end and a length "h" measured between the first end and the second end;
- a first wing having a third end and a fourth end and a length "g" measured between the third end and the fourth end, with the third end of the first wing abutting the second end of the elongated section and the ratio of the length "g" to the length "h" being greater than approximately 0.30;
- a second wing having a fifth end and a sixth end with the fifth end of the second wing abutting the second end of the elongated section;
- an open area bounded by the first wing, the second wing and the second end of the elongated section, the open area having a width "k" measured along at least one line that extends from the first wing to the second wing, the open area being accessible from above and below a plane that includes the first wing and the second wing so that an actuator arm can be positioned in the open space between the first wing and the second wing and extend above and below the first wing and the second wing;
- an arm adapted for attachment to an actuator, the arm having a first edge, a second edge and a third edge, with the width "k" of the open area being sized so that the first wing and the second wing to not contact the first edge, the second edge or the third edge; and
- a first mount plate positioned over at least part of the arm and attached to the first wing and the second wing for securing the elongated section to the arm.

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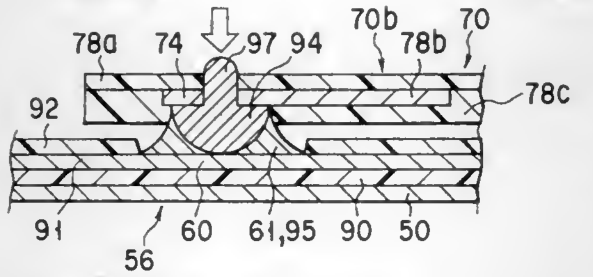
5,838,519
PRINTED CIRCUIT BOARD, MAGNETIC DISK APPARATUS WITH THE PRINTED CIRCUIT BOARD, AND METHOD FOR CONNECTING THE PRINTED CIRCUIT BOARD

Toshimitsu Takizawa; Takahiro Asano, and Nobuyuki Tanaka, all of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan
Filed Sep. 12, 1997, Ser. No. 928,922
Claims priority, application Japan, Mar. 17, 1997, 9-063119
Int. Cl.^{6} G11B *5/55*
U.S. Cl. 360—106 **5 Claims**

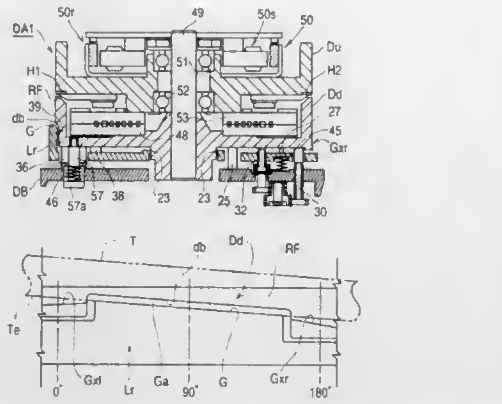


1. A magnetic disk apparatus comprising:
a magnetic disk;
a magnetic head for recording on and retrieving information from the magnetic disk;
a carriage assembly supporting the magnetic head for movement with respect to the magnetic disk;
a substrate unit for delivering signals to and from the magnetic head;
a main printed circuit board extending from the substrate unit and having an extended end portion attached to the carriage assembly; and
a junction printed circuit board provided on the carriage assembly and having one end connected to the magnetic head and the other end connected to the main printed circuit board.
the main printed circuit board including a base layer, a conductor pattern formed on the base layer and including a pad section, and a cover layer covering the whole conductor pattern except the pad section.
the junction printed circuit board including a base layer, a conductor pattern formed on the base layer and including a pad section, a cover layer covering the whole conductor pattern except the pad section, and a bump on the pad section, formed of an electrically conductive material having a melting point higher than that of solder, at least one of the pad section and the bump including a lead portion penetrating the base layer and exposed to the outside.
the bump of the junction printed circuit board being opposed to the pad section of the main printed circuit board across a solder layer and soldered to the pad section of the main printed circuit board in a manner such that the solder layer is heated to be melted through the lead portion.

5,838,520
MAGNETIC RECORDING/REPRODUCING APPARATUS WITH TILTING HEAD DRUM FOR DYNAMIC TRACKING

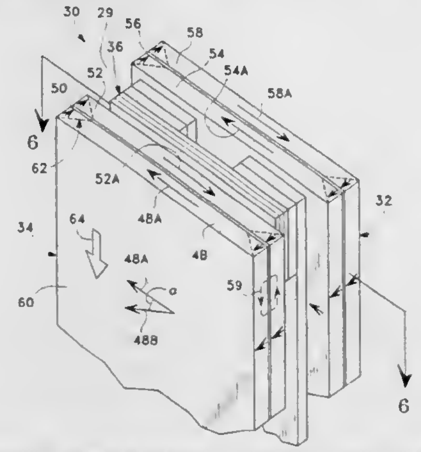
Hiromichi Hirayama, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Tokyo, Japan
Filed Jul. 29, 1997, Ser. No. 902,166
Claims priority, application Japan, Jul. 31, 1996, 8-217850
Int. Cl.^{6} G11B *5/588*
U.S. Cl. 360—109 **2 Claims**

1. Magnetic recording/reproducing apparatus comprising a lower drum having a first tape contacting area contacting with a magnetic tape, an upper drum having a second tape contacting area contacting with the magnetic tape and a rotary magnetic head for recording and reproducing information signals, the upper drum being coaxially and rotatably supported by the lower drum, first tilt driving means for tilting a center axis of the upper and lower drums at a predetermined angle to allow a rotary locus of the rotary magnetic head to coincide with a recorded track on the magnetic tape, a tape running regulation member having a first tape positional regulation surface for guiding a reference edge of the magnetic tape, the tape running regulation member being independently provided close to an outer peripheral surface of a small diameter section of the lower drum, and second tilt driving means for tilting the first tape positional regulation surface of the tape running regulation member to allow the first tape positional regulation surface thereof to match the reference edge of the magnetic tape, characterized in that a second tape positional regulation surface is at least provided at an end of the first tape contacting area in a tape inlet side of the lower drum for guiding the reference edge of the magnetic tape running at a highest magnification speed with respect to a tape running speed of a normal recording operation.



5,838,521
MAGNETORESISTIVE TRANSDUCER HAVING LAMINATED MAGNETIC SHIELDS

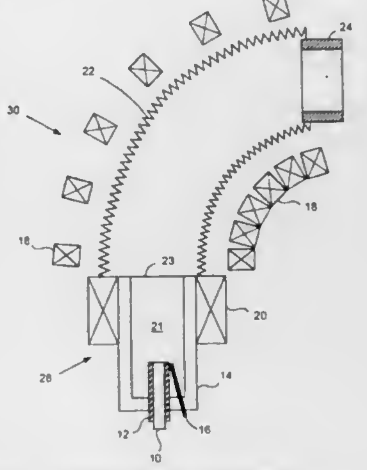
Durga P. Ravipati, Saratoga, Calif., assignor to Read-Rite Corporation, Milpitas, Calif.
Filed Apr. 17, 1995, Ser. No. 423,078
Int. Cl.^{6} G11B *5/39*
U.S. Cl. 360—113 **14 Claims**



1. A thin-film magnetoresistive transducer having first and second ends defining the width of said transducer comprising:
a tri-layer magnetoresistive structure layer formed of ferromagnetic material having a width less than said width of said transducer; and
a pair of laminated magnetic shields, each having a width substantially equal to the width of said transducer, each of said magnetic shields being formed of at least two layers of ferromagnetic material spaced by a non-magnetic layer with one of said layers of ferromagnetic material having a direction of uniaxial anisotropy substantially opposite to the direction of uniaxial anisotropy of the other of said layers of ferromagnetic material, said layers of ferromagnetic material and said non-magnetic layer being co-extensive and of the same width, said magnetoresistive layer being sandwiched between said pair of laminated magnetic shields.

5,838,522
SURFACE TREATMENT OF MAGNETIC RECORDING HEADS

Kyriakos Komvopoulos, Orinda; Ian G. Brown, Berkeley; Bo Wei, Albany; Simone Anders, Albany; Andre Anders, Albany, and C. Singh Bhatia, Morgan Hill, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.
Continuation of Ser. No. 472,939, Jun. 6, 1995, abandoned, which is a division of Ser. No. 306,750, Sep. 15, 1994, Pat. No. 5,476,691, which is a continuation of Ser. No. 185,608, Jan. 21, 1994, abandoned. This application Feb. 3, 1997, Ser. No. 794,672
Int. Cl.^{6} G11B *5/187*
U.S. Cl. 360—122 **8 Claims**

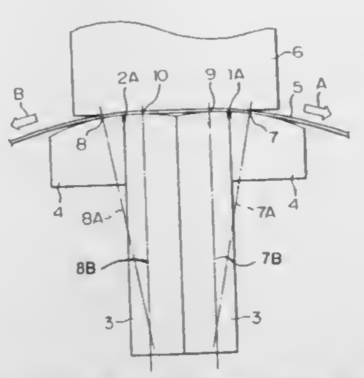


1. A magnetic recording head, comprising:
a multi-layer substrate;
a thin film layer formed on said multi-layer substrate;
said multi-layer substrate including an intermixed layer including a material of said thin film layer intermixed with the substrate material and which is formed during ion implantation of the substrate material; and
said thin film layer formed concomitantly with the ion implantation of the substrate material.

5,838,523
MAGNETIC HEAD WITH REDUCED GAP WEAR

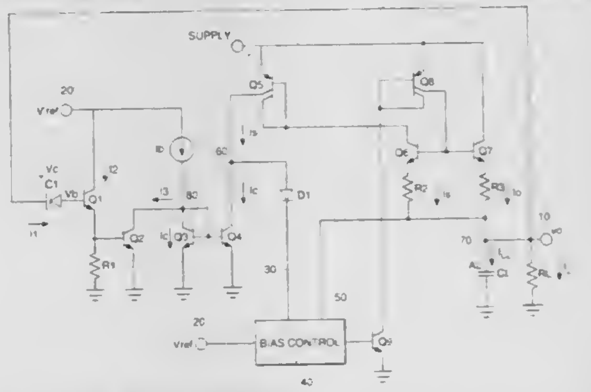
Seijiro Okada, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Sep. 14, 1992, Ser. No. 944,653
Claims priority, application Japan, Sep. 30, 1991, 3-250942
Int. Cl.^{6} G11B *5/187*
U.S. Cl. 360—122 **4 Claims**

1. A magnetic head device for recording and reproducing signals to and from a magnetic tape, said magnetic head assembly comprising:
a magnetic head having a slidable surface for contacting with the magnetic tape and a magnetic gap disposed within said slidable surface; and
means, disposed adjacent to said slidable surface, for pressing the magnetic tape against a predetermined portion of said slidable surface.
said magnetic gap being disposed within said predetermined portion of said slidable surface, and being provided between, but not on, (i) a head peak of said slidable surface and (ii) a tape departure point where the magnetic tape disengages from contact with said slidable surface in a first direction.



5,838,524
CURRENT LIMIT CIRCUIT FOR INHIBITING VOLTAGE OVERSHOOT

Timothy A. Phillips, Cranston, R.I., assignor to Cherry Semiconductor Corporation, East Greenwich, R.I.
Filed Mar. 21, 1997, Ser. No. 820,880
Int. Cl.^{6} H02H *7/00*
U.S. Cl. 361—18 **15 Claims**



9. A driver circuit comprising:
an output node having an output voltage:
a pass transistor to supply current to a load when the load is connected to said output node:
a reference current source providing a reference current:
a current limit circuit coupled to said reference current source and said pass transistor for setting a current limit threshold for the current from said pass transistor: and
a capacitance coupled between said output node and said current limit circuit so as to reduce the current limit threshold in response to a rapid increase in the output voltage.

5,838,525
HIGH SPEED SINGLE-POLE TRIP LOGIC FOR USE IN PROTECTIVE RELAYING

Solveig Ward, Coral Springs, Fla., and Eric Udren, Corapolis, Pa., assignors to ABB Power T&D Company, Inc., Raleigh, N.C.
Filed Apr. 15, 1997, Ser. No. 837,991
Int. Cl.^{6} H02H *3/00*
U.S. Cl. 361—69 **10 Claims**

1. A protective relaying system, comprising:
(a) a local distance relay operatively coupled to a protected line segment at a first location; and
(b) a remote protective relay operatively coupled to said protected line segment at a second location remote from said first location.

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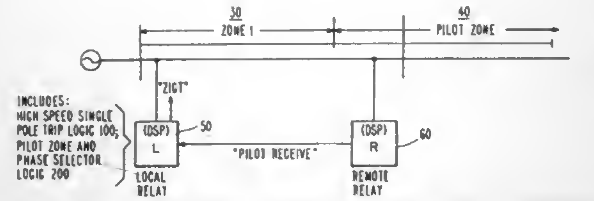


wherein said local distance relay comprises signal generating means for identifying, and generating a first logic signal (PF2PHGT) indicative of, a two-phase-to-ground fault, wherein said first logic signal is employed by said local distance relay to supervise single-pole trip operations; and wherein said local distance relay determines fault type without the use of phasor information obtained from said remote protective relay.

5,838,526

LOAD ACTUATION CIRCUIT WITH A SURGE PROTECTING FUNCTION

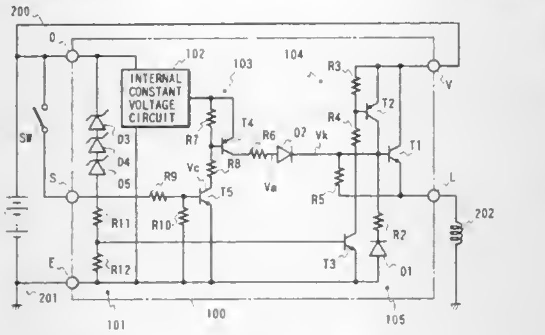
Fukuo Ishikawa, Kariya; Akira Sugiura, Okazaki; Masahisa Makino, Oobu, and Hiroyuki Ban, Alchi-ken, all of Japan, assignors to Anden Co. Ltd, Anjo, and Denso Corporation, Kariya, both of Japan

Filed May 7, 1997, Ser. No. 852,512

Claims priority, application Japan, May 7, 1996, 8-112399

Int. Cl.^{6} H02H *9/00*

U.S. Cl. 361—118 **12 Claims**



1. A load actuation circuit with a surge protection function comprising:

an output transistor having a collector receiving a power voltage from a power line, an emitter connected to one end of a load that is grounded at the other end, and a control electrode;

a control circuit for controlling an electric potential of said control electrode of said output transistor to turn on or off said output transistor;

a surge detection circuit connected between said power line and a ground line in parallel with said output transistor for detecting a power surge voltage superposed on said power voltage of said power line, said surge detection circuit including a constant-voltage diode; and

a feed circuit responsive to a surge detection voltage of said surge detection circuit for supplying a current to said control electrode of said output transistor from said power line to turn on said output transistor when any power surge voltage is detected by said surge detection circuit, said feed circuit causing a voltage drop between said collector and said control electrode of said output transistor when said output transistor is turned on in response to said surge detection voltage of said surge detection circuit, said voltage drop at said output transistor being smaller than a voltage drop at said constant-voltage diode of said surge detection circuit.

5,838,527

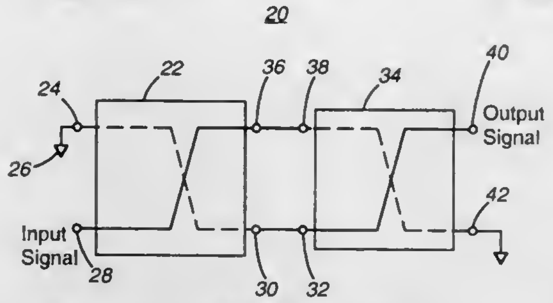
ELECTRICAL SURGE PROTECTION APPARATUS

Zachary Andrew Lawrence, 10930 Squashbush Loop, Peyton, Colo. 80831, and Laurence Everett Buckridge, 11871 E. Buckhorn Way, Franktown, Colo. 80116

Filed Apr. 29, 1997, Ser. No. 841,119

Int. Cl.^{6} H02H *1/00*

U.S. Cl. 361—119 **18 Claims**



1. A surge protection apparatus, comprising:

a first quadrature coupler having a first input coupled to an electrical ground, and a second input connected to an input signal; and

a second quadrature coupler having a third input coupled to a first output of the first quadrature coupler, a fourth input coupled to a second output of the first quadrature coupler, a third output coupled to a signal port and a fourth output coupled to the electrical ground.

5,838,528

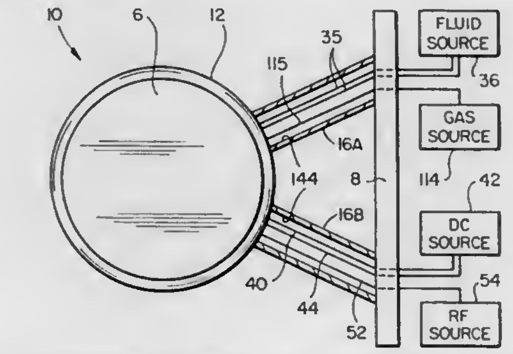
ELECTROSTATIC CHUCH ASSEMBLY

Ron van Os, Sunnyvale, and Eric D. Ross, Santa Cruz, both of Calif., assignors to Watkins-Johnson Company, Palo Alto, Calif.

Continuation of Ser. No. 500,480, Jul. 10, 1995, Pat. No. 5,708,556. This application Jun. 26, 1997, Ser. No. 883,366

Int. Cl.^{6} H02N *13/00*

U.S. Cl. 361—234 **13 Claims**



1. An electrostatic support system for retaining a wafer in a processing chamber having a chamber wall and a bottom, said support system comprising:

a body portion having a support surface for retaining said wafer,

at least one arm member extending between said body portion and the chamber wall for supporting said body portion in the processing chamber with said body portion spaced inwardly from the chamber wall and said body portion and said at least one arm member spaced above the bottom of the chamber, said at least one arm member having at least one longitudinally extending passageway formed therein, said at least one passageway extending between said body portion and the chamber wall, and

an electrostatic system for applying a charge to said support surface for electrostatically coupling said wafer to said support surface, said electrostatic system including at least one electrode carried by said body portion and at least one electrostatic electrical connector positioned in electrical contact with said electrode, said electrostatic electrical connector being positioned in said at least one passageway formed in said arm member such that said electrostatic electrical connector is substantially isolated from said chamber.

5,838,529

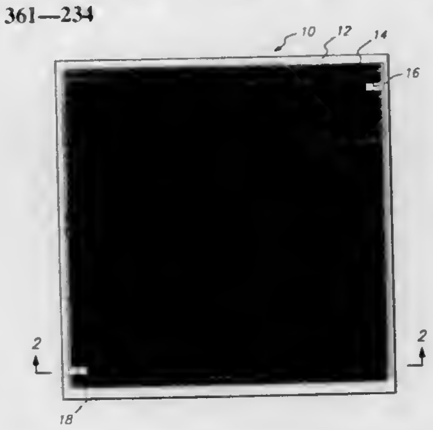
LOW VOLTAGE ELECTROSTATIC CLAMP FOR SUBSTRATES SUCH AS DIELECTRIC SUBSTRATES

Paul Kevin Shufflebotham, San Jose, and Michael Scott Barnes, San Francisco, both of Calif., assignors to LAM Research Corporation, Fremont, Calif.

Filed Dec. 22, 1995, Ser. No. 577,382

Int. Cl.^{6} H02N *13/00*

U.S. Cl. 361—234 **29 Claims**



1. An electrostatic clamp for clamping dielectric substrates comprising:

an array of spaced-apart and electrically conductive electrodes formed on a dielectric base, wherein the width of each of the electrodes in the array of electrodes is less than approximately 100 μm, and the spacing between the electrodes is less than approximately 100 μm;

an electrical contact connected to a first group of the electrodes and a second electrical contact connected to a second group of the electrodes, the first and second groups of electrodes alternating with respect to each other in the array of electrodes.

5,838,530

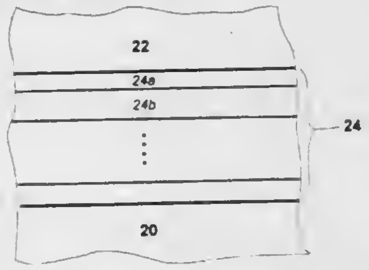
APPLICATIONS OF PROTECTIVE CERAMICS

Guohiao Zhang, P.O. Box 9562, Berkeley, Calif. 94709-0562

Filed Oct. 17, 1996, Ser. No. 731,696

Int. Cl.^{6} H01G *4/06*

U.S. Cl. 361—321.4 **26 Claims**



1. A capacitor-like device in an integrated circuit comprising

a first bottom electrode, said first bottom electrode comprising conductive materials, said first bottom electrode having a top surface;

a second top electrode, said second top electrode comprising conductive materials;

an insulating layer interposed between said first bottom electrode and said second top electrode, said insulating layer comprising at least one layer of a protective ceramic which is a compound of at least one metallic element and at least one non-metallic element from a group consisting of C, N, O, P, S.

5,838,531

POLARIZABLE ELECTRODE FOR ELECTRIC DOUBLE-LAYER CAPACITOR, AND ELECTRIC DOUBLE-LAYER CAPACITOR USING POLARIZABLE ELECTRODE

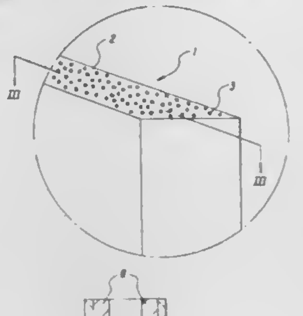
Kazuo Saito; Atsushi Hagiwara, and Toshiharu Okamoto, all of Tokyo, Japan, assignors to Nisshinbo Industries, Inc., Tokyo, Japan

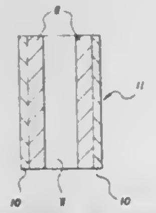
Continuation-in-part of Ser. No. 344,711, Nov. 18, 1994, abandoned. This application Jun. 28, 1996, Ser. No. 672,602

Claims priority, application Japan, Jun. 12, 1993, 5-339728

Int. Cl.^{6} H01G *9/00;9/04*

U.S. Cl. 361—502 **11 Claims**





2. A polarizable electrode for an electric double-layer capacitor, which comprises a solid activated carbon obtained by pyrolyzing a mixture mainly containing an activated carbon and a thermosetting resin and which has, on the surface and/or inside, holes free from said activated carbon, and wherein holes having a diameter of 5 μm–70 μm possess a capacity of 0.01 cc/g–1.0 cc/g.

5,838,532

CHIP TYPE ALUMINUM ELECTROLYTIC CAPACITOR

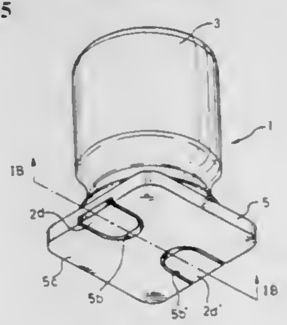
Takumi Nakata, Uji, Japan, assignor to Matsushita Electrical Industrial Co., Ltd., Osaka-fu, Japan

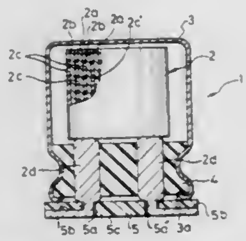
Continuation of Ser. No. 515,462, Aug. 15, 1995, abandoned. This application Aug. 7, 1997, Ser. No. 908,194

Claims priority, application Japan, Jan. 31, 1995, 7-013931

Int. Cl.^{6} H01G *9/02*

U.S. Cl. 361—505 **4 Claims**





1. A chip type aluminum electrolytic capacitor comprising:

a capacitor element (2) having a pair of lead members (**2***d*, **2***d'*), and said capacitor element being impregnated with an electrolytic solution composed of a non-volatile material with a

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higher boiling point than water and wherein water is not an added ingredient in the preparation of the electrolyte solution,

a cylindrical case (3) for containing said capacitor element, and said cylindrical case having an opening (3*a*),

a seal member (4) for sealing said opening,

an insulating board (5) being put on said opening, said insulating board having a mounting surface (5*a*) to be fixed to an electronic circuit board, and said mounting surface containing said lead members thereon, and

wherein, water in the electrolyte solution and present in the form of a chemical bonding, reaction, adsorption and absorption, inside of said cylindrical case, is regulated in quantity so as to be sufficiently low in percentage by weight of said electrolytic solution that the internal pressure in said cylindrical case is less than a value at which deformations are generated in the cylindrical case and in said seal member from the evaporation of said regulated quantity of water when said mounting surface is mounted on said electronic circuit board and is subjected to a temperature in excess of the evaporation temperature of water.

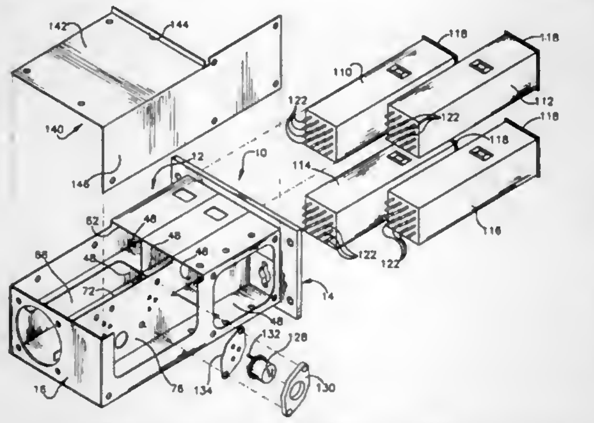
5,838,533
HOUSING ASSEMBLY FOR CIRCUIT COMPONENTS

Berdj N. Yazaryan, Van Nuys, and Vanacan Tatavooslan, Mission Vejo, both of Calif., assignors to Eaton Corporation, Cleveland, Ohio

Filed Mar. 19, 1997, Ser. No. 816,794

Int. Cl.^{6} H02B ***1/00***

U.S. Cl. 361—600 **5 Claims**



1. An apparatus comprising a plurality of tubular housing sections, a plurality of electrical circuit components disposed in said tubular housing sections, a first tubular housing section of said plurality of tubular housing sections having first and second parallel side walls and third and fourth parallel side walls which extend perpendicular to said first an second parallel side walls, said first tubular housing section having a first compartment which is at least partially defined by said first, second, third and fourth side walls, said plurality of electrical circuit components includes a first electrical circuit component which is at least partially disposed in said first compartment, a second tubular housing section of said plurality of tubular housing sections having fifth and sixth parallel side walls and seventh and eighth parallel side walls which extend perpendicular to said fifth and sixth parallel side walls and perpendicular to said first and second side walls of said first tubular housing section, said second side wall of said first tubular housing section being disposed in abutting engagement with said fifth side wall of said second tubular housing section, said second tubular housing section having a second compartment which is at least partially defined by said fifth, sixth, seventh and eighth side walls, said plurality of electrical circuit components includes a second electrical circuit component which is at least partially disposed in said second compartment, a third tubular housing section of said plurality of tubular housing sections having ninth and tenth parallel side walls and eleventh and twelfth parallel side walls which extend perpendicular to said ninth and tenth parallel side walls and perpendicular to said first and second side walls of said first tubular housing section, said eleventh side wall of said third tubular housing section being disposed in abutting engagement with said fourth side wall of said first tubular housing section, said third tubular housing section having a third compartment which is at least partially defined by said ninth, tenth, eleventh and twelfth side walls, said plurality of electrical circuit components includes a third electrical circuit component which is at least partially disposed in said third compartment, a fourth tubular housing section of said plurality of tubular housing sections having thirteenth and fourteenth parallel side walls and fifteenth and sixteenth parallel side walls which extend perpendicular to said thirteenth and fourteenth parallel side walls and to said first and second side walls of said first tubular housing section, said thirteenth side wall of said fourth tubular housing section being disposed in abutting engagement with said tenth side wall of said third tubular housing section, said fifteenth side wall of said fourth tubular housing section being disposed in abutting engagement with said eighth side wall of said second tubular housing section, said fourth tubular housing section having a fourth compartment which is at least partially defined by said thirteenth, fourteenth, fifteenth, and sixteenth side walls, said plurality of electrical circuit components includes a fourth electrical circuit component which is at least partially disposed in said fourth compartment, means for interconnecting said first, second, third and fourth tubular housing sections to at least partially define a housing assembly, said first, sixth, ninth, twelfth, fourteenth and sixteenth side walls of said tubular housing sections have surfaces which cooperate to at least partially define a chamber which extends across end portions of said first, second, third and fourth compartments, and electrical circuit elements are at least partially disposed in said chamber and are connected with said first, second, third and fourth electrical circuit components disposed in said first, second, third and fourth compartments.

5,838,534
ELECTRONIC APPLIANCE HAVING AN EASY TO DISASSEMBLE FASTENER CAP

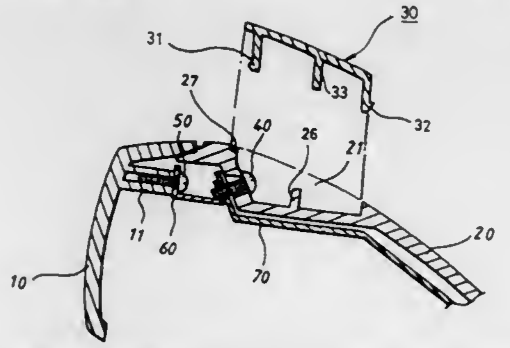
Dong-Wook Yang, Suwon, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed May 9, 1997, Ser. No. 853,866

Claims priority, application Rep. of Korea, May 9, 1996, 1996 11213

Int. Cl.^{6} G02B ***1/00***

U.S. Cl. 361—600 **6 Claims**



1. An electronic appliance with a two-piece cover, comprising:

a first cover; and

a second cover coupled to the first cover with a fastener;

the electronic appliance further comprising:

- a fastener well having a push preventing projection formed at a center of a bottom of said well, a front assembly groove formed on a front side of said push preventing projection, and a back assembly groove formed on a back side of said push preventing projection; and
- a fastener cap having a supporting rib projecting from a middle of said cap to engage said push preventing projection within said fastener well during insertion of said fastener cap into said well, a back assembly projection mating with said back assembly groove inside said fastener well, and a front assembly projection inserted into said front assembly groove inside said fastener well.

5,838,535
HOUSING FOR ELECTRIC COMPONENTRY

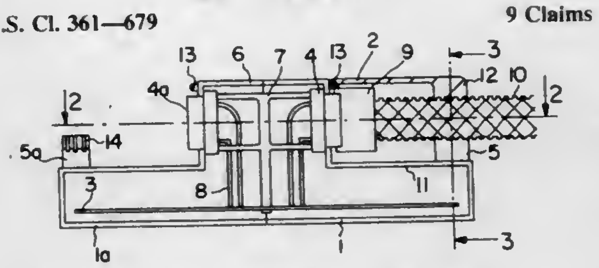
William Krusel, Brighton, Mich.; Jens Gröger, Hanover; Rainer Risse, Pattensen, both of Germany; Richard A. Romer, Grosse Pointe; Thomas Corcoran, Troy, both of Mich., and Harald Kaess, Isernhagen, Germany, assignors to WABCO GmbH, Hanover, Germany

Filed Jan. 9, 1997, Ser. No. 780,927

Claims priority, application Germany, Jan. 17, 1996, 196 01 518.9

Int. Cl.^{6} H02B ***1/00***

U.S. Cl. 361—679 **9 Claims**



1. A housing for electric componentry, comprising

a closed frame in which said electric componentry is received,

a first electric connection element which is connected to said electric componentry and which passes through a wall of said frame,

a second electric connection element which is connected to said first connection element,

an electric connection cable connected to said second electric connection element,

a cover attached to said frame, said first and second electric connection elements being received within said cover, and

a fastening element which fastens said electric connection cable to said housing such that said electric connection cable is arranged parallel to a flat outer surface of said frame,

said fastening element comprising first and second parts which bear against each other with said electric connection cable therebetween, said first part of said fastening element being integral with said frame, and said second part of said fastening element being integral with said cover,

said housing being configured so that said first and second parts of said fastening element are caused to bear against each other with said electric connection cable therebetween by closing of said cover.

5,838,536
DISPLAY DEVICE HAVING TILT MECHANISM FOR ADJUSTMENT WITH RESPECT TO OPERATOR DEVICE

Kenichi Miyazawa, and Noboru Ishil, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Nov. 26, 1996, Ser. No. 753,494

Claims priority, application Japan, Nov. 30, 1995, 7-312161

Int. Cl.^{6} G06F ***1/16***

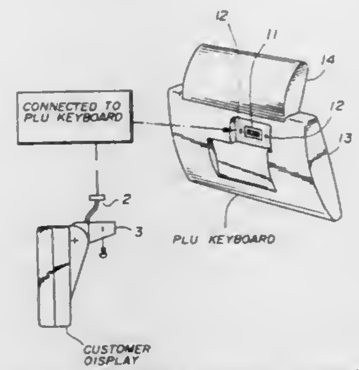
U.S. Cl. 361—681 **15 Claims**

1. A display apparatus comprising:

a device having an operation surface operated by an operator;

a display provided on a back surface of said device;

a tilt mechanism capable of adjusting a tilt of said display with respect to said device; and



a connector provided on a back surface of said device, wherein said connector is connected to said display.

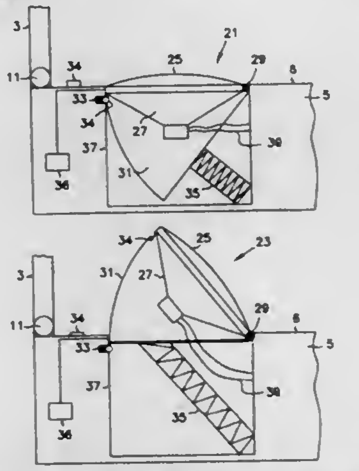
5,838,537
RETRACTABLE SPEAKERS FOR PORTABLE COMPUTER

Anthony K. Lundgren, Sioux City, Iowa, and Richard W. Griencewic, McCook Lake, S. Dak., assignors to Gateway 2000, Inc., North Sioux City, S. Dak.

Filed Aug. 21, 1996, Ser. No. 700,790

Int. Cl.^{6} G06F ***1/16***

U.S. Cl. 361—683 **8 Claims**



3. A portable computer comprising:

a housing baving a plurality of surfaces that protect at least a processor and system bus within the housing;

a retractable sound producing device rotatably coupled to the housing to move between a retracted position and a plurality of positions out of a cavity in the housing; and

wherein said housing and said retractable sound producing device are configured to hold said device in said plurality of positions out of the speaker cavity.

5,838,538
COMPUTER SYSTEM WITH A CHASSIS EQUIPPED WITH SUPPORT STRUCTURES CONFIGURED TO SUPPORT MULTIPLE LENGTH VERSIONS OF A PRINTED CIRCUIT BOARD

Dawson L. Yee, Beaverton, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Nov. 14, 1996, Ser. No. 748,864

Int. Cl.^{6} G06F ***1/16;*** **H05K** ***7/02***

U.S. Cl. 361—683 **8 Claims**

1. A computer system comprising:

a chassis; and

at least three printed circuit board (PCB) support structures affixed to the chassis, the at least three PCB support structures configured to form at least two subset combinations to support

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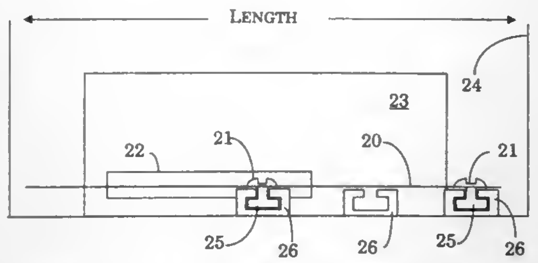


a PCB of one of at least two pre-determined lengths, employing a selected one of the at least two subset combinations of the PCB support structures, but a constant predefined total number of fasteners regardless of the length of the PCB and which subset combination of the PCB support structures is used.

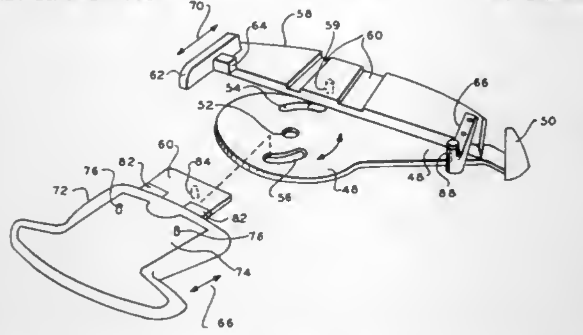
5,838,539
DOCKING MODULE FOR PORTABLE COMPUTERS

Jeffrey Doss; Roy Kenneth Fischer; Randall Ronald Toltzman, all of Scottsdale, and Christopher Harold Davey, Tempe, all of Ariz., assignors to Electronics Accessory Specialists International, Scottsdale, Ariz.

Filed Nov. 8, 1995, Ser. No. 555,301

Int. Cl.^{6} G06F *1/16;* **H05K** *5/02*

U.S. Cl. 361—686 **47 Claims**



1. A docking module for electrically connecting a portable computer to a plurality of ancillary support devices, comprising:
a housing;
a plurality of electrically interconnected connectors mounted on opposite sides of said housing; and
engagement means for alternatively pulling and pushing said portable computer relative to said housing, said engagement means having a spaced pair of retractable implements, said retractable implements being operable while retracting to straddle and laterally position said portable computer, said engagement means including a transverse member mounted to reciprocate in said housing, said spaced pair of implements being mounted on opposite ends of said transverse member and being positioned and sized to project through said housing in order to engage said portable computer.

5,838,540
SCANNER CASING

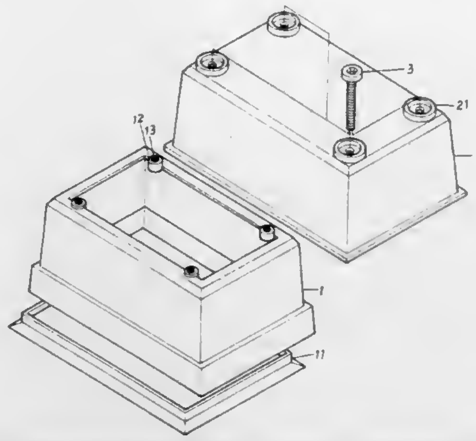
Chang Wen-Shyong, 58, Ma Yuan West St., Taichung, Taiwan

Filed Apr. 9, 1997, Ser. No. 850,306

Int. Cl.^{6} H05K *5/02*

U.S. Cl. 361—686 **2 Claims**

1. A scanner casing comprising:
a lower housing and an upper housing covering the lower housing,
a glue material adhered on a lower periphery edge of said lower housing,
said lower housing adhered on a scanner,



four threaded fastening portions disposed on four upper corners of said lower housing,
each said threaded fastening portion having a threaded hole,
four hollow fastening portions disposed on four upper corners of said upper housing,
each said threaded hole matching each said corresponding hollow fastening portion to be fastened by a bolt.

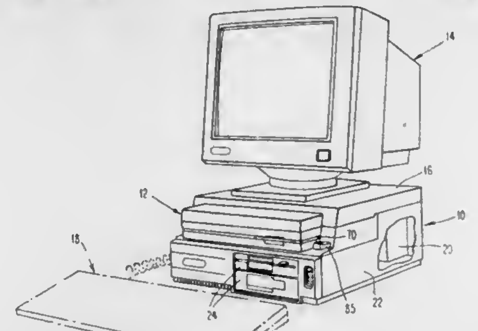
5,838,541
COMPUTER EXPANSION SYSTEM INCLUDING EXPANSION BASE AND MONITOR SUPPORT STRUCTURE

Teodros Mesfin; Jon Kolas, both of Houston, and John E. Youens, Spring, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Continuation of Ser. No. 688,744, Jul. 31, 1996, Pat. No. 5,687,061, which is a continuation of Ser. No. 296,737, Aug. 26, 1994, Pat. No. 5,561,589, which is a continuation of Ser. No. 774,203, Oct. 10, 1991, Pat. No. 5,384,686, which is a continuation-in-part of Ser. No. 597,769, Oct. 15, 1990, Pat. No. Des. 335,490. This application Sep. 8, 1997, Ser. No. 925,933

Int. Cl.^{6} G06F *1/16;* **H05K** *7/10;* **H01R** *13/629*

U.S. Cl. 361—686 **26 Claims**



1. A computer expansion system comprising:
an expansion base including an upper surface for receiving a portable computer in a rest position, the portable computer of the type which includes an integral display screen, the expansion base including electronics for coupling to electronics in the portable computer; and
a removable monitor support structure for supporting a monitor, the support structure for resting on the upper surface of the expansion base above at least a portion of the rest position of the portable computer.

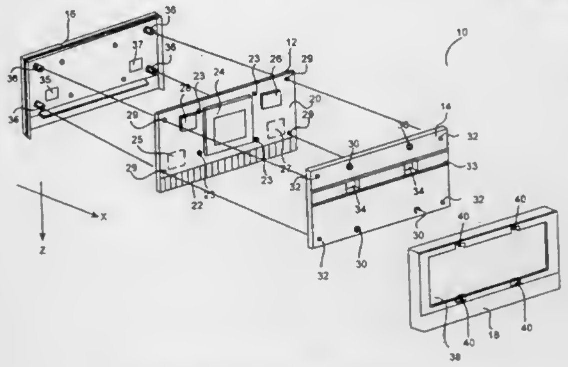
5,838,542
PROCESSOR CARD ASSEMBLY INCLUDING A HEAT SINK ATTACHMENT PLATE AND AN EMI/ESD SHIELDING CAGE

Darul J. Nelson, Beaverton; James V. Noval, Portland; Ricardo E. Suarez, Beaverton, all of Oreg., and Mostafa A. Aghazadeh, Chandler, Ariz., assignors to Intel Corporation, Santa Clara, Calif.

Filed Sep. 30, 1996, Ser. No. 723,027

Int. Cl.^{6} H05K *7/20;9/00*

U.S. Cl. 361—704 **9 Claims**



1. A processor card assembly comprising:
a processor card including a circuit board having a processor mounted thereon, the circuit board having a first and a second plurality of fastening features;
a metallic plate having a third and a fourth plurality of fastening features, the third plurality of fastening features cooperating with the first plurality of fastening features for physically attaching and thermally coupling the processor card to the metallic plate;
a back cover having a fifth plurality of fastening features that cooperate with the second plurality of fastening features of the circuit board and the fourth plurality of fastening features of the metallic plate, to allow the metallic plate and the back cover to physically and electro-magnetically enclose the processor card to reduce electro-magnetic interference emissions and/or shield electrostatic discharges from the processor; and
wherein the metallic plate further includes a sixth plurality of fastening features selectively employed to removably accept a selected one of a plurality of alternative heat sinks external to said assembly.

5,838,543
RADIO FREQUENCY POWER AMPLIFICATION MODULE

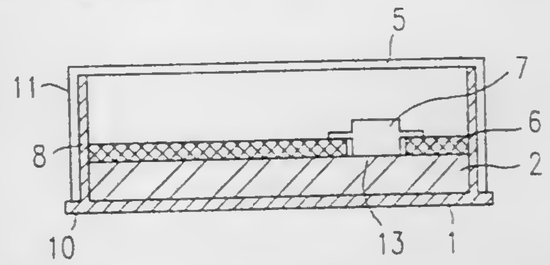
Morio Nakamura, Katano, and Masahiro Maeda, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 6, 1997, Ser. No. 812,484

Claims priority, application Japan, Mar. 6, 1996, 8-048584; Mar. 19, 1996, 8-062362

Int. Cl.^{6} H05K *7/20*

U.S. Cl. 361—704 **23 Claims**



1. A radio frequency power amplification module comprising:
a radiation section;
a printed circuit board attached to the radiation section;
a semiconductor device for power amplification, mounted on the printed circuit board; and
a cap,
wherein the radiation section includes a plurality of radiation boards, the plurality of radiation boards at least including a first radiation board as a lowermost layer, and a second radiation board attached onto the first radiation board, the first radiation board being coupled to the cap and wherein a common through hole, aligned with the semiconductor device, is provided in the printed circuit board.

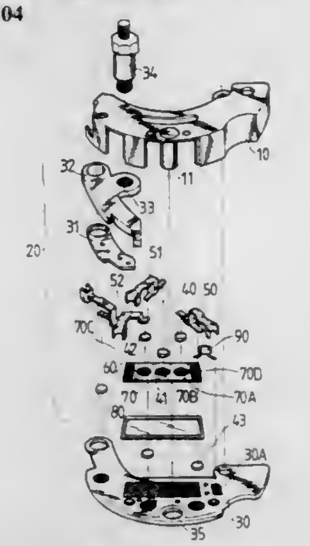
5,838,544
HEAT DISSIPATING STRUCTURE FOR RECTIFIERS OF CAR ALTERNATORS

Chen-Ku Wei, Nan-Tou, Taiwan, assignor to Mobiletron Electronics Co., Ltd., Taichung, Taiwan

Filed May 13, 1997, Ser. No. 855,171

Int. Cl.^{6} H05K *7/20*

U.S. Cl. 361—704 **3 Claims**



1. A heat dissipating structure for rectifiers of car alternators comprising:
an upper cover;
a rectifier assembly, disposed below said upper cover, and being comprised of a plurality of rectifying elements and terminals, and a heat conductive assembly for receiving said rectifying elements, said conductive assembly having a heat conductive plate to which said rectifying elements may be soldered, and a ceramic heat dissipating substrate; and
a heat dissipating plate; wherein said rectifying elements have one side connected to corresponding terminals to form a rectifier circuit;
said rectifying elements have another side connected to said heat conductive assembly, which is in turn connected to said heat dissipating plate; and said ceramic heat dissipating substrate is disposed between said heat conductive plate and said heat dissipating plate.

5,838,545
HIGH PERFORMANCE, LOW COST MULTI-CHIP MODLE PACKAGE

Dennis F. Clocher, Milton; Glenn G. Daves, Beacon, both of N.Y.; Peter M. Elenius, Scotsdale, Ariz.; Joseph J. Lisowski, Hopewell Junction, and Joseph M. Sullivan, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 17, 1996, Ser. No. 733,154

Int. Cl.^{6} H05K *7/20*

U.S. Cl. 361—719 **3 Claims**

1. A high performance multi-chip module package comprising:

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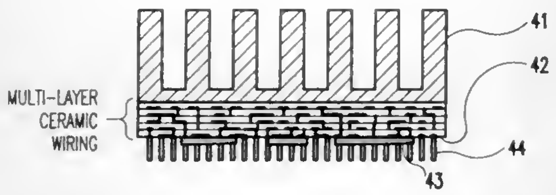


- a heatsink having a heat dissipation surface and a chip carrier surface;
- a plurality of integrated circuit chips bonded to said chip carrier surface of said heatsink;
- electronic circuitry positioned on said chip carrier surface interconnecting said plurality of integrated circuit chips and interconnecting said plurality of integrated circuit chips to an array of interconnects which interconnect said electronic circuitry and said integrated circuit chips to a next level of packaging; and
- an array of interconnects bonded to said electronic circuitry on said carrier surface of said heat sink to connect said electronic circuitry and said integrated circuit chips to a next level of packaging, said array of interconnects including interconnect members positioned about the periphery of each of said plurality of integrated circuit chips and between adjacent integrated circuit chips of said plurality of integrated circuit ships.

5,838,546
MOUNTING STRUCTURE FOR A SEMICONDUCTOR CIRCUIT

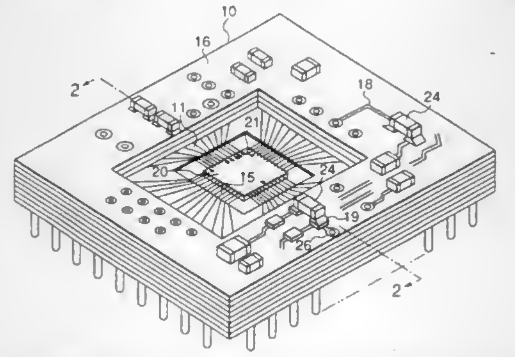
Tadayoshi Miyoshi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 14, 1997, Ser. No. 834,163

Claims priority, application Japan, Apr. 12, 1996, 8-115818

Int. Cl.^{6} H05K *01/16*

U.S. Cl. 361—749 **7 Claims**



1. A semiconductor mounting structure comprising a flex rigid substrate,

- wherein a flex portion is provided with a connection terminal for a semiconductor integrated circuit, the semiconductor integrated circuit being directly connected and mounted to said connection terminal for the semiconductor integrated circuit; and
- wherein the rigid portion of said flex rigid substrate is provided with an external input/output terminal, and the semiconductor integrated circuit is connected and mounted to the mounting substrate by using said external input/output terminal.

5,838,547
ELECTRICAL SAFETY BARRIER

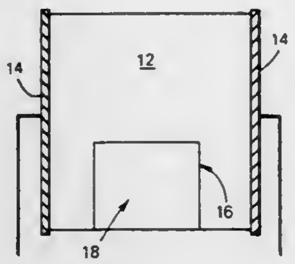
Bernard John Gane, Harpenden, and Laurence Albert Fletcher, Barton Le Clay, both of England, assignors to MTL Instruments Group plc, Bedfordshire, England

Filed Aug. 24, 1995, Ser. No. 518,899

Claims priority, application United Kingdom, Aug. 26, 1994, 9417235

Int. Cl.^{6} H05K *1/16*

U.S. Cl. 361—765 **6 Claims**



1. An electrical safety barrier comprising a ceramic substrate and electrical circuit components carried thereon defining a protective circuit between a hazardous area and a non-hazardous area, and at least one thick-film printed resistor on the ceramic substrate, wherein the at least one resistor comprises resistor ink deposited between two tracks on the substrate, the ink being trimmed to a predetermined value so that the width of the current path from track to track is not less than 50% of the full width of the at least one resistor.

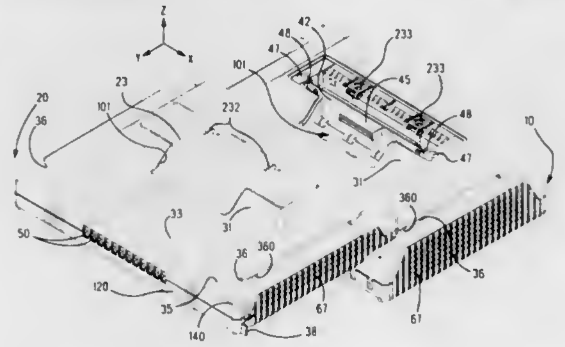
5,838,548
NETWORK APPARATUS

Bret Allen Matz, Mechanicsburg, and William John Schnoor, Hummelstown, both of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Feb. 29, 1996, Ser. No. 607,956

Int. Cl.^{6} H05K *1/04*

U.S. Cl. 361—784 **19 Claims**



2. A network apparatus comprising: a base hub containing a motherboard and active circuitry on the motherboard for operation in a communications network and multiple communication ports connected to the active circuitry, an expansion module containing additional communication ports, an interconnection mechanism for connecting the additional communication ports and the active circuitry comprising; an interconnect board mounted on the first motherboard, an electrical connector on the interconnect board projecting from the base hub, a mating interconnect board on a second motherboard protecting from the expansion module for mating with the electrical connector; the additional communication ports being on the second motherboard for connection to the active circuitry, and wherein the expansion module slidaby interlocks with tracks on the base hub to prealign and blind mate the mating interconnect board with the electrical connector.

5,838,549
MEMORY MODULE AND AN IC CARD

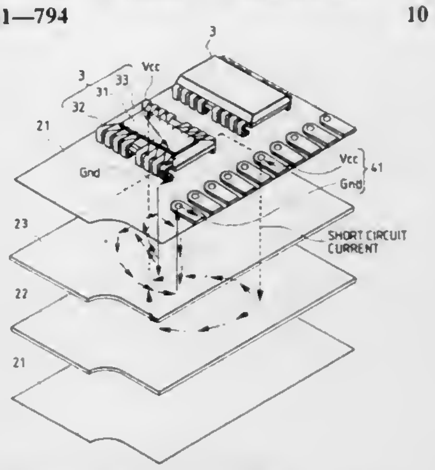
Tatsuya Nagata, Ishioka; Hiroya Shimizu, Toride; Atsushl Nakamura, Fuchu; Hideshi Fukumoto, Hitachinaka, and Toshio Sugano, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 27, 1997, Ser. No. 788,423

Claims priority, application Japan, Jan. 25, 1996, 8-010717

Int. Cl.^{6} H05K *1/11;* H01R *9/09*

U.S. Cl. 361—794 **10 Claims**



1. A semiconductor module comprising:

- a multilayer printed circuit board having a plurality of metal conductive layers and a plurality of insulating layers interposed between the metal conductive layers;
- a plurality of semiconductor devices mounted on at least one side of the multilayer printed circuit board and electrically connected to the multilayer printed circuit board: and
- a plurality of connection terminals arranged at one edge of the at least one side of the multilayer printed circuit board to electrically connect the printed circuit board to external circuits;
- wherein the plurality of metal conductive layers include a signal layer having the plurality of semiconductor devices mounted thereon and the plurality of connection terminals formed thereon, a power supply layer for electrically connecting a power supply terminal of each of the semiconductor devices with a power supply terminal of the connection terminals, and a ground layer for electrically connecting a ground terminal of each of the semiconductor devices with a ground terminal of the connection terminals;
- wherein when the power supply terminal of each of the semiconductor devices is located farther from the connection terminals than the ground terminal, the power supply layer is arranged closer to the semiconductor devices than the ground layer, and when the ground terminal of each of the semiconductor devices is located farther from the connection terminals than the power supply terminal, the ground layer is arranged closer to the semiconductor devices than the power supply layer.

5,838,550
GROUNDING CLIP FOR SHIELDED MODULAR CONNECTOR

Terrel L. Morris, Garland; Eric C. Peterson, McKinney, and Jeffrey N. Metcalf, Plano, all of Tex., assignors to Hewlett-Packard Company, Palo Alto, Calif.

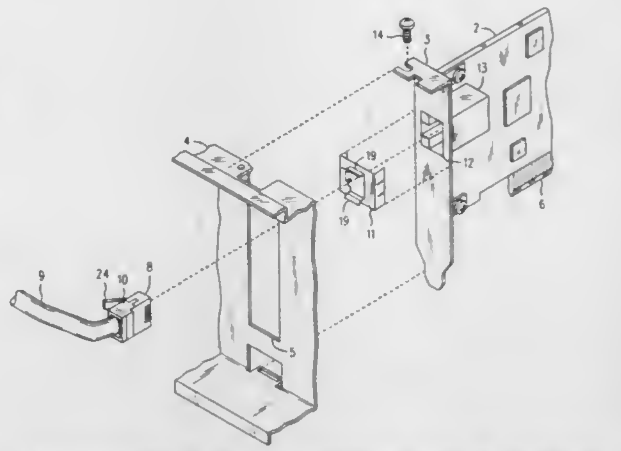
Filed Aug. 28, 1997, Ser. No. 919,461

Int. Cl.^{6} H05K *9/00*

U.S. Cl. 361—818 **5 Claims**

1. A data communications assembly comprising:

- a circuit assembly;
- a shielded modular jack mounted to the circuit assembly and having an opening therein that receives a shielded modular plug;



- a bracket mounted to the circuit assembly and having an opening therein aligned with and adjacent to the opening in the modular jack;
- a grounding clip slidably attached to the bracket by folded portions that grip the edges of the bracket, that has an orifice therein shaped to generally match the opening in the shielded modular jack, that has a pair of folded tabs that aligns the orifice in the grounding clip to the opening in the shielded modular jack by extending into that opening, and that has a pair of resilient curved contacts that extend in a direction opposite that of the folded tabs and contact an exposed shield portion of a shielded modular plug.

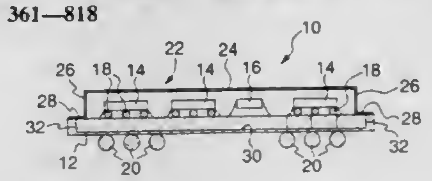
5,838,551
ELECTRONIC PACKAGE CARRYING AN ELECTRONIC COMPONENT AND ASSEMBLY OF MOTHER BOARD AND ELECTRONIC PACKAGE

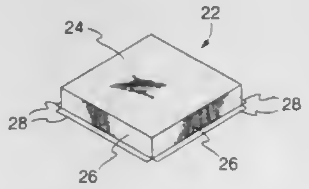
Yee-Ning Chan, Nepean, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Aug. 1, 1996, Ser. No. 691,056

Int. Cl.^{6} H05K *9/00*

U.S. Cl. 361—818 **12 Claims**





1. An electronic package comprising:

- a rigid planar dielectric substrate carrying a ground member extending across substantially the whole area within the confines of the edges of the substrate;
- a covering EMI shield extending over the electronic component to locate the electronic component between the EMI shield and the around member of the substrate, the EMI shield being electrically interconnected to the ground member of the substrate to form with the ground member. a Faraday cage around the electronic component;
- and a plurality of second level interconnects mounted upon a second side of the substrate and electrically interconnected through circuit paths in the substrate to the first level interconnects.

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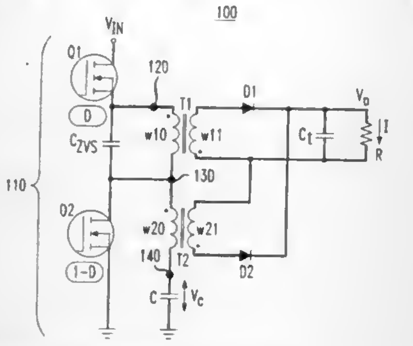
5,838,552
ASYMMETRICAL POWER CONVERTER AND METHOD OF OPERATION THEREOF

Simon Fraidlin, Plano, Tex.; Valery I. Meleshin, Moscow, Russian Federation; Rais K. Miftakhutdinov, Moscow, Russian Federation, and Sergey M. Korotkov, Moscow, Russian Federation, assignors to Lucent Technologies Inc, Murray Hill, N.J.

Filed Apr. 1, 1997, Ser. No. 829,921
Int. Cl.^{6} H02M *3/335*
U.S. Cl. 363—16 **30 Claims**

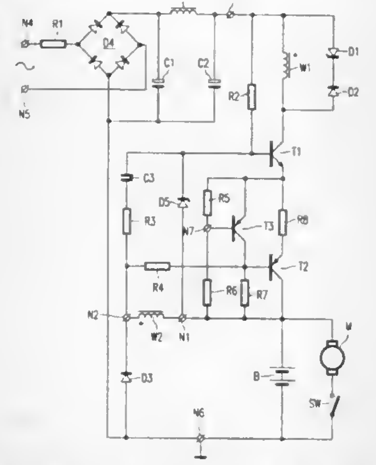


1. An asymmetrical converter, comprising:
- first and second transformers having serially-coupled primary windings, parallel-coupled secondary windings and differing turns ratios;
- a first power switch coupled to a first end of said serially-coupled primary windings;
- a second power switch coupled to a node between said serially-coupled primary windings;
- a first capacitive element coupled to a second end of said serially-coupled primary windings to maintain a volts-second balance thereacross during alternate switching cycles of said first and second power switches; and
- a rectifier, coupled to said parallel-coupled secondary windings, that delivers a rectified voltage to an output of said converter during both of said alternate switching cycles.

5,838,553
VOLTAGE STABILIZED SELF-OSCILLATING POWER SUPPLY

Schelte Heeringa, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 14, 1997, Ser. No. 800,704
Claims priority, application European Pat. Off., Mar. 1, 1996, 9600557
Int. Cl.^{6} H02M *3/335;* **H02J** *7/10*
U.S. Cl. 363—18 **41 Claims**

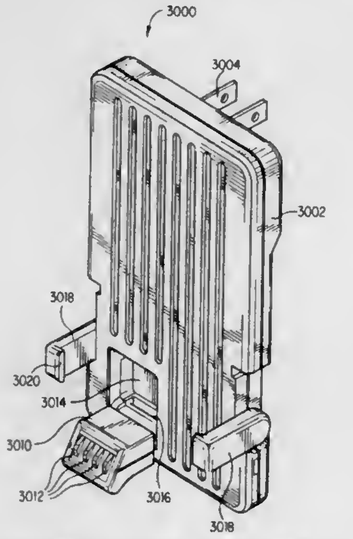


1. A power-supply circuit for powering a load from an input voltage, which circuit comprises: a transformer having a primary winding and a secondary winding; a first switching transistor having a control electrode, having a first main electrode and having a second main electrode coupled to the primary winding for periodically connecting the primary winding to the input voltage; a sensing resistor coupled to the first main electrode of the first switching transistor; means including a second switching transistor for turning off the first switching transistor in response to a voltage drop across the sensing resistor; a rectifier diode connected in series with the load to be powered to the secondary winding, characterized in that the second switching transistor is connected in series with the first switching transistor with a first main electrode of the second switching transistor coupled to the first main electrode of the first switching transistor via the sensing resistor, and the second switching transistor is of a conductivity type opposite to that of the first switching transistor.

5,838,554
SMALL FORM FACTOR POWER SUPPLY

Thomas W. Lanni, Laguna Niguel, Calif., assignor to Comarco Wireless Technologies, Inc., Irvine, Calif.

Continuation-in-part of Ser. No. 767,307, Dec. 16, 1996, abandoned, which is a continuation-in-part of Ser. No. 567,369, Dec. 4, 1995, Pat. No. 3,636,110, which is a continuation-in-part of Ser. No. 233,121, Apr. 26, 1994, Pat. No. 5,479,331. This application Dec. 19, 1997, Ser. No. 994,905
Int. Cl.^{6} H02M *3/335*
U.S. Cl. 363—21 **36 Claims**

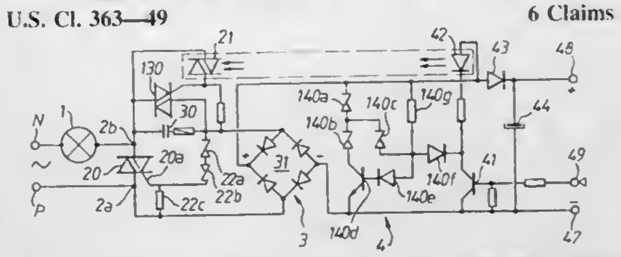


1. A small form factor power supply capable of providing between about zero and seventy five watts DC, the small form factor power supply comprising:
- a transformer having a core and primary and secondary coils;
- a printed circuit board adapted to have various circuit components mounted thereon, wherein the printed circuit board defines certain wiring patterns that are coupled to the primary and secondary coils of the transformer that are magnetically coupled to the core;
- a rectifier circuit that is coupled to the printed circuit board and coupled to the secondary coil to provide a DC power source capable of delivering between zero and seventy five watts of DC power;
- a regulator coupled to coupled to one of either the primary coil and the secondary coil to regulate an output of the transformer; and
- a case having louvers and depressions enclosing the printed circuit board, the core and the circuit components such that the louvers prevent a user from contacting the depressions receiving heat from the printed circuit board, the core and the circuit components, wherein the case reaches a maximum temperature of less than about one hundred forty degrees Fahrenheit when the rectifier circuit delivers seventy five watts DC power.

5,838,555
TWO-WIRE POWER SUPPLY ELECTRONIC SWITCH

Pascal Lejeune, Limoges, and Dominique Selas, Pau, both of France, assignors to Legrand, and Legrand SNC, both of Limoges, France

Filed Sep. 24, 1997, Ser. No. 936,622
Claims priority, application France, Oct. 11, 1996, 96 12469
Int. Cl.^{6} H02M *1/12;5/42;7/155;* **H02H** *7/125*
U.S. Cl. 363—49 **6 Claims**

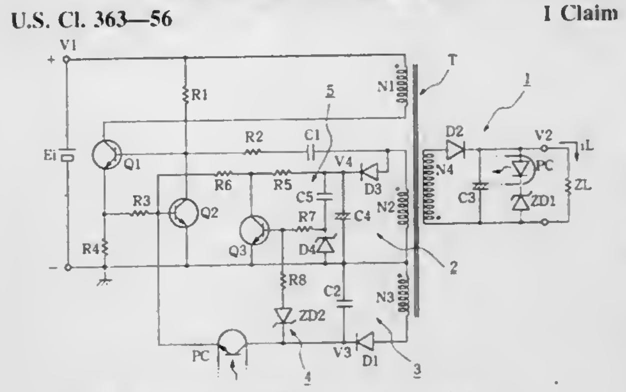


1. A switch adapted to be connected in series with a load between two poles of an alternating current mains electrical power supply, having two terminals adapted to be connected to one pole of said mains supply and to said load, respectively, said load being connected to the other pole of said mains supply, and including a triggered bidirectional conduction main switch connected between said two terminals and a controller adapted, in response to an active state of a command signal, to turn on said main switch with a particular time-delay relative to the zero crossing of the voltage between said two terminals, said controller including a rectifier power supply unit having a first input connected directly to a first terminal and a second input connected to the second terminal via a capacitor adapted to limit the current in said power supply unit, wherein said controller includes a triggered bidirectional conduction auxiliary switch shunting said capacitor, said auxiliary switch being turned on at the time of each zero crossing of the voltage between said two terminals with said command signal in an active state.

5,838,556
SWITCHING POWER SUPPLY CIRCUIT

Kenji Yokoyama, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Sep. 11, 1996, Ser. No. 712,190
Claims priority, application Japan, Sep. 18, 1995, 7-263593
Int. Cl.^{6} H02H *7/122;* **H02M** *3/335*
U.S. Cl. 363—56 **1 Claim**

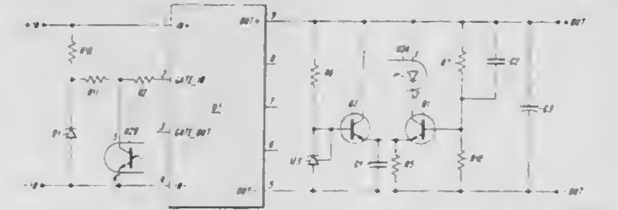


1. A switching power supply circuit comprising:
- a dc voltage source;
- a transformer having a primary winding and a secondary winding and is connected in the primary winding to the dc voltage source;
- switching means provided between the dc voltage source and the transformer;
- a secondary side circuit provided on the secondary winding side of the transformer and comprising a rectifying smoothing circuit;
- switching control means for controlling turning on and off of the switching means by detecting output voltage and current of the secondary side circuit:
- first rectified output generation means for rectifying and outputting a forward mode output comprising a first auxiliary winding wound on the transformer and a rectifying circuit:
- second rectified output generation means for rectifying and outputting a back-boost mode output comprising a second auxiliary winding wound on the transformer and a rectifying circuit;
- a threshold value circuit which judges presence of an overload state when an output of the second rectified output generation circuit is below a predetermined threshold value:
- oscillation control means for supplying a control stop output to the switching control means when presence of an overload state has been judged by the threshold value circuit thereby to set the switching means to an intermittent oscillation mode; and
- a differentiating circuit for differentiating the output of the first rectified output generation means to detect a starting time and thereby interrupt the control stop output of the oscillation control means.

5,838,557
CIRCUIT FOR USE IN A DC-DC CONVERTER HAVING A BOOSTER MODULE

Jonathan R. Wood, Sudbury, Mass., assignor to Altor, Inc., Natick, Mass.

Filed Jul. 28, 1997, Ser. No. 901,191
Int. Cl.^{6} H02M *3/16*
U.S. Cl. 363—60 **5 Claims**

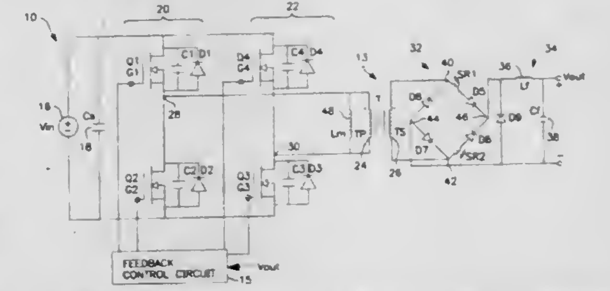


1. An apparatus for use in a DC-DC converter of the type including a booster module for controlling power and, having a plurality of input terminals including a gate-in terminal and at least first and second output terminals, said apparatus comprising:
- an input circuit, coupled between said input terminals, for developing a control voltage at the gate-in terminal; and
- an output circuit, coupled between said output terminals, which determines an error signal based on the output from the output terminals, and which feeds back a pure DC signal into the gate-in terminal of said booster module for controlling power.

5,838,558
PHASE STAGGERED FULL-BRIDGE CONVERTER WITH SOFT-PWM SWITCHING

F. Dong Tan, Irvine, and Leonard Y. Inouye, Hermosa Beach, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed May 19, 1997, Ser. No. 858,926
Int. Cl.^{6} H02M *5/42*
U.S. Cl. 363—91 **13 Claims**



1. A pulse width modulated soft switching DC-to-DC converter comprising:

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a DC input voltage source;

a transformer with primary and secondary windings, said primary winding including a magnetizing inductance such that said primary winding operates as if an inductor is connected in parallel therewith;

a switching circuit coupling said DC input voltage to said transformer primary winding, said switching circuit comprising a first pair of switching devices connected in parallel with said DC input voltage and a second pair of switching devices connected in parallel with said DC input voltage and said first pair of switching devices, said switching devices selectively turning on and off to convert said DC input voltage to an approximately square wave voltage which is supplied to said primary winding of said transformer;

a rectifying circuit connected to said transformer secondary winding for rectifying an output voltage of said transformer secondary winding, said rectifying circuit comprising first and second legs having first and second saturable reactors connected in series with first and second diodes, respectively, said first and second saturable reactors blocking current flow in the transformer secondary winding when said first diode is in a reverse recovery state and when said transformer secondary winding is in a short circuit state; and

a control circuit, connected to an output terminal of said converter and connected to said switching devices, said control circuit generating pulse width modulated (PWM) switching signals turning said switching devices on and off, said control circuit turning on simultaneously a first switching device in said first pair and a third switching device in said second pair at a beginning of an energy transfer stage, said energy transfer stage corresponding to a time period during which said third switching device remains on, said control circuit detecting a voltage level at said output terminal and varying a pulse width of a PWM switching signal that controls said third switching device to vary a time period during which said third switching device remains on based on aid voltage level at said output terminal, said control circuit maintaining said first switching device in an on state after turning said third switching device to an off state for a sufficient period of time to achieve soft switching.

5,838,559

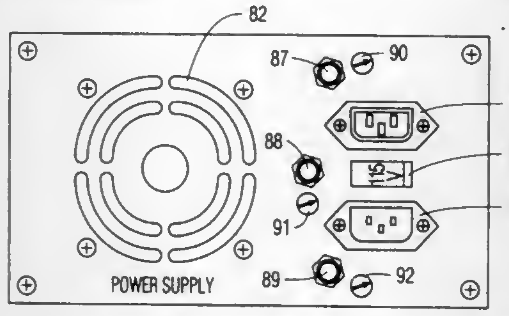
HOST ELECTRONIC EQUIPMENT WITH INTERNAL POWER SUPPLY ADAPTED FOR SUPPLYING POWER DIRECTLY TO PERIPHERALS

Phillip Lam, Mission Viejo, Calif., assignor to AM Group Corp, Irvine, Calif.

Continuation-in-part of Ser. No. 789,841, Jan. 29, 1997, Pat. No. 5,777,397, which is a continuation-in-part of Ser. No. 734,959, Oct. 23, 1996, Pat. No. 5,753,979. This application Feb. 6, 1998, Ser. No. 20,271

Int. Cl.^{6} H02M *1/00;* **H02J** *1/00*

U.S. Cl. 363—146 **9 Claims**



1. A power supply for internal connection in a system having a plurality of components which require different DC voltages for operation, said power supply including a housing, said power supply also including a plurality of wires extending through said housing for permanent connection to respective ones of said components, said power supply having at the face of said housing sockets for mating with external connectors to peripheral equipment, said power supply including means for providing different DC voltages on said wires and at said sockets.

5,838,560

Patent Not Issued For This Number

5,838,561

AUTOMATIC CONTROL LOOP MONITORING AND DIAGNOSTICS

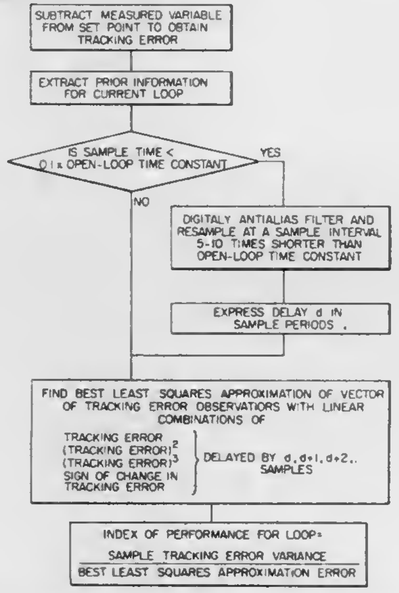
James Gareth Owen, Montreal, Canada, assignor to Pulp and Paper Research Institute of Canada, Pointe-Claire, Canada

Filed Sep. 23, 1996, Ser. No. 722,920

Claims priority, application United Kingdom, Apr. 29, 1996, 9608953.7

Int. Cl.^{6} G06F *19/00*

U.S. Cl. 364—152 **21 Claims**


SUBTRACT MEASURED VARIABLE FROM SET POINT TO OBTAIN TRACKING ERROR
EXTRACT PRIOR INFORMATION FOR CURRENT LOOP
IS SAMPLE TIME < 0.1 x OPEN-LOOP TIME CONSTANT
YES
NO
DIGITALY ANTIALIAS FILTER AND RESAMPLE AT A SAMPLE INTERVAL 5-10 TIMES SHORTER THAN OPEN-LOOP TIME CONSTANT
EXPRESS DELAY d IN SAMPLE PERIODS .
FIND BEST LEAST SQUARES APPROXIMATION OF VECTOR OF TRACKING ERROR OBSERVATIORS WITH LINEAR COMBINATIONS OF
TRACKING ERROR
(TRACKING ERROR)²
(TRACKING ERROR)³
SIGN OF CHANGE IN TRACKING ERROR
DELAYED BY d, d+1, d+2.. SAMPLES
INDEX OF PERFORMANCE FOR LOOP=
SAMPLE TRACKING ERROR VARIANCE
BEST LEAST SQUARES APPROXIMATION ERROR

1. A method of diagnosing a malfunction of a process control system which includes at least one closed loop control loop comprising measuring a histogram of tracking error of said control loop, determining distortion of said tracking error relative to a Gaussian distribution, and indicating a malfunction in the process in the event a deviation from said Gaussian distribution of said tracking error exceeds predetermined limits, wherein said distortion (K) is measured by subtracting from a height of a tracking error histogram bar of said histogram centered on zero, a number of samples multiplied by an area between a pair of limits defining a normal density about a mean of said histogram, and then indicating a malfunction in the process in the event a value of K is different from 0 by a predetermined amount.

5,838,562

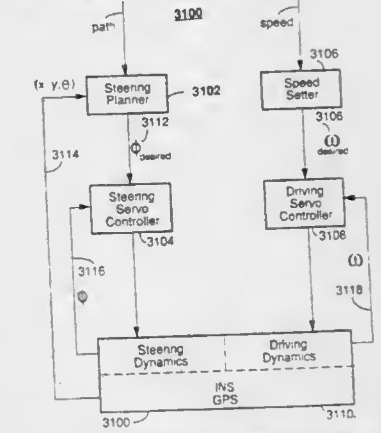
SYSTEM AND A METHOD FOR ENABLING A VEHICLE TO TRACK A PRESET PATH

Adam J. Gudat, Edelstein; Walter J. Bradbury; Dana A. Christensen, both of Peoria; Carl A. Kemner, Peoria Heights; Craig L. Koehrsen, Peoria; Christos T. Kyrtsos, Peoria; Norman K. Lay, Peoria; Joel L. Peterson, Peoria; Larry E. Schmidt, Peoria; Darrell E. Stafford, Dunlap; Louis J. Weinbeck, Peoria, all of Ill.; Lonnie J. Devier; Prithvi N. Rao, both of Pittsburgh, Pa.; Gary K. Shaffer, Butler, Pa.; Wenfan Shi; Doog Hun Shin, both of Pittsburgh, Pa.; James W. Sennott, Bloomington, Ill.; William L. Whittaker; Jay H. West, both of Pittsburgh, Pa.; Karl W. Kleimenhagen, Peoria, Ill.; Richard G. Clow, Phoenix, Ariz.; Baoxin Wu, and Sanjiv J. Singh, both of Pittsburgh, Pa., assignors to Caterpillar Inc., Peoria, Ill.

Division of Ser. No. 487,980, Feb. 5, 1990, Pat. No. 5,610,815. This application May 1, 1995, Ser. No. 432,248

Int. Cl.^{6} G06F *165/00*

U.S. Cl. 364—424.02 **10 Claims**



1. A system for a vehicle for enabling said vehicle to track a preset path comprising:

supervisory means for representing a desired path as at least a fourth order continuous function;

means for planning steering, by outputting a desired steering angle, based on said desired path from said supervisory means and sensed vehicle positions input from a positioning system;

means for controlling steering of the vehicle, by outputting steering servo commands to a steering system of the vehicle, responsive to said desired steering angle from said means for planning steering and to feedback from said steering system of the vehicle;

means for setting speed, by outputting a desired speed signal, based on a desired speed input from said supervisory means; and

means for controlling the speed of the vehicle, by outputting speed commands to a vehicle speed system, wherein said speed command is based on a difference between said desired speed signal and an actual vehicle speed fed back from said vehicle speed system.

5,838,563

SYSTEM FOR CONFIGURING A PROCESS CONTROL ENVIRONMENT

Andrew P. Dove, Austin; Larry O. Jundt, Round Rock; Stephen G. Hammock, Austin, and J. Clint Fletcher, Pflugerville, all of Tex., assignors to Fisher-Rosemont Systems, Inc., Austin, Tex.

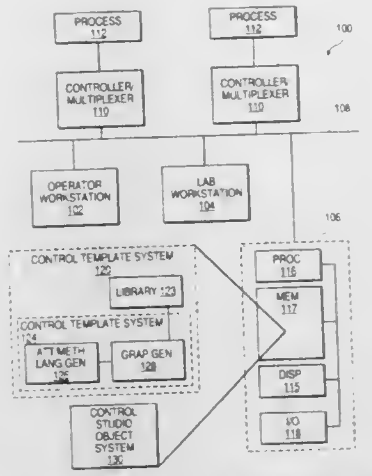
Filed Apr. 12, 1996, Ser. No. 631,863

Int. Cl.^{6} G06F *15/00*

U.S. Cl. 364—188 **23 Claims**

1. A method for configuring a process control environment, the process control environment including a computer system having a processor coupled to a display device, the method comprising:

presenting, on the display device, a stencil view including a stencil object, the stencil object representing a process control module;



presenting, on the display device, a diagram view, the diagram view representing the process control environment configuration:

dragging the stencil object from the stencil view to the diagram view;

dropping the stencil object on the diagram view in a position indicative of a location of the process control module in the process control environment; and

configuring the process control environment in accordance with the diagram view.

5,838,564

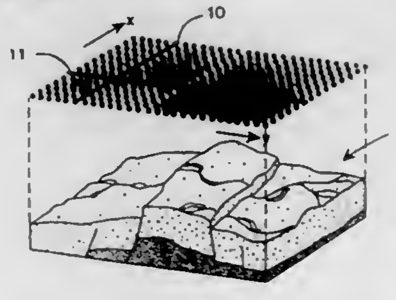
APPARATUS FOR SEISMIC SIGNAL PROCESSING AND EXPLORATION

Michael S. Bahorich, Arvada, Colo., and Steven L. Farmer, Tulsa, Okla., assignors to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 353,934, Dec. 12, 1994, Pat. No. 5,563,949. This application Oct. 1, 1996, Ser. No. 716,612

Int. Cl.^{6} G06F *19/00*

U.S. Cl. 364—421 **20 Claims**



1. In a computer workstation wherein 3-D seismic data is read into memory and divided into an array of analysis cubes, wherein each cube has at least a portion of at least three separated seismic traces located therein, and wherein the computer is used to transform such data into a display of seismic attributes, the computer CHARACTERIZED BY performing a process comprising the steps of:

(1) measuring in each of said cubes the coherency/similarity of said at least three traces relative to two pre-determined axes; and

(2) recording said coherency/similarity of said cubes in a form for displaying a two-dimensional map of subterranean features to identify subsurface features commonly associated with the entrapment and storage of hydrocarbons.

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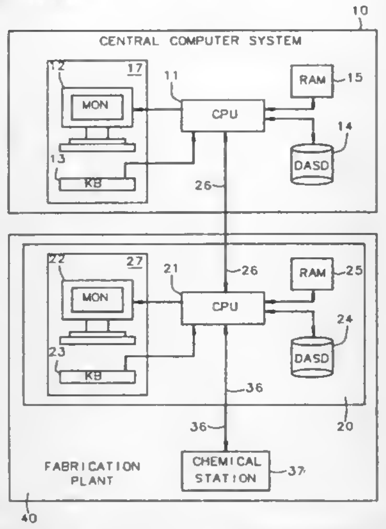
5,838,565
MANUFACTURING CONTROL METHOD FOR IC PLANT BATCH SEQUENTIAL MACHINE

Hung-Ming Hsieh; Yirn-Sheng Pan, and Horng-Huei Tseng, all of Hsinchu, Taiwan, assignors to Vanguard International Semiconductor Corporation, Hsin-Chu, Taiwan

Filed May 15, 1997, Ser. No. 857,165
Int. Cl.^{6} G06F *19/00*
U.S. Cl. 364—468.06 31 Claims



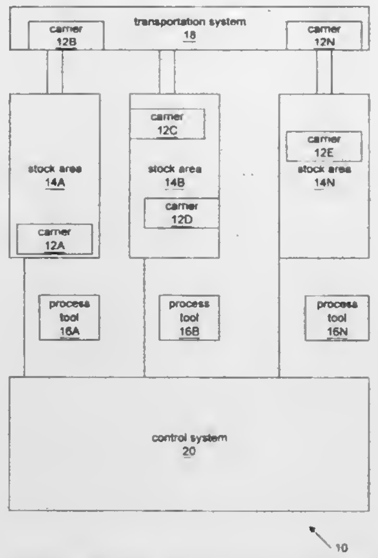
1. A method of operating a batch sequential machine in a manufacturing plant subsequent to preventative maintenance steps to optimize processing of lots of work through a plurality of series of processing stations which perform various processing functions, comprising the following steps:
providing a batch sequential machine in a manufacturing plant,
providing a data processing system having memory means for data storage,
providing central processing means for
a) accessing data from said memory means,
b) receiving data from data input means and
c) supplying data to said memory means,
collecting interval-times $(I_{i,j})$ for processing of lots through individual processing stations,
forming a matrix of reduced times for processing lots through said processing stations,
determining permutations of said reduced times for a series of combinations of said processing stations for performing required processing tasks, and
selecting the combination of interval-times providing the maximum reduction of total processing time.

5,838,566
SYSTEM AND METHOD FOR MANAGING EMPTY CARRIERS IN AN AUTOMATED MATERIAL HANDLING SYSTEM

Michael R. Conboy, Buda, and Elfido Coss, Jr., Austin, both of Tex., assignors to Advanced Micro Devices

Filed Dec. 10, 1996, Ser. No. 763,233
Int. Cl.^{6} G06F *19/00*
U.S. Cl. 364—468.22 47 Claims

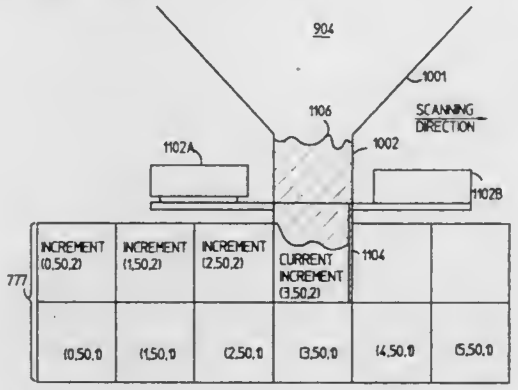
1. An automated material handling system, comprising:
a plurality of material carriers, a first subset of which contain material and a second subset of which are absent material;
a first stock area comprising a plurality of first bins, each of which are configured to store a material carrier drawn from either said first or said second subset;
a control system coupled to the first stock area for computing a first empty percentage calculated as the number of said first bins which contain material carriers from the second subset relative to the number of said first bins; and
a transportation system responsive to said control system for moving a material carrier drawn from said second subset between a staging area and the first stock area based on a comparison of the first empty percentage to a predetermined threshold.



5,838,567
SYSTEM AND METHOD FOR INCREMENTAL FABRICATION OF CIRCUIT BOARDS

Robert F. Boggio, Jr., Loveland, Colo., assignor to Hewlett-Packard Co., Palo Alto, Calif.

Continuation of Ser. No. 235,435, Apr. 29, 1994, abandoned. This application Jul. 10, 1996, Ser. No. 677,989
Int. Cl.^{6} G06F *19/00*
U.S. Cl. 364—468.28 17 Claims

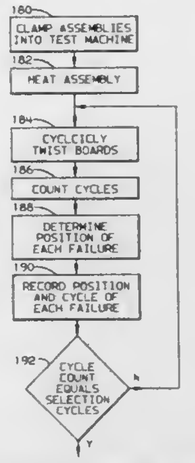


1. A computer-based method for depositing material onto a fabrication base to form a circuit board, the method carried out prior to insertion of pre-fabricated components into the circuit board, the method comprising the steps of:
(a) receiving design data representing a layout of the circuit board;
(b) transforming said design data into a three-dimensional matrix of increments, each increment being identified within said matrix by an address and being assigned a raw fabrication material selected from a plurality of such raw fabrication materials; and
(c) depositing said assigned raw fabrication materials onto the fabrication base in an incremental three-dimensional fashion as indicated by said matrix to thereby three-dimensionally form the circuit board so that it is suitable for subsequent insertion of pre-fabricated components.

5,838,568
HEATED CIRCUIT ASSEMBLY TESTER AND METHOD

Gerard Truman Dickinson, Owego, N.Y.; James Lee McGinniss, Jr., Friendsville, Pa.; Ronald F. Tokarz, Endwell, and Aleksander Zubelewicz, Binghamton, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 28, 1996, Ser. No. 672,882
Int. Cl.^{6} G06F *19/00*
U.S. Cl. 364—468.28 23 Claims


180
CLAMP ASSEMBLIES INTO TEST MACHINE
182
HEAT ASSEMBLY
184
CYCLCICLY TWIST BOARDS
186
COUNT CYCLES
188
DETERMINE POSITION OF EACH FAILURE
190
RECORD POSITION AND CYCLE OF EACH FAILURE
192
CYCLE COUNT EQUALS SELECTION CYCLES
N
Y

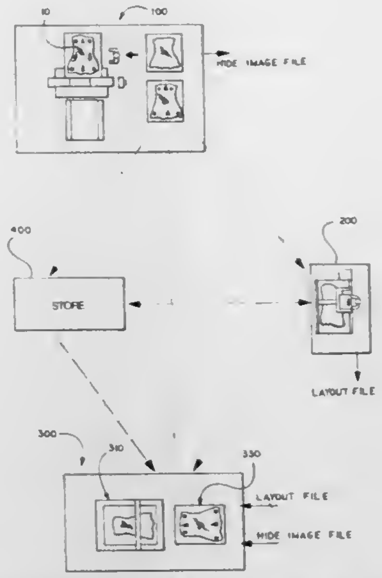
5. A device for generating digital signals for controlling a computer system of a stress test machine, comprising:
checking means for determining when card assemblies have reached testing temperature;
initiating means for automatically starting the stress testing depending upon reaching test temperature;
stress means for automatically controlling a maximum displacement cyclicly applied to a card assembly during testing;
data means for recieving data for a multitude of failures for a card;
count means for providing a displacement cycle count,
associating means for relating the failure data to the displacement cycle count when receiving the failure data; and
storing means for saving the failure data and related cycle count in a failure distribution for a respective card assembly in a computer data base for later access.

5,838,569
METHOD OF DIGITIZING AND CUTTING UP REMNANTS OF NON-REPETITIVE SHAPES

Pierre Gane, Pont de la Maye, France, assignor to Letra Systemes, Cestas, France

PCT No. PCT/FR95/00551, § 371 Date Oct. 25, 1996, § 102(e) Date Oct. 25, 1996, PCT Pub. No. WO95/29046, PCT Pub. Date Nov. 2, 1995
PCT Filed Apr. 27, 1995, Ser. No. 732,220
Claims priority, application France, Apr. 27, 1994, 94 05083
Int. Cl.^{6} G06F *15/46*
U.S. Cl. 364—470.05 27 Claims

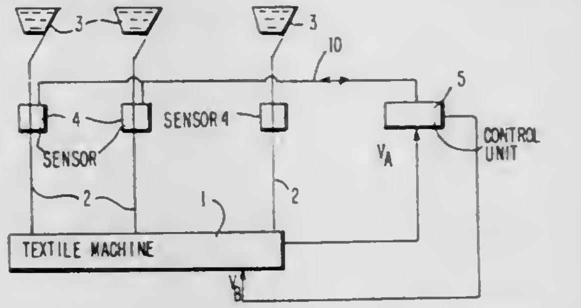
1. A method of cutting up sheet material in the form of remnants of non-repetitive shapes and that might be flawed, the method including the following operations:
digitizing the configuration of each remnant so as to generate and record graphics information representative of the shape of the remnant;
generating first position information representative of the configuration of the remnant during digitization;
recording the first position information corresponding to the remnant whose configuration has been digitized;
defining from said graphics information a layout for pieces to be cut out from the remnant so as to use the surface of the remnant optimally;
projecting onto a work surface images whose positions correspond to said recorded first position information; placing the corresponding remnant on the work surface with a configuration corresponding to the projected images; and
cutting out the pieces from the placed remnant in compliance with said layout;
whereby said pieces are cut from the remnant in a configuration similar to that which the remnant had during digitization.



5,838,570
DEVICE FOR MONITORING THE FEED OF A PLURALITY OF YARNS TO A TEXTILE MACHINE HAVING ENCODED SENSOR MEANS, AND A METHOD FOR ITS CONTROL

Tiziano Barea, Busto Arsizio, Italy, assignor to B.T.S.R. International S.p.A., Olgiate Olona, Italy

Filed Jun. 27, 1996, Ser. No. 675,433
Claims priority, application Italy, Jul. 3, 1995, MI95A1420
Int. Cl.^{6} G06F *15/46*
U.S. Cl. 364—470.14 19 Claims



1. A device for monitoring the feed of a plurality of yarns to a textile machine comprising sensor means cooperating with each of said yarns, said sensors means including 4 sensors, said sensors being arranged to sense the state of feed of said yarns and in particular their movement or stoppage, their tension and the speed at which they are fed to said machine, said sensors being connected to a control unit which, on the basis of the signals generated by said sensors controls the operation of the latter, characterised in that at least part of said sensors have their own identification code and wherein the control unit, on the basis of a periodic reference signal (V_A) which is a function of the operating position of the textile machine, is structured and arranged to interrogate said sensors individually based on each of their identification codes and thereby receive from said sensors the data relative to the state of feed of the yarns monitored by said sensors.

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5,838,571

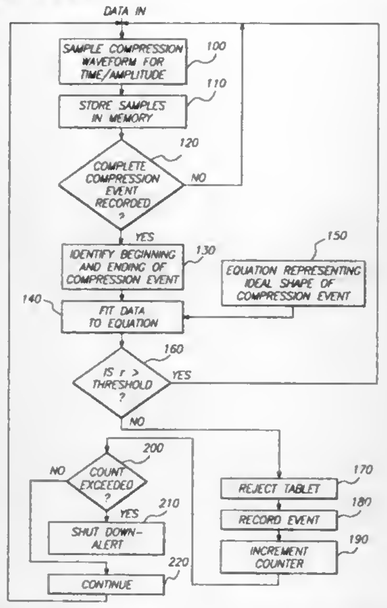
TABLET PRESS MONITORING AND CONTROLLING METHOD AND APPARATUS

David A. Lewis, Fairfield, Calif., assignor to ALZA Corporation, Palo Alto, Calif.

Filed Jan. 29, 1996, Ser. No. 593,769

Int. Cl.^{6} G06F *9/315;11/30*

U.S. Cl. 364—476.01 **24 Claims**



1. A system for monitoring a compression event in a tablet compressing machine, comprising:

- at least one data collection channel for sampling a plurality of points along a compression event waveform;
- a processor for statistically fitting said sampled waveform to an equation representing an ideal compression event waveform; and
- apparatus for altering the operation of at least one of: (i) the tablet compressing machine; and (ii) a machine associated with the operation of said tablet compressing machine; based upon quality of the fit between the sampled waveform and the ideal waveform, wherein said apparatus performs an operation selected from the group consisting of: (i) rejecting a tablet formed in said tablet compressing machine if said fit quality falls below a preset value; (ii) signaling that a particular punch or die in said machine is malfunctioning; (iii) using said sampled waveform, via a feedback controller, to adjust the amount of solid material fed into a die for a subsequent compression if said fit quality falls above a preset value and ignoring said sampled waveform if said fit quality fall below said preset value; and (iv) combinations thereof.

5,838,572

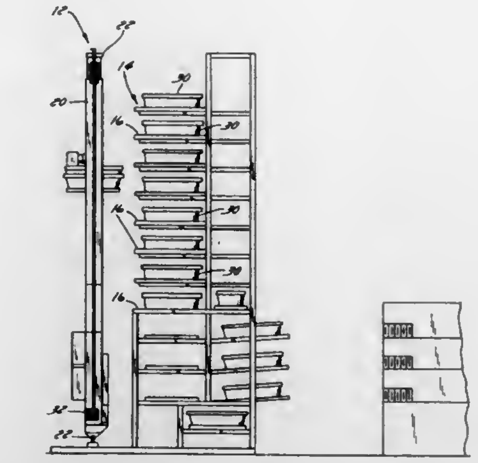
REAL-TIME INTERRUPT DRIVEN PC CONTROL SYSTEM FOR A STORAGE AND RETRIEVAL MACHINE

Robert C. Hofstetter, and Wesley S. Crucius, both of Brookfield, Wis., assignors to HK Systems, Inc., New Berlin, Wis.

Continuation of Ser. No. 42,241, Apr. 2, 1993, abandoned. This application Nov. 22, 1995, Ser. No. 835,215

Int. Cl.^{6} G06F *17/00*

U.S. Cl. 364—478.01 **22 Claims**



1. A method of controlling a storage and retrieval machine in event driven fashion, the method comprising:

(A) providing said storage and retrieval machine with a horizontally movable base, a vertically movable carriage, and a microprocessor-based control system that controls movement of said base and said carriage of storage and retrieval machine, said microprocessor-based control system including a motion controller, a machine control task, an input/output interface, an input/output task, and at least one microprocessor that executes said machine control task and said input/output task;

(B) issuing a plurality of interrupts to said machine control task in response to events which occur in an operating environment of said storage and retrieval machine, at least some of plurality of interrupts being issued by said motion controller, and at least some of plurality of interrupts being issued by said input/output task in response to input signals from sensors received at said input/output interface; and

(C) responding to said interrupts, said responding step including the steps of

  (1) receiving said plurality of interrupts at said machine control task, and

  (2) executing at least one subroutine in response to the reception of each interrupt, said execution of said subroutines controlling movement of said base and said carriage of said storage and retrieval machine, and said executing step including the step of providing information to said motion controller which enables said motion controller to cooperate with base and hoist servo motors of said storage and retrieval machine to deliver said carriage to a next rack location;

wherein movement of said base and said carriage of said storage and retrieval machine (1) is substantially entirely controlled by issuing and responding to said interrupts in steps (B) and (C) as different events occur in said operating environment that cause said interrupts to be issued and (2) is controlled in a manner which is substantially free of polling by said machine control task of said input/output interface and said motion controller for status information.

5,838,573

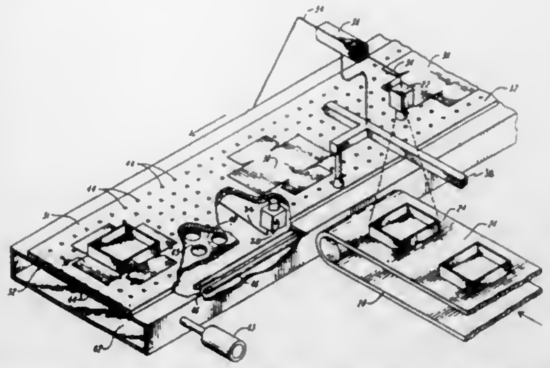
PROCESS AND APPARATUS FOR SPOTTING LABELS

Charles F. H. Crathern, Contoocook, N.H., and John DiValerio, Havertown, Pa., assignors to Crathern & Smith, Inc., Huntingdon Valley, Pa.

Continuation of Ser. No. 510,856, Aug. 3, 1995, abandoned. This application Oct. 3, 1997, Ser. No. 943,741

Int. Cl.^{6} B07C *17/00*

U.S. Cl. 364—478.18 **9 Claims**



1. In apparatus for physically registering separate, individual items of thin sheet material of a first set sequentially presented on a movable conveyor belt to corresponding individual members of a sequence of a second set, said apparatus including means for releasably retaining said items on a surface of said conveyor belt, video means for viewing said items on said surface of said conveyor belt and for providing first signals representative of said viewing, means for establishing parameters of said members of said second set and for providing second signals representative of said parameters, computer means for determination of sufficient information from said signals to provide commands to effect such registration, means for physically spotting at least one of said items with respect to one of said members in said registration regardless of the original orientation of said items and members and responsively to commands from said computer means, each of said items having at least one predetermined design disposed thereon within the borders of said item, said conveyor means being a flexible, light-transmissive conveyor belt for supporting and moving said items with said design face down against an upper surface of said belt, and means for illuminating the opposite surface of said belt so as to provide illumination of said items of said first set on said one surface of said belt, the improvement wherein

- said video means is disposed for sequentially viewing each said design on a corresponding one of said items on said belt, as each said design is illuminated by transmission of said illumination through both said belt and said corresponding one of said items, so as to provide first signals as representative of each said design;
- means for forming first digitized information from said first signals;
- means for storing second digitized information of at least the location and details of a standard of said design; and
- means for comparing said first digitized information with said standard and for comparing said first digitized information with said second digitized information so as to determine said commands.

5,838,574

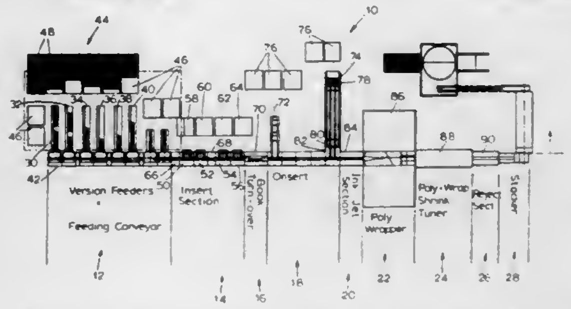
SYSTEM FOR CONTROLLING FEEDERS OF A PACKAGE ASSEMBLY APPARATUS

Larry A. Olson, Naperville; James A. Trchka, Clarendon Hills, both of Ill., and William T. Montgomery, Lancaster, Pa., assignors to R. R. Donnelley & Sons Company, Chicago, Ill.

Filed Oct. 11, 1995, Ser. No. 540,937

Int. Cl.^{6} G06F *17/00*

U.S. Cl. 364—478.07 **36 Claims**



36. A system for use in connection with a package assembly line, wherein the package assembly line has a piece feeder and a component feeder, wherein the piece feeder is arranged to feed pieces to a transport of the package assembly line, wherein the component feeder is arranged to feed components to the transport of the package assembly line so that the components and the pieces are combined into packages, and wherein the components have corresponding component identifiers thereon, the system comprising:

- storing means for storing a piece data file having piece identifiers;
- detecting means for detecting a component identifier from a component;
- comparing means for comparing the detected component identifier to a corresponding piece identifier; and.
- means for modifying the piece data file if the detected component identifier fails to match the corresponding piece identifier.

5,838,575

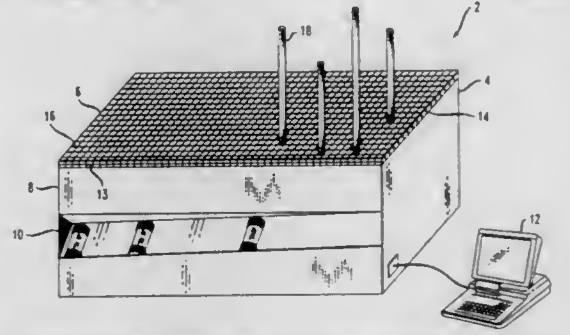
SYSTEM FOR DISPENSING DRUGS

Nicholas Lion, Princeton, N.J., assignor to Rx Excell Inc.

Filed Dec. 14, 1995, Ser. No. 572,619

Int. Cl.^{6} G06F *17/00;* **G06G** *7/48*

U.S. Cl. 364—479.01 **27 Claims**



1. A prescription dosage unit dispensing system comprising:

(a) a housing comprising a plurality of cells, each cell being dimensioned and arranged to receive a base-port subunit;

(b) at least one base-port subunit positioned within a corresponding one of said plurality cells, said base-port subunit being operable to dispense a preselected number of solid dosage units into a vial; and

(c) at least one disposable drug-containing tower unit containing, in sealed condition, a single type of solid dosage unit, said at least one tower unit being dimensioned and arranged for releasable engagement with a corresponding base-port subunit and having at one end thereof a defeatable seal, wherein said corresponding base-port subunit is configured to open the defeatable seal upon insertion of a sealed drug-containing tower unit into an associated cell.

5,838,576

Patent Not Issued For This Number

5,838,577

ELECTRICAL APPARATUS CAPABLE OF BEING CONNECTED TO PLURAL KINDS OF PERIPHERAL DEVICES

Kaneyoshi Tokano, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 1, 1994, Ser. No. 347,869

Claims priority, application Japan, Dec. 22, 1993, 5-323771

Int. Cl.^{6} G11B *33/10;* **H04N** *5/907*

U.S. Cl. 364—483 **13 Claims**

1. An electrical apparatus capable of being connected to plural kinds of peripheral devices alternatively, comprising:

- connecting means for connecting the plural kinds of peripheral devices alternatively;
- power supply means for supplying electrical power to the connected peripheral device via said connecting means;
- comparing means for comparing the power of said power supply means to a predetermined value; and
- notification means for notifying a user which peripheral device or devices is/are usable for the given power supply conditions

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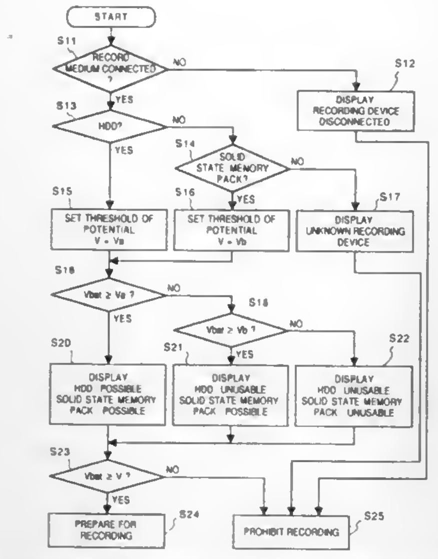

START
S11
RECORD MEDIUM CONNECTED ?
NO
YES
S12
DISPLAY RECORDING DEVICE DISCONNECTED
S13
HDD?
S14
SOLID STATE MEMORY PACK?
S15
SET THRESHOLD OF POTENTIAL V = Va
S16
SET THRESHOLD OF POTENTIAL V = Vb
S17
DISPLAY UNKNOWN RECORDING DEVICE
S18
Vbat ≥ Va ?
S19
Vbat ≥ Vb ?
S20
DISPLAY HDD POSSIBLE SOLID STATE MEMORY PACK POSSIBLE
S21
DISPLAY HDD UNUSABLE SOLID STATE MEMORY PACK POSSIBLE
S22
DISPLAY HDD UNUSABLE SOLID STATE MEMORY PACK UNUSABLE
S23
Vbat ≥ V ?
S24
PREPARE FOR RECORDING
S25
PROHIBIT RECORDING

on the basis of a comparison result by said comparing means before said peripheral device is connected to the apparatus.

5,838,578

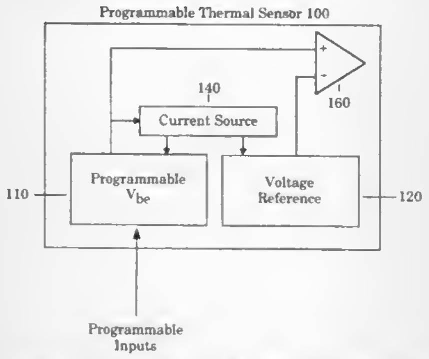
METHOD AND APPARATUS FOR PROGRAMMABLE THERMAL SENSOR FOR AN INTEGRATED CIRCUIT

Jack D. Pippin, Portland, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 124,980, Sep. 21, 1993, abandoned. This application Jun. 6, 1996, Ser. No. 660,016

Int. Cl.⁶ H01K *3/08;* **H03F** *1/30*

U.S. Cl. 364—488 **19 Claims**



8. An apparatus for detecting a threshold temperature in an integrated circuit comprising:

voltage reference means for generating a voltage reference substantially independent of a temperature of the integrated circuit;

at least one programmable input for receiving a value corresponding to a threshold temperature of the integrated circuit;

temperature sensing means for generating a sensing voltage wherein the sensing voltage varies substantially linearly with the temperature of the integrated circuit, the temperature sensing means scaling the sensing voltage in accordance with the value to generate a comparison voltage, wherein the comparison voltage is substantially equal to the voltage reference when the integrated circuit attains the threshold temperature; and

comparison means coupled to the temperature sensing means and the voltage reference means, wherein the comparison means generates a signal when the comparison voltage exceeds the voltage reference to indicate the integrated circuit temperature attained the threshold temperature.

5,838,579

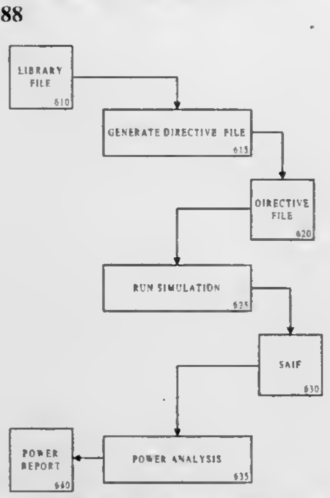
STATE DEPENDENT POWER MODELING

Janet Olson, Saratoga; Ivailo Nedelchev, Santa Clara; Yuegin Danny Lin; Ashutosh S. Mauskar, both of Sunnyvale, and James Sproch, Saratoga, all of Calif., assignors to Synopsys, Inc., Mountain View, Calif.

Filed Oct. 29, 1996, Ser. No. 740,502

Int. Cl.⁶ G06F *17/50*

U.S. Cl. 364—488 **23 Claims**



9. In a computer controlled power estimation system, a computer implemented method for providing a power consumption model for a physical circuit, said method comprising the steps of:

a) identifying a set of signals for a library cell representative of said physical circuit and storing said set of signals into a computer readable memory;

b) designating at least one designated signal pin of said library cell and storing a signal pin designation thereof into said power consumption model of said library cell within said computer readable memory;

c) associated with said designated signal pin, defining a first state of said set of signals;

d) associated with said designated signal pin, defining a first power consumption function representative of power consumed by said physical circuit upon a transition on said designated signal pin provided said first state exists contemporaneously with said transition on said designated signal pin; and

e) storing said first power consumption function and said first state into said power consumption model for said library cell of said computer readable memory;

f) associated with said designated signal pin, defining a second state of said set of signals;

g) associated with said designated signal pin, defining a second power consumption function representative of power consumed by said physical circuit upon a transition on said designated signal pin provided said second state exists contemporaneously with said transition on said designated signal pin; and

h) storing said second power consumption function and said second state into said power consumption model for said library cell of said computer readable memory.

5,838,580

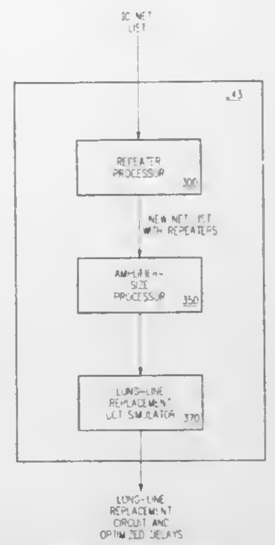
METHOD OF OPTIMIZING REPEATER PLACEMENT IN LONG LINES OF A COMPLEX INTEGRATED CIRCUIT

Chakra R. Srivatsa, San Jose, Calif., assignor to Sun Microsystems, Inc., Palo Alto, Calif.

Filed Jun. 20, 1996, Ser. No. 667,908

Int. Cl.⁶ G06F *17/50*

U.S. Cl. 364—489 **17 Claims**


IC NET LIST
43
REPEATER PROCESSOR
300
NEW NET LIST WITH REPEATERS
AMPLIFIER-SIZE PROCESSOR
350
LONG-LINE REPLACEMENT CCT SIMULATOR
370
LONG-LINE REPLACEMENT CIRCUIT AND OPTIMIZED DELAYS

1. A method of operating a general-purpose computer system to minimize a time delay required for a signal to propagate between a first node and a second node of an integrated circuit, wherein a simulation of the integrated circuit is stored as circuit data in a first region of memory in the computer system, the method comprising:

analyzing the circuit data in the first region of memory to obtain signal-propagation-speed characteristics for a conductor connected between the first and second nodes;

generating a first simulated time delay representing a time required for the signal to propagate between the first and second nodes over said conductor;

deciding, based on the signal-propagation-speed characteristics of the conductor, whether separating the conductor into line segments, each of the line segments being separated from another of the line segments by a repeater amplifier, decreases the time required for the signal to propagate between the first and second nodes; and

indicating how many of the line segments are required to minimize the time delay required for said signal to propagate between said first node and said second node if separating the conductor into the plurality of segments decreases the time required for the signal to propagate between the first and second nodes.

5,838,581

LAYOUT SYSTEM FOR LOGIC CIRCUIT

Yasuaki Kuroda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 30, 1996, Ser. No. 723,365

Claims priority, application Japan, Sep. 29, 1995, 7-253648

Int. Cl.⁶ G06F *17/50*

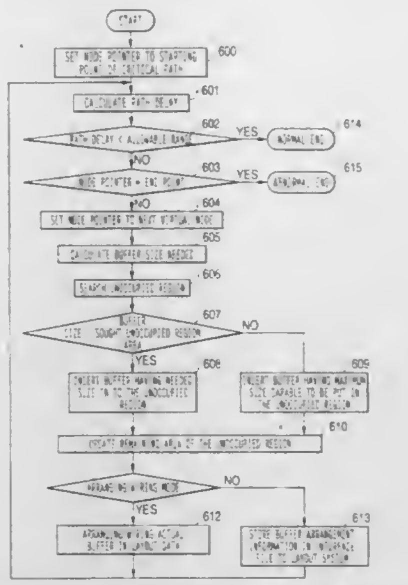
U.S. Cl. 364—491 **4 Claims**

1. A layout system for adjusting a delay of a critical path in a logic circuit comprising:

critical path extracting means for extracting said critical path in a primitive layout data;

unoccupied region extracting means for extracting a region unoccupied with a circuit block along said critical path in said primitive layout data;

size calculating means for calculating a buffer size for adjusting said delay of said critical path into a range of a allowable delay; and



buffer inserting means for inserting a buffer into said region unoccupied with said circuit block.

5,838,582

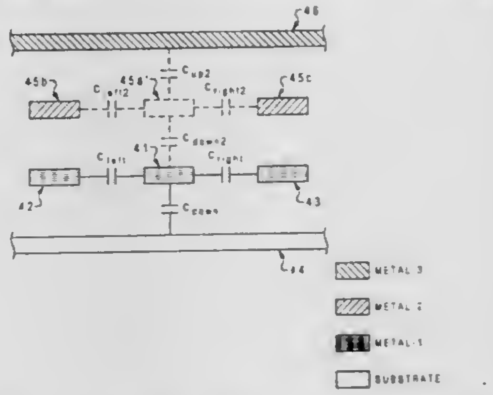
METHOD AND SYSTEM FOR PERFORMING PARASITIC CAPACITANCE ESTIMATIONS ON INTERCONNECT DATA WITHIN AN INTEGRATED CIRCUIT

Sharad Mehrotra, Austin, and Paul Gerard Villarrubia, Round Rock, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 7, 1996, Ser. No. 726,720

Int. Cl.⁶ G06F *17/50*

U.S. Cl. 364—490 **13 Claims**



1. A method of performing parasitic capacitance estimation on interconnect data for an integrated circuit, wherein said integrated circuit includes a substrate layer and a plurality of metal layers, said method comprising the steps of:

identifying a center wire within one of said plurality of metal layers;

determining a first capacitance value between a first wire and said center wire, wherein said first wire and said center wire are in the same metal layer of said plurality of metal layers;

determining a second capacitance value between a second wire and said center wire, wherein said second wire and said center wire are in the same metal layer of said plurality of metal layers;

determining a third capacitance value between a third wire and said center wire, wherein said third wire is in a metal layer directly beneath said center wire;

determining a fourth capacitance value between a fourth wire and said center wire, wherein said fourth wire is in a metal layer directly above said center wire;

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distributing said fourth capacitance value among a plurality of wires if there is more than one wire within said metal layer directly above said center wire; and

estimating a total parasitic capacitance for said center wire based on said first capacitance value, said second capacitance value, said third capacitance value, and said fourth capacitance value or said distributed fourth capacitance values.

5,838,583

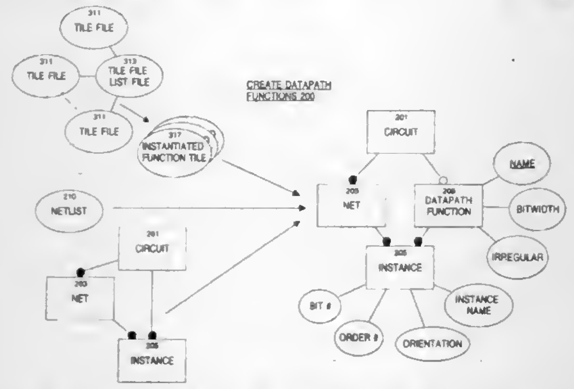
OPTIMIZED PLACEMENT AND ROUTING OF DATAPATHS

Ravi Varadarajan, Fremont, and Robert Thompson, Los Gatos, both of Calif., assignors to Cadence Design Systems, Inc., San Jose, Calif.

Filed Apr. 12, 1996, Ser. No. 631,828

Int. Cl.^{6} G06F *17/50*

U.S. Cl. 364—491 **31 Claims**



1. In a computer aided integrated circuit design system for designing integrated circuits including a plurality of datapath regions, each datapath region including at least one datapath function, each datapath function including at least one logic cell instance, a computer memory readable by a processor in the system for determining a placement of cell instances in a datapath function from a netlist of logic cell instances for the datapath function, comprising:

a first structured description of the unique relative vertical or horizontal placement of logic cell instances in a datapath function, having a plurality of instance descriptions, each instance description including:
- i) an instance identifier specifying a logic cell instance;
- ii) a bit identifier specifying a bit position in the datapath function relative to a first bit position in the datapath function; and,
- iii) an order identifier specifying a serial position of the logic cell instance within the specified bit position, and relative to a first serial position of other logic cell instances also assigned to the bit position.

5,838,584

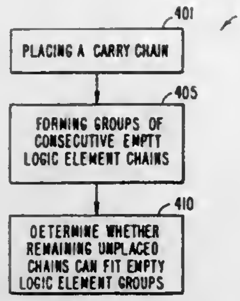
OPTIMIZING CHAIN PLACEMENT IN A PROGRAMMABLE LOGIC DEVICE

Peter J. Kazarian, Cupertino, Calif., assignor to Altera Corporation, San Jose, Calif.

Continuation of Ser. No. 379,060, Jan. 27, 1995, abandoned. This application Apr. 4, 1997, Ser. No. 825,838

Int. Cl.^{6} H01L *25/10*

U.S. Cl. 364—491 **27 Claims**


401
205
PLACING A CARRY CHAIN
405
FORMING GROUPS OF CONSECUTIVE EMPTY LOGIC ELEMENT CHAINS
410
DETERMINE WHETHER REMAINING UNPLACED CHAINS CAN FIT EMPTY LOGIC ELEMENT GROUPS

1. A method of implementing logical functions in a programmable logic device comprising the steps of:

inputting design characteristics, said design characteristics defining a plurality of chains wherein a chain is a group of linked circuit elements, into a programmed digital computer;

in said programmed digital computer, solving a bin packing problem for said design characteristics after chain placement, each bin comprising a plurality of logic elements linked in a linear fashion, wherein a routing of said logic elements is predetermined;

programming said programmable logic device with a result of said solving step; and

using said programmable logic device to implement said logical functions.

5,838,585

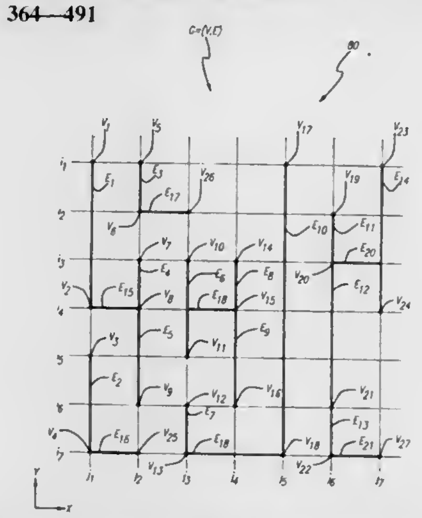
PHYSICAL DESIGN AUTOMATION SYSTEM AND METHOD USING MONOTONICALLY IMPROVING LINEAR CLUSTERIZATION

Ranko Scepanovic; James S. Koford, both of San Jose, Calif.; Valeriy B. Kudryavtsev; Stanislav V. Aleshin, both of Moscow, Russian Federation; Alexander E. Andreev, Moskovskaja Oblast, Russian Federation, and Alexander S. Podkolzin, Moscow, Russian Federation, assignors to LSI Logic Corporation, Milpitas, Calif.

Continuation of Ser. No. 410,049, Mar. 24, 1995, abandoned. This application Dec. 8, 1997, Ser. No. 986,753

Int. Cl.^{6} G06F *17/50*

U.S. Cl. 364—491 **35 Claims**



1. A method of improving a placement of cells, and a routing including wires interconnecting said cells, for a microelectronic integrated circuit, the method comprising the steps of:

(a) defining a grid including a plurality of first gridlines that extend parallel to a first axis, and a plurality of second gridlines that extend parallel to a second axis that is angularly displaced from said first axis;

(b) representing said cells as vertices located at intersections of said first and second gridlines;

(c) representing said wires as edges that extend along said first and second gridlines;

(d) creating clusters of vertices such that each cluster includes vertices located on a respective first gridline;

(e) computing a cover as including a minimum block of clusters that are connected to all other clusters by said wires extending along said second gridlines; and

(f) spatially reordering clusters outside said cover along said second axis in accordance with a predetermined reordering function.

5,838,586

Patent Not Issued For This Number

5,838,587

METHOD OF RESTRICTED SPACE FORMATION FOR WORKING MEDIA MOTION

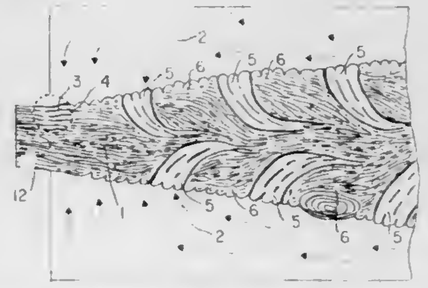
Valeriy S. Maisotsenko, 5628 S. Idalia St., Aurora, Colo. 80015, and Vassili A. Arsiri, Odessa, Ukraine, assignors to Valeriy S. Maisotsenko, Aurora, Colo.

PCT No. PCT/US94/14890, § 371 Date Apr. 30, 1996, § 102(e) Date Apr. 30, 1996, PCT Pub. No. WO95/18419, PCT Pub. Date Jul. 6, 1995

Continuation-in-part of Ser. No. 176,010, Dec. 30, 1993, abandoned. This PCT application Dec. 30, 1994, Ser. No. 637,701

Int. Cl.^{6} F15D *1/02*

U.S. Cl. 364—512 **70 Claims**



1. A method for testing the flow of a fluid, the results of which could be used to assist in selecting a flow channel configuration for a fluid flow apparatus, the method comprising the steps of:

(a) providing a fluid flow test model having an inlet port for receiving a flowing fluid, an outlet port for discharging a flowing fluid, and a fluid chamber located between said inlet port and said outlet port through which a flowing fluid could be directed;

(b) providing a test medium which is capable of flowing through said fluid chamber, wherein said test medium comprises a liquid having a characteristic wavelength when flowing through said fluid chamber;

(c) flowing said test medium through said test model from said inlet port and through said fluid chamber to said outlet port; and

(d) subjecting to electromagnetic radiation, during said step of flowing, at least some test medium flowing through said fluid chamber, whereby said test medium exhibits an electromagnetic response representative of a flow characteristic of said test medium, and wherein, to assist in identifying a flow structure of said test medium flowing through said test chamber, at least one of the following relationships with said characteristic wavelength is provided:

- (i) said test medium comprises solid particles suspended in a fluid, with said solid particles having a size of from about 50% of said characteristic wavelength to about 200% of said characteristic wavelength;
- (ii) said electromagnetic radiation comprises a frequency of electromagnetic radiation having a wavelength within an order of magnitude of said characteristic wavelength; and
- (iii) said fluid chamber has a depth d_L that is substantially equal to the value calculated by one of the following two equations:

$$d_l=K(\lambda/2)+\lambda/4;$$

and

$$d_l=K(\lambda)$$

where:

d_L is the depth of said fluid chamber;

λ is the characteristic wavelength;

K is an integer value determined from the ratio of 2 d/λ by dropping any remainder portion of the ratio; and

d is an assumed approximate desired depth for the fluid chamber.

5,838,588

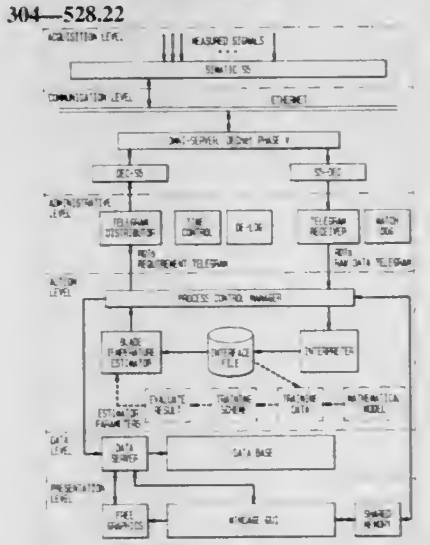
GRAPHICAL USER INTERFACE SYSTEM FOR STEAM TURBINE OPERATING CONDITIONS

Nugroho Iwan Santoso, Cranbury, N.J., and Walter Zorner, Baiersdorf, Germany, assignors to Siemens Corporate Research, Inc., Princeton, N.J.

Filed Dec. 13, 1996, Ser. No. 768,047

Int. Cl.^{6} G05B *15/00*

U.S. Cl. 304—528.22 **8 Claims**



1. In a system for monitoring steam turbine blade temperature utilizing measurement parameter values, a graphical user interface utilizing a computer for displaying a menu so as to allow selection for viewing of any of the following turbine diagram windows:

turbine overview;

HP turbine;

LP1 turbine;

LP2 turbine;

any other turbine included within the system;

wherein for each turbine, view windows selectable through said menu are provided, including: turbine overview, actual on-line turbine condition on a Mollier diagram, and a trend diagram window;

said turbine overview window displaying a current value of blade temperature; and

said Mollier diagram and said actual turbine condition on said Mollier diagram being generated automatically by said computer based on thermodynamic calculations and blade temperature estimation by a hybrid artificial neural network.

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5,838,589

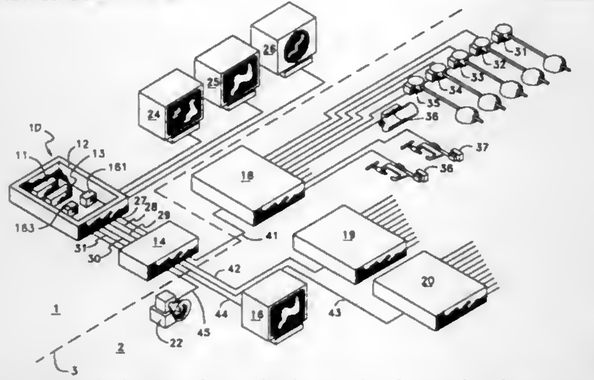
INTRINSICALLY SAFE DATA ACQUISITION SYSTEM AND APPARATUS

George Michael Nail, Oklahoma City; Alan Wayne Burkhard, Edmond, and Jeffrey Roland Wedekind, Oklahoma City, all of Okla., assignors to M-I L.L.C, Houston, Tex.

Division of Ser. No. 325,009, Oct. 18, 1994, Pat. No. 5,583,764. This application May 20, 1996, Ser. No. 650,458

Int. Cl.^{6} G06F *17/00*

U.S. Cl. 364—551.01 **15 Claims**



1. An intrinsically safe monitoring device for use in a hazardous area, comprising:
- an enclosure;
- a CPU board mounted in said enclosure;
- a video display screen in said enclosure;
- a video driver board in said enclosure for supporting said video display;
- a data input device mounted on said enclosure for providing communication with said internal CPU board;
- wherein said CPU board, said video driver board and display screen, and said data input device are each intrinsically safe for class 1, division 1, group C and D areas.

5,838,590

INFORMATION PROCESSING APPARATUS

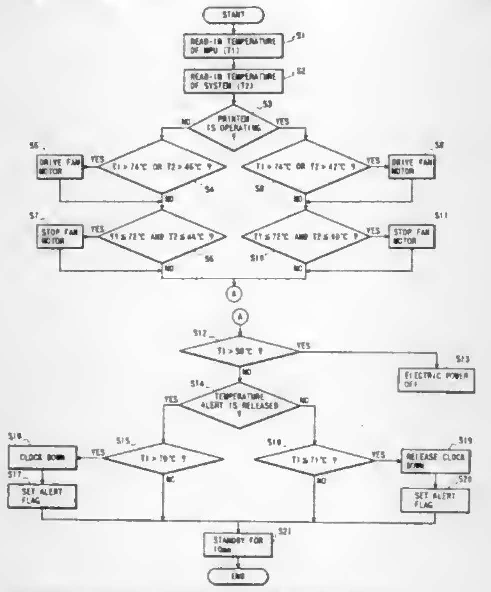
Noboru Shimoyama, and Kazuhisa Kawakami, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 4, 1996, Ser. No. 760,352

Claims priority, application Japan, Dec. 5, 1995, 7-316482; Nov. 27, 1996, 8-316179

Int. Cl.^{6} G01K *15/00*

U.S. Cl. 702—130 **31 Claims**



1. An information processing apparatus including:
- a control substrate on which an element is disposed;
- element temperature detecting means for detecting a temperature emitted by said element;
- radiating means for reducing the temperature of the atmosphere in the information processing apparatus;
- system temperature detecting means for detecting the temperature of the atmosphere in said apparatus; and
- control means for comparing a predetermined first set temperature and a third set temperature lower than said first set temperature and the temperature detected by said system temperature detecting means with one another, comparing a predetermined second set temperature and a fourth set temperature lower than said second set temperature and the temperature detected by said element temperature detecting means with one another, and controlling the driving of said radiating means on the basis of the results of said comparisons.

5,838,591

TEMPERATURE CONTROL APPARATUS FOR MOTOR AND INFORMATION STORING MEDIUM USED THEREFOR

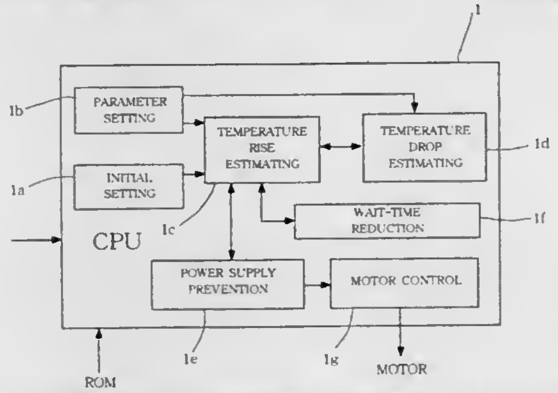
Hiroshi Yamaguchi, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jun. 11, 1997, Ser. No. 873,188

Claims priority, application Japan, Jun. 20, 1996, 8-160048

Int. Cl.^{6} H02H *7/00*

U.S. Cl. 364—557 **21 Claims**



1. An apparatus for controlling temperature of a motor by estimation on the basis of a temperature representative variable θ as well as different parameters which include an incremental parameter A reflecting a temperature rise under driving of the motor, a decremental parameter S reflecting a temperature drop by heat dissipation of the motor, and an upper limit parameter θmax reflecting an upper tolerable limit temperature of the motor, the apparatus comprising:
- initial setting means for setting an initial value of θ;
- temperature rise estimating means for calculating $\theta+A$ for renewal of θ when the motor is driven;
- temperature drop estimating means for calculating $\theta-\theta/S$ for renewal of θ periodically at a predetermined time interval while the temperature control apparatus is operating; and
- power supply prevention means for preventing power supply to the motor when θ becomes no less than θmax and until θ becomes lower than θmax.

5,838,592

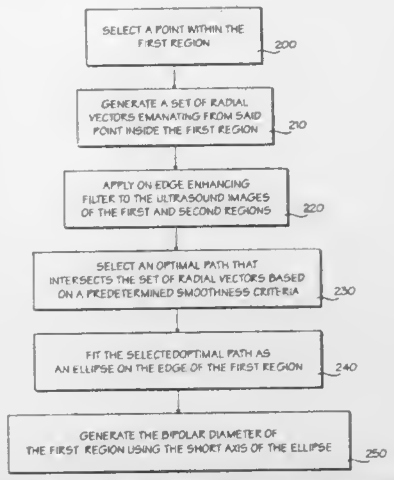
METHOD AND APPARATUS FOR MEASURING FETUS HEAD AND ABDOMINAL CIRCUMFERENCE

Ray Steven Spratt, San Jose, Calif., assignor to Diasonics Ultrasound Inc., Santa Clara, Calif.

Filed Oct. 14, 1996, Ser. No. 730,106

Int. Cl.^{6} A61B *8/00*

U.S. Cl. 364—560 **18 Claims**



SELECT A POINT WITHIN THE FIRST REGION
200
GENERATE A SET OF RADIAL VECTORS EMANATING FROM SAID POINT INSIDE THE FIRST REGION
210
APPLY ON EDGE ENHANCING FILTER TO THE ULTRASOUND IMAGES OF THE FIRST AND SECOND REGIONS
220
SELECT AN OPTIMAL PATH THAT INTERSECTS THE SET OF RADIAL VECTORS BASED ON A PREDETERMINED SMOOTHNESS CRITERIA
230
FIT THE SELECTEDOPTIMAL PATH AS AN ELLIPSE ON THE EDGE OF THE FIRST REGION
240
GENERATE THE BIPOLAR DIAMETER OF THE FIRST REGION USING THE SHORT AXIS OF THE ELLIPSE
250

1. A method for measuring a circumference of a first region enclosed in a second region internal to a living organism, wherein the first and second regions consist of different cellular matter, said method comprising the steps of:
- a) generating a point inside an interior of said first region;
- b) generating a set of radial vectors emanating from said point in the interior of said first region; and
- c) selecting a path that intersects said set of radial vectors, said path is selected by selecting a distinguishable ultrasonic measurement along the respective radial vectors, using an equation consisting of:

$$\text{optimal path}=\max \sum_{i=\text{vector}} \text{data}\,(\text{radius}(i))-(\text{radius}(i)-\text{radius}(i-1))^2$$

; and

- d) measuring a length of said path to generate the circumference of said first region.

5,838,593

SIMULATION APPARATUS

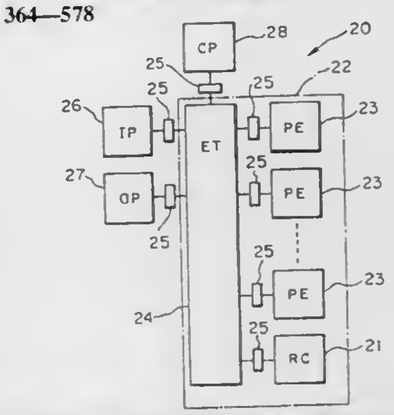
Hiroaki Komatsu; Minoru Saitoh, both of Kawasaki; Toshihide Sasaki, and Hiroshi Tsukamoto, both of Kitsuregawa-machi, all of Japan, assignors to Fujitsu Limited, and Fujitsu Automation Limited, both of Kawasaki, Japan

Filed Oct. 5, 1995, Ser. No. 539,775

Claims priority, application Japan, Mar. 20, 1995, 7-060910

Int. Cl.^{6} G06F *3/00*

U.S. Cl. 364—578 **25 Claims**



1. A simulation apparatus for simulating a logic circuit, the logic circuit including a known internal logic portion and an unknown internal logic portion, said simulation apparatus comprising:
- a real chip simulation section which includes a real chip said real chip simulation section driving said real chip to simulate said unknown internal logic portion;
- a logic simulation hardware section which simulates said known internal logic portions; and
- a dedicated network which connects said real chip simulation section and said logic simulation hardware section so as to transfer event data between said real chip simulation section and said logic simulation hardware section, wherein said real chip includes input and output pins,
- said real chip simulation section generates a respective minimum processing unit for each of the input and output pins of said real chip, to simulate said unknown internal logic portion, and
- said unknown internal logic portion simulated by said real chin simulation section and said known internal logic portion simulated by said logic simulation hardware section are combined to simulate said logic circuit.

5,838,594

METHOD AND APPARATUS FOR GENERATING FINITE ELEMENT MESHES, AND ANALYZING METHOD AND APPARATUS

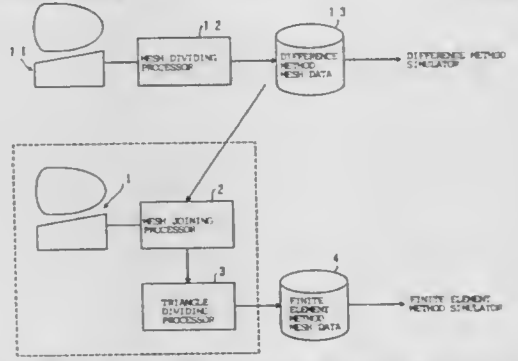
Shuichi Kojima, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 25, 1996, Ser. No. 591,793

Claims priority, application Japan, Feb. 24, 1995, 7-037327; Dec. 28, 1995, 7-343930

Int. Cl.^{6} G06F *17/10*

U.S. Cl. 364—578 **39 Claims**



11
12
13
MESH DIVIDING PROCESSOR
DIFFERENCE METHOD MESH DATA
DIFFERENCE METHOD SIMULATOR
1
2
MESH JOINING PROCESSOR
3
TRIANGLE DIVIDING PROCESSOR
4
FINITE ELEMENT METHOD MESH DATA
FINITE ELEMENT METHOD SIMULATOR

1. A finite element mesh generating method which is implemented on a computer and generates triangular meshes used in finite element method analysis, said finite element mesh generating method comprising the steps of:
- (a) inputting orthogonal meshes used in finite difference method and mesh joining conditions;
- (b) setting flags indicating candidates of lattice points which are to be deleted out of lattice points of the orthogonal meshes, based on the orthogonal meshes;
- (c) reducing a number of meshes by joining the lattice points having the set flag and lattice points adjacent thereto, based on the mesh joining conditions; and
- (d) successively generating triangular meshes by searching nodes formed by lattice points remaining on the meshes after joining the lattice points and generating oblique sides of rectangles which are formed by connecting said nodes.

5,838,595

APPARATUS AND METHOD FOR MODEL BASED PROCESS CONTROL

Michael Francis Sullivan, Dallas; Judith Susan Hirsch, Plano; Stephanie Watts Butler, Plano; Nicholas John Tovell, Plano; Jerry Alan Stefani, Richardson; Purnendu K. Mozumder; Ulrich H. Wild, both of Dallas; Chun-Jen Jason Wang, Richardson, all of Tex., and Robert A. Hartzell, Sacramento, Calif., assignors to Texas Instruments, Inc., Dallas, Tex.

Continuation of Ser. No. 358,226, Dec. 16, 1994, abandoned, which is a continuation of Ser. No. 93,842, Jul. 19, 1993, Pat. No. 5,402,367. This application Nov. 25, 1996, Ser. No. 755,689

Int. Cl.^{6} G05B *13/04*

U.S. Cl. 364—578 **20 Claims**

1. An apparatus for controlling a factory, comprising:
- circuitry for configuring a plurality of control strategies for said factory;

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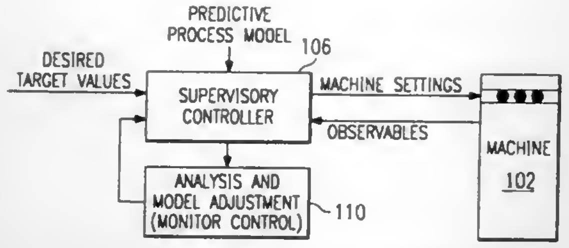


circuitry for selecting a process model from a plurality of process models and for selecting a control strategy from said plurality of control strategies;
circuitry for performing a process for a machine of the factory from said process model and said control strategy;
circuitry for analyzing said process to determine if said process is within predetermined limits; and
circuitry for tuning said process model in accordance with said analysis.

5,838,596
SIMULATION SYSTEM FOR CONTROL SEQUENCE FOR SHEET TRANSPORTATION

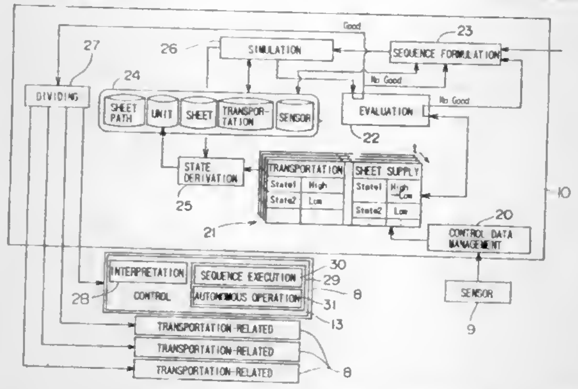
Yoshiki Shimomura; Sadao Tanigawa; Kazuhiro Ogawa; Hirofumi Nishino; Kenji Katsuhara; Toshimitsu Takakura, all of Osaka; Tetsuo Tomiyama, Tokyo; Yasushi Umeda, Tama, and Tomohiko Sakao, Tokyo, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed May 14, 1997, Ser. No. 856,087

Claims priority, application Japan, May 21, 1996, 8-126159

Int. Cl.^{6} G06F *9/455;* **G03G** *21/00*

U.S. Cl. 364—578 **6 Claims**



1. A simulation system for a control sequence for a sheet transportation system, which is adapted to simulate sheet transportation, upon receiving a control sequence formulated for the sheet transportation system, to check how a sheet is to be transported in the sheet transportation system on the basis of the applied control sequence, the simulation system comprising:
data extraction means for extracting necessary data from hardware systems constituting the real sheet transportation system;
virtual sheet transportation system generation means for generating a virtual sheet transportation system in a computer on the basis of the data extracted by the data extraction means;
sheet representation means for representing a sheet by information indicative of locations of opposite ends of the sheet and a distance therebetween; and
transportation simulation implementation means for moving the sheet represented by the sheet representation means by a predetermined unit distance in the virtual sheet transportation system on the basis of the control sequence.

5,838,597
MPEG-2 DECODING WITH A REDUCED RAM REQUISITE BY ADPCM RECOMPRESSION BEFORE STORING MPEG-2 DECOMPRESSED DATA

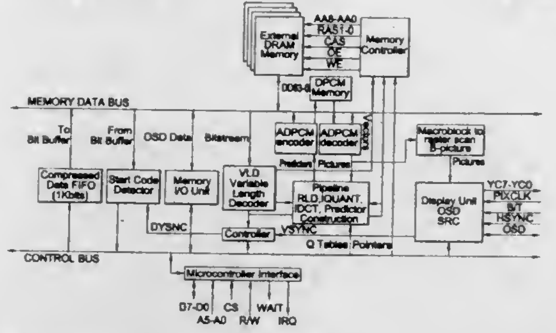
Danilo Pau, Sesto San Giovanni, and Roberto Sannino, Bergamo, both of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Filed Dec. 3, 1996, Ser. No. 758,805

Claims priority, application European Pat. Off., Dec. 4, 1995, 95830504; Mar. 11, 1996, 96830106

Int. Cl.^{6} G06F *17/00*

U.S. Cl. 364—715.02 **10 Claims**



10. An MPEG-2 decoder comprising:
a video memory comprising a plurality of buffers;
a MPEG-2 decompression stage for at least the respective I and P images, the data relative to these images being stored in respective buffers of said video memory;
means for recompressing the I and P images according to an adaptive pulse code modulation (ADPCM) scheme and after the MPEG-2 decompression;
means for storing the so coded data relative to the ADPCM recompressed I and P images in respective buffers of the video memory; and
means for decoding the stored data relative to the ADPCM recompressed I and P images and for decompressing the images according to an ADPCM seheme for display.

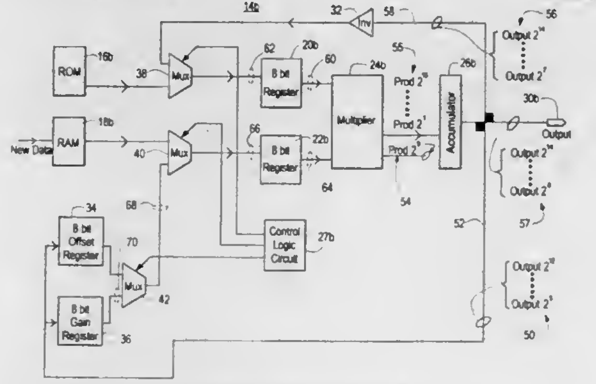
5,838,598
METHOD AND APPARATUS FOR GAIN CORRECTION OF A SIGMA-DELTA CONVERTER

Christopher Peter Hurrell, Maidenhead, England, assignor to Analog Devices, Inc., Norwood, Mass.

Filed Dec. 12, 1995, Ser. No. 571,148

Int. Cl.^{6} G06F *17/10;* **H03M** *1/00;1/10*

U.S. Cl. 364—724.011 **9 Claims**



1. A gain corrected digital filter comprising:
a multiplier;
first storage means for storing coefficients representing impulse responses of the filter;
second storage means for storing data values to be filtered;
first and second multiplicand registers, responsive to said first and second storage means, respectively, for providing a coefficient and a series of said data values to said multiplier to perform a convolution of said data values;

an accumulator, responsive to said multiplier, to accumulate the sum of a convolution of said data values;
an inverter, responsive to said accumulator, for supplying to one of said first and second multiplicand registers the inverse of the accumulated sum;
a gain correction circuit responsive to said accumulator, for generating a gain correction factor; and
switching means for delivering to said first and second registers in a convolution mode said coefficient and said series of data values to perform a convolution and in a compensation mode said inverted accumulated sum and said gain error correction factor to obtain at the output of said accumulator the convolution of the data values compensated for gain errors.

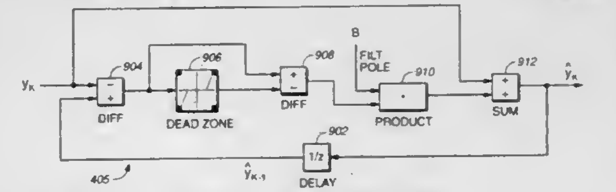
5,838,599
METHOD AND APPARATUS FOR NONLINEAR EXPONENTIAL FILTERING OF SIGNALS

Kuoting Mike Tao, Campbell; Ramesh Balakrishnan, Palo Alto, and Xiaohua George He, Menlo Park, all of Calif., assignors to Measurex Corporation, Cupertino, Calif.

Filed Sep. 13, 1996, Ser. No. 713,473

Int. Cl.^{6} G06F *17/10*

U.S. Cl. 364—724.014 **18 Claims**



1. Apparatus for filtering a signal comprising:
means for receiving at least one input signal;
means for establishing a dead zone within which a dead zone response to said input signal remains relatively constant; and
means responsive to said dead zone response and said input signal for exponential filtering of said input signal.

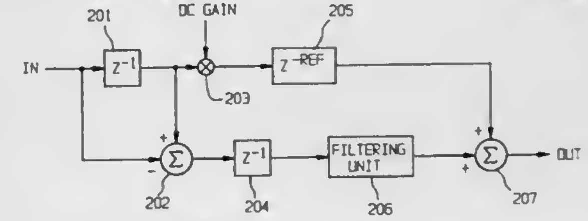
5,838,600
DC GAIN INVARIANT FILTER IMPLEMENTATION

David Lowell McNeely, and Paul Gothard Knutson, both of Indianapolis, Ind., assignors to Thomson Consumer Electronics, Indianapolis, Ind.

Filed Aug. 18, 1997, Ser. No. 912,795

Int. Cl.^{6} G06F *17/10*

U.S. Cl. 364—724.012 **8 Claims**



1. A circuit, comprising:
an input terminal for receiving an input signal;
a first delay unit for delaying the input signal to generate a first delayed signal;
a subtracting unit for subtracting the input signal from the first delayed signal to generate a difference signal;
a second delay unit for delaying the difference signal to generate a second delayed signal;
a reference delay unit for delaying the first delayed signal by a predetermined reference time period to generate a reference signal;
a filtering unit for filtering the second delayed signal to generate a filtered signal; and
an adding unit for adding the reference signal to the filtered signal to generate an output signal.

5,838,601
ARITHMETIC PROCESSING METHOD AND ARITHMETIC PROCESSING DEVICE

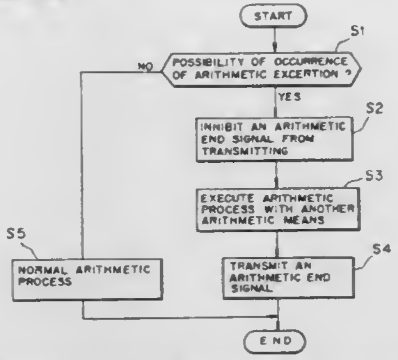
Hideo Yamashita, and Yuji Yoshida, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 2, 1996, Ser. No. 674,514

Claims priority, application Japan, Feb. 14, 1996, 8-027103

Int. Cl.^{6} G06F *7/38*

U.S. Cl. 364—748 **8 Claims**


START
S1
NO
POSSIBILITY OF OCCURRENCE OF ARITHMETIC EXCEPTION ?
YES
S2
INHIBIT AN ARITHMETIC END SIGNAL FROM TRANSMITTING
S3
EXECUTE ARITHMETIC PROCESS WITH ANOTHER ARITHMETIC MEANS
S5
NORMAL ARITHMETIC PROCESS
S4
TRANSMIT AN ARITHMETIC END SIGNAL
END

1. An arithmetic processing method in which a dedicated arithmetic unit executes an arithmetic process in which a pipeline mode according to an arithmetic processing instruction from an instruction control unit and then transmits an end notice signal of said arithmetic process as an arithmetic end signal to said instruction control unit, comprising of the steps of:
judging whether a possibility exists during said arithmetic process for an arithmetic exception to occur in an arithmetic result to be obtained from said arithmetic process;
inhibiting the arithmetic end signal from transmitting to the instruction control unit when said judging step judges that the possibility exits;
executing said arithmetic process with the possibility for the arithmetic exception to occur by another arithmetic unit different from said dedicated arithmetic unit; and
transmitting the arithmetic end signal regarding said arithmetic process to said instruction control unit after completion of said executing step by arithmetic unit.

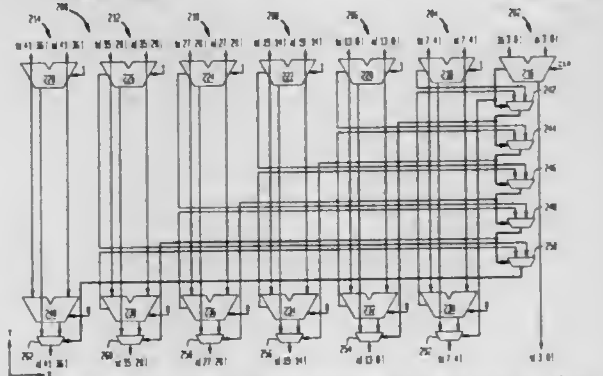
5,838,602
FAST CARRY GENERATION ADDER HAVING GROUPED CARRY MUXES

Ronald L. Feiller, Whitehall; Hon Shing Lau, and Le Tieu Ly, both of Allentown, all of Pa., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Sep. 11, 1996, Ser. No. 712,532

Int. Cl.^{6} G06F *7/50*

U.S. Cl. 364—788 **20 Claims**



1. An integrated circuit having a fast carry generation adder, comprising:
(a) an initial stage comprising an initial adder group; and
(b) two or more intermediate stages, connected to the initial stage, wherein:
each intermediate stage comprises a carry-in-one adder group, a carry-in-zero adder group, a sum mux, and a carry mux;

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each adder group performs addition operations on different subsets of bits from two binary numbers being added together by the fast carry generation adder;

the initial adder group is connected to both the carry mux and the sum mux of a first of the intermediate stages;

for each intermediate stage, the carry mux and the sum mux are both connected to both the carry-in-one adder group and the carry-in-zero adder group;

the adder groups for the intermediate stages are arranged in an array of row and columns, wherein:

one row corresponds to the carry-in-one adder groups for the intermediate stages;

another row corresponds to the carry-in-zero adder groups for the intermediate stages; and

each column corresponds to the carry-in-one adder group and the carry-in-zero adder group for one of the intermediate stages; and

the carry muxes are interconnected and grouped together in a column substantially parallel to the columns of the array formed by the adder groups for the intermediate stages.

5,838,603

SEMICONDUCTOR DEVICE AND METHOD FOR FABRICATING THE SAME, MEMORY CORE CHIP AND MEMORY PERIPHERAL CIRCUIT CHIP

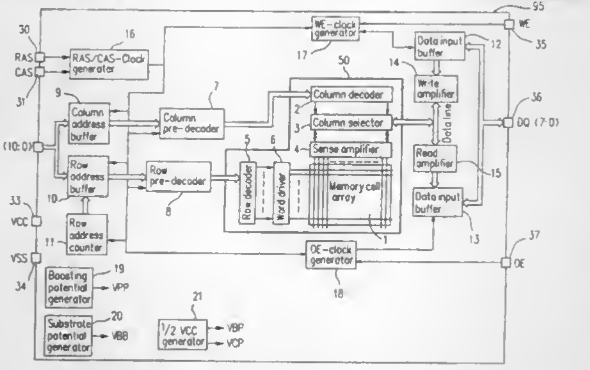
Toshiki Mori, Ibaraki; Ichiro Nakao, Kadoma; Tsutomu Fujita, Hirakata, and Reiji Segawa, Kadama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 6, 1995, Ser. No. 549,097

Claims priority, application Japan, Oct. 11, 1994, 6-245312

Int. Cl.^{6} G11C *5/06*

U.S. Cl. 365—63 **8 Claims**



1. A semiconductor device comprising a plurality of circuit blocks including a first circuit block and a second circuit block, a block parameter of the first circuit block being different from a block parameter of the second circuit block,

wherein the first circuit block is formed on a first semiconductor chip, and the second circuit block is formed on a second semiconductor chip and is electrically connected with the first circuit block, and

the block parameter is a parameter selected from the group consisting of: an operational clock frequency; a design rule; a threshold value (Vt) of a transistor; a power voltage; whether the circuit block consists of digital circuits or analog circuits; whether the circuit block is an ordinary MOS circuit, a CMOS circuit, a bipolar circuit, or a bi-CMOS circuit; whether the circuit block is a ROM or a RAM; and whether the circuit block is a logic circuit or a memory.

5,838,604

SEMICONDUCTOR MEMORY DEVICE WITH AN INCREASED BAND WIDTH

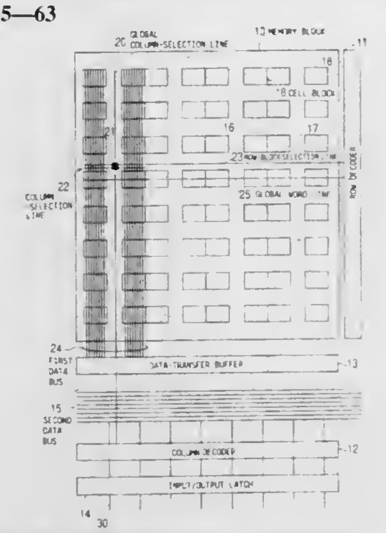
Hironobu Tsuboi; Yoshinori Okajima; Tsuyoshi Higuchi, and Makoto Koga, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Feb. 20, 1997, Ser. No. 803,448

Claims priority, application Japan, Sep. 17, 1996, 8-244904

Int. Cl.^{6} G11C *5/06*

U.S. Cl. 365—63 **16 Claims**



1. A semiconductor memory device comprising:

a plurality of bit lines;

first sense amplifiers each connected to a corresponding one of said plurality of bit lines;

gates each provided for a corresponding one of said first sense amplifiers;

a first data bus laid out in parallel to said plurality of bit lines and said first data bus connected to a given one of said first sense amplifiers via a corresponding one of said gates; and

column-selection lines laid out perpendicularly to said plurality of bit lines and said column-selection lines opening at least one of said gates so as to select corresponding at least one of said first sense amplifiers from said first sense amplifiers arranged in a direction perpendicular to said plurality of bit lines.

5,838,605

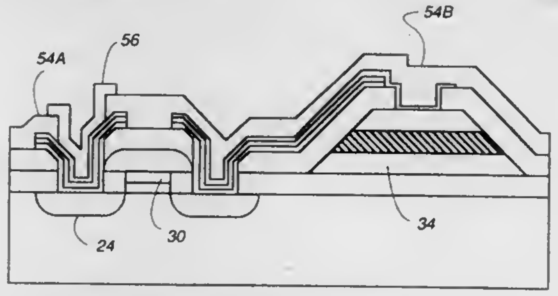
IRIDIUM OXIDE LOCAL INTERCONNECT

Richard A. Bailey, Woodland Park, Colo., assignor to Ramtron International Corporation, Colorado Springs, Colo.

Filed Mar. 20, 1996, Ser. No. 618,884

Int. Cl.^{6} H01L *29/78;* G11C *11/22*

U.S. Cl. 365—145 **11 Claims**



1. A ferroelectric memory cell comprising:

a transistor having a source/drain contact;

a ferroelectric capacitor having an electrode contact;

a conductive layer that extends from the source/drain contact of the transistor proximate to, but not making contact with, the electrode contact of the ferroelectric capacitor; and

an iridium oxide local interconnect on an upper surface of the conductive layer, the iridium oxide local interconnect extending from the source/drain contact of the transistor to the electrode contact of the ferroelectric capacitor.

5,838,606

THREE-TRANSISTOR STATIC STORAGE CELL

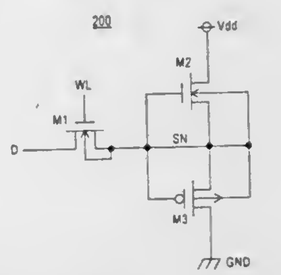
Dennis Blankenship, and Stephen Mann, both of Durham, N.C., assignors to Mitsubishi Semiconductor America, Inc., Durham, N.C.

Filed Apr. 28, 1997, Ser. No. 845,840

Int. Cl.^{6} G11C *11/00*

U.S. Cl. 365—156 **12 Claims**

Three Transistor Static Storage Cell



1. A memory device comprising:

a memory array having a plurality of storage cells for storing data,

each of said storage cells being coupled to a bit line and a word line of said memory array and including:

a storage node,

a first MOS transistor of a first conductivity type having first drain coupled to a first source of potential, and a source, a first gate and a first gate back plate coupled storage node, and

a second MOS transistor of a second conductivity type having a drain coupled to a second source of potential, and a second source, a second gate and a second gate hack plate coupled to said storage node.

5,838,607

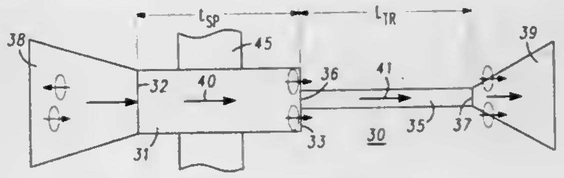
SPIN POLARIZED APPARATUS

Xiaodong T. Zhu, Chandler; Saied N. Tehrani, Tempe; Eugene Chen, Gilbert, and Mark Durlam, Chandler, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 25, 1996, Ser. No. 723,162

Int. Cl.^{6} G11C *11/00;* H01L *29/161*

U.S. Cl. 365—158 **36 Claims**



1. Spin polarized apparatus comprising:

a spin polarizing section of magnetic material with an electron input port and a polarized electron port spaced apart and defining a spin polarizing section length therebetween, the spin polarizing section being magnetized in a magnetization direction and constructed such that electrons entering the electron input port exit through the polarized electron port all having similar spin directions dependent upon the magnetization direction of the spin polarizing section;

a transport section of magnetic material with a polarized electron input port electrically coupled to the polarized electron port of the spin polarizing section and an electron output port spaced apart and defining a transport section length therebetween, the transport section being magnetized in a first direction and the transport section being constructed such that electrons entering the polarized electron input port exit through the electron output port all having spin directions in the first direction.

5,838,608

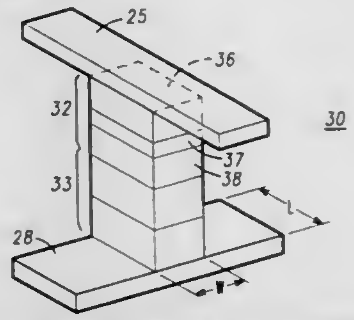
MULTI-LAYER MAGNETIC RANDOM ACCESS MEMORY AND METHOD FOR FABRICATING THEREOF

Theodore Zhu, Chandler, and Saied N. Tehrani, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 16, 1997, Ser. No. 874,436

Int. Cl.^{6} G11C *11/15*

U.S. Cl. 365—158 **22 Claims**



1. A multi-layer magnetic random access memory unit comprising:

a magnetic storage element having a first magnetoresistive layer and a second magnetoresistive layer separated by a non-magnetic material layer; and

a current control element, connected to the magnetic storage element in series and made from poly-silicon, for controlling a current in the magnetic storage element;

wherein the magnetic storage element has a length and a width, the width being less than a width of magnetic domain walls within the first and second magnetoresistive layers.

5,838,609

INTEGRATED SEMICONDUCTOR DEVICE HAVING NEGATIVE RESISTANCE FORMED OF MIS SWITCHING DIODE

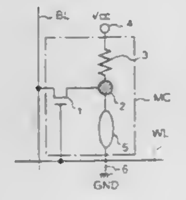
Hirotada Kuriyama, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

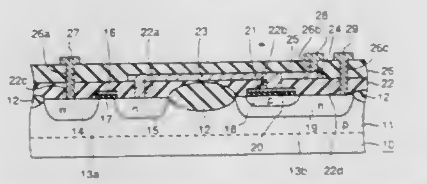
Division of Ser. No. 628,200, Apr. 5, 1996, Pat. No. 5,689,458. This application Sep. 8, 1997, Ser. No. 925,140

Claims priority, application Japan, Jun. 8, 1995, 7-141789

Int. Cl.^{6} G11C *11/00*

U.S. Cl. 365—159 **8 Claims**





1. An integrated semiconductor device formed on a main surface of a semiconductor substrate, comprising a memory cell including an access transistor connected between a read/write node and a storage node, and having a gate electrode connected to a cell select node, and a negative resistance element formed of an MIS switching diode connected between said storage node and a second power

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supply node to which a second potential lower than a first potential supplied to a first potential node is supplied, wherein said MIS switching diode comprises

- a first conductivity type semiconductor region formed with an exposed face on the main surface of said semiconductor substrate, and having a depth of 0.05 μM–1 μm and an impurity concentration of 1×10^{17}/cm^3–1×10^{19}/cm^3,
- a second conductivity type semiconductor region beneath said first conductivity type semiconductor region, and forming a junction with said first conductivity type semiconductor region, and electrically connected to said second power supply potential node,
- a tunnel insulation film formed in contact with the exposed face of said first conductivity type semiconductor region on the main surface of said semiconductor substrate, and formed of any of a silicon oxide film of 25 Å–50 Å in thickness, a silicon nitride film of 50 Å–70 Å in thickness, or a silicon nitride oxide film of 30 Å–60 Å in thickness, and
- an electrode formed of a conductor layer, on a surface of said tunnel insulation film, and electrically connected to said storage node.

5,838,610
SEMICONDUCTOR MEMORY DEVICE HAVING MULTILEVEL MEMORY CELL ARRAY

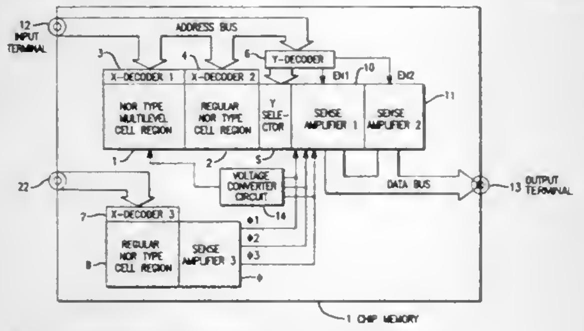
Kiyokazu Hashimoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 6, 1997, Ser. No. 798,022

Claims priority, application Japan, Feb. 7, 1996, 8-020821

Int. Cl.^{6} G11C *11/56*

U.S. Cl. 365—168 **7 Claims**



4. A semiconductor memory device comprising:

- a bit line,
- a power supply line laid parallel to said bit line,
- a plurality of memory transistors arranged in parallel to one another between said bit line and said power supply line, and
- a plurality of word lines connected to the gates of said plurality of memory transistors,
- wherein said bit line and said power supply line are each divided into a first and a second region, said plurality of memory transistors arranged within said first region being regular memory transistors and said plurality of memory transistors arranged within said second region being multilevel memory transistors.

5,838,611
NONVOLATILE SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING SAME

Kohji Kanamori, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

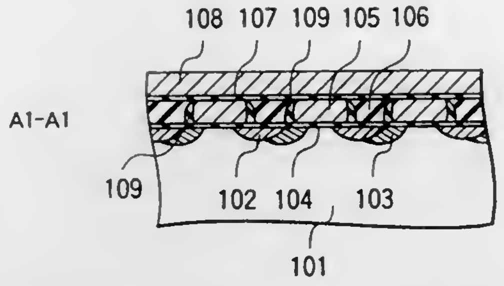
Filed Aug. 14, 1997, Ser. No. 911,002

Claims priority, application Japan, Aug. 15, 1996, 8-215634

Int. Cl.^{6} G11C *11/34*

U.S. Cl. 365—174 **8 Claims**

1. A non-volatile semiconductor memory device having a contactless array structure, said device comprising:



- a plurality of bit-lines;
- a plurality of word-lines, each word-line of said plurality of word-lines overlapping said plurality of bit-lines;
- a plurality of floating gates, each floating gate of said plurality of floating gates located elevationally between a respective bit-line of said plurality of bit-lines and an overlapping respective word-line of said plurality of word-lines; and
- a plurality of offset regions, each offset region of said plurality of offset regions being adjacent and extending parallel to a respective bit-line of said plurality of bit-lines, said each floating gate partially overlapping a respective offset region of said plurality of offset regions, each offset region of said plurality of offset regions having a higher resistance than the adjacent respective channel region.

5,838,612
READING CIRCUIT FOR MULTILEVEL NON VOLATILE MEMORY CELL DEVICES

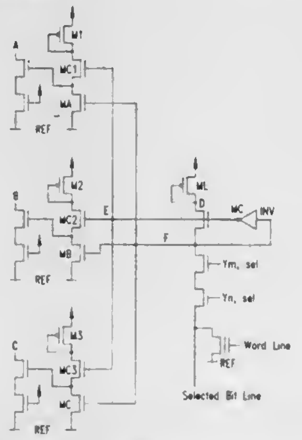
Cristiano Calligaro, Torre D'Isola; Vincenzo Daniele, Brugherio; Roberto Gastaldi, Agrate Brianze; Alessandro Manstretta, Broni; Nicola Telecco, Monreale, and Guido Torelli, S. Alessio, all of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Continuation of Ser. No. 625,895, Apr. 1, 1996, abandoned. This application Jun. 4, 1997, Ser. No. 869,072

Claims priority, application European Pat. Off., Mar. 31, 1995, 95830127

Int. Cl.^{6} G11C *11/34*

U.S. Cl. 365—185.03 **9 Claims**



1. Reading circuit for multilevel non-volatile memory cell devices, said reading circuit comprising, for each memory cell to be read:

- a decoding circuit,
- a selection line having a node which is voltage-stabilized by means of a feedback loop,
- a group of lines for connection to reference currents,
- a group of current comparator circuit means, each having an output terminal connected to said decoding circuit, with first and a second input terminal of each of said current comparator circuit means respectively coupled to said selection line and to a respective connection line of one of said reference currents,

- a decoupling and control stage comprising a transistor connected to said voltage-stabilized node of said selection line and through a selection-line load to a power supply, said transistor having a control terminal connected to said voltage-stabilized node through an inverter,
- wherein current replica circuit means are inserted between said decoupling and control stage and said first input terminal of each of said current comparator circuit means and are controlled by said feedback loop,
- wherein each said current replica circuit means comprises a first and a second transistor connected in series between a second reference potential and a load homologous to said selection-line load and also connected to the power supply, said first transistor having a control terminal connected to said voltage-stabilized node, said second transistor having a control terminal connected to said voltage-stabilized node through an inverter circuit, and
- interface means for coupling to respective current comparator circuit means, said interface means having at least one control terminal connected to a circuit node between said first and second transistors.

5,838,613
SEMICONDUCTOR MEMORY DEVICE HAVING SECURITY FUNCTION

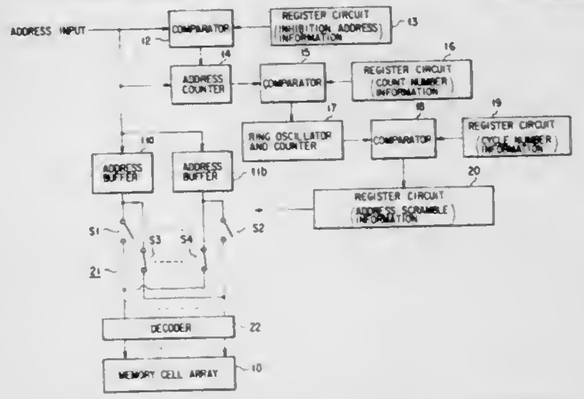
Makoto Takizawa, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 21, 1995, Ser. No. 531,855

Claims priority, application Japan, Sep. 22, 1994, 6-228220

Int. Cl.^{6} G11C *11/34*

U.S. Cl. 365—185.04 **40 Claims**


ADDRESS INPUT
COMPARATOR
12
REGISTER CIRCUIT (INHIBITION ADDRESS INFORMATION)
13
14
15
16
ADDRESS COUNTER
COMPARATOR
REGISTER CIRCUIT (COUNT NUMBER INFORMATION)
17
18
19
11a
RING OSCILLATOR AND COUNTER
COMPARATOR
REGISTER CIRCUIT (CYCLE NUMBER INFORMATION)
ADDRESS BUFFER
ADDRESS BUFFER
11b
20
REGISTER CIRCUIT (ADDRESS SCRAMBLE INFORMATION)
S1
S3
S4
S2
21
DECODER
22
MEMORY CELL ARRAY
10

1. A non-volatile semiconductor memory device comprising:

- a first comparing circuit for comparing an input address with an access inhibition address and outputting a first coincidence signal when the input address coincides with the access inhibition address;
- a first counter responsive to the first coincidence signal for counting a number of input address changes;
- a second comparing circuit for comparing a count of said first counter with a first count and outputting a second coincidence signal when the count of said first counter coincides with the first count;
- an oscillator responsive to the second coincidence signal for outputting pulse signals in response to the second coincidence signal;
- a second counter for counting the number of pulse signals output by said oscillator;
- a third comparing circuit for comparing a count of said second counter and a second count and outputting a third coincidence signal when the count of said second counter coincides with the second count; and
- an output circuit responsive to the third coincidence signal for outputting data different from data stored in said non-volatile semiconductor memory device at an address which is input to said non-volatile semiconductor memory device.

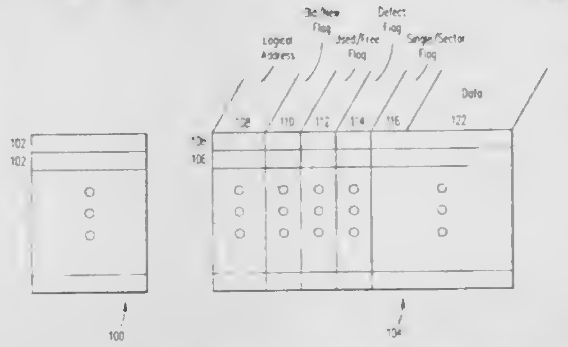
5,838,614
IDENTIFICATION AND VERIFICATION OF A SECTOR WITHIN A BLOCK OF MASS STORAGE FLASH MEMORY

Petro Estakhri, Pleasanton, and Berhau Iman, Sunnyvale, both of Calif., assignors to Lexar Microsystems, Inc., Fremont, Calif.

Continuation-in-part of Ser. No. 831,266, Mar. 31, 1997, which is a continuation-in-part of Ser. No. 509,706, Jul. 31, 1995. This application May 19, 1997, Ser. No. 858,847

Int. Cl.^{6} G11C *16/04*

U.S. Cl. 365—185.11 **1 Claim**



1. A storage device having nonvolatile memory and being coupled to a host for storing information, organized in blocks, in the nonvolatile memory, each block having associated therewith a logical block address (LBA) and a physical block address (PBA), the LBA provided by the host to the storage device for identifying a block to be accessed, the PBA developed by the storage device for identifying a free location within the nonvolatile memory wherein the accessed block is to be stored, each stored block within the nonvolatile being selectively erasable and further having one or more sectors, the storage device comprising:

- a. a memory device for storing a table defined by n LBA rows, each of the LBA rows being uniquely addressable by an LBA and for storing a virtual PBA for identifying the location of the stored block, a move virtual PBA for identifying the location of a portion of the stored block, and status information including flag means for indicating whether any sectors of the stored block have been moved to the move virtual PBA location within the nonvolatile memory;
- b. means for receiving from the host, a block of information identified by a particular LBA to be stored in the nonvolatile memory, for developing the virtual PBA if the particular LBA is "unused" and for developing the move virtual PBA if the particular LBA is "used";
- c. defect flag stored within each of the blocks and being set to a predetermined value for identifying successfully erased blocks,
- wherein portions of a block may be stored in more than one PBA-identified location within the nonvolatile memory to avoid an erase operation each time the host writes to the storage device and to avoid transfer of the entire block to a free location within the nonvolatile memory each time a portion of the block is being re-written.

5,838,615
NONVOLATILE SEMICONDUCTOR MEMORY DEVICE HAVING REDUCED SOURCE LINE RESISTANCE

Eiji Kamiya, and Seiichi Mori, both of c/o Intellectual Property Division, Kabushiki Kaisha Toshiba, 1-1 Shibaura 1-chome, Minato-ku, Tokyo 105, Japan

Filed Feb. 5, 1997, Ser. No. 795,018

Claims priority, application Japan, Feb. 6, 1996, 8-019894

Int. Cl.^{6} G11C *16/04*

U.S. Cl. 365—185.12 **36 Claims**

1. A nonvolatile semiconductor memory device comprising:

- a semiconductor substrate;

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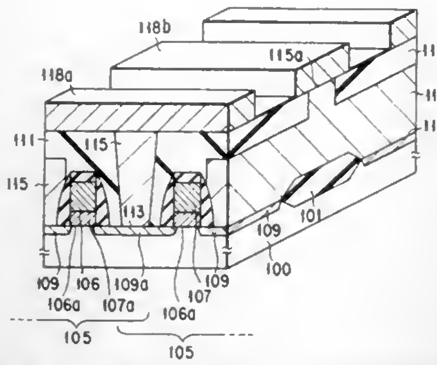


an element isolation film formed on said semiconductor substrate to define an element area;
first second, and third semiconductor regions formed in said element area, said first, second, and third semiconductor regions being spaced apart from each other and each having a conductivity type which is opposite to a conductivity type of said semiconductor substrate;
a first gate electrode insulatively spaced from a portion of said semiconductor substrate between said first and second semiconductor regions;.
a second gate electrode insulatively spaced from a portion of said semiconductor substrate between said first and third semiconductor regions;
an insulating interlayer formed over at least said first and second gate electrodes;
a first conductor and a second conductor formed on said insulating interlayer, said first conductor and said second conductor each extending in the same first direction;
a first electrode for electrically connecting said second semiconductor region to said first conductor;
a second electrode for electrically connecting said third semiconductor region to said first conductor; and
a third electrode formed in said insulating interlayer for electrically connecting said first semiconductor region to said second conductor, said third electrode extending in a second direction perpendicular to said first direction and being insulated from said first and second conductors except for a contact portion thereof which contacts said second conductor.

5,838,616

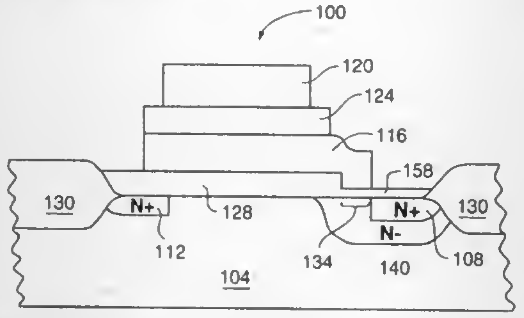
GATE EDGE ALIGNED EEPROM TRANSISTOR

Todd A. Randazzo, Colorado Springs, Colo., assignor to Symbios, Inc., Fort Collins, Colo.

Filed Sep. 30, 1996, Ser. No. 723,327

Int. Cl.^{6} H01L *29/788;* G11C *13/00*

U.S. Cl. 365—185.14 **23 Claims**



1. An electrically-erasable electrically-programmable read only memory (EEPROM) transistor comprising:
a semiconductor substrate;
source and drain regions disposed in a horizontal spaced apart relationship in the semiconductor substrate, the drain region having an edge;
a floating gate conductor vertically spaced from the source and drain regions and having an outside edge which is substantially vertically aligned with the edge of the drain region; and
an insulation layer disposed vertically between the floating gate conductor and the source and drain regions, the insulation layer having first and second segments, the first segment extending between the drain region and the floating gate conductor and having a first thickness, the second segment extending from the first segment and having a second thickness which is substantially greater than the first thickness.

5,838,617

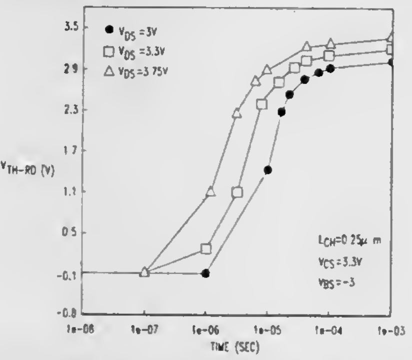
METHOD FOR CHARGING ELECTRICALLY PROGRAMMABLE READ-ONLY MEMORY DEVICES

Jeffrey Devin Bude, New Providence, and Mark Richard Pinto, Summit, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Continuation-in-part of Ser. No. 450,179, May 25, 1995, Pat. No. 5,659,504. This application Jul. 3, 1997, Ser. No. 888,030

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—185.18 **26 Claims**



1. A method for charging a floating gate of an n-channel memory cell having a source, drain, control gate, floating gate, and a substrate comprising:
applying a voltage to the drain terminal of the cell to affect a positive bias of less than about 4.5 volts between the drain and the source (V_{DS});
applying a voltage to the control gate terminal of the cell to affect a positive bias of about 10 volts or less between the control gate and the source (V_{CS}) wherein the control gate voltage is selected to provide the device with a desired threshold voltage and;
applying a negative voltage to the substrate to effect a negative bias of about –0.5 volts to about –4 volts between the substrate and the source (V_{BS}) wherein the current that charges the floating gate is initiated by the electron current from the source to the drain.

5,838,618

BI-MODAL ERASE METHOD FOR ELIMINATING CYCLING-INDUCED FLASH EEPROM CELL WRITE/ ERASE THRESHOLD CLOSURE

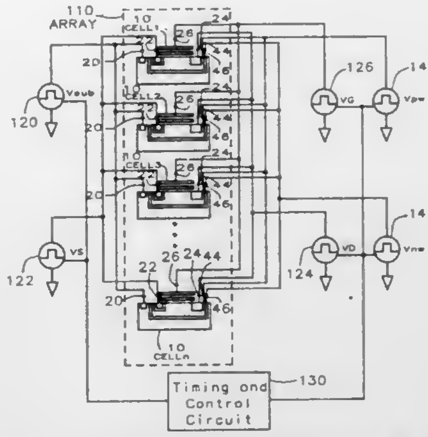
Jian-Hsing Lee; Juang-Ker Yeh, both of Hsin-Chu; Kuo-Reay Peng, Faung-San, and Ming-Chou Ho, Taichung, all of Taiwan, assignors to Taiwan Semiconductor Manufacturing Company Ltd., Hsin-Chu, Taiwan

Filed Sep. 11, 1997, Ser. No. 927,472

Int. Cl.^{6} G11C *16/04;7/00*

U.S. Cl. 365—185.29 **32 Claims**

1. A method to erase a flash EEPROM cell, which is comprised of a source and a drain diffused within a first well of a first conductivity type which is diffused into a second well of a second conductivity type which is further diffused in to a semiconductor substrate of the first conductivity type, and a control gate, a floating gate, and a tunneling oxide disposed upon the semiconductor substrate, to improve a write/erase threshold voltage closure from repeatedly writing and erasing said flash EEPROM cell, comprising the steps of:
a) channel erasing said flash EEPROM cell by the steps of,



applying a first relatively large negative voltage pulse to the control gate of said EEPROM cell,
concurrently applying a first moderately large positive voltage pulse to said first well,
concurrently applying a ground reference potential to the semiconductor substrate,
concurrently floating said drain, source, and second well: and then
b) source erasing to detrap said flash EEPROM cell by the steps of:
floating said drain and said.second well,
concurrently applying the ground reference potential to said semiconductor substrate and said first well,
concurrently applying a second relatively large negative voltage pulse to said control gate, and
concurrently applying a second moderately large positive voltage pulse to said source.

5,838,619

METHOD AND APPARATUS FOR REDUNDANCY MANAGEMENT OF NON-VOLATILE MEMORIES

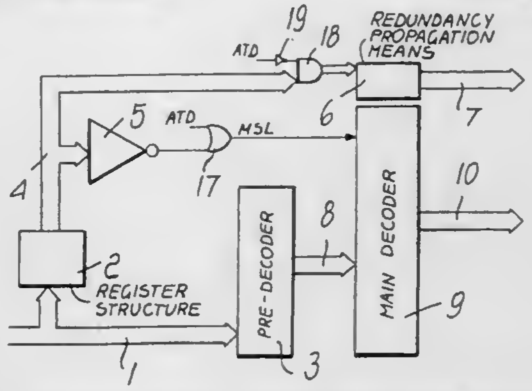
Luigi Pascucci, Sesto San Giovanni, Italy, assignor to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Filed Mar. 27, 1997, Ser. No. 828,039

Claims priority, application European Pat. Off., Mar. 29, 1996, 96830167

Int. Cl.^{6} G11L *7/00*

U.S. Cl. 365—185.09 **17 Claims**



11. A memory including a memory matrix of memory lines, â plurality of redundancy memory lines, and a redundancy management circuit, comprising:
means for selecting a memory matrix memory lines;
means for selecting a redundancy line;
an address bus connected to the means for selecting a memory matrix memory line and to the means for selecting a redundancy line;
means for enabling operation of the means for selecting a memory matrix memory line when the address bus is transitioning and when the means for selecting a redundancy line has not selected a redundancy line; and
means for blocking operation of the means for selecting a redundancy line when the address bus is transitioning.

5,838,620

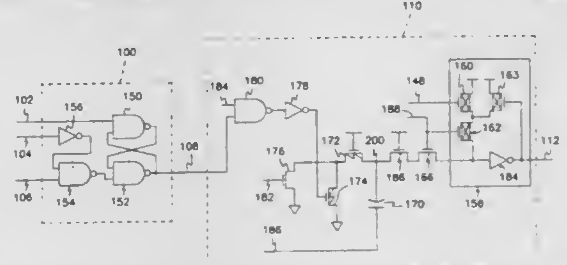
CIRCUIT FOR CANCELLING AND REPLACING REDUNDANT ELEMENTS

Paul S. Zagar, and Adrian E. Ong, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Continuation of Ser. No. 417,007, Apr. 5, 1995, abandoned. This application Feb. 6, 1997, Ser. No. 796,148

Int. Cl.^{6} G11C *13/00*

U.S. Cl. 365—200 **4 Claims**



1. A method of repairing an integrated circuit, the method comprising the steps of;
programming a first redundant element to respond to an address of a defective selectively addressable primary element;
one time enabling the first redundant element;
permanently disabling the first redundant element after the step of one time enabling the first redundant element;
programming a second redundant element to respond to an address of the defective selectively addressable primary element; and
one time enabling the second redundant element.

5,838,621

SPARE DECODER CIRCUIT

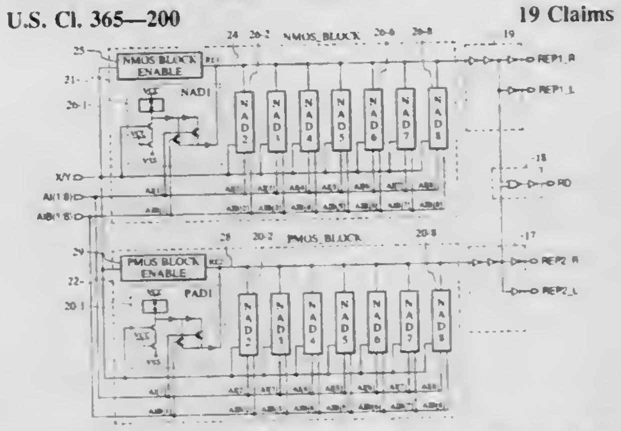
Dae-Sik Kim, Seoul, Rep. of Korea, assignor to LG Semicon Co., Ltd., ChungCheong Buk-Do, Rep. of Korea

Filed Apr. 14, 1997, Ser. No. 832,732

Claims priority, application Rep. of Korea, Apr. 12, 1996, 1996 11012

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—200 **19 Claims**



1. A spare decoder circuit for generating a redundancy signal for accessing a redundancy cell in response to an address of a failed cell in a memory device, comprising:
a first programming part comprising: a first signal line for generating the redundancy signal; first enabling means for providing a first constant electric potential to the first signal line; and first programming cells coupled to address lines and controlling the electric potential of the first signal line; and

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a second programming part comprising: a second signal line for generating the redundancy signal; second enabling means for providing a second constant electric potential to the second signal line; and second programming cells coupled to address lines and controlling the electric potential of the second signal line,

wherein the first and second enabling means comprise:

a first fuse having a first terminal coupled to a power supply voltage; and

a logic circuit coupled to receive an enabling signal and also coupled to a second terminal of the first fuse, wherein the logic circuit generates a low level potential when the first fuse is coupled to the power supply and generates a high level potential when the first fuse is uncoupled from the power supply and the enabling signal is applied.

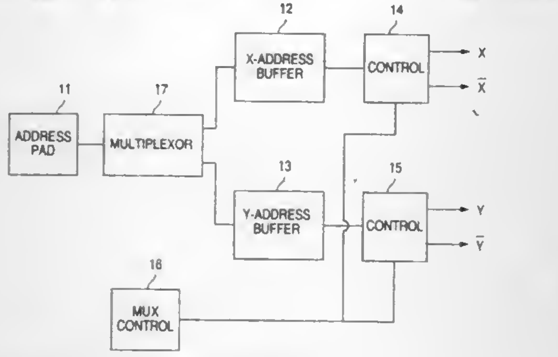
5,838,622
RECONFIGURABLE MULTIPLEXED ADDRESS SCHEME FOR ASYMMETRICALLY ADDRESSED DRAMS

Lawrence C. Liu, Menlo Park; Li-Chun Li, Los Gatos, both of Calif., and Michael A. Murray, Bellevue, Wash., assignors to Mosel Vitelic Corporation, San Jose, Calif.

Filed Feb. 28, 1997, Ser. No. 850,933

Int. Cl.^{6} G11C *8/00*

U.S. Cl. 365—230.02 **24 Claims**



1. In a memory, a structure comprising:

a first circuit for storing an X address bit;

a second circuit for storing a Y address bit; and

a configurable control circuit for selecting between the read out of the X address bit and the Y address bit.

5,838,623
METHOD FOR DETECTING REDUNDED DEFECTIVE ADDRESSES IN A MEMORY DEVICE WITH REDUNDANCY

Luigi Pascucci, Sesto san Giovanni, Italy, assignor to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

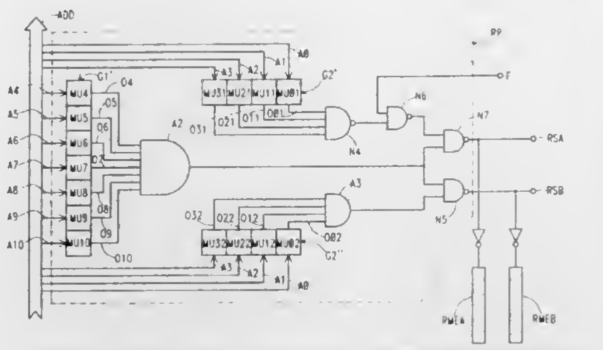
Filed Apr. 17, 1997, Ser. No. 841,904

Claims priority, application European Pat. Off., Apr. 18, 1996, 96830216

Int. Cl.^{6} G11C *13/00*

U.S. Cl. 365—222 **14 Claims**

1. A method of detecting redunded defective addresses in a memory device with redundancy comprising at least one memory register for storing at least one defective address, said memory register comprising a plurality of memory units each one storing a defective address bit and comparing said defective address bit with a respective current address bit of a current address supplied to the memory device, the memory register activating a respective redundancy selection signal when the current address coincides with the at least one defective address stored therein, the method comprising the steps of:



a) activating a forcing signal for forcing the activation of said redundancy selection signal to be independent of the coincidence of a first group of current address bits, associated to a respective first group of said memory units, with the defective address bits stored in said respective first group of memory units;

b) scanning all possible configurations of a second group of current address bits associated to a second group of said memory units and sequentially supplying the memory device with all said configurations;

c) detecting a configuration of said second group of current address bits for which said redundancy selection signal is activated;

d) while supplying the memory device with said configuration of the second group of current address bits, deactivating said forcing signal and sequentially supplying the memory device with a scanning of all possible configurations of said first group of address bits; and

e) detecting a configuration of said first group of current address bits for which said redundancy selection signal is activated.

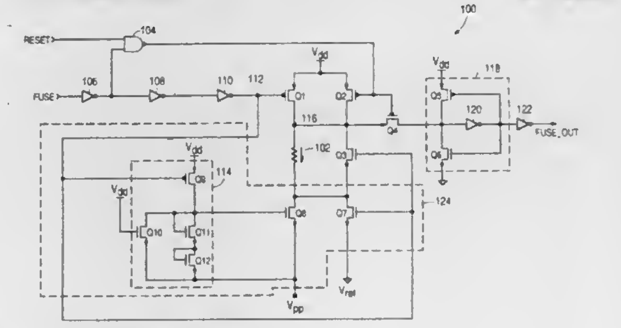
5,838,624
CIRCUITS FOR IMPROVING THE RELIABILITY OF ANTIFUSES IN INTEGRATED CIRCUITS

David J. Pilling, Los Altos; Raymond M. Chu, Saratoga, and Sik K. Lui, Sunnyvale, all of Calif., assignors to Integrated Device Technology, Inc., Santa Clara, Calif.

Continuation of Ser. No. 473,039, Jun. 6, 1995, Pat. No. 5,680,360. This application May 2, 1997, Ser. No. 850,902

Int. Cl.^{6} G11C *17/16*

U.S. Cl. 365—225.7 **30 Claims**



1. A circuit comprising:

a source of a first potential;

a source of a second potential;

a source of a reference potential;

an antifuse having a first terminal coupled to the source of the first potential and a second terminal coupled to the source of the second potential during an operation to program the antifuse and coupled to the source of the reference potential during an operation to read a state of the antifuse;

a latch having an input terminal coupled to one of the antifuse first and second terminals to store the state of the antifuse during the read operation;

a current limiter coupled between the latch input terminal and the one of the antifuse first and second terminals to substantially prevent current flow through the antifuse after the latch stores the state of the antifuse.

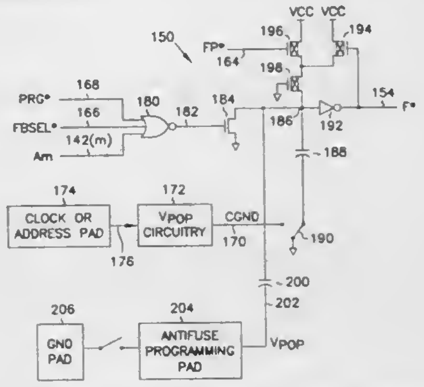
5,838,625
ANTI-FUSE PROGRAMMING PATH

Douglas J. Cutter, Fort Collins, Colo.; Fan Ho, and Kurt D. Beigel, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Oct. 29, 1996, Ser. No. 742,820

Int. Cl.^{6} G11C *17/16*

U.S. Cl. 365—225.7 **29 Claims**



1. A programmable circuit providing a programmed signal in an integrated circuit comprising:

a first node carrying the programmed signal;

a first programming bus:

a first anti-fuse including a first terminal coupled to the first node and a second terminal coupled to the first programming bus: and

an anti-fuse programming pad coupled to the first programming bus for permitting a sufficient voltage to short the first anti-fuse to be applied to the first programming bus from external to the integrated circuit,

wherein the anti-fuse programming pad is bonded to ground during assembly and packaging of the integrated circuit.

5,838,626
NON-VOLATILE MEMORY

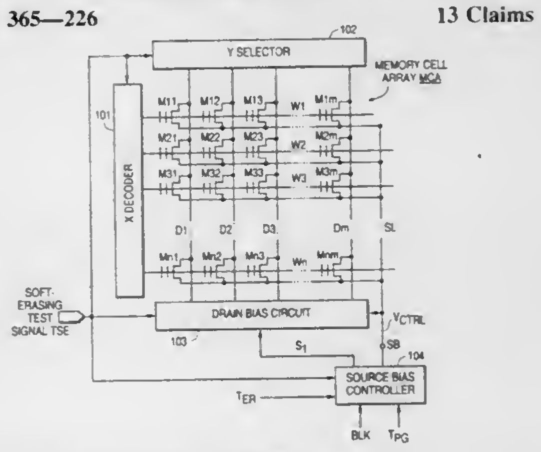
Sadao Nakayama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 8, 1997, Ser. No. 908,708

Claims priority, application Japan, Aug. 9, 1996, 8-210785

Int. Cl.^{6} G11C *13/00*

U.S. Cl. 365—226 **13 Claims**



5. A non-volatile memory comprising:

a plurality of cell blocks each comprising a plurality of nonvolatile memory cells which are electrically rewritable, each nonvolatile memory cell comprising a source, a drain, a control gate and a floating gate, the sources of the non-volatile memory cells being connected to a source bias line, the drains being connected in columns to bit lines, respectively, the control gates being connected in rows to word lines, respectively, and the word lines being shared between a plurality of cell blocks;

a word line controller for controlling a voltage of each of the word lines;

a bit line controller for controlling a voltage of each of the bit lines: and

a bias controller for concurrently applying a first bias voltage to the source bias line and a second bias voltage to the bit lines in cell blocks.

5,838,627
ARRANGEMENT OF POWER SUPPLY AND DATA INPUT/OUTPUT PADS IN SEMICONDUCTOR MEMORY DEVICE

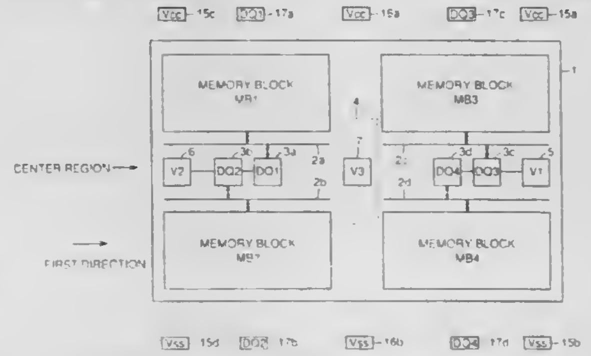
Shigeki Tomishima; Mikio Asakura; Masaki Tsukude, and Kazutami Arimoto, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 616,734, Mar. 15, 1996, Pat. No. 5,604,710, which is a continuation-in-part of Ser. No. 445,819, May 22, 1995, abandoned. This application Dec. 16, 1996, Ser. No. 768,090

Claims priority, application Japan, May 20, 1994, 6-106879; Nov. 29, 1994, 6-294205; May 10, 1995, 7-111866

Int. Cl.^{6} G11C *8/00;7/00;5/02*

U.S. Cl. 365—230.03 **32 Claims**



1. A semiconductor memory device, comprising:

a memory array divided into a plurality of memory blocks by a first region disposed along a first direction and a second region disposed along a second direction perpendicular to said first direction, said first region crossing said second region;

a plurality of external signal receiving pads arranged in a crossing portion, the crossing portion being substantially a portion at which said first region crosses said second region, said plurality of external signal receiving pads receiving external signals, said plurality of memory blocks accessed by said external signals;

a plurality of data output pads provided corresponding to said plurality of memory blocks respectively, said plurality of data output pads arranged in a region excluding said crossing portion in said first region, each of said plurality of data output pads being arranged adjacent to a corresponding one of said memory blocks; and

a plurality of data output buffers provided corresponding to said plurality of data output pads respectively, each receiving data from a corresponding one of said memory blocks and outputting said data to a corresponding one of said data output pads.

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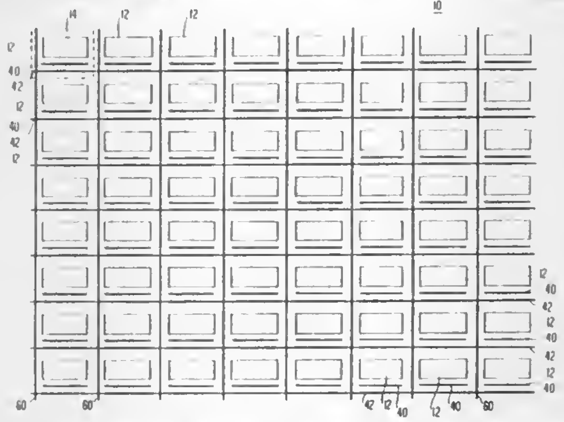
5,838,628
PROGRAMMABLE LOGIC ARRAY INTEGRATED CIRCUITS

Richard G. Cliff, Milpitas; L. Todd Cope, San Jose; Cameron R. Mc Clintock, Mountain View; William Leong, San Francisco; James A. Watson, Santa Clara; Joseph Huang, San Jose, and Bahram Ahanin, Cupertino, all of Calif., assignors to Altera Corporation, San Jose, Calif.

Continuation of Ser. No. 655,870, May 24, 1996, Pat. No. 5,668,771, which is a continuation of Ser. No. 245,509, May 18, 1994, Pat. No. 5,550,782, which is a continuation-in-part of Ser. No. 111,693, Aug. 25, 1993, Pat. No. 5,436,575, which is a continuation-in-part of Ser. No. 754,017, Sep. 3, 1991, Pat. No. 5,260,610, and Ser. No. 880,942, May 8, 1992, Pat. No. 5,260,611. This application Apr. 22, 1997, Ser. No. 840,534

Int. Cl.^{6} G11C *13/00*

U.S. Cl. 365—230.03 **15 Claims**



1. A programmable logic device organized in a two-dimensional array comprising:
a first plurality of conductors, each of said first plurality of conductors provided in a first dimension of said two-dimensional array;
a second plurality of conductors, each of said second plurality of conductors provided in a second dimension of said two-dimensional array;
a plurality of logic blocks devoted substantially to logic functions, each of said logic blocks programmably coupled to at least one of said first or second plurality of conductors; and
a plurality of memory blocks devoted substantially to user memory, each of said memory blocks programmably coupled to at least one of said first or second plurality of conductors,
wherein at least one of said memory blocks is selectively organized in a variable memory configuration.

5,838,629
SEMICONDUCTOR MEMORY DEVICE HAVING LEVEL-SHIFTED PRECHARGE SIGNAL

Fumihiro Kohno, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

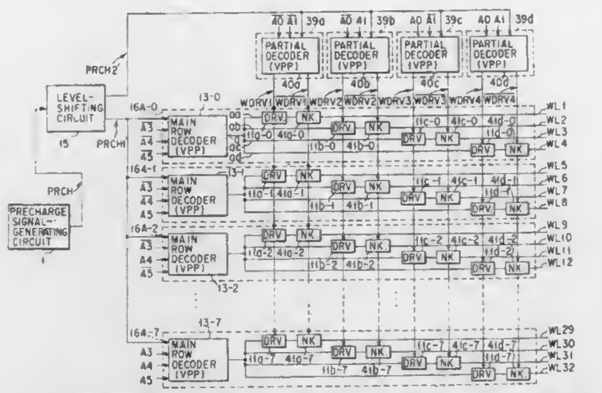
Division of Ser. No. 696,738, Aug. 14, 1996, which is a division of Ser. No. 379,290, Jan. 27, 1995, abandoned. This application Aug. 6, 1997, Ser. No. 907,030

Claims priority, application Japan, Jan. 23, 1994, 7-008471; Jan. 31, 1994, 6-008921

Int. Cl.^{6} G11C *11/407;8/00*

U.S. Cl. 365—230.06 **23 Claims**

1. A dynamic random access memory device comprising:
a low-potential power-supply line applied with a low potential;
a high-potential power-supply line applied with a high potential;
a memory cell array including a plurality of dynamic random access memory cells;
a boosted voltage-generating circuit for generating a boosted potential higher than the high potential;
a precharge signal generating circuit for generating a precharge signal for setting the high potential at a high level;



a first level-shifting circuit for level-shifting the precharge signal to generate a first boosted precharge signal which sets the boosted potential at the high level;
a second level-shifting circuit for level-shifting the precharge signal to generate a second boosted precharge signal which sets the boosted potential at the high level;
at least first and second boosted potential lines;
at least first and second word lines to which said memory cells are connected;
at least one word-line selecting circuit including:
  a row decoder for receiving the boosted precharge signal, address signals for setting the high potential at the high level, and the boosted potential used as a drive voltage;
  a row-decoder output line connected to an output of said row decoder;
  at least first and second row-decoder partial output lines;
  a first word-line driving circuit including a P-channel insulated-gate FET which has a gate electrically coupled to said first row-decoder partial output line, a source connected to said first boosted potential line, and a drain connected to said first word line; and
  a second word-line driving circuit including a P-channel insulated-gate FET which has a gate electrically coupled to said second row-decoder partial output line, a source connected to said second boosted potential line, and a drain connected to said second word line;
  a boosted potential line selecting circuit including:
    at least first and second partial decoders for receiving the second boosted precharge signal, other address signals for setting the high potential at the high level, and the boosted potential used as a drive voltage;
    a first partial decoder output line connected to an output of said first partial decoder;
    a second partial decoder output line connected to an output of said second partial decoder;
    a first boosted potential line driving circuit including a P-channel insulated-gate FET which has a gate electrically coupled to said first row-decoder partial output line, a source connected to said boosted potential, and a drain connected to said first boosted potential line; and
    a second boosted potential line driving circuit including a P-channel insulated-gate FET which has a gate electrically coupled to said second row-decoder partial output line, a source connected to said boosted potential, and a drain connected to said second boosted potential line;
a first inverting circuit including at least one inverter connected to an output of said first boosted potential line driving circuit and the high potential used as a drive voltage;
a second inverting circuit including at least one inverter connected to an output of said second boosted potential line driving circuit and the high potential used as a drive voltage;
a first word-line noise killer circuit including an N-channel insulated-gate FET having a gate connected to an output of said first inverting circuit, a drain connected to said first word line, and a source connected to said low potential; and
a second word-line noise killer circuit including an N-channel insulated-gate FET having a gate connected to an output of

said second inverting circuit, a drain connected to said second word line, and a source connected to said low potential.

5,838,630
INTEGRATED CIRCUIT DEVICE, SEMICONDUCTOR MEMORY, AND INTEGRATED CIRCUIT SYSTEM COPING WITH HIGH-FREQUENCY CLOCK SIGNAL

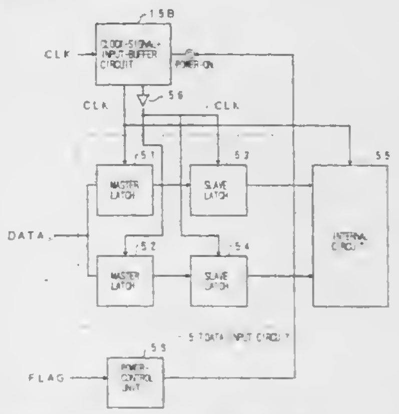
Yoshinori Okajima, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Division of Ser. No. 766,173, Dec. 12, 1996. This application Dec. 15, 1997, Ser. No. 990,999

Claims priority, application Japan, Jul. 9, 1996, 8-179550

Int. Cl.^{6} G11C *8/00;7/00*

U.S. Cl. 365—233 **28 Claims**



1. An integrated-circuit device comprising:
a first clock-input circuit receiving a first clock signal;
a first data-input circuit receiving a first data signal in synchronism with said first clock signal;
a second clock-input circuit receiving a second clock signal;
a second data-input circuit receiving a second data signal in synchronism with said second clock signal; and
a control circuit controlling a timing to start receiving said second data signal based on a timing to start receiving said first data signal.

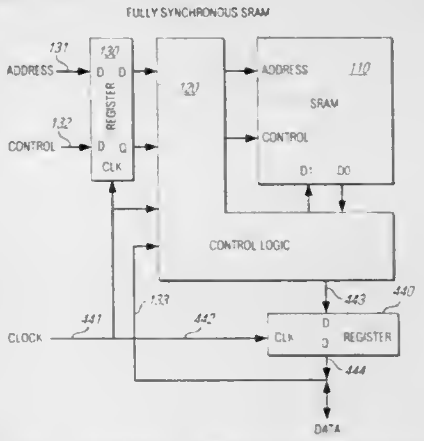
5,838,631
FULLY SYNCHRONOUS PIPELINED RAM

John R. Mick, San Jose, Calif., assignor to Integrated Device Technology, Inc., Santa Clara, Calif.

Filed Apr. 19, 1996, Ser. No. 635,128

Int. Cl.^{6} G11C *13/00*

U.S. Cl. 365—233 **29 Claims**



1. A synchronous random access memory system comprising a memory,
control logic for controlling the writing of data to and the reading of data from said memory;
address storage registers for storing at least two addresses in said memory at which data is to be written or from which data is to be read in response to control signals, the address storage registers being capable of receiving and storing the address on a rising edge of a clock signal;
control storage registers for storing at least two control signals for controlling the writing of data to or the reading of data from said memory system, the control registers being capable of receiving and storing the at least two control signals on the rising edge of the clock signal;
data storage registers for storing at least one set of data signals to be written into said memory, the data storage registers being capable of receiving and storing data on the rising edge of the clock signal,
structure for receiving data to be written into said memory and for also receiving data to be read out from said memory system,
an address bus terminal coupled to a first of said address storage registers for receiving the addresses of data to be written into the memory and to be read out of the memory system; and
a control terminal coupled to a first of said control storage registers for receiving control signals indicating whether data is to be written into the memory or read out of the memory system, wherein:
  in a read operation, said random access memory system is capable of providing data at said structure for receiving data, said data corresponding to an address in said random access memory;
  in a write operation, said random access memory system is capable of storing in said memory system write data received at said structure for receiving data, said write data corresponding to an address in said random access memory, and
  in a read operation immediately following said write operation, said random access memory system is capable of outputting said write data at said structure for receiving data, before said write data is written into said memory.

5,838,632
SEMICONDUCTOR MEMORY APPARATUS

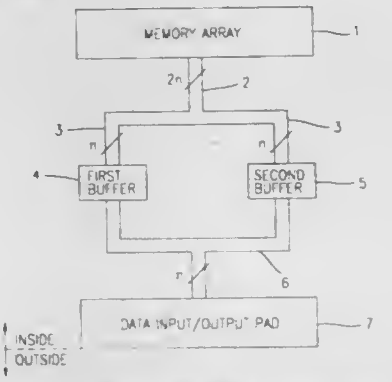
Yang Sung Joo, Seoul, Rep. of Korea, assignor to LG Semicon Co., Ltd., Choongcheongbuk-Do, Rep. of Korea

Filed Oct. 23, 1997, Ser. No. 956,355

Claims priority, application Rep. of Korea, Oct. 25, 1996, 1996 48240

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—239 **2 Claims**



1. A semiconductor memory apparatus, comprising:
a memory array for storing a data;
data input/output pads for inputting/outputting data;
a data bus having a bus width equal to at least twice the number of input/output pads connected between the data input/output pads and the memory array in a time interleaved manner to increase the data transmission rate between the memory array and the data input/output pads; and

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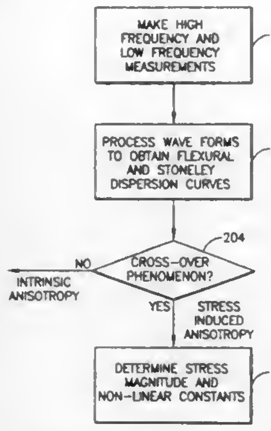
a column address strobe command is low activated for strobing column address and output the first data, and then is high activatied for sequential data output.

5,838,633
METHOD FOR ESTIMATING FORMATION IN-SITU STRESS MAGNITUDES USING A SONIC BOREHOLE TOOL

Bikash K. Sinha, West Redding, Conn., assignor to Schlumberger Technology Corporation, Ridgefield, Conn.
Filed Jan. 27, 1997, Ser. No. 789,441
Int. Cl.⁶ G01V *1/40*
U.S. Cl. 367—31 **4 Claims**


MAKE HIGH FREQUENCY AND LOW FREQUENCY MEASUREMENTS
200
PROCESS WAVE FORMS TO OBTAIN FLEXURAL AND STONELEY DISPERSION CURVES
202
204
CROSS-OVER PHENOMENON?
NO
INTRINSIC ANISOTROPY
YES
STRESS INDUCED ANISOTROPY
DETERMINE STRESS MAGNITUDE AND NON-LINEAR CONSTANTS
206

1. A method of estimating in-situ stress magnitude of an earth formation traversed by a borehole containing borehole fluid by utilizing a sonic logging tool having a monopole source, a plurality of dipole sources, and a plurality of sonic detectors, said method comprising:

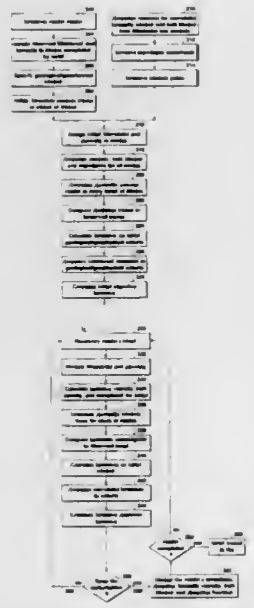
a) generating a relatively low frequency signal and a relatively high frequency signal with at least one source;
b) detecting the slow flexural, fast flexural, and Stoneley wave arrivals at the detectors for the relatively low frequency signal and the relatively high frequency signal;
c) determining the Stoneley wave velocity as a function of frequency;
d) determining the azimuthal orientation of the maximum velocity of at least one of the slow and fast flexural wave arrivals for at least one of the relatively low frequency signal and the relatively high frequency signal;
e) determining the velocities of the slow and fast flexural waves, as a function of frequency, for the relatively low frequency signal and for the relatively high frequency signal at the determined azimuthal orientation and at an orientation normal thereto;
f) associating formation anisotropy with stress in the formation if, at the determined azimuthal orientation, the velocity of the fast flexural wave for one of the relatively high frequency signal and the relatively low frequency signal is greater than the velocity of the slow flexural wave, and at the orientation normal to the determined azimuthal orientation, for the other of the relatively high frequency signal and relatively low frequency signal, the velocity of the fast flexural wave is greater than the velocity of the slow flexural wave; and, if formation anisotropy is associated with stress in the formation;
g) selecting a reference state velocity;
h) determining a velocity change, B, due to uniaxial stress, at a plurality of discrete frequencies; and
i) determining the stress magnitude and a plurality of non-linear formation parameters according to the equation:

$$A_1S+A_2Sc_{111}/c_{66}+A_3Sc_{112}/c_{66}+A_4Sc_{123}/c_{66}=B,$$

where A_1, A_2, A_3, A_4, and B are functions of frequency, c_{66} is the formation shear modulus in the reference state, and A_1, A_2, A_3, and A_4 are frequency dependent sensitivities of flexural wave velocities to S, Sc_{111}/c_{66}, Sc_{112}/c_{66}, and Sc_{123}/c_{66}, respectively.

5,838,634
METHOD OF GENERATING 3-D GEOLOGIC MODELS INCORPORATING GEOLOGIC AND GEOPHYSICAL CONSTRAINTS

Thomas A. Jones, Bellaire, and Sterling J. Helwick, Jr., Houston, both of Tex., assignors to Exxon Production Research Company, Houston, Tex.
Filed Dec. 9, 1996, Ser. No. 760,951
Int. Cl.⁶ G01V *1/34;1/30*
U.S. Cl. 367—73 **32 Claims**

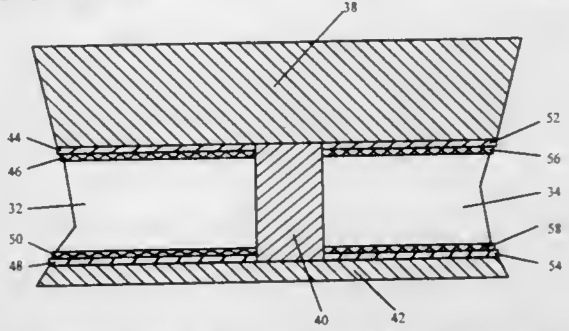


1. A method of forming a geologic model of a subsurface earth reservoir of interest based on lithofacies and porosity data obtained from wells in the reservoir and seismic traces obtained from seismic survey data, said geologic model being arranged into an assigned number of model blocks in a three-dimensional array corresponding to the reservoir, comprising the steps of:

forming a tentative geologic model by assigning obtained lithofacies and porosity values to model blocks where well data are present and by assigning estimated lithofacies and porosity values to model blocks where well data are not present;
forming synthetic seismic traces based on model block values of lithofacies and porosity, taking into account fluid saturation;
forming a statistical measure indicative of the match between the synthetic seismic traces and the obtained seismic traces;
forming measures indicative of the distribution of lithofacies and porosity values within the tentative geologic model;
comparing the measures so formed with specified criteria to determine if the degree of agreement is acceptable;
retaining the current tentative geologic model if it is determined acceptable during said step of comparing;
forming a new tentative geologic model by perturbing the lithofacies and porosity values within the current tentative geologic model if said current tentative geologic model is determined unacceptable during said step of comparing; and
iteratively repeating said steps of forming synthetic seismic traces, forming measures, comparing measures, and retaining or perturbing until specified limits of acceptability are achieved.

5,838,635
THIN SPEED TRANSDUCER SENSOR

Karl Masreliez, 14606 SE. 50th St., Bellevue, Wash. 98006
Continuation-in-part of Ser. No. 338,648, Nov. 14, 1994, Pat. No. 5,581,515. This application Oct. 31, 1996, Ser. No. 741,817
Int. Cl.⁶ G01S *15/00;* **G01C** *21/00*
U.S. Cl. 367—89 **22 Claims**



1. A watercraft and speed sensor combination comprising:
a watercraft having a hull, the hull having a certain first thickness and a mechanical strength; and
a transducer assembly coupled to the hull, the transducer assembly having a second thickness, the second thickness being thinner than the hull, the transducer assembly having a mechanical strength less than the mechanical strength of the hull, yet sufficient to provide a watertight seal between itself and the hull, and the transducer assembly being rigidly coupled directly to the hull for support, the hull providing the required mechanical strength, and a single hole through the hull for providing electrical connection to the transducer assembly, and the transducer assembly extending outward along the hull away from the hole to provide the watertight seal for the hole in the hull.

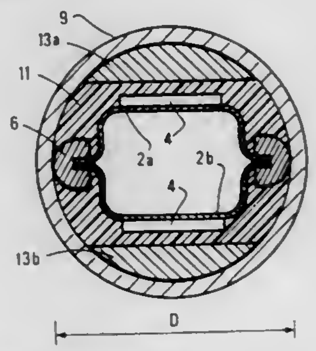
5,838,636
UNDERWATER VEHICLE GUIDANCE SYSTEM AND METHOD

Robert L. Ashford, Pearl City, Hi.; David F. Bleil, Silver Spring, and Zaka I. Slawsky, Bethesda, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Jun. 24, 1969, Ser. No. 839,789
Int. Cl.⁶ G01S *15/00*
U.S. Cl. 367—95 **9 Claims**

1. A guidance system for a propelled water vehicle having a steering mechanism, a hydrophone for detecting sonic signals and a homing system responsive to detected sonic signals generated by a short range target to control said steering mechanism comprising
means for tracking and indicating the relative paths of the vehicle and target,
means for generating sonic command signals in the water correlative to the indication on said tracking means,
means for eliminating spurious signals detected by said hydrophone,
gating means for passing sonic command signals detected during a predetermined operational period,
means for storing said passed sonic command signals,
means for applying said passed sonic command signals to said storing means,
means for applying the sonic command signals stored in said storage means to the steering mechanism during a predetermined read-out period,
means for controlling the length of said operational period and said read-out period, and
means for resetting said storing means after said read-out period.

5,838,637
HYDROPHONE AND PROCESS FOR MANUFACTURING IT

Georges Constantinou, La Varenne St. Hilaire; Jean Laurent, Morainvillier, and Marc Bernard, Lamorlay, all of France, assignors to Institut Francais du Petrole, and Vinci Technologies, both of Rueil-Malmaison, France
Filed Apr. 29, 1997, Ser. No. 848,184
Claims priority, application France, Apr. 29, 1996, 96 05485
Int. Cl.⁶ H04R *17/00*
U.S. Cl. 367—173 **15 Claims**



6. A hydrophone comprising at least one detection unit (**1**) including a casing made up of two cups (**2***a*, **2***b*) having each a support face resting against a corresponding support face of the other cup, each one of them being provided with a flexible central part, and at least one sensitive element (**4**) associated with electrodes (**5**), that is fastened onto the central part of at least one of the cups, on a face thereof that becomes concave when it is subjected to an increase in the outside static pressure, electric conductors (**5***a*) connected to the electrodes (**5**) of each sensitive element (**4**), comprising a rigid external tube (**9**), a means allowing sealed positioning of at least one casing in a diametral plane of the tube, obtained by injection of a sealing material forming a coating of controlled thickness for detection unit (**1**) and part of the inner wall of rigid tube (**9**).

5,838,638
PORTABLE VERTICLE JUMP MEASURING DEVICE

Steven M. Tipton; Matt Hackworth, and Kelly Willson, all of Tulsa, Okla., assignors to The University of Tulsa, Tulsa, Okla.
Filed Feb. 10, 1997, Ser. No. 797,395
Int. Cl.⁶ G04B *47/00;* **G04F** *8/00;* **A63B** *23/00*
U.S. Cl. 368—10 **10 Claims**

1. A portable vertical jump measuring device, which comprises:
a plurality of normally open switches wired in parallel, each said switch being adapted to deliver a signal and deactivated in response to a jumper stepping thereon, wherein said switches are embedded in a portable mat;
a timer connected to said switch and adapted to receive said switch signal to measure a time period said switch is activated while said jumper is in the air;
means to receive said measured time period and to calculate the square of said activated time period and thereafter multiply the result by a constant to derive vertical jump height; and

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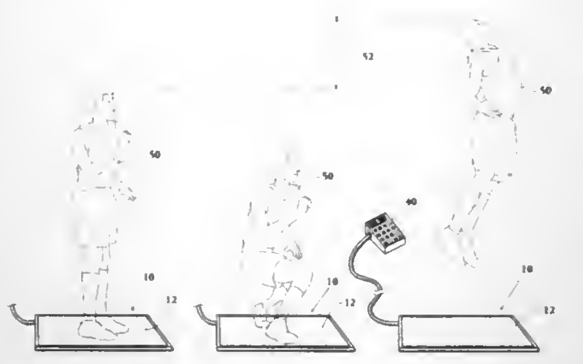
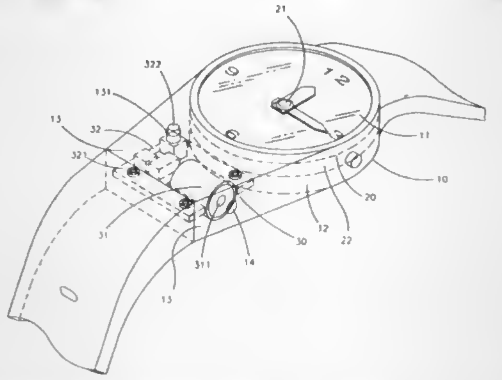


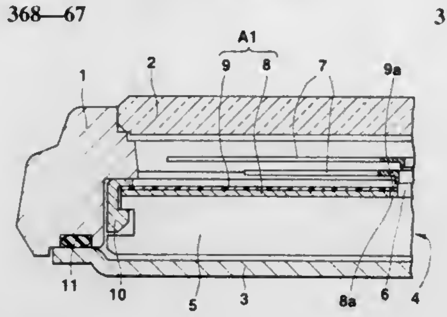
an output device connected to said means to display the resultant vertical jump height of said jumper.

5,838,639
WATCH HAVING LASER POINTER
Hsien-Jung Hwang, 4F, No. 10, Alley 5, Lane 268, Futeh St., Hsin-Yi District, Taipei, Taiwan
Filed Jun. 24, 1997, Ser. No. 881,197
Int. Cl.^{6} G04B *47/00*
U.S. Cl. 368—10 **3 Claims**



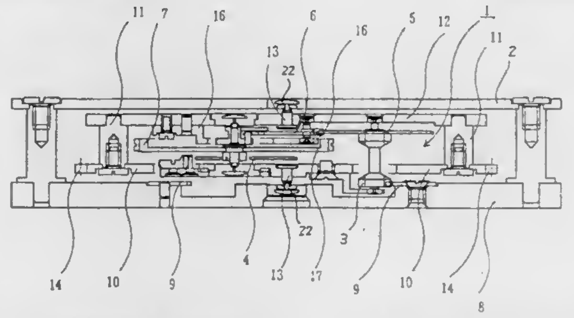
1. A watch having a laser pointer, comprising
a housing having a clear cover defining a first receiving cell therein, a modulating core being disposed within said receiving cell, a partitioning portion being disposed at one side and a second receiving space having a laser diode module disposed therein, a power supply being fixedly disposed thereunder, said cover of said housing being provided with an button opening atop of the second receiving cell, said button opening being corresponding to a button switch of a circuit of said laser diode module, the top of said button switch being projected over said cover of said housing, said housing being provided with a light aperture which is aligned with a hole of a light source;
a modulating core having a time display being received within said housing, said modulating core including a modulating body disposed beneath said display, said modulating core being disposed at the peripheral of said laser diode module;
a laser diode module being configured by a light source and a circuitry, said light source having a cylindrical housing and being provided with a transparent aperture atop, a convex lens being disposed beneath said aperture, said cylindrical housing further including a laser diode under said convex lens, said laser diode being electrically connected to a printed circuit board and which is provided with a button switch; and
a power supply being configured by at least one or more batteries, each of the receiving cell being provided with a positive conductor and a negative conductor and which are electrically connected to the input of said modulating core and said laser diode module.

5,838,640
LUMINESCENT DEVICE AND WATCH WITH LUMINESCENT DEVICE
Hiroyuki Sonoda, Ome, and Shunji Minami, Fussa, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan
Filed Jul. 8, 1997, Ser. No. 889,430
Claims priority, application Japan, Jul. 12, 1996, 8-183319
Int. Cl.^{6} G04B *19/06*
U.S. Cl. 368—67 **37 Claims**



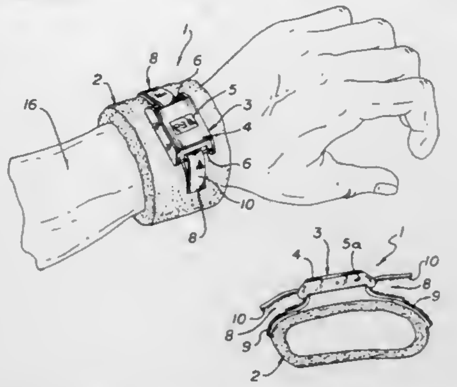
1. A watch comprising:
a watch case comprising an analog hand mechanism having hands, in the inside thereof;
a plate-like luminescent device which is provided in the watch case for illuminating the analog hand mechanism in the watch case; and
any one of a metallic layer or a metallic ink layer, which gives a feeling of metallic gloss by receiving illumination of light emitted from a surface of the luminescent device, which is disposed at least in a side of an upper surface and a lower surface of the luminescent device.

5,838,641
MECHANICAL TIMEPIECE WITH TOURBILLON MECHANISM
Muneo Tohkoku, and Tsuyoshi Tanaka, both of Chiba, Japan, assignors to Seiko Instruments Inc., Japan
PCT No. PCT/JP96/02266, § 371 Date Sep. 15, 1997, § 102(e) Date Sep. 15, 1997, PCT Pub. No. WO97/07435, PCT Pub. Date Feb. 27, 1997
PCT Filed Aug. 9, 1996, Ser. No. 860,851
Claims priority, application Japan, Aug. 18, 1995, 7-210784
Int. Cl.^{6} G04B *15/00;19/20*
U.S. Cl. 368—127 **20 Claims**



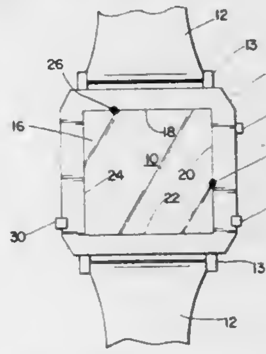
1. A mechanical timepiece comprising: a tourbillon mechanism having a cage mounted for rotation and a timed annular balance, a pallet-fork and an escape wheel mounted in the cage for rotation therewith, the cage having an upper plate, a lower plate and a plurality of connecting members directly connecting the upper plate and the lower plate in spaced-apart relation, the lower plate having a gear on an outer periphery thereof; and a gear train having a train wheel connected to the gear of the lower plate of the cage for rotationally driving the cage.

5,838,642
WRIST SWEATBAND WITH WATCH
Patricia A. Tully, 1605 Erin, Apt. 4, Monroe, La. 71201
Filed Apr. 10, 1997, Ser. No. 833,918
Int. Cl.^{6} G04B *37/00;* A44C *5/00*
U.S. Cl. 368—282 **3 Claims**



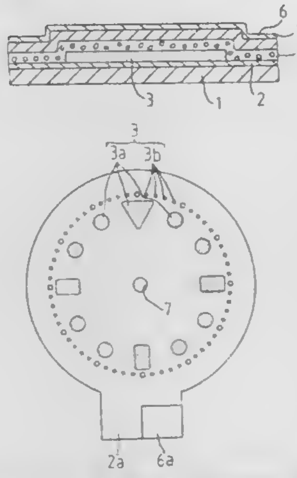
1. A wrist sweatband for a watch having a pair of band attachment pins, said wrist sweatband comprising a sweatband provided on the wrist, a watch seated on said sweatband, a pair of pile element strips of a loop-pile fastener provided on said sweatband and loop element strips of said loop-pile fastener extending from said pile element strips, respectively, of said loop-pile fastener, and loop element strips of said loop-pile fastener extended around the band attachment pins, respectively, and caused to engage said pile element strips, respectively, of said loop-pile fastener for removably fastening the watch to said sweatband.

5,838,643
TIMEPIECE DISPLAY AND METHOD OF DISPLAYING INFORMATION TIME ON A TIMEPIECE
Daniel J. Reiner, 92 Watkins Ave., Latrobe, Pa. 15650
Filed May 31, 1996, Ser. No. 658,843
Int. Cl.^{6} G04B *19/00*
U.S. Cl. 368—223 **11 Claims**



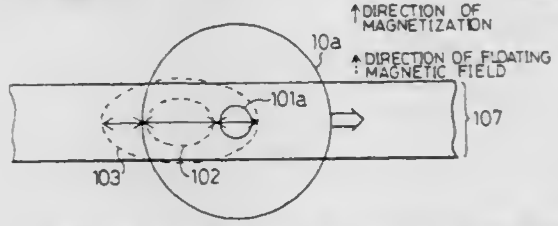
1. A timepiece which comprises:
a. a timepiece face having a polygonal configuration when viewed in plan;
b. a timekeeping mechanism coupled with said timepiece face;
c. means for indicating only the hour of item along one side of said polygon;
d. means for indicating only the minute of the hour along another non-parallel one side of said polygon; and
e. a decorative design on said timepiece.

5,838,644
ELECTROLUMINESCENT DISPLAY AND LUMINOUS TIMEPIECE DIAL
Koji Yoneda; Koji Hirose; Shigehiko Aoki, and Iwao Hirayama, all of Tokyo, Japan, assignors to Seiko Precision Inc., Japan
Filed Oct. 27, 1995, Ser. No. 549,091
Claims priority, application Japan, Oct. 27, 1994, 6-264031; Sep. 14, 1995, 7-236663
Int. Cl.^{6} G04B *19/06*
U.S. Cl. 368—232 **19 Claims**



1. An electroluminescent display comprising: a transparent substrate; a transparent electrode formed on a surface of the transparent substrate; a decorative pattern layer comprised of a fluorescent material formed directly on a surface of the transparent electrode opposite the transparent substrate; an electroluminescent layer formed on the transparent electrode and covering the decorative pattern layer; an insulating layer formed on the electroluminescent layer; and a rear electrode formed on the insulating layer.

5,838,645
MAGNETO-OPTICAL RECORDING MEDIUM HAVING A PLURALITY OF MAGNETIC LAYERS
Junji Hirokane, Nara; Michinobu Mieda; Junichiro Nakayama, both of Shiki-gun, and Akira Takahashi, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Division of Ser. No. 595,259, Feb. 1, 1996, Pat. No. 5,684,764.
This application May 30, 1997, Ser. No. 866,594
Claims priority, application Japan, Mar. 27, 1995, 7-68379
Int. Cl.^{6} G11B *11/00*
U.S. Cl. 369—13 **7 Claims**


↑DIRECTION OF MAGNETIZATION
↑DIRECTION OF FLOATING MAGNETIC FIELD
10a
101a
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103
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1. A data reproducing apparatus for reproducing data from a magneto-optical disk comprising a record layer, made of a perpendicular magnetization film, for recording data, a reproduction layer where a light beam is irradiated to read out the data, an auxiliary reproduction layer, interposed between said record layer and said reproduction layer, for reflecting the data recorded in said record layer, and an intermediate layer, interposed between said auxiliary reproduction layer and reproduction layer, for weakening a magnetic exchange coupling force between said auxiliary reproduction layer and reproduction layer, each of said reproduction layer and said auxiliary reproduction layer being made of a perpendicular magnetization film in which a width of a magnetic domain existing in a stable manner varies in response to temperatures, said

magneto-optical disk satisfying a condition that the width of a magnetic domain existing in a stable manner in said reproduction layer and said auxiliary reproduction layer is not longer than a width of a magnetic domain in said record layer in a specific temperature range, said temperature range corresponding to a temperature distribution within a part of a spot of said light beam, said data reproducing apparatus comprising:

a light source for irradiating the light beam onto said magneto-optical disk;

a differentiating circuit for differentiating a reproduction signal; and

a mark detecting circuit for detecting a record mark position using an output of said differentiating circuit.

5,838,646

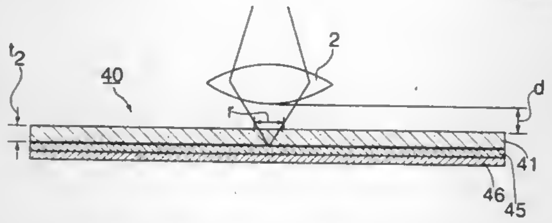
OPTICAL DISK HAVING A PROTECTIVE LAYER OF SPECIFIED THICKNESS RELATIVE TO THE NUMERICAL APERTURE OF THE OBJECTIVE LENS

Tetsu Watanabe, and Yoshio Aoki, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 613,035, Mar. 8, 1996, Pat. No. 5,757,733, which is a continuation of Ser. No. 383,351, Feb. 3, 1995, Pat. No. 5,533,001, which is a division of Ser. No. 277,357, Jul. 19, 1994, Pat. No. 5,392,263, which is a continuation of Ser. No. 761,874, Sep. 13, 1991, abandoned. This application Mar. 14, 1997, Ser. No. 818,552

Int. Cl.^{6} G11B *11/00;7/24*

U.S. Cl. 369—13 **6 Claims**



1. An optical recording and/or reproducing apparatus for use with an optical recording medium having a light-transmitting cover layer and a recording layer provided on a surface of the light-transmitting cover layer, the apparatus comprising:

a light source for radiating a light beam; and

an objective lens for converging the light beam radiated from the light source onto the recording layer through the light-transmitting cover layer, wherein

the light beam converged by the objective lens is characterized by a wavelength, λ, and a minimum diameter, $2\omega_0$, given by:

$$2\omega_0=0.82\ (\lambda/NA),$$

and the objective lens has a numerical aperture, NA, that falls within a range of $0.55 \leqq NA \leqq 1.10$.

5,838,647

Patent Not Issued For This Number

5,838,648

METHOD AND APPARATUS FOR SCANNING BARCODES

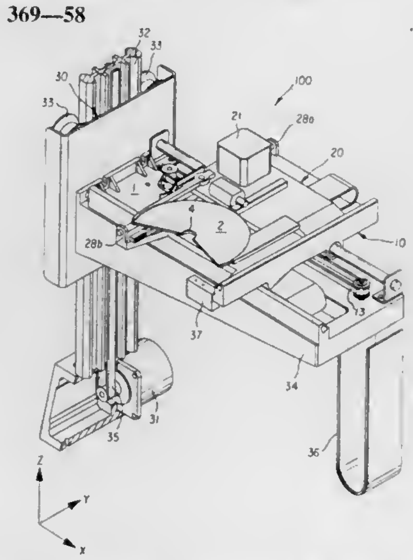
Mario Litsche, Backnang, and Martin Landis, Stuttgart, both of Germany, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 18, 1996, Ser. No. 752,188

Claims priority, application Germany, Nov. 23, 1995, 195 43 656.3

Int. Cl.^{6} G11B *5/09*

U.S. Cl. 369—58 **14 Claims**



1. Method for scanning a barcode on a flat object by a scanning device, wherein a holding device secures a flat object, the holding device being attached to first and second carriages movable in two directions at right angles to one another comprising the steps of:

energizing a drive motor for moving one carriage in a first direction (X) and energizing another drive motor for moving the other carriage in a direction (Y) at right angles to the first direction (X) so as to move the barcode along a path corresponding to its orientation past the scanning device;

scanning the barcode by the scanning device;

decoding the scanned barcode;

transmitting the decoded barcode to a control unit; and

terminating the decoding, scanning and motor energizing operations for moving the carriage in the two directions (X, Y) at right angles to one another.

5,838,649

APPARATUS FOR DEMODULATING DIGITAL FM SIGNAL IN AN OPTICAL DISC DEVICE

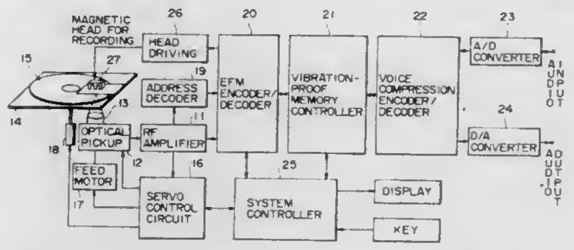
Yoshiro Joichi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Division of Ser. No. 665,884, Jun. 19, 1996. This application Oct. 23, 1997, Ser. No. 955,909

Claims priority, application Japan, Jun. 20, 1995, 7-176748

Int. Cl.^{6} H09H *5/76;* **G11B** *7/24*

U.S. Cl. 369—60 **18 Claims**



1. Apparatus for recording or reproducing data on a disc-shaped recording medium having a wobbled spiral groove thereon, comprising:

means for emitting a laser beam to impinge on said recording medium;

means for receiving said laser beam reflected from said recording medium;

means for detecting a frequency modulated signal produced by the reflection of said laser beam from said spiral groove and which is expected to have level inversions at data bit boundaries of said frequency modulated (FM) signal;

means for demodulating said FM signal, said means for demodulating includes means for correcting a signal level of said FM signal just after said means for detecting senses the absence of a level inversion at a respective one of said data bit boundaries;

a recording or reproducing head moveable in respect to said recording medium;

means for determining a position of said recording or reproducing head on said recording medium in response to said demodulated FM signal; and

means for recording data on or reproducing data from said determined position on the recording medium by means of said head.

5,838,650

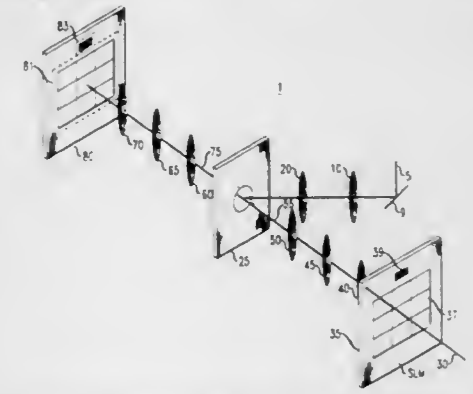
IMAGE QUALITY COMPENSATION METHOD AND APPARATUS FOR HOLOGRAPHIC DATA STORAGE SYSTEM

Scott Patrick Campbell, Chatham; Kevin Richard Curtis, Summit, and Thomas J. Richardson, South Orange, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jun. 26, 1996, Ser. No. 670,923

Int. Cl.^{6} G11B *7/00*

U.S. Cl. 369—103 **22 Claims**



1. A method for reading data in a holographic storage system comprising:

directing a light beam at an holographic storage medium for projecting an image on a detector, said storage medium containing an image of at least one page of data;

monitoring a quality of a projection of a page indicator image stored in said storage medium, said page indicator being stored in said medium such that the quality of its projected image is indicative of the projected quality of the corresponding data page image on said detector;

varying a parameter of said system originally used to store said data page and said page indicator in said storage medium; and

based on said monitored quality of the page indicator image projection, varying further said parameter or not varying said parameter and reading data from said data page projected on said detector.

5,838,651

OPTICAL READ-OUT HEAD CAPABLE OF IMPROVED READ-OUT OF MEDIA WITH DIFFERENT PIT HEIGHTS

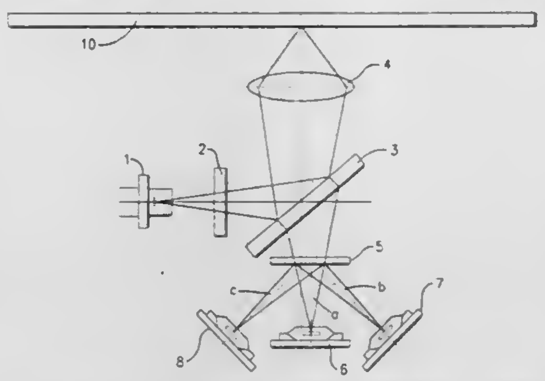
Jun-ichi Takahashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 7, 1996, Ser. No. 689,247

Claims priority, application Japan, Aug. 15, 1995, 7-208029

Int. Cl.^{6} G11B *7/12*

U.S. Cl. 369—109 **4 Claims**



1. An optical read-out head comprising a light source, an objective lens for focussing light on an optical recording medium having a plurality of different pit heights, and at least one photodetector for detecting light reflected from said medium, further comprising:

light separating means for separating reflected light into diffracted sub-beams each conveying information content of a different pit height of said optical recording medium, and provided in an optical path of said reflected light defined from said objective lens to said photodetector; and

light receiving means including said at least one photodetector, for separately receiving said diffracted sub-beams.

5,838,652

DATA PROCESSING OPTICAL HEAD APPARATUS

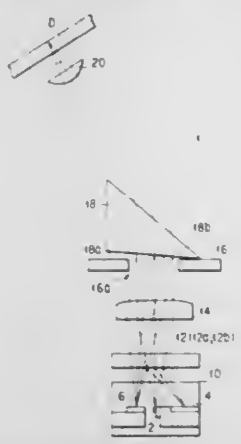
Satoru Kishita, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 30, 1996, Ser. No. 689,059

Claims priority, application Japan, Jul. 31, 1995, 7-194699

Int. Cl.^{6} G11B *7/00*

U.S. Cl. 369—112 **4 Claims**



1. A data-processing apparatus comprising:

a light source for emitting a light beam;

an adjusting unit constructed and arranged to adjust an amount of the light beam emitted from said light source;

a collimating lens constructed and arranged to collimate the light beam;

a focusing lens constructed and arranged to focus the light beam collimated by said collimating lens on a recording medium;

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a deflecting portion constructed and arranged to deflect the light beam reflected by the recording medium and applied through said focusing lens to a first position adjacent to said light source;

a first light-receiving element provided at the first position, constructed and arranged to receive the light beam reflected by said deflecting unit and converting the same into an electric data signal;

a reflecting surface provided between said collimating lens and said focusing lens, having a reflectance of at most 50% and inclined from a plane perpendicular to an optical axis of said collimating lens, constructed and arranged to reflect a part of the light beam applied through said collimating lens and focusing the same at a second position adjacent to said light source;

a second light-receiving element provided at the second position, constructed and arranged to receive the light beam focused at the second position and to convert the same into an electric monitor signal;

a control unit constructed and arranged to control said adjusting unit in accordance with the electric monitor signal, thereby to cause said light beam adjusting unit to adjust the amount of the light beam emitted from said light source; and

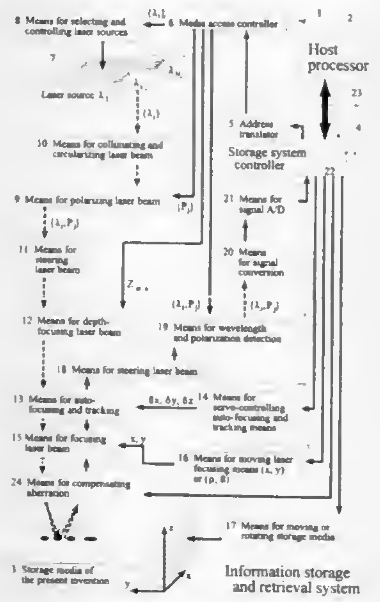
an aperture controlling unit provided between said collimating lens and said reflecting surface and having an aperture whose diameter is less than an effective diameter of said collimating lens and greater than or equal to an effective diameter of said focusing lens, and wherein said reflecting surface and said aperture controlling unit have such inclination angles and such aperture diameters that the entire light beam reflected by said reflecting surface passes through said collimating lens.

5,838,653

MULTIPLE LAYER OPTICAL RECORDING MEDIA AND METHOD AND SYSTEM FOR RECORDING AND REPRODUCING INFORMATION USING THE SAME

Bunsen Fan, Cortlandt Manor, and Sadeg M. Faris, Pleasantville, both of N.Y., assignors to Reveo, Inc., Hawthorne, N.Y.

Filed Oct. 4, 1995, Ser. No. 539,279
Int. Cl.^{6} G11B *7/24;* G11C *13/04*
U.S. Cl. 369—275.1 **63 Claims**


8 Means for selecting and controlling laser sources
6 Media access controller
1
2
Host processor
7
Laser source λ1
10 Means for collimating and circularizing laser beam
5 Address translator
Storage system controller
23
4
22
9 Means for polarizing laser beam
21 Means for signal A/D
20 Means for signal conversion
11 Means for steering laser beam
12 Means for depth-focusing laser beam
19 Means for wavelength and polarization detection
18 Means for steering laser beam
13 Means for auto-focusing and tracking
14 Means for servo-controlling auto-focusing and tracking means
15 Means for focusing laser beam
16 Means for moving laser focusing means (x, y) or (ρ, θ)
24 Means for compensating aberration
17 Means for moving or rotating storage media
3 Storage media of the present invention
Information storage and retrieval system

1. An information storage device comprising:

a first information storage structure having a first plurality of first and second information value storage locations recorded therein, wherein each said first information value storage location recorded in said first information storage structure has a first characteristic wavelength band $\Delta\lambda_a$ and a first characteristic polarization state P_1, and reflects spectral components that are incident thereto and have a wavelength within said first characteristic wavelength band $\Delta\lambda_a$ and a polarization state equal to said first characteristic polarization state P_1, and each said second information value storage location recorded in said first information storage structure transmits spectral components that are incident thereto and have an attribute selected from the group consisting of a wavelength outside of said first characteristic wavelength band $\Delta\lambda_a$ and a polarization state which is equal to a second characteristic polarization state P_2 orthogonal to said first characteristic polarization state P_1; and

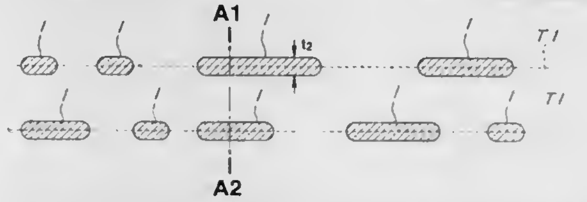
a second information storage structure mounted to said first said information storage structure, and having a second plurality of first and second information value storage locations recorded therein, wherein each said first information value storage location recorded in said second information storage structure has said second characteristic polarization state P_2 and a second characteristic wavelength band $\Delta\lambda_b$ overlapping at least a portion of said first characteristic wavelength band $\Delta\lambda_a$, and reflects spectral components that are incident thereto and have a wavelength within said second characteristic wavelength band $\Delta\lambda_b$ and a polarization state equal to said second characteristic polarization state P_2, and each said second information value storage location recorded in said second information storage structure transmits spectral components that are incident thereto and have an attribute selected from the group consisting of a wavelength outside of said second characteristic wavelength band $\Delta\lambda_b$ and a polarization state equal to said first characteristic polarization state P_1.

5,838,654

OPTICAL RECORDING MEDIUM HAVING A SPECIFIED RANGE OF PIT WIDTHS AND PIT DEPTHS

Masaki Kagawa, and Katsuhiko Ohtomo, both of Miyagi, Japan, assignors to Sony Corporation, Yokyo, Japan

Filed May 5, 1997, Ser. No. 851,477
Claims priority, application Japan, May 20, 1996, 8-125151
Int. Cl.^{6} G11B *7/24*
U.S. Cl. 369—275.1 **20 Claims**



1. An optical recording medium comprising pits formed in at least a portion of recording tracks and indicating information signals, wherein

a refractivity of a substrate of said optical recording medium is n and the wavelength of light for use to reproduce data is λ, the depth of the pits is included in a range from $\lambda/(4n)$ to $\lambda/(2n)$ and the width of each pit is included in a range from 0.3 to 0.6 μm, and

the number of regions in the recording tracks in which the pits are formed is larger than the number of regions in which no pit is formed.

5,838,655

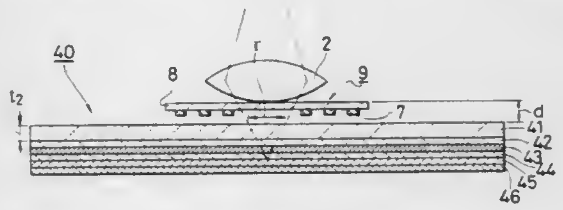
Patent Not Issued For This Number

5,838,656

OPTICAL DISK SYSTEM HAVING AN OBJECTIVE LENS WITH A NUMERICAL APERTURE RELATED TO THE THICKNESS OF THE PROTECTIVE LAYER

Tetsu Watanabe, and Yoshio Aoki, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 613,035, Mar. 8, 1996, Pat. No. 5,757,733, which is a continuation of Ser. No. 383,351, Feb. 3, 1995, Pat. No. 5,533,001, which is a division of Ser. No. 277,357, Jul. 19, 1994, Pat. No. 5,392,263, which is a continuation of Ser. No. 761,874, Sep. 13, 1991, abandoned. This application Jul. 9, 1997, Ser. No. 890.238
Claims priority, application Japan, Jan. 31, 1990, 2-21210
Int. Cl.^{6} G11B *7/24*
U.S. Cl. 369—275.2 **9 Claims**



1. A recordable optical disc, comprising:

a recordable layer onto which a laser beam is converged by an objective lens having a numerical aperture (NA) falling within a range of about 0.55 to 0.70, the recordable layer having an optical characteristic that changes when heated by the converged laser beam; and

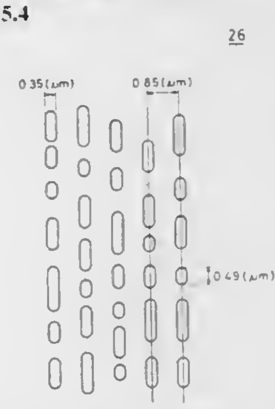
a light-transmitting substrate supporting the recordable layer, the light-transmitting substrate having a thickness falling within a range of about 0.1 to 0.6 mm and transmitting the laser beam therethrough to the recordable layer.

5,838,657

HIGH DENSITY OPTICAL DISC AND OPTICAL DISC PLAYER

Yoichi Tsuchiya, Hashima; Hitoshi Terasaki, Gifu; Shuichi Ichiura, Hashima; Toshio Ito, Hashima; Yasuyuki Kano, Hashima; Yoshimoto Yamaguchi, Gifu; Seizo Kato, Ogaki, and Osamu Ota, Gifu, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Division of Ser. No. 285,553, Aug. 3, 1994, abandoned, which is a continuation-in-part of Ser. No. 227,641, Apr. 14, 1994, Pat. No. 5,477,527. This application Feb. 8, 1996, Ser. No. 598,383
Claims priority, application Japan, Feb. 2, 1994, 6-11087; Mar. 5, 1994, 6-60019
Int. Cl.^{6} G11B *3/70*
U.S. Cl. 369—275.4 **9 Claims**



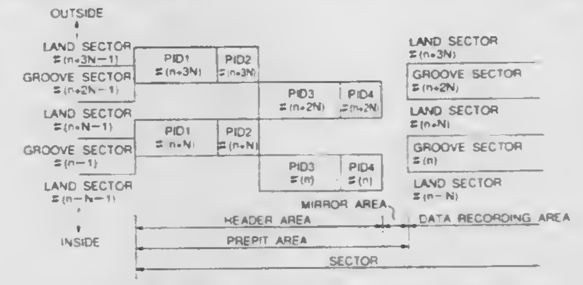
1. An optical disc having a pit width of 0.2–0.35 μm, a track pitch of 0.7–0.85 μm and a pit depth of 100–120 nm.

5,838,658

OPTICAL DISC

Kazuhiko Nakane; Hiroyuki Ohata; Masato Nagasawa; Kenji Gotoh; Yoshinobu Ishida, all of Tokyo; Isao Satoh, Neyagawa; Shunji Ohara, Higashiosaka; Takashi Ishida, Yawata, and Yoshinari Takemura, Settsu, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, and Matsushita Electric Industrial Co.,, Osaka, both of Japan

Filed Jun. 26, 1997, Ser. No. 883,173
Claims priority, application Japan, Jun. 26, 1996, 8-166219
Int. Cl.^{6} G11B *7/00*
U.S. Cl. 369—275.4 **4 Claims**



1. An optical disc having a data recording area comprising:

disc substrate with grooves formed circumferentially and lands between said grooves,

a phase-change recording film is formed in the data recording area for recording information using the leading and trailing edges of recording marks produced by a localized change in reflectivity effected in the phase-change recording film by emitting thereto a laser beam of a particular wavelength λ focused by a lens of a particular aperture NA, and

a single recording spiral is formed by alternately connecting groove recording tracks equivalent to one disc circumference and land recording tracks equivalent to one disc circumference with a track pitch p where $p<(\lambda/NA)<2p$,

said recording tracks comprise an integer number of recording sectors where the length of a recording sector is sufficient to store the data written to a recording sector of a read-only optical disc and is an integer multiple of the synchronous frame length of a read-only optical disc, and

each recording sector comprises a mirror area that is simply a mirror surface area, and a header field preformatted with embossed pits that are detectable from a push-pull signal in the radial direction and represent such information as address information where

at least the address information recorded to the header field is modulated by a runlength-limited modulation method,

the header field comprises recorded four times a physical address area PID containing a single frequency pattern area VFO for synchronization clock generation and timing detection during reproduction, an address mark AM for byte synchronization during header reproduction and starting the detection timing, an address area Pid for holding the sector address information, an address error detection area IED for storing the address error detection code, and a postamble PA for completing modulation,

where the four physical address areas PID are labelled PID1, PID2, PID3 and PID4 from the first PID in the header field with PID1 and PID2 offset approximately p/2 toward the outside circumference from the track center of a groove recording track, and PID3 and PID4 offset approximately p/2 toward the inside circumference from the track center of a groove recording track,

the address of the land recording sector adjacent on the outside circumference side of a groove recording sector recorded to the address area Pid of PID1 and PID2, and the address of the groove recording sector recorded to the address area Pid of PID3 and PID4, are each numbered to increment 1 in the sector sequence of the recording spiral,

the recording marks in said VFO are longer than the shortest recording mark of the modulation method, and VFO length in PID1 and PID3 is long enough to contain the edges of sufficient recording marks to lock reproduction clock synchro-

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nization within the VFO, VFO length in PID2 and PID4 is long enough to contain the edges of sufficient recording marks to reassert reproduction clock synchronization within the VFO, and the VFO areas in PID1 and PID3 are sufficiently longer than the VFO areas in PID2 and PID4,

the address mark AM is longer than the longest recording mark of the modulation method and long enough to contain plural channel bit patterns of a recording mark length not appearing in the modulation bit sequence,

the Pid is at least long enough to discriminate a number of recording sectors capable of storing user data exceeding the recording capacity of the above read-only optical disc medium,

the IED is a length enabling address area Pid reproduction errors to be detected with an error detection rate less than or equal to a particular rate,

the postamble PA is at least the length required by the modulation method and is a length enabling recording marks to be completed, and

the mirror area is longer than the longest recording mark of the modulation method.

5,838,659
HIERARCHICAL SYNCHRONIZATION METHOD

Jukka Kainulainen, Helsinki, Finland, assignor to Nokia Telecommunications Oy, Espoo, Finland

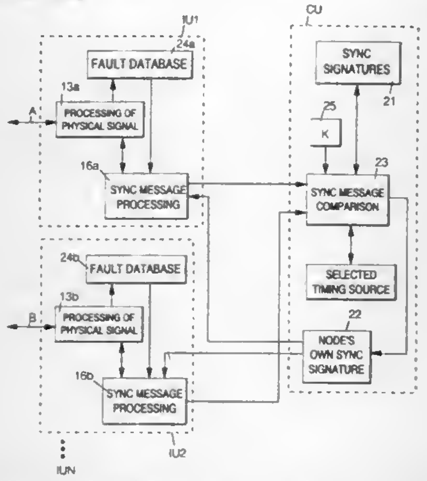
PCT No. PCT/F195/00111, § 371 Date Aug. 14, 1996, § 102(e) Date Aug. 14, 1996, PCT Pub. No. WO95/24800, PCT Pub. Date Sep. 14, 1995

PCT Filed Feb. 28, 1995, Ser. No. 693,163

Claims priority, application Finland, Mar. 1, 1994, 940978

Int. Cl.^{6} H04J *3/06*

U.S. Cl. 370—216 **7 Claims**



1. A method of hierarchical synchronization for a telecommunications system employing message-based synchronization, the system comprising a plurality of nodes interconnected by transmission lines, wherein the nodes interchange signals containing synchronization messages each having a synchronization signature indicating a priority of the corresponding signal in an internal synchronization hierarchy of the system, and wherein a node is forced to enter into a predetermined standard state in a change situation in order to prevent the selection of faulty synchronization messages, the method comprising:

(A) in a change situation,
  (a1) the node entering into a state of forced timing where it has selected a synchronization signature received from a neighboring node and synchronized itself with a clock frequency of a signal from the neighboring node, and upon transition to the state of forced timing,
  (a2) measuring a time period with a timer, and then, after expiry of the time period,
  (a3) the node entering into a state of normal timing, and
(B) when the selected synchronization signature changes while in said state of forced timing,
  (b1) accepting the signature, and
  (b2) restarting measurement of the time period of the forced state, and
(C) when a quality of the signal corresponding to the selected synchronization signature becomes inadequate for synchronization,
  (c1) the node entering into the predetermined standard state in order to prevent the selection of a faulty synchronization signature, and
  (c2) restarting the measuring of the time period of the forced state,

wherein a transition is performed at least whenever a signal is received from said neighboring node through only one transmission line.

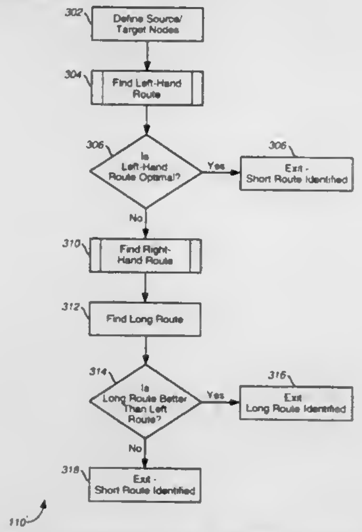
5,838,660
DYNAMIC RESTORATION PROCESS

William D. Croslin, Colorado Springs, Colo., assignor to MCI Communications Corporation, Washington, D.C.

Filed Nov. 14, 1996, Ser. No. 749,168

Int. Cl.^{6} H04J *1/16*

U.S. Cl. 370—216 **8 Claims**


302
Define Source/ Target Nodes
304
Find Left-Hand Route
306
Is Left-Hand Route Optimal?
Yes
306
Exit - Short Route Identified
No
310
Find Right-Hand Route
312
Find Long Route
314
Is Long Route Better Than Left Route?
Yes
316
Exit Long Route Identified
No
318
Exit - Short Route Identified
110

1. A process for generating an optimal restoral route for a telecommunications network having a diverse interconnected set of nodes arranged in a dynamically changing topology updated in a database, the network impacted at a failure point between source and target nodes, the process comprising the steps:

identifying all possible short routes, which are those that accumulate less than a specified maximum threshold of cost, and include either a left-hand route from the source node to the target node, or a right-hand route from the target node to the source node; and

if no short route is found that connects the source and target nodes, then identifying long routes by identifying an intersection of right-hand and left-hand routes.

5,838,661
METHOD AND ARRANGEMENT FOR SHUTTING OFF A RECEIVE CHANNEL IN A DATA COMMUNICATIONS SYSTEM

Geary Leger, Fremont; Bhoopal R. Benjaram, Sunnyvale, and Peter R. Carpenter, Watsonville, all of Calif., assignors to Cirrus Logic, Inc., Fremont, Calif.

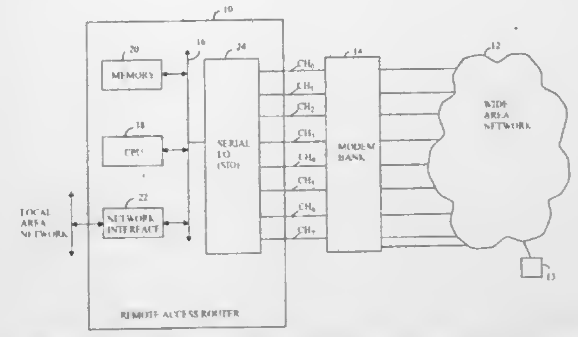
Filed Mar. 27, 1996, Ser. No. 623,260

Int. Cl.^{6} H04J *1/16;3/14*

U.S. Cl. 370—229 **14 Claims**

1. A method of controlling a receive channel in a data communications system that receives data frames, comprising:

setting a shutoff counter with an initial count;



changing the count in the shutoff counter upon the receipt of each data frame to determine a current shutoff count;

shutting off the receive channel when the shutoff counter reaches a predetermined count;

setting a warning storage element with a warning value;

comparing said current shutoff count with the warning value; and

generating an indication of an approaching shutoff when the shutoff count reaches the warning value.

5,838,662
SYSTEM AND METHOD FOR TRANSFERRING DATA

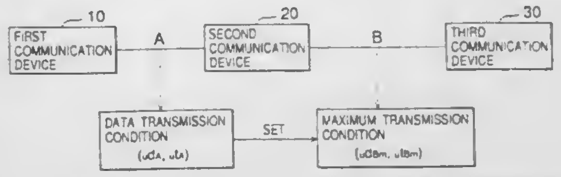
Naoyuki Miyamoto, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed May 30, 1995, Ser. No. 453,358

Claims priority, application Japan, Sep. 26, 1994, 6-229420

Int. Cl.^{6} H04L *12/26;12/56*

U.S. Cl. 370—230 **31 Claims**


10
FIRST COMMUNICATION DEVICE
A
20
SECOND COMMUNICATION DEVICE
B
30
THIRD COMMUNICATION DEVICE
DATA TRANSMISSION CONDITION (uda, uta)
SET
MAXIMUM TRANSMISSION CONDITION (udBm, utBm)

1. A data transfer system comprising a first communication device, a second communication device connected thereto via a first line, a third communication device connected thereto via a second line, and a fourth communication device connected thereto via a third line,

wherein if a data transfer direction from said first communication device to said fourth communication device is defined as an up direction and a data transfer direction from said fourth communication device to said first communication device is defined as a down direction,

said second communication device includes:

an actual data transmission condition acquisition section for monitoring data on a circuit for an up channel of said second line, and detecting actual data length time $({}_u d_{Br})$ and data transmission time interval $({}_u t_{Br})$ to obtain the actual data length time $({}_u d_{Br})$ and data transmission time interval $({}_u t_{Br})$ from the circuit for the up channel,

a busy condition occurrence determination section for comparing maximum data length time $({}_u d_{Bm})$ and data transmission time interval $({}_u t_{Bm})$ for the up channel of the second line which is already stored in the second communication device or the busy condition occurrence determination section to said actual data length time $({}_u d_{Br})$ and data transmission time interval $({}_u t_{Br})$ for the up channel of the second line which is obtained by said actual data transmission condition acquisition section to determine whether or not a busy condition is occurring on the up channel of the second line and to obtain values of the differences between said maximum data length time $({}_u d_{Bm})$ and data transmission time interval $({}_u t_{Bm})$ and said actual length time $({}_u d_{Br})$ and data transmission time interval $({}_u t_{Br})$, respectively;

a data transmission condition determination section for determining a data length time $({}_u d_A)$ and data transmission time interval $({}_u t_A)$ for an up channel of the first line, which allows data to be transferred without causing a busy condition in the data transfer on the up channel of said second line, based on the results output by the busy condition occurrence determination section and using a specified allocation criteria, and

a data transmission condition transmission section for transmitting said data length time $({}_u d_A)$ and data transmission time interval $({}_u t_A)$ determined by the said data transmission condition determining section to said first communication device; and

said first communication device includes:

a data transmission condition reception section for receiving said data length time $({}_u d_A)$ and data transmission time interval $({}_u t_A)$ for the up channel of said first line, which is transmitted by said second communication device, and

a data transmission condition transmission section for enabling data transmission according to said data length time $({}_u d_A)$ and data transmission time interval $({}_u t_A)$ received by the data transmission condition reception section.

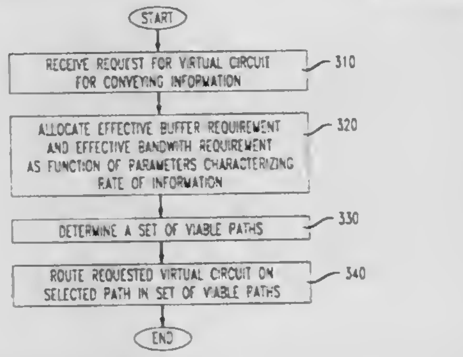
5,838,663
METHOD FOR ADMISSION CONTROL AND ROUTING BY ALLOCATING NETWORK RESOURCES IN NETWORK NODES

Anwar Elwalid, Murray Hill; Debasis Mitra, Summit, and Robert H. Wentworth, Matawan, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of Ser. No. 506,160, Jul. 24, 1995, abandoned. This application Apr. 25, 1997, Ser. No. 845,651

Int. Cl.^{6} H04L *12/56*

U.S. Cl. 370—233 **30 Claims**


START
RECEIVE REQUEST FOR VIRTUAL CIRCUIT FOR CONVEYING INFORMATION
310
ALLOCATE EFFECTIVE BUFFER REQUIREMENT AND EFFECTIVE BANDWITH REQUIREMENT AS FUNCTION OF PARAMETERS CHARACTERIZING RATE OF INFORMATION
320
DETERMINE A SET OF VIABLE PATHS
330
ROUTE REQUESTED VIRTUAL CIRCUIT ON SELECTED PATH IN SET OF VIABLE PATHS
340
END

1. A method comprising the steps of:

receiving a signal representing a request for a virtual circuit for conveying data from a communication device, the requested virtual circuit to be routed through a node connected to a link, said node comprising a buffer of size B and said link being characterized by a capacity C, wherein said data arrives at said node at a rate characterized by a set of parameters, said set of parameters including a long term average rate r, a maximum burst size B_T and a peak rate P;

determining effective bandwidth and buffer space requirements e_0 and b_0 from said set of parameters, wherein a ratio of said effective buffer space requirement b_0 to said buffer size B is substantially equal to a ratio of said effective bandwidth requirement e_0 to said link bandwidth capacity C,

said effective bandwidth requirement e_0 satisfying the expression:

$$e_0 = \frac{P}{1 + \frac{B/C}{B_T}\,(P - r)} \text{ if } r \leqq \frac{B_T}{B/C}\text{ , or } e_0 = r \text{ if } \frac{B_T}{B/C} \leqq r < P;$$

admitting said virtual circuit request if said determined bandwidth and buffer space requirements e_0 and b_0 are less than

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available buffer memory space in said buffer and available link bandwidth capacity in said link.

5,838,664

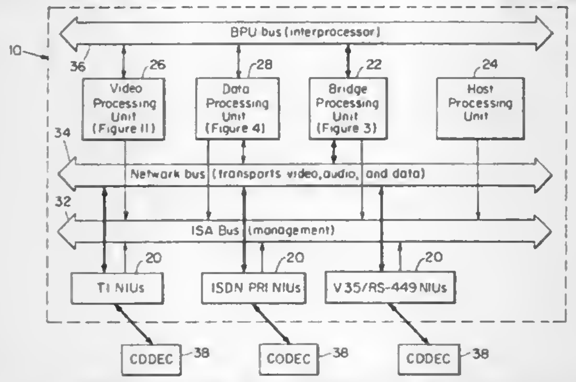
VIDEO TELECONFERENCING SYSTEM WITH DIGITAL TRANSCODING

Mark D. Polomski, Hollis, N.H., assignor to VideoServer, Inc., Burlington, Mass.

Filed Jul. 17, 1997, Ser. No. 896,554

Int. Cl.^{6} H04J *3/22;* **H04N** *7/15*

U.S. Cl. 370—263 **20 Claims**


BPU bus (interprocessor)
10
36
26
28
22
24
Video Processing Unit (Figure 11)
Data Processing Unit (Figure 4)
Bridge Processing Unit (Figure 3)
Host Processing Unit
34
Network bus (transports video, audio, and data)
32
ISA Bus (management)
20
T1 NIUs
ISDN PRI NIUs
V35/RS-449 NIUs
CODEC
38

1. A multipoint control unit for receiving compressed video signals from terminals in a conference and for transmitting selected compressed video signals to the terminals, the multipoint control unit comprising:

a plurality of decoders, each decoder for decoding the compressed video signals from respective terminals to uncompressed video signals in a pixel domain;

a pixel bus receiving the uncompressed video signals at timeslots associated with respective terminals;

a selector for selecting the uncompressed video signals from one or more timeslots of the pixel bus; and

a plurality of encoders, each encoder for encoding the selected uncompressed video signals for transmission to respective terminals.

5,838,665

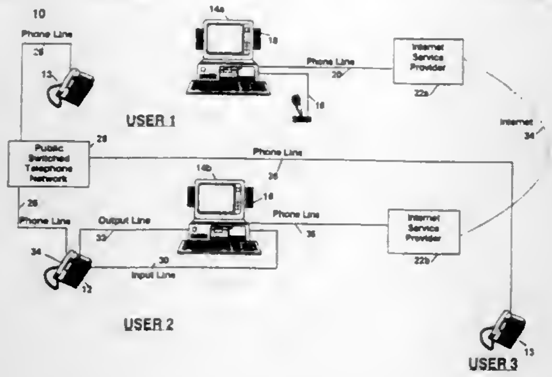
DATA NETWORK TELEPHONE ADAPTOR DEVICE

Simon M. Kahn, and Alan P. Haber, both of Jerusalem, Israel, assignors to Integrated Technology, Inc., Teaneck, N.J.

Filed Mar. 11, 1996, Ser. No. 613,509

Int. Cl.^{6} H04L *12/16;* **H04Q** *11/00;* **H04M** *3/42*

U.S. Cl. 370—260 **14 Claims**



1. A data network/telephone adaptor device for simultaneous telephone conferencing among at least three parties,

a first party having a telephone instrument at one end of a telephone line,

a second party having a first data network terminal linked to the telephone line by the device, the first data network terminal including audio/data encoding means for reversibly encoding voice sounds as data for voice communications over a data network, and

a third party having a second data network terminal including audio/data encoding means for reversibly encoding voice sounds as data for voice communications over the data network,

said data network/telephone adaptor device comprising:

telephone circuit means including isolation circuitry, for terminating the telephone line, and

means for connecting said telephone circuit means to the audio/data encoding means of the first data network terminal to allow for simultaneous telephone conferencing among the first, second and third parties, wherein the second and third parties communicate via the voice-encoded data communications over the data network, and the first party communicates via voice communications over the telephone line with the second party, and in addition via the voice-encoded data communications over the data network with the third party.

5,838,666

RECORDING MEDIUM MANAGEMENT METHOD WHERE RECORDING IS CARRIED OUT BY DATA RECORDING UNITS IN ACCORDANCE WITH MANAGEMENT TABLES

Tatsuya Igarashi, Kanagawa, and Katsuyuki Teranishi, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

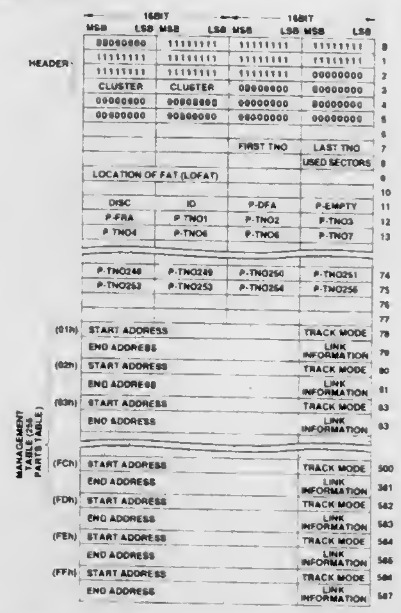
PCT No. PCT/JP94/00964, § 371 Date Mar. 20, 1995, § 102(e) Date Mar. 20, 1995, PCT Pub. No. WO94/29867, PCT Pub. Date Dec. 22, 1994

PCT Filed Jun. 14, 1994, Ser. No. 374,727

Claims priority, application Japan, Jun. 14, 1993, 5-141819; Oct. 28, 1993, 5-270099

Int. Cl.^{6} G11B *7/00*

U.S. Cl. 369—275.3 **29 Claims**



1. A recording medium management method for carrying out management of recording digital data with respect to a recording medium,

wherein management of recording digital data onto the recording medium where recording is carried out in first data recording units is carried out in accordance with a first table,

wherein a designated area of the recording medium is caused to undergo management in accordance with the first table to carry out recording in second data recording units with respect to the designated area,

wherein management of recording digital data onto the recording medium in the designated area, where recording is carried out in second data recording units, is carried out in accordance with a second table,

wherein data corresponding to the respective second data recording units are formed in the second table, and

wherein data corresponding to the respective second data recording units include information indicating whether digital data already has been recorded, in the corresponding second data recording units of the recording medium.

5,838,667

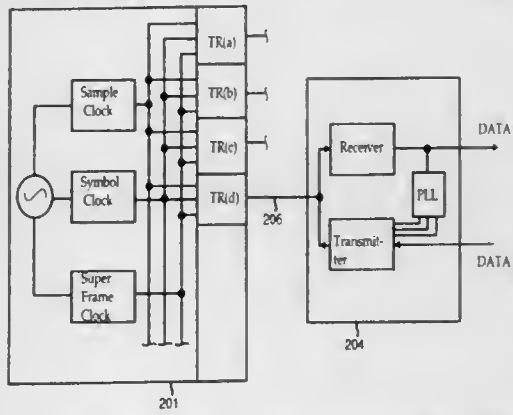
TIME DIVISION DUPLEXED HIGH SPEED DATA TRANSMISSION SYSTEM AND METHOD

John A. C. Bingham, Palo Alto, and Po Tong, Fremont, both of Calif., assignors to AMATI Communications Corporation, San Jose, Calif.

Continuation of Ser. No. 501,250, Jul. 11, 1995, Pat. No. 5,680,394. This application Aug. 13, 1997, Ser. No. 910,125

Int. Cl.^{6} H04J *3/06;* **H04L** *5/14*

U.S. Cl. 370—294 **12 Claims**



1. A central unit for use in a subscriber line based communication system that facilitates bi-directional data transmission between a central unit and a plurality of remote units over distinct transmission lines that share a binder, the central unit comprising:

a plurality of transceivers, each transceiver being suitable for communicating with a selected remote unit over a selectd transmission line:

a synchronizing unit including a superframe clock, a symbol clock and sample clock each of which provide clock signals to each of the transceivers such that each transceiver is arranged to provide periodic downstream communication periods during which the central unit may transmit information to the plurality of remote units and to provide periodic upstream commuinication periods during which the plurality of remote units may trnsmit information to the central unit, the upstream communication periods being arranged such that they do not overlap with the downstream communication periods, whereby data transmissions within the binder are time division duplexed and synchronized such that the transmissions within the binder are transmitted in only one direction at a time.

5,838,668

SATELLITE BROADCAST COMMUNICATIONS SYSTEM

Kazuhiro Okada; Hideki Hieida, and Koichiro Takeda, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

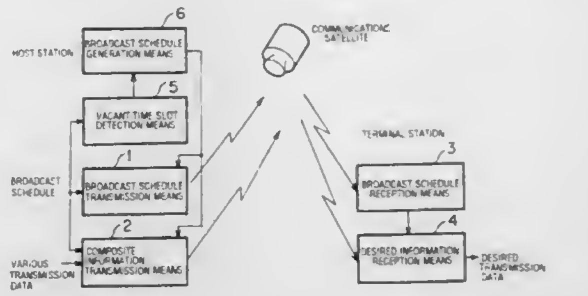
Filed Mar. 26, 1996, Ser. No. 622,701

Claims priority, application Japan, Jun. 13, 1995, 7-146063

Int. Cl.^{6} H04J *3/24*

U.S. Cl. 370—312 **18 Claims**

1. A satellite broadcast communication system in which a host station sends data packet signals to a plurality of terminal stations via a communications satellite comprising:


6
HOST STATION
BROADCAST SCHEDULE GENERATION MEANS
5
VACANT TIME SLOT DETECTION MEANS
1
BROADCAST SCHEDULE
BROADCAST SCHEDULE TRANSMISSION MEANS
2
VARIOUS TRANSMISSION DATA
COMPOSITE INFORMATION TRANSMISSION MEANS
COMMUNICATIONS SATELLITE
TERMINAL STATION
3
BROADCAST SCHEDULE RECEPTION MEANS
4
DESIRED INFORMATION RECEPTION MEANS
DESIRED TRANSMISSION DATA

broadcast schedule transmission means, disposed in the host station, for transmitting a broadcast schedule that defines titles and transmission times for a plurality of transmission data;

composite information transmission means, disposed in the host station, for transmitting the plurality of transmission data in form of data packets at the respective transmission times according to said broadcast schedule;

broadcast schedule reception means disposed in each of the terminal stations, for receiving said broadcast schedule;

desired information reception means, disposed in each of the terminal stations, for receiving desired transmission data at a particular scheduled transmission time described in the broadcast schedule received by said broadcast schedule reception means, selectively from the plurality of transmission data sent form said composite information transmission means in the form of data packets;

vacant time slot detection means, disposed in the host station, for searching said broadcast schedule and thereby detecting vacant time slots during which no data transmission is scheduled;

broadcast schedule generation means, disposed in the host station, for rearranging said broadcast schedule so that said detected vacant time slots are used to send retransmission data duplicating the transmission data once transmitted by said composite information transmission means; and

wherein said broadcast schedule transmission means transmits said broadcast schedule rearranged by said broadcast schedule generation means to said broadcast schedule reception means in the respective terminal stations, and said composite information transmission means transmits the retransmission data to said broadcast schedule reception means in addition to the plurality of transmission data according to said broadcast schedule rearranged by said broadcast schedule generation means.

5,838,669

METHOD OF SYNCHRONIZING SATELLITE SWITCHED CDMA COMMUNICATION SYSTEM

Diakoumis Parissis Gerakoulis, Dover, N.J., assignor to AT&T Corp., Middletown, N.J.

Filed Aug. 28, 1996, Ser. No. 704,041

Int. Cl.^{6} H04J *3/06*

U.S. Cl. 370—320 **16 Claims**

1. A method of synchronizing CDMA processing in a satellite communication system connecting multi-point ground stations, comprising the steps of:

acquiring access and Synchronization signals transmitted by a satellite at a terrestrial subscriber unit;

setting a reference propagation delay time:

establishing a propagation delay in terms of arrival of a message in relation to one of a plurality of quantified timing marks subsequent to the reference propagation delay time, when the satellite receives a first signal from the terrestrial subscriber unit on an access channel;

conveying the established quantified propagation delay to the terrestrial subscriber unit;

adjusting timing of uplink CDMA code chips at the terrestrial subscriber unit from the original reference propagation delay derived from the access channel;

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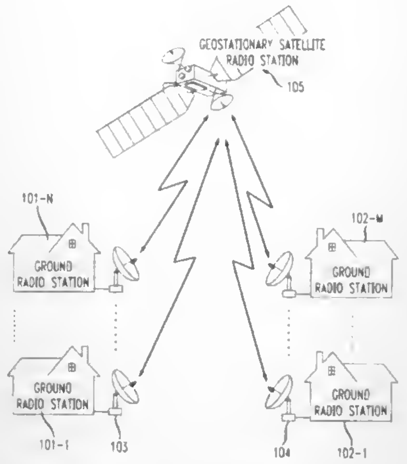


tracking synchronizing by adjusting code delay of the uplink arrival time of a reference code; and

retaining synchronization by downlink code delay transmission.

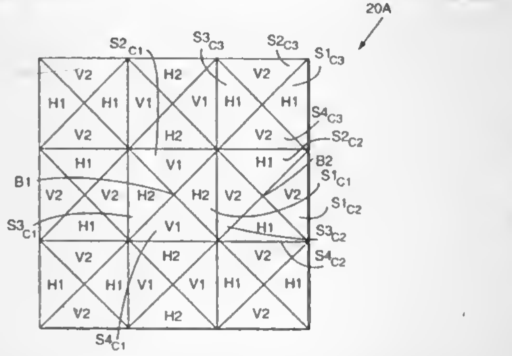
5,838,670
POINT TO MULTIPOINT RADIO ACCESS SYSTEM

Jan-Olof V. Billström, Solna, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Jan. 29, 1997, Ser. No. 790,477

Int. Cl.⁶ H04J *3/16*

U.S. Cl. 370—328 **31 Claims**



1. A radio access system comprising at least a first cell and a second cell, the first cell having at least four base station antennae, each of the four base station antennae transmitting a microwave carrier to one of a corresponding at least four sectors of the first cell, a band of the microwave carrier being divided into at least a first set of channels and a second set of channels, wherein a first base station antenna serving a first sector of the first cell transmits on the first set of channels and a second base station antenna serving a second sector of the first cell adjacent the first sector transmits on the second set of channels, and wherein at least two of the base station antennae of the first cell have differing polarizations;

the second cell being adjacent to the first cell, and wherein a second cell base station antenna transmits either on a different one of the separate sets of channels or with a different polarization than any first cell base station antenna with which it is aligned.

5,838,671
METHOD AND APPARATUS FOR CALL ADMISSION CONTROL IN CDMA MOBILE COMMUNICATION SYSTEM

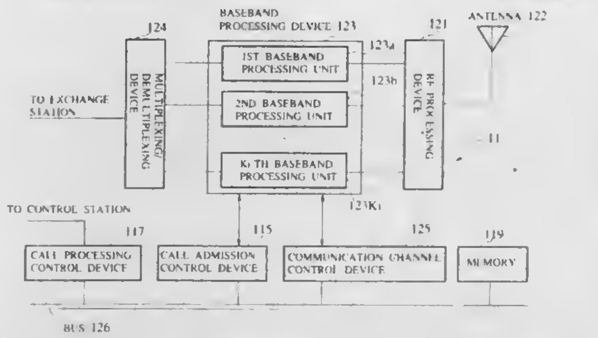
Yoshihiro Ishikawa, and Narumi Umeda, both of Yokohamashi, Japan, assignors to NTT Mobile Communications Network Inc., Tokyo, Japan

Filed Jun. 18, 1996, Ser. No. 665,407

Claims priority, application Japan, Jun. 23, 1995, 7-158036; Sep. 20, 1995, 7-241848; Dec. 14, 1995, 7-326056

Int. Cl.⁶ H04B *7/216*

U.S. Cl. 370—335 **50 Claims**


BASEBAND
PROCESSING DEVICE 123
124
121
ANTENNA 122
123a
123b
1ST BASEBAND PROCESSING UNIT
2ND BASEBAND PROCESSING UNIT
Ki TH BASEBAND PROCESSING UNIT
MULTIPLEXING/DEMULTIPLEXING DEVICE
RF PROCESSING DEVICE
TO EXCHANGE STATION
11
TO CONTROL STATION
123Ki
117
115
125
119
CALL PROCESSING CONTROL DEVICE
CALL ADMISSION CONTROL DEVICE
COMMUNICATION CHANNEL CONTROL DEVICE
MEMORY
BUS 126

1. A method of call admission control in a CDMA mobile communication system having a plurality of base stations and mobile stations, the method comprising the steps of:

calculating at each base station a blocking probability and an outage probability of communication quality within a radio zone of each base station;

adjusting at each base station a maximum number of simultaneously connectable users within a radio zone of each base station according to the blocking probability and the outage probability of communication quality calculated at the calculating step; and

carrying out at each base station a call admission control for each new call occurred within a radio zone of each base station according to the maximum number of simultaneously connectable users adjusted at the adjusting step.

5,838,672
METHOD FOR MEASURING THE TIMING OF A RECEIVED SIGNAL IN A COMMUNICATION SYSTEM AND MOBILE STATION IMPLEMENTING THE METHOD

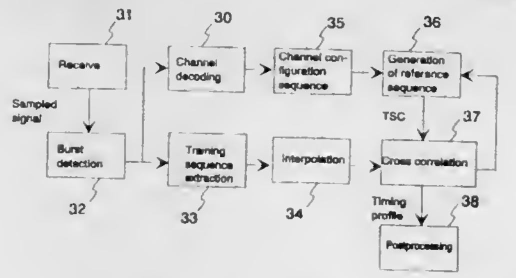
Jukka Tapio Ranta, Salo, Finland, assignor to Nokia Mobile Phones Ltd., Finland

Filed Sep. 30, 1996, Ser. No. 723,016

Claims priority, application Finland, Oct. 3, 1995, 954704

Int. Cl.⁶ H03H *7/30;* **H03K** *5/159;* **H04Q** *7/00*

U.S. Cl. 370—335 **12 Claims**



1. A method for measuring the timing of a received signal in a digital mobile communication system where bursts, each including a training sequence, are transmitted between a mobile station and a base station and a selected training sequence is stored in memory in the mobile station, wherein the steps comprise:

receiving a burst at the mobile station;

extracting a training sequence from the burst and performing a determination of correlation between the training sequence extracted from the burst and the selected training sequence stored in the memory to obtain a result, and

measuring the timing of a received signal on the basis of the result obtained from said determination of correlation, characterized in that

said timing is measured using the result obtained from the determination of correlation of training sequences extracted from at least two received bursts.

5,838,673
RADIO TELEPHONE SYSTEM FOR MINIMIZING CO-CHANNEL INTERFERENCE UTILIZING GEOGRAPHIC SEPARATION OF SIGNALS AND TRANSMISSION POWER CONTROL

Mordechai Ritz, Givat Elah; Giora Silbershatz, Haifa, and Shmuel Miller, Tal-El, all of Israel, assignors to Geotek Industries, Inc., Montvale, N.J.

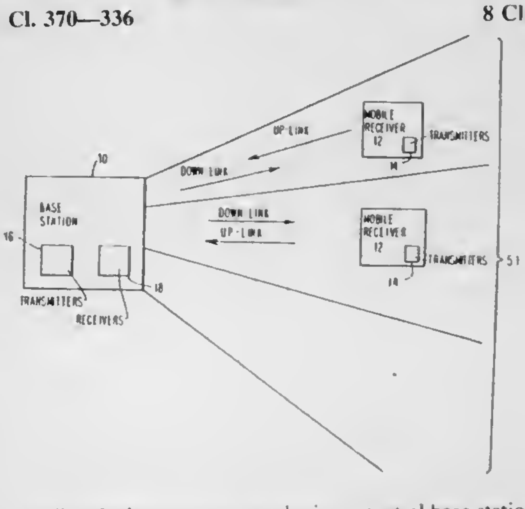
PCT No. PCT/US94/14562, § 371 Date Jul. 2, 1996, § 102(e) Date Jul. 2, 1996, PCT Pub. No. WO95/17048, PCT Pub. Date Jun. 22, 1995

PCT Filed Dec. 16, 1994, Ser. No. 557,030

Claims priority, application Israel, Dec. 16, 1993, 108056

Int. Cl.⁶ H04B *1/713*

U.S. Cl. 370—336 **8 Claims**



1. A radio telephone system employing a central base station and a plurality of mobile receivers for operating in an area divided into a plurality of transmission sectors extending radially outward from said base station, said base station assigning a plurality of frequency hopping radio channels to each of said plurality of transmission sectors, said frequency hopping radio channels having at least first, second and third time division time slots, said system comprising:

a first geographic zone located in the central portion of a first of said transmission sectors, said base station being capable of assigning a first of said time division time slots of each of said radio channels assigned to said first of said transmission sectors to a first set of users located in said first geographic zone;

a second geographic zone located in a fringe portion of said first of said transmission sectors, said base station being capable of assigning a second of said time division time slots of each of said radio channels assigned to said first of said transmission sectors to a second set of users located in said second geographic zone;

a third geographic zone located in a fringe portion of a second of said transmission sectors, said base station being capable of assigning said first of said time division time slots of each of said radio channels assigned to said second of said transmission sectors to a third set of users located in said third geographic zone;

a transmitter in said base station for generating transmissions from said base station in said first of said transmission sectors covering said first of said transmission sectors and overlapping into said third geographic zone of said second of said transmission sectors, said first sector transmissions from said base station in said first time division time slot having a first down-link transmission power;

a transmitter in said base station for generating transmissions from said base station in said second of said transmission sectors covering said second of said transmission sectors and overlapping into said second geographic zone of said first of said transmission sectors, said second sector transmissions from said base station in said first time division time slot having a second down-link transmission power, said first down-link transmission power being less than said second down-link transmission power.

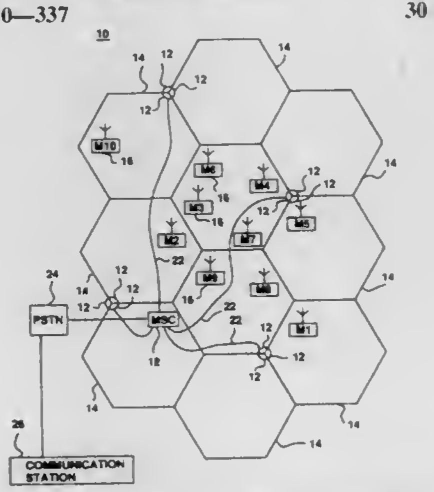
5,838,674
CIRCUITRY AND METHOD FOR TIME DIVISION MULTIPLE ACCESS COMMUNICATION SYSTEM

Ulf Göran Forssén, Saltsjö-Boo, and Carl Fredric Ulf Kronestedt, Stockholm, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Jul. 31, 1996, Ser. No. 690,568

Int. Cl.⁶ H04J *3/16*

U.S. Cl. 370—337 **30 Claims**



1. In a communication device operable to transmit communication signals in a time-division multiple access communication system defining at least one carrier frequency divided into a plurality of time slots of which at least a selected time slot thereof forms a traffic channel, the carrier frequency permitting tuning of a selected remote communication station thereto to detect signal energy thereon, an improvement of circuitry for concurrently transmitting a first communication signal to a first remote communication station and at least a second communication signal to at least a second remote communication station upon the traffic channel formed of the selected time slot, the first and at least second remote communication stations spatially spaced apart from one another and positioned at any location within a selected area, said circuitry comprising:

a plurality of antennas selectively coupled to the communication device to receive the first communication signal and the at least second communication signal therefrom, said plurality of antennas for concurrently transducing the first communication signal and the at least second communication signal upon the traffic channel; and

an antenna pattern former coupled to receive indications of positioning, from the communication device, of the first and second remote communication stations, respectively, said antenna pattern former for selectively coupling the first communication signal to at least a first set of said plurality of antennas in a manner to form a first antenna beam pattern for transmission of the first communication signal pursuant thereto, the first antenna beam pattern encompassing the positioning of the first remote communication station and for selectively coupling the at least second communication signal to at least a second set of said plurality of antennas in a manner to form at least a second antenna beam pattern for

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transmission of the second communication signal pursuant thereto, the second antenna beam pattern encompassing the positioning of the second remote communication station, the first antenna beam pattern and the at least second antenna beam pattern together encompassing the selected area such that, when positioned within the selected area and tuned to the carrier frequency, the selected remote communication station detects the signal energy of at least one of the first and second communication signals, respectively.

5,838,675

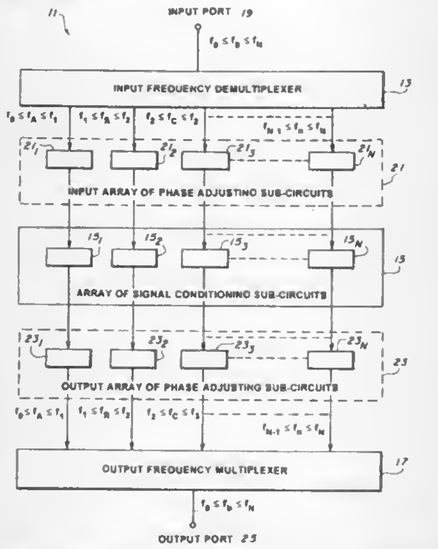
CHANNELIZED RECEIVER-FRONT-END PROTECTION CIRCUIT WHICH DEMULTIPLEXES BROADBAND SIGNALS INTO A PLURALITY OF DIFFERENT MICROWAVE SIGNALS IN RESPECTIVE CONTIGUOUS FREQUENCY CHANNELS, PHASE ADJUSTS AND MULTIPLEXES CHANNELS

Christen Rauscher, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 3, 1996, Ser. No. 674,951

Int. Cl.^{6} H04J *1/00;1/02;3/04;* **H04B** *1/10*

U.S. Cl. 370—343 **24 Claims**


11
INPUT PORT 19
$f_0 \le f_b \le f_N$
INPUT FREQUENCY DEMULTIPLEXER
13
$f_0 \le f_A \le f_1$
$f_1 \le f_B \le f_2$
$f_2 \le f_C \le f_3$
$f_{N-1} \le f_n \le f_N$
21
INPUT ARRAY OF PHASE ADJUSTING SUB-CIRCUITS
15
ARRAY OF SIGNAL CONDITIONING SUB-CIRCUITS
23
OUTPUT ARRAY OF PHASE ADJUSTING SUB-CIRCUITS
OUTPUT FREQUENCY MULTIPLEXER
17
OUTPUT PORT 25

1. A receiver front-end channelized receiver protection circuit for protecting a wideband receiver from detrimental effects of interference signals within the bandwidth of received signals, said receiver channelized protection circuit comprising:

a frequency demultiplexer for separating a broadband input signal into a plurality of different signal components in respective contiguous frequency channels;

a plurality of signal conditioning sub-circuits respectively responsive to said plurality of different signal components for selectively performing a conditioning operation on said plurality of different signal components to produce a plurality of conditioned signal components each of which is not detrimently affected by disturbances from signal components from other contiguous frequency channels; and

a frequency multiplexer having a plurality of contiguous frequency channels for recombining said plurality of conditioned signal components into a composite signal of original bandwidth and at a safe power level.

5,838,676

Patent Not Issued For This Number

5,838,677

SWITCHING SYSTEM HAVING MEANS FOR CONGESTION CONTROL BY MONITORING PACKETS IN A SHARED BUFFER AND BY SUPPRESSING THE READING OF PACKETS FROM INPUT BUFFERS

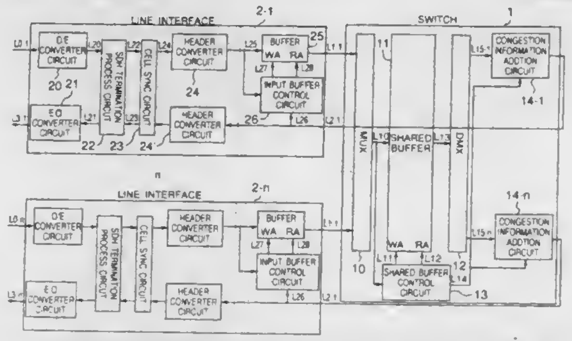
Takahiko Kozaki, Tokyo; Masahiro Takatori, Yokohama; Noboru Endo, Kodaira; Akihiko Takase, Tokyo, and Yozo Oguri, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 15, 1996, Ser. No. 633,306

Claims priority, application Japan, Apr. 18, 1995, 7-092198

Int. Cl.^{6} H04Q *11/04*

U.S. Cl. 370—389 **42 Claims**



1. A switching system connected to a plurality of input lines and a plurality of output lines, comprising:

a plurality of input buffers provided for said input lines;

a plurality of input buffer control circuits corresponding to said input buffers, each input buffer control circuit writes a packet arriving at one of said input lines in one of said input buffers and reads said packet from said one input buffers, said packet being distributed to one of said output lines as a destination;

a switch which temporarily stores packets read from the plurality of input buffers in a shared buffer, and distributes each packet to one of said output lines determined as a destination by header information of said packet;

a monitor circuit which monitors a storage state of packets in said shared buffer on a destination output line basis, and generates congestion control information representing a congested output line; and

a congestion notifying circuit which notifies each of said input buffer control circuits of said congestion control information,

wherein each of said input buffer control circuits decides whether to read said packet from said input buffer in accordance with said congestion control information.

5,838,678

METHOD AND DEVICE FOR PREPROCESSING STREAMS OF ENCODED DATA TO FACILITATE DECODING STREAMS BACK-TO BACK

Joseph W. Davis, 2776 Peachtree Walk, and Shawn M. Hayes, 1100 N. Court Dr., both of Duluth, Ga. 30136

Filed Jul. 24, 1996, Ser. No. 686,629

Int. Cl.^{6} H04J *3/24*

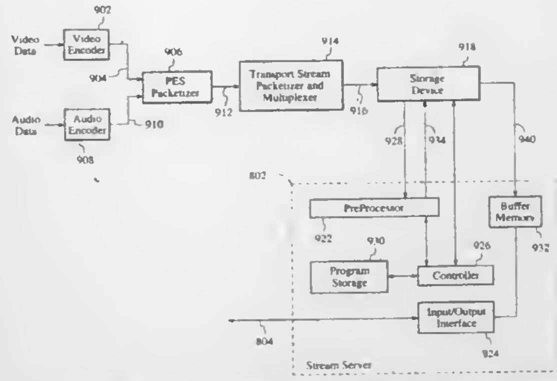
U.S. Cl. 370—389 **17 Claims**

1. A method for preprocessing multiplexed streams of packets of packetized, encoded, audio and video sequences such that an audio decoder can decode the encoded audio sequence to produce an audio sequence and a video decoder can, without being reset, decode the encoded video sequence to produce a video sequence, the method including the steps of:

a) verifying that a multiplexed stream complies with an encoding standard for audio and video data;

b) preprocessing packets of the packetized, encoded, video sequence such that no video artifacts are produced when the video decoder decodes another encoded video sequence adjacent to the encoded video sequence; and

c) preprocessing the packets of packetized, encoded, audio data sequence such that a start time of the audio sequence is within a first predetermined time of a start time of the video sequence and a temporal length of the audio sequence is within a second predetermined time of a temporal length of the video sequence.



5,838,679

ASYNCHRONOUS TRANSFER MODE (ATM) MULTI-CHANNEL SWITCH WITH STRUCTURE OF GROUPING/ TRAP/ROUTING

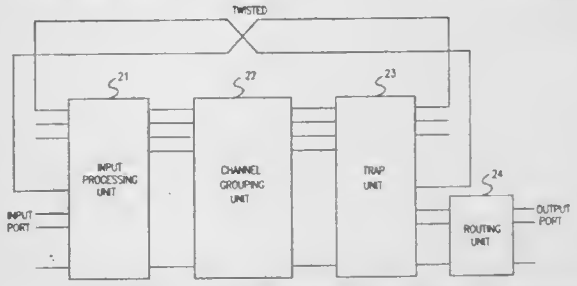
Hyup Jong Kim; Kyeong Soo Kim, and Chan Pak, all of Daejeon, Rep. of Korea, assignors to Electronics and Telecommunciations Research Institute, Daejeon, and Korea Telecommunication Authority, Seoul, both of Rep. of Korea

Filed Jul. 6, 1995, Ser. No. 499,071

Claims priority, application Rep. of Korea, Dec. 15, 1994, 1994-34513; Dec. 21, 1994, 1994-35747

Int. Cl.^{6} H04L *12/56*

U.S. Cl. 370—395 **8 Claims**



1. An ATM multi-channel switch with a structure of grouping/ trap/routing comprising:

an input processing means for executing reading control of externally inputted cells and adjusting synchronization between an externally inputted cell and a cell returned by blocking and feedback, said input processing means comprising:

- a serially connected latching means, a number thereof being input port numbers plus one, for latching control cell data;
- a multiplexing means for multiplexing each cell outputted from said latching means; and
- a multiplexing control means for controlling operations of said latching means and said multiplexing means.

a channel grouping means for grouping cells outputted from said input processing means according to switching control data;

a trapping means for deciding whether cells grouped in said channel grouping means require switching beyond the capacity of the channel and, if these cells require switching beyond the capacity of the channel, sending them to said input processing means by feedback; and

a routing means for routing cells outputted from said trapping means.

5,838,680

ATM CELL SWITCH WITH MASTER AND SLAVE DEMULTIPLEXER MODULES AND REDUCED CURRENT FLUCTUATIONS

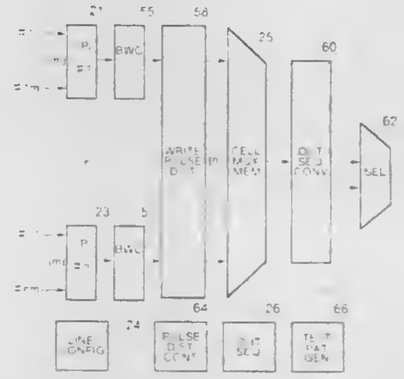
Akira Noiri; Tatsuhiko Kitamura; Mitsuhiro Murasugi, and Hiromichi Wada, all of Tokyo, Japan, assignors to OKI Electric Industry, Co., Ltd., Tokyo, Japan

Filed Aug. 7, 1995, Ser. No. 511,890

Claims priority, application Japan, Aug. 12, 1994, 6-190341

Int. Cl.^{6} H04L *12/56*

U.S. Cl. 370—395 **27 Claims**



1. An ATM cell switch for routing cells from a plurality of input ports to a plurality of output ports according to headers contained in the cells, comprising:

a certain number of input memories for temporarily storing the cells received from said input ports, before said cells are routed to said input ports, each input port supplying cells to just one of said input memories,

a write pulse distributor coupled to said input memories for distributing write pulses to said input memories, causing data of said cells to be written in said input memories; and

a pulse distribution controller coupled to said write pulse distributor, for staggering said write pulses so that not more than M of said input memories receive said write pulses simultaneously, where M is a certain positive integer less than the number of input memories.

5,838,681

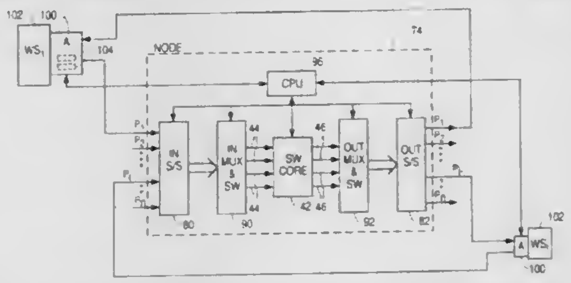
DYNAMIC ALLOCATION OF PORT BANDWIDTH IN HIGH SPEED PACKET-SWITCHED DIGITAL SWITCHING SYSTEMS

Flavio Bonomi, 526 Lowell Ave., Palo Alto, Calif. 94301; Kent H. Headrick, 35266 Severn Dr., Newark, Calif. 94560, and Amit Shah, 880 Bremerton Dr., Sunnyvale, Calif. 94087

Filed Jan. 24, 1996, Ser. No. 590,970

Int. Cl.^{6} H04L *12/56*

U.S. Cl. 370—395 **35 Claims**



1. A system for cross connecting users in a packet-switched network comprising a node having a plurality of input and output ports for receiving data from and routing data to the users, the node having means for routing data from any user to one or more other users and having a maximum capacity at which data can be routed through the node, each port having a maximum data rate capacity.

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an actual transmission rate of data through the port, and an unused data rate capacity equal to the difference between the maximum data rate capacity and the actual transmission rate of the data; an adapter at each user for interfacing the user to the network, the adapter having means for transmitting data from each user to a corresponding input port and for receiving data from a corresponding output port; and control means for dynamically allocating the unused data rate capacity of the ports in response to the actual data rate requirements of the ports such that the aggregate data rates of the ports do not exceed said maximum capacity of the switch.

5,838,682

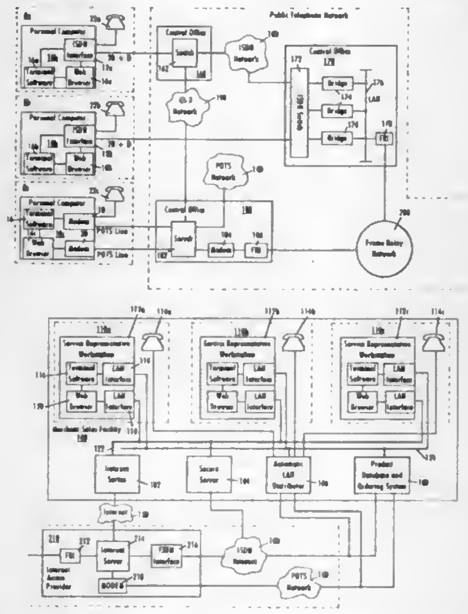
METHOD AND APPARATUS FOR ESTABLISHING COMMUNICATIONS WITH A REMOTE NODE ON A SWITCHED NETWORK BASED ON HYPERTEXT DIALING INFORMATION RECEIVED FROM A PACKET NETWORK

George J. Dekelbaum, Basking Ridge; Philip J. Fischer, Bedminster, both of N.J.; Charles N. Judice, Rochester, N.Y.; Richard G. Backus, Manassas, Va., and Stephen J. Flaherty, Upper Marlboro, Md., assignors to Bell Atlantic Network Services, Inc., Arlington, Va.

Filed Nov. 28, 1995, Ser. No. 563,243

Int. Cl.⁶ H01L *12/66*

U.S. Cl. 370—401 **46 Claims**



1. A terminal device for retrieving information from a plurality of remote information sites on a first communications network and, in response to the retrieved information, establishing communications with a remote node on a second communications network distinct from the first communications network, the terminal device comprising:

- a first communications interface connected to the first communications network for receiving address data from a selected one of the remote information sites;
- an output device connected to said first communications interface for providing said address data;
- an input device for designating said address data; and
- a second communications interface connected to the second communications network and responsive to a designation of said address data by said input device for establishing communications with the remote node corresponding to said address data.

5,838,683

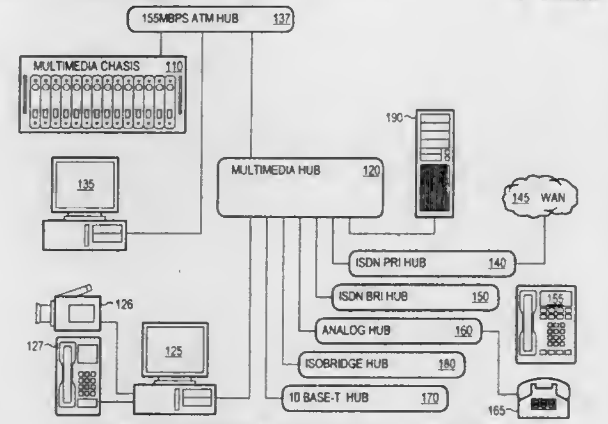
DISTRIBUTED INTERACTIVE MULTIMEDIA SYSTEM ARCHITECTURE

Robert David Corley, Carrollton; Richard A. Dunlap, Euless; Paul S. Hahn, Plano; Michael H. McClung, Dallas, and Christopher E. Pearce, Addison, all of Tex., assignors to Selsius Systems Inc., Dallas, Tex.

Filed Mar. 13, 1995, Ser. No. 402,834

Int. Cl.⁶ H04J *3/24*

U.S. Cl. 370—408 **98 Claims**



1. A survivable communications network, comprising:

- first and second manager subsystems, said first and second manager subsystems having first and second equivalent manager subsystem resources associated therewith, respectively;
- first and second central hubs, each of said first and second central hubs having first and second equivalent central hub resources associated therewith, respectively;
- a peripheral hub having peripheral hub resources associated therewith;
- a common bus capable of coupling a selectable one of said first and second central hubs to a selectable one of said first and second manager subsystems, said first central hub thereby capable of decoupling from a failed one of said first and second manager subsystems and coupling instead to an operating one of said first and second manager subsystems, said second central hub thereby capable of decoupling from a failed one of said first and second manager subsystems and coupling instead to a functioning one of said first and second manager subsystems; and
- first and second redundant channels coupling said peripheral hub to said first and second central hubs, respectively, said peripheral hub thereby capable of decoupling from a failed one of said first and second central hubs and coupling instead to a functioning one of said first and second central hubs, said network thereby able to survive failure of a selected one of said first and second manager subsystems and a selected one of said first and second central hubs.

5,838,684

LOW LATENCY, HIGH CLOCK FREQUENCY PLESIOASYNCHRONOUS PACKET-BASED CROSSBAR SWITCHING CHIP SYSTEM AND METHOD

Thomas M. Wicki, Palo Alto; Jeffrey D. Larson, San Jose; Albert Mu, Milpitas, and Raghu Sastry, Santa Clara, all of Calif., assignors to Fujitsu, Ltd., Japan

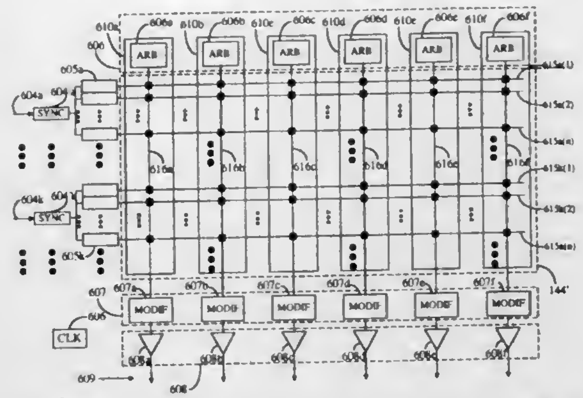
Filed Feb. 22, 1996, Ser. No. 603,926

Int. Cl.⁶ H04L *12/56*

U.S. Cl. 370—416 **10 Claims**

1. A router circuit for communicating with neighboring circuits comprising:

- a plurality of input ports for receiving frames of data, each frame including a plurality of data words;
- a plurality of output ports for transmitting frames of data;
- a plurality of input buffers for storing data words received at an input port, at least one input port coupled to send data words to at least two input buffers;



- a crossbar switch having a plurality of inputs and outputs, each input buffer coupled to an input of the crossbar switch dedicated to said input buffer, each output port coupled to an output of the crossbar switch dedicated to said output port, the crossbar switch for switchably coupling any input buffer to any output port; and
- a plurality of arbiter subsystems, at least one arbiter subsystem dedicated to each output port, each arbiter subsystem for non-iteratively selecting a connection path from one of the input buffers, through the crossbar switch, and to the corresponding output port.

5,838,685

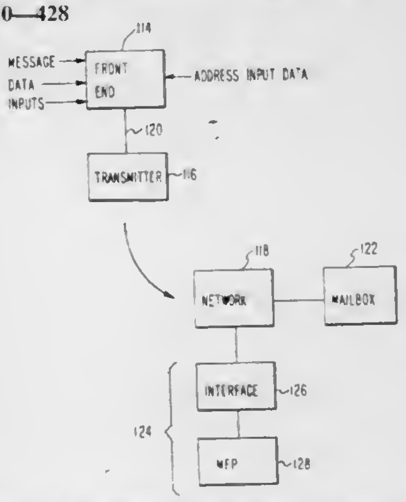
METHOD AND APPARATUS FOR THE TRANSMISSION OF DATA FILES

Gary Hochman, 17 Windsor Dr., Muttontown, N.Y. 11753

Filed Feb. 6, 1997, Ser. No. 797,554

Int. Cl.⁶ H04J *3/24;* **H04Q** *11/04*

U.S. Cl. 370—428 **7 Claims**



1. A method for the integrated transmission of store-and-forward messages of varying data formats over a network, comprising the steps of:

- composing a message body of an identified data format for an intended recipient;
- annexing to said message body a unique identifier corresponding to the data format of the message body;
- transmitting the identifier and message body through the network for reception by a host facility;
- inspecting the identifier at the host facility to identify the data format of the message body; and
- advising the recipient of the receipt of the message and its data format.

5,838,686

SYSTEM FOR DYNAMICALLY ALLOCATING A SCARCE RESOURCE

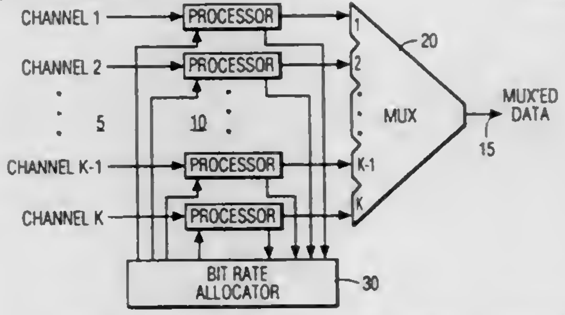
Mehmet Kemal Ozkan, Indianapolis, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

PCT No. PCT/US94/04421, § 371 Date Oct. 11, 1996, § 102(e) Date Oct. 11, 1996, PCT Pub. No. WO95/29546, PCT Pub. Date Nov. 2, 1995

PCT Filed Apr. 22, 1994, Ser. No. 722,165

Int. Cl.⁶ H04J *3/17*

U.S. Cl. 370—433 **13 Claims**



1. A system for dynamically allocating a resource, comprising:

- a plurality of resource users (**5**);
- a resource (**15**,**20**) having a maximum utilization level sharable among the plurality of resource users (**5**);
- a plurality of need analyzers (**10**,**16**), associated with respective resource users (**5**), for dynamically generating respective signals (COMPLEXITY), each representing the relative need for the resource by the associated resource user (**5**);
- a plurality of access controllers (**10**,**14**), associated with respective resource users (**5**), for controlling access to the resource (**15**,**20**) by the associated user (**5**) in response to an allocation signal (CONTROL); and
- a resource allocator (**30**), for dynamically generating respective allocation signals (CONTROL) representing allocated resource utilization levels, in response to the plurality of need representative signals (COMPLEXITY) from the need analyzers (**10**,**16**);
- wherein said need representing signals represent the needs of picture signals from different sources, respectively.

5,838,687

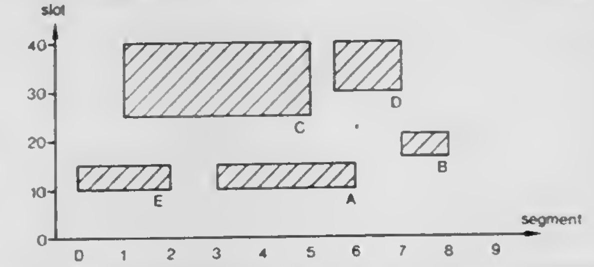
SLOT REUSE METHOD AND ARRANGEMENT

Lars Ramfelt, Kista, Sweden, assignor to Dynarc AB, Sweden

Filed Nov. 27, 1996, Ser. No. 757,347

Int. Cl.⁶ H04J *3/16*

U.S. Cl. 370—443 **13 Claims**



1. A slot reuse method for increasing a throughput in a dynamic synchronous transfer mode (DTM) network, the method comprising the steps of:

- providing a DTM block token format having a capacity;
- providing a source and a destination node;
- providing parameters and segments;
- providing disjointed segments of the DTM network;
- providing a plurality of slots;

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extending the DTM block token format to include the parameters describing the segments disposed between the source and the destination node;

reserving the capacity of the DTM block token format only on the segments disposed between the source and the destination node; and

transmitting the throughput simultaneously in the same slot over disjointed segments of the DTM network.

5,838,688

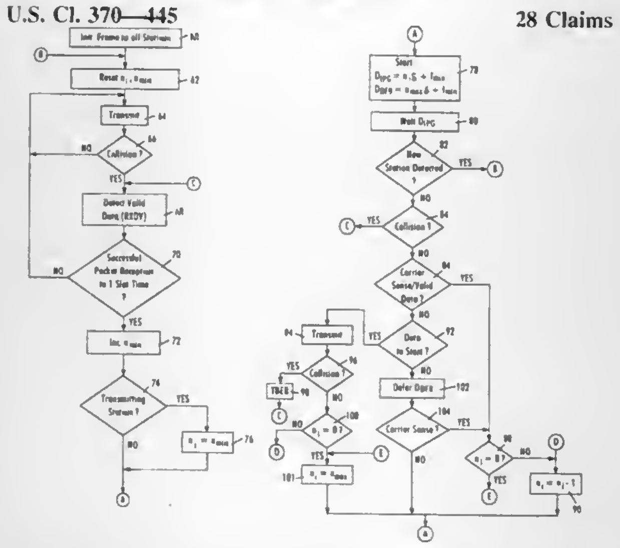
DETERMINING THE NUMBER OF ACTIVE NUDES ON AN ETHERNET NETWORK BY COUNTING A NUMBER OF PACKET RECEPTIONS

Jayant Kadambi, Milpitas; Mohan Kalkunte, Sunnyvale, and Jim Mangin, San Ramon, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 11, 1996, Ser. No. 730,725

Int. Cl.^{6} H04B *7/14*

U.S. Cl. 370—445 **28 Claims**



20. A network interface for connection with media of a network, comprising:

a carrier sensor configured to identify a successful packet reception on the media;

a collision detector capable of detecting a collision on the media;

a controller for determining a number of stations active on the media based on a number of the successful packet receptions beginning within a predetermined slot time after respective detected collisions, the controller setting a delay integer based on the successful packet receptions and within a range including zero and the determined number of stations;

a programmable timer counting, based on the successful packet reception on the media, a first interval including a multiple of the delay integer and a predetermined delay interval, the predetermined delay interval being related to the predetermined slot time; and

a transmitter outputting a data packet onto the media after an absence of activity determined by said sensor during a deferral interval including said first interval and a predetermined interpacket gap interval.

5,838,689

CELL RECEIVER

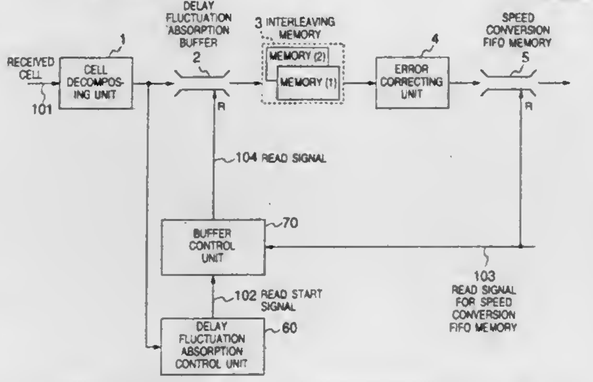
Akito Fukui, Yokohama; Shinobu Yagi, Machida, and Katsuyuki Yamazaki, Tokyo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd, Osaka, and Kokusai Denshin Denwa Co., Ltd., Tokyo, both of Japan

Filed Jul. 8, 1996, Ser. No. 676,955

Claims priority, application Japan, Jul. 11, 1995, 7-174707; Jul. 13, 1995, 7-177765

Int. Cl.^{6} H04J *3/16*

U.S. Cl. 370—465 **7 Claims**



1. A cell receiver for receiving a cell assembled from data of a fixed speed and recovering the data of the original fixed speed, comprising:

a delay fluctuation absorption buffer for storing a received cell and absorbing a delay fluctuation of the received cell:

an interleaving memory for storing data output from said delay fluctuation absorption buffer for the execution of octet interleaving;

error correcting means for correcting any error in the data by using error detecting codes included in the data output from said interleaving memory;

a speed conversion FIFO memory for storing the data excepting the error correcting codes output from said error correcting means, and for converting the data into data having the original fixed speed by reading the data stored in the speed conversion FIFO memory out in synchronism with a first read signal;

delay fluctuation absorption control means for counting the number of received cells and generating a read start signal indicating a timing when a cell is read from said delay fluctuation absorption buffer; and

buffer control means, responsive to the first read signal, for generating a second read signal for reading a cell from said delay fluctuation absorption buffer.

5,838,690

METHOD FOR DYNAMICALLY ASSIGNING COMMUNICATION BANDS

Hideaki Kano; Kensuke Inoue, both of Yokohama, and Naoki Ono, Kawasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 12, 1996, Ser. No. 747,676

Claims priority, application Japan, Nov. 13, 1995, 7-293209

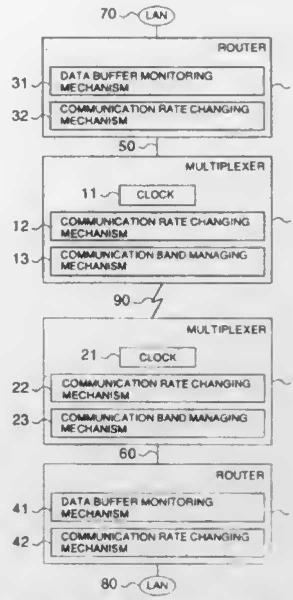
Int. Cl.^{6} H04J *3/00*

U.S. Cl. 370—468 **14 Claims**

1. A method for dynamically assigning communication bands in a network system, said network system including at least a first network and a second network each having a plurality of terminal devices connected thereto, a first inter-network connection unit connected to said first network to perform data transmission between said first network and said second network, a second inter-network connection unit connected to said second network to perform data transmission between said first network and said second network, a first multiplexer connected to said first inter-network connection unit, a second multiplexer connected to said second inter-network connection unit, and a multiplex line for transmitting multiplexed data between said first multiplexer and said second multiplexer, said method comprising the steps of:

detecting arrival of time when a communication band assigned to said first inter-network connection unit is to be change, using said first multiplexer on the basis of information preset in a managing table for managing a communication band to be assigned to said first inter-network connection unit in time base; and

changing a communication band assign to the first inter-network connection unit in response to said detection of the arrival of the time of changing.


70
LAN
ROUTER
31
DATA BUFFER MONITORING MECHANISM
32
COMMUNICATION RATE CHANGING MECHANISM
30
50
MULTIPLEXER
11
CLOCK
12
COMMUNICATION RATE CHANGING MECHANISM
13
COMMUNICATION BAND MANAGING MECHANISM
10
90
MULTIPLEXER
21
CLOCK
22
COMMUNICATION RATE CHANGING MECHANISM
23
COMMUNICATION BAND MANAGING MECHANISM
20
60
ROUTER
41
DATA BUFFER MONITORING MECHANISM
42
COMMUNICATION RATE CHANGING MECHANISM
40
80
LAN

5,838,691

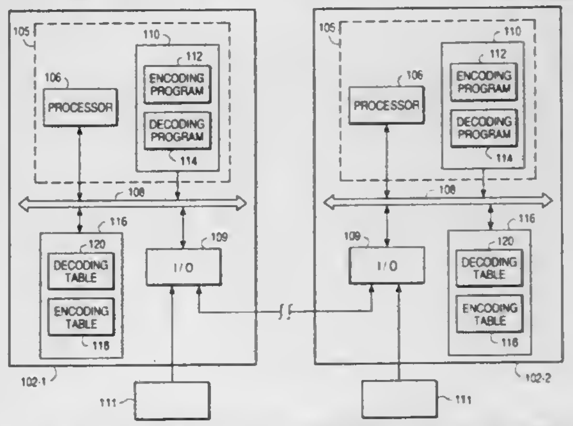
CODEBOOK-BASED LOSSY DATA COMPRESSION ENCODING SYSTEM

Ke-Chiang Chu, Saratoga; Dulce Ponceleon, Palo Alto, and James Normile, Woodside, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Sep. 30, 1996, Ser. No. 723,695

Int. Cl.^{6} G03F *11/00*

U.S. Cl. 391—5.1 **10 Claims**



1. A method for searching a codebook comprising a plurality of records and a plurality of codes, each record having an associated code, the method comprising:

(a) determining during a sample period, for each of the plurality of records, a frequency of occurrence of receiving input data matching the record;

(b) sorting the records by their frequency of occurrence;

(c) selecting a record that matches a received input from the sorted records that have a selected number M greatest frequencies of occurrence; and

(d) retrieving the code associated with the selected record.

5,838,692

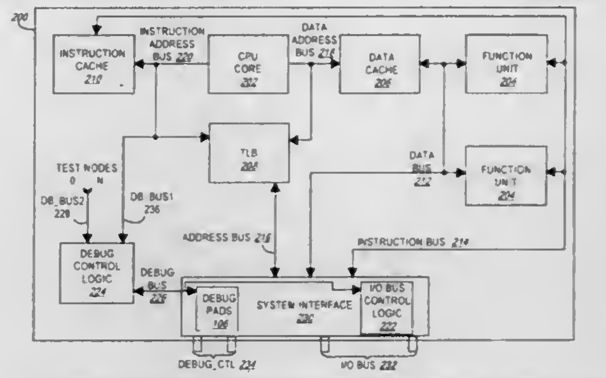
SYSTEM AND METHOD FOR EXTRACTING REALTIME DEBUG SIGNALS FROM AN INTEGRATED CIRCUIT

Paul G. Tobin, Fort Collins, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 14, 1996, Ser. No. 749,121

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 371—22.1 **13 Claims**



1. A method for extracting custom debug signals coupled to custom debug pads of an integrated circuit via an external I/O bus of said integrated circuit, said integrated circuit operable to drive standard debug data from internal nodes of said integrated circuit onto said I/O bus when said I/O bus is in an idle state during normal operation of said integrated circuit said method comprising the steps of:

(a) obtaining said standard debug data from internal nodes of said integrated circuit and said custom debug data from said custom debug pads in realtime during said normal operation of said integrated circuit;

(b) determining when said I/O bus is idle during said normal operation of said integrated circuit;

(c) selecting said custom debug data for output onto said I/O bus;

(d) driving said selected custom debug data onto said I/O bus when said I/O bus is idle during normal operation of said integrated circuit; and

(e) indicating via at least one external debug control pin of said integrated circuit that said custom debug data is present on said I/O bus.

5,838,693

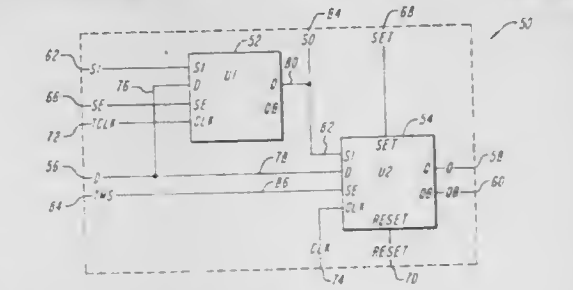
PARTIAL SCAN LOGIC

Sean P. Morley, Tarrytown, N.Y., assignor to ATG Technology, Inc., Ramsey, N.J.

Continuation of Ser. No. 568,733, Dec. 5, 1995, abandoned. This application May 15, 1997, Ser. No. 856,942

Int. Cl.^{6} G01R *31/28*

U.S. Cl. 371—22.31 **6 Claims**



1. A partial scan circuit, comprising

a sequential scan element for arbitrarily performing either a scan function or a synchronous logic function for the circuit as determined by the state of a scan control signal, the scan element performing the synchronous logic function responsive to a system clock and performing the scan function responsive to a test clock, and the scan element comprising a data input for the synchronous logic function, a data output

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for the synchronous logic function, a scan input for the scan function, a scan output for the scan function, and a system clock input, a test clock input and control signal inputs for controlling the operation of the scan element including the synchronous logic function and the scan function,

wherein the data output of the synchronous logic function of the scan element is electrically isolated from the scan output of the scan function and the data output of the synchronous logic function does not change state during performance of the scan function.

5,838,694

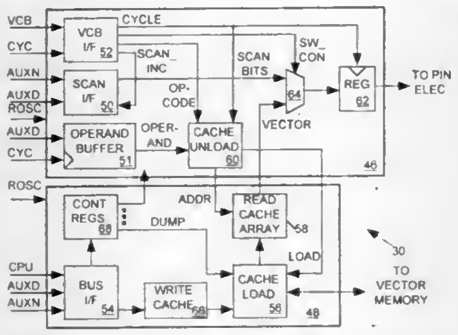
DUAL SOURCE DATA DISTRIBUTION SYSTEM FOR INTEGRATED CIRCUIT TESTER

Gregory Illes, San Jose; Kenneth L. Skala, Fremont; Richard B. Morris, and Duane A. Champoux, both of San Jose, all of Calif., assignors to Credence Systems Corporation, Fremont, Calif.

Filed Apr. 28, 1997, Ser. No. 847,924

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 371—27.1 **14 Claims**



1. An apparatus for performing a test on a circuit device having a plurality of terminals, the apparatus comprising:

a plurality of tester nodes, each tester node coupled to a separate terminal of said circuit device and each tester node comprising:

a pin electronics circuit for carrying out a sequence of test actions at said terminal in response to an input sequence of vectors;

first data storage means for storing vectors in a set of addressable storage locations; and

instruction processing means, coupled to said data storage means and said pin electronics circuit, for receiving and executing a sequence of instructions, wherein each of said instructions instructs said instruction processing means to read a vector at an indicated one of said storage locations, wherein at least one of said instructions instructs the instruction processing means to alter the read vector to produce an altered output vector and to deliver the altered output vector to the pin electronics circuit.

5,838,695

METHOD AND APPARATUS FOR PERFORMING REED-SOLOMON PRODUCT LIKE DECODING OF DATA IN CD-ROM FORMAT

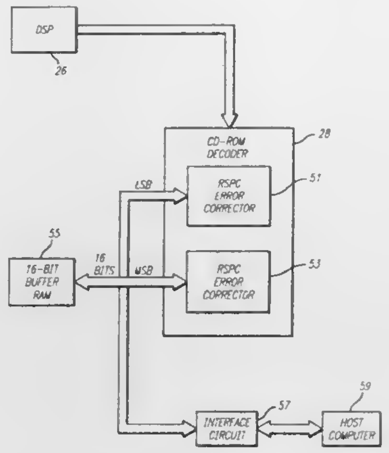
Hsin-Lung Yang, Hsinchu, Taiwan, assignor to Winbond Electronics Corp., Taipei, Taiwan

Filed Dec. 30, 1996, Ser. No. 777,562

Int. Cl.^{6} H03M *13/00;* **G11B** *20/18*

U.S. Cl. 371—37.5 **8 Claims**

1. A decoder for performing REED-SOLOMON product-like code (RSPC) decoding of sector data in a CD-ROM format, in a CD-ROM player including a buffer memory for storing the sector data, the sector data being ordered in a plurality of words, each word including a least significant byte (LSB) and a most significant byte (MSB), comprising:



a first RSPC error corrector adapted to receive the LSB during a first time interval;

a second RSPC error corrector adapted to receive the MSB substantially during the first time interval;

wherein the first RSPC error corrector performs the RSPC decoding operation over the LSB during a second time interval, and the second RSPC error corrector performs the RSPC decoding operation over the MSB substantially during the second time interval.

5,838,696

RECORD CARRIER AND DEVICES FOR READING AND RECORDING SUCH A RECORD CARRIER

Johannes J. Mons, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 389,369, Feb. 16, 1995. This application Feb. 16, 1995, Ser. No. 389,369

Claims priority, application European Pat. Off., Feb. 16, 1994, 94200339

Int. Cl.^{6} G11C *29/00*

U.S. Cl. 371—40.11 **8 Claims**

1. A device for reading a data signal recorded on a record carrier and which represents data words, added codewords (C2) of a first-type and added codewords (C1) of a second-type, the added codewords of the first type having a predefined first relation to the data words, the added codewords of the second-type having a predefined second relation to the data words combined with the added codewords of the first type; the first and second relations determining error correction of the data words in accordance with a predetermined algorithm; the data words in the recorded data signal being grouped into blocks which each comprise a control portion containing control data words representing control information and a data portion containing user-supplied data words; the second-type (C1) codewords applicable to the data words of a block being distributed over a portion of the data signal whose length is smaller than that of a portion of the data signal over which the first-type codewords (C2) applicable to the data words of said block are distributed; said device comprising:

demodulating means for recovering the blocks of data words and associated codewords from said data signal;

first error correcting means coupled to said demodulating means for correcting errors in the recovered blocks of data words based only on the second-type (C1) codewords associated therewith;

distributing means coupled to said first error correcting means for inverting the distribution of the first-type (C2) codewords so as to restore them to their original positions in relation to the data words in the corrected blocks produced by said first error correcting means;

second error correcting means coupled to said distributing means for correcting errors in the recovered blocks of data words based on the first-type (C2) codewords associated with said blocks; and

decoding means coupled to at least one of said demodulating means and said first error correcting means for separating control data words representing control information from the control portions of the data signal blocks, the control data words so obtained being uncorrected when obtained from said demodulating means and being corrected solely in accordance with the second-type (C1) codewords when obtained from said first error correcting means;

whereby upon read-out of a block of data words the relevant control information is recovered substantially immediately and is either uncorrected or corrected solely in accordance with the second-type (C1) codewords.

5,838,697

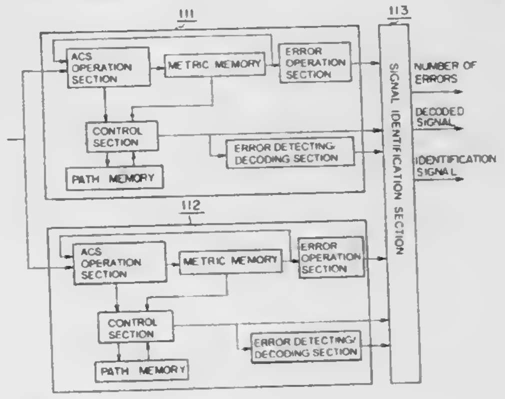
BIT ERROR COUNTING METHOD AND COUNTING TECHNICAL FIELD

Masami Abe, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Division of Ser. No. 564,353, Dec. 15, 1995, abandoned. This application Apr. 29, 1997, Ser. No. 848,236

Int. Cl.^{6} G06F *11/10;* **H03M** *13/12*

U.S. Cl. 371—43.8 **13 Claims**



1. A signal identification device for identifying a received signal, the device comprising:

a first decoding circuit for Viterbi decoding a signal of a first type, the first decoding circuit having

a first calculation circuit for repeatedly calculating branch metrics of the received signal based on a first generator polynomial, and

a first ACS circuit for selecting a first survivor path of first maximum-likelihood survivor path metrics which reflect the branch metrics calculated by the first calculation circuit;

a second decoding circuit for Viterbi decoding a signal of a second type, the second decoding circuit having

a second calculation circuit for repeatedly calculating branch metrics of the received signal based on a second generator polynomial, and

a second ACS circuit for selecting a second survivor path of second maximum-likelihood survivor path metrics which reflect the branch metrics calculated by the second calculation circuit; and

a signal-identifying circuit for identifying the received signal as a signal of the first type or a signal of the second type, based on the selected first survivor path of the last of the first maximum-likelihood survivor path metrics and the selected second survivor path of the last of the second maximum-likelihood survivor path metrics.

5,838,698

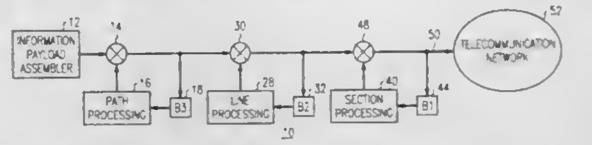
ALIGNMENT OF PARITY BITS TO ELIMINATE ERRORS IN SWITCHING FROM AN ACTIVE TO A STANDBY PROCESSING CIRCUIT

James Arthur Doubler, Wheaton, and Michael Paul Hammer, La Grange Park, both of Ill., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Apr. 28, 1995, Ser. No. 430,627

Int. Cl.^{6} H04L *5/24*

U.S. Cl. 371—49.1 **20 Claims**



1. In a telecommunication apparatus having first and second processing devices where the first device processes sequential frames of data in an active mode and the second device operates in a standby mode ready to take over the processing of the frames of data from the first device, each of the sequential frames of data including a plurality of hierarchical generated parity bits, a method for aligning the parity bits during a change of processing of the frames of data from the first device to the second device comprising the steps of:

(a) determining whether the lowest rank parity bit in a first frame of data processed by the second device has the same polarity as the lowest rank parity bit processed by the first device during the first frame;

(b) inverting the polarity of the lowest rank parity bit in the first frame of data processed by the second device if its polarity is not the same as the polarity of the corresponding parity bit processed by the first device during the first frame;

(c) for parity bits processed by the second device, determining for each parity bit of a higher rank than the lowest rank parity bit if a polarity inversion of a lower ranked parity bit has occurred;

(d) if the determination of step (c) is true for a one of the higher rank parity bits, selecting one inversion sequence from a set of inversion sequences to control inversions of the parity of said one parity bit, said selection of the one inversion sequence based on the number of inversions of lower rank parity bits.

5,838,699

LINE MEMORY CIRCUIT

Yoshifumi Imanaka, Kanagawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 524,905, Sep. 7, 1995, abandoned. This application Jul. 18, 1997, Ser. No. 897,001

Claims priority, application Japan, Apr. 28, 1995, 7-105321

Int. Cl.^{6} G06F *7/02*

U.S. Cl. 371—68.2 **10 Claims**

1. A line memory circuit, which has an information bit line match/mismatch bit encoded at the head of each line in said line memory circuit used in an encoding circuit, comprising:

a line memory for storing input picture element data of an i-th line;

a comparator for sequentially comparing picture element data of the i-th line with preceding picture data of an (i−1)th line,

a match/mismatch bit generating circuit for generating match/mismatch bits which indicate whether contents of the i-th line matches with contents of the (i−1)th line or not;

an encoding circuit for encoding picture element data on the (i−1)th line according to the preceding matching result generated by the match/mismatch bit generating circuit when the contents of the (i−1)th line and the contents of the (i−2)th line are mismatched;

wherein said storing operation of the input picture element data of i-th line into the line memory, said comparing operation of the picture element data of the i-th line with the picture data of the (i−1)th line, and said encoding operation of the picture

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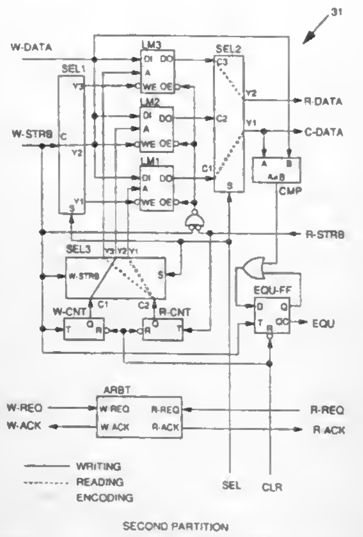


element data of the (i−1)th line are carried out during storing the i-th line of the picture data.

5,838,700

RAMAN FIBRE LASER, BRAGG FIBRE-OPTICAL GRATING AND METHOD FOR CHANGING THE REFRACTION INDEX IN GERMANIUM SILICATE GLASS

Evgeny Mikhailovich Dianov, and Alexandr Mikhailovich Prokhorov, both of Moscow, Russian Federation, assignors to Nauchny Tsentr Volokonnoi Optiki Pri Institute Obschei Fiziki Rossiiskoi Akademii Nauk, Moscow, Russian Federation

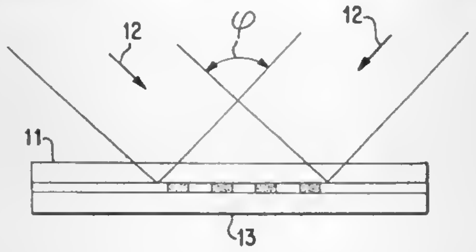
PCT No. PCT/RU96/00182, § 371 Date Feb. 11, 1997, § 102(e) Date Feb. 11, 1997, PCT Pub. No. WO97/05511, PCT Pub. Date Feb. 13, 1997

PCT Filed May 7, 1996, Ser. No. 776,933

Claims priority, application Russian Federation, Jul. 28, 1995, 95113514; Jun. 4, 1996, 9611058

Int. Cl.^{6} H01S *3/30;3/00;* G02B *6/34*

U.S. Cl. 372—6 **20 Claims**



1. A Raman fiber laser, comprising a fiber light guide based on SiO^2 having at least one impurity dope as the active medium, a laser emitting in the wavelength range from 1.0 to 1.1 mc as the pumping source, and two Bragg gratings as the distributed reflectors for wavelength within the range from 1.20 to 1.28 mc forming a resonator, wherein an optical fiber contains P^2O^5 as the impurity dope, and the distributed reflectors form a resonator for first Stokes component, the optical fiber containing P^2O^5 in the amount from 1 to 30 mole %.

5,838,701

Q-SWITCHED SOLID-STATE LASER

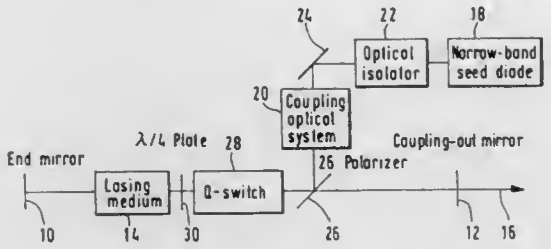
Nils Deutsch, Göttingen; Thomas Schröder, Jena; Uwe Stamm, and Wolfgang Zschocke, both of Göttingen, all of Germany, assignors to Lambda Physik Gesellschaft Zur Herstellung Von Lasern mbH, Germany

Filed Feb. 20, 1997, Ser. No. 803,119

Claims priority, application Germany, Feb. 29, 1996, 196 07 689.7

Int. Cl.^{6} H01S *3/11*

U.S. Cl. 372—10 **4 Claims**



1. A laser system having a Q-switched solid-state laser without a wavelength-selective element in its resonator and a narrow-band laser diode whose emitted narrow-band radiation is coupled into the solid-state laser as exciting injection radiation (seed radiation) in such a way that the Q-switched solid-state laser emits radiation only in a single longitudinal mode.

5,838,702

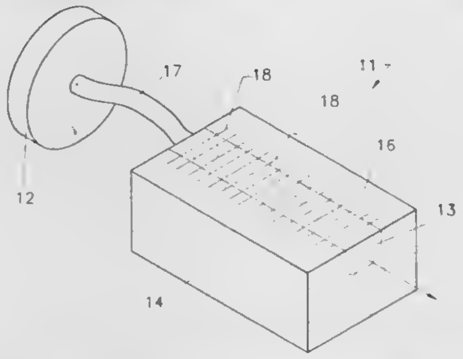
METHOD OF ELECTRICALLY CONTROLLING REGIONS OF FERROELECTRIC POLARIZATION DOMAINS IN SOLID STATE BODIES

Robert L. Byer, Stanford; Martin M. Fejer, and Eric J. Lim, both of Menlo Park, all of Calif., assignors to The Board of Trustees of Leland Stanford, Jr., University, Stanford, Calif.

Division of Ser. No. 305,215, Feb. 1, 1989, abandoned. This application May 12, 1994, Ser. No. 241,788

Int. Cl.^{6} H01S *3/10*

U.S. Cl. 372—21 **12 Claims**



1. In a method of forming an optic device having regions of differing dominant ferroelectric polarizations within a solid state body for frequency conversion of electromagnetic radiation, comprising the steps of altering the composition of said body at one of said regions to be different than the composition of said body at another of said regions, and applying an electric field to said body having a potential value selected to form desired dominant ferroelectric polarizations in said altered composition.

5,838,703

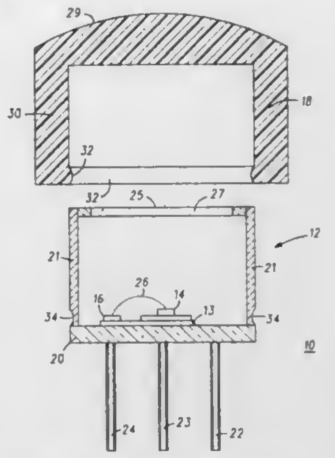
SEMICONDUCTOR LASER PACKAGE WITH POWER MONITORING SYSTEM AND OPTICAL ELEMENT

Michael S. Lebby, Apache Junction; John W. Stafford, and Wenbin Jiang, both of Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 30, 1996, Ser. No. 719,829

Int. Cl.^{6} H01S *3/18;3/13;3/04;3/08*

U.S. Cl. 372—43 **23 Claims**



1. A semiconductor laser package comprising:

a vertical cavity surface emitting laser generating an emission along a path;

a power monitoring system laterally spaced apart from the vertical cavity surface emitting laser and optically positioned to receive a portion of the emission;

a mounting structure at least partially encapsulating the vertical cavity surface emitting laser and the power monitoring system, and capable of providing support for mounting of the vertical cavity surface emitting laser and the power monitoring system; and

an optical element mounted to an uppermost aspect of the mounting structure utilizing snap-fit connections, thereby providing for proper z-axis alignment of the optical element relative to the vertical cavity surface emitting laser, the optical element including optical properties to direct a portion of the laser emission toward the power monitoring system.

5,838,704

PULSATION LASER HAVING AN ACTIVE REGION WITH A THICKER CENTRAL REGION IN A RESONATOR LENGTH DIRECTION

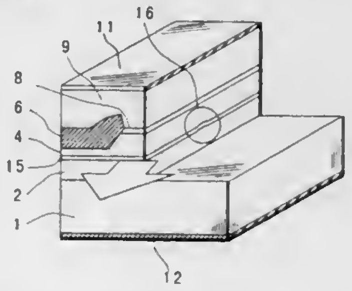
Yutaka Mihashi; Motoharu Miyashita, and Shoichi Karakida, all of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1996, Ser. No. 649,447

Claims priority, application Japan, Nov. 24, 1995, 7-306104

Int. Cl.^{6} H01S *3/07*

U.S. Cl. 372—45 **7 Claims**



1. A pulsation laser comprising:

a lower cladding layer extending in a resonator length direction of said pulsation laser;

an active layer disposed on said lower cladding layer and extending in the resonator length direction, said active layer including at least one quantum well layer, having a thicker central region, and extending along the resonator length direction and thinner regions, on opposite sides of and adjacent the central region, extending along the resonator length direction; and

an upper cladding layer disposed on said active layer and extending along the resonator length direction.

5,838,705

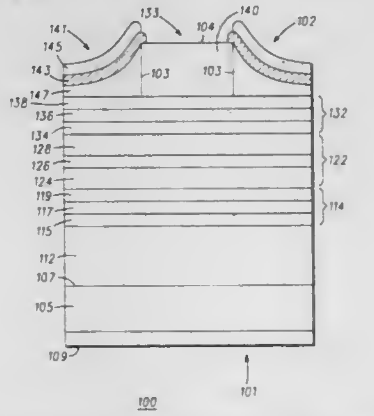
LIGHT EMITTING DEVICE HAVING A DEFECT INHIBITION LAYER

Chang-Long Shieh, Paradise Valley; Wenbin Jiang, Phoenix; Paul Claisse, Gilbert, and Craig A. Gaw, Scottsdale, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 4, 1996, Ser. No. 743,288

Int. Cl.^{6} H01S *3/19;3/08;* H01L *33/00*

U.S. Cl. 372—45 **7 Claims**



1. A light emitting device having a defect inhibition layer comprising:

a first stack of distributed Bragg reflectors including alternating layers of differing refractive indexes with the first stack of distributed Bragg reflectors having a first dopant type and a first concentration;

a first cladding region disposed on the first stack of distributed Bragg reflectors;

an active area disposed on the first cladding region;

a second cladding region disposed on the active area;

the first and second cladding regions and the active area being formed of material selected from the group GaAs and AlGaAs;

a second stack of distributed Bragg reflectors disposed on the second cladding region, the second stack of distributed Bragg reflectors including alternating layers of differing refractive indexes with the second stack of distributed Bragg reflectors having a second dopant type and a second dopant concentration; and

a defect inhibition area including a thin layer formed of one of indium gallium arsenide, indium gallium arsenide phosphide and indium gallium phosphide positioned within one of the first and second cladding regions.

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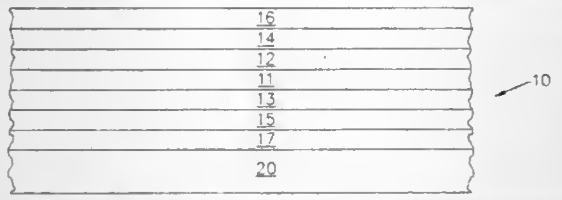
5,838,706
LOW-STRAIN LASER STRUCTURES WITH GROUP III NITRIDE ACTIVE LAYERS

John Adam Edmond; Gary E. Bulman, both of Cary, and Hua-Shuang Kong, Raleigh, all of N.C., assignors to Cree Research, Inc., Durham, N.C.

Division of Ser. No. 309,247, Sep. 20, 1994, Pat. No. 5,592,501. This application Nov. 19, 1996, Ser. No. 752,203

Int. Cl.^{6} H01S *3/19*

U.S. Cl. 372—45 **4 Claims**



1. A substrate structure that will support a Group III nitride laser structure with minimum strain, the substrate structure comprising:
- a silicon carbide substrate;
- a first buffer layer upon said substrate formed of a graded composition of silicon carbide and aluminum gallium—nitride in which the portion adjacent the substrate is substantially entirely silicon carbide and the portion furthest from the substrate is substantially entirely aluminum gallium nitride with the portions therebetween being progressively graded in content from predominantly silicon carbide to predominantly aluminum gallium nitride; and
- a second buffer layer upon said first layer and progressively graded from a composition matching the composition of said first buffer layer to a composition matching the composition of the lower cladding layer of a laser structure built upon said substrate structure.

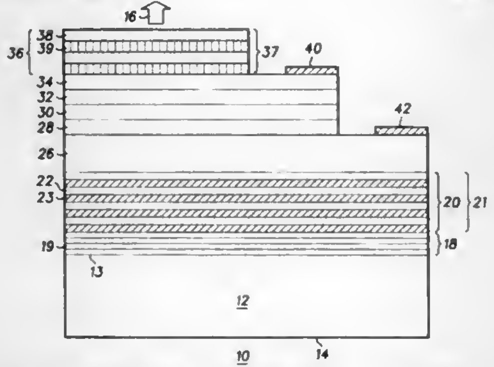
5,838,707
ULTRAVIOLET/VISIBLE LIGHT EMITTING VERTICAL CAVITY SURFACE EMITTING LASER AND METHOD OF FABRICATION

Jamal Ramdani, Gilbert; Michael S. Lebby, Apache Junction, and Wenbin Jiang, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumberg, Ill.

Filed Dec. 27, 1996, Ser. No. 775,048

Int. Cl.^{6} H01S *3/19;3/04;3/08;* **H01L** *21/20*

U.S. Cl. 372—45 **30 Claims**



1. A vertical cavity surface emitting laser comprising:
- a metallic supporting substrate having a surface;
- a first buffer layer disposed on the surface of the metallic supporting substrate;
- a first distributed Bragg reflector disposed on the first buffer layer, capable of serving as a second buffer layer, the first distributed Bragg reflector including pairs of alternating layers;
- a first contact layer disposed on the first distributed Bragg reflector, a first cladding region disposed on the first contact layer, an active region disposed on the first cladding region, a second cladding region disposed on the active region, and a second contact layer disposed on the second cladding region; and
- a second distributed Bragg reflector disposed on the second contact layer.

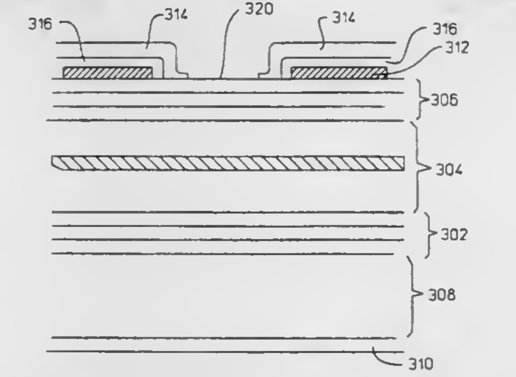
5,838,708
INTEGRATION OF SURFACE EMITTING LASER AND PHOTODIODE FOR MONITORING POWER OUTPUT OF SURFACE EMITTING LASER

Hong Lin, Palo Alto; Long Yang, Union City; Michael R. T. Tan, Menlo Park, and Shih-Yuan Wang, Palo Alto, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 332,231, Oct. 31, 1994, Pat. No. 5,491,712. This application Aug. 1, 1995, Ser. No. 509,886

Int. Cl.^{6} H01S *3/18*

U.S. Cl. 372—50 **10 Claims**



1. An integrated light emitting device and photodetecting device comprising:
- an active region including a light generation region for generating light in response to light passing therethrough, the active region having a first side and a second opposite side, the light generation region emitting light in a first direction through a first surface;
- a single contiguous second mirror region layer having a first side and a second opposite side, the single contiguous second mirror region layer for reflecting light towards the light generation region, the first side of the single continuous second mirror region layer being located on the first side of the active region, at least one current isolation region extending downwardly from the surface of the second side of the single contiguous second mirror region layer, the current isolation region separating the single contiguous second mirror region layer into at least a first photodetector mirror region, the current isolation region, and a first light emitting mirror region, wherein the first photodetector mirror region, the current isolation region, and the first light emitting mirror region are all formed within the single contiguous second mirror region layer;
- a first mirror region having a first side and a second opposite side, the first mirror region for reflecting light towards the light generation region, the first side of the first mirror region being located on the second side of the active region;
- a substrate having a first and second opposite side, the first side of the substrate region being located on the second side of the first mirror region;
- a first contact on the surface of the first photodetector mirror region, wherein the first contact is biased to reverse bias the first photodetector mirror region; and
- a second contact on the surface of the first light emitting mirror region, wherein the second contact is biased to forward bias the first light emitting mirror region,
- wherein the active region, single contiguous second mirror region layer and first mirror region act as a waveguide for improving the optical collecting efficiency of the photodetecting device by guiding light to the first mirror region of the photodetecting device.

5,838,709
ULTRAVIOLET LASER SOURCE

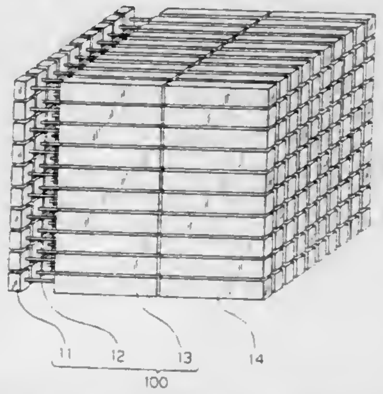
Soichi Owa, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Jun. 7, 1996, Ser. No. 657,910

Claims priority, application Japan, Jun. 7, 1995, 7-140805; Nov. 29, 1995, 7-310763; Feb. 29, 1996, 8-043019; Mar. 13, 1996, 8-056593

Int. Cl.^{6} H01S *3/14*

U.S. Cl. 372—68 **54 Claims**



1. An ultraviolet laser comprising:
- a bundle of a plurality of laser elements arranged parallel to each other, each of said laser elements comprising:
  - a laser beam emitting section for emitting light in a wavelength range including infrared to visible regions; and
  - a wavelength converting optical system for wavelength-converting the emitted light into ultraviolet light, said wavelength converting optical system comprising optical elements each comprised of a nonlinear optical crystal, said optical elements being arranged along an emission direction of a fundamental wave emitted from said laser beam emitting section.

5,838,710
OPTICAL AMPLIFICATION DEVICE

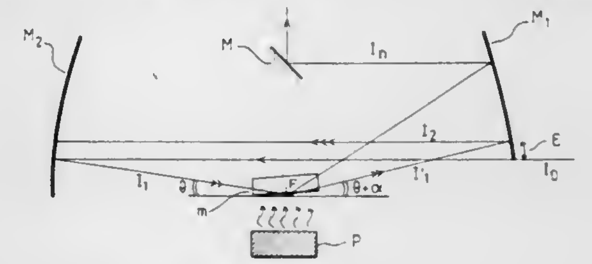
Christian Larat, Paris; Gilles Feugnet, Les Ulis, and Muriel Schwarz, Chatillon, all of France, assignors to Thomson-CSF, Paris, France

Filed Sep. 12, 1996, Ser. No. 713,209

Claims priority, application France, Oct. 6, 1995, 95 11793

Int. Cl.^{6} H04S *3/09*

U.S. Cl. 372—69 **9 Claims**



1. An optical amplifier comprising:
- a cavity having,
  - an optical axis, and
  - a solid amplifier medium having a parallelepiped geometry with a length along a first axis being greater than a length along a second axis that is perpendicular to said first axis;
- an optical pump source coupled to said solid amplifier medium so as to pump said solid amplifier medium and generate an optical pumping zone;
- a first concave and confocal mirror positioned at a first side of said cavity; and
- a second concave and confocal mirror positioned at an opposite side of said cavity such that said solid amplifier medium is disposed between said mirrors, said first concave and confocal mirror and said second concave and confocal mirror being positioned to have a common focal point in said cavity; and
- means for exiting an optical beam from said cavity after said optical beam is amplified, wherein
- said mirrors and said solid amplifier medium being oriented such that the optical beam that enters said cavity reflects off of said first mirror and through said solid amplifier medium in a first pass through said solid amplifier medium so as to overlap with said optical pumping zone, said optical beam being reflected off of said focal point and directed to said second mirror,
- in a second pass said optical beam being directed by said mirrors through said solid amplifier medium and so as to overlap with said optical pumping zone a second time and reflect off of said focal point for a second time so that said optical beam, and
- a waist of said optical beam being maintained in said first and said second pass.

5,838,711

Patent Not Issued For This Number

5,838,712
DIODE-PUMPED HIGH PERFORMANCE SOLID STATE LASER

Juergen Kraenert; Holger Kuehn; Holger Mueller, all of Jena, and Siegfried Kufert, Kahla, all of Germany, assignors to JENOPTIK Aktiengesellschaft, Jena, Germany

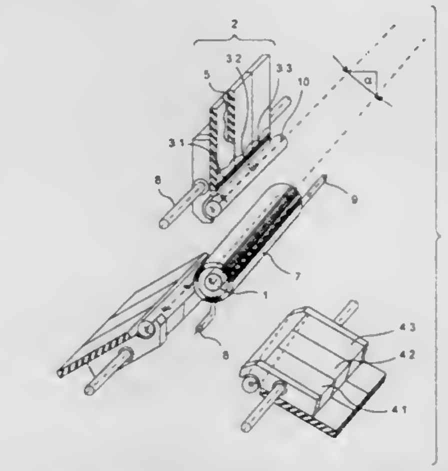
PCT No. PCT/EP96/01151, § 371 Date Dec. 18, 1996, § 102(e) Date Dec. 18, 1996, PCT Pub. No. WO96/34435, PCT Pub. Date Oct. 31, 1996

PCT Filed Mar. 18, 1996, Ser. No. 750,691

Claims priority, application Germany, Apr. 28, 1995, 195 15 635.8

Int. Cl.^{6} H01S *3/09;3/091*

U.S. Cl. 372—75 **11 Claims**



1. In a diode-pumped high performance solid state laser having a solid state laser rod, at least one pump module which is arranged parallel to the axis of the solid state laser rod and which comprises at least two temperature-stabilized laser diode arrays and coupling optics which are arranged between the pump module and solid state laser rod, the improvement comprising: laser diode arrays of

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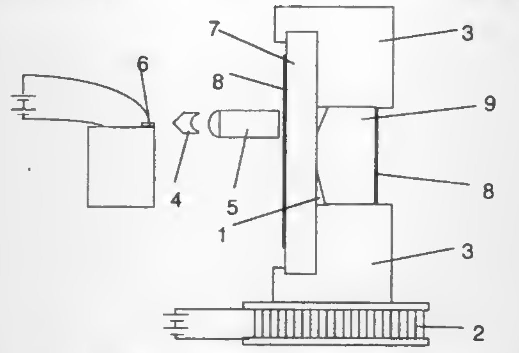
a pump module being arranged in order of decreasing emission wavelength with reference to the identical operating temperature;

said first laser diode array of each pump module being stabilized at the temperature at which the emission wavelength corresponds most closely to the absorption bands of the laser-active medium; and

the path length of the radiation emitted in each instance through the solid state laser rod by a laser diode array and the required absorption path for the radiation, determined by the emission wavelength of the radiation and the doping of the laser-active medium, being substantially adapted to one another.

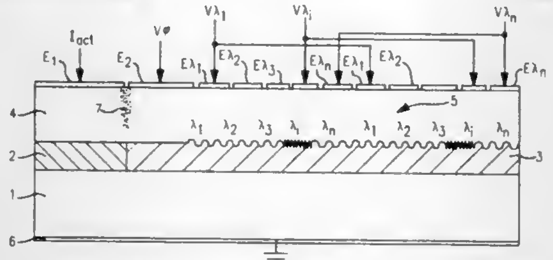
5,838,713
CONTINUOUSLY TUNABLE BLUE MICROCHIP LASER
Yutaka Shimoji, 2125 University Ct., Clearwater, Fla. 34624
Filed Apr. 21, 1997, Ser. No. 848,349
Int. Cl.^{6} H01S *3/08*
U.S. Cl. 372—92 **20 Claims**



1. A blue microchip continuously tunable laser comprising;

two different laser media, said laser media being a first crystal and a second crystal which are bonded to each other by an optical contact which includes a gap of at least 0.5 micron and at most 3 microns in thickness, said first crystal lasing at a continuously tunable wavelength of at least 860 nm and at most 960 nm, said second crystal frequency doubling at a continuously tunable output wavelength of at least 430 nm and at most 480 nm, said first crystal being pumped by a semiconductor pumping laser at a power of at least 30 m Watts and said second crystal emitting at least 10 micro Watts output power at a noise level of at most 0.5%.

5,838,714
TUNABLE WAVELENGTH LASER EMISSION COMPONENTS
Franck Delorme, Villejuif, France, assignor to France Telecom, France
Filed Aug. 15, 1996, Ser. No. 695,988
Claims priority, application France, Aug. 18, 1995, 9509915
Int. Cl.^{6} H01S *3/08;3/10;3/19*
U.S. Cl. 372—96 **12 Claims**

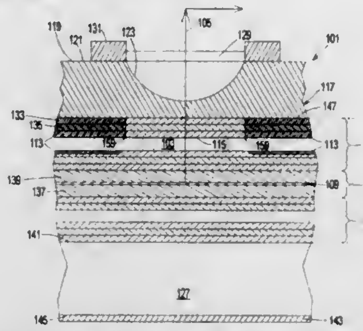


1. A wavelength tunable laser emission component for tuning a laser emission wavelength of the component, the component comprising:

a substrate having an active emission section and a Bragg section divided into a plurality of subsections adapted to receive a control voltage, the Bragg section having a waveguide with an electro-absorbent structure, the waveguide corresponding to particular Bragg wavelengths defining a comb of reflecting peaks; and

a first voltage control means for controlling the control voltages of each of the plurality of subsections of the Bragg section wherein the laser emission wavelength is tuned to at least one of the particular Bragg wavelengths according to the control voltages applied thereto.

5,838,715
HIGH INTENSITY SINGLE-MODE VCSELS
Scott W. Corzine; Dubravko I. Babic, both of Sunnyvale; Richard P. Schneider, Jr., Mountain View; Michael R. Tan, Menlo Park, and Shih-Yuan Wang, Palo Alto, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Jun. 20, 1996, Ser. No. 667,259
Int. Cl.^{6} H01S *3/08;3/19*
U.S. Cl. 372—96 **20 Claims**



1. A vertical cavity surface emitting laser (VCSEL) for radiating a high-intensity single-mode light beam along an optical axis, the VCSEL comprising:

an optical cavity having an optical loss, the optical cavity including:

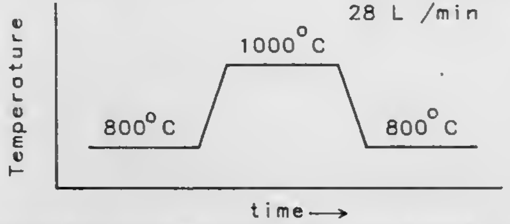
a first mirror region and a second mirror region, the first mirror region and the second mirror region being conductive and having opposite conductivity modes,

a plane light-generating region sandwiched between the first mirror region and the second mirror region, perpendicular to the optical axis, and

means for defining a lateral extent of the optical cavity in the plane of the light-generating region; and

loss-determining means, coupled to the optical cavity, for progressively increasing the optical loss of the optical cavity with increasing lateral distance from the optical axis.

5,838,716
LEAK CHECK PROCEDURE FOR A DRY OXIDATION FURNACE TUBE
Hui-Hua Chang; Yu-Jen Yu, and Chi-Fu Ni, all of Hsin-Chu, Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Ltd., Hsin-Chu, Taiwan
Filed Jun. 3, 1997, Ser. No. 868,339
Int. Cl.^{6} F27D *7/06;* **F27B** *5/14*
U.S. Cl. 373—111 **7 Claims**



1. A method for detecting leaks in a dry oxidation furnace which cause failure of contacts to active elements of p-channel MOSFETS by boron depletion comprising:

(a) providing a silicon wafer;

(b) cleaning said silicon wafer with an aqueous HF solution;

(c) measuring a first thickness of a silicon oxide film on said silicon wafer;

(d) providing an oxidation furnace having

(i) a fused quartz tube;

(ii) a gas inlet port;

(iii) a gas exit port;

(iv) means for inserting and removing silicon wafers from said fused quartz tube; and

(v) means for heating said fused quartz tube:

(e) providing a flow of a dry gas through said oxidation furnace;

(e) heating said oxidation furnace to a first temperature;

(f) inserting said silicon wafer into said oxidation furnace;

(g) ramping said oxidation furnace to a second temperature;

(h) maintaining said oxidation furnace at said second temperature for a period of time;

(i) ramping said oxidation furnace to said first temperature;

(j) removing said silicon wafer;

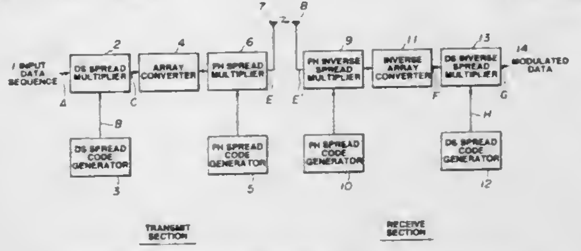
(k) measuring a second thickness of a silicon oxide film on said silicon wafer;

(l) computing the difference between said first thickness and said second thickness;

(m) comparing said difference with a calibrated value; and

(n) determining that said oxidation furnace has a leak sufficient to cause said failure of contacts if said difference exceeds said calibrated value.

5,838,717
SPECTRUM SPREAD COMMUNICATION SYSTEM
Satoru Ishii, and Atsushi Hoshikuki, both of Mobara, Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, Japan
Filed Jul. 11, 1995, Ser. No. 500,748
Claims priority, application Japan, Jul. 12, 1994, 6-181974
Int. Cl.^{6} H04B *1/69;1/707*
U.S. Cl. 375—201 **6 Claims**



1. A spectrum spread communication system comprising:

a DS spread code generator for generating a DS spread code sequence containing a plurality of bits;

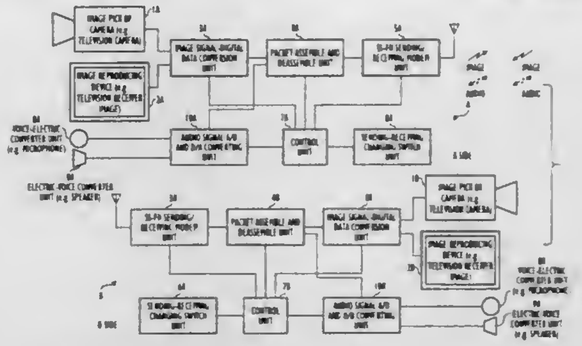
a DS spread multiplier for multiplying an inlet data sequence by said DS spread code sequence, wherein one cycle of the DS spread code sequence corresponds to one bit of the inlet data sequence, to obtain a modulated DS spread code sequence containing a plurality of chips which correspond to one bit of the inlet data sequence:

an array conversion means for carrying out conversion of data array of each of a plurality of input data sequences generated by said DS spread multiplier while using one chip of said DS spread code sequence as a unit by converting chips from each data sequence into different frames; and

an FH spread multiplier for multiplying a data sequence generated by said array conversion means by an FH spread code sequence, while using one chip of the modulated DS spread code sequence as a unit of an FH frame:

whereby an output signal of said FH spread multiplier is transmitted so that each chip of an input data sequence is transmitted at a different frequency.

5,838,718
METHOD AND APPARATUS FOR TRANSMITTING DATA SIGNALS
Toshihiro Ichihashi, Tokyo, Japan, assignor to Kokusai Electric Co., Ltd., Tokyo, Japan
Filed Jun. 12, 1996, Ser. No. 661,965
Claims priority, application Japan, Jun. 13, 1995, 7-146448
Int. Cl.^{6} H04B *15/00;* **H04K** *1/00;* **H04L** *27/30*
U.S. Cl. 375—202 **20 Claims**



7. An apparatus for exchanging data signals, comprising:

means for converting an image signal into a digital image data;

means for converting an audio signal into digital audio data;

means for generating data packets from said digital image data and said digital audio data;

means for transmitting said data packets to another apparatus at a location different from a location of said apparatus; and

means for receiving data packets transmitted by said another apparatus, wherein said data packets comprising said digital image data are transmitted in only one direction, while data packets comprising said digital audio data are bi-directionally transmitted, wherein a spread spectrum frequency-hopping scheme is used to exchange data signals, each data packet being synchronized with a hopping channel, a bi-directional audio transmission being performed independently of a direction of transmission of an image data packet.

5,838,719
NOISE SHAPING TECHNIQUE FOR SPREAD SPECTRUM COMMUNICATIONS
Timothy F. Moore, III, Port Washington, N.Y., assignor to InterDigital Technology Corporation, Wilmington, Del.
Continuation of Ser. No. 542,306, Oct. 12, 1995, abandoned, which is a continuation of Ser. No. 146,650, Nov. 2, 1993, Pat. No. 5,459,758. This application Aug. 12, 1997, Ser. No. 910,069
Int. Cl.^{6} H04L *1/69*
U.S. Cl. 375—206 **26 Claims**

1. A method for transmitting at least one information carrying baseband communication signal over a spread spectrum bandwidth from a transmitter to a receiver, comprising:

inputting said signal to said transmitter;

processing said signal by frequency translating the information carrying portion of said signal toward the edge of the spread spectrum bandwidth;

spread spectrum encoding said translated signal;

transmitting said encoded signal from said transmitter;

receiving said transmitted signal by said receiver;

spread spectrum decoding said received signal; and

frequency retranslating said decoded signal to produce a baseband output data signal.

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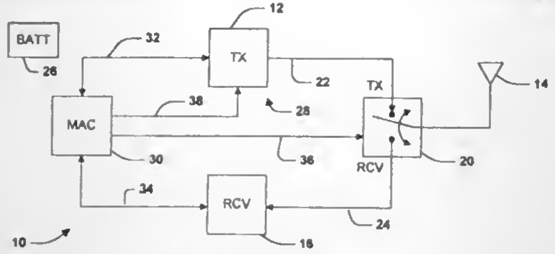
5,838,720
TRANSCEIVER CONTROL WITH SLEEP MODE OPERATION

Daniel J. Morelli, Norton, Ohio, assignor to Teletransactions, Inc., Akron, Ohio

Filed Feb. 23, 1996, Ser. No. 605,914

Int. Cl.^{6} H04B *1/38;7/00;1/16;* **H04L** *5/16*

U.S. Cl. 375—219 **13 Claims**



1. A transceiver apparatus, comprising:

a receiver portion for receiving a packet of information, the packet comprising indicia for indicating whether the packet is to be responded to, and the indicia preceding at least one of control information and data also included in the packet;

a transmitter portion for transmitting information, the transmitter portion being switchable, based on a control input, between a low power consumption mode and an active mode during which information is transmitted; and

a control circuit coupled to the receiver portion for processing the packet received by the receiver portion to determine whether the packet is to be responded to wherein, prior to the receiver portion receiving the entire packet, the control circuit evaluates the indicia and provides the control input to the transmitter portion to initiate a switch of the transmitter portion from the low power consumption mode to the active mode in the event the packet is to be responded to,

wherein the packet comprises a length field indicative of the length of the packet, and the control circuit compares the length of the packet to a predetermined criteria in connection with providing the control input to the transmitter portion.

5,838,721
SPREAD SPECTRUM COMMUNICATION EQUIPMENT

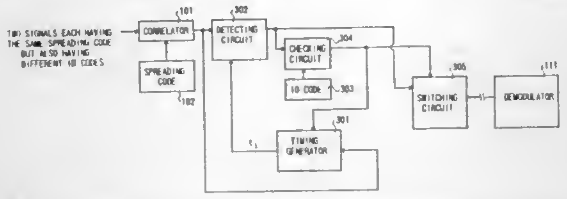
Kising Chau, Chiba, and Yoshimi Takahashi, Tokyo, both of Japan, assignors to Uniden Corporation, Chiba, Japan

Division of Ser. No. 355,773, Dec. 14, 1994, Pat. No. 5,671,248. This application Jun. 6, 1997, Ser. No. 870,557

Claims priority, application Japan, Apr. 21, 1994, 6-105011

Int. Cl.^{6} H04J *11/00;* **H04B** *1/06*

U.S. Cl. 375—208 **11 Claims**



4. In a spread spectrum communication equipment for providing communications between a plurality of stations, a circuit for distinguishing a first received signal over a second received signal having the same pseudo-noise code as the first received signal comprising:

a receiving circuit responsive to said first and second received signal for detecting correlation between a received pseudo-noise code and a reference pseudo-noise code, and

a checking circuit responsive to an output signal of the receiving circuit and a reference identification code for generating a first control signal if said output signal coincides with said reference identification code, and for generating a second control signal if said output signal does not coincide with said reference identification code.

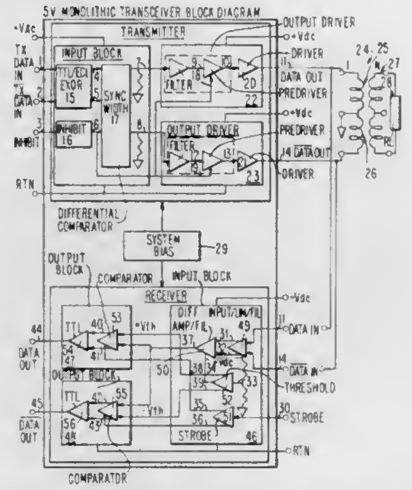
5,838,722
MONOLITHIC TRANSCEIVER INCLUDING FEEDBACK CONTROL

Michael Consi, Lindenhurst, N.Y., assignor to Aeroflex, Inc., Plainview, N.Y.

Filed Apr. 24, 1996, Ser. No. 638,907

Int. Cl.^{6} H04B *1/38;3/00;* **H03K** *19/0175;* **H03F** *1/23*

U.S. Cl. 375—219 **6 Claims**



1. An amplifier comprising an input wave-shaping circuit having an output; a predriver coupled to the output; a driver coupled to said predriver, said driver having an output transistor group having feedback means coupled to the predriver and an output; means for controlling quiescent current for the predriver based upon the predriver's input signal state, whereby the quiescent current is zero when the predriver input signal state is zero and non-zero when the input signal state is non-zero such that the current in the output transistor group is zero and the feedback means is operatively disengaged to place the output impedance of the output transistor group high when the input signal is zero.

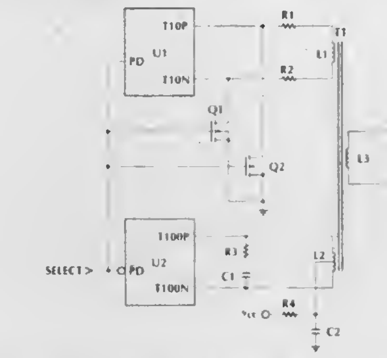
5,838,723
DUAL 10BASE-T AND 100BASE-TX TRANSMISSION TERMINATION CIRCUIT

Michael P. Mack, Mountain View, and Phillip R. Marzolf, Campbell, both of Calif., assignors to Micro Linear Corporation, San Jose, Calif.

Filed Mar. 28, 1996, Ser. No. 624,189

Int. Cl.^{6} H04B *1/40*

U.S. Cl. 375—220 **23 Claims**



21. A method of transmitting data over a computer network to other circuits in the network comprising the step of:

a. transmitting the data from a first transmitter circuit having a differential voltage driven transmit output pair coupled to a first primary winding of a transmit transformer and inductively coupled to a second primary winding of the transmit transformer wherein the second primary winding is loaded by a resistive snubber and loaded by a high impedance differential current driven transmit output pair of a second transmitter circuit, wherein the resistive snubber comprises a capacitor and a resistor coupled in series and wherein the resistive snubber is coupled across the differential current driven transmit output pair of the second transmitter; and

b. transmitting the data from the second transmitter circuit while coupling the differential voltage driven transmit output pair of the first transmitter circuit a whereby voltage transients caused by the leakage inductance of the transformer and the first transmitter circuit are inhibited.

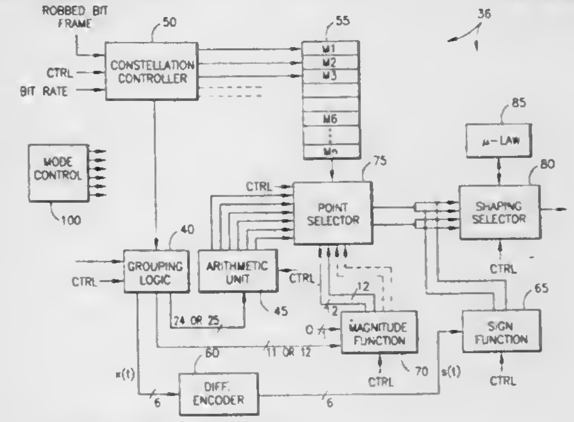
5,838,724
SPECTRAL AND POWER SHAPING MAPPER FOR HIGH DATA RATE SIGNALLING

Paul Dana Cole, Fairfield; Yuri Goldstein, Southbury, and William Hanna, Wolcott, all of Conn., assignors to General DataComm, Inc., Middlebury, Conn.

Continuation-in-part of Ser. No. 807,955, Mar. 4, 1997, Ser. No. 801,066, Feb. 14, 1997, Ser. No. 838,367, Apr. 8, 1997, and Ser. No. 851,597, May 5, 1997. This application Jun. 10, 1997, Ser. No. 872,630

Int. Cl.^{6} H04B *1/38*

U.S. Cl. 375—222 **19 Claims**



1. A PAM mapper, comprising:

a) memory means for storing indications of at least one PAM constellation; and

b) code generation means coupled to said memory means, said code generation means adapted to function in a first spectral and power shaping mode and in a second power shaping mode without spectral shaping, said code generation means including

(i) grouping logic means for taking a group of incoming bits, and in both said first and second modes, for dividing said group of incoming bits into a first subgroup of bits, a second subgroup of bits, and a third subgroup of bits,

(ii) means for receiving said first subgroup of bits, and for generating therefrom in said first mode two sign manipulation vectors, and in said second mode a single sign vector,

(iii) means for receiving said second subgroup of bits and for generating therefrom in said first and second modes at least two magnitude manipulation vectors,

(iv) means for receiving said third subgroup of bits and generating at least one integer value therefrom,

(v) point selector means for receiving said at least two magnitude manipulation vectors and said at least one integer value, and for selecting at least two sequences of at least one indication of a constellation point each from said at least one PAM constellation, and

(vi) a shaping selector means including a convolutional encoder, said shaping selector means for receiving said at least two sequences and for receiving in said first mode said two sign manipulation vectors and in said second mode said single sign vector, said shaping selector means for selecting a convolutionally encoded output in said first mode based on said at least two sequences and said two sign manipulation vectors, and in said second mode based on said at least two sequences and said single sign vector.

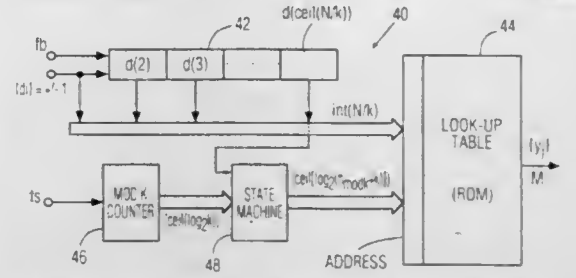
5,838,725
FLOATING POINT DIGITAL TRANSVERSAL FILTER

Aravanan Gurusami, East Syracuse; Michael Nekhamkin, DeWitt, and Robert J. Chamberlin, Jamesville, all of N.Y., assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 6, 1996, Ser. No. 759,669

Int. Cl.^{6} H03H *7/30*

U.S. Cl. 375—229 **2 Claims**



1. A digital finite impulse response (FIR) filter comprising:

an input for receiving a data signal to be filtered, said data signal having a bit rate of fb;

a shift register coupled to said input for receiving said data signal, said shift register having (N/k)-1 stages, where N is a number of taps and k is an interpolation factor, each of said (N/k)-1 stages having an output;

an input for receiving a sampling signal fs, where k=fs/fb;

a modulo-K counter having an input for receiving the sampling signal fs and an output for supplying an output signal having ceil ($\log_2 k$) bits, where ceil ($\log_2 k$) is the least integer greater than or equal to $\log_2 k$; and

a memory having address input means coupled to the input of the digital FIR filter and to the outputs of said (N/k)-1 shift register stages forming a first N/k address bits, and to the output of said modulo-K counter forming ceil ($\log_2 k$) most significant address bits, and an output for supplying a filter output signal M, said memory having stored therein different filter output values, said output values being determined by the formula:

$$M=2^{int\ N/k}((N\ mod\ k)+k).$$

5,838,726
METHOD OF AUTOMATICALLY ADJUSTING THE OUTPUT VOLTAGE IN A TRANSMISSION SYSTEM

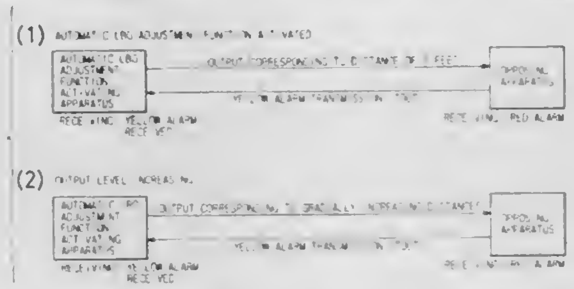
Kenji Nemoto, and Tsudoi Kubo, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Jun. 28, 1996, Ser. No. 673,267

Claims priority, application Japan, Jun. 29, 1995, 7-163318

Int. Cl.^{6} H04B *3/00;* **H04L** *25/00*

U.S. Cl. 375—257 **5 Claims**


(1)
AUTOMATIC LBO ADJUSTMENT FUNCTION ACTIVATED
AUTOMATIC LBO ADJUSTMENT FUNCTION ACTIVATING APPARATUS
OUTPUT CORRESPONDING TO DISTANCE OF FEET
OPPOSING APPARATUS
YELLOW ALARM TRANSMISSION
RECEIVING YELLOW ALARM RECEIVED
RECEIVING RED ALARM
(2)
OUTPUT LEVEL INCREASING
AUTOMATIC LBO ADJUSTMENT FUNCTION ACTIVATING APPARATUS
OUTPUT CORRESPONDING TO GRADUALLY INCREASING DISTANCE
OPPOSING APPARATUS
YELLOW ALARM TRANSMISSION
RECEIVING YELLOW ALARM RECEIVED
RECEIVING RED ALARM

1. A method of automatically adjusting an output voltage in a transmitting apparatus which transmits a signal via a coaxial cable to a receiving apparatus, comprising the steps of:

making the output level of the signal at said transmitting apparatus a limit level of reception at said receiving apparatus; and

automatically adjusting said signal output level of said transmitting apparatus to a signal output level which is in accordance with the length of a coaxial cable between said transmitting apparatus and said receiving apparatus.

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wherein said automatic adjustment is done by starting the output level at the output level corresponding to a coaxial cable length of zero, and thereafter successively increasing said output level by selecting one of a plurality of the output levels to correspond to greater lengths.

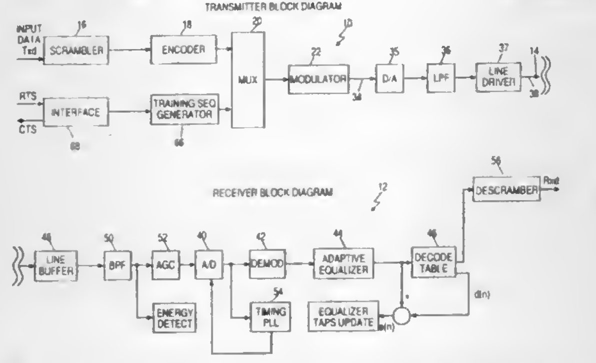
5,838,727

METHOD AND APPARATUS FOR TRANSMITTING AND RECEIVING DIGITAL DATA OVER A BANDPASS CHANNEL

David Lewis Lyon, Rancho Santa Fe; Chanchai Poonpol, San Diego, both of Calif.; Michael Andrew Montgomery, Cedar Park, and Jimmy Everett Neeley, Georgetown, both of Tex., assignors to Schlumberger Technology Corporation, Austin, Tex.

Filed Feb. 15, 1991, Ser. No. 657,225
Int. Cl.^{6} H04L *5/12*

U.S. Cl. 375—261 **24 Claims**



22. A system for transmitting acquired digital input data as a quadrature amplitude modulated waveform and for receiving the waveform and demodulating the waveform to construct a representation of the input data, comprising:

means for acquiring the digital input data;

mapping means coupled to the acquiring means for mapping the digital input data into a series of symbols representing points in signal space, and for outputting the location of the points as two coordinate streams representing the x and y coordinates of the points;

modulation means for quadrature amplitude modulating the x and y coordinate streams to orthogonal carrier signals and combining the orthogonal carrier signals to form a sampled waveform,

the modulation means being operable for multiplying the x and y coordinate streams by samples of the carrier signals to form x and y sampled product values where the rate of sampling the carrier signals is four times the carrier frequency, and for adding the x and y product values to form sampled waveform sums;

digital to analog converter means for converting the sampled waveform sums into an analog quadrature amplitude modulated waveform for transmission over a bandpass channel;

analog to digital converter means for converting the analog quadrature amplitude modulated waveform received from the bandpass channel into received digital sampled waveform sums;

demodulation means for receiving the digital sampled waveform sums at the sample rate and dividing by representations of the orthogonal carrier signals to form received x and y coordinate streams; and

decoding means for constructing a representation of the input data using the x and y coordinate streams.

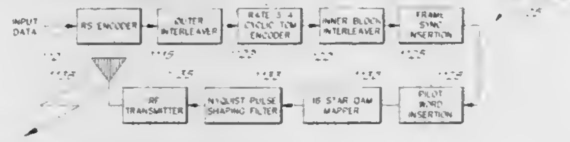
5,838,728

HIGH RATE REED-SOLOMON CONCATENATED TRELLIS CODED 16 STAR QAM SYSTEM FOR TRANSMISSION OF DATA OVER CELLULAR MOBILE RADIO

Siavash M. Alamouti; Andrew S. Wright, both of Vancouver, and William D. Haymond, Surrey, all of Canada, assignors to AT&T Wireless Services, Inc., Florham Park, N.J.

Continuation of Ser. No. 344,156, Nov. 23, 1994, Pat. No. 5,659,578. This application May 6, 1997, Ser. No. 852,151
Int. Cl.^{6} H04L *27/34*

U.S. Cl. 375—265 **20 Claims**



1. A data transmitter comprising:

a trellis encoder having a plurality of defined next states each corresponding to an input and a present state, said next states cyclically assigned to the corresponding input and present states;

a signal constellation mapper coupled to said trellis encoder; and

a transmitter coupled to said signal constellation mapper.

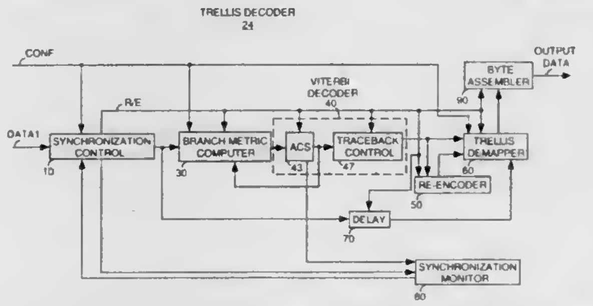
5,838,729

MULTIPLE MODE TRELLIS DECODER FOR A DIGITAL SIGNAL PROCESSING SYSTEM

Keren Hu, Plainsboro; William Wei-Lian Lin, East Windsor, and Maurice David Caldwell, Plainsboro, all of N.J., assignors to Thomson multimedia, S.A., France

Filed Apr. 9, 1996, Ser. No. 629,680
Int. Cl.^{6} H04N *5/46*

U.S. Cl. 375—265 **21 Claims**



1. In a system, for processing a trellis encoded video input signal, apparatus comprising:

a pre-processing network for subjecting said input signal to one of a plurality of pre-processing modes to provide a processed signal exhibiting one of a plurality of signal formats, said formats being associated with said modes; and

a trellis decoder for decoding said processed signal, wherein said trellis decoder employs a state transition trellis with the same number of trellis states for decoding processed signals of a plurality of signal formats from said pre-processing network.

5,838,730

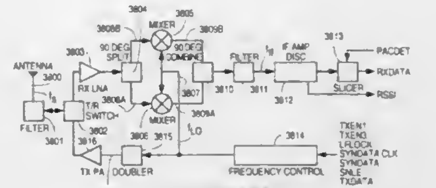
RADIO TRANSMITTER/RECEIVER FOR WIRELESS LOCAL AREA NETWORK

Peter K. Cripps, Redwood City, Calif., assignor to Netwave Technologies Limited, Pleasanton, Calif.

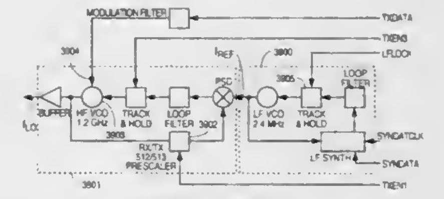
Division of Ser. No. 82,313, Jun. 25, 1993. This application May 11, 1995, Ser. No. 439,083
Int. Cl.^{6} H04L *27/10*

U.S. Cl. 375—272 **5 Claims**

1. A radio transmitter/receiver circuit for a wireless local area network, comprising:



RADIO RECEIVER/TRANSMITTER



FREQUENCY CONTROL BLOCK

a first circuit generating a first signal, said first signal having a first frequency f_1 which is switchable between a plurality of frequencies;

a second circuit receiving said first signal and generating a second signal on an output lead, said second signal having a second frequency f_2 which is switchable between a first multiple Af_1 of said first frequency and a second multiple Bf_1 of said first frequency;

an image reject mixer circuit comprising a first third order mixer and a second third order mixer, said image reject mixer circuit having a first input lead, a second input lead and an output lead, said first input lead of said image reject mixer circuit being coupled to an antenna, said second input lead of said image reject circuit being coupled to said output lead of said second circuit;

an IF amplifier, an input lead of said IF amplifier being coupled to said output lead of said image reject mixer circuit; and

a frequency multiplier circuit, an input lead of said frequency multiplier circuit being coupled to said output lead of said second circuit, an output lead of said frequency multiplier circuit being at least selectively coupled to said antenna; wherein the transmitter/receiver circuit conforms to the PCMCIA form factor.

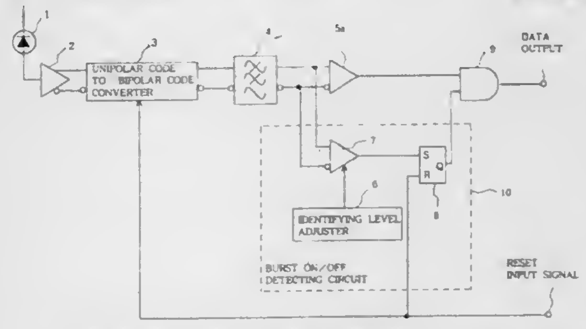
5,838,731

BURST-MODE DIGITAL RECEIVER

Takeshi Nagahori, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 30, 1995, Ser. No. 565,098
Claims priority, application Japan, Dec. 1, 1994, 6-298110
Int. Cl.^{6} H04L *25/34*

U.S. Cl. 375—289 **6 Claims**


1
2
3
UNIPOLAR CODE TO BIPOLAR CODE CONVERTER
4
5a
9
DATA OUTPUT
7
S
R
Q
6
IDENTIFYING LEVEL ADJUSTER
8
10
BURST ON/OFF DETECTING CIRCUIT
RESET INPUT SIGNAL

1. A burst-mode digital receiver comprising:

a unipolar code-to-bipolar code converter for converting unipolar code pulses of an inputted burst signal into bipolar code pulses;

an identifying circuit for identifying logic levels of "1" and "0" with an identifying level set at a center of a pulse amplitude of the bipolar code pulses outputted from said unipolar code-to-bipolar code converter;

a burst on/off detecting circuit that continuously outputs a signal until the inputted burst signal is finished, after a pulse amplitude of the inputted burst signal exceeds a constant value; and

a gate for selectively turning on and off an output signal from said identifying circuit depending on the signal outputted from said burst on/off detecting circuit.

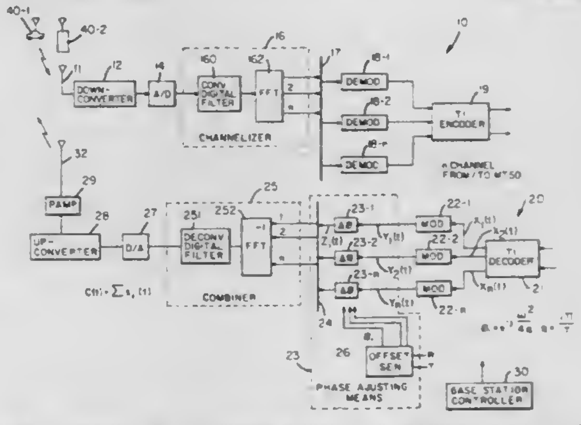
5,838,732

REDUCING PEAK-TO-AVERAGE VARIANCE OF A COMPOSITE TRANSMITTED SIGNAL GENERATED BY A DIGITAL COMBINER VIA CARRIER PHASE OFFSET

Ronald R. Carney, Palm Bay, Fla., assignor to AirNet Communications Corp., Melbourne, Fla.

Filed Oct. 31, 1994, Ser. No. 331,778
Int. Cl.^{6} H04L *25/03;27/36;* **H04J** *9/00;* **H03C** *3/02*

U.S. Cl. 375—297 **18 Claims**



10. A method for processing signals in a multiple mobile subscriber unit wireless communication system comprising:

providing a plurality, n, of baseband channel signals, $x_1(t)$, $x_2(t)$, . . . , $x_n(t)$, the baseband channel signals representing signals to be transmitted to a plurality of the mobile subscriber units;

adjusting the phases of at least a subset of the n baseband channel signals, and providing a plurality of phase adjusted baseband signals $z_1(t)$, $z_2(t)$, . . . , $z_m(t)$ in response thereto, the phases being adjusted according to a prescribed phase shift relationship, the prescribed phase relationship being selected to reduce the peak to average power in a power amplified radio frequency, RF, signal;

digitally combining a plurality of the phase adjusted baseband signals $z_1(t)$, $z_2(t)$, . . . , $z_m(t)$ onto a like plurality of carrier signals, to produce a composite digital signal, c(t), consisting of the n phase adjusted baseband signals modulated onto a like number, n, of digital carrier signals spaced apart in frequency, the wideband composite digital signal c(t) having an envelope that varies over time and a predetermined bandwidth;

digital-to-analog (D/A) converting the composite digital signal, c(t), to provide an analog signal;

up-converting the analog signal to produce a radio frequency, RF, signal;

power amplifying the RF signal, to provide the power amplified RF signal; and

transmitting, via an antenna, the power amplified RF signal to the plurality of mobile subscriber units.

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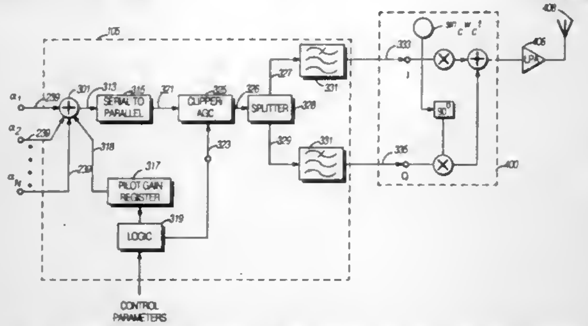
5,838,733
METHOD AND APPARATUS FOR MITIGATING SIGNAL DISTORTION IN A COMMUNICATION SYSTEM

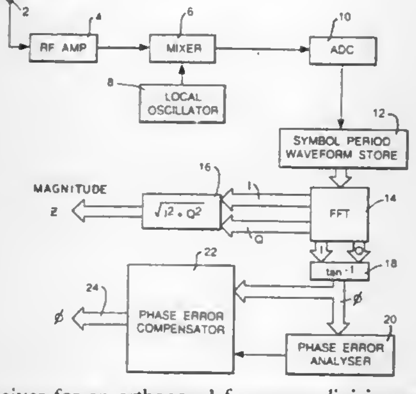
Eugene J. Bruckert, Arlington Heights, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Continuation of Ser. No. 173,434, Dec. 23, 1993, abandoned. This application Jul. 21, 1997, Ser. No. 897,189
Int. Cl.^{6} H04K *1/02;* **H04L** *25/03*
U.S. Cl. 375—297 **2 Claims**



1. A method of mitigating signal distortion in a digital communication system, the method comprising the steps of:
obtaining a first parameter related to a power of a baseband signal waveform over a first multiple symbol period;
determining a first automatic gain control value based on the first obtained parameter;
applying the first automatic gain control value to the baseband signal waveform over the first multiple symbol period;
obtaining a second parameter related to a power of the baseband signal waveform over a second multiple symbol period;
determining a second automatic gain control value based on the second obtained parameter, wherein the second automatic gain control value does not equal the first automatic gain control value; and
applying the second automatic gain control value to the baseband signal waveform over the second multiple symbol period.

5,838,734
COMPENSATION FOR LOCAL OSCILLATOR ERRORS IN AN OFDM RECEIVER

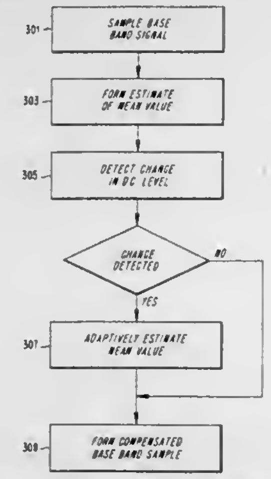
Derek Thomas Wright, London, United Kingdom, assignor to British Broadcasting Corporation, London, United Kingdom
PCT No. PCT/GB94/00962, § 371 Date Mar. 26, 1996, § 102(e) Date Mar. 26, 1996, PCT Pub. No. WO94/26046, PCT Pub. Date Nov. 10, 1994
PCT Filed May 5, 1994, Ser. No. 549,831
Claims priority, application United Kingdom, May 5, 1993, 9309212
Int. Cl.^{6} H04L *27/06*
U.S. Cl. 376—316 **9 Claims**



1. A receiver for an orthogonal frequency division multiplexed signal comprising:
means for receiving a Fourier transform (FT) representation of the signal,
inverse Fourier transform means for converting the FT to the frequency domain,
means for deriving magnitude and phase of each frequency domain component of the inverse FT,
means for analyzing the phase of the frequency domain component;
means for compensating for phase errors common to all carriers in one Fourier Transform symbol wherein the phase errors comprise phase noise from a local oscillator.

5,838,735
METHOD AND APPARATUS FOR COMPENSATING FOR A VARYING D.C. OFFSET IN A SAMPLED SIGNAL

Anders Khullar, Bjärred, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden
Filed Jul. 8, 1996, Ser. No. 679,461
Int. Cl.^{6} H04L *27/06*
U.S. Cl. 375—319 **4 Claims**

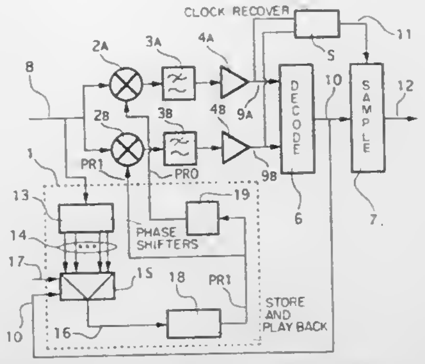

301
SAMPLE BASE BAND SIGNAL
303
FORM ESTIMATE OF MEAN VALUE
305
DETECT CHANGE IN DC LEVEL
CHANGE DETECTED
NO
YES
307
ADAPTIVELY ESTIMATE MEAN VALUE
309
FORM COMPENSATED BASE BAND SAMPLE

1. In a direct-conversion receiver, an apparatus for compensating a current sample of a base band signal having a variable d.c. level, comprising:
means for generating samples of the base band signal;
means for forming an estimate of a mean value of the samples;
means for detecting a change in the d.c. level of the base band signal based on the current sample; and
means for generating the compensated sample by forming a difference between the current sample and the estimate, thereby substantially removing the change in the d.c. level.

5,838,736
METHOD AND APPARATUS FOR GENERATING CARRIERS FOR PHASE DEMODULATION HAVING AT LEAST TWO PHASE STATES, AND A CORRESPONDING DEMODULATION STAGE

Gérard Thomas, Eragny Sur Oise; Luc Brignol, Paris, and Florence Christien, Sannois, all of France, assignors to Alcatel N.V., Rijswijk, Netherlands
Filed Jan. 16, 1996, Ser. No. 585,462
Claims priority, application France, Jan. 17, 1995, 95 00452
Int. Cl.^{6} H03D *3/22;* **H04L** *27/22*
U.S. Cl. 375—329 **17 Claims**

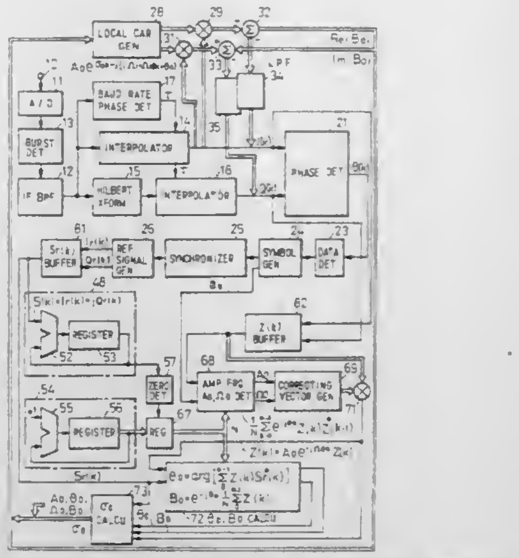
1. Apparatus for generating two receive carriers (**PR0**, **PR1**) having the same frequency, referred to as the carrier frequency fp=1/Tp, and being in quadrature relative to each other, said apparatus being designed to be integrated in a demodulation stage for demodulating a received signal (**8**) modulated using phase modulation having at least two phase states (**P1** to **P16**), said received signal (**8**) conveying at least one series of symbols, which series is constituted by an initialization sequence comprising at least one initialization symbol (Si), and by a message sequence comprising at least one message symbol (Su_1 to Su_3), each symbol corresponding to one of said phase states;
said apparatus being characterized in that said initialization sequence is known to said apparatus (**1**), and in that said apparatus (**1**) comprises:
first phase-shifting means (**13**) for generating a plurality of phase-shifted signals (**14**) from said received signal (**8**), each phase-shifted signal having a distinct phase shift relative to said received signal;
signal selection means (**15**) for selecting a signal, referred to as a selected signal (**16**) from among said plurality (**14**), as a function
either of a predetermined phase state (**17**) associated with said initialization symbol (Si) during reception of said initialization sequence,
or of an estimated phase state (**10**) estimated by said demodulation stage on the basis of the received signal (**8**) during reception of said message sequence;
said selected signal (**16**) constituting one of said receive carriers and referred to as a reference carrier;
storing and play-back means (**18**) for storing the selected signal (**16**) and playing it back after a delay that is substantially equal to a symbol duration (Ts), so as to deliver said reference carrier; and
second phase-shifting means (**19**) for generating the other one of said receive carriers from said reference carrier.



5,838,737
METHOD AND APPARATUS FOR ESTIMATING PSK MODULATED SIGNALS

Takahioro Yamaguchi, and Shinsuke Tajiri, both of Sendai, Japan, assignors to Advantest Corporation, Tokyo, Japan
Division of Ser. No. 538,943, Oct. 11, 1995, Pat. No. 5,590,158, which is a continuation of Ser. No. 186,603, Jan. 26, 1994, abandoned. This application Jun. 14, 1996, Ser. No. 663,847
Claims priority, application Japan, Jan. 28, 1993, 5-12304; Jan. 28, 1993, 5-12305
Int. Cl.^{6} H03D *3/22;* **H04L** *27/22*
U.S. Cl. 375—331 **5 Claims**

1. A Phase-Shift Keying (PSK) modulated signal estimating apparatus comprising:
analog-to-digital (A/D) converting means for converting an input PSK modulated signal to a digital PSK modulated signal;
orthogonal transformation means, receiving the digital PSK modulated signal from said A/D converting means as an in-phase component thereof, for providing a quadrature component of said digital PSK modulated signal;
phase detecting means for detecting an instantaneous phase of the digital PSK modulated signal from said in-phase component and said quadrature component of the digital PSK modulated signal;
symbol generating means for determining an ideal modulation symbol based on said instantaneous phase of said digital PSK modulated signal and the instantaneous phase of the digital PSK modulated signal which was detected one symbol before;
ideal reference signal generating means, supplied with said ideal modulation symbol, for generating an in-phase component and a quadrature component of an ideal reference signal corresponding to said ideal modulation symbol;
a detected vector buffer storing a pair of said in-phase component and said quadrature component of said digital PSK modulated signal as a detected vector;
an ideal vector buffer storing a pair of said in-phase component and said quadrature component of said ideal reference signal as an ideal vector in synchronization with storing said in-phase component and said quadrature component of said digital PSK modulated signal in said detected vector buffer;
accumulating means for accumulating said in-phase component and said quadrature component of the stored ideal reference signal;
counting means for counting a number of accumulations of said accumulating means;
means for effecting operations of said accumulating means and said counting means in synchronization with one another;
detecting means for detecting the number of accumulations of said counting means when an accumulated value of said accumulating means becomes zero;
amplitude and frequency detecting means for averaging, over n (n being a positive integer) symbol clocks, a complex correlation between a currently detected vector comprising said in-phase component and quadrature component of said digital PSK modulated signal read out of said detected vector buffer, a complex conjugate of the vector which was detected n symbol clocks before and an accumulation of phase variations of ideal modulation symbols over said n symbol clocks, and for calculating an amplitude A_0 and an offset frequency Ω_0 on the basis of a magnitude and a phase angle of an averaged value of said complex correlation, respectively;
means for generating a correcting vector having a magnitude and a phase angle opposite in polarity from the calculated amplitude A_0 and the offset frequency Ω_0;
correcting means for multiplying the detected vector read out of said detected vector buffer by said correcting vector to correct said detected vector; and
phase offset and I-Q origin offset calculating means for obtaining a phase error θ_0 by detecting a phase angle of a sum of products, over said n symbol clocks, of the corrected detected vector and a complex conjugate of the ideal vector comprising said in-phase component and said quadrature component of said ideal reference signal read out of said ideal vector buffer, and for obtaining an I-Q origin offset by averaging said corrected detected vector over said n symbol clocks and shifting the averaged vector in-phase by said phase error θ_0;



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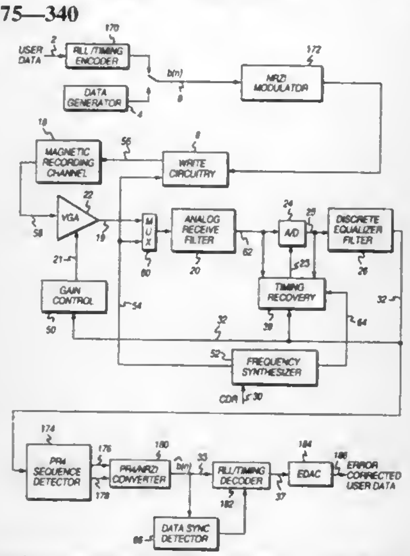
5,838,738
CODING TO IMPROVE TIMING RECOVERY IN A SAMPLED AMPLITUDE READ CHANNEL

Christopher P. Zook, Longmont, Colo., assignor to Cirrus Logic, Inc., Fremont, Calif.

Filed Jul. 29, 1996, Ser. No. 681,693

Int. Cl.^{6} H03M *7/46*

U.S. Cl. 375—340 **20 Claims**



1. A sampled amplitude read channel for reading digital data from a sequence of discrete time sample values generated by sampling pulses in an analog read signal from a read head positioned over a disc storage medium, comprising:

(a) an encoder for encoding user data during a write operation into codewords according to a first mapping which improves a phase error estimate for timing recovery, the phase error estimate generated as a function of a slope of the pulses in the analog read signal;

(b) a sampling device for sampling the analog read signal during a read operation to generate the sequence of discrete time sample values;

(c) timing recovery for generating synchronous sample values as a function of the discrete time sample values and the phase error estimate; and

(d) a discrete time detector for detecting the codewords from the synchronous sample values.

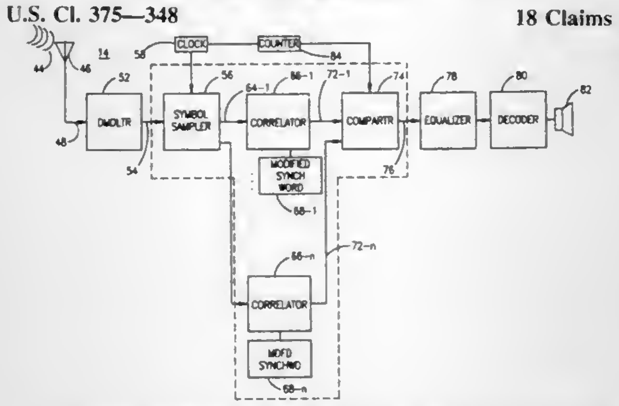
5,838,739
CHANNEL ESTIMATOR CIRCUITRY, AND ASSOCIATED METHOD, FOR A DIGITAL COMMUNICATION SYSTEM

Rajaram Ramesh; Gregory E. Bottomley; Ravinder David Koilpillai, all of Cary, and Ali S. Khayrallah, Apex, all of N.C., assignors to Ericsson Inc.

Filed Mar. 29, 1996, Ser. No. 625,010

Int. Cl.^{6} H04B *1/10*

U.S. Cl. 375—348 **18 Claims**



1. A channel estimator for estimating a channel impulse response of a transmission channel upon which a communication signal having synchronization symbols is transmitted by a transmitter, the communication signal transmitted at a communication signal symbol rate to a receiver, said channel estimator comprising:

a symbol sampler coupled to receive signals representative of the communication signal received by the receiver, said symbol sampler for sampling values of a portion of the signal corresponding to at least the synchronization symbols of the signal at a sampling rate greater than the communication signal symbol rate, thereby to sample each of the synchronization symbols at least at a first sampling point and at a second sampling point, and for generating at least a first sampled signal and a second sampled signal of values representative of the synchronization symbols sampled at the first and second sampling points, respectively; and

metric calculating circuitry coupled to receive the at least the first sampled signal and the second sampled signal sampled signals generated by said symbol sampler, said metric calculating circuitry for calculating metrics between portions of the at least the first sampled signal and the second sampled signal sampled signals and a stored data word, the stored data word of values representative of the synchronization symbols modified by a selected level of distortion introduced upon the communication signal by the transmitter and the receiver, prior to transmission and subsequent to reception, respectively, of the communication signal, said metric calculating circuitry further for selecting which of the at least first sampled signal and the second sampled signal corresponds most closely with the stored data word, thereby to estimate the channel impulse response.

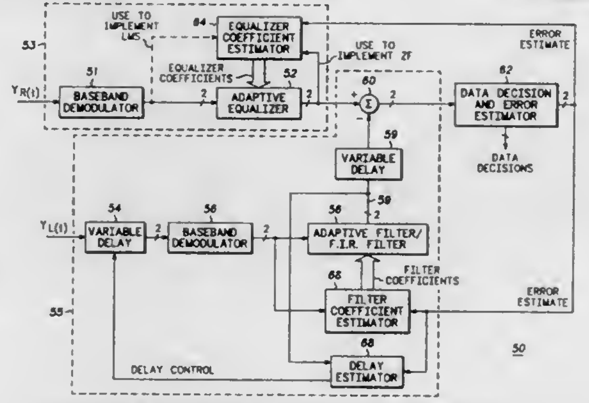
5,838,740
CROSSPOLE INTERFERENCE CANCELING RECEIVER FOR SIGNALS WITH UNRELATED BAUD RATES

Kurt Albert Kallman, Mesa, and Randy Lee Turcotte, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 17, 1996, Ser. No. 633,636

Int. Cl.^{6} H04B *1/10*

U.S. Cl. 375—346 **20 Claims**



1. A receiver for canceling crosspolarization interference caused by transmission of crosspolarized signals of unrelated baud rates through a dual polarization frequency reuse channel, said receiver comprising:

a direct channel portion for receiving a direct channel signal of a first baud rate through said dual polarization frequency reuse channel, said direct channel signal having a direct channel component and a cross channel interference component, said direct channel portion providing an equalized output signal;

a crosspolarization interference canceling portion receiving a cross channel signal of a second baud rate through said dual polarization frequency reuse channel, said crosspolarization interference canceling portion providing a combined output signal substantially without crosspolarization interference; and

a data decision and error estimating portion receiving said combined output signal and providing data decisions based on said combined output signal, said data decision and error estimating portion providing an error estimate based on said combined output signal and a threshold value,

said crosspolarization interference canceling portion including a variable delay element for delaying said cross channel signal based a delay estimate signal,

said crosspolarization interference canceling portion including a cross channel demodulator for demodulating said cross channel signal;

said crosspolarization interference canceling portion including a cross channel adaptive filter providing a cancellation signal based on adaptive filter coefficients and a delayed and demodulated version of said cross channel signal provided through the variable delay element and the cross channel demodulator, said adaptive filter coefficients based on said error estimate and the delayed cross channel signal;

said crosspolarization interference canceling portion including a delay estimator providing said delay estimate signal to said variable delay element, said delay estimate signal based on said error estimate and said cancellation signal,

said crosspolarization interference canceling portion including a summer for combining the cancellation signal with said equalized output signal whereby said cross channel interference component is canceled from said direct channel signal.

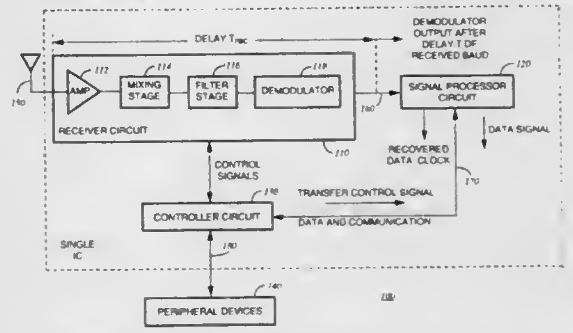
5,838,741
COMMUNICATION DEVICE AND METHOD FOR REDUCING EFFECTS OF NOISE INTRODUCTION BY SYNCHRONIZING DATA TRANSFER TO A RECEIVED SIGNAL

Edgar Herbert Callaway, Jr., Boca Raton; Zakir Hussain Ansari; Von Alan Mock, both of Boynton Beach; Eric Thomas Eaton, and David Jeffrey Hayes, both of Lake Worth, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 10, 1997, Ser. No. 797,324

Int. Cl.^{6} H03D *1/04;* H03K *5/01;* H04B *1/00;* H04L *1/00*

U.S. Cl. 375—346 **12 Claims**



1. A communication device comprising:

an antenna for detecting a radio frequency signal;

a receiver circuit coupled to the antenna for receiving the radio frequency signal and generating at an output a demodulated signal therefrom;

a signal processing circuit having an input coupled to the output of the receiver circuit for processing the demodulated signal to generate at an output a data signal;

a first electrical communication path coupling the output of the receiver circuit to the input of the signal processing circuit; and

a controller circuit coupled to the output of the signal processing circuit, the controller circuit generating a transfer control signal to control timing of transfer of signals between the receiver circuit, the signal processing circuit and the controller circuit, by:

determining when a predetermined portion of a symbol in the radio frequency signal is at an input to the receiver circuit;

initiating a time delay of a first predetermined period of time upon determining the predetermined portion of a symbol; and

generating the transfer control signal to enable transfer of the data signal for a second predetermined period of time beginning after the first predetermined period of time.

5,838,742
DIVERSITY PATH CO-CHANNEL INTERFERENCE REDUCTION

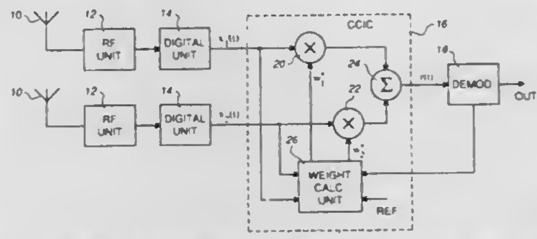
Adnan Abu-Dayya, Ontario, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Oct. 17, 1996, Ser. No. 730,828

Claims priority, application Canada, Jul. 10, 1996, 2180924

Int. Cl.^{6} H04B *7/10;* H04L *1/02*

U.S. Cl. 375—347 **27 Claims**



1. A method of combining a plurality of diversity path signals, each signal comprising time division multiplexed symbols in a time slot including one or more known symbols, comprising the steps of, repeatedly in the time slot:

(a) determining from symbols of the diversity path signals, within a window including one or more known symbols, weights for combining the diversity path signals for producing a combined signal having an enhanced SINR (signal to interference plus noise power ratio);

(b) combining symbols of the diversity path signals in accordance with the determined weights to produce the combined signal for one or more symbols adjacent to the window;

(c) demodulating the combined signal to determine said one or more symbols adjacent to the window; and

(d) returning to step (a) with the window moved to include one or more of the symbols determined in step (c) as one or more of the known symbols.

5,838,743
SYSTEM FOR SERIAL RECEPTION OR READING OF INFORMATION

Joseph Colineau, Bures S/Yvetter, and Michel Audoin, Villeneuve St Georges, both of France, assignors to Thomson-CSF, Paris, France

PCT No. PCT/FR94/01433, § 371 Date Aug. 9, 1995, § 102(e) Date Aug. 9, 1995, PCT Pub. No. WO95/16317, PCT Pub. Date Jun. 15, 1995

PCT Filed Dec. 8, 1994, Ser. No. 495,583

Claims priority, application France, Dec. 10, 1993, 93 14869

Int. Cl.^{6} H04L *7/02*

U.S. Cl. 375—354 **1 Claim**

1. A system for receiving or reading a digital serial information signal, comprising:

a sampling portion in which the information signal is sampled at regular intervals under control of a local clock to provide a succession of information samples;

an amplitude monitoring circuit configured to receive the succession of information samples from the sampling portion and a weighting factor to provide a succession of amplitude corrected information samples:

a system element connected to receive the succession of amplitude corrected information samples, said system element including a table, said table including

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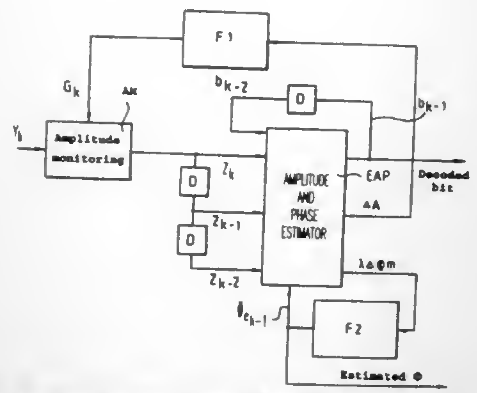


precalculated probable phase values, wherein each one of the precalculated probable phase values is related to two consecutive information samples of the succession of information samples, and

estimated values of amplitude deviation with respect to a nominal value; and

wherein said system element is configured to provide a precalculated probable phase value at an output portion as a measured phase value and an amplitude deviation value as an input to an amplitude monitoring filter configured to convert the amplitude deviation value to the weighting factor and to supply the weighting factor to the amplitude monitoring circuit.

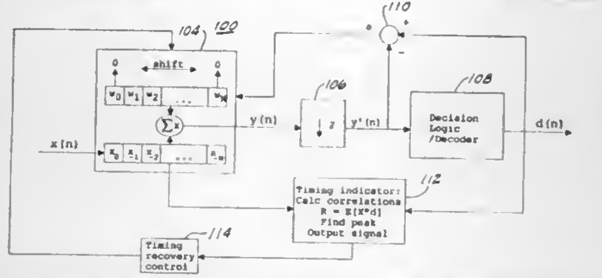
5,838,744
HIGH SPEED MODEM AND METHOD HAVING JITTER-FREE TIMING RECOVERY

Baohua Zheng, St. Louis, Mo., assignor to TALX Corporation, St. Louis, Mo.

Filed Oct. 22, 1996, Ser. No. 735,139

Int. Cl.⁶ H04L *7/02*

U.S. Cl. 375—355 **14 Claims**


104
100
110
0
shift
0
w_0 w_1 w_2 ... w_N
Σx
y(n)
106
↓2
y'(n)
108
Decision Logic /Decoder
d(n)
x(n)
x_0 x_{-1} x_{-2} ... x_{-N}
Timing indicator: Calc correlations R = E[X*d] Find peak Output signal
112
114
Timing recovery control

1. A modem receiver for recovering a data signal d(n) from a complex baseband signal, the data signal having a transmitter symbol rate, the receiver comprising:

means for sampling the complex baseband signal at a fixed sample clock rate substantially equal to twice the transmitter symbol rate to generate baseband samples x(n);

a fractionally spaced adaptive equalizer for processing the samples x(n) in time coordination with the fixed sample clock rate, said equalizer having adjustable taps including a leading tap, a trailing tap and middle taps between the leading tap and the trailing tap, the equalizer taps being used in filtering the samples x(n) to generate equalized output samples y(n);

a down-sampler by a factor of two which discards every other sample of y(n) to generate candidate data samples y'(n);

decision logic and a decoder for extracting the data samples d(n) from y'(n) at a receiver symbol rate which equals the sample rate of y'(n), said adaptive equalizer shrinking the leading and the trailing taps to zero while updating the middle taps in response to an error signal representative of the difference between d(n) and y'(n) so that the mean-squared error of said error signal is minimized;

a timing indicator utilizing correlations E[X*d] of the baseband signal samples x(n) and the extracted data samples d(n) for providing a timing indicator output signal indicating the speed of the receiver symbol rate relative to the transmitter symbol rate, where $X=X(n)=[x_0, x_{-1}, x_{-2}, \ldots, x_{-N}](n)$ is a vector of N baseband samples in the delay line of the adaptive equalizer; and

a timing recovery control initiating timing recovery events to advance or retard the equalized output samples y(n) by shifting the adaptive equalizer taps left or right and by advancing or retarding the equalizer output in response to the timing indicator output signal whereby the receiver symbol rate is increased or decreased to correspond to the transmitter symbol rate without introducing any jitter in the equalized output samples y(n).

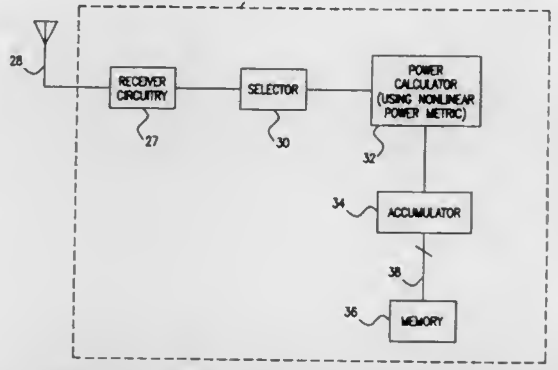
5,838,745
SYNCHRONIZATION METHOD, AND ASSOCIATED CIRCUITRY, FOR IMPROVED SYNCHRONIZATION OF A RECEIVER WITH A TRANSMITTER USING NONLINEAR TRANSFORMATION METRICS

Eric Yi-Pin Wang, Raleigh; Amer Hassan, and Torbjorn Solve, both of Cary, all of N.C., assignors to Ericsson Inc., Research Triangle Park, N.C.

Filed Oct. 9, 1996, Ser. No. 728,179

Int. Cl.⁶ H04L *7/06*

U.S. Cl. 375—364 **45 Claims**



1. A method for coarse synchronization of a receiver with a transmitter using a nonlinear power metric, the receiver and the transmitter coupled together by way of a communication channel, said method comprising the steps of:

transmitting, from the transmitter, a control signal upon the communication channel, the control signal being divided into a succession of consecutive multiframes, each of said multiframes comprising a multiplicity of discrete frames therein, and each of said multiframes comprising at least one high-power synchronization signal therein;

detecting, at the receiver, the control signal transmitted during said step of transmitting;

selecting a given portion of the control signal within a given multiframe; and

calculating the energy accumulated within said given portion using said nonlinear power metric.

5,838,746
RADIO COMMUNICATION SYSTEM PERMITTING OF MANAGEMENT OF VARIABLE TRANSMISSION DELAYS

Martial Bellec, Pleumeur Bodou, France, assignor to U.S. Philips Corporation, New York, N.Y.

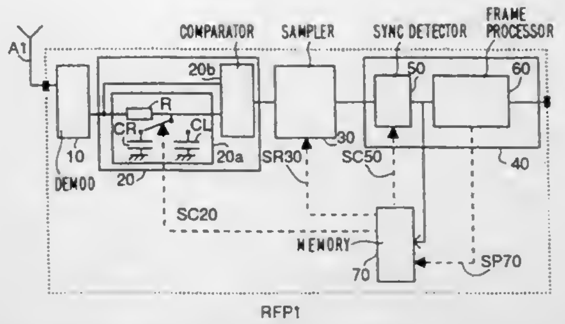
Filed Dec. 13, 1995, Ser. No. 572,217

Claims priority, application France, Dec. 14, 1994, 9415071

Int. Cl.⁶ H04L *7/00*

U.S. Cl. 375—365 **10 Claims**

1. A radio communication system comprising at least one terminal synchronized with a radio station for transmitting radio frames to said radio station which contain information streams among



which comprise notably a preamble word (P) and which arrive at said radio station with a delay that is smaller than a certain limit, wherein said radio station comprises an estimation circuit for estimating a DC component of received radio frames, which estimation is used as a decision threshold by said radio station to assign a value to the information streams of the received radio frames, wherein said radio station further comprises means for determining the delay, and control means for controlling said estimation circuit, so that:

(i) as long as the delay is undetermined, the estimation is made during a time interval of which the time interval boundaries, defined on the basis of said certain limit, correspond to the minimum and maximum possible receiving instants of the preamble word, and

(ii) when the delay is determined, the estimation is made only during the preamble word.

5,838,747
ASYNCHRONOUS SERIAL DATA TRANSMISSION APPARATUS WITH EDGE INTERRUPT OPERATION AND TIMER INTERRUPT OPERATION

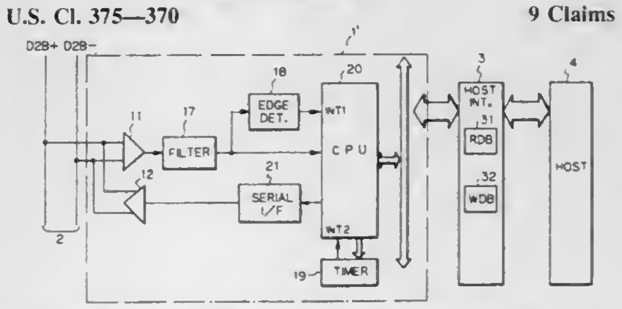
Hisaji Matsumoto, Kanagawa, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 29, 1996, Ser. No. 688,644

Claims priority, application Japan, Jul. 28, 1995, 7-193688

Int. Cl.⁶ H04L *25/38*

U.S. Cl. 375—370 **9 Claims**



1. A serial data transmission apparatus connected to a data transmission bus, comprising:

-an edge detecting means for detecting an edge in a signal at said data transmission bus;

timer means;

first operating means for operating said timer means in response to said edge, said first operating means being stopped when said timer means is being operated; and

second operating means for carrying out one of an operation of fetching a bit data on said data transmission bus and an operation of transmitting a bit data to said data transmission bus, in response to said timer means whose content reaches a predetermined value.

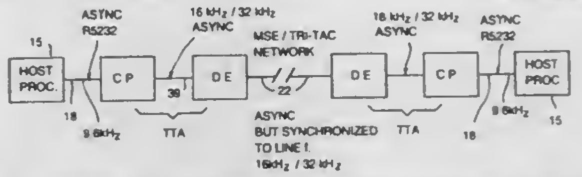
5,838,748
COMMUNICATION INTERFACE BETWEEN COMPUTER AND SYNCHRONOUS DIGITAL TELEPHONE LINE EMPLOYING ASYNCHRONOUS DATA TRANSMISSION FORMAT AND HAVING ENHANCED RELIABILITY

Hai Nguyen, East Brunswick, N.J., assignor to Star Dynamic Corp., North Bergen, N.J.

Continuation of Ser. No. 21,868, Feb. 24, 1993, abandoned. This application Aug. 14, 1996, Ser. No. 698,288

Int. Cl.⁶ H04L *25/38*

U.S. Cl. 375—370 **38 Claims**



1. Apparatus for providing communication between two computers over a communications network and for detecting a command word received from the network for interrupting communication, the command word being repeated for a predetermined time, the apparatus comprising:

first means for organizing data transmitted onto the network in asynchronous format such that the data is arranged in frames with a flag designating the start and stop of each frame and having an interframe period between each frame during which data is not transmitted, each frame having a time period less than the predetermined time of transmission of the command word so that the command word will be transmitted, at least in part, during the interframe period;

second means coupled to the first means and responsive to the command word for interrupting communication; and

third means coupled to the second means and responsive to the flag for placing the second means in a disabled state for the time period of each frame so that the second means cannot respond to the command word during a frame, and when the time period is complete, for enabling the second means to respond to the command word during the interframe period when data is not transmitted in order to avoid misinterpreting data as the command word.

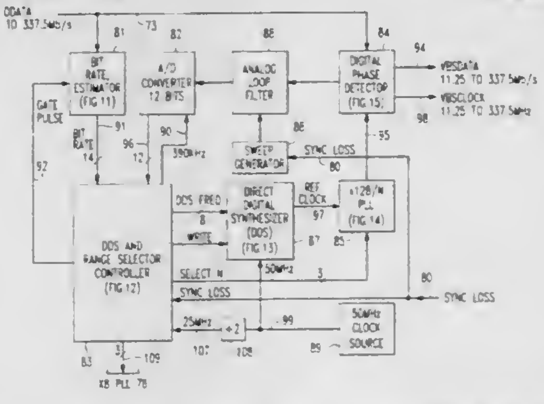
5,838,749
METHOD AND APPARATUS FOR EXTRACTING AN EMBEDDED CLOCK FROM A DIGITAL DATA SIGNAL

Paul W. Casper, West Melbourne; Jeffrey S. Grant, Palm Bay, and Marc E. Sawyer, Melbourne, all of Fla., assignors to Broadband Communications Products, Inc., West Melbourne, Fla.

Filed Jun. 5, 1995, Ser. No. 462,168

Int. Cl.⁶ H04L *7/00*

U.S. Cl. 375—376 **53 Claims**



37. A method for extracting, from a digital data signal, an embedded clock signal that falls within a data clock signal range comprising the steps of:

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(a) monitoring said digital data signal and deriving therefrom a data rate estimate signal representative of an estimate of the data rate of data contained in said digital data signal;

(b) generating a reference clock signal having a frequency established in accordance with said data rate estimate signal;

(c) coupling said reference clock signal generated in step (b) to a first input of a phase detector having a second input coupled to receive said digital data signal, and an output;

(d) providing a sweepable loop filter in a loop path including said reference clock signal and said phase detector, thereby forming a phase-locked loop; and

(e) controllably sweeping said loop filter, and thereby said phase-locked loop, until said phase detector produces an output representative that said phase-locked loop is locked to said embedded clock signal of said digital data signal.

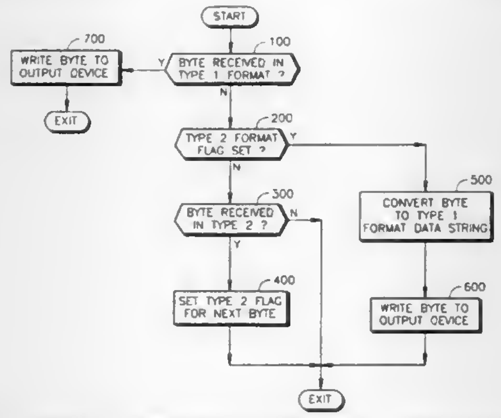
5,838,750
BINARY DATA ELECTRONIC COMMUNICATION SYSTEM

Richard F. Rynaski, Middlefield, and Fred G. Williams, Kensington, both of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Oct. 31, 1995, Ser. No. 550,973

Int. Cl.^{6} H04L ***23/00***

U.S. Cl. 375—377 **1 Claim**


START
100
BYTE RECEIVED IN TYPE 1 FORMAT ?
Y
N
700
WRITE BYTE TO OUTPUT DEVICE
EXIT
200
TYPE 2 FORMAT FLAG SET ?
Y
N
300
BYTE RECEIVED IN TYPE 2 ?
N
Y
500
CONVERT BYTE TO TYPE 1 FORMAT DATA STRING
400
SET TYPE 2 FLAG FOR NEXT BYTE
600
WRITE BYTE TO OUTPUT DEVICE
EXIT

1. A method of transmitting alphanumeric binary data with enhanced security, comprising:

providing a message signal packet having a portion in a first standard data transmission format selected from the group consisting of ASCII, PPP, SLP and MODBUS, and having a second portion of said message signal packet in a second standard data transmission format selected from said group;

transmitting said message signal packet including data in both of said first and second standard data transmission formats;

receiving said message signal packet including data in both of said first and second standard data transmission formats;

detecting the portion of said message signal packet that is in said second standard data transmission format and converting said portion into said first standard data transmission format; and

outputting said message signal packet in said first standard data transmission format to an output device.

5,838,751
CORE PLATE REPAIR USING GUIDE TUBE GAP WEDGES

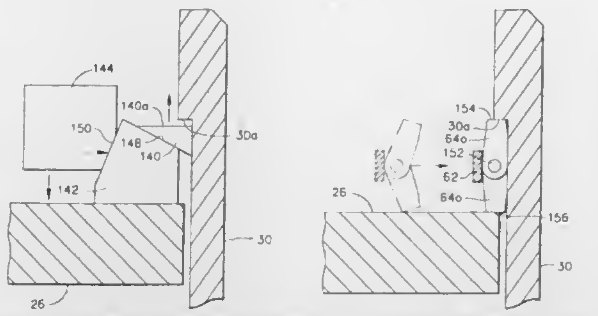
Jeffrey Lee Thompson; Douglas Kevin Ethridge, both of San Jose; John Geddes Erbes, Mt. View, all of Calif., and Martin Daniel Kaylor, Dayton, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 664,605, Jun. 18, 1996, Pat. No. 5,646,970. This application Feb. 5, 1997, Ser. No. 796,093

Int. Cl.^{6} G21C ***19/00***

U.S. Cl. 376—260 **15 Claims**

7. A boiling water reactor comprising:



first and second mutually adjacent, vertically disposed control rod guide tubes, each guide tube having a step at a top end thereof;

a core plate having mutually adjacent first and second apertures penetrated by said first and second guide tubes respectively;

a first wedge block interposed between said core plate and said step of said first guide tube, wherein said first wedge block blocks said core plate from moving closer than a predetermined distance relative to said step of said first guide tube;

a support member to which said first wedge block is attached; and

a tensioning device for pressing said first wedge block against an outer surface of said first guide tube by tensioning said support member.

5,838,752
APPARATUS AND METHOD FOR CARRYING OUT WORKINGS AT REACTOR BOTTOM

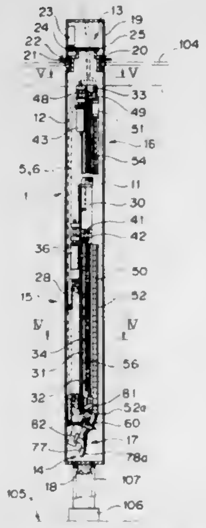
Mitsuaki Shimamura, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 20, 1997, Ser. No. 803,277

Claims priority, application Japan, Feb. 20, 1996, 8-032030

Int. Cl.^{6} G21C ***19/00·17/08;*** **H04N** ***7/18***

U.S. Cl. 376—260 **5 Claims**



1. An apparatus for carrying out work at a reactor bottom, the work includes at least one of inspecting, cleaning and recovering radioactive corrosion products and other foreign matters deposited or stuck onto a foot mirror of a reactor pressure vessel in a light-water cooling reactor, and cutting, grinding and welding structural members in relation to the foreign matters, said apparatus comprising:

a body case having a shape of a vertically long tube, having an opening formed in a peripheral surface thereof, said body case being suspended from above the reactor pressure vessel to be installed over an upper end of a control rod driving mechanism housing which is vacant after withdrawal of a control rod driving mechanism from the housing;

a turning mechanism for turning said body case about an axis thereof and setting a direction of the opening of the body case;

working means housed in the body case;

a developing mechanism for projecting and retracting said working means laterally outward through said opening with respect to the body case;

a lifting mechanism for moving said working means up and down with respect to the body case; and

a transfer mechanism for three-dimensionally transferring said working means, which has been descended by said lifting mechanism, along an upper surface of said foot mirror, said transfer mechanism comprising a linear guide member holding said working means at a distal end thereof, extending downward from said lifting mechanism and being bendable in one direction, and a tip oscillating mechanism provided at a distal end of said guide member and having a degree of freedom for actively moving said working means on a horizontal plane, a degree of freedom for moving said working means in the vertical direction and a degree of freedom for rotating said working means about an axis thereof in a direction in which said working means is to be transferred.

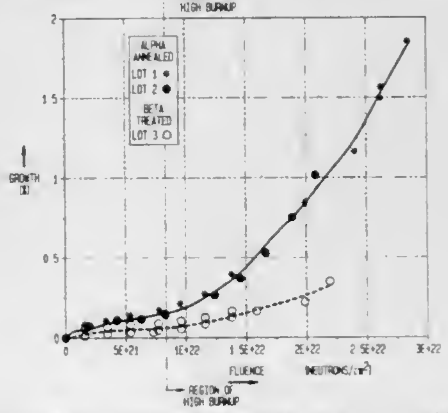
5,838,753
METHOD OF MANUFACTURING ZIRCONIUM NIOBIUM TIN ALLOYS FOR NUCLEAR FUEL RODS AND STRUCTURAL PARTS FOR HIGH BURNUP

Leonard F. P. Van Swam, Richland, Wash.; Friedrich Garzarolli, Höchstadt, and Heinrich Ruhmann, Herzogenaurach, both of Germany, assignors to Siemens Power Corporation, Richland, Wash.

Filed Aug. 1, 1997, Ser. No. 904,366

Int. Cl.^{6} G21C ***3/20;*** **C22C** ***16/00***

U.S. Cl. 376—412 **29 Claims**



1. A process for fabricating nuclear fuel rod cladding tube comprising a zirconium alloy consisting essentially of 0.5 to 3.25 weight percent niobium, from 0.3 to 1.8 weight percent tin, the balance of said alloy being essentially nuclear grade zirconium with incidental impurities and having a microstructure of beta niobium second phase precipitates distributed uniformly intragranularly and intergranularly forming radiation resistant second phase precipitates in the alloy matrix, comprising:

(a) beta quenching a zirconium alloy billet consisting essentially of from 0.5 to 3.25 weight percent niobium, from 0.3 to 1.8 weight percent tin, the balance of said alloy being essentially nuclear grade zirconium with incidental impurities by heating to a temperature in the beta range above 950° C. and rapidly quenching the billet to a temperature below the α plus β to α transformation temperature to form a martensitic structure;

(b) extruding the beta-quenched billet at a temperature below 600° C. to form a hollow;

(c) annealing said hollow by heating at a temperature up to 590° C.;

(d) pilgering said annealed hollow; and

(e) final annealing said pilgered annealed hollow to a temperature up to 590° C. to form said nuclear fuel rod cladding tube comprising the alloy having a microstructure of beta niobium second phase precipitates distributed uniformly intragranularly and intergranularly forming radiation resistant second phase precipitates in the alloy matrix so as to result in increased resistance to aqueous corrosion to that of Zircaloy when irradiated to high fluence.

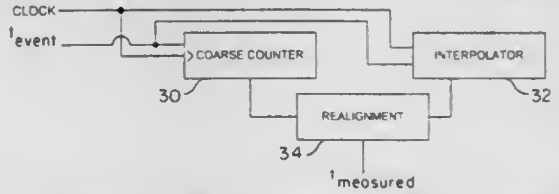
5,838,754
VERNIER DELAY LINE INTERPOLATOR AND COARSE COUNTER REALIGNMENT

Mark S. Gorbics, Franklin Lakes, N.J.; Keith M. Roberts, Nyack, and Richard L. Sumner, Pomona, both of N.Y., assignors to Lecroy Corporation, Chestnut Ridge, N.Y.

Division of Ser. No. 602,904, Feb. 16, 1996, Pat. No. 5,703,838. This application Mar. 11, 1997, Ser. No. 814,835

Int. Cl.^{6} G06M ***3/00***

U.S. Cl. 377—20 **14 Claims**



1. Apparatus for measuring an interval of time, comprising:

a counter for counting both rising and falling edges of a periodic pulse signal having a predetermined pulse period and providing as an output a count signal indicative of the number of counted edges;

an interpolator for receiving said periodic pulse signal and providing a time signal representative of a fraction of said pulse period that has passed since the receipt of a pulse;

realignment means for realigning said counter and said interpolator by comparing said count signal and said time signal and adjusting said count signal in accordance with this comparison; and

means for combining said adjusted count signal and said time signal to produce a combined time signal representative of an interval of time.

5,838,755
FREQUENCY FORMING CIRCUIT WITH PULSE SWALLOWER

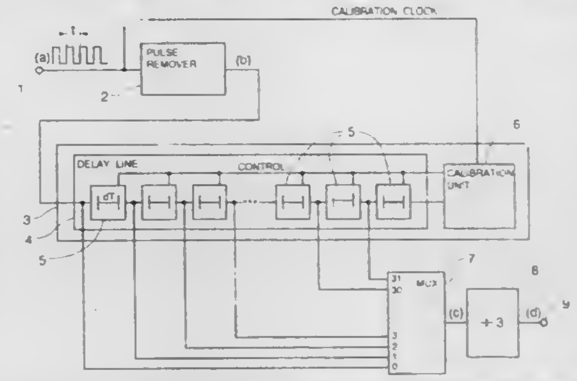
Saila Tammelin, Oulu, Finland, assignor to Nokia Mobile Phones Limited, Salo, Finland

Filed Dec. 9, 1996, Ser. No. 762,416

Claims priority, application Finland, Dec. 11, 1995, 955923

Int. Cl.^{6} H03K ***21/00***

U.S. Cl. 377—48 **4 Claims**



1. A frequency forming circuit, which receives a first pulse string having a first frequency and period t, for forming a second pulse string having a second frequency equal to the first frequency divided by a partial fraction k*a/b, where k, a and b are whole numbers and a is greater than b, is characterized in that it includes

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means (**2**) receiving the first pulse string for removing a–b pulses from the end of each consecutive period of the first pulse string equal in length to a pulses,

a digital delay line (**4**) receiving the pulse string thereafter, consisting of serially connected, controllable elements (**5**) that produce essentially the same unit delay, and which includes an intermediate output before each element for outputting each pulse from the delay line before an element whose ordinal number in the delay line equals the ordinal number of said pulse in the pulse string,

a multiplexer (**7**) for receiving pulses from the intermediate outputs of the delay line and combining them to form a new pulse string and

means (**6**) for controlling the elements (**5**) forming the digital delay line (**4**) to produce an average unit delay (a–b)*t/b with the same control.

5,838,756
RADIATION COMPUTED TOMOGRAPHY APPARATUS

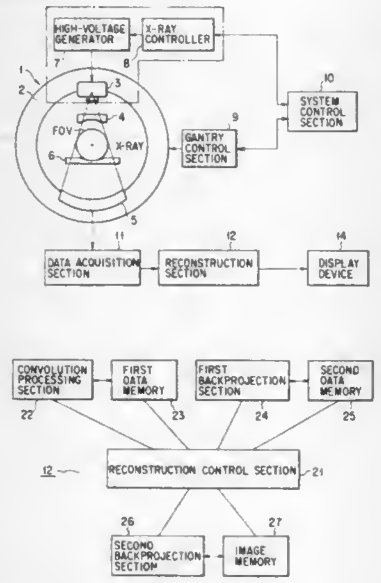
Katsuyuki Taguchi, and Tadaharu Kobayashi, both of Tochigi-ken, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 3, 1997, Ser. No. 778,820

Claims priority, application Japan, Jan. 8, 1996, 8-001015; Jan. 9, 1996, 8-001213

Int. Cl.⁶ A61B *6/03*

U.S. Cl. 378—4 **31 Claims**



1. A radiation CT apparatus comprising:

a radiation source for irradiating a subject with radiations;

detection means having at least two detector columns to detect radiations allowed to pass through the subject;

means for obtaining data to be backprojected in accordance with data detected by said detection means; and

image reconstruction means for reconstructing a transmitted image of the subject, wherein

said image reconstruction means includes

first backprojection means for backprojecting detected data to a predetermined centering plane, and

second backprojection means for backprojecting data backprojected to a plurality of centering plane to said voxels corresponding to backprojected data.

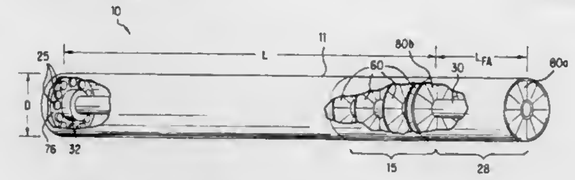
5,838,757
HARD X-RAY POLYCAPILLARY TELESCOPE

Michael H. Vartanian, Niskayuna, N.Y., assignor to Michael H. Vartanian & Co., Inc., Niskayuna, N.Y.

Filed Oct. 18, 1996, Ser. No. 733,487

Int. Cl.⁶ G21K *7/00*

U.S. Cl. 378—43 **27 Claims**



1. An x-ray apparatus for use in imaging an object, comprising: detectors for detecting x-rays;

optic modules, each of said optic modules being disposed in front of a respective one of said detectors and having an optical axis aligned therewith, each of the optic modules having polycapillary fibers with entrance ends open to an entrance aperture of the x-ray apparatus and exit ends aligned to direct x-rays entering the entrance ends to said respective one of said detectors, said polycapillary fibers being decollimated at said entrance ends to provide a predetermined field-of-view;

a Fourier grid assembly disposed in front of said optic modules and having pairs of entrance and exit grids each aligned with a respective one of said optic modules, said pairs of entrance and exit grids having spaced apart bars with a bar spacing period such that an integral number of bar spacing periods at said entrance grid subtends said predetermined field-of-view of said polycapillary fibers, said entrance and exit grid pairs having more than one integral number of bar spacing periods; and

means for rotating as a whole said optic modules, said detectors and said Fourier grid assembly with respect to said object to acquire imaging data from said detectors.

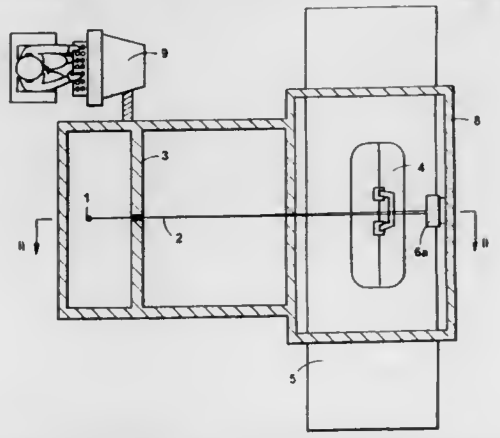
5,838,758
DEVICE AND METHOD FOR INSPECTION OF BAGGAGE AND OTHER OBJECTS

Kristoph D. Krug, and Jay A. Stein, both of Framingham, Mass., assignors to Vivid Technologies, Woburn, Mass.

Continuation of Ser. No. 165,737, Dec. 10, 1993, Pat. No. 5,490,218, which is a continuation of Ser. No. 566,083, Aug. 10, 1990, Pat. No. 5,319,547. This application Mar. 13, 1995, Ser. No. 403,277

Int. Cl.⁶ G01N *23/06*

U.S. Cl. 378—53 **62 Claims**



1. A device for detecting plastic explosive objects in packages or luggage which contain non-explosive plastic, or plastic-like objects in an initially unidentified ensemble of objects, comprising:

a conveyor for sequentially moving packages or luggage through an inspection region,

a stationary X-ray exposure system located at said inspection region and positioned to expose sequentially said packages or luggage comprising an initially unidentified ensemble of objects in said inspection region to X-ray radiation of at least two substantially different energies,

a stationary X-ray detection system positioned to detect X-ray radiation transmitted through an item of luggage or package, said detection system providing data corresponding to the intensity of transmitted radiation of said two energies,

a computer operatively connected to said detection system to receive said data and programmed to calculate a value of a specific property of a plastic explosive object in said item of luggage or package, and automatically discriminate said plastic explosive object from non-explosive plastic, or plastic-like objects that are present in said initially unidentified ensemble of objects based on said calculated value of said specific property, said automatic discrimination utilizing x-ray transmission data of rays passing through said item of luggage or package, and near but not through said plastic explosive object to remove by computer calculation the contribution of unwanted overlying and underlying material of said ensemble of objects from the calculated value of said specific property of said plastic explosive object, and

said computer programmed to automatically indicate, based on said discrimination, presence of said plastic explosive object while said item of package or luggage progresses on said conveyor.

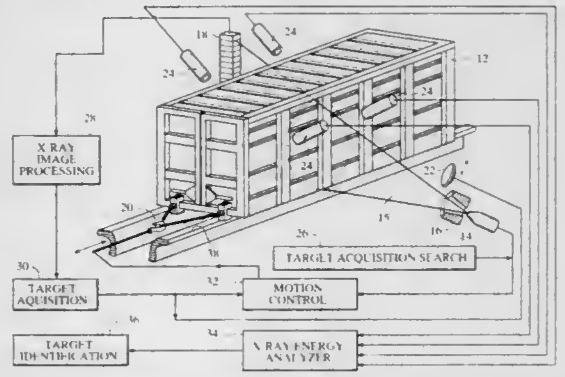
5,838,759
SINGLE BEAM PHOTONEUTRON PROBE AND X-RAY IMAGING SYSTEM FOR CONTRABAND DETECTION AND IDENTIFICATION

Robert A. Armistead, Los Altos Hills, Calif., assignor to Advanced Research and Applications Corporation, Sunnyvale, Calif.

Cntinuation-in-part of Ser. No. 674,919, Jul. 3, 1996, Pat. No. 5,638,420. This application Jun. 5, 1997, Ser. No. 869,318

Int. Cl.⁶ G01N *23/04*

U.S. Cl. 378—57 **15 Claims**



1. A security inspection apparatus for probing the contents of a cargo container comprising,

an X-ray source having an output beam with sufficient energy and flux for traversing a cargo container,

X-ray detectors disposed to intercept the output beam of the X-ray source after traversing the cargo container, the detector having an output signal,

a motor connected to the X-ray source and X-ray detectors in a position establishing relative motion, in a scan pattern, between the cargo container on the one hand and the source and detector on the other hand,

a beam recorder connected to receive the output signal from the detectors and plot a representation of the cargo container,

a beam converter selectively movable into the X-ray beam path between the X-ray source and the cargo container capable of converting the X-ray beam into a neutron beam directed into the cargo container,

a gamma radiation spectrometer capable of detecting gamma rays from neutron activation of specific atoms, said spectrometer disposed in proximity to the cargo container and producing a signal in response to said gamma rays.

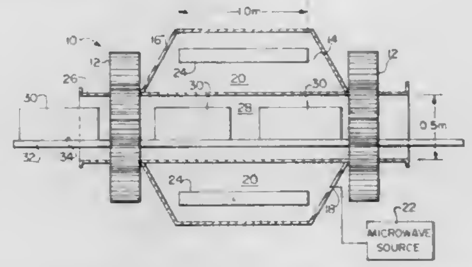
5,838,760
METHOD AND APPARATUS FOR PRODUCT X-RADIATION

Kenneth G. Moses, 2727 Via Miguel, Palos Verdes Estates, Calif. 90274, assignor to Kenneth G. Moses, Palos Verdes Estates, Calif.

Continuation-in-part of Ser. No. 371,799, Jan. 12, 1995, Pat. No. 5,577,090. This application Sep. 25, 1996, Ser. No. 719,803

Int. Cl.⁶ H01J *35/00*

U.S. Cl. 378—119 **27 Claims**



1. An x-ray apparatus for product irradiation comprising:

a chamber and a gas confined within said chamber;

means connected to said chamber for heating said gas to create a hot electron plasma:

means disposed proximate to said chamber for magnetically confining said hot electron plasma in an annular configuration:

and means for supporting and locating said product proximately to said chamber for receiving x-rays radiating therefrom: and

wherein said chamber has an inner diameter of at least about 20 cm, an outer diameter of at least about 40 cm and a length of at least about 60 cm.

5,838,761
X-RAY TUBE WITH GETTER

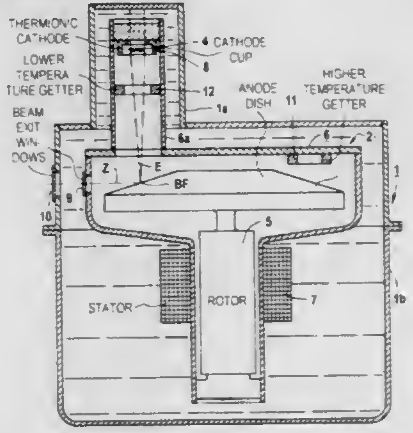
Heinrich Behner, Moehrendorf, and Thomas Weller, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed May 1, 1997, Ser. No. 848,873

Claims priority, application Germany, May 6, 1996, 196 18 135.6; Mar. 27, 1997, 197 13 076.3

Int. Cl.⁶ H01J *35/20*

U.S. Cl. 378—123 **6 Claims**



1. An x-ray tube comprising:

a vacuum housing having a housing projection;

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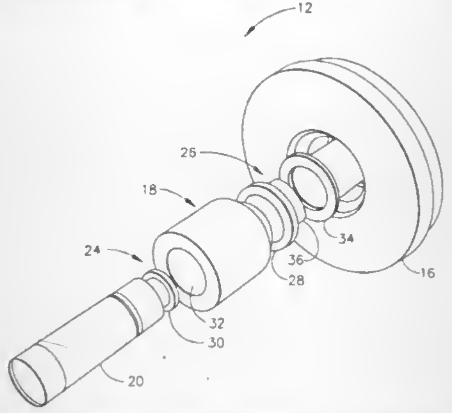
an anode disposed in said vacuum housing, said anode, during operation, emitting heat radiation at a heat radiation temperature;
a cathode disposed in said housing projection;
a first getter for bonding free gases arising in said vacuum housing during operation of said x-ray tube, said first getter being disposed in said vacuum housing in a region permeated by said heat radiation and substantially at said heat radiation temperature; and
a second getter for bonding free gases arising in said vacuum housing during operation of said x-ray tube, said second getter disposed at a location in said housing projection at a temperature substantially lower during operation than said heat radiation temperature.

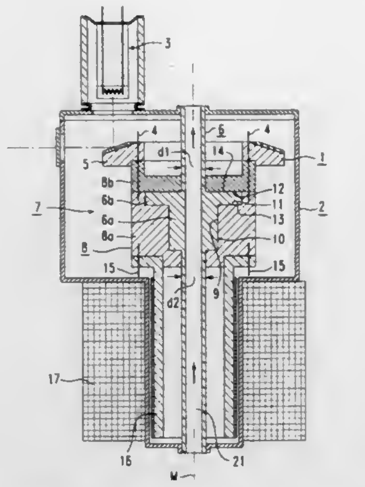
5,838,762
ROTATING ANODE FOR X-RAY TUBE USING INTERFERENCE FIT
Eti Ganin, Whitefish Bay; Mark O. Derakhshan, West Allis, and Thomas G. Ebben, Sullivan, all of Wis., assignors to General Electric Company, Milwaukee, Wis.
Filed Dec. 11, 1996, Ser. No. 762,013
Int. Cl.^{6} H01J *35/10*
U.S. Cl. 378—125 **3 Claims**



1. A method for assembling a rotating X-ray tube structure, the X-ray tube structure having a cathode for emitting electrons, and a rotor and a bearing assembly for facilitating rotation of an anode, the method comprising the steps of:
identifying at least one joint in the X-ray tube structure;
using interference fit assembly to eliminate shifts at the at least one joint;
wherein the step of using interference fit assembly further comprises the step of:
using interference fit assembly between the rotor and the anode target to provide a first joint, the first joint having balance retention; and
using interference fit assembly between the bearing assembly and the rotor to provide a second joint the second joint having balance retention.

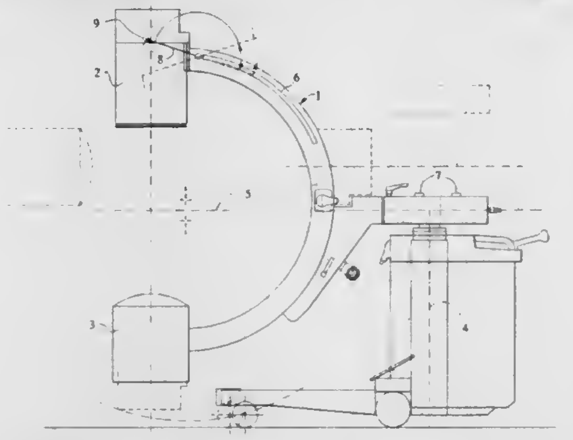
5,838,763
X-RAY TUBE WITH A PLAIN BEARING
Bernhard Hiller, Buckenhof; Roland Koeppel, and Edwin Gemmel, both of Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany
Filed Jul. 18, 1997, Ser. No. 896,440
Claims priority, application Germany, Jul. 26, 1996, 196 30 351.6
Int. Cl.^{6} H01J *35/10*
U.S. Cl. 378—133 **4 Claims**

1. An X-ray tube comprising:
an evacuated housing;
an anode assembly and a cathode assembly in said housing; and



means for rotatably mounting said anode assembly in said housing including a plain bearing, said plain bearing comprising an inner bearing part having opposite ends connected to said housing so as to be stationary relative to said housing, a rotating outer bearing part connected to said anode assembly and rotatable therewith in said housing, said inner bearing part extending through said outer bearing part and forming a bearing gap therewith, liquid metal lubricant disposed in said gap at least in a region for transmission of force, said gap being substantially coextensive with said opposite ends of said inner bearing part and having an identical diameter at each of said ends.

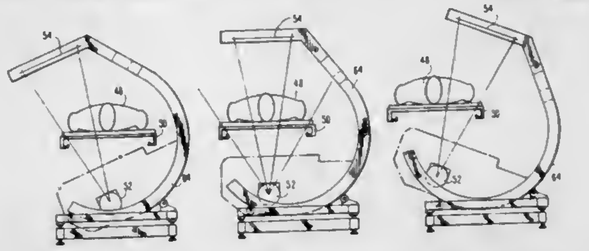
5,838,764
MEDICAL SYSTEM WITH ADJUSTABLE HANDLE
Edmund Saffer, Eggolsheim; Helmut Richter, Baiersdorf, and Hans-Juergen Schweiger, Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany
Filed Jun. 25, 1997, Ser. No. 881,915
Claims priority, application Germany, Jun. 25, 1996, 196 25 411.6
Int. Cl.^{6} G05G *5/00*
U.S. Cl. 378—197 **17 Claims**



1. A medical system comprising:
a plurality of movable components each having a disengageable brake for holding that component, after adjustment thereof, in an adjusted position, at least one of said components having a plug-in receptacle;
each brake having switching means associated therewith for engaging and disengaging that brake;
a sterilizeable handle having a gripping end and an opposite plug-in end releaseably receivable in said plug-in receptacle; and
means contained in said handle, including a manually depressable pushbutton at said gripping end of said handle, for

operating at least one of said switching means when said plug-in end of said handle is received in said plug-in receptacle.

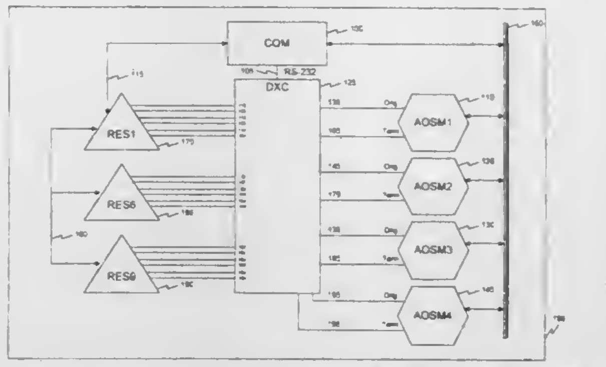
5,838,765
WHOLE-BODY X-RAY BONE DENSITOMETRY USING A NARROW-ANGLE FAN BEAM, INCLUDING VARIABLE FAN BEAM DISPLACEMENT BETWEEN SCAN PASSES
Russell J. Gershman, Middleborough; Richard E. Cabral, Tewksbury; Noah Berger, Waltham, and Jay A. Stein, Framingham, all of Mass., assignors to Hologic, Inc., Waltham, Mass.
Continuation-in-part of Ser. No. 345,069, Nov. 25, 1994, which is a continuation-in-part of Ser. No. 156,287, Nov. 22, 1993, Pat. No. 5,432,834. This application Jun. 7, 1995, Ser. No. 486,368
Int. Cl.^{6} G21K *5/10*
U.S. Cl. 378—196 **53 Claims**



1. A whole body x-ray bone densitometry system comprising:
a table extending parallel to a Y-axis of an XYZ coordinate system for supporting a patient at a patient position;
an x-ray source for emitting a narrow angle fan beam of x-rays to irradiate at any one time a scan line which is transverse to the Y-axis and is substantially shorter than the width of a body cross-section of a typical adult patient occupying the patient position;
an x-ray detector aligned with said source along a source-detector axis which is transverse to the Y-axis, for receiving x-rays from the source within the angle of said fan beam after passage thereof through the patient position, said detector comprising a number of detecting elements arranged along a direction transverse to the Y-axis and to the source-detector axis;
a source-detector support on which the source and detector are mounted at opposite sides of the patient position; and
a scanning mechanism moving the patient table and the source-detector support relative to each other parallel to the Y-axis to scan the patient position with said narrow angle fan beam in successive scans parallel to the Y-axis in which the source-detector axis is at different angles relative to the patient position as between different ones of said successive scans, but in each of said successive scans an origin of the fan beam in the source is at the same vertical distance from the patient table.

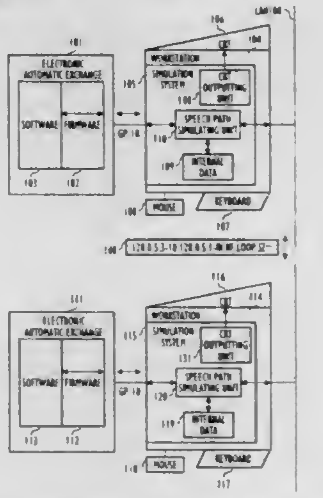
5,838,766
SYSTEM AND METHOD FOR PROVIDING SHARED RESOURCES TO TEST PLATFORMS
Kevin W. Rand, Garland, Tex., assignor to MCI Communications Corporation, Washington, D.C.
Filed Sep. 26, 1996, Ser. No. 721,409
Int. Cl.^{6} H04M *1/24;3/08;3/22*
U.S. Cl. 379—9 **20 Claims**

13. A method of performing a plurality of tests comprising a first test and a second test, wherein a shared resource is required for performing the first test and the second test, the method comprising the steps of:
sending from a first test platform a first command requesting the shared resource in one of blocking mode and non-blocking mode;



sending from a second test platform a second command requesting the shared resource;
receiving the first command and then the second command in a manager;
allocating the shared resource to the first test platform in response to receiving the first command; and
deallocating the shared resource from the first test platform and allocating the shared resource to the second test platform if the first test platform requested the shared resource in non-blocking mode in the first command.

5,838,767
METHOD OF SIMULATIVE TESTING STORED PROGRAM CONTROL TYPE ELECTRONIC AUTOMATIC EXCHANGE
Mami Aoyama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Mar. 7, 1995, Ser. No. 399,547
Claims priority, application Japan, Mar. 8, 1994, 6-037197
Int. Cl.^{6} H04M *3/08;3/22*
U.S. Cl. 379—10 **5 Claims**



1. A method of simulatively testing a stored program control type electronic automatic exchange, wherein a plurality of simulation systems are connected directly to a network to simulate operations of trunks or common channel signaling terminals, and wherein said automatic exchange to be tested is directly connected to one of said plurality of simulation systems, and another of said plurality of simulation systems is directly connected to another electronic automatic exchange, said method comprising the steps of transmitting and receiving, between the trunks of the electronic automatic exchanges, character string data which are representative of, and are transmitted and received in place of, a control signal or a common channel signal which is to be transferred between said trunks, using a data communication function of said network between said plurality of simulation systems.

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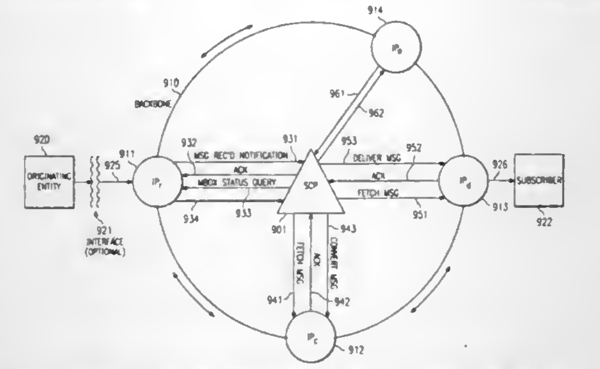
5,838,768
SYSTEM AND METHOD FOR CONTROLLED MEDIA CONVERSION IN AN INTELLIGENT NETWORK

Gulamabbas Sumar, Sorögatan; Bo Arne Valdemar Åström, Telefonvägen; Björn Arne Svennesson, Kevingeringen, all of Sweden, and Robert Johannes Bernardus Schmersel, AM Brunssum, Netherlands, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Oct. 3, 1996, Ser. No. 724,845
Int. Cl.^{6} H04M *1/64*
U.S. Cl. 379—89 **33 Claims**



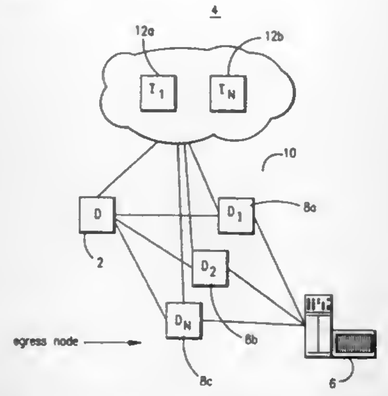
1. In a method for communicating in an IN (Intelligent Network) telecommunications system comprising a plurality of IPs (Intelligent Peripherals) connected to an SCP (Service Control Point) over a network, said plurality of IPs being further connected to each other over a distinct telecommunications backbone, an improvement of a method for converting a received-form message formed in a first medium into a converted-form message formed in a second medium, said method comprising the steps of:

providing the received-form message formed in the first medium to a recipient IP;
transporting the received-form message from the recipient IP to a conversion IP;
converting the received-form message at the conversion IP into the converted-form message formed in the second medium;
transporting the converted form message to a delivery IP; and
delivering the converted-form message formed in the second medium to the intended recipient of said message.

5,838,769
METHOD OF REDUCING RISK THAT CALLS ARE BLOCKED BY EGRESS SWITCH OR TRUNK FAILURES

Howard McNeil, Allen, Tex.; Donald Pitchford, Campbell, Calif., and Iyad S. Tarazi, Reston, Va., assignors to MCI Communications Corporation, Washington, D.C.

Filed Dec. 31, 1996, Ser. No. 775,764
Int. Cl.^{6} H04M *1/24;3/08;3/22*
U.S. Cl. 379—14 **18 Claims**



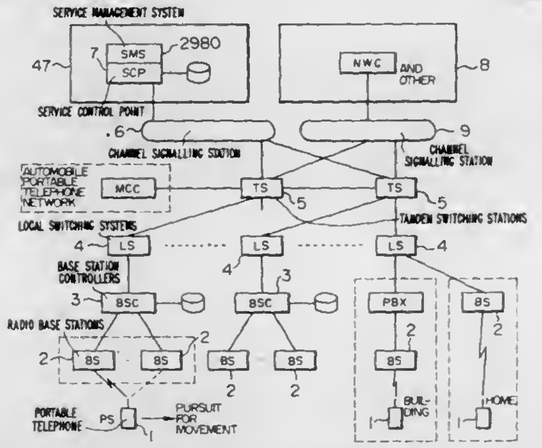
1. In a telecommunications network, a method of reducing the risk of traffic not being routed from an origination node to a destination due to outages at nodes of said network, comprising the steps of:

forming an egress node from a plurality of network switches, any one of said switches adaptable to route traffic to said destination;
allocating traffic among a number of direct trunks each connecting said origination node to one of said switches of said egress node;
selecting a tandem node connected to both said origination node and said egress node to route the traffic if all said direct trunks are busy;
if more than one trunk connects said tandem node to said egress node, routing the traffic from said tandem node to said egress node by randomly distributing the traffic onto any one of the trunks connecting said tandem node to said egress node;
connecting said egress node to said destination by at least one egress trunk or at least one trunk of another network;
notifying said egress node that traffic cannot be routed to said destination when said egress trunk is busy; and
wherein upon being notified, said egress node directing the traffic to said destination using another hierarchical level of routing.

5,838,770
PORTABLE TELEPHONE SYSTEM

Yutaka Fukushima; Tetsuo Takemura, both of Yokohama; Shinichi Iwaki, Kamakura; Mitsuyoshi Hashida, Yokohama; Masao Wanami, Yokohama; Isao Shimbo, Yokohama; Mitsuhiro Wada, Yokohama; Hirofumi Udaki, Yokohama; Yoshihiro Kondo, Yokohama; Yoshinobu Yamamoto, Fujisawa; Arata Nakagoshi, Kokubunji; Kouichi Ohta, Yokohama; Hiroshi Kuwahara, Kodaira, and Yumiko Watanabe, Tokyo, all of Japan, assignors to Hitachi, Ltd., and Kokusai Electric Co., Ltd., both of Tokyo, Japan

Division of Ser. No. 941,963, Sep. 8, 1992, Pat. No. 5,579,370. This application Aug. 8, 1996, Ser. No. 689,359
Claims priority, application Japan, Oct. 7, 1991, 3-259488
Int. Cl.^{6} H04M *3/22;1/60*
U.S. Cl. 379—34 **3 Claims**



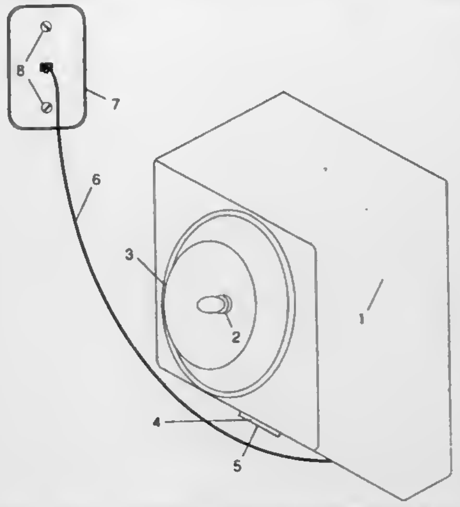
2. A portable telephone system, comprising:

a switching system:
a plurality of radio base stations, each of said radio base stations respectively connected to said switching system through transmission paths in a respective area: and
a portable telephone connected to said a respective one of said radio base stations through radio transmission paths,
wherein, when a plurality of calls for establishing communication between said portable telephone and another terminal are received at said respective one of said radio base stations in a busy state, said respective one of said radio base stations holds said calls in the order of reception thereof, and establishes communication between said portable telephone and said another terminal in the order in which said calls were received when the busy state is cleared.

5,838,771
EMERGENCY RESPONSE TELEPHONE MONITORING DEVICE

John Daniel Moeller, 300 Lawton Blvd., Knoxville, Tenn. 37922

Filed Sep. 4, 1996, Ser. No. 707,427
Int. Cl.^{6} H04M *11/04*
U.S. Cl. 379—37 **5 Claims**



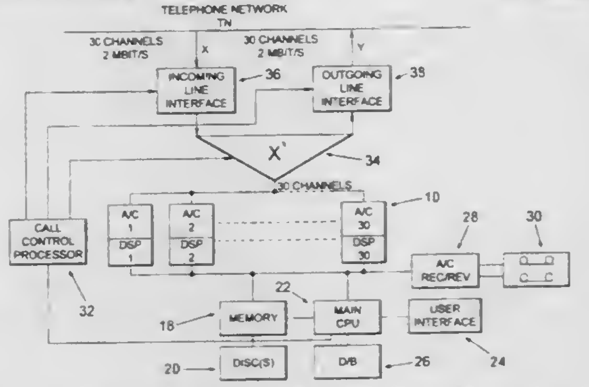
1. An emergency response telephone monitoring devices comprising:

means for enabling an emergency response team to quickly locate the address wherein emergency telephone number is dialed by a user of a telephone connectively attached to the device wherein;
a low cost totally self contained externally mounted and weather sealed device having a highly identifiable automatically operated alarm system of significant report and flashing light of significant intensity, powered solely by readily accessible inexpensive batteries for a period of time in excess of one year, thus requiring no external AC power source to back up the aforementioned batteries in said device comprising;
a microchip processor means of control operatively connected to any telephone interface within a home telephone network;
a flashing light circuit and audible alarm circuit of significant report, activated by said microprocessor and highly visible from the exterior of the dwelling powered solely by the aforementioned batteries;
an emergency voice message microchip controlled by the microprocessor having a prerecorded voice message that when activated by way of a telephone touch tone key is transmitted to and received by all parties actively connected to the telephone line;
an accessory control interface for connecting and operating external devices by said microprocessor;
a means of control whereby the microprocessor monitors the output of the device's battery power supply and generates an audible tone in the ear piece of the users handset if the voltage level of the battery power supply is less than a preset lower limit;
a means of control whereby the microprocessor utilizes innovative low power technology to provide all functions for a period of time in excess of one year, on one set of readily available low voltage batteries;
a specific program code written and installed in the aforementioned microprocessor chip that determines from the audible touch tone frequencies being received from the telephone network which touch tone digit the user is entering and upon entering a preprogrammed set of digit(s), the microprocessor recognizes said digit(s) and performs the preprogrammed function or functions initiated by said digit(s) who's functions comprise;
a monitor, activation, deactivation, system test and reporting, battery strength test and reporting and voice activation;
where activation of the alarm is accomplished by monitoring the telephone network for the predetermined digit or digits to be dialed on any telephone device operatively connected to the network which touch tone digit the user is dialing and determines if the user entered or dialed the correct telephone number sequence, where upon, the microprocessor powers the microprocessor pin which is connected to the appropriate micro switch thus activating the emergency response telephone monitoring device;
where upon being activated, deactivation of the alarm is accomplished by monitoring the telephone network for the predetermined digit or digits to be dialed on any telephone device operatively connected to the network which touch tone digit the user is dialing and determines if the user entered or dialed the correct telephone number sequence, where upon, the microprocessor powers the microprocessor pin which is connected to the appropriate micro switch thus deactivating the emergency response telephone monitoring device;
which can be tested to insure proper operation by monitoring the telephone network for the predetermined digit(s) to be dialed on any telephone devices operatively connected to the network.

5,838,772
VOICE SERVICES EQUIPMENT

Jeffrey Wilson, Fareham, and John Stephen Sinden, Hayling Island, both of England, assignors to Telsis Holdings Limited

PCT No. PCT/GB92/01000, § 371 Date Dec. 3, 1993, § 102(e) Date Dec. 3, 1993, PCT Pub. No. WO92/22165, PCT Pub. Date Dec. 10, 1992
PCT Filed Jun. 3, 1992, Ser. No. 157,076
Claims priority, application United Kingdom, Jun. 4, 1991, 9111947
Int. Cl.^{6} H04M *1/64*
U.S. Cl. 379—67 **23 Claims**



1. A voice services equipment comprising a voice services module having a plurality of audio ports and being operable to generate an interactive control signal in response to programming of the voice services module, and switching means responsive to said interactive control signal from said voice services module to provide a selectable switching function between said audio ports, a plurality of dedicated incoming line connections from a telephone network for receiving only incoming calls from the network, and a plurality of dedicated outgoing line connections to the telephone network for placing only outgoing calls to the network, such that the selectable switching function is between a selected combination of the dedicated line connections and said voice services module to provide a two-way connection between the following: (i) one of the dedicated incoming line connections and one of the audio ports, (ii) one of the dedicated incoming line connections and one of the dedicated outgoing line connections, and (iii) one of the audio ports and one of the dedicated outgoing line connections, and to provide a three-way connection between one of the dedicated incoming line connections, one of the dedicated outgoing line connections and one of the audio ports, and wherein the number of dedicated incoming line connections is the same as the number of audio ports in the voice services module, and the number of dedicated outgoing connections is no greater than the number of dedicated incoming line connections.

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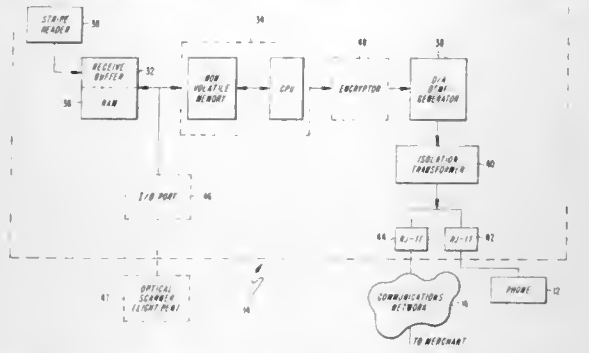
5,838,773
PERSONAL READER CAPTURE TRANSFER TECHNOLOGY

Meyer W. Eisner, Bensalem, and Stanley G. Scwartz, Philadelphia, both of Pa., assignors to Belco Systems Technology Corp., Langhorne, Pa.

Continuation of Ser. No. 512,798, Aug. 8, 1995, abandoned. This application Jun. 9, 1997, Ser. No. 871,526

Int. Cl.^{6} H04M *11/00*

U.S. Cl. 379—91.01 **20 Claims**



16. A customer transaction device comprising:

means for inputting card information from a financial transaction card selected from the group consisting of credit cards, debit cards and bank cards,

memory means for storing card information,

means for comparing said input card information to said stored card information and for enabling transmission of said input card information over a telephone communications path when said input card information is substantially identical to said stored card information, and

communication means including a transmitter for transmitting said card information over said telephone communications path, said transmitter permitting simultaneous voice transmission over said telephone communications path.

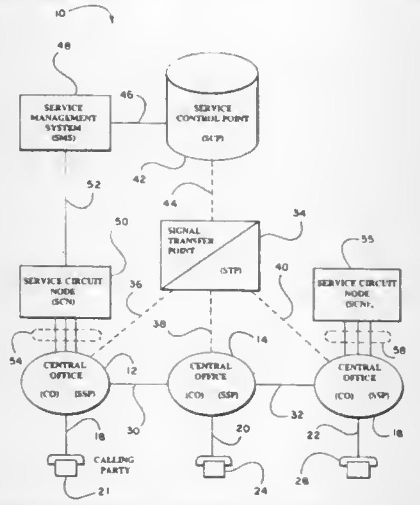
5,838,774
TELEPHONE POLLING METHOD

Frank J. Weisser, Jr., Atlanta, Ga., assignor to BellSouth Corporation, Atlanta, Ga.

Filed Jul. 1, 1996, Ser. No. 673,916

Int. Cl.^{6} H04M *11/00*

U.S. Cl. 379—92.02 **20 Claims**


10
48
SERVICE MANAGEMENT SYSTEM (SMS)
46
SERVICE CONTROL POINT (SCP)
42
52
44
SIGNAL TRANSFER POINT (STP)
34
50
SERVICE CIRCUIT NODE (SCN)
36
40
55
SERVICE CIRCUIT NODE (SCN)
38
14
54
CENTRAL OFFICE (CO) (SSP)
12
CENTRAL OFFICE (CO) (SSP)
CENTRAL OFFICE (CO) (SSP)
58
18
30
20
32
22
CALLING PARTY
21
24
26

20. A telephone polling method for tabulating calls made to a telephone polling number in an Advanced Intelligent Network, including a switch, a service circuit node, and a service control point, wherein the service control point is functionally connected to the switch and the service circuit node, wherein the service control point includes a database of subscriber information including a list of telephone polling numbers corresponding to subscribers, and wherein the telephone polling method comprises the steps of:

receiving a call from a calling party made to the telephone polling number at the calling party's switch;

sending call identifying information associated with the call made to the telephone polling number from the switch to the service control point; and

at the service control point:

- determining whether the call identifying information identifies a call made to the telephone polling number of a subscriber;
- tabulating a response corresponding to the call made to the telephone polling number;
- recording the identity of the calling party;
- determining from the identity of the calling party whether the calling party has called the telephone polling number previously;
- blocking tabulation of the response from the calling party if the calling party has previously called the telephone polling number; and
- sending instructions to the switch for handling the call made to the telephone polling number.

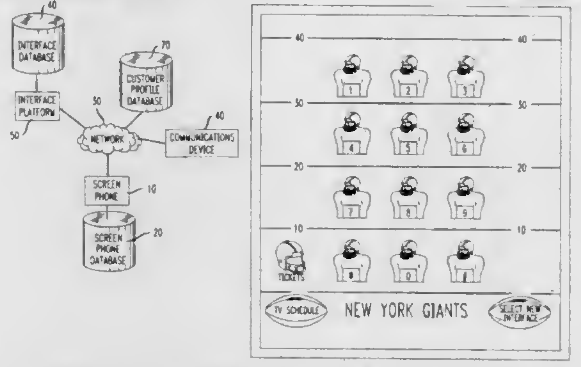
5,838,775
SYSTEM AND METHOD FOR PROVIDING A USER-SELECTABLE INTERFACE FOR A SCREEN TELEPHONE

John Richard Montalbano, Carmel, Ind., assignor to AT&T Corp, Middletown, N.J.

Filed Dec. 12, 1996, Ser. No. 764,800

Int. Cl.^{6} H04M *11/00*

U.S. Cl. 379—93.23 **28 Claims**



1. A method for providing an interactive screen phone interface that is selectable by a user, comprising:

(a) receiving an interface request for the interactive screen phone interface, said interface comprising selectable graphic elements that represent numbers on a telephone keypad; and

(b) sending the requested interface to the screen phone for presentation to the user.

5,838,776
POWER CONTROLLER FOR A HEATING/AIR CONDITIONING UNIT

James E. Adkins, II, 140-D South Dr., South Point, Ohio 45680, and Kenneth W. Winters, P.O. Box 728, Maynardville, Tenn. 37807

Filed Aug. 23, 1996, Ser. No. 701,920

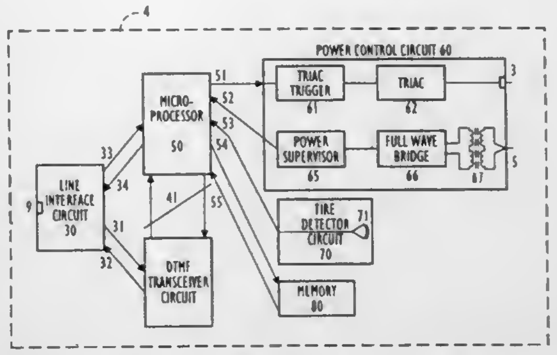
Int. Cl.^{6} H04M *11/00*

U.S. Cl. 379—102.05 **81 Claims**

1. A power control apparatus for controlling power from a power source to a power device comprising:

a modular structure;

power input means, disposed in the modular structure, for receiving power from the power source;



power output means, disposed in the modular structure, for outputting power directly to a power conductor of the power device: and

power control means, disposed in the modular structure, for monitoring a parameter of the received power from the power input means, removing the output power from the power output means when the parameter falls outside a predetermined range, and reapplying the output power to the power output means after measuring a predetermined event.

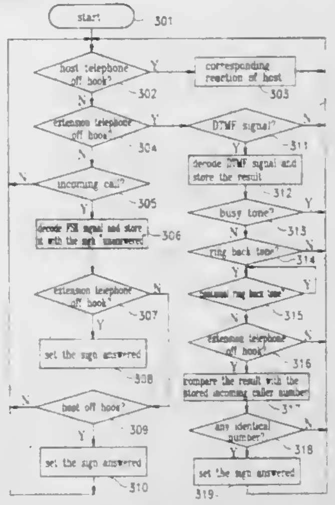
5,838,777
APPARATUS FOR AUTO-DETECTING DIALING OF A PARALLEL COMMUNICATION DEVICE

Jackson Chang; Jeffrey Lai; Taing Xu, and James Yin, all of Taipei, Taiwan, assignors to Inventec Corporation, Taipei, Taiwan

Filed Feb. 28, 1997, Ser. No. 808,379

Int. Cl.^{6} H04M *1/56;15/06;1/00;3/00*

U.S. Cl. 379—142 **23 Claims**


start
301
host telephone off hook?
302
Y
N
corresponding reaction of host
303
extension telephone off hook?
304
DTMF signal?
311
decode DTMF signal and store the result
312
incoming call?
305
decode FSK signal and store it with the sign "unanswered"
306
busy tone?
313
ring back tone?
314
unusual ring back tone?
315
extension telephone off hook?
307
set the sign answered
308
extension telephone off hook?
316
compare the result with the stored incoming caller number
317
host off hook?
309
any identical number?
318
set the sign answered
310
set the sign answered
319

1. Apparatus for detecting dialing of a plurality of parallel-coupled telephones in a communication system, which comprising:

FSK (Frequency Shift Keying) decoding means for acquiring a dial-in number by decoding a telephone signal;

parallel device detecting means for detecting whether said plurality of parallel-coupled telephones of said parallel communication system are off hook;

storage means for storing a plurality of telephone numbers and said dial-in number of said plurality of parallel-coupled telephones;

ring-back signal detecting means for detecting whether a ring-back signal is sent to said apparatus after sending said outgoing number, to determine if an outgoing call is successfully made by said plurality of parallel-coupled telephones;

DTMF (Dual Tone Multiple Frequency) decoding means for acquiring said outgoing number by decoding a DTMF signal sent by said parallel communication system; and

a processor for proceeding with a plurality of interior signals and sequentially receiving said plurality of interior signals according to an order, and make said electrical apparatus detect said outgoing number; proceed with said telephone numbers and store said dial-in number in said storage means, and either set the display "unanswered" or remain the original display on said plurality of parallel-coupled telephones, after comparing said outgoing number with said plurality of telephone numbers.

5,838,778
RESERVED SPEECH PATH FORMING METHOD IN A PARALLEL-CONNECTED TELEPHONE SYSTEM

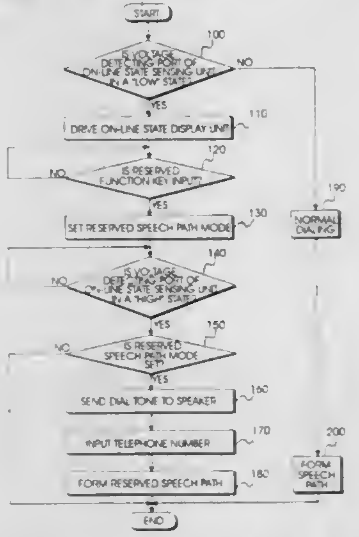
Sung-Ha Jung, Goomi, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jan. 19, 1996, Ser. No. 588,982

Claims priority, application Rep. of Korea, Apr. 26, 1995, 9971/1995

Int. Cl.^{6} H04M *13/00*

U.S. Cl. 379—182 **16 Claims**


START
100
IS VOLTAGE DETECTING PORT OF ON-LINE STATE SENSING UNIT IN A "LOW" STATE?
NO
YES
110
DRIVE ON-LINE STATE DISPLAY UNIT
120
IS RESERVED FUNCTION KEY INPUT?
NO
YES
130
SET RESERVED SPEECH PATH MODE
190
NORMAL DIALING
140
IS VOLTAGE DETECTING PORT OF ON-LINE STATE SENSING UNIT IN A "HIGH" STATE?
NO
YES
150
IS RESERVED SPEECH PATH MODE SET?
NO
YES
160
SEND DIAL TONE TO SPEAKER
170
INPUT TELEPHONE NUMBER
200
FORM SPEECH PATH
180
FORM RESERVED SPEECH PATH
END

1. A method for forming a reserved speech path in a parallel-connected telephone system comprising at least two telephone sets connected in parallel to a common telephone line, said method comprising the steps of:

determining, at a first telephone set, whether a second telephone set connected in parallel with said first telephone set to said common telephone line within said parallel-connected telephone system is in an on-line state;

permitting input of a reserved function key at said first telephone set without disconnecting said second telephone set from said common telephone line, when said second telephone set within said parallel-connected telephone system is in said on-line state;

setting said first telephone set in a reserved speech path mode in response to input of said reserved function key;

determining, at said first telephone set, whether said second telephone set shifts from said on-line state to an off-line state; and

informing a user of said first telephone set of the availability of the common telephone line for dialing a telephone number and forming said reserved speech path, after said second telephone set within said parallel-connected telephone system shifts from said on-line state to said off-line state.

5,838,779

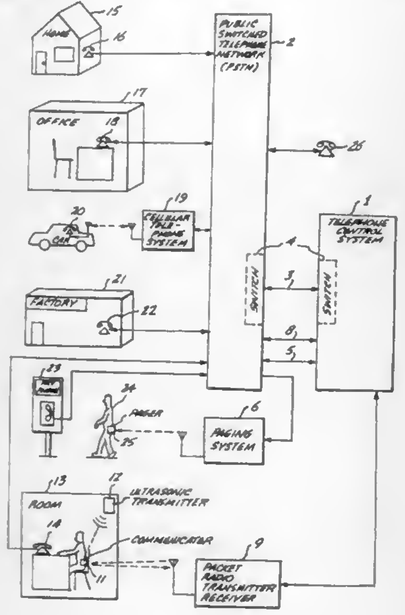
ADJUNCT CONTROLLER FOR A TELEPHONE SYSTEM

Robert M. Fuller, Redmond; Frederick A. Epler, Issaquah, and Maxwell E. Manowski, Enumclaw, all of Wash., assignors to Aspect Telecommunications Corporation, San Jose, Calif.

Division of Ser. No. 249,453, May 26, 1994, Pat. No. 5,673,299, which is a division of Ser. No. 480,242, Feb. 15, 1990, Pat. No. 5,375,161, which is a continuation-in-part of Ser. No. 439,601, Nov. 21, 1989, abandoned, which is a continuation-in-part of Ser. No. 841,931, Mar. 20, 1986, Pat. No. 4,893,335, which is a continuation-in-part of Ser. No. 650,821, Sep. 14, 1984, abandoned. This application Apr. 27, 1995, Ser. No. 429,908

Int. Cl.^{6} H04M *3/42;1/00;1/56;15/06*

U.S. Cl. 379—211 **14 Claims**



6. A telephone system for providing telephone services, said system comprising:

(a) a telephone switch servicing a plurality of telephone subscribers via communication facilities of said switch, said communication facilities handling both voice and data communications;

(b) a telephone switch controller coupled to said switch via said communication facilities, said controller communicating with said switch via said communication facilities by means of data in the form of switch functions, said controller including a memory for storing a plurality of sequences of switch functions, said controller communicating a prompt via said communication facilities to a caller in response to a telephone call placed by said caller to a predetermined telephone address associated with a subscriber, and communicating a selected sequence of switch functions stored in said memory to said switching system in response to a command received from said caller, said controller including a timer mode of operation wherein said memory means stores a timer command mode and a corresponding time interval command, said controller changing a presently commanded mode to a different mode for said commanded interval and thereafter reverting to another call processing mode other than said different mode.

5,838,780

DOUBLE-REGISTRATION AVOIDANCE METHOD FOR USE IN REGISTERING SUBSCRIBER DIRECTORY NUMBERS

Yoshiro Nagao, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Sep. 6, 1995, Ser. No. 524,231

Claims priority, application Japan, Jan. 25, 1995, 7-009430

Int. Cl.^{6} H04M *3/42*

U.S. Cl. 379—213 **10 Claims**

4. A double-registration avoidance method for use in registration of subscriber directory numbers, the method comprising the steps of:

accumulating a plurality of request commands inputted by an operator via a call processor for updating intercommunicative directory numbers;

checking conflicting request commands within the accumulated request commands to exclude the checked conflicting request commands from the accumulated request commands; and

executing remaining request commands to delete, then change, and then add directory numbers in that order,

the step of executing remaining request commands to change including the steps of:

classifying directory numbers corresponding to request commands to either of ring-formed and line-formed sets,

executing changing of the directory numbers classified to each of the ring-formed and line-formed sets,

returning request commands, for which the changing of the directory numbers has been executed, to the call processor, and

indicating contents of request commands, which have not been able to execute and the causes of having not been able to execute.

5,838,781

METHOD AND ARRANGEMENT OF ESTABLISHING BEARER CAPABILITY INFORMATION ON A CALL INCOMING TO AN ISDN EXCHANGE

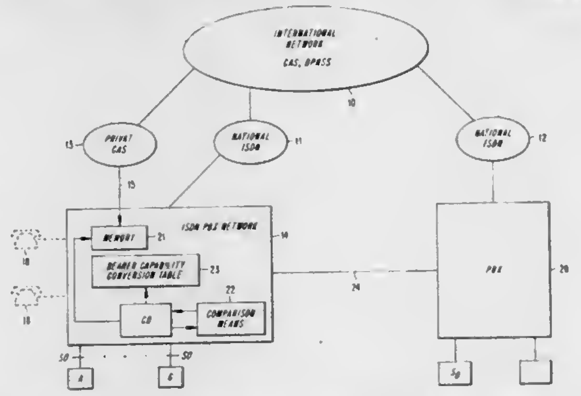
Leif Isaksson, Tyresö, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Dec. 5, 1996, Ser. No. 760,264

Claims priority, application Sweden, Dec. 15, 1995, 95044996

Int. Cl.^{6} H04M *7/00*

U.S. Cl. 379—229 **5 Claims**



1. A method of establishing a bearer capability class of a received, incoming call to an ISDN exchange, the received call has a directory number, but no or faulty bearer capability classification, the method comprising the following steps:

setting bearer capability class of the incoming call to a default bearer capability class;

alloting unique directory numbers to ISDN terminals/applications connected to the exchange, which ISDN terminals/applications require a bearer capability class differing from the default class;

comparing the directory number of the incoming call with allotted unique directory numbers which bearer capability classes differ from the default bearer capability class and,

if the directory number of the incoming call is equivalent to any of the directory numbers with a bearer capability class differing from default then

converting the bearer capability class of the incoming call to the specified class and

proceed with call set up.

5,838,782

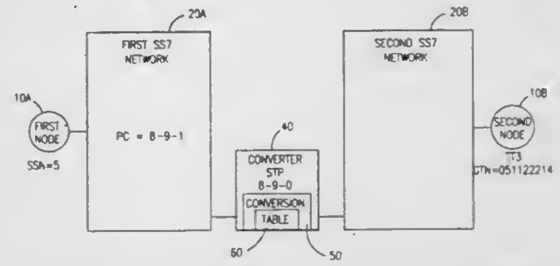
SYSTEM FOR CONVERTING A ROUTING ADDRESS WITHIN A TELECOMMUNICATIONS NETWORK

Jan E. Lindquist, Aachen, Germany, assignor to Ericsson, Inc., Research Triangle Park, N.C.

Filed May 24, 1996, Ser. No. 653,266

Int. Cl.^{6} H04M *7/00;3/42;* **H04J** *3/02;3/12*

U.S. Cl. 379—230 **21 Claims**



1. A method for communicating a signal between a first node within a first Signaling System No. 7 (SS7) network and a second node within a second SS7 network, wherein said first SS7 network and said second SS7 network are connected by a converter signal transfer point (STP), and wherein said signal includes a point code and subsystem number representing said first node as a calling party address, wherein said point code and subsystem number are routeable within said first SS7 network but not routeable within said second SS7 network, said method comprising the steps of:

receiving said signal from said first node by said converter signal transfer point (STP), said signal including said point code and subsystem number representing said first node as said calling party address (Cgpa);

converting said received point code and subsystem number into a global title number routeable within said second telecommunications network by said converter STP, and replacing said global title number in said signal as said calling party address, wherein said global title number represents said converter STP; and

transmitting said signal from said converter STP towards said second node over said second SS7 network.

5,838,783

SMART DIRECTORY MANAGEMENT

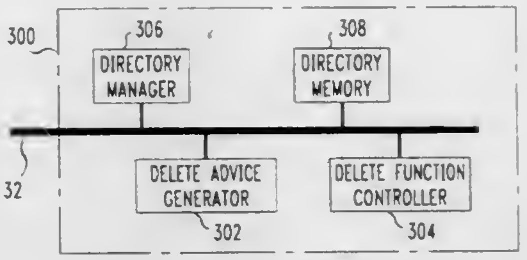
Frank S. Cheng, Middlesex; Randall J. Penning, Monmouth, and Michael D. Porter, Morris, all of N.J., assignors to Lucent Technologies, Inc., Murray Hill, N.J.

Filed Dec. 27, 1995, Ser. No. 579,176

Int. Cl.^{6} H04M *7/00*

U.S. Cl. 379—355 **10 Claims**

1. A smart directory management method for selecting a recommended delete-directory-entry from a plurality of directory entries in a directory memory, the method comprising:



selecting the recommended delete-directory-entry using only information contained in the plurality of directory entries based on a predetermined delete strategy;

outputting the recommended delete-directory-entry to a user through a user interface device;

deleting the recommended delete-directory-entry after receiving the delete instruction from the user;

managing the directory memory;

determining the recommended delete-directory-entry based on the predetermined delete strategy and the information contained in the plurality of directory entries obtained from the directory memory; and

communicating with the user through the user interface device by at least one of outputting to the user the recommended delete-directory-entry and receiving from the user data required in the managing step.

5,838,784

ONE-TOUCH DIALING APPARATUS AND METHOD FOR REGISTERING DIALING NUMBERS IN A TELEPHONE SYSTEM

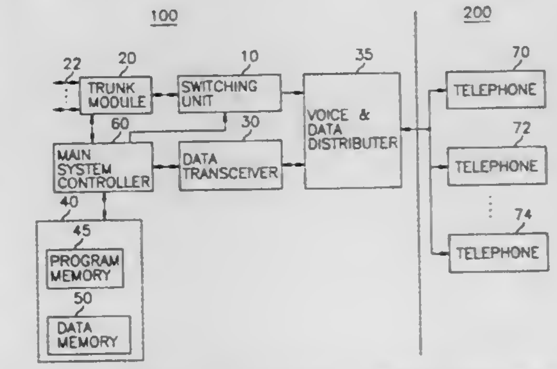
Yun-Kyung Yu, Incheon, Rep. of Korea, assignor to Daewoo Telecom Ltd., Incheon, Rep. of Korea

Filed Aug. 28, 1996, Ser. No. 704,191

Claims priority, application Rep. of Korea, Aug. 28, 1995, 95-26985

Int. Cl.^{6} H04M *1/56*

U.S. Cl. 379—356 **16 Claims**



1. A one-touch dialing apparatus for registering dialing numbers in a telephone system having a plurality of telephones, each of the telephones being identified by an intercom number and having a number of memory buttons, the apparatus comprising:

memory means divided into a plurality of memory blocks, each memory block having a number of memory locations, each memory location for storing a dialing number, wherein each of the memory blocks is associated with a corresponding one of the telephones and is directly indexed by said corresponding telephone's intercom number;

means for prompting a source telephone for an intercom number for a subject telephone;

means, in response to receiving an intercom number for a subject telephone generated from the source telephone, for selecting a memory block corresponding to the subject telephone having the intercom number;

means for addressing sequentially each of the memory locations in the selected memory block;

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means for assigning each of the memory buttons to a corresponding one of the addressed memory locations; and

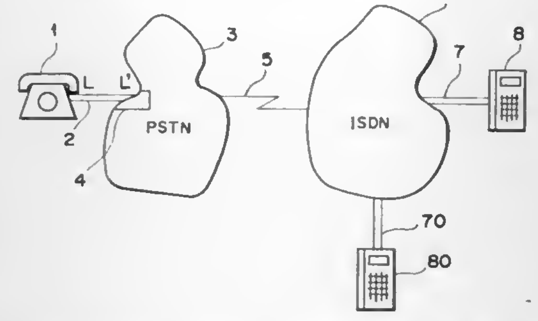
means for registering a dialing number into an addressed memory location assigned to one of the memory buttons.

5,838,785
VOICE LEVEL CONTROLLER

Osamu Hirata, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 201,711, Feb. 25, 1994, abandoned, which is a continuation of Ser. No. 802,284, Dec. 4, 1991, abandoned. This application Feb. 3, 1995, Ser. No. 384,590
Claims priority, application Japan, Dec. 4, 1990, 2-405374
Int. Cl.^{6} H04M *1/00*

U.S. Cl. 379—395 26 Claims



1. A signal level controller for an outgoing call of a calling station comprising:

sending means coupled to an ISDN for sending a SETUP message to the ISDN;

receiving means coupled to the ISDN for receiving a CALL PROCEEDING message including a Progress identifier formed in the ISDN in response to the SET UP message for informing the calling station whether a station called by the outgoing call of the calling station is connected to an analog network or a digital network; and

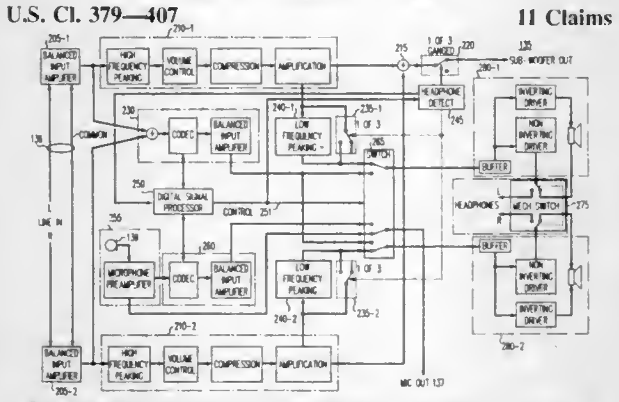
control means coupled to the receiving means for controlling a signal level of the station called by the outgoing call of the calling station in accordance with the Progress identifier received by said receiving means.

5,838,786
INTELLIGENT ACOUSTIC SYSTEMS PERIPHERAL

David A. Brown, Indianapolis; Alan Dean Michel, Fishers; Wayne Allen Weise, Noblesville, all of Ind., and James Edward West, Plainfield, N.J., assignors to Lucent Technologies, Inc., Murray Hill, N.J.

Filed Oct. 4, 1996, Ser. No. 726,436
Int. Cl.^{6} H04M *1/00;3/00*

U.S. Cl. 379—407 11 Claims



9. A method for use in controlling the operation of an echo canceler, the method comprising the steps of:

detecting the presence of headphones; and

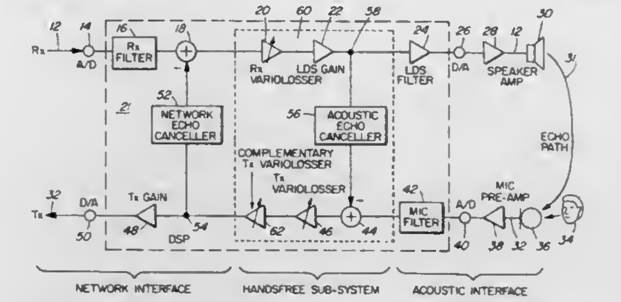
responsive to the detecting step, retraining the echo canceler as the function of the detection of the headphones.

5,838,787
METHOD AND SYSTEM FOR CONTROLLING ECHO RETURN LOSS USING A COMPLEMENTARY VARIOLOSSES IN TRANSMIT PATH

Heping Ding, Kanata, and Scott McClennon, Ottawa, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jun. 27, 1996, Ser. No. 669,712
Int. Cl.^{6} H04M *9/08*

U.S. Cl. 379—409 6 Claims



3. An audio system for a telephone terminal operable in handsfree mode, the system comprising:

a transmit path having a microphone and a transmit variolosser;

a receive path having a loudspeaker and a receive variolosser;

an acoustic echo canceller operatively connected between said receive path and said transmit path;

a digital signal processor responsive to a speech activated switch means to determine the instantaneous state of the system and to control loss introduced by respective variolossers and said acoustic echo canceller, the improvement comprising, a complementary variolosser in said transmit path controllable by said digital signal processor such that the loss of said complementary variolosser is set to zero when the system is in transmit mode, ramps up to a predetermined maximum at a rate of approximately 2 dB/60 ms when the system is in quiescent mode, ramps up to the predetermined maximum at a rate of approximately 6 dB/34 ms when the system is in receive mode without double talk detected, and diminishes at a rate of approximately 6 dB/4 ms when the system is in receive mode with double talk detected, wherein the sum of the losses due to said first and second variolossers and said acoustic echo canceller is sufficient for said handsfree terminal to meet a preselected second echo return loss target (ERLT2), and

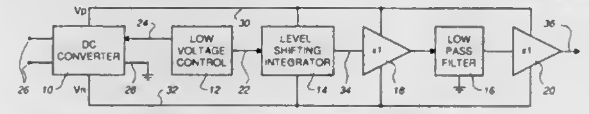
the additional loss selectively introduced by said complementary variolosser in combination with the loss introduced by said first and second variolossers and said acoustic echo canceller is sufficient for the handsfree terminal to meet a preselected first echo return loss target (ERLT1).

5,838,788
TELEPHONE RINGING SIGNAL GENERATOR

Gyula Jakab, Nepean, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Oct. 17, 1996, Ser. No. 730,830
Int. Cl.^{6} H04M *3/02;5/12*

U.S. Cl. 379—418 8 Claims



7. A telephone ringing signal generator comprising:

a DC converter for producing a high positive voltage and a high negative voltage;

a level-shifting integrating circuit coupled to the high positive voltage and the high negative voltage and responsive to a low voltage square wave control signal at a desired ringing frequency to produce at said frequency a high voltage generally trapezoidal waveform having positive and negative peak amplitudes determined by the high positive voltage and the high negative voltage, respectively;

a first high voltage unity gain buffer coupled to the high positive voltage and the high negative voltage and having an input, coupled to an output of the level-shifting integrating circuit for receiving the high voltage generally trapezoidal waveform, and an output;

a low pass filter having an input coupled to the output of the first buffer and arranged to filter the high voltage generally trapezoidal waveform to produce a high voltage telephone ringing signal at said frequency; and

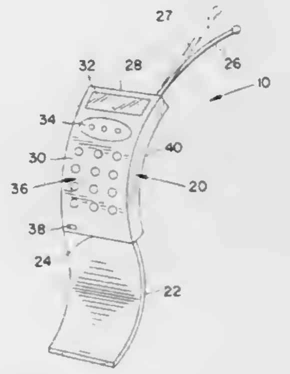
a second high voltage unity gain buffer coupled to the high positive voltage and the high negative voltage and arranged to couple an out put of the low pass filter to an output of the telephone ringing signal generator.

5,838,789
S-SHAPED FLIP CELLULAR TELEPHONE

Gregory S. Mendolia, Forest, Va., assignor to Ericsson Inc., Triangle Park, N.C.

Filed Dec. 30, 1996, Ser. No. 777,431
Int. Cl.^{6} H04M *1/00*

U.S. Cl. 379—433 11 Claims



1. A cellular telephone, comprising:

a body having a front side and a top end and a bottom end;

display panel mounting means on the front side adjacent the top end;

ear piece mounting means on the front side of the body between the display panel mounting means and the bottom end;

microphone mounting means on the body proximate the bottom end;

an antenna mounted in the body and extending from a top end portion of the body;

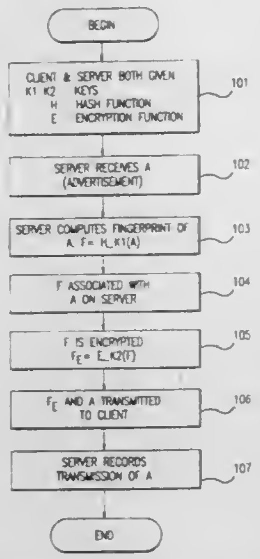
wherein, the body is shaped at least at the top end portion so that the antenna diverges at an oblique angle from a plane defined by the ear piece mounting means and the microphone mounting means.

5,838,790
ADVERTISEMENT AUTHENTICATION SYSTEM IN WHICH ADVERTISEMENTS ARE DOWNLOADED FOR OFF-LINE DISPLAY

Jon D. McAuliffe; Brian D. Marsh, both of New York, and Mark A. Moraes, Forest Hills, all of N.Y., assignors to Juno Online Services, L.P., New York, N.Y.

Filed Apr. 19, 1996, Ser. No. 635,275
Int. Cl.^{6} H04K *1/00*

U.S. Cl. 380—4 50 Claims


BEGIN
CLIENT & SERVER BOTH GIVEN
K1 K2 KEYS
H HASH FUNCTION
E ENCRYPTION FUNCTION
101
SERVER RECEIVES A (ADVERTISEMENT)
102
SERVER COMPUTES FINGERPRINT OF A. F= H_K1(A)
103
F ASSOCIATED WITH A ON SERVER
104
F IS ENCRYPTED F_E= E_K2(F)
105
F_E AND A TRANSMITTED TO CLIENT
106
SERVER RECORDS TRANSMISSION OF A
107
END

1. For use in an electronic mail system, a method for detecting unauthorized alteration of advertisements transferred from a remote computer and stored in a memory device of a local computer, comprising the steps of:

(a) establishing a communications link between the local computer and the remote computer;

(b) electronically transferring an advertisement from the remote computer to the local computer;

(c) storing the advertisement in the memory device of the local computer;

(d) electronically transferring e-mail messages between the local computer and the remote computer;

(e) terminating the communications link between the local computer and the remote computer;

(f) at the local computer, determining if the advertisement has been altered;

(g) if the advertisement was not altered, outputting the advertisement at the local computer;

(h) if the advertisement was altered, recording an alteration event in a statistics file stored in the memory device of the local computer; and

(i) simultaneously with step (g), allowing a user at the local computer to create e-mail messages and to read e-mail messages received from the remote computer.

5,838,791
ENCODER AND DECODER

Naoya Torii; Noboru Iwayama; Masahiko Takenaka; Takayuki Hasebe, and Masahiro Matsuda, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Aug. 9, 1995, Ser. No. 512,909
Claims priority, application Japan, Aug. 10, 1994, 6-219368
Int. Cl.^{6} H04N *7/64*

U.S. Cl. 380—20 10 Claims

1. An encoder comprising:

compressing and encoding means for compressing and encoding original data to produce compressed and encoded data in an input order;

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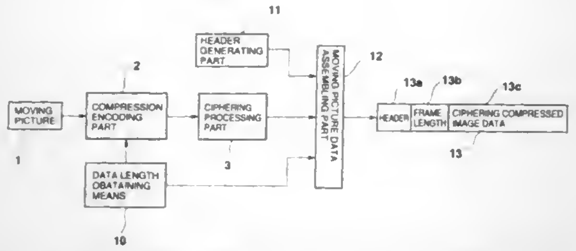

11
HEADER GENERATING PART
2
12
MOVING PICTURE
COMPRESSION ENCODING PART
CIPHERING PROCESSING PART
MOVING PICTURE DATA ASSEMBLING PART
13a
13b
13c
HEADER
FRAME LENGTH
CIPHERING COMPRESSED IMAGE DATA
1
3
13
DATA LENGTH OBATAINING MEANS
10

data length obtaining means for carrying out frame analysis in the input order of the compressed and encoded data and obtaining a frame data length;

header generating means for generating a header storing synchronous patterns;

ciphering processing means for ciphering the compressed and encoded data to generate ciphered and compressed data; and

data assembling means for assembling the header obtained by said header generating means, the frame data length and the ciphered and compressed data into a frame.

5,838,792

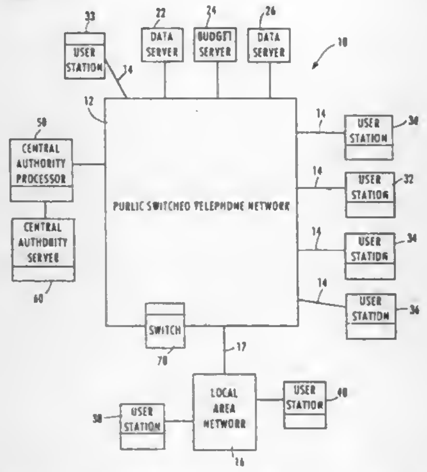
COMPUTER SYSTEM FOR CENTRALIZED SESSION KEY DISTRIBUTION, PRIVACY ENHANCED MESSAGING AND INFORMATION DISTRIBUTION USING A SPLIT PRIVATE KEY PUBLIC CRYPTOSYSTEM

Ravi Ganesan, Arlington, Va., assignor to Bell Atlantic Network Services, Inc., Arlington, Va.

Continuation-in-part of Ser. No. 277,376, Jul. 18, 1994, Pat. No. 5,557,678. This application Aug. 8, 1996, Ser. No. 694,373

Int. Cl.^{6} H04L *9/30*

U.S. Cl. 380—21 **22 Claims**



1. An article of manufacture for effecting secure communications during a communications session between users in a secured communication cryptosystem in which users are each associated with a public crypto-key and a private crypto-key, comprising:

computer readable storage medium; and

computer programming stored on said storage medium;

wherein said stored computer programming is configured to be readable from said computer readable storage medium by a computer and thereby cause said computer to operate so as to:

generate a private crypto-key using a private exponent and a modulus N which is a product of a plurality of numbers within a set of large prime numbers, the modulus N having a bit length;

divide the generated private crypto-key into a private user key portion having a first bit length and a central authority key portion having a second bit length, wherein the first bit length is smaller than said second bit length and is no larger than fifteen percent of the bit length of the modulus N but no less than 56 bits;

direct the private user key portion to only a single user of the cryptosystem; and

direct the central authority key portion to only a central storage device.

5,838,793

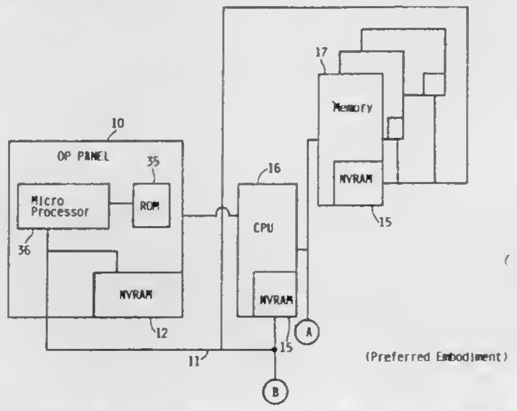
CONTROLLING MOVEMENT OF OWNED PARTS

David Otto Lewis, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 9, 1996, Ser. No. 629,980

Int. Cl.^{6} H04K *1/00;* **H04L** *9/00;* **G07D** *7/00*

U.S. Cl. 380—25 **18 Claims**



1. A method for preventing theft of replaceable computer parts comprising:

storing a part security code in a replaceable-part non-volatile memory located on each of a plurality of replaceable computer parts;

storing a system security code in a non-volatile computer system memory;

comparing the part security codes stored in the replaceable-part memories with the system security code stored in the computer system memory; and

allowing the computer system to function with any particular one of the plurality of replaceable computer parts only if the part security code of the particular one part is compatible with the security code;

wherein the step of storing a part security code in the replaceable-part non-volatile memories includes the step of setting a value of an enabling bit in at least one of the replaceable-part non-volatile memories located on the plurality of replaceable parts.

5,838,794

METHOD AND APPARATUS FOR INTER-ROUND MIXING IN ITERATED BLOCK SUBSTITUTION SYSTEMS

Lothrop Mittenthal, Thousand Oaks, Calif., assignor to Teledyne Electronic Technologies, Newbury Park, Calif.

Filed Jan. 11, 1996, Ser. No. 584,523

Int. Cl.^{6} H04L *9/28*

U.S. Cl. 380—28 **16 Claims**

1. A method of encryption to be performed by a computer, comprising the steps of:

(a) receiving successive blocks of data, each block of data being sub-divided into n sub-blocks of data, where n is an integer, each sub-block being assigned to one of n substitution boxes;

(b) selecting one of a quick trickle or a quasi quick trickle permutation as a base permutation;

(c) determining if a set of preselected exponents is to be applied to the base permutation;

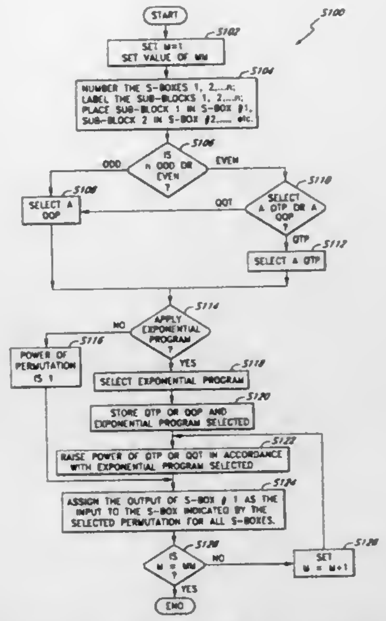
(d) generating the set of preselected exponents from one of quick trickle or a quasi quick trickle permutation;

(e)(1) applying the set of preselected exponents to the base permutation if step (c) determines that a set of preselected exponents is to be applied, to obtain a sequence of permutations, otherwise (e)(2) applying an exponent of one to the base permutation to obtain a resulting permutation;

(f) for each round in a determined number of rounds, if step (e)(1) is applied, applying a corresponding one of the sequence of permutations to the substitution boxes, assigning an output of each numbered substitution box as an input to the substitution box whose number is indicated by the corresponding one of the sequence of permutations, and if step (e)(2)is applied, applying the resulting permutation to the substitution boxes, assigning an output of each numbered substitution box as an input to the substitution box whose number is indicated by the resulting permutation;

(g) repeating steps (e) and (f) for the predetermined number of rounds; and

(h) displaying the encrypted data provided in step (g).


START
S100
S102
SET M=1
SET VALUE OF MM
S104
NUMBER THE S-BOXES 1, 2,...n;
LABEL THE SUB-BLOCKS 1, 2,...n;
PLACE SUB-BLOCK 1 IN S-BOX #1,
SUB-BLOCK 2 IN S-BOX #2,.... etc.
S106
IS n ODD OR EVEN ?
ODD
EVEN
S108
SELECT A QQP
S110
SELECT A QTP OR A QQP ?
QQT
QTP
S112
SELECT A QTP
S114
APPLY EXPONENTIAL PROGRAM ?
NO
YES
S116
POWER OF PERMUTATION IS 1
S118
SELECT EXPONENTIAL PROGRAM
S120
STORE QTP OR QQP AND EXPONENTIAL PROGRAM SELECTED
S122
RAISE POWER OF QTP OR QQT IN ACCORDANCE WITH EXPONENTIAL PROGRAM SELECTED
S124
ASSIGN THE OUTPUT OF S-BOX # 1 AS THE INPUT TO THE S-BOX INDICATED BY THE SELECTED PERMUTATION FOR ALL S-BOXES.
S126
IS M = MM ?
NO
S128
SET M = M+1
YES
END

5,838,795

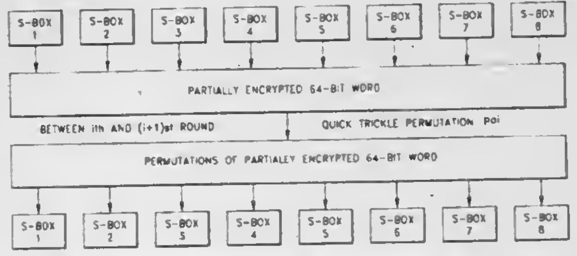
METHOD AND APPARATUS FOR STATISTICAL DIFFUSION IN ITERATED BLOCK SUBSTITUTION

Lothrop Mittenthal, Thousand Oaks, Calif., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Division of Ser. No. 584,523, Jan. 11, 1996. This application Jul. 7, 1997, Ser. No. 888,454

Int. Cl.^{6} H04L *9/28*

U.S. Cl. 380—28 **9 Claims**


S-BOX 1
S-BOX 2
S-BOX 3
S-BOX 4
S-BOX 5
S-BOX 6
S-BOX 7
S-BOX 8
PARTIALLY ENCRYPTED 64-BIT WORD
BETWEEN ith AND (i+1)st ROUND
QUICK TRICKLE PERMUTATION Poi
PERMUTATIONS OF PARTIALEY ENCRYPTED 64-BIT WORD
S-BOX 1
S-BOX 2
S-BOX 3
S-BOX 4
S-BOX 5
S-BOX 6
S-BOX 7
S-BOX 8

1. A method of encryption to be performed by a computer, comprising:

(a) receiving successive blocks of data, each block of data being sub-divided into n sub-blocks of data, where n is an integer, the sub-block being assigned to n individual substitution boxes;

(b) selecting one of a quick trickle or a quasi quick trickle permutation as a base permutation;

(c) determining if a set of preselected exponents is to be applied to the base permutation;

(d) generating the set of preselected exponents from one of a quick trickle or a quasi quick trickle permutation;

(e)(1) applying the set of preselected exponents to the base permutation if step (c) determines that a preselected set of exponents is to be applied, to obtain a sequence of permutations, otherwise (e)(2) applying an integer k as an exponent to the base permutation for the kth round of encryption to obtain a resulting permutation;

(f) for each round in a predetermined number of rounds, if (e)(1) is applied, applying a corresponding one of the permutations to the partially encrypted sub-blocks, assigning each partially encrypted sub-block as an input to the substitution box whose number is indicated by the the corresponding one of the sequence of permutations, and if (e)(2) is applied, applying the resulting permutation to the partially encrypted sub-blocks, assigning each partially encrypted sub-block as an input to the substitution box whose number is indicated by the resulting kth permutation; and

(g) repeating (e) and (f) for the predetermined number of rounds; and

(h) displaying the encrypted data provided in step (g).

5,838,796

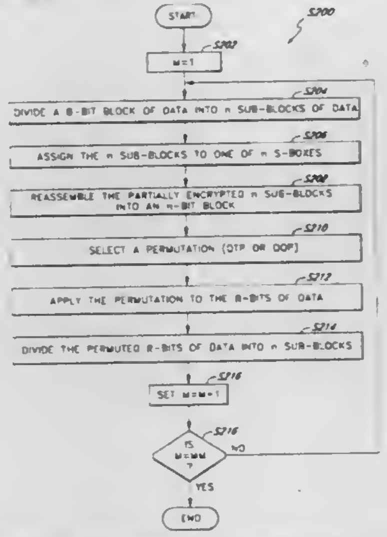
STATISTICALLY OPTIMIZED BIT PERMUTATIONS IN INTERATED BLOCK SUBSTITUTION SYSTEMS

Lothrop Mittenthal, Thousand Oaks, Calif., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Division of Ser. No. 584,523, Jan. 11, 1996. This application Jul. 7, 1997, Ser. No. 888,884

Int. Cl.^{6} H04L *9/28*

U.S. Cl. 380—28 **6 Claims**


START
S200
S202
M=1
S204
DIVIDE A B-BIT BLOCK OF DATA INTO n SUB-BLOCKS OF DATA
S206
ASSIGN THE n SUB-BLOCKS TO ONE OF n S-BOXES
S208
REASSEMBLE THE PARTIALLY ENCRYPTED n SUB-BLOCKS INTO AN n-BIT BLOCK
S210
SELECT A PERMUTATION (QTP OR QQP)
S212
APPLY THE PERMUTATION TO THE B-BITS OF DATA
S214
DIVIDE THE PERMUTED B-BITS OF DATA INTO n SUB-BLOCKS
S216
SET M=M+1
S218
IS M=MM ?
NO
YES
END

1. A method of encryption to be performed by a computer, comprising:

(a) providing a block of clear text data, the block comprising m bits of data, the block of data being sub-divided into n sub-blocks of data, the sub-blocks being assigned to n individual substitution boxes;

(b) partially encrypting the n sub-blocks by assigning each of the n sub-blocks to one of n substitution boxes;

(c) reassembling the partially encrypted n sub-blocks into an m-bit block;

(d) selecting one of a quick trickle permutation or a quasi quick trickle permutation;

(e) applying the permutation to the m bits of data;

(f) dividing the permuted m bits of data into n sub-blocks of data;

(g) repeating steps (b) to (f) for a predetermined number of rounds; and

(h) displaying the encrypted data provided in (g).

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5,838,797
SECURE COMMUNICATION BY ENCRYPTION/ DECRYPTION OF VECTOR AT PSK MODULATION/ DETECTION STAGE

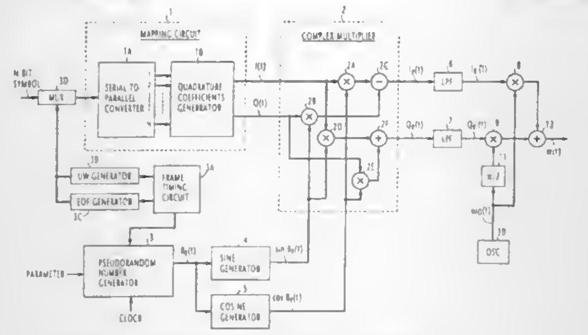
Motoya Iwasaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 26, 1995, Ser. No. 576,968

Claims priority, application Japan, Dec. 26, 1994, 6-322642

Int. Cl.^{6} H04L *27/18*

U.S. Cl. 380—49 **4 Claims**



1. A secure communication system comprising:

a mapping circuit for mapping an N-bit symbol to a corresponding one of a predetermined number of vectors in a two-dimensional phase plane, where N is an integer equal to or greater than one;

a first pseudorandom number generator for producing a first pseudorandom number varying in a range between 0 and 2π radian;

means for producing a first sine-wave and a first cosine-wave in accordance with said first pseudorandom number;

a first complex multiplier for complex, multiplying an output vector of said mapping circuit by the first sine-wave and the first cosine-wave;

a first lowpass filter circuit for lowpass-filtering an output vector of said first complex multiplier;

a first oscillator for producing a carrier;

a quadrature modulator for quadrature-modulating said carrier with the lowpass-filtered vector for transmission;

a second oscillator for producing a local carrier having a same frequency as the quadrature-modulated carrier;

a quadrature detector for receiving the quadrature-modulated carrier and quasi-synchronously quadrature-detecting the received carrier with said local carrier;

a second lowpass filter circuit for lowpass-filtering an output vector of said quadrature detector;

a sampling circuit for sampling the lowpass-filtered output vector in response to a sampling pulse;

a second pseudorandom number generator for producing a second pseudorandom number varying in a range between 0 and 2π radian, said second pseudorandom number being identical in magnitude to, but opposite in sign to said first pseudorandom number;

means for producing a second sine-wave and a second cosine-wave in accordance with said second pseudorandom number;

a second complex multiplier for complex-multiplying an output vector of said sampling circuit by the second sine-wave and the second cosine-wave;

a quadrature demodulator for detecting a phase error of said local carrier with respect to the quadrature-modulated carrier and quadrature-demodulating an output vector of said second complex multiplier with the detected phase error; and

means for estimating a phase error of an output vector of said quadrature demodulator with respect to said N-bit symbol and producing therefrom a timing signal and applying the timing signal to said sampling circuit as said sampling pulse.

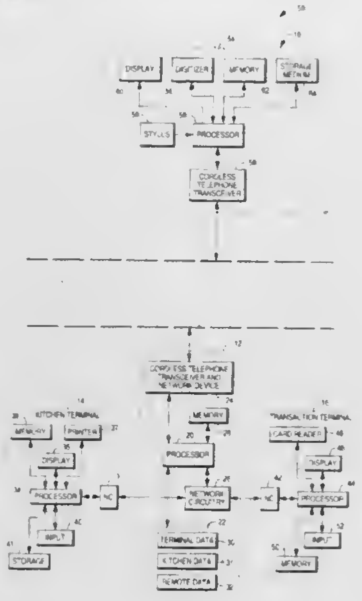
5,838,798
RESTAURANT TRANSACTION PROCESSING SYSTEM AND METHOD

Harden E. Stevens, III, Lexington, S.C., assignor to NCR Corporation, Dayton, Ohio

Filed Feb. 7, 1996, Ser. No. 597,726

Int. Cl.^{6} H04L *9/00;* **E04H** *3/04*

U.S. Cl. 380—49 **13 Claims**



1. A restaurant transaction processing system, comprising:

a portable order processing device having a display and having a digitizer and stylus for input of restaurant order information, the portable order processing device further having a first cordless telephone transceiver for transmitting the order information;

a host computer system having a second cordless telephone transceiver for receiving the transmitted order information, the host computer system further having network circuitry for establishing a network between the host computer and remote network terminals and having a storage medium for maintaining data from the terminals and from the portable order processing device;

a kitchen terminal having network circuitry for connecting into the network, the kitchen terminal including a display and printer for, respectively, displaying and printing order information, and including an input for inputting order ready messages to be transmitted back to the portable order processing device; and

a payment terminal having network circuitry for connecting into the network, the payment terminal completing payment for orders received from the portable order processing device.

5,838,799
DIGITAL SOUND BROADCASTING USING A DEDICATED CONTROL CHANNEL

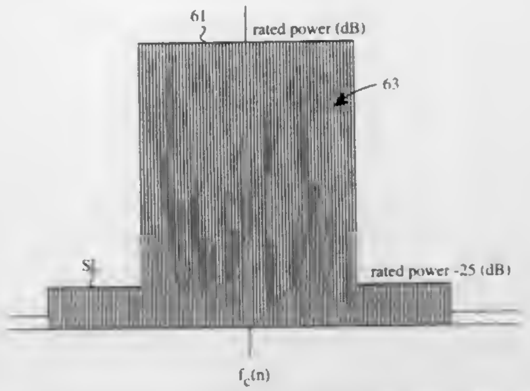
John M. Cioffi, Cupertino; John A. C. Bingham, Palo Alto, and Mark P. Mallory, Sunnyvale, all of Calif., assignors to Amati Communications Corporation, San Jose, Calif.

Continuation of Ser. No. 119,698, Sep. 10, 1993, abandoned. This application May 26, 1995, Ser. No. 453,564

Int. Cl.^{6} H04H *5/00;1/00*

U.S. Cl. 381—2 **31 Claims**

1. A method of transmitting digital sound by frequency modulation using carrier frequencies in an FM radio band of frequencies, said FM radio band of frequencies being organized into a plurality of FM radio band signal strength masks, each of said FM radio band signal strength masks having a central portion and two sidelobe portions, the method comprising the steps of:



transmitting a discrete multi-tone digital FM band radio audio signal in parallel over a first plurality of sub-channels, said discrete multi-tone digital FM band radio audio signal representing a content of said digital sound, said first plurality of sub-channels representing a subset of available sub-channels within a first FM radio band signal strength mask of said FM radio band signal strength masks, said available sub-channels being located in one of said central portion of said first FM radio signal strength mask that is unoccupied by an analog audio signal and at least one of said two sidelobe portions of said first FM radio signal strength mask that is nonoverlapped by two immediately adjacent FM radio band signal strength masks of said plurality of FM radio band signal strength masks; and

transmitting a control signal on a control sub-channel, said control sub-channel representing a sub-channel of said available sub-channels that is different from said first plurality of sub-channels, the control signal containing information for decoding the discrete multi-tone digital FM band radio signal upon reception by a receiver including information indicative of the number of sub-channels that carry the discrete multi-tone digital radio audio signal as well as their location in the FM radio band of frequencies.

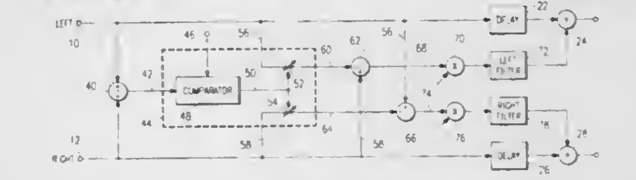
5,838,800
APPARATUS FOR ENHANCING STEREO EFFECT WITH CENTRAL SOUND IMAGE MAINTENANCE CIRCUIT

Danny D. Lowe; Mark Williams, both of Calgary, Canada, and Paul Burrowes, Castro Valley, Calif.; assignors to QSound Labs, Inc., Alberta, Canada

Filed Dec. 11, 1995, Ser. No. 570,516

Int. Cl.^{6} H04R *5/00*

U.S. Cl. 381—17 **7 Claims**



1. Apparatus for enhancing stereo effects achieved upon reproducing left and right channel stereo audio signals using left and right audio transducers, comprising:

means for combining left and right channel audio input signals to produce a gate signal;

means for comparing said gate signal with a threshold signal and producing a control signal;

variable attenuator means responsive to said control signal and receiving said left and right channel audio signal for producing respective left and right channel level-adjusted signals;

left and right audio placement filters;

first means for subtracting said left channel level-adjusted signal from said right channel audio input signal and producing a first output signal fed to said left audio placement filter;

second means for subtracting said right channel level-adjusted signal from said left channel audio input signal and producing a second output signal fed to said right audio placement filter, and

signal combining means for combining an output signal from said left audio placement filter and said left channel audio input signal for producing an enhanced left channel signal fed to the left audio transducer and for combining an output signal from said right audio placement filter and said right channel audio input signal for producing an enhanced right channel signal fed to the right audio transducer.

5,838,801
DIGITAL HEARING AID

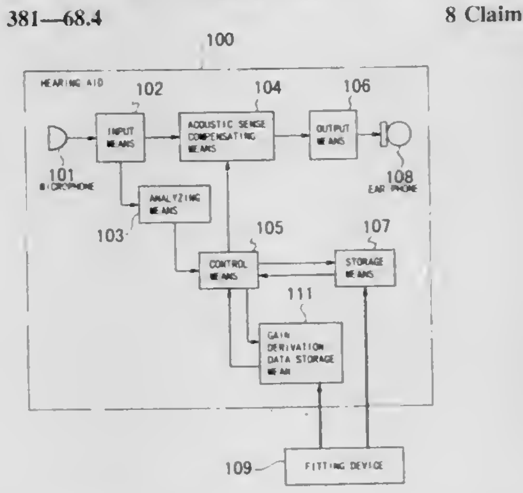
Ryuuichi Ishige, and Yukio Mitome, both of Tokyo, Japan, assignors to Nec Corporation, Tokyo, Japan

Filed Dec. 9, 1997, Ser. No. 987,617

Claims priority, application Japan, Dec. 10, 1996, 8-329354

Int. Cl.^{6} H04R *25/00*

U.S. Cl. 381—68.4 **8 Claims**



1. A digital hearing aid comprising:

input means for converting an input sound into a digital data for generating an input data;

analyzing means for analyzing said input data converted by said input means by a digital conversion and calculating an acoustic pressure at each frequency band;

control means for inputting a result of calculation by said analyzing means;

acoustic sense characteristics storage means for preliminarily storing acoustic sense characteristics of a deafness and a person having healthy acoustic sense from a fitting means;

gain calculation data storage means for preliminarily storing an acoustic pressure range the easiest to hear for the deafness from said fitting means;

acoustic sense compensating means for performing acoustic sense compensation process by amplifying said input data with a given gain;

said control means calculating said gain of each frequency range on the basis of the acoustic sense characteristics and an acoustic pressure range stored in said acoustic sense characteristics storage means and said gain calculation data storage means.

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5,838,802
APPARATUS FOR CANCELLING VIBRATIONS

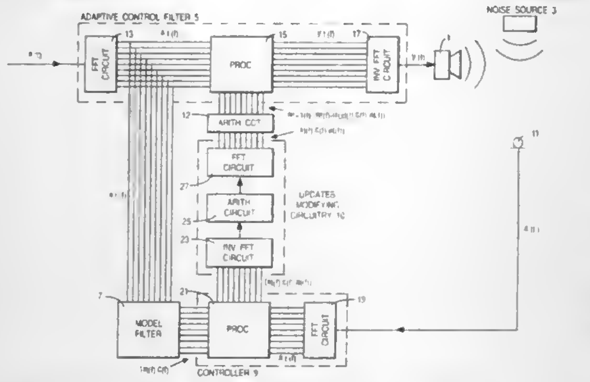
Malcom Swinbanks, Cambridge, United Kingdom, assignor to Gec-Marconi Limited, Middlesex, United Kingdom

Continuation of Ser. No. 502,323, Jul. 13, 1995, abandoned. This application Feb. 28, 1997, Ser. No. 808,155

Claims priority, application United Kingdom, Jul. 18, 1994, 9414484; Aug. 4, 1994, 9415763

Int. Cl.^{6} A61F *11/06;* **H03B** *29/00*

U.S. Cl. 381—71.2 **7 Claims**



1. An apparatus for cancelling vibrations comprising:
means for providing a reference signal representative of the vibrations to be cancelled;
filter means comprising
  means for resolving the reference signal into its frequency components;
  means for applying weights to said frequency components to obtain weighted frequency components; and
  means for combining the weighted frequency components to provide an output signal of said filter means; and
actuator means responsive to the output signal of said filter means to produce vibrations which destructively interfere with the vibrations to be cancelled, said means for resolving utilizing N updates of said reference signal to resolve said reference signal into its frequency components, said means for resolving being updated n times between successive resolvings of the reference signal into its frequency components where $1<n<N$, the weights applied by said means for applying being constrained so that the operation of said filter means in the frequency domain is substantially equivalent to that of an m weight time domain filter where $m \leqq N-n+1$ and where N, n, and m are positive integers.

5,838,803
MUTING CIRCUIT

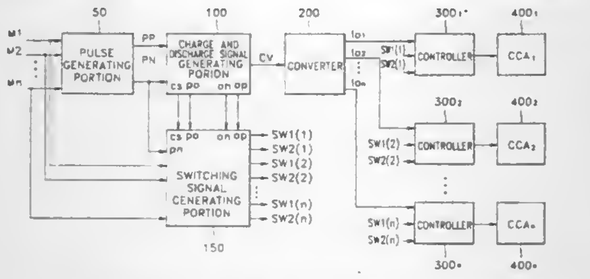
Dong-Jin Keum, Pucheon; Jin-Sub Choi, and Duck-young Jung, both of Kyungki-do, all of Rep. of Korea, assignors to Samsun Electronics, Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 30, 1996, Ser. No. 777,467

Claims priority, application Rep. of Korea, Dec. 30, 1995, 95-69721

Int. Cl.^{6} H04B *15/00*

U.S. Cl. 381—94.5 **13 Claims**



1. A mute control circuit for muting at least one output terminal responsive to a plurality of mute signals received at a plurality of input terminals, the mute control circuit comprising:
pulse generating means for receiving the plurality of mute signal and generating a first and a second control pulses;
charge/discharge signal generating means for receiving the first and second control pulses and generating a charge/discharge signal and a plurality of switching control signals;
controlling means for receiving said charge/discharge signal and muting the output terminal according to the plurality of switching control signals; and
switching signal generating means for receiving the plurality of mute signals, generating a plurality of switching signals responsive to said plurality of switching control signals of said charge/discharge signal generating means, and supplying the plurality of switching signals to said controlling means.

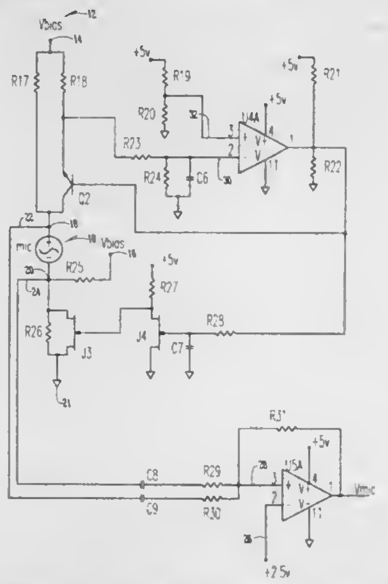
5,838,804
APPARATUS AND METHOD FOR PROVIDING PROPER MICROPHONE DC BIAS CURRENT AND LOAD RESISTANCE FOR A TELEPHONE

James R. Holthaus, Omaha, Nebr., and David L. Dilley, Ft. Collins, Colo., assignors to Transcrypt International, Inc., Lincoln, Nebr.

Filed Aug. 7, 1996, Ser. No. 693,389

Int. Cl.^{6} H04R *3/00*

U.S. Cl. 381—111 **22 Claims**



1. An apparatus for providing proper microphone bias current and load resistance to a telephone microphone connected between a source of DC bias current and a first impedance path to ground comprising:
a comparator including a first connection that is electrically connectable to a reference voltage source and a second connection that is electrically connectable to the bias current;
first and second load resistance devices connected in parallel to the bias current, the first load resistance device having a substantially greater electrical resistance than the second load resistance device;
a first switching device connected to the output of the comparator and in series with the second resistance device;
a second switching device connected to the output of the comparator and to a second impedance path to ground for the microphone, the second impedance path being lower in impedance than the first impedance path;
microphone output connections;
wherein the comparator closes the first switching device if the bias voltage exceeds the reference voltage so that the second resistance device is removed from parallel with the first resistance device and therefore presents its substantially greater resistance to the microphone to produce high impedance to the microphone, and the second switching device is opened to connect the microphone to the first impedance path to ground;
and wherein the comparator opens the first switching device if the reference voltage exceeds the bias voltage so that the second resistance device is connected in parallel with the first resistance device and therefore presents its substantially less resistance to the microphone to produce relatively low impedance to the microphone and the second switch is closed to connect the microphone to the second impedance path to ground.

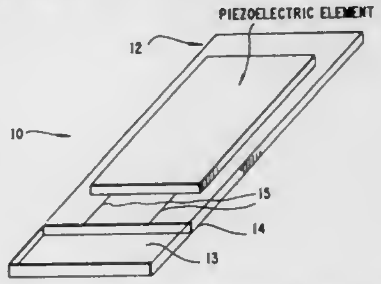
5,838,805
PIEZOELECTRIC TRANSDUCERS

Mark Warnaka, Howard, and Glenn E. Warnaka, State College, both of Pa., assignors to Noise Cancellation Technologies, Inc., Linthicum, Md.

Filed Nov. 6, 1995, Ser. No. 554,049

Int. Cl.^{6} H04R *25/00*

U.S. Cl. 381—190 **24 Claims**



1. A transducer system for imparting motion to a sound radiating diaphragm having a certain mechanical impedance comprising:
a piezoelectric element subject to displacement by applied electric potential and having a top side, an under side and an outer perimeter;
a substrate for imparting motion from said piezoelectric element to a sound radiating diaphragm, said substrate having an upper and lower side, with the upper side of the substrate being directly joined to the underside of the piezoelectric element, said substrate having a larger surface area than the piezoelectric element and having substantially the same rigidity as the piezoelectric element but a greater rigidity than the diaphragm to which the lower side of the substrate will be attached; and,
means to apply electric potential to the piezoelectric element. wherein the transducer system has a mechanical impedance that is matched to the mechanical impedance of the sound radiating diaphragm.

5,838,806
METHOD AND CIRCUIT FOR PROCESSING DATA, PARTICULARLY SIGNAL DATA IN A DIGITAL PROGRAMMABLE HEARING AID

Ullrich Sigwanz, Erlangen, and Fred Zoels, Altenthann, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

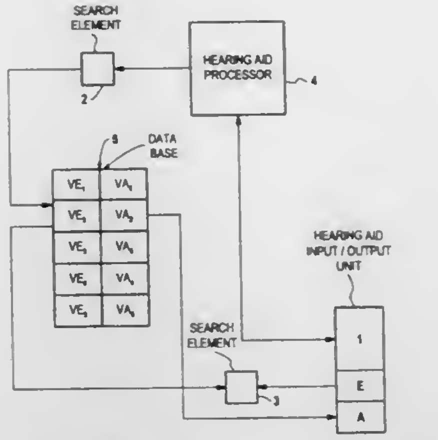
Filed Mar. 14, 1997, Ser. No. 818,180

Claims priority, application European Pat. Off., Mar. 27, 1996, 96104903

Int. Cl.^{6} H04R *25/00*

U.S. Cl. 381—312 **21 Claims**

1. A method for processing a plurality of successive incoming input data values in a programmable digital hearing aid to obtain respective output data values therefrom, comprising the steps of:
(a) providing a hearing aid having a hearing aid housing adapted to be worn at an ear;
(b) for a plurality of different input values, calculating, externally of said hearing aid housing, a plurality of respective output values using a selected characteristic function, and storing said plurality of input values in a data memory in said hearing aid housing as a plurality of stored input values and storing the plurality of respective output values in said data memory, allocated to said stored input values, as a plurality of stored output values;
(c) upon receipt of a current, incoming input data value by said hearing aid, searching said data memory, comprising said stored input values with said incoming input data value employing a comparison condition, said comparison condition being selected from the group consisting of one of said stored input values being identical to said incoming input data value, and one of said stored input values being within a predetermined deviation from said incoming input data value;
(d) after finding said one of said stored input values, searching said data memory for one of said stored output values respectively allocated to said one of said stored input values;
(e) emitting said one of said stored output values as an output data value; and
(f) repeating steps (c), (d) and (e) for each further incoming input data value.



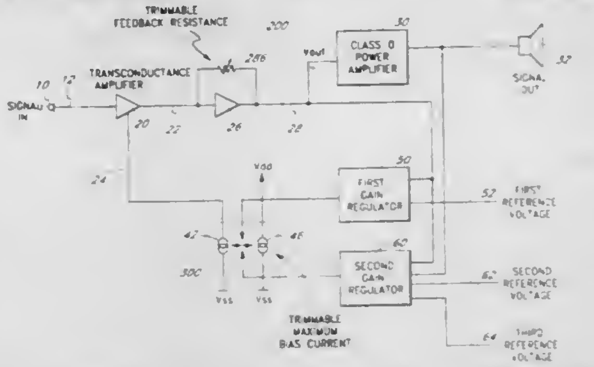
5,838,807
TRIMMABLE VARIABLE COMPRESSION AMPLIFIER FOR HEARING AID

Olle Andersson, Jarfalla, Sweden; Jonas Weiland, La Jolla, and Mehrdad Negahban, Irvine, both of Calif., assignors to Mitel Semiconductor, Inc., San Diego, Calif.

Filed Oct. 19, 1995, Ser. No. 545,406

Int. Cl.^{6} H04R *25/00*

U.S. Cl. 381—321 **8 Claims**



1. A transconductance compression amplifier in a hearing aid comprising:
an input stage comprising an amplifier with an input port for receiving an input signal, an output port for outputting a compressed output signal, and a gain defined by a bias current;
a first current source supplying a first current to a circuit common;

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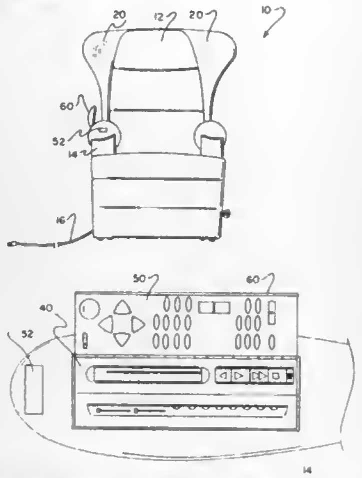
- a second current source supplying said bias current to said amplifier, wherein said second current source supplies current in variable relation to the amount of current supplied by said first current source;

and wherein said variable relation is dependent on the output signal level from said transconductance compression amplifier.

5,838,808
ACOUSTICAL CHAIR SYSTEM

Douglas Prosser, 430 7th St., New Cumberland, Pa. 17070
Filed Mar. 13, 1997, Ser. No. 816,511
Int. Cl.^{6} H04R *25/00*
U.S. Cl. 381—388 **6 Claims**

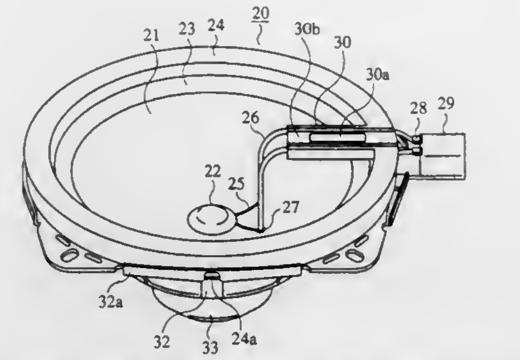


1. An acoustical chair system comprising:
a chair having a pair of arm rests and an upper back support;
a plurality of speakers secured within said upper back support;
a compact disc/tape/radio player secured within one of said arm rests and electrically connected to said plurality of speakers for producing an audible sound for a user sitting within said conventional chair;
a first cover pivotally attached to said arm rest containing said compact disc/tape/radio player for allowing selective covering and uncovering of said compact disc/tape/radio player;
a video cassette recorder secured within the arm rest opposite of said compact disc/tape/radio player and electrically connected to said compact disc/tape/radio player; and
a second cover pivotally attached to said arm rest containing said video cassette recorder for allowing selective covering and uncovering of said video cassette recorder said second cover including a universal remote control for allowing said user to control a conventional television and other electrical devices.

5,838,809
SPEAKER

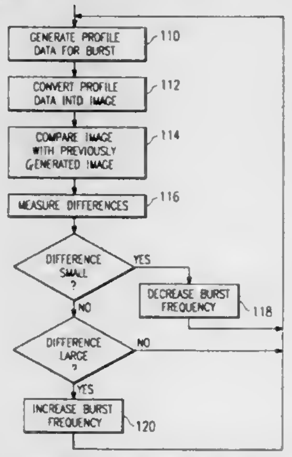
Masanobu Sato; Fujio Hayakawa, both of Tokyo; Ikuo Saga, and Taizo Nakamura, both of Aichi, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan
Filed Mar. 26, 1998, Ser. No. 48,262
Claims priority, application Japan, May 30, 1997, 9-142774
Int. Cl.^{6} H04R *25/00*
U.S. Cl. 381—409 **4 Claims**

1. A speaker of a highly waterproof structure in which a tinsel cord support member is provided so as to overhang to the front of a diaphragm and tinsel cords are guided through said tinsel cord support member, wherein:
said tinsel cord support member is formed on a gasket, two grooves for supporting said tinsel cords and conducting them from a tip end portion of the tinsel cord support member up to near input terminals provided outside said gasket are formed at a predetermined spacing from each other in the tinsel cord support member, and a hollow portion is provided between said grooves formed in the tinsel cord support member.



5,838,810
METHOD AND SYSTEM OF DETECTING PROFILE MATURATION USING IMAGE PROCESSING TECHNIQUES

William B. Buzbee, Half Moon Bay, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Oct. 10, 1996, Ser. No. 728,452
Int. Cl.^{6} G06L *9/00*
U.S. Cl. 382—100 **20 Claims**

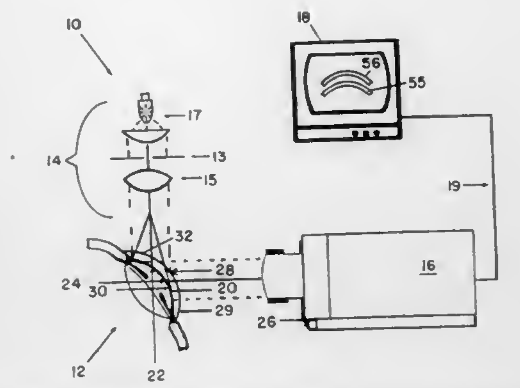


1. A method of controlling a burst frequency of a burst profiler executing on a computer system, the method comprising the steps of:
representing data from a first profile burst as a first image;
measuring, on the computer system, a difference between the first image and a second image; and
adjusting the burst frequency in response to the difference.

5,838,811
SYSTEM FOR MEASURING CURVED SURFACES

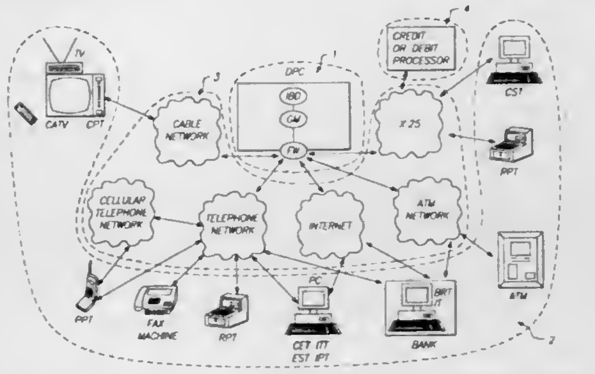
Richard C. Lindmark, 4712 El Hachero Ct. SE., Rio Rancho, N. Mex. 87124
Continuation of Ser. No. 590,917, Jan. 24, 1996, abandoned, which is a continuation of Ser. No. 341,841, Nov. 18, 1994, Pat. No. 5,539,837, which is a continuation-in-part of Ser. No. 875,428, Apr. 29, 1992, abandoned. This application Feb. 10, 1997, Ser. No. 799,031
Int. Cl.^{6} G06K *9/00*
U.S. Cl. 382—100 **6 Claims**

1. Apparatus for measuring a transparent curved subject surface and for presenting a mathematical expression describing the curvature of said transparent curved subject surface to a user and displaying an image of the subject surface to a user comprising:
an illumination subsystem for directing light along an illumination axis;
an image formation subsystem for acquiring image data, along an observation axis at an angle to said illumination axis;
a positioning subsystem for locating and positioning said transparent curved subject surface proximate the intersection of observation axis and said illumination axis;
data processor subsystem coupled to said image formation subsystem for accepting said image data and for converting said image data into an image pixel data set;
contrast enhancement means for generating a silhouette image data set of said curved surface from said image pixel data set;
coordinate assigning means for defining a set of coordinates to said silhouette data set;
curve approximating means for defining a mathematical expression for said silhouette data set;
display means for displaying said image pixel data set and said mathematical expression to a user.



5,838,812
TOKENLESS BIOMETRIC TRANSACTION AUTHORIZATION SYSTEM

David Ferrrin Pare, Jr.; Jonathan Alexander Lee, both of Berkeley, and Ned Hoffman, Sebastopol, all of Calif., assignors to SmartTouch, LLC, Berkeley, Calif.
Continuation of Ser. No. 442,895, May 17, 1995, Pat. No. 5,613,012, which is a continuation-in-part of Ser. No. 345,523, Nov. 28, 1994, Pat. No. 5,615,277. This application Jul. 25, 1996, Ser. No. 687,251
Int. Cl.^{6} G06K *9/00*
U.S. Cl. 382—115 **19 Claims**

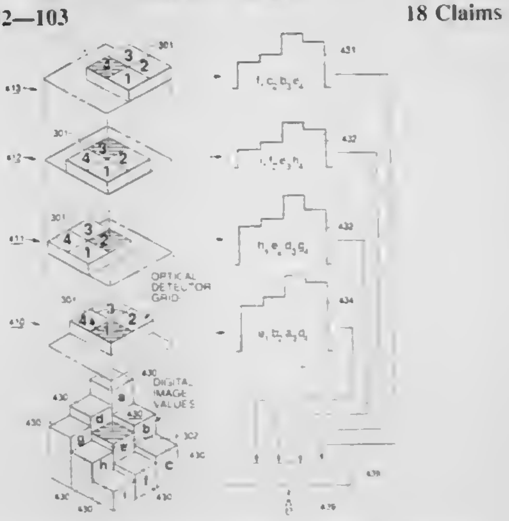


1. A method for tokenless authorization of commercial transactions at retail points of sale between a buyer and a seller who are collocated and who are using a computer system and at least one biometric input apparatus, said method comprising the steps of:
- a. a buyer registration step, wherein the buyer registers with the computer system a PIN, at least one registration biometric sample, and at least one buyer financial account;
- b. a seller registration step, wherein the seller registers with the computer system at least one seller registration financial account, and at least one biometric input apparatus that uniquely identifies the seller to the computer system using a seller identification code;
- c. a proposal step, wherein the seller proposes a commercial transaction to the buyer;
- d. an acceptance step, wherein the buyer signals acceptance of the seller's proposed commercial transaction by directly entering into the biometric input apparatus the buyer's personal authentication information comprising a PIN and at least one bid biometric sample forming a transaction agreement;
- e. a transmission step, wherein the transaction agreement is forwarded to the computer system along with the seller identification code that uniquely identifies the seller, the seller identification code being provided by the biomeric input apparatus;
- f. a seller identification step, wherein the computer system compares the seller identification code with previously registered seller identification codes for producing either a successful or failed identification of the seller;
- g. a buyer identification step, wherein the computer system compares the personal authentication information in the transaction agreement with previously registered biometric samples for producing either a successful or failed identification of the buyer;
- h. a payment step, wherein upon determination of sufficient resources, a financial account of the buyer is debited and a financial account of the seller is credited; and
- i. a presentation step, wherein any combination of the results of steps a) through h) are presented to the buyer or seller,

wherein a commercial transaction is conducted without the buyer using any portable man-made memory devices such as smartcards or magnetic stripe cards for identifying the buyer.

5,838,813
DITHERED IMAGE RECONSTRUCTION

Henry C. Kancler, Los Altos, and James D. Roberts, San Jose, both of Calif., assignors to Lockheed Martin Corp., Sunnyvale, Calif.
Filed Dec. 20, 1996, Ser. No. 770,493
Int. Cl.^{6} G06K *9/20;* H04N *1/195*
U.S. Cl. 382—103 **18 Claims**



1. A method for reconstructing a dithered image, comprising:
(a) applying a detector array to an image, the image comprising a plurality of image sections, the detector array comprising a plurality of detectors, each detector having a plurality of dither positions, each dither position associating the detector with one of the image sections;
(b) adjusting each detector to a first dither position;
(c) for each detector, obtaining a first signal corresponding to an associated image section for the first dither position;
(d) adjusting each detector to a subsequent dither position;
(e) for each detector, obtaining a subsequent signal corresponding to an associated image section for the subsequent dither position;

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(f) for each image section, determining an estimated output signal by comparing the signals obtained in steps (c) and (e) corresponding to the image section and further comparing the signals obtained in steps (c) and (e) for each detector having a dither position associating the detector with the image section; and

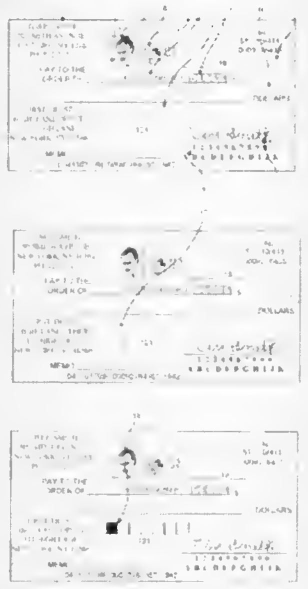
(g) generating an output comprising the estimated output signals for the image sections.

5,838,814
SECURITY CHECK METHOD AND APPARATUS

Steven Jerome Moore, 9 Sonoma Rd., Cortlandt Manor, N.Y. 10566

Filed Jan. 2, 1996, Ser. No. 581,808
Int. Cl.^{6} G06K *9/00*

U.S. Cl. 382—115 **7 Claims**



1. A security method for authenticating the validity of a draft comprising:

(i) providing the authorized maker of a draft requiring a signature for transaction of said draft with an electronically-readable means for identifying the account from which said draft is to be drawn;

(ii) obtaining said electronically-readable means from a person transacting a signed draft;

(iii) electronically reading said electronically-readable identification means and converting the same into an electronic data stream;

(iv) electronically inputting the amount for which said signed draft is drawn and coupling such with said electronic data stream relating to said identification;

(v) exporting said coupled data to a data processing means having access to account information concerning fund availability in said account at the time of transaction of the draft;

(vi) providing the inputter of said signed draft amount with confirmation that said account has sufficient funds to cover said draft;

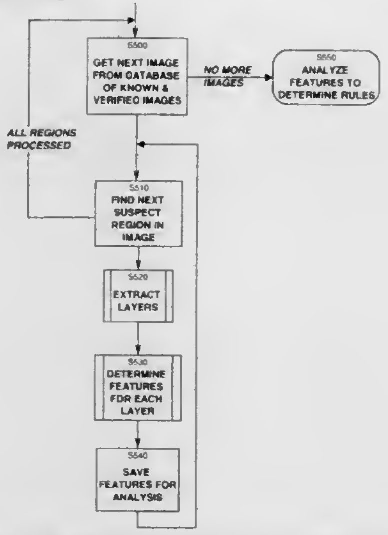
(vii) segregating said inputted amount from other funds in the account and debiting the same upon receipt of said signed draft if said draft is determined to have been signed by said authorized maker.

5,838,815
METHOD AND SYSTEM TO ENHANCE ROBUST IDENTIFICATION OF ABNORMAL REGIONS IN RADIOGRAPHS

David Gur; Bin Zheng, and Yuan-Hsiang Chang, all of Pittsburgh, Pa., assignors to University of Pittsburgh, Pittsburgh, Pa.

Continuation of Ser. No. 352,169, Dec. 1, 1994, Pat. No. 5,627,907. This application Feb. 22, 1996, Ser. No. 605,754
Int. Cl.^{6} G06K *9/00*

U.S. Cl. 382—128 **23 Claims**


S500
GET NEXT IMAGE FROM DATABASE OF KNOWN & VERIFIED IMAGES
NO MORE IMAGES
S550
ANALYZE FEATURES TO DETERMINE RULES
ALL REGIONS PROCESSED
S510
FIND NEXT SUSPECT REGION IN IMAGE
S520
EXTRACT LAYERS
S530
DETERMINE FEATURES FOR EACH LAYER
S540
SAVE FEATURES FOR ANALYSIS

1. A method of detecting an abnormal region in living tissue depicted in a digital radiograph, the method comprising:

identifying a suspected abnormal region depicted in the radiograph;

extracting multiple topographic layers of the suspected abnormal region from the digital radiograph, the multiple topographic layers being extracted from the same radiograph;

determining features of the region in each of said layers; and

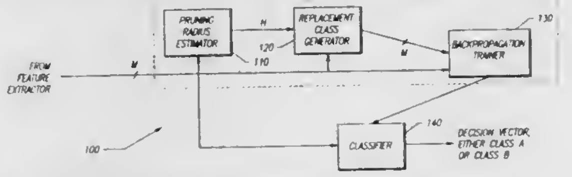
applying an inter-layer multivariate criterion to said features to determine whether said suspected abnormal region is an abnormal region.

5,838,816
PATTERN RECOGNITION SYSTEM PROVIDING AUTOMATED TECHNIQUES FOR TRAINING CLASSIFIERS FOR NON STATIONARY ELEMENTS

Bart A. Holmberg, Bellevue, Wash., assignor to Hughes Electronics, Los Angeles, Calif.

Continuation of Ser. No. 229,846, Apr. 18, 1994, abandoned, which is a continuation of Ser. No. 993,171, Dec. 18, 1992, abandoned. This application Feb. 7, 1996, Ser. No. 598,128
Int. Cl.^{6} G06K *9/66*

U.S. Cl. 382—157 **6 Claims**



2. An improved pattern recognition system comprising:

first means for generating a plurality of feature vectors from a single class of non-stationary data samples;

second means for estimating a pruning radius for said feature vectors in said single class of non-stationary data samples;

third means for generating a replacement class of data samples from said single class of data samples based on said pruning radius, said third means including means for generating a uniform distribution of random replacement vector elements occupying a class space for said replacement class of data samples wherein said vector elements are selected from a uniform distribution, and means for deleting from said uniform distribution of random replacement vector elements all vector elements which are within a hypersphere of said pruning radius of a feature vector to provide said replacement class;

fourth means for classifying raw data to facilitate the recognition of a pattern therein, said fourth means including a plurality of classifier weights;

fifth means for automatically training said fourth means based on said pruning radius and said replacement class of data samples, said fifth means including means for determining said classifier weights;

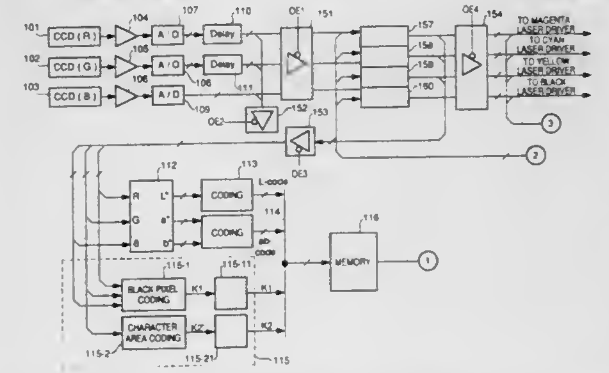
sixth means for adapting said estimated pruning radius and said classifier weights based on current results from said fourth means.

5,838,817
IMAGE PROCESSING APPARATUS AND METHOD FOR CODING AND DECODING CHROMATICITY INFORMATION

Masahiro Funada, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 46,269, Apr. 15, 1993, abandoned. This application May 26, 1995, Ser. No. 451,973
Claims priority, application Japan, Apr. 17, 1992, 4-097810
Int. Cl.^{6} G06T *9/00*

U.S. Cl. 382—166 **32 Claims**



1. An image processing apparatus comprising:

input means for inputting lightness information of a block of pixel data comprised of a plurality of pixels and chromaticity information of the block of pixel data;

first extracting means for extracting an amplitude value of the lightness information from the block of pixel data;

second extracting means for extracting an amplitude value of the chromaticity information from the block of pixel data; and

coding means for coding the chromaticity information based upon a ratio of the amplitude value of the chromaticity information to the amplitude value of the lightness information;

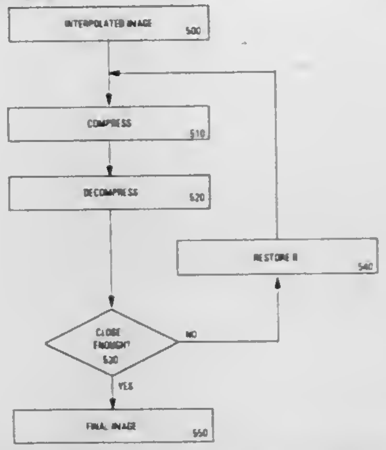
wherein the amplitude value of the lightness information corresponds to a difference between maximum and minimum values of the lightness information for the block of pixel data, and the amplitude value of the chromaticity information corresponds to a difference between chromaticity values at maximum and minimum lightness values in the block of pixel data.

5,838,818
ARTIFACT REDUCTION COMPRESSION METHOD AND APPARATUS FOR MOSAICED IMAGES

Cormac Herley, Los Gatos, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 18, 1997, Ser. No. 878,170
Int. Cl.^{6} G06K *9/00;9/36*

U.S. Cl. 382—166 **18 Claims**



1. A lossy compression process for a mosaiced image having a raw data plane and an interpolated plane, the process comprising the steps of:

a) compressing the mosaiced image to yield a compressed image;

b) decompressing the compressed image to yield a decompressed image having a decompressed data plane and a decompressed interpolated plane;

c) comparing the raw data plane to the decompressed data plane; and

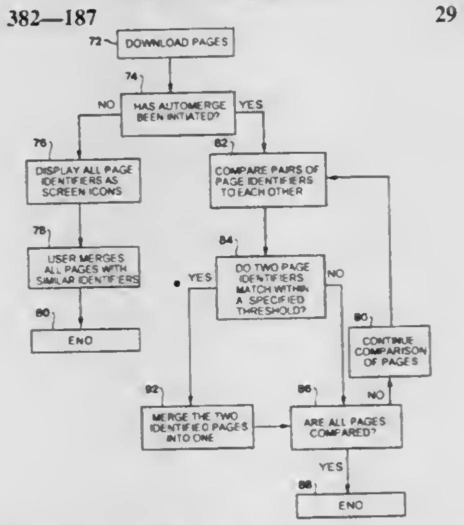
d) if the decompressed data plane is sufficiently different from the raw data plane, inserting the raw data plane into the decompressed image in place of the decompressed data plane.

5,838,819
SYSTEM AND METHOD FOR PROCESSING AND MANAGING ELECTRONIC COPIES OF HANDWRITTEN NOTES

Laurence W. Ruedisueli, Berkeley Heights, and Gordon Thomas Wilfong, Gillette, both of N.J., assignors to Lucent Technologies Inc., Murray HIll, N.J.

Filed Nov. 14, 1995, Ser. No. 557,872
Int. Cl.^{6} G06K *9/00*

U.S. Cl. 382—187 **29 Claims**


72
DOWNLOAD PAGES
74
HAS AUTOMERGE BEEN INITIATED?
NO
YES
76
DISPLAY ALL PAGE IDENTIFIERS AS SCREEN ICONS
78
USER MERGES ALL PAGES WITH SIMILAR IDENTIFIERS
80
END
82
COMPARE PAIRS OF PAGE IDENTIFIERS TO EACH OTHER
84
DO TWO PAGE IDENTIFIERS MATCH WITHIN A SPECIFIED THRESHOLD?
YES
NO
90
CONTINUE COMPARISON OF PAGES
92
MERGE THE TWO IDENTIFIED PAGES INTO ONE
86
ARE ALL PAGES COMPARED?
NO
YES
88
END

1. An electronic notepad for managing electronic copies of handwritten notes, the electronic notepad comprising:

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a handwriting capturing device having a surface for generating data signals corresponding to a plurality of sessions of handwritten notes written substantially adjacent to the surface on a plurality of pages, with each session of handwritten notes including a handwritten page identifier, and the data signals include a respective electronic identifier corresponding to a respective handwritten page identifier; and

a processor, operatively connected to the surface and responsive to the data signals, for generating the electronic copies of the plurality of sessions in data files, with each electronic copy associated with a respective session and with a respective electronic identifier;

wherein the electronic identifiers of the plurality of sessions facilitate the management of the electronic copies corresponding to the plurality of pages of handwritten notes.

5,838,820

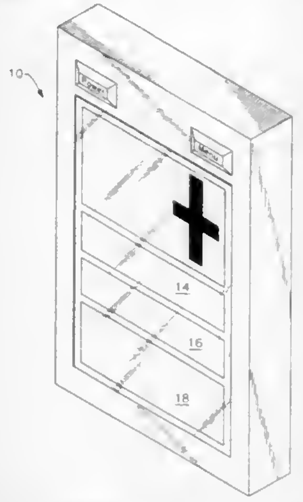
PATTERN RECOGNITION APPARATUS AND METHOD

Anthony J. Bergman, 2212 Cypress Point Dr. West, Clearwater, Fla. 34623

Filed Apr. 30, 1997, Ser. No. 846,597

Int. Cl.^{6} G06K *9/187;9/205;9/243*

U.S. Cl. 382—187 **12 Claims**



1. A pattern recognition method for scanning and saving a user-drawn image, in compressed numerical form, in a computer memory, comprising the steps of:

separating shapes in said user-drawn image from a background by determining the smallest square which completely encompasses all shapes while maintaining a relative distance relationship between each shape;

transforming the smallest square into a target square of predetermined size;

subdividing the target square into a plurality of smaller rectangles;

subdividing each rectangle of said plurality of smaller rectangles into a plurality of sectors;

scanning each sector of said plurality of sectors;

assigning at least one binary value to each sector, said at least one binary value being assigned to denote a first preselected graphical quality of said sector;

forming a binary string by grouping together all of said binary values for each sector;

forming a target list of said binary strings;

forming a master list of sublists, said master list representing a map of interrelated binary strings, for a plurality of prescanned images;

searching each of said sublists to locate a first numerical value in each sublist having a value equal to or greater than a corresponding value in said target list;

preparing a list of index values where each index value represents an item in said sublists; and

saving the compressed numerical form of the user-drawn image by saving said items from said target list in said sublists at positions identified by their respective index values.

5,838,821

METHOD AND APPARATUS FOR SELECTING COMPRESSION METHOD AND FOR COMPRESSION FILE USING THE SELECTED METHOD

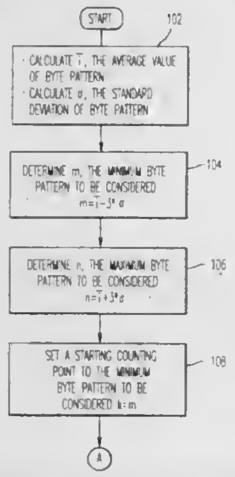
Akio Matsubara, Yokohama, and Hayashi Taniguchi, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 14, 1996, Ser. No. 615,821

Claims priority, application Japan, Mar. 14, 1995, 7-053847; Feb. 15, 1996, 8-028174

Int. Cl.^{6} G06K *9/00*

U.S. Cl. 382—190 **49 Claims**


START
102
· CALCULATE T̄, THE AVERAGE VALUE OF BYTE PATTERN
· CALCULATE σ, THE STANDARD DEVIATION OF BYTE PATTERN
104
DETERMINE m, THE MINIMUM BYTE PATTERN TO BE CONSIDERED m=T̄−3*σ
106
DETERMINE n, THE MAXIMUM BYTE PATTERN TO BE CONSIDERED n=T̄+3*σ
108
SET A STARTING COUNTING POINT TO THE MINIMUM BYTE PATTERN TO BE CONSIDERED k=m
A

1. A machine implemented method of analyzing a file, comprising the steps of:

obtaining a file;

determining a frequency of occurrence of bit patterns in the file;

determining characteristics of the file by analyzing the frequency of occurrence of the bit patterns in the file;

determining a number of byte values which have a frequency less than a predetermined threshold;

determining a number of consecutive byte values which have a frequency less than the predetermined threshold; and

determining the file is not an image file when the number of consecutive byte values which have a frequency less than the predetermined threshold exceeds a predetermined number.

5,838,822

IMAGE COMMUNICATING APPARATUS

Hiroshi Nobuta, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1994, Ser. No. 357,708

Claims priority, application Japan, Dec. 20, 1993, 5-344846; Dec. 27, 1993, 5-348676; Dec. 27, 1993, 5-348679

Int. Cl.^{6} G06T *9/00*

U.S. Cl. 382—232 **13 Claims**

1. An image communication apparatus comprising:

receiving means for receiving a binary encoded image signal obtained by encoding together a binary image signal and first additional information using a binary encoding method, the first additional information being associated with receiving of said binary image signal,

said receiving means being further for receiving a multi-value encoded image signal and second additional information, the multi-value encoded image signal having been obtained by encoding a multi-value image signal using a multi-value encoding method, and the second additional information being represented as character information in connection with receiving of the multi-value image signal and not encoded by the multi-value encoding method;

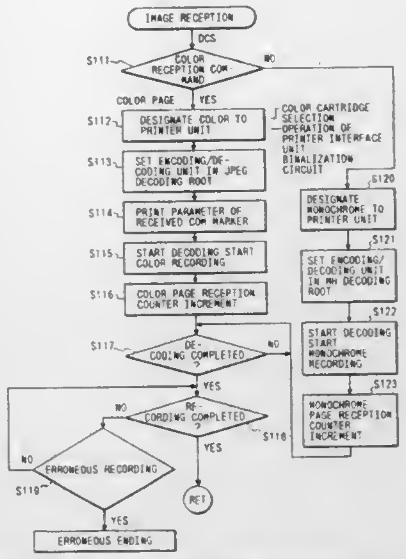


IMAGE RECEPTION
DCS
S111
COLOR RECEPTION COMMAND
NO
COLOR PAGE
YES
S112
DESIGNATE COLOR TO PRINTER UNIT
COLOR CARTRIDGE SELECTION
OPERATION OF PRINTER INTERFACE UNIT BINALIZATION CIRCUIT
S113
SET ENCODING/DECODING UNIT IN JPEG DECODING ROOT
S114
PRINT PARAMETER OF RECEIVED COM MARKER
S115
START DECODING START COLOR RECORDING
S116
COLOR PAGE RECEPTION COUNTER INCREMENT
S117
DECODING COMPLETED ?
NO
YES
RECORDING COMPLETED ?
NO
S118
YES
RET
NO
ERRONEOUS RECORDING
S119
YES
ERRONEOUS ENDING
S120
DESIGNATE MONOCHROME TO PRINTER UNIT
S121
SET ENCODING/DECODING UNIT IN MH DECODING ROOT
S122
START DECODING START MONOCHROME RECORDING
S123
MONOCHROME PAGE RECEPTION COUNTER INCREMENT

first decoding means for decoding the binary encoded image signal;

second decoding means for decoding the multi-value encoded image signal; and

output means for selectively outputting first image data and second image data,

wherein said first image data is image data obtained by a decoding operation of said first decoding means, and said second image data are the second additional information represented as character information and image data obtained by a decoding operation of said second decoding means.

5,838,823

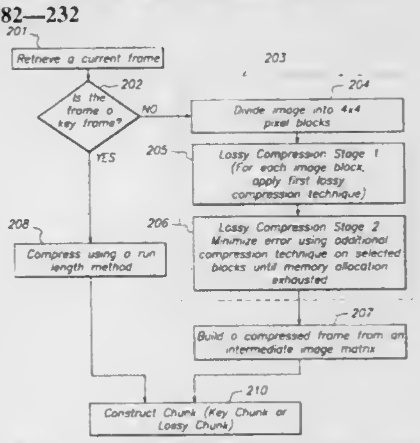
VIDEO IMAGE COMPRESSION AND DECOMPRESSION

Laurent Ancessi, Vancouver, Canada, assignor to Electronic Arts, Inc., San Mateo, Calif.

Filed Feb. 29, 1996, Ser. No. 609,867

Int. Cl.^{6} G06K *9/36;* **H04N** *1/41;1/415*

U.S. Cl. 382—232 **7 Claims**


201
Retrieve a current frame
203
202
Is the frame a key frame?
NO
YES
204
Divide image into 4x4 pixel blocks
205
Lossy Compression Stage 1 (For each image block, apply first lossy compression technique)
206
Lossy Compression Stage 2 Minimize error using additional compression technique on selected blocks until memory allocation exhausted
208
Compress using a run length method
207
Build a compressed frame from an intermediate image matrix
210
Construct Chunk (Key Chunk or Lossy Chunk)

1. A method of compressing an image frame having a target compression ratio and an allocation of memory to produce a homogeneous image quality across the frame, comprising:

dividing at least a portion of the image frame into a plurality of blocks, each block being an uncompressed version of the block;

performing a first compression method on a plurality of the blocks to form a plurality of first compressed versions of the blocks having an overall compression ratio exceeding the target compression ratio;

determining an image quality rating for each compressed version of each block;

identifying a block in the image frame having the poorest image quality rating,

performing a second compression method on the identified block to create a second compressed version of the block,

comparing the first and second compressed versions of the block to determine which has a better image quality rating;

performing a third compression method on said block responsive to determining that the first compressed version has a better image quality rating than the second compressed version,

performing a comparison between the first compressed version of said block and the third compressed version of said block to determine which has a better image quality rating; and

replacing the first compressed version of the block with the second compressed version of the block in the image frame responsive to determining that the second compressed version has a better image quality rating, otherwise replacing the first compressed version with the third compressed version in the image frame if the third compressed version has a better image quality rating;

determining the amount of memory used by the image frame;

repeatedly identifying a block in the image frame having the poorest image quality, performing a second compression, comparing the first and second versions, performing a third compression method, performing a comparison between the first and third versions, replacing the first compressed version, and determining the amount of memory, until the memory used by the image frame approximates the amount of memory allocated for the image frame.

5,838,824

ENCODING/DECODING APPARATUS PROVIDING WITH INPUT/OUTPUT INTERFACE FOR EXTERNAL EQUIPMENT

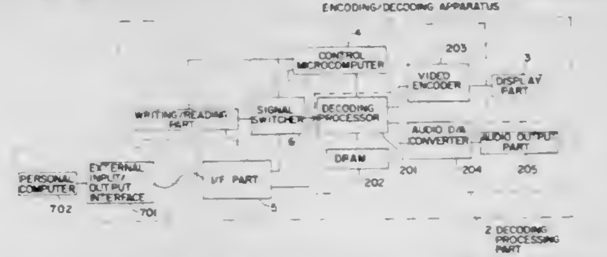
Masaya Narikawa, Osaka; Haruko Ishigami, Moriguchi; Yutaka Nishikawa, Kobe, and Mitsunori Ueda, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 687,688, Jul. 26, 1996, abandoned. This application Oct. 8, 1996, Ser. No. 727,242

Claims priority, application Japan, Jul. 26, 1995, 7-190171

Int. Cl.^{6} G60K *9/00*

U.S. Cl. 382—232 **19 Claims**



1. An encoding/decoding apparatus for use with a recording medium in which data is stored, comprising:

writing/reading means for reading a data signal from said recording medium;

decoding processing means for converting the data signal read from said writing/reading means into a video signal;

display means for displaying the video signal from said decoding processing means;

input/output interface means for external equipment for transferring the data signal read from said writing/reading means to external equipment;

signal switching means for supplying the data signal of said writing/reading means to one of said decoding processing means and said input/output interface means for external equipment; and

control means for controlling said writing/reading means, said decoding processing means, said signal switching means and said input/output interface means for external equipment.

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5,838,825
APPARATUS FOR DECOMPRESSING IMAGE DATA WHICH HAS BEEN COMPRESSED USING A LINEAR TRANSFORM

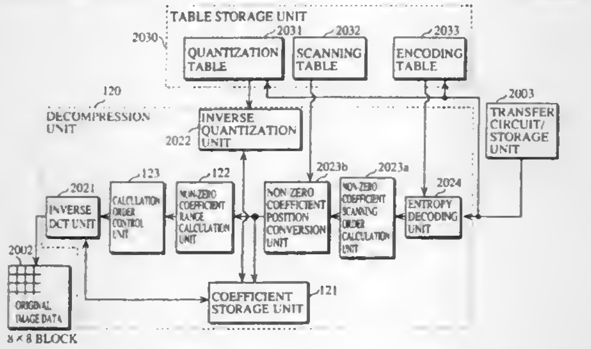
Yoshimasa Obayashi, Kyoto; Katsuyuki Kaneko, Moriguchi; Yoshiteru Mino, Hirakata, and Sadafumi Tomida, Kobe, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jan. 16, 1997, Ser. No. 784,709

Claims priority, application Japan, Jan. 17, 1996, 8-005934

Int. Cl.^{6} G06K *9/36;9/46*

U.S. Cl. 382—233 **23 Claims**



1. An apparatus for decompressing image data, wherein said compressed image data has been compressed by performing an n-dimensional transform (n being an integer) for groups of original image data which include every pixel in an n-dimensional coordinate space, sorting each resulting coefficient in the n-dimensional coordinate space into a sequence according to a predetermined order, and forming sets of grouped data which are each made of a non-zero coefficient and an order number showing a position of the non-zero coefficient in the sequence, said apparatus comprising:

storage means (a) which includes an area for storing every coefficient in the n-dimensional coordinate space;

initializing means (b) for having the storage means (a) store a value zero for every coefficient;

coordinate value calculating means (c) for calculating, on receiving a set of said grouped data, coordinate values in the n-dimensional coordinate space for the non-zero coefficient included the set of said grouped data, based on the order number included in the set of grouped data;

writing means (d) for writing a non-zero coefficient into a storage location in said storage means (a) which corresponds to the coordinate values calculated by the coordinate value calculating means (c);

non-zero coefficient region specifying means (e) for specifying a region in the storage means (a) which stores non-zero coefficients; and

inverse transform means (f) for restoring data to data which corresponds to original image data by performing an n-dimensional inverse transform for only coefficients in the region specified by the non-zero coefficient region specifying means (e),

wherein the n-dimensional inverse transform is a sum of products calculation using the coefficients,

wherein the n-dimensional inverse transform can be divided into n separate one-dimensional inverse transforms,

wherein the non-zero coefficient region specifying means (e) specifies a coordinate range which shows where the non-zero coefficients are located, in each out of m axes which compose the n-dimensional coordinate space, where m is an integer between one and n,

and wherein the inverse transform means(f) includes:

a first inverse transform unit (f1) which performs a one-dimensional inverse transform, for each of the m axes using only the coefficients which belong to the coordinate range specified by the non-zero coefficient region specifying means(e); and

a second inverse transform unit (f2) for performing a one-dimensional inverse transform using all of the coefficients in the coordinate range for each of the (n–m) remaining axes:

wherein the non-zero coefficient region specifying means (e) specifies, in each of the m axes, a highest value out of the coordinates of all of the non-zero coefficients calculated by the coordinate value calculating means (c), and sets the highest value as one edge of the coordinate range.

5,838,826
IMAGE PROCESSING APPARATUS AND METHOD USING PLURAL AMOUNTS CORRESPONDING TO ENCODED DATA TO CONTROL ENCODING

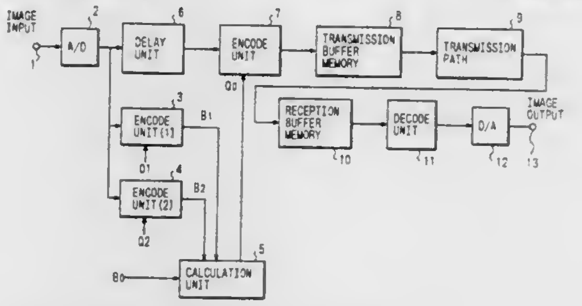
Masahiko Enari; Nobuhiro Hoshi, and Hiroshi Takizawa, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 813,832, Dec. 27, 1991, abandoned. This application Sep. 30, 1994, Ser. No. 312,942

Claims priority, application Japan, Dec. 28, 1990, 2-408947; Apr. 15, 1991, 3-082401; Apr. 15, 1991, 3-082402; Apr. 17, 1991, 3-085386

Int. Cl.^{6} G06K *9/036;9/46*

U.S. Cl. 382—234 **28 Claims**



1. An image processing apparatus comprising:

input means for inputting image data;

first counting means for counting a first encoded data amount corresponding to first encoded image data encoded by using a first control coefficient which determines the first encoded data amount;

second counting means for counting a second encoded data amount corresponding to second encoded image data encoded by using a second control coefficient which determines the second encoded data amount: and

generating means for generating encoded image data corresponding to the image data input by said input means in accordance with both the first and second encoded data amounts,

wherein said first and second counting means perform counting operations of the first and second encoded data amounts on the same image data in parallel.

5,838,827
APPARATUS AND METHOD FOR SEARCHING MOTION VECTOR

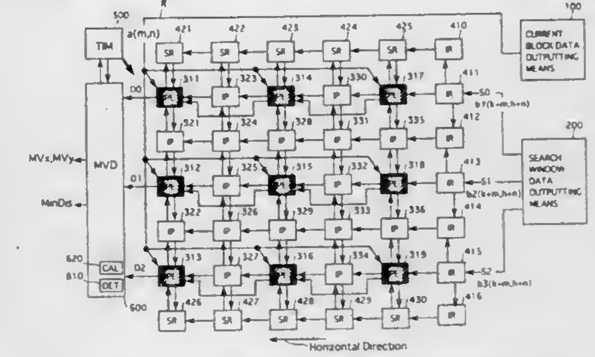
Takayuki Kobayashi; David Wuertele, and Yutaka Okada, all of Tokyo, Japan, assignors to Graphics Communication Laboratories, Tokyo, Japan

Filed Oct. 27, 1995, Ser. No. 549,530

Claims priority, application Japan, Nov. 10, 1994, 6-276704

Int. Cl.^{6} G06K *9/36;9/46*

U.S. Cl. 382—236 **34 Claims**



1. A motion vector searching apparatus for searching a plurality of motion vectors indicative of visual motion between a current picture and a reference picture forming part of successive pictures for displaying a dynamic picture image, said current picture being partially formed by a current picture block represented by a plurality of pixels distributed in rows and columns, said reference picture being partially formed by a search window including a set of reference picture blocks represented by a plurality of pixels distributed in rows and columns, and said reference picture blocks each having a block size the same as that of said current picture block, comprising:

current block data outputting means for outputting current block data including pixel values representative of the pixels of said current picture block;

search window data outputting means for outputting search window data including pixel values representative of the pixels of the search window which is expected to include one reference picture block most similar to said current picture block;

a set of processor elements each including a transmission register capable of receiving and registering said search window data, each of said processor elements being capable of computing a distortion value indicative of a distortion between said current picture block and one of the reference picture blocks of said search window on the basis of said current block data outputted from said current block data outputting means and said search window data received and registered by its own transmission register, and said search window being larger than a window consisting of a plurality of reference picture blocks which are equal in number to said processor elements and which are arranged under condition that any two adjoining reference picture blocks are horizontally, vertically or diagonally deviated by one-pixel pitch from each other;

a set of intermediate registers wedged into said set of processor elements and capable of receiving and registering said search window data, the total number of said processor elements and said intermediate registers being equal to that of the reference picture blocks included in said search window, and the reference picture blocks included in said one of said search windows being classified into two difference groups consisting of a first block group which is constituted by the reference picture blocks respectively corresponding to said processor elements, and a second block group which is constituted by the reference picture blocks respectively corresponding to said intermediate registers;

transmission controlling means for controlling said transmission and intermediate registers to cause the pixel values of each of the reference picture blocks of said search window to pass through the corresponding transmission or intermediate register, and only the distortion values of the reference picture blocks of said first block group being computed by said processor elements; and

minimum distortion detecting means for detecting the minimum value from said distortion values computed by said processor elements.

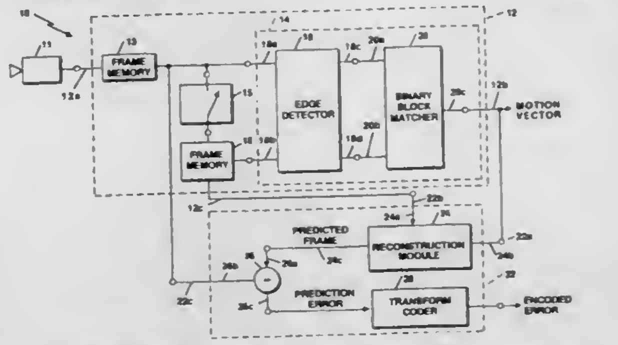
5,838,828
METHOD AND APPARATUS FOR MOTION ESTIMATION IN A VIDEO SIGNAL

Marcelo M. Mizuki, Coral Springs, Fla.; Ichiro Masaki, Action, Mass.; Anantha Chandrakasan, Belmont, Mass., and Berthold Horn, Carlisle, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Dec. 12, 1995, Ser. No. 570,889

Int. Cl.^{6} G06K *9/36;9/46*

U.S. Cl. 382—236 **20 Claims**



1. An apparatus for estimating motion of objects between a present image frame and a reference image frame, the apparatus comprising:

an edge detector having a first input port, a second input port, a first output port and a second output port, the edge detector for receiving the present image frame at the first input port, the reference image frame at the second input port and for providing at the first output port a present image binary edge map and for providing at the second output port a reference image binary edge map: and

a binary block matcher having a first input port coupled to the first output port of the edge detector, having a second input port coupled to the second output port of the edge detector and having an output port, the binary block matcher for receiving the present and reference image binary edge maps, each of the present and reference image binary edge maps having a like plurality of blocks, the binary block matcher for comparing each of the plurality of blocks of the present image binary edge map with each of the plurality of blocks of the reference image binary edge map and for generating a motion vector for each of the plurality of blocks of the present image binary edge map.

5,838,829
METHOD AND APPARATUS FOR ENCODING A CONTOUR OF AN OBJECT IN A VIDEO SIGNAL

Jin-Hun Kim, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Jan. 23, 1997, Ser. No. 788,948

Claims priority, application Rep. of Korea, Mar. 22, 1996, 1996 7857

Int. Cl.^{6} G06K *9/00*

U.S. Cl. 382—242 **20 Claims**

1. A method for encoding a current contour of an object in a video signal based on a previous contour thereof, comprising the steps of:

(a) extending the current contour over neighboring pixels thereof to thereby generate an extended contour;

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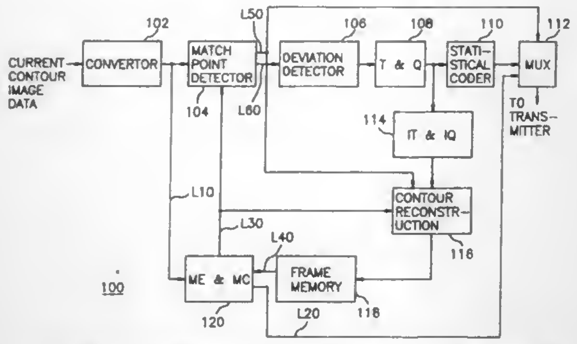


(b) finding a displacement between the extended and the previous contours and setting the displacement as a motion vector for the current contour; and

(c) encoding the current contour based on the motion vector.

5,838,830

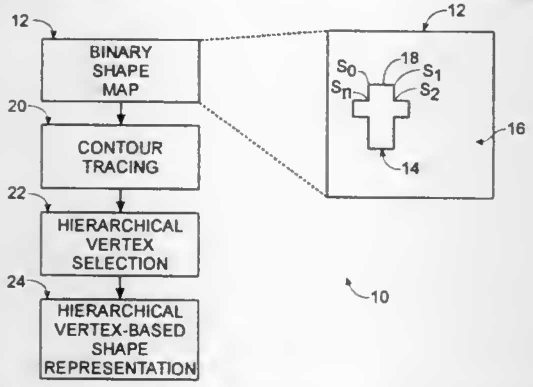
VERTEX-BASED HIERARCHICAL SHAPE REPRESENTATION AND CODING METHOD AND APPARATUS

Richard J. Qian, Vancouver, and M. Ibrahim Sezan, Camas, both of Wash., assignors to Sharp Laboratories of America, Inc., Camas, Wash.

Filed Apr. 3, 1997, Ser. No. 825,646

Int. Cl.^{6} G06K *9/00*

U.S. Cl. 382—243 **9 Claims**


12
BINARY SHAPE MAP
20
CONTOUR TRACING
22
HIERARCHICAL VERTEX SELECTION
24
HIERARCHICAL VERTEX-BASED SHAPE REPRESENTATION
12
S0
18
S1
Sn
S2
16
14
10

1. A method of vertex-based hierarchical shape representation and coding comprising:

selecting an image of interest;

defining a representation of the shape of the image of interest;

establishing a boundary between the object of interest and the remainder of the image of interest;

tracing the contour of the image of interest to determine the coordinates of all of a collection of contour points on the contour;

determining a number of hierarchical layers in which the contour points will be stored;

selecting the most salient contour points on the contour;

storing the most salient contour points in a base hierarchical layer;

storing less salient contour points in successive less salient hierarchical layers; and

building a content-based data base of shape-representative hierarchical layers.

5,838,831

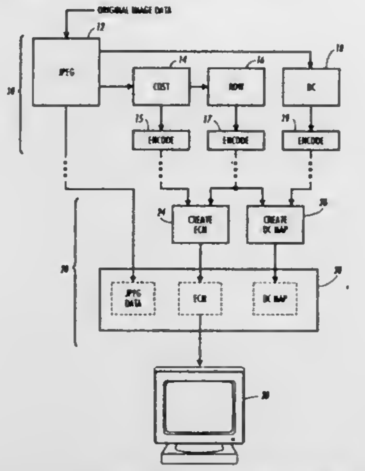
COMPRESSION OF IMAGE DATA WITH RETAINING COST DATA FOR EACH COMPRESSED IMAGE BLOCK

Ricardo L. de Queiroz, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 26, 1996, Ser. No. 721,519

Int. Cl.^{6} G06K *9/36;9/46*

U.S. Cl. 382—248 **3 Claims**



1. A method of processing digital data forming an image, the data being organized as a set of blocks, each block corresponding to an area of the image, comprising the steps of:

compressing each block, said compressing step yielding a string of bits for each block;

counting a number of bits in each string of bits;

recording a cost function for each string of bits, said cost function being a number related to the number of bits in each string of bits;

transmitting the cost function of each string of bits to a receiver;

associating each cost function with a predetermined area in a map including a plurality of areas, thereby yielding an encoding cost map;

converting each cost function into a luminance; and

displaying the luminance of each cost function in the encoding cost map, with each cost function corresponding to one area in the encoding cost map.

5,838,832

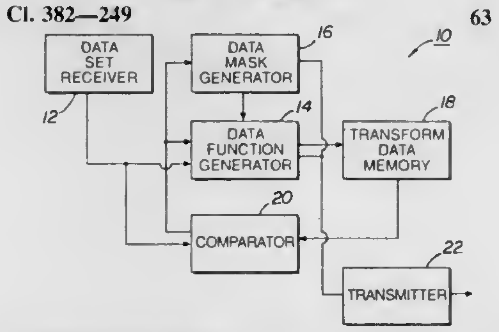
METHOD AND SYSTEM FOR REPRESENTING A DATA SET WITH A DATA TRANSFORMING FUNCTION AND DATA MASK

Michael F. Barnsley, Duluth, Ga., assignor to Iterated Systems, Inc., Atlanta, Ga.

Filed Apr. 3, 1995, Ser. No. 415,559

Int. Cl.^{6} G06K *9/36*

U.S. Cl. 382—249 **63 Claims**



1. A method for representing a data set comprising the steps of:

selecting one of a complex, affine, and projective transformation function that generates an attractor that approximates a data set; and

selecting a data mask function for constraining said attractor produced by said data set transformation function whereby said attractor more accurately represents said data set.

5,838,833

FRACTAL IMAGE COMPRESSION METHOD AND DEVICE AND FRACTAL IMAGE RESTORATION METHOD AND DEVICE

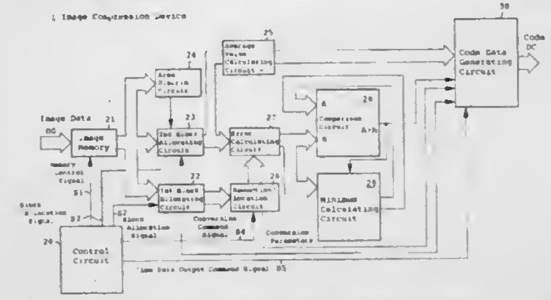
Atsushi Ishikawa, and Tetsuya Itoh, both of Okazaki, Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Jun. 7, 1996, Ser. No. 659,246

Claims priority, application Japan, Jun. 30, 1995, 7-165670; Jul. 7, 1995, 7-172000; Jul. 21, 1995, 7-185196; Aug. 9, 1995, 7-202940; Aug. 25, 1995, 7-217094

Int. Cl.^{6} G06K *9/36;9/46*

U.S. Cl. 382—249 **11 Claims**



1. A fractal image compression device comprising:

a domain block allocation means for dividing an original image into a plurality of domain blocks;

a density pattern storing means for storing as domain blocks a plurality of density pattern data created independently for the original image;

a range block allocation means for dividing said original image into a plurality of range blocks having different size from said domain blocks;

a pattern generating means for selecting the domain blocks output from the domain block allocating means or the domain blocks read from the density pattern storing means, and converting said selected domain block to a pattern of the same size as said range block allocated by said range block allocation means;

an error calculation means for calculating error by comparing said range block and said pattern generated by said pattern generating means; and

a coding means for coding the original image data by generating a code data which contains information relating to a conversion parameter producing the smallest error in said pattern for the range block and information relating to the position of the domain block having the smallest error in pattern.

5,838,834

IMAGE PROCESSING APPARATUS AND METHOD FOR QUANTIZING IMAGE DATA AND QUANTIZATION ERRORS USING SINGLE QUANTIZING UNIT AND PLURALITIES OF QUANTIZATION TABLES

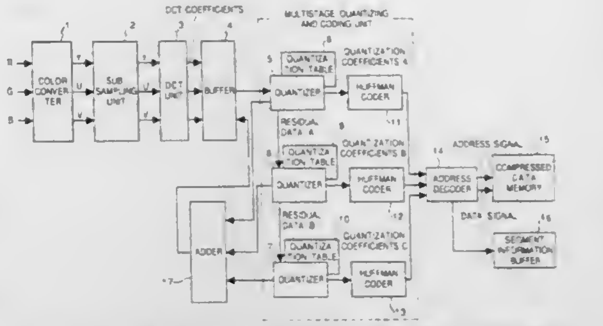
Kazuhiro Saito, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 5, 1992, Ser. No. 972,433

Claims priority, application Japan, Nov. 7, 1991, 3-291454; Jan. 21, 1992, 4-008152; Jul. 31, 1992, 4-205248

Int. Cl.^{6} G06K *9/36;9/38;9/46*

U.S. Cl. 382—25.1 **15 Claims**



1. An image processing apparatus comprising:

input means for inputting image data;

quantization means for quantizing the image data in units of blocks; and

generation means for generating plural kinds of quantization tables, each of which comprises a plurality of coefficients and is defined in consideration of preservation of information in frequency space,

wherein said quantization means is a single unit and quantizes the image data by using a first quantization table of said plural kinds of quantization tables and further quantizes quantization errors which are generated by quantizing the image data by using a second quantization table of the plurality of quantization tables.

5,838,835

BETTER CONTRAST NOISE BY RESIDUE IMAGE

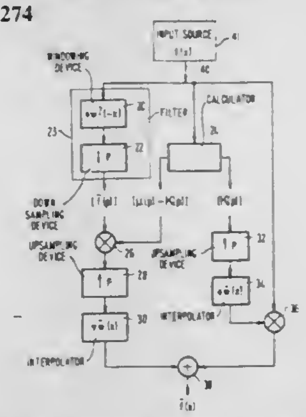
Jean B. O. S. Martens, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 432,756, May 2, 1995, abandoned. This application Oct. 14, 1997, Ser. No. 949,647

Claims priority, application European Pat. Off., May 3, 1994, 942012329

Int. Cl.^{6} G06K *9/40*

U.S. Cl. 382—274 **9 Claims**



1. A method for contrast-enhancing in a multi-dimensional image, said method comprising the steps of:

sampling the multi-dimensional image according to a regular array of instants;

based on said instants, locally detecting a local contrast quantity;

detecting said quantity as being in one of a low range or a high range;

when in said high range, locally relatively enhancing said local contrast quantity with an enhancement factor that is a monotonically non-increasing, non-uniform function of said local contrast quantity, such that in said high range, the local contrast quantity after said enhancing, is a monotonically increasing function of said local contrast quantity before said enhancing.

5,838,836

METHOD AND APPARATUS FOR ROUGH CROPPING IMAGES

John F. Omvik, North Andover, Mass., assignor to Agfa Division-Bayer Corporation, Wilmington, Mass.

Filed Nov. 6, 1995, Ser. No. 553,938

Int. Cl.^{6} G06K *9/36*

U.S. Cl. 382—276 **12 Claims**

1. A method for determining and specifying a rough crop area for an image to be scanned by a scanning system, said method comprising the following steps:

(A) Selecting an original image to be scanned;

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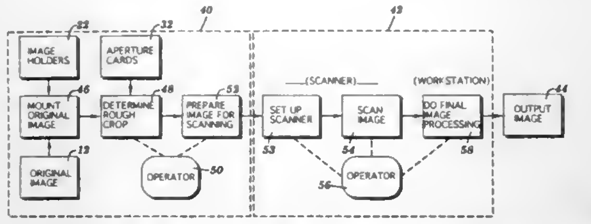


(B) Selecting an image holder, and fixedly mounting said original image in said image holder;
(C) Selecting an aperture card, said aperture card having an opening corresponding to said rough crop area of said image to be scanned;
(D) Identifying said aperture card according to a size and shape of said opening, thereby providing an aperture card identification;
(E) Placing said selected aperture card on top of said image holder and displacing said aperture card relative to said image holder in such manner as to display in said opening a region of said original image corresponding to said rough crop area of said image to be scanned;
(F) Obtaining a measure of said displacement of said aperture card relative to said image holder, said measure of said displacement and said aperture card identification providing a rough crop specification; and,
(G) Using said rough crop specification for controlling said scanning system.

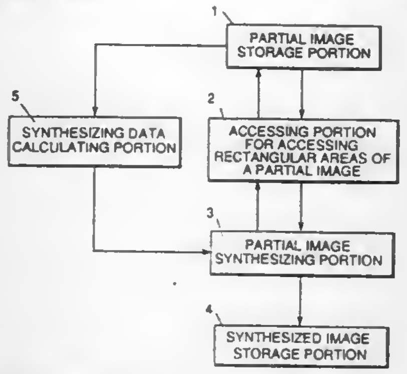
5,838,837
IMAGE SYNTHESIZING DEVICE
Masashi Hirosawa, Yamatokooriyama, and Yoshihiro Kitamura, Osaka, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 8, 1996, Ser. No. 629,314

Claims priority, application Japan, Apr. 10, 1995, 7-083833

Int. Cl.^{6} G06K *9/36;9/32;9/54;9/60*

U.S. Cl. 382—284 **14 Claims**


1
PARTIAL IMAGE STORAGE PORTION
5
SYNTHESIZING DATA CALCULATING PORTION
2
ACCESSING PORTION FOR ACCESSING RECTANGULAR AREAS OF A PARTIAL IMAGE
3
PARTIAL IMAGE SYNTHESIZING PORTION
4
SYNTHESIZED IMAGE STORAGE PORTION

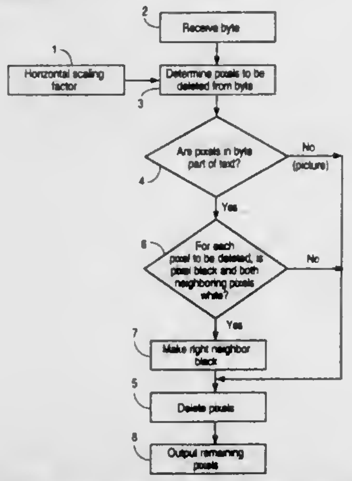
1. An image synthesizing device comprising:
a partial image storage portion for storing a plurality of partial images taken from a part of an object, said images having adjoining portions overlapping each other;
a synthesizing data calculating portion for calculating synthesizing information for a plurality of the partial images stored in the partial image storage portion;
a partial image accessing portion for accessing one by one accessible tetragonal areas into which each partial image is divided for storage in the partial image storage portion, each of said areas consisting of a plurality of pixel rows and columns and being processed by the partial image accessing portion on the basis of the synthesizing information obtained by the synthesizing data calculating portion;
a partial image synthesizing portion for synthesizing partial images processed by the partial image accessing portion according to the synthesizing information from the synthesizing data calculating portion; and
a synthesized image storage portion for storing a synthesized image obtained by the partial image synthesizing portion.

5,838,838
DOWN-SCALING TECHNIQUE FOR BI-LEVEL IMAGES
Mark A. Overton, Escondido, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 19, 1996, Ser. No. 694,711

Int. Cl.^{6} G06K *9/46*

U.S. Cl. 382—298 **22 Claims**


2
Receive byte
1
Horizontal scaling factor
Determine pixels to be deleted from byte
3
Are pixels in byte part of text?
4
No
(picture)
Yes
6
For each pixel to be deleted, is pixel black and both neighboring pixels white?
No
Yes
7
Make right neighbor black
5
Delete pixels
8
Output remaining pixels

1. A method for down scaling an original pixel pattern having horizontal rows of pixels and vertical columns of pixels, said method comprising the step of:
horizontally scaling said pixel pattern, said step of horizontally scaling said pixel pattern comprising the steps of:
determining a horizontal scale factor for reducing a length of said horizontal rows of pixels;
receiving an original group of bits corresponding to a group of pixels in a row of pixels, a bit of a first logic level representing a dot to be displayed by a display device, a bit of a second logic level representing that a dot is not to be displayed;
identifying bits to be deleted from said group of bits to achieve said horizontal scale factor;
identifying which of said bits to be deleted meet a first criterion, said first criterion being that said bit to be deleted is of said first logic level bounded by bits of said second logic level, wherein bits immediately to either side of said group of bits along said row are presumed to be of said second logic level;
setting a bit, within said group and adjacent to a bit to be deleted which met said first criterion, from said second logic level to said first logic level;
deleting said bits to be deleted to reduce a size of said group of bits to achieve said horizontal scale factor; and
outputting a horizontally scaled group of bits.

5,838,839
IMAGE RECOGNITION METHOD
Susumu Seki, Chiba; Shigeki Nagaya, and Ryuichi Oka, both of Ibaraki, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka; Hitachi, Ltd., Tokyo, and Real World Computing Partnership, Ibaraki, all of Japan

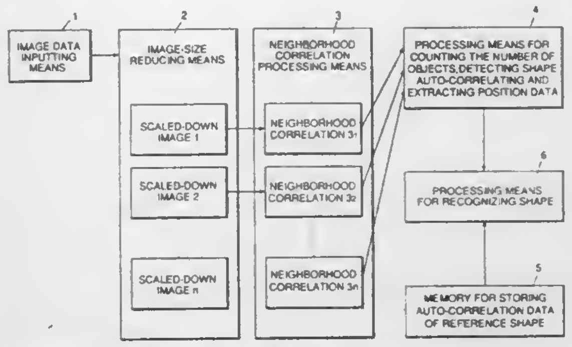
Filed Jun. 28, 1996, Ser. No. 672,759

Claims priority, application Japan, Dec. 1, 1995, 7-313838

Int. Cl.^{6} G06K *9/32*

U.S. Cl. 382—299 **3 Claims**

1. An image recognition method for recognizing an image comprising the steps of:
obtaining an input image;


1
IMAGE DATA INPUTTING MEANS
2
IMAGE-SIZE REDUCING MEANS
SCALED-DOWN IMAGE 1
SCALED-DOWN IMAGE 2
SCALED-DOWN IMAGE n
3
NEIGHBORHOOD CORRELATION PROCESSING MEANS
NEIGHBORHOOD CORRELATION 3₁
NEIGHBORHOOD CORRELATION 3₂
NEIGHBORHOOD CORRELATION 3n
4
PROCESSING MEANS FOR COUNTING THE NUMBER OF OBJECTS,DETECTING SHAPE AUTO-CORRELATING AND EXTRACTING POSITION DATA
6
PROCESSING MEANS FOR RECOGNIZING SHAPE
5
MEMORY FOR STORING AUTO-CORRELATION DATA OF REFERENCE SHAPE

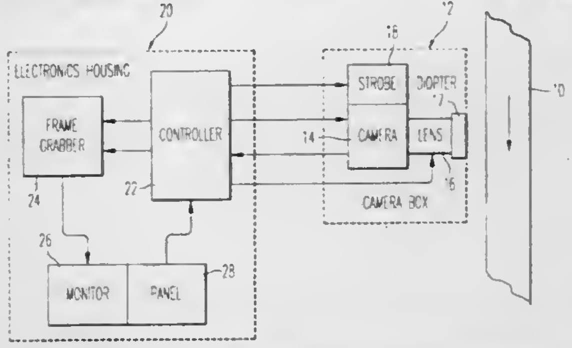
generating, from the input image, a series of scaled-down images each having different resolutions, wherein each scaled-down image is comprised of a plurality of pixels;
performing neighborhood correlation on each of the scaled-down images;
isolating at least one object from the scaled-down images;
detecting a shape auto-correlation of the object; and
comparing the shape auto-correlation of the object to a shape auto-correlation of a reference shape.

5,838,840
INSPECTION DEVICE USING A FIELD MODE VIDEO CAMERA WITH INTERPOLATION TO REPLACE MISSING PIXELS
Edwin E. King, Lombard; Daniel T. Trabbic, Elmhurst; Richard M. O'Grady, Chicago, and Brian S. Patrick, Westmont, all of Ill., assignors to BST/Pro Mark, Elmhurst, Ill.

Filed Aug. 29, 1996, Ser. No. 705,200

Int. Cl.^{6} G06K *9/32*

U.S. Cl. 382—300 **9 Claims**



1. A device for inspecting printing on a web, comprising:
a strobe lamp for illuminating said web;
a field mode video camera producing a video image of said web with two fields, and generating an output of a single field;
a frame grabber receiving said output, storing alternate pixels of said output and reproducing said image by enlarging the stored pixels and interpolating both horizontally and vertically to replace a field of said video image which is not included in said output and alternate pixels which are not stored and to produce a reproduced image; and
monitor means for displaying said reproduced image.

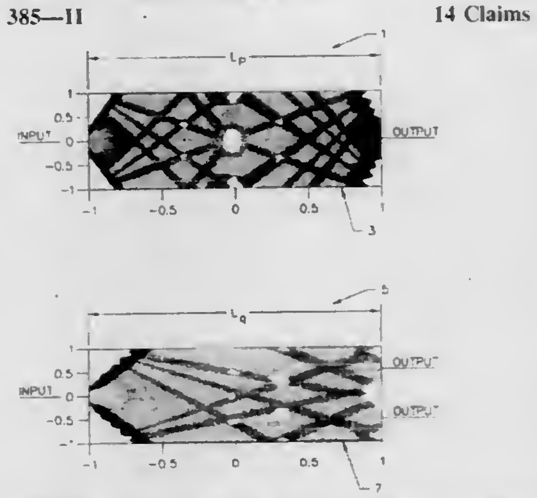
5,838,841
Patent Not Issued For This Number

5,838,842
SELF-IMAGING WAVEGUIDE OPTICAL POLARIZATION OR WAVELENGTH SPLITTERS
David M. Mackie, College Park, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 10, 1997, Ser. No. 783,300

Int. Cl.^{6} G02B *6/00*

U.S. Cl. 385—11 **14 Claims**



1. A simultaneous 1-by-1 and 1-by-2 self-imaging waveguide integrated optical polarization splitter comprising:
an input waveguide containing orthogonally polarized light of two modes;
a multimode interference region having a refractive index, the multimode interference region aligned with said input waveguide such that the refractive index of the multimode interference region for said orthogonally polarized light is different for said two modes, with the length of said multimode interference region set such that the light polarization mode experiencing the lower refractive index in said region is singly self-imaged while the light having the other polarization mode is doubly self-imaged;
a first output waveguide containing the light polarization mode experiencing the higher refractive index; and
second and third output waveguides each containing half the power of the other light polarization mode.

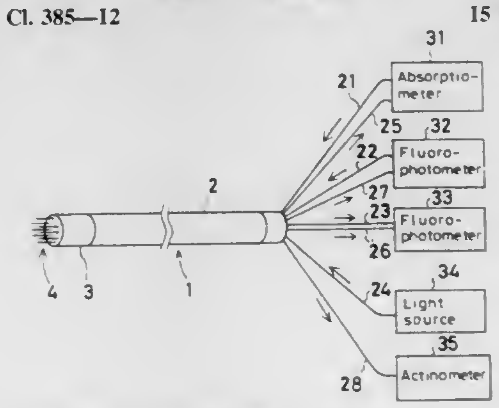
5,838,843
MULTIPURPOSE OPTICAL SENSOR
Shinichi Aose; Koichi Miura, and Takashi Hiyama, all of Tokai-mura, Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan

Filed Feb. 23, 1996, Ser. No. 604,742

Claims priority, application Japan, Mar. 6, 1995, 7-045462

Int. Cl.^{6} G02B *6/04*

U.S. Cl. 385—12 **15 Claims**



1. A multipurpose optical sensor, comprising:
a plurality of optical fiber pairs; and

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an optical system for converting light guided through each of said optical fiber pairs and leaving leading ends of one optical fiber of each of said optical fiber pairs into a substantially parallel light beam in a direction at right angles with an axis thereof, and converging said substantially parallel light beam incident on said axis from a direction at right angles therewith and guiding the thus converged light beam from said leading ends into the other optical fiber of each of said optical fiber pairs in the form of guide light,

said optical fiber pairs being concentrically located in the vicinity of said leading ends, each of said optical fiber pairs having a pair of opposing optical fibers, with the center of the concentric circle being positioned therebetween, being opposed to each other at an interval and disposed such that said substantially parallel light beam leaving one opposing optical fiber is incident on the other opposing optical fiber, and trailing ends of said optical fiber pairs being constructed such that said trailing ends separately receive or give out light,

wherein a first pair of said plurality of optical fiber pairs measures a first type of measurement and a second pair of said plurality of optical fiber pairs measures a second type of measurement different from the first type of measurement.

5,838,844
INTEGRATED OPTICAL CIRCUIT COMPRISING A POLARIZATION CONVERTOR

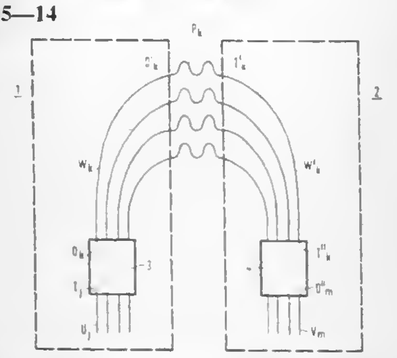
Cornelis Van Dam, Zoetermeer, Netherlands; Helmut Heidrich; Karl M. Hamacher, both of Berlin, Germany; Cornelis A. M. Steenbergen; Meint K. Smit, both of Delft, Netherlands, and Carl M. Weinert, Berlin, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 18, 1996, Ser. No. 715,693

Claims priority, application European Pat. Off., Sep. 20, 1995, 95202541; Nov. 2, 1995, 95202957

Int. Cl.^{6} G02B *6/126*

U.S. Cl. 385—14 **15 Claims**



1. Integrated optical circuit comprising a first device having an output for emitting radiation with a first state of polarization, a second device having an input for receiving radiation with a second, different state of polarization, and a polarization converter connected between the output and the input, characterized in that the polarization convertor comprises a curved section of an integrated waveguide integrally formed with said first and second devices on a single substrate.

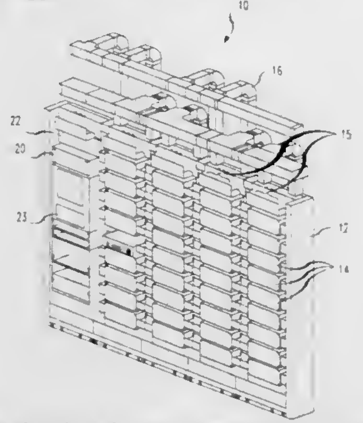
5,838,845
PRIMARY STAGE OPTICAL WITCH ASSEMBLY FOR AN OPTICAL FIBER ADMINISTRATION SYSTEM

Frank Salvatore Leone, Berkeley Heights; Richard Joseph Pimpinella, Hampton, and Randy Alan Reagan, Morris Plains, Morris County, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Sep. 9, 1996, Ser. No. 709,976

Int. Cl.^{6} G02B *6/26;6/42*

U.S. Cl. 385—16 **15 Claims**



1. An optical switch for use in an optical fiber administration system, wherein said optical switch includes electronic components and optical components, said optical switch comprising:

a shelf structure defining a confined space;

a compartment disposed within said confined space of said shelf structure;

an optical module mountable at a first position within said compartment, wherein said optical module contains most of said optical components;

an electronic module selectively mountable at a second position within said compartment, wherein said electronic module contains most of said electronic components;

wherein said electronic module can be selectively removed from said shelf structure without affecting the position of said optical module within said shelf structure.

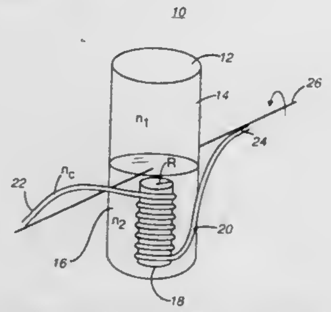
5,838,846
FIBER OPTIC SWITCH AND ATTENUATOR

John Kermit Murdock, Frisco, Tex., assignor to McDonnell Douglas

Continuation of Ser. No. 678,495, Jul. 9, 1996, abandoned. This application Oct. 6, 1997, Ser. No. 944,363

Int. Cl.^{6} G02B *6/26*

U.S. Cl. 385—16 **18 Claims**



5. A fiber-optic switch and attenuator, comprising:

a sealed capsule;

a first fluid contained in the sealed capsule having a first index of refraction and having a first density;

a second fluid contained in the sealed capsule having a second index of refraction, the second index of refraction being greater than the first index of refraction, the second fluid having a second density, the second density not being equal to the first density;

a bobbin within the sealed capsule; and

a fiber optic core wrapped around the bobbin has a core index of refraction, the core index of refraction being less than the second index of refraction and greater than the first index of refraction, the fiber optic core having a first end and a second end outside the sealed capsule.

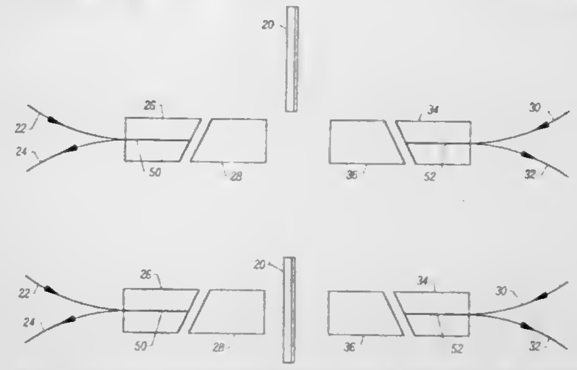
5,838,847
EFFICIENT ELECTROMECHANICAL OPTICAL SWITCHES

Jing-Jong Pan, Milpitas; Jing-Yu Xu, San Jose, and Charlene Jia-Ling Yang, Fremont, all of Calif., assignors to E-Tek Dynamics, Inc., San Jose, Calif.

Continuation of Ser. No. 727,075, Oct. 8, 1996, Pat. No. 5,742,712. This application Oct. 23, 1997, Ser. No. 956,637

Int. Cl.^{6} G02B *6/26*

U.S. Cl. 385—18 **8 Claims**



8. A method for switching two optical signals, the method comprising:

transmitting a first optical signal along an optical path from a first input optical fiber;

collimating the first signal from the first input fiber with a first GRIN lens;

reflecting the first signal back through the first GRIN lens with a movable reflector so that the first GRIN lens focusses the first signal into a first output fiber;

transmitting a second optical signal along an optical path from a second input optical fiber;

collimating the second signal from the second input fiber with a second GRIN lens;

reflecting the first signal back through the second GRIN lens with the movable reflector so that the second GRIN lens focusses the second signal into a second output fiber;

moving the movable reflector out of the optical paths of the first and second signals so that the first signal from the first GRIN lens is focussed into the second output fiber by the second GRIN lens, and so that the second signal from the second GRIN lens is focussed into the first output fiber by the first GRIN lens.

5,838,848
N×N WAVELENGTH ROUTER, OPTICAL ROUTING METHOD AND ASSOCIATED COMMUNICATION NETWORK

Jean-Pierre Laude, Saclas, France, assignor to Instruments, S.A., Paris, France

Filed Jan. 8, 1997, Ser. No. 780,357

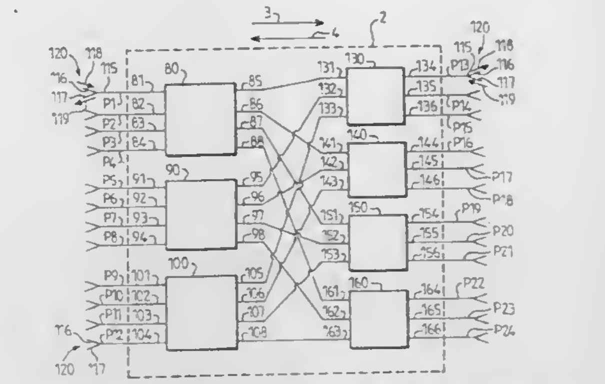
Claims priority, application France, Jan. 9, 1996, 96 00170; Feb. 28, 1996, 96 02496

Int. Cl.^{6} G02B *6/28*

U.S. Cl. 385—24 **14 Claims**

1. An N×N wavelength router comprising:

N inputs and N outputs which are provided to transmit optical signals, each optical signal having a wavelength, from the N inputs to the N outputs; and



switching means for directing each of the optical signals from any one of the N inputs to any one of the N outputs according to the wavelength of said optical signal, wherein the switching means includes

n m×m couplers each having m inputs and m outputs, N being equal to n×m and the N inputs of the n m×m couplers being the inputs of the N×N router, and

m n×n routers each having n inputs and n outputs, each of said n inputs being connected to one of the outputs of, respectively, the n m×m couplers and the N outputs of the m n×n routers being the outputs of the N×N router, each of the n×n routers being capable of switching the optical signal having the wavelength from any one of its n inputs to any one of its n outputs, according to the wavelength of said optical signal, said n×n router having a transmission spectrum according to the wavelength in a form of a series of peaks, the series of peaks from the m n×n routers being different from one another.

5,838,849
OPTICAL COMPONENT WHEREIN EITHER AN OPTICAL FIELD DISTRIBUTION OF RECEIVED LIGHT OR AN OPTICAL FIELD DISTRIBUTION OF A PROPAGATION MODE OF A RECEIVING WAVEGUIDE HAS A DOUBLE-HUMP SHAPE

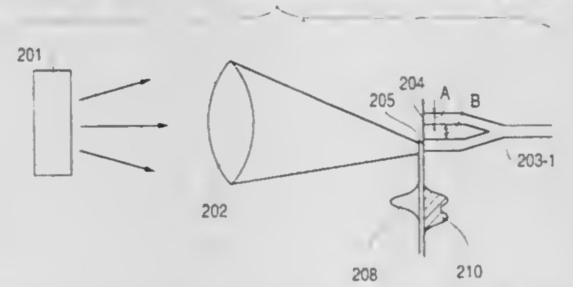
Masataka Shirasaki, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 21, 1997, Ser. No. 802,767

Claims priority, application Japan, Mar. 22, 1996, 8-066718

Int. Cl.^{6} G02B *6/26*

U.S. Cl. 385—31 **38 Claims**



1. An optical waveguide having a light receiving end and a propagation mode with a double-hump shaped optical field distribution at the light receiving end to receive light into the optical waveguide, wherein substantially the total Power of the propagation mode is converted into a single, non-double-hump shaped optical field distribution.

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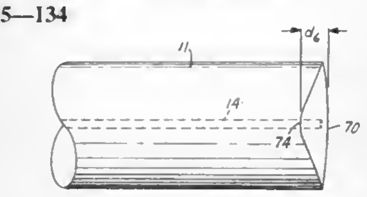
5,838,850
CURVED-ANGLE CLEAVING OF OPTICAL FIBERS

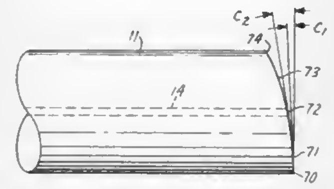
Charles M. Mansfield, and Gordon Wiegand, both of Austin, Tex., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 213,974, Mar. 15, 1994, abandoned. This application Mar. 19, 1997, Ser. No. 820,810

Int. Cl.^{6} G02B *6/26*

U.S. Cl. 385—134 **7 Claims**





1. A curved-angle cleaved optical fiber end-face having a cleave initiation angle within the range of 0° to 2°, a cleave angle at a core of said optical fiber within the range of 3° to 10°, and a cleave roll-off dimension no greater than 75% of a diameter of said optical fiber.

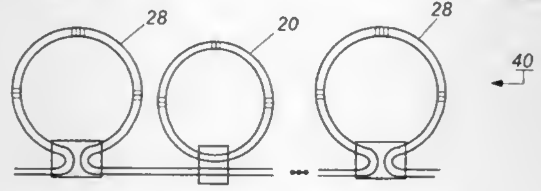
5,838,851
OPTICAL-LOOP SIGNAL PROCESSING USING REFLECTION MECHANISMS

Philip Henry Wisseman, Hermosa Beach, and Chung-Ching Shih, Palos Verdes Estates, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Jun. 24, 1996, Ser. No. 668,806

Int. Cl.^{6} G02B *6/26*

U.S. Cl. 385—32 **10 Claims**



1. A fiber-optic signal processing system comprising:
an optical fiber having an input and an output;
an optical element formed in a predetermined loop;
an optical coupling device for optically coupling light from said input of said optical fiber to said optical element and for coupling light from said optical element to said optical fiber, said optical element forming a time delay line; and
one or more predetermined reflection mechanisms having predetermined frequency characteristics formed in said loop, said reflection mechanisms being capable of varying the frequency response of said fiber optic signal processing system.

5,838,852
ADJUSTABLE OPTICAL POWER LIMITER

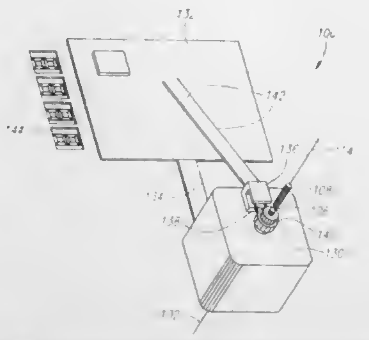
Chun-Ming Ko, 5326 Glenwood Way, El Sobrante, Calif. 94803

Filed Jan. 28, 1997, Ser. No. 789,855

Int. Cl.^{6} G02B *6/32*

U.S. Cl. 385—34 **21 Claims**

17. An adjustable optical power limiter comprising:



a first collimator having an optical fiber with a grade reflective index (GRIN) lens disposed thereon;
a second collimator having an optical fiber with a grade reflective index (GRIN) lens disposed thereon, said second collimator being substantially parallel to said first collimator, such that at least a portion of an optical signal transmitted through said first collimator enters said second collimator, at least one of said first collimator and second collimator being rotatable about a longitudinal axis of said at least one of said first collimator and second collimator;
a motor having a rotatable shaft, said rotatable shaft mechanically coupled to said at least one rotatable collimator; and
wherein an edge of at least one of said optical fiber and said GRIN lens of said at least one rotatable collimator is polished at an angle.

5,838,853
OPTICAL WAVEGUIDE

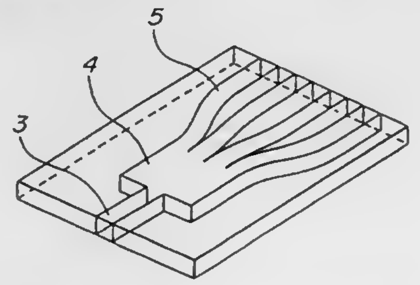
Kuniaki Jinnai; Yasunari Kawabata, and Norio Takeda, all of Tokyo, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Jan. 7, 1997, Ser. No. 779,736

Claims priority, application Japan, Jan. 9, 1996, 8-001521

Int. Cl.^{6} G02B *6/26*

U.S. Cl. 385—50 **7 Claims**



1. An optical waveguide for an optical branching device comprising:
a primary optical waveguide portion having an input end optically coupled to an input-side optical fiber;
branched optical waveguide portions each having one end continuously connected to an output end of said primary optical waveguide portion and the other end coupled to each of a plurality of output-side optical fibers; and
an unbranched introductory waveguide portion coupled to said input end of said primary optical waveguide portion and having a width substantially identical with a core diameter of said input-side optical fiber.

5,838,854
INTEGRATED OPTICAL CONTROL ELEMENT AND A METHOD FOR FABRICATING THE SAME AND OPTICAL INTEGRATED CIRCUIT ELEMENT AND OPTICAL INTEGRATED CIRCUIT DEVICE USING THE SAME

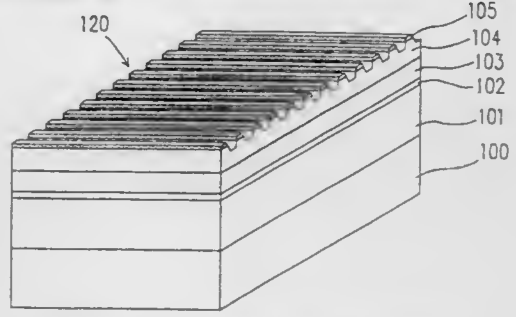
Mototaka Taneya; Fumihiro Konushi; Hidenori Kawanishi, all of Nara; Tatsuya Morioka, Tenri, and Atsushi Shimonaka, Ikoma-gun, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 579,437, Dec. 27, 1995. This application Oct. 21, 1997, Ser. No. 955,161

Claims priority, application Japan, Dec. 28, 1994, 6-328585; Aug. 17, 1995, 7-209745

Int. Cl.^{6} G02B *1/295;6/26*

U.S. Cl. 385—50 **14 Claims**



1. An integrated optical control element, comprising:
a substrate having a surface structure which includes one of a concave portion and a step;
a first waveguide portion for allowing light incident from outside to propagate therein, said first waveguide portion being formed over the substrate;
a layer structure for allowing the light which has propagated in the first waveguide portion to be incident thereon and for transmitting the light therethrough or reflecting the light therefrom,
said layer structure being provided over the surface structure and including at least one layer having a refractive index different from an equivalent refractive index of a region with which said at least one layer is in contact; and
a second waveguide portion for receiving at least part of the light which has been transmitted through or reflected from the layer structure.

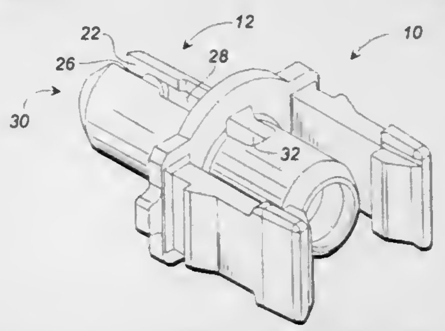
5,838,855
SLEEVE HOUSING FOR OPTICAL COUPLING BUILDOUT

Daniel Lee Stephenson, Lilburn, Ga., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed May 16, 1997, Ser. No. 857,841

Int. Cl.^{6} G02B *6/36*

U.S. Cl. 385—53 **14 Claims**



1. An improved sleeve housing for use in a fiber optic buildout, of the type which includes a tubular member on a buildout block adapted to receive a sleeve holding an attenuator piece, the improvement comprising:
said tubular member having an outer opening whose diameter is smaller than the outside diameter of said sleeve, said tubular member having an inner diameter adapted to receive and retain said sleeve, said tubular member having at least one slit which extends longitudinally from the outer opening of said tubular member along the outside wall of said tubular member, said tubular member being made of a resilient material, the inside of the outer portion of said tubular member including an internal shoulder which has an inside diameter which is less than the outside diameter of a sleeve retained within said tubular member,
whereby said tubular member can be sprung open to receive said sleeve, said tubular member then springing back to retain said sleeve whereby said sleeve cannot slide out of said tubular member due to the smaller outside diameter of said opening at the end of said tubular member, said sleeve being retained by said internal shoulder.

5,838,856
OPTICAL-FIBER CABLE CONNECTOR ASSEMBLY

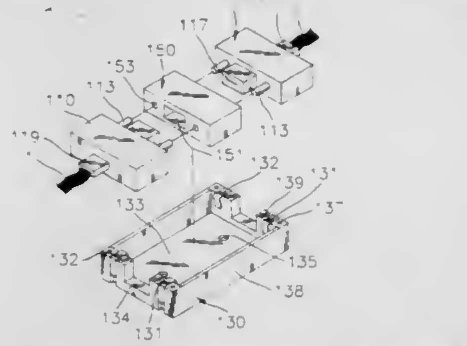
Ho-Kyung Lee, Incheon, Rep. of Korea, assignor to Daewoo Telecom, Ltd., Incheon, Rep. of Korea

Filed Oct. 29, 1996, Ser. No. 740,399

Claims priority, application Rep. of Korea, Oct. 31, 1995, 1995-38970

Int. Cl.^{6} G02B *6/40*

U.S. Cl. 385—54 **9 Claims**



1. A connector assembly for connecting two optical-fiber cables each of which involves at least one optical fiber, the connector assembly comprising:
a pair of connectors each of which is provided with at least one through-hole into which the optical fiber is fitted, wherein one of the connectors has a pair of guide holes and the other has a pair of guide pins fitted into the guide holes, respectively; and
a case provided with a bottom plate, a plurality of side walls and at least one pair of clamping members fixed to two of the side walls facing each other, respectively, wherein the connectors are inserted in the case and the opposite clamping members urge the connectors to come in a face-to-face contact with each other.

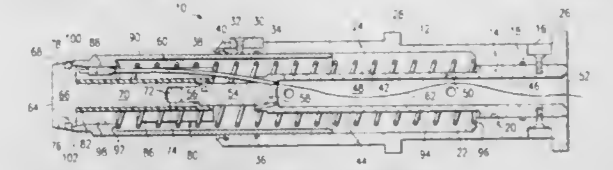
5,838,857
JOINED CHAMBER CONNECTOR

Edward J. Niekrasz, Bonita, Calif., assignor to Lockheed Martin Corporation, Bethesda, Md.

Filed Apr. 7, 1997, Ser. No. 826,705

Int. Cl.^{6} G02B *6/38*

U.S. Cl. 385—56 **28 Claims**



15. A joined chamber connector, comprising:
a connector plug, including,
a housing;
at least one said signal contact for coupling signals;
a chamber within said housing for containing said signal contact in a dielectric fluid;

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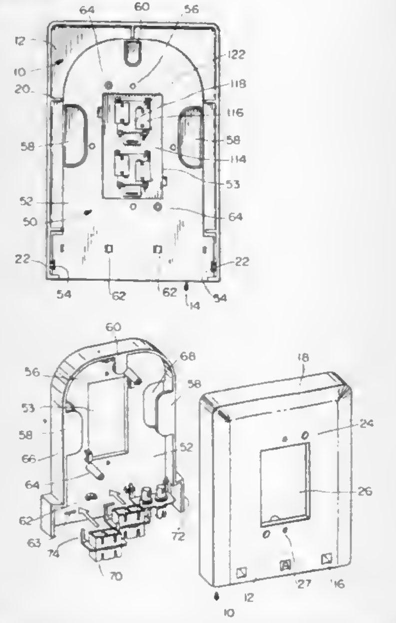
- a cover movable with respect to said housing, said cover being sealed to said housing when moved to a closed position sealing said chamber closed;

a connector receptacle, including
- a housing;
- at least one complimentary signal contact mateable with the signal contact of said connector plug;
- a chamber within said connector receptacle housing for containing said complementary signal contact in a dielectric fluid;
- a cover movable with respect to said connector receptacle housing, and being sealed thereto when moved to a closed position, thereby sealing said connector receptacle chamber closed; and

said connector plug being structured so that when coupled to said connector receptacle, said connector plug cover is moved to a position to open said connector plug chamber and said connector receptacle cover is moved to a position to open said connector receptacle chamber so that said chambers are joined as a common chamber, and whereby said signal contact and said complimentary signal contact are joined in said common chamber and remain in said dielectric fluid.

5,838,858
FIBER OPTIC CONNECTION UNIT
Rowland S. White, Lumenburg, Mass., assignor to Molex Incorporated, Lisle, Ill.
Filed May 7, 1997, Ser. No. 852,484
Int. Cl.⁶ G02B *6/36*
U.S. Cl. 385—76 **13 Claims**

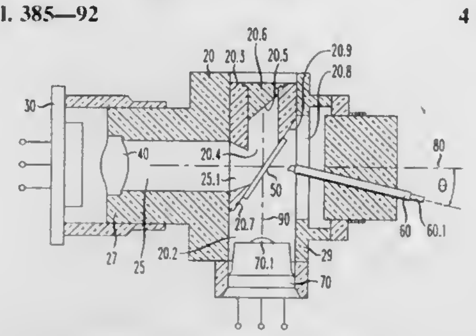


6. An optical fiber connection unit comprising a base plate and a cover plate;

said base plate comprising:
- a rear wall for mounting to a surface, said rear wall defining an aperture for passage of optical fibers into the unit; and
- a peripheral wall on said rear wall, said peripheral wall having: (a) at lease one retaining means protruding therefrom for retaining optical fibers arranged on said rear wall and within said peripheral wall, (b) at least one discontinuity to allow connection to fibers retained in the unit in use, and (c) a curved portion having a radius of curvature corresponding to a minimum radius of curvature of an optical fiber;

said cover plate comprising:
- an outer face for mounting to said base plate and defining a second aperture for reception of an electrical outlet module, wherein said base plate and said cover plate define an enclosure for retaining fibers therein for connection, said first aperture and said second aperture allow the unit to be mounted to an electrical outlet box and to have an electrical connector module mounted thereto respectively, and said aperture defined by said rear wall, said outer face and said discontinuity of said peripheral wall allows connection to said optical fibers.

5,838,859
BIDIRECTIONAL OPTICAL TRANSCEIVER ASSEMBLY
Timothy Butrie, Orefield, Pa.; Shigemasa Enoeda, Okaya, Japan; Joseph Edward Riska, Macungie, Pa.; Stephen James Salko, Weatherly, Pa.; Thomas Stanley Stakelon, Allentown, Pa.; Alka Swanson, San Diego, Calif., and Toshimichi Yasuda, Okaya, Japan, assignors to Lucent Technologies Inc., Murray Hill, N.J.
Filed Nov. 25, 1996, Ser. No. 756,220
Int. Cl.⁶ G02B *6/36*
U.S. Cl. 385—92 **4 Claims**



1. An optical transceiver assembly comprising a housing,

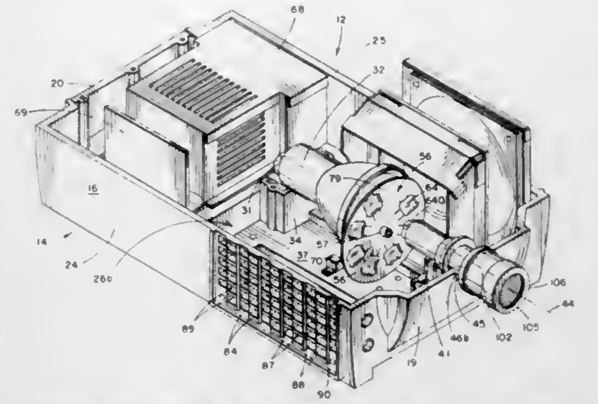
mounted in said housing, a plane polarized light source, a pane polarized beam splitter, an optical fiber, a photodetector, and a lens for focusing an outgoing optical signal from said source through said splitter into said fiber, said splitter being positioned to reflect an incoming optical signal on said fiber to said photodetector, CHARACTERIZED IN THAT

said splitter is a non-birefringent device, and

the polarization orientation of said splitter is essentially parallel to that of said plane polarized light source.

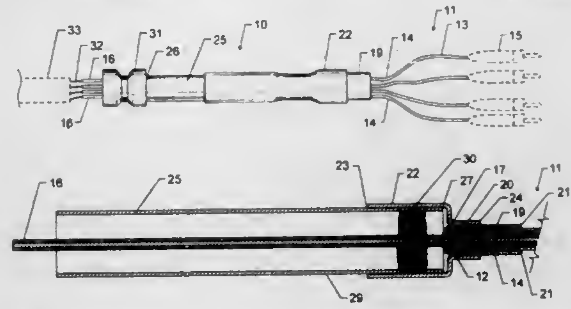
5,838,860
FIBER OPTIC LIGHT SOURCE APPARATUS AND METHOD
Brett M. Kingstone, Orlando, and Pinhas Koren, Altamonte Springs, both of Fla., assignors to Super Vision International, Inc., Orlando, Fla.
Continuation-in-part of Ser. No. 311,129, Sep. 23, 1994, Pat. No. 5,528,714, and Ser. No. 277,887, Jul. 20, 1994, Pat. No. 5,617,496, which is a continuation of Ser. No. 65,942, May 21, 1993, Pat. No. 5,333,228. This application Jun. 18, 1996, Ser. No. 664,438
Int. Cl.⁶ G02B *6/00;6/44*
U.S. Cl. 385—100 **18 Claims**

1. A lateral illumination fiber optic cable comprising:
- a central core extending longitudinally of the cable;
- at least one optical fiber helically wound about said central core over a selected length thereof; and



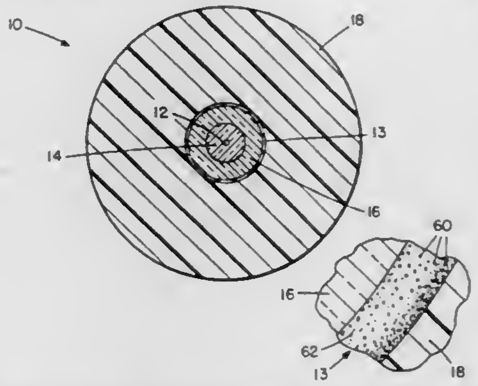
- a transparent tubular sheath encompassing the core and the optical fiber.

5,838,861
TRANSITION ASSEMBLY FOR OPTICAL FIBER
Todd A. Bunde, Newport News, Va., assignor to Newport News Shipbuilding and Dry Dock Company, Newport News, Va.
Filed Jul. 11, 1997, Ser. No. 891,595
Int. Cl.⁶ G02B *6/44*
U.S. Cl. 385—100 **26 Claims**



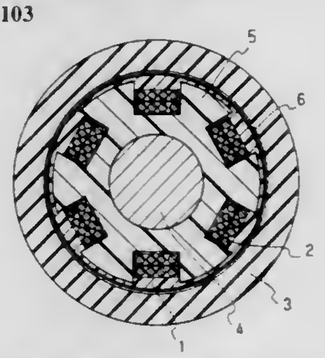
18. A transition assembly for optical fiber, the transition assembly comprising:
- a pneumatic tube having a longitudinal axis, an entrance end, an exit end, an interior surface and an exterior surface;
- a furcation tube assembly having an entrance end and an exit end, the entrance end of the furcation tube assembly placed in an operable relationship to the exit end of the pneumatic tube; the furcation tube assembly comprising at least one furcation tube, each furcation tube having an inner tube, a polyamide fiber sheath surrounding the inner tube, and an outer sheath surrounding the polyamide fiber sheath; and
- at least one furcation tube extending from the entrance end of the furcation tube assembly, the furcation tube having a length of the outer sheath removed to expose the polyamide fiber sheath and the inner tube; wherein the exposed inner tube is disposed within the exit end of the pneumatic tube, extends along the longitudinal axis of the pneumatic tube, and protrudes from the entrance end of the pneumatic tube; and wherein a length of the exposed polyamide fiber sheath overlaps the exterior surface of the exit end of the pneumatic tube;
- a non-adhesive-lined heat shrink tube overlapping a length of the furcation tube assembly;
- an adhesive-lined heat shrink tube having an entrance end overlapping a length of the exit end of the pneumatic tube and the exposed polyamide fiber sheath; and an exit end overlapping a length of the non-adhesive-lined heat shrink tube;
- an RTV silicone tube seal disposed within the pneumatic tube and sealing the exposed inner tube to the interior surface of the pneumatic tube; and
- a plastic-bodied, push-fit pneumatic connector attached to the exterior surface of the entrance end of the pneumatic tube through which the exposed inner tube extends.

5,838,862
STRIPPABLE TIGHT BUFFERED OPTICAL WAVEGUIDE FIBER
Ching-Kee Chien, Horseheads, N.Y., assignor to Corning Incorporated, Corning, N.Y.
Filed Jul. 3, 1997, Ser. No. 887,595
Int. Cl.⁶ G02B *6/44*
U.S. Cl. 385—102 **20 Claims**



1. A tight buffered optical waveguide fiber comprising:
- (a) an optical waveguide fiber;
- (b) a first protective coating surrounding and in contact with an external surface of said optical waveguide fiber;
- (c) an interfacial layer surrounding and in contact with an external surface of said first protective coating, said interfacial layer comprising a surfactant and an antifoaming agent; and
- (d) a second protective coating surrounding and in contact with an external surface of said interfacial layer.

5,838,863
CABLE SEALED WITH A POLYURETHANE RESIN AND SEALING PROCESS OF THE SAME
Yoji Fujiura, Kyoto-fu; Yukio Zenitani, Nara-ken, and Masami Koike, Osaka-fu, all of Japan, assignors to Sanyo Chemical Industries, Ltd., Kyoto, Japan
Filed Feb. 4, 1997, Ser. No. 794,817
Claims priority, application Japan, Feb. 15, 1996, 8-054190
Int. Cl.⁶ G02B *6/44*
U.S. Cl. 385—103 **9 Claims**



1. A cable whose inner opening space has been sealed with a polyurethane resin formed from a polyurethane resin-forming sealing material comprising components (A) and (B):
- (A): a component comprising a dispersion (1) of at least one selected from the group consisting of (a) a water-insoluble water absorbent resin (D) and (b) a hydrogel of said resin (D) in a polyol (C), wherein said resin (D) is formed by polymerizing in the polyol (C) a water soluble monomer or a precursor thereof and at least one selected from the group consisting of a crosslinking agent and a polysaccharide; and
- (B): a component comprising an organic polyisocyanate (2).

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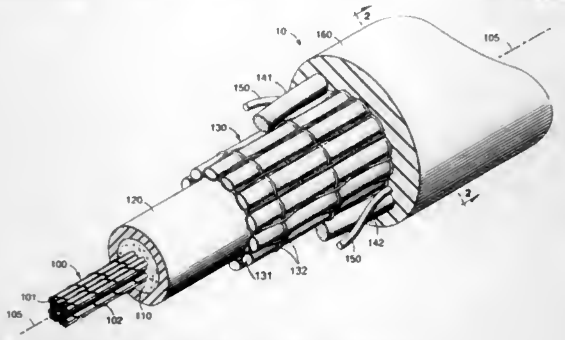
5,838,864
OPTICAL CABLE HAVING AN IMPROVED STRENGTH SYSTEM

Parbhubhai Dahyabhai Patel, Dunwoody, and Phillip Maurice Thomas, Suwanee, both of Ga., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Apr. 30, 1997, Ser. No. 846,719
Int. Cl.^{6} G02B *6/44*
U.S. Cl. 385—113 **26 Claims**

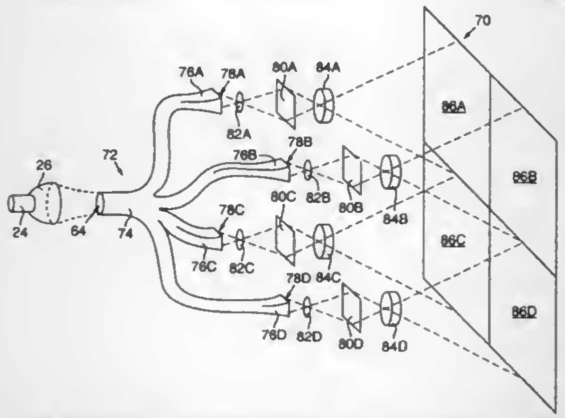


20. A communications cable, which comprises:
- a core comprising at least one transmission medium;
- a jacket which comprises a plastic material and which encloses said core;
- a prefabricated strength tape comprising a linear array of flexible strands that extend in a longitudinal direction of the cable but do not undulate in said longitudinal direction, the strands being partially embedded in the plastic jacket and having negligible compression stiffness in comparison to their tensile stiffness; and
- a pair of diametrically opposed rigid strength rods that extend in the longitudinal direction of the cable and are substantially embedded in the plastic jacket, said rods having a tensile stiffness for receiving tensile loads applied to the plastic jacket, and a compressive stiffness that effectively inhibits contraction of the plastic jacket.

5,838,865
FIBER OPTIC LIGHT HOMOGENIZER FOR USE IN PROJECTION DISPLAYS

Paul E. Gulick, Tualatin, Oreg., assignor to Clarity Visual Systems, Inc., Wilsonville, Oreg.

Filed Jun. 5, 1997, Ser. No. 870,094
Int. Cl.^{6} G02B *6/04*
U.S. Cl. 385—121 **27 Claims**

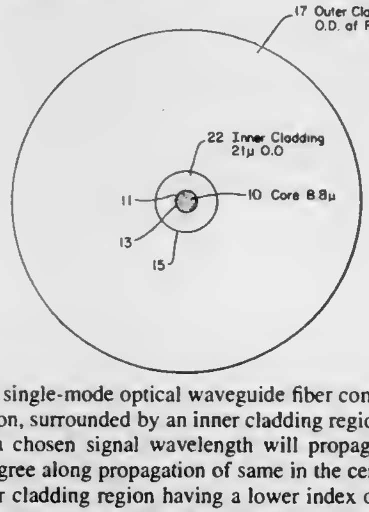


1. In an image projection system, an apparatus for producing from a light source having a nonuniform source illumination profile distributed across a first cross-sectional shape a predetermined illumination profile across an image forming device having a second cross-sectional shape, comprising:
- a bundle of light propagating fibers having an input end with substantially the first cross-sectional shape receiving from the light source the nonuniform source illumination profile and having an output end with substantially the second cross-sectional shape, the first cross-sectional shape being different than the second cross-sectional shape and the light propagating fibers following rearranged pathways within the bundle so as to propagate to the image forming device the predetermined illumination profile distributed across the second cross-sectional shape.

5,838,866
OPTICAL FIBER RESISTANT TO HYDROGEN-INDUCED ATTENUATION

A. Joseph Antos, Elmira, N.Y.; Timothy L. Hunt, Wilmington, N.C.; Dale R. Powers, Painted Post, N.Y., and William A. Whedon, Wilmington, N.C., assignors to Corning Incorporated, Corning, N.Y.

Filed Oct. 11, 1996, Ser. No. 728,713
Int. Cl.^{6} G02B *6/02*
U.S. Cl. 385—127 **13 Claims**


17 Outer Cladding O.D. of Fiber 125μ
22 Inner Cladding 21μ O.D
11
10 Core 8.8μ
13
15

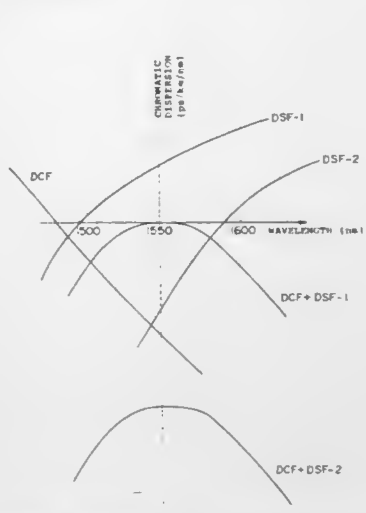
1. In a single-mode optical waveguide fiber comprising a central core region, surrounded by an inner cladding region through which light at a chosen signal wavelength will propagate to an appreciable degree along propagation of same in the central core region, said inner cladding region having a lower index of refraction than said central core region, the inner core region further surrounded by an outer cladding region, the improvement comprising germanium dioxide in the inner cladding region at a concentration within the range of about 0.005 percent by weight to about 1 percent by weight of said inner cladding region, effective to significantly reduce the concentration of oxygen atoms in the inner cladding region which are available to form defects that cause hydrogen-induced attenuation.

5,838,867
DISPERSION COMPENSATING FIBER AND OPTICAL TRANSMISSION SYSTEM INCLUDING THE SAME

Masashi Onishi; Hiroo Kanamori; Masayuki Nishimura; Tomonori Kashiwada, and Yasushi Koyano, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Apr. 15, 1997, Ser. No. 834,305
Claims priority, application Japan, Apr. 15, 1996, 8-092692
Int. Cl.^{6} G02B *6/16*
U.S. Cl. 385—123 **22 Claims**

1. A dispersion compensating fiber having the following characteristics for light in the 1.55 μm wavelength band:
- chromatic dispersion not less than −40 ps/km/nm and not more than 0 ps/km/nm;
- dispersion slope not less than −0.5 ps/km/nm^{2} and not more than −0.1 ps/km/nm^{2};
- transmission loss not more than 0.5 dB/km;
- polarization mode dispersion not more than 0.7 ps·km$^{-1/2}$;
- mode field diameter not less than 4.5 μm and not more than 6.5 μm;
- cut-off wavelength not less than 0.7 μm and not more than 1.7 μm in the length of 2 m; and

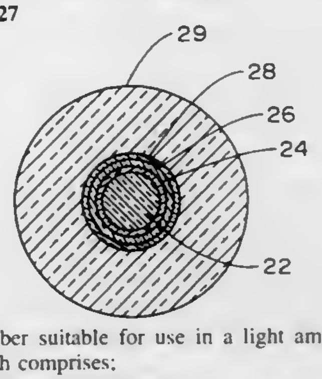


- bending loss at the diameter of 20 mm, not more than 100 dB/m.

5,838,868
SEMICONDUCTOR FIBER LIGHT AMPLIFIER

Mark F. Krol, New Hartford; Philipp Kornreich, North Syracuse; John L. Stacy, Sauquoit, and Raymond K. Boncek, Fayetteville, all of N.Y., assignors to Syracuse University, Syracuse, N.Y.

Filed Jun. 30, 1995, Ser. No. 497,361
Int. Cl.^{6} G02B *6/22*
U.S. Cl. 385—127 **20 Claims**



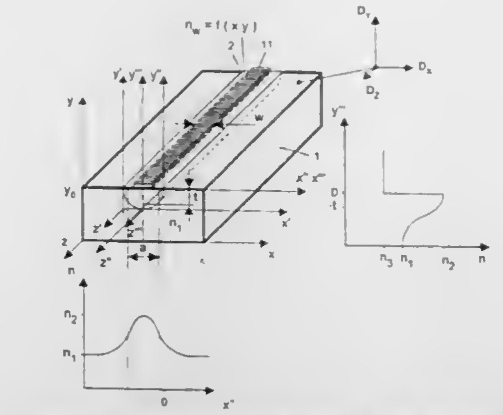
12. A glass fiber suitable for use in a light amplifier or laser application which comprises:
- (a) an inner cylindrical glass core;
- (b) a plurality of substantially uniform layers of a direct gap semiconductor material surrounding said core; and
- (c) a substantially uniform layer of an outer glass cladding surrounding said semiconductor layers.

5,838,869
STRIP WAVEGUIDE AND USES THEREOF

Andreas Rasch; Matthias Rottschalk; Jens-Peter Ruske, and Volker Groeber, all of Jena, Germany, assignors to LDT GmbH & Co. Laser-Display-Technologie KG, Gera, Germany

PCT No. PCT/EP96/00492, § 371 Date Oct. 3, 1996, § 102(e) Date Oct. 3, 1996, PCT Pub. No. WO96/24868, PCT Pub. Date Aug. 15, 1996

PCT Filed Feb. 6, 1996, Ser. No. 718,352
Claims priority, application Germany, Feb. 7, 1995, 195 03 931.9; Dec. 14, 1995, 195 46 668.3
Int. Cl.^{6} G02B *6/122*
U.S. Cl. 385—132 **8 Claims**



1. A channel waveguide comprising:
- a surface substrate material;
- a channel-shaped structure fabricated in or on said substrate material by a process for changing the refractive index of the substrate material for providing a channel waveguide or by applying a suitable material for providing a channel waveguide on the substrate material having geometric and substance parameters, said parameter being set in dependence of wavelength ranges to be transmitted in the UV, visible and/or IR regions, so that in relation to wavelength (λ) of guided light in a vacuum the width of the wavelength range for single-mode light guidance is provided by the equation

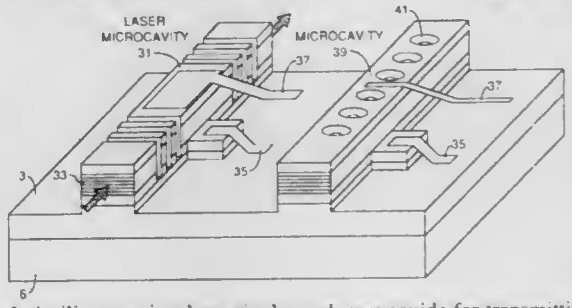
$$\Delta\lambda \geqq 0.48\times\lambda - 85\ nm$$

with λ and $\Delta\lambda$ in nm and defining $\lambda_1=\lambda$ for a given channel waveguide, is ensured, that is to each given wavelength (λ) in the range between λ_1 and $\lambda_1+\Delta\lambda$ one and only one refractive index, i.e. the effective refractive index of the fundamental mode (N_{00}), can be allocated, and the single-mode range will be determined by the efficient oscillation build-up, from a technical point of view, of fundamental mode N_{00} at wavelength $\lambda_1+\Delta\lambda$ on the one hand, and by the efficient oscillation build-up, from a technical point of view, of the first mode in lateral direction (N_{01}) or of the first mode in depth direction (N_{10}) at wavelength λ_1 on the other, and with transmission at a technically sufficient degree of effectiveness signifying that the effective refractive index N_{eff} of the mode guided in the channel waveguide must be at least 5×10^{-5} above the refractive index of surrounding material n_s, where n_s designates the value of substrate material index n_1 or superstrate material n_3, whichever is higher, and with the minimum possible value of the usable wavelength (λ_{min}) and the maximum possible value of the usable wavelength (λ_{max}) being determined by the transmission range of the materials used, said channel waveguide being defined as a single-mode integrated-optical wideband channel waveguide (SOWCW).

5,838,870
NANOMETER-SCALE SILICON-ON-INSULATOR PHOTONIC COMPONETS

Richard A. Soref, Newton, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 28, 1997, Ser. No. 808,924
Int. Cl.^{6} G02B *6/10*
U.S. Cl. 385—131 **40 Claims**



1. A silicon-on-insulator single mode waveguide for transmitting optical waves in the near infra-red wavelength range comprising:

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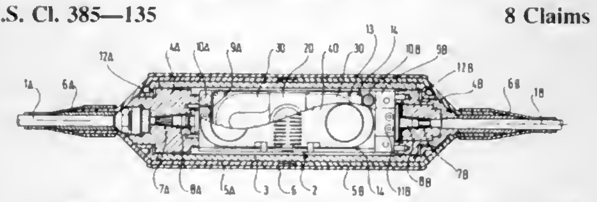
(a) a silicon light transmissive strip having a lower surface portion, a cross sectional height H of less than about 300 nanometers and wherein said lower surface portion has a cross sectional width of less than 1–5 H;
(b) a dielectric insulating layer having an upper surface portion underlying the lower surface portion of said light transmissive strip, and a lower surface portion;
(c) a silicon substrate having an upper surface portion underlying the lower surface portion of said dielectric insulating layer.

5,838,871
DEVICE FOR ORGANIZING OPTICAL FIBER CABLE CONNECTIONS AND OPTICAL CABLE JOINT BOX

Jean-François Libert, Pont de Briques; Bruno Daguet, Rueil Malmaison; Romuald Lemaitre, Boulogne sur Mer, and François Mesnil, Escalles, all of France, assignors to Alcatel Submarcom, Clichy, France

Continuation of Ser. No. 643,041, May 2, 1996, abandoned.
This application Nov. 10, 1997, Ser. No. 996,986
Claims priority, application France, May 3, 1995, 95 05270
Int. Cl.^{6} G02B *6/36*

U.S. Cl. 385—135 **8 Claims**



1. An optical fiber cable connection organizer device comprising:
a substantially parallelepiped-shaped support assembly having lateral accessways at first and second ends for fibers of the cables;
first means for retaining splices jointing the fibers of the cables;
second means for stowing a surplus length at ends of the jointed fibers; and
third means for unrestricted storage of an additional slack in the fibers from each cable,
said third means coupling said lateral accessways to said second means in said support assembly and comprising a stowing assembly having at least a first stowing level for the additional slack in the fibers from the cables entering via said accessways, said first stowing level including a first magazine situated in a first end part of said support assembly said second end and open substantially facing the accessway at said second end, for stowing a loose coil of the additional slack in fibers entering from the accessway at said second end, and a second magazine situated in a second end part of said support assembly opposite said first end and open substantially facing the first magazine and the accessway at said first end, for stowing a loose coil of the additional slack in fibers entering from the accessway at said first end.

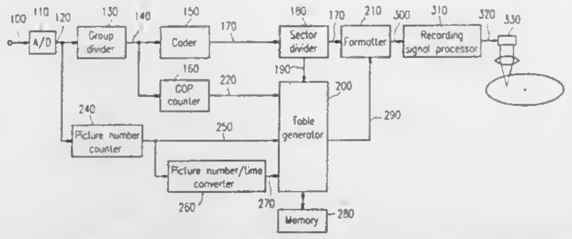
5,838,872
IMAGE INFORMATION RECORDING APPARATUS AND IMAGE INFORMATION RECORDING METHOD

Toshiyuki Kawara, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 15, 1996, Ser. No. 617,486
Claims priority, application Japan, Mar. 20, 1995, 7-060758
Int. Cl.^{6} H04N *5/91;5/917*

U.S. Cl. 386—68 **40 Claims**

1. An image information recording apparatus comprising:
a coder for generating a plurality of group data, each of the plurality of group data including at least one intra-coded picture data, by receiving and coding a plurality of picture data, each of the plurality of picture data corresponding to a picture;



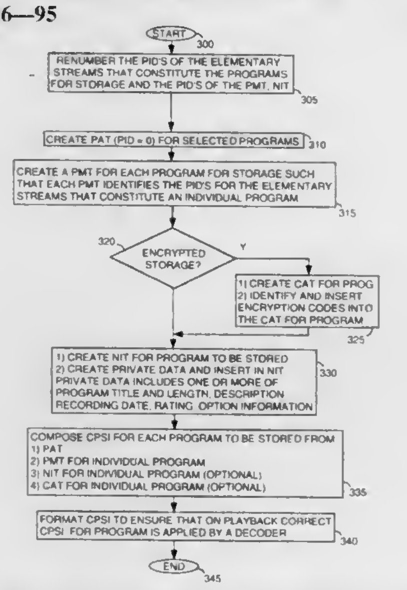
a sector address generator for generating a sector address indicating a top sector among a plurality of sectors on a recording medium in which auxiliary data corresponding to each of the plurality of group data is recorded, the auxiliary data corresponding to each of the plurality of group data being located immediately anterior to the group data;
a jump address generator for determining for first group data among the plurality of group data, which of another of the plurality of group data, representing a second group data, includes second picture data to be reproduced in a normal reproduction operation at a second time later than a first time by a predetermined fixed time period, the first time being a time when first picture data located at a top of the first group data is reproduced in the normal reproduction operation, for determining a top sector address of the auxiliary data immediately anterior to the thereby determined second group data, and for outputting, as a jump address of the first group data at least for purposes of high speed reproduction the top sector address; and
a recorder for recording the plurality of group data and the corresponding auxiliary data on the recording medium, with the auxiliary data corresponding to the first group data including the jump address.

5,838,873
PACKETIZED DATA FORMATS FOR DIGITAL DATA STORAGE MEDIA

Harold Blatter; Kevin Elliott Bridgewater, both of Indianapolis; Michael Scott Deiss, Zionsville, and Thomas Edward Horlander, Indianapolis, all of Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Aug. 13, 1996, Ser. No. 696,306
Int. Cl.^{6} H04N *5/76;7/52;7/92*

U.S. Cl. 386—95 **16 Claims**


START
300
RENUMBER THE PID'S OF THE ELEMENTARY STREAMS THAT CONSTITUTE THE PROGRAMS FOR STORAGE AND THE PID'S OF THE PMT, NIT
305
CREATE PAT (PID = 0) FOR SELECTED PROGRAMS
310
CREATE A PMT FOR EACH PROGRAM FOR STORAGE SUCH THAT EACH PMT IDENTIFIES THE PID'S FOR THE ELEMENTARY STREAMS THAT CONSTITUTE AN INDIVIDUAL PROGRAM
315
320
ENCRYPTED STORAGE?
Y
1) CREATE CAT FOR PROG
2) IDENTIFY AND INSERT ENCRYPTION CODES INTO THE CAT FOR PROGRAM
325
1) CREATE NIT FOR PROGRAM TO BE STORED
2) CREATE PRIVATE DATA AND INSERT IN NIT PRIVATE DATA INCLUDES ONE OR MORE OF PROGRAM TITLE AND LENGTH, DESCRIPTION RECORDING DATE, RATING OPTION INFORMATION
330
COMPOSE CPSI FOR EACH PROGRAM TO BE STORED FROM
1) PAT
2) PMT FOR INDIVIDUAL PROGRAM
3) NIT FOR INDIVIDUAL PROGRAM (OPTIONAL)
4) CAT FOR INDIVIDUAL PROGRAM (OPTIONAL)
335
FORMAT CPSI TO ENSURE THAT ON PLAYBACK CORRECT CPSI FOR PROGRAM IS APPLIED BY A DECODER
340
END
345

1. A storage medium having recorded thereon a plurality of packetized data programs in a data format including packet identifiers (PIDs) that identify individual packetized datastreams constituting a program, said data format facilitating the association and assembly of said packetized datastreams of said program by a decoder, independent of PID de-mapping data, wherein said PIDs include:

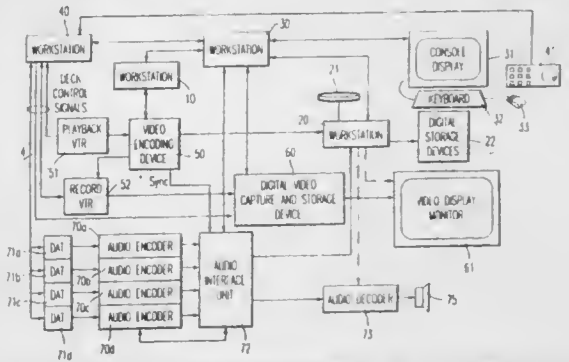
a base PID for identifying a first datastream;
a second PID of predetermined offset value to said base PID for identifying a second datastream; and wherein corresponding packetized datastreams that constitute different programs are given the same PID.

5,838,874
AUDIOVISUAL ENCODING SYSTEM WITH A REDUCED NUMBER OF AUDIO ENCODERS

Sheau-Bao Ng, Cranbury, N.J.; Mikhail Tsinberg, Riverdale, N.Y.; Masaru Sakurai, Yokohama, Japan; David Lehmann, Mount Holly; Jay Yogeshwar, Lawrenceville, both of N.J.; Faramarz Azadegan, Waltham, Mass.; Teiichi Ichikawa, Yokohama, Japan; Hiroaki Unno, Ichikawa, Japan; Hideki Mimura, Yokohama, Japan; Tetsuya Kitamura, Komea, Japan; Christopher J. Cookson, Los Angeles, Calif.; Greg B. Thagard, Redondo Beach, Calif., and Andrew Drusin Rosen, Canoga Park, Calif., assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan, and Time Warner Entertainment Co., L.P., Burbank, Calif.

Continuation-in-part of Ser. No. 438,014, May 8, 1995, abandoned. This application Jun. 6, 1995, Ser. No. 467,991
Int. Cl.^{6} H04N *5/76;5/928*

U.S. Cl. 386—96 **40 Claims**



1. A method of performing multipass video encoding and one-pass audio encoding for an audiovisual sequence having a plurality of audio tracks, comprising the steps of:
performing a first video encoding pass while simultaneously performing one-pass audio encoding of at least one but not all of said plurality of audio tracks; and
performing a subsequent video encoding pass while performing one-pass audio encoding of at least some of said plurality of audio tracks which are unencoded.

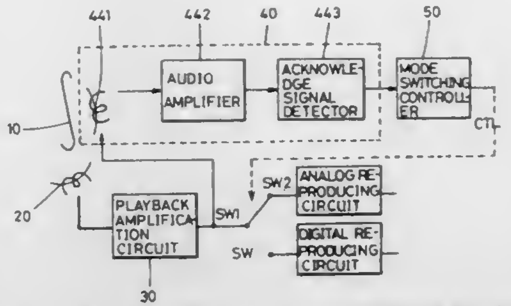
5,838,875
APPARATUS AND METHOD FOR DISCRIMINATING BETWEEN ANALOG AND DIGITAL VIDEO SIGNALS IN HIGH DEFINITION VIDEO CASSETTE RECORDER

Dohyeon Cho, Seoul; Ho Won Lee, Kyungki-Do; Man Chul Choi, Seoul; Yong Hyu Shin, Kyungki-Do; Yoon Seok Seoh, Seoul; Soon Ki Lim, Seoul; Joong Kwon Joh, Seoul; Mun Chae Joung, Seoul; Young Jun Choi, Seoul; Kwan-Bo Shim, Seoul, and Seungil Kim, Seoul, all of Rep. of Korea, assignors to Goldstar Co., Ltd., Seoul, Rep. of Korea

Continuation of Ser. No. 191,187, Feb. 3, 1994, abandoned.
This application Aug. 27, 1996, Ser. No. 703,838
Claims priority, application Rep. of Korea, Feb. 5, 1993, 1574/1993; Feb. 5, 1993, 1575/1993; Feb. 19, 1993, 2336/1993; Mar. 9, 1993, 3521/1993; Mar. 29, 1993, 5013/1993
Int. Cl.^{6} H04N *5/76*

U.S. Cl. 386—123 **15 Claims**

9. In an analog/digital videocassette recorder including a playback amplification circuit for amplifying a video signal recorded on video tracks of a video tape, an analog reproducing circuit for processing an analog video signal, and a digital reproducing circuit for processing a digital video signal, an apparatus for discriminating whether a video signal reproduced from a video tape is an analog video signal or a digital video signal, the apparatus comprising:


441
442
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AUDIO AMPLIFIER
ACKNOWLEDGE SIGNAL DETECTOR
MODE SWITCHING CONTROLLER
10
CTL
20
SW2
ANALOG REPRODUCING CIRCUIT
PLAYBACK AMPLIFICATION CIRCUIT
SW1
SW
DIGITAL REPRODUCING CIRCUIT
30

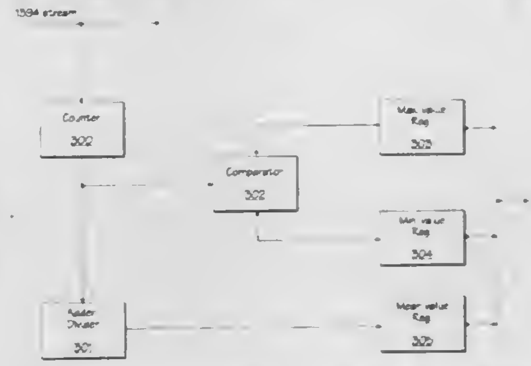
audio means for reproducing a signal recorded on an audio track of a video tape,
acknowledge signal detector means for detecting whether the signal reproduced by the audio means is an acknowledge signal indicating that a digital signal is recorded on corresponding video tracks of the video tape, and
mode control means for connecting the playback amplification circuit with the digital reproducing circuit when the acknowledge signal is detected by the acknowledge signal detector means, and connecting the playback amplification circuit with the analog playback circuit when no acknowledge signal is detected by the acknowledge signal detector means.

5,838,876
FRAME-ACCURATE EDIT AND PLAYBACK IN DIGITAL STREAM RECORDING

Ryuichi Iwamura, San Diego, Calif., assignor to Sony Corporation, Tokyo, Japan, and Sony Electronics, Inc., Park Ridge, N.J.

Filed Sep. 24, 1996, Ser. No. 719,037
Int. Cl.^{6} H04N *5/781;5/85*

U.S. Cl. 386—125 **5 Claims**



1. A method for estimating recording time remaining on a computer readable media, comprising the steps of:
sectorizing said media into sectors having a predetermined length;
determining a data transfer rate for data to be recorded on said media; and
calculating said estimated recording time using said predetermined length and said data transfer rate.

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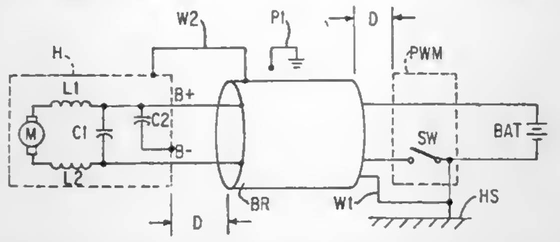
5,838,877

NOISE SUPPRESSION IN PWM-DRIVEN DC MOTOR

James Elliot; Mohamed Abbas, both of Dayton; John R. Suriano, Kettering, and Thomas W. Holmes, Tipp City, all of Ohio, assignors to ITT Automotive Electrical Systems, Inc., Auburn Hills, Mich.

Filed Aug. 2, 1995, Ser. No. 510,430
Int. Cl.^{6} H02P ***5/06***

U.S. Cl. 388—804 **11 Claims**



1. In a motor which is driven by current supplied on leads from a remote PWM controller, and which radiates RFI, the improvement comprising:

a) a shield around the leads;
b) a housing around the motor; and
c) connections which ground the shield, the housing, and the PWM controller at a common point.

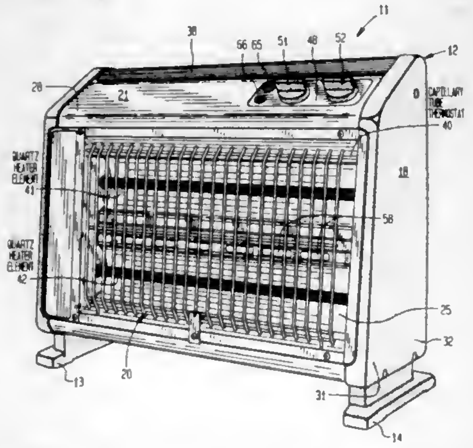
5,838,878

PORTABLE QUARTZ HEATER

Rodney Jané, Westboro, and Arthur Wong, Melrose, both of Mass., assignors to Honeywell Consumer Products Inc., Southborough, Mass.

Filed Jan. 31, 1995, Ser. No. 381,366
Int. Cl.^{6} F24H ***3/04***

U.S. Cl. 392—376 **18 Claims**



1. A portable electric heater comprising:

housing means including a bottom wall, a rear wall, a pair of side walls each having front and back portions, a top wall having front and back portions, a divider wall having a given area, and a front grill wall; said rear wall, said divider wall and said back portions of said side and top walls at least partially defining a chamber; and said divider wall, said front grill wall, and said front portions of said side and top walls at least partially defining a cavity horizontally juxtaposed to said chamber;

a plurality of elongated quartz heater elements mounted in said cavity; said heater elements comprising a pair of substantially horizontal, vertically spaced apart heater elements mounted closely adjacent to said divider wall;

temperature sensing means mounted in said cavity; said temperature sensing means comprising a capillary thermal switch having an actuator tube mounted in an upper portion of said cavity adjacent to said front portion of said top wall;

an electrically energizable fan mounted in said chamber;

said rear wall defining a plurality of inlet openings; and

said divider wall defining a plurality of discharge openings having a combined area equal to less than 2.5% of the given area.

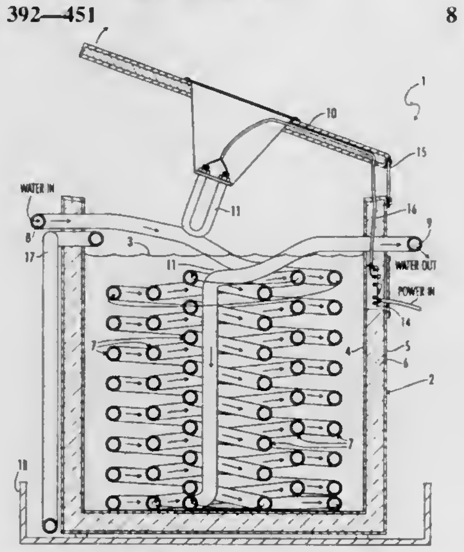
5,838,879

CONTINUOUSLY CLEANED PRESSURELESS WATER HEATER WITH IMMERSED COPPER FLUID COIL

Howard Harris, Ashland City, Tenn., assignor to Howard Harris Builders, Inc., Ashland City, Tenn.

Filed Dec. 27, 1995, Ser. No. 579,424
Int. Cl.^{6} F24H ***1/22***

U.S. Cl. 392—451 **8 Claims**



1. An electric water heater comprising:

a. a water tank having a wall, a bottom and a tank top, the tank top adapted to be separated from the wall, the water tank adapted to hold a quantity of non-pressurized and non-circulating heat transfer liquid up to an upper liquid level that is below the tank top, to define an air gap region inside the tank between the upper liquid level and the top;

b. a thermally conductive coil mounted inside the tank and having a water inlet and a water outlet that each extend outwardly through the tank wall, whereby the tank top can be separated from the tank wall independently of the water inlet and water outlet;

c. an electric heating element attached to the tank top and extending downwardly through the air gap region in the tank and below the upper liquid level; and

d. whereby the electric heating element contacts and heats the heat transfer liquid inside the tank and whereby the heat transfer liquid contacts the coil to heat water from a domestic water supply that enters the water inlet and circulates through the coil such that heated water leaves the water outlet and returns to the domestic water supply.

5,838,880

GROUND HEATING SYSTEM

Richard Edgar Brooks, Jr., Chassell, Mich., and Mark Bruckelmyer, Duluth, Minn., assignors to Ground Heaters, Inc., Spring Lake, Mich.

Filed Jan. 16, 1996, Ser. No. 585,510
Int. Cl.^{6} F24H ***1/10;*** **F28D** ***3/00***

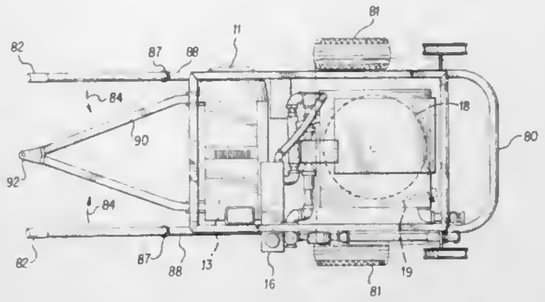
U.S. Cl. 392—485 **21 Claims**

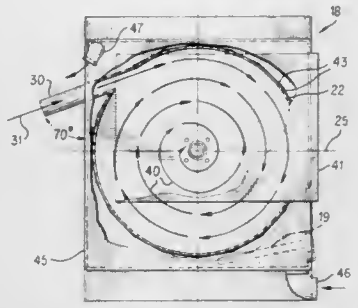
1. A ground heating system comprising:

an internal combustion engine providing a shaft output and an exhaust gas stream;

an electric generator driven by the shaft output of said internal combustion engine, said electric generator providing an electric output;

a working fluid for transferring heat to the ground;





a heat exchanger for receiving the exhaust gas stream and transferring heat from the exhaust gas stream to said working fluid, said heat exchanger having a disc-shaped chamber for receiving exhaust gas from said internal combustion engine, said chamber having an axial and a radial direction extending from a center of said chamber, and said chamber having a radial dimension larger than an axial dimension of said chamber; and

an electric heating element for converting said electric output of said generator into heat and for transferring heat to said working fluid.

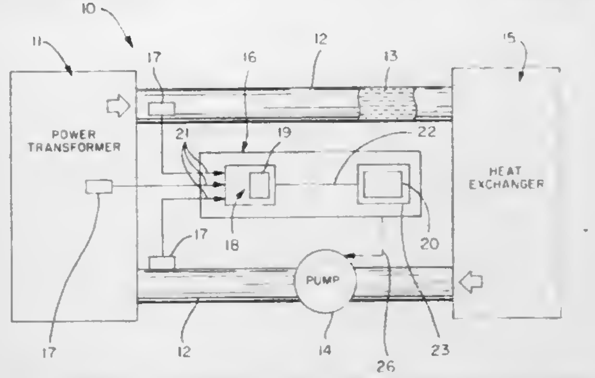
5,838,881

SYSTEM AND METHOD FOR MITIGATION OF STREAMING ELECTRIFICATION IN POWER TRANSFORMERS BY INTELLIGENT COOLING SYSTEM CONTROL

John Keith Nelson, Niskayuna, and John Arthur Palmer, Troy, both of N.Y., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jul. 14, 1995, Ser. No. 502,829
Int. Cl.^{6} G06F ***15/18***

U.S. Cl. 395—22 **28 Claims**



1. In a system comprising a power transformer having a cooling system, wherein a liquid coolant is driven by at least one pump to circulate through a transformer and at least one heat exchanger, wherein an operation at excessive flow rates of the liquid coolant and decreased temperatures cause an undesired streaming electrification, wherein a location and certain regimes of operation of said at least one pump may enhance the streaming electrification, an intelligent controller comprising:

elements of fuzzy logic and neural network,

plurality of analog inputs acquiring input data on operation of the circulation system, a main processor, and

instrumentation for designation of a plurility of level designations for said analog inputs,

said fuzzy logic interpreting said input data according to predetermined fuzzy membership functions and generating fuzzifier outputs, wherein each fuzzy membership function corresponds to a respective one of said level designations, said analog inputs are given fuzzy memberships in the fuzzy regions of operating parameter regimes, such as: very low, low, medium, high and very high,

said fuzzy logic further breaking up the analog inputs for a single node into a plurality of fuzzifier output nodes and allowing minor modifications in operating conditions of the cooling system by changing said level designations,

the fuzzy logic being implemented with a pseudo-neural network configuration, the pseudo-neural network configuration including an input layer, a hidden layer and an output layer, wherein the analog inputs are inputted into the input layer,

wherein a ramp function is used as an activation function for the hidden layer, and

wherein said fuzzifier outputs from the output layer of the fuzzy logic are processed by the main processor, said main processor includes a fully connected feed-forward neural network having an input layer receiving said fuzzifier outputs, a number of these fuzzifier outputs being five times the number of said analog inputs acquiring input data, at least a first hidden layer and an output layer, and

wherein the number of nodes in the output layer of the main processor neural network includes four nodes and corresponds to processor outputs indicating control outputs and alarm outputs, said control outputs request for more cooling or for less cooling, and said alarm outputs are indicative of an instrumentation failure or for streaming electrification danger, and a pump operator interpreting the control outputs from the main processor into a relay operation of said at least one pump, and further including two alarms, one alarm for signaling an over-temperature condition, and another alarm for signaling a malfunction or unexpected operating regime.

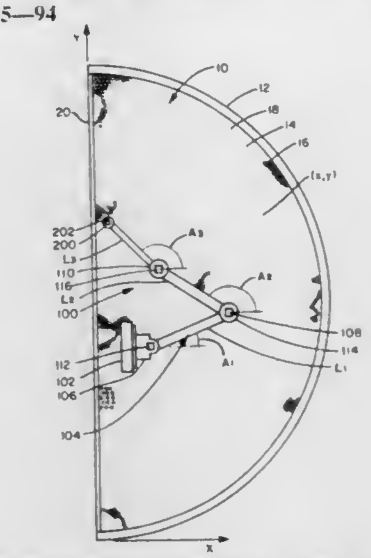
5,838,882

DYNAMIC POSITION TRACKING AND CONTROL OF ROBOTS

Zhongxue Gan, Storrs; Jeffrey Sherman Katz, West Hartford; Qing Tang, Wethersfield, all of Conn., and Lance Terrance Fitzgibbons, Southwick, Mass., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 31, 1996, Ser. No. 741,900
Int. Cl.^{6} G05B ***13/00;19/00***

U.S. Cl. 395—94 **20 Claims**



1. A computer controlled robot for servicing a heat exchanger having a substantially planar tube sheet which defines a multiplic-

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ity of laterally spaced tube openings of known shape, each of which is centered at a coordinate on a tube sheet coordinate system, comprising:

a manipulator having a base fixed with respect to the tube sheet, an articulated arm for moving parallel to said tube sheet, and an end effector carried by the arm for sequential positioning under a plurality of selected tube openings, the end effector carrying a tool which is actuable in a direction perpendicular to the tube sheet for insertion into a respective selected tube opening;

a sensory system having means carried by the end effector and means in said computer, for dynamically positioning the tool relative to a selected tube opening, said sensory system including,

means for generating an image of a portion of the tube sheet,

means for processing said image and generating a first signal commensurate with the spatial relationship of the tool to the selected tube opening,

means carried on the end effector for projecting a structured light beam toward the tube sheet at the location of either one of said selected tube opening or a laterally spaced tube opening,

means on the end effector for receiving a structured light pattern reflected by the tube sheet from said means for projecting,

means for sensing the reflected light pattern and generating a second signal commensurate with the spatial relationship of the reflection to said either one of said selected tube opening or laterally spaced tube opening,

means on the end effector for sensing at least one of force and torque acting on the end effector resulting from the tool partially entering said selected tube opening or a probe partially entering said laterally spaced tube opening;

means for generating a third signal commensurate with at least one of said sensed force or torque; and

means in said computer responsive to said first, second, and third signals, for controlling said arm to center said tool for actuation fully into said selected opening.

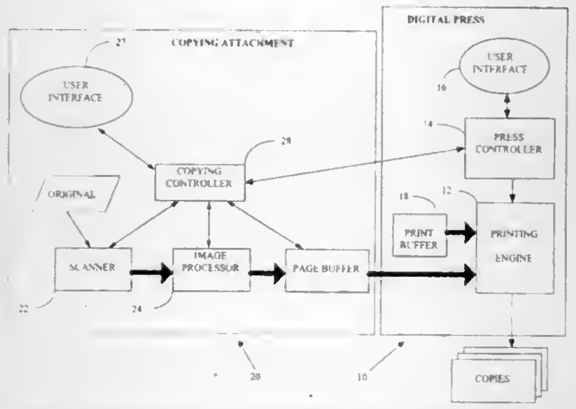
5,838,883
COPYING ATTACHMENT FOR DIGITAL PRINTING PRESS

Gil Pekelman, Rosh Haayin, Israel, assignor to Portalis, Rosh Haayin, Israel

Filed Sep. 20, 1996, Ser. No. 718,250

Int. Cl.^{6} G06F *15/00;* H04N *1/21*

U.S. Cl. 395—106 **28 Claims**



1. A copying attachment, attachable to a digital press, which is normally configured to print out digital image data received from external sources for enabling the digital press to also serve as a copier for copying an original document, the copying attachment comprising:

(a) a scanner, for scanning an image on the original document;

(b) a digital image processor, connected to said scanner and receptive to image data output therefrom, the output of said image processor having a format and values receptive by said digital press;

(c) a buffer memory, receptive to image data output from said image processor and operative to store at least one full color page image; and

(d) a copying controller, for controlling the operation of said scanner, said image processor and said buffer memory;

said controller being operative to cause a full color page image to be output from said buffer memory and to cause said digital press to print out one or more copies of said page image.

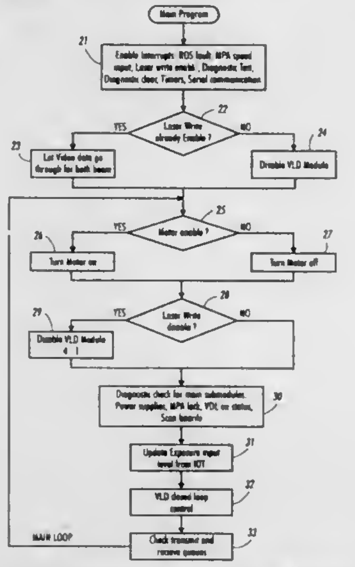
5,838,884
SYSTEM FOR A RASTER OUTPUT SCANNER

Vincent W. AuYeung, Temple City, and Khuay Cam, Stanton, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 23, 1996, Ser. No. 735,622

Int. Cl.^{6} G06K *15/00*

U.S. Cl. 395—107 **4 Claims**


Main Program
21
Enable Interrupts: ROS fault, MPA speed input, Laser write enable, Diagnostic Test, Diagnostic door, Timers, Serial communication
22
Laser Write already Enable ?
YES
NO
23
Let Video data go through for both beam
24
Disable VLD Module
25
Motor enable ?
YES
NO
26
Turn Motor on
27
Turn Motor off
28
Laser Write disable ?
YES
NO
29
Disable VLD Module
30
Diagnostic check for main submodules. Power supplies, MPA lock, VDI on status, Scan beam
31
Update Exposure input level from IOT
32
VLD closed loop control
33
Check transmit and receive queues
MAIN LOOP

1. A system for controlling a raster output scanner print head having either a laser diode means comprising a laser diode, a polygon and a paper path means, or any other light source for a printing application with or without a polygon device comprising:

if a polygon is required by the print head, a polygon application program for receiving from the polygon a signal which is a function of the polygon speed, for outputting a signal to the polygon to maintain the polygon speed within a predetermined range,

a laser diode means application program for

A. receiving from said laser diode means a signal that is a function of the laser diode temperature, for outputting a signal to the laser diode to maintain the temperature within a predetermined range, and for outputting a signal which is a function of the diode temperature, and

B. receiving from said laser diode means a signal that is a function of the laser diode output light intensity, for outputting a power signal to the laser diode to control the output light intensity within a predetermined range, and for outputting a laser diode output light intensity signal and a power signal, and

an operating system responsive to the signals which are functions of the polygon speed, diode temperature, light intensity and power to create an indication visible to a system operator or to stop the operation of the paper path means if any of these signals are outside of a predetermined range.

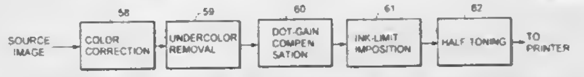
5,838,885
SALT-AND-PEPPER-NOISE REDUCTION

Joseph Shu, San Jose, and Jack Boyce, El Cerrito, both of Calif., assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Sep. 9, 1996, Ser. No. 709,682

Int. Cl.^{6} G06K *15/00*

U.S. Cl. 395—109 **18 Claims**



1. For operating an ink-jet printing mechanism to produce a display in response to electrical source-image signals representing a source image consisting of an array of pixels, the value of each of which consists of more than one relatively fine-resolution component value associated with that pixel, a method comprising the steps of:

A) performing a sequence of at least one image-revision step, in which sequence each image-revision step receives an input image consisting of input pixels and produces therefrom an output image consisting of output pixels, the input image of the first image-revision step is the source image, the input image of any subsequent image-revision step is the output image of the preceding image-revision step, and one said image-revision step is a half-toning step each input pixel of whose input image consists of fine-resolution half-tone-input color components and a fine-resolution half-tone-input black component, the half-toning step including:

i) performing on each fine-resolution half-tone-input color component a respective half-toning operation that generates a corresponding coarse-resolution color value therefrom;

ii) performing on each fine-resolution half-tone-input black component a half-toning operation that generates a corresponding coarse-resolution black value therefrom, the half-toning operation performed on the fine-resolution half-tone-input black components being independent of the fine-resolution half-tone-input color components' values;

B) operating the printing mechanism to apply to a print medium black ink independently of the coarse-resolution color values in accordance with the coarse-resolution black value; and

C) operating the printing mechanism to apply to a print medium colored ink independently of the coarse-resolution black values in accordance with the coarse-resolution color values.

5,838,886
PRINTING METHOD AND APPARATUS THEREFOR

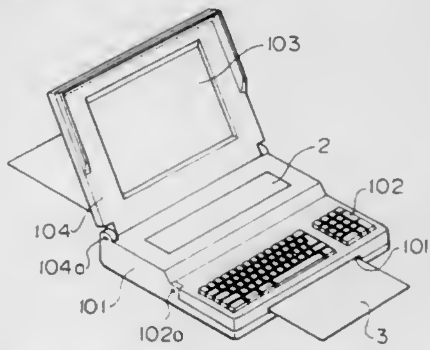
Tsutomu Takahashi, Kawasaki; Susumu Takase; Naohisa Suzuki, both of Yokohama; Koji Fukunaga, Tokyo; Masaki Nishiyama; Jiro Tateyama, both of Yokohama, and Hisatsugu Naito, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1992, Ser. No. 921,701

Claims priority, application Japan, Jul. 30, 1991, 3-190338; Jul. 30, 1991, 3-190339; Jul. 30, 1991, 3-190343

Int. Cl.^{6} G06K *15/00*

U.S. Cl. 395—112 **13 Claims**



6. A printing method comprising the steps of:

storing, in storing means connected to a printing unit through a general-purpose interface, an indication of whether or not initialization of said printing unit required to perform a printing operation instructed by a host has been performed;

performing said initialization prior to performing the printing operation if said initialization is indicated as not having been performed and the printing operation has been instructed by said host; and

initializing a memory area of the printing unit regardless of the indication stored in said storing step by said storing means.

5,838,887
PRINTER HAVING A BACKED-UP MEMORY FOR STORING OPTIONAL EMULATION PROGRAM

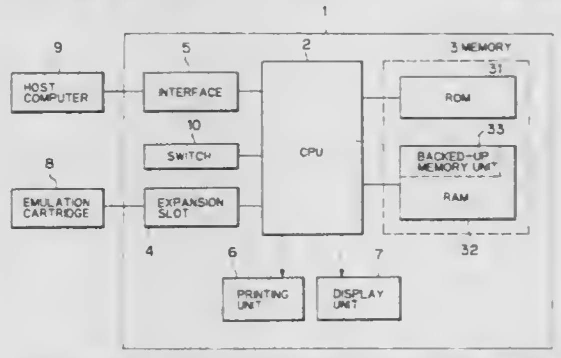
Masahiro Murakami, Hekinan, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Continuation of Ser. No. 794,047, Nov. 19, 1991, abandoned. This application Jun. 17, 1993, Ser. No. 77,505

Claims priority, application Japan, Nov. 21, 1990, 2-317502

Int. Cl.^{6} G06K *15/00*

U.S. Cl. 395—112 **10 Claims**



1. A printer for receiving a control code and print data from a host computer and for controlling a printing unit according to the received control code to carry out printing based on the print data, comprising:

input means for inputting an emulation program used for interpreting the control code;

first storage means for storing the emulation program that has been inputted to said input means, said first storage means comprising back up memory means for backing up the first storage means so as not to erase the stored emulation program when the printer is powered off;

control means for controlling said input means, said first storage means and said back up memory means so that the emulation program inputted to said input means is installed in said first storage means; and

second storage means for storing a preselected emulation program, wherein the emulation program stored in said first storage means and the preselected emulation program stored in said second storage means are selectively used in accordance with an identification code added to the control code received from the host computer.

5,838,888
IMAGE RECORDER

Naoki Oda, Kasugai, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Dec. 27, 1996, Ser. No. 774,377

Claims priority, application Japan, Dec. 27, 1995, 7-353898

Int. Cl.^{6} G06K *15/00*

U.S. Cl. 395—115 **20 Claims**

1. An image recorder comprising:

a print buffer for storing print data received from a processor;

a printing head having printing elements for plural channels that print on the basis of the print data stored in the print buffer;

a storage device that temporarily stores the print data in the print buffer and supplies the print data to the printing elements sequentially for each dot to be printed; and

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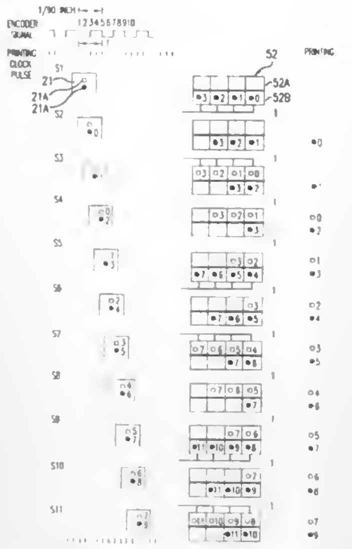


a buffer control device that transfers the print data corresponding to a first channel group from the print buffer to the storage device at a staggered timing from transferring the print data corresponding to a second channel group from the print buffer to the storage device.

5,838,889

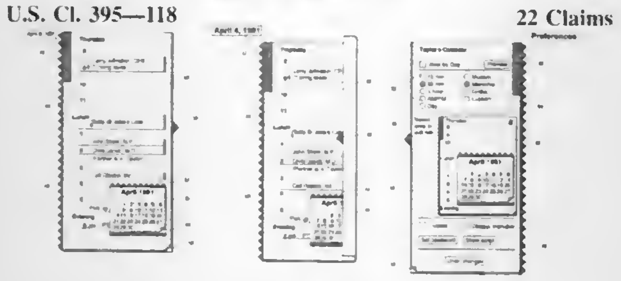
METHOD AND APPARATUS FOR FLIPPING A DOUBLE-SIDED GRAPHIC IMAGE HAVING DIFFERENT SIZED FIRST AND SECOND SIDES

Susan L. Booker, San Carlos, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Continuation of Ser. No. 257,560, Jun. 10, 1994, abandoned, which is a division of Ser. No. 831,256, Jan. 29, 1992, Pat. No. 5,351,995. This application May 18, 1995, Ser. No. 444,190

Int. Cl.^{6} G06T *3/40*

U.S. Cl. 395—118 **22 Claims**



1. A computer system for displaying and manipulating a double-sided graphic image comprising:

a processor;

a display device coupled to the processor for displaying the graphic image, wherein the graphic image includes a first side and an opposing second side, wherein the first side is not a same size as the second side; and

a first input device coupled to provide a flip command to the processor, wherein if the first side is displayed the graphic image is flipped such that the first side is hidden and the second side is displayed in response to the flip command, wherein if the second side is displayed the graphic image is flipped such that the second side is hidden and the first side is displayed in response to the flip command.

5,838,890

HOUSEHOLD INFORMATION SYSTEM DATA PROCESSOR CHANGING AN INITAL IMAGE

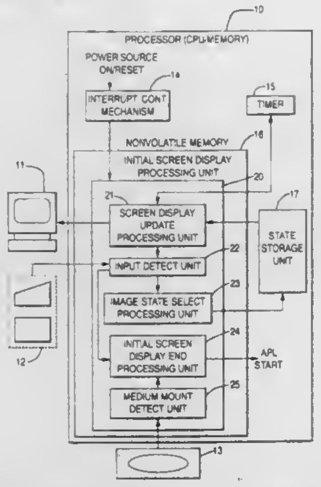
Yoichi Aoki; Yasuo Satoh; Chiaki Ito; Seizi Kakizawa; Shinichi Konya; Haruhiko Mio; Makoto Wanishi, and Takeo Asawa, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 118,746, Sep. 10, 1993, abandoned. This application Dec. 24, 1996, Ser. No. 774,587

Claims priority, application Japan, Feb. 10, 1993, 5-022418

Int. Cl.^{6} G06F *3/00*

U.S. Cl. 395—174 **8 Claims**



1. A data processor coupled to a power source and a main storage device and comprising:

a display unit;

an input unit;

state storage means for storing a state of an image to be displayed, which state determines kinds of movement of the image;

a nonvolatile memory arranged in the data processor and being other than the main storage device of the data processor, said nonvolatile memory coupled to the display unit and to the input unit and comprising:

initial image display processing means, driven when the power source is turned on, and when the data processor is reset, for processing an initial moving image for display on said display unit until loading of a system program from said main storage device is completed,

said initial image display processing means comprising:

image display update processing means for changing the image displayed as the moving image by calculation on said display unit with a passage of time based on the state of the image,

input detect means for detecting input from said input unit, and

image state select processing means for selecting, in response to the input from said input means, the state of the image that had been predetermined with respect to said input, and for storing the selected state in said state storage means.

5,838,891

DATA STORAGE SYSTEM AND STORAGE MANAGING METHOD

Masahiro Mizuno; Akira Ogawa; Toshio Matsumoto; Shiro Ogura; Kazuhiko Ito; Hitoshi Yamamoto; Kazuo Ito, and Hiroshi Baba, all of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

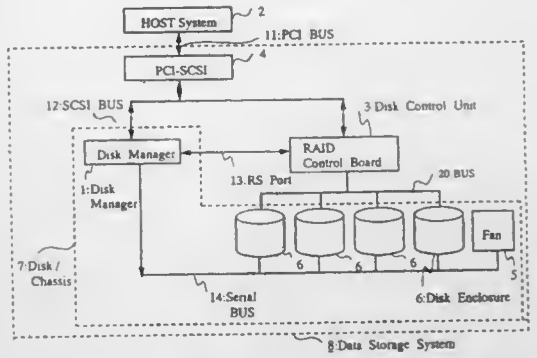
Filed Mar. 6, 1996, Ser. No. 611,783

Claims priority, application Japan, Mar. 22, 1995, 7-062976

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—182.03 **22 Claims**

20. A storage managing method of a system having a host system coupled to a data storage system, the data storage system having a storage unit and a storage manager, the method comprising the steps of:



(a) transferring data between the storage unit and the host system through a first communication path coupled to the storage unit, the storage manager and the host system;

(b) transferring managing information between the storage manager and the host system through the first communication path;

(c) monitoring and controlling operation of the storage unit by the storage manager through a second communication path coupled to the storage unit and the storage manager, the second communication path being different and independent from the first communication path;

wherein the storage unit has a plurality of storage enclosures and wherein the step of monitoring and controlling operation of the storage unit further includes step of communicating with each of the plurality of storage enclosures through the second communication path and collecting information from each of the storage enclosures.

5,838,892

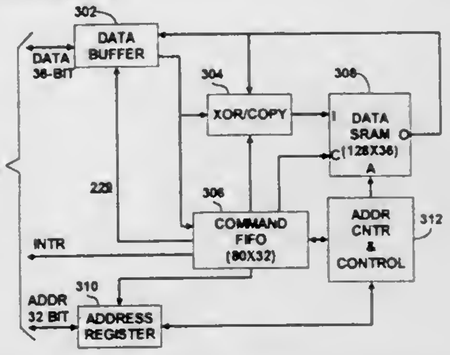
METHOD AND APPARATUS FOR CALCULATING AN ERROR DETECTING CODE BLOCK IN A DISK DRIVE CONTROLLER

Carrel Wilson, Villa Park, Calif., assignor to EMC Corporation, Hopkinton, Mass.

Filed Dec. 29, 1995, Ser. No. 581,698

Int. Cl.^{6} G06F *11/34*

U.S. Cl. 395—182.04 **13 Claims**



1. In a disk drive controller including a memory for storing a plurality of blocks each having a predetermined size, and a parity engine for calculating an error detecting code block, the party engine comprising:

a data buffer RAM, having an input terminal and an output terminal, for storing a block having the predetermined size;

a function circuit, having a first input terminal coupled to the disk drive controller memory, a second input terminal coupled to the output terminal of the data buffer RAM, and an output terminal coupled to the input terminal of the data buffer RAM; and

a command circuit, for conditioning the function circuit and the data buffer RAM to operate in a first operating mode to retrieve a block from the disk drive controller memory and store it in the data buffer RAM, and in a second operating mode to calculate the exclusive-OR (XOR) of a block from the disk drive controller memory with a block from the data buffer RAM and store it in the data buffer RAM.

5,838,893

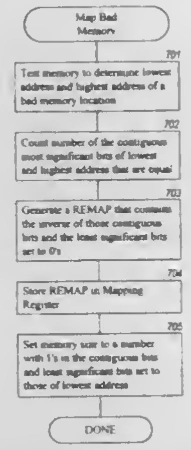
METHOD AND SYSTEM FOR REMAPPING PHYSICAL MEMORY

John R. Douceur, Bellevue, Wash., assignor to Microsoft Corporation, Redmond, Wash.

Filed Dec. 26, 1996, Ser. No. 777,165

Int. Cl.^{6} G06F *11/22;12/00*

U.S. Cl. 395—182.05 **24 Claims**


Map Bad Memory
701
Test memory to determine lowest address and highest address of a bad memory location
702
Count number of the contiguous most significant bits of lowest and highest address that are equal
703
Generate a REMAP that contains the inverse of those contiguous bits and the least significant bits set to 0's
704
Store REMAP in Mapping Register
705
Set memory size to a number with 1's in the contiguous bits and least significant bits set to those of lowest address
DONE

1. A method for remapping physical memory that is malfunctioning, physical memory having memory locations with addresses, the addresses ordered from a lowest address to a highest address, each address having bits ordered from a highest-order bit to a lowest-order bit, the method comprising:

scanning physical memory to determine which memory locations are malfunctioning;

identifying a lowest address and a highest address of the memory locations that are malfunctioning;

identifying the highest-order, contiguous bits of the lowest address that are the same as the highest-order, contiguous bits of the highest address;

generating a remapping value that contains a bitwise inverse of each of the identified highest-order, contiguous bits as the highest-order, contiguous bits of the remapping value and contains a 0 in each of the other bits of the remapping value; and

when receiving an address to access physical memory,

generating a remapped address by performing a bitwise exclusive-OR of the received address with the remapping value; and

accessing physical memory using the generated remapped address.

5,838,894

LOGICAL, FAIL-FUNCTIONAL, DUAL CENTRAL PROCESSOR UNITS FORMED FROM THREE PROCESSOR UNITS

Robert W. Horst, Saratoga, Calif., assignor to Tandem Computers Incorporated, Cupertino, Calif.

Continuation-in-part of Ser. No. 992,944, Dec. 17, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 484,281

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—182.09 **7 Claims**

1. A fault tolerant processing system, comprising:

a first central processing unit comprising a pair of first processor devices operating to execute each instruction of an instruction stream at substantially the same moment in time;

a second central processing unit comprising a second processor device operating to execute each instruction of substantially

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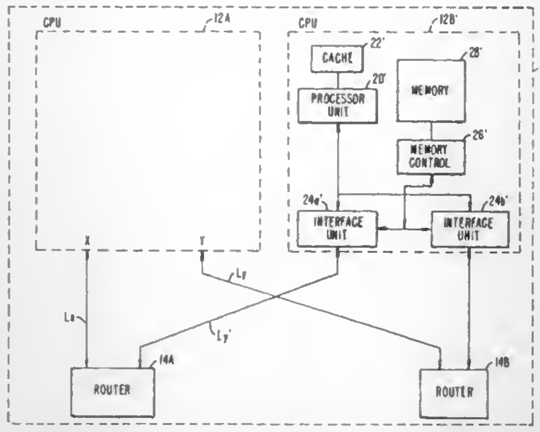


an identical copy of the instruction stream, the pair of first processor devices and the second processor device executing identical instructions of the instruction stream and the identical copy of the instruction stream at substantially the same moment in time;

whereby the first and second central processing units operate in synchronism to perform substantially the same operations at substantially the same moments in time, including providing output data; and

a data checking element connected to receive and compare the output data from the first and second central processing units, and selectively outputting the output data from the first or the second central processing unit; wherein said first and second central processing units operate in error-checking redundancy, duplexed pair.

5,838,895
FAULT DETECTION AND AUTOMATIC RECOVERY APPARATUS OR WRITE-READ POINTERS IN FIRST-IN FIRST-OUT

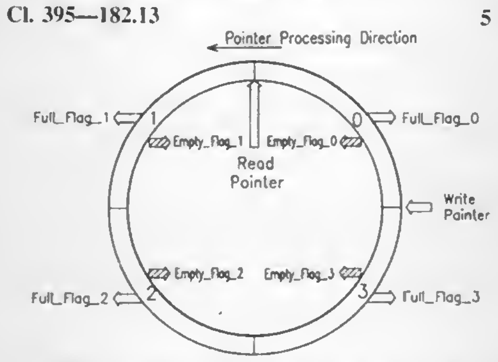
Seong-Do Kim; Hee-Bum Jung, and Won-Chul Song, all of Daejeon, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon, and Korea Telecommunication Authority, Seoul, both of Rep. of Korea

Filed May 15, 1997, Ser. No. 857,045

Claims priority, application Rep. of Korea, Dec. 11, 1996, 1996 64192

Int. Cl.^{6} G06F *12/00;13/00*

U.S. Cl. 395—182.13 **5 Claims**



1. In a FIFO memory which temporally stores data which is input when synchronized with a write clock and outputs the data in the order input therein when synchronized with a read clock, a fault detection and automatic recovery apparatus of write-read pointers comprises:

a write controller which receives input of a write performance enable signal of FIFO input from the outside and an effective state signal of the present register of a write pointer and selectively outputs a write control signal;

a first counter which outputs a carry signal which indicates that one cell is produced and a write low-ranking data pointer when synchronized with the write clock and counts frame-structured low-ranking data when the write control signal output from the above write controller is enabled;

a second counter which is connected in series with the first counter and outputs a write cell pointer when synchronized with said write clock and counts the carry signal corresponding to one cell output from the above first counter only when said write control signal of said write controller is enabled;

a write flag generator which disables an effective state signal of the present register of a write pointer corresponding to an enabled address among the write empty flag signals of each register group input from an outside reading processor and, upon receiving input of a signal resulting from a comparison made between write-read pointers, outputs an effective state signal of a register corresponding to the write cell pointer output from the second counter by synchronizing said effective state signal with the carry signal of said first counter and then enabling said effective state signal selectively;

a first multiplexer which, upon receiving input of the state signal of the register output from said write flag generator, selects and outputs only the state signal of a register corresponding to the write cell pointer output from said second counter;

a second multiplexer which, upon receiving input of the state signal of the register output from said write generator, selects and outputs only the state signal of the register corresponding to the next address of the present write cell pointer output from said second counter;

an analyzer of write-read pointers which, upon receiving input of said read pointer input from the outside reading processor, said write cell pointer output from said second counter and the state signal of the register output from said second multiplexer, outputs a signal resulting from a comparison made between write-read pointer by analyzing the relation of write-read pointers;

a first decoder which decodes the signal of the write cell pointer output from said second counter according to the write control signal output from said write controller; and

a second decoder which decodes the signal of the write low-ranking data pointer output from said first counter.

5,838,896
CENTRAL PROCESSING UNIT FOR PREVENTING PROGRAM MALFUNCTION

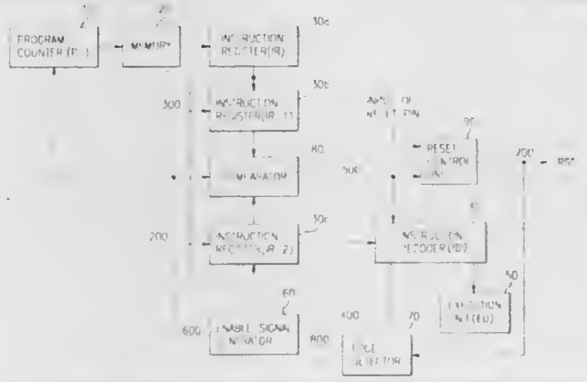
Dae Keun Han, Choongcheongbuk-Do, Rep. of Korea, assignor to LG Semicon Co., Ltd., Choongcheongbuk, Rep. of Korea

Filed Dec. 30, 1996, Ser. No. 773,934

Claims priority, application Rep. of Korea, Dec. 31, 1995, 1995 70175

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—182.21 **6 Claims**



1. A central processing unit for preventing a program malfunction, comprising:

a program counter for designating an address of an instruction to be executed;

a first instruction register for storing an instruction outputted from a memory by the program counter;

a second instruction register for fetching an instruction stored in the first instruction register in accordance with a first internal clock signal;

a third instruction register for fetching an instruction stored in the first instruction register in accordance with a second internal clock signal;

a comparator, which is operated in accordance with an enable signal, for comparing whether instructions stored in the second instruction register and the third instruction register are identical;

a reset controller for outputting a reset signal in accordance with an output signal from the comparator;

an instruction decoder for decoding an operation code of an instruction stored in the third instruction register in accordance with an output signal from the comparator and for outputting a control signal and a program count value change instruction;

an execution unit for executing an instruction in accordance with a control signal from the instruction decoder;

an edge detector for detecting an edge of an output signal from the reset controller and for outputting an edge detection signal; and

an enable signal generator for outputting an enable signal in accordance with the edge detection signal and an output signal from the instruction decoder.

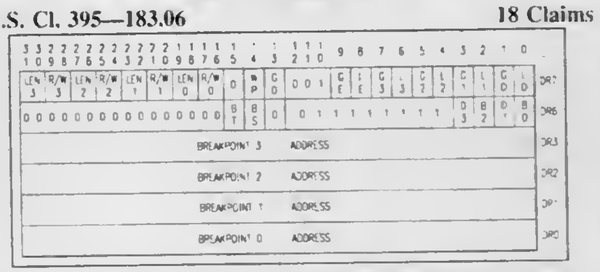
5,838,897
DEBUGGING A PROCESSOR USING DATA OUTPUT DURING IDLE BUS CYCLES

Mark W. Bluhm, Plann, and Mark W. Hervin, Dallas, both of Tex., assignors to Cyrix Corporation, Richardson, Tex.

Filed Feb. 27, 1996, Ser. No. 606,774

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—183.06 **18 Claims**



1. A method of detecting processor state information in a processor which includes a plurality of external pins for communicating information, comprising:

selecting in a visibility register at least one of a plurality of a modes that identify processor state information;

detecting an idle bus cycle by a bus interface unit of the processor; and

outputting, by the bus interface unit, the processor state information identified in the selected mode onto the external pins of the processor in response to detecting the idle bus cycle.

5,838,898
MICROPROGRAM CONTROLLED DATA PROCESSING SYSTEM HAVING A RUNAWAY MONITOR FUNCTION

Yasunori Sawai, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 14, 1995, Ser. No. 528,054

Claims priority, application Japan, Sep. 14, 1994, 6-219337

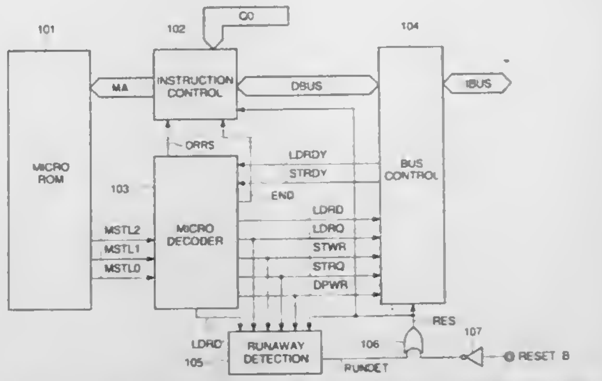
Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—185.03 **11 Claims**

9. An apparatus for detecting an abnormal condition during execution of a microprogram by a processing unit, the microprogram including at least one instruction code, said apparatus comprising:

an instruction controller configured to receive the instruction code and to generate a micro address based on the instruction code;

a micro ROM connected to receive the micro address from the instruction controller and to generate a set of micro codes corresponding to the instruction code;



a micro decoder connected to the instruction controller and the micro ROM, the micro decoder configured to receive the set of micro codes and to generate a predetermined series of microorders based on the set of micro codes, the series of microorders corresponding to control signals used to control the processing unit; and

a runaway detecting circuit connected to receive the series of microorders output from the micro decoder, the runaway detecting circuit configured to detect a runaway condition during the execution of the microprogram based on whether or not the series of microorders correspond to an allowable series of microorders.

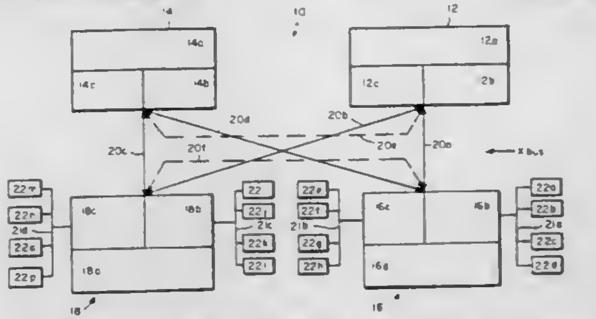
5,838,899
DIGITAL DATA PROCESSING METHODS AND APPARATUS FOR FAULT ISOLATION

William I. Leavitt, Lexington; Conrad R. Clemson, Shrewsbury; Jeffrey S. Somers, Northboro; John M. Chaves, Hudson; David R. Barbera, and Shawn A. Clayton, both of Worcester, all of Mass., assignors to Stratus Computer, Marlboro, Mass.

Continuation-in-part of Ser. No. 309,210, Sep. 20, 1994, Pat. No. 5,630,056. This application Jun. 5, 1996, Ser. No. 658,563

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—185.09 **17 Claims**



1. A fault-detecting and fault-isolating digital data processing apparatus comprising:

plural functional units,

plurality of bus means, each connected to and providing communications between a respective pair of functional units, the functional units each including:

error phase means, coupled to the respective bus means of that functional unit, for placing the functional unit in an error isolation phase substantially concurrently with the other functional units, and for transmitting test data onto at least one of those bus means during a respective portion of that error isolation phase and exclusive, with respect to that phase, of any other unit connected to that bus,

bus error detecting means, coupled to the respective bus means of that functional unit, for detecting a communication error, including any of parity error, an error correction code error and a loopback error, on that bus means, and for signaling a bus error to the other functional units in the event of such communication error.

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error isolation means, coupled to the bus error detecting means, for signaling the other functional units during the error isolation phase that the respective functional unit is faulty based on (i) whether the bus error detecting means of that functional unit detected a loopback errors (ii) whether the bus error detecting means of another functional unit signaled a bus error in response to test data transmitted during the error isolation phase, and (iii) whether another functional unit signaled that it was faulty.

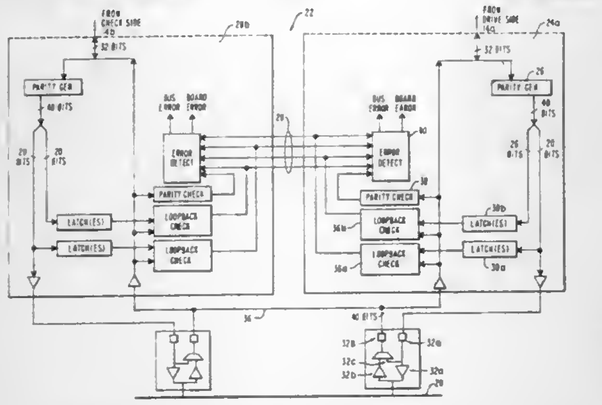
5,838,900
DIGITAL DATA PROCESSING METHODS AND APPARATUS FOR FAULT DETECTION AND FAULT TOLERANCE

Charles J. Horvath, Concord; William I. Leavitt, Grafton; Mark D. Tetreault, Northborough; Gregory M. Green, and Peter C. Churchill, both of Boxborough, all of Mass., assignors to Stratus Computer, Inc., Marlboro, Mass.

Continuation of Ser. No. 309,210, Sep. 20, 1994, Pat. No. 5,630,056. This application Dec. 3, 1996, Ser. No. 759,099

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—185.09 **4 Claims**



1. A fault detecting digital data processing device comprising

A. bus means for transmitting applied signals between plural functional units,

B. a first such functional unit including a first processing section for generating a first signal and for applying a portion thereof to said bus means,

C. said first functional unit further including a second processing section for generating a second signal and for applying a portion thereof to said bus means, said second signal normally being substantially identical to said first signal,

said portion of said second signal applied to said bus means by said second processing section being complementary to said portion of said substantially identical first signal applied to said bus means by the first processing section,

said second processing section applying said portion of said second signal to said bus means substantially concurrently with application of said portion of said first signal to said bus means by said first processing section, said portions of said first and second signals so applied to said bus means defining a third signal and

D. fault-detection means, coupled to said first and second processing sections and to said bus means, for receiving said third signal from said bus means and for comparing at least portions thereof with corresponding portions of said first signal and of said second signal generated by those respective processing sections,

said fault-detection means including means for signaling fault in response to at least selected differences between those compared signal portions.

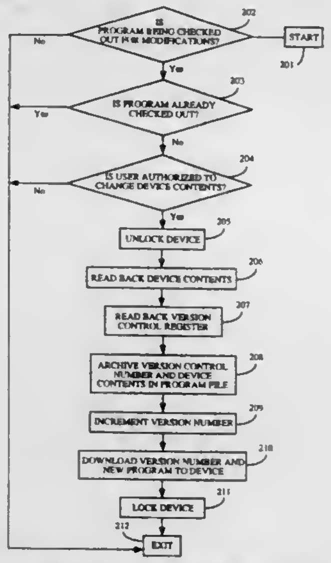
5,838,901
OVERRIDABLE DATA PROTECTION MECHANISM FOR PLDS

Derek R. Curd, San Jose; Neil G. Jacobson, Mountain View; Sholeh Diba, Los Gatos; Napoleon W. Lee, Milpitas; Wei-Yi Ku, and Kameswara K. Rao, both of San Jose, all of Calif., assignors to Xilinx, Inc., San Jose, Calif.

Filed Aug. 5, 1996, Ser. No. 692,389

Int. Cl.^{6} G06F *1/00*

U.S. Cl. 395—186 **7 Claims**


START
201
IS PROGRAM BEING CHECKED OUT FOR MODIFICATIONS?
202
No
Yes
IS PROGRAM ALREADY CHECKED OUT?
203
Yes
No
IS USER AUTHORIZED TO CHANGE DEVICE'S CONTENTS?
204
No
Yes
UNLOCK DEVICE
205
READ BACK DEVICE CONTENTS
206
READ BACK VERSION CONTROL REGISTER
207
ARCHIVE VERSION CONTROL NUMBER AND DEVICE CONTENTS IN PROGRAM FILE
208
INCREMENT VERSION NUMBER
209
DOWNLOAD VERSION NUMBER AND NEW PROGRAM TO DEVICE
210
LOCK DEVICE
211
212
EXIT

1. A method of controlling the modification of configuration data in a programmable logic device (PLD), said configuration data programmably creating data paths and logic functions within said PLD, said method comprising:

confirming authorization for a user to modify said configuration data in said PLD, including determining whether another user is accessing said PLD;

unlocking said PLD after receipt of said authorization;

reading back said configuration data and contents of a version control register;

automatically incrementing said contents of said version control register;

downloading new configuration data provided by said user; and locking said PLD.

5,838,902
COPY PROTECTION CIRCUIT FOR A DATA IN A MEMORY

Jong Su Shin, Choongchungbook-Do, Rep. of Korea, assignor to LG Semicon Co., Ltd., Cheongju, Rep. of Korea

Continuation-in-part of Ser. No. 429,258, Apr. 25, 1995, abandoned. This application Nov. 7, 1997, Ser. No. 965,770

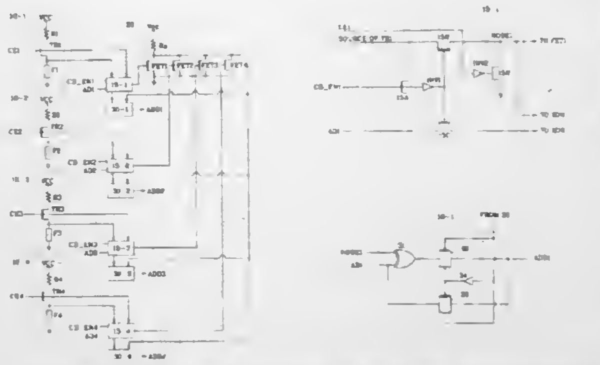
Claims priority, application Rep. of Korea, Apr. 30, 1994, 1994/9562

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—186 **7 Claims**

1. A copy protection circuit for a data in a memory, comprising:

a security data store circuit for storing a security data encoded in accordance with a chip enabling signal applied thereto;



a program circuit coupled to said security data store circuit to program said security data store circuit;

a switch circuit for outputting a switching signal controlled by the security data inputted through said program circuit; and

a data converting circuit for converting an input address by receiving the input address and the security data and for outputting one of a converted address and the input address to an X, Y-address buffer/decoder in accordance with an output of the switch circuit.

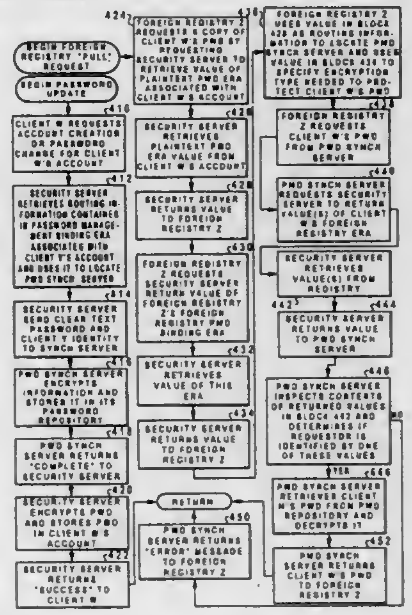
5,838,903
CONFIGURABLE PASSWORD INTEGRITY SERVERS FOR USE IN A SHARED RESOURCE ENVIRONMENT

George Robert Blakely, III; Ivan Matthew Milman, and Wayne Dube Sigler, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 13, 1995, Ser. No. 556,724

Int. Cl.^{6} G06F *12/14*

U.S. Cl. 395—188.01 **18 Claims**


BEGIN FOREIGN REGISTRY "PULL" REQUEST
BEGIN PASSWORD UPDATE
424
FOREIGN REGISTRY Z REQUESTS A COPY OF CLIENT W'S PWD BY REQUESTING SECURITY SERVER TO RETRIEVE VALUE OF PLAINTEXT PWD ERA ASSOCIATED WITH CLIENT W'S ACCOUNT
FOREIGN REGISTRY Z USES VALUE IN BLOCK 428 AS ROUTING INFORMATION TO LOCATE PWD SYNCH SERVER AND USES VALUE IN BLOCK 434 TO SPECIFY ENCRYPTION TYPE NEEDED TO PROTECT CLIENT W'S PWD
410
CLIENT W REQUESTS ACCOUNT CREATION OR PASSWORD CHANGE FOR CLIENT W'S ACCOUNT
SECURITY SERVER RETRIEVES PLAINTEXT PWD ERA VALUE FROM CLIENT W'S ERA
FOREIGN REGISTRY Z REQUESTS CLIENT W'S PWD FROM PWD SYNCH SERVER
RETURN

1. A method of managing passwords in a network including a plurality of clients, a main data store, and a remote registry, said method comprising:

maintaining password synchronization between passwords stored in said main data store and passwords stored within said remote registry; and

checking password integrity among said plurality of clients utilizing a password strength server so that each client maintains a password having a composition consistent with a format specified by a network server of said network.

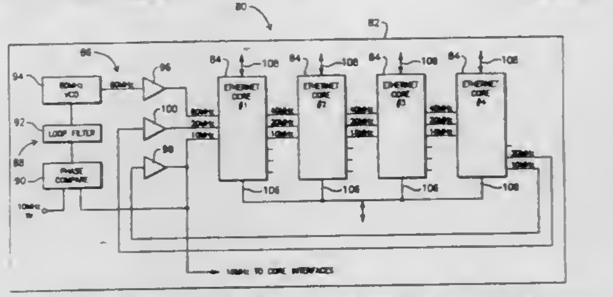
5,838,904
RANDOM NUMBER GENERATING APPARATUS FOR AN INTERFACE UNIT OF A CARRIER SENSE WITH MULTIPLE ACCESS AND COLLISION DETECT (CSMA/CD) ETHERNET DATA NETWORK

Michael D. Rostoker, Boulder Creek; D. Tony Stelliga, Pleasanton, both of Calif.; Dave Paolino, Andover, and Willem A. H. Engelse, Townsend, both of Mass., assignors to LSI Logic Corp., Milpitas, Calif.

Continuation of Ser. No. 141,194, Oct. 21, 1993, Pat. No. 5,625,825. This application Apr. 28, 1997, Ser. No. 847,717

Int. Cl.^{6} G06F *13/36*

U.S. Cl. 395—200.8 **11 Claims**



1. A random number generating apparatus for an interface unit of a Carrier Sense with Multiple Access and Collision Detect (CSMA/CD) data network, said interface unit including a first transmit backoff unit for implementing a backoff algorithm in response to a network collision signal and a random number, said apparatus comprising:

a first random number generator having first and second modes of randomizing said random numbers, and

a multiplexer for selecting a random number pertaining to one of modes in accordance with an address of a data packet being processed by the interface unit, wherein said random number affects the time in which a packet is to be to re-transmitted, whereby one of said first and second modes is selected to differ with another randomizing mode of a second random number generator of a second transmit back-off time unit to prevent lock-up condition between said first and second transmit back-off units.

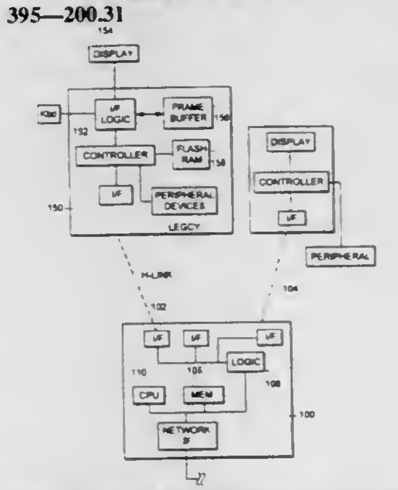
5,838,905
REMOTE TERMINAL OPERATION

Kevin B. Leigh, Houston, Tex., assignor to Compaq Computer Corp., Houston, Tex.

Division of Ser. No. 580,170, Dec. 28, 1995. This application Jul. 30, 1997, Ser. No. 903,548

Int. Cl.^{6} G06F *15/16*

U.S. Cl. 395—200.31 **30 Claims**



1. A method of operating a distributed computer system, comprising:

preparing computer operating software which is divided into a plurality of functional layers;

operating a first layer of the computer operating software carrying out a first application in a first unit:

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operating a second layer of the computer operating software carrying out said first application in a second unit, remote from the first unit;

communicating an instruction level command from the first unit to the second unit, said instruction level command being based on an operation of the software operating at the first unit;

receiving said instruction level command at the second unit; and

operating the software at the second unit based on the received instruction level command to thereby take some action at the second unit based on said software operating in said second unit.

5,838,906

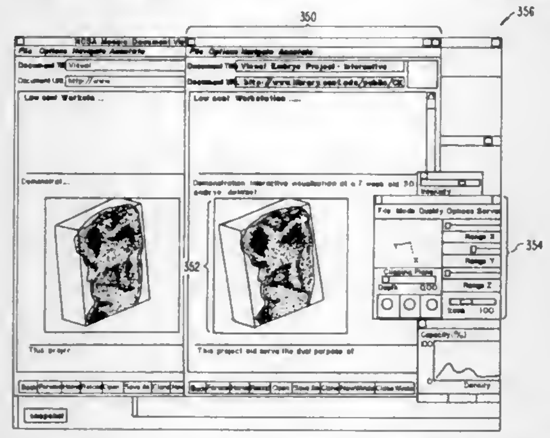
DISTRIBUTED HYPERMEDIA METHOD FOR AUTOMATICALLY INVOKING EXTERNAL APPLICATION PROVIDING INTERACTION AND DISPLAY OF EMBEDDED OBJECTS WITHIN A HYPERMEDIA DOCUMENT

Michael D. Doyle, Alameda; David C. Martin, San Jose, and Cheong S. Ang, Pacifica, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Oct. 17, 1994, Ser. No. 324,443

Int. Cl.^{6} C06F *9/44;15/16;17/30*

U.S. Cl. 395—200.32 **10 Claims**



1. A method for running an application program in a computer network environment, comprising:

providing at least one client workstation and one network server coupled to said network environment, wherein said network environment is a distributed hypermedia environment;

executing, at said client workstation, a browser application, that parses a first distributed hypermedia document to identify text formats included in said distributed hypermedia document and for responding to predetermined text formats to initiate processing specified by said text formats; utilizing said browser to display, on said client workstation, at least a portion of a first hypermedia document received over said network from said server, wherein the portion of said first hypermedia document is displayed within a first browser-controlled window on said client workstation, wherein said first distributed hypermedia document includes an embed text format, located at a first location in said first distributed hypermedia document, that specifies the location of at least a portion of an object external to the first distributed hypermedia document, wherein said object has type information associated with it utilized by said browser to identify and locate an executable application external to the first distributed hypermedia document, and wherein said embed text format is parsed by said browser to automatically invoke said executable application to execute on said client workstation in order to display said object and enable interactive processing of said object within a display area created at said first location within the portion of said first distributed hypermedia document being displayed in said first browser-controlled window.

5,838,907

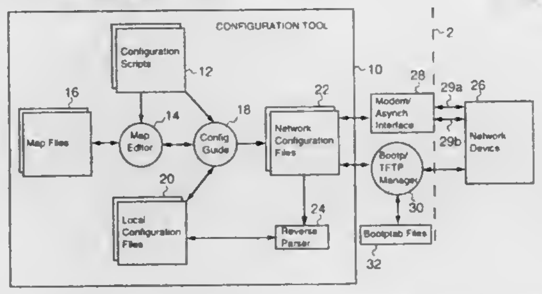
CONFIGURATION MANAGER FOR NETWORK DEVICES AND AN ASSOCIATED METHOD FOR PROVIDING CONFIGURATION INFORMATION THERETO

Peter A. Hansen, Houston, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Filed Feb. 20, 1996, Ser. No. 603,062

Int. Cl.^{6} G06F *9/00*

U.S. Cl. 395—200.5 **18 Claims**



1. For a computer system having a processor subsystem and a memory subsystem coupled by a system bus for bi-directional exchanges therebetween, a configuration manager for configuring a network device remotely coupled thereto, said configuration manager comprising:

at least one configuration script stored in said memory subsystem, said configuration script containing a series of executable instructions for constructing a configuration file and a bootptab file for a first specified type network device, said configuration script including at least a first section containing a series of configuration commands which generate requests for information, and a second section containing a set of connection rules for connecting said first specified type of network device to at least one other specified type of network device, and where said second section of said configuration script includes at least (i) an identifier for each connection interface of said first specified type of network device and (ii) a list of network device types that can be connected to the connection interface associated therewith, said list being provided for each of said identifiers;

a first software module, executable by said processor subsystem, for constructing a configuration file suitable for upload to a network device of said first specified type and a bootptab file suitable for identifying said network device, said first software module constructing said configuration file and said bootptab file by executing said series of executable instructions contained in said configuration script; and

a second software module, executable by said processor subsystem, for processing a configuration request issued by said network device by identifying said network device using said constructed bootptab file and configuring said network device by uploading said constructed configuration file thereto.

5,838,908

DEVICE FOR HAVING PROCESSORS EACH HAVING INTERFACE FOR TRANSFERRING DELIVERY UNITS SPECIFYING DIRECTION AND DISTANCE AND OPERABLE TO EMULATE PLURALITY OF FIELD PROGRAMMABLE GATE ARRAYS

Douglas J. Matzke, Plano, and Donald E. Steiss, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

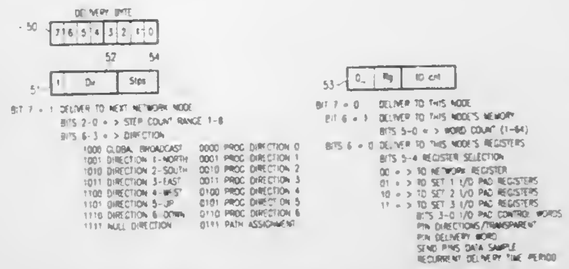
Continuation of Ser. No. 338,936, Nov. 14, 1994, abandoned. This application Aug. 13, 1997, Ser. No. 910,802

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—200.6 **13 Claims**

1. A virtual field programmable gate array device comprising:

a plurality of processors operable to communicate within a network array, each of said plurality of processors operable to



emulate a plurality of logic gates of a plurality of field programmable gate arrays as an algorithms;

each of said plurality of processors including a network interface connected to a predetermined number of adjacent processors and operable to receive network information from and to send network information to said predetermined number of adjacent processors, said network interface of each of said plurality of processors transferring network information by a plurality of delivery units, each of said plurality of delivery units including a transfer delivery unit specifying a direction corresponding to one of said predetermined number of adjacent processors and a distance to a specific processor to which said network information is to be transferred within said network array.

5,838,909

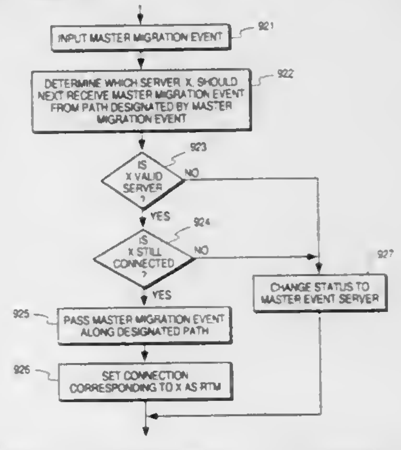
REDUCING LATENCY WHEN SYNCHRONIZING ACCESS TO A MULTI-USER DATABASE OVER A NETWORK

H. Scott Roy, San Francisco, and William D. Harvey, Palo Alto, both of Calif., assignors to Sandcastle, Inc., San Jose, Calif.

Filed May 23, 1996, Ser. No. 652,803

Int. Cl.^{6} G06F *15/80*

U.S. Cl. 395—200.39 **59 Claims**


INPUT MASTER MIGRATION EVENT
921
DETERMINE WHICH SERVER X SHOULD NEXT RECEIVE MASTER MIGRATION EVENT FROM PATH DESIGNATED BY MASTER MIGRATION EVENT
922
IS X VALID SERVER ?
923
NO
YES
IS X STILL CONNECTED ?
924
NO
YES
CHANGE STATUS TO MASTER EVENT SERVER
927
PASS MASTER MIGRATION EVENT ALONG DESIGNATED PATH
925
SET CONNECTION CORRESPONDING TO X AS RTM
926

1. A method of reducing latency in accessing in a master database stored in a node of a network having a plurality of nodes including a first node and a second node, the first node including a first event server and the second node including a second event server, the first event server and the second event server each having a status as a master event server or a slave event server with respect to network events, the event server having the status of master event server sequencing node commands to the master database, wherein at any given time only one node in the network can have the status of master event server and each node in the network processes events received from the master event server differently than events received from slave event servers, the method comprising the steps of:

(a) changing the status of the first event server from master event server to slave event server based on a network latency criterion; and

(b) assigning the status of master event server to the second event server based on the network latency criterion.

5,838,910

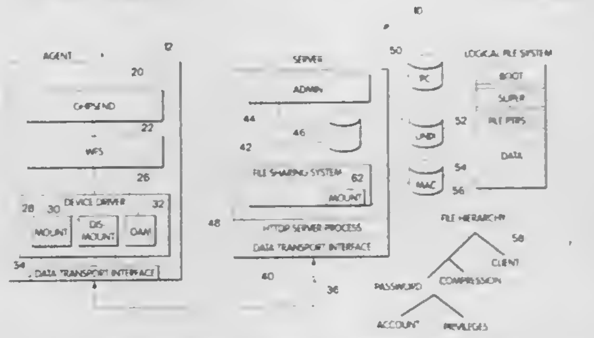
SYSTEMS AND METHODS FOR EXECUTING APPLICATION PROGRAMS FROM A MEMORY DEVICE LINKED TO A SERVER AT AN INTERNET SITE

Steven D. Domenikos, 54 Myrtle St., Millis, Mass. 02054, and George C. Domenikos, 100 Boatswain Way #203, Chelsea, Mass. 02150

Filed Mar. 14, 1996, Ser. No. 616,746

Int. Cl.^{6} H04Q *9/00*

U.S. Cl. 395—200.33 **27 Claims**



1. A process for allowing a client to connect to a server of an Internet site for executing an application program stored on a disk linked to the server, comprising

providing said server with an administration program for storing a file system of computer files on said disk according to a select file system protocol and providing a partitioning program for generating a disk partition for storing a file system of computer files according to said select file system protocol.

providing a data transport interface for connecting to said server.

transporting from said server a server address signal representative of a network address of said server. and a path name signal representative of a file system that includes the application program.

generating a mount request. as a function of said path name signal. and transporting said mount request to said server for directing said server to provide an array of server file pointers that point to a file descriptor representative of said file system that includes the application program.

generating an array of remote file pointers. as a function of said server address signal. said path name signal and said array of server file pointers.

providing said array of remote file pointers to a program loader element operating on said client. and

directing said program loader to select one of said remote file pointers and to transport from said disk to a local program memory element. a file block associated with said selected remote file pointer.

5,838,911

METHOD AND APPARATUS FOR OBTAINING NETWORK INFORMATION BY USING A DYNAMIC LINK LIBRARY

Alan Rosenhauer. Franklin; Paul S. Pruett. Columbia. and Joel R. Jensen. Franklin. all of Tenn., assignors to Electronic Data Systems Corporation. Plano. Tex.

Filed May 23. 1996. Ser. No. 652.870

Int. Cl.^{6} H04L *9/00*

U.S. Cl. 395—200.33 **14 Claims**

1. A computer network information communication system. comprising:

a client computer running an application program. the application program operable to generate a first call requesting information about the computer network. that information resident on a server computer;

a first dynamic link library function operable to receive and interpret the first call and to generate. from the first call. a second call:

a second dynamic link library function operable to receive the second call. and generate from the second call at least one

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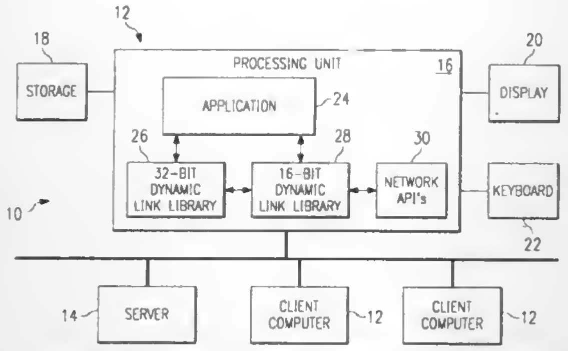


network application program interface call identifying the requested network information, the second dynamic link library function further operable to receive the requested network information from the server computer in response to the network application program interface call, process the requested network information, and return the processed network information to the first dynamic link library function;

the first dynamic link library function further operable to return the processed network information to the application program; and

wherein the first and second dynamic link library functions reside on the same computer.

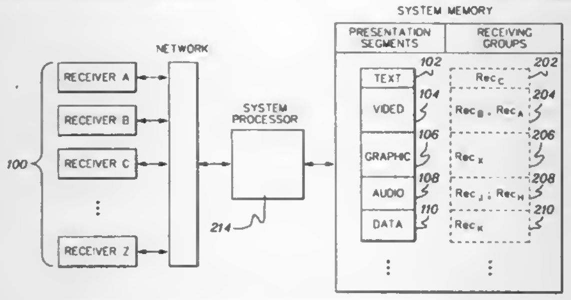
5,838,912
DISTRIBUTION OF DIGITALLY ENCODED PRESENTATIONS

Peter Poon, Somers, N.Y.; John Kalung Leung, Riverside, Conn., and Fred Tze-Keung Tong, Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 4, 1996, Ser. No. 701,854

Int. Cl.⁶ G06F *17/00*

U.S. Cl. 395—200.34 **55 Claims**



1. A system for distributing through a connectionless environment data representing a digitally encoded presentation, comprising:

means for receiving a request, issued by a receiver, for one segment of a plurality of predefined segments of said digitally encoded presentation;

means for creating a receiving group, said receiving group being designated to receive said one segment;

means for assigning said receiver to said receiving group;

means for multicasting said one segment to said receiving group subsequent to the passage of a predefined amount of time since the creation of said receiving group.

5,838,913
CONTROL MESSAGE TRANSMISSION IN TELECOMMUNICATIONS SYSTEMS

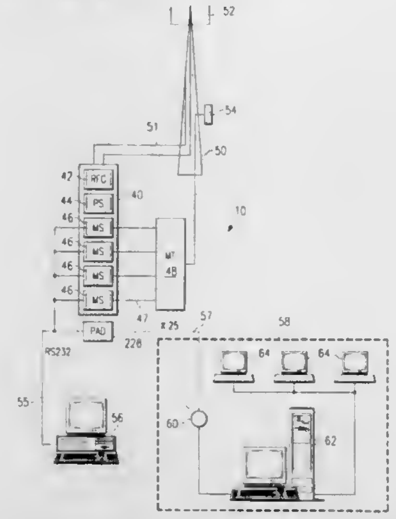
Martin Lysejko, Bagshot, and Guy A. Cooper, Slough, both of United Kingdom, assignors to DSC Communications Corporation, Plano, Tex.

Filed Nov. 16, 1995, Ser. No. 558,409

Claims priority, application United Kingdom, Jun. 2, 1995, 9510870

Int. Cl.⁶ H04Q *1/00*

U.S. Cl. 395—200.38 **12 Claims**



1. A communications interface for a telecommunications network station comprising:

a plurality of network elements,

a controller for controlling the plurality of network elements,

an internal bus interconnecting the controller and the network elements, the controller operating as a busmaster on the bus, each of the network elements operating as a slave on the bus,

a pool of buffers for temporary message storage, wherein the controller performs a polling function for temporarily storing a message received from the plurality of network elements over the internal bus in a buffer and/or for taking a message from a buffer for transmission to the plurality of network elements over the internal bus.

5,838,914
COLLABORATION SYSTEM FOR ALLOWING COMPUTER TO DRAW ANNOTATION IMAGES ON THE OUTPUT OF SELECTED PROGRAM AND REPLICATING THE ANNOTATION IMAGES ON DISPLAYS OF OTHER COMPUTERS

Allison A. Carleton, Lisle; Catherine M. FitzPatrick, Winfield; Theresa M. Pommier, Westmont, and Krista S. Schwartz, Batavia, all of Ill., assignors to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 473,852, Jun. 7, 1995, Pat. No. 5,781,727, which is a continuation of Ser. No. 35,092, Mar. 19, 1993, Pat. No. 5,649,104. This application Aug. 5, 1997, Ser. No. 906,370

Int. Cl.⁶ G06F *13/00*

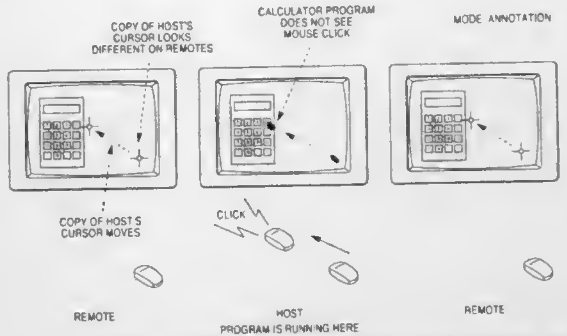
U.S. Cl. 395—200.34 **5 Claims**

1. A system for allowing multiple parties to collaborate, comprising:

a) multiple remote computers, at different locations, each:
  i) having a display, and
  ii) having storage space for programs;

b) means for linking the remote computers together using a network;

c) substantially identical remote program means running on each remote computer, and communicating with one host program running on a host computer:
  i) for allowing the user of each remote computer:


COPY OF HOST'S CURSOR LOOKS DIFFERENT ON REMOTES
CALCULATOR PROGRAM DOES NOT SEE MOUSE CLICK
MODE ANNOTATION
COPY OF HOST'S CURSOR MOVES
CLICK
REMOTE
HOST
PROGRAM IS RUNNING HERE
REMOTE

    A) to select and run a program stored in the storage space of any remote computer;
    B) to provide program input to the program selected; and
  ii) for:
    A) showing output of the program selected on the display of the remote computer;
    B) allowing the user of the remote computer to draw annotation images on the display of the user's remote computer; and
    C) selectively replicating the annotation images on the displays of other remote computers, and wherein one or more of the steps of i) and ii) are accomplished by a computer program which is distinct from the host program.

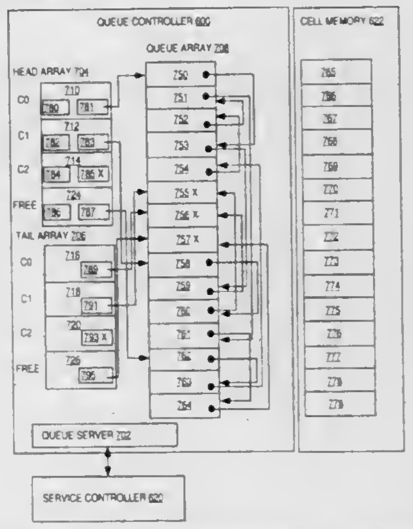
5,838,915
SYSTEM FOR BUFFERING DATA IN THE NETWORK HAVING A LINKED LIST FOR EACH OF SAID PLURALITY OF QUEUES

Daniel E. Klausmeier, Sunnyvale, and Satish P. Sathe, San Mateo, both of Calif., assignors to Cisco Technology, Inc., San Jose, Calif.

Continuation of Ser. No. 493,666, Jun. 21, 1995, abandoned. This application Nov. 17, 1997, Ser. No. 972,153

Int. Cl.⁶ G06F *13/00*

U.S. Cl. 395—200.45 **26 Claims**



1. A method for buffering digital information comprising:

A) establishing a plurality of linked lists including a linked list for each queue of a plurality of queues;

B) storing a data element that arrives on one of a plurality of logical connections by performing the steps of
  B1) determining a destination queue for the data element, said destination queue being one of said plurality of queues and being the queue corresponding to the logical connection on which said data element arrives;
  B2) placing the data element in a selected block in a memory corresponding to said destination queue;
  B3) updating the linked list that corresponds to the destination queue to reflect that the selected block is a last block in the destination queue; and

transmitting information from a specified queue, said specified queue having a head, the step of transmitting including the steps of:

inspecting a linked list of said plurality of linked lists that corresponds to said specified queue to determine a source block in said memory, wherein the source block is a block at the head of the specified queue;

transmitting a data element that is stored in the source block; and

updating the linked list associated with the specified queue to reflect that the source block is no longer at the head of the specified queue.

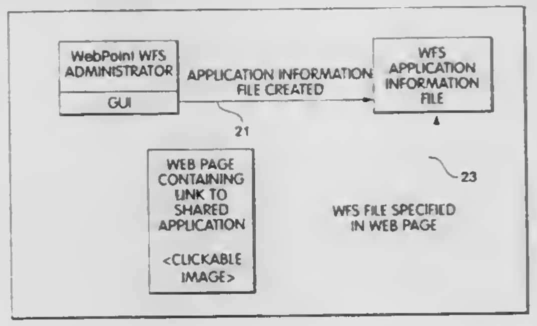
5,838,916
SYSTEMS AND METHODS FOR EXECUTING APPLICATION PROGRAMS FROM A MEMORY DEVICE LINKED TO A SERVER

Steven D. Domenikos, 54 Myrtle St., Millis, Mass. 02054, and George C. Domenikos, 100 Boatswain Way, #203, Chelsea, Mass. 02150

Continuation-in-part of Ser. No. 616,746, Mar. 14, 1996. This application Mar. 14, 1997, Ser. No. 818,665

Int. Cl.⁶ G01D *1/16*

U.S. Cl. 395—200.49 **17 Claims**


WebPoint WFS ADMINISTRATOR
GUI
APPLICATION INFORMATION FILE CREATED
WFS APPLICATION INFORMATION FILE
21
WEB PAGE CONTAINING LINK TO SHARED APPLICATION <CLICKABLE IMAGE>
23
WFS FILE SPECIFIED IN WEB PAGE

1. Method for allowing a client to execute an application program stored on a memory device linked to an HTTP server, comprising the steps of

mounting a remote file system containing the application program and being linked to the HTTP server,

monitoring the operating system to detect file system requests for files stored within said remote file system,

providing plural redirector elements for translating said file system requests into selected transport protocols, wherein at least one of said redirector elements includes an HTTP redirector for translating the file system requests into HTTP complaint signals, and

passing the file system requests to at least one of said redirector elements for translating the file system requests into signals for transmission across a network.

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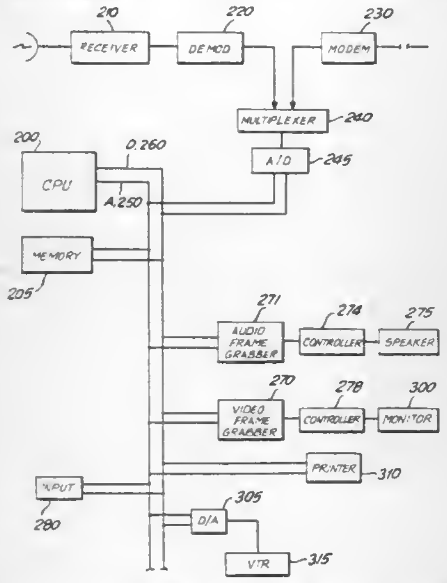
5,838,917
DUAL CONNECTION INTERACTIVE VIDEO BASED COMMUNICATION SYSTEM

Michael J. Paolini, Boca Raton, Fla., assignor to EagleView Properties, Inc., Delray Beach, Fla.

Continuation of Ser. No. 768,667, Sep. 18, 1996, abandoned, which is a continuation of Ser. No. 440,762, May 15, 1995, abandoned, which is a continuation-in-part of Ser. No. 173,491, Dec. 23, 1993, abandoned, which is a continuation of Ser. No. 221,331, Jul. 19, 1988, Pat. No. 5,276,866. This application Oct. 1, 1997, Ser. No. 941,728

Int. Cl.^{6} G06F *13/38*

U.S. Cl. 395—200.49 **11 Claims**



1. An apparatus for interactive video based communication comprising: a telephone based, multi-user access means for describing a request for information; a random access information storage means for storing plural information tracks; data processing means for receiving said request for information and selectively searching based on said request and generating identifying information indicating information tracks in said information storage means responsive to said request for information; a telephone based communication link means connected to a plurality of remotely located receivers for configuring said receivers for selective storage or display of identified information tracks; and transmitting means separately connected to said receivers for transmitting said identified information tracks in compressed video format to a plurality of said remotely located receivers, wherein said remotely located receivers include frame grabber means for selectively acquiring transmitted information tracks responsive to said search requests.

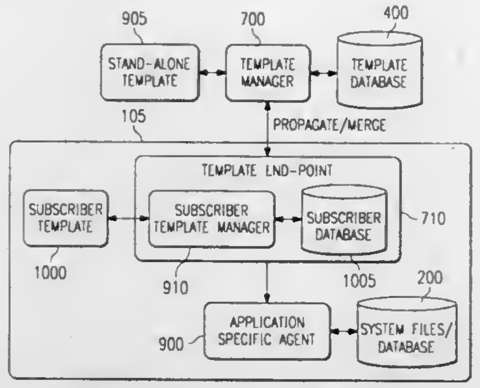
5,838,918
DISTRIBUTING SYSTEM CONFIGURATION INFORMATION FROM A MANAGER MACHINE TO SUBSCRIBED ENDPOINT MACHINES IN A DISTRUBUTED COMPUTING ENVIRONMENT

Neal R. Prager, Austin; Carey Lee Jung, Cedar Park, and Stephen Thomas Cochran, Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 169,574, Dec. 13, 1993, abandoned. This application Mar. 31, 1995, Ser. No. 414,960

Int. Cl.^{6} G06F *15/177*

U.S. Cl. 395—200.51 **16 Claims**



1. A method of distributing system configuration information from a manager machine to a set of one or more endpoint machines in a distributed computing environment to configure said set of endpoint machines, the manager machine supporting a template manager and a central configuration database in which system configuration information is stored in a generic configuration format and organized into a set of templates, and wherein at least one or more endpoint machines are configurable using system configuration information in a respective native configuration format that differs from the generic configuration format, said method comprising the steps of:

(a) in response to a subscription request from an endpoint machine identifying a template, copying the template manager to the endpoint machine to generate a subscriber template manager;

(b) propagating a portion of the central configuration database associated with the template from the manager machine to the endpoint machine to generate a subscriber database in which system configuration information is stored in the generic configuration format, wherein said system configuration information defines one or more of (1) user access rights and user privileges, said user access rights and user privileges including file read, file write and application execution; (2) file system access rights, and file system access rights including access to one or more specified file systems in a distributed computer system; (3) network connections, said network connections including a description of physical and logical connections between said one or more endpoint machines; and (4) printer availability; and

(c) propagating the system configuration information in the generic configuration format from the subscriber database to an application running on the endpoint machine.

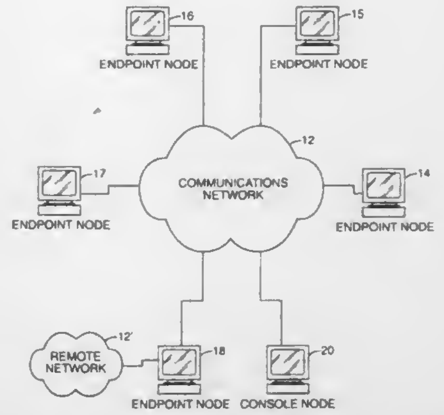
5,838,919
METHODS, SYSTEMS AND COMPUTER PROGRAM PRODUCTS FOR ENDPOINT PAIR BASED COMMUNICATIONS NETWORK PERFORMANCE TESTING

Peter James Schwaller; John Quillian Walker II; Steven Thomas Joyce, and Timothy Scott Huntley, all of Raleigh, N.C., assignors to Ganymede Software, Inc., Research Triangle Park, N.C.

Filed Sep. 10, 1996, Ser. No. 711,607

Int. Cl.^{6} G01R *31/00*

U.S. Cl. 395—200.54 **34 Claims**



1. A method for testing the performance of at communications network including a plurality of endpoint nodes comprising the steps of:

defining a test scenario including an endpoint node specific test protocol between a first endpoint node and an associated second endpoint node to simulate communications traffic therebetween to be tested;

providing the endpoint node specific test protocol to the first endpoint node;

determining a partner endpoint node test protocol from the endpoint node specific test protocol;

communicating the determined partner endpoint node test protocol over the network from the first endpoint node to the associated second endpoint node;

initiating executing the endpoint node specific test protocol;

wherein said network is a computer network;

wherein said defining step is preceded by the step of adding a console node residing on a computer;

wherein the first endpoint node and the second endpoint node reside on computers;

wherein said providing step includes the step of providing the endpoint node specific test protocol to the first endpoint node from the console node over the network;

wherein said initiating step is followed by the step of monitoring the performance of the network while the endpoint node specific test protocol is executed to obtain performance data;

wherein said first endpoint node and said second endpoint node define a first endpoint node pair between which said endpoint node specific test protocol is executed;

wherein said test scenario includes a second endpoint node specific test protocol associated with a second endpoint node pair to simulate communications traffic therebetween;

wherein said providing step includes the step of providing said second endpoint node specific test protocol to a first one of said second endpoint pair;

wherein said determining step includes the step of determining a second partner endpoint node test protocol from the second endpoint node specific test protocol;

wherein said communicating step includes the step of communicating the second partner endpoint node test protocol to the other one of the second endpoint pair from the first one of the second endpoint pair; and,

wherein said initiating step includes the step of initiating executing the second endpoint node specific test protocol.

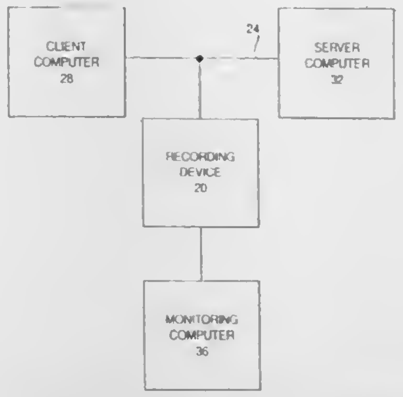
5,838,920
METHOD AND APPARATUS FOR IDENTIFYING TRANSACTIONS

James M. Rosborough, Lakewood, Colo., assignor to Advanced System Technologies, Inc., Englewood, Colo.

Continuation of Ser. No. 513,435, Aug. 10, 1995, Pat. No. 5,781,449. This application Jul. 18, 1997, Ser. No. 896,749

Int. Cl.^{6} G06F *17/00*

U.S. Cl. 395—200.54 **22 Claims**



1. A method for analyzing the transmission of a plurality of service packets along a communication line, comprising:

providing a communications data set including information relating an ordering of a collection of service packets, the service packets being communicated along the communication line, wherein the information includes start and stop times for each of a plurality of service requests that include the service packets;

selecting a first selected time interval;

comparing a time interval between the stop time of a first service request and the start time of a second service request with the first selected time interval to identify a first sequence of the service requests included in a first transaction;

selecting a second time interval different from the first selected time interval; and

comparing the time interval with the second selected time interval to identify a second sequence of the service requests included in a second transaction.

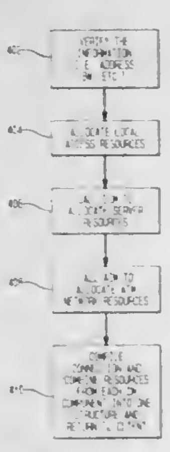
5,838,921
DISTRIBUTED CONNECTION MANAGEMENT SYSTEM WITH REPLICATION

Thomas H. Speeter, San Ramon, Calif., assignor to Silicon Graphics, Inc., Mountain View, Calif.

Filed Dec. 8, 1995, Ser. No. 569,056

Int. Cl.^{6} G06F *15/16*

U.S. Cl. 395—200.57 **12 Claims**



1. A distributed connection management system for an interactive multimedia network, the network comprising servers, one or more switching networks, and one or more local access networks having one or more neighborhoods, the system comprising:

a server connection manager for each server in the network to allocate and recover bandwidth resources between the server and the switching network;

a network connection manager for the switching network to allocate and recover bandwidth resources for the switching network;

a neighborhood connection manager for each neighborhood in the local access networks to allocate and recover bandwidth resources for the neighborhood, to determine a switching connection manager and said server connection manager needed to complete the connection, and to combine resources from said connection manager components to establish a network connection, said neighborhood connection manager comprising a master component and a slave component, wherein said slave component is a replication of said master

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component, and said slave component is accessed when said master component is unresponsive; and

means for requesting a connection across the network.

5,838,922

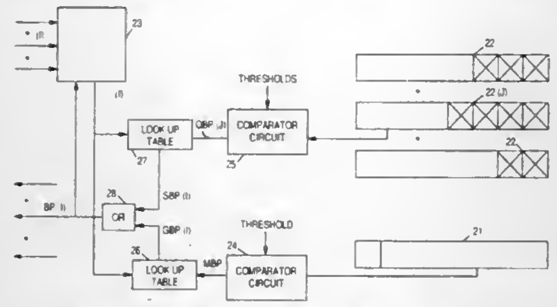
BACK PRESSURE ACCESS CONTROL SYSTEM FOR A SHARED BUFFER WITH ALLOCATION THRESHOLD FOR EACH TRAFFIC CLASS

Claude Galand, Cagnes/Mer; Aline Fichon, La Colle sur Loup; Pierre Austray, Nice, all of France, and Ilias Iliadis, Ruschlikon, Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 7, 1996, Ser. No. 660,318

Int. Cl.⁶ G06F *13/14;* **H04L** *12/54*

U.S. Cl. 395—200.62 **2 Claims**



1. An access control system for a data system including a memory system (**13**) capable of storing at least two different classes of data traffic, a plurality of input adapters (**10**) for data to be made available to said memory system, a plurality of output adapters (**15**) for receiving data from said memory system, storage control means (**14**) (i) for dynamically allocating locations in said memory system to queues assigned to particular output adapters, (ii) for monitoring the number of memory locations already allocated throughout the memory system and (iii) for monitoring the number of memory locations allocated to a particular output adapters, said access control system being characterized by having:

for each different class of traffic, means for defining allocation thresholds for data stored anywhere in said memory system;

for each different class of traffic, means for defining allocation thresholds for data stored in a queue previously allocated to a particular output adapter;

means (**23**) for identifying the traffic class and the target output adapter for data traffic available at a selected one of said input adapters;

means for generating a back pressure signal as a function of the class of the data traffic at said selected one of said input adapters and of whether or not defined allocation thresholds for the target output adapter have been equalled or exceeded; and

means for accepting the data traffic available at said selected input adapter only if no back pressure signal was generated.

5,838,923

METHOD AND SYSTEM FOR SYNCHRONIZING COMPUTER MAIL USER DIRECTORIES

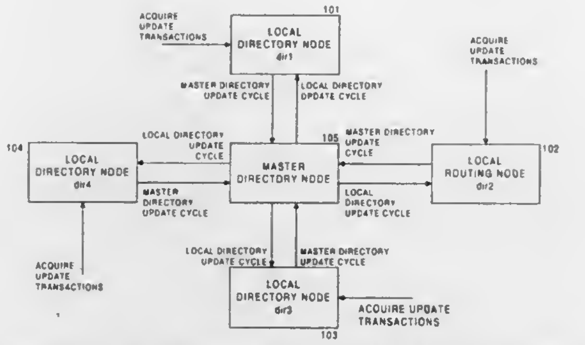
Duncan Wayne Lee, New Westminster, Canada, and Mark Ledsome, Seattle, Wash., assignors to Microsoft Corporation, Redmond, Wash.

Continuation of Ser. No. 81,444, Jun. 22, 1993, abandoned. This application Jul. 22, 1996, Ser. No. 686,176

Int. Cl.⁶ G06F *13/42*

U.S. Cl. 395—200.66 **40 Claims**

1. A method in a computer mail system for synchronizing a user directory stored in a responding directory node with a more current user directory stored in an originating directory node, the method comprising the steps of, for each of a plurality of consecutive synchronization cycles:


ACQUIRE UPDATE TRANSACTIONS
101
LOCAL DIRECTORY NODE dir1
MASTER DIRECTORY UPDATE CYCLE
LOCAL DIRECTORY UPDATE CYCLE
ACQUIRE UPDATE TRANSACTIONS
104
LOCAL DIRECTORY NODE dir4
LOCAL DIRECTORY UPDATE CYCLE
105
MASTER DIRECTORY NODE
MASTER DIRECTORY UPDATE CYCLE
102
LOCAL ROUTING NODE dir2
MASTER DIRECTORY UPDATE CYCLE
LOCAL DIRECTORY UPDATE CYCLE
LOCAL DIRECTORY UPDATE CYCLE
MASTER DIRECTORY UPDATE CYCLE
ACQUIRE UPDATE TRANSACTIONS
LOCAL DIRECTORY NODE dir3
ACQUIRE UPDATE TRANSACTIONS
103

acquiring in the originating directory node a plurality of directory update transactions for updating the contents of the user directory stored in the originating directory node;

assigning to each acquired directory update transaction a consecutive sequence number indicating an order of acquisition;

updating the contents of the user directory stored in the originating directory node based on the acquired directory update transactions;

selecting a series of two or more of the acquired directory update transactions for transmission to the responding directory node, the assigned sequence number of the first directory update transaction in the series being consecutive to an originating directory node synchronization number that stores the sequence number of a last confirmed directory update transaction, the assigned sequence numbers of all directory update transactions in the series being consecutive, such that each directory update transaction after the last confirmed directory update transaction is selected;

transmitting the selected series of directory update transactions from the originating directory node to the responding directory node;

receiving in the responding directory node at least one of the directory update transactions in the transmitted series of directory update transactions;

updating the contents of the user directory stored in the responding directory node by processing any directory update transactions received in the responding directory node whose sequence numbers are consecutive to each other and consecutive to a responding directory node synchronization number that stores the sequence number of a last processed directory update transaction;

transmitting from the responding directory node to the originating directory node a confirmation message indicating the largest consecutive sequence number of the directory update transactions received and processed in the responding directory node; and

upon receiving the transmitted confirmation message in the originating directory node, setting the originating directory node synchronization number to the sequence number indicated by the confirmation message thereby completing the synchronization of the user directory stored in the responding directory node with the user directory stored in the originating directory node,

such that the originating directory node transmits to the responding directory node in each synchronization cycle all directory update transactions acquired after the last confirmed directory update transaction, irrespective of whether these directory update transactions were previously transmitted, so that the responding directory node can receive all of these transactions in order even though some of these transactions may have been previously received in the responding directory node.

5,838,924

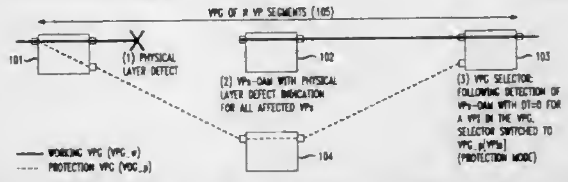
ASYNCHRONOUS TRANSFER MODE (ATM) CONNECTION PROTECTION SWITCHING APPARATUS AND METHOD

Jon Anderson, Brielle, N.J.; Curtis J. Newton, Medford, Mass., and Tai H. Noh, Manalapan, N.J., assignors to Lucent Technologies Inc, Murray Hill, N.J.

Filed Aug. 6, 1996, Ser. No. 689,175

Int. Cl.⁶ H01J *13/00*

U.S. Cl. 395—200.69 **37 Claims**


VPG OF n VP SEGMENTS (105)
101
(1) PHYSICAL LAYER DEFECT
102
(2) VPs-OAM WITH PHYSICAL LAYER DEFECT INDICATION FOR ALL AFFECTED VPs
103
(3) VPG SELECTOR: FOLLOWING DETECTION OF VPs-OAM WITH DT=0 FOR A VPI IN THE VPG, SELECTOR SWITCHED TO VPG_p[VPIs] (PROTECTION MODE)
104
WORKING VPG (VPG_w)
PROTECTION VPG (VPG_p)

1. A node for use in an asynchronous transfer mode (ATM) protection switching transmission system comprising:

means for defining virtual path groups (VPGs) within a virtual path identifier (VPI) address that indicates a destination node virtual path switching function;

means for mapping said VPGs to prescribed managed ATM transmission paths, the node being arranged to receive at least one working VPG (VPG_w) from at least one working ATM transmission path and at least one corresponding protection VPG (VPG_p) from at least one protection ATM transmission path;

means for defining each of said VPGs including a plurality of virtual paths having a corresponding plurality of VPI addresses with a common destination node virtual path switching function;

means for defining a VPI address, VPG association so that the VPI address definition is not changed;

means for detecting a defect in the at least one VPG_w; and

means for VPG_protection switching from receiving the at least one VPG_w having the defect and the VPI address being associated therewith from said at least one working ATM transmission path to receiving a corresponding VPG_p from said at least one protection ATM transmission path.

5,838,925

METHOD AND APPARATUS FOR TRANSMISSION OF COMPRESSED PICTURE DATA

Hiroki Kotani, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

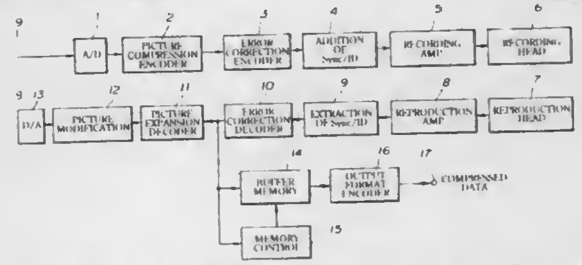
PCT No. PCT/JP95/01698, § 371 Date Apr. 15, 1996, § 102(e) Date Apr. 15, 1996, PCT Pub. No. WO96/07273, PCT Pub. Date Mar. 7, 1996

PCT Filed Aug. 25, 1995, Ser. No. 624,548

Claims priority, application Japan, Aug. 26, 1994, 6-202110

Int. Cl.⁶ H04N *7/48;7/50*

U.S. Cl. 395—200.77 **7 Claims**



1. A method for transmitting compressed picture data for carrying out in every frame transmission of picture data compressed using frame correlation, comprising the steps of:

(a) transmitting in every frame compressed picture data of a first kind and

(b) transmitting at the same time in the same frame compressed picture data of a second kind necessary for decoding said compressed picture data of said first kind.

5,838,926

DATA PROCESSING APPARATUS AND METHOD IN A NETWORK SYSTEM FOR CONNECTING A PLURALITY OF TERMINALS

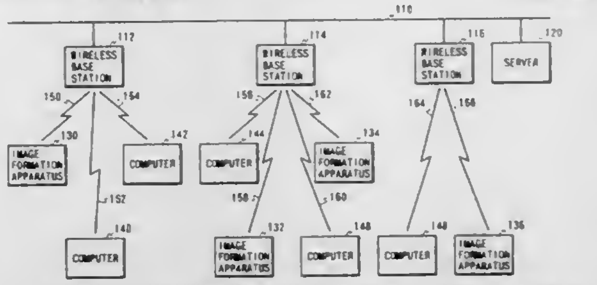
Yoichi Yamagishi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 10, 1997, Ser. No. 814,194

Claims priority, application Japan, Mar. 13, 1996, 8-083084

Int. Cl.⁶ G06F *15/16*

U.S. Cl. 395—200.79 **17 Claims**



1. A data process apparatus in a network system capable of connecting a plurality of terminals, said apparatus comprising:

judgment means for judging a setting position of said data process apparatus within the network system;

request means for requesting a data process;

sorting means for sorting the plurality of terminals based on the setting position judged by said judgment means:

display means for causing a display unit to display information representing the plurality of terminals, sorted by said sorting means, within the network system which terminal should perform the data process requested by said request means; and

indication means for indicating the terminal corresponding to the information displayed on the display unit by said display means, to perform the data process.

5,838,927

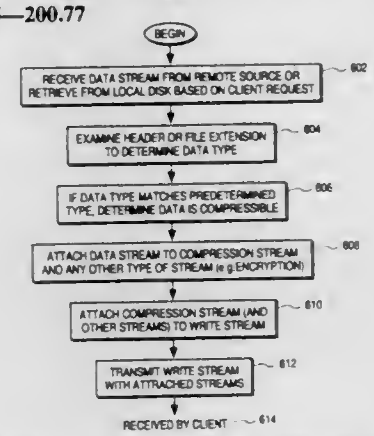
METHOD AND APPARATUS FOR COMPRESSING A CONTINUOUS, INDISTINCT DATA STREAM

William G. Gillon, Daly City, and Andrew McFadden, Cupertino, both of Calif., assignors to WebTV Networks, Mountain View, Calif.

Filed Nov. 22, 1996, Ser. No. 754,164

Int. Cl.⁶ G06F *13/38;15/17*

U.S. Cl. 395—200.77 **22 Claims**


BEGIN
RECEIVE DATA STREAM FROM REMOTE SOURCE OR RETRIEVE FROM LOCAL DISK BASED ON CLIENT REQUEST
602
EXAMINE HEADER OR FILE EXTENSION TO DETERMINE DATA TYPE
604
IF DATA TYPE MATCHES PREDETERMINED TYPE, DETERMINE DATA IS COMPRESSIBLE
606
ATTACH DATA STREAM TO COMPRESSION STREAM AND ANY OTHER TYPE OF STREAM (e.g. ENCRYPTION)
608
ATTACH COMPRESSION STREAM (AND OTHER STREAMS) TO WRITE STREAM
610
TRANSMIT WRITE STREAM WITH ATTRACHED STREAMS
612
RECEIVED BY CLIENT
614

1. In a networked computer system comprising a plurality of logically interconnected network servers and client systems, and wherein at least some of said network servers are comprised of a compression unit and at least some of said client systems are comprised of a data decompression unit, a method of transmitting and receiving a continuous, indistinct data stream so as to reduce latency between the time data is retrieved and the time the data is transmitted by a network server, the method comprising the steps of:

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in response to a request from a client system, retrieving at a network server data to be transmitted back to the client system;

as soon as data retrieval is initiated and without regard to retrieving a complete block of data, determining whether the retrieved data is compressible;

without regard to retrieving a complete block of data, attaching the retrieved data to a compression stream generated at the compression unit and essentially simultaneously transmitting the data as it is retrieved and attached to the compression stream, and continuing to retrieve the requested data, attach it to the compression stream and transmit the attached data without regard to any predetermined length of the data until all requested data has been sent; and

receiving the transmitted data as attached to the compression stream in the form of a continuous, indistinct data stream at a decompression unit of a client server, and detaching and decompressing the data as it is received without regard to any predetermined length of the data.

5,838,928

BACKGROUND COMMUNICATION SYSTEM HAVING I/O CONTROL BOARD AND LAN BOARD FITTED INTO A BUS EXPANSION SLOT SEPARATE FROM OTHER BUS EXPANSION SLOTS

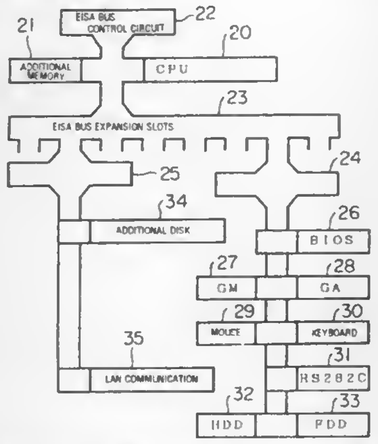
Shigehiko Terashima, Kawasaki, Japan, assignor to Fujitsu Limited, Japan

Filed Feb. 10, 1995, Ser. No. 386,664

Claims priority, application Japan, Sep. 19, 1994, 6-222874

Int. Cl.⁶ G06F *13/00;13/38*

U.S. Cl. 395—200.8 **6 Claims**



1. A background communication system for uploading and downloading files in background by using a personal computer having a processor and a plurality of bus expansion slots, comprising:

a single-tasking operating system running on the processor to execute a single real-time task;

a first bus expansion slot extended from the processor via a first bus expansion board, to which standard components for the personal computer are installed;

a second bus expansion slot extended from the processor through a second bus expansion board, to provide a bus connection separate from bus activities of the processor and said first bus expansion slot;

an additional external disk to store files transmitted by background communication;

an I/O control board to connect said external disk to the personal computer, said I/O control board being fitted in said second bus expansion slot;

a LAN board to connect a LAN cable to the personal computer, said LAN board being fitted in said second expansion slot together with said I/O control board, said second bus expansion slot allowing data to be transferred between said I/O control board and said LAN board during the uploading and downloading of the files in background, without interrupting operations of the processor working under said single-tasking operating system; and

network control means for controlling said bus expansion slots, said I/O control board and said LAN board.

5,838,929

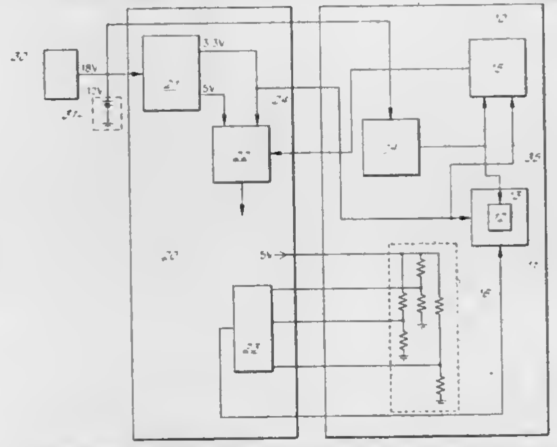
UPGRADE CPU MODULE WITH INTEGRAL POWER SUPPLY

Roy K. Tanikawa, Irvine, Calif., assignor to AST Research, Inc., Irvine, Calif.

Filed Jun. 1, 1995, Ser. No. 457,531

Int. Cl.⁶ G06F *13/00*

U.S. Cl. 395—282 **8 Claims**



1. A computer processing unit module which is insertable into a computer motherboard, said computer motherboard including circuitry which interfaces to said module, and said motherboard coupled to a first power supply which supplies power to the computer motherboard at a first voltage, the module comprising:

a computer processing unit;

a second power supply integral to the module and configured to receive power from the first power supply, said second power supply further configured to supply power to the module at a second voltage; and

a power good detection circuit integral to the module and configured to check the power supplied by said second power supply, said power good detection circuit providing a power good output signal indicating whether power supplied by said second power supply complies with at lest one predetermined requirement, wherein said power good signal is configured to be communicated to said computer motherboard so that said motherboard may take protective action when said power good signal indicates that the power supplied by said second power supply fails to meet said predetermined requirement.

5,838,930

METHOD AND APPARATUS FOR CONTROLLING A COMMAND CYCLE ON A BUS

Shigeru Harashima, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 29, 1996, Ser. No. 705,939

Claims priority, application Japan, Aug. 30, 1995, 7-221828

Int. Cl.⁶ G06F *13/00;13/14*

U.S. Cl. 395—287 **15 Claims**

1. A computer system for controlling access to I/O devices connected to a bus, comprising:

a main body having a first bus coupled to a central processor;

an extended unit connected to the main body through a connector, the extended unit having a second bus, the second bus for having commonly connected thereto a conventional I/O device and an enhanced I/O device for executing enhanced data transfer, said first bus having a plurality of I/O channels;

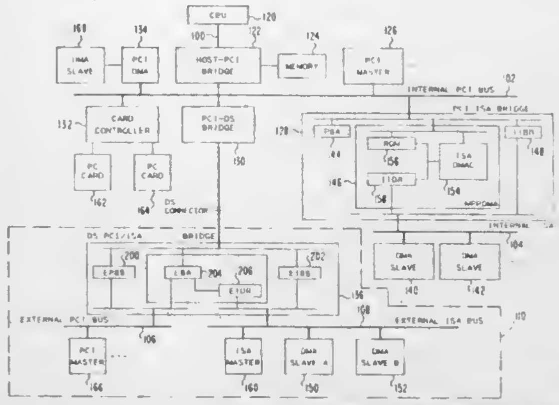
bridge means coupled between the first bus and the second bus;

a bus arbiter, coupled to the first bus, for arbitrating bus accesses by using each of a pair of a bus access request signal line and a bus access enable signal line assigned to bus agents on the first bus;

means for degating the conventional I/O device from an I/O channel to allow the enhanced I/O device to be read/write-accessed, the conventional I/O device having a first command cycle for read/write access;

means, coupled to the bridge means, for issuing an enhanced command cycle to the enhanced I/O device after the conventional I/O device is degated, the enhanced I/O device having a second command cycle capable of execution at a higher speed than the first command cycle; and

a DMA controller, coupled to the PCI bus, for executing direct memory access (DMA).



5,838,931

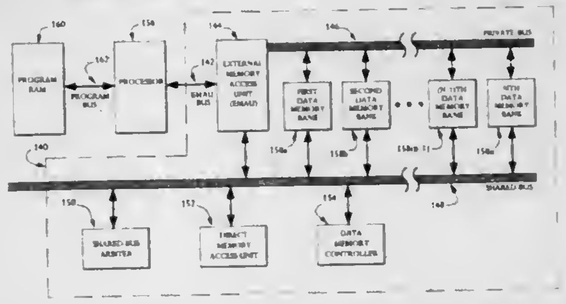
METHOD AND APPARATUS FOR ENABLING A PROCESSOR TO ACCESS AND EXTERNAL COMPONENT THROUGH A PRIVATE BUS OR A SHARED BUS

David Regenold, Mesa, Ariz., and Parviz Hatami, Santa Clara, Calif., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 353,172, Dec. 8, 1994, abandoned. This application May 9, 1997, Ser. No. 854,158

Int. Cl.⁶ G06F *11/30*

U.S. Cl. 395—308 **18 Claims**



1. An external component access apparatus for enabling a processor to access a first external component, said external component access apparatus comprising:

(a) an external component access unit;

(b) an external component access unit bus for coupling said external component access unit to said processor;

(c) a bidirectional private bus for coupling said external component access unit to said first external component; and

(d) a bidirectional shared bus for coupling said external component access unit to said first external component and for coupling a second external component to said first external component;

(e) wherein said processor instructs said external component access unit to access said first external component along one of said private bus and said shared bus; wherein said processor has sole access to said private bus to access said first external component; and further wherein said second external component is denied access to said first external component when said processor is accessing said first external component.

5,838,932

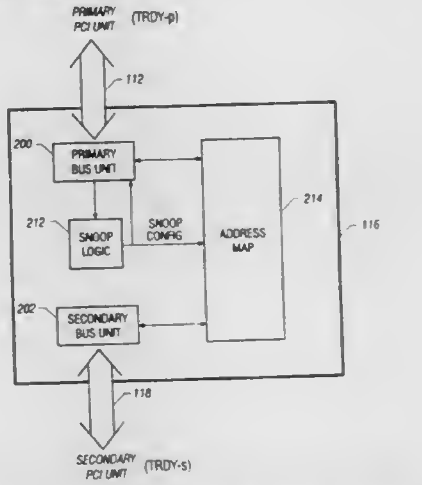
TRANSPARENT PCI TO PCI BRIDGE WITH DYNAMIC MEMORY AND I/O MAP PROGRAMMING

Khaldoun Alzien, Houston, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 774,122, Dec. 23, 1996, and a continuation-in-part of Ser. No. 773,037, Dec. 23, 1996. This application Jun. 30, 1997, Ser. No. 884,199

Int. Cl.⁶ G06F *17/30*

U.S. Cl. 395—308 **14 Claims**



1. A method of communicating a transaction between a device coupled to a first bus and a device coupled to a second bus, the devices having configuration registers for holding a programmable base address, the base address being written during a configuration cycle, each device individually responding to a configuration cycle, the method comprising the steps of:

(a) snooping configuration cycles communicated over the first bus, said configuration cycles including a base address;

(b) storing the base address contained in a configuration cycle responded to by a device attached to the first bus, the base address being stored in an address map;

(c) forwarding a transaction originating on the second bus to the first bus if the transaction is addressed to a device contained in the address map.

5,838,933

CONTROL CIRCUIT AND METHOD FOR A FIRST-IN FIRST-OUT DATA PIPELINE

Charles E. Molnar, Webster Groves, Mo., and Ian W. Jones, Palo Alto, Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Continuation-in-part of Ser. No. 140,654, Oct. 21, 1993, abandoned, and Ser. No. 140,655, Oct. 21, 1993, abandoned. This application Sep. 9, 1994, Ser. No. 303,919

Int. Cl.⁶ G06F *13/00*

U.S. Cl. 395—309 **23 Claims**

1. An apparatus, comprising:

a latch capable of latching a data element and capable of transitioning between a transparent state and an opaque state; and

a control circuit capable of announcing the availability of the data element to a data destination after the data element has propagated through the latch and without any latching or unlatching action of the latch prior to the announcement of the availability of the data element; the control circuit further capable of directing the latch to abort the latching of the data

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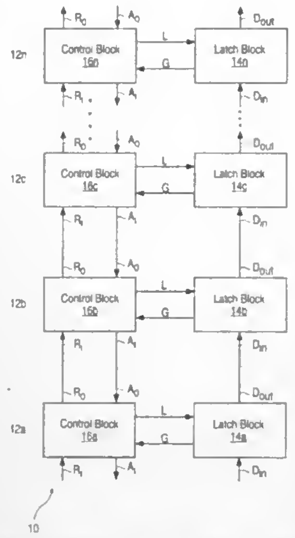


element in the event that the data destination provides permission to send a second data element.

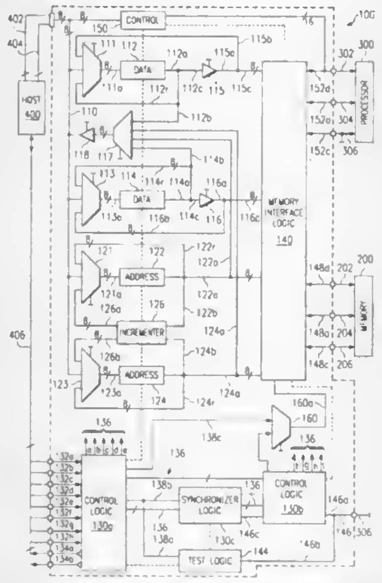
5,838,934
HOST PORT INTERFACE

Frederic Boutaud, Roquefort Les Pins, France; Jason Jones, Houston, Tex.; Marc Couvrat, St. Laurent du Var; Oliver Mougenot, Tourrettes Sur Loup, both of France, and Mansoor A. Chishtie, Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 7, 1995, Ser. No. 471,900

Int. Cl.⁶ G06F *13/00*

U.S. Cl. 395—309 **43 Claims**



1. A circuit for interfacing a processor with a host processor, comprising:

a memory associated with said processor that is selectively accessible by both said processors or by said host processor,

a plurality of storage devices selectively interconnectable with said memory and said host processor,

a logic circuit interconnected with said storage devices and processors for interconnecting at least a portion of said storage devices to said memory in response to signal from said processors,

a memory interface circuit interconnected between said memory and said logic circuit, and

a storage device for storing preselected control signals selectively interconnectable with said processors.

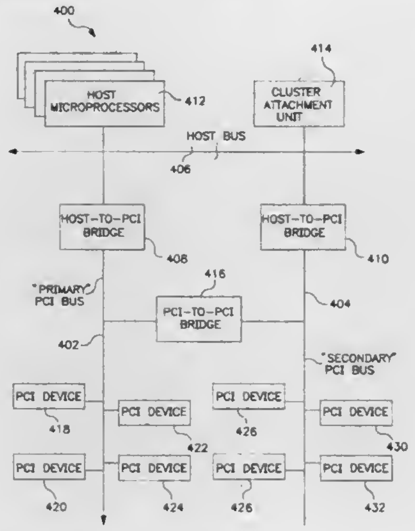
5,838,935
METHOD AND APPARATUS PROVIDING PROGRAMMABLE DECODE MODES FOR SECONDARY PCI BUS INTERFACES

Barry R. Davis, Scottsdale, and Scott Goble, Chandler, both of Ariz., assignors to Intel Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 490,775, Jun. 15, 1995, Pat. No. 5,734,847. This application Dec. 29, 1995, Ser. No. 580,838

Int. Cl.⁶ G06F *13/00*

U.S. Cl. 395—309 **4 Claims**



1. A computer system comprising:

a host processor;

a system bus connected to the host processor;

first and second PCI buses;

first and second host-to-PCI bridges respectively connecting said first and second PCI buses to said host bus; and

a PCI-to-PCI bridge interconnecting said first and second PCI buses.

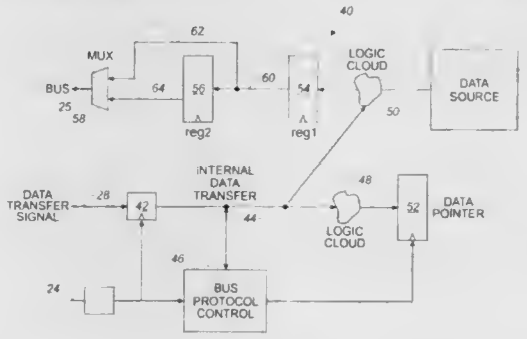
5,838,936
ELASTIC BUS INTERFACE DATA BUFFER

Vi Chau, Laguna Niguel; Sam Su, Rowland Hts., and Dan Tarr, Irvine, all of Calif., assignors to Emulex Corporation, Costa Mesa, Calif.

Filed Mar. 10, 1997, Ser. No. 813,271

Int. Cl.⁶ G06F *9/38*

U.S. Cl. 395—309 **16 Claims**



1. A method for transferring data from one device to another along a computer bus comprising:

(a) generating a clock signal having a plurality of clock cycles;

(b) receiving an external data transfer signal;

(c) creating an internal data transfer signal that begins after the beginning of the clock cycle following the external data transfer signal;

(d) transferring the data from the device to a first register in response to the presence of the internal data transfer signal;

(e) transferring existing data from the first register to a second register each time new data is transferred from the device to the first register;

(f) transferring data in the first register to the bus in response to the presence of an internal data transfer signal; and

(g) transferring data from the second register to the bus in response to the absence of an internal data transfer signal wherein data is transferred from the device to the first register and from the first to the second register when the internal data transfer signal is present at the time of an active edge of a clock cycle.

5,838,937
DATA TRANSMITTING/RECEIVING METHOD USING DISTRIBUTED PATH CONTROL IN DATA SWITCHING SYSTEM

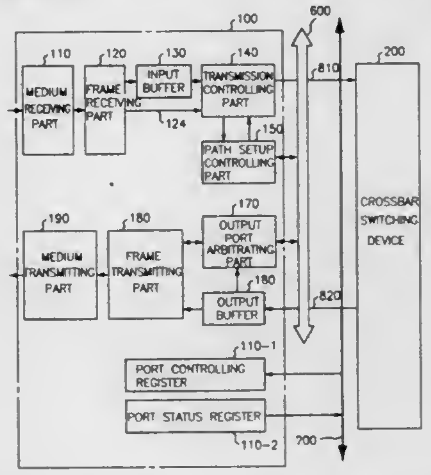
Hyeun Tae Lee, and Keun Woo Lee, both of Daejeon, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon, Rep. of Korea

Filed Nov. 20, 1996, Ser. No. 754,091

Claims priority, application Rep. of Korea, Dec. 23, 1995, 1995-55866

Int. Cl.⁶ H04Q *11/04;* **G06F** *13/00*

U.S. Cl. 395—311 **4 Claims**



4. A data transmitting/receiving method using a distributed path control in data switching system with a plurality of communication ports, said method comprising the steps of:

(1) storing data by discriminating a first code and a last code of a received data frame, and then reading and storing a frame header,

requesting a path setting and then initializing a trial number,

transmitting a setup request signal in a next time slot with a destination output port address if a polling address corresponds to an origination input port address, and thus transmitting the stored frame header through a data channel when the response signal received from a destination output port indicates an end of the path controlling operations and transmitting data stored in an input buffer to the end of a frame and requesting a path release at the polling address; and

2) releasing said path in response to a path release request when the port address corresponds to said destination output port address and if said destination output port is not in use and an output buffer is not in a full state, and a communication channel is available, indicating the end of the path controlling operation in a response bus in response to said path setup request and receiving a frame through the path to discriminate an initial code and last code of said frame, thereby transmitting said data, wherein said step (2) further comprises the steps of:

(3) examining a destination port address and determining a path control mode if said destination port address is the port address of an output port arbitration part, using said output port arbitration part;

(4) indicating an end of the path controlling operation in a response bus if said request of step (3) is a path release request,

asserting a crossbar strobe (CXB-STB) response bus signal to said crossbar switch control means,

returning to an initial state,

determining if said output port is in an output port using mode or if said output buffer is in a full state when said path control mode is a path setup request;

(5) indicating a busy state of said output port in said response bus signal when said output port of said step (4) is in use or said output buffer is in a full state, and so notifying said path setup controlling part of an origination input port.

returning to an initial state, and

determining if said output port is in a communication channel unavailable state when said output buffer is not in a full state;

(6) transmitting said response bus signal by indicating a path setup rejection if said communication in unavailable in said step (5),

transmitting said response bus signal by displaying an end of the path controlling operation to said path setup control part of said origination input port if said communication is available,

receiving data through the path set up by asserting said CXB-STB response bus signal to said crossbar switch control means and storing them to said output buffer, and

determining the type of data by reading data stored in said output buffer by said frame transmission part; and

(7) transmitting a frame initial code generation command to a medium transmitting part with data if said data is a frame initial code,

transmitting normal data to said medium transmitting part if said data are normal data, and

transmitting the frame last code generation command to said medium transmitting part when said end code of said frame is received.

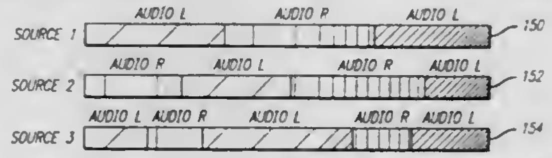
5,838,938
MULTIMEDIA USER INTERFACE EMPLOYING COMPONENTS OF COLOR TO INDICATE THE VALUES OF VARIABLES

Oliver F. Morgan, San Jose, Calif., assignor to Sony Electronics, Inc., San Jose, Calif.

Filed Feb. 15, 1995, Ser. No. 388,694

Int. Cl.⁶ G09B *5/06*

U.S. Cl. 395—328 **12 Claims**



1. In a computer controlled editing system for editing a multimedia production including a central processing unit (CPU) coupled to a display device and storage means coupled to said CPU, a method for displaying available source material for editing including the steps of:

storing a plurality of source logs corresponding to blocks of source materials for editing by said computer controlled editing system; and

displaying, on said display device, a timeline, wherein at least a section of one block corresponding to said source logs is manifested by a variable mapped to a component of color along at least a portion of said timeline, and said component of color varies continuously and gradually along the timeline as the value of said variable varies with time along the timeline.

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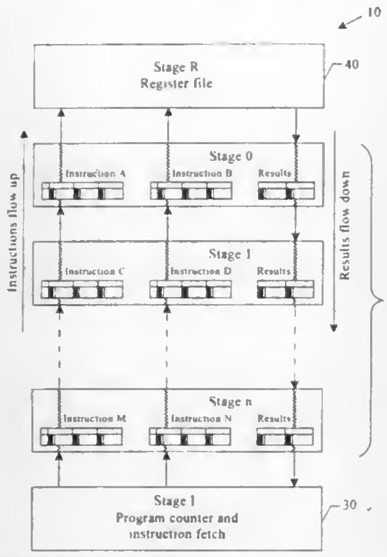
5,838,939
MULTI-ISSUE/PLURAL COUNTERFLOW PIPELINE PROCESSOR

Ivan E. Sutherland, Santa Monica, Calif., assignor to Sun Microsystems, Inc., Palo Alto, Calif.

Filed May 9, 1997, Ser. No. 853,970
Int. Cl.⁶ G06F *9/38*

U.S. Cl. 395—376 **25 Claims**



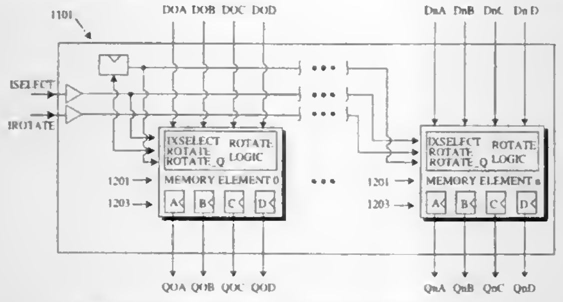
1. A computer system architecture comprising:
an instruction fetching unit;
a register file;
a pipeline connected between the instruction fetching unit and the register file, the pipeline including a plurality of stages:
each stage in the pipeline including:
a first instruction register for storing a first instruction,
a second instruction register for storing a second instruction, and
a first results register for storing results: and
wherein instructions are transferred in a first direction from stage to stage, and results are transferred in an opposite direction from stage to stage.

5,838,940
METHOD AND APPARATUS FOR ROTATING ACTIVE INSTRUCTIONS IN A PARALLEL DATA PROCESSOR

Sunil Savkar, New York, N.Y.; Michael C. Shebanow, Plano, Tex.; Gene W. Shen, Mountain View, and Farnad Sajjadian, Sunnyvale, both of Calif., assignors to Fujitsu Limited, Japan

Continuation of Ser. No. 457,049, Jun. 1, 1995, abandoned. This application Sep. 8, 1997, Ser. No. 926,185
Int. Cl.⁶ G06F *9/40*

U.S. Cl. 395—392 **6 Claims**



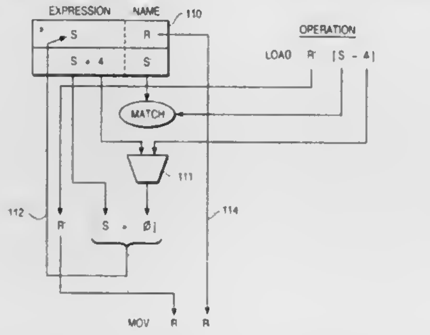
1. In a parallel processing microprocessor having a set of sequentially executable instructions stored in a plurality of addressable storage elements, a method for coordinating the issue of the instructions comprising:
simultaneously fetching a first set of instructions comprising a first plurality of executable instructions in order from the addressable storage elements, the order defined as a first physical memory order;
storing the fetched first set of instructions in parallel in the order received from the addressable storage elements;
sorting the stored first set of instructions into a first issue order;
issuing at least one executable instruction of the first set of executable instructions for execution with a priority in accordance with the first issue order;
re-sorting a remaining number of non-issued executable instructions of the first set of executable instructions into the physical memory order;
simultaneously fetching a second set of executable instructions comprising a second plurality of executable instructions from the storage elements;
storing the second set of executable instructions in parallel in physical memory order;
merging the re-sorted non-issued executable instructions of the first set of executable instructions with the second set of executable instructions;
re-ordering the merged executable instructions into a second physical memory order; and
sorting the re-ordered executable instructions into a second issue order prior to execution.

5,838,941
OUT-OF-ORDER SUPERSCALAR MICROPROCESSOR WITH A RENAMING DEVICE THAT MAPS INSTRUCTIONS FROM MEMORY TO REGISTERS

Robert C. Valentine, Qiryat Tivon; Gad S. Sheaffer, Haifa; Ronny Ronen, Haifa; Ilan Spillinger, Haifa, and Adi Yoaz, Haifa, all of Israel, assignors to Intel Corporation, Santa Clara, Calif.

Filed Dec. 30, 1996, Ser. No. 774,659
Int. Cl.⁶ G06F *9/00;9/318*

U.S. Cl. 395—393 **16 Claims**



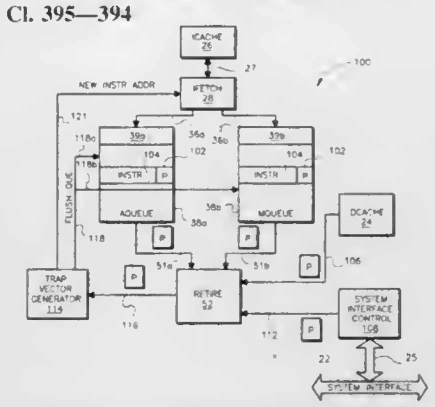
13. A data processing system which includes a processor coupled to a memory system, the processor having a renamer that operates on an operation stream, the renamer comprising:
a bi-directional associative memory (BAM) having at least a first entry and a second entry, the first and second entries storing representations of first and second operations, respectively, each representation being stored as an expression that points to a location in the memory system and a name that is a register which holds the contents of the location;
renaming logic that iteratively accesses the BAM to convert a memory LOAD operation into a register-to-register move operation, a first access matching a component of an expression of the memory LOAD operation with the name of the second operation stored in the second entry of the BAM, the expression of the memory LOAD operation being renamed using the expression of the second operation, a second access matching the renamed expression of the memory load operation with the expression of the first operation such that the renamed expression is renamed with the name of the first operation.

5,838,942
PANIC TRAP SYSTEM AND METHOD

Gregg Lesartre, Fort Collins, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 1, 1996, Ser. No. 609,807
Int. Cl.⁶ G06F *9/00*

U.S. Cl. 395—394 **31 Claims**



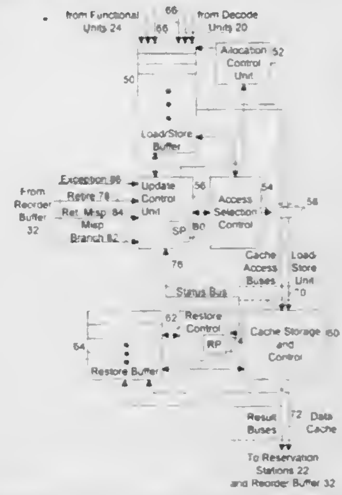
8. A system for recovering from inaccurate results produced from out of order execution of instructions in a processor of software, the system comprising:
first means for collecting and executing said instructions out of order;
second means, associated with said first means, for recognizing an architecturally incorrect execution of an instruction and asserting a panic trap indicator associated with said instruction, said asserted panic trap indicator being indicative of said incorrect execution, said panic trap indicator being a nonarchitectural hardware signal that is invisible to said software; and
third means, operative when retiring said instruction after execution, for recognizing said asserted panic trap and for recommencing fetching beginning with said invalid instruction.

5,838,943
APPARATUS FOR SPECULATIVELY STORING AND RESTORING DATA TO A CACHE MEMORY

Hebbalalu Suryaprakash Ramagopal, and Rajiv M. Hattangadi, both of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Mar. 26, 1996, Ser. No. 621,958
Int. Cl.⁶ G06F *9/38*

U.S. Cl. 395—394 **40 Claims**



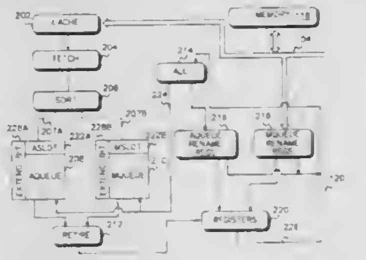
1. An apparatus for performing speculative stores in a microprocessor, comprising:
a first buffer configured to store a plurality of store memory accesses;
a first control unit coupled to said first buffer, wherein said first control unit is configured to select at least one of said plurality of store memory accesses for cache access, and wherein said one of said plurality of store memory accesses is speculative;
a cache coupled to receive said one of said plurality of store memory accesses, wherein said cache is configured to read first data from a cache line accessed by said one of said plurality of store memory accesses, and wherein said cache is further configured to store second data corresponding to said one of said plurality of store memory accesses into said cache line subsequent to reading said first data; and
a second buffer coupled to said cache, wherein said second buffer is configured to store said first data;
wherein said first control unit is configured to receive an indication that said one of said plurality of store memory accesses is incorrectly executed, and wherein said first control unit is configured to convey said one of said plurality of store memory accesses to said cache in response to said indication, and wherein said cache is configured to store said first data into said cache line in response to said indication, whereby said first data is restored to said cache line when said one of said plurality of store memory accesses is incorrectly executed.

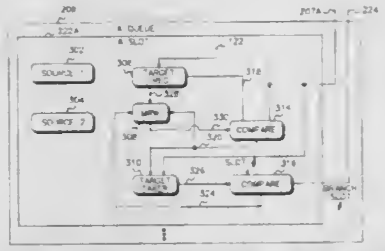
5,838,944
SYSTEM FOR STORING PROCESSOR REGISTER DATA AFTER A MISPREDICTED BRANCH

Donald Kipp; Gregg Lesartre; Samuel David Naffziger, and Jonathan P. Lotz, all of Fort Collins, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 31, 1996, Ser. No. 693,825
Int. Cl.⁶ G06F *9/302*

U.S. Cl. 395—394 **12 Claims**





1. A system for facilitating recovering most recent writer status when correcting for a mispredicted branch in a processor of a computer system that executes instruction out of order, said system comprising:
a sort system within said processor for storing instructions to be executed in an order said instructions are fetched from a memory of said computer system;
a queue comprising a plurality of slots for receiving instructions from said sort system, each said slot comprising
a target register for receiving a target register number of a register for receiving the results of an instruction stored in said slot,
a most recent writer status bit for storing an indication that an instruction stored in said slot is the last instruction in said queue to write to said target register number.

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a target taker register for receiving a target taker slot number of a second instruction that replaces said instruction in said slot as a most recent writer,

a first compare circuit for comparing said target register number to a second target register number received when a second instruction is being inserted into said queue, and for storing, into said target taker register, a slot number of said second instruction, when said compare circuit indicates that said target register number equals said second target register number,

a second compare circuit for receiving a slot number of a mispredicted branch and for comparing said slot number of said mispredicted branch to said target taker slot number, and for setting said most recent writer status bit when said second compare circuit indicates that said target taker slot number is greater than said slot number of said mispredicted branch.

5,838,945

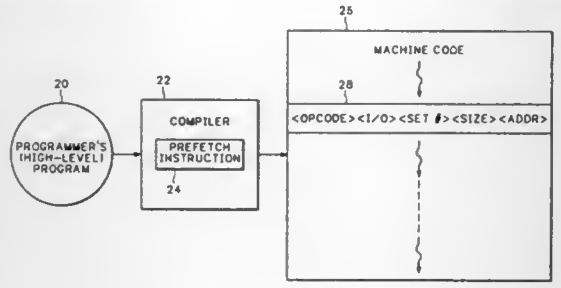
TUNABLE SOFTWARE CONTROL OF HARVARD ARCHITECTURE CACHE MEMORIES USING PREFETCH INSTRUCTIONS

David R. Emberson, Santa Cruz, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Continuation of Ser. No. 499,312, Jul. 7, 1995, abandoned. This application Oct. 17, 1997, Ser. No. 953,220

Int. Cl.^{6} G06F *9/22*

U.S. Cl. 395—376 **16 Claims**


20
PROGRAMMER'S (HIGH-LEVEL) PROGRAM
22
COMPILER
PREFETCH INSTRUCTION
24
25
MACHINE CODE
28
<OPCODE><I/O><SET #><SIZE><ADDR>

1. A method for use by a computer, said method for prefetching information which is either data or instructions from a main memory to a cache memory including a data cache set and an instruction cache set, comprising the steps of:

executing a prefetch command including prefetch instructions which includes an address field indicating the address of said information in said main memory and a variable instruction/data field for specifying what type of information is to be retrieved from said main memory;

deciding whether said information is data or instructions and filling said instruction/data field with a data/instruction value;

accessing said information in said main memory;

if in said deciding step it is decided that said information is data, after retrieving said data, sending said data to said data cache set as specified by said data/instruction field; and

if in said deciding step it is decided that said information is instruction, after retrieving said instruction, sending said data to said instruction cache set as specified by said data/instruction field.

5,838,946

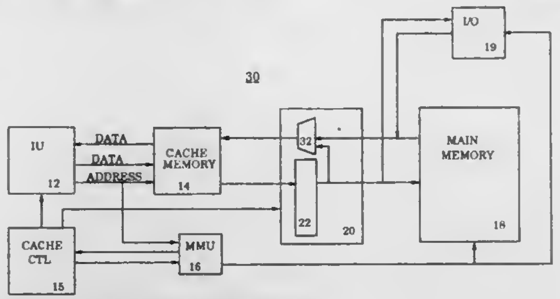
METHOD AND APPARATUS FOR ACCOMPLISHING PROCESSOR READ OF SELECTED INFORMATION THROUGH A CACHE MEMORY

Joseph Anthony Petolino, Jr., Palo Alto, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Continuation of Ser. No. 236,679, May 2, 1994, abandoned, which is a continuation of Ser. No. 931,906, Aug. 18, 1992, abandoned, which is a continuation of Ser. No. 504,634, Apr. 14, 1990, abandoned. This application Sep. 5, 1995, Ser. No. 523,217

Int. Cl.^{6} G06F *12/12*

U.S. Cl. 395—461 **19 Claims**



1. A computer system comprising:

a device for providing information;

a cache for storing information;

a buffer coupled to said cache;

a processor for issuing a read request identifying requested information available from one of said cache and said device for providing information;

a device for determining whether the requested information is available from said cache, and, if not available from said cache, for determining whether the requested information is of a first type or a second type; and

a device, responsive to a determination that the requested information is not available from said cache and is of a second type, for reading the requested information, in sequence, by

transferring selected information from said cache into the buffer,

transferring the requested information from said device for providing information into said cache,

transferring the requested information from said cache to said processor, and

transferring the selected information from said buffer back into said cache.

5,838,947

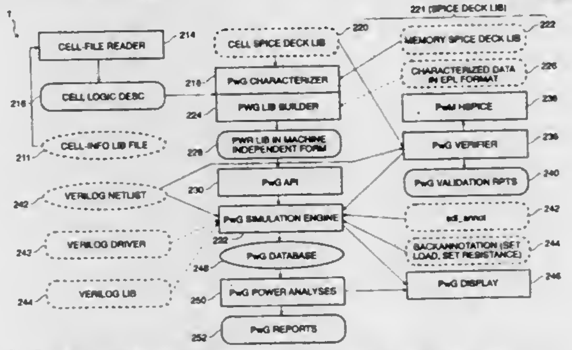
MODELING, CHARACTERIZATION AND SIMULATION OF INTEGRATED CIRCUIT POWER BEHAVIOR

Harish K. Sarin, Fremont, Calif., assignor to Synopsys, Inc., Mountain View, Calif.

Filed Apr. 2, 1996, Ser. No. 633,836

Int. Cl.^{6} G06F *9/455*

U.S. Cl. 395—500 **20 Claims**



1. In a programmed computer, a method of predicting power behavior of a circuit, said method comprising the steps of:

providing data for calculating power in a block;

generating a power object for said block by condensing said data according to a power dissipation model; and

simulating functional behavior for said block and calculating from said functional behavior actual power consumed by said block within said circuit from said power object, wherein said actual power includes effects of output load switching.

5,838,948

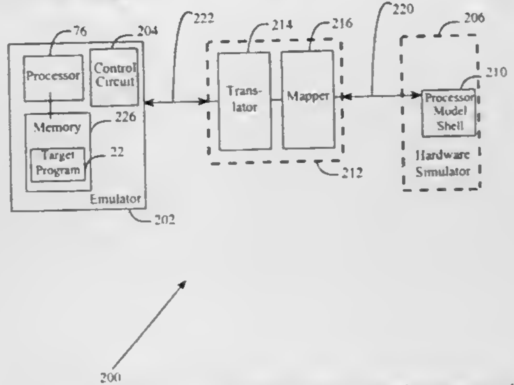
SYSTEM AND METHOD FOR SIMULATION OF COMPUTER SYSTEMS COMBINING HARDWARE AND SOFTWARE INTERACTION

Geoffrey J. Bunza, Beaverton, Oreg., assignor to Eagle Design Automation, Inc., Beaverton, Oreg.

Filed Dec. 1, 1995, Ser. No. 566,401

Int. Cl.^{6} G06F *9/455*

U.S. Cl. 395—500 **62 Claims**



1. A system for testing and analyzing electronic systems, including a target microprocessor and simulated target circuitry, and accompanying target program to be executed on the target microprocessor, the system comprising:

a memory storing a plurality of computer instructions, said computer instructions including the target program;

a processor emulator employing a hardware device for emulating the target microprocessor, said processor emulator coupled to said memory to execute said computer instructions;

a hardware simulator coupled to said processor emulator to simulate the target circuitry; and

a communications interface to control communication between said processor emulator and said hardware simulator, said processor emulator communicating with said memory to receive said computer instructions from said memory, and said processor emulator communicating with said hardware simulator using said communications interface only when an event requires interaction of the target program with the target circuitry.

5,838,949

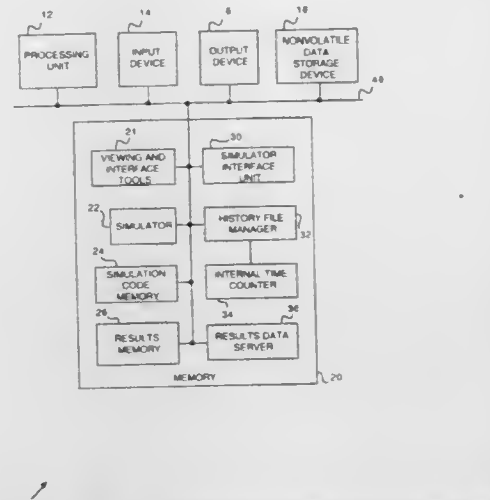
SYSTEM AND METHOD FOR EXECUTION-SEQUENCED PROCESSING OF ELECTRONIC DESIGN SIMULATION RESULTS

Jean André Hassoun, Cupertino, Calif., assignor to Design Acceleration Inc., San Jose, Calif.

Filed Dec. 28, 1995, Ser. No. 579,696

Int. Cl.^{6} G06F *9/455*

U.S. Cl. 395—500 **29 Claims**



1. A computer-implemented method for execution-sequenced processing of electronic design simulation results comprising the steps of:

receiving a set of electronic design simulation results generated by an electronic design simulator, each simulation result comprising a result value that corresponds to a result identifier and a simulation-time value;

generating a first graphical history that indicates a sequence of simulation result value transitions that occurred during the execution of electronic design simulation code associated with a single simulation-time value; and

generating a second graphical history that indicates final simulation result values generated from a final iterative execution of a set of simulation code statements.

5,838,950

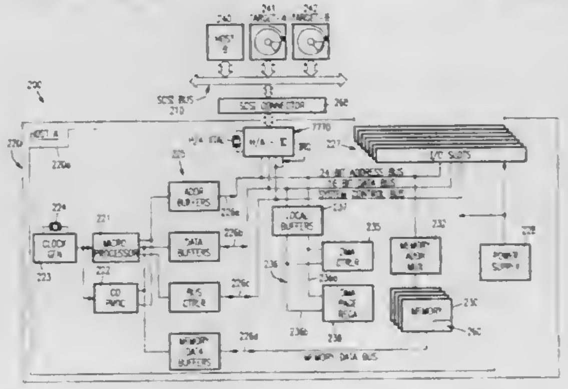
METHOD OF OPERATION OF A HOST ADAPTER INTEGRATED CIRCUIT

Byron Arlen Young, Palo Alto, and Paul von Stamwitz, Mountain view, both of Calif., assignors to Adaptec, Inc., Milpitas, Calif.

Division of Ser. No. 964,532, Oct. 15, 1992, Pat. No. 5,659,690. This application Jun. 7, 1995, Ser. No. 486,096

Int. Cl.^{6} G06F *13/24;13/00*

U.S. Cl. 395—500 **8 Claims**



1. A method of operation of a host adapter integrated circuit connected between a host computer bus and another I/O bus, said method comprising:

loading a control block including a command for an operation of said host adapter integrated circuit on said another I/O bus in a control block array of said host adapter integrated circuit by a host adapter driver executing on said host computer;

loading an address for said control block in a hardware queue-in first in first out memory circuit, hereinafter queue-in FIFO, contained within said host adapter integrated circuit; and

changing a value of a queue-in FIFO counter contained within said host adapter integrated circuit upon loading of said address in said queue-in FIFO, and upon removing said address from said queue-in FIFO.

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5,838,951

WAFER MAP CONVERSION METHOD

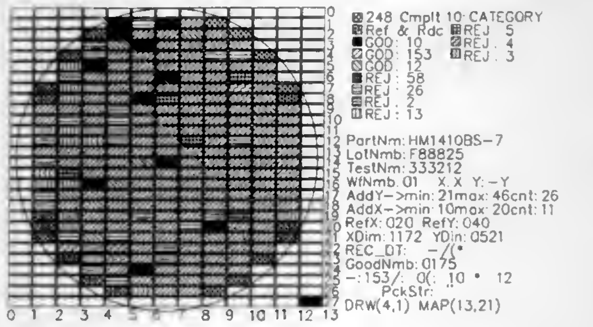
Chee Jung Song, Seoul, Rep. of Korea, assignor to ANAM Industrial Co., Lte, Seoul, Rep. of Korea, and AMKOR Electronics, Inc., Chandler, Ariz.

Filed Aug. 28, 1996, Ser. No. 704,477

Claims priority, application Rep. of Korea, Feb. 29, 1996, 96-5343

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—500 **13 Claims**



1. A wafer map conversion method comprising:

preparing a wafer map format file including a header portion recorded with basic information about a wafer and a data portion recorded with category grades of dies of the wafer;

converting the wafer map format file to create a converted file by translating the wafer map format file, the converted file including a variety of information about the wafer recorded by items and category grades and actual positions of the dies recorded in accordance with the type of the wafer; and

forming, using the converted file, a processing mode which displays category grades and actual positions of the dies, and information about the wafer and dies.

5,838,952

EMULATOR APPARATUS TO BREAK RUNNING PROGRAM WHEN VARIABLE IS READ WITHOUT BEING INITIALIZED

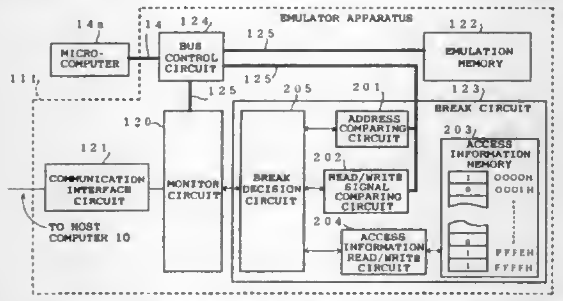
Masahiro Okano, Hyogo, and Eisuke Shimomura, Tokyo, both of Japan, assignors to Mitsubishi Electric Semiconductor Software Co., LTD., Hyogo, and Mitsubishi Denki Kabushiki Kaisha, Tokyo, both of Japan

Filed Nov. 12, 1996, Ser. No. 747,049

Claims priority, application Japan, May 28, 1996, 8-133765

Int. Cl.^{6} G06F *9/455;11/00*

U.S. Cl. 395—500 **13 Claims**



1. An emulator apparatus operating a microcomputer by an emulation program, the emulator apparatus comprising:

read/write access deciding means connected to system buses of the microcomputer for determining whether the emulation program performs a read access or a write access to a memory address of the microcomputer while the emulation program is executing;

access information storing means for, when the read/write access deciding means determines that the emulation program performs a write access to a memory address of the microcomputer while the emulation program is executing, correlating information indicating the presence of the write access with the write-accessed memory address of the microcomputer and storing the information; and

break means for breaking execution of the emulation program when the read/write access deciding means determines that the emulation program performs a read access to a memory address of the microcomputer, and the access information storing means does not contain information indicating the presence of a write access to the read-accessed memory address of the microcomputer.

5,838,953

INFORMATION PROCESSING APPARATUS

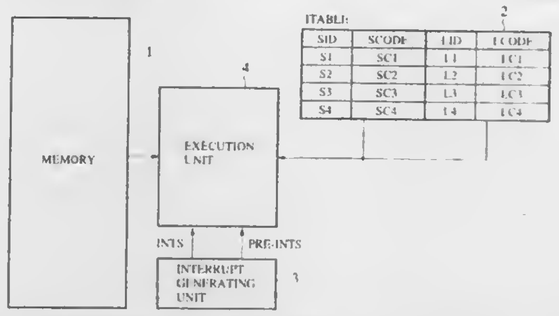
Takahiro Tokuyoshi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 13, 1997, Ser. No. 800,172

Claims priority, application Japan, Feb. 13, 1996, 8-025299

Int. Cl.^{6} G06F *9/455*

U.S. Cl. 395—500 **3 Claims**



2. An information processing apparatus comprising:

a memory for storing an instruction stream which is constituted by instructions having instruction identifiers including a plurality of flag instruction identifiers and a plurality of flag-less instruction identifiers and is required for an instruction simulation, and is analyzed before an instruction simulation is started, and in which a flag instruction identifier of an instruction whose flag operation procedure can be omitted is changed into a flag-less instruction identifier;

an instruction code storage unit for storing the flag instruction identifiers of the instructions and flag instruction codes corresponding to the respective flag instruction identifiers, and the flag-less instruction identifiers of the instructions and flag-less instruction codes corresponding to the flag-less instruction identifiers;

a peripheral simulator, serving as a simulator for a peripheral device, for generating an interrupt signal, and generating a predictive interrupt signal one instruction cycle before interruption occurs on the basis of a prediction result obtained by predicting a timing at which interruption occurs by analyzing the instruction stream stored in said memory before the instruction simulation is started;

an execution unit for sequentially reading the instructions from said memory, extracting the instruction identifiers of the read instructions, reading the instuction codes corresponding to the extracted instruction identifiers from said instruction code storage unit, performing an execution process to the instructions on the basis of the read instruction codes, and when a predictive interrupt signal is generated by said peripheral simulator and an instruction executed immediately after the predictive interrupt signal is generated has a flag-less instruction identifier, then performing an execution process to the instruction executed immediately after according to a flag instruction code and performing an execution process to an interrupt process procedure on the basis of the interrupt signal generated by said interrupt generating unit; and

a bus simulator, to which said memory, said peripheral simulator, and said execution unit are connected to perform input control thereof, for giving the predictive interrupt signal generated by said peripheral simulator to said execution unit.

5,838,954

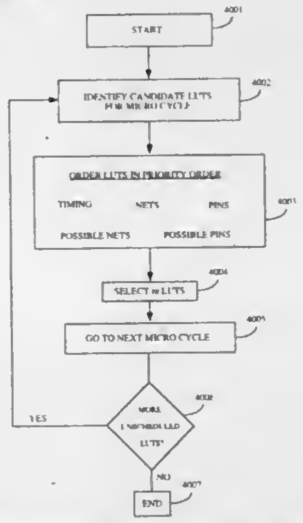
COMPUTER-IMPLEMENTED METHOD OF OPTIMIZING A TIME MULTIPLEXED PROGRAMMABLE LOGIC DEVICE

Stephen M. Trimberger, San Jose, Calif., assignor to Xilinx, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 516,910, Aug. 8, 1995, Pat. No. 5,701,441. This application Jul. 9, 1997, Ser. No. 890,710

Int. Cl.^{6} G06F *17/50*

U.S. Cl. 395—500 **4 Claims**



1. A computer-implemented method of optimizing a design in a time multiplexed programmable logic device comprising:

(a) identifying a micro cycle;

(b) identifying all look-up tables (LUTs) from a list of LUTs of said design that may be scheduled in said micro cycle;

(c) ordering said LUTs in priority order;

(d) selecting the M LUTs with the highest priority, wherein M is less than or equal to the number of real LUTs in said programmable logic device;

(e) labeling said M LUTs with the current micro cycle number;

(f) removing said M LUTs from said list;

(g) identifying the next micro cycle; and

(h) if un-labelled LUTs exist, then repeating (a)–(h), otherwise exiting said computer-implemented method.

5,838,955

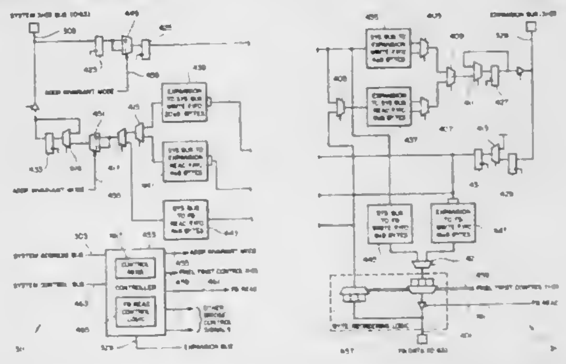
CONTROLLER FOR PROVIDING ACCESS TO A VIDEO FRAME BUFFER IN SPLIT-BUS TRANSACTION ENVIRONMENT

Brian A. Childers, Santa Clara, and Eric A. Baden, Saratoga, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed May 3, 1995, Ser. No. 434,197

Int. Cl.^{6} G06F *15/16:13/00*

U.S. Cl. 395—503 **8 Claims**



1. In a system comprising a requesting agent coupled to a system bus that comprises an address bus, control lines for indicating a requested transfer type, a data bus, address bus arbitration control lines and data bus arbitration control lines, the system further including a system bus arbiter coupled to the system bus for resolving competing requests for access to the address bus and for separately resolving competing requests for access to the data bus, a graphics controller for enabling the requesting agent to access a frame buffer, the graphics controller comprising:

memory means, responsive to a first control signal, for storing data received from the frame buffer, the memory means being further responsive to a second control signal for supplying the stored data to the data bus; and

control means, coupled to the system bus and to the memory means, comprising:

means for receiving a frame buffer read request from the requesting agent;

means for initiating a frame buffer read operation in accordance with parameters contained in the received frame buffer read request;

means for requesting access to the data bus;

means for generating the first control signal in response to data associated with the frame buffer read request becoming available at an output of the frame buffer; and

means for generating the second control signal in response to the requested access to the data bus being granted.

5,838,956

CLOCK GENERATING CIRCUIT

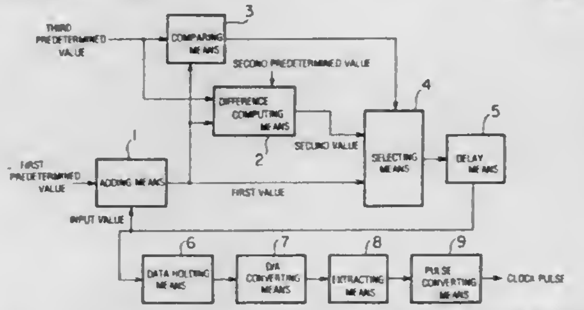
Toshio Kawasaki, and Shigemi Alzawa, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Mar. 25, 1997, Ser. No. 824,364

Claims priority, application Japan, Sep. 4, 1996, 8-233521

Int. Cl.^{6} G06F *1/04*

U.S. Cl. 395—555 **14 Claims**



1. A clock generating circuit which generates a clock signal with a desired frequency, comprising:

adding means for adding a first predetermined value to an input value supplied thereto to obtain a first value;

difference computing means coupled to said adding means for computing the difference between a value obtained by adding a second predetermined value to said first value and a third predetermined value to yield a second value;

comparing means coupled to said adding means for comparing said first value with said third predetermined value;

selecting means, coupled to said adding means, said difference computing means, and said comparing means, for selectively outputting said first value or said second value, based on the result of the comparison performed by said comparing means;

delay means coupled to said selecting means for delaying the output value of said selecting means by a predetermined time and sending the delayed output value as said input value to said adding means;

data holding means coupled to said delaying means for holding sinusoidal wave data to output the sinusoidal wave data corresponding to an address specified by the delayed output value received from said delay means;

D/A converting means coupled to said data holding means for converting the sinusoidal wave data into an analog signal;

extracting means coupled to said D/A converting means for extracting a signal having a predetermined frequency from the analog signal; and

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pulse converting means coupled to said extracting means for converting the signal having the predetermined frequency into a digital signal, thereby generating the clock signal with the desired frequency.

5,838,957

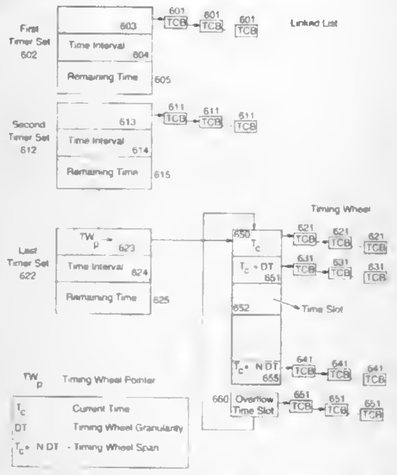
MULTI-STAGE TIMER IMPLEMENTATION FOR TELECOMMUNICATIONS TRANSMISSION

Balachandar Rajaraman, Raleigh, N.C., and Subir Varma, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 1, 1996, Ser. No. 595,065

Int. Cl.^{6} G06F *1/14*

U.S. Cl. 395—557 **16 Claims**



1. In a telecommunications network containing one or more host computers, each host computer containing a plurality of tasks, each of said plurality of tasks periodically generating timer requests wherein each timer request specifies the time interval in which it is to expire, a system for implementing a timing control mechanism for controlling said periodically generated timer requests:

a first burst timer set for controlling said timer requests characterized by having specified that they are to expire within a first time interval;

a second burst timer set for controlling said timer requests characterized by having specified that they are to expire after said first time interval, but before a second time interval, wherein said second time interval is longer than said first time interval; and

a third timer set, organized according to a timing wheel structure, for controlling said timer requests characterized by having specified that they are to expire after said second time interval.

5,838,958

AUTOMATIC TRACK FOLLOWING SYNC TIMING

Joel M. Widom, Laguna Beach, and David L. Hill, Irvine, both of Calif., assignors to Aiwa Co., Ltd., Tokyo, Japan

Filed Jun. 3, 1996, Ser. No. 656,741

Int. Cl.^{6} G11B *15/18*

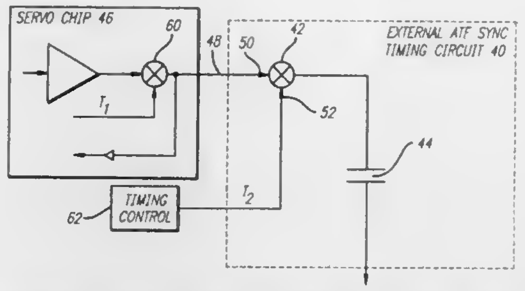
U.S. Cl. 395—559 **20 Claims**

1. An apparatus for externally adjusting an automatic track following (ATF) signal having a sampling pulse width, comprising:

a timing means for generating an external timing signal to shorten the width for said sampling;

an external switch comprising a first, signal input for receiving said ATF sampling pulse and a second, control input for receiving said external timing signal; and

at least one external capacitor connected in series with said external switch for receiving an output signal responsive to said ATF sampling pulse, shortened from said sampling pulse width under control of said timing signal.



5,838,959

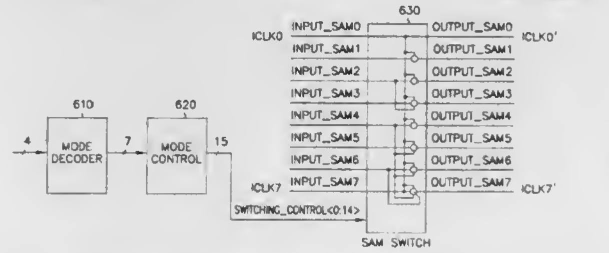
PROGRAMMABLE DATA PORT CLOCKING SYSTEM WITH AUTOMATIC DISABLE AND NOISE SUPPRESSION FOR ASYNCHRONOUS TRANSFER MODE SYSTEMS

Mark Thomann; Huy Thanh Vo, and Glen E. Hush, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Continuation of Ser. No. 478,325, Jun. 7, 1995, Pat. No. 5,680,595. This application Jul. 14, 1997, Ser. No. 892,609

Int. Cl.^{6} G06F *13/40*

U.S. Cl. 395—559 **14 Claims**



1. A method for programming a set of data ports to form a data path, comprising the steps of:

preselecting a plurality of subsets of the data ports to define a plurality of data paths having varying widths;

assigning a specific mode word to each of the data paths;

programming a configuration register with the specific mode word for a particular width data path; and

decoding the specific mode word to program the data ports to enable a data path having the particular width.

5,838,960

APPARATUS FOR PERFORMING AN ATOMIC ADD INSTRUCTIONS

Edward S. Harriman, Jr., Bedford, Mass., assignor to Bay Networks, Inc., Santa Clara, Calif.

Filed Sep. 26, 1996, Ser. No. 721,267

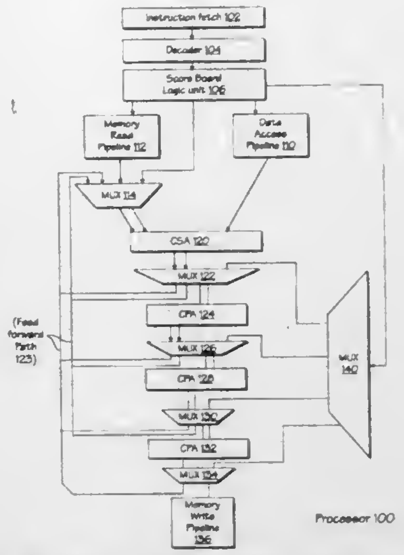
Int. Cl.^{6} G06F *9/38*

U.S. Cl. 395—562 **13 Claims**

1. A pipelined processor comprising:

a decoder; and

an add circuit coupled to the decoder, the add circuit configured to execute a first atomic add instruction and a second atomic add instruction in consecutive clock cycles, wherein said first atomic add instruction and said second atomic add instruction both update a first memory address location.



5,838,961

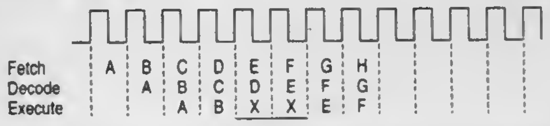
METHOD OF OPERATION AND APPARATUS FOR OPTIMIZING EXECUTION OF SHORT INSTRUCTION BRANCHES

Alan G. Smith, San Ramon, Calif., assignor to CPU Technology, Inc., Pleasanton, Calif.

Filed Oct. 1, 1996, Ser. No. 724,198

Int. Cl.^{6} G06F *9/38*

U.S. Cl. 395—580 **10 Claims**



1. A method of operation in a CPU, said method comprising

fetching a sequence of computer instructions from memory, said sequence including a branch instruction designating a target instruction, said target instruction having a displacement from said branch instruction;

determining whether said displacement is less than a predetermined amount;

invalidating execution of said branch instruction and invalidating instructions between said branch instruction and said target instruction when said displacement is less than said predetermined amount; and

executing said target instruction;

whereby refetching of said target instruction from memory is avoided.

5,838,962

INTERRUPT DRIVEN DYNAMIC ADJUSTMENT OF BRANCH PREDICTIONS

Douglas V. Larson, Santa Clara, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 9, 1997, Ser. No. 840,080

Int. Cl.^{6} G06F *9/32*

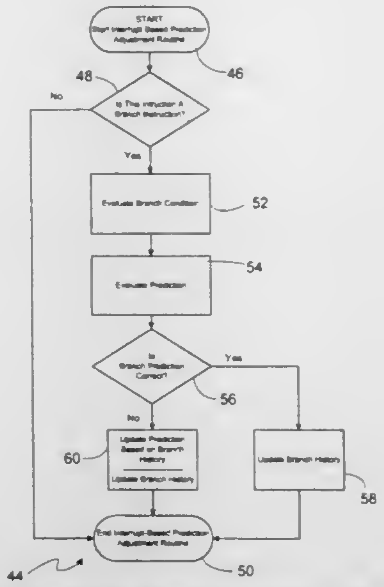
U.S. Cl. 395—586 **23 Claims**

1. A method of adjusting a branch prediction associated with a branch instruction contained in a segment of program code that is being executed by a central processing unit, the method comprising:

interrupting execution of the program code when execution of the branch instruction by the central processing unit is pending;

executing a prediction adjustment routine that updates the branch prediction; and

resuming execution of the program code.


START Start Interrupt-Based Prediction Adjustment Routine
46
48
No
Is The Instruction A Branch Instruction?
Yes
Evaluate Branch Condition
52
Evaluate Prediction
54
Is Branch Prediction Correct?
Yes
56
No
60
Update Prediction Based on Branch History
Update Branch History
Update Branch History
58
End Interrupt-Based Prediction Adjustment Routine
44
50

5,838,963

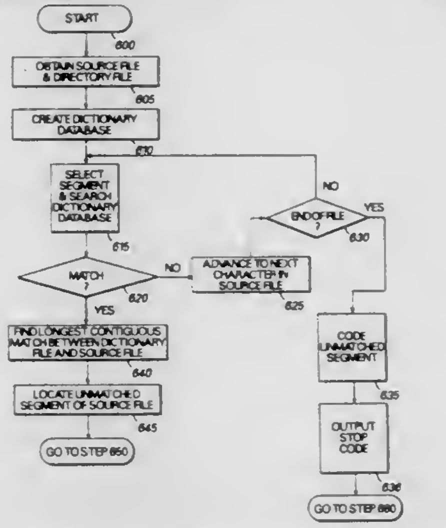
APPARATUS AND METHOD FOR COMPRESSING A DATA FILE BASED ON A DICTIONARY FILE WHICH MATCHES SEGMENT LENGTHS

Laurence Kelvin Griffiths, Southhampton, United Kingdom, assignor to Microsoft Corporation, Redmond, Wash.

Filed Oct. 25, 1995, Ser. No. 547,818

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 395—606 **17 Claims**


START
600
OBTAIN SOURCE FILE & DIRECTORY FILE
605
CREATE DICTIONARY DATABASE
610
SELECT SEGMENT & SEARCH DICTIONARY DATABASE
615
END OF FILE ?
630
YES
NO
MATCH ?
620
NO
ADVANCE TO NEXT CHARACTER IN SOURCE FILE
625
YES
FIND LONGEST CONTIGUOUS MATCH BETWEEN DICTIONARY FILE AND SOURCE FILE
640
LOCATE UNMATCHED SEGMENT OF SOURCE FILE
645
GO TO STEP 650
CODE UNMATCHED SEGMENT
635
OUTPUT STOP CODE
636
GO TO STEP 660

16. An apparatus for decoding an encoded file with a dictionary file to generate a source file, the encoded file having codes including matched codes and unmatched codes, each matched code having a length of a matched segment and a location in the dictionary file of the matched segment, the matched segment representing a contiguous match between characters of the source file and the dictionary file, each unmatched code having a length of an unmatched segment and characters of the unmatched segment, the unmatched segment representing characters of the source file between the matched segment and a prior matched segment, comprising:

a decision module, responsive to the encoded file, for selecting one of the codes of the encoded file and for determining whether the selected code is one of the unmatched codes or one of the matched codes;

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a decoder module, responsive to the selected code being one of the matched codes to obtain the length of the matched segment and the location in the dictionary file of the matched segment, the decoder module being further responsive to the selected code being one of the unmatched codes to obtain from the unmatched code the unmatched segment length and the characters of the unmatched segment; and

an output module, responsive to the matched segment length and to the matched segment location, for outputting characters in the dictionary file corresponding to the matched segment, the output module being further responsive to the unmatched segment length and the characters of the unmatched segment to output characters of the source file corresponding to the characters of the unmatched segment.

5,838,964

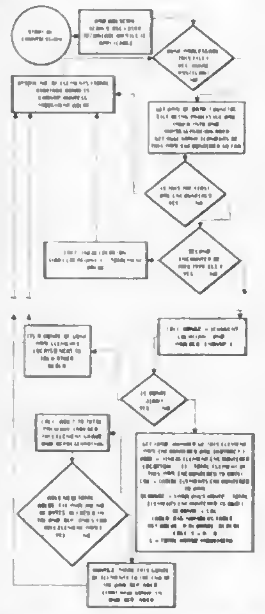
DYNAMIC NUMERIC COMPRESSION METHODS

David R. Gubser, 1171 E. Lassen Ave., Chico, Calif. 95926

Filed Jun. 26, 1995, Ser. No. 494,779

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 395—612 **38 Claims**



1. A numeric method to compress a digital data file including the steps of:

(a) determining and storing numbers present as elements in the data; and then for at least all types of elements but one present,

(b) determining and storing the number of the element present;

(c) determining and storing the location in the data of the first one of the element;

(d) determining and storing the location in the data of the last one of the element;

(e) determining and storing the count of movements required to move a group of the element together toward an end element by moving the opposite end element until it is adjacent an element, moving the adjacent element toward the end element while moving the opposite end element back to its original position and so on until the elements of a single type are grouped together; and

(f) organizing the stored types of elements, numbers of element, locations of first and last element, and count, and a representation of the number of bytes used to express such stored types of elements, numbers of element, locations of first and last element, and count, into a representation of the digital data file.

5,838,965

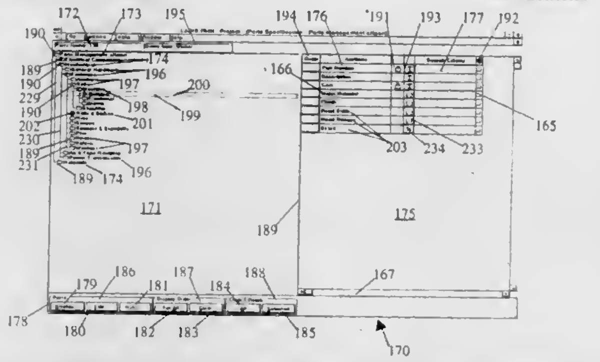
OBJECT ORIENTED DATABASE MANAGEMENT SYSTEM

Thomas S. Kavanagh; Christopher W. Beall, both of Boulder; William C. Heiny, Arvada; John D. Motycka, Evergreen; Samuel S. Pendleton, Louisville; Thomas D. Smallwood, Lafayette; Brooke E. Terpening, Golden, and Kenneth A. Traut, Boulder, all of Colo., assignors to CADIS, Inc., Boulder, Colo.

Filed Nov. 10, 1994, Ser. No. 339,481

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 395—614 **47 Claims**



1. A database system for management of information relating to component parts, comprising:

an object oriented representation of information describing the characteristics of existing instances of component parts that are logically organized in a parent-child/class-subclass structure, wherein attributes of an instance are dependent upon information concerning attributes of a component part that corresponds to that instance that is locally available from a class to which that instance belongs plus information concerning inherited attributes from a parent class;

programmed computer circuits for querying said information in a guided and iterative manner to locate component parts having attributes that are compatible with attributes that are desired by a searcher querying the information; and,

a display coupled to said computer circuits for displaying search results, the display being operative to display a window showing a graphical representation of said structure, the display being operative to simultaneously display a window showing attributes of a selected class.

5,838,966

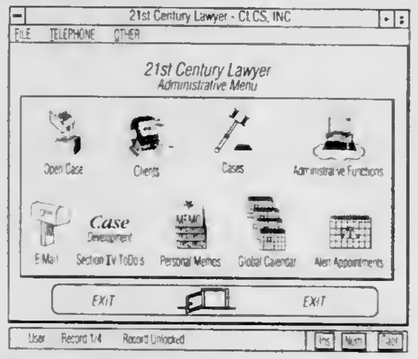
COMPUTER-AIDED LITIGATION CONTROL SYSTEM

Robert W. Harlan, Coto De Caza, Calif., assignor to Computerized Litigation Control Systems, Inc., Laguna Hills, Calif.

Filed Jul. 12, 1995, Ser. No. 501,601

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 395—615 **5 Claims**



1. A computer aided litigation control system, said system including a computer, said computer including a data file for each case, said computer also including a matrix of sections and levels of activities undertaken in a litigation proceedings for organizing the storage and retrieval of data stored in said data file, said computer also including a plurality of screens each of which corresponds to a different point in said matrix and being accessed by a user selecting a point in said matrix, each of said screens including a pattern of fields each having a designated activity associated with it for prompting a user, said system permitting data entry only via a selected field and associating with said data a code for later retrieval of said data, subsets of said fields having like codes associated therewith for permitting later access only to subsets of data previously stored in said data file and having like codes associated therewith.

5,838,967

IMAGE FILING APPARATUS AND METHOD FOR STORING IMAGE DATA AND DIRECTORY INFORMATION

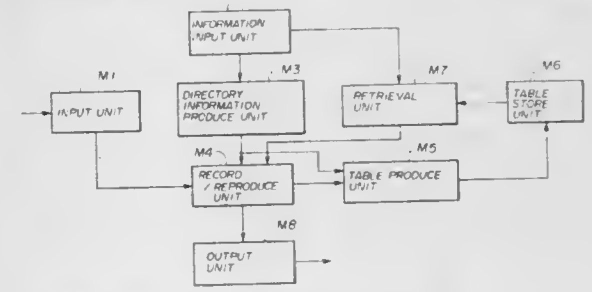
Tetsuhisa Okayama, Oume; Yoshiaki Aoyama, Tokyo; Hiroyuki Hoshino, Tachikawa, and Hirohisa Yamaguchi, Tokyo, all of Japan, assignors to Teac Corporation, Tokyo, Japan

Continuation of Ser. No. 51,071, Apr. 21, 1993, abandoned. This application Dec. 29, 1994, Ser. No. 366,008

Claims priority, application Japan, Apr. 23, 1992, 4-104876; Apr. 23, 1992, 4-104877; Apr. 23, 1992, 4-104878; Apr. 23, 1992, 4-104879

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 395—616 **10 Claims**



1. Digital-data write/read apparatus comprising:

a disc for writing thereto/reading therefrom data, with the data stored in said disc being arranged in such a manner that said data defines a plurality of sectors/clusters of data, the recording area of said disc comprising a directory information region for storing directory information therein and an actual data region for storing data files therein, the regions being positionally and functionally separated from one another, said directory information comprising file name records, each of which comprises a file name, file production data/time, information for pointing the position of the file in said actual-data region, the file size and identification information;

identification information inputting means for inputting the identification information; and

data processing means for inputting/outputting and managing the data constituting the data files, said means comprising a microprocessor, first information storage means for storing therein a first type of information obtained from said disc, second information storage means for storing therein a second type of information produced from said first type of information and instruction means for receiving instructions from an operator and then giving said instructions to said microprocessor, wherein said second type of information comprises an identification-information retrieval table information using said identification information which comprises matters different from matters indicating positions on said disc.

5,838,968

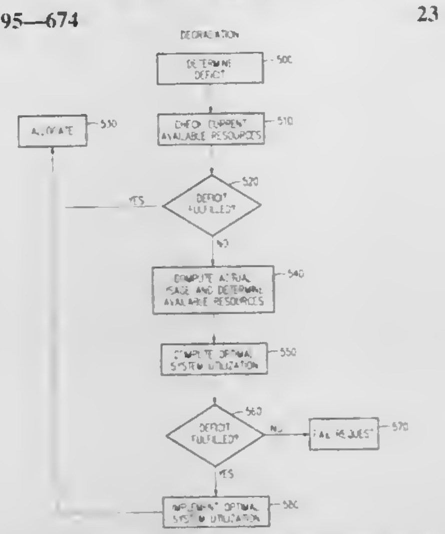
SYSTEM AND METHOD FOR DYNAMIC RESOURCE MANAGEMENT ACROSS TASKS IN REAL-TIME OPERATING SYSTEMS

Daniel Culbert, Los Altos, Calif., assignor to Chromatic Research, Inc., Sunnyvale, Calif.

Filed Mar. 1, 1996, Ser. No. 609,337

Int. Cl.^{6} G06F *9/00*

U.S. Cl. 395—674 **23 Claims**


DEGRADATION
DETERMINE DEFICIT
500
CHECK CURRENT AVAILABLE RESOURCES
510
ALLOCATE
530
DEFICIT FULFILLED?
520
YES
NO
COMPUTE ACTUAL USAGE AND DETERMINE AVAILABLE RESOURCES
540
COMPUTE OPTIMAL SYSTEM UTILIZATION
550
DEFICIT FULFILLED?
560
NO
FAIL REQUEST
570
YES
IMPLEMENT OPTIMAL SYSTEM UTILIZATION
580

1. A method of dynamic resource management on a data processing system including a processor, at least one system resource, and a plurality of tasks, the processor being coupled to the system resource and capable of executing the plurality of tasks, the method comprising the steps of:

executing instructions on the processor to create at least two tasks capable of executing on the processor, each of the at least two tasks having a priority;

creating at least one task resource utilization vector for each of the at least two tasks, the task resource utilization vector comprising the quantity of the at least one system-resource that each of the at least two tasks prefers to utilize while executing on the processor; and

dynamically varying the quantity of the at least one system resource that the at least two tasks have allocated based on the availability of the at least one system resource and the priorities of the at least two tasks.

5,838,969

SYSTEM AND METHOD FOR COLLECTING AND DISPATCHING SELECTED EVENTS IN A COMPUTER APPLICATION PROGRAM

Kelly Jacklin, San Francisco, and Daniel Clifford, Palo Alto, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed May 10, 1996, Ser. No. 644,704

Int. Cl.^{6} G06F *15/163;9/00*

U.S. Cl. 395—680 **20 Claims**

1. An apparatus for handling events in a computer system, comprising:

an application routine for selectively registering subsets of events to form one or more handler tables arranged into a handler table stack;

an event manager for determining whether a new event is registered in said one or more handler tables;

one or more event handlers for responsively handling said new event which is determined to be registered in said one or more handler tables, said event manager placing said new event in an event queue when said new event is not listed in one of said handler tables but said table is a filtering table, and said event manager dispatching said new event to another of said

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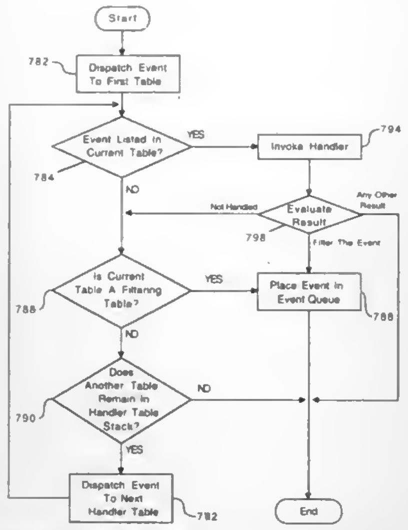

Start
782
Dispatch Event To First Table
Event Listed In Current Table?
784
YES
Invoke Handler
794
NO
Not Handled
Evaluate Result
Any Other Result
798
Filter The Event
Is Current Table A Filtering Table?
788
YES
Place Event In Event Queue
786
NO
Does Another Table Remain In Handler Table Stack?
790
NO
YES
Dispatch Event To Next Handler Table
792
End

handler tables when said new event is not listed in said first handler table and said table is not a filtering table.

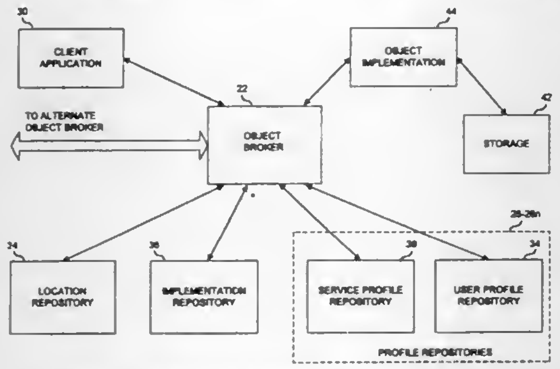
5,838,970
OBJECT-ORIENTED COMPUTER ENVIRONMENT AND RELATED METHOD

Tony Clifton Thomas, Flower Mound, Tex., assignor to Recognition International Inc., Irving, Tex.

Continuation of Ser. No. 317,734, Oct. 4, 1994, abandoned. This application Aug. 14, 1997, Ser. No. 911,428

Int. Cl.⁶ G06F *9/40*

U.S. Cl. 395—683 **48 Claims**



1. A method of managing an object-oriented computer environment for use by a plurality of users comprising the steps of:

providing a plurality of objects stored in object implementation repositories for performing object operations, each of said objects having a life cycle including object creation, object activation and object deletion;
providing a plurality of object brokers to manage said objects in performance of said object operations;
storing, in a plurality of location repositories separate from said object implementation repositories, location information identifying the storage locations of respective ones of said object implementation repositories;
causing the object brokers to access the information in at least one of said repositories during the life cycles of one or more of said objects; and
using the information within the repositories during the life cycles of said objects to manage the use of system resources by said objects.

5,838,971
PROCESS FOR IMPLEMENTING DYNAMIC DATA TYPES IN DISTRIBUTED COMPUTING NETWORKS USING AN OSF/DCE PLATFORM

Kurt Stadler, and Raimund Mödl, both of München, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

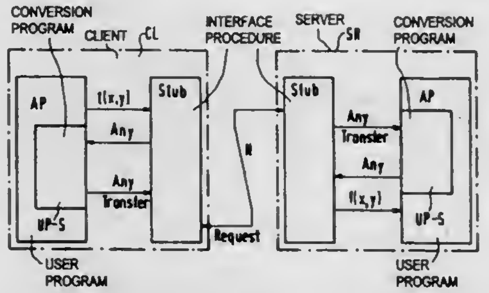
PCT No. PCT/DE94/01105, § 371 Date Mar. 28, 1996, § 102(e) Date Mar. 28, 1996, PCT Pub. No. WO95/09503, PCT Pub. Date Apr. 6, 1995

PCT Filed Sep. 22, 1994, Ser. No. 624,363

Claims priority, application Germany, Sep. 29, 1993, 43 33 166.1

Int. Cl.⁶ G06F *9/40*

U.S. Cl. 395—684 **6 Claims**



1. A method for implementing dynamic data types in distributed computing networks using an OSF/DCE platform, comprising the steps of:

defining each dynamic data type by a user program,
adding an IDL control instruction transmit_as on to a definition of the dynamic data type as an attribute so that after compilation of the dynamic data type into an interface procedure a call to a conversion program is inserted into the interface procedure,
converting the dynamic data type into a defined data type available in program execution and capable of being processed by the stub whenever a dynamic type occurs in the user program on a client side by the interface procedure calling the conversion program, and
passing the defined data type on to the interface procedure for further processing.

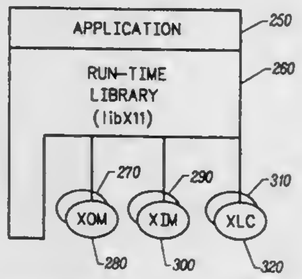
5,838,972
METHOD AND APPARATUS FOR DYNAMICALLY LOADING AN INPUT RUN-TIME MODULE AND AN OUTPUT RUN-TIME MODULE

Shinobu Matsuzuka, Sunnyvale, and Hidetoshi Tajima, Mountain View, both of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed Feb. 9, 1996, Ser. No. 599,319

Int. Cl.⁶ G06F *9/445*

U.S. Cl. 395—685 **31 Claims**



1. A method implemented on a computer system for dynamically loading an input run-time module and an output run-time module for an application program, comprising the steps of:

retrieving an external configuration file
selecting the input run-time module in response to the external configuration file;
loading the input run-time module at run-time;

selecting the output run-time module in response to the external configuration file, the input run-time module physically divided into a different library from the output run-time module; and
loading the output run-time module at run-time independently from the loading of the input run-time module;
wherein the step of selecting the input run-time module comprises the step of selecting a local method model or a server method model; and
wherein the step of loading the input run-time module comprises the steps of:
  loading an input method core object, the input method core object including a plurality of input methods;
  loading a local translator run-time module in response to a selection of the local method model, the local translator for invoking methods in the input method core object;
  loading an input method stub run-time module in response to the selection of the local method model, the input method stub run-time module for passing input requests from the application program to the local translator runtime module;
  loading a client-side protocol handler in response to a selection of the server method model, the client-side protocol handler for encoding input requests from the application program;
  loading a server-side protocol handler in response to the selection of the server method model, the server-side protocol handler for decoding the input requests from the application program; and
  loading a server translator in response to the selection of the server method model, the server translator for translating the input requests from the application program and for invoking methods in the input method core object.

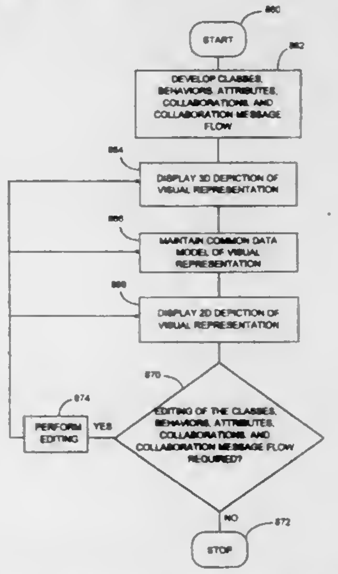
5,838,973
SYSTEM AND METHOD FOR INTERACTIVELY TRANSFORMING A SYSTEM OR PROCESS INTO A VISUAL REPRESENTATION

Theodore R. Carpenter-Smith, St. Charles; Michael John Gombar, Elburn; James B. Fisher, Naperville, and Thomas M. Barfield, El Grove, all of Ill., assignors to Andersen Consulting LLP, Chicago, Ill.

Filed May 3, 1996, Ser. No. 642,782

Int. Cl.⁶ G06F *9/40;* G06T *15/00*

U.S. Cl. 395—701 **101 Claims**


860
START
862
DEVELOP CLASSES, BEHAVIORS, ATTRIBUTES, COLLABORATIONS AND COLLABORATION MESSAGE FLOW
864
DISPLAY 3D DEPICTION OF VISUAL REPRESENTATION
866
MAINTAIN COMMON DATA MODEL OF VISUAL REPRESENTATION
868
DISPLAY 2D DEPICTION OF VISUAL REPRESENTATION
870
EDITING OF THE CLASSES, BEHAVIORS, ATTRIBUTES, COLLABORATIONS AND COLLABORATION MESSAGE FLOW REQUIRED?
874
PERFORM EDITING
YES
NO
872
STOP

36. An interactive, real-time software tool, implemented by a computer, for physically transforming an applied object-oriented programming (OOP) based system or process into a visual representation, the software tool comprising:

(a) class-interactively developing means for developing, in real time, the visual representation which is physically embodied in a computer-readable medium for visualization on a computer display device, the visual representation having at least one of: a class, a class behavior, a class attribute, a collaboration, and a message flow of the collaborations;
(b) maintaining means, operatively coupled to the class-developing means, for automatically maintaining a common data model of the visual representation in order to simultaneously reflect of development of the common data model throughout the software tool; and
(c) three-dimensional (3D) visual representation means, operatively coupled to the class-developing means and the maintaining means, for displaying a 3D depiction of the visual representation on the display device.

5,838,974
METHOD FOR ACTIVATING OR RATHER DEACTIVATING SUBPROGRAMS USING VIEWS CONTROLLED VIA PROGRAM ATTRIBUTES IN AN AUTOMATION SYSTEM BASED PREFERABLY ON STATE GRAPHS

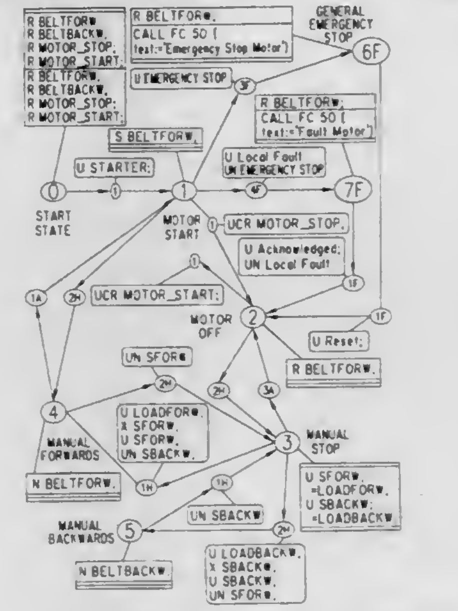
Christian Ritscher, Obermichelbach; Joerg Middel, Weisendorf; Roland Schneider, Erlangen; Dieter Wissmann, Effeltrich, and Guenther Rath, Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Oct. 16, 1995, Ser. No. 543,662

Claims priority, application European Pat. Off., Oct. 14, 1994, 94116315

Int. Cl.⁶ G06F *9/45*

U.S. Cl. 395—702 **5 Claims**



1. A method for activating or deactivating subprograms in a process controlling program, the method comprising the steps of:

providing graphical object types for creating the program, the graphical object types being elements of a programming system based on state graphs;
providing program attribute types for creating the program;
interrelating each of the graphical object types with another one of the graphical object types in an application-dependent manner for creating the program;
assigning a program attribute corresponding to the program attribute types in an application-dependent manner to each one of the graphical object types;
from the program, combining the graphical object types having predetermined program attributes of the program attribute types in an application-dependent manner into one of an activatable view and a deactivatable view representing the subprograms; and

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automatically generating program code from the graphical object types which are interrelated with one another in the application-dependent manner, wherein the program code runs on an automation system.

5,838,975

METHOD FOR TESTING AND DEBUGGING COMPUTER PROGRAMS

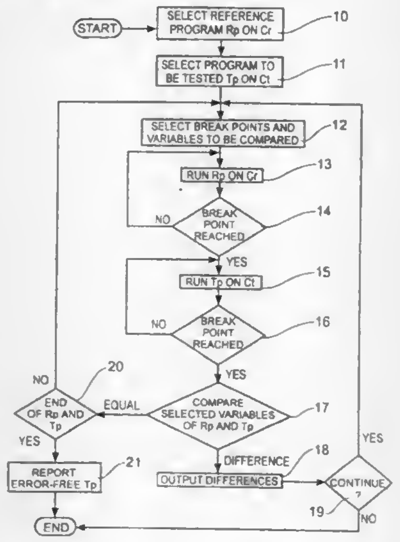
David Andrew Abramson, 30 Trunole St., Coorparoo, Queensland, and Rok Sosic, 3/23 Osterley Road, Carina, Qld 4152, both of Australia

Filed Apr. 18, 1995, Ser. No. 425,097

Claims priority, application Australia, Apr. 19, 1994, PM5196

Int. Cl.⁶ G06F *9/45*

U.S. Cl. 395—704 **14 Claims**



1. A computerized method for dynamically testing and debugging an executable behaviorally unknown computer program in an environment including:

a first computer, said first computer having at least a central processing unit, dynamic memory and a display apparatus;

a second computer, said second computer having at least a central processing unit and dynamic memory; and

communications apparatus linking said first computer to said second computer so that said first computer can communicate with said second computer;

the invented method including the steps of:

(i) said first computer executing at least one instruction of an executable behaviorally known computer program until a break point is reached;

(ii) said first computer calculating at least one variable value at said break point;

(iii) said second computer executing at least one instruction of an executable behaviorally unknown program until a break point is reached;

(iv) said second computer calculating at least one related variable value at said break point;

(v) said first computer ascertaining said variable values calculated by said second computer in step (iv) by use of said communications apparatus;

(vi) said first computer determining the difference between said variable values of step (ii) and step (iv).

5,838,976

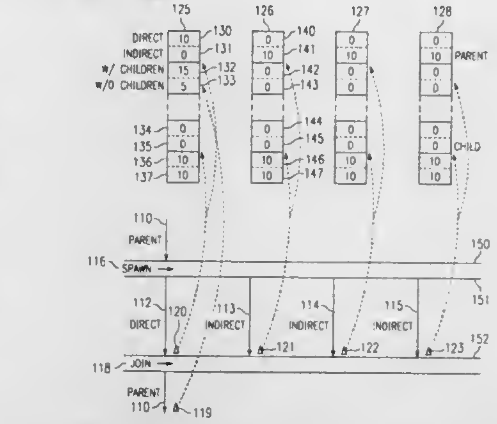
SYSTEM AND METHOD FOR PROFILING CODE ON SYMMETRIC MULTIPROCESSOR ARCHITECTURES

Chuck Summers, Plano, Tex., assignor to Hewlett-Packard Co., Palo Alto, Calif.

Filed Nov. 28, 1995, Ser. No. 563,334

Int. Cl.⁶ G06F *9/45*

U.S. Cl. 395—704 **37 Claims**



1. A method of profiling a process having a plurality of threads executing on a computer system, comprising:

allocating a memory storage area within the computer system for each thread, each memory storage area having a plurality of memory cells, wherein each memory cell is associated with a particular thread of the plurality of threads;

registering a parent thread with a plurality of child threads, the parent and plurality of child threads selected from the plurality of threads;

calculating, by each child thread, a delta for a particular code region of the process; and

storing, by each child thread, the delta in a first memory cell associated with the child thread and in a second memory cell associated with the registered parent thread.

5,838,977

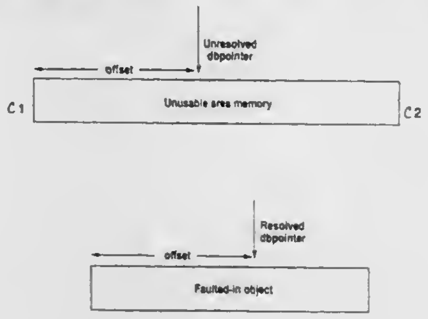
TRANSLATING AN OBJECT GRAPH AT RUN TIME

Anil Gupta, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 785,961, Oct. 31, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 473,610

Int. Cl.⁶ G06F *9/45*

U.S. Cl. 395—705 **4 Claims**



1. A method of translating an object graph to be resilient to pointer casting and pointing to objects embedded in larger objects, comprising the steps of:

forming a typeobject having a description of information contained in a type declaration of an object graph;

determining a location of pointers, from the type declaration of the object graph, to be traversed to translate said object graph;

maintaining memory allocation of a memory including size, address, and typeobject in a single table, about a portion of said memory that comprise said object graph;

accessing said single table including said size, address and typeobject to determine whether an object is embedded in a larger object;

translating said object graph by traversing said pointers.

5,838,978

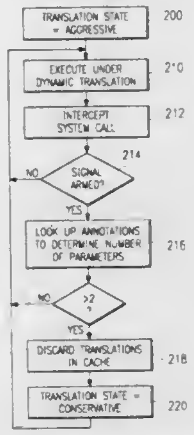
SYSTEM AND METHOD OF USING ANNOTATIONS TO OPTIMIZE DYNAMICALLY TRANSLATED CODE IN THE PRESENCE OF SIGNALS

William B. Buzbee, Half Moon Bay, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 9, 1996, Ser. No. 731,098

Int. Cl.⁶ G06F *9/45;9/455*

U.S. Cl. 395—705 **16 Claims**


TRANSLATION STATE = AGGRESSIVE
200
EXECUTE UNDER DYNAMIC TRANSLATION
210
INTERCEPT SYSTEM CALL
212
SIGNAL ARMED?
214
NO
YES
LOOK UP ANNOTATIONS TO DETERMINE NUMBER OF PARAMETERS
216
>2 ?
NO
YES
DISCARD TRANSLATIONS IN CACHE
218
TRANSLATION STATE = CONSERVATIVE
220

1. A method of dynamically translating an application in a computer system, wherein the application has been annotated to indicate a number of parameters expected by each entry point of the application, the method comprising the steps of:

aggressively translating the application to produce translated blocks;

storing the translated blocks in the computer system;

executing the translated blocks in an emulated computer system;

intercepting a system call made by an executing block;

determining whether the system call arms a signal handler that can use a machine state of the emulated computer system at a potential stopping point; and

if the signal handler can use the machine state, conservatively translating the application.

5,838,979

PROCESS AND TOOL FOR SCALABLE AUTOMATED DATA FIELD REPLACEMENT

Johnson M. Hart, Weston; Ashraf Afifi, Burlington, both of Mass.; Antonio Pizzarello, Phoenix, Ariz., and Dominic Chan, Carlisle, Mass., assignors to Peritus Software Services, Inc., Billerica, Mass.

Filed Oct. 31, 1995, Ser. No. 550,869

Int. Cl.⁶ G06F *17/30*

U.S. Cl. 395—707 **10 Claims**

1. A process for modifying a computer program unit stored on media, said process comprising in sequence:

(a) identifying all variables in said computer program unit;

(b) selecting as seeds a subset of variables that share a set of known attributes and storing the identity of said seeds;

(c) determining from the syntax of elements of the computer program unit which of the remaining variables is related to one or more of the seeds such that they share the same set of attributes;

(d) storing the identities of said related remaining variables in a transitive closure database;

(e) repeating steps (c) and (d) with said related variables as seeds until there are no new related variables; and

(f) modifying said computer program unit in accordance with the contents of the transitive closure database.

5,838,980

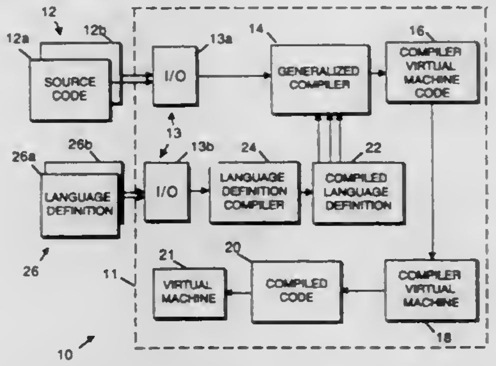
COMPILATION AND VIRTUAL MACHINE ARRANGEMENT AND PROCESS FOR SOURCE CODE INCLUDING PRE-RUNTIME EXECUTABLE LANGUAGE STRUCTURE CONSTRUCTS

Juan Guillen, Russell, and James M. Leask, Canata, both of Canada, assignors to Sybase, Inc., Emeryville, Calif.

Continuation of Ser. No. 183,480, Jan. 18, 1994, abandoned. This application Jun. 25, 1997, Ser. No. 882,247

Int. Cl.⁶ G06F *9/45*

U.S. Cl. 395—708 **13 Claims**



1. A source code processing system for processing predetermined source code that includes expressions and pre-runtime executable structure constructs established according to a predetermined syntactic and semantic scheme, comprising:

(a) a language subsystem for establishing a syntactic and semantic scheme according to which source code can be prepared for compilation according to the predetermined syntactic and semantic scheme,

(b) a source of code expressions and pre-runtime executable structure constructs, the form of said expressions and said pre-runtime executable structure constructs conforming to the syntax and semantics of said language subsystem,

(c) a compilation system connected to said language subsystem and said source of source code, said compilation system being effective for parsing and tokenizing said predetermined source code, and being effective to produce compiler virtual machine code including compiled instructions representing said expressions and uncompiled instructions representing said pre-runtime executable structure constructs; and

(d) a compiler virtual machine processing system connected to said compilation system and receiving compiler virtual machine code including said compiled instructions representing said expressions and said uncompiled instructions representing said pre-runtime executable structure constructs from said compilation system, said compiler virtual machine processing system being effective for executing said uncompiled instructions representing said pre-runtime executable structure constructs received from said compiler system.

5,838,981

DATA COMMUNICATION APPARATUS WITH A PROGRAM RENEWAL FUNCTION

Hirokazu Gotoh, Atsugi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 20, 1996, Ser. No. 716,128

Claims priority, application Japan, Oct. 5, 1995, 7-284693

Int. Cl.⁶ G06F *12/12*

U.S. Cl. 395—712 **14 Claims**

1. A data communication apparatus having a program renewal operation to renew an original program with a renewal program, comprising:

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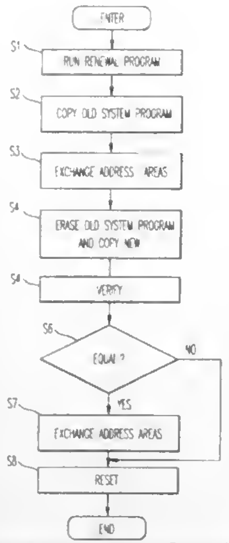


a non-volatile first memory area configured to store the original program prior to the program renewal operation and to store the renewal program after completion of the program renewal operation;

a second memory area configured to store said original program copied from said first memory area during the program renewal operation;

a third memory area in which the renewal program is temporarily stored during the program renewal operation;

a controller configured to replace the original program stored in said first memory area prior to said program renewal operation with the renewal program temporarily stored in said third memory area during the program renewal operation; and

an address controller configured to exchange memory addresses of the first and second memory areas so that the controller replaces the original program stored in said first memory area with the renewal program temporarily stored in said third memory area in memory addresses in said first memory area exchanged with memory addresses of said second memory area.

5,838,982
POWER SWITCH METHOD AND APPARATUS FOR PREVENTING A FAILURE IN THE POWER CONTROLLER

Barnes Cooper, Aloha, Oreg., and Steven Ray Bard, Vancouver, Wash., assignors to Intel Corporation, Santa Clara, Calif.

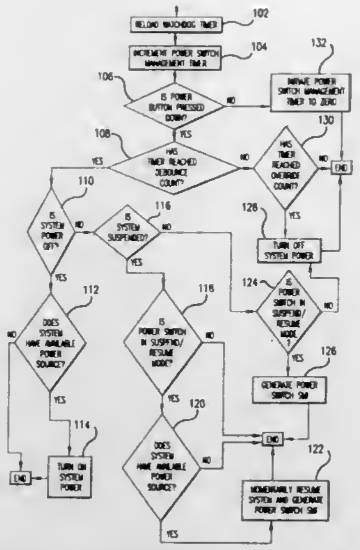
Filed Dec. 19, 1996, Ser. No. 769,386
Int. Cl.^{6} G06F *1/30*
U.S. Cl. 395—750.01 **27 Claims**

1. A method of power switch management of a computer including a power switch and a microcontroller, said method comprising steps of:

if said power switch has been activated in a first manner, performing a system power operation of said computer;

if said power switch has been activated in a second manner, performing a suspend/resume operation of said computer;

determining whether the microcontroller has serviced an interrupt, said interrupt having been generated in response to said power switch being activated by either said first or second manner; and

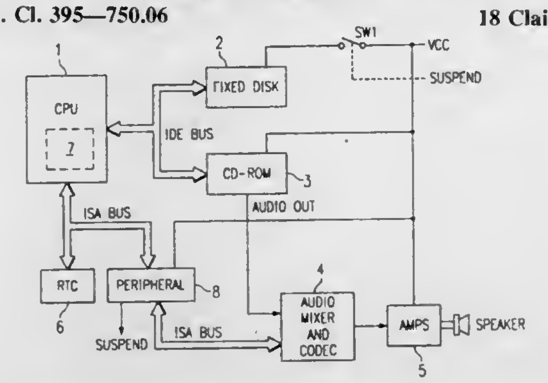

102
RELOAD WATCHDOG TIMER
104
INCREMENT POWER SWITCH MANAGEMENT TIMER
106
IS POWER BUTTON PRESSED DOWN?
132
INITIATE POWER SWITCH MANAGEMENT TIMER TO ZERO
108
HAS TIMER REACHED DEBOUNCE COUNT?
130
HAS TIMER REACHED OVERRIDE COUNT?
110
IS SYSTEM POWER OFF?
116
IS SYSTEM SUSPENDED?
128
TURN OFF SYSTEM POWER
124
IS POWER SWITCH IN SUSPEND/RESUME MODE?
112
DOES SYSTEM HAVE AVAILABLE POWER SOURCE?
118
IS POWER SWITCH IN SUSPEND/RESUME MODE?
126
GENERATE POWER SWITCH SMI
114
TURN ON SYSTEM POWER
120
DOES SYSTEM HAVE AVAILABLE POWER SOURCE?
122
MOMENTARILY RESUME SYSTEM AND GENERATE POWER SWITCH SMI
END
YES
NO

resetting the microcontroller and powering off said computer if said interrupt was not serviced by the microcontroller.

5,838,983
PORTABLE COMPUTER WITH LOW POWER AUDIO CD-PLAYER

Lee Atkinson, Houston, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Filed Aug. 20, 1996, Ser. No. 699,989
Int. Cl.^{6} G06F *1/32*
U.S. Cl. 395—750.06 **18 Claims**



1. A method for operating a portable computer system, comprising the steps of:

receiving a command to place said system in a suspend mode;

determining whether an audio CD is playing in a CDROM drive;

if an audio CD is not playing, placing said system in a suspend mode;

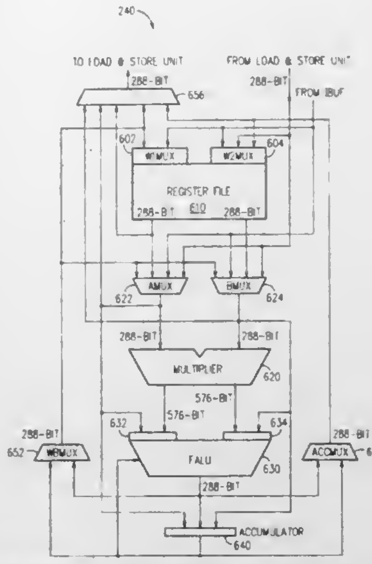
if an audio CD is playing, continuing to operate said CDROM drive, while placing the remainder of said system in a suspend mode.

5,838,984
SINGLE-INSTRUCTION-MULTIPLE-DATA PROCESSING USING MULTIPLE BANKS OF VECTOR REGISTERS

Le Trong Nguyen, Monte Sereno; Seungyoon Peter Song, Los Altos; Moataz A. Mohamed, Santa Clara; Heonchul Park, Cupertino, and Roney Sau Don Wong, Sunnyvale, all of Calif., assignors to Samsung Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Aug. 19, 1996, Ser. No. 697,086
Int. Cl.^{6} G06F *9/30*
U.S. Cl. 395—800.05 **13 Claims**

1. A vector processor comprising:



a first bank of vector registers, wherein each vector register numbers assigned to other vector registers in the first bank;

a second bank of vector registers, wherein each vector register in the second bank is assigned a register number which is distinct from register numbers assigned to other vector registers in the second bank but is the same as a register number assigned to a corresponding vector register in the first bank;

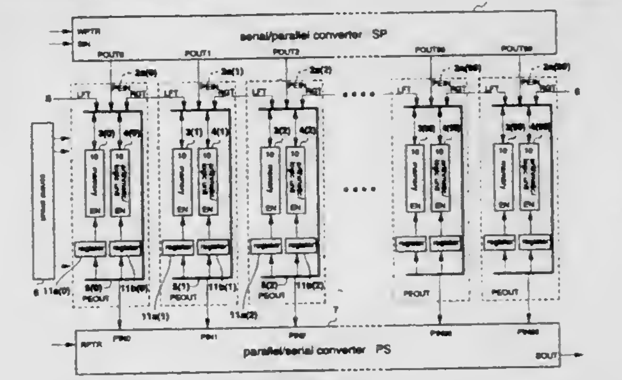
a control register which includes a first field, the first field storing a value that identifies one of the first and second banks as a default bank; and

selection circuitry for first and second banks of vector registers, wherein the selection circuitry is operable in a first mode to access a vector register that is in the default bank and is identified by a register number from an instruction being executed by the vector processor.

5,838,985
PARALLEL PROCESSOR WITH MEMORY/ALU INHIBITING FEATURE

Mitsuharu Ohki, Tokyo, Japan, assignor to Sony Corporation, Japan

Filed Feb. 21, 1996, Ser. No. 604,246
Claims priority, application Japan, Feb. 24, 1995, 7-035764
Int. Cl.^{6} G06F *15/16*
U.S. Cl. 395—800.16 **5 Claims**



1. A parallel processor comprising:

a serial/parallel converter including a plurality of data input registers for receiving a plurality of first data composed of serial data and outputting said first data as parallel data;

a plurality of processor elements for performing prescribed arithmetic operations on said first data as parallel data and outputting a plurality of arithmetically-processed second data;

a parallel/serial converter including a plurality of data output registers for receiving said plurality of second data as parallel data and outputting said second data as serial data,

wherein each one of said plurality of processor elements is coupled to each one of said data input registers and each one of said output registers in a one-to-one relationship;

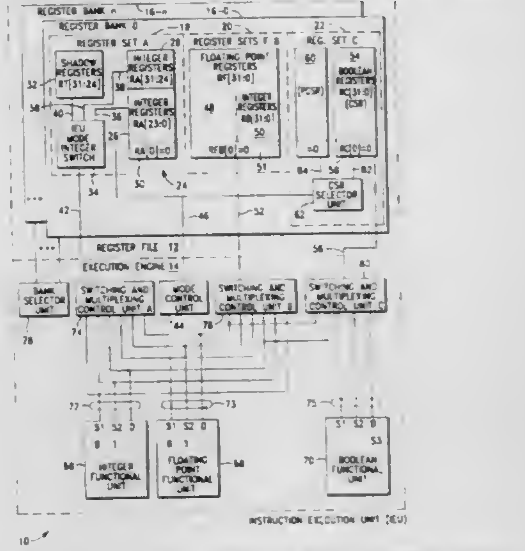
control means for jointly controlling operating states of said plurality of processor elements; and

instruction signal generating means for generating instruction signals instructing inhibiting of said prescribed arithmetic operations occurring at each of said processor elements for which calculations are unnecessary on the basis of a determination of a range of values in which a respective first data falls,

said plurality of processor elements inhibiting prescribed arithmetic operations in accordance with said instruction signals.

5,838,986
RISC MICROPROCESSOR ARCHITECTURE IMPLEMENTING MULTIPLE TYPED REGISTER SETS

Sanjiv Garg, Fremont; Derek J. Lentz, Los Gatos; Le Trong Nguyen, Monte Sereno, and Sho Long Chen, Saratoga, all of Calif., assignors to Seiko Epson Corporation, Tokyo, Japan
Continuation of Ser. No. 665,845, Jun. 19, 1996, Pat. No. 5,682,546, which is a continuation of Ser. No. 465,239, Jun. 5, 1995, Pat. No. 5,560,035, which is a continuation of Ser. No. 726,773, Jul. 8, 1991, Pat. No. 5,493,687. This application Sep. 25, 1997, Ser. No. 937,361
Int. Cl.^{6} G06F *9/34*
U.S. Cl. 395—800.23 **30 Claims**


REGISTER BANK A
REGISTER BANK 0
REGISTER SET A
REGISTER SETS F B
REG. SET C
SHADOW REGISTERS RT[31:24]
INTEGER REGISTERS RA[31:24]
INTEGER REGISTERS RA[23:0]
FLOATING POINT REGISTERS RF[31:0]
INTEGER REGISTERS RB[31:0]
BOOLEAN REGISTERS RC[31:0] (CSR)
(PCSR)
IEU MODE INTEGER SWITCH
CSR SELECTOR UNIT
REGISTER FILE 12
EXECUTION ENGINE 14
BANK SELECTOR UNIT
SWITCHING AND MULTIPLEXING CONTROL UNIT A
MODE CONTROL UNIT
SWITCHING AND MULTIPLEXING CONTROL UNIT B
SWITCHING AND MULTIPLEXING CONTROL UNIT C
INTEGER FUNCTIONAL UNIT
FLOATING POINT FUNCTIONAL UNIT
BOOLEAN FUNCTIONAL UNIT
INSTRUCTION EXECUTION UNIT (IEU)
10

1. In a data processing system, which includes a central processing unit (CPU) that performs operations by executing instructions, a data register system comprising:

a first register set including a plurality of first registers each for holding integer data;

a second register set including a plurality of second registers each for holding integer data or floating point data, wherein a specific instruction includes a field specifying which of said first and second register sets is to be accessed in response to execution of said specific instruction; and

means, responsive to the field, for accessing said first register set or said second register set as specified by said field, including

- i) reading means for reading an operand value from either the first register set or second register set as specified by said field, and
- ii) writing mean for writing a result value to sad first register set or said second register set as specified by said field.

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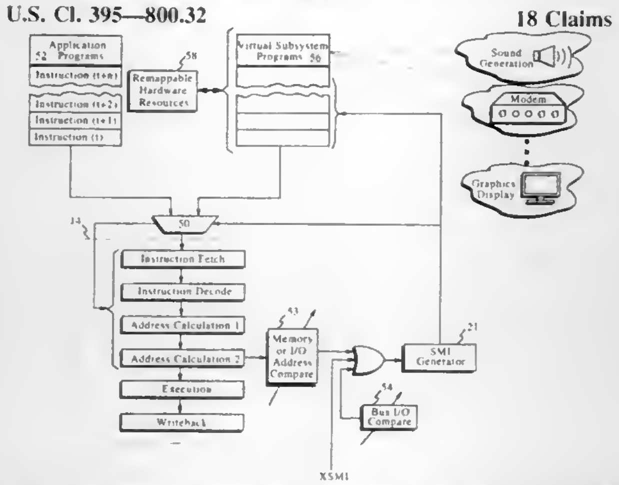
5,838,987
PROCESSOR FOR ELIMINATING EXTERNAL ISOCHRONOUS SUBSYSTEMS

Thomas B. Brightman, Dallas, Tex.; Frederick S. Dunlap, and Andrew D. Funk, both of Longmont, Colo., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Oct. 6, 1995, Ser. No. 540,351

Int. Cl.⁶ G06F *15/76*

U.S. Cl. 395—800.32 **18 Claims**



1. A processing system that eliminates external isochronous subsystems comprising:
- (a) a processor having a plurality of pipeline stages running an operating system and at least one program by executing a series of program instructions;
- (b) trap circuitry, including internal circuitry coupled to at least one of the plurality of pipeline stages, to detect at least one predetermined event; and
- (c) a system management mode mechanism independent of the operating system and responsive to the trap circuitry, to identify the at least one predetermined event and to feed instructions to the processor for execution to perform an equivalent function ordinarily performed by an external isochronous subsystem in response to the at least one predetermined event.

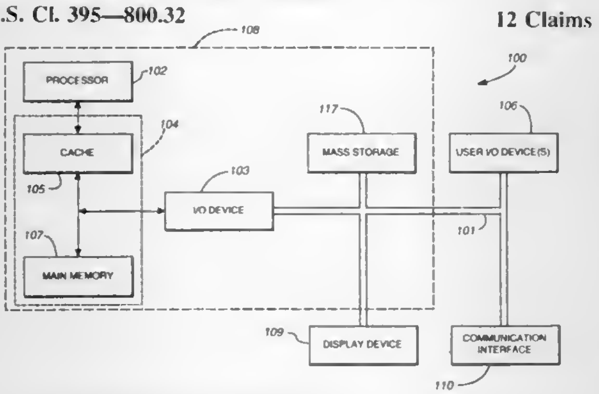
5,838,988
COMPUTER PRODUCT FOR PRECISE ARCHITECTURAL UPDATE IN AN OUT-OF-ORDER PROCESSOR

Ramesh Panwar, Santa Clara, and Arjun Prabhu, Palo Alto, both of Calif., assignors to Sun Microsystems, Inc., Palo Alto, Calif.

Filed Jun. 25, 1997, Ser. No. 882,219

Int. Cl.⁶ G06F *15/76*

U.S. Cl. 395—800.32 **12 Claims**



1. A computer system comprising:
- a memory system;
- a processor coupled to the memory, the processor further comprising:
  - an external interface unit for accessing the memory system;
  - at least one execution unit generating speculative results and speculative condition codes affecting an architectural state of the processor;
  - a results buffer having a number of slots, wherein each live instruction in the processor holds a slot in the results buffer;
  - a condition code buffer having the same number of slots as the results buffer, each live instruction in the processor holds a slot in the condition code buffer such that each slot in the condition code buffer has a one-to-one correspondence with a slot in the results buffer;
  - a plurality of speculative results produced by the execution units in response to a live instruction, wherein each speculative result is stored in a unique slot in the results buffer;
  - a plurality of speculative condition codes produced by the execution units each stored a unique slot in the condition code buffer; and
  - a retirement device determining which slots in the results buffer and condition code buffer are no longer dependent on an unresolved branch and transferring the results in the non-speculative slot to an architectural results register and transferring the condition code in the non-speculative slot to an architectural condition code register.

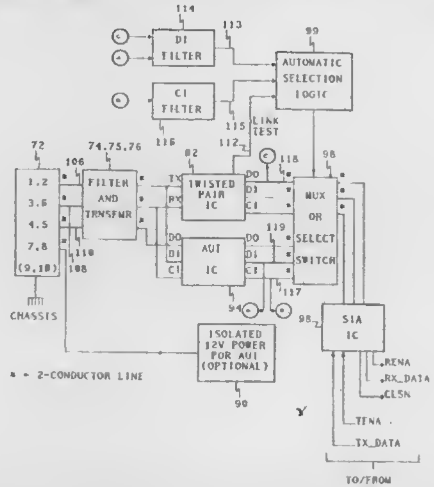
5,838,989
COMMON INTERFACE FOR A NETWORK HAVING DIFFERENT COMMUNICATION MEDIA EMPLOYING A CARRIER SENSE MULTIPLE ACCESS WITH COLLISION DETECTION (CSMA/CD) PROTOCOL

Jerry D. Hutchison, Littleton; Henry S. Yang, Andover, both of Mass., and William C. Mallard, Jr., Nashua, N.H., assignors to Cabletron Systems, Inc., Rochester, N.H.

Continuation of Ser. No. 907,951, Jul. 2, 1992, abandoned. This application Nov. 17, 1995, Ser. No. 560,173

Int. Cl.⁶ G06F *13/00*

U.S. Cl. 395—831 **11 Claims**



1. For use in a station that is connectable to more than one type of communication medium in a network that employs a Carrier Sense Multiple Access with Collision Detection (CSMA/CD) protocol, a common interface comprising:
- a first interface circuit, for conditioning and interpreting signals for communication with a network communication medium of a first type in accordance with a first protocol;
- a second interface circuit, for conditioning and interpreting signals for communication with a network communication medium of a second type in accordance with a second protocol;
- a single connector providing direct connection to a communication medium of either the first type or the second type; and
- switching means for selecting one of the first and second interface circuits for connection to the single connector including means for automatically identifying the protocol used by the network to which the station is connected, the means for automatically identifying including means for alternating between enabling a first mode of operation of the station and enabling a second mode of operation of the station to determine whether the station operates properly in the first mode or the second mode;
- wherein the single connector has multiple connector pins, at least some of which are shared by data or control signals coupled to the first and second interface circuits, and wherein shared pin assignments in the connector as selected to minimize any adverse affects of connecting to a network that is incompatible with the selected interface circuit and its related protocol.

5,838,990
CIRCUIT IN A SEMICONDUCTOR MEMORY FOR PROGRAMMING OPERATION MODES OF THE MEMORY

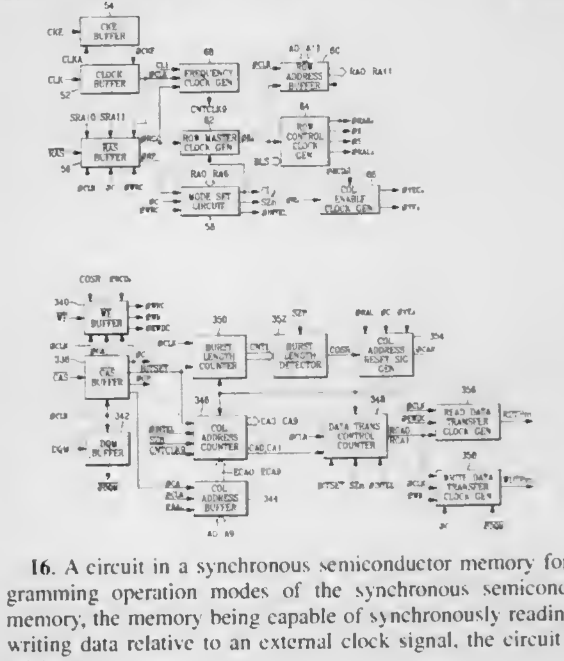
Churoo Park, Suwon; Hyun-Soon Jang, Seoul; Chull-Soo Kim, Suwon; Myung-Ho Kim, Suwon; Seung-Hun Lee, Suwon; Si-Yeol Lee, Yongin-gun; Ho-Cheol Lee; Tae-Jin Kim, both of Seoul, and Yun-Ho Choi, Suwon, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Continuation of Ser. No. 130,138, Oct. 4, 1993, abandoned. This application Aug. 4, 1997, Ser. No. 905,562

Claims priority, application Rep. of Korea, Oct. 2, 1992, 1992/18130; Oct. 2, 1992, 1992/18131; Apr. 27, 1993, 1993/7127

Int. Cl.⁶ G06F *9/00;13/16*

U.S. Cl. 395—834 **47 Claims**



16. A circuit in a synchronous semiconductor memory for programming operation modes of the synchronous semiconductor memory, the memory being capable of synchronously reading and writing data relative to an external clock signal, the circuit comprising:
- a mode set control signal generator for generating a mode set signal in response to a row address strobe, a column address strobe and a write enable strobe;
- a plurality of code registers, coupled to the mode set control signal generator to receive the mode set signal, wherein each code register stores a code in response to the mode set signal, the plurality of code registers including:
  - a first code register for storing a first code;
  - a second code register for storing a second code;
  - a third code register for storing a third code;
  - a fourth code register for storing a fourth code;
  - a fifth code register for storing a fifth code; and
  - a sixth code register for storing a sixth code;
  - wherein the first, second and third codes determine the burst length mode of the semiconductor memory and the fourth, fifth and sixth codes determine the latency mode of the semiconductor memory.

5,838,991
PREEMPTABLE IDLE TIME ACTIVITIES FOR CONSTANT DATA DELIVERY BY DETERMINING WHETHER INITIATING A HOST COMMAND WILL CONFLICT WITH AN IDLE TIME ACTIVITY BEING EXECUTED

James R. Shipman, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1994, Ser. No. 366,035

Int. Cl.⁶ G06F *13/00*

U.S. Cl. 395—838 **39 Claims**

1. A disk drive controller for maximizing data throughput and performing idle time activity while sustaining high-rate data delivery, the controller determining whether initiating a host command will conflict with an idle time activity being executed and terminating the executing idle time activity in response to determining that the host command will conflict with the idle time activity.

5,838,992
METHOD OF SPECIFYING MULTIFUNCTIONAL SUBASSEMBLIES IN A COMMUNICATION SYSTEM

Karl-Heinz Hass, München; Karl Klug, Miesbach, and Hans-Dietrich Von Lindeiner, Friedberg, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

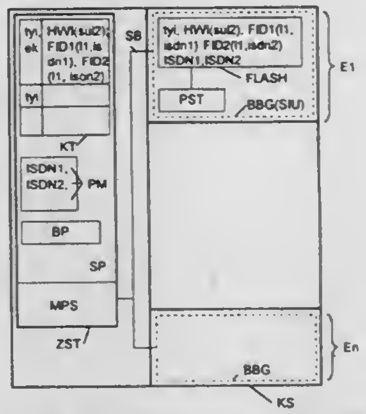
PCT No. PCT/DE96/01131, § 371 Date Dec. 30, 1997, § 102(e) Date Dec. 30, 1997, PCT Pub. No. WO97/02717, PCT Pub. Date Jan. 23, 1997

PCT Filed Jun. 26, 1996, Ser. No. 981,937

Claims priority, application Germany, Jun. 30, 1995, 195 24 024.3

Int. Cl.⁶ G06F *17/00*

U.S. Cl. 395—838 **8 Claims**


tyi, ek
HW(sul2); FID1(I1,isdn1), FID2(I1, isdn2)
tyi
SB
tyi, HW(sul2), FID1(I1, isdn1) FID2(I1,isdn2) ISDN1,ISDN2
FLASH
PST
BBG(SIU)
E1
KT
ISDN1, ISDN2
PM
BP
SP
MPS
ZST
BBG
En
KS

1. A method for specifying functions of processor-controlled modules of a communication system in a communication network, said system being equipped with a central control unit, the method comprising:
- combining circuit-oriented components of at least one function area on at least one area module;
- specifying possible circuit-oriented and procedural functions of an area module by a combination of a circuit technology identification and at least one function identification;

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- allocating at least one program module to each combination of a circuit technology identification and at least one function identification and storing the module in the communication network;
- transmitting a combination of a circuit technology identification and at least one function identification to the respective area module and storing it as a specification of the functions of the area module;
- transmitting at least one allocated program module to the respective area module using the central controller, and storing program module in this controller.

5,838,993

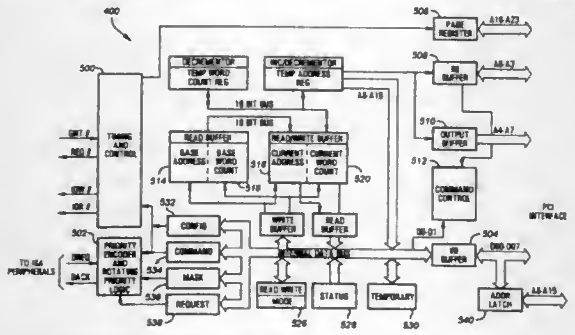
SYSTEM FOR DMA CONTROLLER SHARING CONTROL SIGNALS IN CONVENTIONAL MODE AND HAVING SEPARATE CONTROL SIGNALS FOR EACH NUMBER OF CHANNELS IN DISTRIBUTED MODE

Dwight D. Riley, and Robert C. Elliott, both of Houston, Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 570,394, Dec. 11, 1995, Pat. No. 5,774,680. This application Apr. 26, 1996, Ser. No. 639,879

Int. Cl.^{6} G06F *13/20*

U.S. Cl. 395—842 **28 Claims**



1. A computer system, comprising:
- a bus;
- a processor coupled to said bus for providing cycles;
- a main memory coupled to said bus;
- a direct memory access (DMA) controller coupled to said bus, said DMA controller having a number of DMA channels, said DMA controller being capable of operating in a conventional mode and a distributed mode, said DMA controller having control signals from a control register shared among said number of DMA channels in said conventional mode, said DMA controller having separate control signals provided to each of said number of DMA channels in said distributed mode, each said separate control signal being independently accessible by said processor; and
- a floppy drive system coupled to said DMA controller, said floppy drive system for providing DMA requests to said DMA controller when a DMA transfer between said main memory and said floppy drive system is requested.

5,838,994

METHOD AND APPARATUS FOR THE DYNAMIC ALLOCATION OF BUFFERS IN A DIGITAL COMMUNICATIONS NETWORK

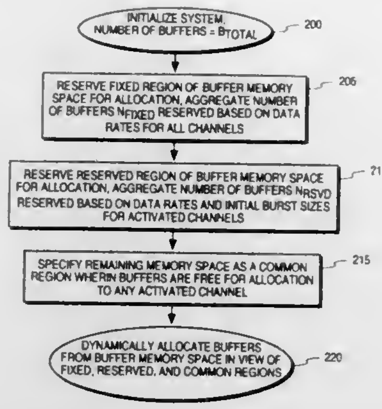
Homayoun S. Valizadeh, San Ramon, Calif., assignor to Cisco Technology, Inc., San Jose, Calif.

Filed Jan. 11, 1996, Ser. No. 583,987

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—876 **14 Claims**

1. A method for managing buffer memory in a communications controller that transmits data over a plurality of channels, wherein the buffer memory has a memory space of B_{total}, the method comprising:


INITIALIZE SYSTEM, NUMBER OF BUFFERS = B_{TOTAL}
200
RESERVE FIXED REGION OF BUFFER MEMORY SPACE FOR ALLOCATION, AGGREGATE NUMBER OF BUFFERS N_{FIXED} RESERVED BASED ON DATA RATES FOR ALL CHANNELS
205
RESERVE RESERVED REGION OF BUFFER MEMORY SPACE FOR ALLOCATION, AGGREGATE NUMBER OF BUFFERS N_{RSVD} RESERVED BASED ON DATA RATES AND INITIAL BURST SIZES FOR ACTIVATED CHANNELS
210
SPECIFY REMAINING MEMORY SPACE AS A COMMON REGION WHEREIN BUFFERS ARE FREE FOR ALLOCATION TO ANY ACTIVATED CHANNEL
215
DYNAMICALLY ALLOCATE BUFFERS FROM BUFFER MEMORY SPACE IN VIEW OF FIXED, RESERVED, AND COMMON REGIONS
220

- reserving a first subset of the memory space B_{total} for allocation to queues associated with each of the plurality of channels based on an aggregate rate of data transmission over the plurality channels such that each queue is provided a minimum reservation of memory space based on a rate of data transmission for an associated channel;
- reserving a second subset of the memory space B_{total} for allocation to queues associated with channels that are activated to transmit data; and
- specifying any remaining memory space of the memory space B_{total} as free for allocation to any queue associated with a channel that is activated to transmit data.

5,838,995

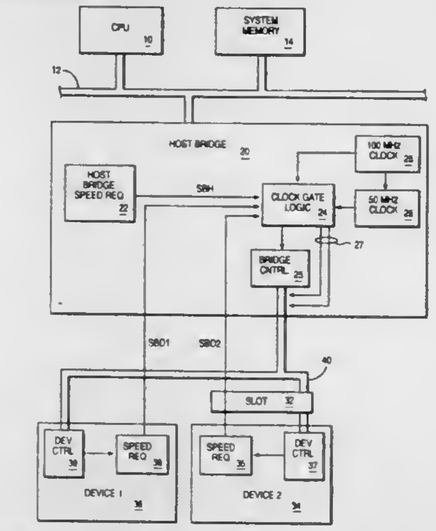
SYSTEM AND METHOD FOR HIGH FREQUENCY OPERATION OF I/O BUS

Wen-Tzer Thomas Chen, Austin, Tex.; Richard Allen Kelley, Apex, N.C., and Danny Marvin Neal, Round Rock, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 18, 1995, Ser. No. 573,682

Int. Cl.^{6} G06F *13/42*

U.S. Cl. 395—880 **17 Claims**



1. A data processing system including a bridge for interconnecting a plurality of devices on a bus, comprising:
- means for outputting, from a first device, a first signal indicating a first device frequency;
- means for outputting, from a second device, a second signal indicating a second device frequency; and
- means in the bridge for dynamically selecting, as a transaction occurs between the first device and the second device, a transaction frequency, based upon the first signal and the second signal, wherein the transaction will occur on the bus at the selected transaction frequency.

5,838,996

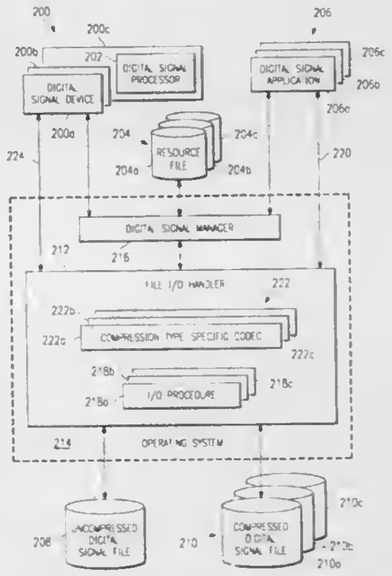
SYSTEM FOR DETERMINING PRESENCE OF HARDWARE DECOMPRESSION, SELECTIVELY ENABLING HARDWARE-BASED AND SOFTWARE-BASED DECOMPRESSION, AND CONDITIONING THE HARDWARE WHEN HARDWARE DECOMPRESSION IS AVAILABLE

Linden A. deCarmo, Plantation, Fla., assignor to International Business Machines Corporation, Austin, Tex.

Filed May 31, 1994, Ser. No. 251,498

Int. Cl.^{6} G06F *5/00;13/14;13/36*

U.S. Cl. 395—888 **23 Claims**



1. Digital signal managing apparatus operative within a computer having a central processing unit (CPU) for selectively enabling hardware-based and software-based decompression of data requested by a utilization apparatus associated with the computer, the digital signal managing apparatus comprising:
- apparatus responsive to a request for determining whether the utilization apparatus contains hardware for decompressing the data without the CPU, the hardware including adjustable characteristics:
- apparatus responsive to the request ascertaining a compression technique originally used to compress the data:
- a file I/O handler responsive to the request for transferring the data to the utilization apparatus, the file I/O handler being controllable by the CPU to decompress the data while transferring the data to the utilization apparatus:
- apparatus cooperating with the determining apparatus and the ascertaining apparatus for controlling the file I/O handler to decompress the data when the utilization apparatus does not contain the hardware: and
- apparatus for conditioning the hardware to receive the data by conforming the hardware's adjustable characterises to the compression technique and for controlling the hardware to decompress the data in accordance with the compression technique when the utilization apparatus does contain the hardware.

5,838,997

PRELOADED SINGLE-USE INSTANT CAMERA

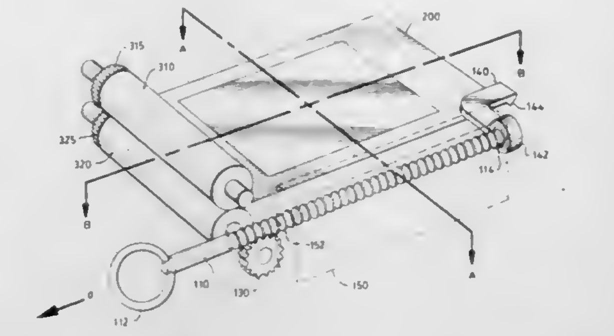
Lawrence M. Douglas, South Easton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 27, 1997, Ser. No. 826,237

Int. Cl.^{6} G03B *17/50*

U.S. Cl. 396—6 **26 Claims**

1. A preloaded single-use instant camera comprising:
- a housing providing a sealed light-tight enclosure: a user-inaccessible film holding compartment in said sealed light-tight enclosure: a predetermined number of independent



pressure-processable film units stacked in said compartment: an exit slot in said housing having dimensions sufficient for the passage therethrough of one of said film units: an exposure system and means for initiating an exposure cycle to thereby effect exposure of the film unit at the foremost level of said stack; a pair of axially-rotatable pressure rollers abutting at a nip: user-operated manual processing means for urging the rotation of said pressure rollers while simultaneously selecting and introducing the film unit at the foremost level of said stack into the nip between said rollers, whereby the rotating pressure rollers grab, compress, and withdraw the selected film unit from said user-inaccessible film holding compartment and ultimately at least partially out of said housing through said exit slot: an exposure count viewing window disposed in said housing: and a rotatable updatable counting disk with a sequence of numerical indicia provided thereon, the sequence of numerical indicia corresponding to the number of preloaded pressure processable film units held in said film holding compartment, the exposure viewing window positioned to view one of said numerical indicia in said sequence.

5,838,998

PHOTO FILM TAKE-UP SPOOL AND SHAFT

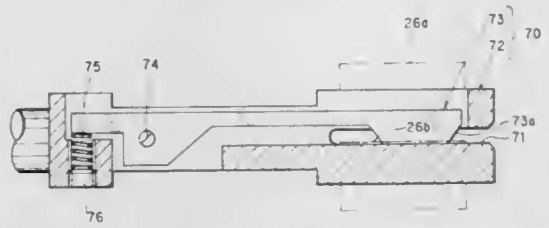
Takeshi Yamazaki; Syunji Kumamoto, and Fumio Noji, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa-ken, Japan

Continuation of Ser. No. 620,353, Mar. 22, 1996, abandoned. This application Sep. 22, 1997, Ser. No. 934,767

Claims priority, application Japan, Mar. 24, 1995, 7-066203

Int. Cl.^{6} G03B *17/02*

U.S. Cl. 396—6 **6 Claims**



1. A take-up shaft for production of a lens-fitted photo film unit, said lens-fitted photo film unit having a cassette containing chamber and a roll chamber between which an exposure aperture is located, said cassette containing chamber containing a cassette; said cassette having unexposed photo film, said photo film being drawn from said cassette before loading into said lens-fitted photo film unit; a leader of said photo film being secured to said take-up shaft which is rotated to wind said photo film thereabout in a form of a photo film roll, said take-up shaft being inserted in said roll chamber to insert said photo film roll, said take-up shaft comprising:
- a shaft body having a cylindrical shape:
- a nip device for nipping said leader in removable fashion, inside said shaft body: and

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at least one curved face, formed between an inside surface of said shaft body and a cylindrical face of said shaft body and at a radius of curvature 0.4–0.85 time as long as a radius of said shaft body, for preventing said leader secured to said shaft body from being sharply bent,

wherein said shaft body has a take-up slot formed therein for insertion of said leader, said take-up slot having first and second walls, said curved face being formed in connection to at least said second wall of said take-up slot; said take-up slot being so eccentric with reference to said shaft body as to form said second wall thicker than said first wall, to facilitate lengthening said radius of curvature of said curved face relatively;

wherein said shaft body also has an auxiliary slot formed through said first wall to communicate with said take-up slot; and

wherein said nip device includes:

a nip rod disposed in said auxiliary slot, said nip rod having first and second ends, said first end being disposed in said take-up slot for causing said first end to nip said leader;

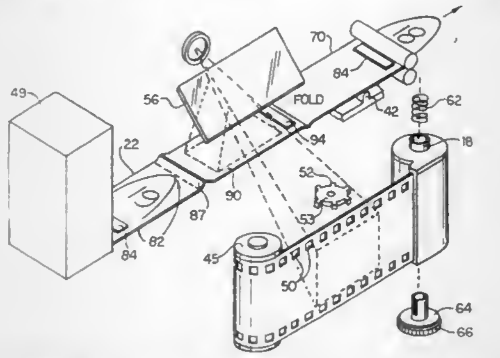
an axis for supporting said nip rod in a swingable manner between said first and second ends;

a spring for biasing said second end to push said first end on to said second wall; and

an adjustor screw movable in a direction of bias of said spring for adjusting said bias of said spring, said spring being disposed between said adjustor screw and said second end.

5,838,999
DUAL EXPOSURE PHOTOGRAPHIC APPARATUS AND METHOD

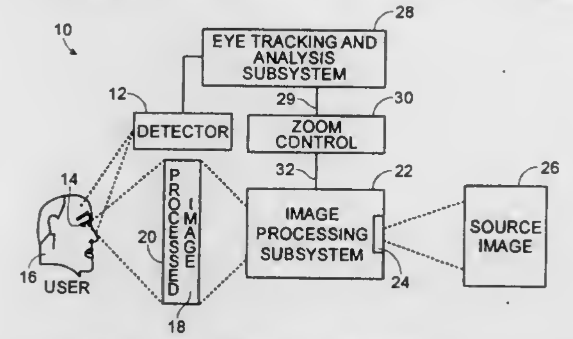
Philip R. Norris, North Reading, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Oct. 29, 1996, Ser. No. 738,772
Int. Cl.^{6} G03B *17/52;19/06*
U.S. Cl. 396—33 **22 Claims**



1. Apparatus for generally simultaneously producing images of a scene on self-developable film and photographic film within said apparatus, the photographic and self-developable films each have successive exposable portions, said apparatus comprising: housing means including self-developable film exiting means: means for supplying the self-developable film within said housing means; camera means disposed within said housing means and containing the photographic film therein, said camera means defining first and second exposure openings, whereby successive portions of the photographic film are presentable at said first exposure opening, and successive portions of the self-developing film are presentable at said second exposure opening; means for generally simultaneously exposing the same scene at least a portion of both the photographic and self-developable films at said first and second openings; and means for processing an exposed portion of the self-developable film within said housing means; and, means for allowing removal of successive ones of the processed exposed portions of the self-developable film from said exiting means; means for advancing successive portions of the photographic film to said first opening; and, said means for allowing removal of the self-developable film also allows successive ones of the exposable portions thereof to advance from said supply means to said second opening when corresponding successive ones of processed portions are removed from said exiting means; further including means for driving said film advancing means of the photographic film in response to removal of the self-developable film from said exiting means, whereby advancement of the self-developable film drives said advancing means until the photographic film is advanced to its next successive exposable portion.

5,839,000
AUTOMATIC ZOOM MAGNIFICATION CONTROL USING DETECTION OF EYELID CONDITION

Thomas Daniel Davis, Jr., Camas, Wash., and Larry Alan Westerman, Portland, Oreg., assignors to Sharp Laboratories of America, Inc., Camas, Wash.
Filed Nov. 10, 1997, Ser. No. 967,684
Int. Cl.^{6} G03B *17/00*
U.S. Cl. 396—51 **17 Claims**



1. An apparatus for adjusting zoom magnification control of an optical system having a variable-magnification device, comprising:

an image processing subsystem for generating a processed image;

an image display for displaying said processed image to a user;

a zoom control for changing the magnification of the variable-magnification device;

a detector coupled to said image display for detecting a zoom condition of the user's face;

an analysis system for analyzing the detected zoom condition and for generating an input signal to said zoom control to change the magnification of the variable-magnification device as a function of the zoom condition of the user's face, wherein said zoom condition is the extent of the conjunctiva of the user's eye visible to said detector.

5,839,001
FOCUS DETECTING APPARATUS

Keiji Ohtaka; Yasuo Suda; Keiji Nagata, all of Yokohama; Kenichiro Yamashita, Matsudo; Terutake Kadohara, and Hitoshi Onoda, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 23, 1996, Ser. No. 777,952
Claims priority, application Japan, Dec. 28, 1995, 7-354103; Dec. 28, 1995, 7-354104; Dec. 28, 1995, 7-354105
Int. Cl.^{6} G03B *13/36*
U.S. Cl. 396—114 **7 Claims**

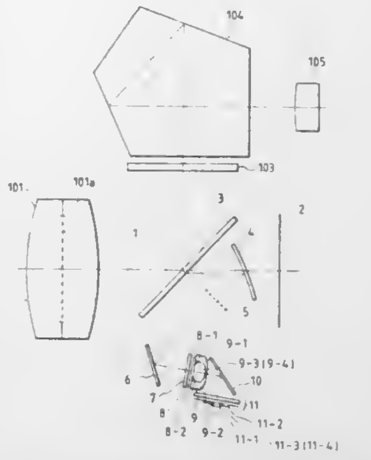
1. A focus detecting apparatus for detecting the focus state of an objective lens, comprising:

a finder optical unit for observing therethrough an image formed by said objective lens;

an optical unit for forming a pair of distributions of light quantity on the basis of light beams transmitted through the different pupils of said objective lens;

a sensor unit for receiving said pair of distributions of light quantity;

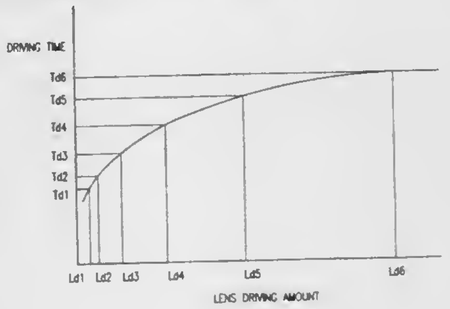
a main mirror disposed in an optical path leading to said objective lens and said optical unit for reflecting the light beam from said objective lens to said finder optical unit; and



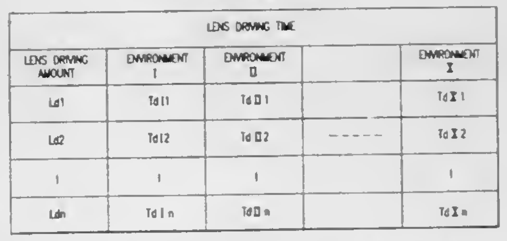
a reflecting mirror having a curved surface having its concave surface facing the light incidence side for reflecting the light beam transmitted through said main mirror in the direction of said optical unit which is opposite to said finder optical unit.

5,839,002
CAMERA HAVING A LENS BARREL AND METHOD

Toshiro Miyake, Kanagawa-ken, and Nobuhiko Terui, Chiba-ken, both of Japan, assignors to Nikon Corporation, Tokyo, Japan
Continuation of Ser. No. 455,548, May 31, 1995, abandoned. This application Dec. 30, 1996, Ser. No. 777,062
Claims priority, application Japan, May 31, 1994, 6-118965; May 30, 1995, 7-132056
Int. Cl.^{6} G03B *13/22*
U.S. Cl. 396—91 **41 Claims**



LENS DRIVING CAPABILITY DATA



LENS DRIVING AMOUNT	LENS DRIVING TIME			
	ENVIRONMENT I	ENVIRONMENT II		ENVIRONMENT X
Ld1	Td I 1	Td II 1		Td X 1
Ld2	Td I 2	Td II 2	------	Td X 2
⋮	⋮	⋮		⋮
Ldn	Td I n	Td II n		Td X n

1. A combination of a camera and a detachable lens barrel, the combination comprising:

at least one photographic lens that forms a photographic image at a designated position in said camera;

a control amount calculation device that determines a lens driving control amount;

a lens driving control device that controls said at least one photographic lens based on said lens driving control amount;

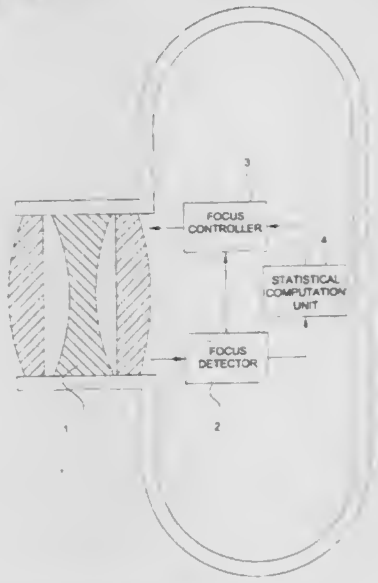
a lens driving device coupled to said at least one photographic lens and linked to said lens driving control device, said lens driving device driving said at least one photographic lens along an optical axis in accordance with said lens driving control amount;

a memory device linked to said lens driving control device, said memory device storing lens driving capability data, said lens driving capability data including at least a characteristic lens driving amount and a corresponding lens driving time relating to said at least one photographic lens; and

a communications device linked to said lens driving control device, said communications device being connectable to said camera, enabling communication between said lens driving control device and said camera such that said lens driving capability data, including the lens driving time, can be communicated to said camera for controlling at least one occurrence of at least one photographic operation, including at least one focusing operation.

5,839,003
FOCUS ADJUSTMENT METHOD AND APPARATUS

Touru Iwane, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan
Filed Jun. 9, 1997, Ser. No. 871,760
Claims priority, application Japan, Jun. 26, 1996, 8-165981
Int. Cl.^{6} G03B *13/36*
U.S. Cl. 396—102 **16 Claims**



1. A focus adjustment apparatus, comprising:

a focus detector that detects focus information:

a statistical computation unit coupled to the focus detector, that determines a statistical value from the focus information: and

a focus controller coupled to the focus detector and the statistical computation unit, that drives an optical system based on the focus information and the statistical value, wherein the focus information includes a defocus amount, and wherein the focus controller:

determines a threshold value based on the statistical value;

determines a target driving position based on the defocus amount; and

drives the optical system to an in-focus state based on the target driving position when the defocus amount exceeds the threshold value.

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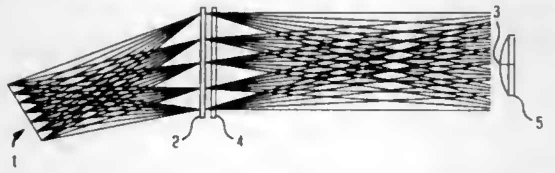
5,839,004
DEVICE AND METHOD FOR FACILITATING THE FOCUSING OF A CAMERA

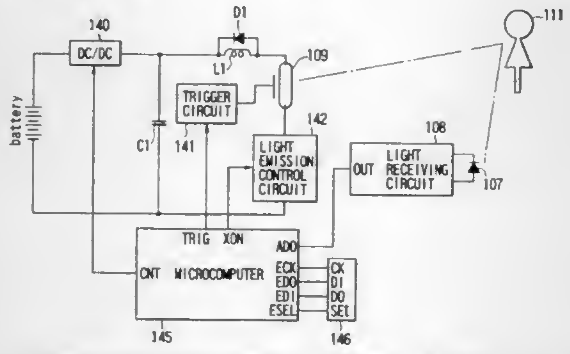
Erland Pettersson, Mölnlycke, and Per Nordlund, Göteborg, both of Sweden, assignors to Victor Hasselblad AB, Sweden
PCT No. PCT/SE96/00257, § 371 Date Nov. 19, 1997, § 102(e) Date Nov. 19, 1997, PCT Pub. No. WO96/27149, PCT Pub. Date Sep. 6, 1996
PCT Filed Feb. 29, 1996, Ser. No. 894,987
Claims priority, application Sweden, Mar. 1, 1995, 9500746
Int. Cl.⁶ G03B *13/24*
U.S. Cl. 396—152 **8 Claims**



1. A device for facilitating the focusing of a camera during a so-called tilt operation, in which an image plane/focusing plane of the camera is angled relative the optical axis of an objective lens (**1**) or vice versa, in order to obtain an inclined plane of focus, the camera being provided with a focusing screen (**2**) located in said image plane/focusing plane and an optical viewing location (**3**), the optical axis of which coincides with the optical axis of said focusing screen (**2**), said tilt operation resulting in the exiting light from the focusing screen being directed away from said viewing location (**3**), characterized in that optical wedge (**4**) is located between said focusing screen (**2**) and said viewing location (**3**) in such a way as to redirect the exiting light to said viewing location (**3**) at which an eyepiece (**5**) or an observer's eye is located.

5,839,005
FLASH PHOTOGRAPHING SYSTEM

Hajime Fukui, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 2, 1997, Ser. No. 867,253
Int. Cl.⁶ G03B *15/03*
U.S. Cl. 396—159 **9 Claims**



1. A flash photographing system composed of a flash device and a camera and controlling a light emitting action by detecting an amount of light received at a light receiving circuit arranged to receive a reflected light from an object caused by a light flux emitted from a light emission source, comprising:

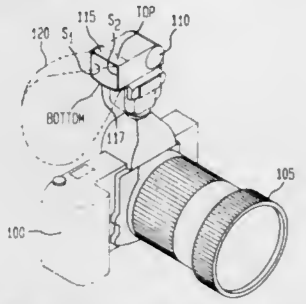
an analog-to-digital conversion circuit which converts an analog output signal of said light receiving circuit into a digital value;

an addition circuit which performs a process of adding up values corresponding to digital values obtained by said analog-to-digital conversion circuit at intervals of a predetermined timing; and

a light emitting action control circuit which controls the light emitting action on the basis of a value obtained by said adding process of said addition circuit.

5,839,006
APPARATUS AND METHOD FOR DIRECTING LIGHT FROM A SWIVEL FLASH HEAD

Arnold Edward Beckerman, Star Rte 70, Box 98C, Great Barrington, Mass. 01230
Filed Oct. 30, 1996, Ser. No. 739,837
Int. Cl.⁶ G03B *15/03; 15/02*
U.S. Cl. 396—174 **22 Claims**



1. An apparatus for providing light for a field of view of a camera, the camera having a camera lens unit that faces in a forward direction toward the camera field of view, and a swivel flash head that can emit light in a side direction at an angle with respect to a vertical plane relative to the camera, comprising:

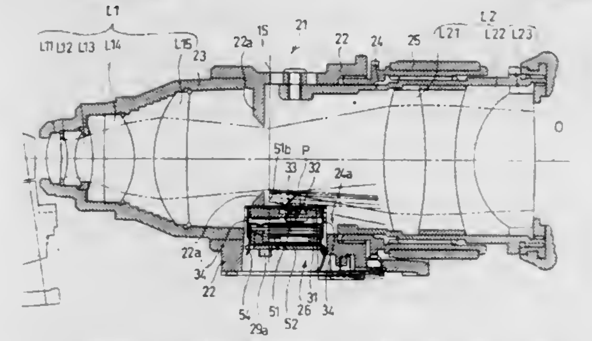
a reflector; wherein, said reflector includes:

a neck region that couples said reflector to a side of the swivel flash head, and

a reflective region that receives the light emitted from the swivel flash head traveling in the side direction and re-directs the received light to illuminate the camera field of view from positions above the camera lens unit when the camera is oriented within a range of camera orientations, said range of camera orientations including horizontal and vertical camera orientations.

5,839,007
INTERNAL INDICATOR OF A VIEW FINDER IN A CAMERA

Sohichiroh Kawakami, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 28, 1997, Ser. No. 919,481
Claims priority, application Japan, Sep. 2, 1996, 8-231748
Int. Cl.⁶ G03B *17/20*
U.S. Cl. 396—296 **11 Claims**



1. An internal indicator apparatus of a finder for a camera, comprising:

a finder optical system which includes an eyepiece system;

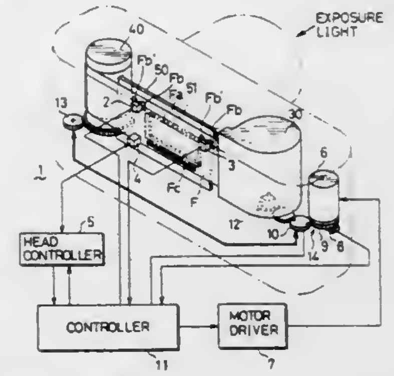
an indicator that indicates photographing data which can be viewed through said eyepiece system, said indicator being located in the vicinity of an image forming plane defined by said finder optical system; and

a position adjusting mechanism which moves said indicator along a predetermined direction so that an indication surface of said indicator is moved to one of said image forming plane and an optically equivalent position thereof;

wherein said camera is a single lens reflex camera, a first object image forming surface defined by a photographing lens of the camera is located at one of on and in a vicinity of a focusing plate of said finder optical system, said image forming plane being a secondary object image forming surface defined by said photographing lens and said finder optical system.

5,839,008
APPARATUS PROVIDED WITH A FILM FRAME JUDGEMENT DEVICE

Yoshiyuki Tanaka, Sakai, and Toshihito Kido, Matsubara, both of Japan, assignors to Minolta Co., Ltd., Osaka, Japan
Division of Ser. No. 801,392, Feb. 20, 1997. This application Mar. 26, 1998, Ser. No. 48,162
Claims priority, application Japan, Feb. 21, 1996, 8-34031
Int. Cl.⁶ G03B *17/24;* **G11B** *5/00*
U.S. Cl. 396—319 **4 Claims**



1. An apparatus comprising:

a feeder which feeds a film having a magnetic recording portion;

a reader which magnetically scans the magnetic recording portion to generate scan signals; and

a judger which executes a first comparison and a second comparison to make judgment as to which of first, second, and third cases:

the first case being that the magnetic recording portion has been recorded with magnetic data

the second case being that the magnetic recording portion has not been recorded with magnetic data; and

the third case being that the first and second cases cannot be discriminated;

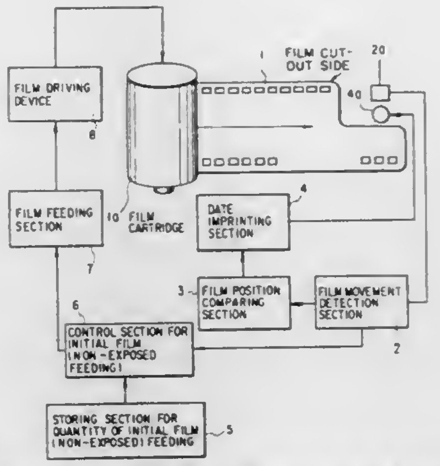
the first comparison comparing a scan signal from each of a plurality of blocks of the magnetic recording portion with a first predetermined level;

the second comparison comparing a scan signal from each of the plurality of blocks of the magnetic recording portion with a second predetermined level, the second predetermined level being lower than the first predetermined level; and

the first comparison being given higher priority than the second comparison.

5,839,009
CAMERA HAVING DATA IMPRINTING FUNCTION

Michi Toguchi; Tatsuya Suzuki, and Akira Inoue, all of Tokyo, Japan, assignors to Olympus Optical Co. Ltd., Tokyo, Japan
Continuation of Ser. No. 614,328, Mar. 12, 1996, abandoned, which is a continuation of Ser. No. 306,244, Sep. 14, 1994, abandoned, which is a continuation of Ser. No. 119,944, Sep. 10, 1993, abandoned. This application Sep. 23, 1997, Ser. No. 935,410
Claims priority, application Japan, Sep. 14, 1992, 4-244958
Int. Cl.⁶ G03B *1/18*
U.S. Cl. 396—408 **4 Claims**


FILM DRIVING DEVICE
8
1
FILM CUT-OUT SIDE
20
40
FILM FEEDING SECTION
10
FILM CARTRIDGE
4
DATE IMPRINTING SECTION
7
3
FILM POSITION COMPARING SECTION
FILM MOVEMENT DETECTION SECTION
6
CONTROL SECTION FOR INITIAL FILM (NON-EXPOSED FEEDING)
2
STORING SECTION FOR QUANTITY OF INITIAL FILM (NON-EXPOSED) FEEDING
5

1. A camera capable of imprinting data on a 135 type photographing film, said photographing film having a film cut-out side which has a cut-out portion at a leader portion of said film, said camera comprising:

a detector for counting a number of perforations of said film cut-out side passing across said detector, said detector being arranged at a position where said detector is adjacent to the cut-out portion of a just-loaded film so that said detector is not covered with the leader portion of said film when said film in a cartridge is loaded in the camera and when the leader portion of said film extends from the cartridge toward said detector;

a film feeder for feeding said film out of the cartridge, with a total quantity of movement of said film being measured from the leader portion of the film by counting the number of perforations of said film passing across said detector after said cut-out portion passes said detector;

a winding control for enabling said film feeder to execute a one frame winding up operation of said film based on a detection result of said detector, after completion of a film exposing operation;

an imprinter for driving a light emitting element a plurality of times during said one frame winding up operation so as to optically imprint a plurality of data on said film; and

an initial film feeding controller for enabling said film feeder to execute an initial film feeding operation from a first perforation of said film cut-out side after loading of said film in the camera and said film extends from the cartridge toward said detector without the leader portion of the film at the film cut-out side covering said detector, and after closing the back lid of the camera, after said film being fed by said film feeder, and after the leader portion of said film cut-out side being detected by said detector,

wherein an amount of initial film feeding is preset at 30 perforations, so as to satisfy a following relation:

$$L > R \geqq D$$

wherein

L: length of one frame of said photographing film corresponding to 8 perforations,

D: amount of film movement necessary for imprinting data on a portion of the film corresponding to 3 perforations, and

R: amount of winding movement after the final frame of said photographing film is exposed, the amount of which corresponds to a minimum value of 3 perforations and a maximum value of 7 perforations,

thereby ensuring a sufficient amount R of the film winding movement required for imprinting data for the final frame of said film.

5,839,010
SWITCH WITH LOCKING RESILIENT TABS

Akihiro Arai, and Yutaka Kamijo, both of Tokyo, Japan, assignors to Asahi Kogaku Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 577,706, Dec. 22, 1995, Pat. No. 5,678,107. This application Apr. 28, 1997, Ser. No. 845,769
Claims priority, application Japan, Dec. 27, 1994, 6-326323
Int. Cl.⁶ G03B *17/00*
U.S. Cl. 396—543 **5 Claims**

1. A switching device in a camera body, comprising:

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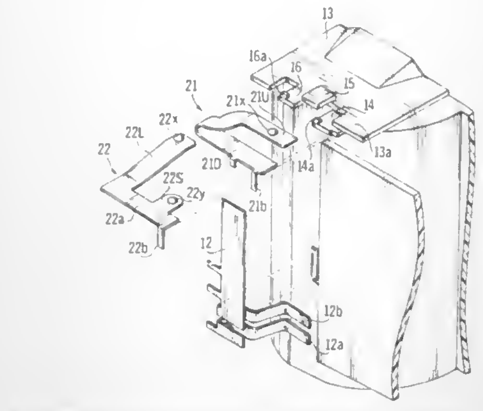


- at least one flat electrically conductive switch plate having flat faces; and
- a plurality of resilient tabs for holding said at least one flat electrically conductive switch plate, said plurality of resilient locking tabs being vertically displaced from one another in a direction normal to said flat faces.

5,839,011
APPARATUS FOR PROCESSING PHOTOSENSITIVE MATERIAL

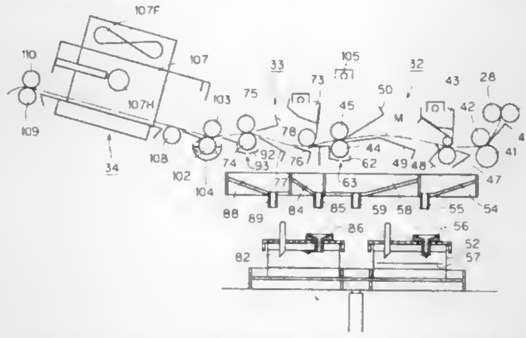
Jun Urasaki; Yoshikazu Takano; Akira Kunihiro, all of Tokyo; Eiji Miyasaka, Shiga; Masaharu Kimura, Shiga, and Yasuhiro Kawaguchi, Shiga, all of Japan, assignors to Mitsubishi Paper Mills Ltd., Tokyo, and Dainippon Screen Mfg. Co., Ltd., Kyoto, both of Japan

Filed Aug. 13, 1997, Ser. No. 910,220

Claims priority, application Japan, Aug. 14, 1996, 8-233649; Aug. 14, 1996, 8-233650

Int. Cl.⁶ G03D *5/06*

U.S. Cl. 395—606 **7 Claims**



1. An apparatus for coating a photosensitive surface of a photosensitive material with a processing liquid while feeding said photosensitive material along a predetermined feed path, with said photosensitive surface positioned upside, said apparatus comprising:

- a first pair of feed rollers for feeding said photosensitive material while holding said photosensitive material therebetween;
- a coating device provided downstream of said first pair of feed rollers in said feed path for coating said photosensitive surface with said processing liquid, said coating device including a restriction assembly for restricting the amount of said processing liquid to be supplied;
- a second pair of feed rollers provided on the downstream side from said first pair of feed rollers in said feed path for rotating in synchronism with said first pair of feed rollers to feed said photosensitive material while holding said photosensitive material therebetween;
- a first guide provided between said coating device and said second pair of feed rollers for raising and guiding said photosensitive material; and
- a second guide provided between said first guide and said second pair of feed rollers for supporting and guiding said back surface of said photosensitive material at a first level that is higher than both a second level at which said coating device contacts said photosensitive material and a third level at which said second pair of feed rollers hold said photosensitive material therebetween.

5,839,012
FILM SPLICING DEVICE

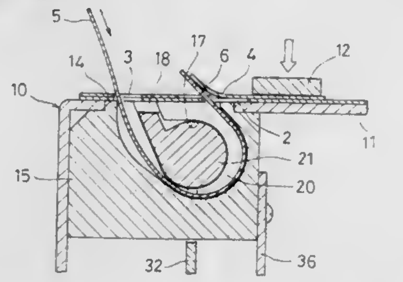
Junichi Miyai, Wakayama, Japan, assignor to Noritsu Koki Co., Ltd., Wakayama, Japan

Filed Dec. 13, 1996, Ser. No. 766,609

Claims priority, application Japan, Dec. 15, 1995, 7-327546

Int. Cl.⁶ G03D *15/04*

U.S. Cl. 396—647 **4 Claims**



1. A film splicing device for slicing a film to a leader, said device comprising a housing having a top plate on which the leader is to be placed, a leader presser provided on said top plate so as to be pivotable toward and away from the top surface of said top plate for pressing the leader against said top plate, said top plate being formed with a window, a film guide mounted in said housing under said window and having a recess opposite to said window, a slide guide mounted in said housing so as to be slidable into and out of said recess, and to define a film turning .path between its outer periphery and an inner wall of said recess when said slide guide is slid into said recess, and a linkage means for coupling said leader presser to said slide guide such that when said leader presser is pivoted down onto the top surface of said top plate, said slide guide slides into said recess, and when said presser is raised from said top plate, said slide guide slides out of said recess.

5,839,013
IMAGE FORMING APPARATUS HAVING A TEST MODE

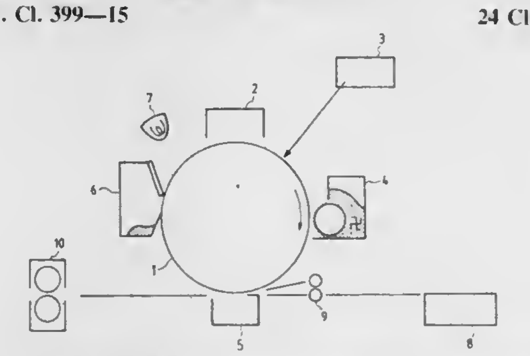
Yoshihiro Murasawa, and Seiya Nishiwaki, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 28, 1994, Ser. No. 266,689

Claims priority, application Japan, Jun. 28, 1993, 5-157023; Jun. 23, 1994, 6-141997

Int. Cl.⁶ G03G *21/00*

U.S. Cl. 399—15 **24 Claims**



18. A test method of an image forming apparatus, comprising the steps of:

- a) setting a test mode for a detection of a cause of a defect in a formed image;
- b) forming a plurality of sample images in different forming conditions;

- c) deciding a result of comparison of the plurality of sample images input manually by an operator;
- d) discriminating whether or not the cause of the defect in the formed image can be specified on the basis of a result decided in said deciding step;
- e) determining a content of a test mode to be sequentially carried out when the cause cannot be specified; and
- f) displaying the specified cause when the cause can be specified.

5,839,014
IMAGE FORMING METHOD AND APPARATUS FOR COPYING IMAGES ON BOTH SIDES OF AN IMAGE FORMING MEDIUM

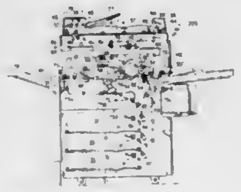
Toshiharu Takahashi, Kawasaki; Masako Shibaki, Yokohama, and Miki Konno, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Tokyo, Japan

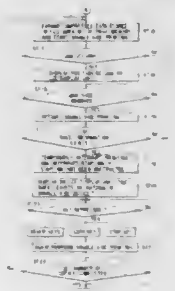
Filed Aug. 26, 1996, Ser. No. 704,954

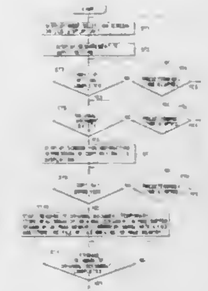
Claims priority, application Japan, Aug. 31, 1995, 7-246980

Int. Cl.⁶ G03G *15/00;21/00*

U.S. Cl. 399—21 **5 Claims**







1. An image forming apparatus for copying images on both sides of image forming mediums, respectively, comprising:

- means for reading image information of a set of originals;
- means for storing the image information read by said reading means;
- means for forming images on the image forming mediums, respectively, using the image information stored in said storing means;
- means for conveying the image forming mediums to said image forming means and, after images are respectively formed on first surfaces of the image forming mediums and images are respectively formed on second surfaces of the image forming mediums, conveying the image forming mediums to a discharge portion;
- first detection means for detecting occurrence of a jam condition during conveyance of the image forming mediums which is performed by said conveying means;
- means for displaying the occurrence of the jam condition in response to detection by said first detection means;
- second detection means for detecting whether a jammed image forming medium has been removed;
- third detection means for detecting whether or not the image forming mediums having the first surfaces on which the images have been formed are short in number, when an image forming operation is performed on the second surfaces of the image forming mediums; and
- controlling means for controlling, when said third detection means detects that the image forming mediums are short in number, said image forming means such that said image forming means performs an image forming operation using the image information stored in said storing means, in accordance with a shortage of the image forming mediums.

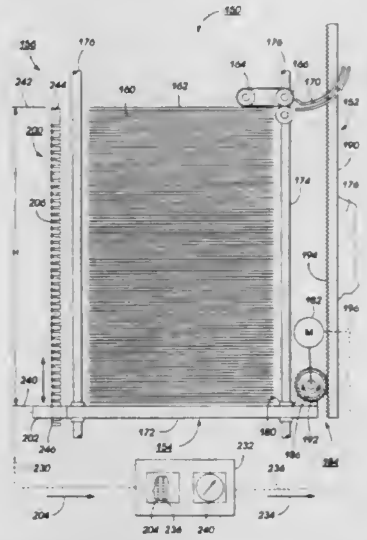
5,839,015
PAPER HEIGHT MEASURE APPARATUS FOR A MEDIA TRAY WITH LINEAR SENSOR

Gary A. Faguy, Hamilton; David G. Joyce, Richmond Hill, and Joseph Azzopardi, Brampton, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 28, 1996, Ser. No. 623,085

Int. Cl.⁶ G03G *15/00*

U.S. Cl. 399—23 **18 Claims**



1. An apparatus for determining the height of a stack of sheet media in a supply bin, comprising:

- an optical sensor; and
- a substantially linearly extending member operatively associated with said sensor to permit relative motion therebetween, at least one of said sensor and said member moving with the supply bin, said sensor generating a signal indicative of the relative motion between said sensor and said member to provide an indication of the height of the stack of the sheet media wherein said member comprises a strip including a pattern of transparent segments and opaque segments.

5,839,016
FUSED IMAGE SENSING

Jeffrey J. Folkins, Rochester, and Vittorio R. Castelli, Yorktown Heights, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 24, 1997, Ser. No. 977,280

Int. Cl.⁶ G03G *15/00*

U.S. Cl. 399—46 **20 Claims**

1. A method of controlling a printing process in a printing machine, comprising the steps of:

- producing a toner image on a surface;

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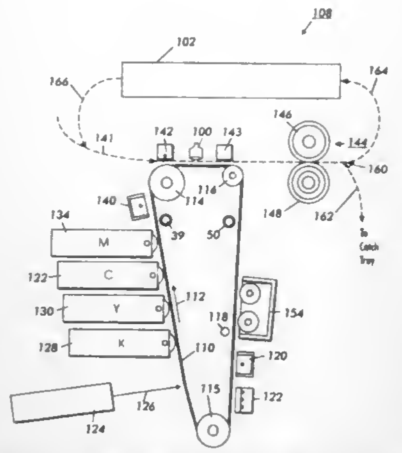


transporting a substrate along a paper path which is adjacent to the toner image;
locating a sensor in the paper path and in a sensing relationship with the toner image;
transferring the toner image to the substrate;
fusing the transferred image to the substrate;
inverting the fused substrate;
sensing the image on the fused substrate with the sensor; and
controlling a printing process based on the sensing of the image on the fused substrate.

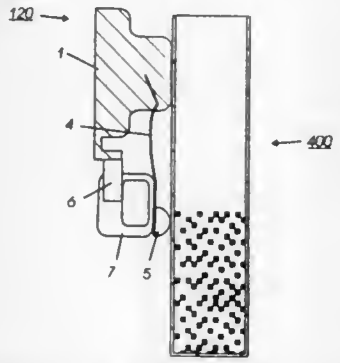
5,839,017
DEVELOPER LEVEL DETECTION SYSTEM

Samuel P. Mordenga, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 9, 1997, Ser. No. 826,956

Int. Cl.^{6} G03G *15/08*

U.S. Cl. 399—35 3 Claims



1. In a sensing system for detecting a full toner condition within a developer waste bottle, said sensing system comprising:
a sensor assembly mounted exterior to the developer waste bottle, said sensor being responsive to magnetic material in said developer bottle when the magnetic material in said toner waste bottle reaches a predetermined level, said sensor assembly comprises
a leaf spring;
a magnetic pad attached at one end of said leaf spring, said magnetic pad in moveable toward a wall of said developer waste bottle when magnetic material in said developer waste bottle reaches said predetermine level; and
a sensor for detecting the movement of said pad.

5,839,018
TONER DENSITY CONTROL FOR AN IMAGE FORMING APPARATUS

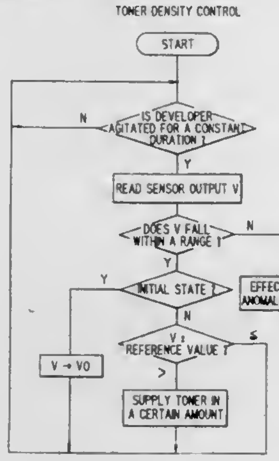
Masato Asanuma, Nara; Toshiaki Ino, Yamatokoriyama; Kanshiro Okamoto, Memphis; Hideji Saiko, Yamatokoriyama; Toshihisa Ishida, Kashiba; Katsuaki Sumida, Kitakatsuragigun; Motoyuki Itoyama, Yamatokoriyama; Hiroo Naoi, Yamatokoriyama; Mitsuru Tokuyama, Nara; Eisaku Hatanaka, Yamatokoriyama; Yuichiro Takesue, Nara; Jitsuo Masuda, Yamatotakada; Masayasu Narimatsu, and Yasuo Kitabatake, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 1, 1996, Ser. No. 625,997

Claims priority, application Japan, Apr. 3, 1995, 7-077745; Jun. 14, 1995, 7-147297; Sep. 21, 1995, 7-243222

Int. Cl.^{6} G03G *15/00*

U.S. Cl. 399—43 27 Claims


TONER DENSITY CONTROL
START
IS DEVELOPER AGITATED FOR A CONSTANT DURATION ?
N
Y
READ SENSOR OUTPUT V
DOES V FALL WITHIN A RANGE ?
N
Y
INITIAL STATE ?
Y
N
EFFECT A PROCESS FOR ANOMALOUS TONER DENSITY
V ≥ REFERENCE VALUE ?
≤
>
V → VO
SUPPLY TONER IN A CERTAIN AMOUNT

1. An image forming apparatus comprising:
a toner density sensor for detecting a toner density of a two-component developer stored in a developing vessel;
toner density control means for comparing an output from said toner density sensor with a reference toner density and maintaining the toner density of the developer at the reference toner density by controlling the amount of supplying toner to the developing vessel;
agitation total detecting means for detecting as an agitation total one of a number of agitations of the developer inside the developing vessel, an approximate operation time of the image forming apparatus and a number of images formed, any of which is proportional to the number of agitations;
toner density correcting means for correcting the output from one of said toner density sensor and the reference toner density in association with an augment of the agitation total;
toner patch density detecting means for creating a toner patch on a photoreceptor and detecting a density of the toner patch;
process parameter controlling means for controlling process parameters including an applied voltage to a main charger in order to adjust the toner patch density detected by said toner patch density detecting means to a predetermined density value; and
toner density correction canceling means for canceling a correction by said toner density correcting means when the process parameter has reached a predetermined value with improvement of developing performances of the developer.

5,839,019
IMAGE FORMING APPARATUS FOR COPYING DIFFERENT GROUPS OF DOCUMENT

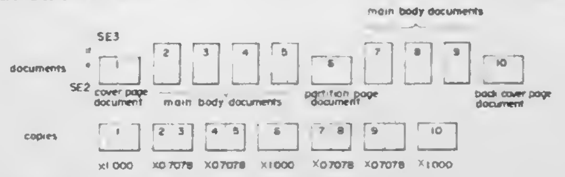
Hiroyasu Ito, Okazaki, Japan, assignor to Minolta Co., Ltd., Osaka, Japan

Division of Ser. No. 362,954, Dec. 23, 1994. This application Mar. 28, 1996, Ser. No. 624,658

Claims priority, application Japan, Dec. 28, 1993, 5-336821; Feb. 28, 1994, 6-029686

Int. Cl.^{6} G03G *21/00*

U.S. Cl. 399—45 31 Claims



1. An image forming apparatus comprising:
document transporting means for sequentially transporting a group of original documents to a predetermined position on a document platen one by one, said group of original documents including main body pages and partition pages which have a dimension different from a dimension of the main body pages;
image forming means for forming an image of each of the original documents on a respective copy sheet in synchronization with an operation of said document transporting means;
sheet supplying means having a plurality of supply portions, and which feeds copy sheets one sheet at a time from the supply portions to said image forming means;
detection means for detecting the dimension of each of the original documents while said original document is being transported to said predetermined position; and
control means for controlling the sheet supplying means in accordance with a detection of said detection means so as to supply a copy sheet for the partition pages from a supply portion different from a supply portion for the main body pages.

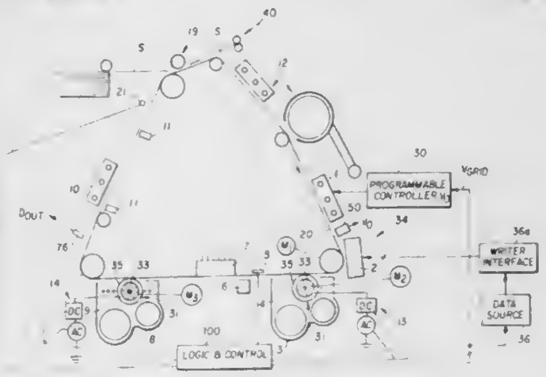
5,839,020
METHOD AND APPARATUS FOR CONTROLLING PRODUCTION OF FULL PRODUCTIVITY ACCENT COLOR IMAGE FORMATION

Allen J. Rushing, Webster, and Matthias H. Regelsberger, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 11, 1997, Ser. No. 799,673

Int. Cl.^{6} G03G *15/00*

U.S. Cl. 399—49 29 Claims



1. A reproduction apparatus comprising:
an electrostatic recording member for supporting an electrostatic image;
a primary charger establishing a primary charge on the member, the primary charge being defined by an adjustable parameter V_o;
an exposure device imagewise modulating the primary charge to form an electrostatic image on the recording member and having an adjustable exposure parameter E_o;
a developer station developing the electrostatic image with charged toner, the developer station having an electrical bias to establish an electrical field for urging movement of the toner to the member, the electrical bias having an adjustable direct current component V_b and an adjustable alternating current component parameter AC;
a controller controlling adjustments to the parameters E_o, V_o and AC by measuring a density parameter D_{OUT} of an exposed and developed area on the member that is formed by operation of said primary charger, said exposure device and said developer station, said controller including a calculator for calculating an error, ΔD_{OUT}, in the measured density parameter from a density setpoint and multiplying ΔD_{OUT} by respective first, second and third constants to obtain respective adjustment values used for adjusting E_o, V_o and AC and wherein in repeated use of said controller to provide repeated adjustment values used for adjusting E_o, V_o and AC a fixed ratio is maintained between said first, second and third constants.

5,839,021
DEVELOPING UNIT FOR AN ELECTROPHOTOGRAPHIC PRINTER EMPLOYING A SUPPLY ROLLER FOR TRANSFERRING TONER TO A DEVELOPING ROLLER

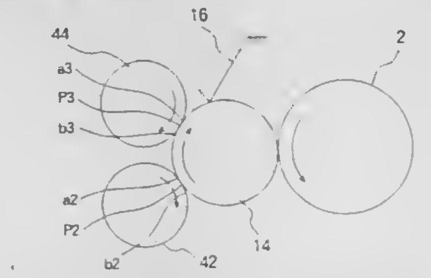
Kuniharu Hayashi; Koichi Matsuzaki, and Masamitsu Nagamine, all of Tokyo, Japan, assignors to Oki-Data Corporation, Tokyo, Japan

Filed Jul. 21, 1997, Ser. No. 897,273

Claims priority, application Japan, Jul. 24, 1996, 8-194825; Mar. 21, 1997, 9-067771

Int. Cl.^{6} G03G *15/06;15/08*

U.S. Cl. 399—55 18 Claims



1. A developing unit having a toner reservoir, for developing a latent electrostatic image on an image surface, comprising:
a developing roller for carrying toner to said image surface; and
at least two supply rollers for transferring toner from said toner reservoir to said developing roller and removing toner from said developing roller, said supply rollers pressing against said developing roller with a nip, and electrically charging said toner by friction at respective points of contact with said developing roller.

5,839,022
FILTER FOR REDUCING THE EFFECT OF NOISE IN TC CONTROL

Yao Rong Wang, Webster, and Lingappa K. Mestha, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 26, 1996, Ser. No. 757,032

Int. Cl.^{6} G03G *15/08*

U.S. Cl. 399—62 18 Claims

1. In an imaging machine having an imaging member, operating components including a toner dispense system, and a control system including memory to provide images on copy sheets, the toner dispense system comprising:
a source of toner material,

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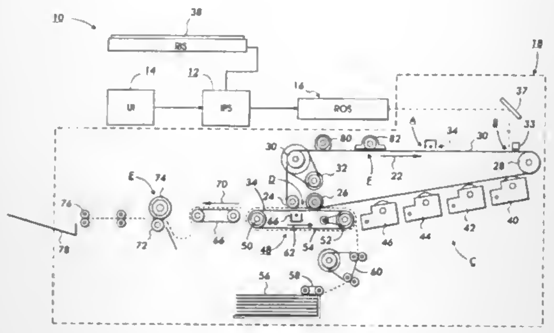
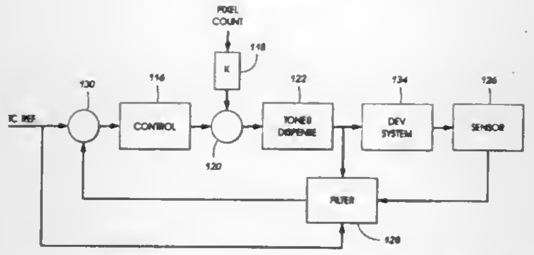




- a dispenser for transferring toner material from the source to a developer device to replenish the developer device with toner material,
- a sensor to provide signals representing a degree of toner concentration,
- a toner concentration reference,
- a filter interconnected to the sensor and to the toner concentration reference to eliminate error in the signals representing the degree of toner concentration, and
- a comparator responding to the toner concentration reference and the signals representing the degree of toner concentration to provide an error signal to the control system, the control system providing a toner dispense signal.

5,839,023
FIXING APPARATUS AND CONTROL METHOD THEREOF

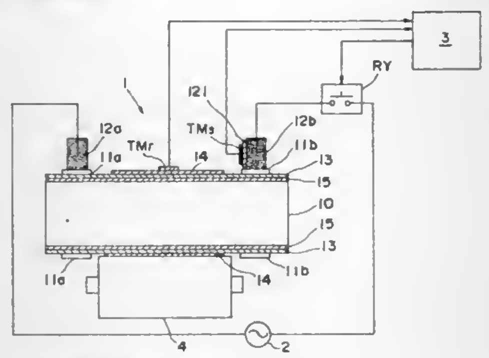
Yuusuke Morigami, Toyohashi, Japan, assignor to Minolta Co., Ltd., Osaka, Japan

Filed Oct. 23, 1996, Ser. No. 731,966

Claims priority, application Japan, Oct. 25, 1995, 7-277465

Int. Cl.^{6} G03G *15/20*

U.S. Cl. 399—69 **23 Claims**



1. A fixing apparatus comprising:
- a heat roller having a resistance heating member that generates heat when current is supplied thereto;
- a power supply member that is electrically connected to said resistance heating member;
- a power source that applies voltage to said resistance heating member by way of said power supply member;
- a first detection means for detecting the temperature of said heat roller;
- a second detection means for detecting the temperature of said power supply member; and
- a control means for stopping the supply of current to said resistance heating member when at least one of the following conditions is present: (1) the temperature detected by said first detection means is higher than a first predetermined temperature, or (2) the temperature detected by said second detection means is higher than a second predetermined temperature.

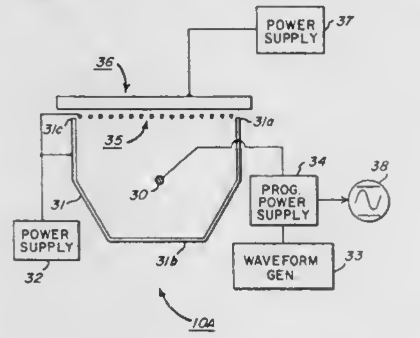
5,839,024
CORONA CHARGING OF A CHARGE RETENTIVE SURFACE

John W. May, Rochester; Martin J. Pernesky, Hornell, and Bruce R. Benwood, Churchville, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 19, 1997, Ser. No. 858,752

Int. Cl.^{6} G03G *15/02*

U.S. Cl. 399—89 **24 Claims**



1. A corona charger for depositing an electrostatic charge on a charge retentive surface, without the creation of sheeting defects, the charger comprising:
- a coronode; and
- a power supply operating in cycles and providing in each of the cycles electrical power to the coronode to produce a net positive charging current with voltage to the coronode from the power supply operating in a portion of each cycle with a positive polarity to generate positive corona emissions, the power supply operating so that an AC component of the voltage provided by the power supply has a positive polarity in the range of about 60% to about 85% of each cycle.

5,839,025
IMAGE FORMING APPARATUS HAVING A WINDOW FOR ILLUMINATING PAPER DISCHARGED TO A DISCHARGE SECTION

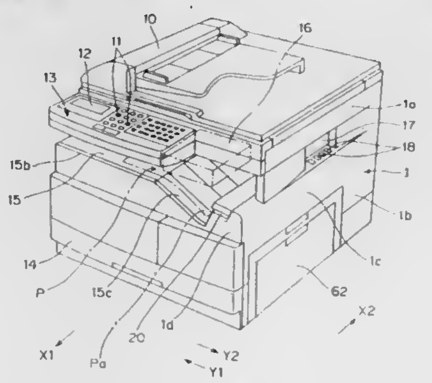
Yoshifumi Okauchi; Tetsuro Tomoe; Yukihiro Itoh; Masahiko Miyazaki, and Syouji Hirano, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed May 22, 1997, Ser. No. 861,784

Claims priority, application Japan, May 31, 1996, 8-138390

Int. Cl.^{6} G03G *21/20*

U.S. Cl. 399—92 **7 Claims**



1. An image forming apparatus comprising:
- a paper discharging section which is so formed as to open toward a front in a main body of the image forming apparatus and into which a paper sheet having an image recorded thereon is discharged, the paper discharge section including a stacking portion at which discharged sheets are stacked, and the paper discharge section defining a paper take out opening through which discharged sheets are taken out; and
- a window formed on a surface of the main body of the image forming apparatus for lighting the paper discharging section, the window having an opening located remotely from the paper take out opening, the window opening admitting light for lighting the stacking portion.

5,839,026
METHOD OF CONTROLLING CHARGE VOLTAGE OF IMAGE FORMING APPARATUS USING ELECTROPHOTOGRAPHIC DEVELOPING PROCESS

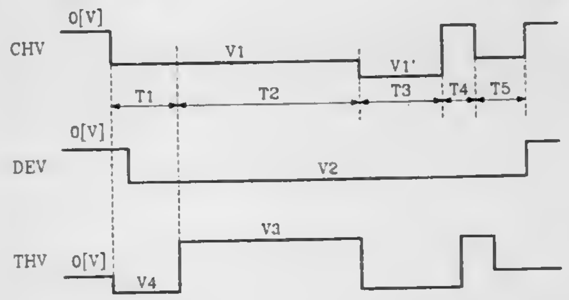
Chang-Kyung Ko, Suwon, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Mar. 18, 1997, Ser. No. 819,319

Claims priority, application Rep. of Korea, Mar. 18, 1996, 1996/7215

Int. Cl.^{6} G03G *15/02*

U.S. Cl. 399—100 **18 Claims**



1. A method for controlling a charge voltage of an image forming apparatus using an electrophotographic developing process, comprising the steps of:
- applying a charge voltage of a predetermined voltage level to a contact charging unit to uniformly charge an outer surface of a photoconductive body to a predetermined polarity while a main motor of said image forming apparatus rotates;
- when cleaning said contact charging unit, applying a charge voltage exhibiting a voltage level lower than said predetermined voltage level to said contact charging unit to increase a potential difference between said contact charging unit and said photoconductive body; and
- transferring charged toner particles adhered to said contact charging unit to said photoconductive body by shutting off said charge voltage being applied to said contact charging unit.

5,839,027
MAGNET LESS SEALABLE DEVELOPER CARTRIDGE

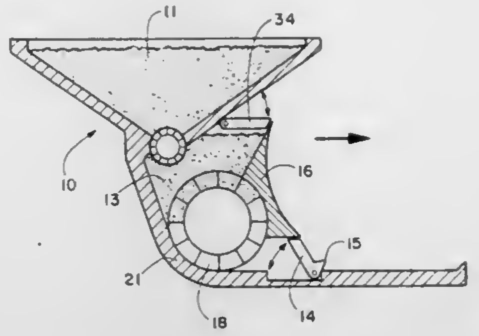
Ravi B. Sahay, San Diego, Calif., and Henry L. Alioth, Las Vegas, Nev., assignors to Ravl & Associates, San Diego, Calif.

Filed Jun. 30, 1997, Ser. No. 885,532

Int. Cl.^{6} G03G *15/08*

U.S. Cl. 399—106 **18 Claims**

1. In a reproduction apparatus of the type having a control means to control the apparatus, a photoreceptor to receive toner through a photoreceptor path and to transfer the toner onto imaged portions of the photoreceptor, and a developer transporter of the magnetic type to carry toner in a magnetic brush to the imaged portions of the photoreceptor and to return unspent toner therefrom, an improved magnet-less cartridge device comprising:



- a housing adjacent to the developer transporter which removably attaches to the reproduction apparatus;
- a developer mix hopper within said housing for holding toner in the form of a developer mix;
- a mixer member within said housing in communicating operation of the control means for mixing the developer mix;
- a scraper at an open end of said housing; and
- a sealing means adjacent to the open end of said housing to seal said cartridge in a plurality of sealing modes, said sealing means in communicating operation of the control means.

5,839,028
PROCESS CARTRIDGE AND REFILLING METHOD THEREFOR

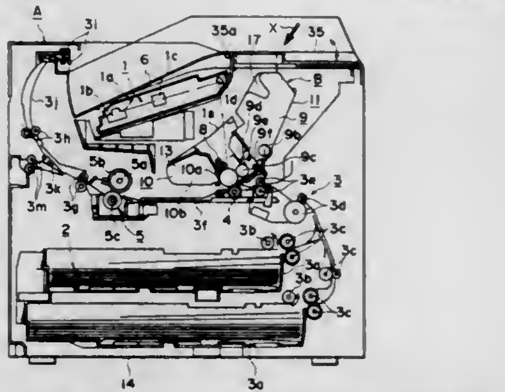
Yoshiya Nomura, Toride; Kanji Yokomori, Odawara, and Shigeo Miyabe, Numazu, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 26, 1996, Ser. No. 703,803

Claims priority, application Japan, Aug. 25, 1995, 7-240791

Int. Cl.^{6} G03G *15/00*

U.S. Cl. 399—109 **16 Claims**



1. A toner refilling method for a process cartridge detachably mountable to a main assembly of an image forming apparatus, said process cartridge including an electrophotographic photosensitive member, developing means for developing a latent image formed on said electrophotographic photosensitive member, a toner accommodating portion for accommodating toner to be used for development by said developing means, cleaning means for removing the toner remaining on said electrophotographic photosensitive member, and a removed toner accommodating portion for accommodating the toner removed from said electrophotographic photosensitive member by said cleaning means, wherein an inside of said toner accommodating portion is divided into four chambers by three separation members, said method comprising the steps of:

(1) a first digging step of digging a hole in said removed toner accommodating portion;

(2) a toner discharging step for discharging the toner accommodated in the removed toner accommodating portion through the hole dug in said removed toner accommodating portion by said first digging step;

(3) a first sealing step of sealing the hole of said removed toner accommodating portion, after the discharging of the toner;

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(4) a second digging step of digging a hole bridging over each of two longitudinal end ones of said three separation members;
(5) a toner refilling step of refilling toner into a first chamber and a second chamber formed by said separation members, through the hole dug in said toner accommodating portion by said second digging step; and
(6) a second sealing step of sealing the hole dug by said second digging step, after the toner is refilled.

5,839,029
CHARGING DEVICE

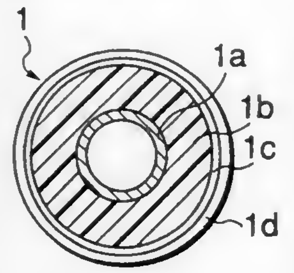
Hiroyuki Kataoka; Eiko Tanaka, and Hiroshi Takayama, all of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Feb. 19, 1997, Ser. No. 802,106

Claims priority, application Japan, Feb. 21, 1996, 8-033223

Int. Cl.^{6} G03G *21/18*

U.S. Cl. 399—115 **6 Claims**



1. A charging device pressed against a surface of a body to be charged in a state of being applied with a voltage so as to charge said body, comprising:
an electrically conductive support to which a voltage is to be applied;
an electrically conductive elastic body layer fixed on said electrically conductive support;
a resistance regulation layer covering said electrically conductive elastic body layer; and
a protective layer laminated on said resistance regulation layer, having hardness of 6 H or more in pencil hardness and made from a silicon compound.

5,839,030
DRUM-TYPE IMAGESETTER WITH VARIABLE DIAMETER

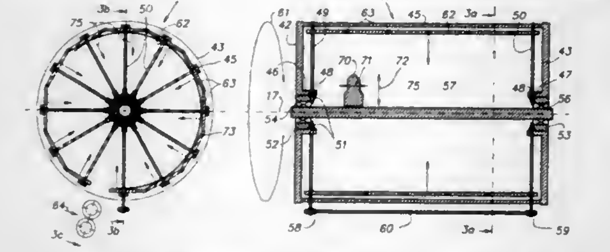
Luc Van Aken, Kuringen; Bert Vackier, 's-Gravenwezel, and Karel Van den Eynde, Deurne, all of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed Oct. 22, 1996, Ser. No. 736,015

Claims priority, application European Pat. Off., Nov. 13, 1995, 95203078.1

Int. Cl.^{6} H04N *1/08*

U.S. Cl. 399—117 **24 Claims**



1. Drum-type imagesetter for producing an image on a flexible sheet of radiation-sensitive material, which comprises
retaining means (**62**, **63**, **87**) forming a drum for retaining said sheet in a substantially cylindrical configuration, and
exposure means (**70**, **103**, **106**, **107**) for image-wise exposing said sheet,
said sheet retaining means comprising adjustment means for allowing different drum diameters to be set for obtaining a duty cycle of at least 90% for different sheet formats.

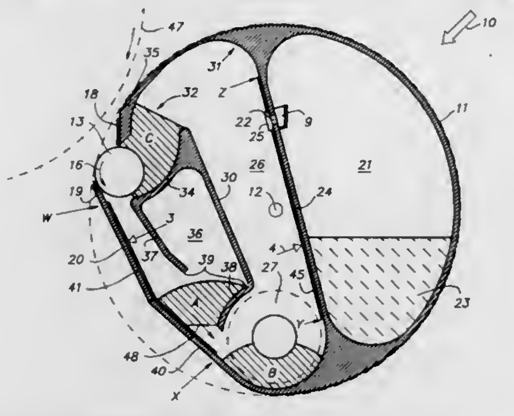
5,839,031
ELECTROSTATOGRAPHIC DEVELOPING DEVICE

William Waterschoot, Belsele; Leo Vackier, 's-Gravenwezel; Robert Janssens, Geel; Luc Van Goethem, Sint-Gillis-Waas, and Eric Van Echelpoel, Lier, all of Belgium, assignors to Agfa-Gevaert, Mortsel, Belgium

Filed May 14, 1997, Ser. No. 855,673

Int. Cl.^{6} G03G *15/04*

U.S. Cl. 399—119 **5 Claims**



1. An electrostatographic developing device, comprising:
a housing rotatably mounted on a horizontal shaft, said housing having an elongated peripheral opening;
a developer roller rotatably mounted in said elongated peripheral opening, said developer roller having a peripheral surface for holding thereon a magnetically attractable dry powder developer for use in developing an electrostatic image formed on an electrostatic image support member passed in close proximity to said developer roller;
a toner chamber in said housing for holding toner;
a developer chamber in said housing for holding developer;
means for adding said toner stored in said toner chamber to said developer stored in said developer chamber;
means for providing fresh developer to said developer roller;
means for completely removing used developer from said developer roller at a location downstream in the rotational direction of said developer roller from the location where said developer roller passes in close proximity to said electrostatic image support member to develop said electrostatic image, but upstream in said rotational direction from the location where said fresh developer is provided to said developer roller, said used developer being formed from said fresh developer being used to develop said electrostatic image on said electrostatic image support member;
a receiving chamber mounted in said housing for receiving said used developer after it has been removed from said developer roller; and
mixing means located in said developer chamber for mixing said used developer and said toner with said developer located in said developer chamber to form said fresh developer.

5,839,032
IMAGE FORMING APPARATUS HAVING SELECTABLY CONTROLLED SHEET DISCHARGE PATHS

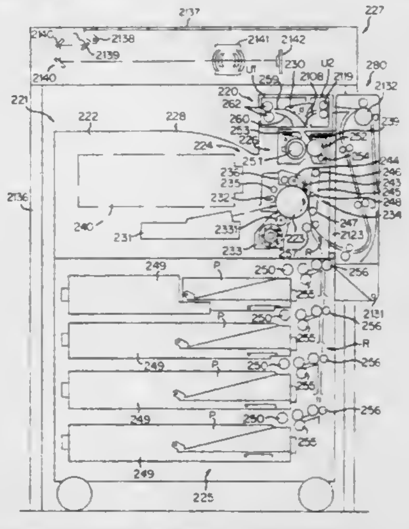
Motokazu Yasui; Masaaki Yoshikawa, and Yasuhisa Katoh, all of Kanagawa, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 25, 1997, Ser. No. 824,548

Claims priority, application Japan, Mar. 8, 1996, 8-051903; Oct. 30, 1996, 8-287780; Jan. 22, 1997, 9-009754; Jan. 22, 1997, 9-009755

Int. Cl.^{6} G03G *15/00*

U.S. Cl. 399—124 **23 Claims**



15. An image forming apparatus, comprising:
an image forming unit for forming a visible image on a sheet;
a sheet feeding unit upward connected to said image forming unit for feeding the sheet towards said image forming unit;
a sheet discharging unit having a discharging tray located at an upper portion of said image forming unit for stacking sheets;
a duplex copying unit for reversing the sheet;
a first discharging path for discharging the sheet towards said discharging tray; and
a second discharging path for discharging the sheet towards a third discharging path or said duplex copying unit, the sheet from said image forming unit being selectably conveyed towards said first discharging path or said second discharging path;
wherein said sheet discharging unit comprises a first unit which establishes said first discharging path and a second unit which establishes said second discharging path.

5,839,033
APPARATUS HAVING FUNCTION OF SETTING BINDING MARGIN, AND METHOD USED BY THE APPARATUS

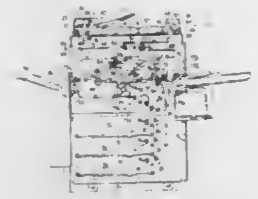
Toshiharu Takahashi, Kawasaki; Masako Shibaki, Yokohama, and Miki Konno, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

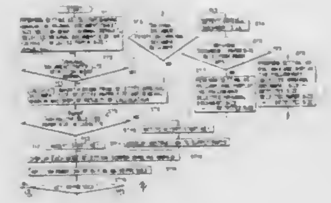
Filed Aug. 26, 1996, Ser. No. 703,353

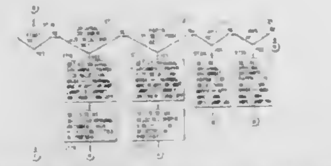
Claims priority, application Japan, Aug. 31, 1995, 7-246982

Int. Cl.^{6} G03G *15/04*

U.S. Cl. 399—187 **10 Claims**







1. An image forming apparatus, comprising:
means for setting image forming conditions including an amount of a margin which is formed in an end region of an image forming medium when an image is, on the image forming medium, formed from image information;
means for inputting information of the size of an original document and the size of the image forming medium;
means for reading the image information of the original document;
means for rotating the image information according to a direction of the image information read by the reading means and image forming mediums;
means for, in accordance with the image information read by said reading means, forming the images on the image forming mediums having the size input by said input means;
means for calculating a magnification with which the image information read by said reading means is formed in a region of the image forming medium except the set margin portion in accordance with the amount of margins, the size information of the image forming medium the size information of the original document and a rotation result of the rotating means, when the amount of margins have been set by the setting means; and
means for converting the image information read by said reading means in accordance with a result of calculation performed by said calculating means to cause said image forming means to form the images on the image forming medium.

5,839,034
IMAGE FORMING DEVICE HAVING A PHOTOSENSITIVE DRUM AND DEVELOPING ROLLER THAT ROTATE IN THE SAME DIRECTION

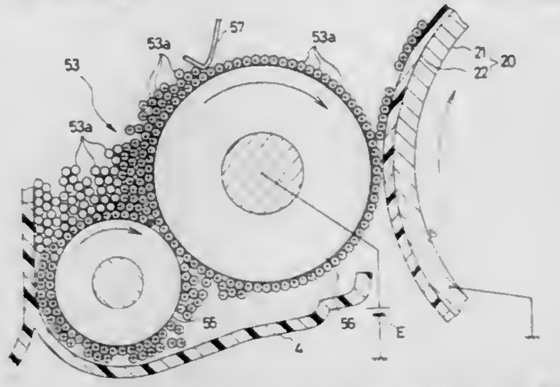
Shougo Sato, Seto, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Sep. 11, 1996, Ser. No. 712,423

Claims priority, application Japan, Sep. 12, 1995, 7-260765

Int. Cl.^{6} G03G *15/00;15/08*

U.S. Cl. 399—167 **14 Claims**



1. An image forming device for forming images on a sheet transported along a sheet-transport pathway from a sheet supply tray to a fixing unit, the image forming device comprising:

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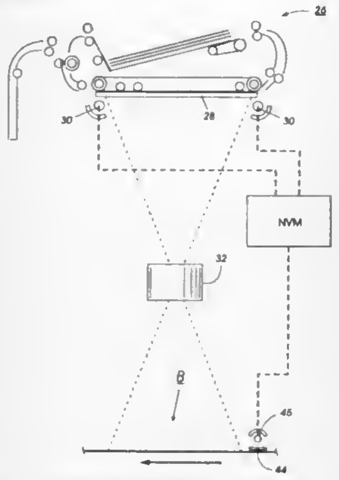
- a photosensitive drum rotated in a predetermined rotational direction at a predetermined peripheral speed, the photosensitive drum having a peripheral surface capable of forming a latent static electric image; and
- a developing roller disposed in confrontation with the photosensitive drum and for developing a latent static electric image formed on the peripheral surface of the photosensitive drum into a toner image, the developing roller being rotated in the predetermined rotational direction at a peripheral speed not more than two times the predetermined peripheral speed.

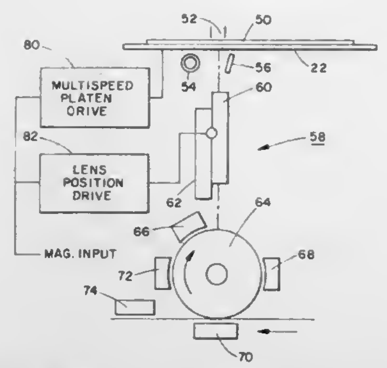
5,839,035
PHOTOMODE CONTRAST CONTROL SYSTEM FOR AN ELECTROSTATOGRAPHIC PRINTING MACHINE
Darrel R. Rathbun, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Jun. 2, 1997, Ser. No. 867,549
Int. Cl.⁶ G03G *15/04*
U.S. Cl. 399—181 **18 Claims**



1. A system for controlling image contrast in an electrostatographic imaging system having a photoconductive member, comprising:
- a first light emitting source for projecting a light image of an original document onto the photoconductive member to create an electrostatic latent image thereon;
- a second light emitting source for generating a line screen pattern on the photoconductive member such that the electrostatic latent image is positioned in superimposed registration with the line screen pattern on the photoconductive member to produce a modulated electrostatic latent image thereon;
- apparatus for varying intensity of the light emitted from said first light emitting source;
- apparatus for varying intensity of the light emitted from said second light emitting source; and
- a control system for maintaining a total amou of the light emitted from said first light emitting source and said second light emitting source substantially constant while varying the intensity of the light emitted from either said first or second first light emitting source.

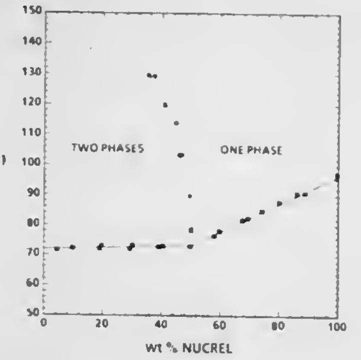
5,839,036
MULTISPEED DRIVE MECHANISM
David K. Shogren, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Jun. 16, 1997, Ser. No. 876,607
Int. Cl.⁶ G03G *15/30*
U.S. Cl. 399—213 **21 Claims**

1. Copying apparatus comprising:
- a movable platen for receiving original documents to be copied;
- an imaging apparatus for imaging the original documents positioned on the platen;



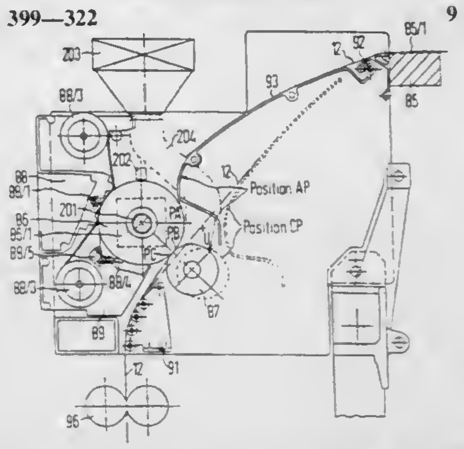
- a multiple speed gear drive mechanism for moving the movable platen with respect to the imaging apparatus, the multiple speed gear drive mechanism including an input shaft, a plurality of input gears mounted on the input shaft, a plurality of drive gears, each of the drive gears engaging one of the input gears on the input shaft and selectively engaging and driving a drive member for driving the platen, wherein the drive gears are supported on a support structure which is pivoted about the input shaft to change a gear ratio of the drive mechanism.

5,839,037
METHOD FOR TRANSFERRING A LIQUID IMAGE
James R. Larson, Fairport; David H. Pan, Rochester; Raymond W. Stover, Webster; John S. Berkes, Webster; Christine J. Tarnawskj, Webster, and Rasin Moser, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Jun. 7, 1995, Ser. No. 473,613
Int. Cl.⁶ G03G *15/10*
U.S. Cl. 399—249 **6 Claims**



1. A method for transferring a liquid developer image on an intermediate surface to a final support substrate, said liquid developer image having a liquid portion including a carrier fluid and having a solid portion including thermoplastic resin and pigment at ambient temperatures, comprising the steps of:
- heating the liquid developer image on the intermediate surface to a given temperature at least such that said solid portion and liquid portion form substantially two distinct liquid phases;
- transferring the liquid developer image to the final support; and
- concentrating the liquid developer image, before said heating step, to a given solid percentage by compacting the solids portion thereof and removing carrier liquid therefrom such that the solid portion and the liquid portion form substantially two phases at said given temperature and wherein said solid percentage ranges from 30 to 45 percent solids.

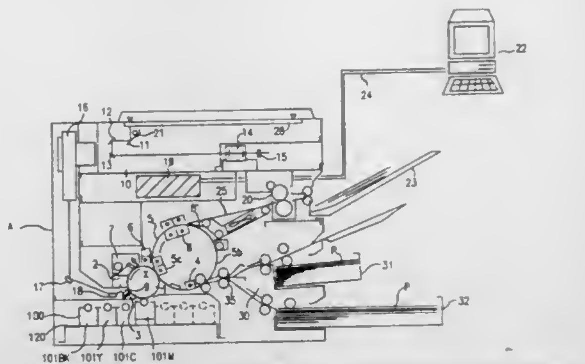
5,839,038
ELECTROPHOTOGRAPHIC PRINTER FOR REEL PAPER HAVING A THERMAL PRINT FIXING STATION
Walter Kopp, Taufkirchen, and Josef Windele, Puchheim, both of Germany, assignors to Oce Printing Systems GmbH, Poing, Germany
Continuation of Ser. No. 541,807, Oct. 10, 1995, abandoned, which is a continuation of Ser. No. 282,498, Aug. 1, 1994, Pat. No. 5,491,545, which is a continuation of Ser. No. 859,527, Jun. 10, 1992, abandoned. This application Sep. 26, 1997, Ser. No. 938,281
Claims priority, application European Pat. Off., Dec. 13, 1989, 89123027
Int. Cl.⁶ G03G *15/20*
U.S. Cl. 399—322 **9 Claims**



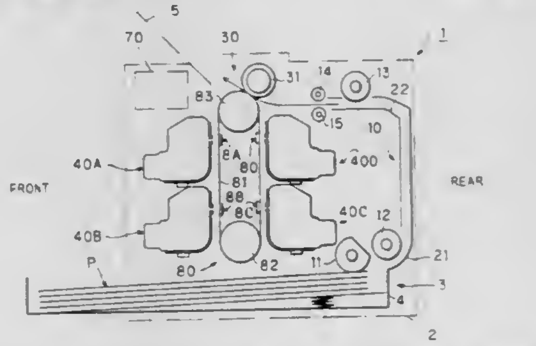
1. An apparatus for fixing a second toner image by pressure and heat on a second side of a recording medium which already has a fixed first toner image on an opposite first side without said already fixed first toner image being smudged or destroyed, comprising:
- a fixing station having a heating roller and a feed roller which presses the recording medium against the heating roller at a fixing gap so that the second toner image on the recording medium is in contact with the heating roller under heat and pressure;
- the fixing station having a wrapping device for wrapping the recording medium around a portion of the heating roller over a predetermined wrapping angle so that the recording medium is heated by the heating roller not only at the fixing gap but also over the entire wrapping angle; and
- the material wrapping device can change the wrapping angle between a standby position and an operating position.

5,839,039
COLOR IMAGE FORMING APPARATUS WITH CONTROLLER
Masanori Yamada, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 569,863, Dec. 8, 1995, Pat. No. 5,625,445, which is a continuation of Ser. No. 310,332, Sep. 22, 1994, abandoned, which is a division of Ser. No. 891,206, Jun. 1, 1992, Pat. No. 5,383,012. This application Dec. 27, 1996, Ser. No. 773,839
Claims priority, application Japan, Jun. 3, 1991, 3-131204
Int. Cl.⁶ G03G *15/14*
U.S. Cl. 399—298 **34 Claims**

1. An image forming apparatus comprising:
- retaining means having plural retaining positions, a formed image capable of being positioned at each retaining position;
- image forming means for forming an image based on an image signal repeatedly input from an external device, in response to the number of images at said retaining positions in said image forming apparatus; and
- transmitting means for transmitting information related to an image formed corresponding to the image signal or information related to an image formation of an incompleted image to the external device, in response to a completion of the image forming by said image forming means.



5,839,040
COLOR IMAGE FORMING DEVICE HAVING INTERMEDIATE TRANSFER BODY SANDWICHED BETWEEN IMAGE RECORDING UNITS
Shigeru Kagayama, Owariasahi, and Osamu Nagata, Aichi-ken, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed May 27, 1997, Ser. No. 863,188
Claims priority, application Japan, May 27, 1996, 8-131756
Int. Cl.⁶ G03G *15/01*
U.S. Cl. 399—302 **19 Claims**



1. An image forming device for forming an image on an image recording medium, the image forming device comprising:
- a plurality of image recording units, each of said plurality of image recording units containing a printing material; and
- an intermediate medium transfer mechanism comprising a plurality of back electrodes and an intermediate medium on which the image is deposited by said plurality of image recording units, the intermediate medium being interposed between each back electrode and a corresponding image recording unit, the intermediate medium transfer mechanism transferring the image on the intermediate medium onto the image recording medium, the intermediate transfer mechanism being interposed between said plurality of image recording units.

5,839,041
RAM SYSTEM INCLUDING A BIDIRECTIONAL METERING MEMBER AND A DUAL PURPOSE SWIPER BLADE
Anthony S. Condello, Webster; Robert M. Jacobs, Ontario, and Rabin Moser, Victor, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Sep. 29, 1997, Ser. No. 936,216
Int. Cl.⁶ G03G *15/20*
U.S. Cl. 399—325 **20 Claims**

1. A release agent management structure, said structure comprising:

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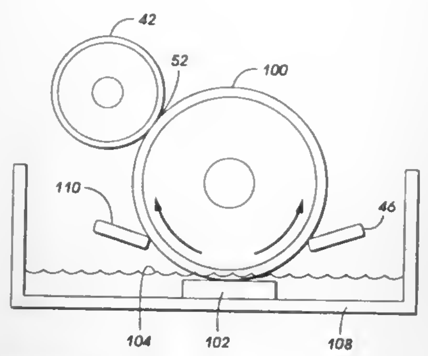


- a donor member;
- a supply of release agent material;
- a metering member supported for rotation in two directions and in pressure contact with said donor member to form a nip therebetween, said metering member also contacting said supply of release agent material for picking up a quantity of release agent material to be metered; and
- a metering structure supported in contact with said metering member intermediate said nip and said quantity of release agent material to be metered regardless of direction of rotation of said metering member.

5,839,042
FIXING DEVICE IN IMAGE FORMING DEVICE

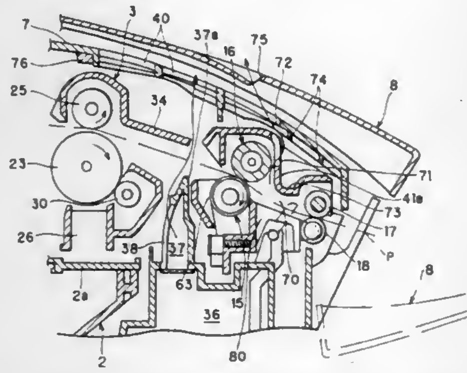
Yoshiya Tomatsu, Kasugai, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed May 7, 1997, Ser. No. 852,606

Claims priority, application Japan, May 8, 1996, 8-113547; May 8, 1996, 8-113549; May 8, 1996, 8-113550; May 9, 1996, 8-115035; Aug. 9, 1996, 8-115034

Int. Cl.⁶ G03G *15/20*

U.S. Cl. 399—328 **30 Claims**



1. A fixing device for thermally fixing a toner image formed on an image recording medium, the fixing device comprising:

- a heat roller comprising a sleeve member formed of a metal, the sleeve member having an inner hollow space and defining a longitudinal center, and a heating element provided in the hollow space, the sleeve member providing a moment of inertia of area ranging from 700 mm^4 to 1700 mm^4 and a maximum deflection amount of not more than 0.29 at the longitudinal center; and
- a pressure roller in pressure contact with the heat roller for nipping the image recording medium between the heat roller and the pressure roller.

5,839,043
THERMAL FIXING APPARATUS AND INDUCTIVELY HEATED SLEEVE

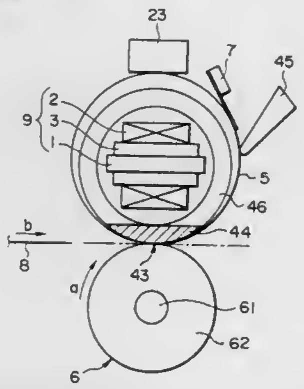
Eiji Okabayashi, and Taizou Oonishi, both of Toyokawa, Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Sep. 4, 1996, Ser. No. 707,688

Claims priority, application Japan, Sep. 4, 1995, 7-226769; Nov. 30, 1995, 7-312845; Jan. 16, 1996, 8-004852; Aug. 22, 1996, 8-221512

Int. Cl.⁶ G03G *15/20*

U.S. Cl. 399—329 **18 Claims**



1. A fixing apparatus for causing a toner deposited on a sheet to be thermally fused and fixed on said sheet, comprising:

- a thin sleeve with flexibility composed of a base layer and a surface layer touching to said sheet, at least said surface layer is made of metal,
- a coil adapted to generate a magnetic field in response to a high-frequency current supplied from a current supplying means and to produce an induced eddy current in said sleeve to generate heat therein,
- a retaining member adapted to retain said coil and disposed stationarily in said sleeve, pressing means pressed against said retaining member through said sleeve and enabled to nip said sheet carrying an unfixed toner thereon in cooperation with said sleeve and to move said sheet together with said sleeve, and
- at least a first heat-diffusing member extended in a direction perpendicular to a direction of conveyance of said sheet and formed of a material with good thermal conductivity characteristics and non-magnetic properties,
- said first heat-diffusing member disposed in said sleeve so as to contact said sleeve at a contact part between said sleeve and said pressing means.

5,839,044
IMAGE FORMING APPARATUS HAVING PAPER RECEIVING PORTION INSIDE THE BODY

Takashi Taruki, Hiratuka, Japan, assignor to Ricoh Company Ltd., Tokyo, Japan

Filed Jul. 16, 1996, Ser. No. 682,005

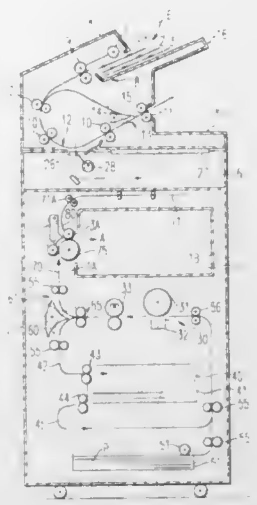
Claims priority, application Japan, Jul. 17, 1995, 7-202841

Int. Cl.⁶ G03G *15/00*

U.S. Cl. 399—361 **5 Claims**

1. An image forming apparatus having a duplex copying function and comprising:

- a document image reading unit;
- an auto-document feeding unit disposed on said document image reading unit for automatically feeding a document to a document receiving tray;
- a copying unit disposed below said document image reading unit and including a visible toner image forming apparatus having a photoconductive element for forming a toner image based on image information of a document;
- a copy sheet cassette disposed at a bottom of said image forming apparatus and accommodating blank copy sheets;



- a duplex copy sheet tray disposed above said copy sheet cassette for temporarily receiving one sided copy sheets and refeeding the same toward said visible toner image forming apparatus; and
- a copy sheet receiving part onto which a simplex or duplex copy sheet is ejected and stacked, disposed between said visible image forming apparatus and said document image reading unit,
- wherein all of said copy sheet cassette, said duplex copy sheet tray, said visible image forming apparatus and said copy sheet receiving part overlap such that all of said copy sheet cassette, said duplex copy sheet tray, said visible image forming apparatus and said copy sheet receiving part are intersected by a single vertical plane.

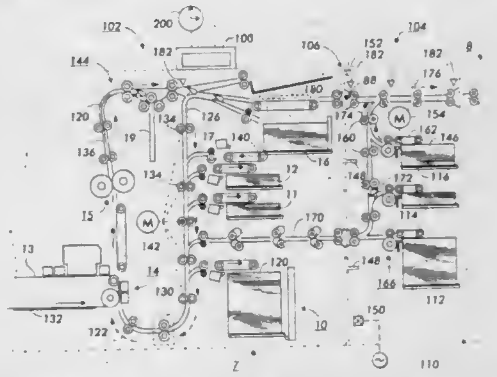
5,839,045
METHOD AND APPARATUS FOR INSERTING SHEETS INTO A STREAM OF SHEETS IN A SPACED APART RELATIONSHIP

Ronald R. Wierszewski, Henrietta, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 31, 1997, Ser. No. 904,013

Int. Cl.⁶ G03G *21/00*

U.S. Cl. 399—382 **6 Claims**



1. A method for synchronizing the feeding of a trailing insert by a first feed mechanism immediately subsequent to the feeding of a leading insert by the first feed mechanism into a stream of substantially equally spaced traversing sheets at a insertion location, the stream of sheets feed from a second feed mechanism, the method comprising:

- placing one of said sheets in operable contact with the second feed mechanism at a sheet feed initiation position at a latent image time related to the transfer of the latent image to the sheet;
- traversing the sheet sequentially with the second feed mechanism and the first feed mechanism;
- advancing the sheet toward a sheet sense position in cooperation with a first sensor adjacent one of the first feed mechanism and the second feed mechanism;
- releasing the first insert from an insert release means at a release time based on the time required for the sheet to travel from the first sensor to an insertion location and the time required for the first insert to travel from an insert release position to the insertion location so that the first insert arrives at the insertion location immediately subsequent to the sheet;
- calculating a release time for the first insert relative to the latent image time; and
- releasing a second insert based on the release time of the first insert relative to the latent image time in order that the second insert arrives at the insertion location immediately subsequent to the first insert.

5,839,046
CONTINUOUS FORM PRINTER

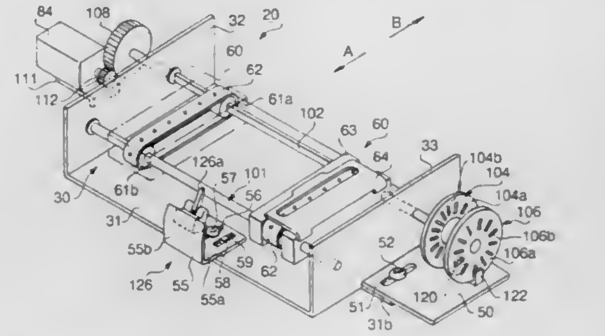
Masatoshi Takano; Yutaka Ishikawa; Hiroyuki Yamaguchi, and Hiroyuki Saito, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1997, Ser. No. 820,006

Claims priority, application Japan, Mar. 18, 1996, 8-088899; Mar. 18, 1996, 8-088900; Mar. 18, 1996, 8-088901; Mar. 22, 1996, 8-093610

Int. Cl.⁶ G03G *15/00*

U.S. Cl. 399—384 **36 Claims**



1. A printer using continuous form paper, comprising:

- a tractor unit for feeding said paper;
- a feed pulse generating system that generates a feed pulse in response to a feeding interval;
- a paper top sensor for detecting the leading edge of said paper and generating a paper top signal;
- a controller which controls said tractor unit according to said feed pulse; and
- a mechanism for adjusting a printing position on said paper, said adjusting mechanism maintaining a constant relationship between said feed pulse and said paper top signal
- wherein the position of said paper top sensor is adjustable with respect to said tractor unit.

5,839,047
SHEET-SIZE DETECTION MECHANISM FOR SHEET CASSETTES AND IMAGE-FORMING-APPARATUS USING THE SAME

Yoshihiro Hirabayashi, Hyogo; Hiroyuki Okitsu, and Hideyuki Nanba, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 22, 1993, Ser. No. 7,965

Claims priority, application Japan, Jan. 28, 1992, 4-013052; Sep. 18, 1992, 4-249760

Int. Cl.⁶ G03G *21/00*; B65H *1/04*

U.S. Cl. 399—389 **5 Claims**

1. A sheet size-detection mechanism on a sheet cassette for sheet size-detection by hardware into which the sheet cassette is loaded, said sheet size-detection mechanism comprising:

- sheet size display means for displaying sheet sizes on a front panel of said sheet cassette;
- sheet size definition parts having different arrangements defining corresponding sheet sizes of said sheet size display means,

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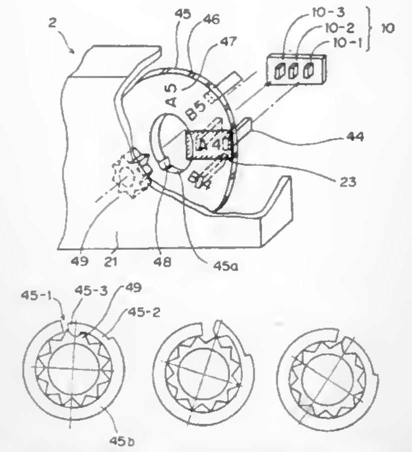


extending from said sheet size display means and contactable with the hardware; and

a rachet mechanism disposed in said sheet size display means to fix said sheet size display means at positions corresponding to respective sheet sizes of said sheet size display means, said rachet mechanism having a cylinder with grooves formed on an inner perimeter and a spring sheet disposed within said cylinder with a movable projection to catch said grooves.

5,839,048

SHEET POST-PROCESSING APPARATUS AND IMAGE FORMING APPARATUS HAVING SAME

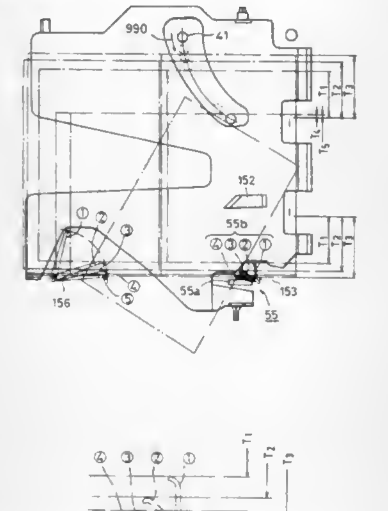
Katsuhito Kato, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 537,448, Oct. 2, 1995, abandoned. This application Jan. 6, 1997, Ser. No. 779,028

Claims priority, application Japan, Sep. 30, 1994, 6-261484

Int. Cl.^{6} G03G *15/00*

U.S. Cl. 399—407 **22 Claims**



1. A sheet post processing apparatus, comprising:

at least one sheet receiving tray for accommodating sheets;

sheet discharging means for discharging sheets to said sheet receiving tray;

sheet processing means for processing, at a plurality of positions at a predetermined interval, sheets accommodated on said sheet receiving tray adjacent first edges of the sheets;

a reference member for guiding second edges of the sheets, the second edges extending in a direction crossing with an extending direction of the first edges, on said sheet receiving tray and for functioning as a reference for alignment of the sheets to a reference position;

an aligning member movable to urge the sheets on said receiving tray to said reference member; and

means for changing, before said aligning member urges the sheet, the reference position of said reference member in accordance with a size of the sheets, to make a distance from the second edges of the sheets to one of the plurality of positions where the sheets are processed by said sheet processing means which is closer to the second edges, substantially equal to a distance from third edges of the sheets, the third edges being opposite form the second edges, to another of the plurality of positions where the sheets are processed by said sheet processing means which is closer to the third edges.

5,839,049

METHOD FOR VARYING THE DENSITY OF PLATED FOAM

Victor A. Ettel, Mississauga; John Ambrose; Paul A. Hynek, both of Burlington; Peter J. Kalal, Mississauga; Lloyd M. Timberg, Burlington, and David K. Vallbacka, Oakville, all of Canada, assignors to Inco Limited, Toronto, Canada

Filed Apr. 24, 1996, Ser. No. 637,298

Int. Cl.^{6} B22F *3/22*

U.S. Cl. 419—2 **18 Claims**

1. A process for varying the density of a plated porous substrate, the process consisting essentially of:

a) providing an initial plated porous substrate;
b) forming a metal powder slurry;
c) coating the initial plated porous substrate with the metal powder slurry;
d) drying the coated substrate;
e) sintering the coated substrate; and
f) creating the finished coated substrate.

5,839,050

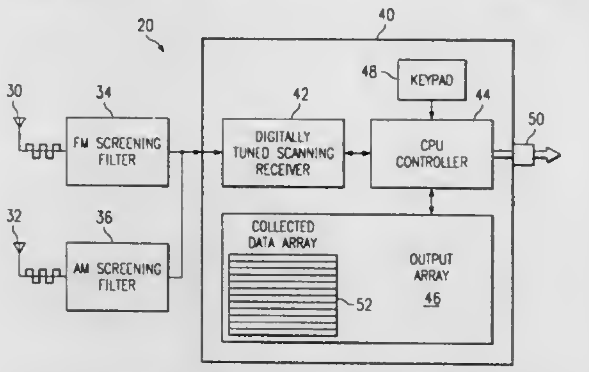
SYSTEM FOR DETERMINING RADIO LISTENERSHIP

Karl Baehr, Albuquerque, N. Mex., and George Chambers, Abilene, Tex., assignors to Actual Radio Measurement, Alburquerque, N. Mex.

Continuation of Ser. No. 385,482, Feb. 19, 1995, abandoned. This application Jul. 16, 1997, Ser. No. 895,343

Int. Cl.^{6} H04B *7/00*

U.S. Cl. 455—2 **20 Claims**



1. A remote radio listenership monitoring system comprising:

a plurality of antennae disposed in an area adjacent to automobiles carrying radio receivers and operable to receive intermediate frequency signals that are radiated by said radio receivers, such intermediate frequency signals corresponding to the frequencies that are then being amplified by said radio receivers, wherein each of said antennae is optimized to receive such intermediate frequency signals within an assigned frequency band that is substantially non-overlapping with the other antennae's frequency bands;

a digital scanning receiver operably connected to said antennae for receiving said radiated intermediate frequency signals occurring within that antenna's assigned frequency band, said scanning receiver comprising an intermediate frequency detection circuit that is operable to scan the antennae's

assigned frequency bands, said scanning receiver being further operable to report as "hit signals" instances where a received intermediate frequency signal exceeds a threshold power level;

a memory device; and

a local processing unit operably connected to said digital scanning receiver and said memory device for receiving said "hit signals" and recording their occurrence in said memory device to form a listenership database, said local processing unit operable to record said "hit signals" when the received intermediate frequency signal exceeds said threshold power level more than a predetermined period after the last such occurence.

5,839,051

HOST RADIO TELEPHONE TO DIRECTLY ACCESS A HANDSET NAM THROUGH A CONNECTER WITHOUT REQUIRING THE HANDSET CONTROLLER TO BE EMPLOYED

Alan Charles Grimmett, Guildford, England; N E Martensson, Woking, United Kingdom; Simon Philip O'Neill, Bracknell, United Kingdom, and Roger Wilkins, Sherborne St John, United Kingdom, assignors to Technophone Limited, Ashwood House, United Kingdom

Continuation of Ser. No. 67,294, May 25, 1993, abandoned, which is a division of Ser. No. 925,516, Aug. 5, 1992, Pat. No. 5,259,018, which is a continuation of Ser. No. 469,249, Jan. 23, 1990, abandoned. This application Nov. 3, 1997, Ser. No. 963,658

Claims priority, application United Kingdom, Mar. 17, 1989, 8906218

Int. Cl.^{6} H04Q *7/32*

U.S. Cl. 455—11.1 **5 Claims**

1. A telephone handset that is only capable of providing telephonic communication when connected to a host radio telephone, said telephone handset comprising:

connector means for removably connecting said telephone handset to a host radio telephone, for enabling a user of said telephone handset to communicate on a radio system only while said telephone handset is connected to said host radio telephone, wherein said radio system includes at least one fixed site and a plurality of radio telephones; and

a telephone handset number assignment module for storing an identification number identifying the telephone handset for communication with a fixed site, both for outgoing and incoming calls occurring only while said telephone handset is connected to said host radio telephone, said telephone handset number assignment module being accessed only while said telephone handset is connected to said host radio telephone such that said telephone handset is otherwise incapable of independently communicating with the fixed site;

wherein said connector means connects said host radio telephone to said telephone handset number assignment module of said telephone handset for enabling said host radio telephone to directly access said identification number from the telephone handset number assignment module through said connector means, without requiring that a controller be employed in said telephone handset for enabling said host radio telephone to access said identification number.

5,839,052

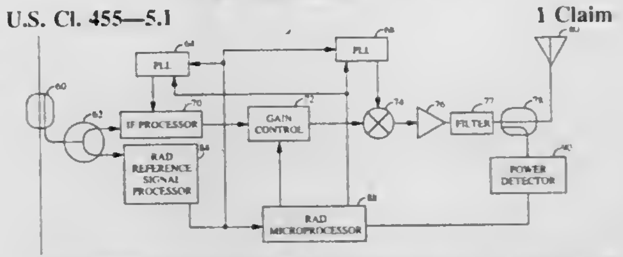
METHOD AND APPARATUS FOR INTEGRATION OF A WIRELESS COMMUNICATION SYSTEM WITH A CABLE TELEVISION SYSTEM

Richard F. Dean; Lindsay A. Weaver, Jr., both of Boulder, Colo., and Charles E. Wheatley, III, Del Mar, Calif., assignors to Qualcom Incorporated, San Diego, Calif.

Filed Feb. 8, 1996, Ser. No. 600,103

Int. Cl.^{6} H04N *7/173*

U.S. Cl. 455—5.1 **1 Claim**



1. An apparatus for providing a communication coverage areas throughout a communication system comprising a cable television plant comprising:

a series of radio antenna devices (RADs) spaced along a cable each of said series of RADs having a cable input and a cable output and a wireless input and a wireless output, wherein each of said series of RADs receives input forward link communication signals and a RAD reference signal from said cable through said cable input and provides output forward link communication signals through said wireless output and receives input reverse link communication signals through said wireless input and provides output reverse link communication signal and upstream gain reference signal through said cable output; and

a headend processor coupled to said cable having a base station, said base station having a set of demodulation elements programmably coupled to at least one of a plurality of said series of RADs;

wherein said RAD reference signal has an absolute value dependent upon a loss between said headend processor and each one of said series of RADs and wherein each one of said series of RADs uses said absolute value of said RAD reference signal to set a power level of said output forward link communication signals.

5,839,053

SYSTEM FOR TRANSMITTING RADIO SIGNALS FROM MOBILE TERMINALS TO PROVIDE SPACE DIVERSITY FOR UPLINK SIGNALS VIA GEOSTATIONARY COMMUNICATION SATELLITES

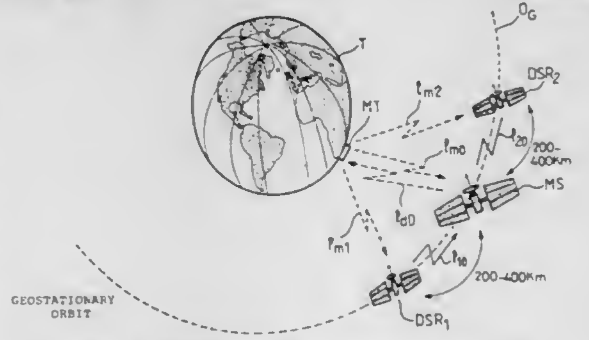
Javier Ventura-Traveset Bosch, Leiden, Netherlands; Giuseppe Caire, Turin, Italy; Mike Yarwood, Noordwijk, Netherlands, and Ezio Biglieri, Turin, Italy, assignors to Agence Spatiale Europeene, Paris, France

Filed Jul. 30, 1996, Ser. No. 689,153

Claims priority, application France, Aug. 2, 1995, 95 09430

Int. Cl.^{6} H04B *7/185*

U.S. Cl. 455—13.1 **15 Claims**



1. A system for transmission of radio signals comprising:

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a geostationary communication satellite in a particular geostationary orbit about the Earth, at least one terrestrial station and at least one terrestrial mobile terminal, said system including bidirectional transmission links between said geostationary satellite and each of said terrestrial mobile terminals and bidirectional transmission links between said geostationary satellite and each terrestrial station, at least one auxiliary satellite co-located in said particular orbit and a transmission link between each of said terrestrial mobile terminals and each co-located auxiliary satellite and an inter-satellite transmission link between each co-located auxiliary satellites and the geostationary communication satellite to form a spatial diversity communication system.

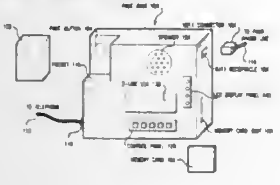
5,839,054
AUTOMATIC REGISTRATION PAGING SYSTEM

Christopher B. Wright, San Francisco, and Stephen D. Bristow, Los Altos, both of Calif., assignors to Brother International Corporation, Somerset, N.J.

Filed Jan. 2, 1996, Ser. No. 581,932

Int. Cl.^{6} H04Q *7/08*

U.S. Cl. 455—31.2 **42 Claims**



35. A method for automatically placing a page request to a dedicated pager using a dedicated pager system, the system comprising the pager and a page base separable from the pager having a dedicated page button and a memory storing all information necessary for placing a page request with a paging service provider, the paging service provider having a database, the method comprising:

receiving a call from the page base;
determining the caller ID of the call;
using the caller ID to retrieve the pager identification code from the database; and
automatically paging the pager utilizing the pager identification code.

5,839,055
NARROW BAND RADIO TRANSMITTING AND RECEIVING APPARATUS AND METHOD

Kazunari Higuchi; Terumi Hakamada, and Kazuya Toki, all of Sendai, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 3, 1995, Ser. No. 538,476

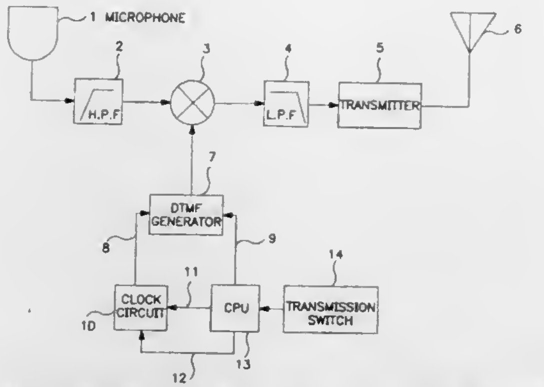
Claims priority, application Japan, Oct. 5, 1994, 6-241223

Int. Cl.^{6} H04B *15/00;17/00*

U.S. Cl. 455—62 **8 Claims**

1. A narrow band radio transmitting and receiving apparatus for use with a DTMF signal comprising:

a transmission block for transmitting an audio signal and the DTMF signal,
the transmission block including:
  a DTMF generator for generating a plurality of DTMF signals, one of the plurality of DTMF signals having a first frequency and another of the plurality of DTMF signals having a second frequency lower than the first frequency,
  a clock circuit for generating a clock signal for driving the DTMF generator,



  a CPU for controlling the operation of the DTMF generator and the clock circuit, and
a mixing circuit for mixing the audio signal and the DTMF signal, and
a reception block for a) receiving the audio signal and the DTMF signal transmitted from the transmission block, and b) reproducing the audio signal,
the reception block including:
  a receiver for receiving the transmitted signals,
  selecting means for selecting one of the DTMF signals at the first frequency or the second frequency,
  a DTMF receiver having an operation speed for detecting the DTMF signals selected from the selecting means,
  a CPU having a clock speed and being controlled by the DTMF signal detected by the DTMF receiver,
  a clock circuit for controlling a clock speed by the CPU and the operation speed of the DTMF receiver,
  an output mute circuit controlled by the CPU, and
  means for reproducing the audio signal responsive to the output mute circuit.

5,839,056
METHOD AND APPARATUS FOR CONTROLLING TRANSMISSION POWER OF A RADIO TRANSMITTER

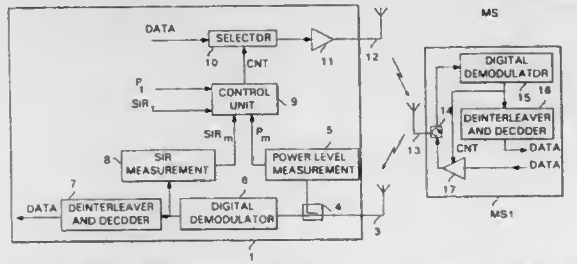
Hannu Häkkinen, Espoo, Finland, assignor to Nokia Telecommunications Oy, Espoo, Finland

Filed Aug. 30, 1996, Ser. No. 705,662

Claims priority, application WIPO, Aug. 31, 1995, PCT/FI95/00463

Int. Cl.^{6} H04B *7/005*

U.S. Cl. 455—69 **9 Claims**



1. A method for controlling transmission power of a radio transmitter in a radio cell in a cellular communications system, comprising the steps of:

determining a first reference value (SIR_m) indicating the quality of signals received from the radio transmitter;
determining a second reference value (P_m, SIR_{pm}) indicating current traffic load in the radio cell
commanding the radio transmitter to adjust transmission power thereof; and
comparing both said first reference value (SIR_m) indicating the quality of the received signals, and said second reference value (P_m, SIR_{pm}) indicating the traffic load, with predetermined target values (SIR_t, P_t, SIR_{pt}) to obtain a result;

said commanding includes commanding the radio transmitter to adjust the transmission power thereof depending on said result of said comparison;
said comparing of said first reference value (SIR_m) indicating the quality of the received signals, and said second reference value (P_m) indicating the traffic load with predetermined target values (SIR_t, P_t) comprises:
  calculating a first comparison value based on a relationship between said first reference value (SIR_m) and a target value for said first reference value (SIR_t);
  calculating a second comparison value based on a relationship between said second reference value (P_m) and a target value for said second reference value (P_t);
  combining said first and second comparison values to obtain a weighted comparison value (CV) which depends more on said first comparison value than on said second comparison value; and
  comparing said weighted comparison value with a predetermined reference value to thereby determine if the transmission power of the radio transmitter should be increased or decreased.

5,839,057

Patent Not Issued For This Number

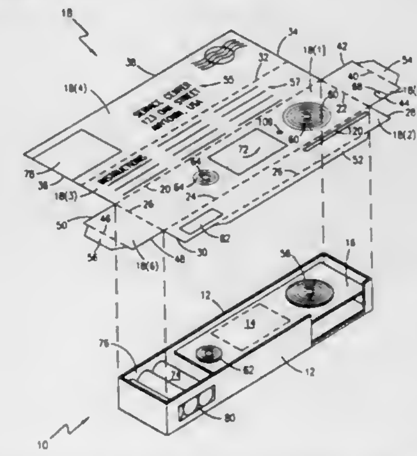
5,839,058
RECYCLABLE CELLULAR TELEPHONE AND METHOD AND APPARATUS FOR SUPPORTING THE USE OF A RECYCLABLE CELLULAR TELEPHONE WITHIN A CELLULAR TELEPHONE NETWORK

John C. Phillips, Apex; Michael Kornby, Cary, both of N.C.; Leif Brunström, Järfälla, Sweden, and John J. Hayes, Jr., Wake Forest, N.C., assignors to Ericsson Inc., Research Triangle Park, N.C.

Filed Nov. 1, 1996, Ser. No. 743,403

Int. Cl.^{6} H04B *11/38*

U.S. Cl. 455—90 **15 Claims**



1. A portable telecommunication instrument, comprising:

a structural frame member;
at least one electrical circuit having components interconnected to provide telecommunication between said portable telecommunication instrument and another instrument, said electrical circuit being mounted to said structural frame member; and
a disposable cover substantially enclosing said structural frame member during use of the portable telecommunication instrument and providing a preaddressed return mail shipping container for said portable telecommunication instrument.

5,839,059
METHOD FOR STARTING A RADIO TRANSMITTER, AND A RADIO TRANSMITTER USING A START-UP ESTIMATED CONTROL VOLTAGE NEEDED FOR LOCKING ONTO SELECTED OUTPUT FREQUENCY

Hannu Häkkinen; Jarmo Mäkinen, and Mikko Tolvonen, all of Espoo, Finland, assignors to Nokia Telecommunications OY, Espoo, Finland

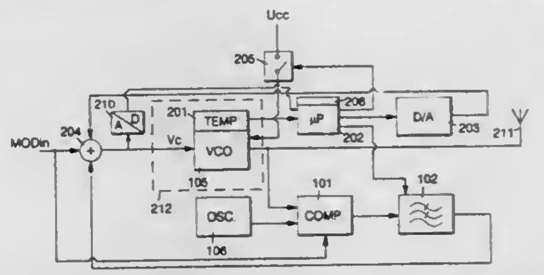
PCT No. PCT/FI94/00193, § 371 Date Feb. 29, 1996, § 102(e) Date Feb. 29, 1996, PCT Pub. No. WO94/27372, PCT Pub. Date Nov. 24, 1994

PCT Filed May 13, 1994, Ser. No. 549,773

Claims priority, application Finland, May 14, 1993, 932204

Int. Cl.^{6} H04B *17/00*

U.S. Cl. 455—115 **6 Claims**



1. A method for starting a radio transmitter comprising a voltage-controlled oscillator (VCO), the VCO being included in a phase/frequency-locked loop which also includes a phase/frequency comparator and a loop filter serving a radio transmitter in a telecommunications system, in varying temperatures, without generating at start-up frequencies different from a desired transmission frequency such as would interfere with neighboring channels, comprising

storing measured data about a relationship between a control voltage for the VCO and a corresponding output frequency of the VCO at specified calibration temperatures;
determining a prevailing VCO temperature;
estimating a start-up control voltage needed to lock said VCO onto a selected output frequency at the prevailing VCO temperature, said start-up control voltage being determined based on (a) a desired output frequency of said VCO, (b) said stored measured data, and (c) temperature-compensation information, thereby obtaining an estimated control voltage such that a start-up frequency of said VCO corresponding to said estimated start-up control voltage will not interfere with neighboring channels; and
setting said estimated start-up control voltage as the control voltage for said VCO by switching said estimated start-up control voltage to said VCO and immediately thereafter switching on the operating voltage of the VCO.

5,839,060
LOGARITHMIC LEVEL DETECTOR AND A RADIO RECEIVER

Wolfdietrich G. Kasperkovitz, and Hendricus C. De Ruijter, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 9, 1996, Ser. No. 798,192

Claims priority, application European Pat. Off., Dec. 11, 1995, 95203439

Int. Cl.^{6} H04B *17/00*

U.S. Cl. 455—226.2 **8 Claims**

1. A logarithmic level detector comprising a cascade of a plurality of limiting amplifier stages, each having a rectifier for providing a level signal, said logarithmic level detector further comprising summing means for forming a summed signal from the respective level signals, the summed signal being a logarithmical amplified version of a level detector input signal, characterized in that the logarithmic level detector further comprises:

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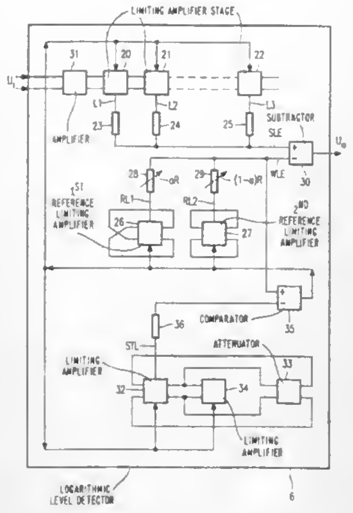


a first reference limiting amplifier stage for forming a first reference level signal representing a relatively low input signal value;
a second reference limiting amplifier stage for forming a second reference level signal representing a relatively high input signal;
weighted summing means for forming a weighted summed reference signal from the first and the second reference signals; and
subtracting means for subtracting the weighted summed reference signal from the summed signal so as to form a level detector output signal.

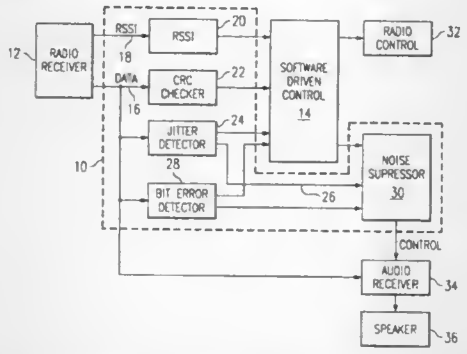
5,839,061
RECEIVER QUALITY MEASUREMENT SYSTEM FOR USE IN DIGITAL CORDLESS TELEPHONES AND LIKE APPARATUS

Alan F. Hendrickson, and Joseph W. Peterson, both of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 191,994, Feb. 4, 1994, abandoned. This application Sep. 20, 1995, Ser. No. 531,049

Int. Cl.^{6} H04B *1/10*

U.S. Cl. 455—296 **9 Claims**



1. A communication circuit designed to be coupled to a radio receiver so as to receive a data signal and a receive signal strength indicator signal indicative of radio carrier strength therefrom, and further designed to be coupled to a controller, said communications circuit comprising:
a first subcircuit that receives said receive signal strength indicator, determines radio carrier strength therefrom, and transfers its determinations to said controller for processing;
a second subcircuit that receives said data signal from said receiver, determines if there are bit errors within that signal, and transfers its determinations to said controller for processing;
a third subcircuit that receives said data signal from said receiver, determines if there is jitter therein, and transfers its determinations to said controller for processing; and
a fourth subcircuit that is coupled to said second and third subcircuits to receive the output thereof, and which is further coupled to said controller so as to receive processing output therefrom, said fourth subcircuit acting in response to the outputs from the second and third subcircuits and the output from the controller to suppress noise within the data bandwidth of the received data signal.

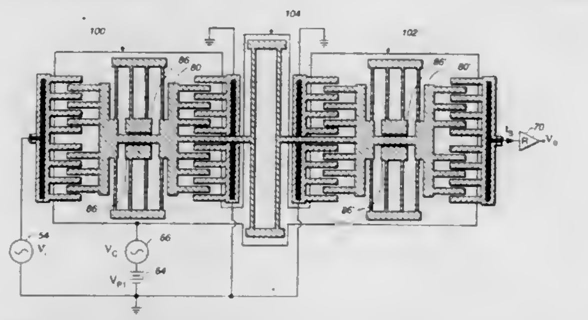
5,839,062
MIXING, MODULATION AND DEMODULATION VIA ELECTROMECHANICAL RESONATORS

Clark Tu-Cuong Nguyen, Berkeley; Vadim Gutnik, Irvine, and Roger T. Howe, Lafayette, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Mar. 18, 1994, Ser. No. 210,199

Int. Cl.^{6} H04B *1/26*

U.S. Cl. 455—323 **15 Claims**



14. An apparatus, comprising:
an electromechanical filter having a nonlinear input transducer, said nonlinear input transducer including two electrostatically coupled electrodes that are patterned to provide for each at least one comb with fingers interdigitated with those of the other;
an oscillator for driving said nonlinear input transducer with a first electrical input signal having AC components comprised of a carrier signal and an excitation signal; wherein
said nonlinear input transducer is driven by said electrical input signal and a passband of said filter includes a difference frequency between a center frequency of said carrier signal and a center frequency of said excitation signal to provide for mixing of said carrier signal and said excitation signal; and
a second electromechanical filter having a second nonlinear input transducer, said second electromechanical filter matched with and coupled to said first electromechanical filter, said second non-linear input transducer patterned to provide at least one comb with interdigitated fingers.

5,839,063
AUTHENTICATION SYSTEM AND METHOD FOR PREVENTING WIRELESS COMMUNICATION FRAUD

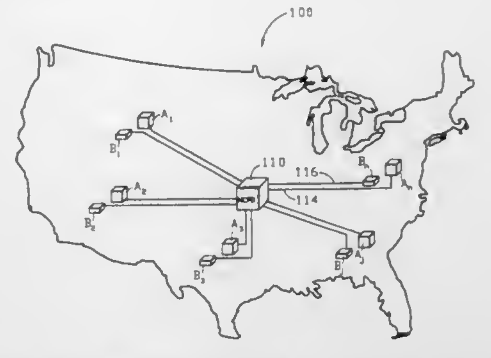
David Y. Lee, Randolph, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Sep. 1, 1995, Ser. No. 522,897

Int. Cl.^{6} H04Q *7/00*

U.S. Cl. 455—410 **19 Claims**

1. A wireless communication system comprising:
at least one wireless communication network capable of providing wireless communication services to a plurality of subscribers;
a database in communication with said at least one wireless communication network capable of storing usage threshold data, said database including a processor for determining when current subscriber usage of any of said plurality of subscribers exceeds said stored usage threshold data; and



at least one paging network in communication with said database capable of notifying any of said subscribers by sending a page to a pager associated with said subscribers when said usage threshold data is exceeded.

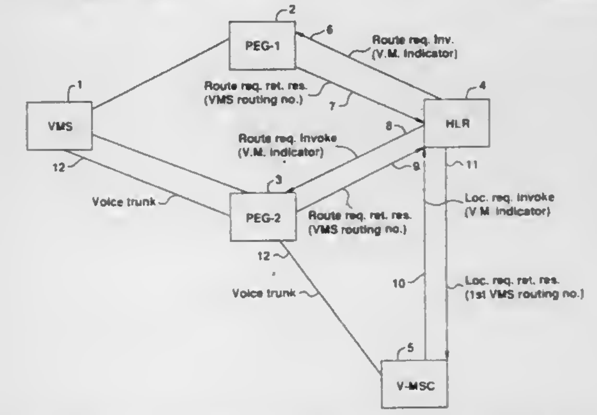
5,839,064
SYSTEM AND METHOD OF DYNAMIC ALLOCATION OF REDUNDANT PERIPHERAL EQUIPMENT GATEWAYS IN A RADIO TELECOMMUNICATIONS NETWORK

George Foti, Dollard des Ormeaux, Canada, assignor to Telefonaktiegolaget IM Ericsson, Stockholm, Sweden

Filed Jul. 26, 1996, Ser. No. 686,595

Int. Cl.^{6} H04Q *7/38*

U.S. Cl. 455—413 **7 Claims**


VMS
1
PEG-1
2
PEG-2
3
HLR
4
V-MSC
5
6
Route req. Inv. (V.M. Indicator)
Route req. ret. res. (VMS routing no.)
7
8
Route req. Invoke (V.M. Indicator)
9
11
12
Voice trunk
Route req. ret. res. (VMS routing no.)
Loc. req. invoke (V.M. Indicator)
12
Voice trunk
10
Loc. req. ret. res. (1st VMS routing no.)

6. In a radio telecommunications network, a method of providing redundant interfaces from a mobile switching center (MSC) to an associated voice mail system (VMS), said method comprising the steps of:
connecting a first peripheral equipment gateway (PEG-1) to said VMS, said PEG-1 providing a first interface between said VMS and said radio telecommunications network;
connecting a second peripheral equipment gateway (PEG-2) to said VMS, said PEG-2 providing a second interface between said VMS and said radio telecommunications network;
receiving an incoming call for said VMS in said MSC;
transmitting a location request message from said MSC to a home location register (HLR), said location request message including an indicator that said location request message is for voice mail retrieval;
simultaneously transmitting from said HLR, a first request for a routing number for said VMS to said PEG-1, and a second request for a routing number for said VMS to said PEG-2, said first and second requests for a routing number including an indicator that said requests are for voice mail retrieval;
receiving, in said HLR, at least one routing number for said VMS;
returning to said MSC, the first routing number received in said HLR;
determining whether a second routing number for said VMS was received in said HLR;
discarding, upon determining that a second routing number was received in said HLR, said second routing number; and
delivering said incoming call to said VMS utilizing the first routing number received in said HLR.

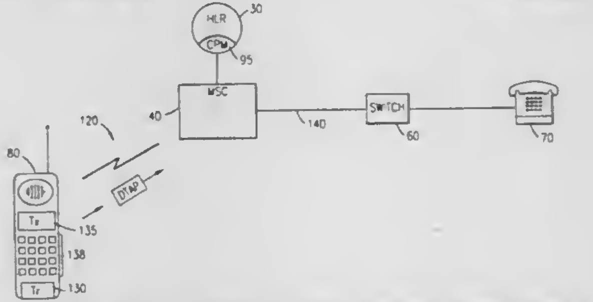
5,839,065
VALIDATION OF A FORWARD-TO-NUMBER BY A MOBILE STATION

Erkki Joensuu; Eric Valentine, both of Plano; David Boltz, Garland; Ranjit Bhatia, Dallas, and James L. Mills, Plano, all of Tex., assignors to Ericsson Inc., Research Triangle Park, N.C.

Filed Apr. 23, 1996, Ser. No. 636,288

Int. Cl.^{6} H04Q *7/20*

U.S. Cl. 455—414 **20 Claims**



1. A method for activating a call forwarding feature from a mobile station, said mobile station served by a mobile switching center (MSC) within a mobile telecommunications system, said method comprising the steps of:
receiving a subscriber activation request and a particular forward-to-number for said call forwarding feature;
querying by the mobile station of a user on whether a verbal verification of Said forward-to-number should be made;
establishing, responsive to an affirmative indication by said user during said querying step, a speech connection with a telephone terminal associated with said particular forward-to-number to verbally verify said forward-to-number; and
transmitting a connection-less signal encapsulating said activation request and said particular forward-to-number to said MSC in response to successful establishment of said speech connection.

5,839,066

Patent Not Issued For This Number

5,839,067
CORPORATE COMMUNICATION SYSTEM

Björn Erik Rutger Jonsson, Järfälla, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

PCT No. PCT/SE95/01584, § 371 Date Nov. 12, 1996, § 102(e) Date Nov. 12, 1996, PCT Pub. No. WO96/22000, PCT Pub. Date Jul. 18, 1996

PCT Filed Dec. 22, 1995, Ser. No. 737,409

Claims priority, application Sweden, Jan. 10, 1995, 9500066

Int. Cl.^{6} H04Q *7/26*; H04M *3/38*

U.S. Cl. 455—422 **17 Claims**

1. A corporate/organization communications system comprising mobile telephones which are associated with a company/organization and which are operating in a mobile telephone network, a local network comprising access units connected to extensions of a private automatic branch exchange PABX which is connected to the public switched telephone network (PSTN) wherein said company/organization allots an individual service profile to each one of said mobile telephones, said mobile tele-

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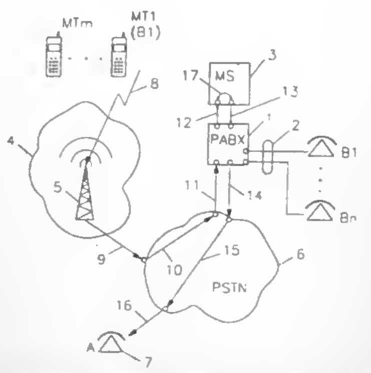


phones being adapted to make outgoing calls to a service node only, said service node being adapted to control services requested by any of said mobile telephones in an outgoing call by comparing said requested services with the service profile allotted to the mobile telephone from which the outgoing call is made, said individual service node being connected to said local network, thus allowing said company/organization to exercise control over the services requested from any one of said mobile telephones although said company/organization has no control over the mobile telephone network.

5,839,068

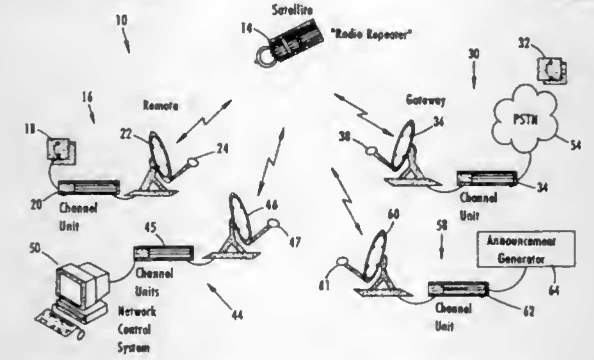
METHOD OF DELIVERING SERVICE VOICE ANNOUNCEMENTS IN A SATELLITE TELEPHONY COMMUNICATION SYSTEM

Nigel Simmons, Potomac, Md., assignor to Hughes Electronics Corporation, El Segundo, Calif.

Continuation of Ser. No. 394,028, Feb. 21, 1995, abandoned. This application Oct. 17, 1996, Ser. No. 731,680

Int. Cl.^{6} H04O *7/20*

U.S. Cl. 455—427 **19 Claims**



10. A method of acquiring service voice announcements in a satellite telephony communication system having a plurality of remote ground transceivers and being capable of placing at least two of said remote ground transceivers in point-to-point communication on an assigned communication channel via a satellite, the steps comprising:

broadcasting said voice announcements on an announcement channel that can be tuned to simultaneously by any of said remote ground transceivers;

tuning one of said ground transceivers To said announcement channel to receive said voice announcements when needed after commencement of said at least two said remote ground transceivers being placed in point-to-point telephony communication.

5,839,069

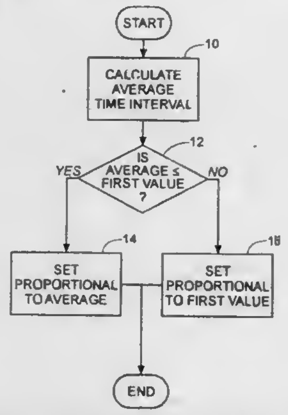
SYSTEM AND METHOD FOR DETERMINING A MOBILE STATION HOME NETWORK SEARCH RATE

Bhaktha R. Keshavachar, Vancouver; Gerald W. Maliszewski, Camas, and Peter J. Sevcik, Vancouver, all of Wash., assignors to Sharp Microelectronics Technology, Inc., Wash., and Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 10, 1996, Ser. No. 630,130

Int. Cl.^{6} H04Q *7/20;7/22;7/36*

U.S. Cl. 455—437 **18 Claims**


START
CALCULATE AVERAGE TIME INTERVAL
10
IS AVERAGE ≤ FIRST VALUE ?
12
YES
NO
SET PROPORTIONAL TO AVERAGE
14
SET PROPORTIONAL TO FIRST VALUE
18
END

8. In a wireless communications system servicing a geographical area and including a plurality of communicating networks within the geographical area, each network including a plurality of intercommunicating cells, the communications system also including a plurality of mobile stations to send and receive user information, each mobile station identifying cells in a network to select one proximate cell for communications, with cells from a predetermined home network being preferably selected, a method for determining the rate at which a mobile station searches for a home network comprising the steps of:

determining the rate at which cells are selected by the mobile station;

searching for a home network at a home network search rate that is proportional to the cell selection rate; and

assigning the most recent time interval measurement between cell selections with the highest priority in generating the home network search rate.

5,839,070

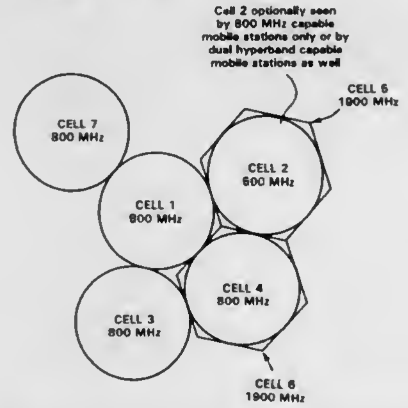
SYSTEM AND METHOD FOR HYPERBAND CELL INTEROPERABILITY IN A CELLULAR TELECOMMUNICATIONS NETWORK

Francis Lupien, and Richard Brunner, both of Montreal, Canada, assignors to Telefonaktiebolaget LM Ericsson (publ), Stockholm, Sweden

Filed Oct. 13, 1995, Ser. No. 542,879

Int. Cl.^{6} H04Q *7/22*

U.S. Cl. 455—440 **45 Claims**


Cell 2 optionally seen by 800 MHz capable mobile stations only or by dual hyperband capable mobile stations as well
CELL 6 1900 MHz
CELL 7 800 MHz
CELL 2 800 MHz
CELL 1 800 MHz
CELL 4 800 MHz
CELL 3 800 MHz
CELL 6 1900 MHz

1. A system for providing seamless interoperability for mobile stations capable of operating in a first hyperband, mobile stations capable of operating in a second hyperband, and multi-hyperband capable mobile stations, each such mobile station roaming between cells within a cellular telecommunications network having a mobile switching center and a plurality of frequency hyperbands, said system comprising:

a serving cell in which said mobile station is operating, said serving cell having a serving base station;

means for building a neighbor list of cells neighboring said serving cell, wherein if said mobile station is one capable of operation in said first hyperband, including neighbor cells operating in the first hyperband, if said mobile station is one capable of operation in said second hyperband, including neighbor cells operating in the second hyperband, and if said mobile station is one that is multi-hyperband capable, said neighbor list including neighbor cells operating in frequency hyperbands supported by said multi-hyperband capable mobile station;

means for measuring signal strengths in each of said plurality of frequency hyperbands between said mobile station and said serving base station, and between said mobile station and said cells in said neighbor list;

means for determining the best candidate cell for communication with said mobile station; and

means for handing off said mobile station to said best candidate cell for communication with said mobile station.

5,839,071

BASE STATION FOR A MOBILE TELECOMMUNICATIONS SYSTEM

Andrew Brian Johnson, Glen Waverley, Australia, assignor to Telstra Corporation Limited, Melbourne, Australia

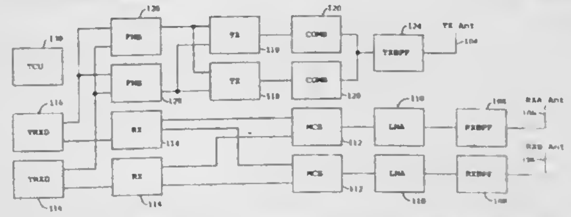
PCT No. PCT/AU94/00561, § 371 Date Jun. 10, 1996, § 102(e) Date Jun. 10, 1996, PCT Pub. No. WO95/08896, PCT Pub. Date Mar. 30, 1995

PCT Filed Mar. 21, 1994, Ser. No. 617,917

Claims priority, application Australia, Sep. 21, 1993, PM1363

Int. Cl.^{6} H04Q *7/00*

U.S. Cl. 455—440 **28 Claims**



1. A base station for a mobile telecommunications system, adapted to communicate with mobile stations of said system which are within a cell area, said cell area being divided into an inner area in which distances to said base station are within a first predetermined range, and an outer area in which said distances are within a second predetermined range, said base station including:

a first transceiver operating at a first carrier frequency and adapted for communication with mobile stations in said inner area; and

a second transceiver operating at a second carrier frequency adapted for communication with mobile stations in said outer area, said second transceiver being adapted to be synchronised to receive bursts delayed by transmission over distances exceeding said first predetermined range.

5,839,072

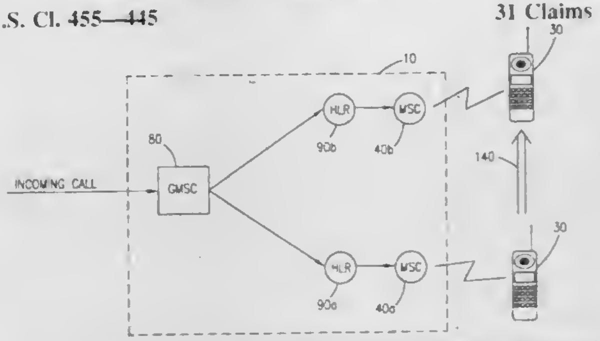
ROUTING AN INCOMING CALL TO A PORTED MOBILE STATION WITHIN A TELECOMMUNICATIONS NETWORK

Gung-Shih Chien, Plano, Tex., assignor to Ericsson Inc., Research Triangle Park, N.C.

Filed Jun. 3, 1996, Ser. No. 656,723

Int. Cl.^{6} H04Q *7/24*

U.S. Cl. 455—445 **31 Claims**



1. A method for retrieving subscriber information associated with a mobile station, said mobile station being assigned to a particular home location register (HLR), said particular HLR storing said subscriber information associated with said mobile station, said method comprising the steps of:

transmitting a first signal with a mobile station identification number from a telecommunications exchange to a centralized database, said first signal requesting a first network address representing said particular HLR;

determining said first network address by indexing on said mobile station identification number within said centralized database;

transmitting said determining first network address back to said telecommunications exchange;

transmitting a second signal from said telecommunications exchange to a gateway mobile switching center (GMSC) associated with said determined first network address;

transmitting a third signal from said GMSC to said particular HLR using said determined first network address, said third signal requesting said subscriber information from said HLR;

retrieving said subscriber information in response to a reception of said third signal by said HLR; and

transmitting said retrieved subscriber information associated with said mobile station back to said GMSC.

5,839,073

Patent Not Issued For This Number

5,839,074

PROCESS OF ALLOCATING FREQUENCIES TO BASE STATIONS OF A MOBILE RADIOTELEPHONE NETWORK

Juergen Plehn, Bonn, Germany, assignor to Detemobil Deutsche Telekom Mobilnet GmbH, Bonn, Germany

PCT No. PCT/EP93/02846, § 371 Date Sep. 29, 1995, § 102(e) Date Sep. 29, 1995, PCT Pub. No. WO94/17640, PCT Pub. Date Aug. 4, 1994

PCT Filed Oct. 15, 1993, Ser. No. 495,467

Claims priority, application Germany, Jan. 27, 1993, 43 02 228.6

Int. Cl.^{6} H04Q *7/00*

U.S. Cl. 455—450 **20 Claims**

1. Process of allocating frequencies to base stations of a mobile radiotelephone network, wherein the process is based on information comprising at least the number of frequencies required for each base station, the frequencies permissible in the mobile radiotelephone network and possible disturbance effects among the base

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A:	1	2	$\overline{3}$	4	$\overline{5}$	6	7	$\overline{8}$	3/2
B:	1	$\overline{2}$	$\overline{3}$	4	$\overline{5}$	6	7	8	3/2
C:	1	$\overline{2}$	$\overline{3}$	4	$\overline{5}$	$\overline{6}$	$\overline{7}$	$\overline{8}$	2/1
D:	1	2	$\overline{3}$	4	$\overline{5}$	$\overline{6}$	7	$\overline{8}$	3/2

stations in the case of at least one of identical frequencies and adjacent frequencies, the process comprising the following steps:

(a) selecting a base station from the base stations to which not all possible frequencies have yet been allocated, according to a first base station selection criterion, and selecting the base station according to further base station selection criteria when the base station is unable to be selected according to the first base station selection criterion,

(b) selecting a frequency according to a first frequency selection criterion, and selecting the frequency according to further frequency selection criteria when the frequency is unable to be selected according to the first frequency selection criterion, and

(c) allocating the frequency selected in step (b) to the base station selected in step (a).

5,839,075

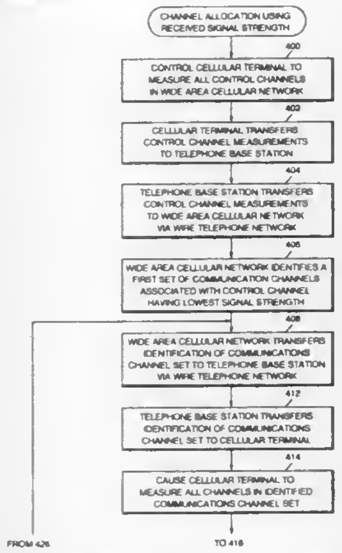
METHODS AND SYSTEMS FOR ALLOCATING A CELLULAR COMMUNICATIONS CHANNEL FOR COMMUNICATION BETWEEN A CELLULAR TERMINAL AND A TELEPHONE BASE STATION USING RECEIVED SIGNAL STRENGTH MEASUREMENTS

Jacobus Cornelius Haartsen, Staffanstorp, Sweden, and Paul W. Dent, Pittsboro, N.C., assignors to Ericsson Inc., Triangle Park, N.C.

Filed Aug. 21, 1995, Ser. No. 517,710

Int. Cl.^{6} H04Q *7/20;7/24*

U.S. Cl. 455—450 **34 Claims**


CHANNEL ALLOCATION USING RECEIVED SIGNAL STRENGTH
400
CONTROL CELLULAR TERMINAL TO MEASURE ALL CONTROL CHANNELS IN WIDE AREA CELLULAR NETWORK
402
CELLULAR TERMINAL TRANSFERS CONTROL CHANNEL MEASUREMENTS TO TELEPHONE BASE STATION
404
TELEPHONE BASE STATION TRANSFERS CONTROL CHANNEL MEASUREMENTS TO WIDE AREA CELLULAR NETWORK VIA WIRE TELEPHONE NETWORK
406
WIDE AREA CELLULAR NETWORK IDENTIFIES A FIRST SET OF COMMUNICATION CHANNELS ASSOCIATED WITH CONTROL CHANNEL HAVING LOWEST SIGNAL STRENGTH
408
WIDE AREA CELLULAR NETWORK TRANSFERS IDENTIFICATION OF COMMUNICATIONS CHANNEL SET TO TELEPHONE BASE STATION VIA WIRE TELEPHONE NETWORK
412
TELEPHONE BASE STATION TRANSFERS IDENTIFICATION OF COMMUNICATIONS CHANNEL SET TO CELLULAR TERMINAL
414
CAUSE CELLULAR TERMINAL TO MEASURE ALL CHANNELS IN IDENTIFIED COMMUNICATIONS CHANNEL SET
FROM 426
TO 416

1. A method for allocating a cellular communications channel for communication between a cellular terminal and a telephone base station, the telephone base station connecting a wire telephone network to the cellular terminal within a local region in a cell of a wide area cellular network which uses a plurality of control channels and communications channels within a cellular network spectrum, said allocating method comprising the steps of:

controlling said cellular terminal to measure received signal strengths of the control channels;

identifying a set of communications channels associated with a measured control channel having lowest received signal strength;

causing said cellular terminal to measure received signal strengths of the set of communications channels;

selecting from said set of communications channels, a communications channel having lowest received signal strength; and

using the selected communications channel having lowest received signal strength for communication between said cellular terminal and said telephone base station within the local region.

5,839,076

METHOD FOR THE TRANSMISSION OF SUBSCRIBER DATA BETWEEN NETWORK NODES IN AT LEAST ONE COMMUNICATIONS NETWORK SUPPORTING THE STRUCTURE OF AN INTELLIGENT NETWORK

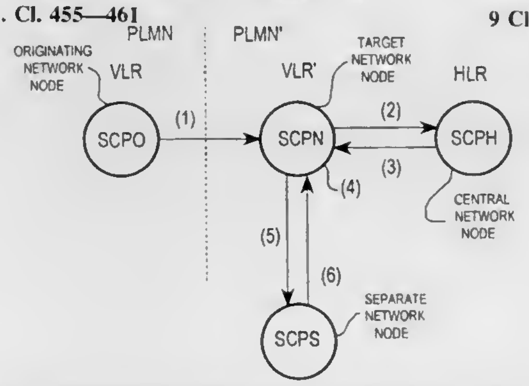
Reinhard Becher, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 8, 1996, Ser. No. 613,069

Claims priority, application Germany, Mar. 13, 1995, 195 09 000.4

Int. Cl.^{6} H04Q *7/24*

U.S. Cl. 455—461 **9 Claims**



9. A method for transmission of subscriber data between network nodes in mobile radio net works, comprising the steps of:

storing subscriber-related service data and subscriber-related trigger data for network subscribers in a central network node;

when a network subscriber roams from a first mobile location zone in a first mobile radio network having an originating network node into a second mobile location zone of a second mobile radio net work having a target network node, automatically requesting by the central network node a subscriber-related service data and trigger data stored for the network subscriber and transmitting the subscriber-related service data and trigger data to the target network node which sets up a connection to a separate network node in a call processing using the subscriber-related trigger data in order to transmit information for further call processing back to the target network node, and wherein the trigger data contains one or more pieces of trigger information known as trigger detection points which identify a call-related trigger profile in a manner dependent on services defined for and called by the network subscriber.

5,839,077

RADIO TRANSMISSION SYSTEM COMPRISING A MASTER STATION AND SLAVE STATIONS, EACH COMPRISING AN ERROR CORRECTING SECTION INCLUDING ERROR CORRECTING METHODS

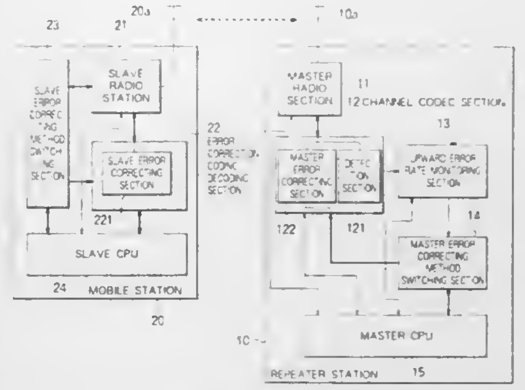
Satoshi Kowaguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 9, 1996, Ser. No. 727,917

Claims priority, application Japan, Oct. 14, 1995, 7-292083

Int. Cl.^{6} H04B *7/00;* **H04Q** *7/20*

U.S. Cl. 455—517 **8 Claims**


23
21
20a
10a
SLAVE ERROR CORRECTING METHOD SWITCHING SECTION
SLAVE RADIO STATION
SLAVE ERROR CORRECTING SECTION
221
SLAVE CPU
24
MOBILE STATION
20
22
ERROR CORRECTION CODING DECODING SECTION
MASTER RADIO SECTION
11
12 CHANNEL CODEC SECTION
13
MASTER ERROR CORRECTING SECTION
DETECTION SECTION
UPWARD ERROR RATE MONITORING SECTION
122
121
14
MASTER ERROR CORRECTING METHOD SWITCHING SECTION
10
MASTER CPU
REPEATER STATION
15

1. A radio transmission system comprising a master station and a plurality of slave stations connected to said master station via a radio transmission path which consists of an upward transmission path from said slave stations two said master station and a downward transmission path from said master station to said slave stations,

said master station comprising:

detection means for detecting an upward error rate for the upward transmission path to produce a detected error rate;

master error correcting means including a plurality of master error correcting methods;

comparison means, connected to said detection means, for comparing the detected error rate with a predetermined reference value to produce degradation information when the detected error rate is larger than the predetermined reference value;

master switching means, connected to said comparison means and said master error correcting means, for supplying, in response to the degradation information, said master error correcting means with a switch control signal to make said master error correcting means switch said master error correcting methods from one to another; and

sending means, connected to said master switching means, for sending the switch control signal via the downward transmission on path to said slave stations,

each of said slave stations comprising:

reception means for receiving the switch control signal to produce a received switch control signal;

slave error correcting means including a plurality of slave error correcting methods which are identical with the master error correcting methods; and

slave switching means, connected to said reception means and said slave error correcting means, for supplying said slave error correcting means with the received switch control signal to make said slave error correcting means switch said slave error correcting methods from one to another.

5,839,078

WASTE PROCESSING METHOD AND APPARATUS

Howard T. Jennings, Warrington, and Lin Li, Manchester, both of United Kingdom, assignors to British Nuclear Fuels PLC, Warrington, United Kingdom

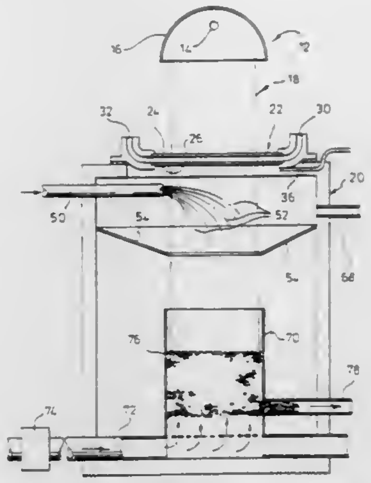
PCT No. PCT/GB96/01582, § 371 Date Mar. 5, 1997, § 102(e) Date Mar. 5, 1997, PCT Pub. No. WO97/05630, PCT Pub. Date Feb. 13, 1997

PCT Filed Jul. 2, 1996, Ser. No. 793,275

Claims priority, application United Kingdom, Jul. 26, 1995, 9515299

Int. Cl.^{6} G21F *9/00*

U.S. Cl. 588—11 **23 Claims**



1. A method of treating toxic waste by the vitrification thereof, the method comprising the steps of providing said waste in the form of relatively small pieces; bringing a high intensity light source to bear on said waste and optional vitrifiable material; said high intensity light source being of sufficient power to cause melting and subsequent vitrification of said waste; and, cooling and storing said vitrified material.

5,839,079

METHOD OF DECONTAMINATING A CEMENTITIOUS OR A METALLIC SURFACE

Jennifer Benson, and Harry Eccles, both of Preston, United Kingdom, assignors to British Nuclear Fuels PLC, Cheshire, United Kingdom

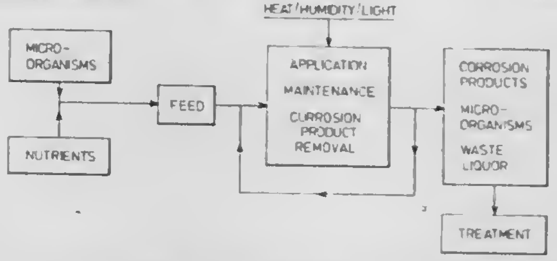
PCT No. PCT/GB95/01772, § 371 Date Jan. 17, 1997, § 102(e) Date Jan. 17, 1997, PCT Pub. No. WO96/03754, PCT Pub. Date Feb. 8, 1996

PCT Filed Jul. 27, 1995, Ser. No. 776,050

Claims priority, application United Kingdom, Jul. 28, 1994, 9415213

Int. Cl.^{6} G21F *9/00*

U.S. Cl. 588—18 **13 Claims**



1. A method for the decontamination of a cementitious or metallic surface having contaminants, the method comprising the steps of supplying to said surface at least one microorganism under conditions conducive to growth of said at least one microorganism; maintaining said conditions conducive to growth of said microorganism and the generation of an acid or metabolites to degrade said surface to a desired depth; terminating said conditions conducive to growth upon achieving at least said desired depth of degradation; removing the products of said degradation; treating said degradation products; and, disposing of said treated degradation products, the method being characterised in that said at least one microorganism is a citric acid generating micro-organism.

5,839,080

TERRAIN AWARENESS SYSTEM

Hans R. Muller, Redmond; Kevin J. Conner, Kent, and Steven C. Johnson, Issaquah, all of Wash., assignors to AlliedSignal, Inc., Morristown, N.J.

Filed Jul. 31, 1995, Ser. No. 509,642

Int. Cl.^{6} G08G *5/04*

U.S. Cl. 701—9 **13 Claims**

1. An apparatus for alerting a pilot of an aircraft of proximity to terrain, the apparatus comprising:

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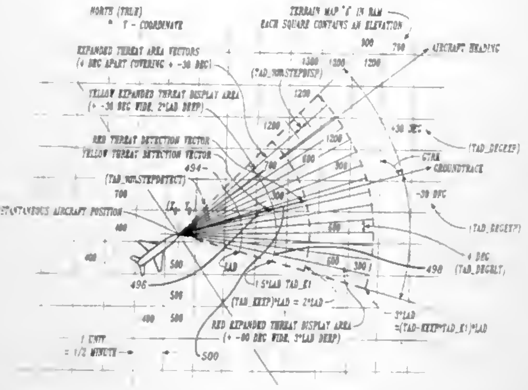

INSTANTANEOUS AIRCRAFT POSITION
RED EXPANDED THREAT DISPLAY AREA
(+ -80 DEG WIDE, 3*LAD DEEP)
1 UNIT = 1/2 MINUTE
500
496
498

an input for receiving signals representative of a position of the aircraft, a flight path angle of the aircraft and a speed of the aircraft, and coupled to a data base of stored terrain information;

an output;

a signal processing device, coupled to said input, and coupled to said output, for:

- (a) defining a look ahead distance as a function of the speed of the aircraft;
- (b) defining a first alert envelope, indicative of a first severity of terrain threat,

wherein boundaries of said first alert envelope are determined as a first function of the flight path angle, said look ahead distance, and a terrain floor boundary;

- (b) defining a second alert envelope, indicative of a second severity of terrain threat, wherein boundaries of said second alert envelope are determined as a second function of the flight path angle, said look ahead distance and said terrain floor boundary; and
- (d) outputting an alert signal when a subset of the stored terrain information is located within the boundaries of at least one of said first and said second alert envelopes.

5,839,081

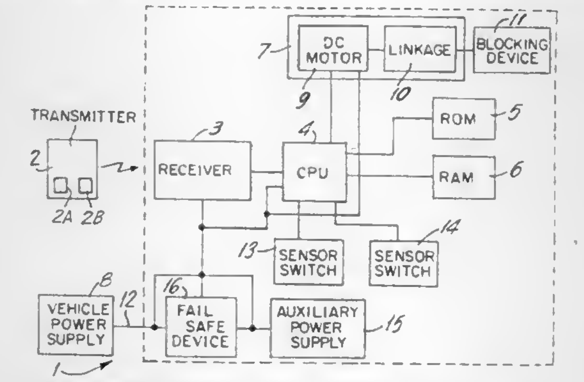
APPARATUS AND METHOD FOR VEHICLE ANTI-THEFT

Raymond Anthony Joao, and Raymond Delfim Joao, both of 122 Bellevue Pl., Yonkers, N.Y. 10703

Continuation of Ser. No. 493,855, Jun. 22, 1995, Pat. No. 5,612,878. This application Mar. 14, 1997, Ser. No. 818,560

Int. Cl.^{6} B60R *25/00*

U.S. Cl. 701—36 **20 Claims**



1. An anti-theft apparatus, which comprises:

a blocking element for blocking the flow of exhaust gases;

a device for moving said blocking element;

a control device for controlling one of said apparatus and said moving device;

an activation device for activating an operation of one of said apparatus and said control device; and

a housing for housing at least one of said blocking element, said moving device and said control device,

wherein said moving device one of moves and displaces said blocking element between a first position, whereat said blocking element is removed from the flow path of exhaust gases, and a second position, whereat said blocking element is in the flow path of exhaust gases.

5,839,082

APPARATUS AND METHOD FOR CONTROLLING DAMPING FORCE CHARACTERISTIC OF VEHICULAR SHOCK ABSORBER

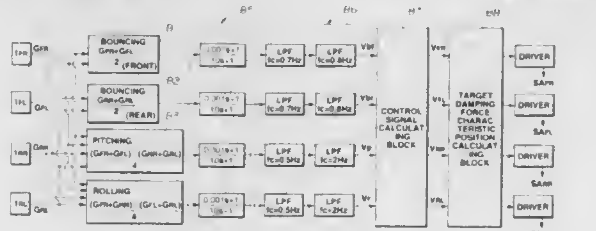
Katsuya Iwasaki, Atsugi, Japan, assignor to Unisia Jecs Corporation, Atsugi, Japan

Filed Dec. 26, 1996, Ser. No. 774,017

Claims priority, application Japan, Dec. 26, 1995, 7-339137

Int. Cl.^{6} B60G *17/015*

U.S. Cl. 701—38 **14 Claims**


BOUNCING
(FRONT)
(REAR)
PITCHING
ROLLING
LPF
CONTROL SIGNAL CALCULATING BLOCK
TARGET DAMPING FORCE CHARACTERISTIC POSITION CALCULATING BLOCK
DRIVER
DRIVER
DRIVER
DRIVER

1. An apparatus for a vehicle, comprising:

a) a plurality of shock absorbers, each shock absorber being interposed between a vehicle body as a sprung mass and a corresponding one of front left and front right road wheels and rear left and rear right road wheels as an unsprung mass and being arranged so as to enable a variable modification of its damping force characteristic;

b) sprung mass vertical acceleration sensors, each arranged on the vehicle body adjacent to the corresponding one of the front left, front right, rear left and rear right road wheels so as to detect a vertical acceleration of the sprung mass at the vehicle body corresponding to one of the shock absorber.;

c) a control unit arranged for extracting vehicular bouncing components, a vehicular pitching component, and a vehicular rolling component from sprung mass acceleration signals derived by said sprung mass vertical acceleration sensors, for developing a control signal to be supplied to each shock absorber on the basis of at least the bouncing components, the pitching component, and the rolling component extracted from said sprung mass vertical acceleration signals, for variably adjusting said damping force characteristic of the corresponding one of the shock absorbers so as to provide a target damping force characteristic on the basis of a corresponding one of the developed control signals; and

d) a vehicular running state detector arranged for detecting a variation rate of a vehicular running velocity, and

wherein said control unit determines whether the vehicle body is inclined with respect to a running road surface on which the vehicle runs according to the variation rate of the vehicular running velocity and nullifies the bouncing components from among the components on the basis of which the control signals are developed when determining that the vehicle body is inclined.

5,839,083

GEAR SHIFT CONTROL DEVICE OF AUTOMATIC TRANSMISSION WITH ESTIMATION OF TIRE GRIP LIMIT

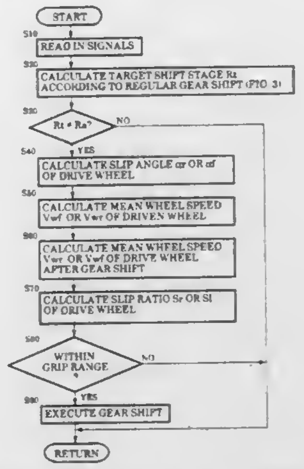
Mizuho Sugiyama, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Mar. 31, 1997, Ser. No. 825,621

Claims priority, application Japan, May 10, 1996, 8-141088

Int. Cl.^{6} G06G *7/70*

U.S. Cl. 701—62 **3 Claims**


START
READ IN SIGNALS
CALCULATE TARGET SHIFT STAGE Sa ACCORDING TO REGULAR GEAR SHIFT (FIG. 3)
NO
YES
CALCULATE SLIP ANGLE αr OR αf OF DRIVE WHEEL
CALCULATE MEAN WHEEL SPEED OF DRIVEN WHEEL
CALCULATE MEAN WHEEL SPEED OF DRIVE WHEEL AFTER GEAR SHIFT
CALCULATE SLIP RATIO Sr OR Sf OF DRIVE WHEEL
WITHIN GRIP RANGE
NO
YES
EXECUTE GEAR SHIFT
RETURN

1. A gear shift control device of an automatic transmission of a vehicle having an engine, a pair of drive wheels and a pair of driven wheels, comprising:

- a means for estimating a target shift stage for harmonizing rotation speed and power output of the engine;
- a means for estimating slip angle of at least one of the pair of drive wheels;
- a means for estimating slip ratio of said at least one drive wheel which would be caused thereon by the automatic transmission being shifted to said target shift stage;
- a means for estimating tire grip of said at least one drive wheel based upon said estimated slip angle and said estimated slip ratio;
- a means for judging if said estimated tire grip of said at least one drive wheel is in a grip range predetermined therefor; and
- a means for executing gear shift of the automatic transmission when said target shift stage is different from a current shift stage with said estimated tire grip being within said predetermined grip range.

5,839,084

DRIVING-TORQUE CONTROL SYSTEM FOR FOUR-WHEEL-DRIVE VEHICLE

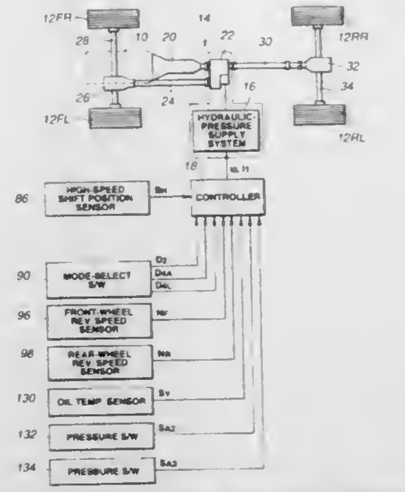
Toshiharu Takasaki, Sagamihara, and Tomoyuki Hara, Isehara, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 18, 1995, Ser. No. 529,465

Claims priority, application Japan, Sep. 21, 1994, 6-226476

Int. Cl.^{6} G06F *7/70;* **B60K** *17/344*

U.S. Cl. 701—67 **15 Claims**


12FR
12RR
12FL
12RL
14
20
22
24
26
28
30
32
34
16
18
HYDRAULIC PRESSURE SUPPLY SYSTEM
86
HIGH-SPEED SHIFT POSITION SENSOR
CONTROLLER
90
MODE-SELECT S/W
96
FRONT-WHEEL REV SPEED SENSOR
98
REAR-WHEEL REV SPEED SENSOR
130
OIL TEMP SENSOR
132
PRESSURE S/W
134
PRESSURE S/W

1. A driving-torque control system for a four-wheel-drive vehicle, said control system comprising:

- a transfer clutch employed in a transfer of the four-wheel-drive vehicle for varying a distribution ratio of driving torque between front and rear road wheels depending on a front-and-rear wheel revolution-speed difference;
- calculation means for deriving a command value of an engaging force of said transfer clutch from said front-and-rear wheel revolution-speed difference;
- load-condition detection means for detecting an input load condition of said transfer clutch, on the basis of said front-and-rear wheel revolution-speed difference and said command value of said engaging force;
- means for comparing said input load condition detected by said load-condition detection means with a predetermined threshold; and
- compensation means for compensating the engaging force of said transfer clutch so that said transfer clutch is held in a completely engaged state for a predetermined holding time duration, when said input load condition detected by said load-condition detection means exceeds said predetermined threshold.

5,839,085

SYSTEM AND METHOD FOR DETECTING VEHICLE TYPES BY UTILIZING INFORMATION OF VEHICLE HEIGHT, AND DEBITING SYSTEM UTILIZING THIS SYSTEM AND METHOD

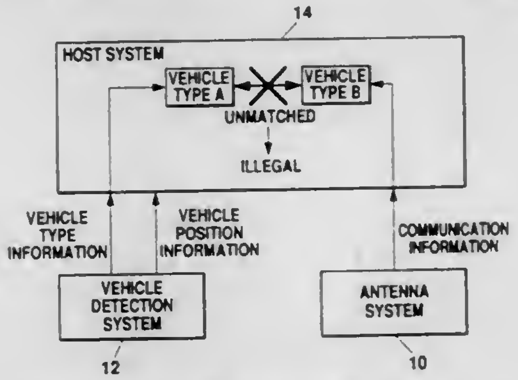
Kazutoshi Yoshikawa, Toyota, and Shuichi Sunahara, Aichi-ken, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jan. 9, 1997, Ser. No. 781,048

Claims priority, application Japan, Jan. 10, 1996, 8-002237

Int. Cl.^{6} G08G *1/08;* **G07B** *15/02*

U.S. Cl. 701—117 **21 Claims**



1. A vehicle type detecting system comprising:

height detecting means for detecting a height of an object on a road; and

vehicle type detecting means for, when the height satisfies at least one of a plurality of vehicle type conditions, determining that the object is a vehicle which belongs to a vehicle type corresponding to said at least one of plurality of vehicle type conditions, each of said vehicle type conditions being defined for every vehicle type;

wherein said height detecting means includes a plurality of sensors each detecting a distance to the object, and means for, if any of the plurality of sensors becomes faulty, generating information representing the detection of distance from the faulty sensor.

8. A vehicle type detecting system comprising:

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height detecting means for detecting a height of an object on a road; and

vehicle type detecting means for, when the height satisfies at least one of a plurality of vehicle type conditions, determining that the object is a vehicle which belongs to a vehicle type corresponding to said at least one of a plurality of vehicle type conditions, each of said vehicle type conditions being defined for every vehicle type;

wherein the vehicle type detecting means includes:

height profile detecting means for repeatedly detecting a height profile of the object by utilizing the height detecting means so as to obtain a plurality of height profiles along a direction crossing in a lengthwise direction of the road with respect to the object;

pattern detecting means for detecting a pattern of variation of the plurality of height profiles detected from the object, along the lengthwise direction of the road; and

means for, when the pattern satisfies at least one of said vehicle type conditions, determining that the object is a vehicle which belongs to a vehicle type corresponding to said at least one of said vehicle type conditions; wherein the height detecting means includes:

a plurality of sensors arranged along the direction crossing the lengthwise direction with a required small interval, the plurality of sensors each detecting the distance to an object passing its neighborhood and supplying detected results to the height profiles detecting means; and

means for, if any of the plurality of sensors goes faulty, generating information representing estimated distance on the basis of the detected result by another sensor located in the proximity of the faulty sensor, and supplying the information to the height profile detecting means instead of the distance to be detected by the faulty sensor.

5,839,086

ON-BOARD ROUTE DISPLAY RECEIVING INFORMATION FROM EXTERNAL DEVICE

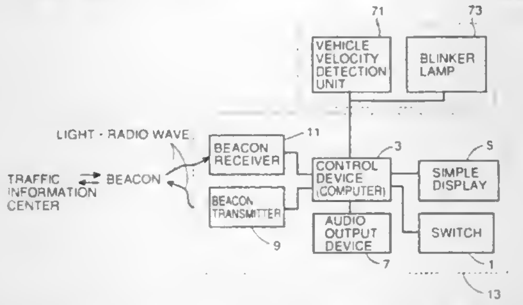
Kazuo Hirano, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 17, 1995, Ser. No. 503,096

Claims priority, application Japan, Jul. 18, 1994, 6-165400; Jul. 5, 1995, 7-169861

Int. Cl.^{6} G01C *21/00;* G06F *165/00*

U.S. Cl. 701—201 **19 Claims**



1. An on-board route display for obtaining, from an external device installed on a road, a recommended route leading a vehicle travelling on the road to a destination and for displaying the recommended route, comprising:

a memory to store names of intersections and information identifying said intersections corresponding to said names,

a setting unit to select a desired one of said stored names of intersections as corresponding to a destination intersection,

a transmitter to transmit to said external device information for identifying said destination intersection corresponding to said selected desired intersection name based on said information stored in said memory,

a receiver to receive recommended route information leading to said destination intersection corresponding to said selected desired intersection name from the external device, and

an indicator to indicate a recommended route to a user comprising a brief pattern figure based on said received recommended route information.

5,839,087

CURRENT POSITION CALCULATING SYSTEM FOR A VEHICLE HAVING A FUNCTION FOR CORRECTING A VEHICLE DIRECTION

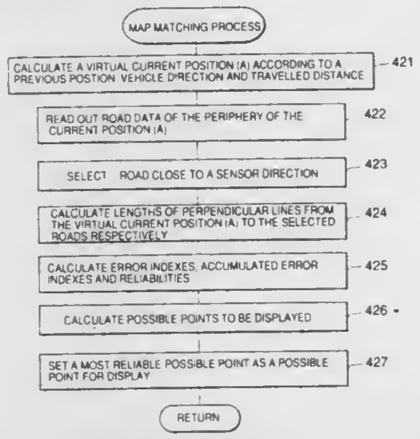
Hiroyuki Sato, 203, Heim-Wakaba,3-13-13, Yamatohigashi, Yamato-shi, Kanagawa-ken, Japan, 242

Filed Jun. 3, 1996, Ser. No. 663,757

Claims priority, application Japan, Jun. 9, 1995, 7-143567

Int. Cl.^{6} G01C *21/20*

U.S. Cl. 701—207 **5 Claims**


MAP MATCHING PROCESS
CALCULATE A VIRTUAL CURRENT POSITION (A) ACCORDING TO A PREVIOUS POSTION VEHICLE DIRECTION AND TRAVELLED DISTANCE
421
READ OUT ROAD DATA OF THE PERIPHERY OF THE CURRENT POSITION (A)
422
SELECT ROAD CLOSE TO A SENSOR DIRECTION
423
CALCULATE LENGTHS OF PERPENDICULAR LINES FROM THE VIRTUAL CURRENT POSITION (A) TO THE SELECTED ROADS RESPECTIVELY
424
CALCULATE ERROR INDEXES, ACCUMULATED ERROR INDEXES AND RELIABILITIES
425
CALCULATE POSSIBLE POINTS TO BE DISPLAYED
426
SET A MOST RELIABLE POSSIBLE POINT AS A POSSIBLE POINT FOR DISPLAY
427
RETURN

1. A current position calculating system being installed on a vehicle for calculating a current position of the vehicle, comprising:

direction detecting means for successively detecting a vehicle direction which changes as the vehicle travels;

distance calculating means for successively calculating a travelled distance of the vehicle;

road data storing means for storing road data which contain line segments connected together;

map matching means for estimating a vehicle current position as a virtual current position according to a previously determined vehicle current position and a relative displacement with respect to said previously determined vehicle current position, said relative displacement having been obtained on the basis of said vehicle direction and said travelled distance, and for determining a most probable latest current position on a road on the basis of distances from the virtual current position to line segments of said road data respectively and angular differences between each of line segment directions and a vehicle direction; and

direction modification means for holding a plural number of angular differences between road and vehicle directions, which are differences between the vehicle directions for a predetermined plural number of previously obtained positions having been determined by the map matching means, and said line segment directions at each of the previously obtained positions respectively, for obtaining an averaged value of the previously obtained plural number of angular differences between road and vehicle directions, and for modifying a latest vehicle direction detected by said direction detecting means on the basis of the averaged value,

wherein said map matching means performs a map matching process on the basis of the vehicle direction having been modified.

5,839,088

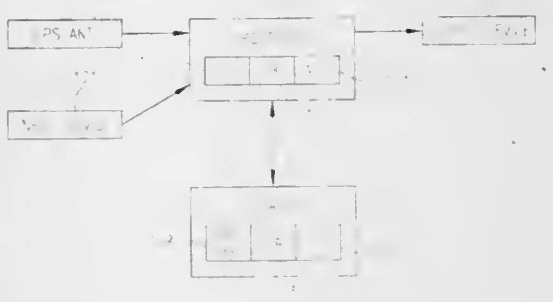
GEOGRAPHIC LOCATION REFERENCING SYSTEM AND METHOD

S. Lee Hancock, Newport Beach, Calif., and Peter H. Dana, Georgetown, Tex., assignors to GO2 Software, Inc., Newport Beach, Calif.

Filed Aug. 22, 1996, Ser. No. 701,586

Int. Cl.^{6} G01C *21/20;* G01S *5/02*

U.S. Cl. 701—213 **18 Claims**



1. A navigational apparatus comprising:

a GPS receiver for providing global coordinates of a first selected location within a geographical area defined in accordance with a known global referencing system;

an input device for providing an address of a second selected location within the geographical area comprising a proprietary address, and an address of a third selected location within the geographical area, said address of said third selected location including a hierarchial arrangement of codes;

a storage device for storing information which identifies a grid and a cell code of the grid;

a processor coupled to the GPS receiver, the input device, and the storage device, and configured to (1) use the information stored in the storage device to determine a pre-defined grid which corresponds to the geographical area, the grid having a plurality of grid cells, with each of the grid cells having a cell code and subdivided into a plurality of sub-cells, and with each of the sub-cells having a sub-cell code and addressed by a hierarchial arrangement of codes, the grid further having a reference point corresponding to a fourth selected location within the geographical area, global coordinates of the fourth selected location defined in accordance with the known global referencing system, and at least one grid parameter defining cell and sub-cell size and orientation; (2) determine a hierarchial arrangement of codes corresponding to the proprietary address by searching through a pre-determined file containing proprietary addresses reserved for the grid; (3) determine global coordinates of the second selected location by modifying the global coordinates of the fourth selected location in accordance with the hierarchial arrangement of codes corresponding to the proprietary address and at least one grid parameter; (4) determine global coordinates of the third selected location by modifying the global coordinates of the fourth selected location in accordance with the information stored in the storage device, the sub-cell code corresponding to the third selected location, and at least one parameter; (5) compare the global coordinates of the first and second selected locations to determine a first value; and (6) compare the global coordinates of the first and third selected locations to determine a second value; and

an output device coupled to the processor for outputting the first and second values.

5,839,089

THUNDER CLOUD OBSERVATION SYSTEM

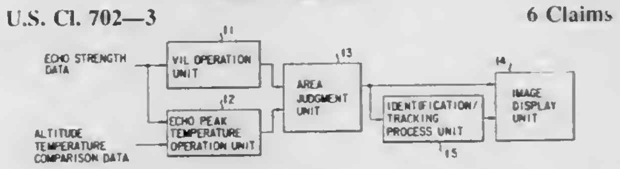
Kazuhiro Yasuda, Tokyo; Yuko Sato, Yokohama; Takashi Murano, and Hiroshi Oikawa, both of Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 20, 1995, Ser. No. 546,449

Claims priority, application Japan, Oct. 20, 1994, 6-255126

Int. Cl.^{6} G01W *1/10*

U.S. Cl. 702—3 **6 Claims**


11
13
14
ECHO STRENGTH DATA
VIL OPERATION UNIT
AREA JUDGMENT UNIT
IMAGE DISPLAY UNIT
12
IDENTIFICATION/ TRACKING PROCESS UNIT
ECHO PEAK TEMPERATURE OPERATION UNIT
ALTITUDE TEMPERATURE COMPARISON DATA
15

1. A thunder cloud observation system comprising:

an arithmetic operation unit for calculating a vertical direction accumulated water content from echo strength data obtained from a climate radar, and calculating an echo peak temperature with reference to altitude-temperature comparison data which is based on high altitude climate data;

an area determination portion for determining a precipitation area from said vertical direction accumulated water content and determining a thunder cloud area generated within the precipitation area from said echo peak temperature; and

an identification/tracking process unit for identifying/tracking the thunder cloud area determined by the area determination unit,

wherein said area determination unit judges an area in which said vertical direction accumulated water content is less than a reference value, to be a cloud-free area, an area in which said water content is at the reference value or higher, to be a precipitation area, and an area within the precipitation area in which an echo peak temperature is at the reference value or less, to be a thunder cloud area.

5,839,090

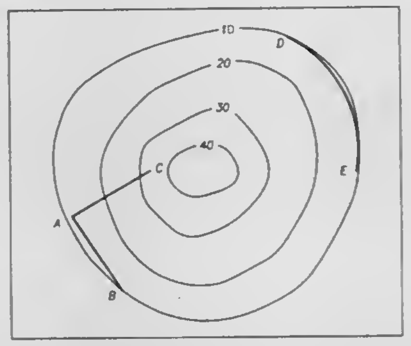
TRENDFORM GRIDDING METHOD USING DISTANCE

Steven Zoraster, Austin, Tex., assignor to Landmark Graphics Corporation, Houston, Tex.

Filed Nov. 14, 1996, Ser. No. 749,145

Int. Cl.^{6} G06F *19/00*

U.S. Cl. 702—5 **5 Claims**



1. A method for imposing an interpretation onto a rectangular grid-based model of a three dimensional object comprising the steps of,

providing a rectangular form grid having contours representative of the general shape of a model of said object, said grid having nodes,

defining at each of said nodes of said form grid a local gradient,

defining geologic data samples on said form grid which are representative of said object,

determining a total distance measurement between each geologic data sample and each grid node of said form grid, where each said total distance measurement is measured along a minimum weighted length path defined by connecting adja-

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cent nodes of said form grid, where said minimum weighted length path between any adjacent pair of grid nodes is increased to define an increased minimum weighted length path by,

the absolute value of the cosine of the angle of a ray joining said adjacent pair of grid nodes and a local gradient of said form grid,

a magnitude of said local gradient, and

a predetermined non-negative real number,

determining an object value at each node of said grid by weighting each data sample in inverse proportion to said increased minimum weighted length between each data sample and said grid node, and

plotting said object value for each node on an x-y map.

5,839,091

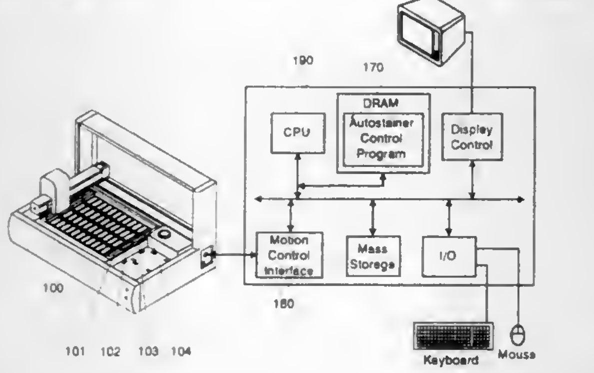
METHOD AND APPARATUS FOR AUTOMATIC TISSUE STAINING

Norman K. Rhett, San Ramon; Ken K. Tseung, Fremont; Mark V. Corl, Fremont; Wai Bun Wong, Fremont, and Ngoc Van Le, Milpitas, all of Calif., assignors to Lab Vision Corporation, Fremont, Calif.

Filed Oct. 7, 1996, Ser. No. 726,702

Int. Cl.^{6} G01N *33/53*

U.S. Cl. 702—19 **29 Claims**



1. A computer implemented method of programming an autostainer device, said method comprising the steps of:

accepting input from a user to select a first reagent for a first slide;

accepting input from a user to select a second reagent for said first slide;

comparing said first reagent with said second reagent for compatibility; and

warning said user if said first reagent is incompatible with said second reagent.

5,839,092

ARCING FAULT DETECTION SYSTEM USING FLUCTUATIONS IN CURRENT PEAKS AND WAVEFORMS

Robert J. Erger; Kon B. Wong, and Charles D. Bettis, all of Cedar Rapids, Iowa, assignors to Square D Company, Palatine, Ill.

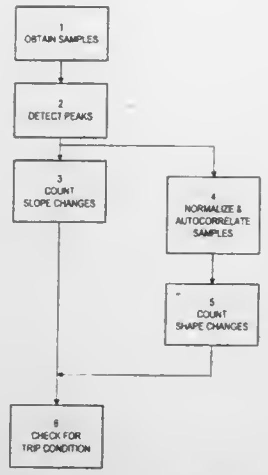
Filed Mar. 26, 1997, Ser. No. 825,005

Int. Cl.^{6} G01R *31/08*

U.S. Cl. 702—58 **32 Claims**

8. A method of detecting arcing faults in a line conductor carrying an electrical current between a power source and a load, said electrical current defining an AC waveform comprising a series of alternating positive half cycles and negative half cycles, said method comprising the steps of:

(a) obtaining current samples in a series of half cycles of said waveform;



(b) determining a peak current within each of the series of half cycles;

(c) normalizing each of the current samples;

(d) comparing the peak currents of a selected pair of said half cycles to determine a slope direction between said selected pair of half cycles;

(e) autocorrelating the normalized current samples to obtain a measure of significant waveform shape changes between the selected half cycles;

(f) counting a number of reversals in polarity occurring within a selected time interval, said reversals in polarity occurring when the slope direction between said selected pair of half cycles differs from the slope direction of a next selected pair of half cycles;

(g) counting a number of significant waveform shape changes occurring within said selected time interval; and

(h) generating an arc indicative signal when the number of reversals in polarity occurring within said selected time interval equals or exceeds a first predetermined threshold number and when the number of significant shape changes occurring within said selected time interval equals or exceeds a second predetermined threshold number.

5,839,093

SYSTEM FOR LOCATING FAULTS AND ESTIMATING FAULT RESISTANCE IN DISTRIBUTION NETWORKS WITH TAPPED LOADS

Damir Novosel, Cary; David Hart, Raleigh; Yi Hu, Cary, all of N.C., and Jorma Myllymaki, Tampere, Finland, assignors to ABB Transmit Oy, Vaasa, Finland

Filed Dec. 31, 1996, Ser. No. 777,623

Int. Cl.^{6} H02H *3/26*

U.S. Cl. 702—59 **31 Claims**

28. A system for locating faults and estimating fault resistance in a distribution network having tapped loads comprising:

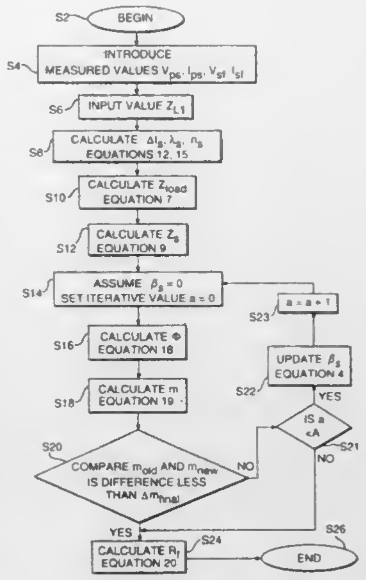
a voltage sensor for measuring line voltage at a monitoring or source location;

a current sensor for measuring line current at a monitoring or source location;

said voltage and current sensors developing pre-fault voltage and current measurements V_{ps} and I_{ps}, and post-fault voltage and current measurements V_{sf} and I_{sf};

impedance calculation means for calculating the load and source impedance Z_{load} and Z_s from the pre-fault voltage and current measurements V_{ps} and I_{ps}, and post-fault voltage and current measurements V_{sf} and I_{sf} as well as the per unit distribution network impedance Z_{L1};

means for iteratively solving equations which consider the effect of fault resistance and fault induced change in load current and which relates fault location to known circuit parameters to develop a fault location value m including,



first means for calculating θ, a unit complex number, based on an estimate of β_s, the phase angle of the current distribution factor,

second means for calculating fault location m based on the value of θ, and

third means for calculating the phase angle β_s of the current distribution factor d_s based on the value of m while considering a variable related to fault resistance;

said means for iteratively solving iteratively processing in said first through third means for calculating based on converging estimates of the values of m and β_s until a desired accuracy is reached.

5,839,094

PORTABLE DATA COLLECTION DEVICE WITH SELF IDENTIFYING PROBE

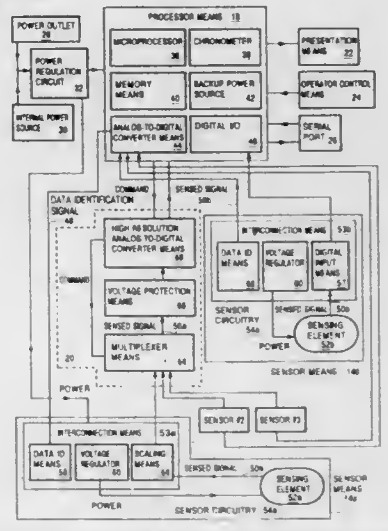
Patrick D. French, Aurora, Colo., assignor to ADA Technologies, Inc., Englewood, Colo.

PCT No. PCT/US95/08308, § 371 Date Apr. 30, 1997, § 102(e) Date Apr. 30, 1997, PCT Pub. No. WO96/01411, PCT Pub. Date Jan. 18, 1996

PCT Filed Jun. 30, 1995, Ser. No. 750,136

Int. Cl.^{6} G01D *3/024*

U.S. Cl. 702—91 **23 Claims**



1. A device for collecting a plurality of different types of sensed physical data, comprising:

a unit, including:

a housing;

processor means mounted within said housing for controlling the input and output of information corresponding with and according to a plurality of different types of sensed physical data to and from a memory means mounted within the housing for storing information;

operator control means for controlling said processor means;

a plurality of input ports operably connected to the processor means; and

a plurality of sensor means, located outside of the housing, for providing sensed signals representative of said plurality of different types of sensed physical data, wherein each sensor means corresponds to a type of sensed physical data and comprises:

an interconnection means supportably connectable to an input port in the housing; and

a sensor memory means for storing sensor information including a unique sensor identifier.

5,839,095

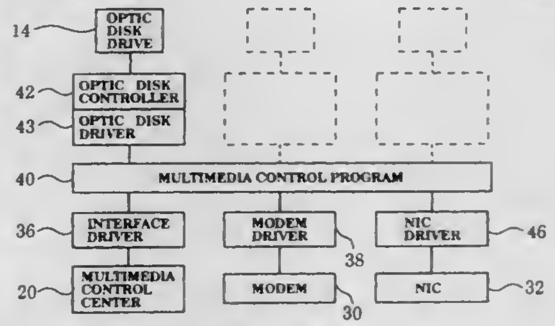
MULTIMEDIA CONTROL CENTER FOR CONTROLLING PERIPHERAL DEVICES OF A PERSONAL COMPUTER

Johny Liu, 3F No. 1 Lane 154, Sec 3, Cheng-Gong Road, Neihu, Taipei, Taiwan

Filed Jun. 7, 1996, Ser. No. 660,265

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 702—122 **7 Claims**



1. A data processing system comprising:

(1) a processor for performing multi-tasking applications;

(2) a display connected to the processor;

(3) an application program executed in the processor which displays video outputs on the display;

(4) input device means connected to the processor for receiving user inputs for the application program;

(5) peripheral device means connected to the processor for performing a peripheral function;

(6) device driver means installed in the processor for controlling the peripheral device means according to peripheral control signals;

(7) multimedia control means for receiving the peripheral control signals generated by a user and passing the signals to the device driver means to control the peripheral device means without using the display of the processor;

(8) a multimedia interface circuit connected to the processor with a multimedia control panel having a plurality of keys for generating the peripheral control signals according to user inputs; and

(9) an interface driver means installed in the processor for controlling the multimedia interface circuit and transmitting the peripheral control signals to the multimedia control means;

wherein the peripheral device means is controlled by the device driver means according to the peripheral control signals transmitted from the multimedia control means without suspending or terminating the application program executed in the processor; and wherein the multimedia control means further transmits message signals generated by the device driver means to the interface driver means and the multimedia interface circuit further comprises a display means for displaying the message signals wherein the interface driver means displays the message signals received from

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the multimedia control means over the display means of the multimedia interface circuit.

5,839,096

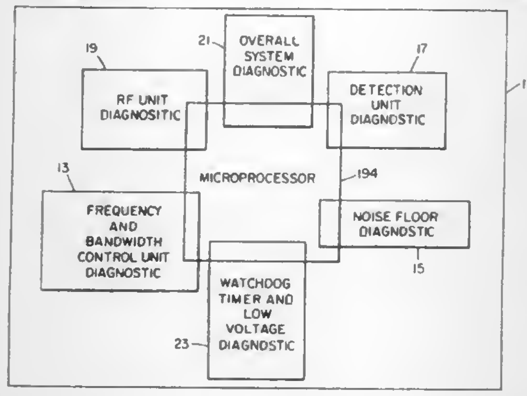
SELF-IMPLEMENTING DIAGNOSTIC SYSTEM

Christopher T. Lyons, Tyngsboro, and Ismail Taskin, Arlington, both of Mass., assignors to Hittite Microwave Corporation, Woburn, Mass.

Filed Mar. 10, 1997, Ser. No. 814,102

Int. Cl.^{6} G01S *7/40*

U.S. Cl. 702—183 **21 Claims**


19
21
OVERALL SYSTEM DIAGNOSTIC
17
RF UNIT DIAGNOSITIC
DETECTION UNIT DIAGNOSTIC
11
13
MICROPROCESSOR
194
FREQUENCY AND BANDWIDTH CONTROL UNIT DIAGNOSTIC
NOISE FLOOR DIAGNOSTIC
15
WATCHDOG TIMER AND LOW VOLTAGE DIAGNOSTIC
23

1. A self-implementing, self-diagnostic system for an anticipatory collision sensor system for a vehicle comprising:
  oscillator means for generating a carrier signal;
  a modulation generator for generating a modulation signal for modulating said carrier signal;
  means for selectively inhibiting said modulation signal to produce a synthetic Doppler shift;
  a mixer device for mixing said carrier signal and said modulation signal to produce a modulated carrier signal;
  a detection device, responsive to said synthetic Doppler shift, for detecting a synthetic Doppler signal induced by said means for inhibiting;
  a measuring device, responsive to said synthetic Doppler signal, for measuring the amplitudes of said synthetic Doppler signal;
  said measuring device including counting means, responsive to said synthetic Doppler signal, for determining the frequency of said synthetic Doppler signal;
  first comparing means, responsive to said measuring means, for comparing said amplitudes to predetermined levels;
  second comparing means, responsive to said frequency of said synthetic Doppler signal, for comparing said frequency to a predetermined value; and
  an indicating device, responsive to said first comparing means and said second comparing means, for indicating the operational status of said anticipatory collision sensor system.

5,839,097

ELECTRICAL HOME APPLIANCE

Markus Klausner, Chemnitz, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

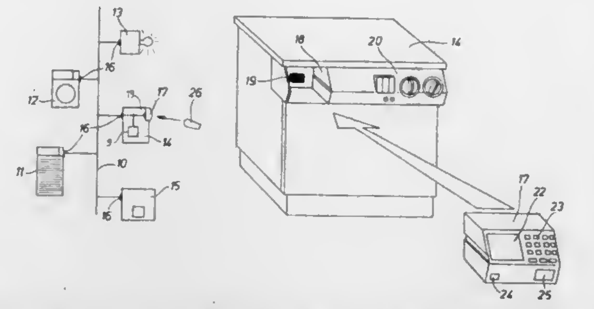
Filed Apr. 17, 1997, Ser. No. 837,347

Claims priority, application Germany, Apr. 20, 1996, 196 15 840.0

Int. Cl.^{6} G06F *1/16;13/10*

U.S. Cl. 702—188 **15 Claims**

1. An electrical home appliance, including a dishwasher, clothes dryer, washing machine, lighting arrangement, heating system control, having an interface, which is arranged on the respective home appliance, for connecting the home appliance to a bus system connected to several home appliances for control by a single central control computer, with the interface being connected to a bus connection module within the respective home appliance for transmitting control commands or sensor signals between the bus system and the home appliance; and wherein the respective home appliance is provided with a plug-in position for the detachable plugging in of the control computer, and a contact configuration is provided at the plug-in position and connected to the interface for establishing a connection between a plugged-in control computer and the interface.



5,839,098

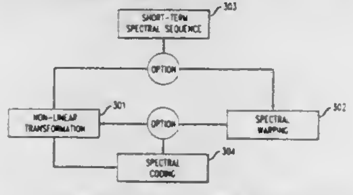
SPEECH CODER METHODS AND SYSTEMS

Rajiv Laroia, Brooklyn, and Boon-Lock Yeo, Yorktown Heights, both of N.Y., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 19, 1996, Ser. No. 770,615

Int. Cl.^{6} G10L *3/02*

U.S. Cl. 704—203 **38 Claims**



1. A method for coding a speech signal to generate a coded signal comprising:
  generating a sequence of spectral magnitude values for a frame interval of said speech signal representing voiced speech, said spectral magnitude value sequence characterizing spectral components of a short-term frequency spectrum of said interval;
  performing at least one of a non-linear transformation or spectral warping process on said sequence to produce an intermediate spectral value sequence having an enhanced characterization of at least one particular frequency range relative to another frequency range in the intermediate spectral sequence; and
  coding said intermediate spectral value sequence to produce at least a portion of said coded signal for said interval of said speech signal.

5,839,099

SIGNAL CONDITIONING APPARATUS

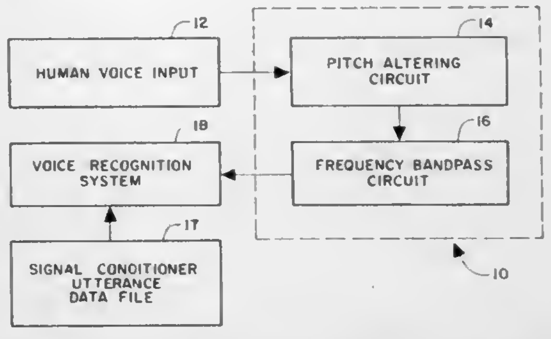
Clyde Stephan Munsell; Albert Russell Schaefer; Rodney Guy Cohen, all of San Diego, and John Richard Cover, Burbank, all of Calif., assignors to GuVolt, Inc., San Diego, Calif.

Filed Jun. 11, 1996, Ser. No. 661,542

Int. Cl.^{6} G10L *3/02*

U.S. Cl. 704—207 **25 Claims**

1. An apparatus for producing a spectrally normalized human voice signal from a human voice input, said spectrally normalized human voice signal being sent to a voice recognition system, said apparatus comprising:
  a pitch altering circuit receiving said human voice input and producing an intermediate analog output;
  a frequency bandwidth limiting circuit receiving said intermediate analog output and producing said spectrally normalized human voice signal; and
  a means for receiving a control signal from the voice recognition system to control a characteristic of said normalized human voice signal.



5,839,100

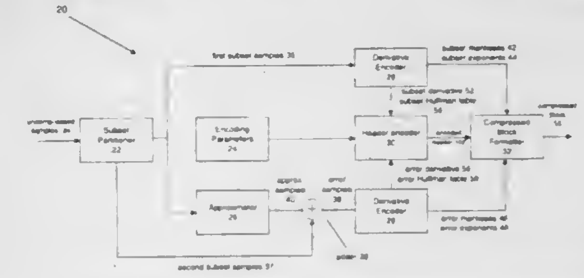
LOSSLESS AND LOSS-LIMITED COMPRESSION OF SAMPLED DATA SIGNALS

Albert William Wegener, 867 Jasmine Dr., Sunnyvale, Calif. 94086

Filed Apr. 22, 1996, Ser. No. 636,019

Int. Cl.^{6} G10L *3/02;9/00;5/02*

U.S. Cl. 704—220 **25 Claims**



1. A sampled data compression method which compresses input blocks of digitized signals, especially speech, audio, or audiovisual signals, that are regularly sampled at a rate of K samples per second and B bits per sample, where said input blocks are replaced by a stream of compressed blocks comprising:
  (a) grouping said sampled data signal into input blocks containing N consecutive samples, in which each said input block requires N*B bits of storage or transmission,
  (b) applying a partitioning method to each said input block to create a first subset containing N1 samples of the input signal and a second subset containing N2 samples of the input signal, where N1+N2=N,
  (c) applying an approximation method to said first subset of N1 samples to create an approximation signal containing N2 samples which approximates said second subset,
  (d) subtracting said approximation signal from said second subset to create an error signal containing N2 samples,
  (e) applying an encoding method to said first subset of N1 samples to create an encoded first subset requiting C1 bits of storage or transmission, wherein said encoded first subset identically represents said first subset of N1 samples using fewer than N1*B bits,
  (f) applying an encoding method to said error signal of N2 samples to create an encoded error signal requiring C2 bits of storage or transmission, wherein said encoded error signal identically represents said error signal of N2 samples using fewer than N2*B bits,
  (g) creating a header containing control bits requiring C3 bits of storage or transmission, which said control bits indicate said block size N, said partitioning method used to create said first subset, said approximation method used to create said approximation signal, said encoding method used to encode said first subset, and said encoding method used to encode said error signal,
  (h) combining said encoded first subset, said encoded error signal, and said header containing control bits into a compressed block requiring C1+C2+C3 bits of storage or transmission, where C1+C2+C3 is less than N*B, and
  (i) combining consecutive said compressed blocks into said stream of compressed blocks.

5,839,101

NOISE SUPPRESSOR AND METHOD FOR SUPPRESSING BACKGROUND NOISE IN NOISY SPEECH, AND A MOBILE STATION

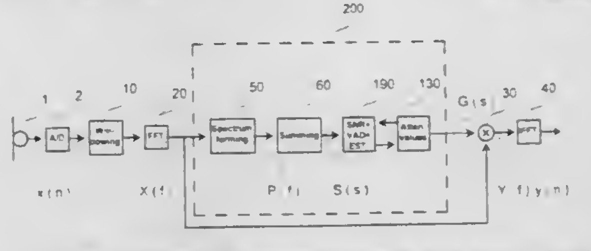
Antti Vähätalo; Juha Häkkinen; Erkki Paajanen, and Ville-Veikko Mattila, all of Tampere, Finland, assignors to Nokia Mobile Phones Ltd., Salo, Finland

Filed Dec. 10, 1996, Ser. No. 762,938

Claims priority, application Finland, Dec. 12, 1995, 955947

Int. Cl.^{6} H04B *15/00*

U.S. Cl. 704—226 **19 Claims**



1. A noise suppressor for suppressing noise in a speech signal, which suppressor comprises means for dividing said speech signal in a first amount of subsignals, which subsignals represent certain first frequency ranges, and suppression means for suppressing noise in a subsignal based upon a determined suppression coefficient, wherein it additionally comprises recombination means for recombining a second amount of subsignals into a calculation signal which represents a certain second frequency range, which is wider than said first frequency ranges, determination means for determining a suppression coefficient for the calculation signal based upon noise contained in it, and that the suppression means are arranged to suppress the subsignals recombined into the calculation signal, with said suppression coefficient determined based upon the calculation signal.

5,839,102

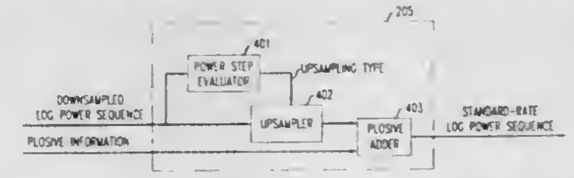
SPEECH CODING PARAMETER SEQUENCE RECONSTRUCTION BY SEQUENCE CLASSIFICATION AND INTERPOLATION

Jesper Haagen, Lyngby, and Willem Bastiaan Kleijn, Basking Ridge, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Nov. 30, 1994, Ser. No. 346,798

Int. Cl.^{6} G10L *9/18*

U.S. Cl. 704—230 **30 Claims**



1. A method of decoding a coded speech signal, the coded signal comprising a sequence of coded parameter value signals representing successive values of a predetermined parameter at successive times, the coded signal further comprising a coded intermediate parameter values signal representing values of the predetermined parameter at one or more times between the times of two of said successive values of the predetermined parameter, the method comprising the steps of:

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classifying the predetermined parameter into one of a plurality of categories based on the coded intermediate parameter values signal;

generating, based on the category into which the predetermined parameter has been classified, one or more intermediate parameter value signals representing values of the predetermined parameter at one or more times between two consecutive ones of the coded parameter value signals; and

decoding the coded speech signal based on the one or more intermediate parameter value signals,

wherein the plurality of categories include at least one of.

(i) an interpolation category representing that each of said one or more intermediate parameter value signals is to be generated based on an interpolation of said two successive values of said predetermined parameter; and

(ii) a step function category representing that each of said one or more intermediate parameter value signals is to be generated based on exactly one of said two successive values of said predetermined parameter.

5,839,103

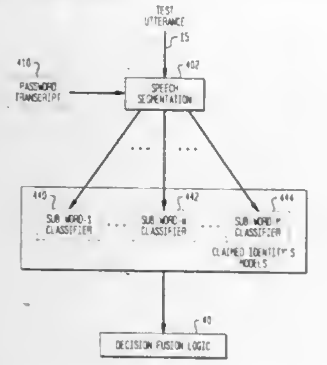
SPEAKER VERIFICATION SYSTEM USING DECISION FUSION LOGIC

Richard J. Mammone, Bridge Water, N.J.; Kevin Farrell, Milford, Conn.; Manish Sharma, Piscataway, N.J.; Devang Naik, Sunnyvale, Calif.; Xiaoyu Zhang, Piscataway, N.J.; Khaled Assaleh, Scottsdale, Ariz., and Han-Seng Liou, Waltham, Mass., assignors to Rutgers, The State University of New Jersey, Piscataway, N.J.

Filed Jun. 7, 1995, Ser. No. 479,012

Int. Cl.^{6} G10L *5/00*

U.S. Cl. 704—232 **24 Claims**



1. A method for speaker verification of a speaker comprising the steps of:

extracting at least one feature from first speech spoken by said speaker;

classifying said at least one feature with a plurality of classifiers for forming a plurality of classified output;

fusing said plurality of classified output for forming fused classifier outputs;

recognizing said fused classifier outputs by determining the similarity of said fused classifier outputs and second speech spoken by said speaker before said speaker verification; and

determining from said recognized fused classifier outputs whether to accept or reject said speaker.

5,839,104

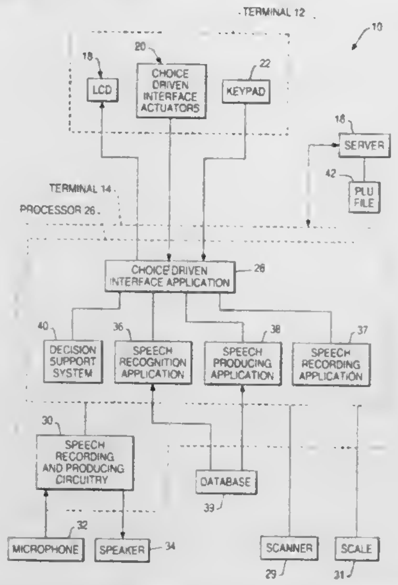
POINT-OF-SALE SYSTEM HAVING SPEECH ENTRY AND ITEM RECOGNITION SUPPORT SYSTEM

Michael S. Miller, Roswell; Janet L. Fath, Atlanta; Diego J. Castaño, Decatur, and Joe Wahome, Jr., Marietta, all of Ga., assignors to NCR Corporation, Daytnn, Ohio

Filed Feb. 20, 1996, Ser. No. 602,483

Int. Cl.^{6} G01G *23/38*

U.S. Cl. 704—251 **10 Claims**


TERMINAL 12
10
18
20
22
LCD
CHOICE DRIVEN INTERFACE ACTUATORS
KEYPAD
16
SERVER
42
PLU FILE
TERMINAL 14
PROCESSOR 26
CHOICE DRIVEN INTERFACE APPLICATION
28
40
36
38
37
DECISION SUPPORT SYSTEM
SPEECH RECOGNITION APPLICATION
SPEECH PRODUCING APPLICATION
SPEECH RECORDING APPLICATION
30
SPEECH RECORDING AND PRODUCING CIRCUITRY
DATABASE
39
32
MICROPHONE
SPEAKER
34
SCANNER
29
SCALE
31

7. A method of purchasing a produce item comprising the steps of:

(a) recording a weight of the produce item and generating a weight signal by a scale;

(b) automatically executing speech recognition software and prompting an operator to speak a name associated with the produce item into a microphone by a computer in response to receipt of the weight signal by the computer;

(c) recording speech representing the name of the produce item by the speech recognition software;

(d) comparing the speech to a database of produce names including the name of the produce item to identify the produce item by the speech recognition software;

(e) determining a price for the produce item by the computer from a price file; and

(f) adding the price to the transaction.

5,839,105

SPEAKER-INDEPENDENT MODEL GENERATION APPARATUS AND SPEECH RECOGNITION APPARATUS EACH EQUIPPED WITH MEANS FOR SPLITTING STATE HAVING MAXIMUM INCREASE IN LIKELIHOOD

Mari Ostendorf, Brookline, Mass., and Harald Singer, Sorakugun, Japan, assignors to ATR Interpreting Telecommunications Research Laboratories, Kyoto, Japan

Filed Nov. 29, 1996, Ser. No. 758,378

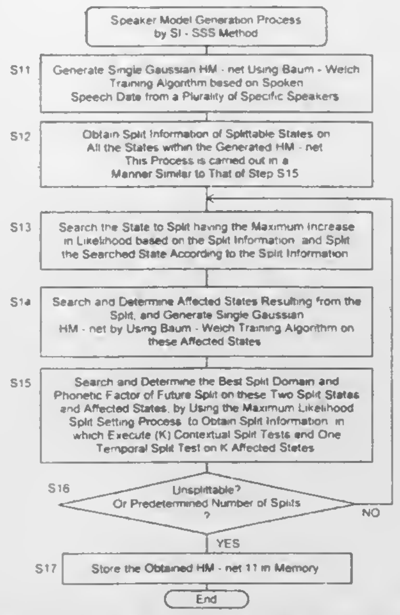
Claims priority, application Japan, Nov. 30, 1995, 7-312286

Int. Cl.^{6} G10L *7/02*

U.S. Cl. 704—256 **10 Claims**

1. A speaker-independent model generation apparatus comprising:

model generation means for generating a hidden Markov model of a single Gaussian distribution using a Baum-Welch training algorithm based on spoken speech data from a plurality of specific speakers, and thereafter for generating a speaker-independent hidden Markov model by iterations of splitting a state having a maximum increase in likelihood upon splitting one state in contextual or temporal domains on the hidden Markov model of the single Gaussian distribution.


Speaker Model Generation Process by SI - SSS Method
S11
Generate Single Gaussian HM - net Using Baum - Welch Training Algorithm based on Spoken Speech Date from a Plurality of Specific Speakers
S12
Obtain Split Information of Splittable States on All the States within the Generated HM - net This Process is carried out in a Manner Similar to That of Step S15
S13
Search the State to Split having the Maximum Increase in Likelihood based on the Split Information and Split the Searched State According to the Split Information
S14
Search and Determine Affected States Resulting from the Split, and Generate Single Gaussian HM - net by Using Baum - Welch Training Algorithm on these Affected States
S15
Search and Determine the Best Split Domain and Phonetic Factor of Future Split on these Two Split States and Affected States, by Using the Maximum Likelihood Split Setting Process to Obtain Split Information in which Execute (K) Contextual Split Tests and One Temporal Split Test on K Affected States
S16
Unsplittable? Or Predetermined Number of Splits ?
NO
YES
S17
Store the Obtained HM - net 11 in Memory
End

5,839,106

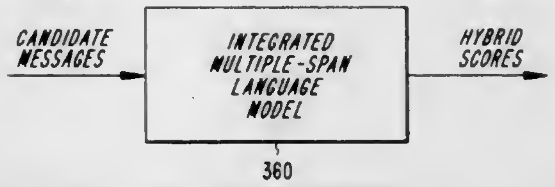
LARGE-VOCABULARY SPEECH RECOGNITION USING AN INTEGRATED SYNTACTIC AND SEMANTIC STATISTICAL LANGUAGE MODEL

Jerome R. Bellegarda, Los Gatos, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Dec. 17, 1996, Ser. No. 768,122

Int. Cl.^{6} G01L *5/06;9/06*

U.S. Cl. 704—257 **45 Claims**



1. A speech recognition system, comprising:

a pre-processor receiving an acoustic signal and processing the acoustic signal to produce an acoustic feature sequence; and

a recognition processor receiving the acoustic feature sequence and processing the acoustic feature sequence using a multiple-span stochastic language model to form a linguistic message, wherein the multiple-span stochastic language model includes a local span providing an immediate word context and a large span providing a global word context.

5,839,107

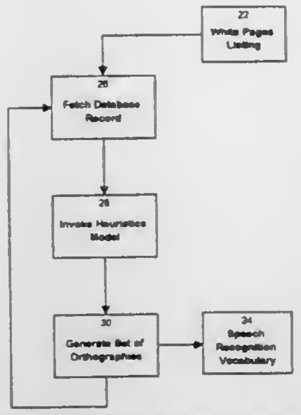
METHOD AND APPARATUS FOR AUTOMATICALLY GENERATING A SPEECH RECOGNITION VOCABULARY FROM A WHITE PAGES LISTING

Vishwa Gupta, Brossard, and Michael Sabourin, St-Lambert, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Nov. 29, 1996, Ser. No. 757,610

Int. Cl.^{6} G10L *3/00*

U.S. Cl. 704—270 **57 Claims**



1. A method for generating a speech recognition dictionary for use in a speech recognition system, the method comprising the steps of:

providing a machine readable medium containing a listing of a plurality of entity identifiers, each entity identifier including at least one word that symbolizes a particular meaning, said plurality of entity identifiers being distinguishable from one another based on either one of individual words and combinations of individual words, at least some of said entity identifiers including at least two separate words;

processing said machine readable medium by a computing device for generating for at least some of said entity identifiers an orthography set including a plurality of orthographies, each orthography being a representation of a spoken utterance, each orthography in a given orthography set being a composition of different words and at least one of said different words being selected from a respective entity identifier;

transcribing said orthography set in the form of data elements forming a data structure capable of being processed by a speech recognition system characterized by an input for receiving a signal derived from a spoken utterance, said speech recognition system being capable of processing the signal and the data structure to select a data element corresponding to an orthography likely to match the spoken utterance and performing a determined action on the basis of the data element likely to match the spoken utterance selected by the speech recognition system;

storing said data structure on a computer readable medium.

5,839,108

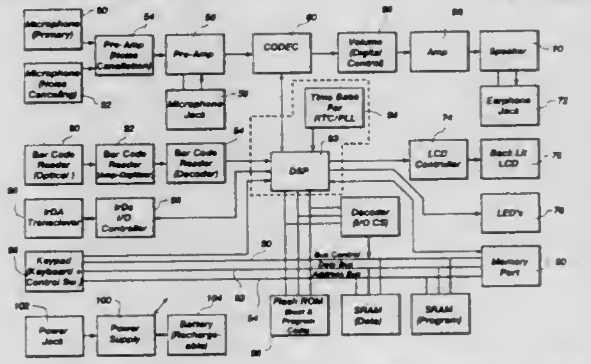
FLASH MEMORY FILE SYSTEM IN A HANDHELD RECORD AND PLAYBACK DEVICE

Norbert P. Daberko, Oceanside, Calif., assignor to Norris Communications, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 612,772, Mar. 7, 1996. This application Jun. 30, 1997, Ser. No. 884,245

Int. Cl.^{6} G11B *9/00*

U.S. Cl. 704—270 **6 Claims**



2. A record/playback device for use with a removable, interchangeable, flash memory recording medium which enables extended voice recording comparable with tape cassette dictating equipment, said device comprising:

a housing;

a first microphone element coupled to the housing and configured to receive and process sound into electrical signals;

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a second microphone element coupled to the housing and configured to receive and process sound so as to cancel noise received at the first microphone element;

control circuitry coupled to the microphone element and including signal input circuitry, amplification circuitry, analog-to-digital conversion circuitry, memory control circuitry, signal output circuitry and control logic circuitry for performing record and playback functional operations with respect to the electrical signals and other regulated components of the record/playback device;

said switch means coupled to the control circuitry for selecting the desired functional operations to be performed;

a receiving socket electrically coupled to the memory control circuitry and configured for electrical coupling with a flash memory module which operates as sole memory of the received processed sound electrical signals and is capable of retaining recorded digital information for storage in nonvolatile form; and

a speaker coupled to the control circuitry for playback of recorded digital information; and a power source coupled to the control circuitry for supplying electrical power to the device.

5,839,109

SPEECH RECOGNITION APPARATUS CAPABLE OF RECOGNIZING SIGNALS OF SOUNDS OTHER THAN SPOKEN WORDS AND DISPLAYING THE SAME FOR VIEWING

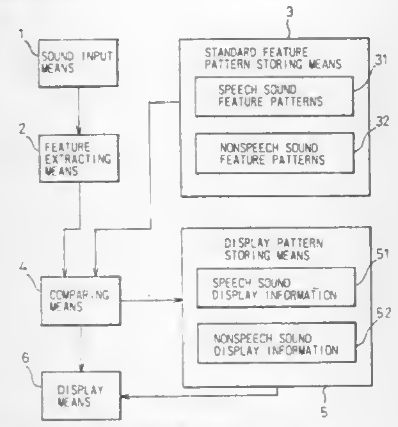
Hitoshi Iwamida, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed May 27, 1994, Ser. No. 250,433

Claims priority, application Japan, Sep. 14, 1993, 5-228990

Int. Cl.^{6} G10L *3/00*

U.S. Cl. 704—271 **6 Claims**


1
SOUND INPUT MEANS
2
FEATURE EXTRACTING MEANS
3
STANDARD FEATURE PATTERN STORING MEANS
31
SPEECH SOUND FEATURE PATTERNS
32
NONSPEECH SOUND FEATURE PATTERNS
4
COMPARING MEANS
DISPLAY PATTERN STORING MEANS
51
SPEECH SOUND DISPLAY INFORMATION
52
NONSPEECH SOUND DISPLAY INFORMATION
6
DISPLAY MEANS
5

1. A speech recognition apparatus comprising:

sound input means for inputting a sound signal:

feature extracting means for extracting features for recognition of the sound signal:

standard feature pattern storing means for storing feature patterns of standard nonspeech sound signals representing sounds other than human speech sounds, as well as feature patterns of standard speech sound signals representing human speech sounds:

comparing means for comparing the extracted features of the input sound signal with the feature patterns stored in the standard feature pattern storing means, and for selecting a standard sound signal corresponding to the input sound signal;

display pattern storing means for storing speech sound display information representing the standard speech sound signals as characters and nonspeech sound display information corresponding to the standard nonspeech sound signals: and

display means for displaying display information corresponding to the standard sound signal selected by the comparing means.

5,839,110

TRANSMITTING AND RECEIVING APPARATUS

Yuji Maeda, Tokyo; Masayuki Nishiguchi, Kanagawa, and Kentaro Odaka, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

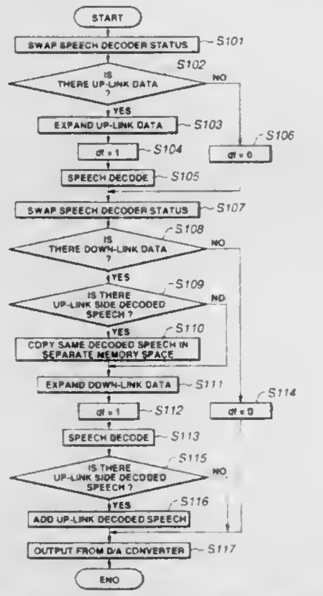
PCT No. PCT/JP95/01537, § 371 Date Jun. 13, 1996, § 102(e) Date Jun. 13, 1996, PCT Pub. No. WO96/06489, PCT Pub. Date Feb. 29, 1996

PCT Filed Aug. 2, 1995, Ser. No. 624,645

Claims priority, application Japan, Aug. 22, 1994, 6-196613

Int. Cl.^{6} G10L *3/00;3/02;5/06;9/00*

U.S. Cl. 704—275 **23 Claims**


START
SWAP SPEECH DECODER STATUS
S101
S102
IS THERE UP-LINK DATA ?
NO
YES
EXPAND UP-LINK DATA
S103
df = 1
S104
S106
df = 0
SPEECH DECODE
S105
SWAP SPEECH DECODER STATUS
S107
S108
IS THERE DOWN-LINK DATA ?
NO
YES
S109
IS THERE UP-LINK SIDE DECODED SPEECH ?
NO
YES
S110
COPY SAME DECODED SPEECH IN SEPARATE MEMORY SPACE
EXPAND DOWN-LINK DATA
S111
df = 1
S112
S114
df = 0
SPEECH DECODE
S113
S115
IS THERE UP-LINK SIDE DECODED SPEECH ?
NO
YES
S116
ADD UP-LINK DECODED SPEECH
OUTPUT FROM D/A CONVERTER
S117
END

1. A speech signal transmitting/receiving apparatus comprising:

compressing and encoding means for compressing and encoding an input speech signal;

transmitting means for transmission processing an output signal of said compressing and encoding means;

receiving means for reception processing a received signal:

expanding and decoding means for expanding and decoding an output signal of said receiving means and outputting a speech signal;

storage means for storing at least one of a signal from said compressing and encoding means and a signal to said expanding and decoding means: and

control means for controlling writing of at least one of the output signal from said compressing and encoding means and the signal to said expanding and decoding means and for controlling a readout operation from said storage means.

wherein said control means judges whether a dual recording mode prevails. based upon at least one of the output signal from said compressing and encoding means and the signal to said expanding and decoding means and. upon fudging a presence of the dual recording mode, said control means causes uplink side and downlink side signals to be stored in said storage means and when reading out signals stored in said storage means. said control means causes the unlink side and downlink side signals to be read out separately and sums the unlink side and downlink side signals read out separately to output a summed signal.

5,839,111

CONTROLLER AND CONTROL METHOD

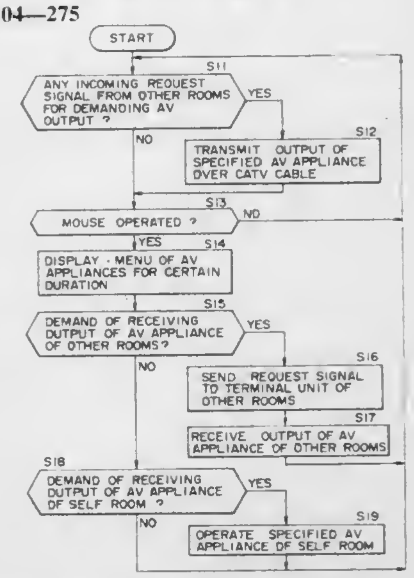
Jochiku Muraoka, and Nobuo Kato, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 23, 1996, Ser. No. 771,682

Claims priority, application Japan, Dec. 28, 1995, 7-342420

Int. Cl.^{6} G10L *3/00*

U.S. Cl. 704—275 **15 Claims**


START
S11
ANY INCOMING REQUEST SIGNAL FROM OTHER ROOMS FOR DEMANDING AV OUTPUT ?
YES
NO
S12
TRANSMIT OUTPUT OF SPECIFIED AV APPLIANCE OVER CATV CABLE
S13
MOUSE OPERATED ?
NO
YES
S14
DISPLAY · MENU OF AV APPLIANCES FOR CERTAIN DURATION
S15
DEMAND OF RECEIVING OUTPUT OF AV APPLIANCE OF OTHER ROOMS?
YES
NO
S16
SEND REQUEST SIGNAL TO TERMINAL UNIT OF OTHER ROOMS
S17
RECEIVE OUTPUT OF AV APPLIANCE OF OTHER ROOMS
S18
DEMAND OF RECEIVING OUTPUT OF AV APPLIANCE OF SELF ROOM ?
YES
NO
S19
OPERATE SPECIFIED AV APPLIANCE OF SELF ROOM

1. An audio visual control system. comprising:

an audio visual network:

a plurality of audio visual appliances coupled with said audio visual network;

a computer network:

a plurality of controllers coupled with said computer network. each of said controllers associated with at least one of said plurality of audio visual appliances. each of said controllers comprising:

- means for transmitting a control request through said computer network. said control request requesting audio visual information from one of said plurality of audio visual appliances associated with another of said plurality of controllers;
- means for receiving a control request that is transmitted through said computer network and:
- means for controlling said associated audio visual appliance in accordance with said control request:

each of said audio visual appliances comprising:

- means for controlling said audio visual appliance in accordance with a control request received by said associated controller so that said audio visual appliance transmits an audio visual signal to said audio visual network: and
- means for receiving an audio visual signal from said audio visual network in response to a control request transmitted by said associated controller.

5,839,112

METHOD AND APPARATUS FOR DISPLAYING AND SELECTING VEHICLE PARTS

James Schreitmueller, San Ramon; Gerhard Blendstrup, Lafaette, and Nasser Shariatpanahy, Danville, all of Calif., assignors to Automatic Data Processing, San Ramon. Calif.

Filed Dec. 28, 1994, Ser. No. 365.520

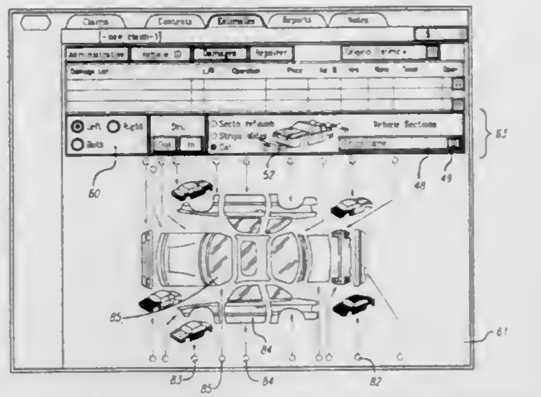
Int. Cl.^{6} G06T *1/00*

U.S. Cl. 705—4 **20 Claims**

1. In a computer system. a method for estimating damage to a vehicle comprising the steps of:

displaying a plurality of identifiers representing vehicle parts:

selecting an identifier, said identifier representing a layer of said vehicle parts, said layer comprising an entire exterior sheet of said vehicle: and



estimating damage to said vehicle using said layer of vehicle parts.

5,839,113

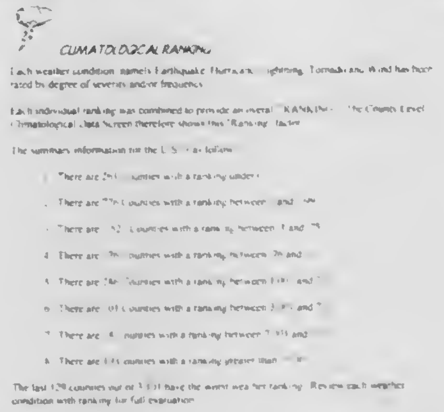
METHOD AND APPARATUS FOR RATING GEOGRAPHICAL AREAS USING METEOROLOGICAL CONDITIONS

Douglas L. Federau, East Lansing; William L. Fringer, and Frederick High, both of Kemos, all of Mich., assignors to Okemos Agency, Inc., Okemos, Mich.

Filed Oct. 30, 1996, Ser. No. 740,505

Int. Cl.^{6} G06F *19/00*

U.S. Cl. 705—4 **45 Claims**



1. A method for ranking geographical areas based on a plurality of meteorological conditions. which comprises:

(a) providing a meteorological chart of the geographical areas for each of the meteorological conditions to be ranked. each chart showing a severity and/or frequency of the meteorological condition in each of the geographical areas:

(b) selecting ranges of the severities and/or frequencies of the meteorological condition for all of the geographical areas:

(c) calculating rating factors for each of the ranges of severities and/or frequencies of the meteorological condition:

(d) determining the individual rating factor for each of the geographical areas for each of the meteorological conditions:

(e) calculating a cumulative rating factor for each of the geographical areas using the individual rating factors for each of the meteorological conditions for the geographical area: and

(f) ranking the geographical areas based on the cumulative rating factors of each of the geographical areas.

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5,839,114

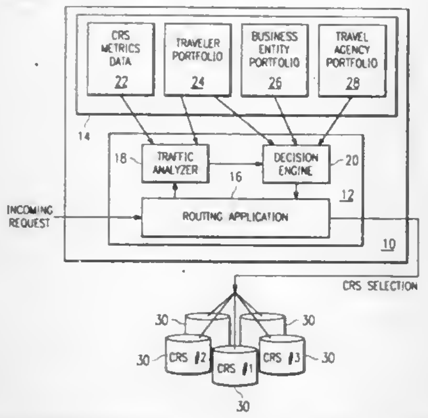
AUTOMATED SYSTEM FOR SELECTING AN INITIAL COMPUTER RESERVATION SYSTEM

Michael F. Lynch, Dallas, and Jonathan A. Turner, Plano, both of Tex., assignors to Electronic Data Systems Corporation, Plano, Tex.

Filed Feb. 29, 1996, Ser. No. 609,040

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 705—5 **21 Claims**



1. An automated system for selecting an initial computer reservation system, comprising:

a database operable to store traveler portfolio information, travel agency portfolio information, and computer reservation system metrics data; and

a processing network connected to said database and operable to:

receive travel request information;

access said database to retrieve traveler portfolio information and computer reservation system metrics data in response to said received travel request information; and

determine a target computer reservation system.

5,839,115

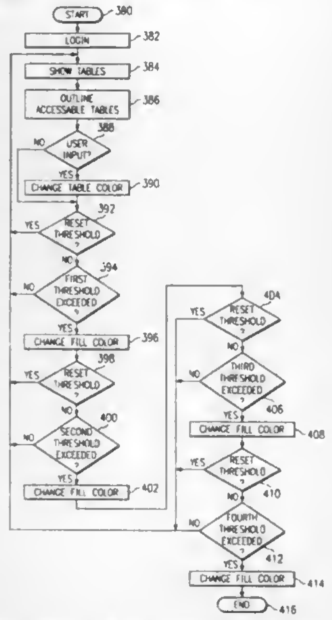
RESTAURANT MANAGEMENT SYSTEM

James Hamilton Coleman, Dallas, Tex., assignor to Altoc Corporation, Dallas, Tex.

Continuation of Ser. No. 351,023, Dec. 7, 1994, Pat. No. 5,602,730. This application Feb. 11, 1997, Ser. No. 798,959

Int. Cl.^{6} G06F *153/00*

U.S. Cl. 705—15 **9 Claims**



1. A restaurant management system, comprising:

an order system for receiving an order from a customer and generated thereby to define desired ones of restaurant items for supply to the customer, each of said restaurant items having a unique preparation time associated therewith and each of said orders defining a predetermined number of desired ones of said restaurant items for delivery to the ordering one of the customers;

a supply system for supplying said desired restaurant items to the one of the customers generating said order;

said order system operable to generate said orders, each with delivery time information associated with each of said associated desired restaurant items to define the relative time of delivery of each of said desired restaurant items relative to a given order to the ordering one of the customers;

a supply control system for controlling the time that said supply system initiates preparation of said desired items and the subsequent supply of the prepared items to each of the customers associated with a given one of said orders and in accordance with both said delivery time information associated with each of said given one of said orders and said preparation time for the associated restaurant items, wherein said supply control system determines the supply time; and

a monitoring system for monitoring said order system and said supply system to ensure that said order system and said supply system are operating correctly and said supply system is supplying the desired items in accordance with orders received by said order system and the time information associated therewith, and for providing an alarm which indicates when said order system and said supply system are not operating correctly.

5,839,116

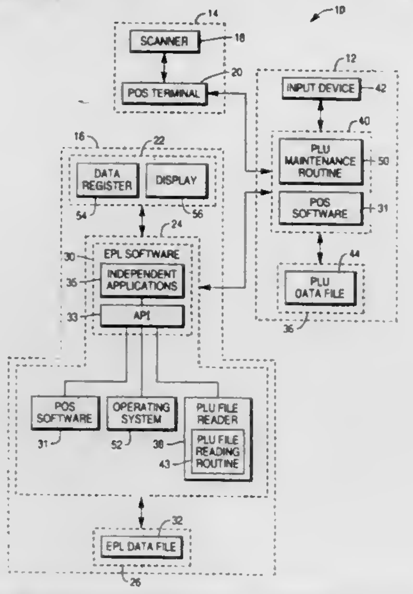
SYSTEM AND METHOD OF OBTAINING INFORMATION FROM A PRICE LOOK-UP FILE

John C. Goodwin, III, Suwanee, Ga., assignor to NCR Corporation, Dayton, Ohio

Filed Oct. 5, 1995, Ser. No. 539,449

Int. Cl.^{6} G06F *151/00*

U.S. Cl. 705—20 **10 Claims**



1. A host electronic price label (EPL) terminal for use in an EPL system, comprising:

control software;

EPL software, the control software and the EPL software each having hooks into an application programming interface (API); and

a price look-up (PLU) file reader attached into the API via interprocess communications for directly accessing information from a PLU file stored on a host computer, such that the modification of one of the programs which attach into the API does not require modification of other programs which attach into the API.

5,839,117

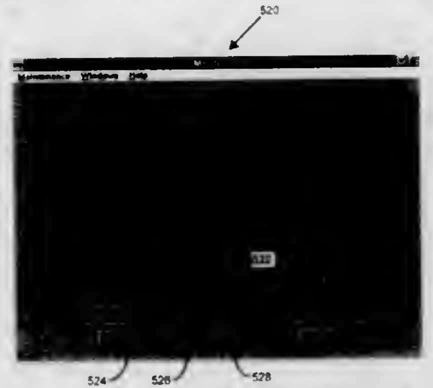
COMPUTERIZED EVENT-DRIVEN ROUTING SYSTEM AND METHOD FOR USE IN AN ORDER ENTRY SYSTEM

Paul Scott Cameron, Minneapolis; John Charles Nash, Shoreview; Robert Christopher Bloomer, Little Canada; Robert Edward Wollan, Minneapolis; Kelly Marie Kreutter, Minnetonka; Melinda Ann Ahler Olmstead, Shoreview; Dale Harry Renner, Edina; Ryan Douglas Bourne, Eden Prairie; Keith Michael Carnish, Minneapolis, and Dean Richard Jones, St. Louis Park, all of Minn., assignors to Andersen Consulting LLP, Chicago, Ill.

Division of Ser. No. 293,470, Aug. 19, 1994, Pat. No. 5,592,378. This application Jan. 6, 1997, Ser. No. 779,231

Int. Cl.^{6} G06F *17/60*

U.S. Cl. 705—27 **34 Claims**



1. A computerized system for the placement of an order by a user via a terminal having a display, comprising:

data capture means for capturing order information;

storage means for storing the order information captured through the data capture means; and

user interface means for providing the user with access to a plurality of order entry functions, the user interface means including means for defining a plurality of user-initiated events and a plurality of application points corresponding to the user-initiated events;

action assignment means for assigning at least one action to at least one of the application points; and

marketing means for dynamic invocation of the action upon user initiation of the event corresponding to the application point assigned to that event, so that the user is provided with the action at a point during the placement of the order at which the action is needed.

5,839,118

SYSTEM AND METHOD FOR PREMIUM OPTIMIZATION AND LOAN MONITORING

Raymond B. Ryan, Darien; Wendy J. Engel, Norwalk, and Samuel Melamed, Stamford, all of Conn., assignors to The Evergreen Group, Incorporated, Stamford, Conn.

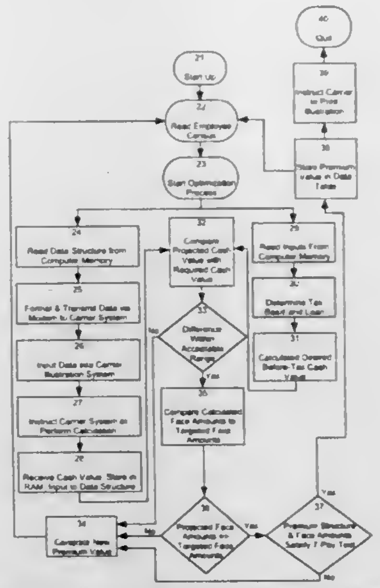
Filed Jan. 16, 1996, Ser. No. 587,051

Int. Cl.^{6} G06F *17/60*

U.S. Cl. 705—36 **15 Claims**

1. A computer-implemented method for determining, at a remote location, an optimum premium structure necessary to achieve financial security at retirement while providing a sufficient level of life insurance protection during employment with respect to a targeted after-tax cash value, the method comprising the steps of:

(a) electronically transmitting the premium structure and census data in a predetermined format to an insurance carrier's computer system;



(b) causing the insurance carrier's computer system to calculate projected before-tax cash values based upon the premium structure and census data;

(c) electronically receiving the projected before-tax cash values from the insurance carrier's computer system;

(d) simultaneously with steps (b) and (c) above,

(i) determining a required loan amount and projected tax liability based upon the premium structure, the required loan amount representing a loan for part of the premium payment,

(ii) calculating a desired before-tax cash value, based upon the projected tax liability, necessary to produce the targeted after-tax cash value;

(e) comparing a projected before-tax cash value with the desired before-tax cash value to determine if the difference between the projected before-tax cash value and the desired before-tax cash value is within a predetermined range;

(f) if the difference between the projected before-tax cash value and the desired before-tax cash value is not within the predetermined range, generating a new premium structure and then repeating steps (b) through (e) using the new premium structure;

(g) if the difference between the projected before-tax cash value and the desired before-tax cash value is within the predetermined range, reporting the premium structure as the optimal premium.

5,839,119

METHOD OF ELECTRONIC PAYMENTS THAT PREVENTS DOUBLE-SPENDING

Ivan V. Krsul, W. Lafayette, Ind.; J. Craig Mudge, Palo Alto, and Alan J. Demers, Boulder Creek, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 27, 1996, Ser. No. 721,484

Int. Cl.^{6} G06F *17/60;* **H04R** *9/00*

U.S. Cl. 705—39 **24 Claims**

9. A method of supporting electronic payments between a buyer and a seller off-line of a financial services provider that prevents double-spending, the method comprising the steps of:

a) generating a first number of electronic monetary tokens in response to a request from the buyer for use with the seller, the first number being greater than two, each electronic token having a second number of bits representing a monetary value of the electronic monetary token;

c) splitting each of the first number of electronic monetary tokens into two electronic token halves by:

c1) for each electronic token creating a first token half by generating a random string having a third number of bits equal to the second number of bits;

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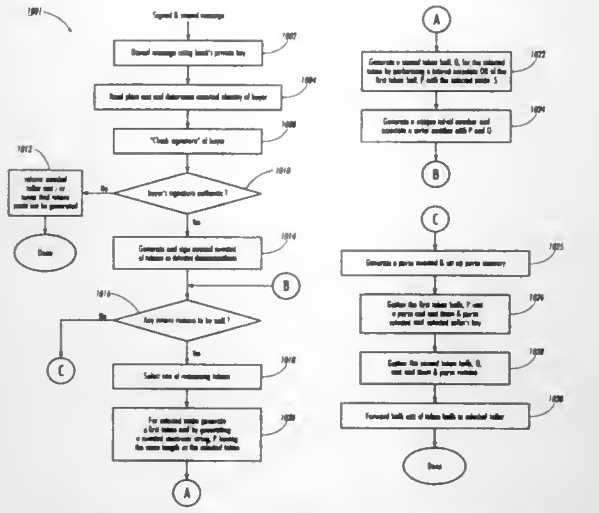


c2) for each electronic monetary token creating a second token half by performing a bitwise XOR using the electronic monetary token and the first token half;

c3) for electronic monetary token associating with each token half a serial number, each electronic token half having no monetary value alone and combining with another electronic token half having a same serial number to recreate an electronic monetary token;

d) electronically transmitting to the seller a first subset of the electronic token halves, none of the first subset of electronic token halves having a same serial number; and

e) electronically transmitting to the buyer a second subset of the electronic token halves, none of the second subset of electronic token halves having a same serial number.

5,839,120
GENETIC ALGORITHM CONTROL ARRANGEMENT FOR MASSIVELY PARALLEL COMPUTER

Kurt Thearling, 13172 Commonwealth, Southgate, Mich. 48195

Continuation of Ser. No. 159,336, Nov. 30, 1993, abandoned. This application May 14, 1997, Ser. No. 856,401

Int. Cl.^{6} G06F *15/18*

U.S. Cl. 706—13 **53 Claims**

1. A genetic algorithm system comprising:

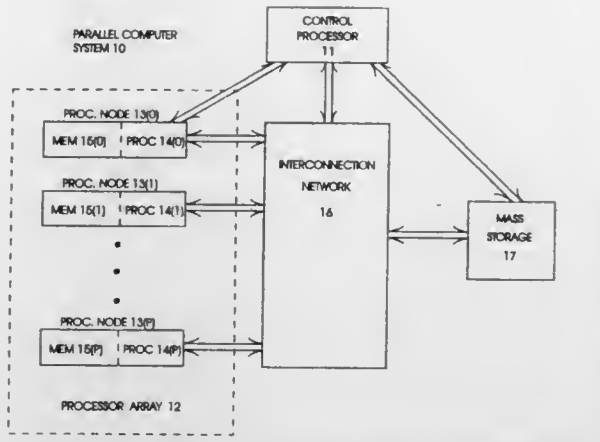
A. a processor array comprising a plurality of processing nodes interconnected by an interconnection network for transferring messages among the processing nodes;

B. a control subsystem comprising:

i. a genome generation portion for enabling the processing nodes to a plurality of genomes distributed among the processing nodes;

ii. an evaluation score generation control portion for enabling said processing nodes to perform an evaluation operation in connection with each genome to generate an evaluation score associated with each genome, said evaluation score generation control portion including:

(a) an evaluation score array generation control portion for enabling said processing nodes to establish an evaluation score array having a plurality of evaluation score entries each associated with a genome,



(b) an evaluation score control portion for enabling the processing nodes to, in parallel, perform evaluation operations in connection with each of their respective genomes to generate an evaluation score and for storing the evaluation score in the evaluation score array entry associated therewith;

iii. a threshold score generation control portion for enabling said processing nodes to generate a threshold value in response to the evaluation scores for the respective genomes, said threshold score generation control portion comprising:

(a) a sort control portion for enabling the processing nodes to generate a sorted evaluation score array comprising a plurality of sorted evaluation score entries in which the evaluation scores from the evaluation score array are in stored order;

(b) a threshold identifier for enabling the processing nodes to identify a sorted evaluation score entry in response to a reaper percentage value, the evaluation score in the identified sorted evaluation score entry comprising the threshold value;

iv. a surviving genome control portion for enabling said processing nodes to identify from the genomes, surviving genomes in response to each genome's evaluation score and the threshold value;

v. a surviving genome propagation control portion for enabling said processing nodes to, in messages transmitted over the interconnection network, duplicate the surviving genomes as a function of their respective evaluation scores and, in messages transmitted over the interconnection network;

vi. a genome mating control portion for enabling said processing nodes to perform a random mating operation in connection with surviving genomes and the original genomes to generate a plurality of mated genomes for use along with the surviving genomes as genomes in a subsequent iteration; and

vii. an iteration control portion for enabling said genome array establishment portion, said evaluation score generation control portion, said threshold score generation control portion, said surviving genome propagation control portion and said genome mating control portion, to control said processing nodes in a series of iterations, the mated genomes and surviving genomes generated during each iteration being used as genomes for the subsequent iteration.

PATENTS

GRANTED November 17, 1998

ERRATA

Designs

For CLASS	See PATENT NO.
D21—303	D401,308
D24—144	D401,350

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DESIGNS

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401,035

JACKET HAVING A DECORATION ACCESSORY

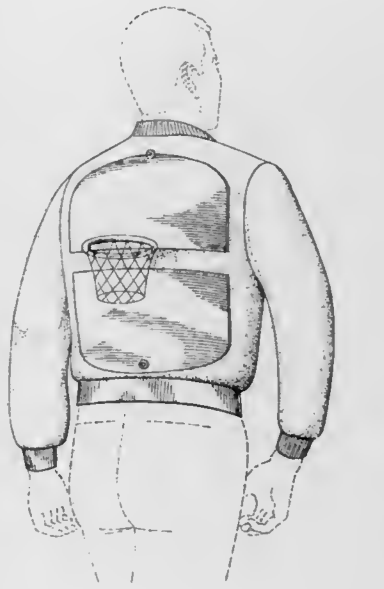
Dwight F. Robinson, 1817 S. Sixth St., Camden, N.J. 08104

Continuation-in-part of Ser. No. 735, Oct. 23, 1992, Pat. No. Des. 352,384. This application Nov. 14, 1994, Ser. No. 31,226

Term of patent 14 years

LOC (6) Cl. 02 - *02*

U.S. Cl. D2—830



401,036

ALLIGATOR SHAPED HEAD BAND

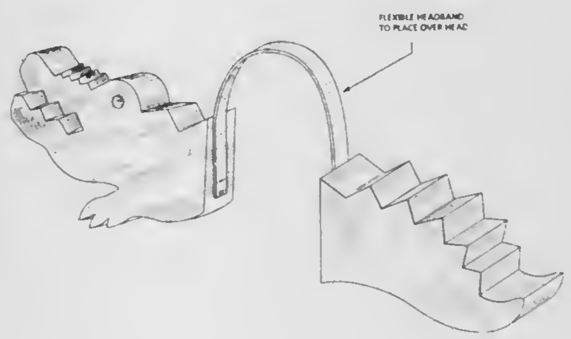
Glenn M Clegg, 2300 Reagan St. #214, Dallas, Tex. 75219

Filed Aug. 12, 1997, Ser. No. 77,911

Term of patent 14 years

LOC (6) Cl. 02 - *03*

U.S. Cl. D2—869



401,037

IN-LINE ROLLER SKATE UPPER SHOE

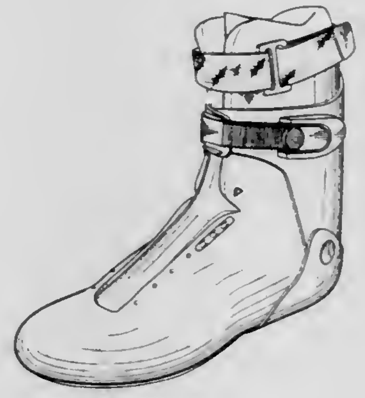
Antonin A. Meibock, Cleveland, Ohio, and John E. Svensson, Seattle, Wash., assignors to K-2 Corporation, Vashon, Wash.

Division of Ser. No. 17,766, Jan. 21, 1994, abandoned, and a continuation-in-part of Ser. No. 94,576, Jul. 19, 1993, Pat. No. 5,437,466, Ser. No. 100,745, Aug. 2, 1993, abandoned, and Ser. No. 120,629, Sep. 13, 1993, Pat. No. 5,452,907. This application Oct. 22, 1996, Ser. No. 61,360

Term of patent 14 years

LOC (6) Cl. 02 - *04*

U.S. Cl. D2—904



401,038

SIDE ELEMENT OF A SHOE MIDSOLE

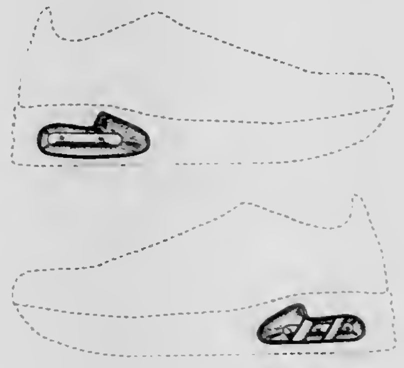
Thomas J. Gray, 1640 Glenview Ave., Portland, Oreg. 97225

Filed Oct. 20, 1997, Ser. No. 78,594

Term of patent 14 years

LOC (6) Cl. 02 - *99*

U.S. Cl. D2—947



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401,039

MIDSOLE OF A SHOE

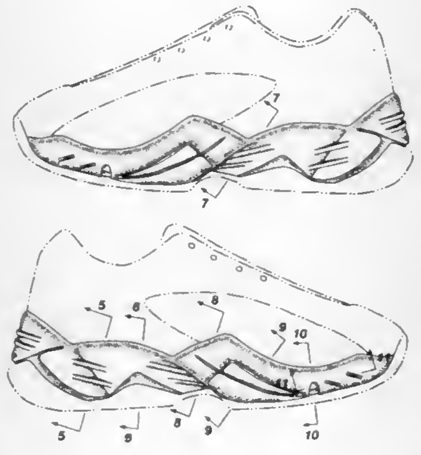
Bo Lupo, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.

Filed May 1, 1998, Ser. No. 87,534

Term of patent 14 years

LOC (6) Cl. 02 - *99*

U.S. Cl. D2—947



401,040

SURFACE ORNAMENTATION FOR A SHOE SOLE

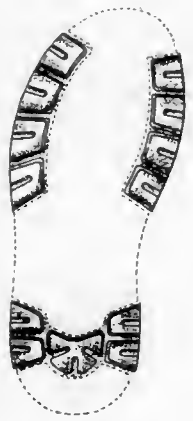
Jules Schneider, Colts Neck, N.J., assignor to Aerogroup International, Inc., Edison, N.J.

Filed Nov. 19, 1996, Ser. No. 62,569

Term of patent 14 years

LOC (6) Cl. 02 - *04*

U.S. Cl. D2—951



401,041

SURFACE ORNAMENTATION FOR A SHOE SOLE

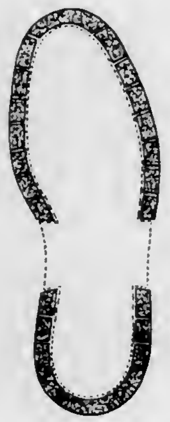
Jules Schneider, Colts Neck, N.J., assignor to Aerogroup International, Inc., Edison, N.J.

Filed Nov. 19, 1996, Ser. No. 62,571

Term of patent 14 years

LOC (6) Cl. 02 - *04*

U.S. Cl. D2—951



401,042

SHOE SOLE

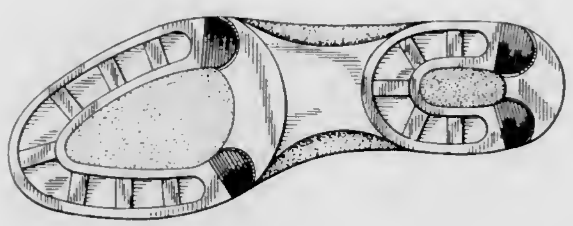
Howard Davis, 45 W. 132nd St.—Suite 3N, New York, N.Y. 10003

Filed Jan. 8, 1997, Ser. No. 64,668

Term of patent 14 years

LOC (6) Cl. 02 - *04*

U.S. Cl. D2—951



401,043

SHOE SOLE

Ejnar Truelsen, Tonder, Denmark, assignor to A/S Eccolet Sko, Bredebro, Denmark

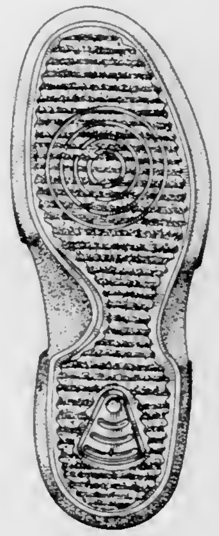
Filed Jan. 14, 1998, Ser. No. 82,074

Claims priority, application Denmark, Jul. 14, 1997, 07091997

Term of patent 14 years

LOC (6) Cl. 02 - *04*

U.S. Cl. D2—955



401,044

SOLE FOR A GOLF SHOE

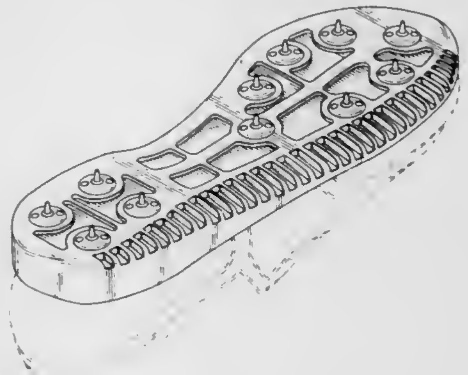
Alan J. Heine, 4069 Ridge St., Fair Oaks, Calif. 95628

Filed Aug. 19, 1996, Ser. No. 58,586

Term of patent 14 years

LOC (6) Cl. 02 - *04*

U.S. Cl. D2—954



401,045

SHOE BOTTOM

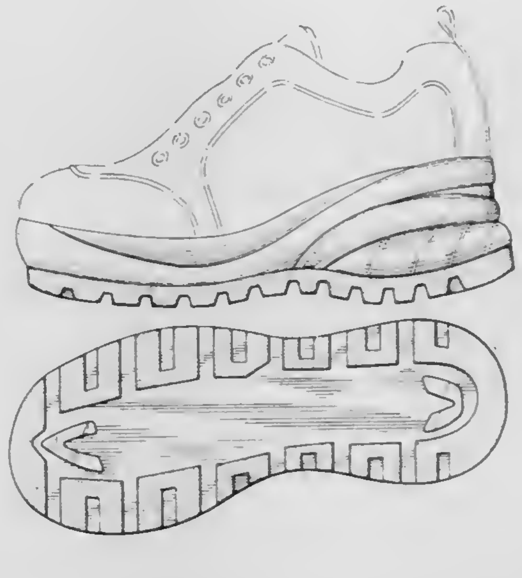
Robert Y. Greenberg, Manhattan Beach, Calif., assignor to Skechers U.S.A., Inc., Manhattan Beach, Calif.

Filed Mar. 24, 1998, Ser. No. 85,452

Term of patent 14 years

LOC (6) Cl. 02 - *04*

U.S. Cl. D2—960



401,046

GOLF CLEAT

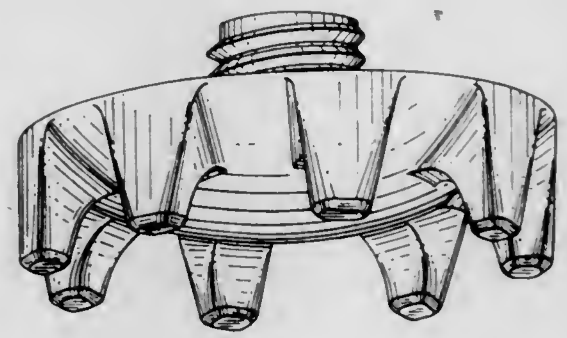
Faris W. McMullin, Boise, Id., assignor to Softspikes, Inc., Rockville, Md.

Filed Feb. 6, 1997, Ser. No. 66,421

Term of patent 14 years

LOC (6) Cl. 02 - *04*

U.S. Cl. D2—962



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401,047

SHOE UPPER

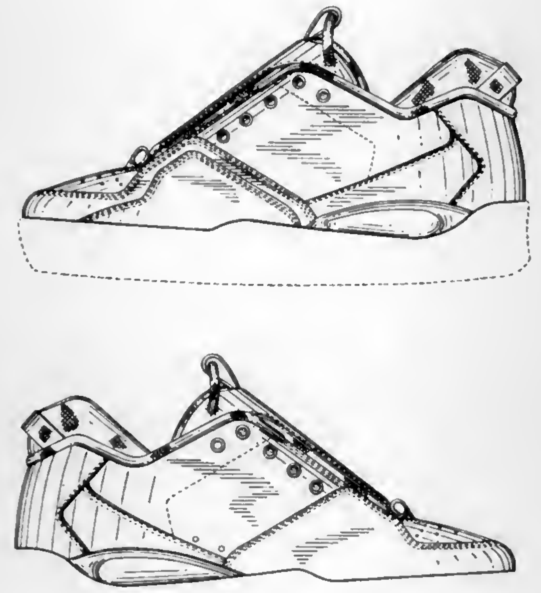
Ralph Serna, Long Beach, Calif., assignor to Vans, Inc., Santa Fe Springs, Calif.

Filed May 15, 1997, Ser. No. 70,757

Term of patent 14 years

LOC (6) Cl. 02 - *04*

U.S. Cl. D2—969



401,048

SHOE UPPER

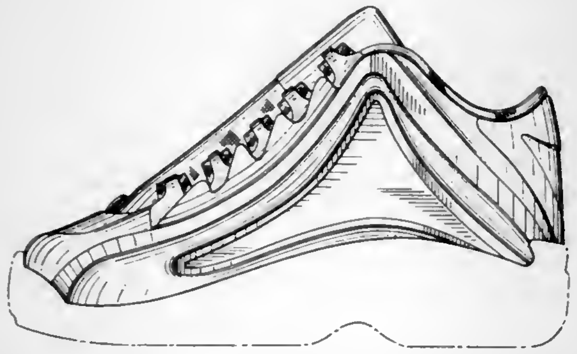
Gabriel P. Prats, Lake Forest, Calif., assignor to FILA Sport S.P.A., Biella, Italy

Filed Jun. 27, 1997, Ser. No. 73,027

Term of patent 14 years

LOC (6) Cl. 02 - *04*

U.S. Cl. D2—969



401,049

SHOE UPPER

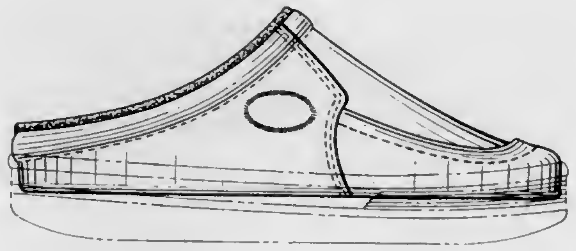
Robert Y. Greenberg, Manhattan Beach, Calif., assignor to Skechers U.S.A., Inc., Manhattan Beach, Calif.

Filed Jul. 16, 1997, Ser. No. 73,696

Term of patent 14 years

LOC (6) Cl. 02 - *04*

U.S. Cl. D2—969



401,050

SHOE UPPER

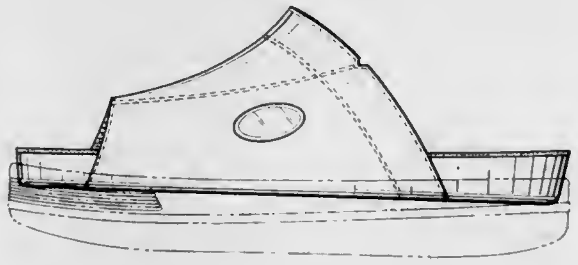
Robert Y. Greenberg, Manhattan Beach, Calif., assignor to Skechers U.S.A., Inc., Manhattan Beach, Calif.

Filed Aug. 29, 1997, Ser. No. 75,924

Term of patent 14 years

LOC (6) Cl. 02 - *04*

U.S. Cl. D2—969



401,051

SHOE UPPER

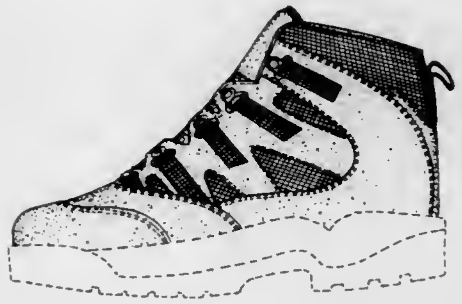
Stephen C. Hamel, Upland, Calif., assignor to Hawe Yue, Inc., Covina, Calif.

Filed Mar. 3, 1998, Ser. No. 84,422

Term of patent 14 years

LOC (6) Cl. 02 - *04*

U.S. Cl. D2—970



401,052

SIDE ELEMENT OF A SHOE UPPER

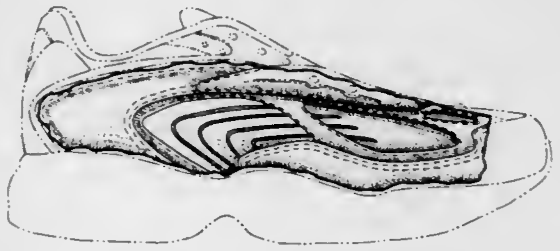
Sergio G. Lozano, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.

Filed May 11, 1998, Ser. No. 87,922

Term of patent 14 years

LOC (6) Cl. 02 - *99*

U.S. Cl. D2—972



401,053

ATHLETIC SOCK

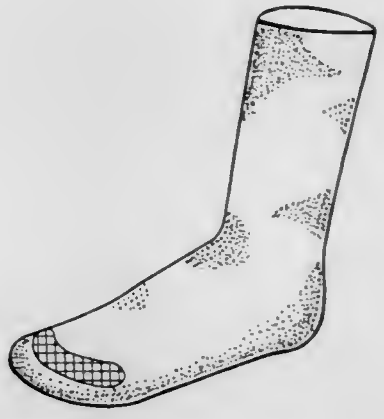
Joseph J. Vodhanel, Jr., 10937 S. Groveland Ave., Whittier, Calif. 90603

Filed May 14, 1997, Ser. No. 70,725

Term of patent 14 years

LOC (6) Cl. 02 - *04*

U.S. Cl. D2—991



401,054

MAGNETIC KEY CASE

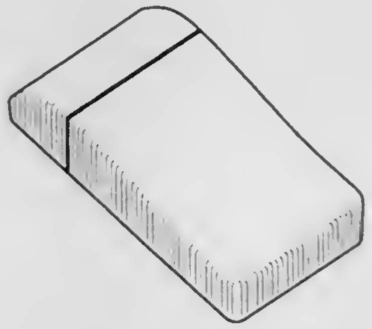
Jerome J. Hartmann, Carlisle, and Thomas R. Steinhagen, West Des Moines, both of Iowa, assignors to Cobbs Manufacturing Company, Des Moines, Iowa

Filed Nov. 3, 1997, Ser. No. 78,883

Term of patent 14 years

LOC (6) Cl. 03 - *01*

U.S. Cl. D3—212



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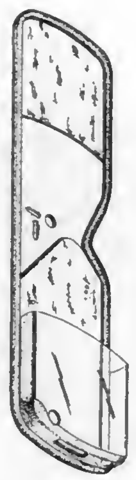
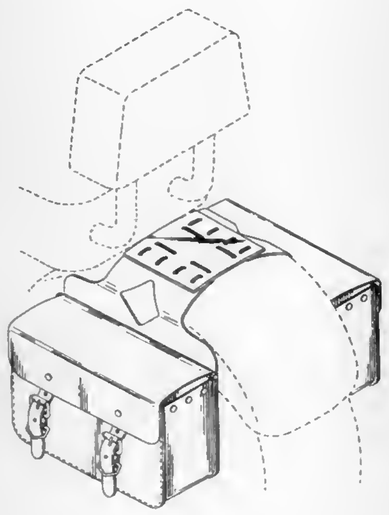
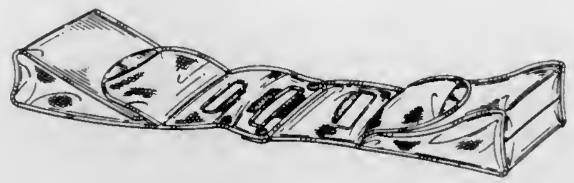
401,055
CARRYING CASE FOR A CELLULAR TELEPHONE
Ali R. Jayez, 7950 Deering Ave., Unit B, Canoga Park, Calif. 91304
Filed Sep. 9, 1997, Ser. No. 76,374
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—218



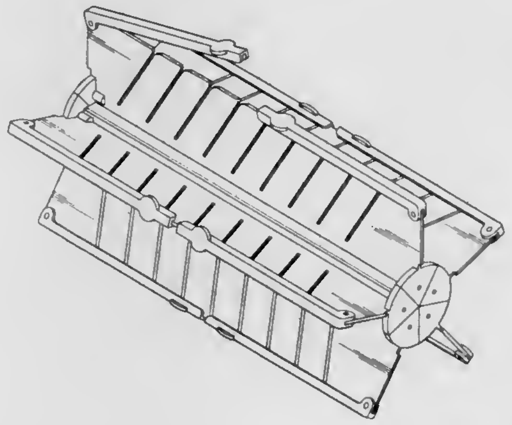
401,056
PANNIERS
Akira Akutsu, Itabashi 1-36-4, Itabashi-ku Tokyo 173, Japan
Filed Mar. 24, 1997, Ser. No. 68,574
Claims priority, application Japan, Nov. 26, 1996, 8-35632
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—231



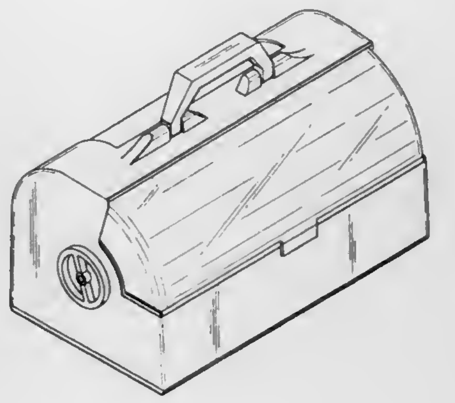
401,057
FOLDABLE SOFT-SIDED CONTAINER
Kevin Rausch, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed May 27, 1997, Ser. No. 71,475
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—231



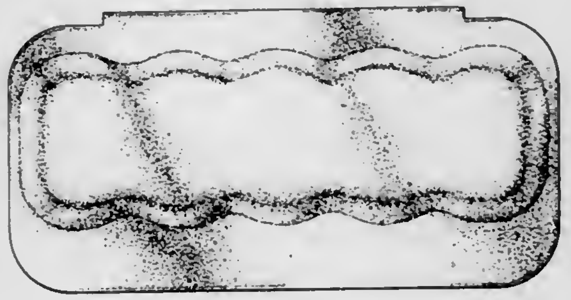
401,058
ROTATABLE HOLDER FOR FISHING LURES
Edwin L. Blackburn, 814 Blackburn St., Grand Prairie, Tex. 75050
Filed Apr. 21, 1997, Ser. No. 69,995
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—260



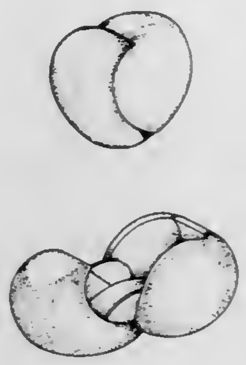
401,059
TACKLE BOX FOR FISHING LURES
Edwin L. Blackburn, 814 Blackburn St., Grand Prairie, Tex. 75050
Filed Apr. 21, 1997, Ser. No. 69,998
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—260



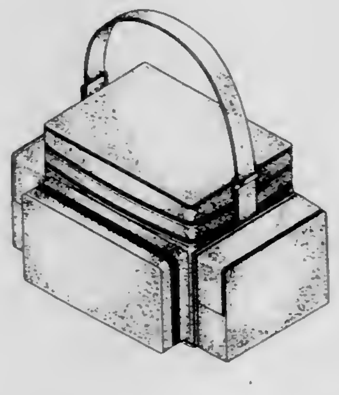
401,060
CASE FOR PLURALITY OF CONTACT LENS
David George Delle Donne, 955 Chaucer Gate Ct., Lawrenceville, Ga. 30243; Jeffrey Gates, 107 Hibernia Ave., Decatur, Ga. 30030, and Peter Jepson, 3408 Immam Dr., Atlanta, Ga. 30319
Filed Dec. 5, 1996, Ser. No. 63,315
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—265



401,061
JEWELRY BOX
Ka Fai Kinsen Au, Block A, 9/F, Goodview Inc. Building, 11 Kin Fat Street, Tuen Mun, N.T., Hong Kong
Filed Jun. 9, 1997, Ser. No. 71,948
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—271



401,062
PISTOL CASE
Alan D. Hauschild, 28908 W. Fox Trail, Lake Villa, Ill. 60046
Filed Nov. 20, 1995, Ser. No. 46,913
Term of patent 14 years
LOC (6) Cl. 03 - *01*
U.S. Cl. D3—287



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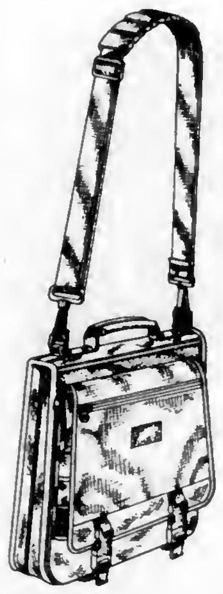
401,063
ZIPPERED CARRYING CASE

Norman Curtis Yamamoto, Yorba Linda, and Bruce A. Carter, Lake Forest, both of Calif., assignors to Avery Dennison Corporation, Pasadena, Calif.

Filed Feb. 21, 1997, Ser. No. 66,778
Term of patent 14 years
LOC (6) Cl. 03 - *01*

U.S. Cl. D3—287

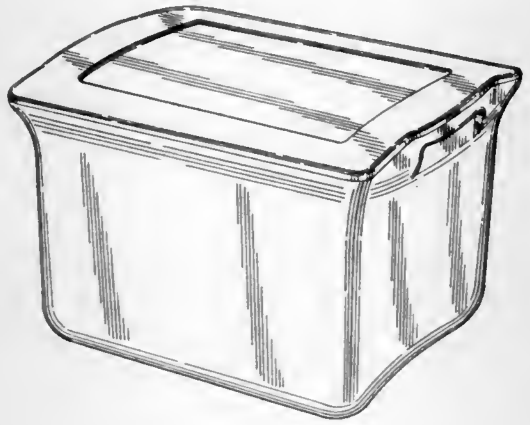


401,064
TOTE BOX

Albert B. Cheris, 25 Oakmont Dr., Highland Park, Ill. 60035, and Mark Dziersk, 222 E. Pearson, Apt. 2402, Chicago, Ill. 60611

Filed Aug. 29, 1997, Ser. No. 75,923
Term of patent 14 years
LOC (6) Cl. 03 - *01*

U.S. Cl. D3—302

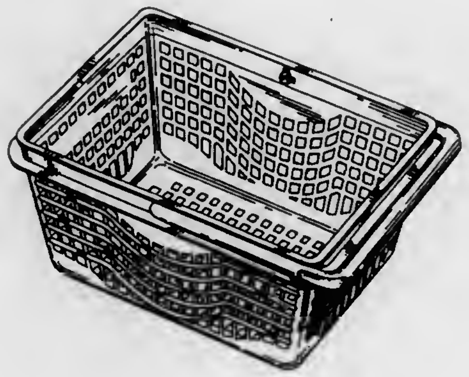


401,065
BASKET

Markku Peltola, Tampere, Finland, assignor to MK-Tresmer OY, Helsinki, Finland

Filed Jan. 3, 1997, Ser. No. 64,562
Claims priority, application Finland, Jul. 3, 1996, 441/96
Term of patent 14 years
LOC (6) Cl. 03 - *01*

U.S. Cl. D3—304

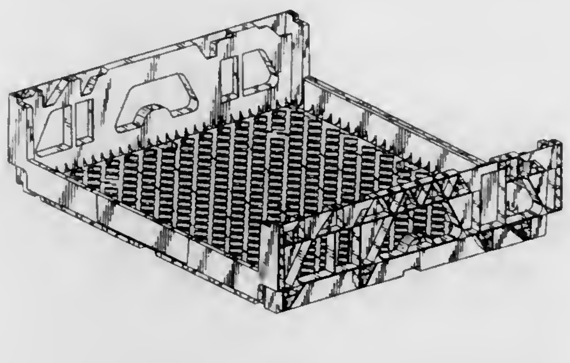


401,066
BREAD TRAY

Jeffrey R. Ackermann, Manhattan Beach, Calif., assignor to Rehrig Pacific Company, Inc., Los Angeles, Calif.

Filed Sep. 10, 1996, Ser. No. 59,414
Term of patent 14 years
LOC (6) Cl. 03 - *01*

U.S. Cl. D3—307

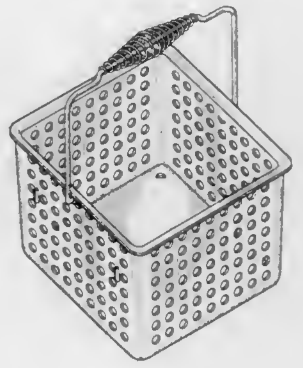


401,067
TOTE

James Hampshire, Solon, Ohio, assignor to InterDesign, Inc., Solon, Ohio

Filed Jun. 30, 1997, Ser. No. 73,052
Term of patent 14 years
LOC (6) Cl. 03 - *01*

U.S. Cl. D3—309

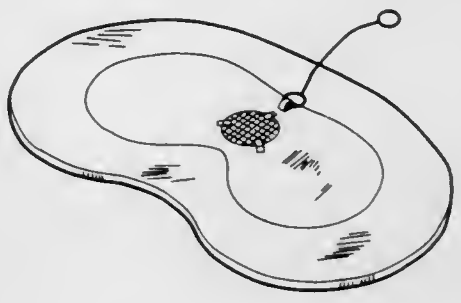


401,068
CANTEEN CUP LID

Ronald D. Kolenda, 604 Simms Landing Rd., Crownsville, Md. 21032, assignor to Ronald D. Kolenda, Albuquerque, N. Mex.

Filed Sep. 4, 1996, Ser. No. 59,156
Term of patent 14 years
LOC (6) Cl. 03 - *99*

U.S. Cl. D3—318

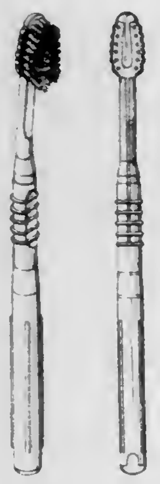


401,069
TOOTHBRUSH

Donald Richard Lamond; John Moldauer, both of New York, N.Y.; Stephen John Raven, Milan, Italy, and Derek Guy Savill, Ashton, United Kingdom, assignors to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.

Filed Aug. 22, 1997, Ser. No. 76,067
Term of patent 14 years
LOC (6) Cl. 04 - *02*

U.S. Cl. D4—104

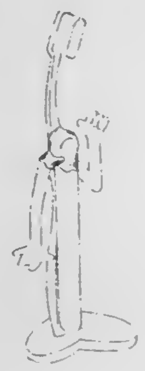


401,070
TOOTHBRUSH WITH STAND

Bertrand Dominique Joseph Barre, Lyon-Limonest, France, assignor to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.

Filed Jun. 7, 1995, Ser. No. 39,897
Term of patent 14 years
LOC (6) Cl. 04 - *02*

U.S. Cl. D4—108



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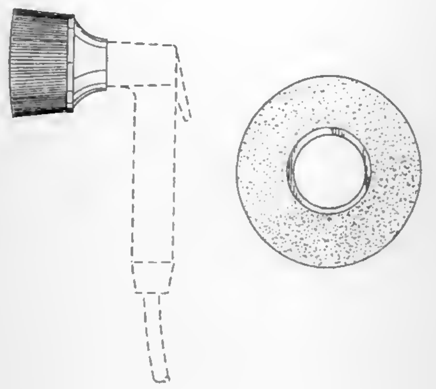
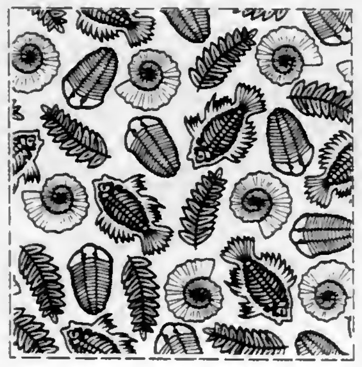
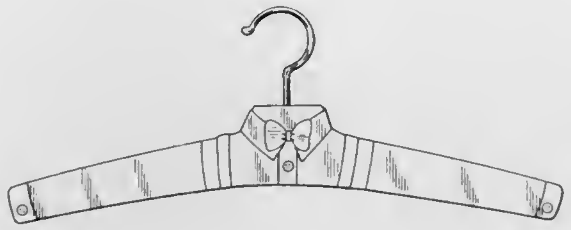
401,071
BRUSH ATTACHMENT FOR A SPRAY NOZZLE
Victor J. Laster, 5901 Brassie Ridge La., Ellenwood, Ga. 30049
Filed Mar. 22, 1996, Ser. No. 52,082
Term of patent 14 years
LOC (6) Cl. 04 - *01*
U.S. Cl. D4—115



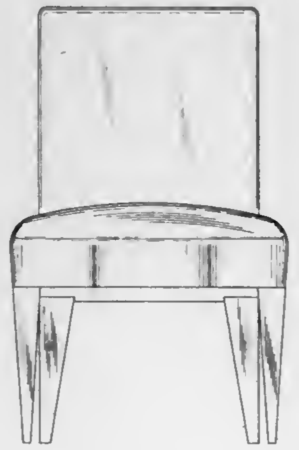
401,072
SURFACE PATTERN FOR LEATHER FABRIC
Marc R. Loverin, Arlington, Mass., assignor to SRL, Inc., Wilmington, Del.
Filed Feb. 10, 1997, Ser. No. 66,263
Term of patent 14 years
LOC (6) Cl. 05 - *06*
U.S. Cl. D5—26



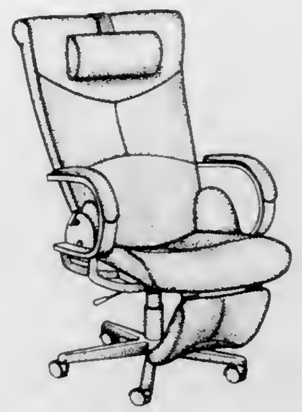
401,073
CLOTHES HANGER
Anthony Chan, Kowloon, Hong Kong, assignor to Asia Splendor, Kowloon, Hong Kong
Filed Mar. 4, 1997, Ser. No. 67,094
Term of patent 14 years
LOC (6) Cl. 06 - *08*
U.S. Cl. D6—316



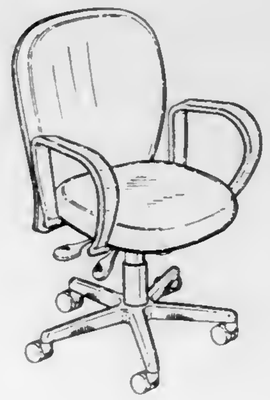
401,074
CHAIR
John Hutton, New York, N.Y., assignor to Donghia Furniture Co., Ltd., New York, N.Y.
Filed Mar. 13, 1997, Ser. No. 67,886
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—334



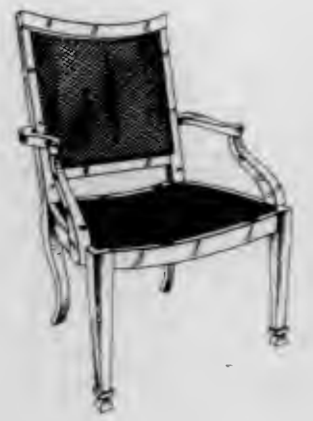
401,075
RECLINING CHAIR
Nathaniel L. Smith, 46 Front St., Holliston, Mass. 01746
Filed Jun. 10, 1996, Ser. No. 55,625
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—366



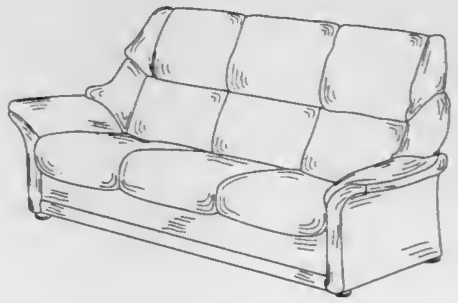
401,076
CHAIR
Jonathan Crinion, Toronto, Canada, assignor to Global Upholstery Company
Filed Nov. 14, 1997, Ser. No. 79,204
Claims priority, application Canada, Nov. 13, 1997, 1997-2917
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—366



401,077
SEAT
Sally Sirkin Lewis, 715 N. Canon Dr., Beverly Hills, Calif. 90210
Filed Sep. 20, 1996, Ser. No. 60,072
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—369



401,078
ARTICLE OF FURNITURE
Harald Relling, Futeveien 9, N-6030 Langevag, Norway
Filed Apr. 21, 1997, Ser. No. 68,973
Claims priority, application Norway, Oct. 21, 1996, 960756
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—381



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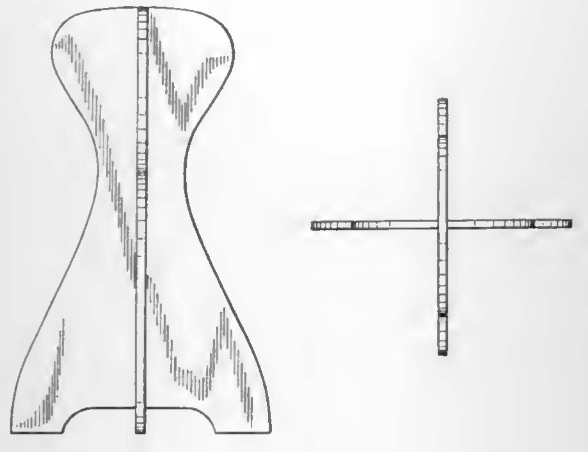
401,079
HAT STAND

Lillian E. Clarke, 970 Park Ave., New York, N.Y. 10028
Filed Nov. 5, 1997, Ser. No. 78,862
Term of patent 14 years
LOC (6) Cl. 06 - *04*

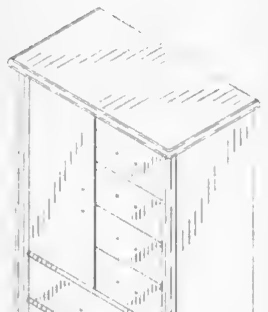
U.S. Cl. D6—415



401,080
ARMOIRE

Paul Zaidman, Winnipeg, Canada, assignor to Palliser Furniture, Ltd., Winnipeg, Canada
Filed May 10, 1996, Ser. No. 54,261
Term of patent 14 years
LOC (6) Cl. 06 - *04*

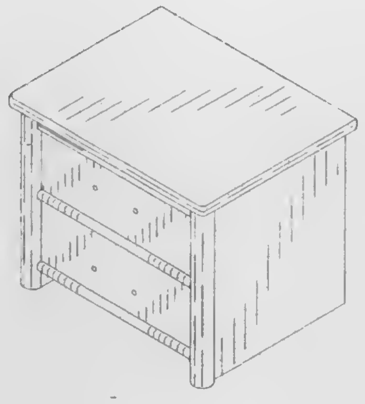
U.S. Cl. D6—445



401,081
NIGHT TABLE

Paul Zaidman, Winnipeg, Canada, assignor to Palliser Furniture, Ltd., Winnipeg, Canada
Filed May 10, 1996, Ser. No. 54,276
Term of patent 14 years
LOC (6) Cl. 06 - *04*

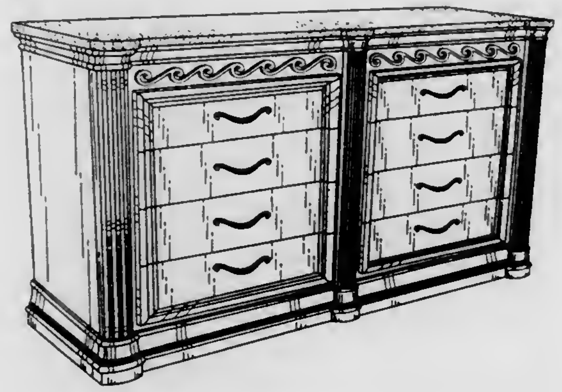
U.S. Cl. D6—446



401,082
CABINET

Timothy M. O'Hare, High Point, N.C., assignor to Bernhardt Furniture Company, Lenoir, N.C.
Division of Ser. No. 58,077, Aug. 7, 1996, Pat. No. Des. 386,628. This application Nov. 24, 1997, Ser. No. 80,533
Term of patent 14 years
LOC (6) Cl. 06 - *04*

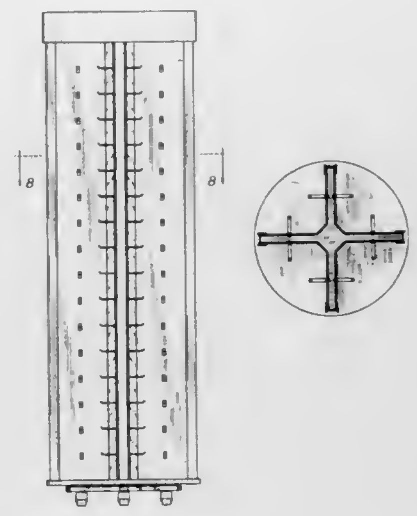
U.S. Cl. D6—446



401,083
EYEGLASS DISPLAY RACK

Richard Woodward, 1455 Penn Rd. NW., Floyd, Va. 24091
Filed Oct. 20, 1997, Ser. No. 78,539
Term of patent 14 years
LOC (6) Cl. 06 - *04*

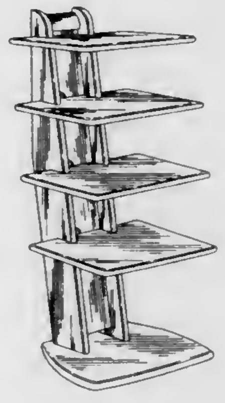
U.S. Cl. D6—461



401,084
STAND FOR ELECTRONIC EQUIPMENT

Richard Martin, Mirabel, Canada, assignor to Belois Ltd, Laval, Canada
Filed Jan. 27, 1998, Ser. No. 82,619
Claims priority, application Canada, Jan. 9, 1998, 1998-0002
Term of patent 14 years
LOC (6) Cl. 06 - *04*

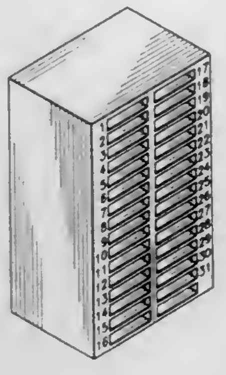
U.S. Cl. D6—474



401,085
FILING CABINET

Tony Grant, 7719 Compass Dr., Orlando, Fla. 32810
Filed Mar. 9, 1998, Ser. No. 84,675
Term of patent 14 years
LOC (6) Cl. 06 - *04*

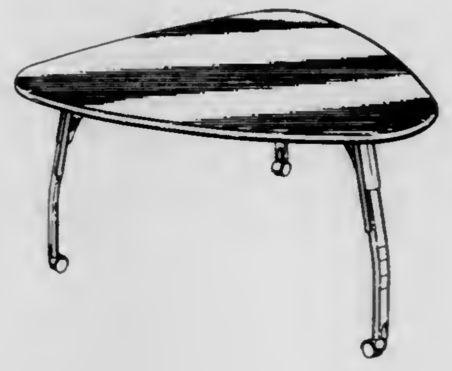
U.S. Cl. D6—478



401,086
CONFERENCE TABLE

John Hellwig, Toronto; Steve Verbeek, Aurora, and Genadij Makarewicz, Brampton, all of Canada, assignors to Teknion Furniture Systems, Downsiew, Canada
Filed Sep. 5, 1997, Ser. No. 76,057
Term of patent 14 years
LOC (6) Cl. 06 - *03*

U.S. Cl. D6—482



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401,087

MEETING TABLE

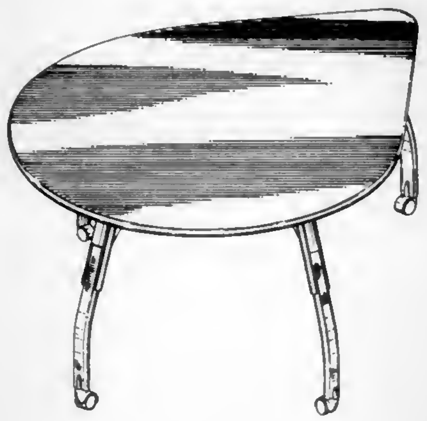
John Hellwig, Toronto; Steve Verbeek, Aurora, and Genadij Makarewicz, Brampton, all of Canada, assignors to Teknion Furniture Systems, Downsview, Canada

Filed Sep. 5, 1997, Ser. No. 76,059

Term of patent 14 years

LOC (6) Cl. 06 - *03*

U.S. Cl. D6—482



401,088

CHAIR BASE

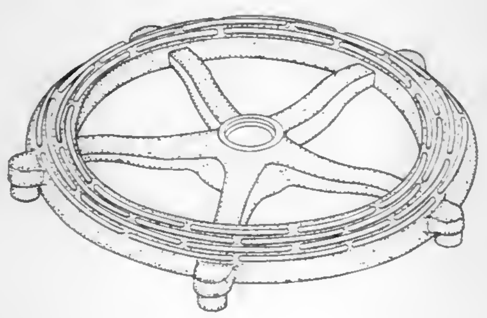
Su-Ming Chen, Kaohsiung Hsien, Taiwan, assignor to King Hong Industrial Co., Ltd., Taiwan

Filed Apr. 16, 1997, Ser. No. 69,437

Term of patent 14 years

LOC (6) Cl. 06 - *06*

U.S. Cl. D6—498



401,089

CHAIR SEAT AND BACK

Emilio Ambasz, Buenos Aires, Argentina, assignor to Center for Design Research and Development N.V., Curacao, Netherlands Antilles

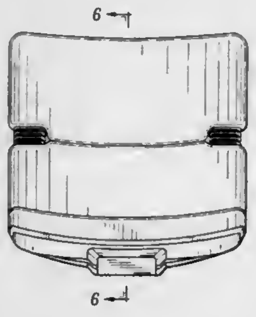
Filed Oct. 3, 1996, Ser. No. 60,664

Claims priority, application Japan, Apr. 24, 1996, 8-12212

Term of patent 14 years

LOC (6) Cl. 06 - *06*

U.S. Cl. D6—500



401,090

HEADBOARD FOR A SEAT FOR A GLIDER OR SWING

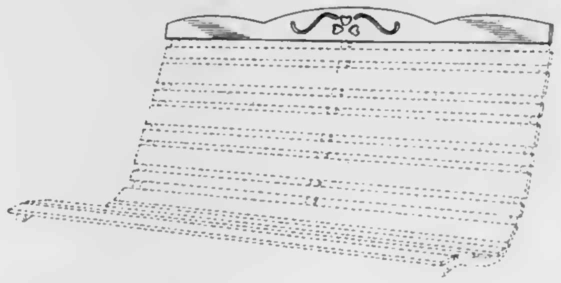
Charles Pomeroy, and John T. Bycraft, both of South Bend, Ind., assignors to Jack-Post Corporation, Buchanan, Mich.

Filed Jul. 16, 1997, Ser. No. 73,747

Term of patent 14 years

LOC (6) Cl. 06 - *06*

U.S. Cl. D6—500



401,091

PANEL HEADBOARD

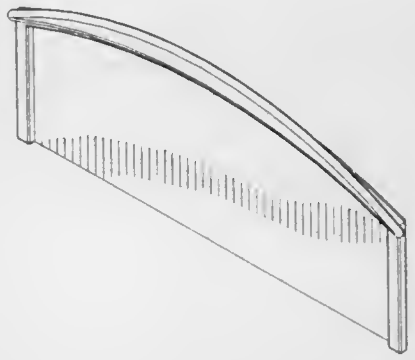
Paul Zaidman, Winnipeg, Canada, assignor to Palliser Furniture Ltd., Winnipeg, Canada

Filed Feb. 28, 1997, Ser. No. 68,459

Term of patent 14 years

LOC (6) Cl. 06 - *01*

U.S. Cl. D6—505



401,092

SHOWER CADDY

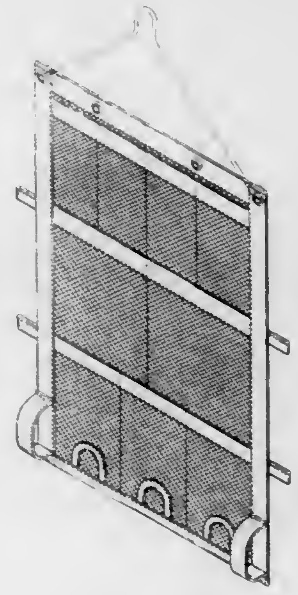
Shailesh Patel, Glenview, Ill., assignor to Selfix, Inc., Chicago, Ill.

Filed Dec. 30, 1996, Ser. No. 64,337

Term of patent 14 years

LOC (6) Cl. 07 - *07*

U.S. Cl. D6—525



401,093

SOAP DISPENSER

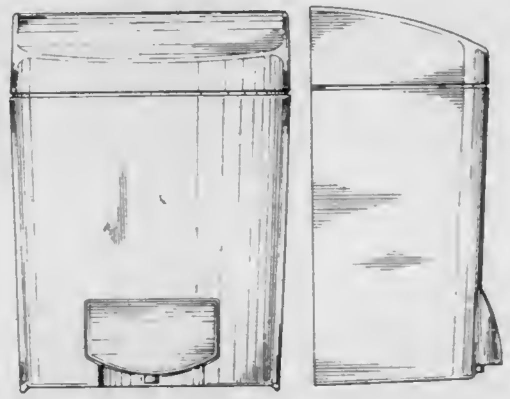
John Richard Arbak, Ventura, and Allan Cameron, Santa Monica, both of Calif., assignors to Bobrick Washroom Equipment, Inc., North Hollywood, Calif.

Filed Jul. 22, 1997, Ser. No. 73,663

Term of patent 14 years

LOC (6) Cl. 07 - *07*

U.S. Cl. D6—545



401,094

BATHROOM-CABINET WITH ONE SET OF SHELVES

Taro Kato, Rua Inhambu, 635 apt.151, Sao Paulo-SP, Brazil

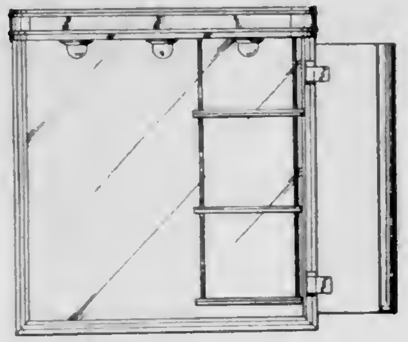
Filed Oct. 2, 1996, Ser. No. 60,629

Claims priority, application Brazil, Apr. 3, 1996, M15600281-5

Term of patent 14 years

LOC (6) Cl. 06 - *04*

U.S. Cl. D6—561



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401,095

BATHROOM-CABINET WITH TWO SETS OF SHELVES

Taro Kato, Rua Inhambu, 635 apt.151, Sao Paulo-SP, Brazil

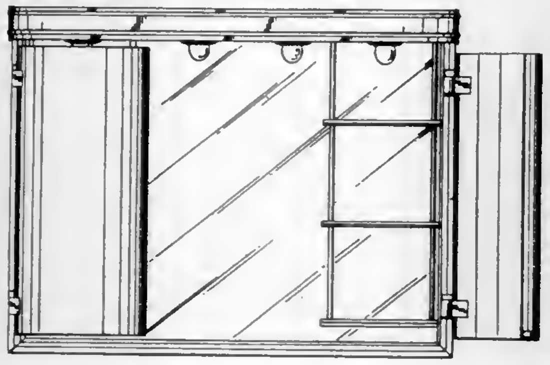
Filed Oct. 2, 1996, Ser. No. 60,630

Claims priority, application Brazil, Apr. 3, 1996, 5600282

Term of patent 14 years

LOC (6) Cl. 06 - *04*

U.S. Cl. D6—561



401,096

WINDOW SHADE

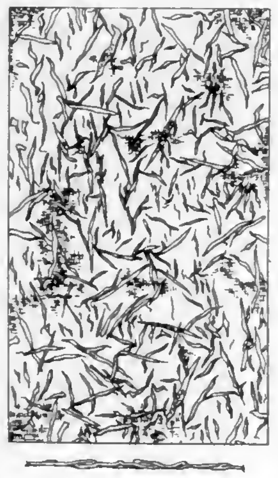
Alyce J. Wichser, 203 Douglas Ave., Waukesha, Wis. 53186

Filed Mar. 28, 1996, Ser. No. 52,342

Term of patent 14 years

LOC (6) Cl. 06 - *10*

U.S. Cl. D6—575



401,097

BLIND

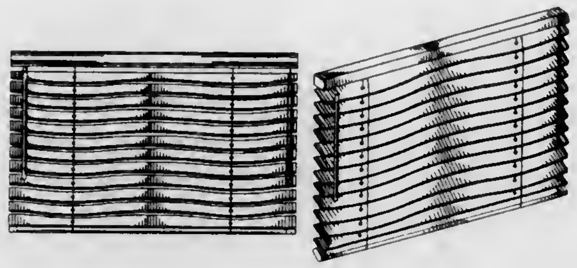
Mark Litecki, 4727 S. Springfield Ave., Chicago, Ill. 60632

Filed Feb. 1, 1997, Ser. No. 66,023

Term of patent 14 years

LOC (6) Cl. 06 - *10*

U.S. Cl. D6—577



401,098

BLIND

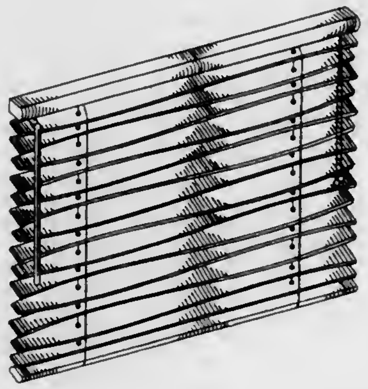
Mark Litecki, 4727 S. Springfield Ave., Chicago, Ill. 60632

Filed Feb. 1, 1997, Ser. No. 66,024

Term of patent 14 years

LOC (6) Cl. 06 - *10*

U.S. Cl. D6—577



401,099

FLOOR COVERING

Ian Karl Pawson, Worcester, and Stephen James Pym, Shropshire, both of England, assignors to Nuway Manufacturing Co., Ltd., London, England

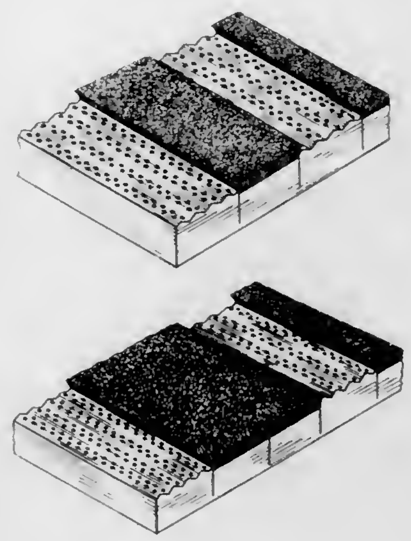
Filed Jan. 29, 1997, Ser. No. 65,253

Claims priority, application United Kingdom, Dec. 27, 1996, 2062088; Dec. 27, 1996, 2062089

Term of patent 14 years

LOC (6) Cl. 06 - *11*

U.S. Cl. D6—582



401,100

MAT

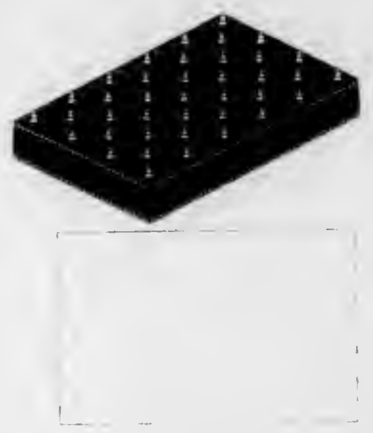
Thomas Emerson Stull, Box 242-8, Rte. 3, Decatur, Tenn. 37322

Filed Feb. 23, 1998, Ser. No. 84,021

Term of patent 14 years

LOC (6) Cl. 06 - *11*

U.S. Cl. D6—582



401,101

TWO-SIDED MESSAGE MAT

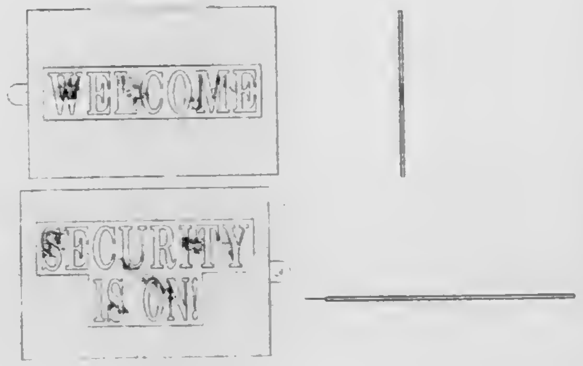
Raymond J. Shanley, Jr., and Rosalee Shanley, both of 10770 Katella Ave., #4, Anaheim, Calif. 92804

Filed Jul. 11, 1997, Ser. No. 73,591

Term of patent 14 years

LOC (6) Cl. 06 - *11*

U.S. Cl. D6—583



401,102

CONVERTIBLE CHILD'S MATTRESS AND DOLL

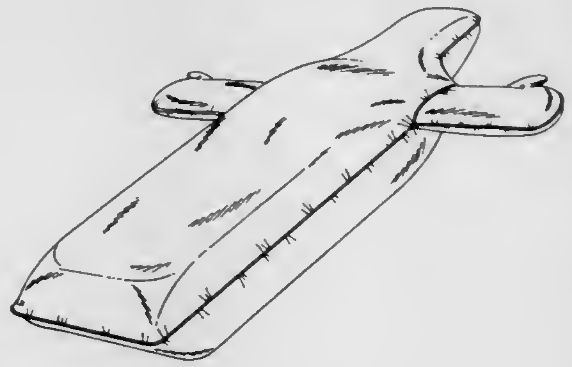
Charles R. Thomas, 120 E. Golden Gate, Detroit, Mich. 48203

Filed Dec. 15, 1997, Ser. No. 81,801

Term of patent 14 years

LOC (6) Cl. 06 - *09*

U.S. Cl. D6—599



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PILLOW

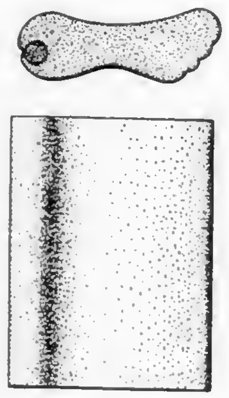
Denys Denney, Bear, Del., assignor to Foamex L.P., Linwood, Pa.

Filed Jan. 7, 1998, Ser. No. 81,663

Term of patent 14 years

LOC (6) Cl. 06 - *09*

U.S. Cl. D6—601



401,104

CURVED PILLOW

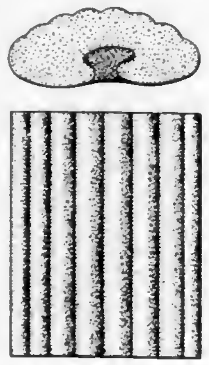
Denys Denney, Bear, Del., assignor to Foamex L.P., Linwood, Pa.

Filed Jan. 7, 1998, Ser. No. 81,664

Term of patent 14 years

LOC (6) Cl. 06 - *09*

U.S. Cl. D6—601



401,105

TOWEL WITH POCKET

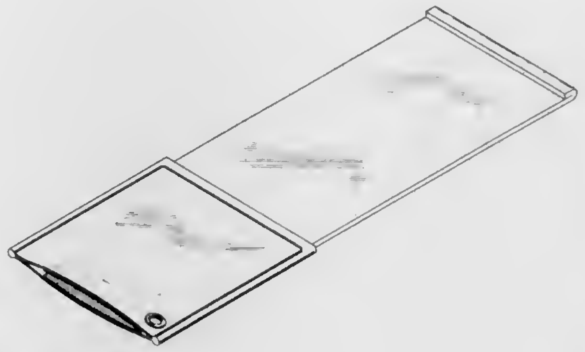
Ric Dewees, 1626 Ethel Ct., Modesto, Calif. 95350

Filed Mar. 5, 1998, Ser. No. 84,577

Term of patent 14 years

LOC (6) Cl. 06 - *13*

U.S. Cl. D6—608



401,106

SIPHON BOTTLE

Dietmar Valentinitsch, Vienna, Austria, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

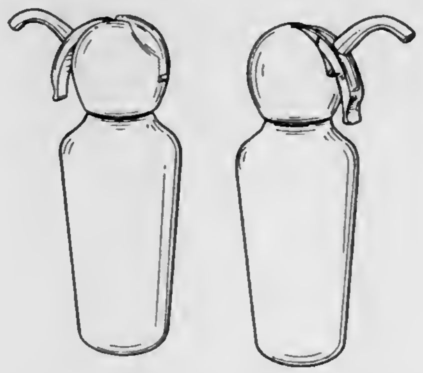
Division of Ser. No. 45,654, Oct. 25, 1995, Pat. No. 5,385,745. This application May 30, 1997, Ser. No. 72,150

Claims priority, application Germany, Apr. 25, 1995, 95 03 639.3

Term of patent 14 years

LOC (6) Cl. 07 - *01*

U.S. Cl. D7—300.1



401,107

OVAL HEAT PLATE

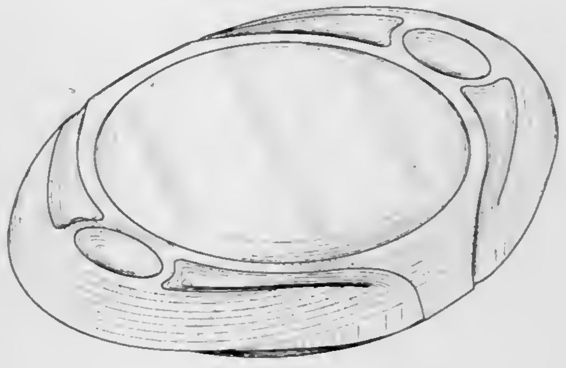
Peter Rimback, Villlage of Oakwood, Ohio, assignor to Hanover Catalog Holdings, Inc., Weehawken, N.J.

Filed Jun. 4, 1997, Ser. No. 71,703

Term of patent 14 years

LOC (6) Cl. 07 - *02*

U.S. Cl. D7—368



401,108

COFFEEMAKER

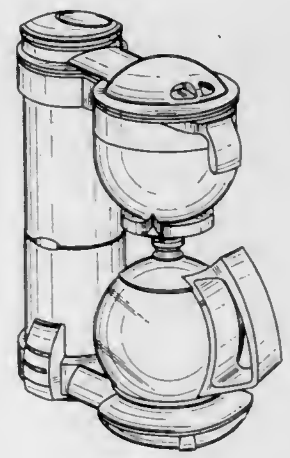
Paweł Pochopień, and Andrzej Śmiałek, both of Kraków, Poland, assignors to Zelmer, Rzeszow, Poland

Filed Mar. 11, 1997, Ser. No. 68,728

Term of patent 14 years

LOC (6) Cl. 07 - *01*

U.S. Cl. D7—309



401,109

LID FOR BAGEL STORAGE CONTAINER

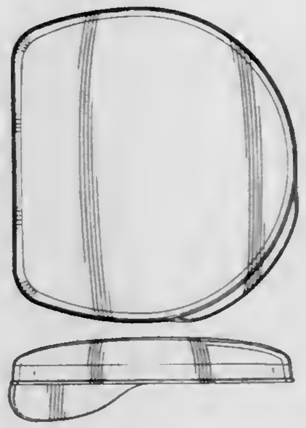
Anthony Demore, Copley, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio

Filed Dec. 15, 1997, Ser. No. 81,841

Term of patent 14 years

LOC (6) Cl. 07 - *99*

U.S. Cl. D7—391



401,110

LID FOR BREAD STORAGE CONTAINER

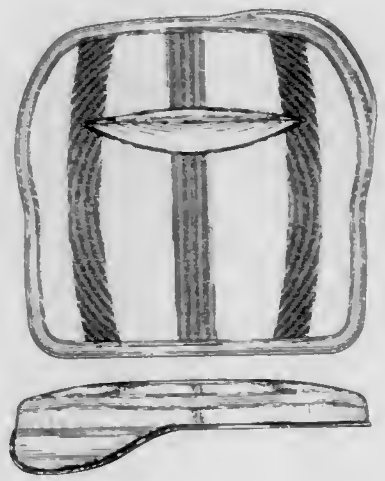
Anthony Demore, Copley, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio

Filed Oct. 10, 1997, Ser. No. 82,383

Term of patent 14 years

LOC (6) Cl. 07 - *99*

U.S. Cl. D7—391



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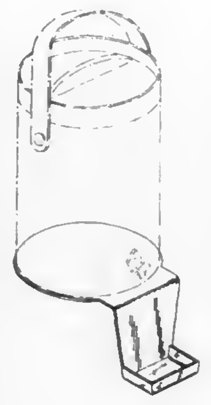
401,111
DRIP COLLECTING DEVICE

Sandra Ann Leatherman, 16206 Skye Ct., Hagerstown, Md. 21740

Filed Jun. 10, 1997, Ser. No. 72,244
Term of patent 14 years
LOC (6) Cl. 07 - *99*

U.S. Cl. D7—397

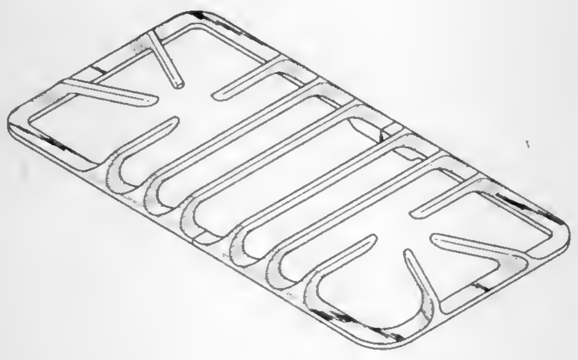


401,112
OVEN GRATE

Lisa M. Miller, Iowa City, Iowa, assignor to Maytag Corporation, Newton, Iowa

Division of Ser. No. 57,178, Jul. 18, 1996. This application May 15, 1997, Ser. No. 70,763
Term of patent 14 years
LOC (6) Cl. 07 - *02*

U.S. Cl. D7—408

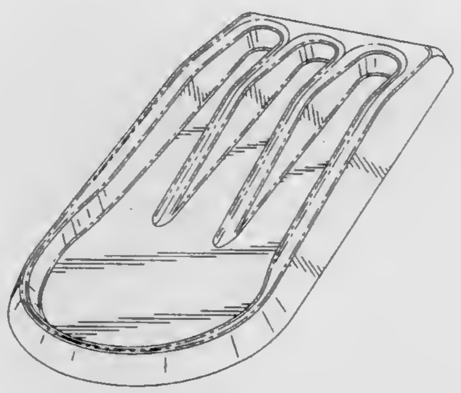


401,113
PLATE FOR HOLDING TACOS

Glenn Raymond Hall, 278 Tarragindi Road, Moorooka, Brisbane, Queensland, Australia, 4105, and Phillip Anton Barton, 49 Spanner Road, Glasshouse Mountains, Queensland, Australia, 4518

Continuation-in-part of Ser. No. 122,915, Sep. 16, 1993, abandoned. This application Aug. 21, 1995, Ser. No. 42,897
Term of patent 14 years
LOC (6) Cl. 07 - *01*

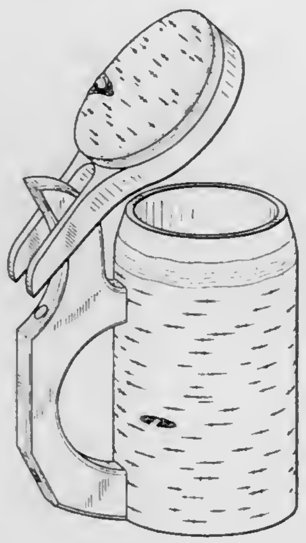
U.S. Cl. D7—504



401,114
DRINKING STEIN

Alva Reed, P.O. Box 57061, North Pole, Ak. 99705
Filed Jun. 24, 1997, Ser. No. 72,556
Term of patent 14 years
LOC (6) Cl. 07 - *01*

U.S. Cl. D7—511

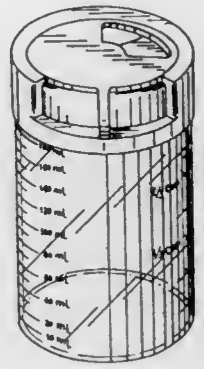


401,115
CONTAINER FOR RECEIVING AND DISPENSING OF PARTICULATES

Daiying Huang, Chicago, Ill., assignor to The Pampered Chef, Ltd., Addison, Ill.

Filed Aug. 26, 1997, Ser. No. 76,144
Term of patent 14 years
LOC (6) Cl. 07 - *06*

U.S. Cl. D7—589

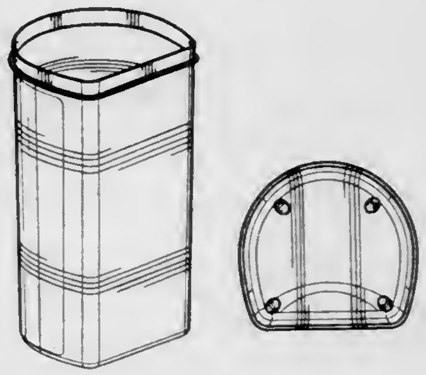


401,116
BAGEL STORAGE CONTAINER

Anthony Demore, Copley, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio

Filed Dec. 15, 1997, Ser. No. 81,839
Term of patent 14 years
LOC (6) Cl. 07 - *06*

U.S. Cl. D7—602

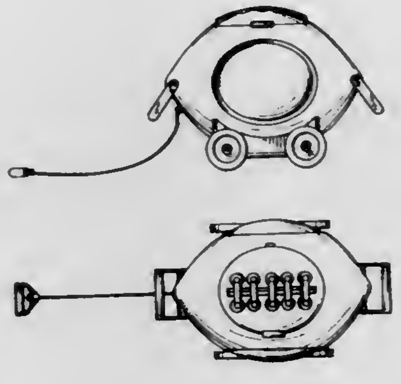


401,117
COOLER

Christine C. Anderson; Terence J. Anderson, both of 41 Fernstead La., Berlin, Conn. 06037; Brian Fox, 200 Ox Yoke Dr., Wethersfield, Conn. 06109, and Mark Hoben, 42 Park Dr., Waterford, Conn. 06385

Filed Jul. 22, 1997, Ser. No. 73,665
Term of patent 14 years
LOC (6) Cl. 07 - *06*

U.S. Cl. D7—606

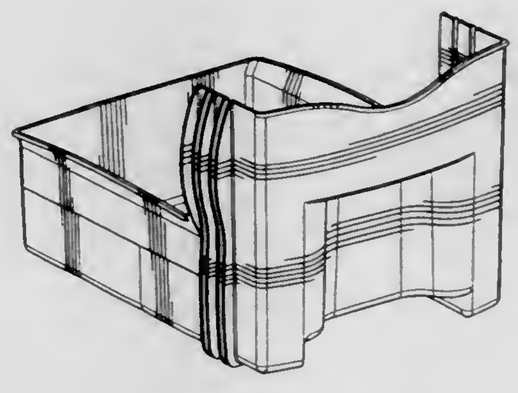


401,118
BREAD STORAGE TRAY

Anthony DeMore, Copley, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio

Filed Dec. 15, 1997, Ser. No. 81,840
Term of patent 14 years
LOC (6) Cl. 07 - *07*

U.S. Cl. D7—609



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TRAY FOR BREAD STORAGE CONTAINER

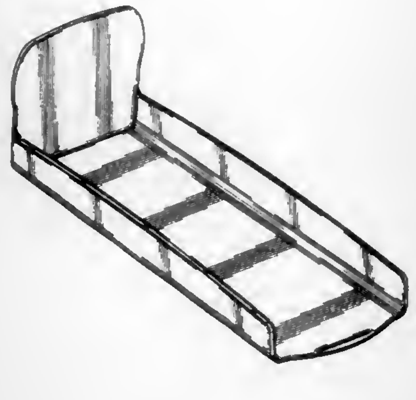
Anthony Demore, Copley, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio

Filed Oct. 10, 1997, Ser. No. 82,807

Term of patent 14 years

LOC (6) Cl. 07 - *07*

U.S. Cl. D7—609



401,120

BREAD STORAGE CONTAINER

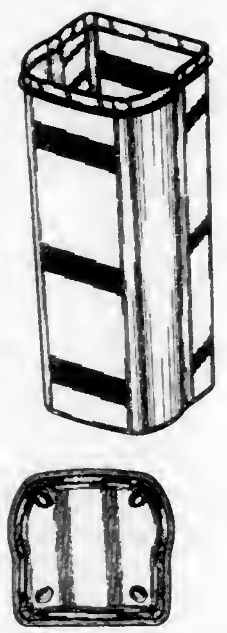
Anthony Demore, Copley, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio

Filed Oct. 10, 1997, Ser. No. 82,810

Term of patent 14 years

LOC (6) Cl. 07 - *07*

U.S. Cl. D7—609



401,121

CUPHOLDER

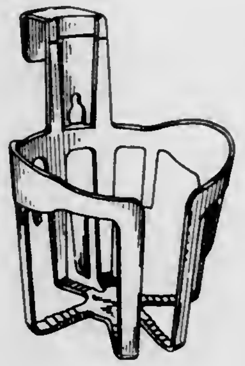
Jerome Hartmann, Carlisle, and Thomas R. Steinhagen, West Des Moines, both of Iowa, assignors to Cobbs Manufacturing Company, Des Moines, Iowa

Filed Jun. 16, 1997, Ser. No. 72,414

Term of patent 14 years

LOC (6) Cl. 07 - *06*

U.S. Cl. D7—620



401,122

CUP HOLDER

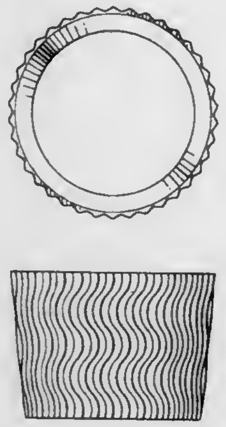
Frederick A. Rench, Boise, and Michael E. Watanabe, Nampa, both of Id., assignors to Boise Cascade Corporation, Boise, Id.

Continuation-in-part of Ser. No. 48,620, Jan. 5, 1996, Pat. No. Des. 383,942. This application Apr. 24, 1997, Ser. No. 69,993

Term of patent 14 years

LOC (6) Cl. 07 - *06*

U.S. Cl. D7—624



401,123

EATING UTENSIL

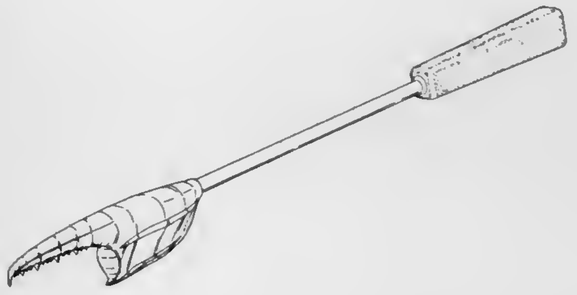
Michael J. McHale, 301 Clematis St., Ste. 200, West Palm Beach, Fla. 33401

Filed Feb. 11, 1998, Ser. No. 83,496

Term of patent 14 years

LOC (6) Cl. 07 - *06*

U.S. Cl. D7—683



401,124

SPIKE TO FACILITATE INSERTION OF A PLANT WATERING SPIKE

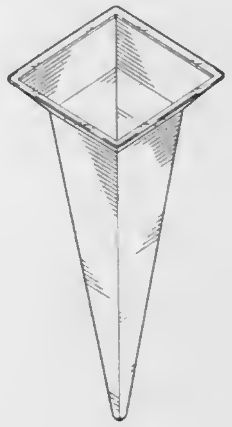
Andrew D. Rose, 8813 E. Charter Oak Dr., Scottsdale, Ariz. 85260

Continuation-in-part of Ser. No. 594,346, Jan. 30, 1996, Pat. No. 5,692,338. This application Jan. 29, 1997, Ser. No. 65,565

Term of patent 14 years

LOC (6) Cl. 08 - *01*

U.S. Cl. D8—1



401,125

POST HOLE DIGGER BLADE

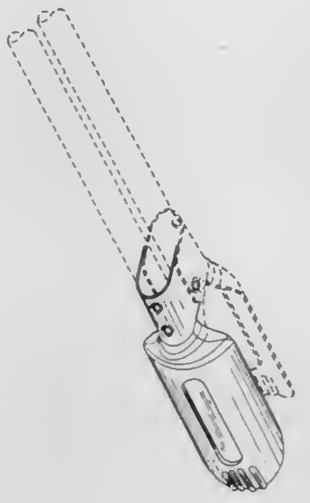
David Bonnes, Westerville, and Herbert Wehner, Columbus, both of Ohio, assignors to Uniontools, Columbus, Ohio

Filed Aug. 21, 1996, Ser. No. 58,705

Term of patent 14 years

LOC (6) Cl. 08 - *01*

U.S. Cl. D8—7



401,126

SNOW SHOVEL

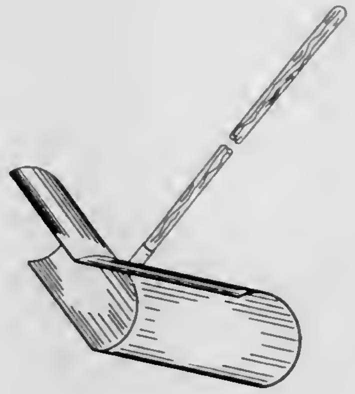
Jay Sroufe, 40 W. Fountain Ave., Glendale, Ohio 45246, assignor to Jay Sroufe, Glendale, Ohio

Filed Sep. 17, 1996, Ser. No. 59,857

Term of patent 14 years

LOC (6) Cl. 08 - *05*

U.S. Cl. D8—10



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401,127
JAR OPENER AND CLOSER

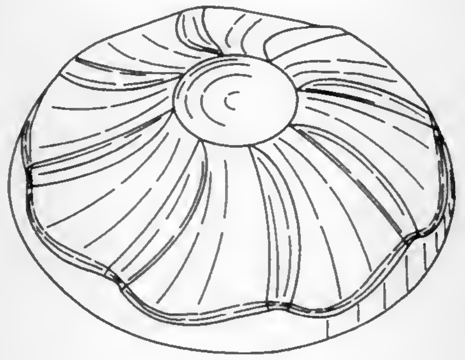
Jeffrey S. Plantz, Seven Hills, and Nicholas E. Stanca, Westlake, both of Ohio, assignors to Magic American Corporation, Cleveland, Ohio

Filed Aug. 11, 1997, Ser. No. 74,848

Term of patent 14 years

LOC (6) Cl. 07 - *99*

U.S. Cl. D8—33



401,128
RECIPROCATING SAW

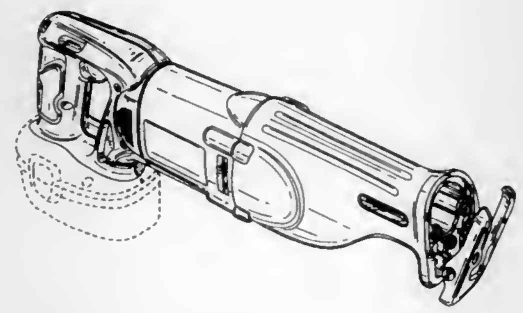
Donald W. Zurwelle, Lutherville, Md., assignor to Black & Decker Inc., Newark, Del.

Filed Jul. 29, 1997, Ser. No. 74,160

Term of patent 14 years

LOC (6) Cl. 08 - *03*

U.S. Cl. D8—64



401,129
SHARPENING DEVICE

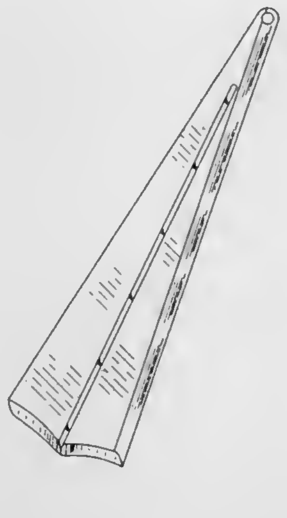
Louis S. Glesser, Golden, Colo., assignor to Spyderco, Inc., Golden, Colo.

Filed Jan. 10, 1997, Ser. No. 64,777

Term of patent 14 years

LOC (6) Cl. 08 - *05*

U.S. Cl. D8—91



401,130
ILLUMINATED SCREWDRIVER

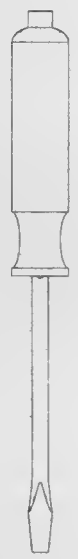
Douglas C. Maier, 1332 S. 78th St., Mesa, Ariz. 85208, and D. B. Wheat, 275 N. Saguaro Dr., #H1, Apache Junction, Ariz. 85220

Filed Sep. 9, 1997, Ser. No. 76,367

Term of patent 14 years

LOC (6) Cl. 08 - *04*

U.S. Cl. D8—87



401,131
ELECTRIC TAPE TRIMMING DEVICE

Masafumi Miyamoto, Ishikawa-ken; Kenji Watanabe, Tokyo; Takanobu Kameda, Tokyo, and Tomoyuki Shimmura, Tokyo, all of Japan, assignors to King Jim Co., Ltd., Tokyo, Japan

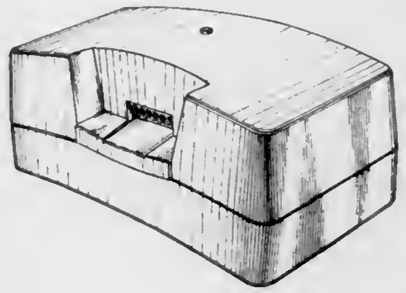
Filed Dec. 2, 1996, Ser. No. 63,218

Claims priority, application Japan, Aug. 9, 1996, 8-23835

Term of patent 14 years

LOC (6) Cl. 08 - *03*

U.S. Cl. D8—98



401,132
PLASTIC CUTTING DEVICE

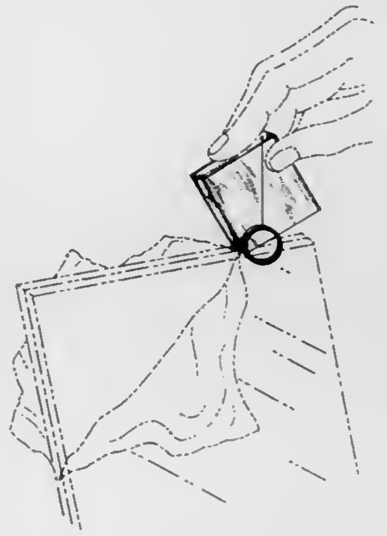
Alan Teetor, and Alan Nathanson, both of 10344 Almayo Ave. #B, Los Angeles, Calif. 90064

Filed Nov. 17, 1997, Ser. No. 79,501

Term of patent 14 years

LOC (6) Cl. 08 - *03*

U.S. Cl. D8—98



401,133
MULTI-PURPOSE FOLDING PLIERS

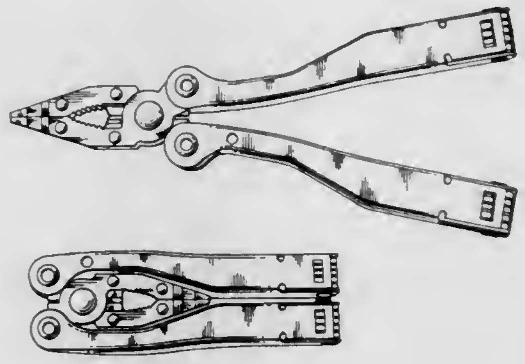
Walter A. Gardiner, Waccabuc; David A. Swinden, Ellenville, both of N.Y.; Joseph Hufnagel, Bethel, Conn.; Oleh Stecyk, Kerhonkson, and Robert L. Naas, Skaneateles, both of N.Y., assignors to Imperial Schrade Corp., Ellenville, N.Y.

Filed Jul. 31, 1996, Ser. No. 57,762

Term of patent 14 years

LOC (6) Cl. 08 - *05*

U.S. Cl. D8—105



401,134
DOOR HINGE

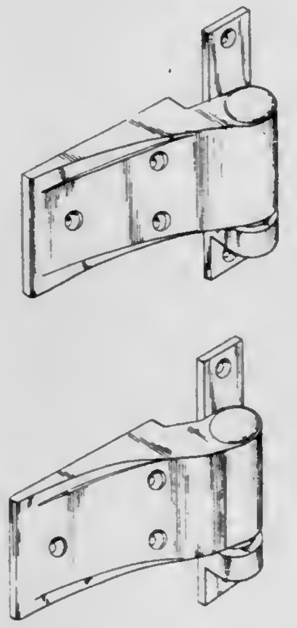
Burl Finkelstein, Newnan, Ga., assignor to Kason Industries, Inc., Shenandoah, Ga.

Continuation-in-part of Ser. No. 42,325, Aug. 7, 1995. This application Apr. 1, 1996, Ser. No. 52,493

Term of patent 14 years

LOC (6) Cl. 08 - *06*

U.S. Cl. D8—329



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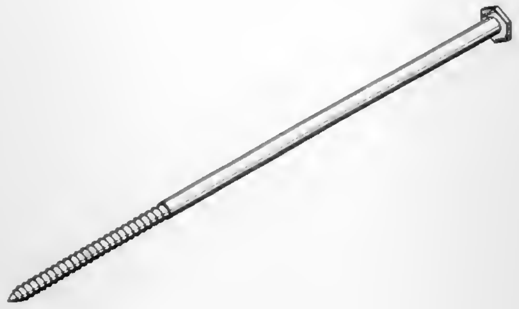
401,135
GUTTER FASTENER

Wayne A. Willert, 22 Second Ave., Port Washington, N.Y. 11050
Filed Nov. 21, 1995, Ser. No. 47,084
Term of patent 14 years
LOC (6) Cl. 08 - *08*

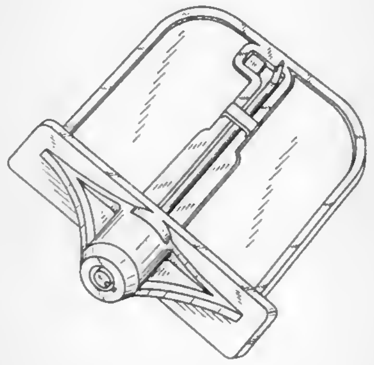
U.S. Cl. D8—387



401,136
FACEPLATE AND LOCKING DEVICE FOR A CHAMBER OPENING ACCEPTING ELECTRONIC DATA MEDIA

Jay S. Derman, Redondo Beach, Calif., assignor to Kensington Microwave Limited, San Mateo, Calif.
Filed Dec. 16, 1996, Ser. No. 63,763
Term of patent 14 years
LOC (6) Cl. 08 - *07*

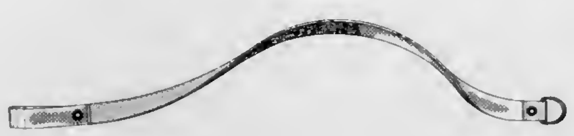
U.S. Cl. D8—341



401,137
TIE STRAP

James E. Boelling, Des Moines, Iowa, assignor to Wy-Tech, Inc., Des Moines, Iowa
Filed May 14, 1996, Ser. No. 56,163
Term of patent 14 years
LOC (6) Cl. 08 - *08*

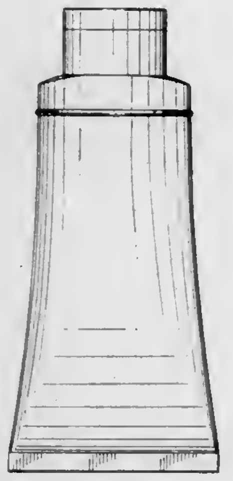
U.S. Cl. D8—394



401,138
COMBINED CONTAINER AND CAP

Marc Rosen, and Kevin Marshall, both of New York, N.Y., assignors to Bath & Body Works, Inc., Reynoldsburg, Ohio
Division of Ser. No. 56,723, Jul. 8, 1996, Pat. No. Des. 386,089. This application Apr. 18, 1997, Ser. No. 69,831
Term of patent 14 years
LOC (6) Cl. 09 - *01*

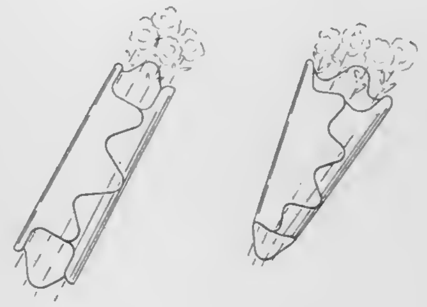
U.S. Cl. D9—302



401,139
FLORAL WRAPPER

Donald E. Weder; Joseph G. Straeter, both of Highland; Lisa A. Straeter, and William F. Straeter, both of Breese, all of Ill., assignors to Southpac Trust International, Inc.
Division of Ser. No. 63,810, Dec. 16, 1996, which is a continuation-in-part of Ser. No. 751, Oct. 23, 1992, abandoned. This application Feb. 17, 1998, Ser. No. 83,835
Term of patent 14 years
LOC (6) Cl. 09 - *05*

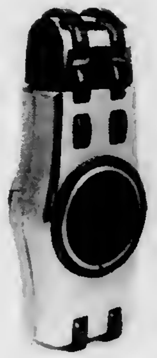
U.S. Cl. D9—305



401,140
PERFUME BOTTLE

Khaled Chahed, 26 avenue Trudaine, 75009 Paris, France
Filed Jan. 27, 1998, Ser. No. 82,615
Claims priority, application Hague Agreement, Aug. 1, 1997, DM/040 982
Term of patent 14 years
LOC (6) Cl. 09 - *01*

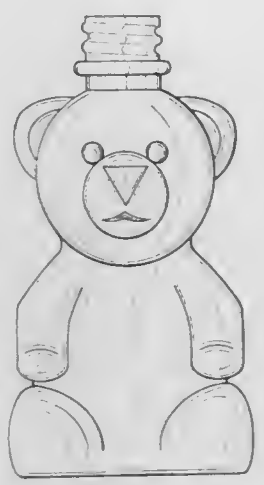
U.S. Cl. D9—307



401,141
FINGERNAIL POLISH CONTAINER

George H. Carroll, 853 Via Alondra, and Len Indelicato, 853 Via Alondra, both of Camarillo, Calif. 93010
Filed Jul. 17, 1997, Ser. No. 73,796
Term of patent 14 years
LOC (6) Cl. 09 - *01*

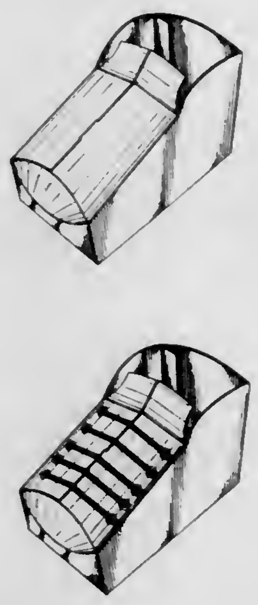
U.S. Cl. D9—318



401,142
SHOE-SHAPED CARTON FOR CARRY-OUT TYPE FOOD

David J. Adamek, River Falls, Wis., assignor to Flour City Packaging Corporation, Minneapolis, Minn.
Filed Nov. 6, 1995, Ser. No. 46,041
Term of patent 14 years
LOC (6) Cl. 09 - *03*

U.S. Cl. D9—319



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401,143
ATTACHMENT-BEARING BOTTLE

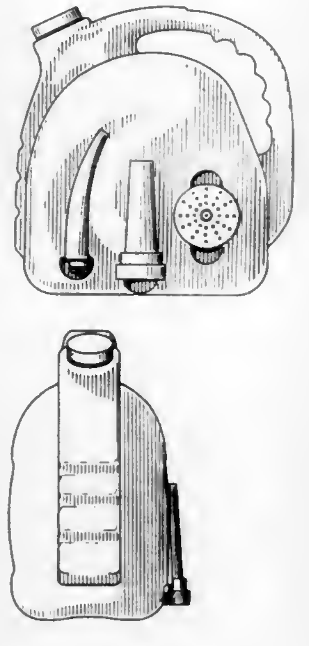
Walter D. Harman, 6990 Bucktrout Pl., Worthington, Ohio 43235, and Douglas K. Harman, 5030 Postlewaite Rd., Columbus, Ohio 43235

Filed Jan. 26, 1998, Ser. No. 82,565

Term of patent 14 years

LOC (6) Cl. 09 - *07*

U.S. Cl. D9—337



401,144
APPLICATOR

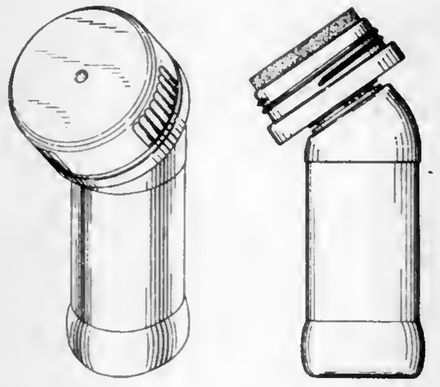
Sozaburo Ohara, Machida, Japan, assignor to Taiho Industries Co., Ltd., Tokyo, Japan

Filed May 2, 1997, Ser. No. 70,174

Term of patent 14 years

LOC (6) Cl. 09 - *03*

U.S. Cl. D9—338



401,145
TRAY FOR RELEASABLY HOLDING A SHAVING RAZOR

Michael J. Gray, Duxbury, Mass., assignor to The Gillette Company, Boston, Mass.

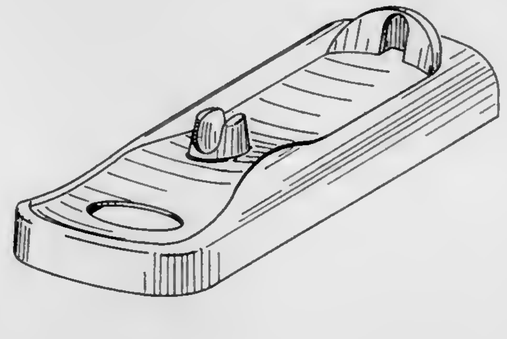
Filed Feb. 19, 1997, Ser. No. 67,306

The portion of the term of this patent subsequent to Oct. 13, 2012, has been disclaimed.

Term of patent 14 years

LOC (6) Cl. 09 - *03*

U.S. Cl. D9—342



401,146
JEWELRY BOX

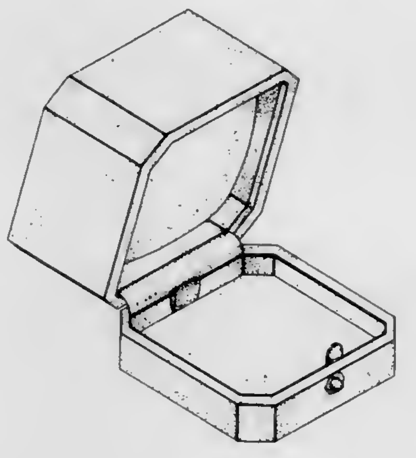
Sanale Srinual, Bangpong Thailand, assignor to Cosmo Group PCL, Bangkok Thailand

Filed Jul. 24, 1996, Ser. No. 57,384

Term of patent 14 years

LOC (6) Cl. 09 - *07*

U.S. Cl. D9—423



401,147
MULTI-SIDED BOX FOR CANDLE

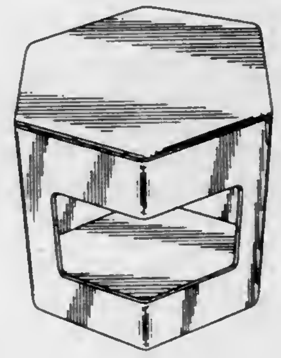
Denada Y. Miller, Duncan, S.C., assignor to Greenleaf, Inc., Spartanburg, S.C.

Filed Nov. 13, 1997, Ser. No. 79,419

Term of patent 14 years

LOC (6) Cl. 09 - *03*

U.S. Cl. D9—431



401,148
TETRAHEDRAL TOP CARTON

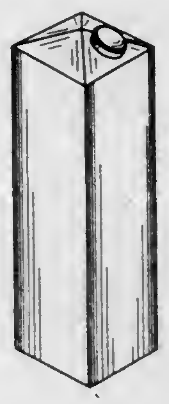
Hichem Bouraoui, 254 Rosalie La., Palatine, Ill. 60074, and Russell Stacy-Ryan, 3000 N. Racine, #2, Chicago, Ill. 60657

Filed Aug. 22, 1997, Ser. No. 75,763

Term of patent 14 years

LOC (6) Cl. 09 - *03*

U.S. Cl. D9—432



401,149
MULTIFUNCTIONAL CAP FOR A TUBULAR CONTAINER

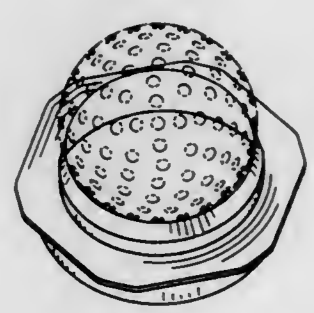
J. Thomas Goserud, 3152 Woodridge Dr., Landisville, Pa. 17538

Filed Jun. 23, 1997, Ser. No. 72,723

Term of patent 14 years

LOC (6) Cl. 09 - *07*

U.S. Cl. D9—439



401,150
SPRAY UNIT

Vincent de Laforcade, Rambouillet, France, assignor to L'Oreal, Paris, France

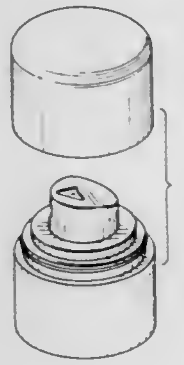
Filed Oct. 18, 1996, Ser. No. 61,227

Claims priority, application Hague Agreement, Apr. 19, 1996, DM/036202

Term of patent 14 years

LOC (6) Cl. 09 - *07*

U.S. Cl. D9—448



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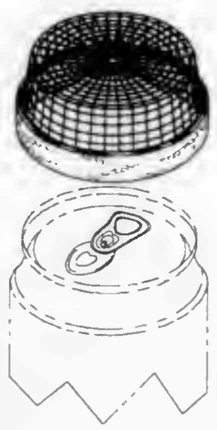
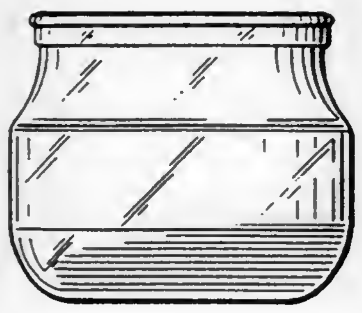
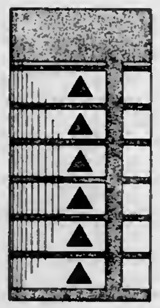
401,151
PERMEABLE DRINK GUARD
Craig Francis Rogge, and Leslie Ann Higman, both of 122 Rothwell Rd., Wilmington, Del. 19805
Filed Jun. 9, 1997, Ser. No. 72,135
Term of patent 14 years
LOC (6) Cl. 09 - *07*
U.S. Cl. D9—454



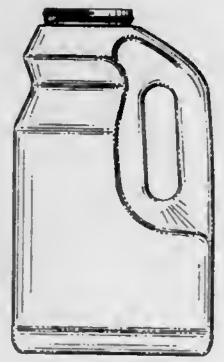
401,152
CONTAINER
Dale G. DeVore, Elmore, and Mark P. Higgins, Waterville, both of Ohio, assignors to Owens-Brockway Glass Container Inc., Toledo, Ohio
Filed Jul. 17, 1997, Ser. No. 73,806
Term of patent 14 years
LOC (6) Cl. 09 - *01*
U.S. Cl. D9—500



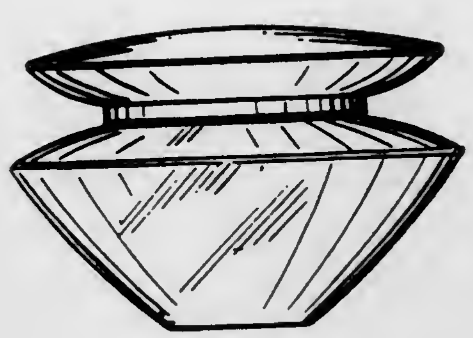
401,153
SHOE POLISH CONTAINER
Chung Sing Lin, No. 33-1, Ta Chiao 3rd St., Yung Kang Shih, Tainan Hsien, Taiwan
Filed Oct. 2, 1996, Ser. No. 60,600
Term of patent 14 years
LOC (6) Cl. 09 - *03*
U.S. Cl. D9—504



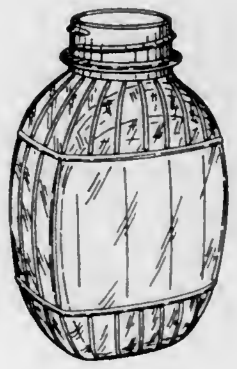
401,154
WIDE MOUTH PLASTIC CONTAINER
Gerald R. Robinson, Perrysburg, Ohio, assignor to Owens-Brockway Plastic Products Inc., Toledo, Ohio
Filed Feb. 5, 1998, Ser. No. 83,225
Term of patent 14 years
LOC (6) Cl. 09 - *01*
U.S. Cl. D9—528



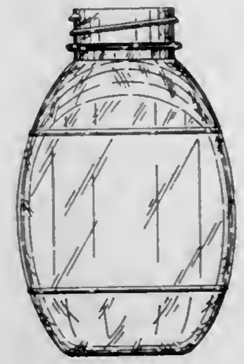
401,155
COSMETIC CREAM CONTAINER
Alain de Mourgues, Paris, France, assignor to Pacific Corporation, Seoul, Rep. of Korea
Filed Nov. 21, 1996, Ser. No. 62,661
Claims priority, application Rep. of Korea, May 22, 1996, 1996 10194
Term of patent 14 years
LOC (6) Cl. 09 - *01*
U.S. Cl. D9—558



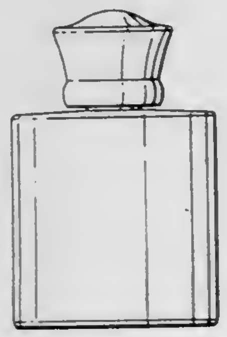
401,156
CONTAINER
Paul C. Gech, Mokena, Ill., assignor to Plochman, Inc., Oakbrook Terrace, Ill.
Filed Nov. 5, 1996, Ser. No. 62,001
Term of patent 14 years
LOC (6) Cl. 09 - *01*
U.S. Cl. D9—569



401,157
CONTAINER
Paul C. Gech, Mokena, and Carl M. Plochman, III, Glencoe, both of Ill., assignors to Plochman, Inc., Oakbrook Terrace, Ill.
Filed Nov. 5, 1996, Ser. No. 62,000
Term of patent 14 years
LOC (6) Cl. 09 - *01*
U.S. Cl. D9—570



401,158
COMBINED BOTTLE AND BOTTLE CAP
Dieter Gottlieb Bakic, Milan, Italy, assignor to The Project Consultancy Limited, West Sussex, England
Filed Jun. 18, 1997, Ser. No. 72,462
Term of patent 14 years
LOC (6) Cl. 09 - *01*
U.S. Cl. D9—574



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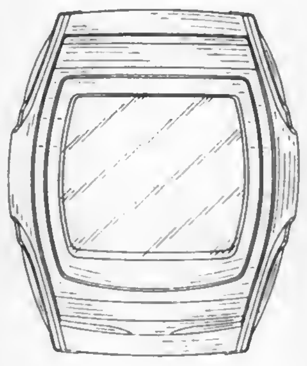
401,159
WATCH CASE

Shoichi Sugita, Wako, and Kotaro Nakazato, Tachikawa, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Dec. 29, 1997, Ser. No. 81,246
Term of patent 14 years
LOC (6) Cl. 10 - *02*

U.S. Cl. D10—30

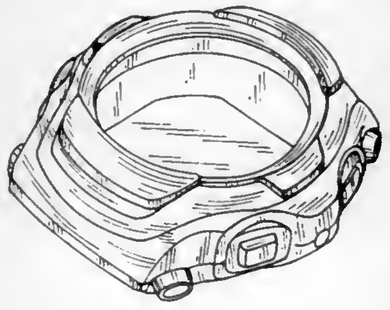


401,160
WATCH CASE

Takayasu Akagi, Fussa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Dec. 29, 1997, Ser. No. 81,248
Term of patent 14 years
LOC (6) Cl. 10 - *02*

U.S. Cl. D10—30

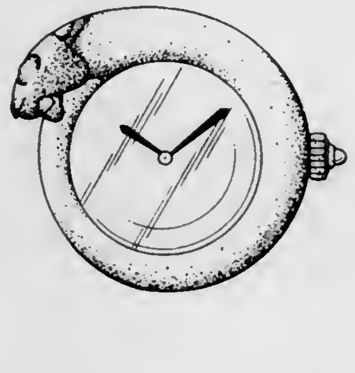


401,161
WATCH

Alain-Dominique Perrin, Rueil-Malmaison, and Jacques Diltoer, Villeneuve-La-Garenne, both of France, assignors to Cartier International B.V., Amsterdam, Netherlands

Filed Oct. 20, 1995, Ser. No. 45,481
Claims priority, application France, Apr. 20, 1995, 952325
Term of patent 14 years

U.S. Cl. D10—34

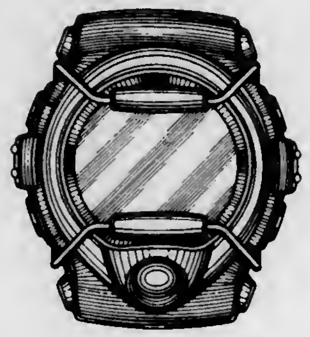


401,162
WATCH CASE WITH A PROTECTION DEVICE

Shingo Ishizaka, Akishima, and Hideyuki Yamamoto, Kosai, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jun. 30, 1997, Ser. No. 73,108
Term of patent 14 years
LOC (6) Cl. 10 - *02*

U.S. Cl. D10—31



401,163
WRISTWATCH

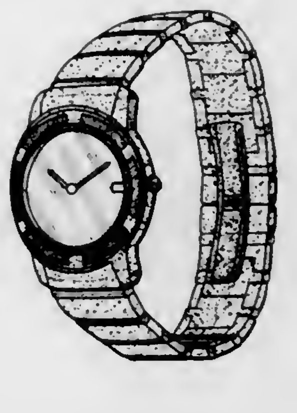
Jean-Philippe Buchser, Ipsach, Switzerland, assignor to Eterna S.A. Fabrique D-3 Horlogerie, Grenchen, Switzerland

Filed Aug. 1, 1997, Ser. No. 74,805

Claims priority, application Switzerland, Feb. 3, 1997, DM/039 382

Term of patent 14 years
LOC (6) Cl. 10 - *01*

U.S. Cl. D10—32



401,164
WRISTWATCH

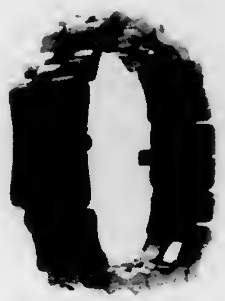
Severin Wunderman, South Laguna, Calif., assignor to Gucci Timepieces SA, Lengnau, Switzerland

Filed Jan. 14, 1998, Ser. No. 82,086

Claims priority, application WIPO, Jul. 14, 1997, DMA/003784

Term of patent 14 years
LOC (6) Cl. 10 - *02*

U.S. Cl. D10—32

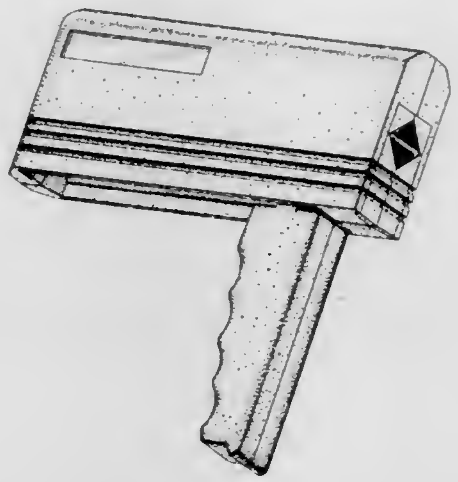


401,165
LOCATOR DEVICE

Thomas Afilani, R.D. 5, Box 171, Jersey Shore, Pa. 17740

Filed Sep. 11, 1997, Ser. No. 76,464
Term of patent 14 years
LOC (6) Cl. 10 - *04*

U.S. Cl. D10—46

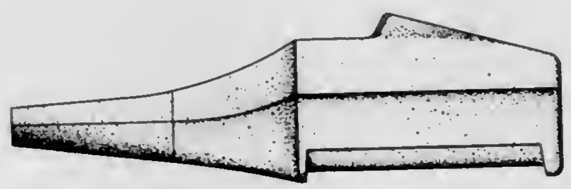


401,166
LOCATOR DEVICE

Thomas Afilani, R.D. 5, Box 171, Jersey Shore, Pa. 17740

Filed Sep. 12, 1997, Ser. No. 76,516
Term of patent 14 years
LOC (6) Cl. 10 - *04*

U.S. Cl. D10—46



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401,167
DISPLAY FOR A COOKING DEVICE

Siegfried Meister, Landsberg a. Lech, Germany, assignor to Rational GmbH, Landsberg a. Lech, Germany

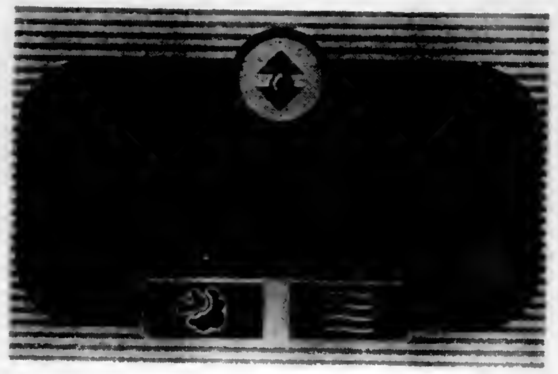
Filed Jun. 11, 1997, Ser. No. 71,974

Claims priority, application Germany, Dec. 11, 1996, M 96 10 749.9

Term of patent 14 years

LOC (6) Cl. 10 - *04*

U.S. Cl. D10—50



401,168
COMBINED THUMB AND PLATE COMPASS

Kurt-Ake Wallberg, Vallentuna, Sweden, assignor to Silva Products AB, Sollentuna, Sweden

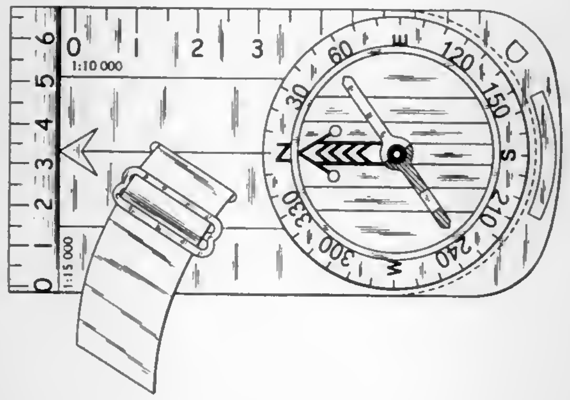
Filed Jul. 30, 1997, Ser. No. 74,244

Claims priority, application Sweden, Jan. 30, 1997, 97 0220

Term of patent 14 years

LOC (6) Cl. 10 - *04*

U.S. Cl. D10—68



401,169
ILLUMINATED LEVEL

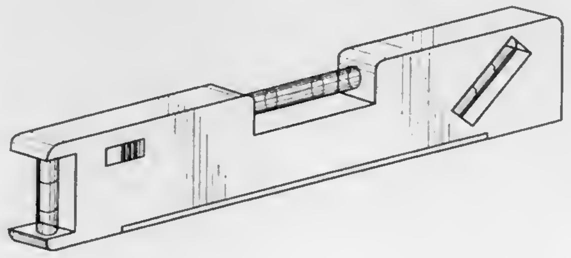
David J. Smith, P.O. Box 66, Louth, LN11 0FZ, United Kingdom

Filed Oct. 23, 1997, Ser. No. 82,040

Term of patent 14 years

LOC (6) Cl. 10 - *04*

U.S. Cl. D10—69



401,170
MODULAR CALIPER

Jean Claude Reymond, Chavannes, Switzerland, assignor to Tesa Brown & Sharpe S.A., Renens, Switzerland

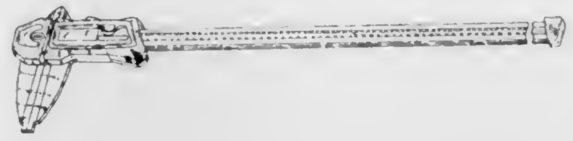
Filed Sep. 24, 1996, Ser. No. 60,227

Claims priority, application Hague Agreement, Jun. 6, 1996, DMA/003343

Term of patent 14 years

LOC (6) Cl. 10 - *04*

U.S. Cl. D10—73



401,171
ELECTRICAL CURRENT SENSOR

Pierre Cattaneo, Collonges s/Saleve, France, assignor to Liaisons Electroniques-Mecaniques LEM S.A., Plans-Les-Ouates, Switzerland

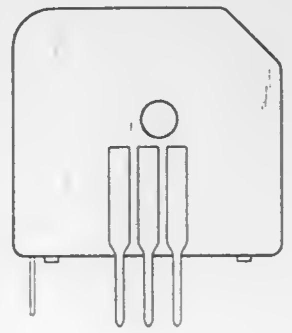
Filed Oct. 29, 1997, Ser. No. 78,667

Claims priority, application Hague Agreement, Jun. 12, 1997, DM/040464

Term of patent 14 years

LOC (6) Cl. 10 - *04*

U.S. Cl. D10—78



401,172
AMMETER

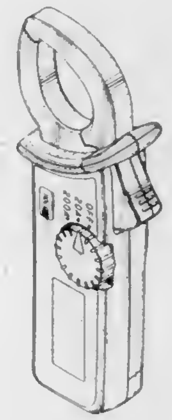
Masamichi Kuramoto, Tokyo, Japan, assignor to Kyoritsu Electrical Instruments Works, Ltd., Tokyo, Japan

Filed Nov. 19, 1997, Ser. No. 79,526

Term of patent 14 years

LOC (6) Cl. 10 - *04*

U.S. Cl. D10—79



401,173
ELECTRONIC SCALE

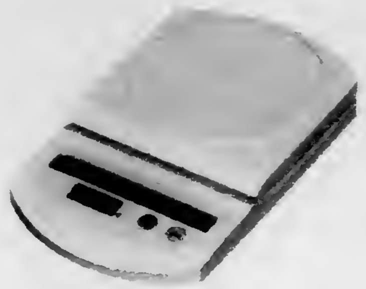
Soji Kurata, Tsurugashima, and Hiroshi Kajimoto, Suginami-ku, both of Japan, assignors to Tanita Corporation, Tokyo, Japan

Filed Jun. 16, 1997, Ser. No. 72,369

Term of patent 14 years

LOC (6) Cl. 10 - *04*

U.S. Cl. D10—91



401,174
SCALE

Franz Alban Stützer, Offenbach am Main, and Bernd Figur, Schaafheim-Schlierbach, both of Germany, assignors to Rowenta Werke GmbH, Offenbach A.M., Germany

Filed Feb. 4, 1998, Ser. No. 83,062

Term of patent 14 years

LOC (6) Cl. 10 - *04*

U.S. Cl. D10—92

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401,175

OCCUPANCY SENSOR

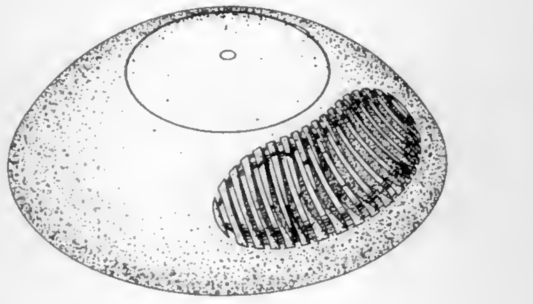
R. Kurt Bender, Dripping Springs, Tex.; Willfred Goldschmidt, Weston, and Justin F. Aiello, Norwalk, both of Conn., assignors to Mytech Corporation, Austin, Tex.

Filed Mar. 17, 1997, Ser. No. 68,019

Term of patent 14 years

LOC (6) Cl. 10 - *05*

U.S. Cl. D10—104



401,176

TRANSMITTER AND RECEIVER FOR TRACKING PERSONAL ARTICLES

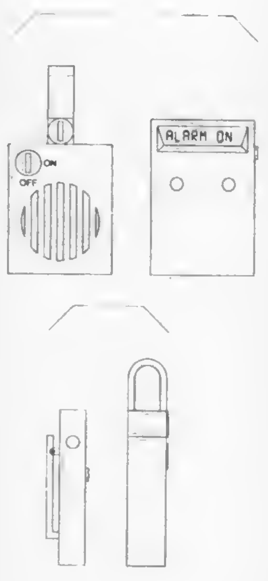
Kevin J. Coupel, 12397 Ruth Rd., Gonzales, La. 70737

Filed Dec. 4, 1997, Ser. No. 80,227

Term of patent 14 years

LOC (6) Cl. 10 - *05*

U.S. Cl. D10—104



401,177

PORTABLE STOLEN VEHICLE PREVENTION AND LOCATER WITH INFORMATION GATHERING SYSTEM

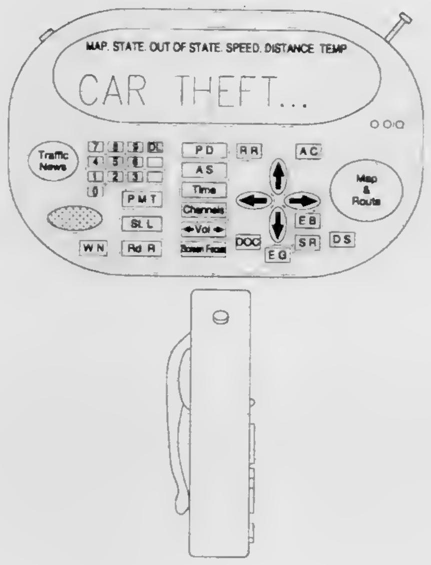
Neil Cambell, 680 W. Virginia St. Apt. 72, Tallahassee, Fla. 32304

Filed Dec. 24, 1997, Ser. No. 81,345

Term of patent 14 years

LOC (6) Cl. 10 - *05*

U.S. Cl. D10—104



401,178

SECURITY SYSTEM CONTROL PANEL

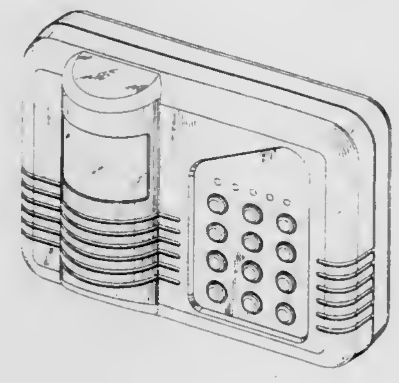
I-Chang Liu, 3F, No. 1-62, Lane 81, Yuan Dong St., Long Jing Hsian, Taichung Hsien, Taiwan

Filed Jan. 7, 1998, Ser. No. 81,655

Term of patent 14 years

LOC (6) Cl. 10 - *05*

U.S. Cl. D10—106



401,179

AUDIBLE SIGNAL FOR ALARM UNITS

Takahiro Sone; Yoshio Imahori; Katsuyuki Sano, and Tomonari Suzuki, all of Shizuoka, Japan, assignors to Star Micronics Co., Ltd., Shizuoka-ken, Japan

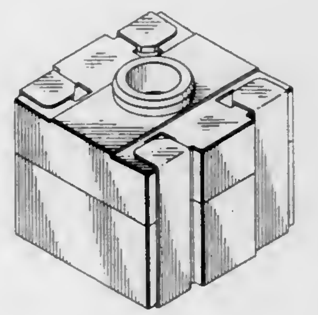
Filed Feb. 4, 1998, Ser. No. 83,003

Claims priority, application Japan, Aug. 8, 1997, 9-64364

Term of patent 14 years

LOC (6) Cl. 10 - *05*

U.S. Cl. D10—116



401,180

SPORTING ICON FIGURINE

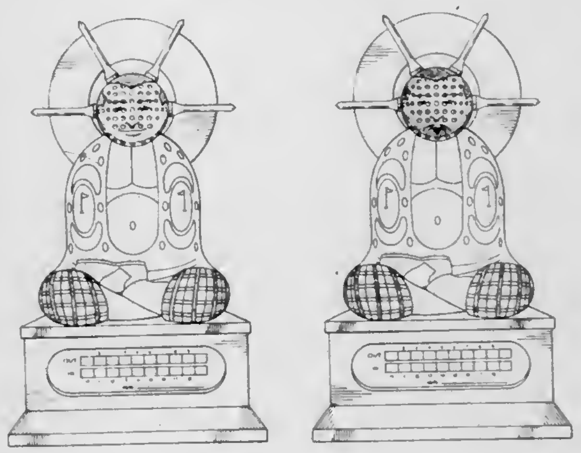
R. Craig Campbell, 5515 County Rd. 33, Canandaigua, N.Y. 14424

Filed Jan. 6, 1997, Ser. No. 64,578

Term of patent 14 years

LOC (6) Cl. 11 - *02*

U.S. Cl. D11—160



401,181

WATCH STRAP

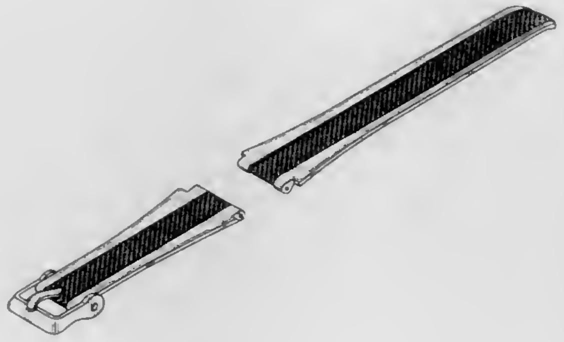
John T. Houlihan, Southbury, Conn., assignor to Timex Corporation, Middlebury, Conn.

Filed Aug. 4, 1997, Ser. No. 74,388

Term of patent 14 years

LOC (6) Cl. 11 - *01*

U.S. Cl. D11—3



401,182

EARRING

Paolo Bulgari, Rome, Italy, assignor to Bulgari S.p.A., Rome, Italy

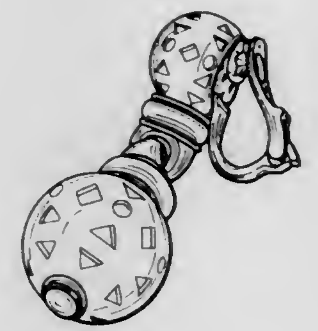
Filed Jul. 21, 1997, Ser. No. 73,732

Claims priority, application WIPO, Apr. 21, 1997, DM/039923

Term of patent 14 years

LOC (6) Cl. 11 - *01*

U.S. Cl. D11—41



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401,183

GEMSTONE

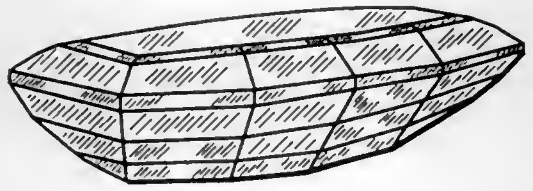
Betzalel Ambar, Encino, Calif., assignor to Ambar Diamonds, Inc., Los Angeles, Calif.

Filed Apr. 8, 1997, Ser. No. 69,363

Term of patent 14 years

LOC (6) Cl. 11 - *01*

U.S. Cl. D11—90



401,184

MOTORCYCLE

Hiroaki Tsukui, and Tetsuya Nakazawa, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

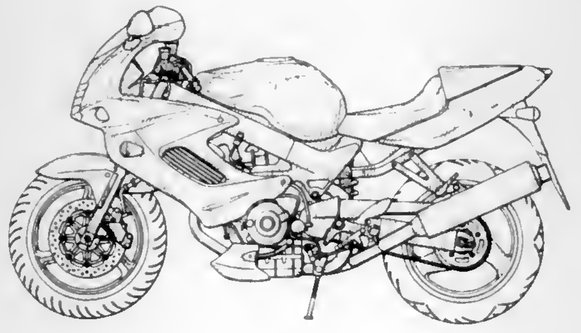
Filed Oct. 22, 1996, Ser. No. 61,356

Claims priority, application Japan, Apr. 22, 1996, 8-11673

Term of patent 14 years

LOC (6) Cl. 12 - *11*

U.S. Cl. D12—110



401,185

VEHICLE

Gerard Gabriel McGovern, Coventry, England, assignor to Rover Group Limited, Warwick, England

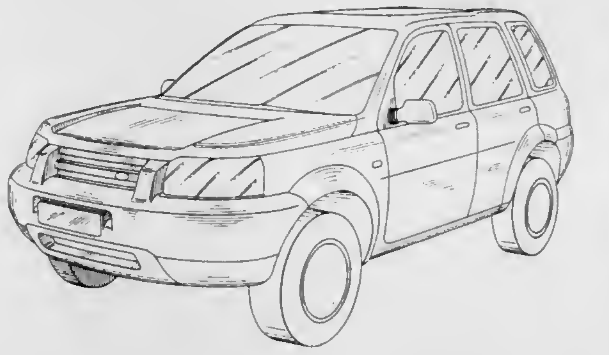
Filed Oct. 10, 1996, Ser. No. 60,894

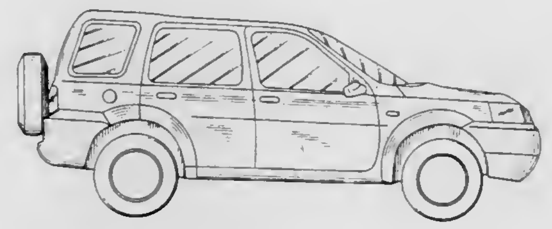
Claims priority, application United Kingdom, Apr. 26, 1996, 2055868; Apr. 26, 1996, 2055869; Apr. 26, 1996, 2055870; Apr. 26, 1996, 2055871

Term of patent 14 years

LOC (6) Cl. 12 - *08*

U.S. Cl. D12—91





401,186

AUTOMOBILE BODY

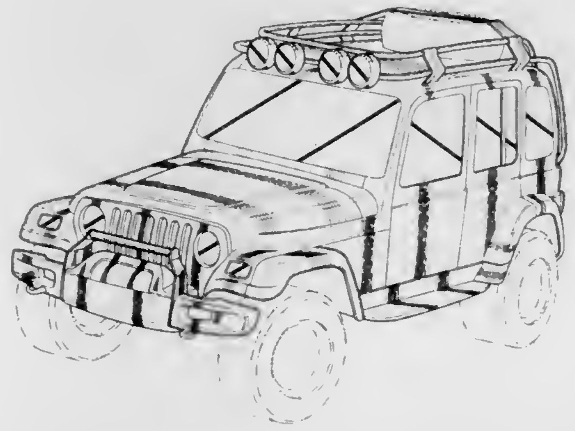
Glenn Abbott, West Bloomfield; Brandon L. Faurote, Rochester Hills, and John P. Sgalia, Farmington Hills, all of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.

Filed Dec. 20, 1996, Ser. No. 63,981

Term of patent 14 years

LOC (6) Cl. 12 - *08*

U.S. Cl. D12—91



401,187

BICYCLE FRAME

Michael Ninic, Landsberg, and Kris Tomasson, Munich, both of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Germany

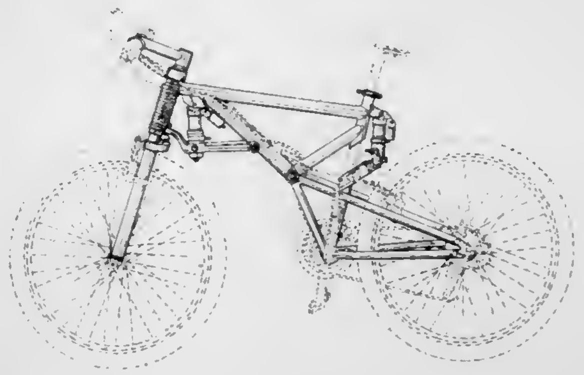
Filed Sep. 5, 1996, Ser. No. 59,730

Claims priority, application Germany, Mar. 5, 1996, M 96 02 195.0

Term of patent 14 years

LOC (6) Cl. 12 - *11*

U.S. Cl. D12—111



401,188

MOTORCYCLE OIL TANK WITH VISIBLE GROOVES

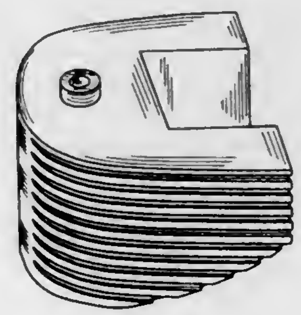
Greg Shickle, 4370 Bell Rd., Auburn, Calif. 95602

Filed Apr. 17, 1995, Ser. No. 37,555

Term of patent 14 years

LOC (6) Cl. 12 - *06*

U.S. Cl. D12—114



401,189

MOTORCYCLE MASTER CYLINDER HOUSING

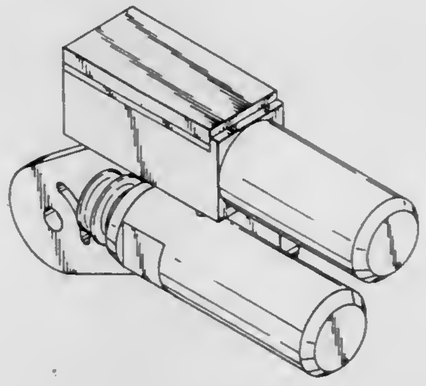
Robert P. Carone, 28028 Ridgecove Ct., Rancho Palos Verdes, Calif. 90275

Filed Mar. 22, 1995, Ser. No. 36,542

Term of patent 14 years

LOC (6) Cl. 01 - *00*

U.S. Cl. D12—126



401,190

MOTOR SCOOTER

Andreas Krause, Schmalbachstrasse 9, D-38112 Braunschweig, Germany

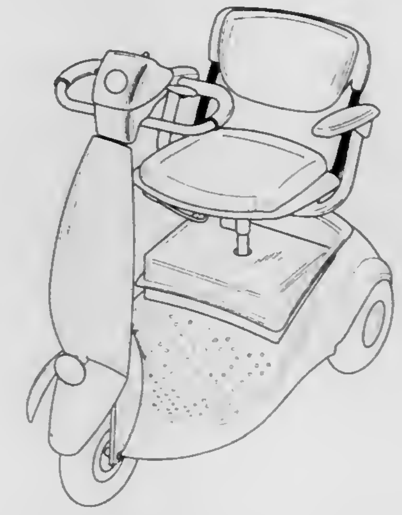
Filed Mar. 31, 1997, Ser. No. 69,740

Claims priority, application Hague Agreement, Sep. 30, 1996, DM/037 686

Term of patent 14 years

LOC (6) Cl. 01 - *00*

U.S. Cl. D12—128



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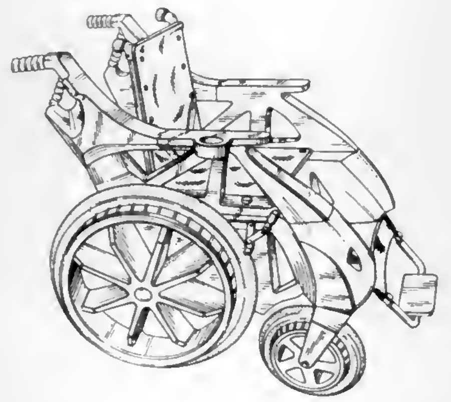
401,191

ALL TERRAIN WHEELCHAIR

Brian Gagnon, 4311 NW. 64th Ave., Coral Springs, Fla. 33067
Filed Jan. 14, 1998, Ser. No. 82,067
Term of patent 14 years
LOC (6) Cl. 12 - *12*

U.S. Cl. D12—131

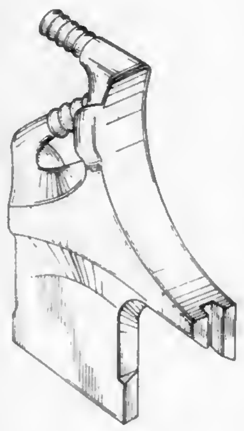


401,192

WHEELCHAIR HANDLE

Brian Gagnon, 4311 NW. 64th Ave., Coral Springs, Fla. 33067
Filed Feb. 27, 1998, Ser. No. 84,304
Term of patent 14 years
LOC (6) Cl. 12 - *12*

U.S. Cl. D12—133

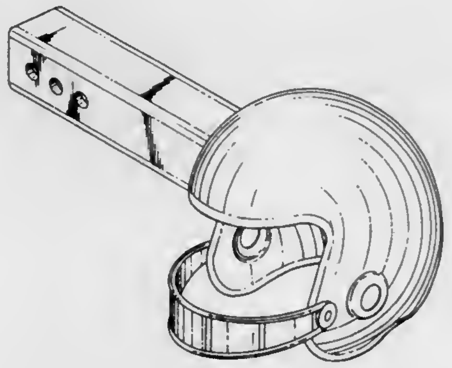


401,193

FOOTBALL HELMET HITCH PLUG

Patrick M. Julian, 6909 Weedin Pl. N.E., Apartment B-402, Seattle, Wash. 98115
Filed Apr. 18, 1998, Ser. No. 86,725
Term of patent 14 years
LOC (6) Cl. 12 - *16*

U.S. Cl. D12—162

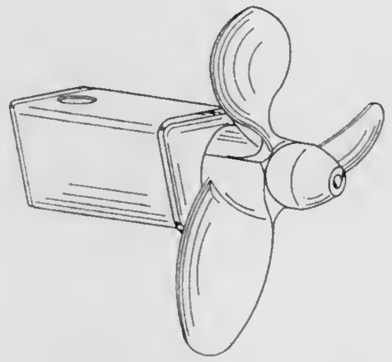


401,194

AUTOMOBILE HITCH COVER

Cary J. Harwood, 71106 Indiana Lake Dr., Union, Mich. 49130
Filed Oct. 15, 1996, Ser. No. 61,031
Term of patent 14 years
LOC (6) Cl. 12 - *16*

U.S. Cl. D12—162

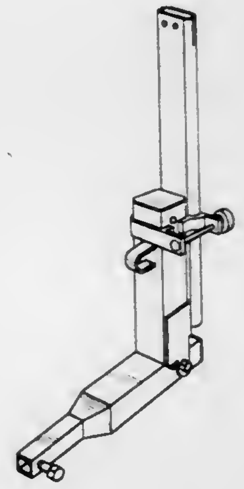


401,195

RACK HITCH MOUNT

Thomas A. Chimenti, Fairfield, Conn., assignor to Industri AB Thule, Hillerstorp, Sweden
Filed Jun. 13, 1997, Ser. No. 72,911
Term of patent 14 years
LOC (6) Cl. 12 - *16*

U.S. Cl. D12—162

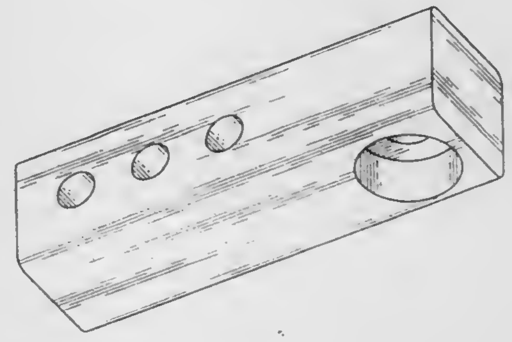


401,196

TRAILER HITCH

Kurt O. Hartwig, 112 Monte Vista Dr., Woodland, Calif. 95695
Filed Oct. 14, 1997, Ser. No. 77,951
Term of patent 14 years
LOC (6) Cl. 12 - *16*

U.S. Cl. D12—162

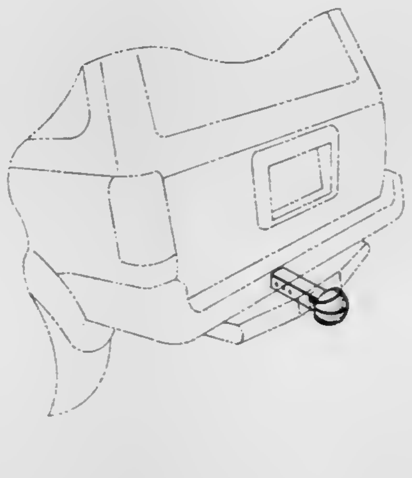


401,197

BASKETBALL HITCH PLUG

Patrick M. Julian, 6909 Weedin Pl. N.E. - Apartment B-402, Seattle, Wash. 98115
Filed Mar. 17, 1998, Ser. No. 85,121
Term of patent 14 years
LOC (6) Cl. 12 - *16*

U.S. Cl. D12—162

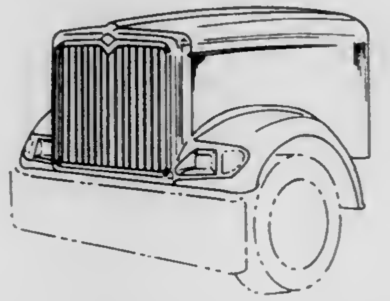


401,198

EXTERIOR SHELL OF A VEHICLE HOOD

Franz Mueller; James P. Pennell, and Robert S. Tirey, all of Fort Wayne, Ind., assignors to Navistar International Transportation Corp, Chicago, Ill.
Filed Dec. 10, 1997, Ser. No. 80,491
Term of patent 14 years
LOC (6) Cl. 12 - *16*

U.S. Cl. D12—173



401,199
SPOILER WITH LEGS

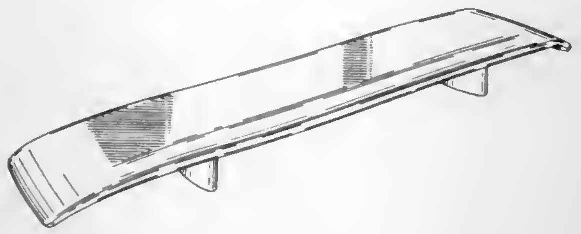
Robert L. Kovach, Independence, and Robert A. Kovach, Auburn, both of Ohio, assignors to Dawn Enterprises, Inc., Valley View, Ohio

Filed Sep. 11, 1995, Ser. No. 43,747

Term of patent 14 years

LOC (6) Cl. 12 - *16*

U.S. Cl. D12—181



401,200
REARVIEW MIRROR

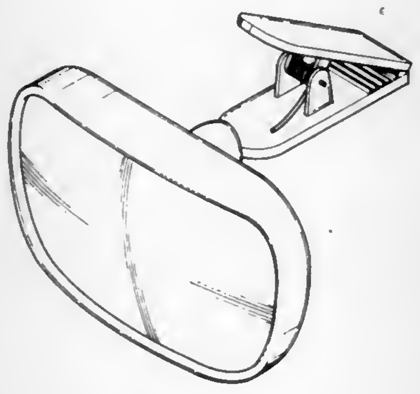
Chi San Huang, P.O. Box 1032, Tainan, Taiwan

Filed Jan. 5, 1998, Ser. No. 82,693

Term of patent 14 years

LOC (6) Cl. 12 - *16*

U.S. Cl. D12—187



401,201
GAUGE POD FOR CUSTOMIZED AUTOMOBILE BODY

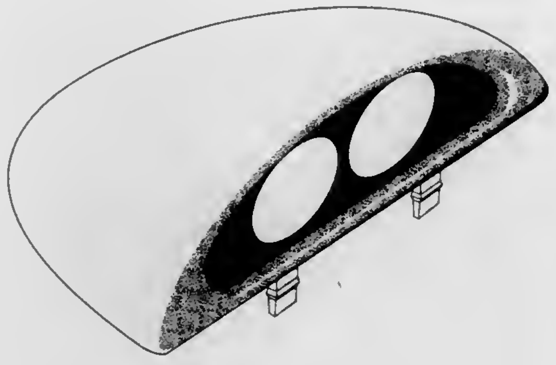
Stephen M. Saleen, Diamond Bar, Calif., assignor to Saleen Performance, Inc., Irvine, Calif.

Filed Jul. 5, 1995, Ser. No. 41,071

Term of patent 14 years

LOC (6) Cl. 12 - *16*

U.S. Cl. D12—192



401,202
HOOD ORNAMENT

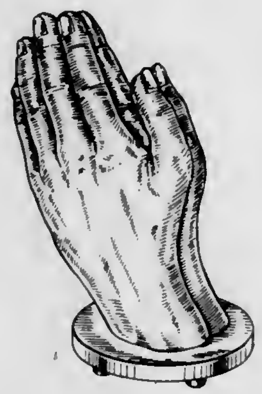
Thomas T. Washington, Sr., 846 Piney Grove Rd., Apt. E2, Columbia, S.C. 29210

Filed Feb. 20, 1998, Ser. No. 83,974

Term of patent 14 years

LOC (6) Cl. 12 - *16*

U.S. Cl. D12—200



401,203
VEHICLE FLOOR MAT

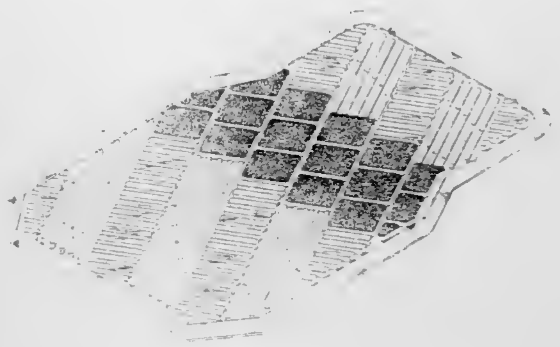
Michael Lu, 58, Ma Yuan West St., Taichung, Taiwan

Filed Feb. 25, 1998, Ser. No. 84,127

Term of patent 14 years

LOC (6) Cl. 12 - *16*

U.S. Cl. D12—203



401,204
WHEEL

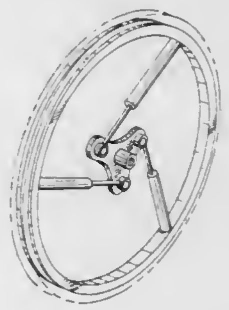
Sabah Naser Al-Sabah, P.B. 36777, Al-Ras 24758, Kuwait

Division of Ser. No. 73,507, Jul. 15, 1997. This application Apr. 16, 1998, Ser. No. 86,591

Term of patent 14 years

LOC (6) Cl. 12 - *16*

U.S. Cl. D12—204



401,205
FRONT FACE OF A VEHICLE WHEEL

Corrado Fischer, Venice, Italy, assignor to Mercedes-Benz AG, Stuttgart, Germany

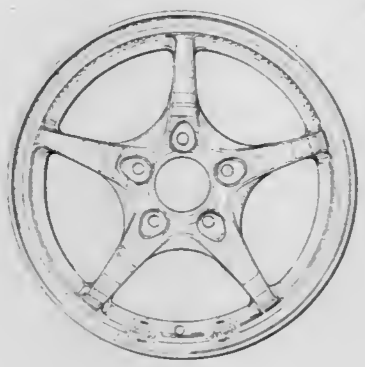
Filed Aug. 19, 1996, Ser. No. 58,550

Claims priority, application Germany, Feb. 19, 1996, M 96 01 421.0

Term of patent 14 years

LOC (6) Cl. 12 - *16*

U.S. Cl. D12—209



401,206
VEHICLE WHEEL FRONT FACE

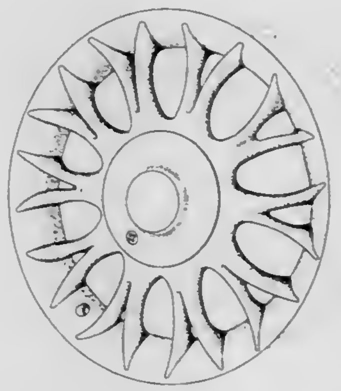
Violeta Ivanova, Chino, Calif., assignor to American Eagle Wheel Corporation, Chino, Calif.

Filed Jan. 16, 1998, Ser. No. 82,171

Term of patent 14 years

LOC (6) Cl. 12 - *16*

U.S. Cl. D12—209



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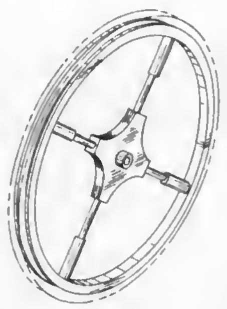
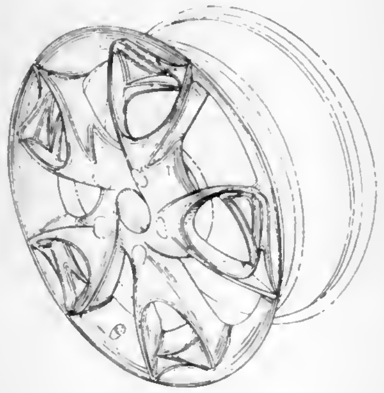
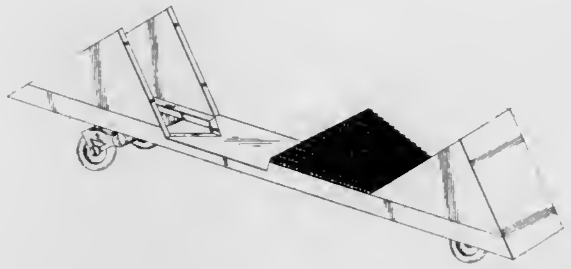
401,207
WHEEL
Sabah Naser Al-Sabah, P.B. 36777 Al Ras, 24758 Kuwait, Kuwait
Filed Jul. 15, 1997, Ser. No. 73,507
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—209



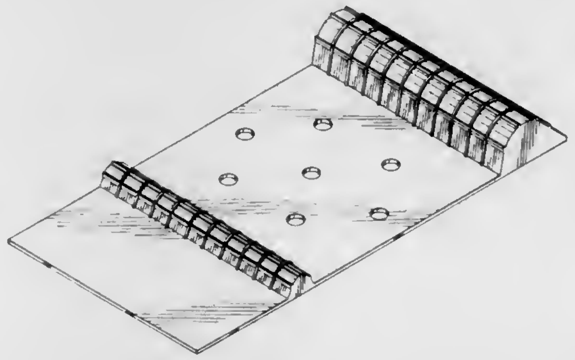
401,208
VEHICLE-WHEEL FRONT FACE
Mark D. Neeper, Denver, Colo., assignor to Mobile Hi-Tech Wheels, Torrance, Calif.
Filed Jan. 6, 1998, Ser. No. 81,552
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—209



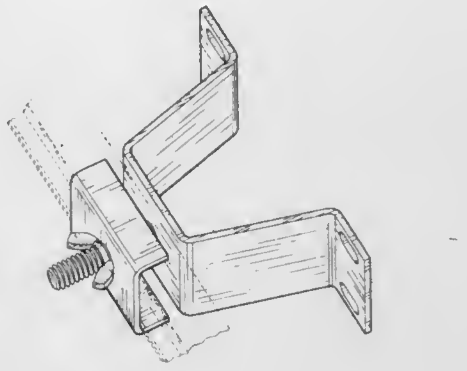
401,209
VEHICLE FOR USE IN OUTER SPACE AS A SPACE PROBE, PLANETARY ROVER OR SPACESHIP
Kenneth M. Gaiter, 680 Lawton St., SW., Apt. 5, Atlanta, Ga. 30310
Filed Jan. 28, 1997, Ser. No. 65,401
Term of patent 14 years
LOC (6) Cl. 12 - *07*
U.S. Cl. D12—320



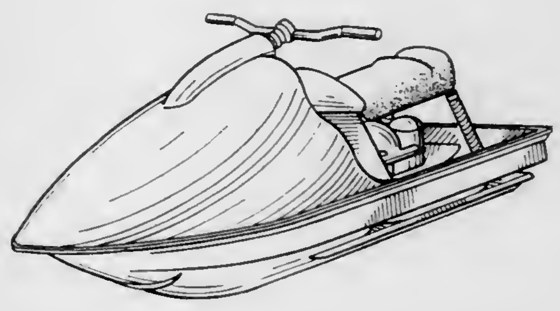
401,210
WHEEL CHOCK
Chin-Fu Chiang, No. 182, Sec. 1, Chin-Hwa Rd., Tainan City, Taiwan
Filed Oct. 23, 1997, Ser. No. 79,151
Term of patent 14 years
LOC (6) Cl. 12 - *06*
U.S. Cl. D12—217



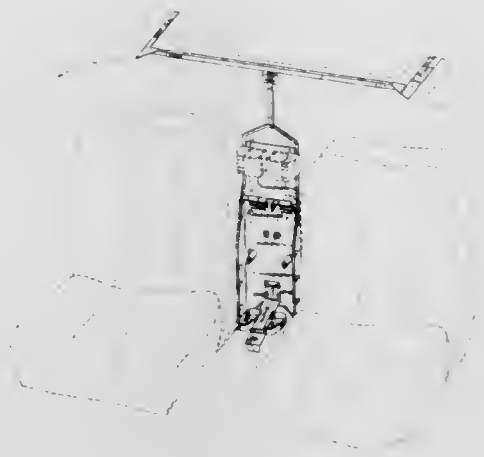
401,211
JACK BRACKET
Patrick F. Simpson, 266 W. Post St., Bloomfield, Ind. 47424
Filed Sep. 4, 1996, Ser. No. 59,161
Term of patent 14 years
LOC (6) Cl. 12 - *06*
U.S. Cl. D12—223



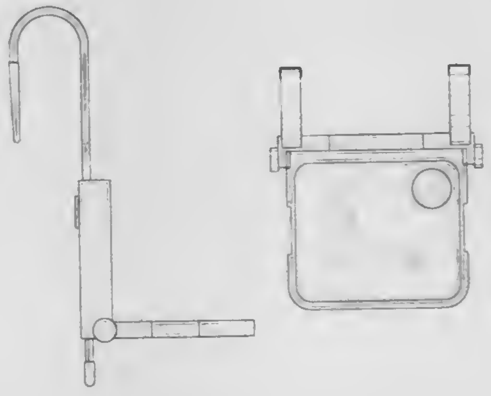
401,212
PERSONAL WATERCRAFT
Bruno A. Tapolsky, Sausalito; Michael R. Hector, Tiburon; Curt A. Bitter, Sausalito, and Timothy S. Wadleigh, Novato, all of Calif., assignors to Stealth Performance Corp., San Rafael, Calif.
Filed Dec. 10, 1996, Ser. No. 63,570
Term of patent 14 years
LOC (6) Cl. 12 - *06*
U.S. Cl. D12—307



401,213
VEHICLE RIFLE MOUNT
Rory Daniel Inchaurregui, Loomis, Calif., assignor to Inch's Tooling & Machining, Loomis, Calif.
Filed Jan. 7, 1998, Ser. No. 81,589
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—406



401,214
VEHICLE SEAT ATTACHED MULTI-PURPOSE TRAY
Rick Benavidez, and Annmarie Benavidez, both of 9801 Old Baymeadows Rd. #8, Jacksonville, Fla. 32256
Filed Feb. 2, 1998, Ser. No. 83,188
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—716



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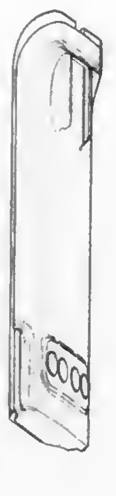
401,215
BATTERY HOUSING

Douglas W. Moskowitz, Ft. Lauderdale, and Craig F. Siddoway, Davie, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 2, 1998, Ser. No. 83,383
Term of patent 14 years
LOC (6) Cl. 13 - *02*

U.S. Cl. D13—103

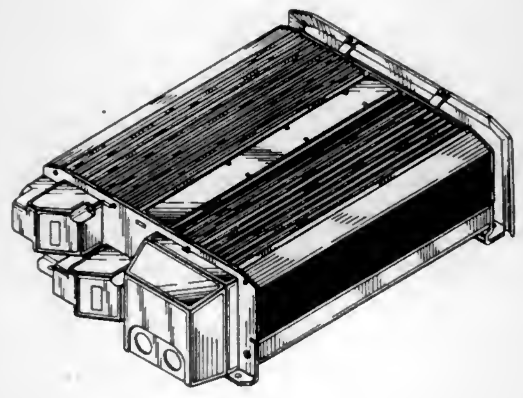


401,216
POWER CONVERTER

Edward Andre Person, Coquitlam; Jeffrey Romeo Franchini, Burnaby; Douglas Kenneth Manness, Port Coquitlam; William Ernest Fenton, Surrey, and Donald Putt, North Vancouver, all of Canada, assignors to Statpower Technologies Corporation, Burnaby, Canada

Filed Apr. 30, 1997, Ser. No. 70,125
Term of patent 14 years
LOC (6) Cl. 13 - *02*

U.S. Cl. D13—110

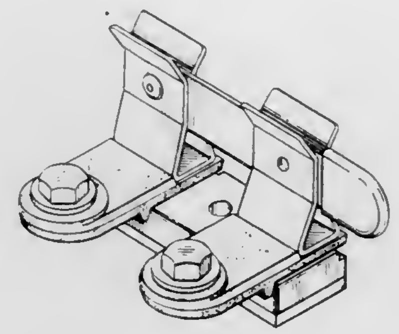


401,217
BATTERY DISCONNECT SWITCH

Steven E. Wirth, Bloomington, Minn., assignor to WirthCo Engineering, Inc., Bloomington, Minn.

Filed Nov. 6, 1997, Ser. No. 79,001
Term of patent 14 years
LOC (6) Cl. 13 - *03*

U.S. Cl. D13—120

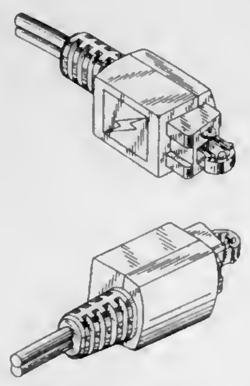


401,218
POWER CONNECTOR

Lena Charlott Brorsson, Lund; Jan Gustav Atterklint, Skärholmen; Sven Ingvar Sjöqvist, Tullinge, all of Sweden; Jacobus Nicolaas Tuin, Best, Netherlands, and Carl-Magnus Hansson, Lund, Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Oct. 4, 1996, Ser. No. 60,692
Claims priority, application Sweden, Apr. 4, 1996, 96-0772
Term of patent 14 years
LOC (6) Cl. 13 - *03*

U.S. Cl. D13—133

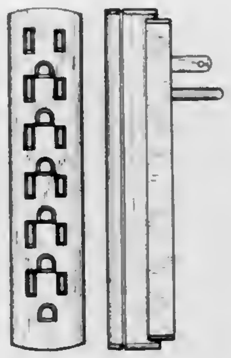


401,219
SOCKET

Albert Stekelenburg, Taipei, Taiwan, assignor to All-Line Inc., Taipei, Taiwan

Filed Dec. 5, 1996, Ser. No. 62,936
Term of patent 14 years
LOC (6) Cl. 13 - *03*

U.S. Cl. D13—137.2

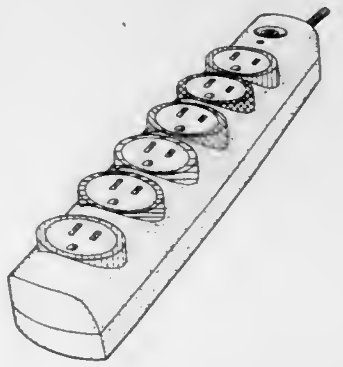


401,220
POWER STRIP

Mark M. Dwight, Palo Alto; Robert M. Bruce, San Francisco, both of Calif., and Curt G. Bingham, Salt Lake City, Utah, assignors to ACCO Brands, Inc., Lincolnshire, Ill.

Filed Jul. 2, 1996, Ser. No. 56,556
Term of patent 14 years
LOC (6) Cl. 13 - *03*

U.S. Cl. D13—139.6

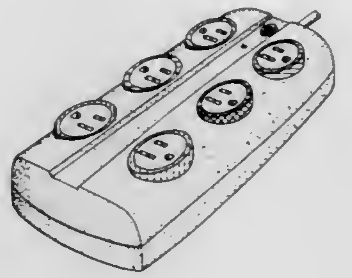


401,221
ELECTRICAL OUTLET

Mark M. Dwight, Palo Alto; Robert M. Bruce, San Francisco, both of Calif., and Curt G. Bingham, Salt Lake City, Utah, assignors to ACCO Brands, Inc., Lincolnshire, Ill.

Filed Jul. 2, 1996, Ser. No. 56,557
Term of patent 14 years
LOC (6) Cl. 13 - *03*

U.S. Cl. D13—139.6

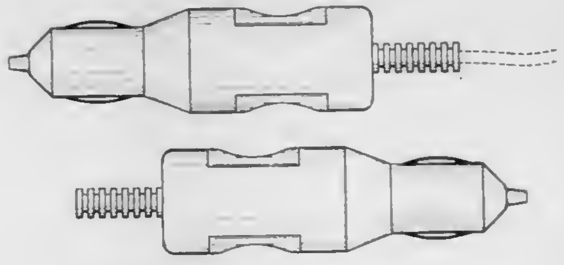


401,222
CIGARETTE LIGHTER ADAPTER

Thomas Wilfred LeBlanc, 150 Bowers Ave., Watertown, N.Y. 13601

Filed Feb. 2, 1998, Ser. No. 83,192
Term of patent 14 years
LOC (6) Cl. 13 - *03*

U.S. Cl. D13—144



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401,223
PACKING PIECE HALF FOR A MULTI CABLE LEED THROUGH

Erik Lindborg, Karlskrona, Sweden, assignor to Lycab AB, Karlskrona, Sweden

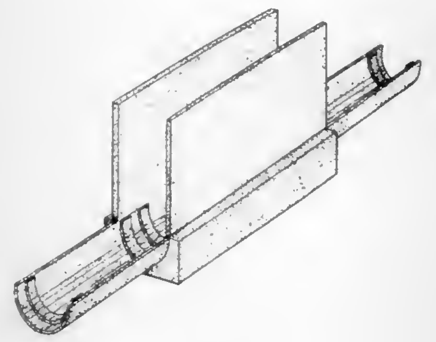
Filed Sep. 23, 1996, Ser. No. 60,120

Claims priority, application Sweden, Mar. 22, 1996, 96-0679

Term of patent 14 years

LOC (6) Cl. 13 - *03*

U.S. Cl. D13—155



401,224
CABLING CHANNEL FOR MODULAR OFFICE SYSTEMS

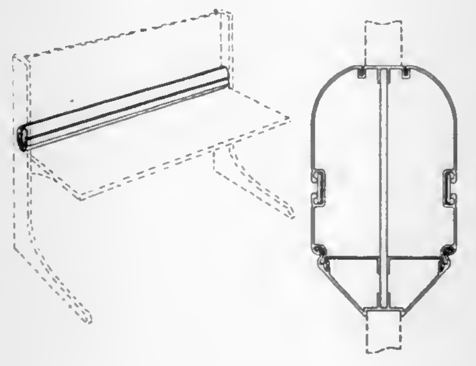
Lloyd C. Mollenkopf, Apple Valley; Russell J. Rein, St. Louis Park; James Hennan, Farmington, and Brian A. Pleschourt, Northfield, all of Minn., assignors to Rosemount Office Systems, Inc., Lakeville, Minn.

Filed Jun. 4, 1997, Ser. No. 71,708

Term of patent 14 years

LOC (6) Cl. 13 - *03*

U.S. Cl. D13—155



401,225
HEAT SINK

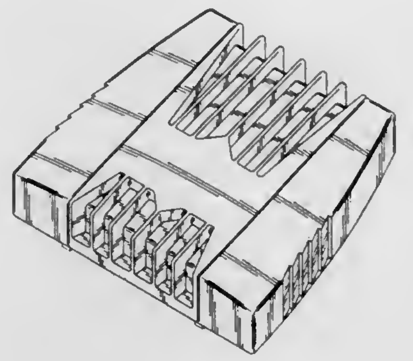
Timothy R. Maack, Mesa, Ariz.; J. Carroll Mays, Woodland Hills, Calif.; David Serpell-Morris, Thousand Oaks, Calif., and Bob Duane Wake, Altadena, Calif., assignors to Rockford Corporation, Tempe, Ariz.

Filed Feb. 27, 1997, Ser. No. 67,375

Term of patent 14 years

LOC (6) Cl. 13 - *03*

U.S. Cl. D13—179



401,226
HOUSING FOR AN ELECTRICAL DEVICE

Toshio Inoko, Nisshin, Japan, assignor to Maspro Denkoh Co., Ltd., Nisshin, Japan

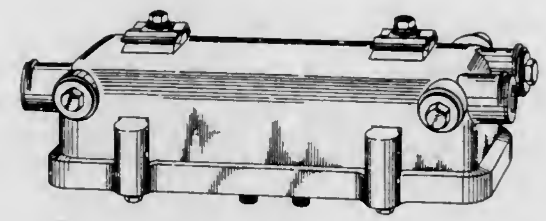
Filed Sep. 25, 1996, Ser. No. 60,257

Claims priority, application Japan, Jul. 12, 1996, 8-20972

Term of patent 14 years

LOC (6) Cl. 13 - *02*

U.S. Cl. D13—184



401,227
CONSOLE STRUCTURE

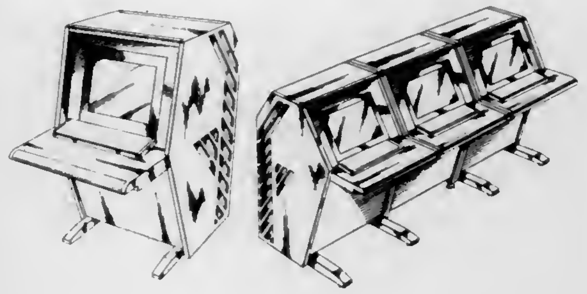
David Catta, Calgary, Canada, assignor to Evans Consoles, Inc., Canada

Filed Apr. 26, 1996, Ser. No. 53,837

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—103



401,228
ELECTRONIC COMPUTER

Takaharu Ando, Ibaraki-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

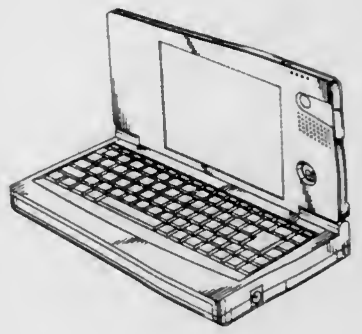
Division of Ser. No. 72,432, Jun. 17, 1997. This application Nov. 18, 1997, Ser. No. 82,695

Claims priority, application Japan, Feb. 14, 1997, 9-3948

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—106



401,229
DATA STORAGE DISK DRIVE HOUSING

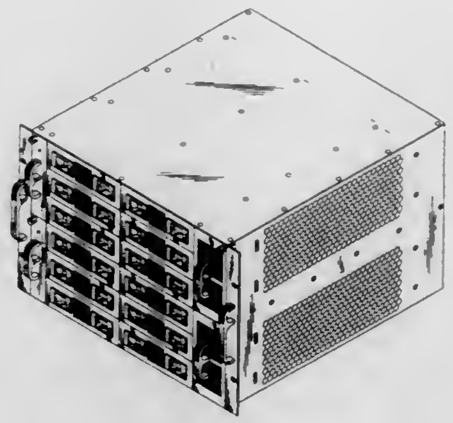
Kurt S. Roehrs, Webster, and James H. O'Brien, Shrewsbury, both of Mass., assignors to Storage Computer Corporation, Nashua, N.H.

Filed Mar. 12, 1997, Ser. No. 67,986

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—109



401,230
SET OF ICONS FOR THE DISPLAY SCREEN OF A VIDEO MONITOR

Marsh S. Marshall, Jr., Washington, D.C.; Morgan C. J. Almeida, London, England; Peter C. Stonier, Washington, D.C., and George D. Escobar, Herndon, Va., assignors to Bell Video Services Company, Reston, Va.

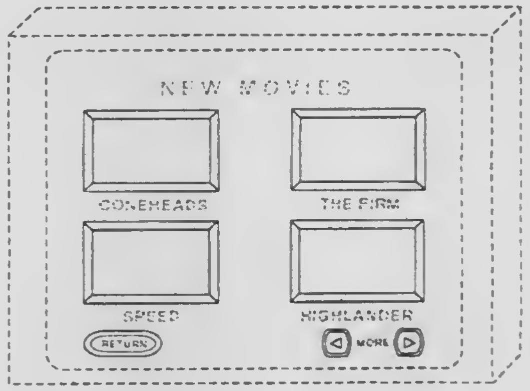
Filed Oct. 5, 1994, Ser. No. 29,437

The portion of the term of this patent subsequent to Nov. 3, 2012, has been disclaimed.

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—114.1



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401,231
COMPUTER SCREEN

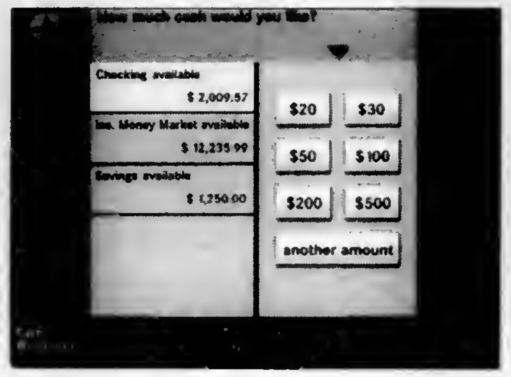
Howard A. Schechtman, Agoura Hills; Peter Paradiso, Santa Monica; Frank McCallick, Ventura; Melvin Michio Takata, Thousand Oaks, all of Calif.; Matt Alancheril, Austin, Tex.; Steven Skov Holt, San Francisco, Calif.; Gregory Horn; Michelle Lassman, both of Palo Alto, Calif.; Mark Rolston, Austin, Tex.; Johannes von Sichart, Palo Alto, Calif., and Ian Steyaert, Austin, Tex., assignors to Citicorp Development Center, Los Angeles, Calif.

Filed Aug. 12, 1996, Ser. No. 58,352

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—114.1



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$ 2,009.57

Ins. Money Market available
$ 12,235.99

Savings available
$ 1,250.00

401,232
COMPUTER DISPLAY WITH A COMPUTER GENERATED ICON

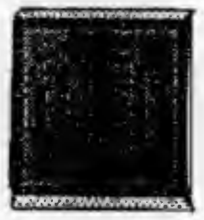
Mark Christensen, West St. Paul, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.

Filed Jan. 24, 1997, Ser. No. 65,361

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D14—114.3



401,233
PORTABLE RADIOTELEPHONE

Katsuhiro Yamaguchi, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

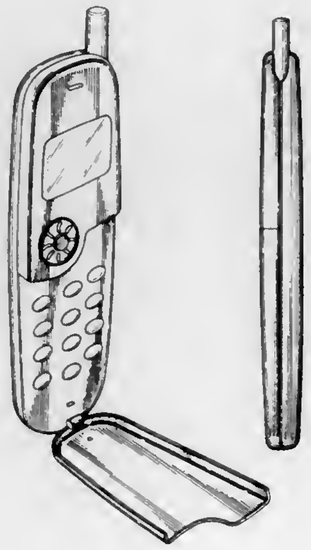
Filed Jan. 16, 1998, Ser. No. 83,564

Claims priority, application Japan, Aug. 22, 1997, 9-065168

Term of patent 14 years

LOC (6) Cl. 14 - *03*

U.S. Cl. D14—138



401,234
MODULAR TELEPHONE SET

Luc Forget, Kanata, Canada, assignor to Mitel Corporation, Kanata, Canada

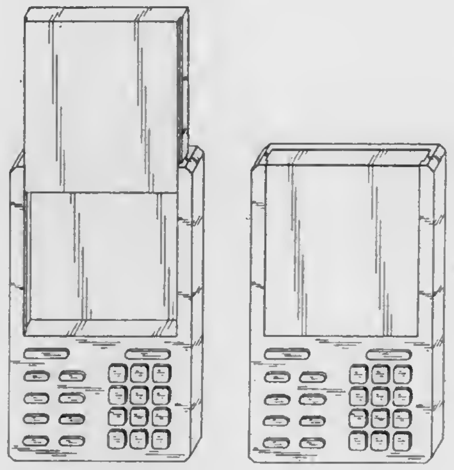
Filed Jun. 19, 1996, Ser. No. 55,981

Claims priority, application Canada, Dec. 22, 1995, 1995-2906

Term of patent 14 years

LOC (6) Cl. 14 - *03*

U.S. Cl. D14—147



401,235
CORDLESS TELEPHONE BASE

Mitsutaka Fuke, and Maki Tomoike, both of Hiroshima-ken, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

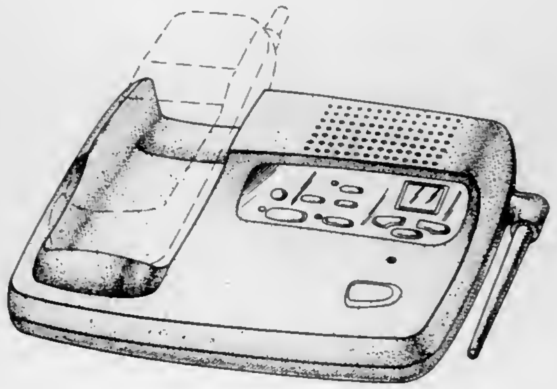
Filed Jun. 24, 1997, Ser. No. 75,917

Claims priority, application Japan, Dec. 24, 1996, 8-39195

Term of patent 14 years

LOC (6) Cl. 14 - *03*

U.S. Cl. D14—149



401,236
RADIO INCORPORATED WITH STATIONERY ORGANIZER

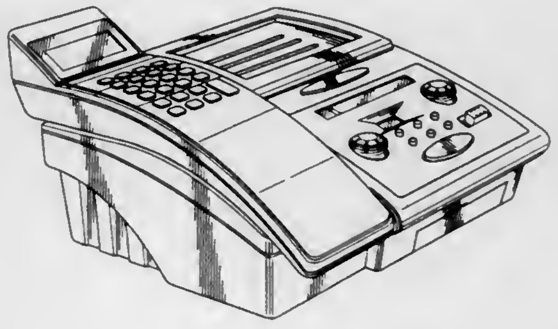
Tat-yin Fong, Shatin, Hong Kong, assignor to Roundup International Ltd., Hong Kong, Hong Kong

Filed Dec. 11, 1997, Ser. No. 80,512

Term of patent 14 years

LOC (6) Cl. 14 - *01*

U.S. Cl. D14—168



401,237
COMBINED PORTABLE RADIO AND COMPACT DISC PLAYER

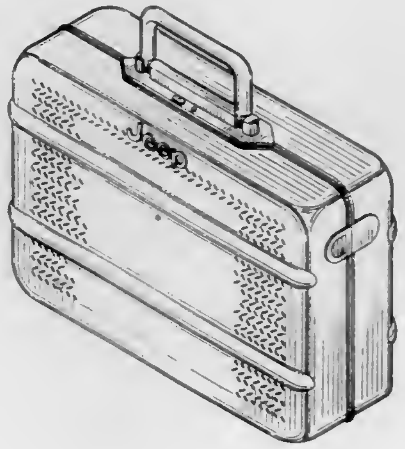
Karl Dallas Kirk, III, New York, N.Y., assignor to Kash 'N Gold, Ltd., Ronkonkoma, N.Y.

Filed Apr. 14, 1998, Ser. No. 86,494

Term of patent 14 years

LOC (6) Cl. 14 - *01*

U.S. Cl. D14—168



401,238
PAGER

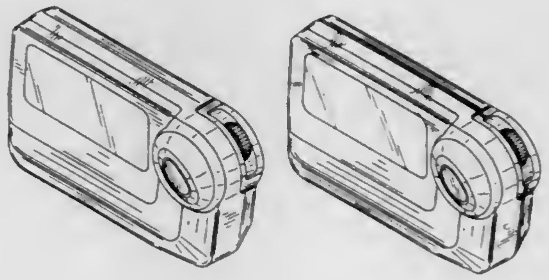
Daisuke Shiono, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 30, 1997, Ser. No. 72,777

Term of patent 14 years

LOC (6) Cl. 14 - *03*

U.S. Cl. D14—191



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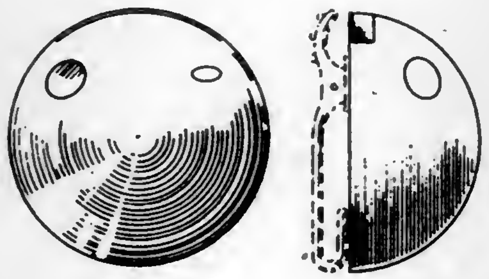
401,239
HEMISPHERICAL PAGER

David C. Delong, 3312 Edenborn Ave., No. 105, Metairie, La. 70002

Filed Jul. 24, 1997, Ser. No. 74,096
Term of patent 14 years
LOC (6) Cl. 14 - *03*

U.S. Cl. D14—191

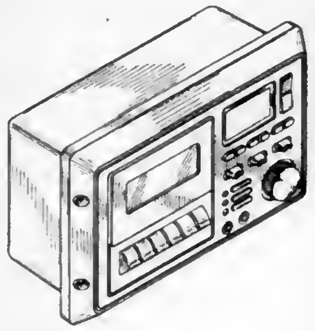


401,240
RADIO CABINET

Marvin J. Metzler, Elkhart, Ind., assignor to Mito Corporation, Elkhart, Ind.

Filed May 20, 1997, Ser. No. 70,967
Term of patent 14 years
LOC (6) Cl. 14 - *03*

U.S. Cl. D14—198

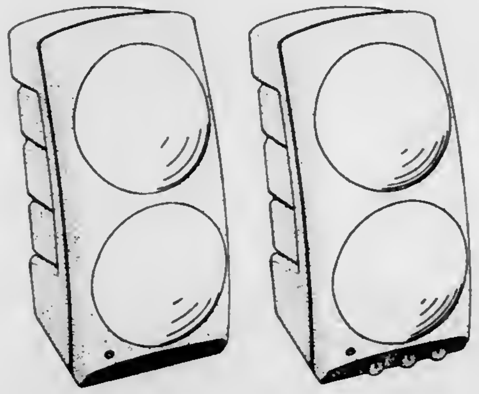


401,241
SPEAKER ENCLOSURE

Lars Runquist, Grove Heights, and David Copeland, Minneapolis, both of Minn., assignors to Telex Communications, Inc., Minneapolis, Minn.

Filed Jul. 16, 1996, Ser. No. 57,081
Term of patent 14 years
LOC (6) Cl. 14 - *01*

U.S. Cl. D14—215

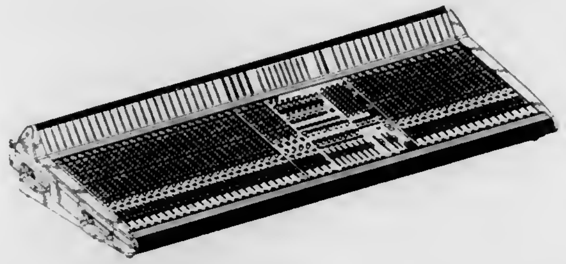


401,242
MIXER

Greg C. Mackie, Kirkland; Charles T. Jensen, Monroe, and Danilo O. Bonilla, Seattle, all of Wash., assignors to Mackie Designs Inc., Woodinville, Wash.

Filed May 2, 1996, Ser. No. 53,916
Term of patent 14 years
LOC (6) Cl. 14 - *01*

U.S. Cl. D14—217

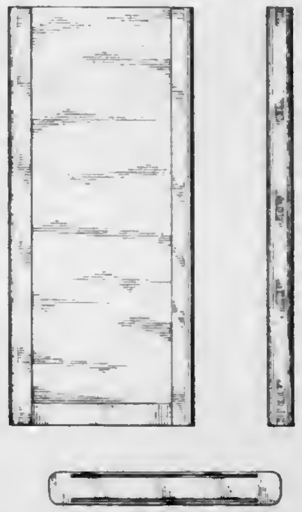


401,243
ANTENNA COVER

David A. Guttadauro, 365 Salem St., Wakefield, Mass. 01880

Filed Apr. 7, 1997, Ser. No. 67,920
Term of patent 14 years
LOC (6) Cl. 14 - *03*

U.S. Cl. D14—230

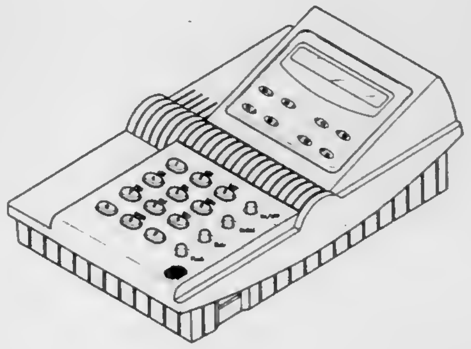


401,244
TALKING MODEM

Fu-Chin Cheng, 8Fl., No.542-7,Chung Cheng Rd., Hsin Tien City, Taipei Hsien, Taiwan

Filed Feb. 25, 1997, Ser. No. 67,055
Term of patent 14 years
LOC (6) Cl. 14 - *03*

U.S. Cl. D14—242

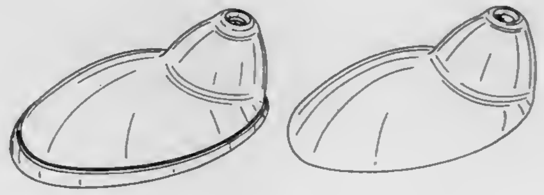


401,245
ANTENNA BASE

Alexander Benn, and Eckard Ruoff, both of Stuttgart, Germany, assignors to Richard Hirschmann GmbH & Co., Neckartenzlingern, Germany

Filed Jun. 23, 1997, Ser. No. 72,673
Term of patent 14 years
LOC (6) Cl. 14 - *03*

U.S. Cl. D14—238

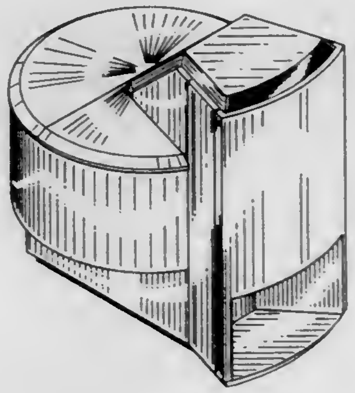


401,246
PAINT DISPENSER

Michael Jacobus Johannes Langeveld, Zoetermeer, and Johannes Hermanus Nicolaas Post, Sassenheim, both of Netherlands, assignors to Fluid Management, Inc., Wheeling, Ill.

Filed Jan. 22, 1996, Ser. No. 49,314
Term of patent 14 years
LOC (6) Cl. 15 - *02*

U.S. Cl. D15—7



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401,247
WOOD-TURNING LATHE

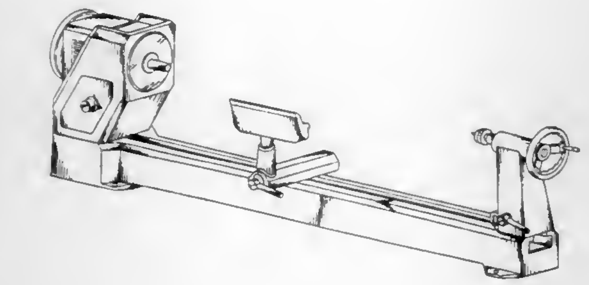
Chin Feng Wang, Taichung Hsien, Taiwan, assignor to Colovos Co., Ltd., Taichung Hsien, Taiwan

Filed Jun. 23, 1997, Ser. No. 72,971

Term of patent 14 years

LOC (6) Cl. 15 - *09*

U.S. Cl. D15—130



401,248
ROLLER MILL

Georg Schrepfer, Niederuzwil, Switzerland, assignor to Buhler AG, Uzwil, Switzerland

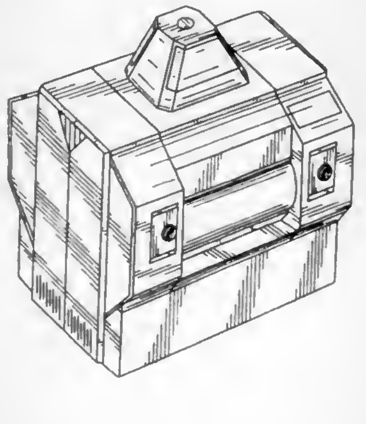
Filed Jun. 4, 1997, Ser. No. 72,209

Claims priority, application Switzerland, Dec. 20, 1959, 123791

Term of patent 14 years

LOC (6) Cl. 15 - *09*

U.S. Cl. D15—131



401,249
ROLLER FOR A WIRE SAW FOR SEMICONDUCTORS

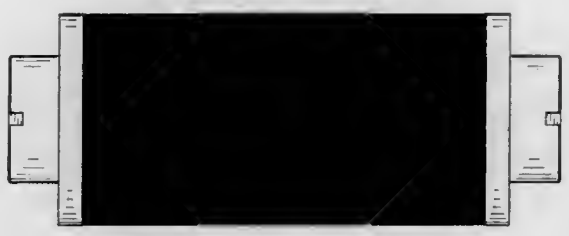
Akio Kawakita, Yokohama, Japan, assignor to Nippei Toyama Corporation, Tokyo, Japan

Filed Aug. 12, 1997, Ser. No. 75,089

Term of patent 14 years

LOC (6) Cl. 15 - *09*

U.S. Cl. D15—133



401,250
SHIELD AND COVER FOR TARGET OF SPUTTER COATING APPARATUS

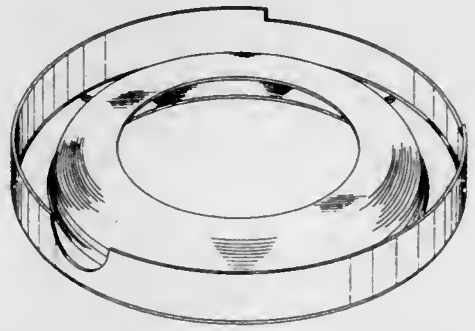
Andrew William Tudhope, Danville; David Bruce Jordan, San Jose, and Josè Luis Gonzalez, Redwood City, all of Calif., assignors to Semiconductor Equipment Technology, San Jose, Calif.

Filed Jan. 27, 1998, Ser. No. 82,599

Term of patent 14 years

LOC (6) Cl. 15 - *09*

U.S. Cl. D15—138



401,251
SHIELD AND COVER FOR TARGET OF SPUTTER COATING APPARATUS

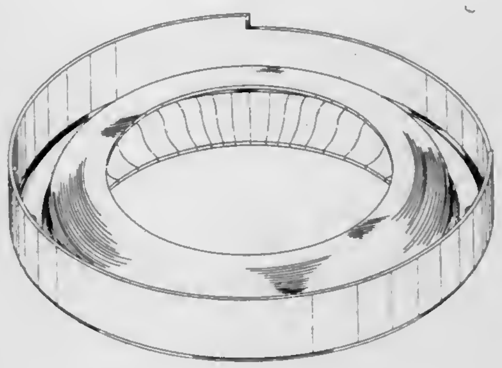
Andrew William Tudhope, Danville; David Bruce Jordan, San Jose, and Josè Luis Gonzalez, Redwood City, all of Calif., assignors to Semiconductor Equipment Technology, San Jose, Calif.

Filed Jan. 27, 1998, Ser. No. 82,617

Term of patent 14 years

LOC (6) Cl. 15 - *09*

U.S. Cl. D15—138



401,252
SHIELD AND COVER FOR TARGET OF SPUTTER COATING APPARATUS

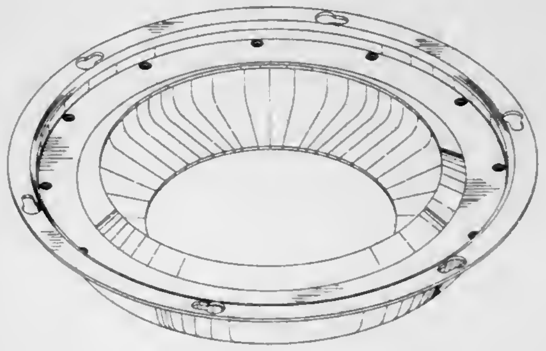
Andrew William Tudhope, Danville; David Bruce Jordan, San Jose, and Josè Luis Gonzalez, Redwood City, all of Calif., assignors to Semiconductor Equipment Technology, San Jose, Calif.

Filed Jan. 27, 1998, Ser. No. 82,647

Term of patent 14 years

LOC (6) Cl. 15 - *09*

U.S. Cl. D15—138



401,253
THROW AWAY TIP FOR CUTTING TOOLS

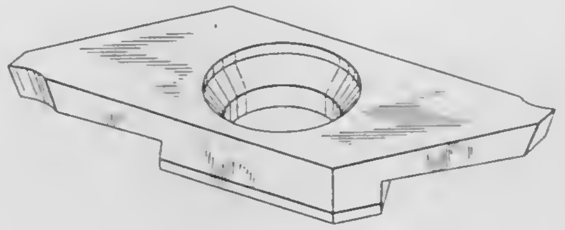
Takashi Inayama, and Tatsuji Kinukawa, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Jun. 30, 1997, Ser. No. 73,837

Term of patent 14 years

LOC (6) Cl. 15 - *09*

U.S. Cl. D15—139



401,254
BRUSH RING

Kimmo Sajakorpi, and Reijo Kuivikko, both of Tampere, Finland, assignors to Sajakorpi Oy, Tampere, Finland

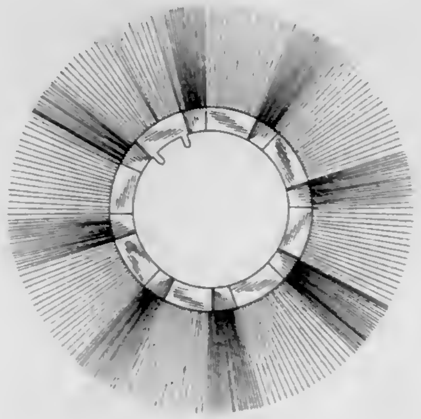
Filed Feb. 28, 1997, Ser. No. 67,114

Claims priority, application Finland, Sep. 3, 1996, 580/96

Term of patent 14 years

LOC (6) Cl. 15 - *99*

U.S. Cl. D15—199



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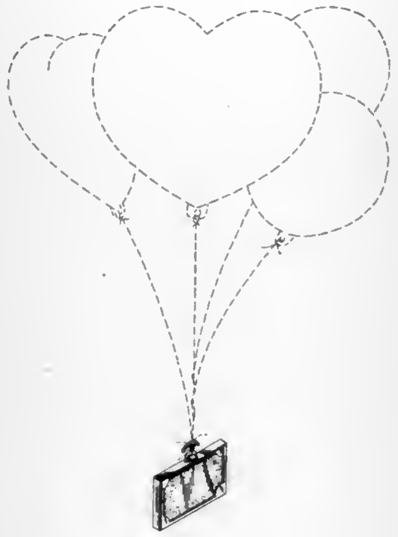
401,255

BALLOON WEIGHT

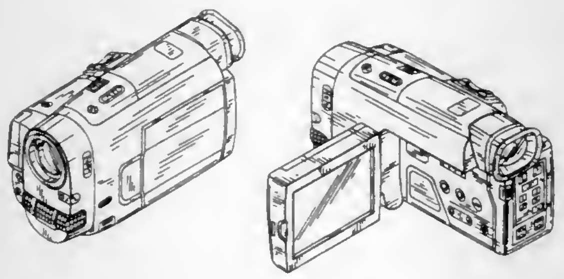
Clark J. Burns, P.O. Box 430, O'Fallon, Mo. 63366-0430
Filed Feb. 2, 1998, Ser. No. 82,968
Term of patent 14 years
LOC (6) Cl. 15 - *09*
U.S. Cl. D15—199



401,256

VIDEO CAMERA COMBINED WITH VIDEO TAPE RECORDER

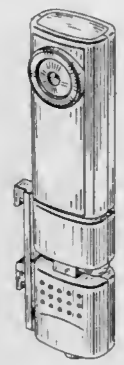
Tomohiro Harata, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Division of Ser. No. 42,751, Aug. 16, 1995, Pat. No. Des. 384,085. This application Jun. 12, 1997, Ser. No. 72,018
Claims priority, application Japan, Feb. 20, 1995, 7-3990
Term of patent 14 years
LOC (6) Cl. 16 - *01*
U.S. Cl. D16—202



401,257

ELECTRONIC STILL CAMERA

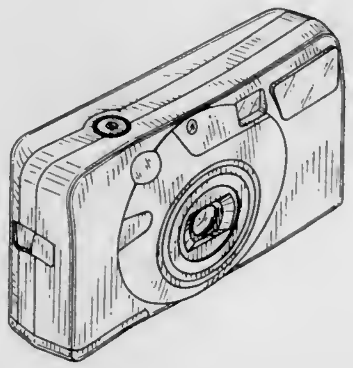
Masaaki Iino, Soka, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Dec. 23, 1997, Ser. No. 81,157
Claims priority, application Japan, Aug. 5, 1997, 9-63648
Term of patent 14 years
LOC (6) Cl. 16 - *01*
U.S. Cl. D16—218



401,258

CAMERA

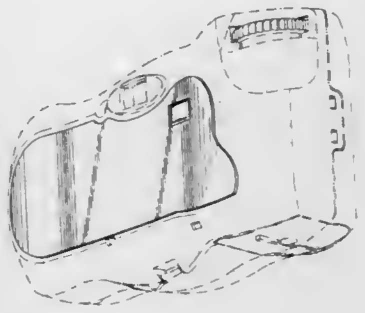
Kunihiko Tanaka, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Dec. 17, 1997, Ser. No. 80,834
Claims priority, application Japan, Jun. 20, 1997, 9-58890
Term of patent 14 years
LOC (6) Cl. 16 - *01*
U.S. Cl. D16—218



401,259

LABEL FOR A CAMERA

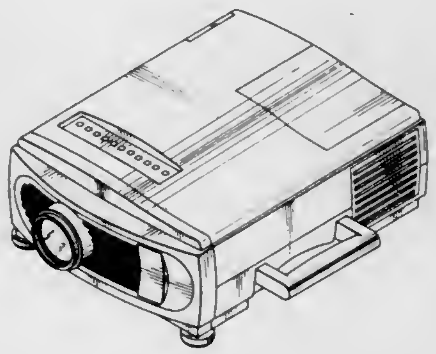
Steven S. Chapman, Corfu; Guy R. Vottis, Rochester, and Wayne Ingalls, Henrietta, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Nov. 6, 1997, Ser. No. 81,819
Term of patent 14 years
LOC (6) Cl. 16 - *05*
U.S. Cl. D16—219



401,260

LIQUID CRYSTAL VIDEO PROJECTOR

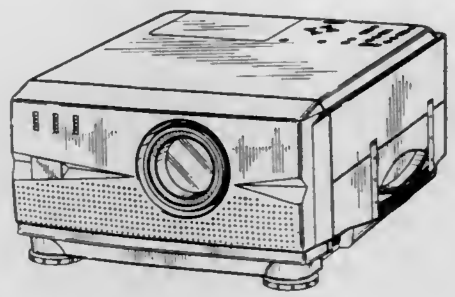
Ryo Kodama, and Hideki Yano, both of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 10, 1998, Ser. No. 83,392
Claims priority, application Japan, Sep. 26, 1997, 9-69279
Term of patent 14 years
LOC (6) Cl. 16 - *02*
U.S. Cl. D16—225



401,261

LIQUID CRYSTAL PROJECTOR

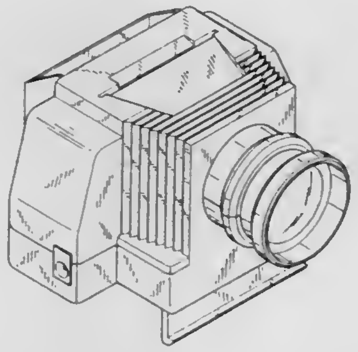
Yoichi Yamazaki, and Aki Nanjo, both of Kawasaki, Japan, assignors to Fujitsu General Limited, Kanagawa-ken, Japan
Filed Feb. 25, 1998, Ser. No. 84,153
Claims priority, application Japan, Aug. 26, 1997, 9-65778
Term of patent 14 years
LOC (6) Cl. 16 - *02*
U.S. Cl. D16—225



401,262

KINESCOPE

Yu-Shen Chen, Taipei Hsien, Taiwan, assignor to Wan Chang Precision Industries Co., Ltd., Taipei Hsien, Taiwan
Filed Feb. 5, 1998, Ser. No. 83,091
Term of patent 14 years
LOC (6) Cl. 16 - *02*
U.S. Cl. D16—227



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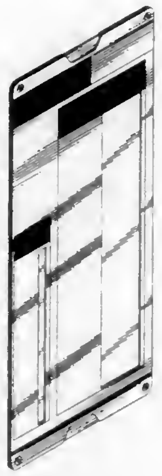
401,263
PHOTOGRAPHY GUIDE FOR DEPTH OF FIELD AND ACTION STOPPING SHUTTER SPEED

Robert J. McCabe, 328 SW. 176th Pl., Seattle, Wash. 98166
Continuation-in-part of Ser. No. 51,720, Mar. 15, 1996, abandoned. This application Aug. 1, 1996, Ser. No. 57,804
Term of patent 14 years
LOC (6) Cl. 16 - *05*

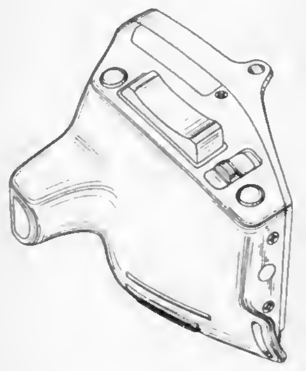
U.S. Cl. D16—237



401,264
LENS GRIP FOR TV CAMERA

Noriaki Miyamoto, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 12, 1997, Ser. No. 76,534
Claims priority, application Japan, Mar. 19, 1997, 9-17924
Term of patent 14 years
LOC (6) Cl. 16 - *05*

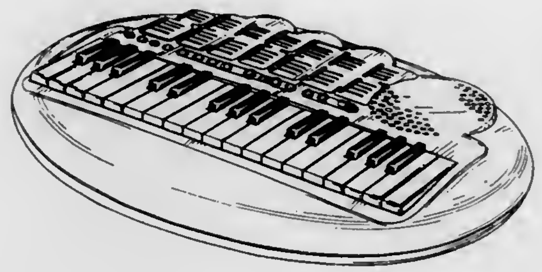
U.S. Cl. D16—243



401,265
ELECTRONIC KEYBOARD MUSICAL INSTRUMENT

Takeshi Ishiguro, San Francisco, Calif., assignor to Yamaha Corporation, Japan
Filed Jan. 8, 1997, Ser. No. 64,663
Term of patent 14 years
LOC (6) Cl. 17 - *01*

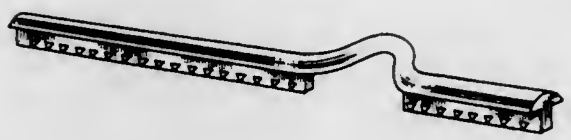
U.S. Cl. D17—1



401,266
TEMPERED LOOP FRET

Richard J. LoJacono, 713 Renate Way, Paso Robles, Calif. 93446
Filed Feb. 11, 1997, Ser. No. 66,560
Term of patent 14 years
LOC (6) Cl. 17 - *03*

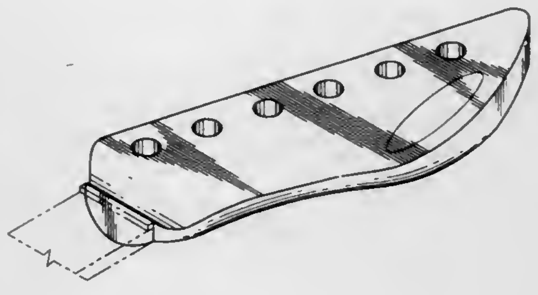
U.S. Cl. D17—20



401,267
GUITAR HEADSTOCK

Stephen G. Dame, and Joseph Ungari, both of Everett, Wash., assignors to Virtual DSP Corporation, Everett, Wash.
Filed Jan. 21, 1998, Ser. No. 82,397
Term of patent 14 years
LOC (6) Cl. 17 - *03*

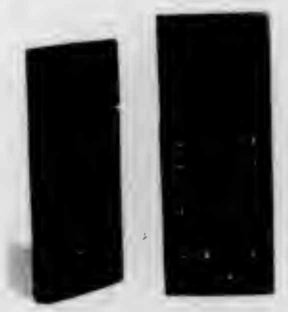
U.S. Cl. D17—20



401,268
CALCULATOR

Nikolai Carels, Amsterdam, Netherlands, assignor to C. van Ijsselmuide Electronic Business Gifts B.V., Capelle a/d Ijssel, Netherlands
Filed Jan. 10, 1997, Ser. No. 64,748
Claims priority, application Hague Agreement, Jan. 3, 1997, DM038709
Term of patent 14 years
LOC (6) Cl. 18 - *01*

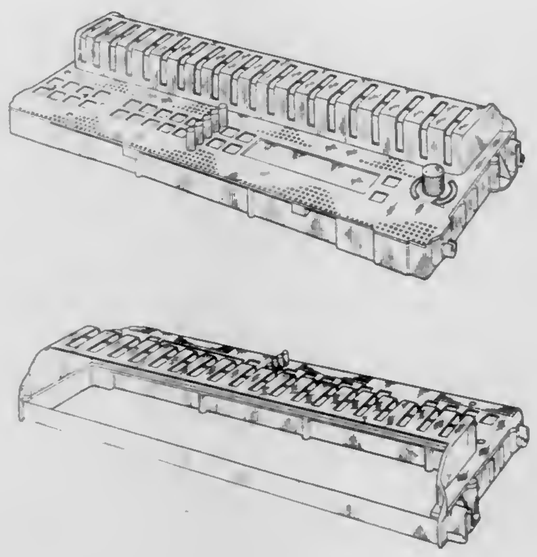
U.S. Cl. D18—7



401,269
INKED RIBBON CARTRIDGE

Sergio Uggetti, Ivrea, Italy, assignor to Olivetti Lexikon S.p.A., Ivrea, Italy
Filed Oct. 10, 1997, Ser. No. 77,878
Claims priority, application Italy, Apr. 21, 1997, TO9700094
Term of patent 14 years
LOC (6) Cl. 18 - *01*

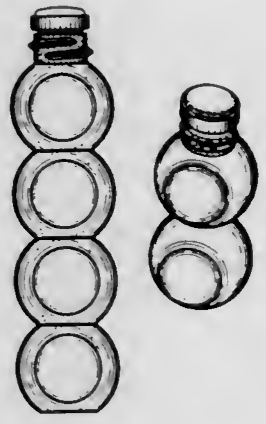
U.S. Cl. D18—12



401,270
BINGO MARKER

Allan Cockram, 797 Lee Ridge Road, Edmonton, Alberta, Canada, T6K 0P6
Filed Mar. 1, 1994, Ser. No. 19,382
Term of patent 14 years
LOC (6) Cl. 19 - *02*

U.S. Cl. D18—16



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401,271
PRINTER

Yoshihiro Nakajima, Osaka, Japan, assignor to Mita Indsutrial Co., Ltd., Osaka, Japan

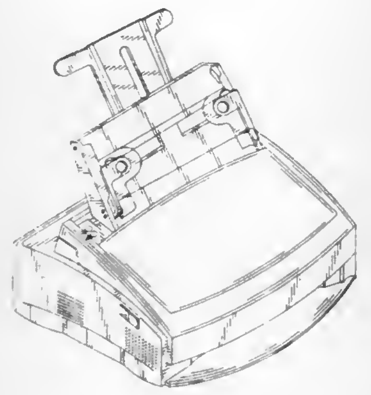
Filed May 2, 1997, Ser. No. 70,244

Claims priority, application Japan, Nov. 12, 1996, 8-34313

Term of patent 14 years

LOC (6) Cl. 14 - *02*

U.S. Cl. D18—55



401,272
HOUSING FOR AN ELECTRIC CALENDER

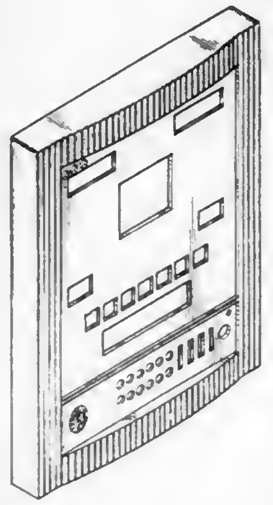
Wu-Yung Shih, P.O. Box 82-144, Taipei, Taiwan

Filed Nov. 28, 1997, Ser. No. 81,002

Term of patent 14 years

LOC (6) Cl. 19 - *03*

U.S. Cl. D19—20



401,273
ROTARY BOOK

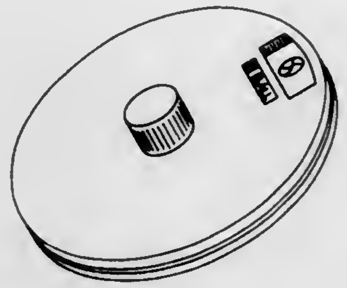
Henry Ellis Mayers, Culham Cottages, Ludgvan-Penzance TR20 8HB, England

Filed May 4, 1995, Ser. No. 38,367

Term of patent 14 years

LOC (6) Cl. 19 - *04*

U.S. Cl. D19—26



401,274
PROTECTIVE COVER FOR BOOKS

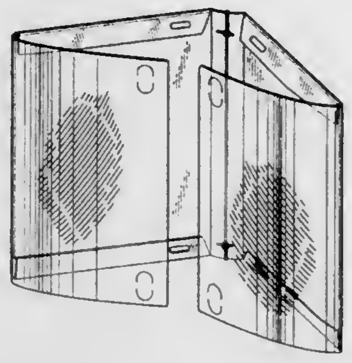
Sharon K. Sills, and Dayle L. Mallory, both of P.O. Box 8540, Medford, Oreg. 97504

Filed Apr. 14, 1997, Ser. No. 68,387

Term of patent 14 years

LOC (6) Cl. 19 - *04*

U.S. Cl. D19—26



401,275
WRITING INSTRUMENT

Yasuo Otake, Huntington Beach, Calif., assignor to Sakura Color Products Corp., Osaka-fu, Japan

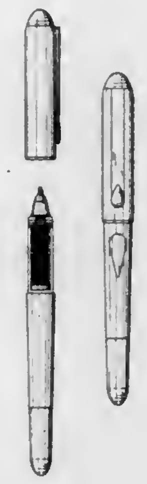
Filed Dec. 16, 1997, Ser. No. 80,807

Claims priority, application Japan, Jun. 26, 1997, 9-59772

Term of patent 14 years

LOC (6) Cl. 19 - *06*

U.S. Cl. D19—43



401,276
WRITING INSTRUMENT

Gerhard Wörther, Hermannstrasse 5, D-76530 Baden-Baden, Germany

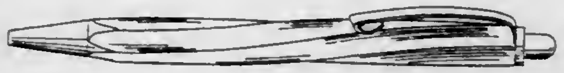
Filed Sep. 9, 1997, Ser. No. 76,406

Claims priority, application Germany, Jul. 24, 1997, M 97 06 802.0

Term of patent 14 years

LOC (6) Cl. 19 - *06*

U.S. Cl. D19—50



401,277
WRITING INSTRUMENT

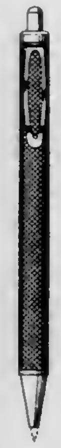
Shun Takemura, Torrance, Calif., assignor to Itoya of America, Ltd., Torrance, Calif.

Filed Feb. 18, 1998, Ser. No. 83,767

Term of patent 14 years

LOC (6) Cl. 19 - *06*

U.S. Cl. D19—50



401,278
PEN

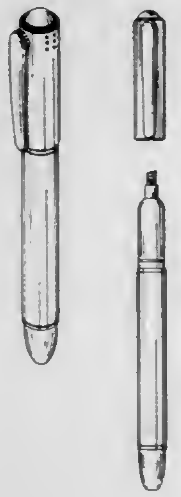
James Hu, No 55, Lane 143, Jiun Gong Rd., Wen Shan District, Taipei, Taiwan

Filed Jan. 29, 1998, Ser. No. 82,675

Term of patent 14 years

LOC (6) Cl. 19 - *06*

U.S. Cl. D19—51



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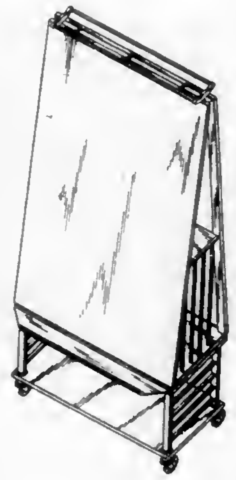
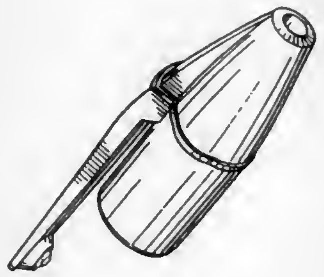
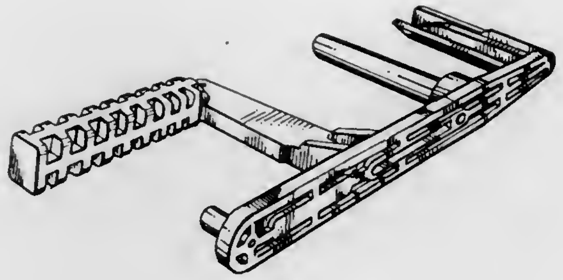
401,279
MOBILE MARKER BOARD
Clarkson S. Thorp, Wayland; Robert C. Wayner, and Bryan R. Gingrich, both of Holland, all of Mich., assignors to Haworth, Inc., Holland, Mich.
Continuation-in-part of Ser. No. 71,759, Jun. 6, 1997, abandoned. This application Dec. 15, 1997, Ser. No. 81,802
Term of patent 14 years
LOC (6) Cl. 19 - *06*
U.S. Cl. D19—52



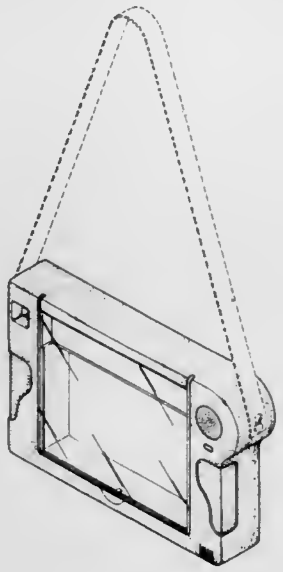
401,280
CAP FOR WRITING INSTRUMENTS
Jean Francois Chevallier, Paris, France; Craig Stevens, Bethany, Conn.; Christine E. Weigand, Milford, Conn., and Richard Williams, Cheshire, Conn., assignors to Bic Corporation, Milford, Conn.
Division of Ser. No. 74,302, Jul. 31, 1997. This application Feb. 17, 1998, Ser. No. 83,752
Term of patent 14 years
LOC (6) Cl. 19 - *06*
U.S. Cl. D19—57



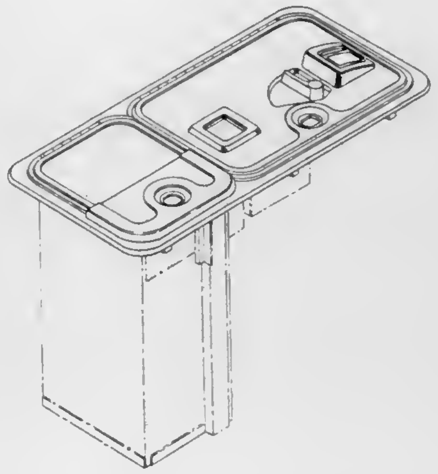
401,281
HAND HELD MASKING DEVICE FRAME
Joe A. Huerta, 12634 S. 35th Pl., Phoenix, Ariz. 85044
Filed Nov. 1, 1996, Ser. No. 61,860
Term of patent 14 years
LOC (6) Cl. 19 - *06*
U.S. Cl. D19—69



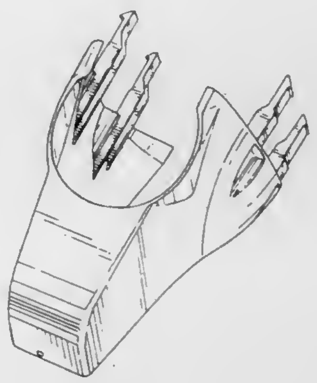
401,282
STATIONERY CASE
Wen-Yi Wang, No. 112, Sec. 3, Min Chuan Rd., Tainan, Taiwan
Filed Oct. 3, 1997, Ser. No. 77,533
Term of patent 14 years
LOC (6) Cl. 19 - *06*
U.S. Cl. D19—78



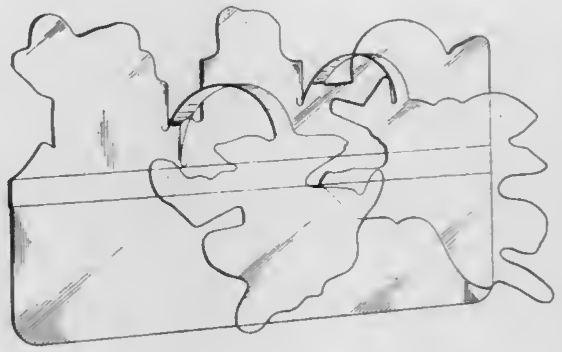
401,283
COIN DOOR BRACKET
Yoshinobu Tanaka, Iwatuki, Japan, assignor to Asahi Seiko Co., Ltd., Tokyo, Japan
Filed Jun. 25, 1997, Ser. No. 72,726
Term of patent 14 years
LOC (6) Cl. 20 - *09*
U.S. Cl. D20—9



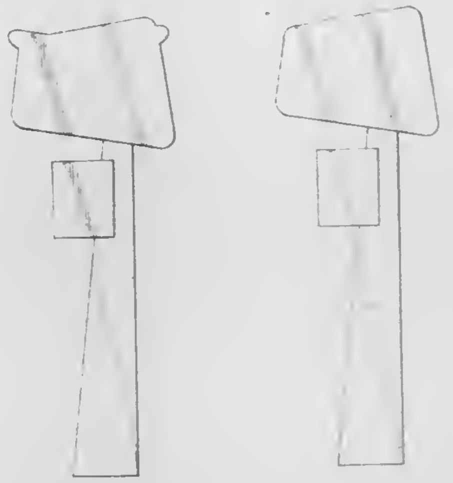
401,284
LOWER MEMBER OF AN ADVERTISING CARRYING BODY FOR USE ON A FILLER GUN
Stein Alvern, Houston, Tex., assignor to Alvern-Norway A/S, Oslo, Norway
Division of Ser. No. 60,806, Oct. 8, 1996, Pat. No. Des. 392,683. This application Oct. 28, 1997, Ser. No. 78,728
Claims priority, application Norway, Apr. 11, 1996, D960230
Term of patent 14 years
LOC (6) Cl. 20 - *03*
U.S. Cl. D20—19



401,285
DECORATION
Kenneth L. Krattiger, 2612 Methil Dr., Birchwood, Wis. 54817
Division of Ser. No. 66,827, Feb. 25, 1997, Pat. No. Des. 392,327. This application Nov. 12, 1997, Ser. No. 79,329
Term of patent 14 years
LOC (6) Cl. 19 - *08*
U.S. Cl. D20—23



401,286
SIGN
Kevin K. McMillan, Oklahoma City, Okla., and James H. Wright, New York, N.Y., assignors to America's Drive-In Trust, Reno, Nev.
Filed Jul. 8, 1997, Ser. No. 73,414
Term of patent 14 years
LOC (6) Cl. 20 - *02*
U.S. Cl. D20—41



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401,287
SNOWBOARD

Oliver Ritzinger, Munich, Germany, assignor to Boards Unlimited Sportartikel GmbH & Co. KG, Gürdding, Germany

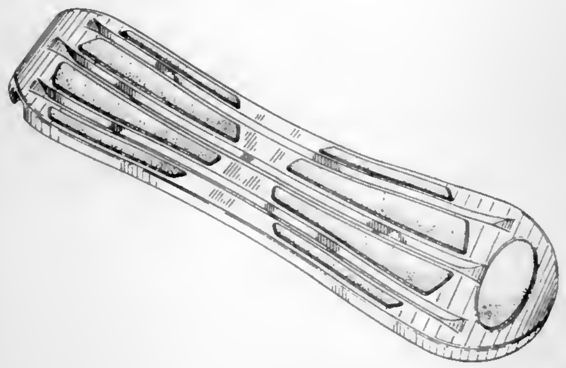
Continuation-in-part of Ser. No. 904,980, Aug. 1, 1997. This application Dec. 4, 1997, Ser. No. 80,306

Claims priority, application Germany, Mar. 25, 1997, I 97 12 569.7; Sep. 9, 1997, M 97 08 617.7

Term of patent 14 years

LOC (6) Cl. 21 - *02*

U.S. Cl. D21—228



401,288
FLYING DISC

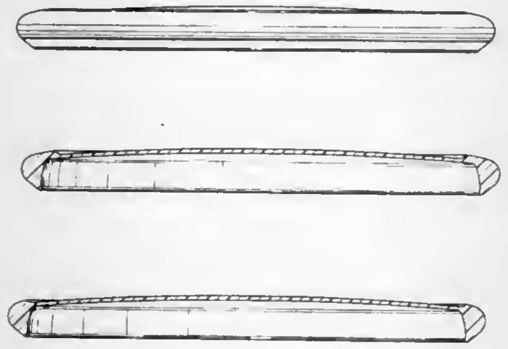
David B. Dunipace, Fontana, Calif., assignor to Champion Discs, Inc., Rancho Cucamonga, Calif.

Continuation-in-part of Ser. No. 52,903, Apr. 8, 1996, Pat. No. Des. 386,222, which is a continuation-in-part of Ser. No. 18,864, Feb. 16, 1994, Pat. No. Des. 369,191. This application Mar. 20, 1997, Ser. No. 68,055

Term of patent 14 years

LOC (6) Cl. 21 - *01*

U.S. Cl. D21—86



401,289
FLYING DISC

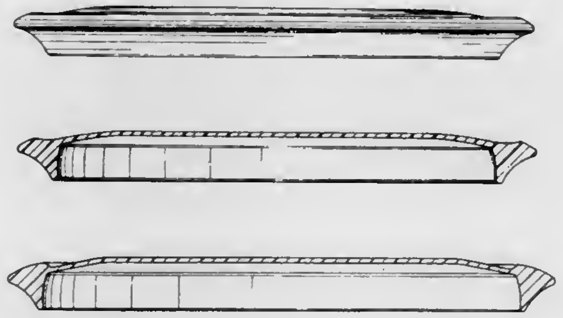
David B. Dunipace, Fontana, Calif., assignor to Champion Discs, Inc., Rancho Cucamonga, Calif.

Continuation-in-part of Ser. No. 52,903, Apr. 8, 1996, Pat. No. Des. 386,222, which is a continuation-in-part of Ser. No. 18,864, Feb. 16, 1994, Pat. No. Des. 369,191. This application Mar. 20, 1997, Ser. No. 68,058

Term of patent 14 years

LOC (6) Cl. 21 - *01*

U.S. Cl. D21—86



401,290
RETURN TOP

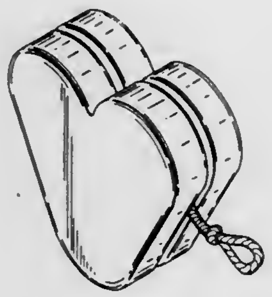
Richard F. Bly, 317 W. Hemlock Ave., Kane, Pa. 16735

Filed Jan. 16, 1998, Ser. No. 82,946

Term of patent 14 years

LOC (6) Cl. 21 - *01*

U.S. Cl. D21—99



401,291
TOY SINK

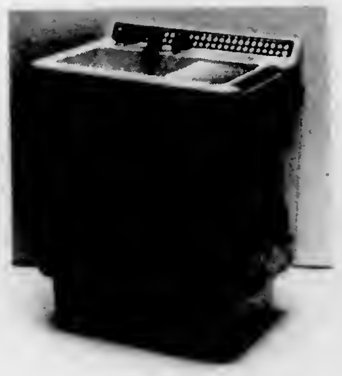
Martin Blumenthal, 99 Longview Ave., Chatham, N.J. 07928

Filed Feb. 20, 1997, Ser. No. 66,758

Term of patent 14 years

LOC (6) Cl. 21 - *01*

U.S. Cl. D21—122



401,292
TOY BULLDOZER

Ken Park, Northville, Mich., assignor to New Bright Industrial Co., Ltd., Kowloon, Hong Kong

Filed Apr. 28, 1997, Ser. No. 70,074

Term of patent 14 years

LOC (6) Cl. 21 - *01*

U.S. Cl. D21—131

401,293
FOOTBALL

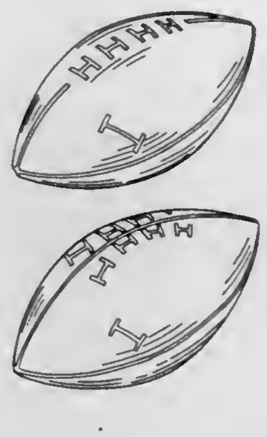
David Alarid, Jr., 1028 N. Fickett St., Los Angeles, Calif. 90033

Filed Aug. 22, 1996, Ser. No. 58,772

Term of patent 14 years

LOC (6) Cl. 21 - *02*

U.S. Cl. D21—204



401,294
REMOVABLE HAND GRIP SLEEVE FOR TENNIS RACKET

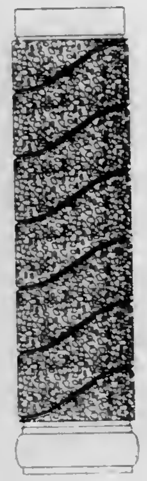
Albert H. Kaner, Sylvan Lake, Mich., assignor to AGC Research and Development Corporation, Southampton, N.J.

Filed Apr. 1, 1997, Ser. No. 68,402

Term of patent 14 years

LOC (6) Cl. 21 - *02*

U.S. Cl. D21—222



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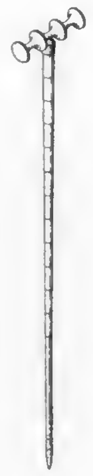
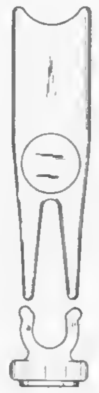
401,295
GOLF CLUB REST

Alex Young, P.O. Box 1056, Granbury, Tex. 76048
Filed Mar. 24, 1997, Ser. No. 69,066
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—223



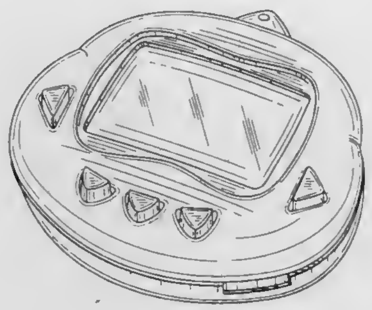
401,296
GOLF DIVOT REPLACEMENT TOOL

Todd E. Cole, 426 Yanke Rd., and Patrick J. Kowalski, 415 E. U.S. 20, both of Michigan City, Ind. 46360
Filed Nov. 20, 1997, Ser. No. 79,724
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—234



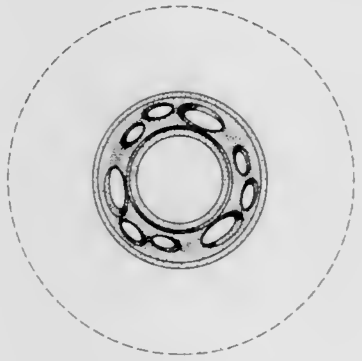
401,297
HAND HELD ELECTRONIC GAME

Au Yeung Sui Fai, Kowloon, Hong Kong, assignor to Watercore Limited, Hong Kong
Filed May 8, 1997, Ser. No. 70,496
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—329



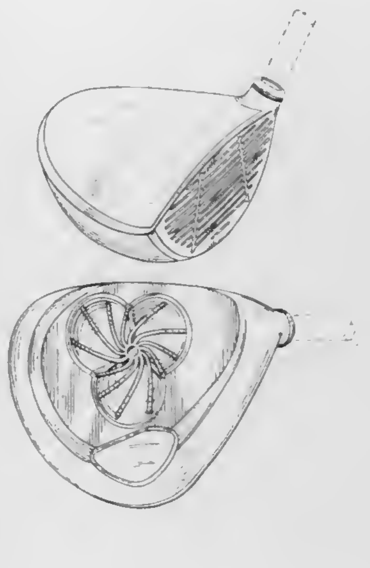
401,298
HUB FOR A SKATE WHEEL

Scott Portzline, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Apr. 14, 1997, Ser. No. 69,184
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—779



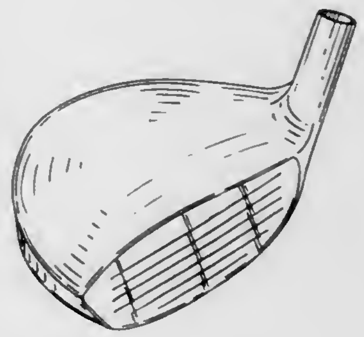
401,299
WOOD-TYPE HEAD FOR A GOLF CLUB

Bruce D. Burrows, 25555 West Avenue Stanford, Valencia, Calif. 91355-1101
Filed Apr. 22, 1997, Ser. No. 69,509
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—733



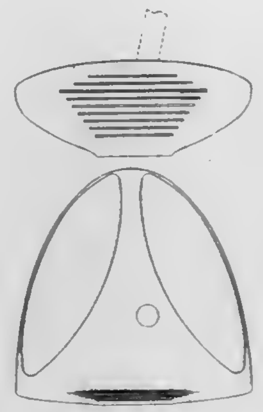
401,300
METALWOOD GOLF CLUB HEAD

William A. Albright, 8005 Rappahanock Ave., Jessup, Md. 20794-9417
Filed Jan. 29, 1998, Ser. No. 82,660
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—733



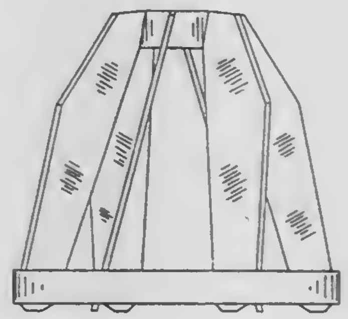
401,301
GOLF CLUB HEAD

John Cherevko, 331 Woodvale Dr., Venice, Fla. 34293
Filed Feb. 5, 1998, Ser. No. 83,135
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—733



401,302
MISSILE FIN UNIT

Yew Seng Chua, Hong Kong, Hong Kong, assignor to Glorious Company, Hong Kong, Hong Kong
Filed Apr. 28, 1997, Ser. No. 69,540
Term of patent 14 years
LOC (6) Cl. 22 - *03*
U.S. Cl. D22—112



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401,303
CLAY TARGET LAUNCHER MOUNT FOR VEHICLE

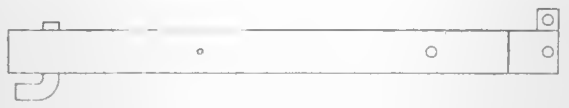
Keith A McComb, Jr., 2084 E. Pinecrest La., Sandy, Utah 84092

Filed Jun. 12, 1997, Ser. No. 72,327

Term of patent 14 years

LOC (6) Cl. 22 - *04*

U.S. Cl. D22—114



401,304
FLY SWATTER WITH REPLACEABLE HEAD PIECE

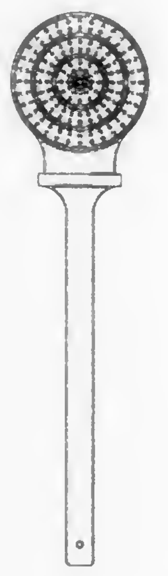
Kate L. Hawkins, 13111 Chirping Sparrow Way, Tustin, Calif. 92780

Filed Aug. 22, 1997, Ser. No. 75,703

Term of patent 14 years

LOC (6) Cl. 22 - *06*

U.S. Cl. D22—124



401,305
SPILL CONTAINER FOR ABOVE GROUND STORAGE TANKS

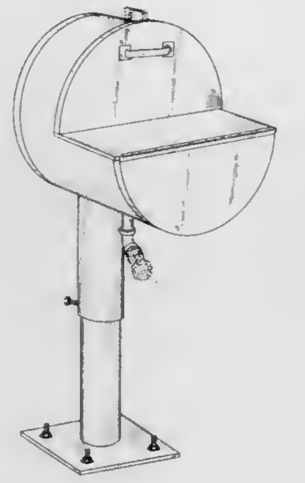
Martin C. Pettesch, Cranford, N.J., assignor to Universal Valve Co., Inc., Elizabeth, N.J.

Continuation-in-part of Ser. No. 632,901, Apr. 16, 1996, Pat. No. 5,687,871. This application Apr. 30, 1997, Ser. No. 69,593

Term of patent 14 years

LOC (6) Cl. 23 - *01*

U.S. Cl. D23—202



401,306
FILTER ELEMENT

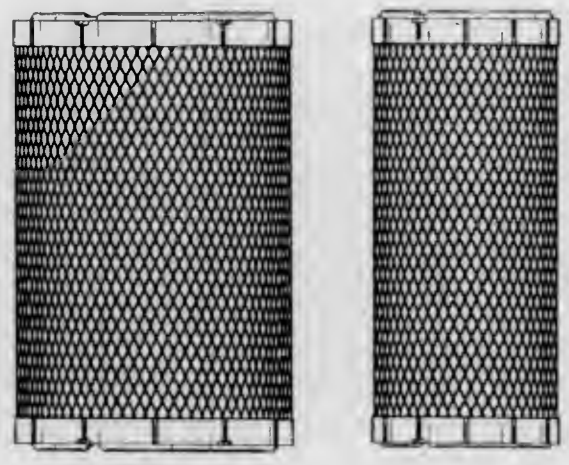
Dennis E. Ward, Richfield; Kevin J. Schrage, Spring Valley, both of Minn.; Paul R. Coulonvaux, Brussels; Johan G. Dewit, Hamme-Mille, both of Belgium, and Jeffrey J. Ivarson, San Rafael, Calif., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Filed Sep. 12, 1997, Ser. No. 76,524

Term of patent 14 years

LOC (6) Cl. 23 - *01*

U.S. Cl. D23—209



401,307
KITCHEN FAUCET

Hans Lobermeier, Menden, Germany, assignor to Friedrich Grohe AG, Hemer, Germany

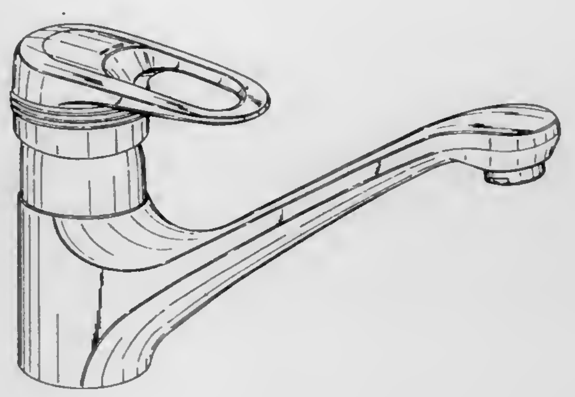
Filed May 6, 1997, Ser. No. 70,337

Claims priority, application Germany, Nov. 19, 1996, M 96 09 980.1

Term of patent 14 years

LOC (6) Cl. 23 - *01*

U.S. Cl. D23—238



401,308
BATTING TARGET

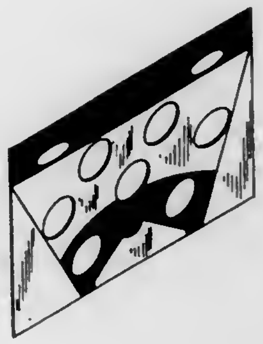
Robert C. D'Emidio, 17 Tingley Rd., Morristown, N.J. 07960

Filed Jun. 23, 1997, Ser. No. 72,663

Term of patent 14 years

LOC (6) Cl. 21 - *01*

U.S. Cl. D21—303



401,309
SHOWER ESCUTCHEON

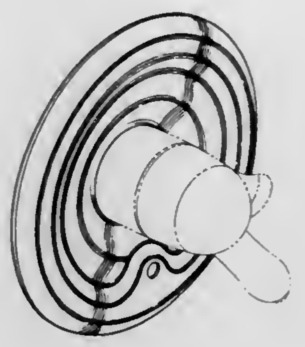
Judd A. Lord, Carmel, Ind., assignor to Masco Corporation of Indiana, Indianapolis, Ind.

Filed Nov. 10, 1997, Ser. No. 79,260

Term of patent 14 years

LOC (6) Cl. 23 - *01*

U.S. Cl. D23—254



401,310
KITCHEN SINK

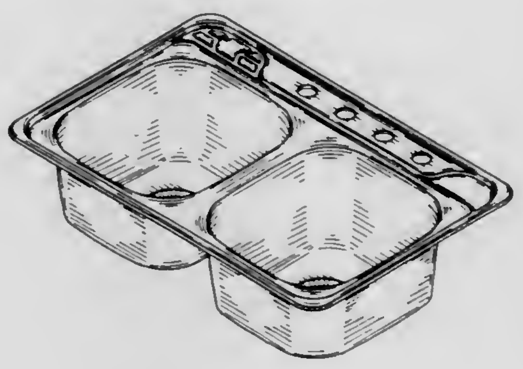
Zong Ta Chang, No. 11, Kung Yeh 7th Road, Kuang Yin Industrial Zone, Tao Yuan, Taiwan

Filed Dec. 29, 1997, Ser. No. 81,300

Term of patent 14 years

LOC (6) Cl. 23 - *02*

U.S. Cl. D23—290



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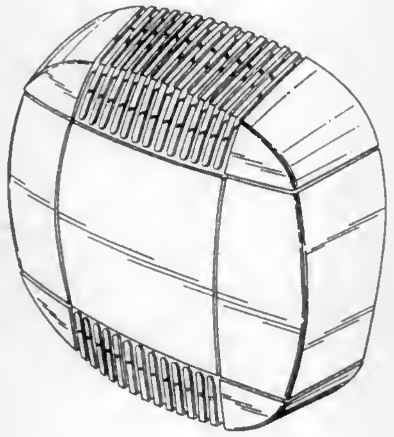
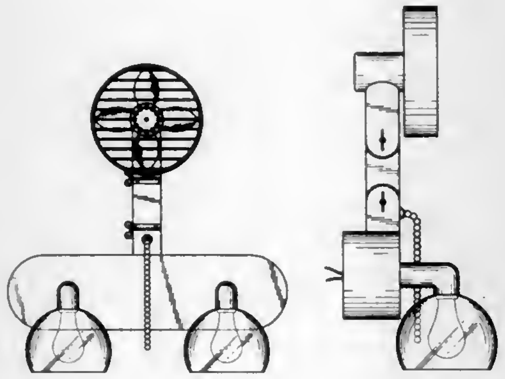
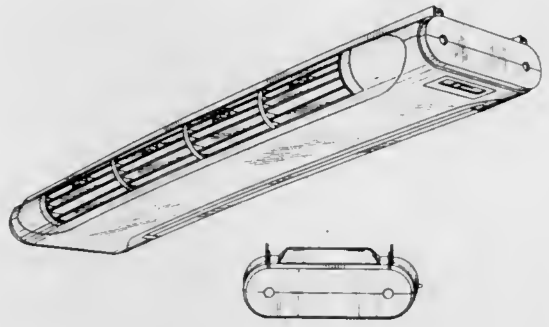
401,311
DRIP DISPENSER FOR A URINAL
Koen De Winter, Beaconfield, Canada, assignor to West Sanitation Services, Inc., Torrance, Calif.
Filed Oct. 15, 1996, Ser. No. 61,024
Term of patent 14 years
LOC (6) Cl. 23 - *02*
U.S. Cl. D23—303



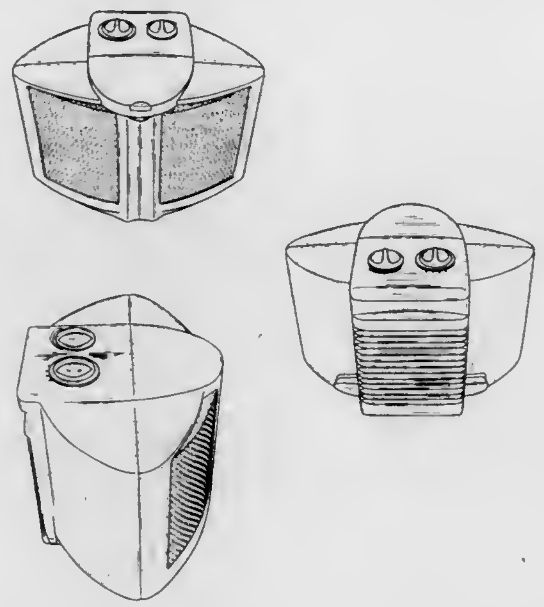
401,312
COMBINED FAN AND LIGHT STRUCTURE
Leonard R. Upchurch, 10320 Cunningham Ave., Westminster, Calif. 92683
Filed Dec. 24, 1997, Ser. No. 81,236
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—328



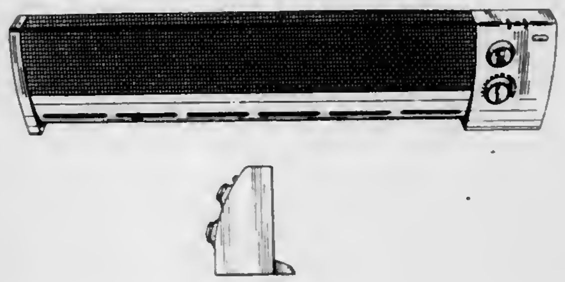
401,313
CAR AIR CONDITIONER
Yutaka Murakami, and Seisuke Shirai, both of Shiga, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan
Filed Jan. 7, 1998, Ser. No. 81,662
Claims priority, application Japan, Jul. 15, 1997, 9-61637
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D23—325



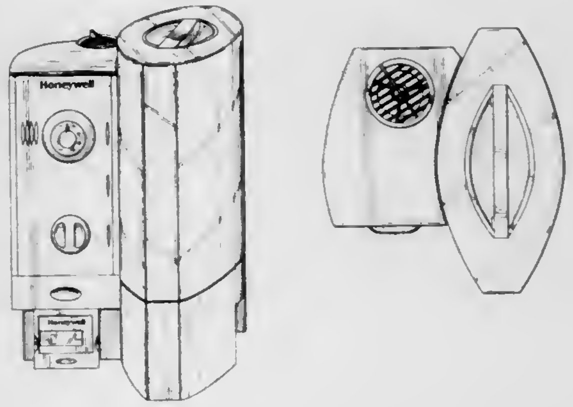
401,314
PORTABLE ELECTRIC HEATER
Stephan Boyle, Belmont; Walter Birdsell, Shrewsbury; Steven L. Hecker, Waltham, all of Mass., and Richard O'Grady, Southington, Conn., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Dec. 12, 1996, Ser. No. 63,634
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—335



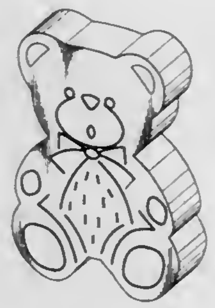
401,315
PORTABLE ELECTRIC HEATER
Stephan Boyle, Belmont; Walter Birdsell, Shrewsbury; Steven L. Hecker, Waltham, all of Mass., and Scott W. Osiecki, Skaneateles, N.Y., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Dec. 12, 1996, Ser. No. 63,638
Term of patent 14 years
LOC (6) Cl. 23 - *03*
U.S. Cl. D23—335



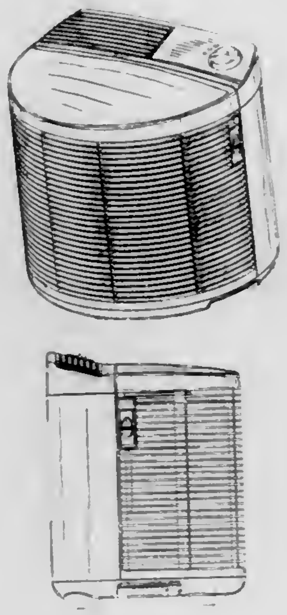
401,316
HUMIDIFIER
Diane Allen, Marlborough; Walter Birdsell, Shrewsbury; Stanley Gresens, Charlestown; Kenneth David Harris, Cambridge, and Marc Drucker, Cambridge, all of Mass., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Dec. 12, 1996, Ser. No. 63,643
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—356



401,317
HUMIDIFIER FOR BROWN SUGAR
Barbara Gillies, Calgary, Canada, assignor to Sugar Bears Inc., Calgary, Canada
Filed Jan. 9, 1998, Ser. No. 81,885
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—356



401,318
AIR CLEANER
William Rakocy, Madison, Conn., assignor to Holmes Products, Corp., Milford, Mass.
Filed Oct. 2, 1997, Ser. No. 81,812
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—364



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401,319
ALTERNATOR FAN

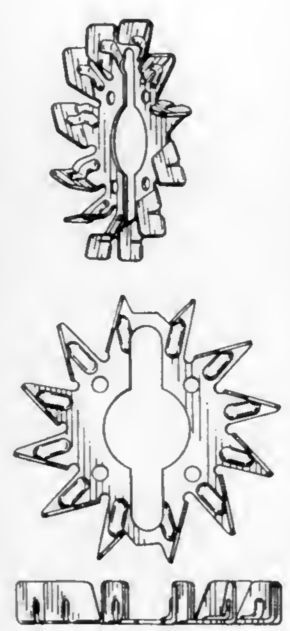
William Bradley, Wheaton, Ill., assignor to Fanco, Inc., Batavia, Ill.

Filed May 5, 1997, Ser. No. 70,284

Term of patent 14 years

LOC (6) Cl. 23 - *04*

U.S. Cl. D23—413



401,320

Patent Not Issued For This Number

401,321
MOTOR HOUSING OF AN ELECTRIC FAN

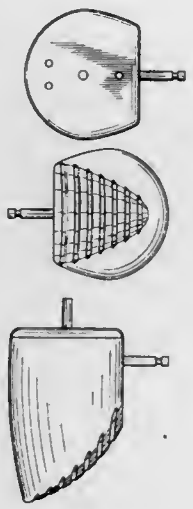
Joe Hsu, 3F, No. 42, Lane 40, Yung Yuan Rd., Yungho City, Taipei Hsien, Taiwan

Filed Oct. 29, 1997, Ser. No. 78,566

Term of patent 14 years

LOC (6) Cl. 23 - *04*

U.S. Cl. D23—411



401,322
COMBINED DECORATIVE BOTTOM HOOD AND LIGHT FIXTURE FOR A CEILING FAN

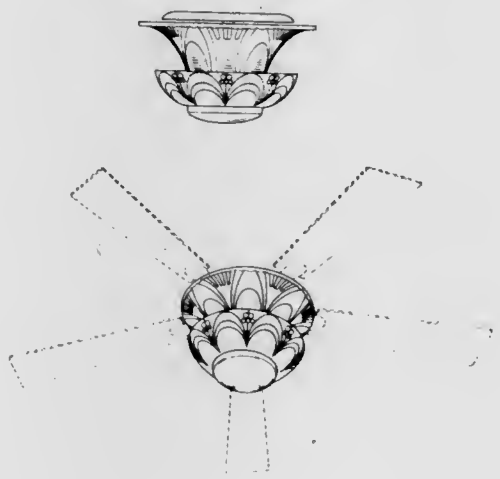
Chen-Tze Liu, Feng Yuan, Taiwan, assignor to Pan Air Electric Co., Ltd., Taichung Hsien, Taiwan

Filed Feb. 5, 1998, Ser. No. 83,089

Term of patent 14 years

LOC (6) Cl. 23 - *04*

U.S. Cl. D23—411



401,323
MEDICATION DISPENSING APPARATUS

Stefan Ritsche, Radolfzell, Germany, assignor to Ing. Erich Pfeiffer GmbH, Germany

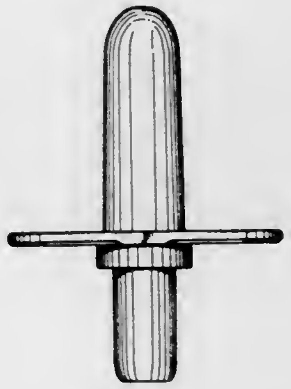
Filed Jul. 12, 1996, Ser. No. 56,955

Claims priority, application Germany, Jan. 23, 1996, M 96 00 802.4

Term of patent 14 years

LOC (6) Cl. 29 - *02*

U.S. Cl. D24—110



401,324
SYRINGE

Birger Hjertman, Vällingby; Rudolf Cseke, Sollentuna; Hans Himbert, Bromma, and Stanley Sommarlund, Huddinge, all of Sweden, assignors to Pharmacia & Upjohn AB, Stockholm, Sweden

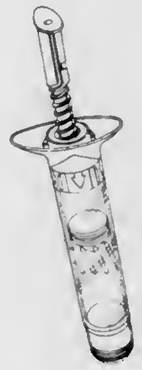
Filed Sep. 5, 1997, Ser. No. 76,054

Claims priority, application Sweden, Mar. 7, 1997, 97-0560

Term of patent 14 years

LOC (6) Cl. 24 - *02*

U.S. Cl. D24—114



401,325
SYRINGE

Birger Hjertman, Vällingby; Rudolf Cseke, Sollentuna; Hans Himbert, Bromma, and Stanley Sommarlund, Hudding, all of Sweden, assignors to Pharmacia & Upjohn AB, Stockholm, Sweden

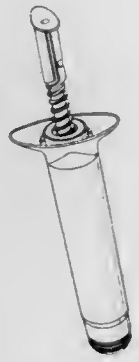
Division of Ser. No. 76,094, Sep. 5, 1997. This application Mar. 12, 1998, Ser. No. 84,855

Claims priority, application Sweden, Mar. 7, 1997, 97-0560

Term of patent 14 years

LOC (6) Cl. 24 - *02*

U.S. Cl. D24—114



401,326
DISPOSABLE DIAGNOSTIC SWAB FOR MEASURING DEPTH OF WOUNDS

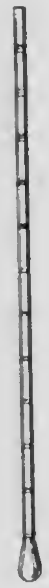
Kami Powell, 1036 Garrison Rd., Ashtabula, Ohio 44004, and Maryann Retalick, 2239 Clay Mill Dr., Geneva, Ohio 44041

Filed Oct. 31, 1997, Ser. No. 83,108

Term of patent 14 years

LOC (6) Cl. 24 - *02*

U.S. Cl. D24—119



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401,327
PANTILINER

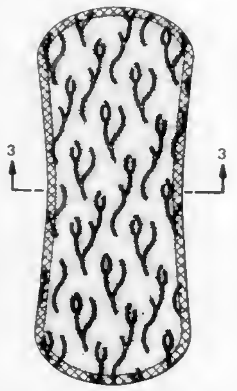
Maria Raidel, Nuremberg, Germany, assignor to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

Filed Apr. 1, 1997, Ser. No. 69,340

Term of patent 14 years

LOC (6) Cl. 24 - *04*

U.S. Cl. D24—125



401,328
ABSORBENT DISPOSABLE UNDERGARMENT

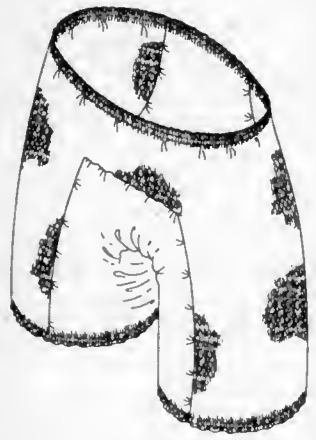
Muffin Anderson, 3503 S. Hudson St., Seattle, Wash. 98118

Filed Sep. 11, 1997, Ser. No. 80,109

Term of patent 14 years

LOC (6) Cl. 24 - *04*

U.S. Cl. D24—126



401,329
ANCHOR PAD

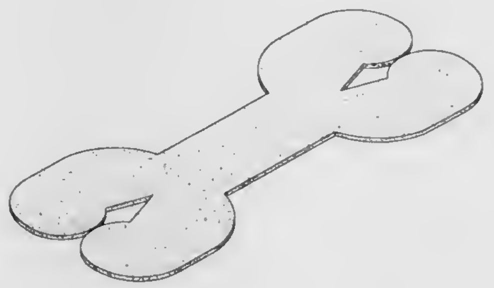
Steven F. Bierman, Del Mar, Calif., assignor to Venetec International, Inc., Mission Viejo, Calif.

Division of Ser. No. 38,063, Apr. 27, 1995, Pat. No. Des. 375,356. This application Jul. 24, 1996, Ser. No. 57,397

Term of patent 14 years

LOC (6) Cl. 24 - *04*

U.S. Cl. D24—128



401,330
CATHETER SECURITY BELT

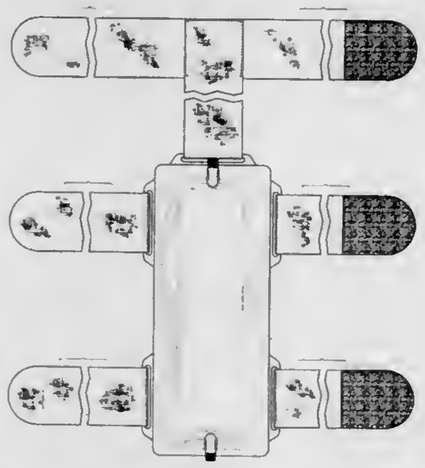
Pamela Jo Wright-Owens, 8056 Redlands St. Apt. #1, Playa Del Rey, Calif. 90293

Filed Jan. 17, 1997, Ser. No. 65,040

Term of patent 14 years

LOC (6) Cl. 08 - *08*

U.S. Cl. D24—128



401,331
SEPTAL SPLINT

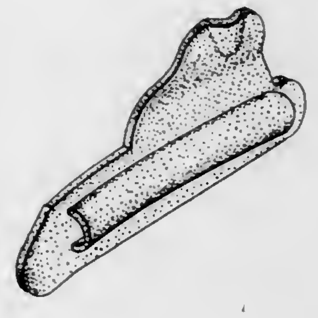
Donald E. Doyle, 4105 Hospital Rd. Suite 102-A, Pascagoula, Miss. 39581

Filed Apr. 8, 1998, Ser. No. 86,181

Term of patent 14 years

LOC (6) Cl. 24 - *01*

U.S. Cl. D24—128



401,332
DECOMPRESSION TUBE

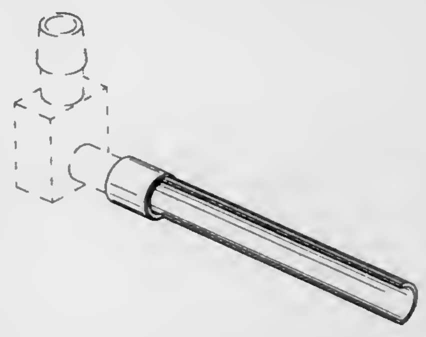
George J. Picha, Independence; J. Timothy Austin, Concord, and Kurt Mulhauser, Painesville Township, all of Ohio, assignors to Applied Medical Technology, Inc., Independence, Ohio

Filed Aug. 21, 1996, Ser. No. 58,704

Term of patent 14 years

LOC (6) Cl. 24 - *01*

U.S. Cl. D24—129



401,333
SURGICAL INSTRUMENT HANDLE

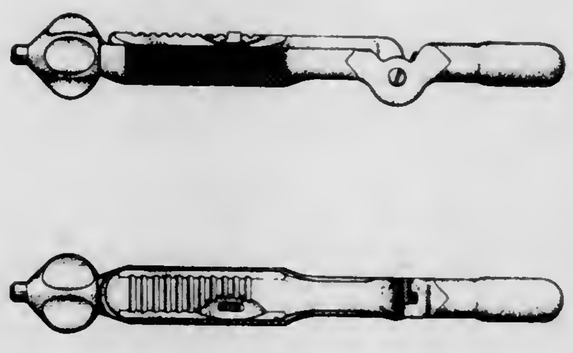
Gregory R. Furnish, Lawrenceville, and W. Michael Hipps, Roswell, both of Ga., assignors to Snowden-Pencer, Inc., Tucker, Ga.

Continuation of Ser. No. 540,472, Oct. 10, 1995. This application Apr. 26, 1996, Ser. No. 53,705

Term of patent 14 years

LOC (6) Cl. 24 - *02*

U.S. Cl. D24—133



401,334
MEDICAL DEVICE HANDLE

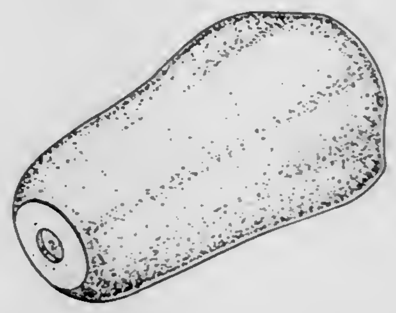
Christopher Herman, Eagan, and Bruce Funk, Maplewood, both of Minn., assignors to Microvena Corporation, White Bear Lake, Minn.

Filed Nov. 25, 1996, Ser. No. 62,789

Term of patent 14 years

LOC (6) Cl. 24 - *02*

U.S. Cl. D24—133



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401,335
COMBINED CERVICAL AND LUMBAR EXTRACTOR AND INJECTOR SURGICAL INSTRUMENT

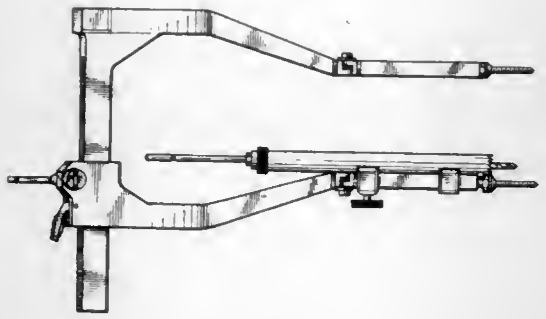
Tibor Koros, and Gabriel Koros, both of 610 Flinn Ave., Moorpark, Calif. 93021

Continuation-in-part of Ser. No. 34,391, Feb. 3, 1995, Pat. No. Des. 381,746. This application Jul. 28, 1997, Ser. No. 74,147

Term of patent 14 years

LOC (6) Cl. 24 - *02*

U.S. Cl. D24—133



401,336
TISSUE ABLATION DEVICE

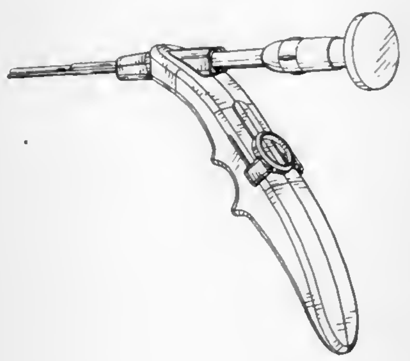
Peter H. Muller, Los Gatos; Rick T. Smethers, Fremont, and David Rapp, Mountain View, all of Calif., assignors to Somnus Medical Technologies, Inc., Sunnyvale, Calif.

Filed Jul. 24, 1997, Ser. No. 74,854

Term of patent 14 years

LOC (6) Cl. 24 - *02*

U.S. Cl. D24—133



401,337
STETHOSCOPE BELL

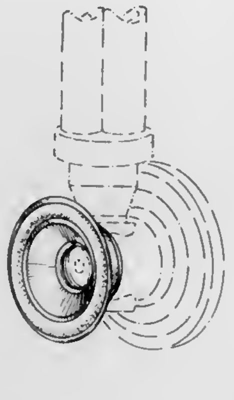
Richard Rashman, Los Angeles, Calif., assignor to Prestige Medical Corporation, Northridge, Calif.

Filed Aug. 14, 1997, Ser. No. 75,367

Term of patent 14 years

LOC (6) Cl. 24 - *02*

U.S. Cl. D24—134



401,338
TIP OF A RESECTOSCOPE ELECTRODE ASSEMBLY DESIGN

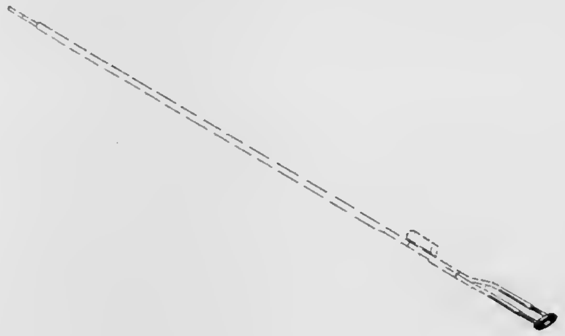
Peter A. Manzie, Berwyn, Ill., assignor to Northgate Technologies, Inc., Elgin, Ill.

Filed Jun. 18, 1996, Ser. No. 56,261

Term of patent 14 years

LOC (6) Cl. 24 - *02*

U.S. Cl. D24—144



401,339
SINGLE DISPENSING MULTI-STRAND PACK

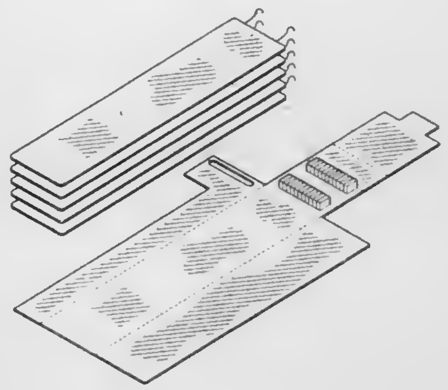
Elizabeth A. Chambers, Danbury, Conn., assignor to Tyco Group S.A.R.L., Luxembourg

Division of Ser. No. 30,424, Oct. 28, 1994, Pat. No. Des. 382,960. This application Feb. 4, 1997, Ser. No. 66,033

Term of patent 14 years

LOC (6) Cl. 24 - *02*

U.S. Cl. D24—145



401,340
DERMATOME HANDLE

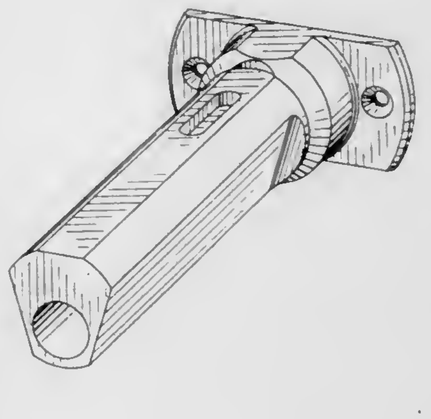
Joel N. Waldman, Fairway, Kans.; James William Petersen, Grain Valley, Mo., and James Edward Petersen, Shawnee Mission, Kans., assignors to Padgett Instruments, Inc., Kansas City, Mo.

Filed Nov. 12, 1996, Ser. No. 62,237

Term of patent 14 years

LOC (6) Cl. 24 - *02*

U.S. Cl. D24—146



401,341
PSYCHOTHERAPEUTIC FLACCID PENILE PROSTHETIC

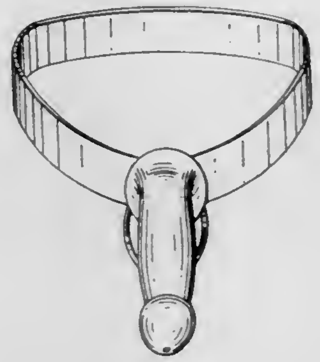
Nick Poubouridis, 31-15 83rd St., Jackson Heights, N.Y. 11370

Filed Oct. 15, 1996, Ser. No. 61,023

Term of patent 14 years

LOC (6) Cl. 24 - *03*

U.S. Cl. D24—155



401,342
HYPERBARIC THERAPY UNIT

Michael W. Allen, Torphins, Scotland, assignor to Hyox Systems Limited, Westhill, Scotland

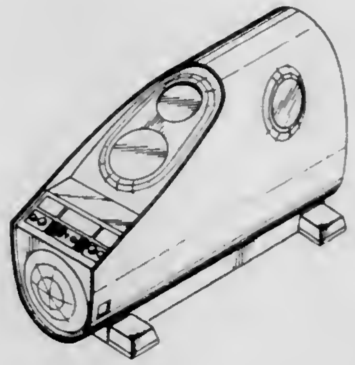
Filed Aug. 17, 1995, Ser. No. 42,767

Claims priority, application United Kingdom, Feb. 28, 1995, 2045744

Term of patent 14 years

LOC (6) Cl. 24 - *01*

U.S. Cl. D24—164



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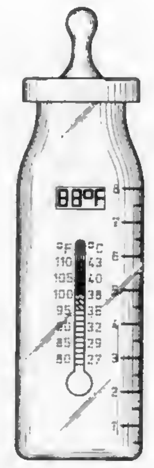
401,343

BABY BOTTLE WITH THERMOSTAT SYSTEM

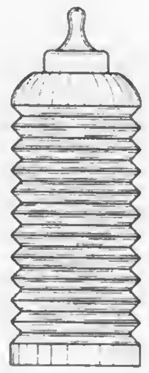
Ahmad Abdelmajid Al-Shraideh, 2566 41st Ave., San Francisco, Calif. 94114
Filed Jun. 19, 1997, Ser. No. 72,583
Term of patent 14 years
LOC (6) Cl. 07 - *01*
U.S. Cl. D24—197



401,344

COLLAPSIBLE BOTTLE

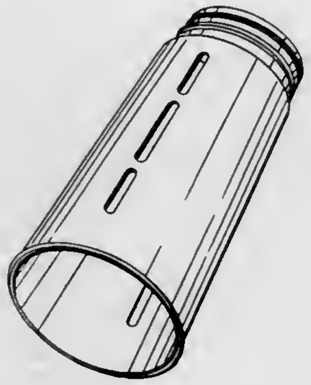
Crystal C. Bonds, 150-34 119th Rd., Jamaica, N.Y. 11434
Filed Jul. 23, 1997, Ser. No. 74,054
Term of patent 14 years
LOC (6) Cl. 07 - *01*
U.S. Cl. D24—197



401,345

HOLDER FOR A FEEDING BOTTLE

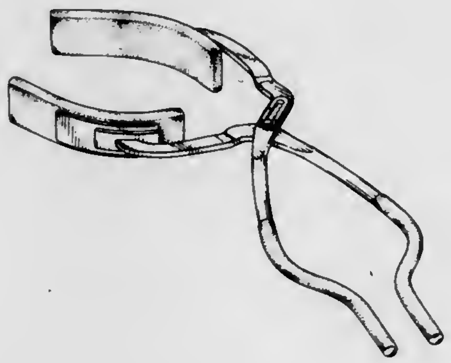
John Landgrebe, 2824 Harrison, Lawrence, Kans. 66047
Filed Oct. 7, 1997, Ser. No. 77,725
Term of patent 14 years
LOC (6) Cl. 07 - *01*
U.S. Cl. D24—199



401,346

COMBINED LIMB CONDITIONING AND MASSAGING TOOL

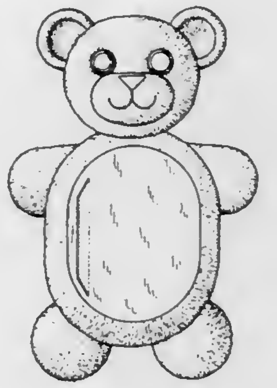
Toshiro Yoshida, 2-8-4, Daido-Minami, Higashi-Yodogawa-ku, Osaka-shi, Osaka, Japan
Filed Apr. 12, 1994, Ser. No. 21,208
Term of patent 14 years
U.S. Cl. D24—200



401,347

PLUSH TOY WITH TUMMY COMPARTMENT FOR AN ICE PACK

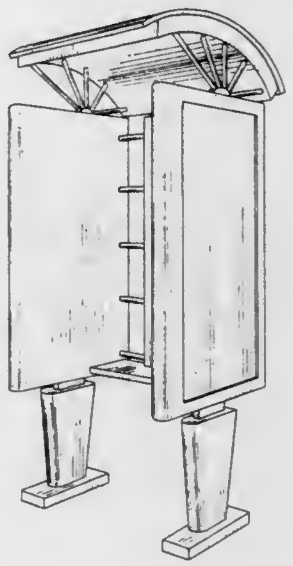
Robert Cosentino, 1562 Kalda La., East Meadow, N.Y. 11554
Filed Aug. 25, 1997, Ser. No. 75,693
Term of patent 14 years
LOC (6) Cl. 24 - *04*
U.S. Cl. D24—208



401,348

KIOSK

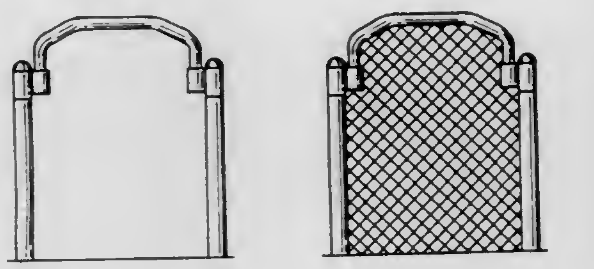
Rudy Fabiano, 32 Benson St., Bloomfield, N.J. 07003
Filed Jul. 23, 1997, Ser. No. 79,109
Term of patent 14 years
LOC (6) Cl. 25 - *03*
U.S. Cl. D25—16



401,349

FENCE UNIT

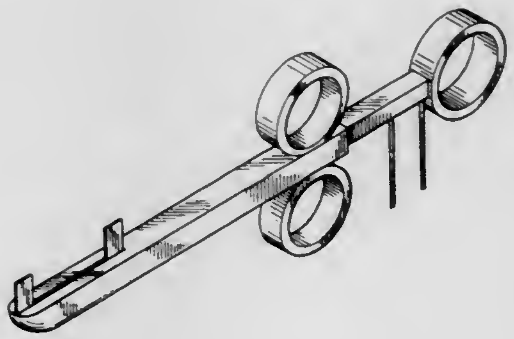
Jimmie Lee Hill, Memphis, Tenn., assignor to Jimmie L. Hill, Sr., Memphis, Tenn.
Division of Ser. No. 48,139, Dec. 21, 1995. This application Jun. 9, 1997, Ser. No. 71,792
Term of patent 14 years
LOC (6) Cl. 25 - *02*
U.S. Cl. D25—38



401,350

ELECTROSURGICAL DEVICE

Malcolm L. Shannon, Jr., 6199 S. Jamaica Ct., Englewood, Colo. 80111
Filed Jun. 23, 1997, Ser. No. 72,681
Term of patent 14 years
LOC (6) Cl. 24 - *02*
U.S. Cl. D24—144



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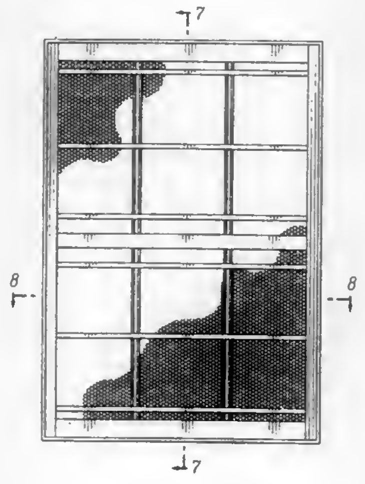
401,351
ARCHITECTURAL WINDOW

Kunishi Miyoshi; Kiyoko Miyoshi, and Kazuki Miyoshi, all of Katano, Japan, assignors to Tsukasa Electric Industry Co., Japan

Filed Mar. 8, 1996, Ser. No. 51,865
Term of patent 14 years
LOC (6) Cl. 25 - *02*

U.S. Cl. D25—52

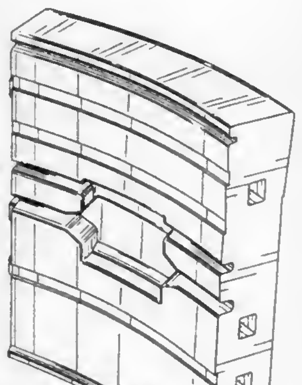


401,352
WALL MODULE

Craig Allan Nimmo, 26 Maureen Court, Miami Keys, Queensland 4210, and Adrian David Case, 25 Colombard Crescent, Wynn Vale, South Australia 5127, both of Australia

Filed Jan. 29, 1997, Ser. No. 65,260
Claims priority, application Australia, Nov. 19, 1996, 3976/96
Term of patent 14 years
LOC (6) Cl. 25 - *02*

U.S. Cl. D25—58

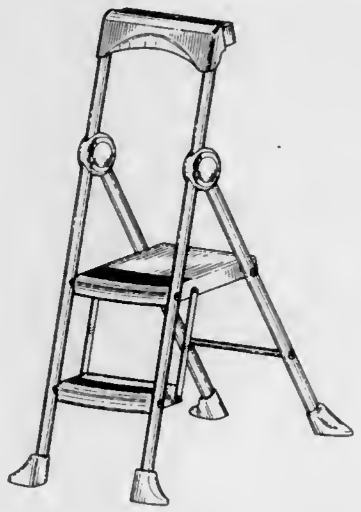


401,353
STEP LADDER

Randall Bell, River Forest, and Walter Herbst, Lake Forest, both of Ill., assignors to Werner Co., Greenville, Pa.

Filed Jun. 5, 1997, Ser. No. 71,634
Term of patent 14 years
LOC (6) Cl. 25 - *04*

U.S. Cl. D25—64

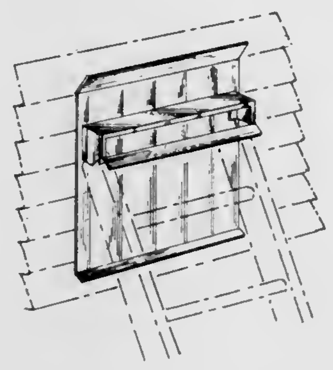


401,354
LADDER ADAPTOR DEVICE

Lawrence R. LaValle, 494 97th La., NE., Blaine, Minn. 55434

Filed Nov. 12, 1997, Ser. No. 79,325
Term of patent 14 years
LOC (6) Cl. 25 - *01*

U.S. Cl. D25—68

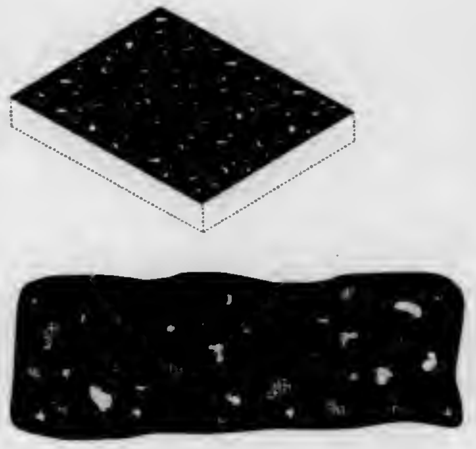


401,355
RECREATIONAL SURFACE BLOCK

Steven G. Mitchell, Yorba Linda, Calif., assignor to Spectra Turf, Inc., Corona, Calif.

Filed Mar. 6, 1996, Ser. No. 51,860
Term of patent 14 years
LOC (6) Cl. 25 - *01*

U.S. Cl. D25—113

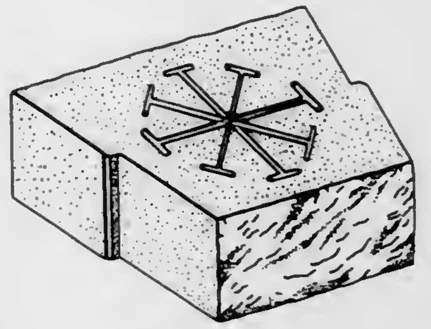


401,356
CONSTRUCTION BLOCK

David L. Adam, Platte City, Mo., assignor to Dru Ann Adam, Platte City, Mo., a part interest

Filed Apr. 30, 1997, Ser. No. 70,129
Term of patent 14 years
LOC (6) Cl. 25 - *01*

U.S. Cl. D25—113

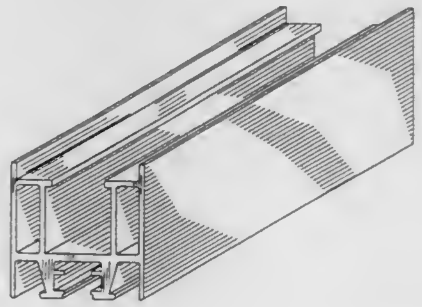


401,357
CONSTRUCTION BEAM EXTRUSION

Jacob Rinot, Herzliya, and Uri Rinot, Rishon Le-Zion, both of Israel, assignors to Rinot Planning & Installation Ltd., Rishon Le-Zion, Israel

Filed Apr. 7, 1997, Ser. No. 68,432
Claims priority, application Israel, Dec. 17, 1996, 27200
Term of patent 14 years
LOC (6) Cl. 25 - *01*

U.S. Cl. D25—122

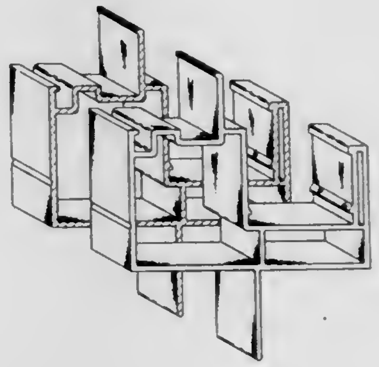


401,358
WINDOW COMPONENT EXTRUSION

Teresa A. Oliver, Kent, Wash., assignor to Mikron Industries, Inc., Kent, Wash.

Filed Jun. 29, 1995, Ser. No. 41,152
Term of patent 14 years
LOC (6) Cl. 25 - *01*

U.S. Cl. D25—124



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401,359

WINDOW COMPONET EXTRUSION

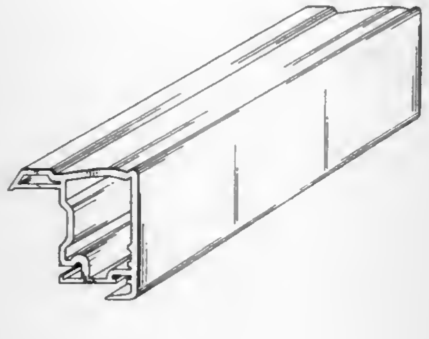
Peggy O. Porter; Michael T. Chaney, both of Monroe, Ohio, and Harold Kuritzky, Hillside, N.J., assignors to Dayton Technologies, Inc., Monroe, Ohio

Filed Nov. 15, 1996, Ser. No. 63,352

Term of patent 14 years

LOC (6) Cl. 25 - *01*

U.S. Cl. D25—124



401,360

GATE

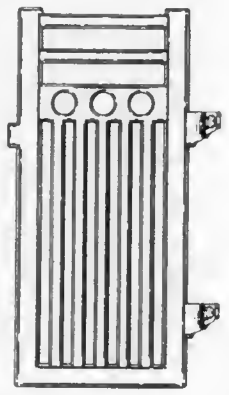
Raymond C. Confer, Lockport, and David J. Lipniarski, North Tonawanda, both of N.Y., assignors to Confer Plastics Inc., North Tonawanda, N.Y.

Filed Jul. 17, 1997, Ser. No. 73,276

Term of patent 14 years

LOC (6) Cl. 24 - *02*

U.S. Cl. D25—50



401,361

RECREATIONAL SURFACE BLOCK

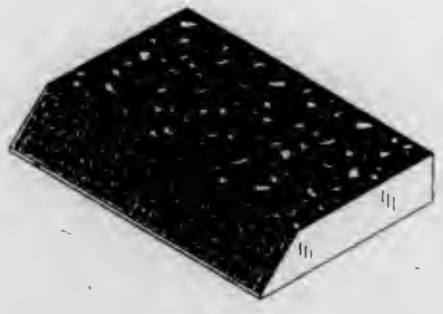
Steven G. Mitchell, Yorba Linda, Calif., assignor to Spectra Turf, Inc., Corona, Calif.

Filed Mar. 6, 1996, Ser. No. 51,179

Term of patent 14 years

LOC (6) Cl. 25 - *01*

U.S. Cl. D25—138



401,362

COMPOSITE ROOFING SHINGLE

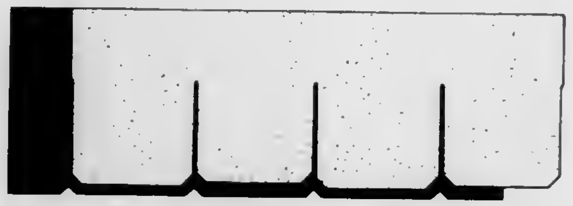
Alfredo A. Bondoc, Somerset; William R. Carroll, Sussex, and Frederick W. Sieling, Bound Brook, all of N.J., assignors to Building Materials Corporation of America, Wayne, N.J.

Filed Dec. 17, 1996, Ser. No. 63,847

Term of patent 14 years

LOC (6) Cl. 25 - *01*

U.S. Cl. D25—139



401,363

LAMINATED ROOFING SHINGLE

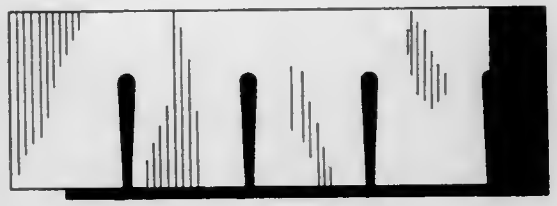
Alfredo A. Bondoc, Somerset; William R. Carroll, Sussex, and Frederick W. Sieling, Bound Brook, all of N.J., assignors to Building Materials Corporation of America, Wayne, N.J.

Filed Dec. 17, 1996, Ser. No. 63,848

Term of patent 14 years

LOC (6) Cl. 25 - *01*

U.S. Cl. D25—139



401,364

CANDLEHOLDER

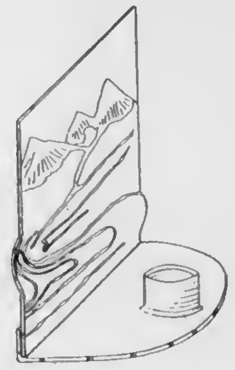
Caralyn H. Kieckhaefer, 3650 Schultz Rd. NW., Bremerton, Wash. 98312

Filed Apr. 22, 1997, Ser. No. 69,757

Term of patent 14 years

LOC (6) Cl. 26 - *01*

U.S. Cl. D26—16



401,365

DECORATIVE LIGHT

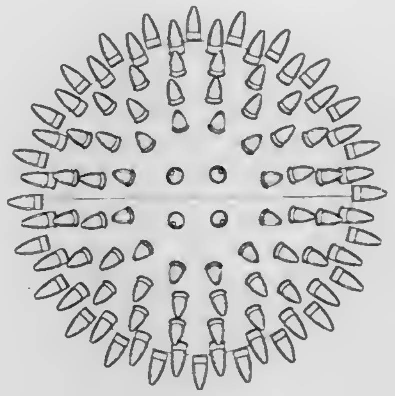
Nick Liu, 4Fl., No. 3-3, Lane 186, Si Wei Rd., Taipei, Taiwan

Filed Sep. 19, 1997, Ser. No. 77,383

Term of patent 14 years

LOC (6) Cl. 26 - *05*

U.S. Cl. D26—24



401,366

MOTORCYCLE LIGHT MOUNTING BAR

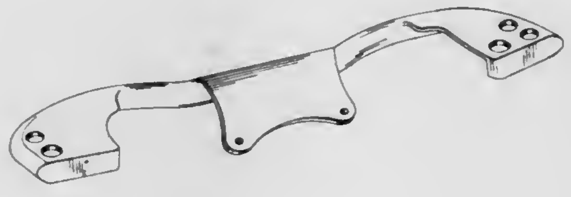
Timothy McCool, Yorba Linda, Calif., assignor to Cobra Engineering Corporation, Anaheim, Calif.

Continuation-in-part of Ser. No. 54,649, May 17, 1996, Pat. No. Des. 383,860. This application Mar. 27, 1997, Ser. No. 68,297

Term of patent 14 years

LOC (6) Cl. 26 - *06*

U.S. Cl. D26—28



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401,367

NIGHT LIGHT

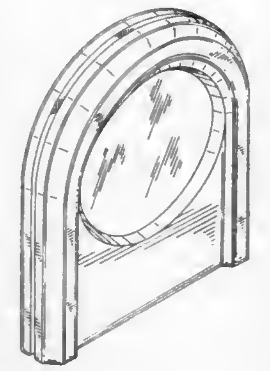
Daniel J. DeLay, Waterford, Wis., assignor to Intermatic Incorporated, Spring Grove, Ill.

Filed Sep. 18, 1997, Ser. No. 76,706

Term of patent 14 years

LOC (6) Cl. 26 - *05*

U.S. Cl. D26—26



401,368

SCHOOL BUS EMERGENCY LAMP

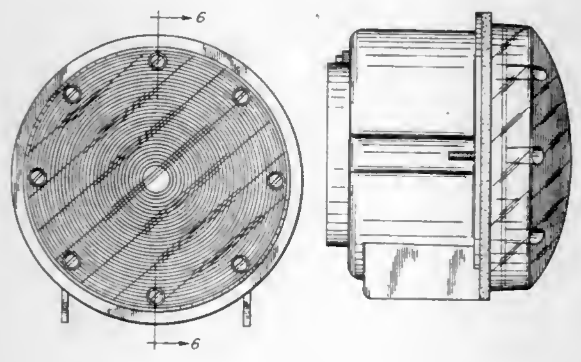
Joseph E. Baader, 333 Holiday Dr., Springfield, Ohio 45505, and John C. Whitson, 10416 Hallmark Clr., Oklahoma City, Okla. 73139

Filed Jun. 17, 1997, Ser. No. 75,974

Term of patent 14 years

LOC (6) Cl. 26 - *06*

U.S. Cl. D26—36



401,369

HAND-HELD LUMINOMETER

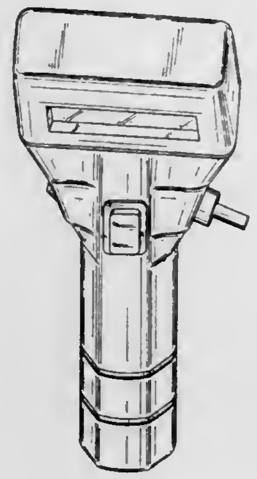
Joseph A. McClintock, Baltimore; David Bernstein, Eldersburg, both of Md., and William Trainor, Hillsboro Beach, Fla., assignors to Universal Healthwatch, Inc., Columbia, Md.

Filed Apr. 28, 1997, Ser. No. 69,562

Term of patent 14 years

LOC (6) Cl. 26 - *02*

U.S. Cl. D26—37



401,370

LUMINAIRE

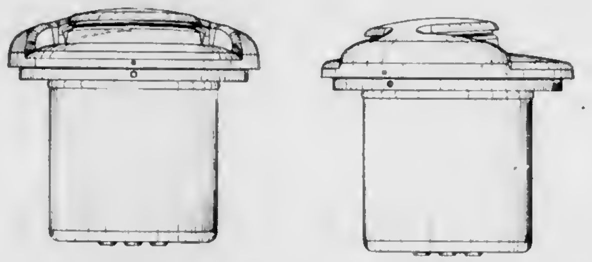
Roberto Fiorato, Viale Del Lavoro, 9/11, 37030 Colognola Ai Colli, Italy, 37030

Filed Jul. 7, 1997, Ser. No. 73,367

Term of patent 14 years

LOC (6) Cl. 26 - *05*

U.S. Cl. D26—67



401,371

COMBINED FLASHLIGHT AND MAGNIFYING LENS

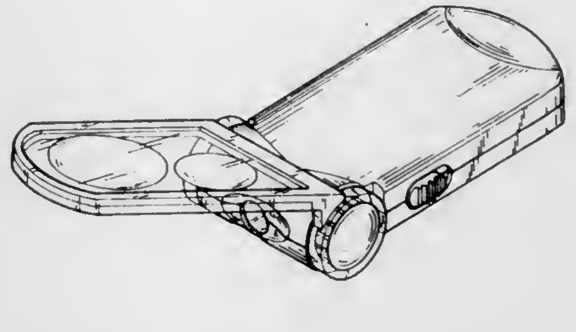
Mike Chen, No. 223, Chung-San Rd., Sec. 1, Yung-Ho, Taipei Hsien, Taiwan

Filed Mar. 13, 1998, Ser. No. 84,936

Term of patent 14 years

LOC (6) Cl. 26 - *02*

U.S. Cl. D26—38



401,372

FLASHLIGHT BODY

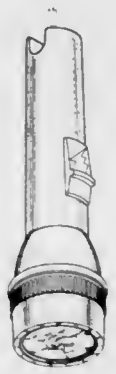
Kai C. A. Yau, Kowloon, Hong Kong; Martin W. Wirt, McFarland, and Robert K. Kloppenburg, Jr., Middleton, both of Wis., assignors to Rayovac Corporation, Madison, Wis.

Filed Jan. 20, 1998, Ser. No. 82,307

Term of patent 14 years

LOC (6) Cl. 26 - *02*

U.S. Cl. D26—49



401,373

PORTABLE HINGED FLOURESCENT LIGHT

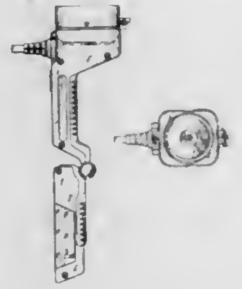
Bruce A. Blye, Commerce, Calif., assignor to National Electric Mfg Corp., Commerce, Calif.

Filed Mar. 2, 1998, Ser. No. 84,346

Term of patent 14 years

LOC (6) Cl. 26 - *02*

U.S. Cl. D26—49



401,374

COMBINED FLASHLIGHT POLICE BATON AND SELF-DEFENSE SPRAY UNIT

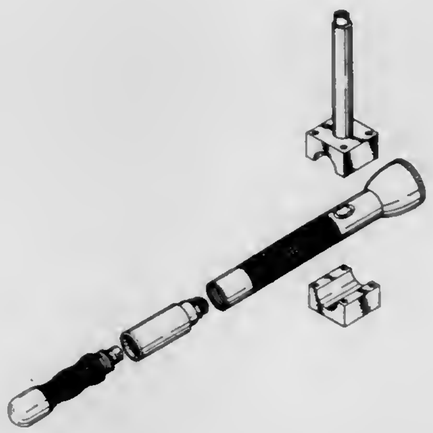
Jonathan B. Lum, 1310-D Moanalualani Pl., Honolulu, Hi. 96819

Filed Feb. 9, 1998, Ser. No. 83,278

Term of patent 14 years

LOC (6) Cl. 26 - *02*

U.S. Cl. D26—38



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401,375
CEILING LIGHT EXTERIOR

Wolfgang Wolber, Götzis; Helfried Schadauer; Anton Feurstein, both of Dornbirn; Friedrich Schabus, Schruns, and Markus Bohle, Dornbirn, all of Austria, assignors to Zumtobel Staff GmbH, Dornbirn, Austria

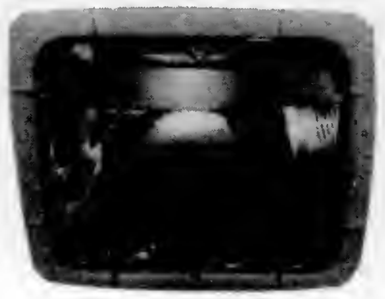
Filed Oct. 3, 1996, Ser. No. 60,660

Claims priority, application Hague Agreement, Apr. 3, 1996, DM/036080

Term of patent 14 years

LOC (6) Cl. 26 - *05*

U.S. Cl. D26—74



401,376
LIGHTING FIXTURE

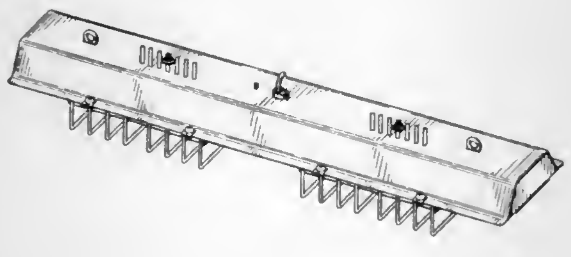
Yeou-Mine Ho, Walnut, Calif., assignor to Michigan Avenue Industrial Corporation, Bell, Calif.

Filed Feb. 6, 1998, Ser. No. 83,347

Term of patent 14 years

LOC (6) Cl. 26 - *05*

U.S. Cl. D26—86



401,377
TABLE LAMP

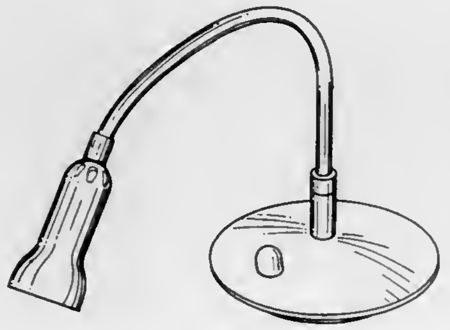
Paul W. Eusterbrock, Minneapolis, Minn., assignor to Holtkotter International, Inc., South St. Paul, Minn.

Filed Dec. 19, 1997, Ser. No. 80,923

Term of patent 14 years

LOC (6) Cl. 26 - *05*

U.S. Cl. D26—107



401,378
LIGHTING SHADE

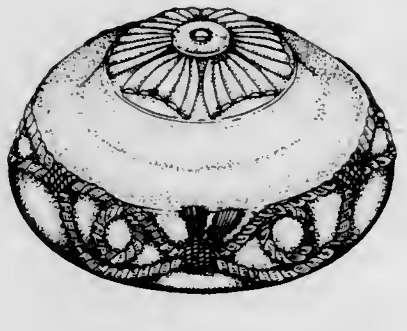
Kuo-Kuang Lin, 4th Fl. No 1, Lane 9, Ming Sheng E. Rd., Sec. 3, Taipei, Taiwan

Filed Oct. 14, 1997, Ser. No. 77,807

Term of patent 14 years

LOC (6) Cl. 26 - *05*

U.S. Cl. D26—134



401,379
GOLFER'S CIGAR HOLDER

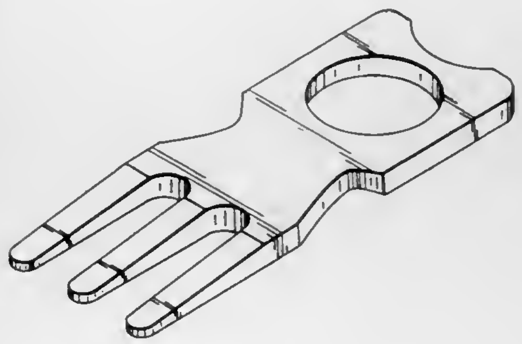
Neil D. Goldoftas, 1648 Curry Dr., Lyndhurst, Ohio 44124

Filed Apr. 2, 1998, Ser. No. 85,949

Term of patent 14 years

LOC (6) Cl. 27 - *06*

U.S. Cl. D27—183



401,380
HAIR COLOR SOLUTION APPLICATOR

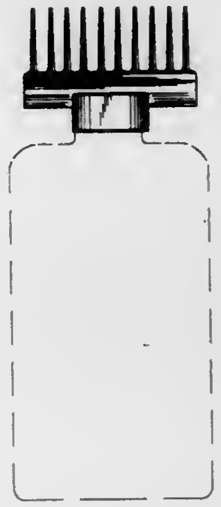
Claude L. Steen, and Bonnie J. Steen, both of 2534 W. Avenue O, Palmdale, Calif. 93551

Filed Mar. 27, 1997, Ser. No. 68,703

Term of patent 14 years

LOC (6) Cl. 28 - *02*

U.S. Cl. D28—7



401,381
HAIR FORMING APPLIANCE

Cornelia Seifert, Bad Soden, Germany, assignor to Braun Aktiengesellschaft, Frankfurt, Germany

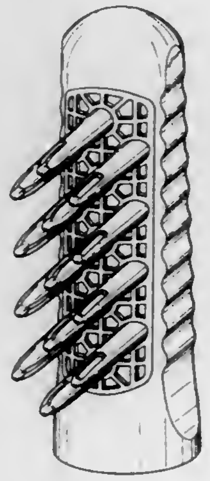
Filed Feb. 6, 1998, Ser. No. 83,349

Claims priority, application Germany, Aug. 11, 1997, M9707428

Term of patent 14 years

LOC (6) Cl. 28 - *03*

U.S. Cl. D28—18



401,382
HAIR STYLER

Cornelia Seifert, Bad Soden, Germany, assignor to Braun Aktiengesellschaft, Frankfurt, Germany

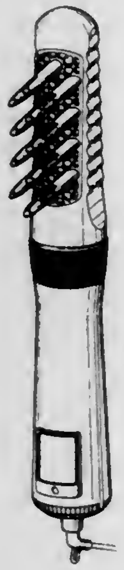
Filed Feb. 6, 1998, Ser. No. 83,479

Claims priority, application Germany, Aug. 11, 1997, 97 07 426.8

Term of patent 14 years

LOC (6) Cl. 28 - *03*

U.S. Cl. D28—13



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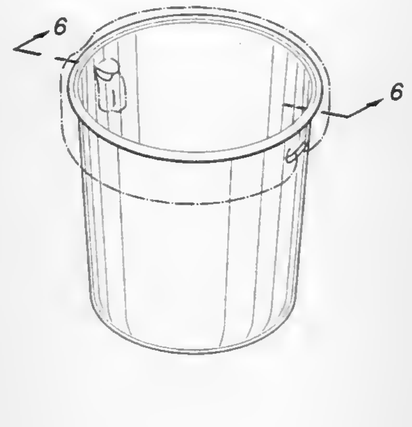
401,383
WASTEBASKET WITH LINER BAG LOCK

Donald A. Gish, 4832 Sterling Hills Dr., Antioch, Calif. 94509
Filed Oct. 21, 1996, Ser. No. 61,432
Term of patent 14 years
LOC (6) Cl. 09 - *09*

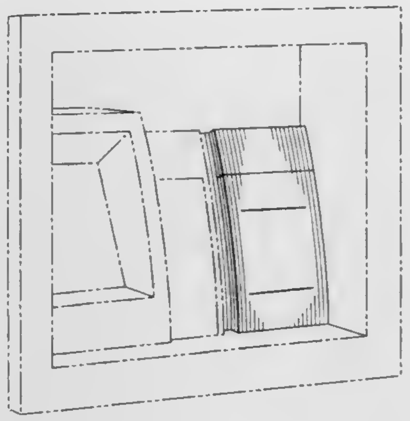
U.S. Cl. D34—1



401,384
PERIPHERAL CABINET FOR NCR 587X TERMINAL

Timothy P. Johnson, 7985 Southbury Dr., Centerville, Ohio 45459
Filed Apr. 21, 1997, Ser. No. 69,979
Claims priority, application United Kingdom, Dec. 3, 1996, 2061400
Term of patent 14 years
LOC (6) Cl. 99 - *00*

U.S. Cl. D99—43



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PATENTS WERE ISSUED ON THE 17th DAY OF NOVEMBER, 1998

NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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  Fleck, Jonathan E.; and Fleck, Abigail M., 5,837,979, Cl. 219-732.000.
A.R.T.E. Parc Equation: *See*—
  Garnier, Yves; and Caucal, Guy, 5,836,525, Cl. 241-28.000.
A. Rawie GmbH & Co.: *See*—
  Roick, Reinhard, 5,836,252, Cl. 104-259.000.
A. Y. McDonald Mfg. Co.: *See*—
  Daghe, Joseph L.; and Eckel, John, 5,836,340, Cl. 137-112.000.
AB Volvo: *See*—
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  Zetterström, Sigvard, 5,836,712, Cl. 403-334.000.
ABB Air Preheater, Inc.: *See*—
  Brophy, Mark E.; and Finnemore, Harlan E, 5,836,378, Cl. 165-9.000.
  Counterman, Wayne S., 5,836,379, Cl. 165-10.000.
ABB Power T&D Company, Inc.: *See*—
  Ward, Solveig; and Udren, Eric, 5,838,525, Cl. 361-69.000.
ABB Transmit Oy: *See*—
  Novosel, Damir; Hart, David; Hu, Yi; and Myllymaki, Jorma, 5,839,093, Cl. 702-59.000.
Abbas, Mohamed: *See*—
  Elliot, James; Abbas, Mohamed; Suriano, John R.; and Holmes, Thomas W., 5,838,877, Cl. 388-804.000.
Abbott Laboratories: *See*—
  Cordle, Christopher T.; Lin, Shih-Bin; Nelles, Lynn P.; and Thomas, Ronald L., 5,837,312, Cl. 426-656.000.
  Ku, Yi-Yin, 5,837,829, Cl. 536-7.400.
  Li, Qun; Wang, Wei-Bo; Chu, Daniel T.; and Hasvold, Lisa Anne, 5,837,868, Cl. 540-580.000.
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Abe, Shingo: *See*—
  Matoba, Hirotsugu; Hirata, Susumu; Ishii, Yorishige; Abe, Shingo; Onda, Hiroshi; and Inui, Tetsuya, 5,838,413, Cl. 349-155.000.
Abe, Tatsuyuki: *See*—
  Watanabe, Atsuo; Nakayama, Kenjiro; and Abe, Tatsuyuki, 5,836,860, Cl. 492-56.000.
Abe, Yoshikazu: *See*—
  Maruyama, Teruo; Abe, Yoshikazu; Takara, Akira; and Ikemoto, Yoshihiro, 5,836,746, Cl. 417-44.100.
Aberg, Bo-Christer, to Albany Nordiskafilt AB. Calendering system including a belt having an adaptable web-contacting surface. 5,836,242, Cl. 100-327.000.
Abita, Joseph L.; Stanford, Ronald L.; and Carkhuff, Bliss G., to Johns Hopkins University, The. Alarm system for blind and visually impaired individuals. 5,838,238, Cl. 340-573.000.
Abkowitz, Martin A.: *See*—
  Law, Kock-Yee; Tarnawskyj, Ihor W.; Mammino, Joseph; McGrane, Kathleen M.; Abkowitz, Martin A.; Ferguson, Robert M.; and Knier, Frederick E., Jr., 5,837,340, Cl. 428-36.800.
Abrahamson, Karil: *See*—
  Falck-Pedersen, Erik S.; Crystal, Ronald G.; Mastrangeli, Andrea; and Abrahamson, Karil, 5,837,511, Cl. 435-172.300.
Abramson, David Andrew; and Sosic, Rok. Method for testing and debugging computer programs. 5,838,975, Cl. 395-704.000.
Abrecht, Christine; Grieder, Alfred; Müller, Klaus; and Obrecht, Daniel, to Hoffmann-La Roche Inc. Tetrahydronaphthalene compounds. 5,837,807, Cl. 530-317.000.
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Academy of Sciences of the Czech Republic, Institute of Organic Chemistry and Biochemistry of the: *See*—
  Kim, Choung Un; Martin, John C.; Luh, Bing Uh; and Misco, Peter F., 5,837,871, Cl. 544-243.000.
ACCO Brands, Inc.: *See*—
  Derman, Jay S., 5,836,183, Cl. 70-58.000.
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  Wurz, Albert; and Skokowski, Richard J., Jr., 5,838,253, Cl. 340-825.540.
Accuracy Microsensors, Inc.: *See*—
  McCarthy, Cornelius J., 5,838,451, Cl. 356-406.000.
ACD Tridon Inc.: *See*—
  Funk, Gregory Allen; Nazione, Michael Charles; and Buechele, Franz, 5,836,042, Cl. 15-250.300.
Ace, Christopher Ian: *See*—
  Preston, Christopher Maurice; and Ace, Christopher Ian, 5,837,532, Cl. 435-320.100.
Acemoglu, Murat; Bantle, Siegfried; Bodmer, David; Cammisuli, Salvatore; Hiestand, Peter; Nimmerfall, Fritz; and Stoll, Georg, to Novartis AG. Polymeric matrices and their uses in pharmaceutical compositions. 5,837,805, Cl. 528-370.000.
Ackerman, Samuel K.: *See*—
  Lee, Cynthia K.; Monath, Thomas P.; Ackerman, Samuel K.; Thomas, William D.; Soman, Gopalan; Kleanthous, Harold; Weltzin, Richard A.; Pappo, Jacques; Ermak, Thomas; Guirakhoo, Farshad; Bhagat, Hitesh; and Sussman, Ilene, 5,837,240, Cl. 424-94.600.
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  Bobba, Mohan LeeLaRama; Acosta, Jorge Luis; Eusterman, Timothy Joseph; Ring, James W.; and McQueen, Alexander, 5,837,988, Cl. 235-467.000.
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  Acres, John F.; Ginsburg, Alec; and Wiebenson, David, 5,836,817, Cl. 463-26.000.
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  Peters, Rick E., 5,836,903, Cl. 602-27.000.
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  Baehr, Karl; and Chambers, George, 5,839,050, Cl. 455-2.000.
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  Boehm, Herbert C.; Morgan, William E.; Aoyama, Steven; Snell, Dean A.; Gosetti, Steven M.; and Pasqua, Samuel A., Jr., 5,836,832, Cl. 473-354.000.
  Snell, Dean A.; and Levitt, Barbara Stefani, 5,837,775, Cl. 525-221.000.
  Stanton, Lawrence E.; Reid, Walter L., Jr.; Scolamiero, Stephen K.; and Dalton, Jeffrey L., 5,836,831, Cl. 473-354.000.
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  Bernstein, Howard; Straub, Julie Ann; Brush, Henry T.; and Church, Charles C., 5,837,221, Cl. 424-9.520.
ADA Technologies, Inc.: *See*—
  French, Patrick D., 5,839,094, Cl. 702-91.000.
Adachi, Hiroki; Goto, Yuugo; Zhang, Hongyong; and Takayama, Toru, to Semiconductor Energy Laboratory Co., Ltd. Method of fabricating semiconductor device and method of processing substrate. 5,837,619, Cl. 438-795.000.
Adachi, Michio: *See*—
  Iwasaki, Kazutoshi; Adachi, Michio; Ushida, Masayasu; and Matsumoto, Yoshio, 5,836,276, Cl. 123-90.170.
Adams, Clifford J.: *See*—
  Brown, Joe Dan; and Adams, Clifford J., 5,836,460, Cl. 211-74.000.
Adams, James C. Piercing device for cigars. 5,836,318, Cl. 131-253.000.
Adams, John E.; Hirabayashi, Kazuhiro; and Takeoka, Toru, to Three Bond Co., Ltd. Radiation curable sealing material for batteries. 5,837,398, Cl. 429-174.000.
Adams, Mark D.: *See*—
  Olsen, Henrik S.; and Adams, Mark D., 5,837,498, Cl. 435-69.400.
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Ishikawa, Yutaka: *See—*
Takano, Masatoshi; Ishikawa, Yutaka; Yamaguchi, Hiroyuki; and Saito, Hiroyuki, 5,839,046, Cl. 399-384.000.
Ishikawajima-Harima Heavy Industries Co. Ltd.: *See—*
Matsui, Kunio; Hirata, Atsushi; and Kimatsuka, Akihiko, 5,836,376, Cl. 164-466.000.
Takei, Nobuo; and Takabe, Shigeru, 5,836,753, Cl. 418-95.000.
Ishizaka, Yasuhiro, to NEC Corporation. Clock signal generator having voltage level converting circuit. 5,838,183, Cl. 327-299.000.
Ishizawa, Yoshio: *See—*
Otani, Shigeki; Soda, Ryutaro; and Ishizawa, Yoshio, 5,837,165, Cl. 252-519.140.
Isis Pharmaceuticals, Inc.: *See—*
Monia, Brett P.; Freier, Susan M.; and Ecker, David J., 5,837,449, Cl. 435-6.000.
Iskarous, Michel: *See—*
Farkas, Gabriel J.; and Iskarous, Michel, 5,837,159, Cl. 252-193.000.
Israelsen, Hans; Hansen, Egon Bech; Johansen, Eric; Madsen, Soeren Michael; Nilsson, Dan; and Vrang, Astrid, to Bioteknologisk Institut; and CHR Hansen's Labortorium Danmark A/S. Recombinant lactic acid bacterium containing an inserted promoter and method of constructing same. 5,837,509, Cl. 435-172.300.
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Sakurai, Noriyuki, 5,836,272, Cl. 123-41.82R.
Itagaki, Hiroshi: *See—*
Nodera, Akio; and Itagaki, Hiroshi, 5,837,757, Cl. 524-87.000.
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Morishita, Yoshii; Matsui, Megumi; Hayashida, Shigeru; Akimoto, Takayuki; and Itagaki, Mikio, 5,837,411, Cl. 430-59.000.
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Cozzette, Stephen N.; Davis, Graham; Itak, Jeanne; Lauks, Imants R.; Piznik, Sylvia; Smit, Nicolaas; Steiner, Susan; Van Der Werf, Paul; Wieck, Henry J.; Mier, Randall M., deceased, 5,837,446, Cl. 435-6.000.
Cozzette, Stephen N.; Davis, Graham; Lauks, Imants R.; Mier, Randall M., deceased; Piznik, Sylvia; Smit, Nicolaas; Van Der Werf, Paul; Wieck, Henry J.; Steiner, Susan; and Itak, Jeanne, 5,837,454, Cl. 435-6.000.
Itani, Kazunori, to Aloka Co., Ltd. Physiological tissue treatment apparatus. 5,837,198, Cl. 422-63.000.
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Saito, Yoshitane; Itani, Kazuo; Watanabe, Yuji; and Katsuno, Takeharu, 5,838,249, Cl. 340-825.060.
Iterated Systems, Inc.: *See—*
Barnsley, Michael F., 5,838,832, Cl. 382-249.000.
Ito, Chiaki: *See—*
Aoki, Yoichi; Satoh, Yasuo; Ito, Chiaki; Kakizawa, Seizi; Konya, Shinichi; Mio, Haruhiko; Wanishi, Makoto; and Asawa, Takeo, 5,838,890, Cl. 395-174.000.
Ito, Eiichi: *See—*
Hara, Masato; Takami, Satoshi; Sakai, Teruo; Takahashi, Noriaki; and Ito, Eiichi, 5,838,431, Cl. 356-138.000.
Ito, Fumitaka; Kokura, Toshihide; Nakane, Masami; Satake, Kunio; and Wakabayashi, Hiroaki, to Pfizer Inc. Substituted quinuclidines as substance P antagonists. 5,837,711, Cl. 514-305.000.
Ito, Fumitaka, to Pfizer Inc. Hydroxamic acid anesthetic compounds. 5,837,717, Cl. 514-326.000.
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Ito, Hajime: *See—*
Aoki, Shiniji; Sugi, Hikaru; Ito, Hajime; and Morikawa, Toshio, 5,836,270, Cl. 123-41.310.
Ito, Hiroki; Moriyama, Takashi; Kamei, Kenji; Kimura, Minoru; Hamano, Suenobu; Yonezawa, Takashi; Nitta, Etsuo; Arai, Kazuhiko; Sasão, Hiroyuki; Takeji, Naoaki; Hashimoto, Takateru; and Hatano, Masayuki, to Mitsubishi Denki Kabushiki Kaisha; Kansai Electric Power Co., Inc., The; Shikoku Electric Power Co., Inc.; and Electric Power Development Co., Ltd. DC circuit breaking device. 5,837,953, Cl. 218-30.000.
Ito, Hiroshi, to NEC Corporation. Timing error detecting circuit. 5,838,172, Cl. 327-20.000.
Ito, Hiroyasu, to Minolta Co., Ltd. Image forming apparatus for copying different groups of document. 5,839,019, Cl. 399-45.000.
Ito, Kazuhiko: *See—*
Mizuno, Masahiro; Ogawa, Akira; Matsumoto, Toshio; Ogura, Shiro; Ito, Kazuhiko; Yamamoto, Hitoshi; Ito, Kazuo; and Baba, Hiroshi, 5,838,891, Cl. 395-182.030.
Ito, Kazuo: *See—*
Mizuno, Masahiro; Ogawa, Akira; Matsumoto, Toshio; Ogura, Shiro; Ito, Kazuhiko; Yamamoto, Hitoshi; Ito, Kazuo; and Baba, Hiroshi, 5,838,891, Cl. 395-182.030.
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Ito, Naoki: *See—*
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Ito, Norihiko: *See—*
Hosokawa, Saiko; Tagawa, Toshiaki; Hirakawa, Yoko; Ito, Norihiko; and Nagaike, Kazuhiro, 5,837,845, Cl. 536-23.530.
Ito, Norio; Shinozaki, Junichiro; and Imaizumi, Hiroshi, to Seiko Epson Corporation. Superconducting bearing device. 5,838,082, Cl. 310-90.500.
Ito, Shinichi: *See—*
Tomofuji, Yoko; Nakase, Makoto; Sato, Takashi; Hazama, Hiroaki; Komano, Haruki; and Ito, Shinichi, 5,837,405, Cl. 430-5.000.
Ito, Takayuki; and Hasushita, Sachio, to Asahi Kogaku Kogyo Kabushiki Kaisha. High-powered zoom lens system. 5,838,500, Cl. 359-689.000.
Ito, Toshio: *See—*
Tsuchiya, Yoichi; Terasaki, Hitoshi; Ichiura, Shuichi; Ito, Toshio; Kano, Yasuyuki; Yamaguchi, Yoshimoto; Kato, Seizo; and Ota, Osamu, 5,838,657, Cl. 369-275.400.
Ito, Tosikazu: *See—*
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Ito, Yasuo: *See—*
Aoki, Keiichiro; Mogi, Kazuhisa; Nakata, Koichi; Ito, Yasuo; and Kurebayashi, Youichi, 5,836,285, Cl. 123-418.000.
Itoh, Masaaki: *See—*
Hichiwa, Tsutomu; Shimada, Masayuki; Nakagawa, Masahiko; and Itoh, Masaaki, 5,838,099, Cl. 313-440.000.
Itoh, Shigeyuki: *See—*
Inoue, Masayuki; Itoh, Shigeyuki; Takami, Yutaka; Matsumoto, Kenji; and Yamashita, Kotaro, 5,838,059, Cl. 257-679.000.
Itoh, Tetsuya: *See—*
Ishikawa, Atsushi; and Itoh, Tetsuya, 5,838,833, Cl. 382-249.000.
Itoh, Yoshinari: *See—*

Haraguchi, Kenji; Suzuki, Takanori; and Itoh, Yoshinari, 5,837,740, Cl. 521-60.000.
Itoh, Yukihiro: *See—*
Okauchi, Yoshifumi; Tomoe, Tetsuro; Itoh, Yukihiro; Miyazaki, Masahiko; and Hirano, Syouji, 5,839,025, Cl. 399-92.000.
Itoi, Hiroto, to Shimadzu Corporation. Gas chromatograph/mass spectrometer. 5,837,883, Cl. 73-23.370.
Itoigawa, Koichi; Iwata, Hitoshi; and Kinoshita, Kenichi, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Catheter having a sensor. 5,836,886, Cl. 600-488.000.
Itou, Takaaki: *See—*
Kinugasa, Yukio; Itou, Takaaki; Hyodo, Yoshihiko; Kidokoro, Toru; and Takagi, Naoya, 5,836,291, Cl. 123-679.000.
Itoyama, Motoyuki: *See—*
Asanuma, Masato; Ino, Toshiaki; Okamoto, Kanshiro; Saiko, Hideji; Ishida, Toshihisa; Sumida, Katsuaki; Itoyama, Motoyuki; Naoi, Hiroo; Tokuyama, Mitsuru; Hatanaka, Eisaku; Takesue, Yuichiro; Masuda, Jitsuo; Narimatsu, Masayasu; and Kitabatake, Yasuo, 5,839,018, Cl. 399-43.000.
ITT Automotive Electrical Systems, Inc.: *See—*
Elliot, James; Abbas, Mohamed; Suriano, John R.; and Holmes, Thomas W., 5,838,877, Cl. 388-804.000.
Greentaner, Lowell T.; Hemmert, David J.; and Kiehnle, Günter, 5,838,081, Cl. 310-90.000.
ITT Manufacturing Enterprises Inc.: *See—*
Feigel, Hans-Jorg; Neumann, Ulrich; Klein, Andreas; and Schiel, Lothar, 5,836,659, Cl. 303-115.200.
Hyzin, Peter Joseph, 5,836,781, Cl. 439-348.000.
ITW-Fastex Italia S.p.A: *See—*
Calabrese, Rocco, 5,836,367, Cl. 138-112.000.
Ivory, Brian. Self cleaning toothbrush. 5,836,036, Cl. 15-167.100.
Iwai, Kazumi: *See—*
Tsukahara, Satoshi; Yoshida, Shohei; Yamagishi, Masahiko; Iwai, Kazumi; Koizumi, Hiromi; and Yoshinaga, Yoichi, 5,836,164, Cl. 60-733.000.
Iwaki, Shinichi: *See—*
Fukushima, Yutaka; Takemura, Tetsuo; Iwaki, Shinichi; Hashida, Mitsuyoshi; Wanami, Masao; Shimbo, Isao; Wada, Mitsuhiro; Udaki, Hirofumi; Kondo, Yoshihiro; Yamamoto, Yoshinobu; Nakagoshi, Arata; Ohta, Kouichi; Kuwahara, Hiroshi; and Watanabe, Yumiko, 5,838,770, Cl. 379-34.000.
Iwamida, Hitoshi, to Fujitsu Limited. Speech recognition apparatus capable of recognizing signals of sounds other than spoken words and displaying the same for viewing. 5,839,109, Cl. 704-271.000.
Iwamura, Ryuichi, to Sony Corporation; and Sony Electronics, Inc. Frame-accurate edit and playback in digital stream recording. 5,838,876, Cl. 386-125.000.
Iwane, Touru, to Nikon Corporation. Focus adjustment method and apparatus. 5,839,003, Cl. 396-102.000.
Iwasaki, Chisato: *See—*
Kawahata, Ken; Nakano, Akira; Fukui, Hirofumi; Hebiguchi, Hiroyuki; Yamamoto, Kenji; and Iwasaki, Chisato, 5,837,559, Cl. 438-30.000.
Iwasaki, Katsuya, to Unisia Jecs Corporation. Apparatus and method for controlling damping force characteristic of vehicular shock absorber. 5,839,082, Cl. 701-38.000.
Iwasaki, Kazutoshi; Adachi, Michio; Ushida, Masayasu; and Matsumoto, Yoshio, to Denso Corporation. Rotational phase adjusting apparatus having fluid reservoir. 5,836,276, Cl. 123-90.170.
Iwasaki, Motoya, to NEC Corporation. Secure communication by encryption/decryption of vector at PSK modulation/detection stage. 5,838,797, Cl. 380-49.000.
Iwata, Hitoshi: *See—*
Itoigawa, Koichi; Iwata, Hitoshi; and Kinoshita, Kenichi, 5,836,886, Cl. 600-488.000.
Iwayama, Noboru: *See—*
Torii, Naoya; Iwayama, Noboru; Takenaka, Masahiko; Hasebe, Takayuki; and Matsuda, Masahiro, 5,838,791, Cl. 380-20.000.
Iwinski, Dean J.: *See—*
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Izumi, Masahiro: *See—*
Castillo, Gilbert; and Izumi, Masahiro, 5,836,061, Cl. 24-702.000.
Izumi, Shogo: *See—*
Nakamichi, Kouichi; Izumi, Shogo; and Yasuura, Hiroyuki, 5,837,285, Cl. 424-464.000.
Izumi, Yoichi: *See—*
Moriwaki, Yoshio; Izumi, Yoichi; Yamamura, Yasuharu; and Kaiya, Hideo, 5,837,317, Cl. 427-217.000.
Izumi, Yoshihiro; and Shinomiya, Tokihiko, to Sharp Kabushiki Kaisha. Tiled display device. 5,838,405, Cl. 349-73.000.
J.C. Bamford Excavators Limited: *See—*
Moses, John; and Burke, John Pius, 5,836,733, Cl. 414-685.000.
Jablonski, Regina L.: *See—*
Janoff, Andrew S.; Cullis, Pieter R.; Bally, Marcel B.; Fountain, Michael W.; Ginsberg, Richard S.; Hope, Michael J.; Madden, Thomas D.; Schieren, Hugh P.; and Jablonski, Regina L., 5,837,279, Cl. 424-450.000.
Jachimowicz, Karen E.: *See—*
Chen, Diana; Wright, Phil; and Jachimowicz, Karen E., 5,838,416, Cl. 349-202.000.
Jacklin, Kelly; and Clifford, Daniel, to Apple Computer, Inc. System and method for collecting and dispatching selected events in a computer application program. 5,838,969, Cl. 395-680.000.
Jackovitz, John F.: *See—*
Singh, Narsingh B.; Partlow, William D.; Strauch, Steven; Stewart, Albert M.; Jackovitz, John F.; Coffey, David W.; and Mazelski, Robert, 5,837,054, Cl. 117-10.000.
Jackson, Jerome: *See—*
Swanson, David K.; Panescu, Dorin; Whayne, James G.; and Jackson, Jerome, 5,836,874, Cl. 600-374.000.
Jackson, Joseph N., to Jackson, Joseph N. Apparatus and method of providing a personal fertility predictor. 5,836,890, Cl. 600-551.000.
Jackson, Robert; and Croghan, Wallace E., Jr., to Hewlett-Packard Company. Stencil dryer. 5,836,084, Cl. 34-107.000.
Jackson, Robert Michael: *See—*
Midya, Pallab; Jackson, Robert Michael; and Anderson, Dale, 5,838,210, Cl. 332-109.000.
Jacobine, Anthony F.; and Nakos, Steven T., to Loctite Corporation. Norbornenyl azlactones. 5,837,751, Cl. 522-167.000.
Jacobs, David L.; Eagen, Eric L.; and Rogers, Jeffrey J. Method and system for reducing drag on the movement of bluff bodies through a fluid medium and increasing heat transfer. 5,836,016, Cl. 2-69.000.
Jacobs, Gregory F., to Minnesota Mining and Manufacturing Company. Wide range vertical retroreflective delineator. 5,837,350, Cl. 428-195.000.
Jacobs, Kenneth; McCoy, John M.; LaVallie, Edward R.; Racie, Lisa A.; Merberg, David; Treacy, Maurice; and Spaulding, Vikki, to Genetics Institute, Inc. Secreted proteins and polynucleotides encoding them. 5,837,490, Cl. 435-69.100.
Jacobs, Robert M.: *See—*
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Jacobs, William R.: *See—*
Sacchettini, James; Blanchard, John; Jacobs, William R.; and Bittman, Robert, 5,837,732, Cl. 514-560.000.
Jacobs, William R., Jr.: *See—*
Sacchettini, James; Blanchard, John; and Jacobs, William R., Jr., 5,837,480, Cl. 435-25.000.
Jacobson, Jerome P.: *See—*
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Jacobson, Neil G.: *See—*
Curd, Derek R.; Jacobson, Neil G.; Diba, Sholeh; Lee, Napoleon W.; Ku, Wei-Yi; and Rao, Kameswara K., 5,838,901, Cl. 395-186.000.
Jacovich, William James Andrew: *See—*
Arnott, Robin A.; and Jacovich, William James Andrew, 5,837,301, Cl. 425-574.000.
Jaecklin, Felix Paul. Construction element, in particular supporting or sound insúlating construction element capable of being planted, set of construction elements and process for producing the same. 5,836,129, Cl. 52-612.000.
Jaekel, Fred G., to Cosma International Inc. Transmission clutch housing formed from a single piece of metal and method for making the same 5,836,431, Cl. 192-70.200.
Jagiello, Jacek: *See—*
Schwarz, James A.; Putyera, Karol, Bandosz, Teresa J.; Jagiello, Jacek; and Amankwah, Kwabena A. G., 5,837,741, Cl. 521-124.000.
Jahns, Ekkehard: *See—*
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Jahns, Thomas M.: *See—*
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Jain, Amit: *See—*
Lee, Neville K.; Jain, Amit; and Martin, Roy E., 5,838,503, Cl. 359-833.000.
Jakab, Gyula, to Northern Telecom Limited. Telephone ringing signal generator. 5,838,788, Cl. 379-418.000.
James, Olive A.: *See—*
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Jané , Rodney; and Wong, Arthur, to Honeywell Consumer Products Inc. Portable quartz heater. 5,838,878, Cl. 392-376.000.
Jang, Hyun-Soon: *See—*
Park, Churoo; Jang, Hyun-Soon; Kim, Chull-Soo; Kim, Myung-Ho; Lee, Seung-Hun; Lee, Si-Yeol; Lee, Ho-Cheol; Kim, Tae-Jin; and Choi, Yun-Ho, 5,838,990, Cl. 395-834.000.
Janik, Leon P., to Stanadyne Automotive Corp. Base/cartridge location and key system for fuel filter assembly. 5,837,137, Cl. 210-232.000.
Janiszewski, Grzegorz; and Bergström, Kjell A. C., to AB Volvo. Transmission for a four wheel drive vehicle with a transverse engine. 5,836,848, Cl 475-204.000.
Jannson, Joanna L.; Jannson, Tomasz P.; and Lerner, Jeremy M., to Physical Optics Corporation. Liquid crystal display system with internally reflecting waveguide for backlighting and non-Lambertian diffusing. 5,838,403, Cl. 349-65.000.
Jannson, Tomasz P.: *See—*
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- Janoff, Andrew S.; Cullis, Pieter R.; Bally, Marcel B.; Fountain, Michael W.; Ginsberg, Richard S.; Hope, Michael J.; Madden, Thomas D.; Schieren, Hugh P.; and Jablonski, Regina L., to Lipsome Company, Inc., The. Encapsulation of ionizable agents in liposomes. 5,837,279, Cl. 424-450.000.
- Jansen, Bernhard: *See—*
  - Scholl, Hans-Joachim; Jansen, Bernhard; and Meyer, Rolf-Volker, 5,837,796, Cl. 528-73.000.
- Jansma, Jon Bennett, to General Electric Company. Fluorescent lamp having phosphor layer with additive. 5,838,100, Cl. 313-485.000.
- Janssen, David C.; and Grimmer, Larry R., to STRATTEC Security Corporation. Tumberless automobile ignition lock. 5,836,187, Cl. 70-252.000.
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  - Waterschoot, William; Vackier, Leo; Janssens, Robert; Goethem, Luc Van; and Echelpoel, Eric Van, 5,839,031, Cl. 399-119.000.
- Japan Bonkote Company Limited: *See—*
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- Japan Cash Machine Co., Ltd.: *See—*
  - Fujita, Masanobu; and Kanno, Noriyuki, 5,836,435, Cl. 194-206.000.
- Japan Science and Technology Corporation: *See—*
  - Watanabe, Yasuyoshi; Kuratsune, Hirohiko; Kitani, Teruo; and Langström, Bengt, 5,837,219, Cl. 424-1.810.
- Japan Synthetic Rubber Co., Ltd.: *See—*
  - Kanda, Kazunori; Ueda, Koichi; Kakiuchi, Tadahiro; Muramoto, Hisaichi; Yasuda, Kenji; Sato, Hozumi; Koshimura, Katsuo; and Nishioka, Takashi, 5,837,421, Cl. 430-281.100.
- Jarrold, Gregory S.; Chatterjee, Dilip K.; and Ghosh, Syamal K., to Eastman Kodak Company. Zirconia-alumina composite ceramic lithographie printing member. 5,836,248, Cl. 101-453.000.
- Jarvis, Stephen Austin: *See—*
  - Maher, David Lord; Rodriguez, Derek Albert; and Jarvis, Stephen Austin, 5,837,922, Cl. 89-46.000.
- Jatco Corporation: *See—*
  - Kosuge, Hideaki, 5,836,157, Cl. 60-362.000.
- Javid, Nasir: *See—*
  - Van Der Stok, Huibert; and Javid, Nasir, 5,837,638, Cl. 502-62.000.
- Javitt, Daniel C. Treatment of negative and cognitive symptoms of schizophrenia with glycine uptake antagonists. 5,837,730, Cl. 514-551.000.
- Jayasena, Sumedha D.: *See—*
  - Gold, Larry; Jayasena, Sumedha D.; Nieuwlandt, Dan; and Davis, Ken, 5,837,456, Cl. 435-6.000.
- Jayaweera, Indira: *See—*
  - Ross, David S.; Jayaweera, Indira; and Leif, Roald N., 5,837,149, Cl. 210-759.000.
- JB Research, Inc.: *See—*
  - Leventhal, Robert D., 5,836,900, Cl. 601-57.000.
- Jeanes, Thomas O.: *See—*
  - Moll, David J.; Burmester, Alan F.; Young, Thomas C.; McReynolds, Kent B.; Clark, James E.; Hotz, Charles Z.; Wessling, Ritchie A.; Quarderer, George J.; Lacher, Ronald M.; Jeanes, Thomas O.; Beck, Henry N.; Bales, Stephen E.; and Smith, Bethanne L., 5,837,032, Cl. 95-45.000.
- Jendersee, Brad; and Lashinski, Robert. Stent delivery and deployment method. 5,836,965, Cl. 606-198.000.
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  - Chen, Li-Yeat; Chen, Jin-Dong; Jeng, Erik S.; and Liaw, Ing-Ruey, 5,837,576, Cl. 438-253.000.
- Jeng, Nanseng: *See—*
  - Figura, Thomas A.; and Jeng, Nanseng, 5,837,596, Cl. 438-446.000.
  - Mathews, Viju K.; Jeng, Nanseng; Fazan, Pierre C.; and Figura, Thomas A., 5,837,378, Cl. 438-439.000.
- Jenison, Steve: *See—*
  - Hjelle, Brian; and Jenison, Steve, 5,837,441, Cl. 435-5.000.
- Jennemann, Paul V. Method and system for radon mitigation. 5,836,815, Cl. 454-341.000.
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- Jennings, Howard T.; and Li, Lin, to British Nuclear Fuels PLC. Waste processing method and apparatus. 5,839,078, Cl. 588-11.000.
- Jennings, Mark E.: *See—*
  - Wright, Philip Dean; Jennings, Mark E.; and Steele, Bryan Scott, 5,836,678, Cl. 362-364.000.
- Jennmar Corporation: *See—*
  - Stankus, John C.; Oldsen, John G.; and Castle, Brian R., 5,836,720, Cl. 405-302.200.
- JENOPTIK Aktiengesellschaft: *See—*
  - Kraenert, Juergen; Kuehn, Holger; Mueller, Holger; and Kufert, Siegfried, 5,838,712, Cl. 372-75.000.
- Jensen, Joel R.: *See—*
  - Rosenhauer, Alan; Pruett, Paul S.; and Jensen, Joel R., 5,838,911, Cl. 395-200.330.
- Jentzsch, K. Reed; Willoughby, Otis H.; and Baldwin, Gary A., to Ball Corporation. Beverage container with increased bottom strength. 5,836,473, Cl. 220-606.000.
- Jeol Ltd.: *See—*
  - Miyabayashi, Nobuyoshi, 5,838,156, Cl. 324-307.000.
- Jeon, Jun-Young, to Samsung Electronics Co., Ltd. Substrate voltage generating circuit of semiconductor memory device. 5,838,189, Cl. 327-537.000.
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  - Lee, Jin Bang; Choi, Byung Cheol; Kim, Seon Kyu; Jeon, Yeong Je; Hong, Seon Young; and Lee, Nam Ho, 5,836,047, Cl. 15-328.000.
- Jepson, Donald; Moore, Robert; Samimi, Mehran; Kashefi, Cyrus; and Bodine, Michael, to Tri Valley Growers. Olive processing method. 5,837,304, Cl. 426-270.000.
- Jespersen, Emil: *See—*
  - Hansen, Preben N.; Pedersen, Steen; Rasmussen, Niels W.; Mogensen, Vagn; and Jespersen, Emil, 5,836,373, Cl. 164-167.000.
- Jespersen, Mark R.: *See—*
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- Jessup, Peter J.; and Croudace, Michael C., to Union Oil Company of California. Gasoline fuel. 5,837,126, Cl. 208-16.000.
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  - Beaton, Stephen Robert; Martin, Wallace Anthony; Kindt-Larsen, Ture; Walker, Craig William; and Duncan, Gregory Scott, 5,837,314, Cl. 427-133.000.
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  - Wang, Chieh-Chun; and Lin, Chia-Ming, 5,836,620, Cl. 285-7.000.
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  - Ng, Sheau-Bao; Tsinberg, Mikhail; Sakurai, Masaru; Lehmann, David; Yogeshwar, Jay; Azadegan, Faramarz; Ichikawa, Teiichi; Unno, Hiroaki; Mimura, Hideki; Kitamura, Tetsuya; Cookson, Christopher J.; Thagard, Greg B.; and Rosen, Andrew Drusin, 5,838,874, Cl. 386-96.000.
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  - Hirosawa, Masashi; and Kitamura, Yoshihiro, 5,838,837, Cl. 382-284.000.
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  - Kozaki, Takahiko; Takatori, Masahiro; Endo, Noboru; Takase, Akihiko; and Oguri, Yozo, 5,838,677, Cl. 370-389.000.
- Takase, Susumu: *See—*
  - Takahashi, Tsutomu; Takase, Susumu; Suzuki, Naohisa; Fukunaga, Koji; Nishiyama, Masaki; Tateyama, Jiro; and Naito, Hisatsugu, 5,838,886, Cl. 395-112.000.
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  - Hirai, Yohei; Takashina, Makoto; and Takebe, Kyoko, 5,837,239, Cl. 424-130.100.
- Takasugi, Yasufumi: *See—*
  - Nagashima, Naoyuki; Azegami, Hitoshi; and Takasugi, Yasufumi, 5,837,744, Cl. 522-4.000.
- Takata Corporation: *See—*
  - Kono, Kaname, 5,836,372, Cl. 164-113.000.
- Takatori, Masahiro: *See—*
  - Kozaki, Takahiko; Takatori, Masahiro; Endo, Noboru; Takase, Akihiko; and Oguri, Yozo, 5,838,677, Cl. 370-389.000.
- Takayama, Hiroshi: *See—*
  - Kataoka, Hiroyuki; Tanaka, Eiko; and Takayama, Hiroshi, 5,839,029, Cl. 399-115.000.
- Takayama, Makoto, to Canon Kabushiki Kaisha. Image processing apparatus having means for controlling exposure using an orthogonal transformation coefficient. 5,838,379, Cl. 348-403.000.
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  - Adachi, Hiroki; Goto, Yuugo; Zhang, Hongyong; and Takayama, Toru, 5,837,619, Cl. 438-795.000.
- Takebe, Kyoko: *See—*
  - Hirai, Yohei; Takashina, Makoto; and Takebe, Kyoko, 5,837,239, Cl. 424-130.100.
- Takeda Chemical Industries, Ltd.: *See—*
  - Iga, Katsumi; Misaki, Masafumi; Okabe, Keiichiro; and Kyo, Emi, 5,837,281, Cl. 424-449.000.
- Takeda, Hideki: *See—*
  - Fukamichi, Kazuaki; Kataoka, Noriyuki; Shimada, Yutaka; and Takeda, Hideki, 5,837,068, Cl. 148-121.000.
- Takeda, Koichiro: *See—*
  - Okada, Kazuhiro; Hieida, Hideki; and Takeda, Koichiro, 5,838,668, Cl. 370-312.000.
- Takeda, Mituyuki: *See—*
  - Kimura, Mitsuteru; Takeda, Mituyuki; and Sato, Hiroyuki, 5,837,884, Cl. 73-25.400.
- Takeda, Norio: *See—*
  - Jinnai, Kuniaki; Kawahata, Yasunari, and Takeda, Norio, 5,838,853, Cl. 385-50.000
- Takehara, Eiji: *See—*
  - Inagaki, Shoji; and Takehara, Eiji, 5,837,155, Cl. 216-18.000.
- Takehara, Nobuyoshi: *See—*
  - Kurokami, Seiji; Fukae, Kimitoshi; and Takehara, Nobuyoshi, 5,838,148, Cl. 323-299.000.
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  - Ito, Hiroki; Moriyama, Takashi; Kamei, Kenji; Kimura, Minoru; Hamano, Suenobu; Yonezawa, Takashi; Nitta, Etsuo; Arai, Kazuhiko; Sasao, Hiroyuki; Takeji, Naoaki; Hashimoto, Takateru; and Hatano, Masayuki, 5,837,953, Cl. 218-30.000.
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  - Oda, Hideyuki; Kawabe, Takashi; Murakami, Nobuaki; Ueda, Katsunori; Yoshikawa, Satoshi; Goto, Kenji; Ohashi, Tomohiro; Hiruma, Eiichi; Takemura, Jyun; Yamamoto, Shigeo; and Nakane, Kazuyoshi, 5,836,284, Cl. 123-308.000.
- Takemura, Tetsuo: *See—*

- Fukushima, Yutaka; Takemura, Tetsuo; Iwaki, Shinichi; Hashida, Mitsuyoshi; Wanami, Masao; Shimbo, Isao; Wada, Mitsuhiro; Udaki, Hirofumi; Kondo, Yoshihiro; Yamamoto, Yoshinobu; Nakagoshi, Arata; Ohta, Kouichi; Kuwahara, Hiroshi; and Watanabe, Yumiko, 5,838,770, Cl. 379-34.000.
- Takemura, Yoshinari: *See—*
  - Nakane, Kazuhiko; Ohata, Hiroyuki; Nagasawa, Masato; Gotoh, Kenji; Ishida, Yoshinobu; Satoh, Isao; Ohara, Shunji; Ishida, Takashi; and Takemura, Yoshinari, 5,838,658, Cl. 369-275.400.
- Takemura, Yukio: *See—*
  - Tomono, Haruo; Takemura, Yukio; Suzuki, Hiroyuki; Matsuo, Yuji; and Kimura, Kazumi, 5,838,506, Cl. 359-871.000.
- Takenaka, Masahiko: *See—*
  - Torii, Naoya; Iwayama, Noboru; Takenaka, Masahiko; Hasebe, Takayuki; and Matsuda, Masahiro, 5,838,791, Cl. 380-20.000.
- Takeoka, Toru: *See—*
  - Adams, John E.; Hirabayashi, Kazuhiro; and Takeoka, Toru, 5,837,398, Cl. 429-174.000.
- Takeshita, Fusayuki: *See—*
  - Sekiguchi, Yasuko; Murashiro, Katsuyuki; Takeshita, Fusayuki; Matsushita, Tetsuya; and Nakagawa, Etsuo, 5,837,161, Cl. 252-299.610.
- Takesita, Norimitsu; Sano, Masahiro; Arakawa, Yasuko; and Ayabe, Kazue, to Calsonic Corporation. Heater/cooler unit of automotive air conditioning device. 5,836,380, Cl. 165-43.000.
- Takesue, Yuichiro: *See—*
  - Asanuma, Masato; Ino, Toshiaki; Okamoto, Kanshiro; Saiko, Hideji; Ishida, Toshihisa; Sumida, Katsuaki; Itoyama, Motoyuki; Naoi, Hiroo; Tokuyama, Mitsuru; Hatanaka, Eisaku; Takesue, Yuichiro; Masuda, Jitsuo; Narimatsu, Masayasu; and Kitabatake, Yasuo, 5,839,018, Cl. 399-43.000.
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  - Morikawa, Takeshi; Nishibe, Yuji; Yamadera, Hideya; Nonomura, Yutaka; Takeuchi, Masaharu; and Sakata, Jiro, 5,838,154, Cl. 324-249.000.
- Takeuchi, Masaru: *See—*
  - Yoneda, Kiyoshi; Morimoto, Yoshihiro; Hirano, Kiichi; Suzuki, Koji; and Takeuchi, Masaru, 5,837,568, Cl. 438-147.000.
- Takeuchi, Yukihisa: *See—*
  - Shibata, Kazuyoshi; Takeuchi, Yukihisa; Shrader, Eric J.; and Eckerle, Joseph S., 5,837,887, Cl. 73-35.110.
- Takeyari, Ryoji; Funada, Takashi; Wakai, Yukihiko; and Hagimoto, Kazuo, to Hitachi, Ltd.; and Nippon Telegraph and Telephone Corporation. Optical regenerator and an optical transmission system. 5,838,475, Cl. 359-176.000.
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  - Yahata, Ken; Miyoshi, Hiroshi; Takiguchi, Yasuyuki; Komoto, Yasuyoshi; and Hayashida, Akira, 5,837,801, Cl. 528-310.000.
- Takiyama, Eiichiro; and Hatano, Yoshitaka, to Showa Highpolymer Co., Ltd. Biodegradable thermosetting urea-resin compositions. 5,837,755, Cl. 524-18.000.
- Takizawa, Hiroshi: *See—*
  - Enari, Masahiko; Hoshi, Nobuhiro; and Takizawa, Hiroshi, 5,838,826, Cl. 382-234.000.
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- Takizawa, Toshimitsu; Asano, Takahiro; and Tanaka, Nobuyuki, to Kabushiki Kaisha Toshiba. Printed circuit board, magnetic disk apparatus with the printed circuit board, and method for connecting the printed circuit board. 5,838,519, Cl. 360-106.000.
- Takubo, Yoko: *See—*
  - Egawa, Junta; Takubo, Yoko; and Masamizu, Kohji, 5,837,097, Cl. 162-5.000.
- Talento, Althea D.: *See—*
  - Blake, J. Thomas; Feeney, William P.; Koo, Gloria C.; and Talento, Althea D., 5,837,220, Cl. 424-9.200.
- TALX Corporation: *See—*
  - Zheng, Baohua, 5,838,744, Cl. 375-355.000.
- Tamai, Naotoshi: *See—*
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- Tammelin, Saila, to Nokia Mobile Phones Limited. Frequency forming circuit with pulse swallower. 5,838,755, Cl. 377-48.000.
- Tamura, Toshiharu, to Japan Bonkote Company Limited. Assembly of thermocouple sensor fitted to iron tip. 5,837,973, Cl. 219-241.000.
- Tan, F. Dong; and Inouye, Leonard Y., to TRW Inc. Phase staggered full-bridge converter with soft-PWM switching. 5,838,558, Cl. 363-91.000.
- Tan, Haw-Chan; Lok, Gordon; Yeh, Joel J.; and Hsu, Sung Liu, to Hon Hai Precision Ind. Co., Ltd. Adapter and mechanism thereof. 5,836,774, Cl. 439-76.100.
- Tan, Michael R.: *See—*
  - Corzine, Scott W.; Babic, Dubravko I.; Schneider, Richard P., Jr.; Tan, Michael R.; and Wang, Shih-Yuan, 5,838,715, Cl. 372-96.000.
- Tan, Michael R. T.: *See—*
  - Lin, Hong; Yang, Long; Tan, Michael R. T.; and Wang, Shih-Yuan, 5,838,708, Cl. 372-50.000.
- Tanabe Seiyaku Co., Ltd.: *See—*
  - Tsujihara, Kenji; Kawaguchi, Takayuki; Okuno, Satoshi; and Yano, Toshiro, 5,837,673, Cl. 814-2.000.
- Tanahashi, Junichi: *See—*
  - Ohshima, Masamichi; Ina, Kenzoh; Nobutani, Toshiyuki; Shimakura, Masami; Tanahashi, Junichi; Ono, Kenichiro; Morimoto, Hajime; Sakashita, Tatsuya; and Matsuzaki, Eiichi, 5,838,291, Cl. 345-97.000.
- Tanaka, Eiko: *See—*
  - Kataoka, Hiroyuki; Tanaka, Eiko; and Takayama, Hiroshi, 5,839,029, Cl. 399-115.000.
- Tanaka, Hirohisa; and Yamamoto, Mari, to Daihatsu Motor Co., Ltd. Heat-resistant oxide. 5,837,642, Cl. 502-304.000.
- Tanaka, Hiroki: *See—*
  - Okabe, Norio; Kameyama, Yasuharu; Taga, Katsutoshi; Sato, Takayuki; Mita, Mamoru; Tanaka, Hiroki; and Ishikawa, Hiroshi, 5,837,154, Cl. 216-14.000.
- Tanaka, Hisashi: *See—*
  - Miyata, Manabu; Shirota, Yuichi; Tanaka, Hisashi; Ito, Koji; and Sugi, Hikaru, 5,836,813, Cl. 454-139.000.
- Tanaka, Makoto, to Murata Kikai Kabushiki Kaisha. Stepper-motor control method. 5,838,132, Cl. 318-685.000.
- Tanaka, Mitsuo: *See—*
  - Hirai, Takehiro; Nakatani, Masahiro; Tanaka, Mitsuo; and Kanda, Akihiro, 5,838,048, Cl. 257-378.000.
- Tanaka, Mitsuru, to NTN Corporation. Stripping fingers for copying machines and printers. 5,837,366, Cl. 428-327.000.
- Tanaka, Mitsuru; and Yano, Kazuyuki, to Futaba Denshi Kogyo K.K. Field emission display. 5,838,095, Cl. 313-309.000.
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- Tanaka, Nobuyuki: *See—*
  - Takizawa, Toshimitsu; Asano, Takahiro; and Tanaka, Nobuyuki, 5,838,519, Cl. 360-106.000.
- Tanaka, Shigeo: *See—*
  - Miyazawa, Kazuhiro; and Tanaka, Shigeo, 5,837,430, Cl. 430-373.000.
- Tanaka, Takafumi, to Brother Kogyo Kabushiki Kaisha. Embroidery sewing machine. 5,836,259, Cl. 112-102.500.
- Tanaka, Torahiko; Katoh, Nobuyuki; and Shimotohno, Kunitada, to Rational Drug Design Laboratories; and National Cancer Center. Nucleic acid of C type hepatitis virus derivation and process for detection virus using said nucleic acid. 5,837,463, Cl. 435-6.000.
- Tanaka, Tsuyoshi: *See—*
  - Tohkoku, Muneo; and Tanaka, Tsuyoshi, 5,838,641, Cl. 368-127.000.
- Tanaka, Yasuzo: *See—*
  - Tachikawa, Kyoji; Tanaka, Yasuzo; Matsumoto, Kaname; and Sakamoto, Hisaki, 5,837,941, Cl. 174-125.100.
- Tanaka, Yoshimasa: *See—*
  - Shimada, Yuzo; Suyama, Takayuki; and Tanaka, Yoshimasa, 5,838,064, Cl. 257-718.000.
- Tanaka, Yoshiyuki; and Kido, Toshihito, to Minolta Co., Ltd. Apparatus provided with a film frame judgement device. 5,839,008, Cl. 396-319.000.
- Tandem Computers Incorporated: *See—*
  - Horst, Robert W., 5,838,894, Cl. 395-182.090.
- Tandler, Hans: *See—*
  - Goetz, Burkhard; Kohle, Dirk; Knoblich, Johannes; Tandler, Hans; and Faltermeier, Bernd, 5,838,425, Cl. 355-18.000.
- Taneya, Mototaka; Konushi, Fumihiro; Kawanishi, Hidenori; Morioka, Tatsuya; and Shimonaka, Atsushi, to Sharp Kabushiki Kaisha. Integrated optical control element and a method for fabricating the same and optical integrated circuit element and optical integrated circuit device using the same. 5,838,854, Cl. 385-50.000.
- Tang, Peng Cho: *See—*
  - Anderson, Mark B.; Levy, Daniel E.; Tang, Peng Cho; Musser, John H.; and Rao, Narasinga, 5,837,689, Cl. 514-25.000.
- Tang, Qing: *See—*
  - Gan, Zhongxue; Katz, Jeffrey Sherman; Tang, Qing; and Fitzgibbons, Lance Terrance, 5,838,882, Cl. 395-94.000.
- Tang, Sanh, to Micron Technology, Inc. Integrated circuitry with interconnection pillar. 5,838,068, Cl. 257-750.000.
- Tang, Yifan, to Emerson Electric Co. Reluctance machine. 5,838,087, Cl. 310-168.000.
- Tani, Nobuhiro: *See—*
  - Morisawa, Tahei; Tani, Nobuhiro; and Aoki, Harumi, 5,836,783, Cl. 439-502.000.
- Tani, Yoshikazu, to Tokiwa Corporation. Cartridge-type feeding case for a solid object. 5,836,708, Cl. 401-70.000.
- Tanigawa, Sadao: *See—*
  - Shimomura, Yoshiki; Tanigawa, Sadao; Ogawa, Kazuhiro; Nishino, Hirofumi; Katsuhara, Kenji; Takakura, Toshimitsu; Tomiyama, Tetsuo; Umeda, Yasushi; and Sakao, Tomohiko, 5,838,596, Cl. 364-578.000.
- Tanigawa, Yukio: *See—*
  - Tanimura, Noritaka; and Tanigawa, Yukio, 5,837,781, Cl. 525-398.000.
- Taniguchi, Hayashi: *See—*
  - Matsubara, Akio; and Taniguchi, Hayashi, 5,838,821, Cl. 382-190.000.
- Taniguchi, Hideaki: *See—*
  - Someya, Sakae; Nashimoto, Ryuuzoh; Suzuki, Hirofumi; Yarita, Katsuhiko; Matsumoto, Shinji; Sasano, Akira; Taniguchi, Hideaki; and Oritsuki, Ryouji, 5,838,399, Cl. 349-46.000.
- Taniguchi, Yasuaki: *See—*
  - Miyata, Satoru; Taniguchi, Yasuaki; Masuda, Kenji; and Kawamura, Yoichi, 5,837,735, Cl. 514-605.000.

- Tanikawa, Roy K., to AST Research, Inc. Upgrade CPU module with integral power supply. 5,838,929, Cl. 395-282.000.
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- Tao, Hun-Jan; and Tsai, Chia-Shiung, to Taiwan Semiconductor Manufacturing Co. Ltd. Wafer surface modification for improved electrostatic chucking efficiency. 5,837,599, Cl. 438-584.000.
- Tao, Kuoting Mike; Balakrishnan, Ramesh; and He, Xiaohua George, to Measurex Corporation. Method and apparatus for nonlinear exponential filtering of signals. 5,838,599, Cl. 364-724.014.
- Tarazi, Iyad S.: *See—*
  - McNeil, Howard; Pitchford, Donald; and Tarazi, Iyad S., 5,838,769, Cl. 379-14.000.
- Tarcha, Peter J.: *See—*
  - Shastri, Venkatram R.; Langer, Robert S.; and Tarcha, Peter J., 5,837,752, Cl. 523-116.000.
- Tarka, Stanley M.: *See—*
  - Zoumas, Barry L.; Tarka, Stanley M.; McKim, J. Michael; Simmons, Bryan J.; Marks, James G., Jr.; and Santanna, Michael, 5,837,227, Cl. 424-78.060.
- Tarnawskj, Christine J.: *See—*
  - Larson, James R.; Pan, David H.; Stover, Raymond W.; Berkes, John S.; Tarnawskj, Christine J.; and Moser, Rasin, 5,839,037, Cl. 399-249.000.
- Tarnawskyj, Ihor W.: *See—*
  - Law, Kock-Yee; Tarnawskyj, Ihor W.; Mammino, Joseph; McGrane, Kathleen M.; Abkowitz, Martin A.; Ferguson, Robert M.; and Knier, Frederick E., Jr., 5,837,340, Cl. 428-36.800.
- Tarr, Dan: *See—*
  - Chau, Vi; Su, Sam; and Tarr, Dan, 5,838,936, Cl. 395-309.000.
- Taruki, Takashi, to Ricoh Company Ltd. Image forming apparatus having paper receiving portion inside the body. 5,839,044, Cl. 399-361.000.
- Tarumi, Yasuo; and Fukuda, Kenichi, to Shin-Etsu Chemical Co., Ltd. Curable fluoropolyether rubber composition. 5,837,774, Cl. 525-104.000.
- Tashiro, Shigeru: *See—*
  - Chimoto, Hiroyuki; Yasuki, Seijiro; and Tashiro, Shigeru, 5,838,383, Cl. 348-553.000.
- Taskin, Ismail: *See—*
  - Lyons, Christopher T.; and Taskin, Ismail, 5,839,096, Cl. 702-183.000.
- Tatara, Yusuke: *See—*
  - Yano, Toru; Kimura, Eisuke; Hayashi, Masanori; Tatara, Yusuke; Yokoyama, Toshio; and Kinoshita, Kenichiro, 5,836,287, Cl. 123-478.000.
- Tatavoosian, Vanacan: *See—*
  - Yazaryan, Berdj N.; and Tatavoosian, Vanacan, 5,838,533, Cl. 361-600.000.
- Tatehana, Atsushi; Onishi, Jiro; and Oshima, Katsuyuki, to Dai Nippon Printing Co., Ltd. Thermal transfer sheet, thermal transfer method using the same, and thermally transferred product. 5,837,648, Cl. 503-227.000.
- Tateyama, Jiro: *See—*
  - Takahashi, Tsutomu; Takase, Susumu; Suzuki, Naohisa; Fukunaga, Koji; Nishiyama, Masaki; Tateyama, Jiro; and Naito, Hisatsugu, 5,838,886, Cl. 395-112.000.
- Tateyama, Noriyuki: *See—*
  - Kudo, Masahiro; Kami, Kuniaki; Hibino, Hiroki; Mizuno, Hitoshi; Horii, Akihiro; Takahashi, Susumu; and Tateyama, Noriyuki, 5,836,869, Cl. 600-173.000.
- Tatham, Lydie Lejarre: *See—*
  - Lauta, Raymond; and Tatham, Lydie Lejarre, 5,838,261, Cl. 340-945.000.
- Tatlock, John H.: *See—*
  - Hornback, William J.; Kalish, Vincent J.; Munroe, John E.; Reich, Siegfried Heinz; Tatlock, John H.; Shepherd, Timothy A.; and Rodriguez, Michael J., 5,837,710, Cl. 514-301.000.
- Tatum, John Philip: *See—*
  - Schofield, John David; Tatum, John Philip; and Woods, Jill, 5,837,046, Cl. 106-31.860.
- Taub, Dennis D.: *See—*
  - Oppenheim, Joost J.; Michiel, Dennis; Chertov, Oleg; Taub, Dennis D.; Xu, Luoling; Wang, Ji Ming; and Murphy, William J., 5,837,247, Cl. 424-185.100.
- Tavernier, Serge; De Meutter, Stefaan; and Van Wunsel, Danny, to AGFA-Gevaert, N.V. Toner image resistant to scratching. 5,837,406, Cl. 430-12.000.
- Tavernier, Serge; De Clercq, Ronny; Joly, Ludo; and de Beeck, Werner Op, to AGFA-GEVAERT, N.V. Toner particles comprising specified polymeric beads in the bulk of the toner particles. 5,837,416, Cl. 430-110.000.
- Tavolacci, Frank L.: *See—*
  - Cronin, Michael E.; and Tavolacci, Frank L., 5,836,079, Cl. 30-101.000.
- Tavtigian, Sean V.; Kamb, Alexander; Simard, Jacques; Couch, Fergus; Rommens, Johanna M.; and Weber, Barbara L., to Myriad Genetics, Inc.; Endo Recherche, Inc.; HSC Research & Development Limited Partnership; and University of Pennsylvaina, Trustees of the. Chromosome 13-linked breast cancer susceptibility gene. 5,837,492, Cl. 435-69.100.
- Tay, Roger Yew-Siow; Garay, Oscar M.; and Balzano, Quirino, to Motorola, Inc. Wide beamwidth antenna system and method for making the same. 5,838,285, Cl. 343-895.000.
- Taya, Masato: *See—*
  - Yamagishi, Chiaki; Sasaki, Nori; Nara, Shigeo; Sato, Hidetaka; Hayashida, Shigeru; and Taya, Masato, 5,837,804, Cl. 528-353.000.
- Taylor, Dene Harvey: *See—*
  - Brault, Donald Armand; Cahill, Douglas Allan; Himmelwright, Richard Scott; and Taylor, Dene Harvey, 5,837,375, Cl. 428-411.100.
- Taylor, James L.: *See—*
  - Huff, George A., Jr.; Clark, Frederick T.; and Taylor, James L., 5,837,128, Cl. 208-112.000.
- Taylor, Julian S. Large diameter low pressure relief valve. 5,836,337, Cl. 137-70.000.
- Taylor, Mark Gavin: *See—*
  - Deards, Nicola; and Taylor, Mark Gavin, 5,837,069, Cl. 148-323.000.
- Taylor, Peter John: *See—*
  - Newcombe, Guy Charles Fernley; Humberstone, Victor Carey; Gardner, Keith; and Taylor, Peter John, 5,838,350, Cl. 347-68.000.
- Taylor, Randy K. Fishing rod and tackle carrier system. 5,836,103, Cl. 43-26.000.
- Tchakarov, Borislav J., to Computalog Limited. Flexible joint for downhole tools. 5,836,388, Cl. 166-242.600.
- TDK Corporation: *See—*
  - Ichimura, Yuji; and Fujii, Tatsuo, 5,837,336, Cl. 428-34.900.
  - Kitahara, Yoshimi, 5,837,963, Cl. 219-121.690.
  - Nagashima, Naoyuki; Azegami, Hitoshi; and Takasugi, Yasufumi, 5,837,744, Cl. 522-4.000.
  - Yada, Yoshio; and Ito, Naoki, 5,837,413, Cl. 430-106.600.
- Teac Corporation: *See—*
  - Okayama, Tetsuhisa; Aoyama, Yoshiaki; Hoshino, Hiroyuki; and Yamaguchi, Hirohisa, 5,838,967, Cl. 395-616.000.
- Team Medical, L.L.C.: *See—*
  - Miller, Scott A., III, 5,836,943, Cl. 606-34.000.
- Tearney, Guillermo J.: *See—*
  - Kenet, Robert O.; Kenet, Barney J.; and Tearney, Guillermo J., 5,836,872, Cl. 600-306.000.
- Tebrinke, Kevin R.: *See—*
  - Degady, Marc; Tebrinke, Kevin R.; Duggan, James A.; Filardo, Susan B.; Puri, Tony R.; and Upmann, Arthur W., 5,837,302, Cl. 426-3.000.
- Technical Casino Services Ltd.: *See—*
  - Towers, Paul, 5,836,583, Cl. 273-142.00B.
- Technichem Engineering, Ltd.: *See—*
  - Ng, Mark J.; and Maeda, Bruce T., 5,837,106, Cl. 203-41.000.
- Technische Consult TECON GmbH: *See—*
  - Vogelpohl, Alfons, 5,837,141, Cl. 210-629.000.
- Techno Togo Limited Company: *See—*
  - Yamauchi, Tsuneo, 5,836,691, Cl. 374-117.000.
- Technogenia S.A.: *See—*
  - Maybon, Guy, 5,836,531, Cl. 241-296.000.
- Technolizenz Establishment: *See—*
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  - Heijna, Roeland J., 5,838,198, Cl. 330-254.000.
  - Kasperkovitz, Wolfdietrich G.; and De Ruijter, Hendricus C., 5,839,060, Cl. 455-226.200.
  - Knapp, Alan G.; and Shannon, John M., 5,838,308, Cl. 345-173.000.
  - Krijn, Marcellinus P.C.M.; Henstra, Alexander; and Van Den Mast, Karel D., 5,838,011, Cl. 250-396.00R.
  - Kuijk, Karel E., 5,838,287, Cl. 345-58.000.
  - Kuijk, Karel E., 5,838,290, Cl. 345-91.000.
  - Lambert, Nicolaas; and Montie, Edwin A., 5,838,288, Cl. 345-74.000.
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  - Mons, Johannes J., 5,838,696, Cl. 371-40.110.
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  - Schwieker, Horst, 5,836,898, Cl. 601-4.000.
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- Universal Video Communications Corp.: *See*—
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- University of CA: *See*—
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- University Of California: *See*—
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- University of California, The Regents of the: *See*—
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  - Deng, Tiliang; and Karin, Michael, 5,837,451, Cl. 435-6.000.
  - Doyle, Michael D.; Martin, David C.; and Ang, Cheong S., 5,838,906, Cl. 395-200.320.
  - German, Michael; Goldfine, Ira D.; and Rothman, Stephen S., 5,837,693, Cl. 514-44.000.
  - Haake, David A.; and Shang, Ellen S., 5,837,263, Cl. 424-234.100.
  - Karin, Michael; Hibi, Masahiko; and Lin, Anning, 5,837,244, Cl. 424-139.100.
  - Komvopoulos, Kyriakos; Brown, Ian G.; Wei, Bo; Anders, Simone; Anders, Andre; and Bhatia, C. Singh, 5,838,522, Cl. 360-122.000.
  - Largman, Corey; Lawrence, Hugh Jeffrey; Humphries, R. Keith; and Sauvageau, Guy, 5,837,507, Cl. 435-172.100.
  - Lewis, Gary K.; Milewski, John O.; Cremers, David A.; Nemec, Ronald B.; and Barbe, Michael R., 5,837,960, Cl. 219-121.630.
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  - Pinkel, Daniel; Segraves, Richard L.; Zhai, Ye Yz; Albertson, Donna G.; and Gray, Joe, 5,837,196, Cl. 422-55.000.
- University of Central Florida: *See*—
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- University of Florida Research Foundation, Inc.: *See*—
  - Peck, Ammon B., 5,837,833, Cl. 536-22.100.
- University of Iowa Research Foundation: *See*—
  - Campbell, Kevin P.; Jung, Daniel; Duclos, Franck; Straub, Volker; and McPherson, John, 5,837,537, Cl. 435-325.000.
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- University of Medicine & Dentistry of NJ: *See*—
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  - Golub, Lorne M.; McNamara, Thomas F.; Ramamurthy, Nungavaram S.; Lee, Hsi-Ming; Simon, Sanford; Lokeshwar, Balakrishna L.; Selzer, Marie G.; and Block, Norman L., 5,837,696, Cl. 514-152.000.
  - Grotendorst, Gary R., 5,837,258, Cl. 424-198.100.
- University of Michgan, The Regents of the: *See*—
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Benavidez, Rick; and Benavidez, Annmarie. Vehicle seat attached multipurpose tray. 401,214, Cl. D12-716.000.
Bender, R. Kurt; Goldschmidt, Willfred; and Aiello, Justin F., to Mytech Corporation. Occupancy sensor. 401,175, Cl. D10-104.000.
Benn, Alexander; and Ruoff, Eckard, to Richard Hirschmann GmbH & Co. Antenna base. 401,245, Cl. D14-238.000.
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  Dwight, Mark M.; Bruce, Robert M.; and Bingham, Curt G., 401,221, Cl. D13-139.600.
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  Boyle, Stephan; Birdsell, Walter; Hecker, Steven L.; and O'Grady, Richard, 401,314, Cl. D23-335.000.
  Boyle, Stephan; Birdsell, Walter; Hecker, Steven L.; and Osiecki, Scott W., 401,315, Cl. D23-335.000.
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Blackburn, Edwin L. Tackle box for fishing lures. 401,059, Cl. D3-260.000.
Blumenthal, Martin. Toy sink. 401,291, Cl. D21-122.000.
Bly, Richard F. Return top. 401,290, Cl. D21-99.000.
Blye, Bruce A., to National Electric Mfg Corp. Portable hinged flourescent light. 401,373, Cl. D26-49.000.
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Bondoc, Alfredo A.; Carroll, William R.; and Sieling, Frederick W., to Building Materials Corporation of America. Laminated roofing shingle. 401,363, Cl. D25-139.000.
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Boyle, Stephan; Birdsell, Walter; Hecker, Steven L.; and Osiecki, Scott W., to Honeywell Inc. Portable electric heater. 401,315, Cl. D23-335.000.
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- Carels, Nikolai, to C. van Ijsselmuide Electronic Business Gifts B.V. Calculator. 401,268, Cl. D18-7.000.
- Carone, Robert P. Motorcycle master cylinder housing. 401,189, Cl. D12-126.000.
- Carroll, George H.; and Indelicato, Len. Fingernail polish container. 401,141, Cl. D9-318.000.
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  - Sugita, Shoichi; and Nakazato, Kotaro, 401,159, Cl. D10-30.000.
- Catta, David, to Evans Consoles, Inc. Console structure. 401,227, Cl. D14-103.000.
- Cattaneo, Pierre, to Liaisons Electroniques-Mecaniques LEM S.A. Electrical current sensor. 401,171, Cl. D10-78.000.
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  - Dunipace, David B., 401,289, Cl. D21-86.000.
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- Chaney, Michael T.: *See—*
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- Chapman, Steven S.; Vottis, Guy R.; and Ingalls, Wayne, to Eastman Kodak Company. Label for a camera. 401,259, Cl. D16-219.000.
- Chen, Mike. Combined flashlight and magnifying lens. 401,371, Cl. D26-38.000.
- Chen, Su-Ming, to King Hong Industrial Co., Ltd. Chair base. 401,088, Cl. D6-498.000.
- Chen, Yu-Shen, to Wan Chang Precision Industries Co., Ltd. Kinescope. 401,262, Cl. D16-227.000.
- Cheng, Fu-Chin. Talking modem. 401,244, Cl. D14-242.000.
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- Cheris, Albert B.; and Dziersk, Mark. Tote box. 401,064, Cl. D3-302.000.
- Chesebrough-Pond's USA Co., Division of Conopco, Inc.: *See—*
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- Chiang, Chin-Fu. Wheel chock. 401,210, Cl. D12-217.000.
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- Chrysler Corporation: *See—*
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- Clarke, Lillian E. Hat stand. 401,079, Cl. D6-415.000.
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  - Hjertman, Birger; Cseke, Rudolf; Himbert, Hans; and Sommarlund, Stanley, 401,325, Cl. D24-114.000.
- Dame, Stephen G.; and Ungari, Joseph, to Virtual DSP Corporation. Guitar headstock. 401,267, Cl. D17-20.000.
- Davis, Howard. Shoe sole. 401,042, Cl. D2-951.000.
- Dawn Enterprises, Inc.: *See—*
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- de Laforcade, Vincent, to L'Oreal. Spray unit. 401,150, Cl. D9-448.000.
- DeLay, Daniel J., to Intermatic Incorporated. Night light. 401,367, Cl. D26-26.000.
- Delle Donne, David George; Gates, Jeffrey; and Jepson, Peter. Case for plurality of contact lens. 401,060, Cl. D3-265.000.
- Delong, David C. Hemispherical pager. 401,239, Cl. D14-191.000.
- D'Emidio, Robert C. Batting target. 401,308, Cl. D21-303.000.
- Demore, Anthony, to Rubbermaid Incorporated. Lid for bagel storage container. 401,109, Cl. D7-391.000.
- Demore, Anthony, to Rubbermaid Incorporated. Lid for bread storage container. 401,110, Cl. D7-391.000.
- Demore, Anthony, to Rubbermaid Incorporated. Bagel storage container. 401,116, Cl. D7-602.000.
- DeMore, Anthony, to Rubbermaid Incorporated. Bread storage tray. 401,118, Cl. D7-609.000.
- Demore, Anthony, to Rubbermaid Incorporated. Tray for bread storage container. 401,119, Cl. D7-609.000.
- Demore, Anthony, to Rubbermaid Incorporated. Bread storage container. 401,120, Cl. D7-609.000.
- de Mourgues, Alain, to Pacific Corporation. Cosmetic cream container. 401,155, Cl. D9-558.000.
- Denney, Denys, to Foamex L.P. Pillow. 401,103, Cl. D6-601.000.
- Denney, Denys, to Foamex L.P. Curved pillow. 401,104, Cl. D6-601.000.
- Derman, Jay S., to Kensington Microwave Limited. Faceplate and locking device for a chamber opening accepting electronic data media. 401,136, Cl. D8-341.000.
- DeVore, Dale G.; and Higgins, Mark P., to Owens-Brockway Glass Container Inc. Container. 401,152, Cl. D9-500.000.
- Dewees, Ric. Towel with pocket. 401,105, Cl. D6-608.000.
- De Winter, Knen, to West Sanitation Services, Inc. Drip dispenser for a urinal. 401,311, Cl. D23-303.000.
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- Dunipace, David B., to Champion Discs, Inc. Flying disc. 401,289, Cl. D21-86.000.
- Dwight, Mark M.; Bruce, Robert M.; and Bingham, Curt G., to ACCO Brands, Inc. Power strip. 401,220, Cl. D13-139.600.
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- Eusterbrock, Paul W., to Holtkotter International, Inc. Table lamp. 401,377, Cl. D26-107.000.
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- Fischer, Corrado, to Mercedes-Benz AG. Front face of a vehicle wheel. 401,205, Cl. D12-209.000.
- Flour City Packaging Corporation: *See—*
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- Fong, Tat-yin, to Roundup International Ltd. Radio incorporated with stationery organizer. 401,236, Cl. D14-168.000.
- Forget, Luc, to Mitel Corporation. Modular telephone set. 401,234, Cl. D14-147.000.
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- Furnish, Gregory R.; and Hipps, W. Michael, to Snowden-Pencer, Inc. Surgical instrument handle. 401,333, Cl. D24-133.000.
- Gagnon, Brian. All terrain wheelchair. 401,191, Cl. D12-131.000.
- Gagnon, Brian. Wheelchair handle. 401,192, Cl. D12-133.000.
- Gaiter, Kenneth M. Vehicle for use in outer space as a space probe, planetary rover or spaceship. 401,209, Cl. D12-320.000.
- Gardiner, Walter A.; Swinden, David A.; Hufnagel, Joseph; Stecyk, Oleh; and Naas, Robert L., to Imperial Schrade Corp. Multi-purpose folding pliers. 401,133, Cl. D8-105.000.
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- Gech, Paul C., to Plochman, Inc. Container. 401,156, Cl. D9-569.000.
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  - Tudhope, Andrew William; Jordan, David Bruce; and Gonzalez, Josè Luis, 401,251, Cl. D15-138.000.
  - Tudhope, Andrew William; Jordan, David Bruce; and Gonzalez, Josè Luis, 401,252, Cl. D15-138.000.
- Goserud, J. Thomas. Multifunctional cap for a tubular container. 401,149, Cl. D9-439.000.
- Grant, Tony. Filing cabinet. 401,085, Cl. D6-478.000.
- Gray, Michael J., to Gillette Company, The. Tray for releasably holding a shaving razor. 401,145, Cl. D9-342.000.
- Gray, Thomas J. Side element of a shoe midsole. 401,038, Cl. D2-947.000.
- Greenberg, Robert Y., to Skechers U.S.A., Inc. Shoe bottom. 401,045, Cl. D2-960.000.
- Greenberg, Robert Y., to Skechers U.S.A., Inc. Shoe upper. 401,049, Cl D2-969.000.
- Greenberg, Robert Y., to Skechers U.S.A., Inc. Shoe upper. 401,050, Cl. D2-969.000.
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579	5,836,203
	5,837,896
599	5,837,897
	5,837,898
610	5,837,899
661	5,837,900
665	5,836,202
856	5,837,901
861.06	5,837,902
861.42	5,837,903
861.56	5,837,904
861.63	5,837,905
861.73	5,837,906
862.23	5,837,907
862.326	5,837,908
862.338	5,837,909
862.473	5,837,910

CLASS 74

61	5,836,204
89 17	5,836,205
333	5,836,206
335	5,836,207
424.8 C	5,836,208
473.21	5,836,209
483 K	5,836,210
493	5,836,211
502 6	5,836,212
551.2	5,836,213
558.5	5,836,214
567	5,836,215
574	5,836,216
	5,836,217
605	5,836,218
606 R	5,836,219
650	5,836,220

CLASS 75

352	5,837,030
505	5,837,031

CLASS 81

3.25	5,836,221
45	5,836,222
436	5,836,223

CLASS 83

22	5,836,224
100	5,836,225
129	5,836,226
342	5,836,228
762	B1 598,759
886	5,836,229

CLASS 84

179	5,837,911
267	5,837,912
329	5,837,913
622	5,837,914
738	5,837,915

CLASS 86

37	5,837,916

CLASS 89

1.11	5,837,918
1.8	5,837,917
1.816	5,837,919
7	5,837,920
14 1	5,837,921
46	5,837,922
	5,837,923

CLASS 91

455	5,836,230
491	5,836,231

CLASS 92

14	5,836,232
63	5,836,233
72	5,836,234
178	5,836,235

CLASS 95

14	5,837,027
45	5,837,032
	5,837,033
54	5,837,034
78	5,837,035
138	5,837,036
172	5,837,037

CLASS 96

101	5,837,038
121	5,837,039
224	5,837,040

CLASS 99

290	5,836,236
348	5,836,237
403	5,836,238
421 V	5,836,239
443 C	5,836,240

CLASS 100

311	5,836,241
327	5,836,242

CLASS 101

44	5,836,243
123	5,836,244
181	5,836,245
216	5,836,246
420	5,836,247
453	5,836,248
467	5,836,249
483	5,836,250

CLASS 102

275 8	5,837,924
310	5,837,925
427	5,837,926
532	5,837,927

CLASS 104

27	5,836,251
259	5,836,252
296	5,836,253

CLASS 106

10	5,837,078
31.14	5,837,042
31.58	5,837,043
31.6	5,837,041
31.67	5,837,044
31.85	5,837,045
31.86	5,837,046
38.3	5,837,047
197 01	5,837,048
427	5,837,049
439	5,837,050
456	5,837,051
705	5,837,052

CLASS 108

51 3	5,836,254
57.25	5,836,255

CLASS 109

24 1	5,836,256

CLASS 110

245	5,836,257
346	5,836,258

CLASS 112

102.5	5,836,259
277	5,836,260

CLASS 116

209	5,836,261

CLASS 117

7	5,837,053
10	5,837,054
82	5,837,055
84	5,837,056

CLASS 118

723 VE	5,837,057
728	5,837,058
733	5,837,059

CLASS 119

173	5,836,262
	5,836,263
207	5,836,264
221	5,836,265
234	5,836,266
715	5,836,267

CLASS 122

392	5,836,268

CLASS 123

41.1	5,836,269
41.31	5,836,270
41.44	5,836,271
41.82 R	5,836,272
52.4	5,836,273
90.16	5,836,274
90.17	5,836,275
	5,836,276
	5,836,277
	5,836,278
	5,836,279
193.4	5,836,280
195 A	5,836,281
219	5,836,282
230	5,836,283
308	5,836,284
418	5,836,285
470	5,836,286
478	5,836,287
491	5,836,288
522	5,836,290
549	5,836,289
679	5,836,291
697	5,836,292
698	5,836,293

CLASS 124

87	5,836,294

CLASS 126

25 R	5,836,295
39 G	5,836,296
299 D	5,836,297
506	5,836,298

CLASS 127

36	5,837,060

CLASS 128

200.23	5,836,299
204.23	5,836,300
205.12	5,836,301
205.23	5,836,302
206.24	5,836,303
630	5,836,304
772	5,836,306
844	5,836,307
	5,836,308
845	5,836,309
	5,836,310
897	5,836,311
	5,836,312
898	5,836,313
	5,836,314
	5,836,315
	5,836,316
	5,836,317

CLASS 131

253	5,836,318

CLASS 132

287	5,836,319
317	5,836,320

CLASS 134

3	5,837,061
6	5,837,062
	5,837,063
	5,837,064
10	5,836,321
32	5,837,067
42	5,836,322
	5,837,065

58 D	5,836,324
58 R	5,836,323
183	5,836,325
198	5,836,326

CLASS 135

16	5,836,327
25.2	5,836,328
90	5,836,330
94	5,836,331
124	5,836,332

CLASS 136

205	5,837,928
225	5,837,929

CLASS 137

1	5,836,333
	5,836,334
14	5,836,335
15	5,836,336
70	5,836,337
75	5,836,338
78.2	5,836,339
112	5,836,340
202	5,836,341
355.26	5,836,343
357	5,836,344
382	5,836,345
414	5,836,346
487.5	5,836,347
489	5,836,348
493.8	5,836,349
550	5,836,350
587	5,836,351
614.19	5,836,352
624.15	5,836,353
884	5,836,354
	5,836,355

CLASS 138

44	5,836,356
98	5,836,357
112	5,836,367
649	5,837,606

CLASS 141

18	5,836,358
23	5,836,359
126	5,836,360
279	5,836,361
286	5,836,362
314	5,836,363
348	5,836,364

CLASS 144

287	5,836,365

CLASS 148

22	5,837,066
121	5,837,068
262	RE. 35,958
323	5,837,069
528	5,837,071
552	5,837,070

CLASS 149

19.6	5,837,930
109.6	5,837,931

CLASS 152

158	5,837,073
209 R	5,837,074
213 A	5,837,075
312	5,837,072
379.3	5,836,366
524	5,837,076
527	5,837,077

CLASS 156

64	5,837,079
73.4	5,837,080
89.26	5,837,081
138	5,837,085
154	5,837,082
158	5,837,083
197	5,837,084
245	5,837,086
250	5,837,087
272.4	5,837,088
275.5	5,837,089
294	5,837,090
308.2	5,837,091
314	5,837,092
345	5,837,093
	5,837,094
499	5,837,095

CLASS 157

1.24	5,836,368

CLASS 159

13.3	5,837,096

CLASS 162

5	5,837,097
	5,837,098
	5,837,099
168.2	5,837,100
255	5,837,101
296	5,837,102
358.2	5,837,103

CLASS 164

5	5,836,369
77	5,836,370
80	5,836,371
113	5,836,372
167	5,836,373
322	5,836,374
452	5,836,375
466	5,836,376
486	5,836,377

CLASS 165

9	5,836,378
10	5,836,379
43	5,836,380
104.21	5,836,381
160	5,836,382
167	5,836,383
173	5,836,384

CLASS 166

77.1	5,836,385
177.3	5,836,386
217	5,836,387
242.6	5,836,388
249	5,836,389
281	5,836,390
295	5,836,391
	5,836,392
308	5,836,393
312	5,836,394
321	5,836,395
376	5,836,396

CLASS 169

5	5,836,397
24	5,836,398

CLASS 172

509	5,836,399

CLASS 173

11	5,836,400
93	5,836,401
185	5,836,402
205	5,836,403

CLASS 174

50	5,837,933
52.1	5,837,934
52.4	5,837,935
65 R	5,837,936
66	5,837,932
	5,837,937
	5,837,938
110 PM	5,837,939
117 F	5,837,940
125.1	5,837,941
138 F	5,837,942
169	5,837,943

CLASS 175

57	5,836,404
	5,836,405
61	5,836,406
101	5,836,407
293	5,836,408
379	5,836,409
415	5,836,410

CLASS 177

136	5,837,945
	5,837,946
245	5,837,944

CLASS 178

18.07	5,837,947

CLASS 180

6.58	5,836,411
65.1	5,836,412
116	5,836,413
207	5,836,414
266	5,836,415
333	5,836,416
417	5,836,417
422	5,836,418
443	5,836,419

CLASS 182

121	5,836,420

CLASS 184

6.2	5,836,421

CLASS 186

63	5,836,422

CLASS 187

245	5,836,423
277	5,837,948
333	5,836,424

CLASS 188

29	5,836,426
73.46	5,836,427
250 G	5,836,428
340	5,836,429
412	5,836,425

CLASS 192

43.2	5,836,430
70.13	5,836,432
70.2	5,836,431
70.25	5,836,433
99 S	5,836,434

CLASS 194

206	5,836,435

CLASS 198

370.03	5,836,436
396	5,836,437
402	5,836,438
415	5,836,439
819	5,836,440

CLASS 200

17 R	5,836,441
50.21	5,837,949
	5,837,950
61.45 R	5,837,951
86 R	5,837,952
284	5,836,442
557	5,836,443

CLASS 202

248	5,837,104

CLASS 203

40	5,837,105
41	5,837,106
78	5,837,107

CLASS 204

192.15	5,837,108
206	5,837,109
240	5,837,110
267	5,837,111
415	5,837,112
420	5,837,113
425	5,837,114
450	5,837,115
606	5,837,116

CLASS 205

50	5,837,117
73	5,837,118
74	5,837,119
93	5,837,120
322	5,837,121
560	5,837,122
574	5,837,123
746	5,837,124
763	5,837,125

CLASS 206

63.5	5,836,444
221	5,836,445
373	5,836,446
423	5,836,447
	5,836,448
455	5,836,449
462	5,836,450
569	5,836,451
702	5,836,453
723	5,836,454
757	5,836,455

CLASS 208

16	5,837,126
60	5,837,127
112	5,837,128
161	5,837,129
213	5,837,130
216 PP	5,837,131

CLASS 209

246	5,836,456

CLASS 210

95	5,837,132
167	5,837,133
175	5,837,134
198.2	5,837,135
207	5,837,136
232	5,837,137
237	5,837,138
474	5,837,139
483	5,837,140
629	5,837,141
650	5,837,142
695	5,837,143
	5,837,144
715	5,837,145
728	5,837,146
739	5,837,147
758	5,837,148
759	5,837,149
782	5,837,150
787	5,837,151
801	5,837,152

CLASS 211

41.2	5,836,458
50	5,836,459
74	5,836,460
153	5,836,461

CLASS 212

260	5,836,462
270	5,836,463

CLASS 213

75 R	RE. 35,961

CLASS 214

344	5,836,464

CLASS 215

216	5,836,465
	5,836,466
	5,836,467
253	5,836,468
384	5,836,469

CLASS 216

2	5,837,153
14	5,837,154
18	5,837,155

CLASS 218

30	5,837,953
40	5,837,954
77	5,837,955

CLASS 219

61	5,837,956
69.15	5,837,957
121.47	5,837,959
121.5	5,837,958
121.63	5,837,960
121.68	5,837,961
	5,837,962
121.69	5,837,963
121.71	5,837,964
121.75	5,837,965
124.34	5,837,966
125.1	5,837,967
130.1	5,837,968
137 WM	5,837,969
201	5,837,970
212	5,837,971
225	5,837,972
241	5,837,973
388	5,837,974
456	5,837,975
645	5,837,976
694	5,837,977
702	5,837,978
732	5,837,979
753	5,837,980

CLASS 220

4.22	5,836,470
571	5,836,472
606	5,836,473

CLASS 221

25	5,836,474
131	5,836,475
	5,836,476
135	5,836,477
309	5,836,478

CLASS 222

83.5	5,836,479
143	5,836,480
182	5,836,481
325	5,836,482
396	5,836,483
494	5,836,484
600	5,836,485

CLASS 223

85	5,836,486
94	5,836,487

CLASS 224

222	5,836,488
262	5,836,489
403	5,836,490
456	5,836,491
493	5,836,492
519	5,836,493
521	5,836,494
537	5,836,495
553	5,836,496
677	5,836,497

CLASS 225

1	5,836,498

CLASS 226

168	5,836,499
189	5,836,500

CLASS 227

8	5,836,501
131	5,836,502
175.1	5,836,503

CLASS 228

103	5,836,504
121	5,836,505
172	5,836,506

CLASS 229

67.1	5,836,507
92	B1 664,725
103.3	5,836,508
112	5,836,509

CLASS 232

15	5,836,510

CLASS 235

70 R	5,837,981
382	5,837,982
437	5,837,983
441	5,837,984
462	5,837,985
	5,837,986
	5,837,987
467	5,837,988
472	5,837,989
	5,837,990
475	5,837,991
488	5,837,992

CLASS 236

21 R	5,836,511

CLASS 238

60	5,836,512

CLASS 239

2.2	5,836,513
14.2	5,836,514
102.2	5,836,515
280.5	5,836,516
290	5,836,517
310	5,836,518
373	5,836,519
553.5	5,836,520
584	5,836,521
588	5,836,522

CLASS 241

5	5,836,523
23	5,836,524
28	5,836,525
49	5,836,527
93	5,836,528
261.1	5,836,530
296	5,836,531

CLASS 242

35.5 R	5,836,532
379.1	5,836,534
381.5	5,836,535
390.5	5,836,536
400.1	5,836,537
559.1	5,836,538
615.3	5,836,539

CLASS 243

334.6	5,836,533

CLASS 244

2	5,836,541
3.16	5,836,540
12.2	5,836,542
	5,836,543
17.17	5,836,544
60	5,836,545
76 B	5,836,546
122 R	5,836,547
137.1	5,836,548
203	5,836,549
214	5,836,550

CLASS 246

122 R	5,836,529

CLASS 248

49	5,836,551
99	5,836,553
152	5,836,554
161	5,836,555
166	5,836,552
188.4	5,836,556
210	5,836,557
218.4	5,836,558
230.3	5,836,559
286.1	5,836,560
291.1	5,836,561
295.11	5,836,562
316.4	5,836,563
354.5	5,836,564
456	5,836,565

CLASS 249

119	5,837,156

CLASS 250

208.1	5,837,993
	5,837,994
214 LS	5,837,995
221	5,837,996
227.11	5,837,997
	5,837,998
231.14	5,837,999
234	5,838,000
236	5,838,001
288	5,838,002
288 A	5,838,003
305	5,838,004
306	5,838,005
310	5,838,006
338.5	5,838,007
339.08	5,838,008
363.05	5,838,009
369	5,838,010
396 R	5,838,011
423 R	5,838,012
492.2	5,838,013
504 R	5,838,014
	5,838,015
	5,838,016
551	5,838,018
559.42	5,838,017

CLASS 251

61.2	5,836,566
129.12	5,836,567
148	5,836,568
327	5,836,569
328	5,836,570
331	5,836,571

CLASS 252

62.2	5,837,157
181.6	5,837,158
193	5,837,159
299.01	5,837,160
299.61	5,837,161
299.63	5,837,162
299.65	5,837,163
500	5,837,164
519.14	5,837,165
583	5,837,166

CLASS 256

19	5,836,572

CLASS 257

10	5,838,019
	5,838,020
30	5,838,021
48	5,838,022
	5,838,023
83	5,838,174
98	5,838,024
102	5,838,025
139	5,838,026
	5,838,027
183	5,838,028
190	5,838,029
192	5,838,030
197	5,838,031
211	5,838,032
213	5,838,033
295	5,838,034
	5,838,035
296	5,838,036
	5,838,037
301	5,838,038
	5,838,045
321	5,838,039
	5,838,040
324	5,838,041
342	5,838,042
355	5,838,043
369	5,838,044
	5,838,046
372	5,838,047
378	5,838,048

383	5,838,049
401	5,838,050
412	5,838,051
437	5,838,052
442	5,838,053
457	5,838,054
510	5,838,055
577	5,838,057
628	5,838,058
640	5,838,056
666	5,838,062
679	5,838,059
685	5,838,060
686	5,838,061
704	5,838,063
718	5,838,064
722	5,838,065
	5,838,066
737	5,838,067
750	5,838,068
766	5,838,069
779	5,838,070
784	5,838,071
786	5,838,072

CLASS 261

28	5,837,167
78.2	5,837,168

CLASS 264

1.27	5,837,169
40.1	5,837,170
45.7	5,837,171
46.4	5,837,172
50	5,837,173
54	5,837,174
73	5,837,175
101	5,837,176
	5,837,177
157	5,837,178
172.11	5,837,179
230	5,837,180
258	5,837,181
318	5,837,182
403	5,837,183
474	5,837,184
511	5,837,185
572	5,837,186

CLASS 266

78	5,837,187
101	5,837,188
131	5,837,189

CLASS 269

20	5,836,573
93	5,836,574
317	5,836,575

CLASS 270

58.02	5,836,576
58.04	5,836,577
58.11	5,836,578
58.16	5,836,579

CLASS 271

9.13	5,836,580
11	5,836,581
12	5,836,582

CLASS 273

142 B	5,836,583
153 S	5,836,584
287	5,836,585
292	5,836,586
296	5,836,587
348.4	5,836,588

CLASS 277

407	5,836,589

CLASS 280

11.2	5,836,590
11.22	5,836,591
11.26	5,836,592
19	5,836,593
28	5,836,594
30	5,836,595
33.991	5,836,596
86.753	5,836,597
93.51	5,836,598
124.128	5,836,599
231	5,836,600
287	5,836,602
483	5,836,603
607	5,836,604
645	5,836,601
718	5,836,606
728.2	5,836,607
	5,836,608
728.3	5,836,609
736	5,836,610
743.1	5,836,611
	5,836,612
789	5,836,605
808	5,836,613

CLASS 281

16	5,836,614
21.1	5,836,615

CLASS 283

56	5,836,616
62	5,836,622
67	5,836,617
70	5,836,618

CLASS 285

4	5,836,619
7	5,836,620
21.2	5,836,621
148.9	5,836,623
261	5,836,624

CLASS 292

145	5,836,625
292	5,836,626
305	5,836,627
346	5,836,628

CLASS 294

1.3	5,836,629
50.5	5,836,630
74	5,836,631
82.12	5,836,632
88	5,836,633
159	5,836,634

CLASS 296

3	5,836,635
24.1	5,836,636
75	5,836,637
97.22	5,836,638
155	5,836,639
180.2	5,836,640
189	5,836,641
216.02	5,836,642
217	5,836,643
219	5,836,644

CLASS 297

68	5,836,645
188.04	5,836,646
216.1	5,836,647
216.14	5,836,648
256.1	5,836,649
256.11	5,836,650
410	5,836,651
423.28	5,836,652
452.31	5,836,653
452.41	5,836,654
452.63	5,836,655
467	5,836,656

CLASS 298

1 A	5,836,657

CLASS 299

60	5,836,658

CLASS 303

115.2	5,836,659
155	5,836,660

CLASS 304

528.22	5,838,588

CLASS 307

2	5,838,073
10.2	5,838,074
10.3	5,838,075
115	5,838,076
130	5,838,077
147	5,838,078

CLASS 310

12	5,838,079
49 R	5,838,080
90	5,838,081
90.5	5,838,082
	5,838,083
105	5,838,084
113	5,838,085
156	5,838,086
168	5,838,087
313 A	5,838,089
	5,838,090
313 C	5,838,091
313 R	5,838,088
326	5,838,092
348	5,838,093

CLASS 312

42	5,836,661
268	5,836,662
351.5	5,836,663

CLASS 313

141	5,838,094
309	5,838,095
336	5,838,096
440	5,838,098
	5,838,099
485	5,838,100
487	5,838,101
495	5,838,097
	5,838,102
	5,838,103
560	5,838,104
582	5,838,105
587	5,838,106

CLASS 315

5.16	5,838,107
39	5,838,108
58	5,838,109
105	5,838,110
111.21	5,838,111
111.81	5,838,112
169.3	5,838,113
237	5,838,115
277	5,838,114
307	5,838,116
	5,838,117
326	5,838,118
366	5,838,119
505	5,838,120

CLASS 318

45	5,838,121
254	5,838,122
	5,838,123
269	5,838,124
285	5,838,125
286	5,838,126
293	5,838,127
439	5,838,128
	5,838,129
560	5,838,131
568.2	5,838,130
685	5,838,132
701	5,838,133
750	5,838,134
771	5,838,135

CLASS 320

6	5,838,136
16 J	5,838,143
43	5,838,137
107	5,838,138
133	5,838,139
	5,838,140
145	5,838,141
148	5,838,142

CLASS 323

238	5,838,144
266	5,838,145
270	5,838,146
289	5,838,147
299	5,838,148
315	5,838,149
349	5,838,150
353	5,838,151
907	5,838,152

CLASS 324

212	5,838,153
249	5,838,154
303	5,838,155
307	5,838,156
348	5,838,157
636	5,838,158
751	5,838,159
754	5,838,160
755	5,838,161
	5,838,162
763	5,838,163
769	5,838,164

CLASS 326

36	5,838,166
38	5,838,165
	5,838,167
81	5,838,168
98	5,838,169
	5,838,170

CLASS 327

19	5,838,171
20	5,838,172
77	5,838,173
94	5,838,175
95	5,838,176
108	5,838,177
116	5,838,178
156	5,838,179
157	5,838,180
175	5,838,181
299	5,838,183
308	5,838,184
382	5,838,185
389	5,838,186
512	5,838,187
530	5,838,188
537	5,838,189
	5,838,190
539	5,838,191
541	5,838,192

CLASS 330

10	5,838,193
139	5,838,194
149	5,838,195
188	5,838,196
252	5,838,197
254	5,838,198
258	5,838,199
	5,838,200
286	5,838,201

CLASS 331

1 A	5,838,202
	5,838,203
1 R	5,838,204
2	5,838,205
3	5,838,206
36 C	5,838,207

CLASS 332

101	5,838,208
109	5,838,210

CLASS 333

1.1	5,838,209
20	5,838,211
26	5,838,212
99.005	5,838,213
177	5,838,214
181	5,838,215
182	5,838,216
193	5,838,217

CLASS 335

4	5,838,218
14	5,838,219

CLASS 336

206	5,838,220

CLASS 338

152	5,838,221
198	5,838,222

CLASS 340

286.07	5,838,223
310.01	5,838,226
425.5	5,838,227
436	5,838,228
442	5,838,229
444	5,838,230
538	5,838,231
542	5,838,232
571	5,838,225
572	5,838,233
	5,838,234
	5,838,235
	5,838,236
573	5,838,237
	5,838,238
583	5,838,239
604	5,838,240
618	5,838,241
628	5,838,242
632	5,838,243
635	5,838,244
674	5,838,245
685	5,838,246
815.45	5,838,247
825.03	5,838,248
825.06	5,838,249
825.07	5,838,250
825.31	5,838,251
	5,838,256
825.44	5,838,252
825.54	5,838,253
	5,838,254
	5,838,257
825.69	5,838,255
870.11	5,838,258
903	5,838,259
907	5,838,260
945	5,838,261
	5,838,262

CLASS 341

11	5,838,268
22	5,838,263
50	5,838,265
51	5,838,266
94	5,838,267
106	5,838,264
139	5,838,269
143	5,838,270
	5,838,272
144	5,838,271
145	5,838,273
155	5,838,274

CLASS 342

8	5,838,275
35	5,838,276
357	5,838,277
377	5,838,278
459	5,838,279

CLASS 343

700 MS	5,838,280
715	5,838,281
727	5,838,282
741	5,838,283
893	5,838,284
895	5,838,285

CLASS 345

30	5,838,286
58	5,838,287
74	5,838,288
79	5,838,289
91	5,838,290
97	5,838,291
	5,838,292
	5,838,293
102	5,838,294
124	5,838,295
127	5,838,296
	5,838,297
136	5,838,298
137	5,838,299
145	5,838,300
146	5,838,301
157	5,838,303
	5,838,304
163	5,838,305
	5,838,306
168	5,838,307
173	5,838,302
	5,838,308
	5,838,309
186	5,838,310
213	5,838,311
	5,838,312
302	5,838,313
327	5,838,314
333	5,838,315
334	5,838,316
339	5,838,317
340	5,838,319
341	5,838,320
342	5,838,318
343	5,838,321
348	5,838,322
349	5,838,323
352	5,838,324
353	5,838,325
355	5,838,326
420	5,838,328
425	5,838,327
426	5,838,329
427	5,838,330
430	5,838,331
	5,838,332
431	5,838,333
503	5,838,334
507	5,838,335
508	5,838,336
519	5,838,337

CLASS 347

8	5,838,338
9	5,838,339
14	5,838,340
	5,838,341
19	5,838,342
22	5,838,343
37	5,838,345
	5,838,346
45	5,838,347
55	5,838,349
68	5,838,350
85	5,838,351
87	5,838,352
	5,838,353
101	5,838,354
115	5,838,355
194	5,838,356
215	5,838,357
247	5,838,358
250	5,838,359
258	5,838,360
262	5,838,361

CLASS 348

7	5,838,362
96	5,838,363
	5,838,364
169	5,838,365
170	5,838,366
211	5,838,368
223	5,838,369
240	5,838,370
	5,838,371
312	5,838,372
	5,838,373
351	5,838,374
394	5,838,375
397	5,838,376
398	5,838,377
401	5,838,378
403	5,838,379
412	5,838,380
458	5,838,381
465	5,838,382
553	5,838,383
563	5,838,384
565	5,838,385
569	5,838,386
581	5,838,387
589	5,838,388
650	5,838,389
682	5,838,390
699	5,838,391
	5,838,392
705	5,838,393
717	5,838,394
726	5,838,395
745	5,838,396

CLASS 349

5	5,838,397
32	5,838,398
46	5,838,399
58	5,838,400
	5,838,401
60	5,838,402
65	5,838,403
	5,838,404
73	5,838,405
113	5,838,406
118	5,838,408
122	5,838,409
123	5,838,410
139	5,838,411
150	5,838,412
155	5,838,413
157	5,838,414
161	5,838,415
187	5,838,407
202	5,838,416

CLASS 351

42	5,838,417
119	5,838,418
177	5,838,419
209	5,838,420
218	5,838,421
223	5,838,422
242	5,838,423
245	5,838,424

CLASS 353

70	5,836,664
120	5,836,665
122	5,836,666

CLASS 355

18	5,838,425
52	5,838,426
100	5,838,427

CLASS 356

3.09	5,838,428
39	5,838,429
138	5,838,430
	5,838,431
139.03	5,838,432
237	5,838,433
243	5,838,434
	5,838,435
345	5,838,436
	5,838,437
346	5,838,438
349	5,838,439
350	5,838,440
351	5,838,441
359	5,838,442
361	5,838,485
363	5,838,443
369	5,838,444
371	5,838,445
372	5,838,446
381	5,838,447
382	5,838,448
399	5,838,449
401	5,838,450
406	5,838,451
445	5,838,453
	5,838,454

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CLASS 358

298	5,838,455
300	5,838,456
302	5,838,457
402	5,838,458
	5,838,459
407	5,838,460
442	5,838,461
456	5,838,462
465	5,838,463
498	5,838,464
520	5,838,465

CLASS 359

2	5,838,466
3	5,838,467
15	5,838,468
21	5,838,469
124	5,838,470
153	5,838,471
155	5,838,472
168	5,838,473
173	5,838,474
176	5,838,475
177	5,838,476
179	5,838,477
198	5,838,478
204	5,838,479
205	5,838,480
208	5,838,481
253	5,838,482
265	5,838,483
282	5,838,484
332	5,838,486
341	5,838,487
	5,838,488
357	5,838,489
385	5,838,491
426	5,838,492
443	5,838,493
455	5,838,494
507	5,838,495
565	5,838,496
	5,838,497
630	5,838,498
631	5,838,490
676	5,838,499
689	5,838,500
718	5,838,501
738	5,838,502
833	5,838,503
834	5,838,504
839	5,838,505
871	5,838,506
877	5,838,507
890	5,838,508

CLASS 360

46	5,838,509
	5,838,510
48	5,838,511
51	5,838,512
73.07	5,838,513
75	5,838,514
78.12	5,838,515
98.08	5,838,516
104	5,838,517
	5,838,518
106	5,838,519
109	5,838,520
113	5,838,521
122	5,838,522
	5,838,523

CLASS 361

18	5,838,524
69	5,838,525
118	5,838,526
119	5,838,527
234	5,838,528
	5,838,529
321.4	5,838,530
502	5,838,531
505	5,838,532
600	5,838,533
	5,838,534
679	5,838,535
681	5,838,536
683	5,838,537
	5,838,538
686	5,838,539
	5,838,540
	5,838,541
704	5,838,542
	5,838,543
	5,838,544
719	5,838,545
749	5,838,546
765	5,838,547
784	5,838,548
794	5,838,549
818	5,838,550
	5,838,551

CLASS 362

32	5,836,667
61	5,836,668
84	5,836,671
92	5,836,669
103	5,836,670
183	5,836,672
234	5,836,675
244	5,836,676
251	5,836,673
304	5,836,677
336	5,836,674
364	5,836,678
391	5,836,679

CLASS 363

16	5,838,552
18	5,838,553
21	5,838,554
49	5,838,555
56	5,838,556
60	5,838,557
91	5,838,558
146	5,838,559

CLASS 364

152	5,838,561
188	5,838,563
421	5,838,564
424.02	5,838,562
468.06	5,838,565
468.22	5,838,566
468.28	5,838,567
	5,838,568
470.05	5,838,569
470.14	5,838,570
476.01	5,838,571
478.01	5,838,572
478.07	5,838,574
478.18	5,838,573
479.01	5,838,575
483	5,838,577
488	5,838,578
	5,838,579
489	5,838,580
490	5,838,582
491	5,838,581
	5,838,583
	5,838,584
	5,838,585
512	5,838,587
551.01	5,838,589
557	5,838,591
560	5,838,592
578	5,838,593
	5,838,594
	5,838,595
	5,838,596
715.02	5,838,597
724.011	5,838,598
724.012	5,838,600
724.014	5,838,599
748	5,838,601
788	5,838,602

CLASS 365

63	5,838,603
	5,838,604
145	5,838,605
156	5,838,606
158	5,838,607
	5,838,608
159	5,838,609
168	5,838,610
174	5,838,611
185.03	5,838,612
185.04	5,838,613
185.09	5,838,619
185.11	5,838,614
185.12	5,838,615
185.14	5,838,616
185.18	5,838,617
185.29	5,838,618
200	5,838,620
	5,838,621
222	5,838,623
225.7	5,838,624
	5,838,625
226	5,838,626
230.02	5,838,622
230.03	5,838,627
	5,838,628
230.06	5,838,629
233	5,838,630
	5,838,631
239	5,838,632

CLASS 366

80	5,836,680
83	5,836,681
84	5,836,682
124	5,836,683
129	5,836,684
136	5,836,685
176.1	5,836,686
207	5,836,687
285	5,836,688
303	5,836,689
325.2	5,836,690

CLASS 367

31	5,838,633
73	5,838,634
89	5,838,635
95	5,838,636
173	5,838,637

CLASS 368

10	5,838,638
	5,838,639
67	5,838,640
127	5,838,641
223	5,838,643
232	5,838,644
282	5,838,642

CLASS 369

13	5,838,645
	5,838,646
58	5,838,648
60	5,838,649
103	5,838,650
109	5,838,651
112	5,838,652
275.1	5,838,653
	5,838,654
275.2	5,838,656
275.3	5,838,666
275.4	5,838,657
	5,838,658

CLASS 370

216	5,838,659
	5,838,660
229	5,838,661
230	5,838,662
233	5,838,663
260	5,838,665
263	5,838,664
294	5,838,667
312	5,838,668
320	5,838,669
328	5,838,670
335	5,838,671
	5,838,672
336	5,838,673
337	5,838,674
343	5,838,675
389	5,838,677
	5,838,678
395	5,838,679
	5,838,680
	5,838,681
401	5,838,682
408	5,838,683
416	5,838,684
428	5,838,685
433	5,838,686
443	5,838,687
445	5,838,688
465	5,838,689
468	5,838,690

CLASS 371

22.1	5,838,692
22.31	5,838,693
27.1	5,838,694
37.5	5,838,695
40.11	5,838,696
43.8	5,838,697
49.1	5,838,698
68.2	5,838,699

CLASS 372

6	RE. 35,962
	5,838,700
10	5,838,701
21	5,838,702
43	5,838,703
45	5,838,704
	5,838,705
	5,838,706
	5,838,707
50	5,838,708
68	5,838,709
69	5,838,710
75	5,838,712
92	5,838,713
96	5,838,714
	5,838,715

CLASS 373

111	5,838,716

CLASS 374

45	5,836,693
117	5,836,691
121	5,836,692
130	5,836,694

CLASS 375

201	5,838,717
202	5,838,718
206	5,838,719
208	5,838,721
219	5,838,720
	5,838,722
220	5,838,723
222	5,838,724
229	5,838,725
257	5,838,726
261	5,838,727
265	5,838,728
	5,838,729
272	5,838,730
289	5,838,731
297	5,838,732
	5,838,733
319	5,838,735
329	5,838,736
331	5,838,737
340	5,838,738
346	5,838,740
	5,838,741
347	5,838,742
348	5,838,739
354	5,838,743
355	5,838,744
364	5,838,745
365	5,838,746
370	5,838,747
	5,838,748
376	5,838,749
377	5,838,750

CLASS 376

260	5,838,751
	5,838,752
316	5,838,734
412	5,838,753

CLASS 377

20	5,838,754
48	5,838,755

CLASS 378

4	5,838,756
43	5,838,757
53	5,838,758
57	5,838,759
119	5,838,760
123	5,838,761
125	5,838,762
133	5,838,763
196	5,838,765
197	5,838,764

CLASS 379

9	5,838,766
10	5,838,767
14	5,838,769
34	5,838,770
37	5,838,771
67	5,838,772
89	5,838,768
91.01	5,838,773
92.02	5,838,774
93.23	5,838,775
102.05	5,838,776
142	5,838,777
182	5,838,778
211	5,838,779
213	5,838,780
229	5,838,781
230	5,838,782
355	5,838,783
356	5,838,784
395	5,838,785
407	5,838,786
409	5,838,787
418	5,838,788
433	5,838,789

CLASS 380

4	5,838,790
20	5,838,791
21	5,838,792
25	5,838,793
28	5,838,794
	5,838,795
	5,838,796
49	5,838,797
	5,838,798

CLASS 381

2	5,838,799
17	5,838,800
68.4	5,838,801
71.2	5,838,802
94.5	5,838,803
111	5,838,804
190	5,838,805
312	5,838,806
321	5,838,807
388	5,838,808
409	5,838,809

CLASS 382

25.1	5,838,834
100	5,838,810
	5,838,811
103	5,838,813
115	5,838,812
	5,838,814
128	5,838,815
157	5,838,816
166	5,838,817
	5,838,818
187	5,838,819
	5,838,820
190	5,838,821
232	5,838,822
	5,838,823
	5,838,824
233	5,838,825
234	5,838,826
236	5,838,827
	5,838,828
242	5,838,829
243	5,838,830
248	5,838,831
249	5,838,832
	5,838,833
274	5,838,835
276	5,838,836
284	5,838,837
298	5,838,838
299	5,838,839
300	5,838,840

CLASS 383

14	5,836,695
120	5,836,696
205	5,836,697

CLASS 384

29	5,836,698
276	5,836,699
480	5,836,700
565	5,836,701
584	5,836,702

CLASS 385

11	5,838,842
12	5,838,843
14	5,838,844
16	5,838,845
	5,838,846
18	5,838,847
24	5,838,848
31	5,838,849
32	5,838,851
34	5,838,852
50	5,838,853
	5,838,854
53	5,838,855
54	5,838,856
56	5,838,857
76	5,838,858
92	5,838,859
100	5,838,860
	5,838,861
102	5,838,862
103	5,838,863
113	5,838,864
121	5,838,865
123	5,838,867
127	5,838,866
	5,838,868
131	5,838,870
132	5,838,869
134	5,838,850
135	5,838,871

CLASS 386

68	5,838,872
95	5,838,873
96	5,838,874
123	5,838,875
125	5,838,876

CLASS 388

804	5,838,877

CLASS 391

5.1	5,838,691

CLASS 392

376	5,838,878
451	5,838,879
485	5,838,880

CLASS 395

22	5,838,881
94	5,838,882
106	5,838,883
107	5,838,884
109	5,838,885
112	5,838,886
	5,838,887
115	5,838,888
118	5,838,889
174	5,838,890
182.03	5,838,891
182.04	5,838,892
182.05	5,838,893
182.09	5,838,894
182.13	5,838,895
182.21	5,838,896
183.06	5,838,897
185.03	5,838,898
185.09	5,838,899
	5,838,900
186	5,838,901
	5,838,902
188.01	5,838,903
200.31	5,838,905
200.32	5,838,906
200.33	5,838,910
	5,838,911
200.34	5,838,912
	5,838,914
200.38	5,838,913
200.39	5,838,909
200.45	5,838,915
200.49	5,838,916
	5,838,917
200.5	5,838,907
200.51	5,838,918
200.54	5,838,919
	5,838,920
200.57	5,838,921
200.6	5,838,908
200.62	5,838,922
200.66	5,838,923
200.69	5,838,924
200.77	5,838,925
	5,838,927
200.79	5,838,926
200.8	5,838,964
	5,838,928
282	5,838,929
287	5,838,930
308	5,838,931
	5,838,932
309	5,838,933
	5,838,934
	5,838,935
	5,838,936
311	5,838,937
328	5,838,938
376	5,838,939
	5,838,945
392	5,838,940
393	5,838,941
394	5,838,942
	5,838,943
	5,838,944
461	5,838,946
500	5,838,947
	5,838,948
	5,838,949
	5,838,950
	5,838,951
	5,838,952
	5,838,953
	5,838,954
503	5,838,955
555	5,838,956
557	5,838,957
559	5,838,958
	5,838,959
562	5,838,960
580	5,838,961
586	5,838,962
606	5,838,963
	5,839,011
612	5,838,964
614	5,838,965
615	5,838,966
616	5,838,967
674	5,838,968
680	5,838,969
683	5,838,970
684	5,838,971
685	5,838,972
701	5,838,973
702	5,838,974
704	5,838,975
	5,838,976
705	5,838,977
	5,838,978
707	5,838,979
708	5,838,980
712	5,838,981
750.01	5,838,982
750.06	5,838,983
800.05	5,838,984
800.16	5,838,985
800.23	5,838,986
800.32	5,838,987
	5,838,988
831	5,838,989
834	5,838,990
838	5,838,991
	5,838,992
842	5,838,993
876	5,838,994
880	5,838,995
888	5,838,996

CLASS 396

6	5,838,997
	5,838,998
33	5,838,999
51	5,839,000
61	RE. 35,963
91	5,839,002
102	5,839,003
114	5,839,001
152	5,839,004
159	5,839,005
174	5,839,006
296	5,839,007
319	5,839,008
408	5,839,009
543	5,839,010
647	5,839,012

CLASS 399

15	5,839,013
21	5,839,014
23	5,839,015
35	5,839,017
43	5,839,018
45	5,839,019
46	5,839,016
49	5,839,020
55	5,839,021
62	5,839,022
69	5,839,023
89	5,839,024
92	5,839,025
100	5,839,026
106	5,839,027
109	5,839,028
115	5,839,029
117	5,839,030
119	5,839,031
124	5,839,032
167	5,839,034
181	5,839,035
187	5,839,033
213	5,839,036
249	5,839,037
298	5,839,039
302	5,839,040
322	5,839,038
325	5,839,041
328	5,839,042
329	5,839,043
361	5,839,044
382	5,839,045
384	5,839,046
389	5,839,047
407	5,839,048

CLASS 400

208	5,836,703
234	5,836,704
486	5,836,705
636	5,836,706

CLASS 401

65	5,836,707
70	5,836,708

CLASS 402

38	5,836,709
79	5,836,710
	5,836,711

CLASS 403

334	5,836,712
359	5,836,713

CLASS 404

0.6	5,836,714
134	5,836,715

CLASS 405

43	5,836,716
125	5,836,717
128	5,836,718
166	5,836,719
302.2	5,836,720

CLASS 406

75	5,836,721
122	5,836,722

CLASS 407

104	5,836,724
107	5,836,723

CLASS 408

1 R	5,836,725
	5,836,726
158	5,836,727
238	5,836,728

CLASS 409

132	5,836,729

CLASS 410

12	5,836,730

CLASS 411

386	5,836,731
443	5,836,732

CLASS 414

685	5,836,733
723	5,836,734
749	5,836,735
786	5,836,736
796.4	5,836,737

CLASS 415

60	5,836,738
104	5,836,739

CLASS 416

5	5,836,740
95	5,836,742
139	5,836,743
193 A	5,836,744

CLASS 417

40	5,836,745
44.1	5,836,746
63	5,836,747
222.2	5,836,748
269	5,836,749
322	5,836,750
413.1	5,836,751

CLASS 418

55.2	5,836,752
95	5,836,753
201.3	5,836,754

CLASS 419

2	5,839,049

CLASS 420

42	5,837,190
560	5,837,191

CLASS 422

2	5,837,192
28	5,837,193
52	5,837,194
	5,837,195
55	5,837,196
61	5,837,197
63	5,837,198
68.1	5,837,199
73	5,837,200
82.08	5,837,202
100	5,837,203
105	5,837,204
109	5,837,205
120	5,837,206
121	5,837,207
195	5,837,208

CLASS 423

26	5,837,210
89	5,837,209
121	5,837,211
213.2	5,837,212
243.01	5,837,213
290	5,837,214
600	5,837,215
632	5,837,216
648.1	5,837,217

CLASS 424

1.69	5,837,218
1.81	5,837,219
9.2	5,837,220
9.52	5,837,221
49	5,837,222
59	5,837,224
64	5,837,223
70.1	5,837,225
78.06	5,837,227
78.1	5,837,226
78.37	5,837,228
85.1	5,837,229
	5,837,230
	5,837,231
85.2	5,837,232
93.1	5,837,233
93.45	5,837,238
93.461	5,837,237
93.7	5,837,234
	5,837,235
	5,837,236
94.6	5,837,240
130.1	5,837,239
136.1	5,837,241
	5,837,242
	5,837,243
139.1	5,837,244
184.1	5,837,245
185.1	5,837,246
	5,837,247
	5,837,248
186.1	5,837,249
193.1	5,837,250
	5,837,251
195.1	5,837,252
	5,837,253
	5,837,254
	5,837,255
	5,837,256
	5,837,257
198.1	5,837,258
226.1	5,837,260
229.1	5,837,261
231.1	5,837,262
234.1	5,837,263
	5,837,264
239.1	5,837,265
255.1	5,837,268
278.1	5,837,269
401	5,837,266
	5,837,270
	5,837,272
405	5,837,273
406	5,837,274
409	5,837,275
423	5,837,276
441	5,837,277
444	5,837,278
449	5,837,280
	5,837,281
450	5,837,279
	5,837,282
	5,837,283
459	5,837,284
464	5,837,285
465	5,837,379
466	5,837,286
484	5,837,287
	5,837,288
	5,837,289
489	5,837,290
	5,837,291
494	5,837,292
852	5,837,293

CLASS 425

12	5,837,294
207	5,837,295
277	5,837,296
320.1	5,837,531
381	5,837,297
456	5,837,298
526	5,837,299
574	5,837,301

CLASS 426

2	RE. 35,964
3	5,837,302
237	5,837,303
270	5,837,304
438	5,837,305
603	5,837,307
604	5,837,308
611	5,837,300
615	5,837,309
646	5,837,310
651	5,837,311
656	5,837,312

CLASS 427

2.21	5,837,313
133	5,837,314
136	5,837,315
150	5,837,348
191	5,837,316
217	5,837,317
226	5,837,318
240	5,837,319
248.1	5,837,320
	5,837,321
249	5,837,322
322	5,837,323
402	5,837,324
421	5,837,325
449	5,837,326
456	5,837,327
542	5,837,328
555	5,837,329
	5,837,330
569	5,837,331
600	5,837,332

CLASS 428

15	5,837,333
34.4	5,837,334
34.9	5,837,335
	5,837,336
36.6	5,837,339
36.8	5,837,340
40.1	5,837,337
41.3	5,837,341
42.3	5,837,338
45	5,837,342
109	5,837,343
139	5,837,344
141	5,837,345
	5,837,346
143	5,837,347
192	5,837,349
195	5,837,350
	5,837,351
198	5,837,352
204	5,837,353
208	5,837,354
209	5,837,355
210	5,837,356
212	5,837,357
213	5,837,358
	5,837,359
216	5,837,360
	5,837,361
217	5,837,362
311.11	5,837,363
312.6	5,837,364
318.8	5,837,365
327	5,837,366
332	5,837,367
340	5,837,376
343	5,837,368
349	5,837,369
359	5,837,370
394	5,837,371
400	5,837,372
404	5,837,373
408	5,837,374
411.1	5,837,375
412	5,837,377
480	5,837,380
	5,837,381
484	5,837,382
486	5,837,383
521	5,837,384
610	5,837,385
623	5,837,386
650	5,837,387
654	5,837,388
667	5,837,389
690	5,837,390
	5,837,391
692	5,837,392

CLASS 429

20	5,837,393
27	5,837,394
35	5,837,395
94	5,837,396
162	5,837,397
174	5,837,398
178	5,837,399
192	5,837,400
212	5,837,401
229	5,837,402

CLASS 430

5	5,837,403
	5,837,404
	5,837,405
12	5,837,406
25	5,837,407
42	5,837,408
45	5,837,409
58	5,837,410
59	5,837,411
	5,837,412
106.6	5,837,413
107	5,837,414
109	5,837,415
110	5,837,416
169	5,837,417
264	5,837,418
270.1	5,837,419
	5,837,420
270.12	5,837,424
281.1	5,837,421
284.1	5,837,422
285.1	5,837,586
296	5,837,423
302	5,837,425
311	5,837,426
312	5,837,427
313	5,837,428
343	5,837,429
373	5,837,430
	5,837,431
379	5,837,432
380	5,837,433
480	5,837,434
490	5,837,435
503	5,837,436
537	5,837,437
544	5,837,438
569	5,837,439
572	5,837,440
	B1 541,054

CLASS 431

153	5,836,755
263	5,836,756
264	5,836,757

CLASS 432

78	5,836,758
239	5,836,759
253	5,836,760

CLASS 433

6	5,836,761
29	5,836,762
102	5,836,764
119	5,836,765
127	5,836,766
141	5,836,767
173	5,836,768
216	5,836,769

CLASS 434

247	5,836,770
362	5,836,771

CLASS 435

4	5,837,443
	5,837,444
5	5,837,441
	5,837,442
6	5,837,446
	5,837,447
	5,837,448
	5,837,449
	5,837,450
	5,837,451
	5,837,452
	5,837,453
	5,837,454
	5,837,455
	5,837,456
	5,837,457
	5,837,458
	5,837,459
	5,837,460
	5,837,461
	5,837,462
	5,837,463
	5,837,464
	5,837,465
	5,837,466
	5,837,467
	5,837,468
	5,837,469
	5,837,470
	5,837,471
7.1	5,837,472
	5,837,475
7.21	5,837,473
7.23	5,837,474
	5,837,476
7.24	5,837,477
	5,837,478
25	5,837,479
	5,837,480
29	5,837,481
34	5,837,482
68.1	5,837,483
69.1	5,837,484
	5,837,485
	5,837,486
	5,837,488
	5,837,489
	5,837,490
	5,837,491
	5,837,492
	5,837,493
	5,837,494
	5,837,495
69.3	5,837,496
69.4	5,837,498
69.6	5,837,499
69.7	5,837,500
91.2	5,837,501
	5,837,502
91.31	5,837,503
108	5,837,504
128	5,837,505
165	5,837,506
172.1	5,837,507
172.3	5,837,508
	5,837,509
	5,837,510
	5,837,511
	5,837,512
183	5,837,513
194	5,837,514
200	5,837,515
221	5,837,516
	5,837,517
226	5,837,518
236	5,837,519
239	5,837,520
240.1	5,837,521
243	5,837,522
252.3	5,837,524
	5,837,525
	5,837,526
252.31	5,837,528
252.5	5,837,527
259	5,837,529
320.1	5,837,523
	5,837,532
	5,837,533
	5,837,534
325	5,837,535
	5,837,536
	5,837,537
	5,837,538
332	5,837,539
337	5,837,540
340	5,837,541
366	5,837,542
373	5,837,543
375	5,837,544
419	5,837,545
693	5,837,497

CLASS 436

10	5,837,547
63	5,837,548
169	5,837,546
513	5,837,550
518	5,837,551
525	5,837,552

CLASS 437

31	5,837,553
43	5,837,554
248	5,837,555

CLASS 438

4	5,837,556
6	5,837,557
15	5,837,558
30	5,837,559
39	5,837,560
47	5,837,561
51	5,837,562
60	5,837,563
95	5,837,564
109	5,837,566
123	5,837,567
147	5,837,568
166	5,837,569
172	5,837,565
	5,837,570
199	5,837,571
	5,837,572
238	5,837,573
239	5,837,574
253	5,837,575
	5,837,576
	5,837,577
254	5,837,578
255	5,837,579
	5,837,580
	5,837,581
	5,837,582
257	5,837,583
263	5,837,584
264	5,837,585
265	5,836,772
305	5,837,587
	5,837,588
314	5,837,589
364	5,837,590
381	5,837,591
382	5,837,592
396	5,837,593
	5,837,594
439	5,837,378
443	5,837,595
446	5,837,596
528	5,837,597
532	5,837,598
584	5,837,599
592	5,837,600
	5,837,601

VOL
1216
ISS
3
NO
17
1998
UMI

621	5,837,602
632	5,837,603
641	5,837,604
649	5,837,605
667	5,837,607
675	5,837,608
678	5,837,609
692	5,837,610
	5,837,611
697	5,837,612
	5,837,613
711	5,837,615
735	5,837,616
738	5,837,617
778	5,837,618
789	5,837,614
795	5,837,619

CLASS 439

74	5,836,773
76.1	5,836,774
159	5,836,775
188	5,836,776
222	5,836,777
235	5,836,778
260	5,836,779
326	5,836,780
348	5,836,781
397	5,836,782
502	5,836,783
	5,836,784
505	5,836,785
557	5,836,786
567	5,836,787
587	5,836,788
604	5,836,789
620	5,836,790
709	5,836,791
736	5,836,792
852	5,836,793

CLASS 440

54	5,836,794
66	5,836,795

CLASS 442

63	5,837,620
143	5,837,621
184	5,837,622
189	5,837,623
208	5,837,624
337	5,837,625
353	5,837,626
385	5,837,627

CLASS 445

24	5,836,796
	5,836,797
	5,836,798
	5,836,799

CLASS 446

236	5,836,800
315	5,836,801
367	5,836,802
379	5,836,803
440	5,836,804

CLASS 451

36	5,836,805
41	5,836,806
	5,836,807
70	5,836,808
89	5,836,809
526	5,836,810

CLASS 452

62	5,836,811
187	5,836,812

CLASS 454

139	5,836,813
234	5,836,814
341	5,836,815

CLASS 455

2	5,839,050
5.1	5,839,052
11.1	5,839,051
13.1	5,839,053
31.2	5,839,054
62	5,839,055
69	5,839,056
90	5,839,058
115	5,839,059
226.2	5,839,060
296	5,839,061
323	5,839,062
410	5,839,063
413	5,839,064
414	5,839,065
422	5,839,067
427	5,839,068
437	5,839,069
440	5,839,070
	5,839,071
445	5,839,072
450	5,839,074
	5,839,075
461	5,839,076
517	5,839,077

CLASS 463

16	5,836,816
26	5,836,817
29	5,836,818
30	5,836,819

CLASS 464

68	5,836,820
89	5,836,821
111	5,836,822
134	5,836,823
175	5,836,824
181	5,836,825

CLASS 470

117	5,836,826

CLASS 473

125	5,836,827
205	5,836,828
224	5,836,829
349	5,836,830
354	5,836,831
	5,836,832
365	5,836,833
374	5,836,834
414	5,836,835
427	5,836,836
472	5,836,837
481	5,836,838
511	5,836,839
563	5,836,841
581	5,836,842
588	5,836,840

CLASS 474

29	5,836,843
80	5,836,844

CLASS 475

131	5,836,845
149	5,836,846
204	5,836,847
	5,836,848
269	5,836,849
286	5,836,850

CLASS 477

107	5,836,851
118	5,836,852

CLASS 482

12	5,836,853
52	5,836,854
57	5,836,855
62	5,836,856
92	5,836,857
106	5,836,858
112	5,836,859

CLASS 492

56	5,836,860

CLASS 493

386	5,836,861
459	5,836,862

CLASS 501

42	5,837,628
70	5,837,629
80	5,837,630
90	5,837,631
96.3	5,837,632
98.4	5,837,633
127	5,837,634

CLASS 502

24	5,837,635
35	5,837,636
41	5,837,637
62	5,837,638
64	5,837,639
185	5,837,640
219	5,837,641
304	5,837,642
416	5,837,644

CLASS 503

201	5,837,645
	5,837,646
	5,837,647
227	5,837,648
	5,837,649

CLASS 504

116	5,837,650
	5,837,651
138	5,837,652
319	5,837,653

CLASS 507

100	5,837,654
103	5,837,655
220	5,837,656

CLASS 508

363	5,837,657
421	5,837,658

CLASS 510

101	5,837,659
122	5,837,661
175	5,837,662
226	5,837,663
238	5,837,664
278	5,837,665
299	5,837,666
365	5,837,667
418	5,837,668
467	5,837,669
490	5,837,670

CLASS 512

26	5,837,671

CLASS 514

2	5,837,672
7	5,837,674
8	5,837,675
	5,837,676
11	5,837,677
12	5,837,678
	5,837,679
	5,837,680
	5,837,681
	5,837,682
15	5,837,684
	5,837,685
17	5,837,686
18	5,837,687
21	5,837,688
25	5,837,689
26	5,837,690
29	5,837,691
44	5,837,692
	5,837,693
	5,837,694
61	5,837,695
152	5,837,696
159	5,837,697
169	5,837,698
	5,837,699
178	5,837,700
183	5,837,703
217	5,837,701
218	5,837,702
220	5,837,704
248	5,837,705
252	5,837,706
255	5,837,707
274	5,837,708
299	5,837,709
301	5,837,710
305	5,837,711
307	5,837,712
312	5,837,713
313	5,837,714
323	5,837,715
326	5,837,716
	5,837,717
341	5,837,718
343	5,837,719
	5,837,720
365	5,837,721
404	5,837,723
422	5,837,724
467	5,837,725
475	5,837,726
483	5,837,727
529	5,837,728
535	5,837,729
551	5,837,730
560	5,837,731
	5,837,732
	5,837,733
594	5,837,734
605	5,837,735
610	5,837,736
632	5,837,737
634	5,837,738

CLASS 521

54	5,837,739
60	5,837,740
124	5,837,741
172	5,837,742
	5,837,743

CLASS 522

4	5,837,744
8	5,837,745
	5,837,746
26	5,837,747
	5,837,748
31	5,837,749
81	5,837,750
167	5,837,751

CLASS 523

116	5,837,752
161	5,837,753
	5,837,754

CLASS 524

18	5,837,755
68	5,837,756
87	5,837,757
108	5,837,758
110	5,837,759
127	5,837,760
190	5,837,761
274	5,837,762
449	5,837,763
451	5,837,764
494	5,837,765
495	5,837,766
497	5,837,767
503	5,837,768
505	5,837,769
513	5,837,770
786	5,837,771

CLASS 525

66	5,837,772
72	5,837,773
104	5,837,774
221	5,837,775
244	5,837,776
263	5,837,777
271	5,837,778
369	5,837,779
379	5,837,780
398	5,837,781
447	5,837,782
471	5,837,783
477	5,837,784
527	5,837,785

CLASS 526

68	5,837,786
160	5,837,787
222	5,837,788
320	5,837,789
323.2	5,837,790
336	5,837,791

CLASS 528

27	5,837,792
29	5,837,793
49	5,837,794
62	5,837,795
73	5,837,796
76	5,837,797
86	5,837,798
102	5,837,799
193	5,837,800
310	5,837,801
	5,837,802
332	5,837,803
353	5,837,804
422	5,837,806

CLASS 530

317	5,837,807
324	5,837,808
326	5,837,809
350	5,837,810
	5,837,811
	5,837,812
	5,837,813
	5,837,814
	5,837,815
	5,837,816
	5,837,817
	5,837,818
	5,837,819
370	5,837,820
387.3	5,837,821
	5,837,822
387.9	5,837,823
395	5,837,824
403	5,837,825
413	5,837,826

CLASS 534

618	5,837,827

CLASS 536

6.4	5,837,828
7.4	5,837,829
17.9	5,837,830
18.5	5,837,831
22.1	5,837,832
	5,837,833
23.1	5,837,834
	5,837,835
	5,837,836
	5,837,837
	5,837,838
23.2	5,837,839
23.4	5,837,840
23.5	5,837,841
	5,837,842
	5,837,843
	5,837,844
23.53	5,837,845
	5,837,846
24.1	5,837,847
	5,837,848
	5,837,849
	5,837,850
	5,837,851
24.31	5,837,857
24.5	5,837,852
	5,837,853
	5,837,854
	5,837,855
	5,837,856
25.3	5,837,858
	5,837,859
	5,837,860
25.6	5,837,861
53	5,837,862
124	5,837,864

CLASS 540

145	5,837,865
	5,837,866
200	5,837,867
580	5,837,868

CLASS 544

113	5,837,869
137	5,837,870
243	5,837,871

CLASS 548

544	5,837,877

CLASS 558

315	5,837,878

CLASS 560

27	5,837,873
159	5,837,874

CLASS 562

571	5,837,872

CLASS 588

11	5,839,078
18	5,839,079

CLASS 600

25	5,836,863
38	5,836,864
	5,836,865
112	5,836,867
173	5,836,869
204	5,836,871
306	5,836,872
374	5,836,874
	5,836,875
398	5,836,873
407	5,836,876
	5,836,877
415	5,836,878
443	5,836,880
447	5,836,881
462	5,836,882
476	5,836,883
485	5,836,884
486	5,836,885
488	5,836,886
494	5,836,887
	5,836,888
509	5,836,889
551	5,836,890
552	5,836,891
585	5,836,892
	5,836,893
587	5,836,894
593	5,836,895

CLASS 601

2	5,836,896
	5,836,897
4	5,836,898
35	5,836,909
46	5,836,899
57	5,836,900
135	5,836,901

CLASS 602

5	5,836,902
27	5,836,903
60	5,836,904

CLASS 604

21	5,836,905
22	5,836,906
27	5,836,907
29	5,836,908
65	5,836,910
72	5,836,911
96	5,836,912
107	5,836,913
117	5,836,914
127	5,837,007
131	5,836,915
158	5,836,916
164	5,836,917
171	5,836,918
187	5,836,919
192	5,836,920
195	5,836,921
214	5,836,922
246	5,836,923
248	5,836,924
280	5,836,925
282	5,836,926
300	5,836,927
317	5,836,928
368	5,836,929
378	5,836,930
385.2	5,836,931
396	5,836,932
403	5,836,933
410	5,836,934
891.1	5,836,935

CLASS 606

1	5,836,936
	5,836,937
9	5,836,938
11	5,836,939
15	5,836,940
	5,836,941
32	5,836,942
34	5,836,943
41	5,836,944
	5,836,945
45	5,836,946
47	5,836,947
61	5,836,948
62	5,836,949
65	5,836,950
108	5,836,951
	5,836,952
114	5,836,953
130	5,836,954
148	5,836,955
	5,836,956
159	5,836,868
	5,836,957
160	5,836,958
169	5,836,959
170	5,836,960
190	5,836,961
191	5,836,962
194	5,836,964
198	5,836,965
	5,836,966
	5,836,967
200	5,836,968
	5,836,969
213	5,836,970

CLASS 607

4	5,836,971
5	5,836,972
	5,836,973
	5,836,974
	5,836,975
	5,836,977
6	5,836,976
7	5,836,978
9	5,836,980
	5,836,981
	5,836,982
	5,836,983
	5,836,984
14	5,836,985
17	5,836,986
	5,836,987
19	5,836,988
27	5,836,989
28	5,836,990
	5,836,991
36	5,836,992
40	5,836,994
48	5,836,995
54	5,836,996
59	5,836,993
75	5,836,997
88	5,836,999

95	5,836,998
	5,837,000
102	5,837,001
104	5,837,002
106	5,837,003
109	5,837,004
112	5,837,005
127	5,837,006

CLASS 623

1	5,837,008

CLASS 640

309.15	5,838,224

CLASS 701

9	5,839,080
36	5,839,081
38	5,839,082
62	5,839,083
67	5,839,084
117	5,839,085
201	5,839,086
207	5,839,087
213	5,839,088

CLASS 702

3	5,839,089
5	5,839,090
19	5,839,091
58	5,839,092
59	5,839,093
91	5,839,094
122	5,839,095
130	5,838,590
183	5,839,096
188	5,839,097

CLASS 704

203	5,839,098
207	5,839,099
220	5,839,100
226	5,839,101
230	5,839,102
232	5,839,103
251	5,839,104
256	5,839,105
257	5,839,106
270	5,839,107
	5,839,108
271	5,839,109
275	5,839,110
	5,839,111

CLASS 705

4	5,839,112
	5,839,113
5	5,839,114
15	5,839,115
20	5,839,116
27	5,839,117
36	5,839,118
39	5,839,119

CLASS 706

13	5,839,120

CLASS 800

2	5,837,875
205	5,837,876

CLASS 814

2	5,837,673

CLASSIFICATION OF DESIGNS

D2—	830	401,035
	869	401,036
	904	401,037
	947	401,038
		401,039
	951	401,040
		401,041
		401,042
	954	401,044
	955	401,043
	960	401,045
	962	401,046
	969	401,047
		401,048
		401,049
		401,050
	970	401,051
	972	401,052
	991	401,053
D3—	212	401,054
	218	401,055
	231	401,056
		401,057
	260	401,058
		401,059
	265	401,060
	271	401,061
	287	401,062
		401,063
	302	401,064
	304	401,065
	307	401,066
	309	401,067
	318	401,068
D4—	104	401,069
	108	401,070
	115	401,071
D5—	26	401,072
D6—	316	401,073
	334	401,074
	366	401,075
		401,076
	369	401,077
	381	401,078
	415	401,079
	445	401,080
	446	401,081
		401,082
	461	401,083
	474	401,084
	478	401,085
	482	401,086
		401,087
	498	401,088
	500	401,089
		401,090
	505	401,091
	525	401,092
	545	401,093
	561	401,094
		401,095
	575	401,096
	577	401,097
		401,098
	582	401,099
		401,100
	583	401,101
	599	401,102
	601	401,103
		401,104
	608	401,105
D7—	300.1	401,106
	309	401,108
	368	401,107
	391	401,109
		401,110
	397	401,111
	408	401,112
	504	401,113
	511	401,114
	589	401,115
	602	401,116
	606	401,117
	609	401,118
		401,119
		401,120
	620	401,121
	624	401,122
	683	401,123
D8—	1	401,124
	7	401,125
	10	401,126
	33	401,127
	64	401,128
	87	401,130
	91	401,129
	98	401,131
		401,132
	105	401,133
	329	401,134
	341	401,136
	387	401,135
	394	401,137
D9—	302	401,138
	305	401,139
	307	401,140
	318	401,141
	319	401,142
	337	401,143
	338	401,144
	342	401,145
	423	401,146
	431	401,147
	432	401,148
	439	401,149
	448	401,150
	454	401,151
	500	401,152
	504	401,153
	528	401,154
	558	401,155
	569	401,156
	570	401,157
	574	401,158
D10—	30	401,159
		401,160
	31	401,162
	32	401,163
		401,164
	34	401,161
	46	401,165
		401,166
	50	401,167
	68	401,168
	69	401,169
	73	401,170
	78	401,171
	79	401,172
	91	401,173
	92	401,174
	104	401,175
		401,176
		401,177
	106	401,178
	116	401,179
D11—	3	401,181
	41	401,182
	90	401,183
	160	401,180
D12—	91	401,185
		401,186
	110	401,184
	111	401,187
	114	401,188
	126	401,189
	128	401,190
	131	401,191
	133	401,192
	162	401,193
		401,194
		401,195
		401,196
		401,197
	173	401,198
	181	401,199
	187	401,200
	192	401,201
	200	401,202
	203	401,203
	204	401,204
	209	401,205
		401,206
		401,207
		401,208
	217	401,210
	223	401,211
	307	401,212
	320	401,209
	406	401,213
	716	401,214
D13—	103	401,215
	110	401,216
	120	401,217
	133	401,218
	137.2	401,219
	139.6	401,220
		401,221
	144	401,222
	155	401,223
		401,224
	179	401,225
	184	401,226
D14—	103	401,227
	106	401,228
	109	401,229
	114.1	401,230
		401,231
	114.3	401,232
	138	401,233
	147	401,234
	149	401,235
	168	401,236
		401,237
	191	401,238
		401,239
	198	401,240
	215	401,241
	217	401,242
	230	401,243
	238	401,245
	242	401,244
D15—	7	401,246
	130	401,247
	131	401,248
	133	401,249
	138	401,250
		401,251
		401,252
	139	401,253
	199	401,254
		401,255
D16—	202	401,256
	218	401,257
		401,258
	219	401,259
	225	401,260
		401,261
	227	401,262
	237	401,263
	243	401,264
D17—	1	401,265
	20	401,266
		401,267
D18—	7	401,268
	12	401,269
	16	401,270
	55	401,271
D19—	20	401,272
	26	401,273
		401,274
	43	401,275
	50	401,276
		401,277
	51	401,278
	52	401,279
	57	401,280
	69	401,281
	78	401,282
D20—	9	401,283
	19	401,284
	23	401,285
	41	401,286
D21—	86	401,288
		401,289
	99	401,290
	122	401,291
	131	401,292
	204	401,293
	222	401,294
	223	401,295
	228	401,287
	234	401,296
	303	401,308
	329	401,297
	733	401,299
		401,300
		401,301
	779	401,298
D22—	112	401,302
	114	401,303
	124	401,304
D23—	202	401,305
	209	401,306
	238	401,307
	254	401,309
	290	401,310
	303	401,311
	325	401,313
	328	401,312
	335	401,314
		401,315
	356	401,316
		401,317
	364	401,318
	365	401,320
	411	401,321
		401,322
	413	401,319
D24—	110	401,323
	114	401,324
		401,325
	119	401,326
	125	401,327
	126	401,328
	128	401,329
		401,330
		401,331
	129	401,332
	133	401,333
		401,334
		401,335
		401,336
	134	401,337
	144	401,338
		401,350
	145	401,339
	146	401,340
	155	401,341
	164	401,342
	197	401,343
		401,344
	199	401,345
	200	401,346
	208	401,347
D25—	16	401,348
	38	401,349
	50	401,360
	52	401,351
	58	401,352
	64	401,353
	68	401,354
	113	401,355
		401,356
	122	401,357
	124	401,358
		401,359
	138	401,361
	139	401,362
		401,363
D26—	16	401,364
	24	401,365
	26	401,367
	28	401,366
	36	401,368
	37	401,369
	38	401,371
		401,374
	49	401,372
		401,373
	67	401,370
	74	401,375
	86	401,376
	107	401,377
	134	401,378
D27—	183	401,379
D28—	7	401,380
	13	401,382
	18	401,381
D34—	1	401,383
D99—	43	401,384

CLASSIFICATION OF PLANTS

P.—	7.1	10,685
	48	10,686
	55	10,688
	56	10,687
	57	10,689
	68.1	10,690
	82.2	10,691
	87.12	10,695
	87.4	10,692
		10,693
		10,694

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GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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PATENTS

November 24, 1998

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Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1214 O.G. 47, on September 15, 1998.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was increased, effective January 1, 1998, and was announced in the *Official Gazette* at 1205 O.G. 3, on December 2, 1997.

International fees were changed, effective on May 1, 1997, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1197 O.G. 69, on April 22, 1997. The basic fee and the designation fee were further changed effective January 1, 1998 and were announced in the *Official Gazette* at 1205 O.G. 3, on December 2, 1997.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective October 1, 1998, and were announced in the *Official Gazette* at 1213 O.G. 153, on August 18, 1998.

The schedule of PCT fees (in U.S. dollars), effective October 1, 1998, is as follows:

International Application (PCT Chapter I) fees:	
Transmittal fee	240.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
— No corresponding prior U.S. national application filed under 35 U.S.C. 111(a)	700.00
— Corresponding prior U.S. national application filed under 35 U.S.C. 111(a and filing fee under 37 CFR 1.16(a) paid)	450.00
— Supplemental search fee, per additional invention (payable only upon invitation)	210.00
European Patent Office as ISA	1250.00
International fees	
Basic fee	455.00
Basic supplemental fee (for each page over 30)	10.00
Designation fee per country or region	
— For the first 11 national or regional offices designated	105.00
— For each designation in excess of 11 offices	No Charge
Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5)	
— Designation fee	105.00
— Confirmation fee	52.50
International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination:	
Handling fee	162.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
— USPTO was ISA in PCT Chapter I	490.00
— Additional examination fee, per additional invention (payable only upon invitation)	140.00
— USPTO was not ISA in PCT Chapter I	750.00
— Additional examination fee, per additional invention (payable only upon invitation)	270.00

U.S. National Stage Fees	Small Entity	Regular
Basic National fee		
USPTO was IPEA		
— All claims presented satisfied provisions of PCT Article 33(2) to (4)	*	*
— All claims presented did not satisfy provisions of PCT Article 33(2) to (4)	*	*
USPTO was ISA but not IPEA	*	*
USPTO was neither ISA nor IPEA		
— Search report has not been prepared by the European Patent Office or the Japanese Patent Office	*	*
— Search report has been prepared by the European Patent Office or the Japanese Patent Office	*	*
Other National fees		
— For each independent claim in excess of 3	*	*
— For each claim in excess of 20.	*	*
— For each application containing a multiple dependent claim	*	*
— Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(l)	65.00	130.00
— Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(l)	130.00	130.00

* No fees are indicated because as of the date this notice was prepared these fee amounts were uncertain. Current fee amounts may be obtained from the Patent and Trademark Office's Web site (www.uspto.gov) or by contacting the PTO General Information Services Division at (703) 308-4357 or (800) 786-9199.

Sep. 16, 1998

BRUCE A. LEHMAN
Assistant Secretary of Commerce and
Commissioner of Patents and Trademarks

Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the

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maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on November 21, 1995 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,467,478 through 5,469,577
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on November 28, 1991 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,065,457 through 5,067,174
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on November 17, 1987 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,706,301 through 4,707,859
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1997, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) ....*
By other than a small entity ....*

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) ....*
By other than a small entity ....*

(g) For maintaining an original or reissue patent, except a design or plant patent, based on applications filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) ....*
By other than a small entity ....*

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable $700.00
(2) unintentional $1,640.00

* No fees are indicated because as of the date this notice was prepared these fee amounts were uncertain. Current fee amounts may be obtained from the Patent and Trademark Office's Web site (www.uspto.gov) or by contacting the PTO General Information Services Division at (703) 308-4357 or (800) 786-9199.

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED ON September 16, 1998 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Application Number	Issue Date
4,611,355	06/671,956	09/16/86
4,611,361	06/709,287	09/16/86
4,611,364	06/716,404	09/16/86
4,611,374	06/747,623	09/16/86
4,611,379	06/790,752	09/16/86
4,611,384	06/729,025	09/16/86
4,611,387	06/721,004	09/16/86
4,611,395	06/730,568	09/16/86
4,611,396	06/723,419	09/16/86
4,611,404	06/810,507	09/16/86
4,611,412	06/661,708	09/16/86
4,611,415	06/631,361	09/16/86
4,611,418	06/716,967	09/16/86
4,611,432	06/702,233	09/16/86
4,611,434	06/690,770	09/16/86
4,611,435	06/593,899	09/16/86
4,611,436	06/745,800	09/16/86
4,611,448	06/693,543	09/16/86
4,611,457	06/713,874	09/16/86
4,611,458	06/726,697	09/16/86
4,611,461	06/607,235	09/16/86
4,611,485	06/677,208	09/16/86
4,611,487	06/711,889	09/16/86
4,611,489	06/685,652	09/16/86
4,611,490	06/654,389	09/16/86
4,611,493	06/654,220	09/16/86
4,611,496	06/632,045	09/16/86
4,611,497	06/667,878	09/16/86
4,611,501	06/799,287	09/16/86
4,611,511	06/655,790	09/16/86
4,611,512	06/705,527	09/16/86
4,611,518	06/642,240	09/16/86
4,611,521	06/620,079	09/16/86
4,611,523	06/735,139	09/16/86
4,611,526	06/732,483	09/16/86
4,611,532	06/542,142	09/16/86
4,611,538	06/690,668	09/16/86
4,611,542	06/666,768	09/16/86
4,611,546	06/643,543	09/16/86
4,611,547	06/745,003	09/16/86
4,611,551	06/681,683	09/16/86
4,611,565	06/725,591	09/16/86
4,611,579	06/602,760	09/16/86
4,611,588	06/741,336	09/16/86
4,611,597	06/547,950	09/16/86

Patent Number	Application Number	Issue Date
4,611,599	06/621,049	09/16/86
4,611,603	06/706,761	09/16/86
4,611,606	06/646,349	09/16/86
4,611,612	06/805,282	09/16/86
4,611,626	06/649,831	09/16/86
4,611,629	06/755,484	09/16/86
4,611,631	06/694,305	09/16/86
4,611,636	06/697,081	09/16/86
4,611,642	06/640,032	09/16/86
4,611,645	06/725,911	09/16/86
4,611,650	06/609,247	09/16/86
4,611,663	06/719,383	09/16/86
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4,611,679	06/698,462	09/16/86
4,611,683	06/556,561	09/16/86
4,611,684	06/694,408	09/16/86
4,611,687	06/758,120	09/16/86
4,611,694	06/698,287	09/16/86
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4,611,740	06/717,895	09/16/86
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4,611,745	06/696,181	09/16/86
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4,611,806	06/694,983	09/16/86
4,611,821	06/778,714	09/16/86
4,611,822	06/798,944	09/16/86
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4,611,831	06/741,430	09/16/86
4,611,846	06/663,790	09/16/86
4,611,848	06/723,447	09/16/86
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4,611,851	06/807,778	09/16/86
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4,611,863	06/516,819	09/16/86
4,611,866	06/771,780	09/16/86
4,611,868	06/681,127	09/16/86
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4,612,322	06/632,852	09/16/86
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4,612,349	06/666,228	09/16/86
4,612,353	06/725,723	09/16/86
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4,612,357	06/753,276	09/16/86
4,612,359	06/787,938	09/16/86
4,612,361	06/779,253	09/16/86
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4,612,368	06/272,580	09/16/86
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4,612,379	06/749,426	09/16/86
4,612,386	06/331,704	09/16/86
4,612,388	06/719,300	09/16/86
4,612,389	06/376,933	09/16/86
4,612,390	06/361,311	09/16/86
4,612,400	06/811,797	09/16/86
4,612,410	06/665,345	09/16/86
4,612,413	06/632,092	09/16/86
4,612,418	06/617,462	09/16/86
4,612,419	06/688,230	09/16/86
4,612,420	06/651,379	09/16/86

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4,612,437	06/577,838	09/16/86
4,612,438	06/575,841	09/16/86
4,612,446	06/651,215	09/16/86
4,612,450	06/587,499	09/16/86
4,612,455	06/608,840	09/16/86
4,612,456	06/414,405	09/16/86
4,612,460	06/541,946	09/16/86
4,612,468	06/698,611	09/16/86
4,612,469	06/669,925	09/16/86
4,612,472	06/664,597	09/16/86
4,612,473	06/632,120	09/16/86
4,612,486	06/724,881	09/16/86
4,612,488	06/746,961	09/16/86
4,612,490	06/703,721	09/16/86
4,612,497	06/776,188	09/16/86
4,612,504	06/673,691	09/16/86
4,612,508	06/772,507	09/16/86
4,612,510	06/679,943	09/16/86
4,612,511	06/543,027	09/16/86
4,612,516	06/765,565	09/16/86
4,612,517	06/612,970	09/16/86
4,612,524	06/678,615	09/16/86
4,612,530	06/722,509	09/16/86
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4,612,541	06/545,775	09/16/86
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4,612,554	06/760,009	09/16/86
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4,612,576	06/656,369	09/16/86
4,612,580	06/650,615	09/16/86
4,612,583	06/641,455	09/16/86
4,612,587	06/643,976	09/16/86
4,612,591	06/668,262	09/16/86
4,612,607	06/745,522	09/16/86
4,612,639	06/676,040	09/16/86
4,612,655	06/597,468	09/16/86
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4,955,088	07/306,048	09/11/90
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4,956,172	07/398,066	09/11/90
4,956,183	07/082,346	09/11/90
4,956,185	07/344,361	09/11/90
4,956,187	07/269,179	09/11/90
4,956,192	07/388,807	09/11/90
4,956,197	07/253,321	09/11/90
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4,956,234	07/148,529	09/11/90
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4,956,684	07/246,598	09/11/90
4,956,703	07/243,633	09/11/90
4,956,708	07/362,280	09/11/90
4,956,722	07/369,228	09/11/90
4,956,734	07/368,816	09/11/90
4,956,740	07/081,645	09/11/90
4,956,742	07/388,857	09/11/90
4,956,761	07/160,322	09/11/90
4,956,766	06/759,002	09/11/90
4,956,777	07/204,336	09/11/90
4,956,783	07/405,180	09/11/90
4,956,793	07/211,014	09/11/90
4,956,794	07/423,539	09/11/90
4,956,796	07/196,928	09/11/90
4,956,799	07/428,035	09/11/90
4,956,803	07/407,077	09/11/90
4,956,805	07/099,754	09/11/90
4,956,817	07/199,008	09/11/90
4,956,824	07/405,944	09/11/90
4,956,828	07/359,574	09/11/90
4,956,836	07/173,824	09/11/90
4,956,842	07/272,059	09/11/90
4,956,843	07/418,856	09/11/90
4,956,844	07/325,292	09/11/90
4,956,846	07/320,307	09/11/90
4,956,851	07/198,504	09/11/90
4,956,853	07/312,643	09/11/90
4,956,855	07/252,952	09/11/90
4,956,856	07/252,955	09/11/90
4,956,863	07/339,555	09/11/90
4,956,864	07/074,954	09/11/90
4,956,866	07/374,450	09/11/90
4,956,875	07/215,011	09/11/90

PATENTS WHICH EXPIRED ON September 13, 1998 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Application Number	Issue Date
5,345,609	07/953,685	09/13/94
5,345,611	08/138,733	09/13/94
5,345,617	08/151,000	09/13/94
5,345,619	08/118,521	09/13/94
5,345,623	08/153,368	09/13/94
5,345,624	08/031,273	09/13/94
5,345,626	08/054,897	09/13/94
5,345,627	08/151,963	09/13/94
5,345,635	08/116,575	09/13/94
5,345,641	07/974,254	09/13/94
5,345,647	08/089,184	09/13/94
5,345,652	08/182,759	09/13/94
5,345,654	07/993,423	09/13/94
5,345,657	08/107,280	09/13/94
5,345,662	08/027,804	09/13/94
5,345,664	08/061,011	09/13/94
5,345,673	08/163,569	09/13/94
5,345,677	07/990,074	09/13/94
5,345,678	07/993,725	09/13/94
5,345,679	08/105,245	09/13/94
5,345,682	08/078,583	09/13/94
5,345,687	07/842,345	09/13/94
5,345,690	07/930,700	09/13/94
5,345,693	07/956,021	09/13/94
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5,345,714	08/099,527	09/13/94
5,345,716	08/124,336	09/13/94
5,345,724	08/045,724	09/13/94
5,345,725	08/043,650	09/13/94
5,345,729	08/025,322	09/13/94
5,345,731	07/996,585	09/13/94
5,345,736	07/918,243	09/13/94
5,345,739	08/071,094	09/13/94
5,345,746	08/057,515	09/13/94
5,345,751	08/077,668	09/13/94
5,345,764	07/743,243	09/13/94
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5,345,790	08/056,174	09/13/94
5,345,791	08/148,006	09/13/94
5,345,797	08/071,248	09/13/94
5,345,799	07/973,104	09/13/94
5,345,804	07/938,250	09/13/94
5,345,810	08/163,504	09/13/94
5,345,826	08/057,683	09/13/94
5,345,833	08/119,647	09/13/94
5,345,834	07/920,385	09/13/94
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5,345,845	08/123,803	09/13/94
5,345,849	08/088,517	09/13/94
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5,345,886	08/014,383	09/13/94
5,345,888	08/152,325	09/13/94
5,345,890	07/749,525	09/13/94
5,345,892	08/204,945	09/13/94
5,345,894	07/954,824	09/13/94
5,345,897	08/071,822	09/13/94
5,345,898	08/112,328	09/13/94
5,345,900	08/016,305	09/13/94
5,345,901	08/097,143	09/13/94
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5,345,916	08/022,204	09/13/94
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5,345,952	08/178,413	09/13/94
5,345,953	08/144,781	09/13/94
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5,345,959	08/091,677	09/13/94
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5,346,027	08/095,173	09/13/94
5,346,030	08/010,992	09/13/94
5,346,034	07/873,247	09/13/94
5,346,036	08/031,480	09/13/94
5,346,043	08/113,871	09/13/94
5,346,052	08/051,675	09/13/94
5,346,056	08/022,194	09/13/94
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5,346,071	08/148,635	09/13/94
5,346,074	08/016,974	09/13/94
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5,346,077	07/856,081	09/13/94
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5,346,081	08/186,640	09/13/94
5,346,092	07/993,075	09/13/94
5,346,099	08/103,665	09/13/94
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5,346,104	08/016,032	09/13/94
5,346,110	08/065,973	09/13/94
5,346,120	08/039,334	09/13/94
5,346,122	07/995,999	09/13/94
5,346,126	08/057,776	09/13/94
5,346,127	08/136,347	09/13/94
5,346,134	08/069,597	09/13/94
5,346,135	07/899,252	09/13/94
5,346,143	08/091,025	09/13/94
5,346,151	08/035,658	09/13/94
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5,346,153	08/056,483	09/13/94
5,346,154	07/944,087	09/13/94
5,346,156	07/941,465	09/13/94
5,346,163	07/913,361	09/13/94
5,346,164	08/014,837	09/13/94
5,346,168	08/085,929	09/13/94
5,346,170	07/976,244	09/13/94
5,346,187	07/923,001	09/13/94
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5,346,215	07/975,535	09/13/94
5,346,220	08/128,563	09/13/94
5,346,222	08/044,033	09/13/94
5,346,227	08/048,216	09/13/94
5,346,229	08/026,737	09/13/94
5,346,232	08/044,015	09/13/94
5,346,235	08/014,797	09/13/94
5,346,244	08/010,181	09/13/94
5,346,256	07/977,423	09/13/94
5,346,262	08/145,725	09/13/94
5,346,267	08/003,461	09/13/94
5,346,272	08/073,212	09/13/94
5,346,280	07/861,216	09/13/94
5,346,282	08/029,051	09/13/94
5,346,285	08/140,883	09/13/94
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5,346,292	08/051,112	09/13/94
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5,346,301	08/041,752	09/13/94
5,346,308	07/928,287	09/13/94
5,346,315	08/025,618	09/13/94
5,346,321	08/034,118	09/13/94
5,346,323	08/103,276	09/13/94
5,346,326	08/099,424	09/13/94
5,346,332	08/068,966	09/13/94
5,346,337	08/056,378	09/13/94
5,346,338	08/063,793	09/13/94
5,346,343	08/043,351	09/13/94
5,346,352	07/836,373	09/13/94
5,346,359	07/946,140	09/13/94
5,346,360	08/101,305	09/13/94
5,346,371	08/058,826	09/13/94
5,346,387	07/884,105	09/13/94
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5,346,397	08/076,981	09/13/94
5,346,399	08/153,093	09/13/94
5,346,409	08/011,742	09/13/94
5,346,411	08/165,191	09/13/94
5,346,413	08/175,170	09/13/94
5,346,415	08/123,674	09/13/94
5,346,418	07/955,311	09/13/94
5,346,424	08/110,061	09/13/94
5,346,428	08/002,637	09/13/94
5,346,434	08/112,803	09/13/94
5,346,435	07/910,181	09/13/94
5,346,437	08/123,950	09/13/94
5,346,438	08/089,845	09/13/94
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5,346,448	08/058,277	09/13/94
5,346,453	08/105,113	09/13/94
5,346,467	08/074,502	09/13/94
5,346,476	07/875,756	09/13/94
5,346,480	07/990,669	09/13/94
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5,346,488	07/844,243	09/13/94
5,346,491	07/788,808	09/13/94
5,346,495	08/202,731	09/13/94
5,346,496	08/106,223	09/13/94
5,346,499	08/056,596	09/13/94
5,346,507	07/671,716	09/13/94
5,346,510	08/134,908	09/13/94
5,346,516	08/122,762	09/13/94
5,346,534	08/071,581	09/13/94
5,346,543	08/135,909	09/13/94
5,346,544	08/107,205	09/13/94
5,346,547	07/880,442	09/13/94
5,346,577	07/772,080	09/13/94
5,346,591	08/052,756	09/13/94
5,346,592	08/105,006	09/13/94
5,346,596	08/024,194	09/13/94
5,346,598	07/658,582	09/13/94
5,346,605	08/084,786	09/13/94
5,346,607	07/954,762	09/13/94
5,346,610	07/997,748	09/13/94
5,346,615	08/076,361	09/13/94
5,346,617	07/852,784	09/13/94
5,346,618	08/051,608	09/13/94
5,346,625	07/962,981	09/13/94
5,346,630	07/961,904	09/13/94
5,346,631	07/986,324	09/13/94
5,346,634	08/017,394	09/13/94
5,346,637	07/991,614	09/13/94
5,346,639	08/179,920	09/13/94
5,346,643	07/987,811	09/13/94
5,346,648	08/128,106	09/13/94
5,346,650	08/107,419	09/13/94
5,346,656	08/055,539	09/13/94
5,346,660	08/022,776	09/13/94
5,346,669	08/162,671	09/13/94
5,346,671	08/022,324	09/13/94
5,346,681	08/079,428	09/13/94
5,346,688	07/991,640	09/13/94
5,346,689	08/111,294	09/13/94
5,346,693	07/913,955	09/13/94
5,346,694	08/047,255	09/13/94
5,346,695	07/996,869	09/13/94
5,346,710	08/070,047	09/13/94
5,346,716	07/936,935	09/13/94
5,346,717	07/961,712	09/13/94
5,346,730	07/735,514	09/13/94
5,346,734	08/047,023	09/13/94
5,346,742	07/968,094	09/13/94
5,346,745	08/069,820	09/13/94
5,346,747	07/996,651	09/13/94
5,346,753	08/120,533	09/13/94
5,346,780	07/978,262	09/13/94
5,346,786	08/216,176	09/13/94
5,346,799	07/986,223	09/13/94
5,346,808	08/148,235	09/13/94
5,346,811	07/820,412	09/13/94
5,346,812	07/946,618	09/13/94
5,346,814	07/961,268	09/13/94
5,346,832	07/993,224	09/13/94
5,346,840	07/986,294	09/13/94
5,346,852	08/027,314	09/13/94
5,346,862	08/055,351	09/13/94
5,346,871	08/028,442	09/13/94
5,346,880	08/043,513	09/13/94
5,346,881	08/107,097	09/13/94
5,346,884	08/130,396	09/13/94
5,346,886	08/151,980	09/13/94
5,346,887	07/690,148	09/13/94
5,346,897	07/899,711	09/13/94
5,346,906	07/976,795	09/13/94
5,346,907	08/017,565	09/13/94
5,346,914	08/061,988	09/13/94
5,346,920	08/062,328	09/13/94
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5,346,934	07/994,591	09/13/94
5,346,935	08/144,510	09/13/94
5,346,937	08/074,548	09/13/94
5,346,938	07/725,341	09/13/94
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5,346,957	08/109,574	09/13/94
5,346,960	08/071,786	09/13/94
5,346,967	08/008,267	09/13/94
5,346,977	08/052,293	09/13/94
5,346,988	07/659,564	09/13/94
5,347,006	07/999,596	09/13/94
5,347,009	08/067,379	09/13/94
5,347,010	08/086,606	09/13/94
5,347,012	07/952,544	09/13/94
5,347,019	08/063,148	09/13/94
5,347,020	08/013,517	09/13/94
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5,347,029	08/168,441	09/13/94
5,347,033	08/082,585	09/13/94
5,347,034	07/871,914	09/13/94
5,347,039	08/074,827	09/13/94
5,347,057	08/008,185	09/13/94
5,347,063	08/028,458	09/13/94
5,347,069	07/967,352	09/13/94
5,347,072	07/989,708	09/13/94
5,347,073	08/053,798	09/13/94
5,347,094	08/057,339	09/13/94
5,347,098	07/913,186	09/13/94
5,347,100	07/857,658	09/13/94
5,347,106	07/819,874	09/13/94
5,347,107	08/102,275	09/13/94
5,347,126	07/908,282	09/13/94
5,347,128	08/049,126	09/13/94
5,347,130	07/981,391	09/13/94
5,347,136	07/974,179	09/13/94
5,347,137	07/856,959	09/13/94
5,347,152	08/156,992	09/13/94
5,347,208	08/066,216	09/13/94
5,347,216	07/902,634	09/13/94
5,347,246	07/968,635	09/13/94
5,347,247	08/070,749	09/13/94
5,347,266	07/824,743	09/13/94
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5,347,273	08/004,299	09/13/94
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5,347,305	07/628,607	09/13/94
5,347,315	08/003,496	09/13/94
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5,347,387	07/856,995	09/13/94
5,347,401	07/776,300	09/13/94
5,347,425	07/961,236	09/13/94
5,347,432	08/075,644	09/13/94
5,347,436	08/051,155	09/13/94
5,347,438	08/082,674	09/13/94
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5,347,445	07/808,668	09/13/94
5,347,453	07/860,414	09/13/94
5,347,471	07/947,253	09/13/94
5,347,495	08/054,141	09/13/94
5,347,516	08/131,858	09/13/94
5,347,522	07/730,262	09/13/94
5,347,528	08/042,516	09/13/94
5,347,529	08/095,401	09/13/94
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5,347,570	08/080,274	09/13/94
5,347,572	07/755,128	09/13/94
5,347,590	07/712,764	09/13/94
5,347,593	07/932,618	09/13/94
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5,347,597	07/840,661	09/13/94
5,347,609	07/941,909	09/13/94
5,347,645	07/813,563	09/13/94
5,347,649	07/489,397	09/13/94
5,347,650	07/672,649	09/13/94
5,347,654	07/830,564	09/13/94

Errata

In the list of patents which expired on April 5, 1998, due to failure to pay maintenance fees, in the OG of September 15, 1998, Patent Number 5,300,370 should not have appeared since the fee was timely paid.

In the list of patents which expired on April 16, 1998, due to failure to pay maintenance fees, in the OG of June 24, 1998, Patent Number 4,511,359 should not have appeared since the fee was timely paid.

In the list of patents which expired on July 19, 1998, due to failure to pay maintenance fees, in the OG of September 29, 1998, Patent Number 5,330,792 should not have appeared since the fee was timely paid.

In the list of patents which expired on July 26, 1998, due to failure to pay maintenance fees, in the OG of October 6, 1998, Patent Number 5,332,443 should not have appeared since the fee was timely paid.

Patents Reinstated Due to the Acceptance of a Late Maintenance Fee From 9/18/98

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
Re. 32,638	06/839,040	03/12/86	04/12/88	09/24/98
Re. 33,835	07/605,559	10/29/90	03/03/92	09/24/98
Re. 34,978	08/001,244	01/21/93	06/27/95	09/24/98
4,477,643	06/602,256	04/20/84	10/16/84	09/22/98
4,564,852	06/767,053	08/16/85	01/14/86	09/23/98
4,580,412	06/780,643	09/26/85	04/08/86	09/23/98
4,746,042	06/866,131	05/21/86	05/24/88	09/23/98
4,748,845	07/112,241	10/21/87	06/07/88	09/23/98
4,790,155	06/932,020	11/18/86	12/13/88	09/21/98
4,794,811	06/891,860	07/30/86	01/03/89	09/21/98
4,816,665	07/082,806	08/06/87	03/28/89	09/18/98
5,830,562	07/056,063	06/01/87	05/16/89	09/23/98
5,844,901	07/195,458	05/16/88	07/04/89	09/23/98
4,888,459	06/943,563	12/18/86	12/19/89	09/24/98
4,891,822	07/283,248	01/30/89	01/02/90	09/22/98
4,893,329	07/246,980	09/20/88	01/09/90	09/23/98
4,893,791	07/241,530	09/07/88	01/16/90	09/22/98
4,893,794	07/250,688	09/22/88	01/16/90	09/22/98
4,894,285	07/127,715	12/02/87	01/16/90	09/18/98
4,898,311	07/182,908	04/18/88	02/06/90	09/23/98
4,899,402	07/251,160	09/29/88	02/13/90	09/23/98
4,900,620	07/254,081	10/06/88	02/13/90	09/23/98
4,908,758	07/133,959	12/17/87	03/13/90	09/23/98
4,908,897	07/309,705	02/13/89	03/20/90	09/23/98
4,911,333	07/188,270	04/29/88	03/27/90	09/18/98
5,106,829	07/587,466	09/19/90	04/21/92	09/18/98
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5,170,209	07/658,647	02/20/91	12/08/92	09/22/98
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5,245,940	07/913,033	07/14/92	09/21/93	09/21/98
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5,292,507	07/945,437	09/14/92	03/08/94	09/21/98
5,309,055	08/033,654	03/16/93	05/03/94	09/24/98
5,309,117	08/005,692	01/19/93	05/03/94	09/23/98
5,311,454	08/014,691	02/08/93	05/10/94	09/23/98
5,313,056	08/103,494	08/06/93	05/17/94	09/23/98

Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

5,384,995, Re. S.N. 09/084,365, May 27, 1998, Cl. 52/40, METHOD OF CENTERING WINDSHIELD GLAZINGS, Heinz Kunert, et. al., Owner of Record: *Saint-Gobain Vitrage International, Courbevoie, France,* Attorney or Agent: Harry C. Jones, Ex. Gp.: 3504

5,411,986, Re. S.N. 08/850,387, May 2, 1997, Cl. 514/514, CHEMOPROTECTIVE ISOTHIOCYANATES, Cheon-Gyu Cho, et. al., Owner of Record: *Inventors,* Attorney or Agent: Richard C. Peet, Ex. Gp.: 1941

5,473,744, Re. S.N. 08/985,814, Dec. 5, 1997, Cl. 395/154, COMPUTER-ASSISTED INTERACTIVE METHOD AND APPARATUS FOR MAKING A MULTI-MEDIA PRESEN-

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TATION, David Allen, et. al., Owner of Record: *Information Presentation Solutions Development, Inc., Los Angeles, Calif.,* Attorney or Agent: Norman E. Brunell, Ex. Gp.: 2772

5,527,851, Re. S.N. 09/161,221, Sep. 25, 1998, Cl. 524/10, STABILISED OLEFIN CARBON MONOXIDE COPOLYMER COMPOSITIONS, Andrew R. Barron, et. al., Owner of Record: *BP Chemicals Ltd., London, England,* Attorney or Agent: Scott A. McCollister, Ex. Gp.: 1714

5,532,042, Re. S.N. 09/109,202, Jul. 2, 1998, Cl. 428/141, MAGNETIC RECORDING MEDIUM, Seigi Kawarai, et. al., Owner of Record: *Hitachi Maxell Ltd., Osaka, Japan,* Attorney or Agent: Joseph A. Kolasch, Ex. Gp.: 1773

5,533,549, Re. S.N. 09/120,590, Jul. 22, 1998, Cl. 137/551, BALL VALVE WITH INTEGRATED REMOVABLE FLOW VENTURI, FLOW BALANCING MEANS, AND PIPE UNION MEANS, John C. Sherman, Owner of Record: *Hydronic Components Inc., Madison Heights, Mich.,* Attorney or Agent: Charles W. Chandler, Ex. Gp.: 3753

5,533,925, Re. S.N. 09/112,273, Jul. 8, 1998, Cl. 451/344, STRUCTURE OF DRIVE SECTION OF POWER TOOL, Hiroshi Sato, Owner of Record: *Ryobi Ltd., Fuchu-Shi, Japan,* Attorney or Agent: Jeremy J. Curcuri, Ex. Gp.: 3722

5,536,257, Re. S.N. 09/116,445, Jul. 16, 1998, Cl. 604/198.000, SAFETY DEVICE FOR HYPODERMIC NEEDLE OR THE LIKE, Phillip O'Byrne, et. al., Owner of Record: *BTG International Ltd., London, England,* Attorney or Agent: Richard G. Besha, Ex. Gp.: 3734

5,538,534, Re. S.N. 09/119,629, Jul. 21, 1998, Cl. 075/466, COMBINED INSTALLATION OF A METAL PRODUCTION UNIT AND A UNIT FOR THE SEPARATION OF AIR GAS, Alain Guillard, et. al., Owner of Record: *L'Air Liquide, Societe Anonyme Pour L'Etude Et L'Exploitation Des Procedes, Georges Claude, Paris-Cedex, France,* Attorney or Agent: E. Joseph Gess, Ex. Gp.: 1742

5,549,572, Re. S.N. 09/116,673, Jul. 16, 1998, Cl. 604/198, SAFETY DEVICE FOR HYPODERMIC NEEDLE OR THE LIKE, Phillip O'Byrne, et. al., Owner of Record: *British Technology Group Ltd., London, England,* Attorney or Agent: Richard G. Besha, Ex. Gp.: 3734

5,551,393, Re. S.N. 09/146,461, Sep. 2, 1998, Cl. 123/306, INDUCTION SYSTEM FOR ENGINE, Junkichi Amano, et. al., Owner of Record: *Yamaha Hatsudoki Kabushiki Kaisha, Shizuoka-Ken, Japan,* Attorney or Agent: Ernest A. Beutler, Ex. Gp.: 3747

5,559,481, Re. S.N. 09/158,074, Sep. 22, 1998, Cl. 333/193, SURFACE ACOUSTIC WAVE FILTER, Yoshio Satoh, et. al., Owner of Record: *Fujitsu Ltd., Kawasaki-Shi, Japan,* Attorney or Agent: John C. Garvey, Ex. Gp.: 2817

5,560,211, Re. S.N. 09/164,391, Sep. 30, 1998, Cl. 62/3.630, WATER COOLER, Glen L. Parker, Owner of Record: *Urus Industrial Corp., Brantford Ontario, Canada,* Attorney or Agent: Richard O. Bartz, Ex. Gp.: 3744

5,560,265, Re. S.N. 09/164,674, Oct. 1, 1998, Cl. 074/559, ROCKER ARM MOUNTING STUD, James Miller, Owner of Record: *Inventor,* Attorney or Agent: Kevin P. Crosby, Ex. Gp.: 3622

5,560,472, Re. S.N. 09/160,950, Sep. 25, 1998, Cl. 198/750, WALKING FLOORS, Richard T. Gist, Owner of Record: *Inventor,* Attorney or Agent: Delbert S. Barnard, Ex. Gp.: 3615

5,560,947, Re. S.N. 09/163,187, Sep. 30, 1998, Cl. 426/106, SEALED PACKAGE CONTAINING RESPIRING PERISHABLE PRODUCE, Laurence D. Bell, Owner of Record: *Fresh Express, Inc., Salinas, Calif.,* Attorney or Agent: Patrick F. Bright, Ex. Gp.: 1761

5,567,461, Re. S.N. 09/166,509, Oct. 5, 1998, Cl. 426/417, METHOD OF TREATING FLUIDS WITH A FILTER, Robert Lehrer, Owner of Record: *Robert Lehrer Associates, Inc., Wilmington, Del.,* Attorney or Agent: Harold Pezzner, Ex. Gp.: 1761

5,570,620, Re. S.N. 09/161,121, Sep. 25, 1998, Cl. 083/152, PANEL CUTTING APPARATUS, Frank Okonski, Owner of Record: *Best Cutting Die Co., Skokie, Ill.,* Attorney or Agent: Barry W. Sufrin, Ex. Gp.: 3724

5,687,763, Re. S.N. 09/161,950, Sep. 29, 1998, Cl. 137/625.330, FLUID FLOW CONTROL DEVICE, Joseph H. Steinke, Owner of Record: *Control Components Inc., Rancho Santa Margarita, Calif.,* Attorney or Agent: Raymond F. Lippitt, Ex. Gp.: 3753

5,692,889, Re. S.N. 09/107,853, Jun. 30, 1998, Cl. 418/201.1, FLUID MACHINE HAVING SCREW ROTORS WITH A STRAIGHT PORTION TO BE CHUCKED, Masao Tateno, et. al., Owner of Record: *Tochigi Fuji Sangyo, Kabushiki Kaisha Tochigi-Shi, Japan,* Attorney or Agent: Theodore W. Olds, Ex. Gp.: 3746

5,695,992, Re. S.N. 09/089,594, Jun. 2, 1998, Cl. 435/320.1, EXPRESSION CASSETTE FOR ANTISENSE EXPRESSION OF RIBOZYME, Andre Lieber, et. al., Owner of Record: *Max-Planck Gesellschaft Zur Forderung Munchen, Germany,* Attorney or Agent: Gabriel P. Katona, Ex. Gp.: 1635

Requests for Reexaminations Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

5,050,609, Re. S.N. 90/005,113, Sep. 22, 1998, Cl. 600/410, MAGNETIZATION TRANSFER CONTRAST AND PROTON RELAXATION AND USE THEREOF IN MAGNETIC RESONANCE IMAGING, Robert S. Balaban, et. al., Owner of Record: *United States of America as Represented by the Secretary of Health and Human Services, Bethesda, Md.,* Attorney or Agent: Patent Branch DHHS, Bethesda, Md., Ex. Gp.: 3736, Requester: Thomas E. Kocovsky Jr., Fay Sharpe Beall Fagan Minnich and McKee, Cleveland, Ohio

5,069,897, Re. S.N. 90/005,110, Sep. 21, 1998, Cl. 424/066, ANTIPERSPERANT CREAMS, Thomas V. Orr, Owner of Record: *The Procter and Gamble Co., Cincinnati, Ohio,* Attorney or Agent: William J. Winter, The Procter and Gamble Co., Cincinnati, Ohio, Ex. Gp.: 1616, Requester: Owner

5,193,447, Re. S.N. 90/005,118, Sep. 28, 1998, Cl. 099/508, CITRUS JUICER, Rafael P. Lucas, et. al., Owner of Record: *Braun Aktiengesellschaft, Kronberg, Germany,* Attorney or Agent: Charles P. Boukus, Jr., Arlington, Va., Ex. Gp.: 1761, Requester: Owner

5,425,435, Re. S.N. 90/005,112, Sep. 21, 1998, Cl. 188/077W, BRAKE SYSTEM FOR DRILLING EQUIPMENT, Truman L. Gregor, Owner of Record: *Gregory Rig Service and Sales, Inc., Odessa, Tex.,* Attorney or Agent: Richard D. Fladung, Pravel Hewitt Kimball and Krieger, Houston, Tex., Ex. Gp.: 3613, Requester: Jacob Kobelt, Kobelt Manufacturing Co. Ltd., Surrey British Columbia, c/o Matthew J. Doglio-Marquardt, Garrison and Associates, Seattle, Wash.

5,445,069, Re. S.N. 90/005,119, Sep. 28, 1998, Cl. 099/508, CITRUS JUICER, Rafael P. Lucas, et. al., Owner of Record: *Braun Aktiengesellschaft, Kronberg, Germany,* Attorney or

Agent: Charles P. Boukus, Jr., Arlington, Va., Ex. Gp.: 1761, Requester: Owner

5,662,557, Re. S.N. 90/005,116, Sep. 25, 1998, Cl. 482/054, REORIENTING TREADMILL WITH LATCH, Scott R. Watterson, et. al., Owner of Record: *Icon Health and Fitness, Logan, Utah,* Attorney or Agent: Jonathan W. Richards, Workman Nydegger and Seeley, Salt Lake City, Utah, Ex. Gp.: 3733, Requester: Owner

5,676,624, Re. S.N. 90/005,117, Sep. 25, 1998, Cl. 482/054, PORTABLE REORIENTING TREADMILL, Scott R. Watterson, et. al., Owner of Record: *Icon Health and Fitness, Logan, Utah,* Attorney or Agent: Jonathan W. Richards, Workman Nydegger and Seeley, Salt Lake City, Utah, Ex. Gp.: 3733, Requester: Owner

5,704,552, Re. S.N. 90/005,111, Sep. 21, 1998, Cl. 239/533.2, INJECTOR, Paul Turner, et. al., Owner of Record: *Lucas Industries Public Ltd. Co., Solihull, England,* Attorney or Agent: Grant H. Peters, Trexler Bushnell Giangiorgi and Blackstone Ltd., Chicago, Ill., Ex. Gp.: 3752, Requester: Owner

5,710,008, Re. S.N. 90/005,115, Sep. 25, 1998, Cl. 435/007.4, METHOD AND DEVICE FOR DIAGNOSING AND DISTINGUISHING CHEST PAIN IN EARLY ONSET THEREOF, George Jackowski, Owner of Record: *Spectral Diagnostics Inc., Etobicoke, Canada,* Attorney or Agent: David A. Jackson, Klauber and Jackson, Hackensack, N.J., Ex. Gp.: 1643, Requester: Saralynn Mandel, Mandel and Adriano, El Granada, Calif.

5,750,750, Re. S.N. 90/005,114, Sep. 23, 1998, Cl. 554/117, HIGH VISCOSITY COMPLEX ALCOHOL ESTERS, Carolyn Boggus Duncan, et. al., Owner of Record: *Exxon Chemical Patents, Inc., Houston, Tex.,* Attorney or Agent: Richard D. Jordan, Morrison and Foerster, Washington, D.C., Ex. Gp.: 1621, Requester: Owner

Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED
October 5, 1998
DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date
120,032	71/105,746	01/01/1918
120,033	71/105,747	01/01/1918
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353,128	71/393,532	12/28/1937
353,146	71/394,670	12/28/1937
353,188	71/395,465	12/28/1937
353,210	71/395,765	12/28/1937
353,221	71/396,000	12/28/1937
353,277	71/396,693	12/28/1937
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656,270	71/641,475	12/31/1957
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656,289	72/021,113	12/31/1957
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656,301	72/027,012	12/31/1957
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656,317	72/027,204	12/31/1957
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656,327	72/008,603	12/31/1957
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656,610	72/015,244	12/31/1957
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1,080,100	73/117,182	12/27/1977
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1,080,403	73/122,620	12/27/1977
1,080,406	73/121,222	12/27/1977
1,080,407	73/059,118	12/27/1977
1,080,409	73/110,440	12/27/1977
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1,080,496	73/121,144	12/27/1977
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1,080,505	73/122,632	12/27/1977
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1,080,532	73/119,070	12/27/1977
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1,080,543	73/120,498	12/27/1977
1,080,544	73/121,807	12/27/1977
1,080,552	73/126,779	12/27/1977
1,080,559	73/121,828	12/27/1977
1,080,560	73/078,467	12/27/1977
1,080,564	73/056,383	12/27/1977
1,080,567	73/096,735	12/27/1977
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Reg. Number	Serial Number	Reg. Date
1,080,575	73/066,042	12/27/1977
1,080,586	73/124,210	12/27/1977
1,080,587	73/124,388	12/27/1977
1,080,591	73/103,510	12/27/1977
1,080,596	73/099,636	12/27/1977
1,080,597	73/116,989	12/27/1977
1,080,598	73/123,347	12/27/1977
1,080,599	73/123,348	12/27/1977
1,080,600	73/124,744	12/27/1977
1,080,601	73/059,990	12/27/1977
1,080,604	73/118,562	12/27/1977
1,080,605	73/061,195	12/27/1977
1,080,620	73/074,680	12/27/1977
1,080,629	73/100,885	12/27/1977
1,080,632	73/102,517	12/27/1977
1,080,634	73/108,953	12/27/1977
1,080,637	73/113,957	12/27/1977
1,080,647	73/125,352	12/27/1977
1,080,649	73/126,653	12/27/1977
1,080,652	72/461,322	12/27/1977
1,080,655	72/441,230	12/27/1977
1,080,663	73/086,126	12/27/1977
1,080,664	73/102,744	12/27/1977
1,080,665	73/114,205	12/27/1977
1,080,667	73/068,836	12/27/1977
1,080,672	73/093,551	12/27/1977
1,082,745	73/122,874	01/17/1978

Notice Regarding Technical Center Box Issue Fee Mailings

The Office will begin mailing address labels with the PTOL-85, "Notice of Allowance and Issue Fee Due" for patent applications allowed in all Technology Centers. These address labels should be used to ensure proper routing of post-allowance correspondence. This directive supersedes the "Special Boxes for Patent Mail" instruction. Any Notice of Allowance and Issue Fee Due received without the accompanying address labels should continue to be addressed to Box Issue Fee.

March 11, 1998

NICHOLAS P. GODICI
Deputy Assistant Commissioner
for Patents (Acting)

Establishment of Box REISSUE Elimination of Box 7

The processing of reissue applications in the Patent and Trademark Office (PTO) has been modified with the establishment of a special box designated Box REISSUE and the elimination of Box 7.

(a) Effective immediately, the PTO has established a special box designated Box REISSUE for **new and continuing reissue application filings** under 37 CFR 1.53(b). All new and continuing reissue application filings addressed to this box will be forwarded immediately to the Office of Initial Patent Examination for expedited processing. This box should not be used for any other reissue application correspondence.

To maximize the advantages of the expedited processing, the envelope should be addressed:

Box REISSUE
Assistant Commissioner for Patents
Washington, D.C. 20231

Box REISSUE should **only** be used for the initial filing of all new and continuing reissue applications. Box REISSUE should **not** be used for any subsequently filed correspondence in reissue applications.

Placing unrelated or extraneous documents in an envelope marked for any special box will significantly delay their reaching the area for which they were intended.

(b) In addition, Box 7, designated for receiving correspondence in reissue applications for patents involved in litigation, is being ELIMINATED herewith. Correspondence addressed to Box 7 is rarely received in the PTO. Current PTO Mail Center procedures provide prompt delivery service, thus eliminating the need for continued use of Box 7. Any further correspondence addressed to Box 7 will be treated as ordinary mail and not given any special status by the PTO Mail Center.

September 28, 1998

STEPHEN G. KUNIN
Deputy Assistant Commissioner for
Patent Policy and Projects

Service by Publication

A petition to cancel the registrations identified below having been filed, and the notice of such proceeding sent by certified mail to registrants at their last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will proceed as in the case of default.

Carlo Development, Inc., Valdosta, Ga., Reg. No. 1,784,148, for the mark "YARDNER", Cancellation No. 27,474.

Peter Pan International, Inc., Reg. Nos. 715,844, 717,941 for the mark "DOUBLE P IN GLOBE DESIGN", Cancellation No. 27,349.

KATRINA PETERSON
Supervisory Legal Assistant
Trademark Trial
and Appeal Board, for
ROBERT M. ANDERSON
Deputy Assistant Commissioner
for Trademarks

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37 CFR 1.47 Notice by Publication

Notice is hereby given of the filing of a national stage application with a petition under 37 CFR 1.47 requesting acceptance of the application without the signature of all inventors. The petition has been granted. A notice has been sent to the last known address of the non-signing inventor. The inventor whose signature is missing (Xiaoguang Sun) may join in the application by promptly filing an appropriate oath or declaration complying with 37 CFR 1.63. The international application number is PCT/US96/11435 and was filed on 08 July 1996 in the names of Jeffrey I. Joseph, Xiaoguang Sun and Katherine D. Crothall for the invention entitled IMPLANTABLE SENSOR AND SYSTEM FOR MEASUREMENT AND CONTROL OF BLOOD CONSTITUENT LEVELS. The national stage application is assigned number 08/981,860 and has a 35 U.S.C. 371(c) date of 23 June 1998.

DEPARTMENT OF COMMERCE

Patent and Trademark Office

Grant of Interim Extension of the term of U.S. Patent No. 4,291,708; T-SCAN™.

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Notice of Term Extension.

SUMMARY: The Patent and Trademark Office has granted an interim extension under 35 U.S.C. § 156(d)(5) for one year of the term of U.S. Patent No. 4,291,708 that claims the medical device "T-SCAN™."

FOR INFORMATION CONTACT: Karin L. Tyson by telephone at (703) 305-9285; by mail marked to her attention and addressed to the Assistant Commissioner for Patents, Box DAC,

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Washington, D.C. 20231; by fax marked to her attention at (703) 308-6916, or by e-mail at karin.tyson@uspto.gov.

SUPPLEMENTARY INFORMATION: Section 156 of Title 35, United States Code, generally provides that the term of a patent may be extended for a period of up to 5 years if the patent claims a product, or a method of making or using a product, that has been subject to certain defined regulatory review. Under § 156, a patent is eligible for term extension only if regulatory review of the claimed product was completed before the original patent term expired.

On December 3, 1993, § 156 was amended by Pub. L. No. 103-179 to provide that if the owner of record of the patent or its agent reasonably expects the applicable regulatory review period to extend beyond the expiration of the patent, the owner or its agent may submit an application to the Commissioner of Patents and Trademarks for an interim extension of the patent term. If the Commissioner determines that, except for receipt of permission to market or use the product commercially, the patent would be eligible for a statutory extension of the patent term, the Commissioner shall issue to the applicant a certificate of interim extension for a period of not more than one year.

On September 4, 1998, patent owner Yeda Research & Development Co., filed an application under 35 U.S.C. § 156(d)(5) for interim extension of the term of U.S. Patent No. 4,291,708. The patent claims the method of use of the medical device "T-SCAN™." The application indicates, and the Food and Drug Administration (FDA) has confirmed, that the medical device is currently undergoing a regulatory review before the FDA for permission to market or use the product commercially. The original term of the patent is due to expire on November 2, 1998. Applicant requests an interim extension of one year.

Review of the application indicates that except for receipt of permission to market or use the product commercially, the subject patent would be eligible for an extension of the patent term under 35 U.S.C. § 156. Since it is apparent that the regulatory review period may extend beyond the date of expiration of the patent, interim extension of the patent term under 35 U.S.C. § 156(d)(5) is appropriate. Accordingly, an interim extension under 35 U.S.C. § 156(d)(5) of the term of U.S. Patent No. 4,291,708 has been granted for a period of one year from the original expiration date of the patent.

October 6, 1998

BRUCE A. LEHMAN
Assistant Secretary of Commerce and
Commissioner of Patents and Trademarks

Certificates of Correction for November 24, 1998

D. 395,640
D. 395,916
D. 396,849
D. 397,991
P. 10,346
Re. 35,834
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Summary of Final Decisions Issued by the Trademark Trial and Appeal Board

October 5-9, 1998

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Citable as Precedent of TTAB
10-6	EX	74/703,465	Sandia Laboratory Federal Credit Union	2(e)(1)	Refusal Affirmed		"CU@HOME" [home banking services accessible via computer]		No
10-6	EX	75/027,857	J. Paul Martha	2(e)(1)	Refusal Affirmed		"INTERNATIONAL BASKETBALL LEAGUE" [entertainment services, namely, organizing and conducting basketball competitions and exhibitions]		No
10-6	EX	74/657,464	Hiromichi Wada	2(e)(3)	Refusal Affirmed		"NEW YORK WAYS GALLERY" [backpacks, duffel bags, carry-on bags, change purses, document cases, garment bags for travel, hand bags, luggage, pouches, purses, tote bags, traveling bags, waist pouches, wallets, and toiletry cases sold empty]		Yes
10-6	OPP	101,627	Simple Shoes, Inc. v. Jay Mohseni	2(d)	Opposition Sustained	"SIMPLE" [footwear and t-shirts]	"SIMPLE BY DESIGN" [headwear, hats, t-shirts, sweatshirts, shorts, swimwear, pants, jeans, jackets, sweaters, overalls, skirts, blouses, coats, pajamas, sleepwear, pullovers, headbands, wristbands, underwear, cardigans and socks]		No

(1)EX = EX PARTE APPEAL; OPP = OPPOSITION; CANC = CANCELLATION; CU = CONCURRENT USE; (SJ) = SUMMARY JUDGMENT; (R) = REQ. FOR RECONSIDERATION; (MD) = MOTION TO DISMISS; (MR) = MOTION TO REOPEN

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Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Citable as Precedent of TTAB
10-7	EX	75/101,700	Polo Ralph Lauren, L.P.	2(d)	Refusal Affirmed		"DENIM" [potpourri and sachets; scented candles]	"DENIM" [cologne and aftershave]	No
10-7	EX (R)	74/501,471	Warnaco, Inc.	2(d)	Request for Reconsideration Denied (Refusal Affirmed)		"OLGA SCOOP" [women's panties]	"SCOOP" [clothing, namely, tops, shirts, t-shirts, sweatshirts, dresses, skirts, pants, shorts, skeggings, leggings, sweatpants, jackets, cardigans, leotards, unitards, tights, bodysuits, short sets, tank sets, and beach cover-ups]	No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (SJ)=SUMMARY JUDGMENT; (R)=REQ. FOR RECONSIDERATION; (MD)=MOTION TO DISMISS; (MR)=MOTION TO REOPEN

SPECIAL BOXES FOR PATENT MAIL

Special box designations should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special boxes. If any documents other than the specified type identified for each special box are addressed to that box, they will be significantly delayed in reaching the appropriate area for which they are intended.

Please address mail as follows:

Box ____________
Assistant Commissioner for Patents
Washington, D.C. 20231

Box Designations	Explanation
Box REISSUE	All new and continuing reissue application filings.
Box 12	Contributions to the Examiner Education Program.
Box 313b	Petitions under 37 CFR 1.313(b) to withdraw a patent application from issue after payment of the issue fee and any papers associated with the petition, including papers necessary for filing a continuing application.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box Comments Patents	Public comments regarding patent related regulations and procedures.
Box CPA	Requests for Continued Prosecution Applications (CPA's) under 37 CFR 1.53(d).
Box DAC	Petitions decided by the Office of Petitions including petitions to revive and petitions to accept late payment of issue fees or maintenance fees.
Box DD	Disclosure Documents or materials related to the Disclosure Document Program.
Box Design	The filing of all design patent applications and any communications relating thereto.
Box Issue Fee	All communications following the receipt of a PTOL–85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee.
Box Missing Parts	Response to the Notice to File Missing Parts of Application and associated papers and fees.
Box MPEP	Submissions concerning the Manual of Patent Examining Procedures.
Box Non-Fee Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection).
Box PATENT APPLICATION	New patent applications and associated papers and fees.
Box Patent Ext.	Applications for patent term extension and any communications relating thereto.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Provisional Patent Application	The filing of all provisional patent applications and any communications relating thereto.
Box Reconstruction	Correspondence pertaining to the reconstruction of lost patent files.
Box Reexam	Requests for Reexamination for *original* request papers *only*.
Box Sequence	Submission of diskette for biotechnical application.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").

SPECIAL BOXES FOR TRADEMARK MAIL

Special box designations should be used to allow forwarding of particular types of trademark mail to the appropriate areas as quickly as possible. In addition to these box designations, filers are encouraged to indicate whether the contents of the envelope contain a fee. Envelopes containing a fee should be marked "FEE;" envelopes not containing a fee should be marked "NO FEE." Box designations and "FEE/NO FEE" indicators should appear on the envelope as well as on the cover sheet or first page of any document.

Please address mail as follows:

Box ____________
FEE (or NO FEE)
Assistant Commissioner for Trademarks
2900 Crystal Drive
Arlington, Virginia 22202-3513

Box Designations	Explanation
Box NEW APP FEE	New trademark applications and fees.
Box ITU FEE	Statements of Use (SOUs) and extension requests.
Box TTAB FEE	Oppositions, cancellation petitions, and ex parte appeals.
Box TTAB NO FEE	Interferences, motions, and extension requests.
Box STATUS NO FEE	Written status inquiries.
Box POST REG FEE	Affidavits, renewals, corrections and amendments.
Box RESPONSES NO FEE	Responses to Examining Attorneys' Office actions and Post Registration actions.

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SPECIAL BOXES APPLICABLE TO *BOTH* PATENT AND TRADEMARK MAIL

The following special box designations are applicable to both patent and trademark related mail, and the recommendations for "Special Boxes for Patent Mail" (above) should be followed for the types of mail listed below.

Please address mail as follows:

Box ____________
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Box Designations	Explanation
Box 3	Mail for the Office of Personnel from NFC.
Box 4	Mail for the Deputy Assistant Secretary of Commerce and Deputy Commissioner of Patents and Trademarks; Office of Legislative and International Affairs.
Box 6	Mail for the Office of Procurement.
Box 8	All papers for the Office of the Solicitor *except* communications relating to *pending litigation and disciplinary proceedings*; papers relating to pending litigation in court cases shall be mailed only to Office of the Solicitor, P.O. Box 15667, Arlington, Virginia 22215 and papers relating to pending disciplinary proceedings before the Administrative Law Judge or the Commissioner shall be mailed only to the Office of the Solicitor, P.O. Box 16116, Arlington, Virginia 22215.
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of PTO documents.
Box 11	Electronic Ordering Service (EOS).
Box 13	Mail for the Employee and Labor Relations Division.
Box 14	Mail directed to the APS Contracts Office.
Box 16	Deposit Account Replenishment Checks.
Box 17	Invoices directed to the Office of Finance.
Box 171	Vacancy Announcement Applications.
Box Assignment	All assignment documents except those filed with new applications.
Box EEO	Mail for the Office of Civil Rights.
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box M Fee	Correspondence regarding patent maintenance fees and related matter.
Box OED	Mail for the Office of Enrollment and Discipline.

Reference Collections of U.S. Patents and Trademarks Available for Public Use in Patent and Trademark Depository Libraries

The following libraries, designated as Patent and Trademark Depository Libraries (PTDLs), receive patent and trademark information from the U.S. Patent and Trademark Office. Many PTDLs have on file patents issued since 1790, trademarks published since 1872, and select collections of foreign patents. All PTDLs receive both the patent and trademark sections of the *Official Gazette of the U.S. Patent and Trademark Office* and numerical sets of patents in a variety of formats. Patent and trademark search systems in the Cassis CD-ROM series are available at all PTDLs to increase access to that information. It is through the CD-ROM systems and other depository materials that preliminary patent and trademark searches may be conducted through the numerically arranged collections.

Each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials.

All information is available for use by the public free of charge, However, there may be charges associated with the use of on-line systems, photocopying and related services.

Since there are variations in the scope of patent and trademark collections among the PTDLs, and their hours of service to the public vary, anyone contemplating use of these collections at a particular library is urged to contact that library in advance about its collections, services, and hours in order to avert possible inconvenience.

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State	*Name of Library*	*Telephone Contact*
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	Birmingham Public Library	(205) 226-3620
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Connecticut	Hartford Public Library	Not Yet Operational
	New Haven Free Public Library	Not Yet Operational
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	Orlando: University of Central Florida Libraries	(407) 823-2562
	Tampa Campus Library, University of South Florida	(813) 974-2726
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	Springfield: Illinois State Library	(217) 782-5659
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	Detroit: Great Lakes Patent and Trademark Center	(313) 833-3379
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	Nashville: Stevenson Science Library, Vanderbilt University	(615) 322-2717
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 495-4500
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-3826
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
	Lubbock: Texas Tech University	(806) 742-2282
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Vermont	Burlington: Bailey/Howe Library, University of Vermont	(802) 656-2542
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	Milwaukee Public Library	(414) 286-3051
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TECHNOLOGY CENTERS		DIRECTORS	Telephone & FAX Numbers Area Code 703	New Case Date*
1600	**BIOTECHNOLOGY, ORGANIC CHEMISTRY & DESIGNS**			
1610	Organic chemistry, bio-affecting & body treating composition	John E. Kittle	308-0193 308-7922	02/19/97
2900	Designs			12/07/93
1620	Immunology & plants	Mary C. Lee	308-2359 308-8494	04/20/97
1640	Combinatorial, linker & non-heterocyclic chemistry			10/05/96
1630	Recombinant molecular & micro-biology, multicellular organism	John J. Doll	308-1123 305-7230	11/23/96
1650	Non-recombinant molecular & micro-biology, non-immuno proteins & peptides			01/21/98
1700	**CHEMICAL AND MATERIAL ENGINEERING**			
1710	Synthetic resins	Theodore Morris	308-1495 305-3599	03/23/97
1770	Stock materials & miscellaneous articles			01/14/97
1720	Fluid separation & agitation, metal foundry, welding, plastic molding apparatus, fuels & related compositions	Richard V. Fisher	308-1193 305-3599	01/31/97
1730	Glass & paper making, tobacco, non-metallic molding, adhesive bonding, tires & coating apparatus			01/18/97
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1760	Food technology, petroleum processing, coating & etching			05/31/96
2700	**COMMUNICATIONS AND INFORMATION PROCESSING**			
2710	Television	James L. Dwyer (Acting)	305-4800 308-5401	08/29/96
2740	Audio, radio, telephone & speech processing			10/13/96
2720	Image & Fax	Jin F. Ng	305-4800 305-5401	10/14/96
2730	General communications & digital communication systems			09/18/96
2750	Storage processing, multiple computers, & multiple process coordinating	Robert E. Garrett	305-0286 308-2177	07/04/96
2760	Specialized data processing	Joseph J. Rolla	305-9700 308-5355	07/04/96
2770	Computer graphics & data bases	Gerald Goldberg	305-9700 308-5355	06/27/96

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	TECHNOLOGY CENTERS	DIRECTORS	Telephone & FAX Numbers Area Code 703	New Case Date*
2780	Processors, control systems, input/ output	Joseph J. Rolla	305-9700 308-5355	07/31/96
2800	**PHYSICS, OPTICS, SYSTEMS COMPONENTS & ELECTRICAL ENGINEERING**			
2810	Semiconductors, electrical circuits, static memory, digital logic	Rolf G. Hille	306-3421 308-7725	06/10/96
2820	Semiconductors & electrical circuits			03/09/97
2830	Power generation & distribution music, electrical components & control circuits	Stewart J. Levy	308-0658 308-7722	12/28/96
2850	Photocopying, recorders, printing, measuring & testing	Margaret A. Focarino	306-3421 308-7725	08/14/96
2870	Liquid crystals, optical elements, optical systems, fiber optics, lasers, electric lamps, registers, optics, measuring & radiant energy	Janice A. Howell	308-0530 305-3594	09/09/96
3600	**TRANSPORTATION, CONSTRUCTION, AGRICULTURE & NATIONAL SECURITY**			
3610	Surface transportation & material handling	Richard A. Bertsch	308-1134 308-2177	09/06/96
3620	Static structures, closures, machine elements & power transmissions, civil engineering, connections, hardware & furniture	Al Lawrence Smith	308-1020 305-3597	02/21/97
3630	Supports & sign exhibiting			06/15/97
3640	Aeronautics, agriculture, earth moving/working, petroleum & mining, plant & animal husbandry, butchering, optics, radio wave & acoustic wave communication, data processing for vehicles, weaponry, nuclear systems & national security	John F. Terapane, Jr.	306-4180 306-4195	11/17/95
3700	**MECHANICAL ENGINEERING, MANUFACTURING AND PRODUCTS**			
3710	Amusement and education devices	Ethel Rollins-Cross	308-1078 305-3579	10/20/96
3720	Packages, containers, manufacturing devices & processes, machine tools & hand tools			12/09/96
3730	Medical instruments, diagnostic equipment, treatment devices, surgery & surgical supplies	John J. Love	308-0873 305-3139	11/16/96
3740	Thermal & combustion technology, motive and fluid power systems, textile manufacturing & apparel	Donald G. Kelly	308-0975 308-7763	11/06/96
3750	Fluid handling & dispensing			11/10/96

TRADEMARK OPERATION

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Philip G. Hampton, II, Assistant Commissioner
Robert M. Anderson, Deputy Assistant Commissioner
David E. Bucher, Director, Trademark Examining Office
Condition of Trademark Applications as of October 1, 1998

	Oldest Date	
Law Office	New*	Amendment Filed
Law Office 101—Jerry Price, Managing Attorney, (703) 308-9101—North Tower, 10th Floor Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	04/20/98	07/07/98
Law Office 102—Thomas Shaw, Managing Attorney, (703) 308-9102—South Tower, 5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/25/98	05/13/98
Law Office 103—Michael A. Szoke, Managing Attorney, (703) 308-9103—North Tower, 4th Floor, Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	01/09/98	05/29/98
Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308-9104—South Tower, 6th Floor, Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	12/15/97	08/10/98
Law Office 105—Thomas Howell, Managing Attorney, (703) 308-9105—South Tower, 6th Floor, Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/20/98	05/26/98
Law Office 106—Mary Sparrow, Managing Attorney, (703) 308-9106—South Tower, 7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	04/09/98	06/08/98
Law Office 107—Thomas Lamone, Managing Attorney, (703) 308-9107—South Tower, 7th Floor, Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/28/98	08/18/98
Law Office 108—David Shallant, Managing Attorney, (703) 308-9108—South Tower, 8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services-Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	12/15/97	07/13/98
Law Office 109—Ronald Sussman, Managing Attorney, (703) 308-9109—South Tower, 8th Floor, Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	01/09/98	08/02/98
Law Office 112—Janice O'Lear, Managing Attorney, (703) 308-9112—North Tower, 4th Floor, Scientific Equipment & Furniture—Int. Classes 9,20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/25/98	07/16/98
Law Office 113—Meryl Hershkowitz, Managing Attorney, (703) 308-9113—North Tower, 4th Floor, Scientific Equipment & Furniture—Int. Classes 9,20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	01/09/98	05/29/98
**Collective Marks—Class 200 **Certification Marks—Classes A & B		
Office of Trademark Services—Terron Sims, Director, (703) 308-9100 Trademark Assistance Center—(703) 308-9000 Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188 Intent-To-Use—(ITU)—(703) 308-9500 Post Registration Section—(703) 308-9500		
Affidavits Under Sections 8 & 15 (All Classes)	07/13/98	—0—
Renewals (All Classes)	08/01/98	—0—
Section 12(c) Publications (All Classes)	08/14/98	—0—

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1. ** Assigned to all Law Office

2. Applicants with inquiries concerning the status of their applications and a touch telephone should call (703) 305–8747 from 6:30 a.m. to Midnight EST, Monday through Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquiries concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

3. * These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.

REEXAMINATIONS

NOVEMBER 24, 1998

Matter enclosed in heavy brackets **[ ]** appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 5,396,906 (3674th)
BACK SUPPORT BELT

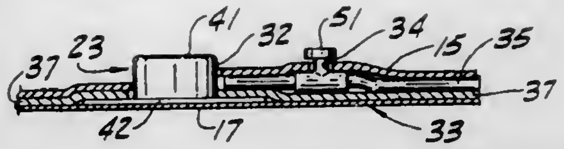
David W. Harrold, 22167 Maretlla Ave., Boca Raton, Fla. 33433

Reexamination Request No. 90/004,436, Oct. 29, 1996.

Reexamination Certificate for Patent 5,396,906, issued Mar. 14, 1995, Ser. No. 930,093, Aug. 13, 1992.

Int. Cl.^{6} A61F *5/37;5/00*

U.S. Cl. 128—876



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–8** is confirmed.

New claims **9–10** are added and determined to be patentable.

1. A back support belt comprising:

an outer layer;

an inner layer generally superposed with the outer layer, the outer and inner layers being sized and shaped for extending around the waist of a human body;

means for attaching opposite ends of the belt for securing the belt around the waist;

inflatable bladder means adapted to be disposed generally opposite the lower back of the human body for providing support to the lower back upon inflation of said bladder means;

a pump comprising a base and a hollow bulb extending from the base, the base being sandwiched between the inner and outer layers of the belt and being secured to the belt for holding the pump in place, the bulb protruding from between the layers through an opening in the outer layer and being movable between a relaxed configuration in which the bulb encloses a first volume of air and a collapsed configuration in which the bulb encloses a second volume of air smaller than the first;

conduit means located between the inner and outer layers and extending from the bulb to said inflatable bladder means;

a valve disposed generally in said conduit means operable to permit fluid communication as the bulb is moved toward its collapsed position to force air from the bulb into said inflatable bladder means.

B1 5,583,267 (3675th)
BIOCATALYTIC PROCESS FOR PREPARING TETRAALKYLBIPHENOLS

Thurman M. Wheeler; Mark K. Morehart; Gregory Kaplan, all of Columbus, and Alexander R. Pokora, Pickerington, all of Ohio, assignors to Enzymol Internaional, Columbus, Ohio

Reexamination Request No. 90/004,862, Dec. 30, 1997.

Reexamination Certificate for Patent 5,583,267, issued Dec. 10, 1996, Ser. No. 379,202, Jan. 27, 1995.

Int. Cl.^{6} C07C *37/00*

U.S. Cl. 568—730

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **7-18** and **20-22** are confirmed.

Claims **1-6** and **19** are cancelled.

7. A process for preparing tetralkyl-substituted biphenol which comprises reacting a 2,6-dialkyl substituted phenol in which the alkyl groups contain 1 to 6 carbon atoms with a peroxidase enzyme in the presence of a peroxide in an aqueous medium to yield a tetralkyl-substituted quinone, and reducing the quinone to obtain a tetralkyl-substituted biphenol.

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REISSUES

NOVEMBER 24, 1998

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 35,965

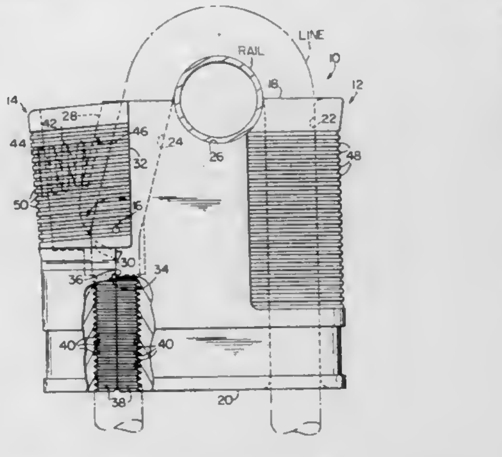
APPARATUS FOR FASTENING AND ADJUSTING A LINE

Peter Cook, 2930 NE. 19th St., Pompano Beach, Fla. 33062

Original No. 5,327,847, dated Jul. 12, 1994, Ser. No. 61,448, May 14, 1993. Continuation-in-part of Ser. No. 970,619, Nov. 3, 1992, Pat. No. 5,327,845. Application for reissue Jul. 9, 1996, Ser. No. 680,530

Int. Cl.^{6} B63B *21/04*

U.S. Cl. 114—218 **40 Claims**



1. An apparatus for fasting a line, comprising:

a body portion defining at least one passageway extending through the body portion for receiving a line;

a handle portion coupled to the body portion and movable relative to the body portion and defining at least one elongated slot; and

a drive arm pivotally mounted on one end to the body portion and coupled on another end to the handle portion, the drive arm defining a line-engaging surface normally biased toward the passageway to engage a line extending through the passageway, and at least one drive surface received within the at least one elongated slot for movement of the drive surface through the elongated slot in response to movement of the handle portion relative to the body portion to move the drive arm between first and second positions, the drive arm being movable between a first position to one side of the passageway to permit movement of a line through the passageway in response to movement of the handle portion toward the body portion, and a second position at least approximately in the passageway to engage a line extending through the passageway upon movement of the handle portion away from the body portion.

Re. 35,966

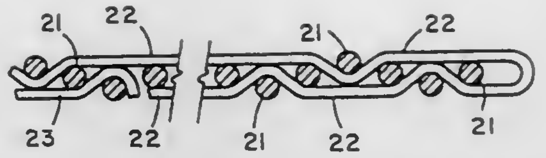
PAPERMAKERS FABRIC WITH ORTHOGONAL MACHINE DIRECTION YARN SEAMING LOOPS

Henry J. Lee, Greenville, S.C., assignor to Asten, Inc., Charleston, S.C.

Original No. 5,411,062, dated May 2, 1995, Ser. No. 111,303, Aug. 23, 1993. Continuation-in-part of Ser. No. 949,044, Sep. 21, 1992, Pat. No. 5,238,027, which is a continuation-in-part of Ser. No. 715,543, Jun. 14, 1991, Pat. No. 5,148,838, which is a continuation of Ser. No. 567,974, Aug. 15, 1990, Pat. No. 5,092,373, which is a continuation-in-part of Ser. No. 534,164, Jun. 6, 1990, Pat. No. 5,103,874. Application for reissue Jul. 3, 1996, Ser. No. 674,798

Int. Cl.^{6} D03D *13/00;15/00*

U.S. Cl. 139—383 AA **18 Claims**



17. A method of forming seaming loops for a papermakers fabric comprising interweaving MD warp yarns with CMD weft yarns in a repeated pattern to define a fabric body having two sides along the machine direction and two ends, all of the MD warp yarns having the same geometric cross-section, trimming back selected MD warp yarns a selected distance from at least one of said fabric ends, and using segments of yarns having a predetermined crimp to form seaming loops by interweaving said yarn segments into spaces vacated by said trimming said selected MD yarns, characterized in that:

at least one of said MD warp yarns woven proximate a side of the fabric body being made of a different material than the other MD warp yarns;

removing said different material warp yarn from the side of the fabric body; and

using selected portions of said removed yarns as said yarn segments.

Re. 35,967

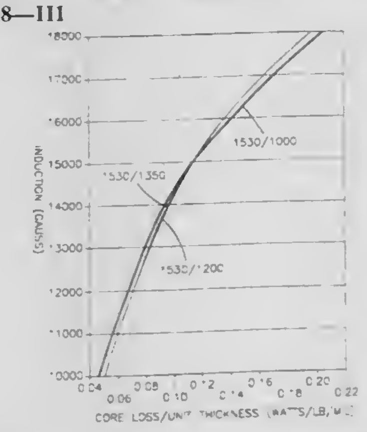
PROCESS OF MAKING ELECTRICAL STEELS

Barry A. Lauer, Macedonia; Gerald F. Beatty, Solon, both of Ohio; Ann M. R. Larson, Appleton, Wis., and Richard J. Blotzer, Parma, Ohio, assignors to LTV Steel Company, Inc., Cleveland, Ohio

Original No. 5,609,696, dated Mar. 11, 1997, Ser. No. 502,675, Jul. 14, 1995. Continuation of Ser. No. 233,371, Apr. 26, 1994, abandoned. Application for reissue Jul. 21, 1997, Ser. No. 897,747

Int. Cl.^{6} H01F *1/04*

U.S. Cl. 148—111 **23 Claims**



1. A method of making electrical steel strip characterized by low core loss and high permeability comprising the steps of:

producing a slab with a composition consisting essentially of (% by weight):

C:	up to 0.01
Si:	0.20–1.35
Al:	0.10–0.45
Mn:	0.10–1.0
S:	up to 0.015
N:	up to 0.006
Sb:	up to 0.07
Sn:	up to 0.12, *and*

the balance being substantially iron,

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hot rolling the slab into a strip with a finishing temperature in the austenite region;

coiling the strip at a temperature ranging from 1300°–1450° F.;

followed by the sequential steps of annealing the strip, cold rolling the strip, batch annealing the strip, and temper rolling the strip, wherein said temper rolling reduces the thickness of the strip by an amount ranging from about 0.25 to about 0.6% and the strip has a permeability when stress relief annealed of at least 2500 Gauss/Oersted.

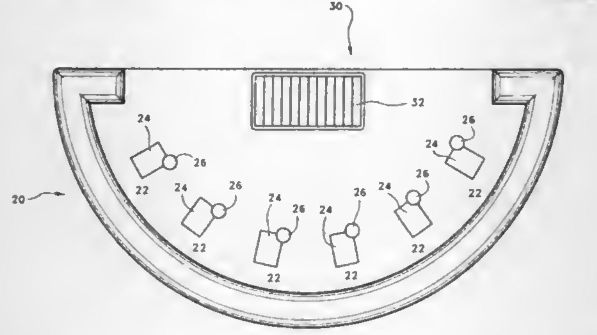
Re. 35,968
CARD GAME

Phillip P. Prerost, Las Vegas, Nev., assignor to Carl Duty, Las Vegas, Nev.

Original No. 5,407,209, dated Apr. 18, 1995, Ser. No. 238,468, May 5, 1994. Application for reissue Apr. 10, 1997, Ser. No. 833,852

Int. Cl.^{6} A63F *1/00*

U.S. Cl. 273—292 **32 Claims**



21. A method of playing a game, said method comprising the steps of:

- *(a) a player placing a first bet;*
- *(b) a dealer dealing a predetermined number of starting cards each to said player and to said dealer;*
- *(c) said player examining said starting cards and electing to stand or take an additional card;*
- *(d) if said player elects to take an additional card, said player examining said starting cards and said additional card and then electing whether to accept or reject said additional card;*
- *(e) if said player elects to reject said additional card, said* player placing a second bet and receiving a replacement card for said rejected additional card;
- *(f) said player electing whether to take subsequent additional cards or to stand; and*
- *(g) comparing said player's hand to said dealer's hand in order to determine a winner of the game according to a predetermined criterion for evaluating hands.*

Re. 35,969
SINGLE SIDED CONTROL VALVE AND PIPE BRACKET ARRANGEMENT

Luann M. Lalone, Adams, and Robert Gayfer, Watertown, both of N.Y., assignors to New York Air Brake Corporation, Watertown, N.Y.

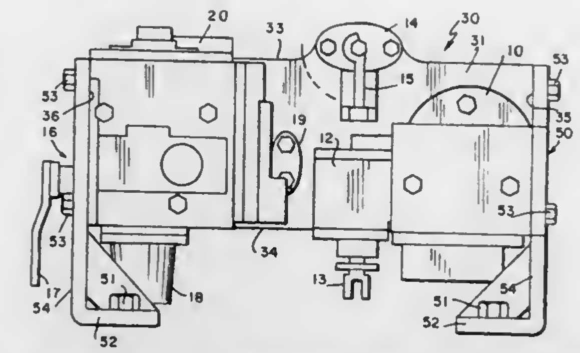
Original No. 5,478,142, dated Dec. 26, 1995, Ser. No. 280,534, Jul. 26, 1994. Application for reissue May 10, 1996, Ser. No. 644,245

Int. Cl.^{6} B60T *15/52*

U.S. Cl. 303—36 **23 Claims**

1. A brake control valve for operating a [vehicles] *vehicle's* air brakes by controlling air pressure in a brake cylinder from at least one reservoir in response to brake pipe pressure in a brake pipe comprising:

a pipe bracket having opposed front and back faces, top and bottom faces and right and left side faces;



said rear face including brake pipe, brake cylinder and at least one reservoir ports and said brake pipe port being adjacent said left face;

a service braking portion mounted to said front face adjacent said right face;

an emergency braking portion mounted to said front face adjacent said left face; and

a pair of mounting brackets adjacent said right and left faces for mounting said control valve to a vehicle.

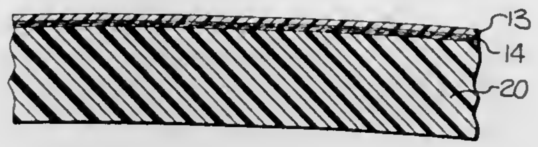
Re. 35,970
INJECTION MOLDED PLASTIC ARTICLE WITH INTEGRAL WEATHERABLE PIGMENTED FILM SURFACE

Thomas M. Ellison, Charlotte, and Brian M. Keith, Waxhaw, both of N.C., assignors to Rexam Industries Corp., Charlotte, N.C.

Original No. 5,536,539, dated Jul. 16, 1996, Ser. No. 438,092, May 8, 1992. Division of Ser. No. 267,568, Jun. 28, 1994, Pat. No. 5,514,427, which is a division of Ser. No. 955,317, Oct. 1, 1992, Pat. No. 5,342,666, which is a continuation of Ser. No. 410,662, Sep. 21, 1989, abandoned, which is a continuation-in-part of Ser. No. 924,295, Oct. 28, 1986, abandoned, and a continuation of Ser. No. 241,856, Sep. 8, 1988, Pat. No. 4,810,540, which is a continuation-in-part of Ser. No. 924,299, Oct. 28, 1986, Pat. No. 4,810,540. Application for reissue Oct. 24, 1996, Ser. No. 736,410

Int. Cl.^{6} B60R *13/04*

U.S. Cl. 428—31 **8 Claims**



1. A decorative surfacing film for in-mold surfacing of a molded plastic article to impart a high quality surface appearance comparable to that of a high quality automotive paint finish, comprising a preformed molecularly unoriented liquid-cast weatherable fluoropolymer film, a bonding layer comprising a preformed film of a melt produced thermoplastic thermoformable olefin polymer different from said cast polymer film, and an adhesive layer adhering said bonding layer to said liquid-cast weatherable fluoropolymer film, said bonding layer having a thickness of at least 2 mils and sufficient to render the preformed decorative surfacing film shape sustaining when thermoformed, said cast polymer film having pigments therein for providing an appearance and color to the molded plastic article comparable to a high quality automotive paint finish.

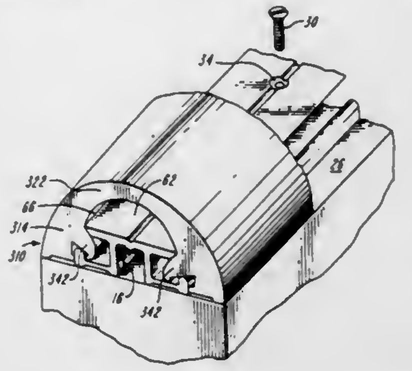
Re. 35,971
RESILIENT STRIP AND MOUNTING MEMBER FOR FLUSH FITTING PROTECTIVE STRIP ASSEMBLY

Gerald Kessler, Youngstown, Ohio, assignor to Boston Metal Products Corp., Medford, Mass.

Original No. 5,110,650, dated May 5, 1992, Ser. No. 688,646, Apr. 19, 1991. Continuation of Ser. No. 383,905, Jul. 21, 1989, Pat. No. 5,013,596. Application for reissue Apr. 28, 1994, Ser. No. 234,683

Int. Cl.^{6} E04F *19/02;* **B60J** *11/00*

U.S. Cl. 428—100 **20 Claims**



1. An elongated protective strip of resilient material to be secured in and partially surrounding a mounting member, said resilient strip comprising:

- (a) a body partially surrounding the mounting member and having a pair of edge portions; and
- (b) a pair of oppositely disposed, inwardly extending solid latch members, each terminating in a hook having an opening on the side of the latch member facing away from the mid-line of the body and each latch member located between a point 45 degrees away from the mid-line of the body and another point 90 degrees away from the mid-line, in the same direction.

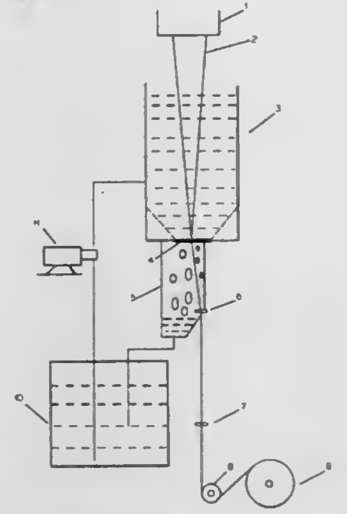
Re. 35,972
ULTRA-ORIENTED CRYSTALLINE FILAMENTS

John A. Cuculo; Paul A. Tucker, both of Raleigh; Gao-Yuan Chen, Apex, and Ferdinand Lundberg, Raleigh, all of N.C., assignors to North Carolina State University, Raleigh, N.C.

Original No. 5,405,696, dated Apr. 11, 1995, Ser. No. 161,320, Dec. 2, 1993. Continuation-in-part of Ser. No. 830,704, Feb. 4, 1992, Pat. No. 5,268,133, which is a continuation-in-part of Ser. No. 525,874, May 18, 1990, Pat. No. 5,149,480. Application for reissue Mar. 25, 1996, Ser. No. 622,431

Int. Cl.^{6} D02G *3/00;3/02*

U.S. Cl. 428—364 **25 Claims**



1. [Thermoplastic] *As spun thermoplastic* polymer filaments having a ratio of the crystalline orientation factor (f_c) to the amorphous orientation factor (f_a) is 1.2 or less, while f_c is 0.9 or above and a crystal size of less than 40 Å in the 100 and $\bar{1}05$ planes and less than 30 Å in the 010 plane.

PLANT PATENTS

GRANTED NOVEMBER 24, 1998

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

10,696

HYBRID TEA ROSE PLANT NAMED 'MACRENO'

Sam McGredy, Auckland, New Zealand, assignor to DeVor Nurseries, Inc., Watsonville, Calif.
Filed Oct. 31, 1996, Ser. No. 742,141
Int. Cl.⁶ A01H *5/00*

U.S. Cl. Plt.—11 **1 Claim**

1. A new and distinct variety of hybrid tea rose, substantially as shown and described.

10,697

HYBRID TEA ROSE PLANT NAME 'MACCHOPSU'

Sam McGredy, Auckland, New Zealand, assignor to DeVor Nurseries, Inc., Watsonville, Calif.
Filed Oct. 31, 1996, Ser. No. 742,142
Int. Cl.⁶ A01H *5/00*

U.S. Cl. Plt.—20 **1 Claim**

1. A new and distinct variety of hybrid tea rose plant variety, substantially as shown and described.

10,698

HYBRID TEA ROSE PLANT NAMED 'MACKATI'

Sam McGredy, Auckland, New Zealand, assignor to DeVor Nurseries, Inc., Watsonville, Calif.
Filed Oct. 31, 1996, Ser. No. 742,145
Int. Cl.⁶ A01H *5/00*

U.S. Cl. Plt.—21 **1 Claim**

1. A new and distinct variety of hybrid tea rose plant, substantially as shown and described.

10,699

FLORIBUNDA ROSE PLANT NAMED 'MACFIRINLIN'

Sam McGredy, Auckland, New Zealand, assignor to DeVor Nurseries, Inc., Watsonville, Calif.
Filed Oct. 31, 1996, Ser. No. 742,144
Int. Cl.⁶ A01H *5/00*

U.S. Cl. Plt.—22 **1 Claim**

1. A new and distinct variety of floribunda rose plant, substantially as shown and described.

10,700

FLORIBUNDA ROSE NAMED 'INTERBAR'

Gerald Parker Ilsink, Doorn, Netherlands, assignor to DeVor Nurseries, Inc., Watsonville, Calif.
Filed Feb. 25, 1997, Ser. No. 804,657
Int. Cl.⁶ A01H *5/00*

U.S. Cl. Plt.—24 **1 Claim**

1. A new and distinct variety of floribunda rose plant, substantialy as shown and described.

10,701

POLYANTHA ROSE PLANT NAMED 'SPEVU'

Hette Spek, Boskoop, Netherlands, assignor to DeVor Nurseries, Inc., Watsonville, Calif.
Filed Oct. 28, 1996, Ser. No. 738,877
Int. Cl.⁶ A01H *5/00*

U.S. Cl. Plt.—27 **1 Claim**

1. A new and distinct variety of polyantha rose plant substantially, as shown and described.

10,702

AZALEA PLANT NAMED 'CONLEI'

Robert Edward Lee, 52063 Ridge Crest Rd., Independence, La. 70443, assignor to Robert Edward Lee, and Plant Development Services Inc., both of Loxley, Ala.
Filed Aug. 27, 1997, Ser. No. 917,899
Int. Cl.⁶ A01H *5/00*

U.S. Cl. Plt.—55 **1 Claim**

1. A new and unique variety of Azalea plant named 'Conlei' as herein shown and described.

10,703

AZALEA PLANT NAMED 'CONLEK'

Robert Edward Lee, Independence, La., assignor to Robert Edward Lee and Plant Development Services Inc., Loxley, Ala.
Filed Aug. 27, 1997, Ser. No. 917,900
Int. Cl.⁶ A01H *5/00*

U.S. Cl. Plt.—57 **1 Claim**

1. A new and unique variety of *Azalea plant* named 'Conlek' as herein shown and described.

10,704

AZALEA PLANT NAMED 'CONLEG'

Robert Edward Lee, 52063 Ridge Crest Rd., Independence, La. 70443, assignor to Robert Edward Lee, Loxley, Ala., and Plant Development Services Inc., Loxley, Ala.
Filed Aug. 27, 1997, Ser. No. 917,924
Int. Cl.⁶ A01H *5/00*

U.S. Cl. Plt.—57 **1 Claim**

1. A new and unique variety of Azalea plant named 'Conleg' as herein shown and described.

10,705

VERBENA PLANT NAMED 'SUNVP-PI'

Ryuichi Tachibana, Yamato, Japan, assignor to Suntory Limited, Osaka, Japan
Filed Nov. 13, 1996, Ser. No. 746,562
Int. Cl.⁶ A01H *5/00*

U.S. Cl. Plt.—87 **1 Claim**

1. A new and distinct variety of verbena plant, substantially as herein illustrated and described, characterized particularly as to novelty by (A) being a spread growth habit having long stems, (B) an abundant branching and plentiful number of flowers in a spike and great profusion blooms, the whole bush remaining in bloom for a considerable period of time, (C) flower size is large and the petal color of flower is deep purplish pink color, (D) a high resistance to rain, heat, drought, cold and pests.

10,706

ANTHURIUM PLANT NAMED 'LINDA'

Magdalena J. M. van Rijn, Schipluiden, Netherlands, assignor to Rijnplant, Schipluiden, Netherlands
Filed Jun. 6, 1997, Ser. No. 870,583
Int. Cl.⁶ A01H *5/00*

U.S. Cl. Plt.—88.1 **1 Claim**

1. A new and distinct cultivar of Anthurium plant named 'Linda', as illustrated and described.

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PATENTS

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ERRATA

Patents

For CLASS	See PATENT NO.
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104—017	5,839,377
123—322	5,839,453
226—176	5,839,613
224—321	5,839,615
271—265	5,839,721
524—555	5,840,804
524—731	5,840,805
546—273	5,840,910
348—181	5,841,251
348—065	5,841,491
351—209	5,841,502
345—501	5,842,004
395—868	5,842,078

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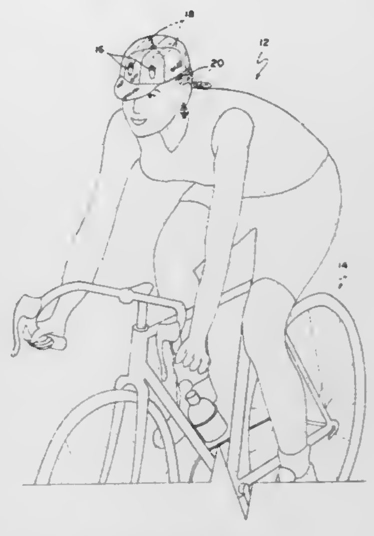
PATENTS

GRANTED NOVEMBER 24, 1998

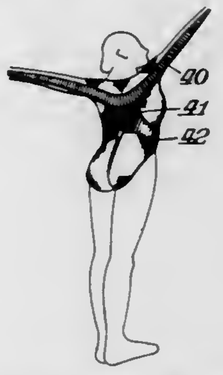
GENERAL AND MECHANICAL

5,839,121
CAP OR HELMET FOR COOLING THE SCALP
Luis O. Laboy Morales, Estancias De San Benito #620, Mayaguez, Puerto Rico, 00680
Filed May 11, 1998, Ser. No. 75,200
Int. Cl.^{6} A42B *3/28*
U.S. Cl. 2—7 **11 Claims**



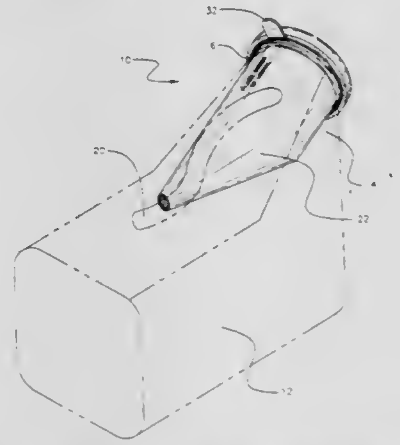
1. A cooling head cover comprising:
a head cover selected from the group consisting of a cap and a helmet, the cover having a front surface;
at least one large opening element in a selected surface of said head cover; and
a flexible funnel element extending from said at least one large opening element, said flexible funnel narrowing in diameter and being closed at an opposite end;
said funnel element having means defining a series of apertures defined through its lower surface, whereby upon locomotion of the user wearing the head cover, the apertures of said at least one funnel ventilate and massage the scalp.

5,839,122
SWIMWEAR GARMENT INCORPORATING RESISTANCE BAND
Timothy P. Dicker, 6906 Foothill Blvd., Tujunga, Calif. 91042-2780, and William T. Wilkinson, P.O. Box 73, Salem, N.J. 08079
Filed Apr. 7, 1997, Ser. No. 834,887
Int. Cl.^{6} A41D *5/00;1/12*
U.S. Cl. 2—67 **20 Claims**



5. A swimwear garment comprising an upper body portion and a trunk portion, said upper body portion and said trunk portion being made from a base fabric, at least one resistance band incorporated in at least one of said upper body portion and said trunk portion, said resistance band having a direction of stretch and having memory characteristics for causing said resistance band to return to its unstretched condition, said resistance band having resistance characteristics which require a greater force to stretch said resistance band and to resist said resistance band returning to its unstretched condition than the resistance force required for stretching said base fabric and permitting said base fabric to return to its unstretched condition, said resistance band having spaced anchor locations at remote portions with respect to each other, and said resistance band including a one-piece resistance band running along the anterior arm/hand to the mid thoracic line laterally and then obliquely to the mid line forming the crotch and meeting a posterior resistance band.

5,839,123
INSERT FOR HANDHELD URINALS
David J. Dunham, Sr., 131 Bridge St., Salem, Mass. 01970-3923
Filed Sep. 30, 1997, Ser. No. 941,876
Int. Cl.^{6} A61G *9/00*
U.S. Cl. 4—144.1 **3 Claims**



1. A handheld urinal for eliminating backflow and spillage of urine comprising, in combination:
a urinal bottle having a generally rectangular configuration, the urinal bottle having a top with an upwardly extending neck with an open mouth, the open mouth having an outwardly extending peripheral flange, the urinal bottle having a handle disposed on the top of the urinal bottle;
a funnel portion adapted for securement within the urinal bottle, the funnel portion having a central cylindrical portion and an upwardly extending tapered portion terminating in an open lower end, the tapered portion having a longitudinal axis oriented at an obtuse angle with respect to a longitudinal axis of the central cylindrical portion such that the tapered portion is angled toward an interior surface of the top of the urinal bottle and the open lower end of the tapered portion is positioned adjacent to the interior surface of the top of the urinal bottle when the funnel portion is secured to the urinal bottle, the central cylindrical portion positioned within the upwardly extending neck, the central cylindrical portion having a peripheral gasket disposed on an upper end thereof, the peripheral gasket engaging the outwardly extending peripheral flange of the open mouth, the peripheral gasket having an inwardly extending ridge disposed around a periphery thereof, the peripheral gasket having an upwardly extending orientation tab, the orientation tab corresponding to the direction of the obtuse angle of the upwardly extending tapered portion for providing a visual indication of the obtuse angle direction for positioning the open lower end at its highest elevation within the urinal bottle.

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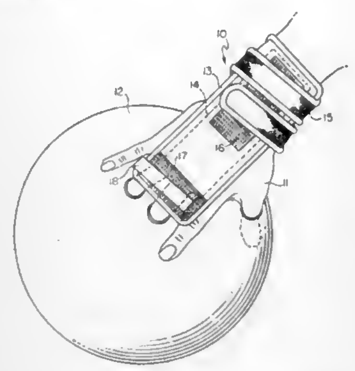
5,839,124
WEDGE SYSTEM FOR BOWLER'S WRIST AND HAND BRACE

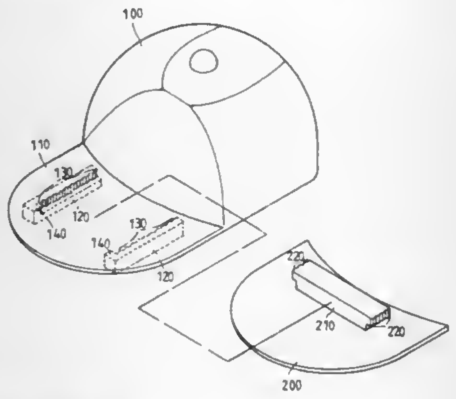
James Tilton, 38448 20th St. E., Palmdale, Calif. 93550
Continuation-in-part of Ser. No. 800,449, Feb. 18, 1997, Pat. No. 5,708,981. This application Aug. 18, 1997, Ser. No. 912,659
Int. Cl.⁶ A41D *13/08*
U.S. Cl. 2—170 **13 Claims**



1. A wrist and hand brace for bowlers comprising:
an elongated base having opposite ends;
strap means carried on said base opposite ends adapted to wrap around the wrist and hand of the user;
an elongated rigid brace member disposed between said base and the wrist and hand of the user;
said rigid brace member having a plurality of rigid non-bendable elements arranged in spaced-apart relationship along the length of said brace member;
said brace member characterized as being flexible about a central longitudinal axis of said elongated brace member;
a wedge-shaped element disposed between the hand of the user and said elongated brace; and
said wedge-shaped element has opposite sides of unequal thickness.

5,839,125
HAT WITH EXTENSIBLE VISOR

Tsao-Hui Chen, 58, Ma Yuan West St., Taichung, Taiwan
Filed Feb. 25, 1998, Ser. No. 30,748
Int. Cl.⁶ A42B *1/06*
U.S. Cl. 2—195.1 **2 Claims**



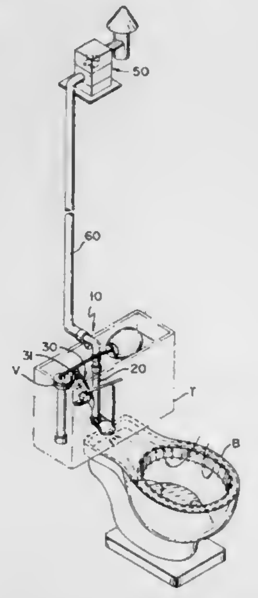
1. A hat comprising:
a main body, a fixed peak disposed on a front portion of the main body, and an extensible visor engaged with the fixed peak,
at least an insertion block disposed on the extensible visor,
the insertion block having two opposite sets of lateral teeth,
at least a pair of L-shaped racks disposed on the fixed peak,
each said L-shaped rack having a front block and a plurality of serrations, and
each set of lateral teeth engaging with a respective one of said plurality of serrations.

5,839,126

Patent Not Issued For This Number

5,839,127
ODOR EXTRACTOR APPARATUS

Jesus M. Curiel, 16537 W. Delhi Ave., Delhi, Calif. 95315
Filed Oct. 31, 1997, Ser. No. 961,669
Int. Cl.⁶ E03D *9/04*
U.S. Cl. 4—216 **2 Claims**

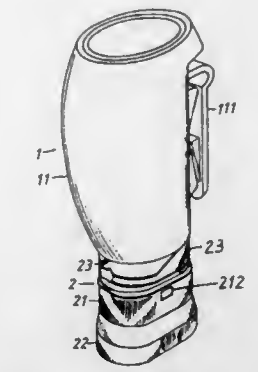


1. An improvement in a toilet assembly that includes a water tank, a bowl, a water conduit with an outlet having a valve and a vertically extending overflow tube within said tank that discharges water in said bowl, said overflow tube having a lateral wall with an internal surface, the improvement comprising means for extracting the air from said overflow tube and said overflow tube including an opening on said lateral wall and further including a tubular member having first and second ends, said first end mounted to said lateral wall so that said opening is covered by said first end and said second end being connected to said outlet so that the water released by said valve is received by said tubular member and carried to said overflow tube wherein said overflow tube includes a flexible sheet mounted on the internal surface of said lateral wall and immediately above said opening so that the water coming from said tubular member is not obstructed as it is discharged on said overflow tube and the air extracted comes primarily from said bowl.

5,839,128
ANTISEPTIC SOLUTION DISPENSER

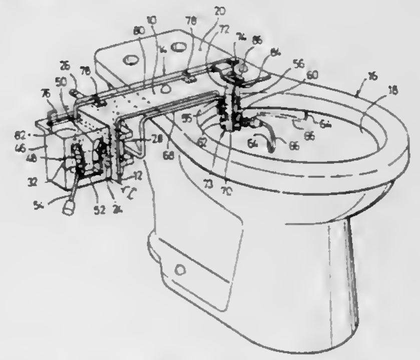
Ming-Wen Wang, 1F, No. 35, Da-Noan Road, Tu-Chen City, Taipei Hsien, Taiwan
Continuation-in-part of Ser. No. 514,702, Aug. 14, 1995. This application Jun. 2, 1997, Ser. No. 863,503
Int. Cl.⁶ E03D *9/02*
U.S. Cl. 4—227.2 **7 Claims**

1. An antiseptic solution dispenser installed in the tank of a toilet to dispense an antiseptic solution, comprising:
a container to hold an antiseptic solution, said container comprising an oval container body and a coupling neck extended from said container body, said coupling neck having a plurality of upper locating flanges and lower locating flanges raised from an outside wall thereof at different elevations and a bottom opening; and
a storage float coupled to said coupling neck of said container, said storage float comprising a half-round barrel and a float connected to a bottom side of said half-round barrel, said half-round barrel including two dispensing openings and an inside flange raised from an inside wall thereof, said inside flange of said half-round barrel cooperating with the locating flanges of said coupling neck so that prior to operation of said dispenser said inside flange cooperates with said lower locating flanges to retain said storage float on said coupling neck and during operation said inside flange cooperates with said upper locating flanges to permit upward and downward movement of said storage float on said coupling neck between said upper locating flanges and said container body;
whereby, as the tank of the toilet is filled with water, the half-round barrel is moved upwards by the rising water, causing the antiseptic solution contained therein to flow out of said half-round barrel through said dispensing openings and as water is drawn away from the tank of the toilet, the half-round barrel is lowered and a metered amount of antiseptic solution flows out of said container body through the bottom opening of said coupling neck into said half-round barrel, the vacuum resulting in the container body from the transfer of antiseptic solution therefrom causes the transfer to cease when the bottom opening of said coupling neck is covered by the level of antiseptic solution in said half-round barrel.



5,839,129
CLEANING WATER SUPPLY DEVICE FOR A TOILET

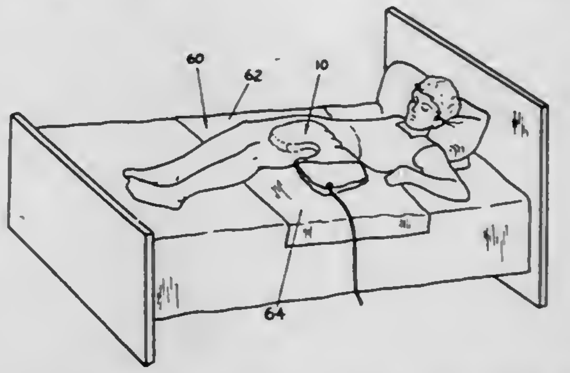
Duk Un Lee, 19-291, Yongsan-dong 5-Ka, Yongsan-Ku, Seoul, Rep. of Korea
Filed Oct. 16, 1997, Ser. No. 951,551
Claims priority, application Rep. of Korea, Oct. 18, 1996, 1996 46658
Int. Cl.⁶ A61H *35/00*
U.S. Cl. 4—448 **2 Claims**



1. A cleaning water supply device for a toilet comprising a bracket having a horizontal portion having a downward fixing portion extended to the downwardly rear direction of a bowl of a toilet at one side end and a vertical portion extended from the other side end of said horizontal portion to the downwardly outside direction of said toilet being fixed at a rear side upper surface of the toilet; a valve assembly having a valve stem being extended to the outside of said vertical portion being mounted inside the vertical portion, an inlet pipe being connected with a cleaning water supplying source, and an outlet pipe being connected with a cleaning water supply fine tube extending from a cleaning water supplying tube fixed to the downward fixing portion of said bracket; and a cleaning water nozzle pipe having an upward nozzle tip at the lower side of the cleaning water supplying tube; a cover which is mounted at the vertical portion of bracket and which has an outwardly arched guide gate, an inwardly arched guide gate, a horizontal guide gate communicating with lower portions of said arched guide gates, and a slot at the upper surface thereof; a rotative manipulating plate having a fitting plate portion which is fixedly engaged with the valve stem of valve assembly; a rotating bracket being rotatively mounted by shaft to the rotative manipulating plate and having a recessed end at the rear end and a lever guidably shifting through the guide gates of the cover at the front end; a nozzle block being rotatively mounted at the lower end of the cleaning water supplying tube and having the cleaning water nozzle pipe connected at the lower portion; a rotating guide member being fixed on the nozzle block and having a horizontal plate and a vertical plate on which a shaft pin is mounted; a reciprocating guide rod, which is reciprocatively mounted at the top of the bracket, having an engaging means with which the shaft pin is engaged and a downwardly arched extension rod engaged with the recessed end of rotating bracket through the slot of cover.

5,839,130
COLLAPSIBLE BED-PAN SUPPORT WITH SHEET

Robert Markus, 247, Ave. Del Poniente D-2, San Clement, Calif. 92672
Filed Mar. 3, 1997, Ser. No. 810,348
Int. Cl.⁶ A61G *9/00*
U.S. Cl. 4—457 **11 Claims**



1. In an inflatable support-pad for a bed pan, which support pad comprises a front wall, a rear wall, a first side wall, and a second side wall, said support-pad having a opening formed therein for receiving a bed pan when the support-pad is inflated, said opening having a first entrance-end adjacent said front wall and a second closed end interiorly thereof, said support pad having a plurality of interior supporting ribs, the improvement comprising:
said opening being a substantially U-shaped opening having a width, as measured in a direction perpendicular to a length of said side walls, that progressively increases from said second closed end of said opening toward said first entrance-end thereof, when said support-pad is deflated; said opening having a pair of annular side walls the perpendicular distance between which at any section thereof defining the width of that section of said U-shaped opening;
said support-pad, when in its deflated state, forming a substantially trapezoidal shape with said front wall having a greater length than said rear wall;

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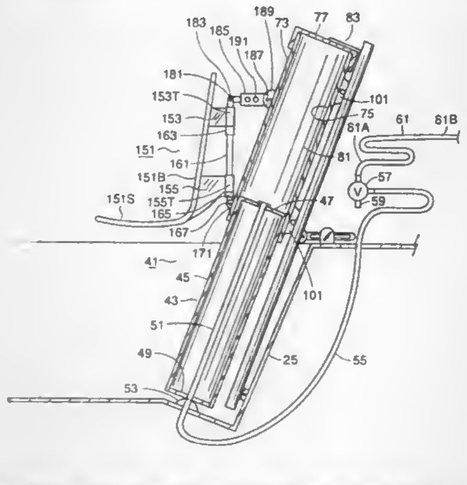
said plurality of interior supporting ribs comprising a pair of spaced-apart longitudinally extending ribs, each having a first end at least extending interiorly to close juxtaposition with said second closed end of said opening, and a second end extending interiorly to at least close juxtaposition to a portion of said rear wall, whereby said U-shaped opening, when said support-pad has been fully inflated, assumes a substantially constant width along at least most of the length thereof from said second closed end to at least close juxtaposition to said first entrance-end.

5,839,131
BATHTUB WITH CHAIR LIFT

Richard C. Schaffer, 3920 W. Vickery, Ft.Worth, Tex. 76107-5626

Filed Feb. 25, 1998, Ser. No. 30,454
Int. Cl.^{6} A47K *3/12*
U.S. Cl. 4—560.1 **17 Claims**



1. A bathtub and a chair lift wherein the bathtub has a cavity for holding water between two spaced apart ends, comprising:

a lift system comprising a first member located in said cavity of said bathtub and a second member coupled to said first member for movement along a path between upward and lower position for movement relative to said first member,

a fluid chamber formed between said two members such that fluid may be injected into said fluid chamber to move said second member to said upward position and released from said fluid chamber to allow said second member to move to said lower position,

coupling means for coupling said two members to said bathtub at one of said ends of said bathtub,

said coupling means allows said second member to move between said lower and upper positions while said first member remains in said cavity of said bathtub,

a chair coupled to said second member,

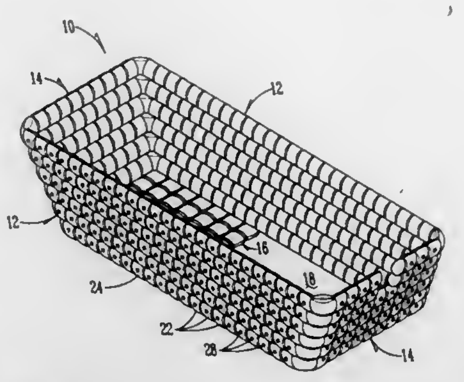
control for injecting a fluid into said fluid chamber for causing said second member to move to said upper position to raise said chair and for releasing said fluid from said fluid chamber to allow said second member to move to said lower position to lower said chair.

5,839,132
INFLATABLE BATHTUB LINER

Todd D. Rooney, 2103 Shady Lane Dr., Norwalk, Iowa 50211

Filed Mar. 19, 1997, Ser. No. 820,108
Int. Cl.^{6} A47K *3/02*
U.S. Cl. 4—583 **3 Claims**

1. A liner for bathtubs having a bathing compartment, said compartment having opposite sidewalls, opposite endwalls, a bottom, and a closeable drain opening in said bottom, comprising:



a thin liner shaped to conform to a bathing compartment of a bathtub with said liner including opposite sidewalls, opposite endwalls, and at least a partial bottom,

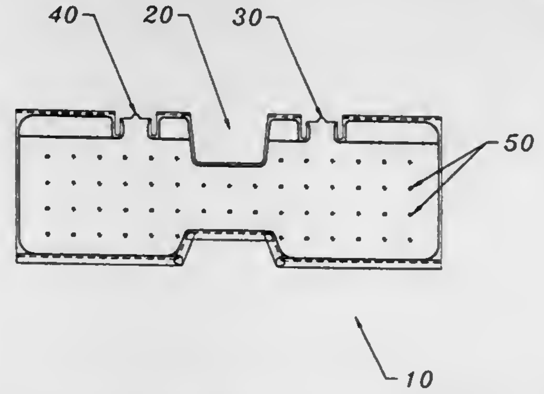
said liner being inflatable so that bathtub liner will have a resilient thickness when inflated wherein the exterior surface will generally engage the interior surface of the bathing compartment of a bathtub, and

a plurality of suction elements contained on the exterior of said liner which engage with the interior of the bathing compartment of said bathtub.

5,839,133
WARMING BLANKET HAVING MULTIPLE INLETS

Scott D. Dickerhoff, Manchester; Thomas F. Kappel, St. Louis, and Robert A. Virag, Chesterfield, all of Mo., assignors to Mallinckrodt Medical, Inc., St. Louis, Mo.

Continuation of Ser. No. 359,223, Dec. 19, 1994, abandoned, which is a continuation of Ser. No. 924,269, Jul. 3, 1992, Pat. No. 5,384,424. This application Jul. 19, 1996, Ser. No. 684,001
Int. Cl.^{6} A47C *27/00;* **A61F** *7/00*
U.S. Cl. 5—423 **5 Claims**

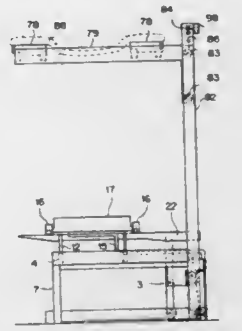


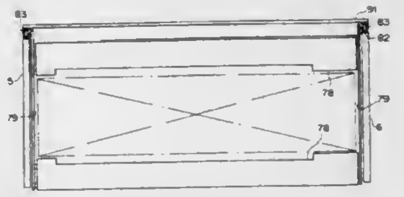
1. A forced warm air convection patient warming system, comprising an inflatable blanket for a patient's body, the blanket having a single upper surface and a single lower surface, the single upper surface being entirely formed of an upper continuous sheet of material and the single lower surface being entirely formed of a lower continuous sheet of material, the upper and lower continuous sheets of material being sealed together along their peripheral edges and welded directly together at a plurality of discrete interior locations on interior surface portions of the two sheets of material so as to form said inflatable blanket, said inflatable blanket having a head end portion adapted for positioning toward a patient's head, said blanket having at least two inlet ports being positioned about said head end portion of said blanket so that, in use, one said inlet port is positioned on one side of a patient's head and another of said inlet ports is positioned on another side of said patient's head, said blanket permitting air to escape from said blanket toward the patient's body, wherein each inlet port is initially sealed closed, and wherein each inlet port is selectively openable by a perforated tear strip.

5,839,134
APPARATUS FOR USE IN CONNECTION WITH A BEND TO LIFT OR LOWER BEDCLOTHES

Takashi Matsuura, and Reiko Matsuura, both of Tokyo, Japan, assignors to Matsura Kenkyujo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 569,352, Dec. 8, 1995, Pat. No. 5,737,782. This application May 8, 1997, Ser. No. 853,148
Int. Cl.^{6} A47C *21/02*
U.S. Cl. 5—504.1 **3 Claims**





1. An auxiliary cushion lift for a bed, said lift comprising:

a pair of auxiliary cushions in the form of elongate members extending from a front end to a rear end of said bed in the longitudinal direction near both side ends of said bed;

a pair of bars extending horizontally in the transverse direction and connected respectively to front and rear ends of said auxiliary cushions; and

a pair of poles provided respectively at the front and rear ends of said bed and extending vertically at one side of said bed, one end of said bars attached to said poles slidably in the vertical direction.

5,839,135
DEVICE FOR WASHING HUMAN BODY LYING ON STRETCHER

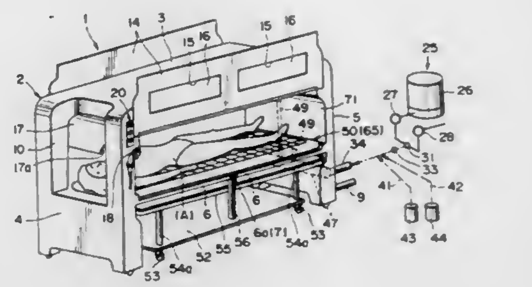
Teruo Kitamura, No.75-12, Uemetsu-cho, Hamamatsu-shi, 430, Japan, assignor to Teruo Kitamura, and Aluvo Co., Ltd., both of Hamamatsu, Japan

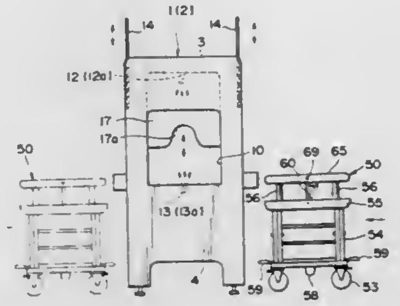
Filed Sep. 8, 1997, Ser. No. 925,068
Int. Cl.^{6} A47K *3/22*
U.S. Cl. 5—606 **11 Claims**

1. A device for washing a user, comprising:

a longitudinally extending stretcher having a longitudinal length sufficient for supporting the user lying thereon along the longitudinal direction thereof;

a housing member having a longitudinally extending top wall member and a pair of opposing, vertically extending front and rear wall members integrally connected to opposite longitudinal ends of said top wall member, respectively, for supporting said top wall member in a generally horizontal position, so that a washing chamber is defined by said top wall member and said front and rear wall members and so that a pair of opposite, side openings are defined at both side ends of said washing chamber,





said front and rear wall members being spaced apart from each other such that said washing chamber has a longitudinal length greater than the longitudinal length of said stretcher;

upper and lower nozzles disposed within said washing chamber for injecting a washing liquid toward the user, lying in said stretcher positioned in said washing chamber, from upper and lower sides of said user;

a pair of shutters provided in respective side openings and each displaced between open and close position for opening and closing at least an upper part of the corresponding side opening; and

a window provided in at least one of said shutters to permit an assisting person to touch the user within said washing chamber through said window even when the corresponding shutter is in said closed position.

5,839,136
COT MOUNTABLE ARM REST AND COT INCORPORATING SAME

Ronald D. Vance, Wilmington, Ohio, and H. Clayton Johnson, Madison, Ala., assignors to Ferno-Washington, Inc., Wilmington, Ohio

Filed May 23, 1997, Ser. No. 862,349
Int. Cl.^{6} A47C *20/02;* **A61G** *7/075*
U.S. Cl. 5—623 **25 Claims**

1. A cot comprising:

an undercarriage;

a cot frame overlying said undercarriage, said cot frame including a backrest frame portion;

a cot frame attaching member attached to said backrest frame portion;

an arm board including a frame engaging surface; and

a pivot assembly including a first pivot assembly portion mechanically coupled to said cot frame attaching member and a second pivot assembly portion mechanically coupled to said arm board, wherein said pivot assembly permits movement of said arm board between an extended arm board position and a

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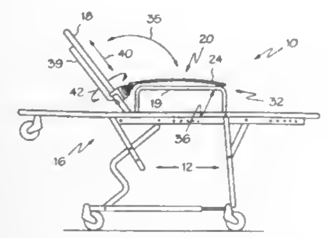
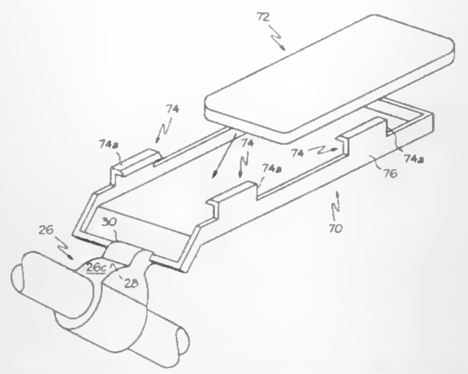
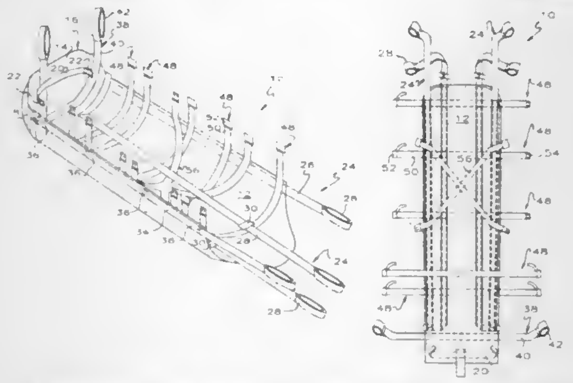




retracted arm board position, and wherein said extended arm board position is characterized by contact of said frame engaging surface with said cot frame.

5,839,137
ROLL UP EMERGENCY PERSONNEL CARRIER

Robert O. Butler, and Kathleen W. Butler, both of 509 Lantana Dr., Port Aransas, Tex. 78373
Filed Nov. 12, 1997, Ser. No. 968,101
Int. Cl.⁶ A61G *1/01*
U.S. Cl. 5—627 **9 Claims**



1. A device for the emergency evacuation of a human, comprising

an elongate panel of bodily flexible material of a size to be wrapped about the human and having a head end, a foot end, an inside for juxtaposition to a victim, an outside and a longitudinal axis dividing the panel into generally equal halves;

a plurality of straps, on the inside of the panel, extending transverse to the longitudinal axis for wrapping the panel about the human;

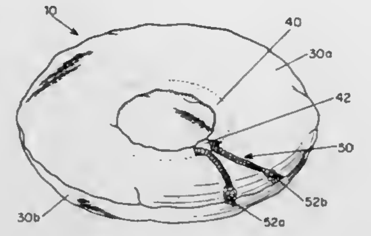
a plurality of straps extending parallel to the longitudinal axis from adjacent one end of the panel to allow towing of the evacuation device along an underlying surface;

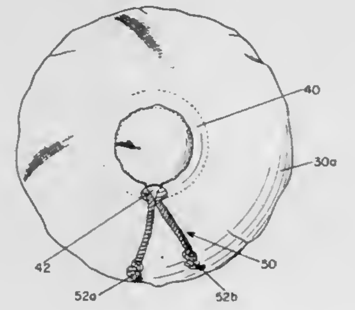
a pouch at the foot end of the panel for receiving feet of the human; and

a strap adjacent the foot end of the panel for tieing the feet of the human together in the pouch thereby preventing splaying of the feet whereby the device may be pulled along an underlying ground surface without the human sliding toward the foot end of the device and minimizing snagging of the victim's feet.

5,839,138
CUSHIONED PILLOW WITH MEANS FOR ADJUSTING FIRMNESS

Edward Weidman, 404 4th Ave., East Northport, N.Y. 11731, and Nancy Hassell, 1 Sutton Pl., Huntington, N.Y. 11743
Continuation-in-part of Ser. No. 757,106, Dec. 2, 1996, abandoned. This application Mar. 10, 1997, Ser. No. 814,257
Int. Cl.⁶ A47G *9/02*
U.S. Cl. 5—636 **6 Claims**





1. An adjustable cushioned pillow comprising:

one or more cover panels forming a closed volume;

a filler material packed within the closed volume;

a sleeve having a hollow interior attached in a loop on at least one cover panel, the sleeve having one or more access openings allowing access to the sleeve's hollow interior; and

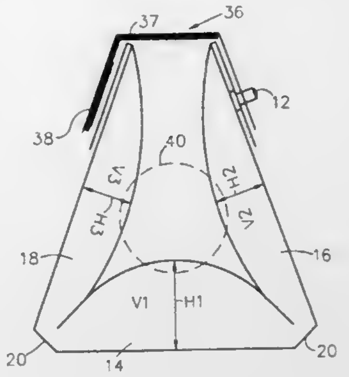
a drawstring having two ends, the drawstring threaded through the sleeve's hollow interior with each end of the drawstring protruding from one of the access openings of the sleeve, whereby the firmness of the pillow may be adjusted by manipulating the drawstring.

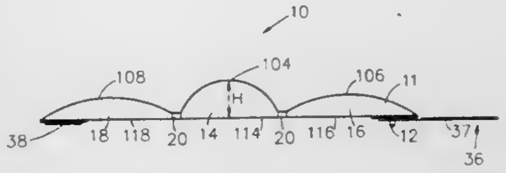
5,839,139
HEEL ELEVATOR FOR THE PREVENTION OF HEEL AND FOOT ULCERATIONS

John Fink, 2939 Arborry Hill Rd., Richfield, Ohio 44286, assignor to John Fink, Richfield, Ohio
Filed Apr. 24, 1997, Ser. No. 840,029
Int. Cl.⁶ A61G *7/075*
U.S. Cl. 5—648 **11 Claims**

1. An article for supporting a portion of a user's body, when assembled said article comprising:

a body having first and second side panels and a middle panel, each said panels having an upper surface and a lower surface, a radius of curvature of said upper surface of said middle panel being less than a radius of curvature of said first side panel.

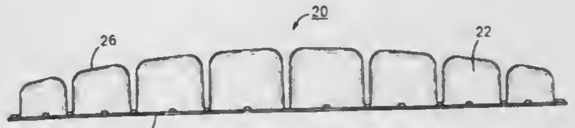


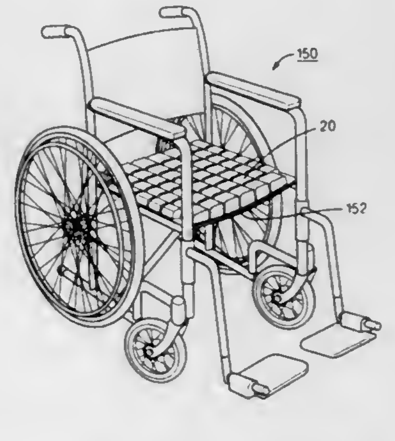


8. The article of claim 1 wherein said article is inflatable.

5,839,140
INFLATABLE WHEELCHAIR CUSHION AND METHODS OF MANUFACTURING AND USE

Jack Wilkerson, Pleasant Valley, N.Y., assignor to Geomarine Systems, Inc., Sanford, Fla.
Continuation of Ser. No. 644,640, Apr. 3, 1996, abandoned. This application Sep. 6, 1997, Ser. No. 927,555
Int. Cl.⁶ A47C *1/022*
U.S. Cl. 5—654 **25 Claims**





1. An inflatable wheelchair cushion, comprising:

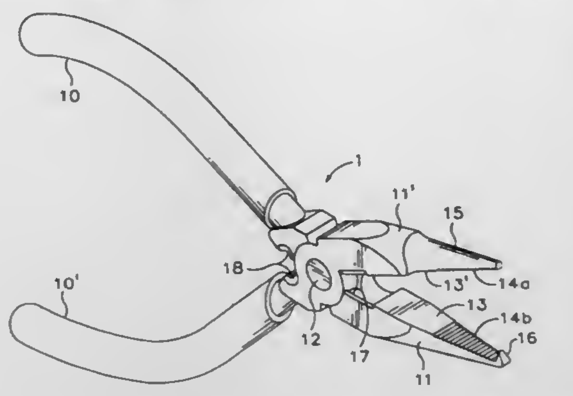
(a) a generally flat, horizontal base member;

(b) a plurality of fluid-fillable cells rising from said base member, top surfaces of said cells, when said cells are filled with fluid to one or more desired pressures, defining a seating surface having a shape generally approximating that of an inverted catenary; and

(c) means to introduce pressurized fluid to said cells or groups of said cells.

5,839,141
FISHERMAN'S TOOL

James R. Hermann, 309 SE. 172nd, Portland, Oreg. 97233
Filed Dec. 30, 1996, Ser. No. 774,617
Int. Cl.⁶ B25F *1/00*
U.S. Cl. 7—106 **6 Claims**



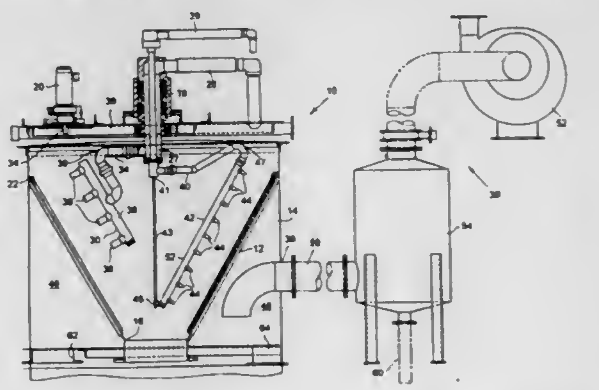
1. A fisherman's tool comprising an improved pair of needlenose pliers comprising first and second intersecting members pivotable at their intersection, said intersecting members comprising a first handle and a first tapered jaw mounted on said first intersecting member and a second handle and a second tapered jaw mounted on said second intersecting member, said first and second tapered jaws each including a substantially planar gripping surface that comprises a smooth portion near said intersection and a scored portion near the pointed end of said tapered jaw, the improvement comprising:

(a) said first jaw being substantially conical and having a reduced cross-sectional area near the pointed end of said first tapered law relative to the corresponding portion of said second tapered jaw; and

(b) a hooked tip on said second tapered jaw, said hooked tip being substantially triangular in cross-section and oriented at approximately right angles to said gripping surface and overlapping said first tapered jaw.

5,839,142
STOCK WASHER FOR WASHING, THICKENING AND CLASSIFYING SOLIDS

Joseph A. Bolton, Queensbury, N.Y., assignor to Thermo Fibertek Inc., Waltham, Mass.
Filed Jul. 9, 1996, Ser. No. 678,478
Int. Cl.⁶ D06B *1/02*
U.S. Cl. 8—156 **12 Claims**



12. The method for washing, thickening and classifying stock including the steps of:

spraying stock onto a conical screen;

spraying wash liquid onto said conical screen thereby washing contaminants from said stock through said conical screen;

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said step of spraying wash liquid further urging said stock through an exit aperture in said conical screen; and

using rotary apparatus for said steps of spraying stock and spraying wash fluid.

5,839,143
APPARATUS FOR REGENERATING IMAGE SUPPORT FROM USED IMAGE-BEARING SUPPORT

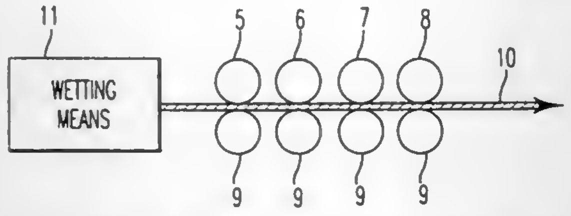
Kiyoshi Tanikawa, and Tadashi Saitoh, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 322,322, Oct. 13, 1994, Pat. No. 5,674,664. This application Feb. 20, 1997, Ser. No. 803,255

Claims priority, application Japan, Oct. 13, 1993, 5-280152

Int. Cl.^{6} G03G *21/00;* **B08B** *1/02*

U.S. Cl. 15—3 **4 Claims**



1. A regenerating apparatus for removing a hydrophobic image from an image support comprising:

wetting means for wetting said image support with at least one of water and an aqueous solution which is selected from the group consisting of an aqueous solution containing a surfactant, an aqueous solution containing a water-soluble polymer and an aqueous solution containing a water-soluble polymer and a surfactant; and

a plurality of image releasing members comprising a first portion which is able to adhere to the hydrophobic image and located downstream of said wetting means, said plurality of image releasing members being arranged in series in order of size of said first portion from small to large along a feeding direction of said image support so as to remove the hydrophobic image from the image support.

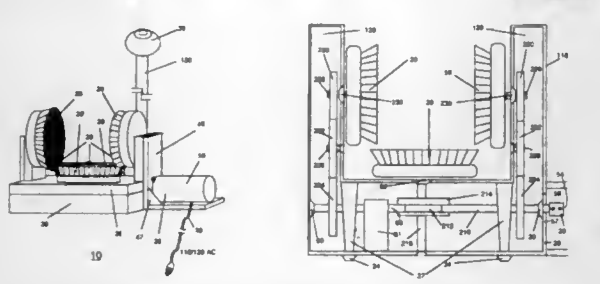
5,839,144
BOOT CLEANING APPARATUS

Byron J. Willner, 131 E. Broad St., Suite 206, Falls Church, Va. 22046

Filed Jun. 6, 1997, Ser. No. 870,360

Int. Cl.^{6} A47L *23/02;23/22*

U.S. Cl. 15—36 **6 Claims**



1. A boot and shoe cleaning apparatus comprising:

a housing, said housing having front and rear and two sides;

a motor and transmission assembly, said transmission assembly disposed in said housing, said motor operatively connected to the transmission assembly, the transmission assembly having a plurality of gears meshingly coupled to drive shafts connected to at least two side brushes and at least one lower brush;

said side brushes positioned exteriorly of said housing and rotating about generally horizontal axes, and said lower brush extending exteriorly of said housing and rotating about a generally vertical axis;

a horizontal scraper bar attached to and extending from the rear of said housing;

and means for selectively applying power to said motor to cause rotation of said brushes, whereby bottom and side portions of a boot or shoe may be effectively cleaned by placing said boot or shoe into contact with said rotating brushes.

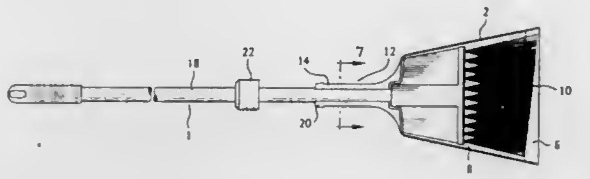
5,839,145
DUSTPAN BROOM COMBINATION

Robert E. Petner, Burlington, N.J., assignor to Quickie Manufacturing Corp., Cinnaminson, N.J.

Filed Jul. 7, 1998, Ser. No. 112,063

Int. Cl.^{6} A46B *15/00*

U.S. Cl. 15—105 **8 Claims**



1. A dustpan broom cleaning tool comprising:

(1) a broom comprising:
  (a) a handle with a polygonal shaped broom head with bristles at one end and a user end; and
  (b) dustpan attachment means secured to and located around the handle for maintaining a dust pan in a fixed position on the handle, said dustpan attachment means having a cavity, interior and exterior surfaces, and detent means which extend from the interior surface into the cavity; and

(2) a dustpan comprising:
  (a) a shovel section at one end configured in substantially the same shape as the broom head;
  (b) a resilient extended section at the other end of the dustpan slideably mounted on the handle, said extended section comprising means to maintain the dustpan fixed in a position of substantial alignment with and covering the broom head when the tool is not in use; and
  (c) dustpan locking means which extend outward from and substantially around the extended section of the dustpan for engagement with the detent means of the dustpan attachment means when the dustpan is slid along the handle from its non-use position toward the user end, whereby when the detent means and dustpan locking means are engaged, the broom head bristles are substantially uncovered and the dustpan is locked in position on the handle.

5,839,146
BACK CLEANING BRUSH

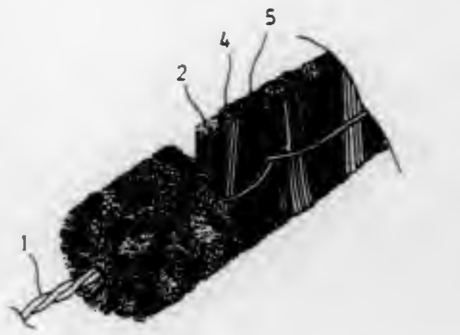
Kuo-Chin Chen, 2-1 Fl., No. 18, Alley 47, Lane 208, Jui An Street, Ta An District, Taipei, Taiwan

Filed Dec. 17, 1997, Ser. No. 992,207

Int. Cl.^{6} A47K *7/02;* **A46B** *3/18*

U.S. Cl. 15—114 **3 Claims**

1. A back cleaning brush comprising two steel wires and a large number of equal-length general brush hairs and equal-length absorbent foam rubber strips positioned between said two steel wires, the length of said foam rubber strips being substantially equal to that of said brush hairs; said two steel wires being spirally twisted together, causing said brush hairs and, said foam rubber strips to be tightly and fixedly clamped in place between said two twisted steel wires with said foam strips dispersed among the brush hairs along the length of said steel wires with two ends of said brush hairs and said foam rubber strips evenly and radially extending outward from said twist steel wires.



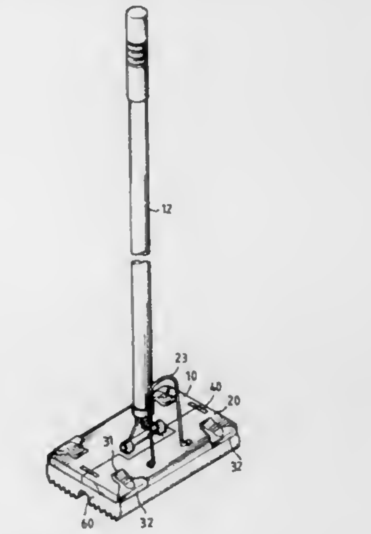
5,839,147
MOPPING DEVICE WITH REPLACEABLE CLEANING MEMBER

Hsieh Chia-Yi, No. 357-2, Chung Hua Road, Wu-Chi Chen, and Chen Chin-Chu, No. 23, Alley 33, Lane 24, Sec 3, Chung Yang Road, Lung-Ching Hsiang, both of Taichung Hsien, Taiwan

Filed Dec. 19, 1997, Ser. No. 994,947

Int. Cl.^{6} A47L *13/14;13/20*

U.S. Cl. 15—119.2 **5 Claims**



1. A mopping device comprising:

a first part having a tongue extending from an inner side thereof which has two first slots defined therein, two first lugs disposed at an upper surface thereof, a handle pivotally connected to said upper surface of said first part;

a second part having a recessed portion defined in an upper surface thereof so as to receive said tongue therein and two second slots defined in an inner side thereof, two second lugs disposed at said upper surface thereof;

two connecting members respectively received in said first slots and said second slots so as to pivotally connect said first part and said second part;

said first part having a torsion spring disposed at an underside thereof, said torsion spring having two legs respectively contacting against said first part and said second part so as to maintain said first part and said second part connected to each other along said respective inner sides thereof, and

said first part having a clamping member pivotally disposed at said first lugs with a link member pivotally connected therebetween, said second part having a clamping member pivotally disposed at said second lugs with a link member pivotally connected therebetween, and said clamping members being adapted to releasably secure a cleaning member.

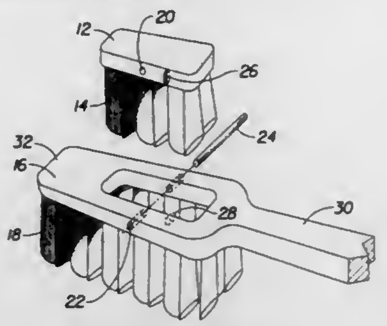
5,839,148
TOOTHBRUSH WITH BOTH STATIONARY AND MOVING TUFTS

Daniel W. Volpenhein, Mason, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 17, 1997, Ser. No. 839,829

Int. Cl.^{6} A46B *7/06;9/04*

U.S. Cl. 15—167.1 **5 Claims**



1. A toothbrush comprising:

(a) an elongated handle having a head at one end and bristles affixed to the head; and

(b) the head having a stationary portion and a moveable portion, wherein the moveable portion is surrounded by the stationary portion and is connected to the stationary portion by a pin extending through a pin hole which extends laterally through the width of the moveable portion and through a pair of aligned pin holes positioned laterally through the width of the stationary portion, such that the moveable portion is pivotally secured within the stationary portion by said pin wherein the bristles are bundled together in tufts, the tufts being affixed to the head, the stationary portion including stationary portion tufts and the moveable portion including moveable portion tufts.

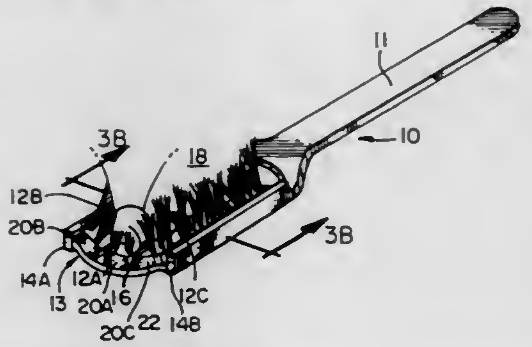
5,839,149
TOOTHBRUSH WITH RESILIENT FLEXIBLE BRISTLE SUPPORT

Paul A. Scheier, and Luise E. Scheier, both of 220 Central Park South, New York, N.Y. 10019

Filed Aug. 26, 1996, Ser. No. 702,982

Int. Cl.^{6} A46B *9/01*

U.S. Cl. 15—167.2 **16 Claims**



1. A toothbrush comprising:

a flexible member formed for resilient flexure between a first shape and a second shape, said flexible member having first and second sides and a central bristle support portion disposed between first and second outer bristle support portions, said bristle support portions being formed of a substantially rigid material, said flexible member also having an elastic portion

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interconnecting said central bristle support portion to said first and second bristle support portions along lateral edges thereof;
- a pair of support members for supporting said flexible member at the first and second sides thereof such that said flexible member is free to flex between said first and second shapes when stressed;
- an array of first bristle tufts attached to said central bristle support portion;
- a first array of second bristle tufts attached to the first outer bristle support portion and aligned in parallel relation to said first bristle tufts; and
- a second array of second bristle tufts attached to the second outer bristle support portion and aligned in parallel relation to said first bristle tufts;
- said second bristle tufts being longer than said first bristle tufts and being unconstrained from inclining relative to said array of first bristle tufts;
- wherein said first and second arrays of second bristle tufts are dimensioned and positioned relative to said array of first bristle tufts such that when the first bristle tufts are pressed against the biting surface of a tooth, said flexible member is caused to change its size and shape whereby said first and second arrays of second bristle tufts are caused to incline toward the array of first bristle tufts such that, simultaneously with the first bristle tufts engaging the biting surface of the tooth, said first and second arrays of second bristle tufts contact the inner and outer sides respectively of the tooth and adjacent gums.

5,839,150

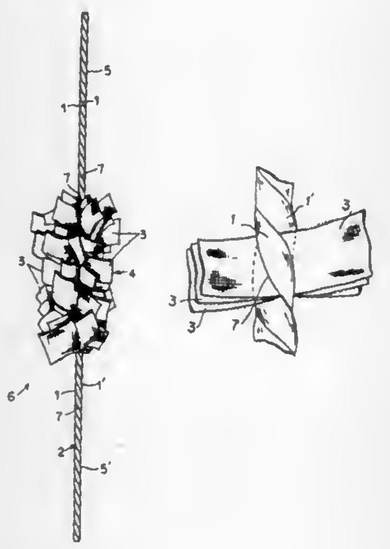
BRUSH

Atsushi Miyaoka, 22-15-1010, Oji 1-chome, Kita-ku, Tokyo 114, Japan

Filed Jul. 23, 1997, Ser. No. 899,360

Int. Cl.^{6} A47L *13/10*

U.S. Cl. 15—209.1 **2 Claims**



1. A brush comprising:
- a plurality of core elements twisted together to form a core; and
- a plurality of brush elements tightly held in caps between the twisted core elements, each said brush element held in each said gap being a plurality of elongated cloth pieces stacked together, wherein said elongated cloth pieces are made of a fabric of ultra-fine fibers which are woven to make loops.

5,839,151

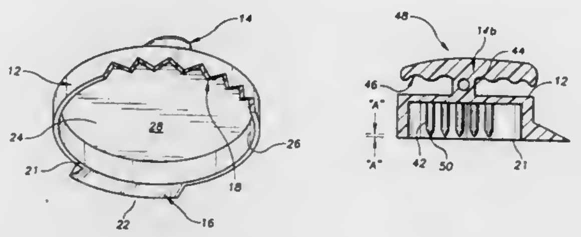
ICE SCRAPING AND SNOW REMOVAL TOOL

Everette Lee Whaley, 3191 Gail Ct., Lithl Springs, Ga. 30057

Filed May 27, 1997, Ser. No. 864,048

Int. Cl.^{6} A47L *13/02*

U.S. Cl. 15—236.05 **20 Claims**



17. An ice scraping and snow removal tool comprising:
- a cap shaped main body defining a cavity and having a main body rim defining an edge;
- a handle extending from an outwardly facing surface of said main body;
- a radially extending scraper edge portion that extends radially from an edge portion of said main body rim;
- a plurality of serrated ice breaking teeth formed into said rim of said main body; and
- a plurality of ice breaking spikes that extend downwardly from a top cavity defining surface of said ice scraping and snow removal tool to a predetermined point above said rim edge of said cap shaped main body;
- said main body being formed from a plastic that is sufficiently bendable to allow a force placed onto said handle to deform said main body sufficiently to cause tip ends of said ice breaking spikes to move toward a plane defined by said rim edge of said cap shaped main body.

5,839,152

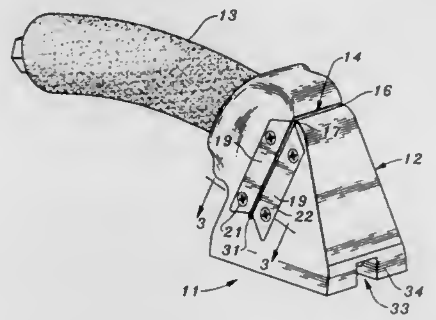
APPARATUS FOR CLEANING TROWEL BLADES

Stephen L. Kruskamp, Fair Oaks, Calif., assignor to Gene H. Howard, Orangevale, Calif., a part interest

Filed Dec. 2, 1996, Ser. No. 759,330

Int. Cl.^{6} A47L *13/02;* **B05C** *17/10*

U.S. Cl. 15—236.06 **35 Claims**



1. An apparatus for cleaning adhesive and debris from an edge of a trowel blade having a thickness, comprising:
- a. a body having an elongated slot extending through at least a portion of said body, said slot having a blade entry side, a blade exit side, and a lower edge extending therebetween; and,
- b. a pair of opposing, co-planar, cleaning blades rigidly mounted on said entry side, on either side of said slot, said blades being arranged in spaced relation a distance slightly greater than the thickness of the trowel blade.

5,839,153

WINDSHIELD WIPER SYSTEM FOR VEHICLES

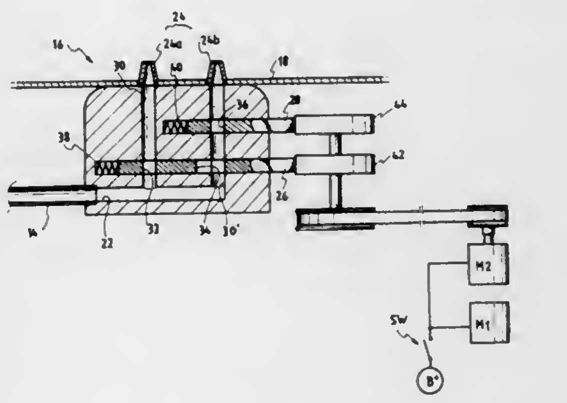
Sungchul Ahn, Ansan, Rep. of Korea, assignor to Hyundai Motor Company, Seoul, Rep. of Korea

Filed Dec. 30, 1996, Ser. No. 773,940

Claims priority, application Rep. of Korea, Dec. 28, 1995, 1995-61918

Int. Cl.^{6} B60S *1/46*

U.S. Cl. 15—250.02 **11 Claims**



1. A windshield wiper system which controls the injection of washer fluid onto a windshield in accordance with movement of a wiper arm, comprising:
- a wiper motor having a rotary power output;
- means for wiping a windshield by receiving the rotary power from the wiper motor, said wiping means including a wiper arm;
- means for injecting washer fluid on the windshield, said injection means including a nozzle through which pressurized fluid is injected and;
- means for controlling the timing of injection of washer fluid on the windshield comprising,
  - a washer fluid control motor operated concurrently with the wiper motor and having a rotary power output, said fluid control motor adapted to be operated by battery power,
  - a nozzle body having a passage connected to the nozzle,
  - a washer fluid interrupter for selectively opening and closing the passage leading to the nozzle, and
  - means for converting the rotary power of the washer fluid control motor into a rectilinear movement of the washer fluid interrupter so that the washer fluid interrupter can open and close the passage according to the rectilinear movement of the washer fluid interrupter.

5,839,154

CHEWING GUM REMOVER

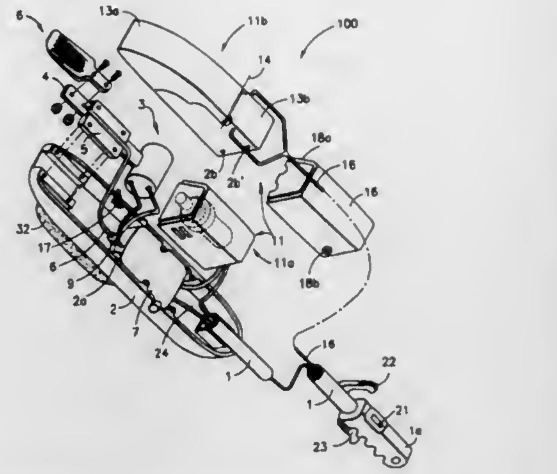
Yuzo Kawai; Katsutoshi Naramura, and Yoshihide Takahashi, all of Nara-ken, Japan, assignors to Suiden Co., Ltd., Japan

Filed Nov. 28, 1995, Ser. No. 563,495

Int. Cl.^{6} A47L *5/30*

U.S. Cl. 15—320 **13 Claims**

1. A gum removal machine, comprising:
- a frame;
- a scraper extending from said frame;
- means in said frame for reciprocating said scraper with respect to said frame;
- said scraper having an outer end shaped for removal of adhered material from a surface;
- a container;
- means for moving pieces of material loosened by said scraper into said container;
- said means for moving mounted on said frame;
- a tank, mounted on said frame; and
- means for discharging a liquid from said tank to said outer end, whereby loosening of said adhered material is facilitated.



5,839,155

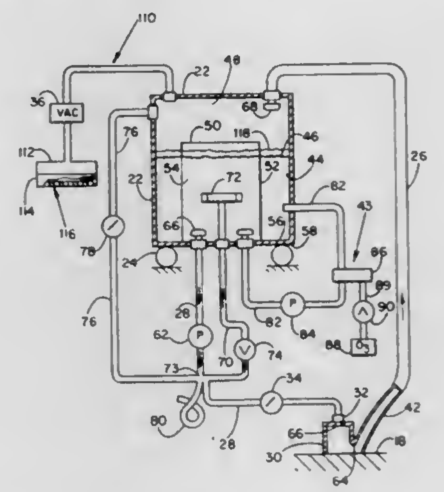
CONTINUOUS FLOW CLEANING SYSTEM WITH OZONE INJECTION

Edward D. Berglund, Maplewood; Sung K. Cho, Roseville, and Lowell H. Schiebe, Corcoran, all of Minn., assignors to CFR Corporation, New Brighton, Minn.

Filed Jun. 6, 1996, Ser. No. 659,393

Int. Cl.^{6} A47L *11/34*

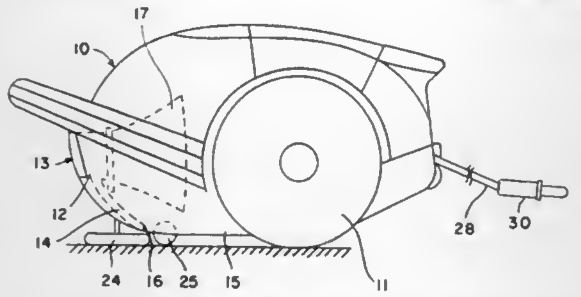
U.S. Cl. 15—321 **33 Claims**



1. A fluid cycling cleaning system, including:
- a reservoir containing a liquid cleaning solution;
- a conveying means for moving the liquid cleaning solution into and out of the reservoir, said conveying means including at least a dispensing conduit in fluid communication with the reservoir for conveying the cleaning solution from within the reservoir to an application area outside of the reservoir, and a supply conduit in fluid communication with the reservoir for providing the liquid cleaning solution to the reservoir, wherein the fluid supply conduit includes a recovery segment for conveying the cleaning solution from the application area back to the reservoir;
- wherein the reservoir and conveying means cooperate to provide a fluid pathway for the liquid cleaning solution;
- an ozone source; and
- a coupling means for fluid coupling the ozone source and the fluid pathway, for introducing ozone from the ozone source into the fluid pathway at a selected location along the fluid pathway.

5,839,156
REMOTE CONTROLLABLE AUTOMATIC MOVING VACUUM CLEANER

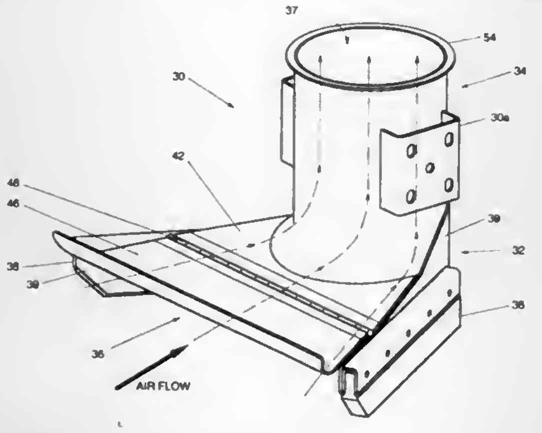
Yi Song Park, and Young Pung No, both of Kwangju, Rep. of Korea, assignors to Kwangju Electronics Co., Ltd., Kwangju, Rep. of Korea
Filed Dec. 18, 1996, Ser. No. 769,807
Claims priority, application Rep. of Korea, Dec. 19, 1995, 1995-52127
Int. Cl.^{6} A47L *9/00*
U.S. Cl. 15—339 **20 Claims**



1. A remote controllable automatic moving vacuum cleaner comprising:
- a vacuum cleaner body having an intake port;
- a means for intaking dust into the vacuum cleaner body through the intake port;
- a means for propelling the vacuum cleaner body across a floor;
- a wheel rotatably attached to the vacuum cleaner body for contacting the floor and enabling the vacuum cleaner body to be propelled across the floor, wherein the vacuum cleaner body moves forward or backward relative to the floor when the wheel rotates forward or backward relative to the body;
- a powered steering mechanism for moving the wheel leftward or rightward relative to the vacuum cleaner body to steer the vacuum cleaner body leftward or rightward relative to the floor when the vacuum cleaner body is propelled across the floor; and
- a means for controlling the powered steering mechanism at a remote distance.

5,839,157
STREET SWEEPER PICK-UP HEAD

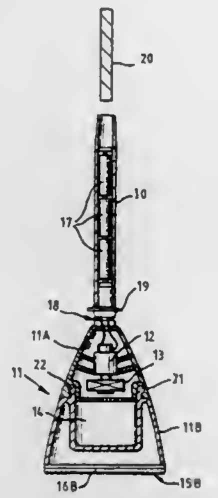
Daniel P. Strauser, Elgin, Ill., and Robert E. Field, Newark, Ohio, assignors to Elgin Sweeper Company, Elgin, Ill.
Filed May 6, 1996, Ser. No. 642,196
Int. Cl.^{6} E01H *1/08*
U.S. Cl. 15—347 **15 Claims**



1. A street sweeper comprising:
- a chassis,
- a collection hopper mounted to the chassis for receiving debris through a suction tube,
- a fan for generating a vacuum in the hopper and suction tube,
- a vacuum pick-up head in communication with the suction tube, the pick-up head having a nozzle assembly, the nozzle assembly having an upper section, a suction chamber in communication with the upper section, and an outlet in the upper section in communication with the suction tube, said suction chamber and upper section having respective internal cross sections,
- the suction chamber having an inlet at the front of the suction chamber in proximity with the ground, two converging sides, a top side, and an upwardly extending arcuate rear wall which translates into the upper section such that the areas of the respective internal cross sections of the suction chamber and the upper section remain substantially the same.

5,839,158
SWEEPING BROOMS

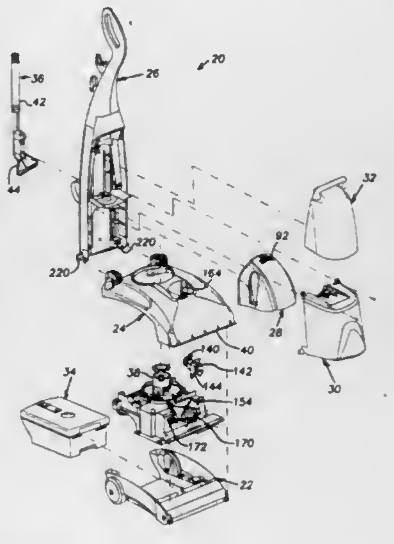
Andreas Schupp, and Timmy Hok Yin Sin, both of New Territories, Hong Kong, assignors to Techtronic Industries Co., Ltd., Hong Kong
Filed Feb. 4, 1997, Ser. No. 795,416
Claims priority, application United Kingdom, Feb. 7, 1996, 9602422; May 16, 1996, 9610290
Int. Cl.^{6} A47L *5/28*
U.S. Cl. 15—350 **3 Claims**



1. A combined vacuum cleaner and broom device comprising a hollow elongate handle having a longitudinal axis extending to a housing at one end, said housing further comprising:
- an electric motor, a fan and a dust collecting compartment, two lines of bristles extending across a remote end of said housing, an aperture between said two lines of bristles for passage of dust and debris into said dust collecting compartment, said handle having a battery compartment inside said handle extending along the length of said handle for holding batteries to power said motor; and
- an electric switch electrically connecting said motor to said batteries, said switch having an operating disc extending externally around said handle and operable by slidable movement parallel said longitudinal axis.

5,839,159
WET EXTRACTOR SYSTEM

Richard Karr, Wapella; David Erickson; Kevin Genge, both of Normal; William Hanold, Bloomington; Gregory Luebbering, Heyworth, and William Phelan, Normal, all of Ill., assignors to White Consolidated Industries, Inc., Cleveland, Ohio
Division of Ser. No. 588,438, Jan. 18, 1996, Pat. No. 5,784,755. This application Sep. 8, 1997, Ser. No. 924,926
Int. Cl.^{6} A47L *7/00*
U.S. Cl. 15—355 **8 Claims**

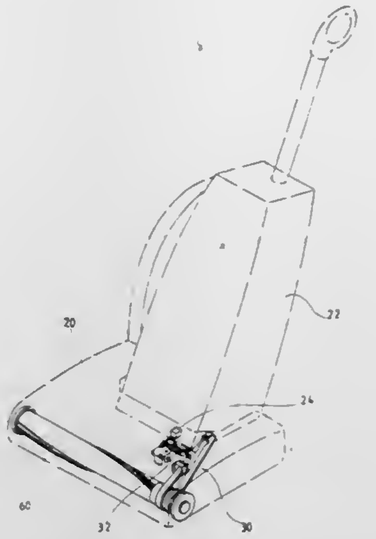


1. A wet extractor comprising:
- a base assembly forming an internal cavity;
- a suction fan attached to said base assembly above said cavity, said suction fan having an inlet;
- a hood assembly secured over said base assembly and defining a floor suction nozzle having an outlet; and
- a liquid recovery tank slidably received in said cavity and having an inlet in fluid communication with said outlet of said floor suction nozzle and an outlet in fluid communication with said inlet of said suction fan.

5,839,160
CLUTCH CONTROL MECHANICAL DEVICE FOR THE BRUSH AXLE OF A VACUUM CLEANER

Chieh-Chun Wang, and Chia-Ming Lin, both of Taichung, Taiwan, assignors to Kinergy Industrial Co., Ltd., Taichung, Taiwan
Filed Feb. 21, 1997, Ser. No. 804,347
Int. Cl.^{6} A47L *9/00*
U.S. Cl. 15—390 **6 Claims**

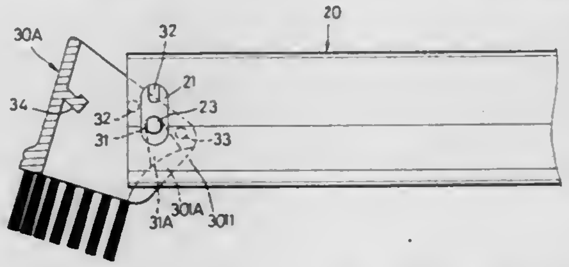
1. A clutch mechanism for a vacuum cleaner having an undercarriage with a rotatable brush axle connected to an endless belt that is movable between driving and non-driving positions, and an upper body movably attached to the undercarriage so as to be movable between an upright position and an oblique position, the clutch mechanism comprising:
- a) a pressure control shaft movably connected to the undercarriage and in contact with the upper body so as to move between first and second positions as the upper body moves between the upright and oblique position;
- b) a belt mount member pivotally connected to the undercarriage and having a portion engaging the endless belt whereby pivoting movement of the belt mount member moves the endless belt between the driving and non-driving positions;
- c) a spring acting on the belt mount member so as to bias the belt mount member toward a position in which the endless belt is in the driving position;



- d) a first pivoting plate in contact with the pressure control shaft whereby movement of the pressure control shaft causes pivoting movement of the first pivoting plate; and,
- e) a second pivoting plate connected to the first pivoting plate and to the belt mount member, whereby when the upper body is in the upright position the endless belt is in the non-driving position and when the upper body is in the oblique position, the endless belt is in the driving position.

5,839,161
SUCTION PIPE ASSEMBLY FOR A VACUUM CLEANER

Wen-Tsung Liang, Feng-Yuan, Taiwan, assignor to Choung Cheng Industrial Co., Ltd., Taichung Hsien, Taiwan
Filed May 28, 1997, Ser. No. 864,071
Int. Cl.^{6} A47L *9/06*
U.S. Cl. 15—398 **4 Claims**



1. A suction pipe assembly for a vacuum cleaner, comprising:
- a pipe body having a distal open end portion;
- a brush member including:
  - a brush base which has a generally U-shaped cross section, a rear section that straddles said distal open end portion of said pipe body and that has opposite lateral side portions pivoted respectively to two diametrically opposite positions of said distal open end portion of said pipe body, and a front section with a distal front end face; and
  - a plurality of bristles provided on said front end face of said front section;
- said brush base being pivotable with respect to said distal open end portion of said pipe body between a position of use, wherein said front section of said brush base extends frontwardly relative to said distal open end portion of said pipe body, and a storing position, wherein said front section of said brush base straddles said pipe body; and
- retaining means for retaining releasably said brush base on the pipe body at said position of use and said storing position.

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5,839,162

Patent Not Issued For This Number

5,839,163
GRIP-SHELL ARRANGEMENT

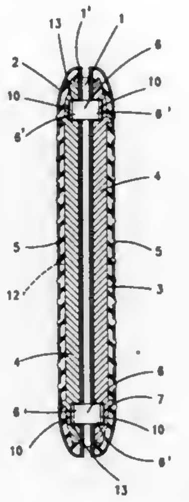
Reiner Hellmann, Holz, Germany, assignor to Vereinigte Stahlwarenfabrik Gebr. Richartz & Söhne GmbH, Solingen, Germany

Filed Feb. 20, 1997, Ser. No. 802,725

Claims priority, application Germany, Feb. 21, 1996, 296 03 009.0; May 8, 1996, 296 08 322.4

Int. Cl.⁶ A47B *95/02*

U.S. Cl. 16—111 R **13 Claims**



1. A grip-shell arrangement for a utensil said arrangement having a housing, a housing wall of which is covered by at least one shell, each shell having a plurality of openings through which there extend plastic knobs of a plastic core which is located in a hollow space of the shell and constitutes a connecting member between the shell and the housing wall, wherein the plastic core has two regions of different hardness, the knobs being associated with a soft one of the regions, and a hard one the regions being located between the soft region and the housing wall to enable an attachment of the core to the housing.

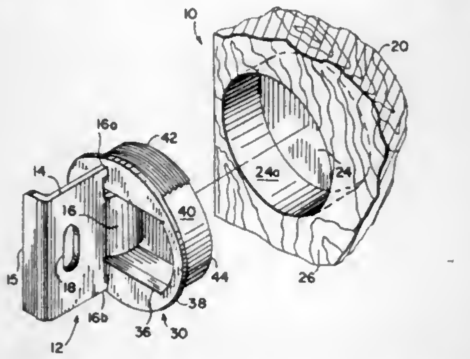
5,839,164
CABINET HINGE WITH PRESS-IN MOUNTING CUP

David R. Cress, Janesville, Wis., and Stephen M. Purcell, Loves Park, Ill., assignors to Newell Operating Company, Freeport, Ill.

Filed Mar. 5, 1996, Ser. No. 610,864

Int. Cl.⁶ E05D *5/02*

U.S. Cl. 16—383 **20 Claims**



1. A hinge for mounting a door with a wood grain to a frame, which comprises:

(a) a mounting cup having a substantially rigid and substantially continuous outer perimeter adapted for mounting within a recess formed in the door;

(b) a hinge member for being mounted to the frame and coupled to the mounting cup to allow selective pivotal movement of the door with respect to the frame; and

wherein the outer perimeter of the mounting cup includes a first portion having a first effective outer diameter and a second portion having a second effective outer diameter, the first outer diameter being larger than the second outer diameter, the first portion providing for an interference fit within the recess when the mounting cup is inserted into the recess, the interference fit to provide substantially all holding force between the hinge and the outer door;

further wherein the first portion of the outer perimeter includes circumferential threads oriented to allow the mounting cup to be selectively and rotatably removed from the recess and further wherein the second portion of the outer perimeter does not include circumferential threads, the first portion being positioned such that the circumferential threads are substantially perpendicular to the wood grain of the door.

5,839,165
TEXTILE MACHINE

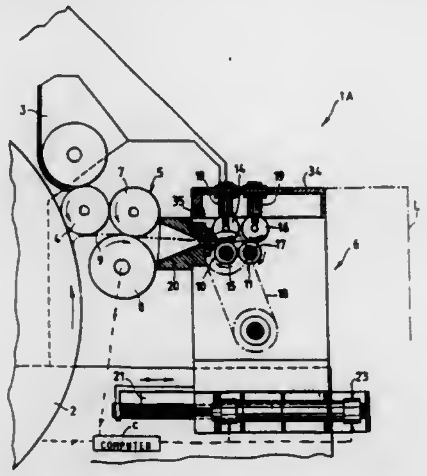
Silvano Patelli; Antonio Cossandl, and Glovanni Battista Pasini, all of Brescia, Italy, assignors to F.LLI Marzoli & C. S.p. A., Bergamo, Italy

Filed Nov. 22, 1996, Ser. No. 755,206

Claims priority, application Italy, Nov. 27, 1995, MI95A2473

Int. Cl.⁶ D01H *5/00*

U.S. Cl. 19—260 **15 Claims**



1. A textile machine (1A–1E) comprising a doffer (2) and a drafting unit (6), said drafting unit (6) being positioned downstream of said doffer (2) with respect to the direction of travel of a fibre web (9) at the operating speed of the textile machine (1A-1E), means (21–23; 29–33) for effecting movement of the drafting unit (6) between a first position (L) coinciding with the maximum distance of the drafting unit (6) from the doffer (2) and a second position coinciding with the minimum distance of the drafting unit (6) from the doffer (2), and means (C) for varying the distance between the drafting unit (6) and the doffer (2) inversely proportional to the operating speed of the textile machine (1A–1E).

5,839,166
CARDING MACHINE AND PROCESS FOR PRODUCING AN AERODYNAMIC CARD WEB

Horst Graute, Coesfeld, Germany, assignor to Spinnbau GmbH, Bremen, Germany

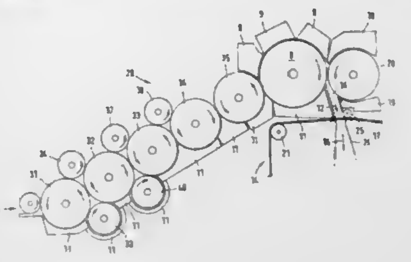
PCT No. PCT/EP95/03088, § 371 Date Feb. 27, 1997, § 102(e) Date Feb. 27, 1997, PCT Pub. No. WO96/06964, PCT Pub. Date Mar. 7, 1996

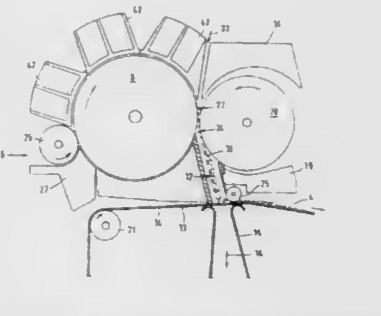
PCT Filed Aug. 3, 1995, Ser. No. 793,668

Claims priority, application Germany, Aug. 27, 1994, 44 30 500.1

Int. Cl.⁶ D01G *21/00*

U.S. Cl. 19—304 **16 Claims**





1. A card apparatus for producing an aerodynamically formed fibrous web, the apparatus including a fiber feed means, a main cylinder rotating at high speed, and a shaft situated adjacent said main cylinder, said shaft transporting thrown-off fibers in an air flow flowing downstream to an air-permeable web transport means and disposing of said fibers on said web transport means in the form of a fibrous web, the improvement comprising a second cylinder parallel and adjacent the main cylinder and rotating at high speed in opposite sense to said main cylinder, where said main cylinder throws off said fibers at a first location into said shaft and thence onto said second cylinder generating a random orientation of said fibers on said second cylinder, and said second cylinder throws off by centrifugal forces said fibers which have been rotated circumferentially from said first location into said airflow at a second location of said shaft spaced downstream from said first location and thence out.

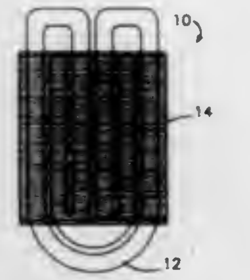
5,839,167
ARTICLE CARRYING CLIP

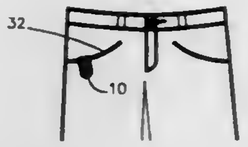
Scott J. Wagner, 1210 Avenue F, Fort Madison, Iowa 52627

Filed Apr. 24, 1995, Ser. No. 427,744

Int. Cl.⁶ A44B *21/00*

U.S. Cl. 24—3.7 **8 Claims**





1. An article carrying clip for releasable attachment to a free edge of an article of clothing of a user and for carrying an article adapted for releasable attachment to hook and loop fastening material, comprising;

(a) a clip having a pair of opposing side members and an inner section nested between said pair of opposing side members;

(b) a strip of hook and loop fastening material formed into a loop and positioned over said opposing side members wherein said opposing side members of said clip are enclosed within said loop of hook and loop fastening material and wherein said inner section of said clip is located outside of said loop of said hook and loop fastening material such that the operative face of said hook and loop fastening material faces away from said clip; and

(c) means securing said loop of hook and loop fastening material to said clip, whereby said clip is releasably slidably attached to the free edge by inserting the free edge between said inner section and said loop of hook and loop fastening material such that the article can be manually pressed onto said operative face where it is retained until manually pulled therefrom by the user.

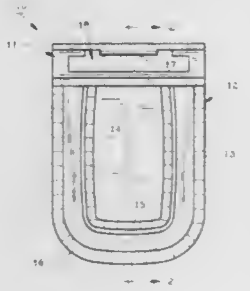
5,839,168
CLIP FOR HOLDING WRITING INSTRUMENTS

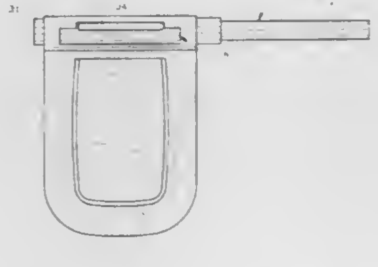
Robert W. Elkins, Oak Ridge, N.C., assignor to Grand Ideas, Inc., Greensboro, N.C.

Filed Jul. 7, 1997, Ser. No. 888,635

Int. Cl.⁶ A45F *5/00;* B43K *25/00*

U.S. Cl. 24—11 S **14 Claims**





1. A clip for a writing instrument comprising: means to releasably retain said clip on a planar surface, and a writing instrument holder, said instrument holder attached to said retaining means, said writing instrument holder defining a slot, said slot including a shorter upper length and a longer lower length.

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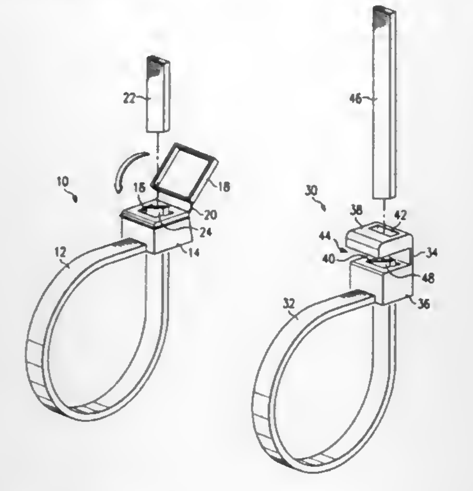
5,839,169
CABLE TIE WITH SAFETY GUARD

John B. Edwards, Dallas, and Kenneth M. Draganski, Rowlett, both of Tex., assignors to DSC Telecom L.P., Plano, Tex.

Filed Jul. 28, 1997, Ser. No. 901,775

Int. Cl.^{6} B65D *63/00*

U.S. Cl. 24—16 PB **4 Claims**



1. A cable tie comprising:
a tie portion;
a head portion connected to the tie portion, the tie portion operable to insert into a slot of the head portion and extend through the head portion; and
a safety guard fixedly connected to the head portion, the safety guard operable to provide sufficient room to allow for removal of an excess end of the tie portion extending through the head portion, the safety guard operable to enclose a remaining end of the tie portion.

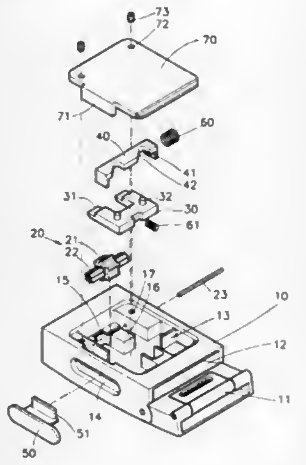
5,839,170
BELT BUCKLE

Hua-Jen Cho, No. 6 Alley 6, Lane 313, Chang-Ane St., Lu-Chou City, Taipei Hsien, Taiwan

Filed Dec. 17, 1997, Ser. No. 992,455

Int. Cl.^{6} A44B *11/02*

U.S. Cl. 24—163 R **8 Claims**



1. A belt buckle comprising:
a main body having a belt end fixing means provided at one end of said main body for holding an end of a belt, a passage formed behind a front surface of said main body for another end of said belt to thread through, and a chamber for receiving other components of said buckle therein;
a ratchet wheel including a plurality of stop teeth around two side portions and a plurality of pressing teeth around a middle portion of said ratchet wheel;
a brake member being mounted in said chamber of said main body;
a push plate being transversely mounted to one surface of said brake member and being pushed by a first spring toward a top wall of said chamber;
a push button being mounted in a slot formed on a said top wall of said chamber; and
a back cover being provided at an edge with an inward extended first stop plate and at two corners with threaded holes for screws to thread through and fix said back cover to said main body.

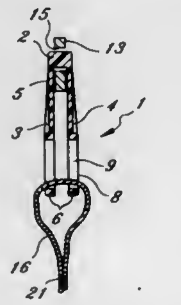
5,839,171
STRAP ANCHORING MEANS

Anthony C. Tyrrell, 1861 SW. 55th Ave., Plantation, Fla. 33317, and Todd A. Tyrrell, 3186 W. Buena Vista Dr., Margate, Fla. 33063

Filed May 15, 1997, Ser. No. 856,760

Int. Cl.^{6} B60R *21/10;* A44C *5/18*

U.S. Cl. 24—265 BC **9 Claims**



4. An anchor for securing a strap to a panel, the anchor comprising:
a web having two lateral edges and extending continuously from one lateral edge to the other lateral edge;
a first flange having a first end and a free second end;
a second flange having a first end and a free second end;
each flange being attached at the first end to the web such that the flanges are disposed substantially parallel to one another and spaced apart by a first distance;
each flange having said free second end wider than the first end, said second end provided with a loop formed by a transverse aperture in the flange, the aperture having a first width and being located closer to said second end than the first end;
the anchor being adapted to engage an edge of a panel of a thickness about equal to or less than said first distance in which there is a slot, by having said free end of one of the flanges pass through the slot so that the anchor may be removably mounted with the web within the slot and a flange on either side of the panel with the loops extending past the edge of the panel and adapted for receiving therethrough a strap having a width less than said first width.

5,839,172
HOOK STRUCTURE FOR MOLDED SURFACE FASTENER

Toshiaki Takizawa; Keisuke Sakakibara; Mitsuru Akeno; Ryuichi Murasaki, and Tsuyoshi Minato, all of Toyama-ken, Japan, assignors to YKK Corporation, Tokyo, Japan

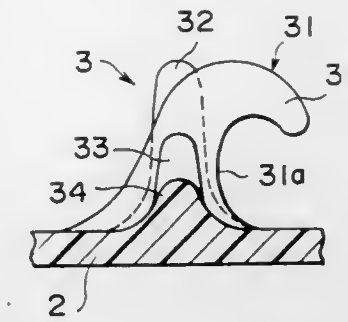
Filed Feb. 21, 1996, Ser. No. 604,579

Claims priority, application Japan, Feb. 28, 1995, 7-039611

Int. Cl.^{6} A44B *18/00*

U.S. Cl. 24—452 **7 Claims**

1. A surface fastener molded of synthetic resin, comprising:
(a) a substrate sheet; and



(b) a multiplicity of hook elements molded on at least one surface of said substrate sheet, each hook element having a hook body having a stem and a curved portion;
(c) each of said hook elements having first and second reinforcing ribs projecting from opposite side surfaces of said hook body;
(d) said first reinforcing rib being greater in height than said second reinforcing rib.

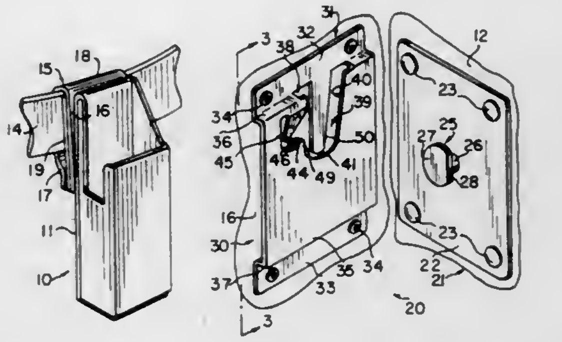
5,839,173
CONNECTOR RELEASABLE IN ONLY ONE ORIENTATION

Edward C. Otrusina, 8118 Nueport Dr. South, Willow Springs, Ill. 60480

Filed Jul. 17, 1997, Ser. No. 895,959

Int. Cl.^{6} A44B *21/00;* A45F *5/00*

U.S. Cl. 24—597 **20 Claims**



1. Apparatus for detachably interconnecting two objects, comprising, in combination:
a female structure adapted to be secured to one of the objects and defining a receptacle and an entrance leading into the receptacle,
a male structure adapted to be secured to the other object and including a shank with an axis and an enlarged head on said shank adapted for movement into and out of said receptacle through said entrance and rotatable about said axis while in said receptacle, and
flexible and resilient wedge structure integral with said female structure and laterally offset to one side of the entrance,
said head being laterally truncated at one side of said axis so that while passing through said entrance in one rotational orientation said head will clear said wedge structure and in all other rotational orientations it will engage said wedge structure,
said wedge structure being normally disposed in a locking position and being yieldably movable to a release position accommodating passage of said head into said receptacle through said entrance,
whereby said head can be inserted into the receptacle in any rotational orientation and removed from said receptacle in only said one rotational orientation.

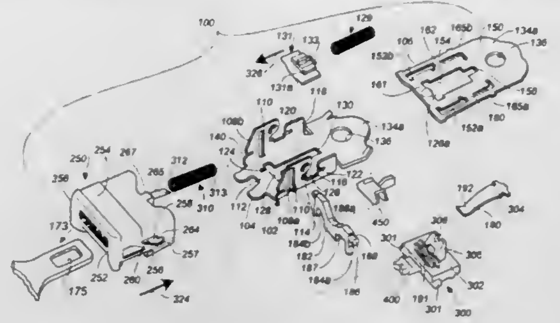
5,839,174
SEAT BELT BUCKLE

Tony Chamings, Royal Oak; Rudi Grzic, Sterling Heights, both of Mich., and Harjeet Gill, Windsor, Canada, assignors to Breed Automotive Technology, Inc., Lakeland, Fla.

Filed Jun. 13, 1997, Ser. No. 874,998

Int. Cl.^{6} A44B *11/26*

U.S. Cl. 24—633 **6 Claims**



1. A seat belt buckle (**100**) comprising:
a frame (**102**) having a tongue receiving opening (**170**) to receive a tongue (**173**) as the tongue is moved in a first direction, a latch member (**180**) arranged to move from a latched position to an unlatched position, an ejector (**129**) to eject the tongue when the latch member is in its unlatched position,
an electronic sensor assembly (**400**) located upon the frame (**102**) comprising a magnetic sensor and a spaced magnet,
a metal bar (**460**) supported on one of the latch member (**180**), the ejector (**131**) and a pivot member (**500**) and movable into position between the sensor and the magnet.

5,839,175
BUCKLING DEVICE WITH ELASTIC UNLOCKING CAPABILTY

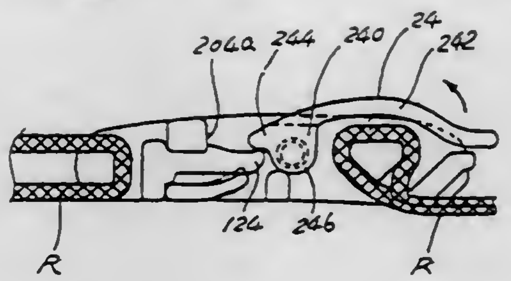
Chih-Jay Lin, Tao-Yuan, Taiwan, assignor to Taiwan Industrial Fastner Corporation, Taipei, Taiwan

Filed May 19, 1997, Ser. No. 858,569

Claims priority, application Taiwan, Sep. 3, 1996, 85213553

Int. Cl.^{6} A44B *11/00:11/25*

U.S. Cl. 24—636 **7 Claims**



1. A buckling device used in conjunction with a strap for fastening an object in position, comprising:
a male fastener, which includes:
a strap-mounting body for fixing a first end of the strap thereto; and
a tongue-like member formed on the strap-mounting body and with an engaging portion; and
a female fastener for engaging with said male fastener, which includes:
a female fastener body having a hollowed inside and formed with an insertion hole;
a locking/releasing piece pivotally mounted on said female fastener body, said locking/releasing piece being formed with a handle portion for a user to operate said locking/releasing piece and a locking portion;

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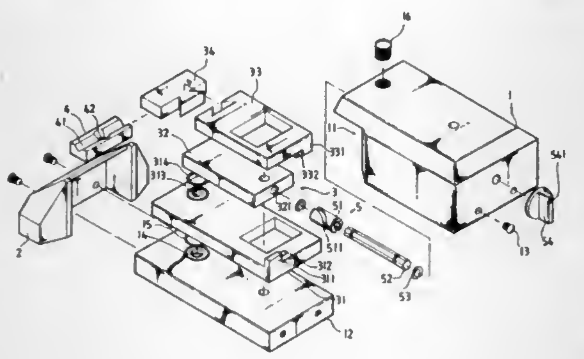
said tongue-like member being arranged to abut said locking portion, thereby maintaining said locking portion in a locking position;

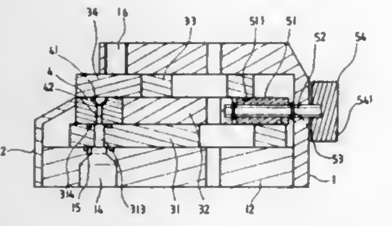
an elastic piece, provided at an entrance defined by the insertion hole, said elastic piece being elastically bent when said tongue-like member is inserted into said insertion hole; and

a strap-mounting bar, mounted inside said female fastener body, for fastening a second end of the strap thereto.

5,839,176
TEXTILE YARN HANGING AND BLOWING NOZZLE STRUCTURE

Sue-Ping Lin, 8F-2, No. 188, Ta Tung Road, Shan Hsia Town, Taipei Hsien, Taiwan
Filed Nov. 4, 1997, Ser. No. 964,202
Int. Cl.⁶ D02G *1/16*
U.S. Cl. 28—272 **8 Claims**





1. A type of textile yarn blowing nozzle structure, comprising:

a hollow housing, one side of said housing having an opening, at the opening being fixed a cover which does not completely seal the opening;

a fixed block, the block being fixed onto the housing by a fixing component, a through air inlet on one side of said fixed block near the opening of the housing, the air inlet for communicating with an outside compressed air equipment for receiving compressed air into the inlet;

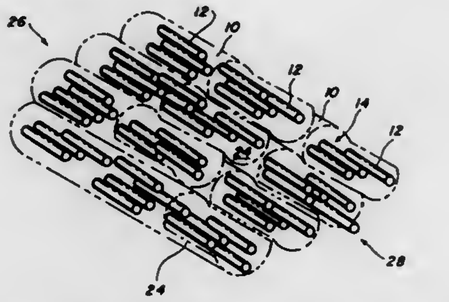
a slide mechanism located inside the housing, said slide mechanism comprising a first slide block having a movable through air channel, said air channel being aligned and communicating with the air inlet on the fixed block, a middle plate on top of the first slide block, the middle plate being slightly smaller than the first slide block, and a movable second slide block on top of the middle plate;

a block piece fitted between the first slide block and the second slide block, the block piece on the same side with the air channel of the first slide block, a V-channel on the block piece, the V-channel having a through air hole, said air hole communicating with the air channel on the first slide block, so that textile yarns may be hanged onto the V-channel of the block piece;

a driving mechanism, being located at the side of the housing and spaced from the block piece, and joined respectively with the first slide block and the second slide block, said driving mechanism serving to drive the first slide block and the second slide block inside the housing to move in opposite directions; and whereby before blowing air onto the yarns, the yarns are hanged onto the V-channel on the block piece, and the driving mechanism will drive the first and the second slide blocks to move in opposite directions, so that the air inlet, the air channel and the air hole are aligned to and communicating with the air hole on the block piece, while the block piece is obstructed by the second slide block, so that the compressed air will be blown directly onto the yarns.

5,839,177
PNEUMATIC ROD LOADING APPARATUS

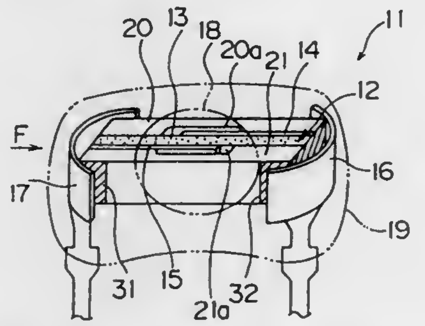
Chulho Kim, Burke, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Aug. 3, 1995, Ser. No. 510,633
Int. Cl.⁶ H01L *41/22*
U.S. Cl. 29—25.35 **9 Claims**



1. An article comprising elongated tubular members secured to each other, said tubular members having support surfaces disposed parallel to each other and arranged in courses; said support surfaces in a course being arranged in a first plane, having upstream and downstream ends with the downstream ends aligned in a second plane disposed perpendicularly to the disposition of said support surfaces, and have a force component that is perpendicular to the disposition of said support surfaces; and loading sections at upstream location of said support surfaces that are open from one direction.

5,839,178
METHOD OF MAKING A ENERGY-TRAPPED TYPE PIEZOELECTRIC RESONATOR

Ryuhei Yoshida, and Tsuneo Amano, both of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan
Division of Ser. No. 541,906, Oct. 10, 1995, abandoned, which is a continuation of Ser. No. 189,722, Jan. 31, 1994, abandoned. This application Feb. 4, 1997, Ser. No. 795,701
Claims priority, application Japan, Feb. 1, 1993, 5-037573; Feb. 1, 1993, 5-037574
Int. Cl.⁶ H01L *41/22*
U.S. Cl. 29—25.35 **6 Claims**



1. A method of manufacturing an energy-trapped type piezoelectric resonator, comprising the steps of:

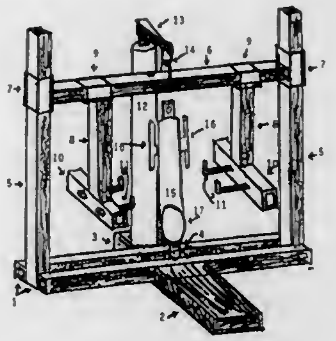
preparing a mother piezoelectric resonance element having a mother piezoelectric plate and a pair of mother resonance electrodes being formed on opposite major surfaces of said mother piezoelectric plate to be partially opposed to each other through said mother piezoelectric plate for defining a resonance part;

pasting a pair of mother reinforcing members, being provided with a cavity in a portion corresponding to said resonance part of said mother piezoelectric resonance element, onto both major surfaces of said mother piezoelectric resonance element, thereby integrating the former with the latter; and

slicing up said pair of mother reinforcing members and said mother piezoelectric resonance element being integrated with each other.

5,839,179
BUNGEE LOADER

David J. Parker, P. O. Box 382, Tok, Ak. 99780
Filed Feb. 27, 1995, Ser. No. 394,515
Int. Cl.⁶ B23P *19/02*
U.S. Cl. 29—235 **5 Claims**



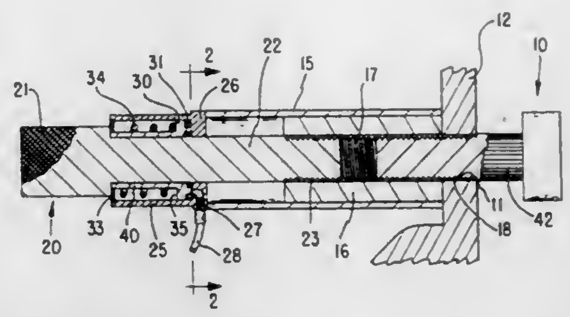
15 = Hydrasorb Piper part #12990-00

1. A bungee loader having: a base; a hydrasorb attach means fixed on the base;

two guide posts extending vertically up from the base; a cross arm extending between and sliding on the guide posts; two loose tolerance cross arm slideable sleeves attached to the cross arm ends and mounted on the respective guide posts; two lift arms attached to and descending down from the cross arm; two loose tolerance slideable lift arm sleeves attached to each lift arm and mounted on the cross arm; a hook arm attached to each lift arm; two hooks horizontally attached to each hook arm; a link chain adjustable connection means from the cross arm to a connecting bracket; and a self-contained hydraulic jack mounted at one end on the base platform and the other end to said connecting bracket and operable to move the cross arm vertically to expand a bungee.

5,839,180
STUD INSTALLER FOR WHEEL STUDS

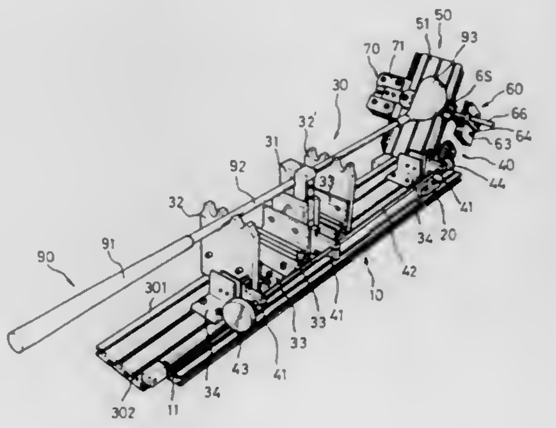
John E. Hochmiller, Hudson, Colo., assignor to Hudson Enterprizes, Inc., Hudson, Colo.
Filed Dec. 19, 1996, Ser. No. 807,114
Int. Cl.⁶ B23P *19/04*
U.S. Cl. 29—252 **8 Claims**



1. A tool for installing studs into a hole in a metal plate such as a truck hub, said tool comprising a guide adapted to engage one surface of said metal plate, connecting means slidable engaging said guide for keeping the movement of said connecting means substantially perpendicular to said surface, puller means for pulling said connecting means slidable within said guide, said connecting means engageable with said stud, said puller means extending in a direction away from said surface, and powered means engaging said puller means for forcing said puller means to pull said connection means within said guide in a direction away from said surface whereby said stud is pulled into said hole in said plate.

5,839,181
JIG BENCH FOR FACILITATING ASSEMBLY OF A GOLF CLUB

Anna C.H. Chu, 5th Fl.-1, No. 2, Lane 8, Linchuan St., Lingya Dist., Kaohsiung, Taiwan
Filed Dec. 10, 1996, Ser. No. 762,774
Int. Cl.⁶ B25B *27/14*
U.S. Cl. 29—281.5 **8 Claims**



1. A jig bench for facilitating the assembly of a golf club having a head, a shaft and a grip, comprising:

- a base;
- a shaft accommodating portion, comprising:
  - a first bed pivotably connected to the base;
  - a first clamping means mounted on the first bed for clamping the shaft of the golf club; and
  - a supporting means mounted on the first bed for supporting the shaft of the golf club;
- a first connecting means for pivotably connecting the base and the first bed together;
- a head accommodating portion, comprising:
  - a second bed pivotably connected to the first bed; and
  - a second clamping means mounted on the second bed for clamping the head of the golf club;
- a second connecting means for pivotably connecting the first bed and the second bed together; and
- a controlling means for controlling a relative angle between the first bed and the second bed.

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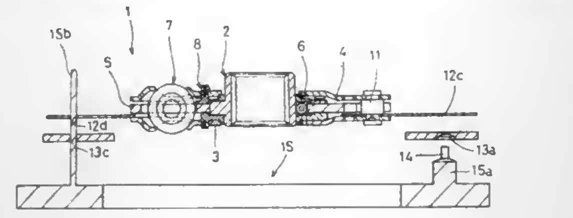
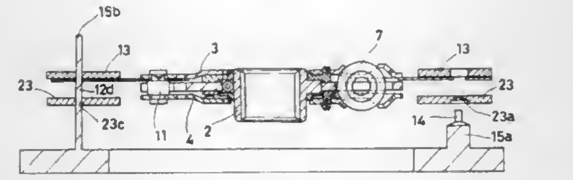
5,839,182
MANUFACTURING METHOD FOR CLUTCH DISC SUBASSEMBLY

Ikuo Murata, Neyagawa, and Hiroshi Teramae, Nara, both of Japan, assignors to Exedy Corporation, Neyagawa, Japan
Division of Ser. No. 512,779, Aug. 9, 1995, Pat. No. 5,651,442. This application Apr. 3, 1997, Ser. No. 833,019
Claims priority, application Japan, Aug. 24, 1994, 6-199437
Int. Cl.^{6} B23Q *3/00*
U.S. Cl. 29—464 3 Claims

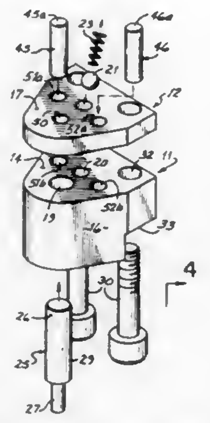




1. A method of assembling a clutch disc subassembly, comprising the steps of
- providing a cushioning plate and a pair of friction facings each having corresponding preformed locating holes, rivet holes, and rivet recess holes formed therein;
- positioning the locating holes of one friction facing and the clutch disc onto projecting pins on a locating jig thereby aligning the cushioning plate and the one friction facing; and
- inserting rivets into the rivet holes; and
- deforming the rivets to fix the cushioning plate and the friction facing to one another.

5,839,183
PUNCH RETAINER

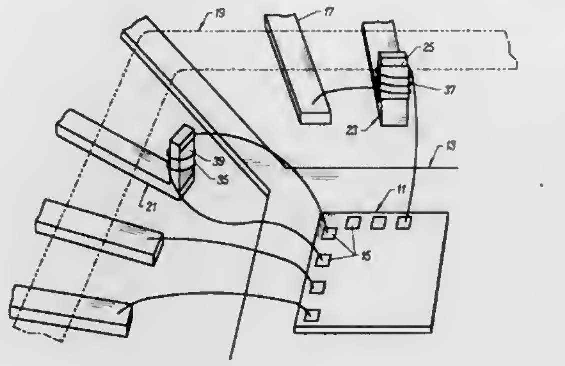
Michael J. Powlett, Stratford-Upon Avon, England, assignor to Porter Precision Products Co., Cincinnati, Ohio
Division of Ser. No. 717,756, Sep. 23, 1996. This application May 5, 1997, Ser. No. 851,183
Int. Cl.^{6} B23Q *3/00;* B23P *19/02;* B26F *1/14*
U.S. Cl. 29—464 6 Claims



1. A method of assembling a punch retainer with a mounting plate, said punch retainer having a retainer body including a top face and a bottom face, a punch bore extending into said retainer body from said bottom face, a datum dowel hole extending into said retainer body from said top face and co-axially aligned with said punch bore, and a registration dowel hole extending into said retainer body from said top face, said punch bore being adapted to receive a piercing punch having a nib of circular shaped cross-section and also adapted to receive a piercing punch having a nib of an irregular shaped cross-section, said punch retainer having a backing plate, said backing plate defining said punch retainer's top face and said retainer body defining said punch retainer's bottom face, said method comprising the steps of
- locating a datum dowel in assembled relation with said datum dowel hole, said datum dowel extending partially above said retainer body's top face,
- forming said registration bore hole to extend from said backing plate into said retainer body, and
- inserting a piercing punch with circular shaped nib into said punch bore,
- press fitting a registration dowel into a relatively tight press fitted relation both with said backing plate and said retainer body, said registration dowel being so press fit when said retainer body is assembled with said mounting plate said registration dowel holds said backing plate and said body in assembled relation, and
- inserting said registration dowel entirely into said punch retainer so no portion of said registration dowel extends above said punch retainer's top face, and then assembling said punch retainer by locating said datum dowel in a datum dowel position bore formed in said mounting plate and by bolting said retainer to said mounting plate.

5,839,184
METHOD FOR CREATING ON-PACKAGE INDUCTORS FOR USE WITH INTEGRATED CIRCUITS

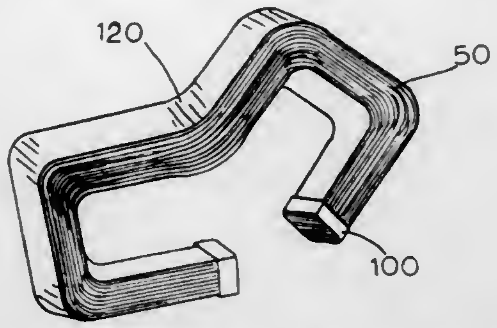
Peter Chi-Ming Ho, San Mateo; D. Douglas Baumann, San Jose, and Sang S. Lee, Sunnyvale, all of Calif., assignors to VLSI Technology, Inc., San Jose, Calif.
Filed Jul. 10, 1997, Ser. No. 890,855
Int. Cl.^{6} H01F *7/06*
U.S. Cl. 29—605 6 Claims



1. A method of forming an inductor on a bond lead of an integrated circuit device comprising the steps of:
- bending a portion of said bond lead away from a surface of said integrated circuit device to form an inductor core;
- applying an electrical insulator on said inductor core; and
- winding a wire around said inductor core and said electrical insulator to form a coil.

5,839,185
METHOD OF FABRICATING A MAGNETIC FLUX CONCENTRATING CORE

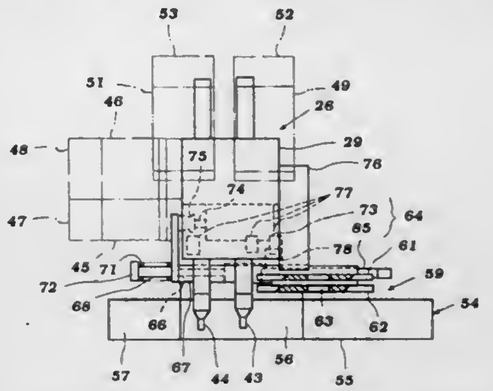
Edward W. Smith, Pecatonica, and Arthur A. Pershall, Rockford, both of Ill., assignors to Sundstrand Corporation, Rockford, Ill.
Filed Feb. 26, 1997, Ser. No. 806,963
Int. Cl.^{6} H01F *3/04*
U.S. Cl. 29—609 9 Claims



1. A method of fabricating a magnetic flux concentrating core, the method comprising the steps of:
- winding a strip of magnetic laminate material in a tape-wound configuration having a plurality of layers;
- securing the layers together at a first point while leaving the layers unsecured at a second point spaced from the first point; and
- removing magnetic laminate material at the first point to form a gap wherein the layers can be separated to permit flexing at the second point.

5,839,186
COMPONENT ATTRACTED STATE DETECTING SYSTEM FOR COMPONENT MOUNTING MACHINE

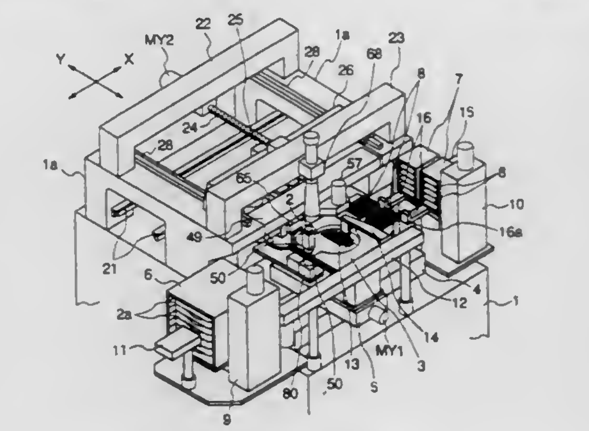
Hitoshi Onodera, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan
Division of Ser. No. 148,832, Nov. 5, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 480,153
Claims priority, application Japan, Nov. 5, 1992, 4-296124
Int. Cl.^{6} B23P *21/00*
U.S. Cl. 29—720 10 Claims



1. A component handling device for providing photographic recognition of a component comprised of a head supported for movement in X and Y directions, a pick-up device carried by said head for picking up a component, a combined light source and diffuser plate for emitting and diffusing light toward a camera carried by said head, said combined light source and diffuser plate having an opening extending therethrough for passing light to a lens of said camera, means for supporting said combined light source and diffuser plate for relative movement to said head between a first operative position in confronting relationship to said camera, a retracted position and a second operative position, and another camera cooperative with said combined light source and diffuser plate when in said second operative position, said head being moveable relative to said other camera, said other camera cooperating with an article carried by said pick-up device.

5,839,187
APPARATUS AND METHOD FOR MOUNTING A CHIP

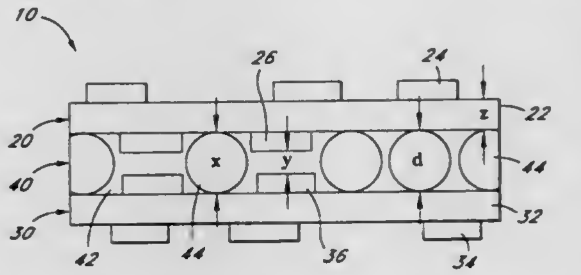
Seiichi Sato, Chikushino, and Kenichi Otake, Fukuoka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jul. 31, 1996, Ser. No. 690,077
Claims priority, application Japan, Aug. 24, 1995, 7-215876
Int. Cl.^{6} B23P *21/00*
U.S. Cl. 29—743 8 Claims



1. A chip mounting apparatus comprising:
- a chip supply portion for supplying chips;
- a substrate positioning section for positioning a substrate;
- a head assembly provided with a plurality of nozzles which pick up the chips from said chip supply portion and perform a horizontal rotation and a vertical rotation so as to invert the chips vertically; and
- a transferring head which picks up the chips, which have been vertically inverted by said vertical rotation, from said nozzles, and mounts the chips on the substrate.

5,839,188
METHOD OF MANUFACTURING A PRINTED CIRCUIT ASSEMBLY

Richard J. Pommer, Trabuco Canyon, Calif., assignor to AlliedSignal Inc., Morristown, N.J.
Filed Jan. 5, 1996, Ser. No. 583,645
Int. Cl.^{6} H05K *3/36*
U.S. Cl. 29—830 12 Claims



1. A method of manufacturing a printed circuit assembly, comprising:
- (a) forming a conductive post on a first printed circuit board, the printed circuit board including an insulating substrate with a conductive layer disposed thereon, wherein the conductive -

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post is disposed on a first contact pad disposed in the conductive layer of the first printed circuit board;

(b) placing a second printed circuit board over the first printed circuit board with a second contact pad aligned with the conductive post and with a dielectric layer disposed there between, the second printed circuit board including an insulating substrate with a conductive layer disposed thereon, wherein the second contact pad is disposed in the conductive layer of the second printed circuit board, and wherein at least one of the first and second printed circuit boards includes a second conductive layer formed on the opposite surface of the insulating substrate; and

(c) compressing the first and second printed circuit boards together until the conductive post extends across the dielectric layer and abuts the second contact pad, thereby electrically connecting the first and second contact pads, and providing a predetermined separation between the conductive layer of the first printed circuit board and the conductive layer of the second printed circuit board.

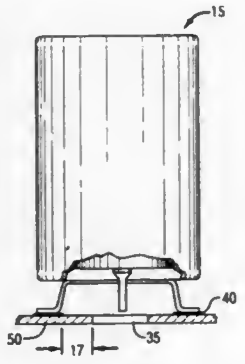
5,839,189
BRACKET FOR ATTACHING PIN-IN-HOLE COMPONENTS TO A SURFACE MOUNT BOARD

Michael R. Pomeroy, Prescott, and Eugene E. Segerson, Gilbert, both of Ariz., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Apr. 3, 1995, Ser. No. 415,714

Int. Cl.^{6} H07R *9/09*

U.S. Cl. 29—839 **19 Claims**



1. A method for attaching an electrical component having more than one lead to a surface mount circuit board, said board having a conductive interconnect pattern including a plurality of lands for attaching a plurality of electrical components, the method comprising the steps of:

soldering a bracket to a plurality of said lands, said bracket including a separate said terminal for each said lead;

providing a solder port in said board operatively aligned with said bracket, said port providing access for soldering each said lead to said bracket for electrical connection with its respective terminal; and

placing said electrical component in operative position on said bracket; and

soldering said leads to said bracket through said solder port.

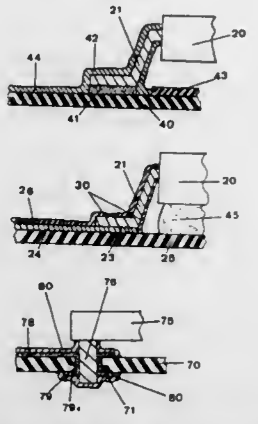
5,839,190
METHODS FOR FABRICATING SOLDERLESS PRINTED WIRING DEVICES

Kenneth W. Sullivan, 5407 Strasburg Rd., Gap, Pa. 17527

Division of Ser. No. 128,115, Sep. 23, 1993, Pat. No. 5,574,629, which is a continuation of Ser. No. 704,465, May 23, 1991, abandoned, which is a continuation of Ser. No. 363,868, Jun. 9, 1989, abandoned. This application Oct. 10, 1996, Ser. No. 731,155

Int. Cl.^{6} H05K *3/32;3/10;3/42*

U.S. Cl. 29—840 **3 Claims**



1. A method for simultaneously providing metal for an electrically conductive wiring pattern on a substrate and metal for electrically connecting a plurality of leads of an electrical component and the wiring pattern comprising:

fixedly connecting each of said leads of said component to the substrate;

plating metal on said substrate in a predetermined arrangement, thereby forming the wiring pattern on said substrate, said wiring pattern confining each of said leads connected to said substrate; and

at the same time as plating metal on said substrate, also plating said metal on each of said leads, thereby forming a continuous metal path between each of said leads of said component and said wiring pattern.

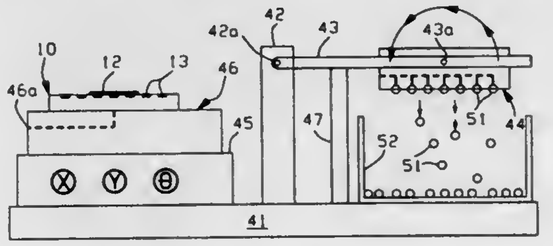
5,839,191
VIBRATING TEMPLATE METHOD OF PLACING SOLDER BALLS ON THE I/O PADS OF AN INTEGRATED CIRCUIT PACKAGE

Kenneth Walter Economy, Escondido; Ronald Allen Norell, Oceanside, and Richard Leigh Bumann, Olivenhain, all of Calif., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Jan. 24, 1997, Ser. No. 789,217

Int. Cl.^{6} H01R *9/00*

U.S. Cl. 29—843 **14 Claims**



1. A method of placing solder balls onto multiple I/O pads which are arranged in a pattern on an integrated circuit package; said method including the steps of:

providing a template with a channel which has multiple openings on a surface of said template that match said pattern of I/O pads;

pouring a plurality of said solder balls onto said surface of said template;

vibrating said template and thereby seating a respective solder ball in each of said openings;

turning said template over, after said vibrating step, with a vacuum applied to said channel; and,

aligning said solder balls on the turned over template to said I/O pads and, in that aligned position, removing said vacuum from said channel.

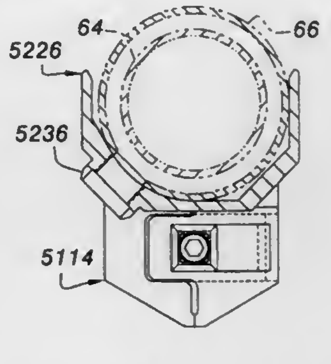
5,839,192
METHOD AND APPARATUS FOR REPAIRING CRACKED CORE SPRAY SUPPLY PIPING IN A BOILING WATER REACTOR

Sterling J. Weems, Chevy Chase, and William E. Sylvester, New Carrollton, both of Md., assignors to MPR Associates, Inc., Alexandria, Va.

Filed Nov. 27, 1996, Ser. No. 758,056

Int. Cl.^{6} B23P *15/00*

U.S. Cl. 29—890.031 **14 Claims**



1. A method of repairing cracked core spray supply piping in a boiling water reactor vessel comprising the steps of

mounting a backing bar with first and second ends for pivotal movement about a fulcrum attached to an inner surface of the reactor vessel;

positioning the first end of the backing bar adjacent a flow divider connecting circumferential arms of the core spray supply piping with a thermal sleeve extending through a nozzle in the reactor vessel;

positioning the second end of the backing bar adjacent the inner surface of the reactor vessel; and

pivoting the second end of the backing bar away from the inner surface of the reactor vessel to cause the first end of the backing bar to pivot towards the inner surface of the reactor vessel and into contact with the flow divider in order to apply an axially compressive force to close any cracks in the weldments joining the flow divider with the thermal sleeve.

5,839,193
METHOD OF MAKING LAMINATED STRUCTURES FOR A DISK DRIVE SUSPENSION ASSEMBLY

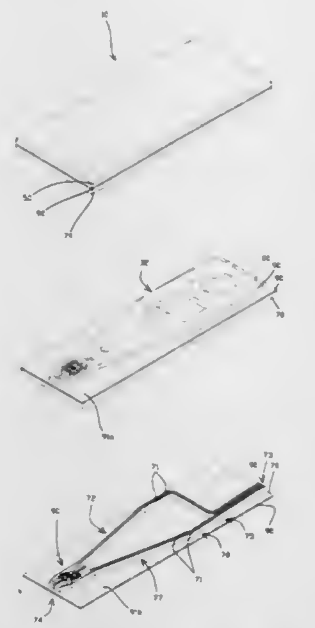
Jeffry S. Bennin, Hutchinson; Todd W. Boucher, Stewart; James H. Dettmann, Duluth; Lloyd C. Goss, Bloomington; Gary E. Gustafson, Darwin; Michael T. Hofflander, Edina; Brent D. Lien, Minneapolis, and Dean E. Myers, Stewart, all of Minn., assignors to Hutchinson Technology Incorporated, Hutchinson, Minn.

Continuation-in-part of Ser. No. 227,960, Apr. 15, 1994, Pat. No. 5,491,597, and Ser. No. 227,978, Apr. 15, 1994, abandoned. This application May 25, 1994, Ser. No. 249,117

Int. Cl.^{6} B21F *35/00*

U.S. Cl. 29—896.9 **30 Claims**

1. A method of manufacture for laminated structures for a disk drive head suspension assembly, the head suspension assembly for positioning a head assembly over a rotatable data storage device, the method comprising the steps of:



providing a multi-layer laminate sheet comprising a first layer of a metal spring material, an intermediate second layer of an electrically insulating material, and a third layer of an electrically conductive material;

forming the first layer into a spring element and exposing areas of the second layer;

forming at least one trace out of the third layer and exposing areas of the second layer, the trace including at least one elongated conductor configured and arranged for electrical coupling to the head assembly; and

forming away at least some of the exposed areas of the second layer.

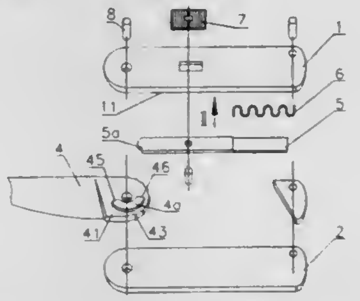
5,839,194
FOLDING KNIFE

Urs Bezold, Märzenweg 14, D 90411 Nürnberg, Germany

Filed Nov. 19, 1996, Ser. No. 752,352

Int. Cl.^{6} B26B *1/04*

U.S. Cl. 30—161 **5 Claims**



1. A folding knife with a latchable blade which is pivotable about a pivot axis between two halves of a housing; end stop surfaces for limiting the opening and closing movement of said blade which are located in a surface on a tang and located within said housing; a locking element in the housing which is movable parallel to an internal surface of the housing in the direction of the pivot axis of the blade and is alternatively positioned in contact with a cam located in said surface on a side of the tang, said cam (4*a*) being semicircular and arranged generally concentric to the pivot axis and having end surfaces (**45**, **46**) formed at opposite ends thereof located in the direction of rotation thereof comprising the end stop surfaces of the tang (**41**), the locking element (5) in respective end positions of the blade (**4**) connecting respective one

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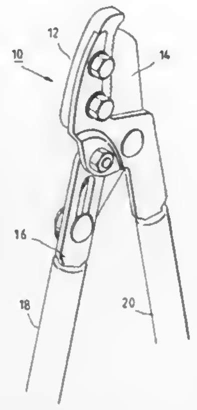
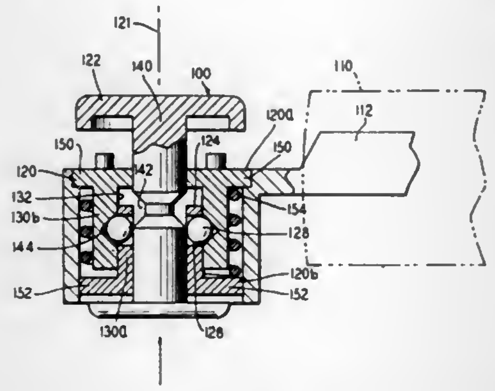
of the end surfaces (**45**, **46**) which is not in contact with the housing so as to lock the blade (**4**) in that particular end position.

5,839,195
GARDENING SHEARS
Yu-Tang Lin, No. 21, Wan Feng Lane, Wan Feng Village, Fu Hsing Hsian, Chang Hua Hsien, Taiwan
Filed Apr. 22, 1997, Ser. No. 840,581
Int. Cl.^{6} B26B *13/00*
U.S. Cl. 30—250 **3 Claims**



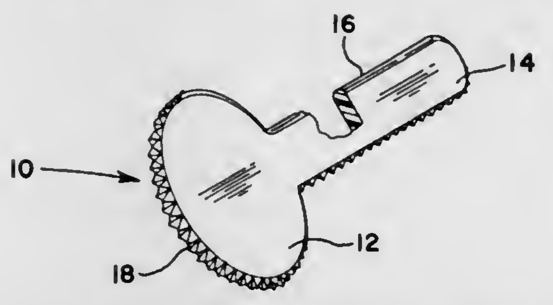
1. A gardening shears comprising:
a fixed jaw;
a movable jaw fastened pivotally with said fixed jaw and provided with a blade opposite to said fixed jaw;
a braking member fastened pivotally at one end thereof with said fixed jaw and provided with a slide slot of a size permitting a pivoting member to slide back and forth, said pivoting member being fastened at one end thereof with said movable jaw; and
two handle fastened respectively at one end thereof with said fixed jaw and said braking member,
wherein said fixed law is provided with a restriction portion for confining a deflection angle of said braking member.

5,839,196
WRENCHLESS COLLET FOR SURGICAL BLADE
A. Frank Trott, Largo, Fla., assignor to Linvatec Corporation, Largo, Fla.
Division of Ser. No. 548,351, Nov. 1, 1995, Pat. No. 5,729,904. This application Jul. 3, 1997, Ser. No. 887,599
Int. Cl.^{6} A61B *17/14*
U.S. Cl. 30—339 **4 Claims**



1. A wrenchless collet for holding a cutting device comprising:
a housing:
clamp means within said housing for holding said cutting device, said clamp means being movable relative to said housing, having an axis and adapted to exert a clamping force on said cutting device parallel to said axis and further comprising:
a first, axially stationary clamping surface:
a second, axially movable clamping surface, said second clamping surface movable to either an open position in which it is spaced from said first clamping surface or a closed position in which it is urged toward said first clamping surface:
bi-stable clamp holding means for selectively holding said clamp means in either said open position or said closed position comprising:
a shaft connected to said second, axially movable clamping surface, said shaft having a first end and a second end, said first and second ends comprising
respective first second shaft pushing members;
a spring biasing means for providing a force;
a rolling member retaining mechanism comprising at least one rolling member and carrier means axially movable relative to said shaft for rotatably holding said rolling member adjacent said shaft;
a first recess in said shaft associated with and adapted to receive a portion of said rolling member therein, said first recess having first and second axially spaced and oppositely directed tapered sides for receiving from said rolling member axially directed force from said spring means;
spring force receiving means interposed between said spring biasing means and said carrier means for urging said carrier means axially in said second direction to thereby urge said rolling member into said first recess and partially axially against one of said tapered sides thereof to hold said shaft in one of said open or closed positions; and
a second recess in said housing associated with and adapted to receive a portion of said rolling member therein, said second recess having first and second oppositely directed tapered sides and adapted to receive said rolling member when axial motion of said shaft causes said rolling member to roll out of engagement with said first recess, said second recess being angularly juxtaposed to said first recess and situated at a greater radial distance from said axis than said first recess, said second recess for receiving said rolling means within said shaft is axially moved a predetermined amount to roll said rolling member sufficiently to place it partially into said second recess, and for urging said rolling member against said shaft to frictionally retain said shaft in the other of said open or closed positions.

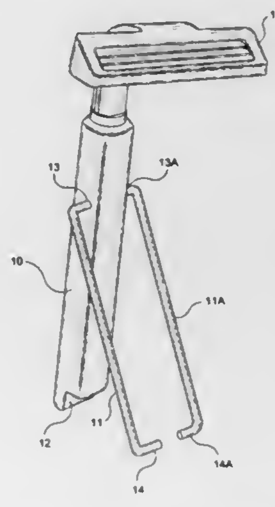
5,839,197
CUTTER AND SEPARATOR UTENSIL
Larry T. Durst, 1139 Bunker Hill Rd., Troy, Ohio 45373
Filed Jun. 30, 1997, Ser. No. 885,776
Int. Cl.^{6} B26B *9/00*
U.S. Cl. 30—353 **6 Claims**



1. A food cutter and cookware separator utensil comprising:
a substantially flat tennis racquet-shaped utensil with a circular-shaped component integral with a rectangular-shaped component;

a knife like edge circumscribing the entire periphery of the utensil;
a plurality of serrulations notching approximately three-fourths of the knife like edge circumscribing the periphery of the circular-shaped component of the utensil; and
a plurality of serrulations notching approximately one-half of the knife like edge circumscribing the periphery of the rectangular-shaped component of the utensil.

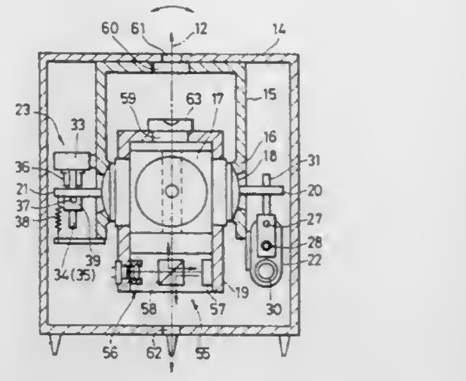
5,839,198
RAZOR WITH INTEGRAL HOLDING MEANS
Clare McCoy, Milford, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Jun. 25, 1997, Ser. No. 882,058
Int. Cl.^{6} B26B *21/40*
U.S. Cl. 30—537 **1 Claim**



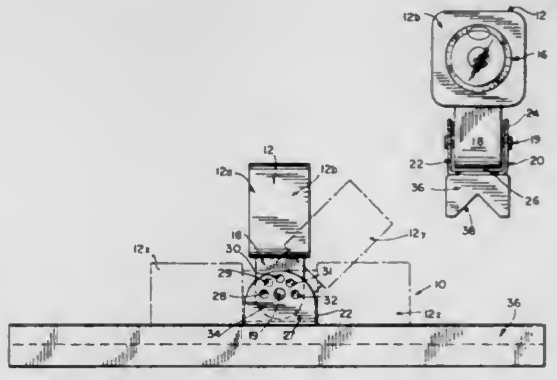
1. A razor unit comprising a handle and integral holding means for temporarily storing the razor unit, wherein the integral holding means comprise a plurality of legs which allow for temporary storage of the razor unit on a substantially horizontal surface and the plurality of legs comprises two legs which pivot inward and outward about a pivot point on the handle of the razor unit, wherein each leg has a top portion adjacent to the pivot point and a lower portion distant from the pivot point and the lower portions of the two legs each comprises a foot section to provide stability when the razor unit is in the standing position and the razor unit is supported in a standing position when the two legs are in the outward position, and wherein the handle further comprises a notch to accomodate the foot sections when the legs are in the inward position.

5,839,199
LASER GRADIENT SETTING DEVICE
Yohei Ogawa, Tokyo-to, Japan, assignor to Kabushiki Kaisha TOPCON, Tokyo-to, Japan
Continuation-in-part of Ser. No. 392,048, Feb. 22, 1995, Pat. No. 5,606,802. This application Oct. 9, 1996, Ser. No. 727,912
Claims priority, application Japan, Sep. 7, 1993, 5-246456
Int. Cl.^{6} G01B *11/26;* **G01C** *5/00*
U.S. Cl. 33—276 **11 Claims**

1. A laser gradient setting device, comprising a reference laser beam emitter rotatably supported for emitting a reference laser beam, a driving means for directing said reference laser beam emitter to a suitable direction, a gradient setting means for setting a gradient, a laser beam irradiating means for emitting a laser beam to at least one direction of the vertical in addition to a reference laser beam and a vertical direction adjusting means for directing a laser beam from said laser beam irradiating means to a vertical direction.



5,839,200
MULTI-FUNCTION HORIZONTAL AND VERTICAL ALIGNMENT TOOL
Dominic Decesare, 223 Center St., Elizabeth, N.J. 07202
Filed Feb. 21, 1997, Ser. No. 804,316
Int. Cl.^{6} G01C *9/26;9/36*
U.S. Cl. 33—381 **17 Claims**



1. Combination level comprising a carrier member having two opposite substantially parallel major surfaces; a tube level mounted substantially co-extensively with a plane defined by one of said two surfaces; a circular level mounted substantially co-extensively with a plane defined by the other of said two surfaces, said carrier member including means for abutting said carrier member against a work to be measured or aligned while providing at least one known angular positional relationship greater than 0° and less than 90° between the work and said major surfaces, whereby selectively positioning said major surfaces in substantially horizontal planes, while said means for abutting contacts the work, establishes the angular orientation of the work including vertical alignment and plumb condition of the work as well as said at least one angular positional relationship greater than 0° and less than 90°.

5,839,201
SEGMENTED, COMBINATION LEVEL AND SQUARE HAVING A ROTATING JOINT
James D. Young, 3 W. Cove Rd., Weaverville, N.C. 28787
Division of Ser. No. 521,109, Aug. 29, 1995, Pat. No. 5,675,901. This application Mar. 14, 1997, Ser. No. 818,099
Int. Cl.^{6} B43L *7/10*
U.S. Cl. 33—451 **3 Claims**

1. A level comprised of:

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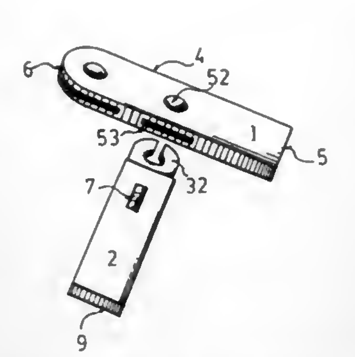
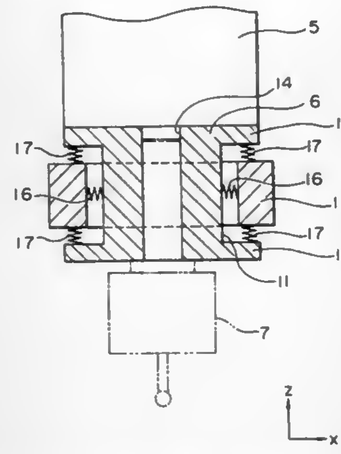


a) at least a first level segment having at least a first straight surface, a distal end, a proximal end, and a level indicating means disposed thereon with respect to the straight surface;
b) a second level segment having at least a first straight surface which is oriented in the same plane as the first straight surface of the first level segment, a distal end, and a proximal end; and
c) a rotating joint means disposed between the proximal end of the first level segment and the proximal end of the second level segment which connects the first level segment and second level segment such that the first straight surfaces thereon can form a plurality of locking angular relationships of from zero degrees up to ninety degrees in discrete increments, and wherein the rotating joint means is comprised of a first portion and a second portion, the first portion being disposed on the first level segment, being separable from the second portion which is disposed on the second level segment without removing any element from either the first portion or the second portion of the rotating joint means, and having a slot therein for receiving the second portion.

5,839,202
MANUAL THREE DIMENSIONAL COORDINATE MEASURING MACHINE

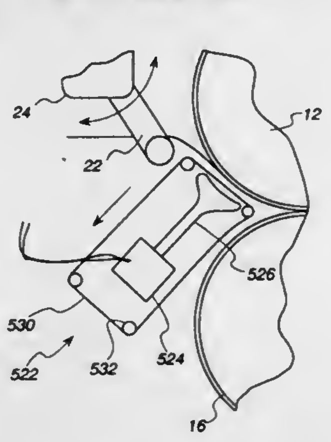
Kazusaku Tezuka, Kawasaki, and Takao Oneta, Utsunomiya, both of Japan, assignors to Mitutoyo Corporation, Kawasaki, Japan
Filed Sep. 12, 1996, Ser. No. 715,384
Claims priority, application Japan, Sep. 18, 1995, 7-238372
Int. Cl.^{6} G01B *5/004*
U.S. Cl. 33—503 34 Claims



1. A manual three dimensional coordinate measuring machine, comprising:
a first axis member extending along a first one of three orthogonal coordinate axes and manually movable with respect to at least one of the three orthogonal coordinate axes;
a probe supported by the first axis member and movable relative to the first axis member;
a slide ring positioned at a bottom side of the first axis member, the slide ring movable relative to the first axis member in at least one arbitrary direction; and
at least one elastic member that elastically holds the slide ring at a predetermined position in a plane and along the first axis and that allows the slide ring to move in the at least one arbitrary direction by elastic deformation, each of the at least one elastic member deforming only in response to a force larger than a predetermined value.

5,839,203
IMPULSE DRYER

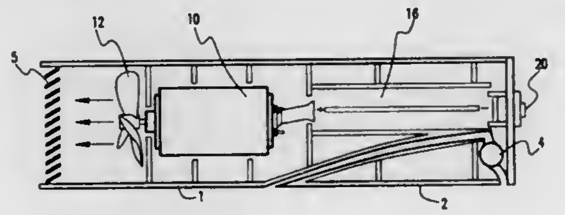
David I. Orloff; Timothy Patterson, and Isaak Rudman, all of Atlanta, Ga., assignors to Institute of Paper Science and Technology, Inc., Atlanta, Ga.
Division of Ser. No. 618,294, Mar. 18, 1996, Pat. No. 5,669,159, which is a continuation-in-part of Ser. No. 440,539, May 12, 1995, Pat. No. 5,598,642. This application Feb. 5, 1997, Ser. No. 794,900
Int. Cl.^{6} F26B *19/00*
U.S. Cl. 34—71 6 Claims



1. Apparatus for drying a fiber web comprising, in combination, pressing means for said web, including a heated roll and another roll or shoe, together forming a nip through which the web passes, the apparatus further comprising web wrapping means for wrapping the web exiting the nip between the rollers, about the heated roll, so as to continuously decrease pressure on the web and so as to prolong the continuously decreasing pressure on the web for a time period at least between one to two times as great as the time period during which the web is pressed in the nip between the rolls, so as to prevent delamination of the dried web.

5,839,204
PORTABLE DRYER WITH A RETRACTABLE HANDLE PITTING INTO AN INDENTED HOUSING

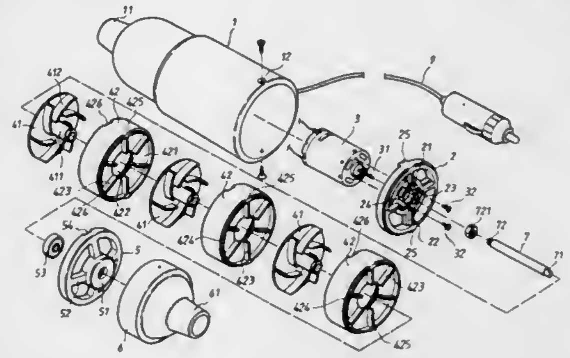
Brenda A Cinque, 18 Guilford Park Dr., West Babylon, N.Y. 11704, and Eugene Delaney, 65 Ontario Ave., Massapequa, N.Y. 11758
Filed Aug. 13, 1997, Ser. No. 910,306
Int. Cl.^{6} A45D *24/10*
U.S. Cl. 34—97 12 Claims



1. A portable dryer having an air inlet and an air outlet, the portable dryer further having a motor and fan that is driven by the motor, the portable dryer further having a power source to power the motor, the portable dryer further comprising:
a housing having at least a first portion proximate to the air inlet and a second portion proximate to the air outlet, the first portion having a first cross sectional area having an indented portion, the second portion having a second cross sectional area different from the first cross sectional; and
a fold up handle pivotally mounted to the housing, wherein the indented portion receives the handle when the handle is in a folded position, the folded handle forming a portion of the housing so that the first cross sectional area substantially equals the second cross sectional area.

5,839,205
ELECTRIC FAN USING MULTIPLE FAN BLADES TO RAISE AIR OUTPUT PRESSURE

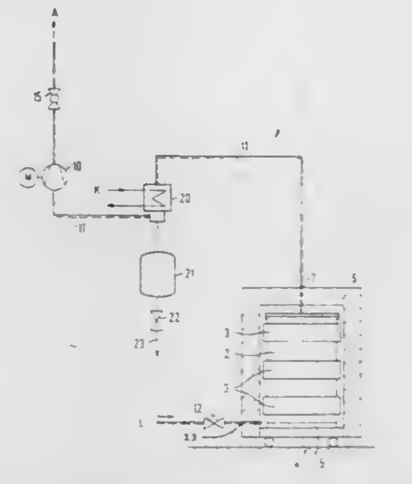
Fred L. Hung, 2F, No. 101, Sec. 2, Chung Ching Rd., Taoyuan City, Taoyuan Hsien, Taiwan
Filed Sep. 8, 1997, Ser. No. 925,185
Int. Cl.^{6} A45D *24/10*
U.S. Cl. 34—97 1 Claim



1. An electric fan comprising:
a cylindrical housing having a reduced tubular rear end for air input and two mounting holes bilaterally disposed at an expanded front end thereof;
an air output cap covered on the expanded front end of said cylindrical housing and fixedly fastened to the mounting holes of said cylindrical housing by screws;
a mounting ring mounted inside said cylindrical housing, said mounting ring comprising an annular rib at the center, a plurality of radial ribs extended from the periphery of its annular rib, a center hole defined within its annular rib, two axial mounting holes bilaterally disposed at its annular rib, a rear pair of projecting portions axially and bilaterally raised from the periphery of a rear side thereof and fastened to a grooved inside wall of said cylindrical housing and a front pair of projecting portions axially and bilaterally raised from the periphery of a front side thereof;
a motor disposed inside said cylindrical housing and fixedly fastened to the mounting holes of said mounting ring by screws, said motor having a motor shaft inserted through the center hole of said mounting ring;
a locating ring mounted inside said cylindrical housing adjacent said air output cap, said locating ring comprising a ring cap at the center, a plurality of radial ribs extended from its ring cap, an axle bearing mounted within its ring cap, and two bottom notches bilaterally disposed at a bottom side thereof;
an axle having a front end supported on said axle bearing of said locating ring and a rear end fixedly connected to the motor shaft of said motor; and
a plurality of fan blade wheel assemblies mounted on said axle inside said cylindrical housing and arranged in a stack and turned to causes currents of air toward the reduced tubular front end of said air output cap, each of said fan blade wheel assemblies comprised of a fan blade wheel and a hood covered on said fan blade wheel, said fan blade wheel comprising a hollow center shaft fixedly fastened to said axle, and a plurality of curved blades radially extended from said hollow center shaft, said hood comprising an inside partition wall, a center hole at the center of said inside partition wall through which the hollow center shaft of said fan blade wheel passes, a plurality of reinforcing ribs raised from said inside partition wall, an upward annular flange axially raised from a front side thereof, two projecting portions symmetrically raised from said upward annular flange at two opposite sides, and two bottom notches bilaterally disposed at a rear side thereof, the bottom notches of the hood of one fan blade wheel assembly at a bottom side being forced into engagement with the front pair of projecting portions of said mounting ring, the projecting portions of the hood of one fan blade wheel at behind being forced into engagement with the bottom notches of the hood of one fan blade wheel at a front side.

5,839,206
DRYING STATION FOR LIQUID OR DAMP WASTE USING A PLIABLE HEATING MAT

Johann Lisson, Darmstadt; Karl-Heinz Kleinschroth, Frankfurt, and Klaus Blinn, Rödermark, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany
Filed Apr. 4, 1997, Ser. No. 834,531
Claims priority, application Germany, Oct. 4, 1994, 44 35 236.0
Int. Cl.^{6} D06F *58/00*
U.S. Cl. 34—132 7 Claims



7. A drying station for contaminated waste from a nuclear power station, comprising:
a container receiving contaminated waste to be dried from a nuclear power station; and
at least one heating mat for delivering heat of evaporation into said container.

5,839,207
FLUID BED APPARATUS, A BED PLATE THEREFORE, AND A METHOD OF MAKING A BED PLATE

Mogens A Christensen, Virum, and Benny H. Madsen, Horsens, both of Denmark, assignors to Niro A/S, Soborg, Denmark
Filed Dec. 20, 1996, Ser. No. 771,771
Claims priority, application Denmark, Dec. 22, 1995, 1471/95
Int. Cl.^{6} F26B *3/08*
U.S. Cl. 34—369 39 Claims

19. A method of making a bed plate for a fluid bed apparatus from a plate blank, said method comprising forming a plurality of bulges or dents each having at least one through-going gas flow opening defined therein by a surrounding edge portion in the plate

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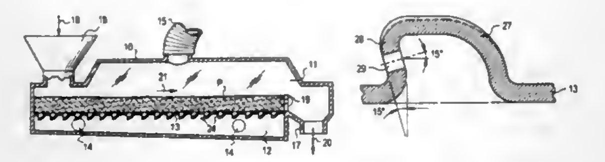


blank in a manner so as to exclude the formation of notches in said edge portion, the maximum dimension of each of the bulges or dents being only a small fraction of the minimum dimension of the bed plate, each of at least a substantial part of the gas flow openings being directed in relation to the plane of the bed plate so as to cause a flow of gas being passed through the opening to contact an adjacent part of the bed plate interconnecting said bulges or dents.

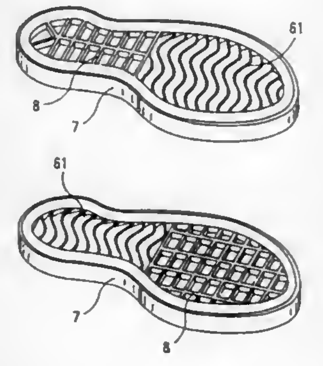
5,839,208
RESILIENT SOLE FOR SHOE

Chin-Shui Huang, Taipei, Taiwan, assignor to Ho-Tai Industrial Co., Taipei, Taiwan, and Hoard International Corp., Wilmington, Del.

Filed Apr. 18, 1997, Ser. No. 844,330

Int. Cl.^{6} A43B ***13/18;13/20***

U.S. Cl. 36—28 **8 Claims**



7. A resilient sole for shoes, essentially comprising:

a top layer provided to be in contact with paw of user;

a bottom layer provided to be in contact with ground; and

an intermediate layer sandwiched between said top layer and said bottom layer, the front half-portion thereof comprising a plurality of ribs in latticed arrangement, the rear half-portion thereof comprising a plurality of wavelike transverse strips arranged in parallel to each other with a suitable distance therebetween, said strip being inclined forward with a suitable angle.

5,839,209
SHOE SOLE HAVING AN IMPROVED CUSHION THEREIN AND METHOD OF MAKING SAME

John A. Healy, Madbury, N.H., and Eckhard Knoepke, Beverly, Mass., assignors to Converse Inc., North Reading, Mass.

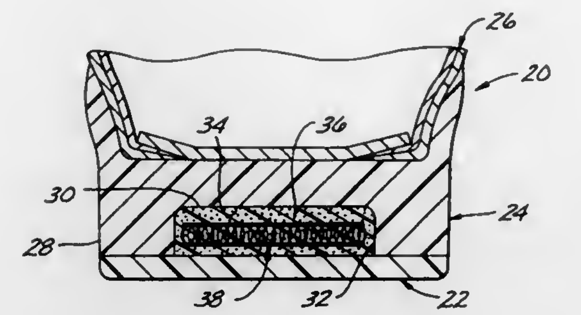
Filed Mar. 26, 1997, Ser. No. 827,350

Int. Cl.^{6} A43B ***13/18***

U.S. Cl. 36—30 A **15 Claims**

1. A method of making a shoe having a midsole, an upper, and an outsole, the method comprising:

providing a shoe midsole having a cavity in an underside thereof;



filling the cavity with a fluid which is curable to an elastomeric solid condition;

allowing the fluid to cure to said elastomeric solid condition.

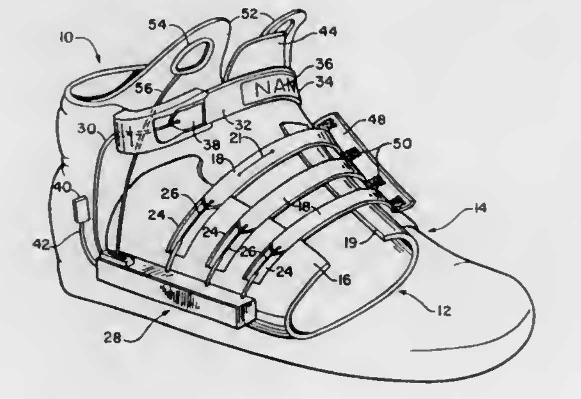
5,839,210
SHOE TIGHTENING APPARATUS

Rejeanne M. Bernier, and Hans S. Croteau, both of 6792 Maury Dr., San Diego, Calif. 92119

Continuation of Ser. No. 277,235, Jul. 19, 1994, which is a continuation-in-part of Ser. No. 189,993, Jan. 31, 1994, abandoned, which is a continuation of Ser. No. 914,740, Jul. 20, 1992, abandoned. This application Sep. 23, 1996, Ser. No. 717,928

Int. Cl.^{6} A43C ***11/12;*** **A43B** ***11/00***

U.S. Cl. 36—50.1 **18 Claims**



1. A shoe tightening apparatus for use with a shoe having a casing to accommodate at least a portion of a foot of a wearer and at least one strap, responsive to tensile force applied thereto, for cinching the casing to a foot disposed in the casing, the apparatus comprising:

a retractor, mounted on said casing and connected to said at least one strap, adapted to apply tensile force to said strap, the retractor comprising:

a) an elastic element connected to the retractor, said elastic element being connected to said strap,

b) a charging mechanism operable by the wearer to tension said elastic element,

c) a catch for releasably holding said elastic element in a stretched condition, said strap being freed from the tensile force to allow insertion and removal of a foot whenever the elastic element is held in the stretched condition, and

d) a release to selectively disengage the catch, a release of the catch allowing the elastic element to discharge and apply the tensile force to said strap.

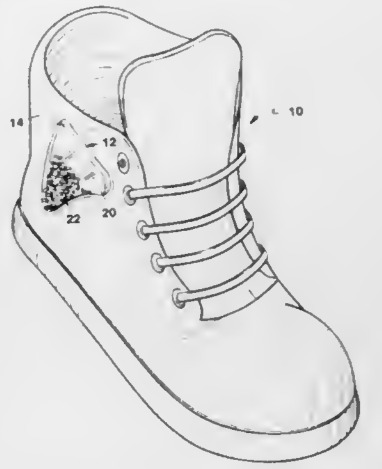
5,839,211
NOVELTY SHOE

Jane Pallera, Arlington, Mass., assignor to The Keds Corporation, Cambridge, Mass.

Continuation of Ser. No. 116,358, Sep. 2, 1993, abandoned. This application Nov. 22, 1994, Ser. No. 343,201

Int. Cl.^{6} A43B ***23/00***

U.S. Cl. 36—136 **5 Claims**



1. A shoe comprising a sole, a shoe upper mounted on the sole, and a display assembly attached upon an outer surface of said shoe upper,

said display assembly comprising:

an outer member comprising a translucent wall at least partially defining a sealed compartment having an arbitrary shape that is defined by dimensions of width, thickness and length, said translucent wall comprising a central portion and generally upstanding sidewalls extending about the periphery of said central portion, said sealed compartment being free of liquid, and

at least one solid decorative device disposed within said sealed compartment,

said translucent wall permitting viewing of said at least one decorative device disposed within said sealed compartment, and

said at least one solid decorative device having dimensions of width, thickness and length, the width of said at least one decorative device being significantly less than the width of the sealed compartment, the thickness of said at least one decorative device being significantly less that the thickness of said sealed compartment, and the length of said at least one solid decorative device being significantly less than the length of said sealed compartment, in a combined dimensional relationship selected to permit free movement of said solid decorative device within said sealed compartment.

5,839,212
EJECTOR APPARATUS FOR AN EARTH MOVING SCRAPER BOWL

Lee J. Brinker, Beloit, Kans., assignor to Kan-Am Industries, Inc., Beloit, Kans.

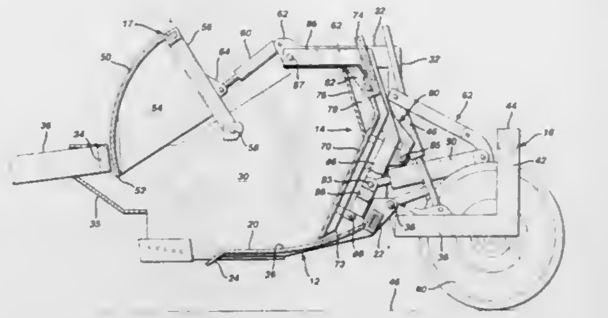
Filed Jan. 27, 1997, Ser. No. 789,337

Int. Cl.^{6} E02F ***03/64***

U.S. Cl. 37—416 **4 Claims**

1. In an earth mover having a bowl structure including a bottom wall having forward and rearward limits and inclined rearwardly and upwardly from a forward marginal horizontal portion and rigidly interconnecting laterally spaced side walls and having an earth cutting forward end edge and arcuately bowed downwardly on a predetermined radius forming a bottom wall surface between its forward and rearward limits, and having a rearward support frame, the improvement comprising:

a side beam at the upper limit of each said side wall;



a lug on each said side beam;

means including a generally upright ejector panel having a depending edge adjacent the bowl arcuate bottom wall surface and extending transversely between said side walls;

means sopporting said ejector panel means for vertical swinging movement between a rearwardly retracted position serving as a rear wall for said bowl structure and a forward bowl load ejection position comprising:

a first pair of elongated links pivotally connected at one end portion, respectively, with said side beams and respectively pivotally connected in horizontal spaced relation by the respective other end portion of each link of said pair of links with respective adjacent side edge portions of said ejector panel means; and,

extensible and retractable actuator means operatively connected with said ejector panel means for reciprocating the ejector panel means between forward and rearward limits of said bottom wall.

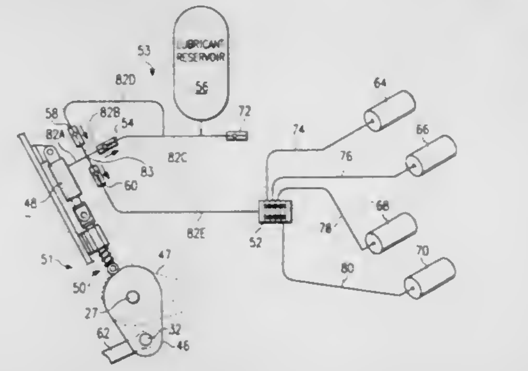
5,839,213
DIPPER DOOR ACTUATED LUBE PUMPING SYSTEM

Ronald E. Abbott, and Theodore M. Willgrubs, both of Marion, Ohio, assignors to GPX Corp., Las Vegas, Nev.

Filed Jul. 1, 1996, Ser. No. 674,090

Int. Cl.^{6} F01M ***1/18***

U.S. Cl. 37—443 **22 Claims**



1. An automatic lubricating system for mining shovels having a dipper assembly, the system comprising:

an actuator associated with the dipper assembly and operable to move relative to a portion of the dipper assembly in response to movement by the dipper assembly under the influence of gravity;

a pump mechanism coupled to the actuator, the pump mechanism operable to pump in response to movement of the actuator relative to a portion of the dipper assembly;

a lubricant supply subsystem coupled to the pump mechanism for supplying lubrication to a selected location in response to pumping of the pump mechanism.

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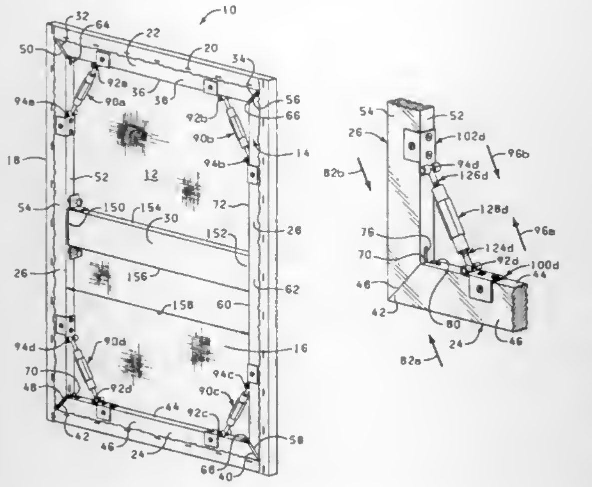
5,839,214
CORNER ADJUSTMENT ASSEMBLY FOR AN ADJUSTABLE FRAME

William L. Peterson, 424 NW. 21st St., Oklahoma City, Okla. 73103

Filed Jun. 3, 1997, Ser. No. 867,723
Int. Cl.^{6} D06C *03/08*
U.S. Cl. 38—102.4 **25 Claims**



1. An adjustable frame for stretching and supporting a painter's canvas, comprising:
- a polygonally shaped frame structure encompassing an open area and adapted to support the painter's canvas across the open area, the frame structure comprising:
  - a plurality of frame members cooperatively positioned to form the frame structure, each frame member having one end movably connected to an adjacently disposed frame member to define one respective corner of the frame structure;
- a plurality of corner adjustment assemblies each corner adjustment assembly including:
  - a first shaft having a first end;
  - a second shaft having a first end, the first end of the first shaft being spaced a distance from the first end of the second shaft;
  - adjustment means for selectively adjusting the distance between the first end of the first shaft and the first end of the second shaft;
  - a first bracket pivotally connected to the first end of the first shaft, the first bracket comprising;
    - a first leg member connected to one of the frame members defining one of the corners of the frame structure; and
  - a second bracket pivotally connected to the first end of the second shaft, the second bracket comprising:
    - a first leg member connected to the other one of the frame members defining the respective corner of the frame structure.

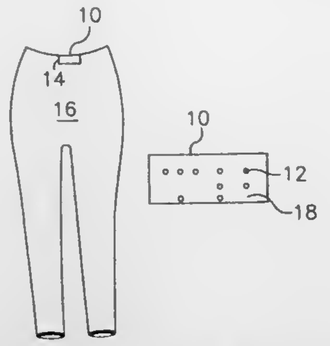
5,839,215
RAISED INDICIA LABELS

Denise L. Lasprogata, 533 E. Lancaster Ave. Apt. D, Wynnewood, Pa. 19096

Filed Dec. 27, 1996, Ser. No. 775,010
Int. Cl.^{6} G09F *3/10*
U.S. Cl. 40—299.01 **14 Claims**

1. A label for attachment to clothing, comprising:

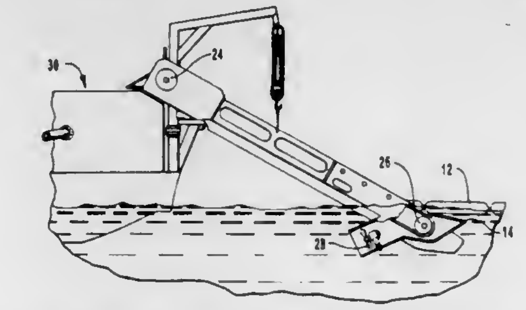
a label formed from a tactile imaging material, said material having raised information conveying indicia thereon providing characteristics of the clothing, said raised indicia being unaffected by normal folding, crumpling or washing of the label.



5,839,216
MARINE HARVESTING AND PROCESSING APPARATUS

Garyn Phillip Baker, Ogden, and Gary Lynn Baker, Brigham City, both of Utah, assignors to International Aquaculture Technology, Inc., Salt Lake City, Utah

Continuation of Ser. No. 489,809, Jun. 13, 1995, abandoned. This application Aug. 15, 1996, Ser. No. 698,092
Int. Cl.^{6} A01K *81/04*
U.S. Cl. 43—6.5 **2 Claims**



1. An elevatable apparatus for harvesting brine shrimp roe from the surface of an open body of water onto a boat, the apparatus comprising:
- (a) an endless movable skimming belt covered with a silk screen pad, the silk screen pad having openings sized to trap brine shrimp roe which are forced against the belt;
- (b) rollers on which the belt revolves;
- (c) a motor and gearing to revolve the belt around the rollers to elevate the harvested brine shrimp roe from the surface of the water into the boat; and
- (d) a frame to which the rollers and motor are mounted, said frame being capable of elevating the belt out of the open body of water when the belt is not in use so that the boat may maneuver freely without experiencing drag from the endless movable skimming belt.

5,839,217

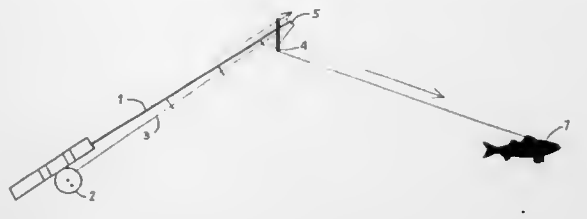
Patent Not Issued For This Number

5,839,218
SIGNAL DEVICE AND METHOD FOR STILL FISHING

Alan C. Cafarella, 63 State Rd., Erving, Mass. 01344

Filed Feb. 24, 1997, Ser. No. 805,367
Int. Cl.^{6} A01K *97/12*
U.S. Cl. 43—17 **4 Claims**

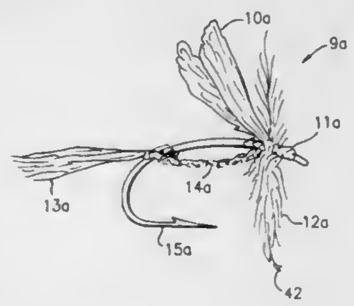
1. A use of a torus having no means for pole attachment in a method of fishing comprising:
- using a fishing rod and tackle of known art comprising at least a rod, reel, line and hook;
- casting said line and said hook into waters believed to contain fish;
- placing said rod in a braced position with said rod at an angle relative to the horizontal; and then
- placing said torus onto said rod in a manner such that said torus is positioned by tension and slack in said line whereby a change in tension produces a change in position of said torus which obviously indicates a bite.



5,839,219
METHOD OF COATING A FISHING FLY AND A FISHING FLY COATED THEREBY

Charles P. Evans, Trumbull; Armand Moscovici, Woodbridge, and Robert C. Evans, Naugatuck, all of Conn., assignors to Vitek Research Corporation, Derby, Conn.

Filed May 8, 1997, Ser. No. 853,020
Int. Cl.^{6} A01N *25/00*
U.S. Cl. 43—42.53 **20 Claims**



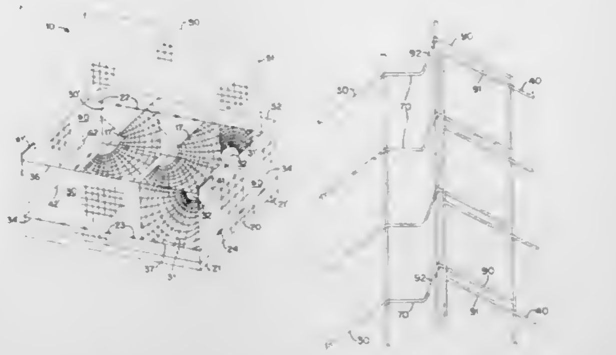
11. A fishing fly comprising:
- a hook;
- filamentous materials attached to the hook; and
- a coating conformal to at least the filamentous materials, wherein the coating is obtained by exposing the fishing fly to a reactive gas.

5,839,220
COLLAPSIBLE MARINE ANIMAL TRAP AND STORAGE UNIT

Eric C. Wass, 18 Hall's La., Rockland, Me. 04841

Continuation-in-part of Ser. No. 271,425, Jul. 7, 1994, abandoned. This application Aug. 30, 1996, Ser. No. 706,299
Int. Cl.^{6} A01K *69/10*
U.S. Cl. 43—105 **13 Claims**

1. A collapsible lobster trap comprising:
- a. a bottom panel;
- b. a plurality of side panels comprising a first pair of opposed side panels and a second pair of opposed side panels, each of said plurality of side panels being connected at a lower end thereof to said bottom panel, and said first pair of opposed side panels having engagement means detachably connecting said first pair of opposed side panels to said second pair of opposed side panels, wherein said engagement means includes a capturing bend on a first end and a capturing bend on a second end of each of said first pair of opposed side panels, wherein said capturing bend on said first end engages one end of one of said second pair of opposed side panels and said capturing bend on said second end engages one end of the other of said second pair of opposed side panels;
- c. a top panel having one top panel side hingedly attached to an upper end of one of said plurality of side panels;
- d. means for securing said first pair of opposed side panels to said top panel; and
- e. at least one collapsible internal partition affixed to said bottom panel and to said first pair of opposed side panels forming multiple chambers therein.



5,839,221
INSECTICIDAL DEVICE

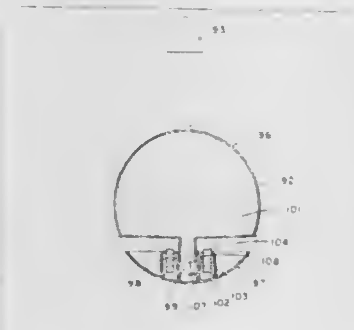
Eyal Ron, Tel-Aviv; Neriel Paglin, Ramat-Gan; Yaron Reshef, Natanya, and Uri Alon, Moshav Havatzelet Hasharon, all of Israel, assignors to Ronpal Ltd., Israel

PCT No. PCT/EP93/03046, § 371 Date Jun. 21, 1995, § 102(e) Date Jun. 21, 1995, PCT Pub. No. WO94/09624, PCT Pub. Date May 11, 1994

PCT Filed Nov. 2, 1993, Ser. No. 428,225

Claims priority, application Israel, Nov. 3, 1992, 103629; Sep. 21, 1993, 107057

Int. Cl.^{6} A01M *1/14;1/20*
U.S. Cl. 43—132.1 **7 Claims**



1. A device for combating insects by attracting insects and then destroying them following their arrival on said device, comprising:
- a spherical body holding a liquid, said body having at least one opening for diffusing the liquid into the surrounding atmosphere, the liquid containing an insect attractant;
- a panel of a color which has insect attracting properties, said panel having an aperture, wherein said spherical body is located within said aperture in a manner so that two hemispheres projecting each from one face of said panel are defined, and
- insect destroying means comprising an adhesive coating on said panel, whereby insects once landing on said panel become adhered thereto;
- wherein said spherical body comprises a top part and a bottom part, said top part defines an enclosure adapted to hold the

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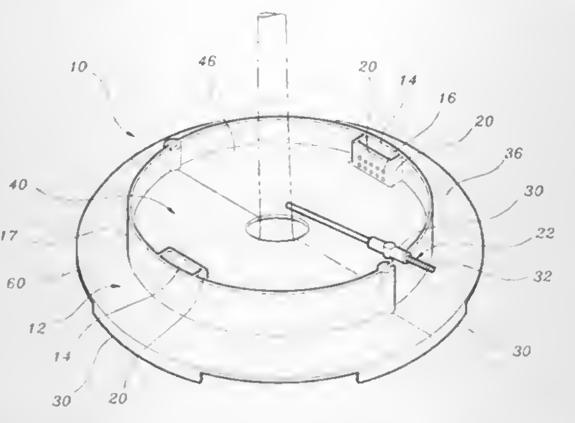
liquid, and said bottom part includes a dish adapted to hold the liquid, the liquid in said top part being emptied into said dish through one of said at least one opening.

5,839,222
APPARATUS AND METHOD FOR INCREASING PLANT ROOT DENSITY AND MEASURING PLANT GROWTH

Jess Sittner, P.O. Box 714, 1542 Esther Dr., Arnold, Mo. 63010
Filed Jan. 27, 1997, Ser. No. 788,327
Int. Cl.^{6} A01G *17/00*
U.S. Cl. 47—25 20 Claims



1. An apparatus for increasing plant root density and measuring plant growth comprising:
- an inverted T-shaped retaining wall having an outermost edge, an innermost edge, a retaining panel attached and located between said outermost edge and said innermost edge and a ledge defined by the area between said retaining panel and said outermost edge; and one or more anchoring lips mounted onto said inverted T-shaped retaining wall which are capable of anchoring said retaining wall to the ground;
- said inverted T-shaped retaining wall formed into a first substantially half circular section, having a convex side and a concave side and a second substantially half circular section having a convex side and a concave side:
- said concave side of said first substantially half circular section releasably connected with said concave side of said second substantially half circular section, thereby forming an elliptic area bounded by said retaining panel into which potting soil or other nutrient rich growth material may be placed; and
- a removable cover of substantially flat material formed to fit within said elliptic area bounded by said retaining panel and seat against said potting soil or other nutrient rich growth material;
- said removable cover having a periphery and a cutout whereby the base of a tree, shrub or bush may be inserted therethrough.

5,839,223
VARIABLE SIZED HOUSING FOR PROTECTING PLANTS BY UTILIZING WATER AS A HEAT SINK

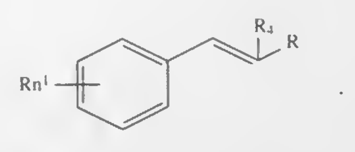
Paul S. Pepich, 8155 South New Castle Ave., Burbank, Ill. 60459-1674
Filed Nov. 7, 1996, Ser. No. 746,169
Int. Cl.^{6} A01G *13/00;31/02;9/00*
U.S. Cl. 47—26 2 Claims

1. A variable sized housing for protecting plants comprising, in combination:
- a plurality of panels each with a rectilinear configuration having a top face, a bottom face, a first side face, and a second side face defining a periphery and an interior space, the first side face of each panel having a triangular cross-section with a first surface integrally formed thereon and a second surface and a third surface both having a T-shaped cut out formed along the length thereof, the second side face of each panel having a triangular cross-section with a first surface integrally formed thereon and a second surface and a third surface both having a T-shaped protrusion formed along the length thereof, the top face of each panel having at least one slot formed along the length thereof for allowing the insertion of water within the interior space of each panel, the bottom face of each panel with a protrusion having a rectangular cross-section formed along the length thereof with a size corresponding to that of the slot of the top face of each panel, whereby the T-shaped protrusions of one panel is adapted to releasably couple with the T-shaped slots of another panel thus creating a right angle with respect to each other and the protrusion of the bottom face of one panel may be releasably inserted within one of the slots of the top face of another panel thus forming a wall with a doubled height when stacked vertically;
- a top with a pyramid configuration having four bevelled side faces forming a square bottom with four side edges each having a length corresponding to that of the panels, the top further including an aperture formed at an apex thereof;
- a cylindrical stopper adapted to be inserted within the aperture of the top with a horizontally oriented lip for allowing the convenient selective removal thereof; and
- an elongated panel couple for allowing the panels to be releasably coupled within a single plane, the panel couple having a triangular cross-section including a first planar surface, a second surface having a T-shaped protrusion formed along the length thereof for coupling with one panel, and a third surface having a T-shaped cut out formed along the length thereof for coupling with another panel;
- whereby the panels may be coupled with various heights and lengths for forming walls which may surround one of a plurality of various plants and provide insulation therefor.

5,839,224
AROMATIC ALDEHYDES AS INSECTICIDES AND FOR KILLING ARACHNIDS

Ralph W. Emerson, and Bradford G. Crandall, Jr., both of Davis, Calif., assignors to Proguard, Inc., Suison City, Calif.
Continuation-in-part of Ser. No. 482,222, Jun. 7, 1995, Pat. No. 5,676,958, which is a continuation-in-part of Ser. No. 366,974, Dec. 30, 1994, Pat. No. 5,536,501. This application Mar. 25, 1996, Ser. No. 621,852
Int. Cl.^{6} A01N *35/00;* A01G *13/00*
U.S. Cl. 47—58 14 Claims

1. A method for providing a susceptible plant with increased resistance to an insect or an arachnid population, said method comprising:
- administering to said plant a nonphytotoxic composition comprising an aromatic compound having the formula of



wherein R represents —CH_2OH, —CHO, —COOH, or —$COOR_5$; n is an integer from 0 to 3; and each R^1 independently represents —OH, —H, or an organic substituent containing 0 to 10 carbon atoms and from 1 to 5 heteroatoms, wherein the total number of carbon and heteroatoms in all R^1 substituents of said compound is no more than 15; R_4 represents hydrogen or an organic constitute containing from 1 to 10 carbon atoms and R_5 represents —H or an organic constituent containing from 1 to 10 carbon atoms, in an amount effective to increase or induce resistance in said plant, whereby at least one of growth and viability of said insect or arachnid population which infects a surface or a part of said plant is impaired.

5,839,225
METHODS AND APPARATUS FOR PREVENTING CONTAMINATION OF SEEDS

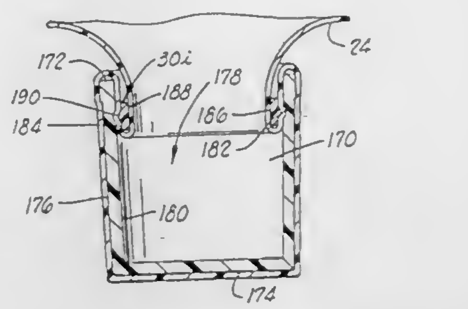
Branislav R. Lovic, Weatherford, Okla., assignor to American Sunmelon, Oklahoma City, Okla.
Filed Jul. 8, 1996, Ser. No. 676,758
Int. Cl.^{6} A01B *79/00;* A01C *1/00;* A23B *4/03;4/044;* B60H *3/00;* A23L *1/36;* A23P *1/00*
U.S. Cl. 47—58 10 Claims

1. A method of producing bacterial or fungal pathogen-reduced cucurbit seeds, said method comprising the steps of flame sterilizing the surface of a cucurbit fruit comprising seeds and pulp, while preserving the ability of at least some of said seeds to germinate after said sterilization step is complete, and releasing the seeds and pulp from said fruit, whereby a released seed and pulp mixture with reduced bacterial or fungal pathogens is produced.

5,839,226
APPARATUS FOR PROVIDING A DECORATIVE COVER FOR FLOWER POT USING A COLLAR

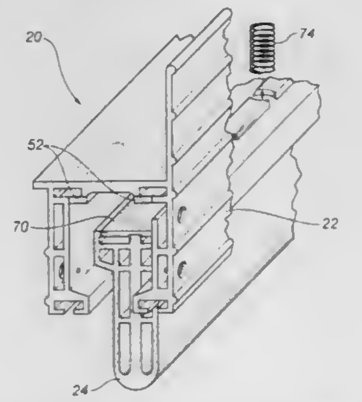
Donald E. Weder, Highland, Ill.; Franklin J. Craig, Valley Park, Mo.; William F. Straeter, Breese, and Joseph G. Straeter, Highland, both of Ill., assignors to Southpac Trust International, Inc.
Continuation of Ser. No. 454,904, May 31, 1995, Pat. No. 5,577,345, which is a division of Ser. No. 343,696, Nov. 22, 1994, Pat. No. 5,533,301, which is a division of Ser. No. 43,506, Apr. 6, 1993, Pat. No. 5,414,959, which is a division of Ser. No. 773,474, Oct. 9, 1991, Pat. No. 5,231,794, which is a division of Ser. No. 404,955, Sep. 8, 1989, Pat. No. 5,077,937, which is a continuation-in-part of Ser. No. 365,767, Jun. 1, 1989, abandoned, said Ser. No. 404,955 and a continuation-in-part of Ser. No. 327,996, Mar. 21, 1989, Pat. No. 4,901,423, is a continuation of Ser. No. 232,541, Aug. 11, 1988, Pat. No. 4,835,834, which is a continuation of Ser. No. 876,405, Jun. 20, 1986, abandoned. This application Nov. 26, 1996, Ser. No. 756,842
Int. Cl.^{6} A01G *9/02*
U.S. Cl. 47—72 2 Claims

1. An apparatus for providing a decorative cover, comprising:
- a flower pot having an outer peripheral surface and an inner peripheral surface, the inner peripheral surface defining an object opening sized and shaped to accommodate a floral grouping ;
- a sheet of material extending along the inner peripheral surface of the pot with at least a portion of the sheet of material extending from the object opening of the flower pot; and
- a collar having an outer peripheral surface, the collar disposed in the object opening of the flower pot in engagement with the sheet of material so as to clamp the sheet of material between the outer peripheral surface of the collar and the inner peripheral surface of the flower pot.



5,839,227
SAFETY EDGE FOR AN ELECTRICALLY OPERATED DOOR

Andrew Joseph Gardner, 13465 - 40 Street, Edmonton, Alberta, Canada, T5A 3L9
Filed Jul. 29, 1997, Ser. No. 902,322
Int. Cl.^{6} E05F *15/02*
U.S. Cl. 49—27 15 Claims



1. A safety edge for an electrically operated door, comprising:
- a female housing strip having an interior cavity in which is positioned at least one first electrical contact means;
- means for attaching the female housing strip to an edge of a door; and
- a male actuator strip having at least one second electrical contact means, the male actuator strip being telescopically received in the female housing strip, the male actuator strip being movable between a first position in which the second electrical contact means is spaced from the first electrical contact means and a second position in which the second electrical contact means engages the first electrical contact means to close a normally open circuit.

5,839,228
SWING-UP SLIDING DOOR ARRANGEMENT

Philip Duffy, Cape Town, South Africa, assignor to Sterling Plumbing Group, Inc., Rolling Meadows, Ill.
PCT No. PCT/US95/10467, § 371 Date May 5, 1997, § 102(e) Date May 5, 1997, PCT Pub. No. WO96/04834, PCT Pub. Date Feb. 22, 1996
PCT Filed Aug. 17, 1995, Ser. No. 750,929
Claims priority, application South Africa, Aug. 17, 1994, 94/6212
Int. Cl.^{6} E05D *15/10*
U.S. Cl. 49—223 5 Claims

1. A screen which comprises two or more overlapping leaves, an upper rail on which the leaves are hung and along which they can slide, and a lower rail for guiding the lower ends of the leaves

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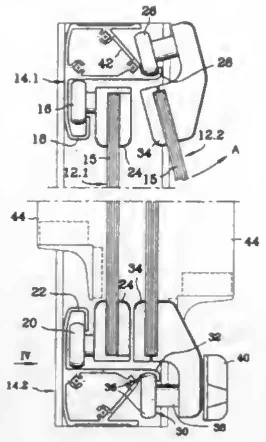


during their sliding movement, at least an outer one of the leaves having runners which engage with the upper rail, characterized in that the runners and upper rail are so constructed that the runners can tilt about a tilt axis extending along the upper rail, and that said outer leaf has a pivotally mounted element rotatable about an axis transverse to the outer leaf which is slidable alone the lower rail and pivotally displaceable between a first condition in which it engages the lower rail for guiding the outer leaf along the lower rail, and a second condition in which it is released from the lower rail, so as to enable the lower end of the outer leaf to swing transversely away from the lower rail, about the tilt axis.

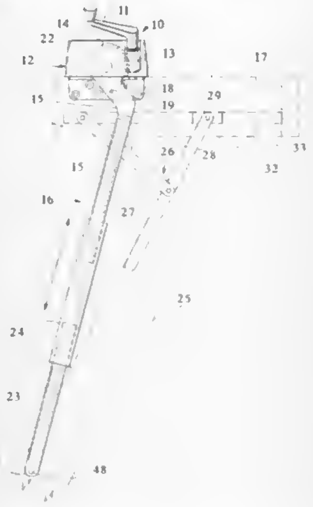
5,839,229
TELESCOPIC OPERATOR FOR CASEMENT WINDOWS

Jeffrey M. Briggs, Mountaintop, and Jerome R. Galati, Pottsville, both of Pa., assignors to Allen-Stevens Corp., West Hazleton, Pa.

Filed Nov. 19, 1996, Ser. No. 746,907

Int. Cl.⁶ E05D *15/28*

U.S. Cl. 149—246 **17 Claims**



1. A window operator for use in moving a window sash between open and closed positions with respect to a window frame, the operator comprising:

a housing for accommodating a first gear segment mounted for rotation about an axis, the gear segment being connected to a handle,

an arm assembly comprising a proximate end portion comprising a second gear segment and distal end portion for pivotal connection to a sash, the second gear segment being enmeshed with the first gear segment, the arm assembly rotating upon rotation of the first gear segment and extending radially with respect to the axis upon rotation of the gear segment,

the arm assembly further comprising a first arm segment and a second arm segment, the first arm segment comprising an inverted U-shaped cross section that at least partially surrounds the second arm segment for telescopic movement of the second arm segment with respect to the first arm segment,

the arm assembly further comprising at least one anti-friction bearing connected to the first arm segment and disposed between the first arm segment and the second arm segment,

the anti-friction bearing comprising a protruding member, the second arm segment comprising a protruding member, the protruding members of the anti-friction bearing and the second arm segment engaging each other to limit movement of the first arm segment with respect to the second arm segment.

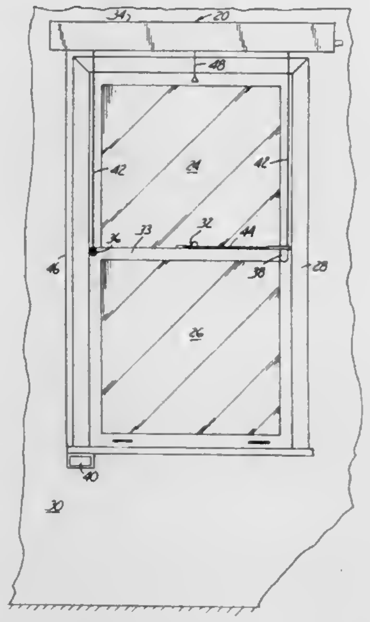
5,839,230
WINDOW PROPELLING SYSTEM

Michael A. Licking, 1129 Boulevard, Sturgis, S. Dak. 57785, and Warren C. Redden, 9440B S. Kipp Rd., Gypsum, Kans. 67448-9709

Continuation-in-part of Ser. No. 303,408, Sep. 9, 1994, Pat. No. 5,595,026. This application Jan. 21, 1997, Ser. No. 786,627

Int. Cl.⁶ E05F *11/00*

U.S. Cl. 49—360 **14 Claims**



1. A window propelling system, the system comprising:

a cylinder assembly having a piston movably disposed therein;

a forced fluid source connected to the cylinder assembly;

a piston cable in communication with the piston, wherein the piston cable extends from the cylinder assembly;

a lift cable having first and second ends for attachment at opposite sides of a window;

a lift pulley assembly connected to the piston cable and supporting the lift cable, the lift pulley assembly transposing a force placed on the piston cable into a force on both ends of the lift cable to open the window to which the lift cable is attached; and

a guide assembly for opening a lock on the window to which the lift cable is attached, the guide assembly comprising:

a frame receiving an end of the lift cable;

a slide block selectively disposed within the frame, wherein the side block is attached to an end of the lift cable and is configured to lock within the frame;

a window unlock cable attached to an end of the slide block, opposite the lift cable; and

a pulley disposed within the slide block assembly directing the window unlock cable to the lock.

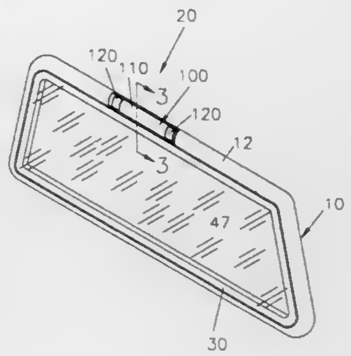
5,839,231
WINDOW ASSEMBLY WITH LIGHT

Stephen Gebhart, Ponte Vedra Beach, Fla.; Ronnie G. Gipson, Dearborn, and James C. Capiak, Three Oaks, both of Mich., assignors to Excel Industries, Inc., Elkhart, Ind.

Filed Aug. 2, 1996, Ser. No. 691,466

Int. Cl.⁶ E06B *3/00*

U.S. Cl. 49—413 **21 Claims**



1. A modular window assembly for closing a window opening in a motor vehicle body, comprising, in combination:

a circumferential frame having an exterior surface and an interior surface;

a window pane mounted by the frame and cooperating with the frame to close the window opening; and

at least one exterior light assembly comprising a stop lamp and at least one cargo lamp, the light assembly being mounted in a recess in the frame and electrical connection means for electrically connecting the light assembly to a power source.

5,839,232
SEALING OR GUIDING ASSEMBLIES

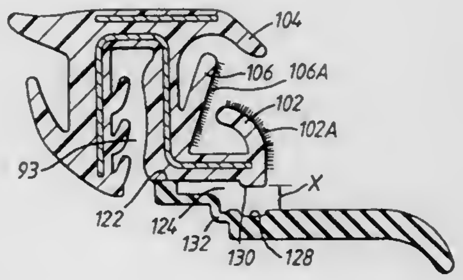
Heinz-Peter Backes, Wegberg, and Heinz Andrzejewski, Viersen, both of Germany, assignors to Draftex Industries Limited, Edinburgh, United Kingdom

Continuation of Ser. No. 370,726, Jan. 10, 1995, abandoned. This application Mar. 17, 1997, Ser. No. 819,446

Claims priority, application United Kingdom, Jan. 11, 1994, 9400408; Apr. 25, 1994, 9408136

Int. Cl.⁶ E06B *7/16*

U.S. Cl. 49—479.1 **12 Claims**



1. A strip assembly for carrying out at least one of sealing and guiding purposes, the assembly comprising

support means defining a rigid mounting surface,

strip means extending longitudinally and having a surface defining a first predetermined area consisting of a restricted part area and a remaining part area and a portion of flexible material attached to the strip means over the restricted part area and not attached to the strip means over the remaining part area, the portion of flexible material not attached to the strip means defining a second predetermined area overlapping said remaining part area,

the strip means including means for attaching it to the support means,

said portion of flexible material where it defines said second predetermined area having first and second possible positions relative to the strip means, the first position being a position operative when the strip means is not attached to the support means and being a position in which said portion of flexible material is positioned so that the second predetermined area is spaced by a predetermined spacing from the strip means over said remaining part area,

the second position being a position operative when the strip strip means is attached to the support means and being a position in which a major part of the second predetermined area of said portion of flexible material is in contact with the strip means in said remaining part area,

said portion of flexible material defining a surface formation distanced along the said portion of flexible material from where said portion of flexible material is attached to said restricted part area and said mounting surface defining a corresponding surface formation, the surface formations interlocking with each other when the strip means is attached to the support means.

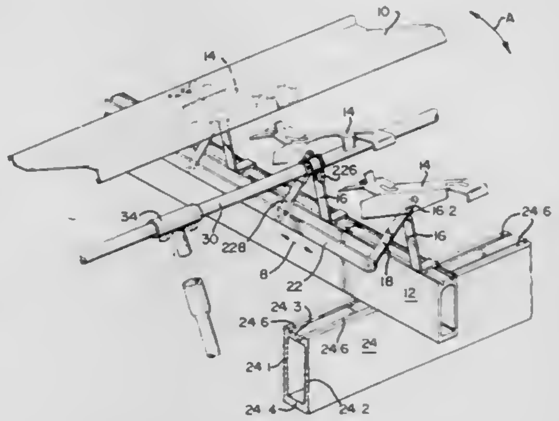
5,839,233
LOUVRE TYPE ROOF STRUCTURES

Dirk Van Zyl Smit, 190 Aldo Street, Sinoville, Pretoria, Gauteng, South Africa

Continuation-in-part of Ser. No. 529,412, Aug. 10, 1995, abandoned. This application Sep. 11, 1996, Ser. No. 710,030

Int. Cl.⁶ E04B *7/00*

U.S. Cl. 52—198 **9 Claims**



1. A louvre type roof structure which includes a plurality of parallel slats mounted on carrier beams, which structure includes

a plurality of carrier elements on which a corresponding plurality of slats are mountable;

mounting means for mounting the carrier elements on the carrier beams to permit pivotal displacement of the carrier elements and said slats mounted thereon between a closed position in which the slats are disposed in a roughly coplanar orientation, and an open position in which the slats are disposed in spaced apart generally parallel planes;

securing means for securing the carrier elements to the respective slats to engage the slats without penetrating the slats so that each slat will be located in a fixed planar orientation relative to the respective carrier element to which it is secured,

said mounting means comprising a pair of mounting levers provided in respect of each of said carrier elements, one of a said pair of mounting levers being a fixed lever securable to a carrier beam in a selected position, and the other one of a said pair of levers being a free lever displaceable relative to a said carrier beam, said fixed lever being rotatably attached to the respective carrier element, and said free lever being fixedly attached to the respective carrier element to permit pivotal displacement of said carrier element relative to said fixed

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lever and carrier beam when said free lever is displaced relative to the carrier beam, said fixed lever being provided with releasable attachment means for releasably attaching said fixed lever to said carrier beam in a selected position, said carrier beam being provided with complementary attachment means for engaging with the attachment means of said fixed lever, said releasable attachment means of the fixed lever and said complementary attachment means of the carrier beam being in the form of complementary male and female engagement formations, which are respectively in the form of complementary tongue-and-groove formations, the fixed lever being provided with a pair of spaced protruding tongue formations, and the carrier beam being provided with a pair of spaced grooves, the spacing of the tongue formations being equidistant to the spacing of the grooves to permit the tongue formations to be engaged releasably within the grooves, the fixed lever being of generally L-shaped configuration having an upright arm to be arranged in generally vertical orientation in use, and a transverse limb to be arranged in generally horizontal orientation in use; and in which the tongue formations are arranged to protrude generally downwardly in use, and are provided on the transverse limb, said pair of complementary spaced grooves being provided in a face of the carrier beam which face is arranged to be generally upwardly directed in use.

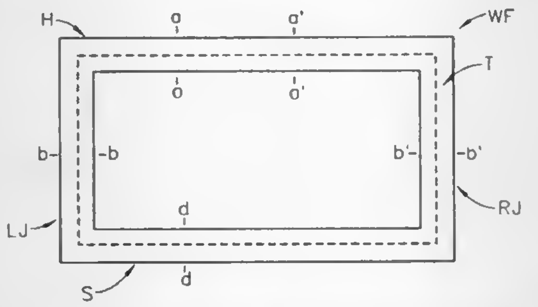
5,839,234
WINDOW FRAMES

Howard E. Mayer, 209 Williamsburg Dr. #5, Thiensville, Wis. 53092

Filed Mar. 4, 1996, Ser. No. 610,483

Int. Cl.^{6} E06B *3/54*

U.S. Cl. 52—213 **29 Claims**



1. A window frame system for containing window sash systems, said window frame system comprising:

- inner and outer window frames;
- each of said inner and outer window frames, as viewed in frontal elevation, comprising:
  - vertically oriented right and left jambs;
  - a generally horizontally oriented bottom sill; and
  - a horizontally oriented top head;
- each of said vertically oriented right and left jambs having a lower portion at a vertically lower extent thereof, and an upper portion at a vertically upper extent thereof;
- each of said generally horizontally oriented bottom sill and said horizontally oriented top head having a horizontally oriented length with a right portion at a right horizontal extent thereof and a left portion at a left horizontal extent thereof; with said horizontally oriented top head horizontally oriented length having one horizontally oriented side on a selection from the group consisting of to the right and to the left of an essential center point of said horizontally oriented length thereof, and an opposite horizontally oriented side respectively selected from the group consisting of to the left and to the right of said essential center point of said horizontally oriented length thereof;
- wherein, for each of said inner and outer window frames, the right and left portions of said generally horizontally oriented bottom sill and of said horizontally oriented top head are continuous with said vertically oriented right and left jambs at: the lower and upper portions of said right and left jambs, respectively;
- wherein the generally horizontally oriented bottom sill of said inner window frame has an upward facing surface and wherein the horizontally oriented top head of said inner window frame has a downward facing surface; and wherein the generally horizontally oriented bottom sill of said outer window frame has an upward facing surface and wherein the horizontally oriented top head of said outer window frame has a downward facing surface;
- and wherein, for each of said inner and outer window frames, the upward facing surface of the generally horizontally oriented bottom sill thereof directly faces the downward facing surface of the horizontally oriented top head thereof;
- said inner and outer window frames being of similar sizes and shapes;
- at least one of said inner and outer window frames having first and second lower window sash system guide means extending essentially the entire horizontally oriented length of the upward facing surface of the generally horizontally oriented bottom sill thereof, and said horizontally oriented top head of said at least one of said inner and outer window frames having first and second upper window sash system guide means extending essentially the entire horizontally oriented length of the downward facing surface thereof, each of said first and second upper window sash system guide means extending upward into said downward facing surface of said horizontally oriented top head of said at least one of said inner and outer window frames to first and second depths, with a change in said depth occurring approximately half-way along the horizontally oriented length of said horizontally oriented top head in said at least one of said inner and outer window frames, with said first upper window sash system guide means being shallower than the second on one horizontally oriented side, and with said second upper window sash system guide means being shallower than said first upper window sash system guide means on the opposite horizontally oriented side;
- such that in use a first window sash system can be horizontally slideably retained within said generally horizontally oriented bottom sill and said horizontally oriented top head corresponding first window sash system guide means in said at least one of the inner and outer window frames, and such that simultaneously a second window sash system can be horizontally slideably retained within said generally horizontally oriented bottom sill and said horizontally oriented top head corresponding second window sash system guide means in said at least one of the inner and outer window frames;
- such that said inner and outer window frames can be affixed to a building wall and first and second window sash systems placed within said at least one of said inner and outer window frames, between corresponding horizontally oriented first upper and first lower, and second upper and second lower window sash system guide means respectively, so that each of said first and second window sash systems can be placed in a closed window sash system position wherein each of said first and second window sash systems can be positioned below the shallower side of one of the horizontally oriented top head contained upper window sash system guide means, such that said first and second window sash systems can not be pried upward, and such that each of said first and second window sash systems can slide horizontally so as to be placed in an open position beneath the deeper side of one of the upper horizontally oriented top head contained window sash system guide means.

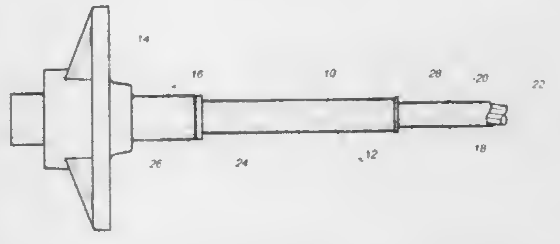
5,839,235
CORROSION PROTECTION TUBE FOR A POST-TENSION ANCHOR SYSTEM

Felix L. Sorkin, P.O. Box 1503, Stafford, Tex. 77477

Filed Aug. 20, 1997, Ser. No. 914,989

Int. Cl.^{6} E04C *5/08*

U.S. Cl. 52—223.13 **18 Claims**



1. A corrosion protection tube for connection to a trumpet portion of an encapsulated anchor of a post-tension anchor system comprising:

- a tubular body have a notch means extending therearound, said notch means for snap-fit engagement with a protrusion extending from the trumpet portion when said tubular body is attached on the trumpet portion, said tubular body body having open ends and a closed interior; and
- a collar formed on said tubular body so as to extend outwardly of an exterior surface of said tubular body adjacent to said notch means.

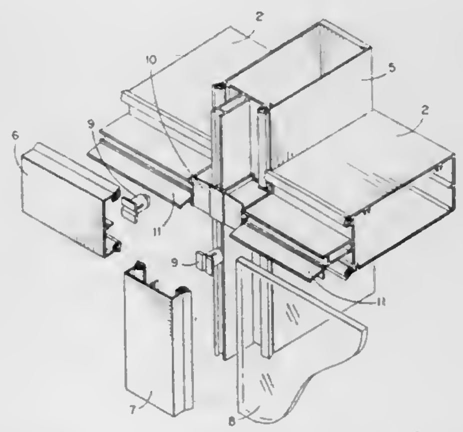
5,839,236
CURTAIN WALL INTEGRAL DRIP SYSTEM

John R. Frey, Riverside, Calif., assignor to International Aluminum Corporation, Monterey Park, Calif.

Filed Jun. 9, 1997, Ser. No. 871,631

Int. Cl.^{6} E04B *1/66*

U.S. Cl. 52—235 **6 Claims**



1. An integral drip system in combination with a thermally isolated straight in glazed curtain wall or window wall system wherein the curtain wall or window wall system includes a skeletal structure providing structural support of a glazing material and a face mount capping system so that said glazing material may be secured to said skeletal structure,

- said drip system comprised of a flange with an appendage,
- said appendage aligned generally parallel to said glazing material supported by said skeletal structure of a thermally isolated straight in glazed system,
- said appendage extending downward from said flange which projects to the exterior of said skeletal structure,
- said appendage protruding at an acute angle from the said flange,
- said appendage extending at the exterior side of said glazing material and being openly exposed to a weep area of said face mount capping system, and wherein
- said weep area is comprised of a water trough and voids located in the lower portion of the face mount capping system and is everywhere spaced from said glazing material,
- said voids located to allow water to drain to the exterior of said wall system.

5,839,237
GARAGE DOOR DECORATIVE COVER

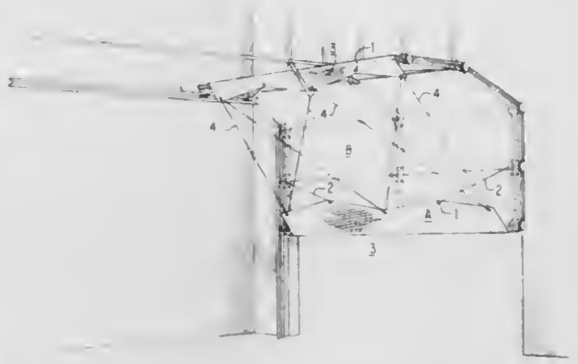
Ray E. Davidson, 2132 Gardenway Drive, Orleans, Ontario, Canada, K4A 3M2, assignor to Ray E. Davidson, Orleans, Canada

Continuation-in-part of Ser. No. 619,441, Mar. 21, 1996, Pat. No. 5,649,390. This application Mar. 17, 1997, Ser. No. 819,435

Claims priority, application Canada, Feb. 13, 1996, 2169383

Int. Cl.^{6} B62D *63/04*

U.S. Cl. 52—3 **24 Claims**



10. A combination garage door and decorative cover, comprising:

- a garage door positionable between open and closed positions;
- a decorative cover fixedly located on opposite sides of an exterior front side of the garage door; and
- attachment devices for affixing at least top and bottom ends of the decorative cover to the garage door;
- means for allowing partial movement of the decorative cover to allow for normal opening and closing of the garage door without the decorative cover riding up or down relative to the garage door.

5,839,238

Patent Not Issued For This Number

5,839,239
APPARATUS AND METHOD FOR BUILDING CONSTRUCTION

Byung K. Jang, 149 Washington Rd., Glenview, Ill. 60025

Filed Apr. 1, 1997, Ser. No. 831,164

Int. Cl.^{6} E04H *12/34;* B66C *23/34*

U.S. Cl. 52—123.1 **20 Claims**

1. A construction apparatus system for constructing a building frame from the bottom comprising:

- a plurality of motorized lifting devices;
- a temporary horizontal working floor frame with horizontal intersecting beams;
- a plurality of solid lifting bar assemblies;
- a roof frame with intersecting wall beams aligned with said intersecting beams of the temporary horizontal working floor frame;
- a plurality of vertical post beams at each intersection of the horizontal intersecting beams of the temporary working floor frame;

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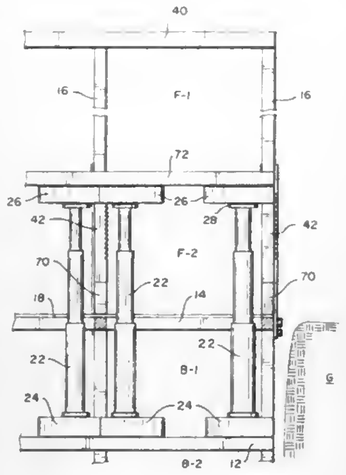
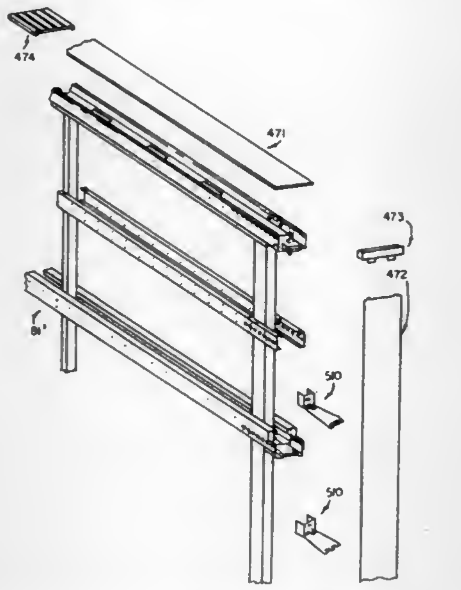


a laser system including a laser device and laser sensors: and
a computerized control system; whereby
each lifting bar assembly is positioned over each motorized lifting device to lift the roof frame to a higher horizontal level in a coordinated manner by laser sensors on selected lifting bar assemblies and a laser device cooperating with the computerized control system for positioning of each vertical post beam at each intersection of the roof frame, and the assembly of each successive floor frame is repeated to complete the building frame from the ground level.

5,839,240
PARTITION CONSTRUCTION AND TRIM SYSTEM THEREFOR

Michael D. Elsholz; Karl J. Mead, both of Grand Rapids, Mich.; Gregg R. Draudt, Somerville, Mass.; Steven D. Desmit, Kalamazoo, and William H. Palermo, Spring Lake, both of Mich., assignors to Steelcase Inc., Grand Rapids, Mich.

Filed Jul. 26, 1996, Ser. No. 686,913
Int. Cl.^{6} E04B *2/76;* E04H *1/00*
U.S. Cl. 52—242 **18 Claims**

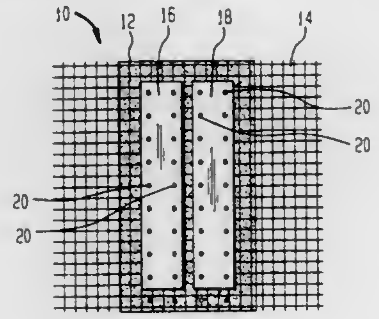


1. A partition system for subdividing a building space comprising:
a partition frame including at least two horizontal frame members having cantilevered ends with notches formed therein; and
an end trim cap having a body configured to cover a vertical side edge of the partition frame at the ends and further having legs configured to engage the notches in the ends of the at least two horizonal frame members to retain the end cap to the partition frame.

5,839,241
REINFORCED WALL PATCH

Frank G. Cacossa, 93 Martin Rd., Livingston, N.J. 07039, and Thomas E. Heide, 1873 Olive St., Piscataway, N.J. 08854

Filed May 21, 1997, Ser. No. 861,380
Int. Cl.^{6} E04F *19/02;13/06*
U.S. Cl. 52—255 **18 Claims**

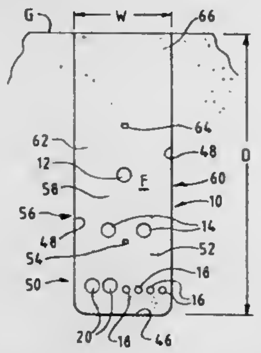


1. A wall patch comprising:
a sheet of fiberglass mesh having first and second opposing surfaces;
a sheet of fibrous material attached to said first surface of said sheet of fiberglass mesh; and
at least one sheet of protective material attached to said second surface of said sheet of fiberglass mesh, wherein said sheet of fiberglass mesh is arranged between said sheet of fibrous material and said at least one sheet of protective material thus forming a three layer structure which remains intact when installed on a wall surface.

5,839,242
COMBINED UTILITY TRENCH METHOD

Timothy P. Berg, Reno, Nev., assignor to Sierra Pacific Resources, Inc., Reno, Nev.

Filed Nov. 17, 1997, Ser. No. 972,082
Int. Cl.^{6} E04G *21/00*
U.S. Cl. 52—741.11 **12 Claims**

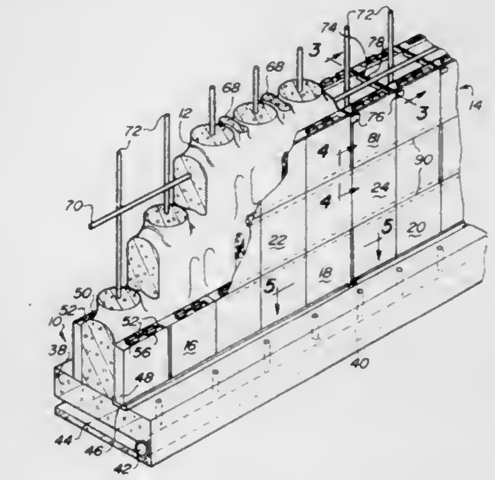


1. A method for installing a plurality of utility lines from a plurality of utility distribution sources to a user comprising the steps of:
excavating a single trench from a common location at about the utility distribution sources, the trench being between about 66 and about 48 inches deep and about 24 inches wide;
positioning the plurality of utility lines in the single trench, wherein an electrical utility line, installed, is at a lowest elevation in the trench which is a lower elevation in the trench than a water line in the trench, which is at an intermediate elevation in the trench which is at a lower elevation in the trench than a gas line:
installing a single partitioned service box through which at least one of the utility lines is accessible: and
burying the plurality of utility lines.

5,839,243
INTERLOCKING AND INSULATED FORM PATTERN ASSEMBLY FOR CREATING A WALL STRUCTURE FOR RECEIVING POURED CONCRETE

Robert J. Martin, Oakland Township, Mich., assignor to New Energy Wall Systems, Inc., Royal Oak, Mich.

Filed Sep. 13, 1996, Ser. No. 713,522
Int. Cl.^{6} E04B *2/20*
U.S. Cl. 52—439 **15 Claims**

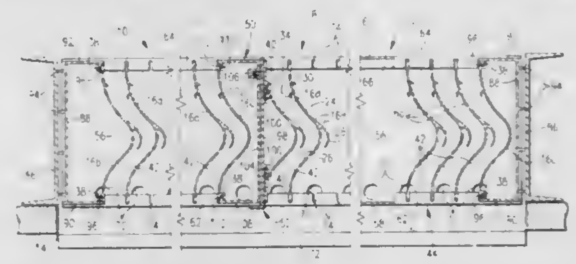


1. An interlocking and insulated form pattern assembly used in creating a wall structure for receiving a poured concrete, said form pattern assembly comprising:
a first integrally molded and durable form structure having a substantially rectangular configuration with a height, a length and a width, said first form structure further including a plurality of interiorly and arcuately formed walls which define in combination vertically extending concrete filling passageways and longitudinally extending concrete filling passageways;
interlocking means for securing said first form structure in an aligned fashion to additionally and identically construct form structures according to a specified stacking arrangement so that said vertically extending passageways and said longitudinally extending passageways extend continuously throughout said stacking arrangement, said interlocking means including alternating projecting portions and recessed portions extending longitudinally along first and second sides of said rectangularly configured form structure and from both upwardly facing surfaces and corresponding downwardly facing surfaces of said form structure so that a selected form structure is capable of being reversibly engaged with at least one further selected form structure; and
moisture drainage means extending both horizontally and vertically within said first form structure and communicating with additional moisture drainage means formed in said identically constructed form structures to create interconnected horizontally and vertically extending drainage channels in said stacking arrangement of form structures, said moisture drainage means including a first plurality of horizontally extending and opposingly mating recessed drainage channels formed along said upwardly and downwardly facing surfaces of each of said selected and stackable form structures, said first plurality of drainage channels communicating with a second plurality of vertically extending drainage channels established within solid wall portions of each of said form structures at spaced apart intervals and in proximity to said first and second sides to create an overall drainage network throughout said wall structure;
said stacking arrangement of form structures receiving a poured concrete to fill said vertically and longitudinally extending concrete passageways of said forms, said drainage network being capable of evacuating moisture from within said wall structure of said forms to a footing upon which said form assembly is constructed.

5,839,244
VERTICAL STORM LOUVER SYSTEM

Paul A. Johnson; Gregg S. Holden; James P. Sullivan, all of Overland Park, and Michael G. Wixson, Olathe, all of Kans., assignors to Architectural Storm Louver,L.L.C., Lenexa, Kans.

Filed Dec. 26, 1996, Ser. No. 773,387
Int. Cl.^{6} E06B *7/08*
U.S. Cl. 52—473 **12 Claims**



1. A louver for placement in an opening for removing water particles from air flowing through the opening, said louver comprising:
a plurality of elongated blades each having opposed lower and upper edges: and
a support frame for supporting said blades in a horizontally spaced and vertically extending configuration so that said blades define therebetween a plurality of horizontally-spaced and vertically extending air passageways for the passage of air through the opening, said support frame including a bottom frame member supporting the lower edges of said blades and a top frame member supporting the upper edges of said blades, said bottom frame member including a generally horizontally-extending base portion, said base portion having a plurality of drain holes formed therein for draining the water particles removed from the air out of said louver, said bottom frame member further including a pair of front and rear wall sections extending upwardly from said base portion, the upper ends of said front and rear wall sections each including a generally horizontally-extending ledge, each of said ledges including a plurality of horizontally-spaced slots formed therein, the lower edges of said blades being received and supported in said slots.

5,839,245
WALLBOARD ANCHOR SYSTEM

Thomas C. Behling, Elkhart, Ind., assignor to Alpha Systems, Inc., Elkhart, Ind.

Filed Oct. 14, 1994, Ser. No. 324,108
Int. Cl.^{6} E04C *2/34*
U.S. Cl. 52—481.1 **6 Claims**

1. A method of manufacturing a wall for a manufactured building, said method comprising:
providing a rectangular frame having opposite plate members and studs extending between said plate members;
applying glue to said studs and said plate members;
placing wallboard in contact with said glue applied to said studs and plate members;

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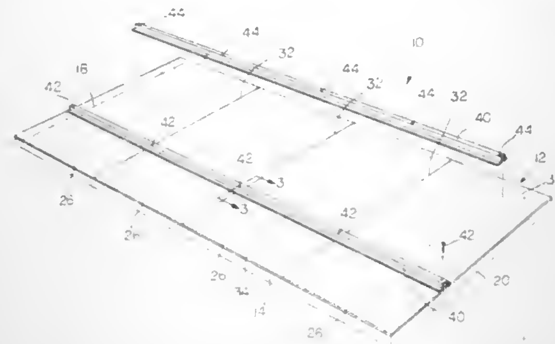
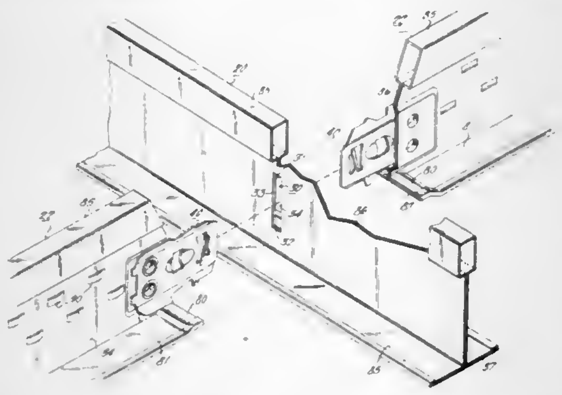


attaching a rigid rail to said studs to overly and in contact with the wallboard to urge said wallboard against said studs as said glue cures; and

removing the rail when said glue has set.

5,839,246
GRID FRAMEWORK FOR SUSPENDED CEILING
Daniel C. Ziegler, Millersville, and William J. Platt, Aston, both of Pa., assignors to Worthington Armstrong Venture, Malvern, Pa.
Filed Sep. 12, 1996, Ser. No. 712,764
Int. Cl.^{6} F04C *2/42*
U.S. Cl. 52—506.07 **11 Claims**



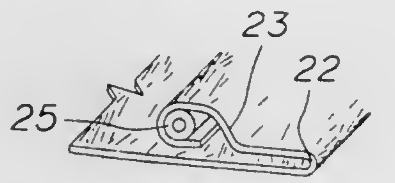
1. In a suspended ceiling, a system for keeping a metal framework that supports panels substantially intact in a rectangular formation during a fire comprising:

1) a main runner having a vertical slot therein;

2) a pair of cross runners having an end clip on each cross runner inserted from opposing direction toward one another through the slot wherein
   a) each clip has a spring engagement with the main runner that prevents withdrawal of the clip from the slot;
   b) a pair of clips form an interlock, each with the other, that prevents each of the clips from further movement toward the other or away from the other;
   c) each clip has a bottom stop at the bottom of the clip which abuts the main runner and prevents further entry of the clip into the slot;
   d) each clip has a top stop at the top of the clip that abuts the main runner and prevents further entry of the clip into the slot;

3) the interlock, and the top and bottom stops in abutting relationship with the main runner, form means on the end clips for permitting controlled longitudinal expansion that occurs in stages to relieve longitudinal compressive forces in the cross runner caused by fire whereby the cross runners remain substantially straight and in line in the rectangular grid formations during an expansion of the cross runners caused by such fire and wherein in said means for permitting controlled longitudinal expansion
   a) the bottom stop is sheared off the clip by forces of expansion,
   b) the top stop is forced through the slot by the forces of expansion, and
   c) the interlock is disengaged by the forces of expansion.

5,839,247
REINFORCED EXTERIOR SIDING
David H. Beck, 7530 Cain Rd., Jackson, Mich. 49201
Continuation of Ser. No. 456,249, May 31, 1995, Pat. No. 5,526,627, which is a continuation of Ser. No. 171,726, Dec. 22, 1993, Pat. No. 5,461,839. This application May 10, 1996, Ser. No. 644,135
Int. Cl.^{6} E04D *1/00*
U.S. Cl. 52—519 **12 Claims**

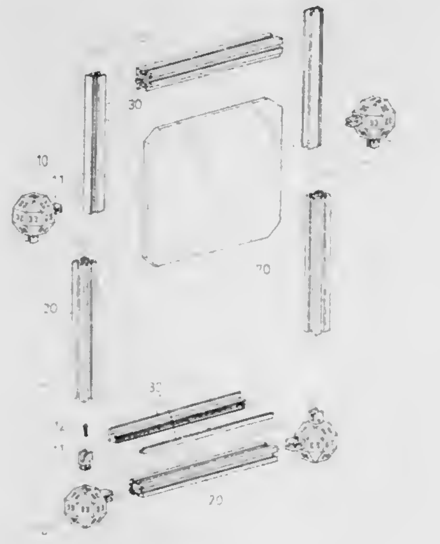


1. An exterior finishing panel, comprising:

an elongated thermoplastic sheet having a length and a width including an outwardly-facing surface having an aesthetic appearance and an inwardly-facing surface;

a reinforcing tape-like member adhered along a portion of the length of said thermoplastic sheet, said reinforcing tape-like member providing improved stiffness to a portion of said finishing panel.

5,839,248
FRAME ASSEMBLY
Rui-Wen Liang, 58, Ma Yuan West St., Taichung, Taiwan
Filed Dec. 16, 1996, Ser. No. 779,285
Int. Cl.^{6} E04B *1/38;* **F16B** *7/00*
U.S. Cl. 52—655.2 **5 Claims**



1. A frame assembly comprising:

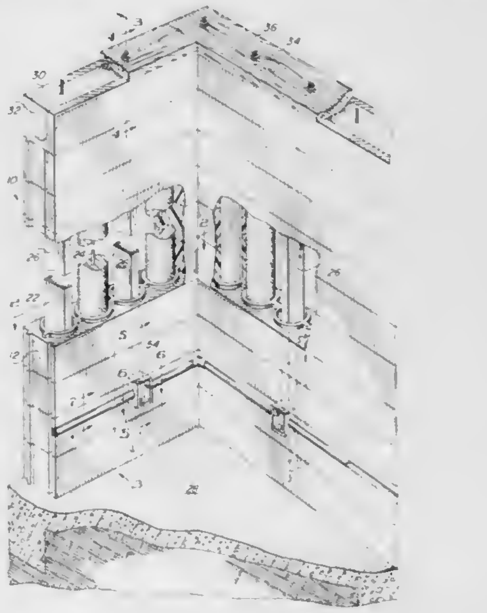
at least a first outer frame, a second outer frame, a third outer frame, a fourth outer frame, a first inner frame, a second inner frame, a third inner frame, a fourth inner frame, a first joint, a second joint, a third joint, a fourth joint, and a flat plate,

the flat plate surrounded by the first inner frame, the second inner frame, the third inner frame, and the fourth inner frame,

the first inner frame inserted in the first outer frame, the second inner frame inserted in the second outer frame, the third inner frame inserted in the third outer frame, and the fourth inner frame inserted in the fourth outer frame,

the first outer frame and the fourth outer frame connected by the first joint, the second outer frame and the fourth outer frame connected by the second joint, the second outer frame and the third outer frame connected by the third joint, and the first outer frame and the third outer frame connected by the fourth joint, each of the joints having a polyhedron body and a plurality of plugs connected to the polyhedron body, each of the polyhedron bodies having a plurality of square faces, a plurality of inserted recesses formed on each of the square faces of the polyhedron body, each of the plugs having a U-shaped plate, a through hole, a plurality of apertures, a recess hole, a slot, and two inserting blocks, a fastening element inserted in the slot, the fastening element having a screw rod, an adjusting bolt disposed on the screw rod, a first fin and a second fin connected to the screw rod, and a spring, the first fin having a first tip end, the second fin having a second tip end, the spring having a first hook end hooking the first tip end and a second hook end hooking the second tip end, the first fin having a first protruded portion connected to the screw rod, the second fin having a second protruded portion connected to the screw rod, a first rivet fastening the first fin in the plug, a second rivet fastening the second fin in the plug, the screw rod inserted in the corresponding recess hole, and the inserting blocks inserted in the corresponding inserted recesses respectively.

5,839,249
FOAM BLOCK WALL AND FABRICATION METHOD
Scott J. Roberts, 1730 N. Kittredge Rd., Flagstaff, Ariz. 86001
Filed Oct. 16, 1996, Ser. No. 730,940
Int. Cl.^{6} E04B *1/00*
U.S. Cl. 52—745.08 **20 Claims**



1. A method for fabricating a foam block wall comprising the steps of:

a. providing a plurality of first foam blocks aligned end to end horizontally, each first foam block having an upper surface, a lower surface, opposing, parallel oriented exterior side surfaces and a plurality of first passageways extending vertically between the upper and lower block surfaces and defining a reduced thickness sidewall between the exterior side surface and each first passageway;

b. providing a plurality of second foam blocks aligned end to end horizontally, each second foam block having an upper surface, a lower surface, opposing, parallel oriented exterior side surfaces and a plurality of second passageways extending vertically between the upper and lower block surfaces and defining a reduced thickness sidewall between the exterior surface and each second passageway;

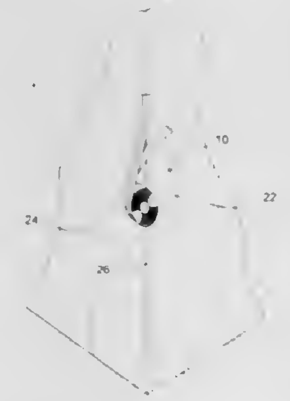
c. positioning the lower surfaces of the plurality of second foam blocks on the upper surfaces of the plurality of first foam blocks with each second passageway aligned with a corresponding first passageway;

d. providing a plurality of block alignment elements, each block alignment element having a first end, a second end, and first and second edge alignment surfaces disposed between the first and second ends and dimensioned to simultaneously engage the first and second passageways of the first and second blocks at angularly spaced apart intervals;

e. positioning each block alignment element through one of the second passageways of one of the second foam blocks and through the second passageway of the second block and through one of the corresponding first passageways of one of the first foam blocks, and further engaging the first and second passageways of the first and second foam blocks with the edge alignment surfaces to align the first and second foam blocks relative to each; and

f. grouting a plurality of aligned first and second passageways with a material.

5,839,250
EDGE PROTECTOR
Stanley A. Hibler, 3286 Stadler Dr., Pickerington, Ohio 43147
Filed Sep. 6, 1996, Ser. No. 709,185
Int. Cl.^{6} E04G *21/00*
U.S. Cl. 52—746.1 **10 Claims**



1. A method for protecting an outside corner which is formed by two walls, which comprises:

(a) supplying a tape wound in roll form which tape is formed from polymeric material in a thickness of about 5 to 15 mils and which is axially scored, the tape having a front surface and a rear surface which is coated with a pressure sensitive adhesive;

(b) unrolling said tape from said roll with the score in axial alignment with the outside corner; and

(c) pressing said coated rear surface on each wall extending from the corner to form a corner edge protector on said corner.

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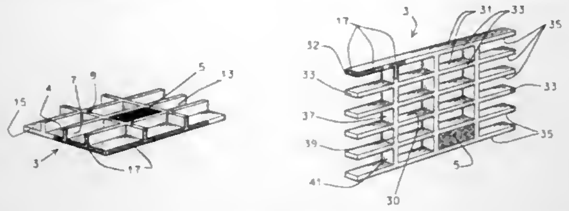
5,839,251
MASONRY STRUCTURE BUILDING AID

Alex Howard Weinstein, 4403 W. Grace St., Richmond, Va. 23230

Filed Oct. 16, 1996, Ser. No. 732,610
Int. Cl.^{6} E04F *21/18*
U.S. Cl. 52—749.13 **6 Claims**

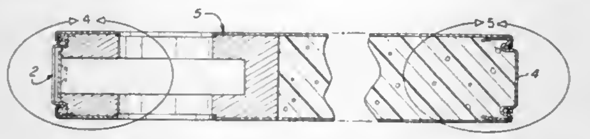


1. An article of manufacture comprising a container of unitary continuous structure having cavities adapted to accept masonry material, and a bonding agent disposed within said container, said container being dissolvable by contact with an aqueous catalyst, thereby causing said bonding agent to contact said catalyst with consequent curing of said bonding agent to a hardened state.

5,839,252
METAL DOOR WITH CONTINUOUS FRAME AND METHOD

David M. Berghorn, Waterford, and Shaojun Gao, Detroit, both of Mich., assignors to The Stanley Works, New Britain, Conn.

Filed Apr. 4, 1997, Ser. No. 835,143
Int. Cl.^{6} E04C *2/34;* E06B *3/76*
U.S. Cl. 52—784.13 **21 Claims**

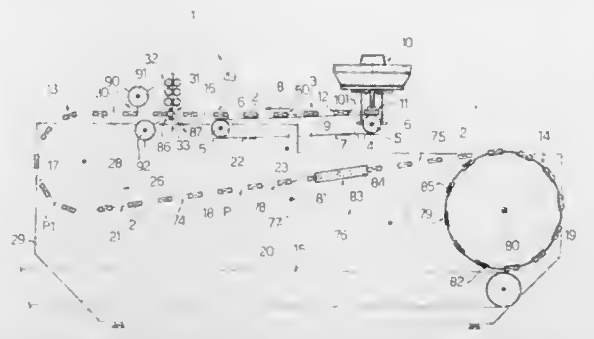


1. A metal door comprising a continuous substantially rectangular frame with stiles and rails, and a pair of substantially rectangular panels engaged with said frame, said frame comprising an integrally formed continuous, unitary metallic frame member of generally uniform cross section with marginal portions extending along the sides thereof and channels in its outer face extending along said side marginal portions, said panels having opposed flanges extending along the sides thereof overlying and adjacent said marginal portions of said stiles of said frame and engaged in said channels to secure said panels thereto.

5,839,253
PRODUCT OVERWRAPPING MACHINE

Fiorenzo Draghetti, Medicina, Italy, assignor to G.D Societa' per Azioni, Bologna, Italy

Filed Mar. 13, 1997, Ser. No. 816,637
Claims priority, application Italy, Mar. 15, 1996, BO96A0140
Int. Cl.^{6} B65B *19/22*
U.S. Cl. 53—234 **14 Claims**

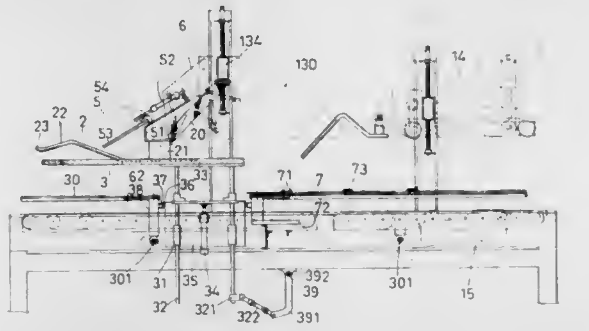


1. A machine for overwrapping products (**2**) in sheets (**33**) of wrapping material, the machine (**1**) comprising conveying means (**3, 13, 14, 15**) for feeding a product (**2**) continuously in a given traveling direction (**8**) and along a given path (P), while maintaining a lateral surface (**12**) of the product (**2**) perpendicular at all times to said traveling direction (**8**); supply means (**32**) for feeding a sheet (**33**) of wrapping material through said path (P) at an intercepting station (**31**) where the sheet (**33**) is intercepted by the product (**2**); first wrapping means (**87, 89**) for engaging the sheet (**33**) and folding the sheet (**33**) into a U about the product (**2**); second wrapping means (**91, 92; 103, 104**) movable to and from an engaged position engaging the sheet (**33**) and for further folding the sheet (**33**) about the product (**2**) to form a tubular wrapping (**35**) with opposite open ends (**36**); first stabilizing means (**60, 61**) movable to and from an operating position to close the tubular wrapping (**35**) by means of a longitudinal joint; third wrapping means (**84**) for folding said open ends (**36**) on to the product (**2**); and second stabilizing means (**85**) for fixing said folded ends (**36**) by means of an end joint; the machine (**1**) being characterized in that said conveying means (**3, 13, 14, 15**) comprise a gripping device (**43**) movable with the conveying means (**3, 13, 14, 15**) along said path (P), and also movable, in relation to the conveying means (**3, 13, 14, 15**), to and from a gripping position contacting, in use, end surfaces (**42**) of the product (**2**) parallel to said traveling direction (**8**); and control means (**45**) for maintaining the gripping device (**43**) in the gripping position for at least one interval of time in which said first stabilizing means (**60, 61**) are in the operating position.

5,839,254
FOLDING AND DELIVERY DEVICE FOR DOUBLE-LAYERED CARTON SEALING MACHINE

Tuan-Mei Chiu Chen, Chia-Yi Hsien, Taiwan, assignor to Tien Heng Machinery Co. Ltd., Hsien, Taiwan

Filed Jan. 6, 1998, Ser. No. 871,838
Int. Cl.^{6} B65B *7/20*
U.S. Cl. 53—377.2 **1 Claim**



1. A sealing and delivery device for double-layered carton sealing machine comprising:

two folding rod units respectively consisting of a guide plate and a guide rod, each said guide plate shaped as an inverted L and fixed under a lateral rod of an upper case, each said guide rod fixed under said guide plate and extending forward;

two lifting devices respectively consisting of a sleeve, an upright rod, a lifting frame and a first air cylinder, said sleeve fixed with a platform and inserted through by said upright rod to let said rod to slide up and down, an upper end of said upright rod fixed with said lengthwise lifting frame, said first air cylinder moving up and down said upright rod for lifting and lowing said lifting frame, a plate fixed with said sleeve having a cylindrical member fixed at two sides, a shaft fitted in said cylindrical member and connected with a shaft support of a stationary frame so as to permit said lifting device to move in and out with a proper elasticity to cope with small size difference of cartons, said upright rod having its lower end fixed with a block connected with one end of a connecting rod, the other end of said connecting rod connected with a crank of a synchronous horizontal rod pivotally fixed with a bearing base fixed under said platform so that said two lifting devices may be moved up and down simultaneously;

a front swing unit disposed in said upper case, consisting of a folding plate and a second air cylinder, said second air cylinder having its upper end pivotally connected with a rod fixed between two opposite sides of said upper case and a piston rod pivotally connected with a rod of said folding plate so as to permit said folding plate to swing up and down by means of a support shaft as a pivot;

two side swing units respectively consisting of a plate provided under a slanting rod, a third air cylinder pivotally attached on said plate, a swing rod also pivotally attached on said plate, said swing rod having a shaft at a proper location, said shaft pivotally connected with and moved by said third air cylinder so as to move said swing rod so that an outer end of said swing rod may contact a lower portion of a rear flap of a carton and then push up said rear flap to a preset level;

a rear swing unit disposed in said upper case, consisting of a rod pivotally connected with a movable plate, a fourth air cylinder moving said movable plate, a swing arm fixed with a lower end of said movable plate, a fifth air cylinder fixed on said movable plate and having its piston rod end pivotally connected with an intermediate portion of said movable plate, said swing arm moved by said fifth air cylinder to push the drooping rear flap upward and then to fold forward so that two side flaps may be folded down for sealing;

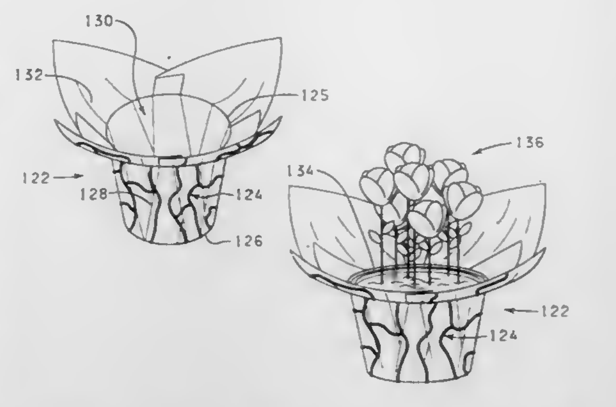
two flat plates respectively pivotally connected with a stationary frame on said platform with a connecting rod, a spring used to pull said flat plate with elasticity, a threaded rod provided to screw said flat plate with stationary frame and protruding in a slot in said stationary frame so that said flat plate may move within the length of said slot; and,

said two guide rods with their outer ends passing through an aperture between a front flap and two side flaps of a moving-on carton and forcing said two side flaps to swing outward, said two lifting frames moved by said first air cylinders to clamp two sides of an outer box at the folding lines of said side flaps and lift said outer box up to a preset level, said two flat plates moved to contact two sides of an inner box and support lower edges of said outer box to prevent said outer box from falling down, said front swing unit and said side swing units firstly folding inward down the front flap, the rear flap, said rear swing unit further folding the side flaps inward down during forward movement of said carton, and said moving carton finally sealed by said upper and said lower sealing device.

5,839,255
METHOD FOR FORMING A PREFORMED POT COVER HAVING A THREE DIMENSIONAL PATTERN PRINTED THEREON

Donald E. Weder, Highland, Ill., assignor to Southpac Trust International, Inc.

Division of Ser. No. 821,012, Mar. 19, 1997, Pat. No. 5,720,152, which is a division of Ser. No. 477,003, Jun. 7, 1995, Pat. No. 5,661,951. This application Nov. 10, 1997, Ser. No. 967,706
Int. Cl.^{6} B65B *11/00*
U.S. Cl. 53—397 **11 Claims**



1. A method for forming a decorative cover about a flower pot, comprising:

providing a flower pot having an outer peripheral surface, a lower end and an open upper end, the flower pot defining a floral containing space formed therein;

providing at least one sheet of material having a three-dimensional printed pattern thereon wherein the three-dimensional pattern is produced by application of a foamable ink composition to the sheet of material;

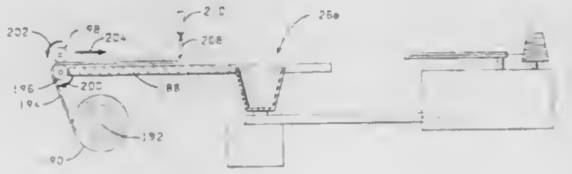
forming the sheet of material into a preformed pot cover comprising a preformed base and a skirt, the preformed base being sized to contain the flower pot and having an upper end, a lower end, an outer peripheral surface and a pot opening formed through the upper end thereof providing access to a pot receiving space, the skirt connected to the upper end of the preformed base so as to extend a distance outwardly from the upper end of the base and terminating with an outer periphery; and

positioning the flower pot in the pot receiving space of the preformed pot cover such that the open upper end of the flower pot remains substantially uncovered and thereby provide the decorative cover about the flower pot.

5,839,256
CONVEYABLE COVER FORMER AND FASTENING SYSTEM

Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Southpac Trust International, Inc.

Continuation of Ser. No. 465,294, Jun. 5, 1995, Pat. No. 5,661,952, which is a continuation of Ser. No. 88,976, Jul. 8, 1993, Pat. No. 5,450,707. This application Apr. 7, 1997, Ser. No. 826,841
Int. Cl.^{6} B65B *11/18;49/00;51/00*
U.S. Cl. 53—399 **21 Claims**



1. A method for processing an article, comprising:

providing the article having an outer peripheral surface;

providing a sheet of material;

forming the sheet of material about at least a portion of the outer peripheral surface of the article;

providing a fastener applicating means having a fastening station for applying a fastener about the cover;

moving the article having the cover formed about the outer peripheral surface of the article to the fastening station of the fastener applicating means;

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automatically applying the fastener about a portion of the cover formed about at least a portion of the outer peripheral surface of the article at the fastening position of the fastener applicating means; and

removing the article having the cover fastened thereabout from the fastener applicating means.

5,839,257
DRUG PACKAGING MACHINE

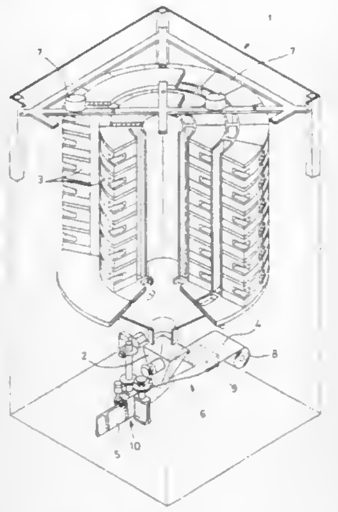
Jan Soderstrom; David A. Shultz, both of Buffalo Grove, Ill.; Shinichi Honda, Toyonaka, Japan; Hiroyasu Hamada, Toyonaka, Japan, and Ryuji Kitai, Toyonaka, Japan, assignors to AutoMed Technologies Incorporated, Buffalo Grove, Ill., and Kabushiki Kaisha Yuyama Seisakusho, Toyonaka, Japan

Filed Apr. 21, 1997, Ser. No. 845,237

Claims priority, application Japan, Apr. 22, 1996, 8-100407

Int. Cl.^{6} B65B *61/02;9/06*

U.S. Cl. 53—411 **4 Claims**



3. A method of packaging drugs in a series of connected bags in accordance with a prescription, said method comprising:

distinguishing between a first type of drugs and a second type of drugs, wherein said first type of drugs can be packaged in a bag and said second type of drugs cannot be packaged in a bag;

forming a series of connected bags from a packaging sheet, wherein said plurality of bags includes a bag corresponding to each of said first type of drugs prescribed in said prescription and a bag corresponding to each of said second type of drugs prescribed in said prescription;

dispensing, in a prescribed order of taking, said first type of drugs into each bag which corresponds to said first type of drugs such that each bag which corresponds to said second type of drugs is an empty bag; and

printing drug taking data for each of said first and second types of drugs prescribed in said prescription on each of said corresponding bags.

5,839,258
STORING METHOD FOR ADSORBENT PARTICLES

Hiroaki Takayanagi; Naoko Takasaki, and Takashi Mikawa, all of Kanagawa, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Filed Nov. 27, 1996, Ser. No. 756,578

Claims priority, application Japan, Nov. 28, 1995, 7-309213

Int. Cl.^{6} B65B *55/02*

U.S. Cl. 53—425 **7 Claims**

1. A method for storing adsorbent particles of styrene-divinylbenzene copolymer, which comprises hermetically sealing the adsorbent particles, irradiating the adsorbent particles with radioactive rays in the hermetically sealed condition, and storing said adsorbent particles in the hermetically sealed condition.

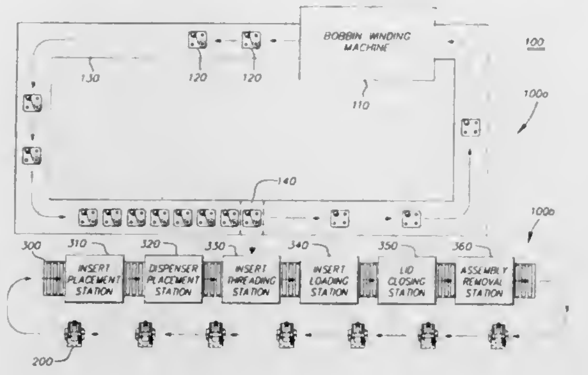
5,839,259
METHOD FOR ASSEMBLING DENTAL FLOSS DISPENSER PRODUCTS

Richard M. Prospero, Princeton; Erik Lunde, Morganville; Harry Swanson, Bloomfield, and Lee Adams, Flemington, all of N.J., assignors to Johnson & Johnson Consumer Products, Inc., Skillman, N.J.

Division of Ser. No. 381,512, Jan. 31, 1995, Pat. No. 5,666,782. This application Apr. 9, 1997, Ser. No. 838,396

Int. Cl.^{6} B65B *35/54*

U.S. Cl. 53—445 **7 Claims**



1. A method for assembling a thread dispenser product formed of a bobbin of wound thread, a dispenser case, and a dispenser insert for rotatably supporting said bobbin of wound thread within said dispenser case, comprising the steps of:

(A) detachably mounting with a moveable latching bar said dispenser insert in an insert loading area of a singular dispenser assembly fixture, said insert loading area having a flat horizontal surface for mating with a bottom surface of said dispenser insert, said bottom surface of said dispenser insert having at least one opening, said moveable latching bar being pivotally coupled to said singular fixture assembly and having a ridge for mating with said at least one opening in said bottom surface of said dispenser insert, said moveable latching bar being moveable between a locking position and a depressed position;

(B) detachably mounting said dispenser case in a dispenser case loading area of said singular dispenser assembly fixture;

(C) loading said bobbin of wound thread onto said dispenser insert while said dispenser insert is mounted in said insert loading area;

(D) detaching said dispenser insert with said bobbin of wound thread loaded thereon from said insert loading area;

(E) loading said dispenser insert with said bobbin of wound thread loaded thereon into said dispenser case while said dispenser case is mounted in said dispenser case loading area; and

(F) after step (E), detaching said dispenser case from said dispenser case loading area;

wherein said ridge in said moveable latching bar horizontally restrains said dispenser insert within said insert loading area when said moveable latching bar is in said locking position and said ridge is positioned within said at least one opening in said bottom of said dispenser insert, and said dispenser insert is free to move horizontally from said insert loading area toward said dispenser case loading area when said moveable latching bar is in said depressed position.

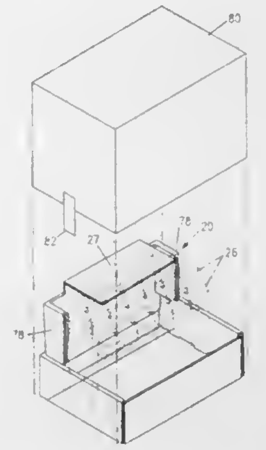
5,839,260
PACKAGING SYSTEM

Harvey Brody, Costa Mesa, Calif., assignor to Norvey, Inc., Santa Ana, Calif.

Division of Ser. No. 614,630, Mar. 13, 1996, Pat. No. 5,664,683. This application Apr. 28, 1997, Ser. No. 840,330

Int. Cl.^{6} B65B *43/10;43/26*

U.S. Cl. 53—456 **8 Claims**



1. A method of packaging articles of merchandise, comprising the steps of:

(a) providing a shipping/display carton having a bottom, a front wall, a rear wall, a pair of opposed side walls, a display panel extending vertically from the rear wall, and an extension section joined to the display panel along an extension section fold line, wherein the bottom, front wall, rear wall, and side walls define a receptacle portion for a plurality of articles of merchandise, and wherein the extension section is foldable along the extension section fold line between a substantially vertical position and a substantially horizontal position;

(b) placing a plurality of articles of merchandise in the receptacle portion while the extension section is in its substantially vertical position;

(c) folding the extension section along the extension section fold line to its substantially horizontal position;

(d) placing an open-bottomed HSC carton over the shipping/display carton; and

(e) securing the HSC carton to the bottom of the shipping/display carton.

5,839,261
MOWER WITH AN IMPROVED OPERATING DEVICE

Jean-Paul Haberkorn, Monswiller, and Jean-Pierre Fritsch, Hohengoeft, both of France, assignors to Kuhn S.A., Saverne Cedex, France

Filed Apr. 3, 1997, Ser. No. 832,833

Claims priority, application France, Apr. 17, 1996, 96 05051

Int. Cl.^{6} A01D *34/66*

U.S. Cl. 56—6 **18 Claims**

1. A mower including:

a cutting mechanism extending:

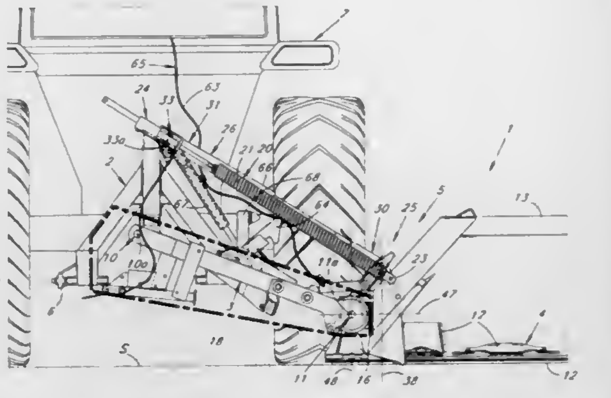
in a work position, transversely to a direction of forward travel and level with the ground, and

in a windrowing position, transversely to said direction of forward travel and a certain distance above the ground;

a hitch structure intended to be connected to a hitch device of a motor vehicle;

a carrying beam connected to the hitch structure by means of a first articulation and to the cutting mechanism by means of a second articulation;

an operating device making it possible to bring the cutting mechanism at least into the work position and into the windrowing position and including:



an operating member connected to the cutting mechanism and comprising:

a first lever connected to said cutting mechanism by means of a third articulation, and

a latch intended to stop the upward pivoting of the cutting mechanism about the longitudinal axis of the second articulation during bringing into the windrowing position; and

an operating element connected at one of its ends to said operating member by means of a fourth articulation and at the other of its ends to the hitch structure by means of a fifth articulation;

wherein the operating member additionally includes a second lever connected on the carrying beam by means of a sixth articulation and on the first lever by means of a seventh articulation.

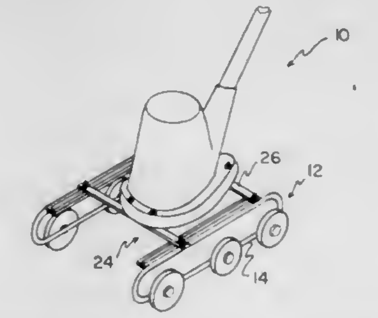
5,839,262
WHEELED WEED TRIMMER SUPPORT SYSTEM

Richard S. Sorensen, 30 Holly Hill Ct., Walnut Creek, Calif. 94596

Filed Feb. 12, 1998, Ser. No. 22,359

Int. Cl.^{6} A01D *53/00*

U.S. Cl. 56—16.7 **7 Claims**



1. A wheeled weed trimmer support system comprising, in combination:

a pair of wheel assemblies each including a frame with an oval configuration defined by a lower linear bar and an upper linear bar coupled together via a pair of semicircular end portions such that the linear bars reside in parallel relationship within a single vertical plane, the upper linear bar of each wheel assembly having an auxiliary bar of a similar size and shape coupled at a pair of ends thereof to those of the upper linear bar such that the auxiliary bar and the upper linear bar reside in parallel relationship within a single horizontal plane and define a slot, wherein the lower linear bar has three wheels rotatably coupled to an outer surface thereof;

a plurality of bolt units each including a lower portion with an intermediate extent slidable along the slot of the corresponding wheel assembly, the lower portion further having an enlarged upper and lower extent for maintaining the bolt unit situated vertically, each bolt unit further having a threaded upper portion;

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- a first support assembly including a pair of cross bars each having a pair of ends with apertures formed therein for being removably coupled to the upper portion of a corresponding bolt unit for supporting a first type of weed trimmer thereon and further maintaining the wheel assemblies in parallel relationship;
- a second support assembly including a plate having a square configuration and an aperture formed in each of four corners thereof each for being removably coupled to the upper portion of a corresponding bolt unit for maintaining the wheel assemblies in parallel relationship, the plate having a circular cut out formed in a central extent thereof for allowing the passage of a bottom of a second type of weed trimmer therethrough, the second support assembly further including a coupling tab coupled to a front edge of the plate with a horizontal extent extending over the cut out for mounting to the second type of weed trimmer; and
- a third support assembly including a plate having a square configuration and an aperture formed in each of four corners thereof each for being removably coupled to the upper portion of a corresponding bolt unit for maintaining the wheel assemblies in parallel relationship, the plate having a circular cut out formed in a central extent thereof and a plurality of bores formed about the cut out for supporting coupling bolts therein, the third support assembly further including a plurality of coupling arms each with a horizontal portion with an inboard end having an elongated slot formed therein for coupling with a corresponding one of the coupling bolts and extending radially with respect to the cut out of the plate, each coupling arm further including a vertical portion which defines a portion of a cylinder and is coupled to an outboard end of the coupling arm and extended upwardly therefrom for encompassing a post of a third type of weed trimmer, wherein the coupling bolts may be tightened to secure the coupling arms about the post.

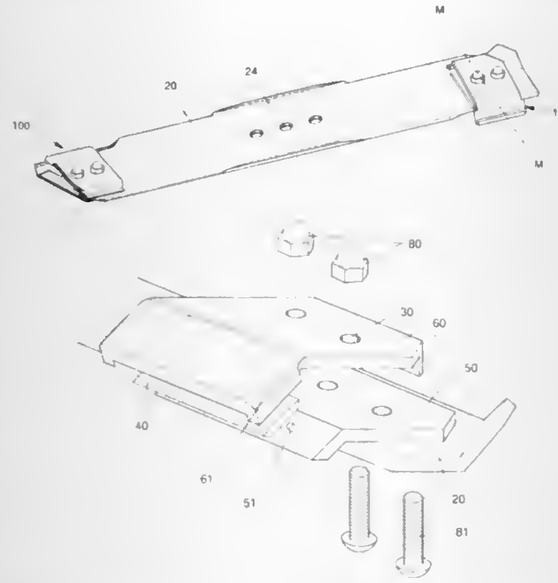
5,839,263
LAWNMOWER BLADE WITH REPLACEABLE KNIVES

Horst Fred Biernath, 4550 Runnemede Rd. NW., Atlanta, Ga. 30327; Mark Erich Biernath, 2460 Cogburn Ridge Rd., Alpharetta, Ga. 30004, and Rolf Werner Biernath, 405 Crestview Dr., Maplewood, Minn. 55119

Filed Aug. 1, 1997, Ser. No. 905,074

Int. Cl.^{6} A01D *34/73*

U.S. Cl. 56—255 **11 Claims**



1. A device for cutting vegetation on a surface comprising of an elongated, oblate member or blade body of predetermined strength, length, width, and thickness, a means of mounting said blade body to a source of rotation so said blade body rotates in a plane with a broad surface facing up, said plane is parallel to the surface of vegetation, said plane is at a predetermined height to the surface of vegetation, and said blade body having at least one leading edge, said leading edge located on the forward facing direction of rotation of the blade body, and a trailing edge located on said blade body opposite the leading edge, and a knife member selected from the group consisting of carbide and high speed steel and chrome steels and powder metal knives, and said knife member having at least one cutting edge, and said knife member further includes at least one hole, and a safety cage assembly is used as a means for positioning the knife member at predetermined angles and location with respect to the blade body, said safety cage assembly having at least a knife member holder with at least one positioning pin, and a clamping member or clamp with a safety lip overhanging said knife member, with the knife member sandwiched between said knife member holder and said clamp, and a means of attaching said safety cage assembly to said blade body in such a way that said safety cage assembly protrudes a predetermined distance beyond the leading edge of said blade body, said safety cage assembly is located at predetermined locations on said blade body, said safety cage assembly contains said knife member in an event said knife breaks and is attached in a detachable manner.

5,839,264
STEEL CORD FOR REINFORCEMENT OF OFF-ROAD TIRE

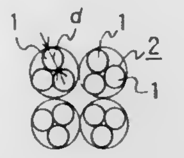
Takeshi Uchio, Tokyo, Japan, assignor to Tokyo Rope Manufacturing Co., Tokyo, Japan

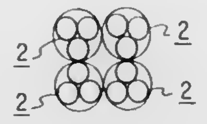
Filed Nov. 13, 1996, Ser. No. 748,389

Claims priority, application Japan, Jan. 29, 1996, 8-034336

Int. Cl.^{6} D02G *3/02;3/36*

U.S. Cl. 57—237 **2 Claims**





1. A steel cord for reinforcement of an off-road tire, said off-road tire comprising at least one belt layer including an outermost belt layer and at least said outermost belt layer comprising said steel cord,

- wherein said steel cord has a 3×3, a 3×4, a 4×3 or a 4×4 structure, said steel cord has an identical cord diameter at all points along the steel cord in a longitudinal direction, said steel cord has a cord lay length equal to from 3.5 to 7.5 times said cord diameter and said steel cord has an elongation at break of at least 4%, and
- wherein said steel cord comprises a plurality of element wires according to said structure, each of the element wires have a wire diameter of from 0.3 to 0.5 mm and a tensile strength of from 2000 to 3300 MPa, said tensile strength being determined by taking apart said steel cord, removing an individual one of the element wires and subsequently measuring said tensile strength of said individual one of the element wires after the removing.

5,839,265
COOLING DEVICE FOR FALSE TWISTING MACHINE

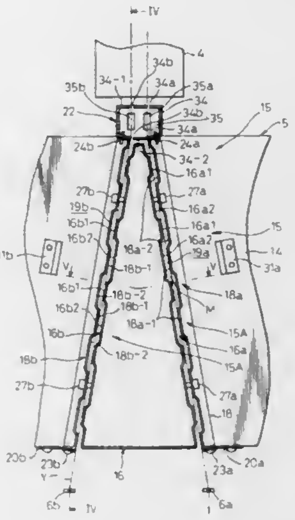
Jun Takagi; Misao Kashiwagi, and Nobuhiro Koizumi, all of Otu, Japan, assignors to Toray Engineering Co., Ltd., Osaka, Japan

Filed May 29, 1997, Ser. No. 865,099

Claims priority, application Japan, May 30, 1996, 8-161131

Int. Cl.^{6} D01H *7/46*

U.S. Cl. 57—290 **10 Claims**



1. A cooling device arranged between a heating device and a twisting device in a false twisting machine for cooling a false twisted yarn, comprising:

- a first yarn contacting member;
- a second yarn contacting member spaced from the first yarn contacting member to form a passageway between the first and second yarn contacting members, the yarn to be cooled moving along the passageway;
- the arrangement of the first and second yarn contacting members being such that the yarn to be cooled must make contact with a surface of at least one of the contacting members; and
- means for generating a flow of gas in the passageway in a direction transverse to the direction of the movement of the yarn, the flow of gas cooling the yarn moving along the passageway.

5,839,266
VARIABLE SPEED TRASH BELT FOR OPEN-END SPINNING MACHINE AND METHOD

Phillip K. Anthony, and Benjamin Eugene Ferguson, both of Pickens, S.C., assignors to Cimtec Control Solutions, Inc., Charlotte, N.C.

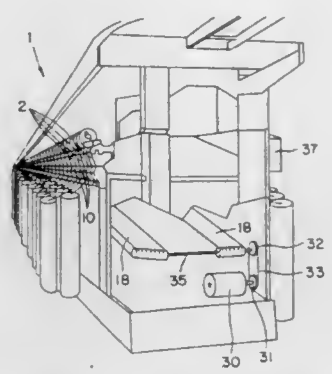
Continuation of Ser. No. 711,879, Sep. 12, 1996, Pat. No. 5,694,758. This application Jul. 17, 1997, Ser. No. 896,112

Int. Cl.^{6} D01H *11/00*

U.S. Cl. 57—301 **5 Claims**

1. A method of reducing trash recirculation into a fiber formation stream of an open-end spinning machine yarn formation station in an open-end spinning machine having a movable trash belt which collects trash removed from sliver during yarn formation, comprising the steps of:

- (a) moving the trash belt at a first predetermined rate of movement for a first predetermined period of time;
- (b) moving the trash belt at a second predetermined rate of movement less than the first rate of movement for a second predetermined period of time;



- (c) cleaning the trash belt at least during step (a); and
- (d) repeating steps (a) through (c).

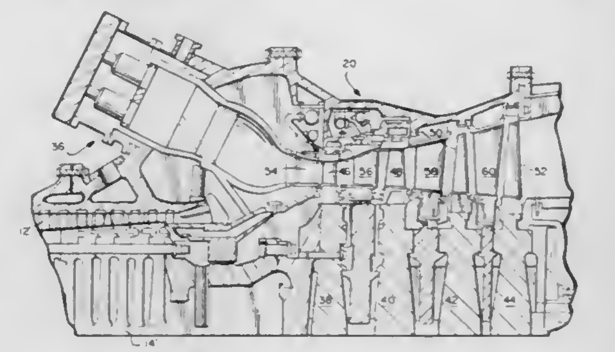
5,839,267
CYCLE FOR STEAM COOLED GAS TURBINES

Roger W. Schonewald, Scotia; Jairaj Ramachandran, Ballston Lake, and George W. Scheper, Jr., Schenectady, all of N.Y., assignors to General Electric Co., Schenectady, N.Y.

Filed Mar. 31, 1995, Ser. No. 414,696

Int. Cl.^{6} F02C *6/00*

U.S. Cl. 60—39.02 **11 Claims**



1. A method operating a four stage gas turbine in a combined cycle system comprising the steps of:

- compressing inlet air with a multi-stage compressor with a pressure ratio of substantially 23 to 1;
- directing substantially all of the air discharged from the compressor to a combustion system of the four stage gas turbine to produced gaseous products of combustion;
- directing the gaseous products of combustion through a turbine section of the four stage gas turbine;
- exhausting the gaseous products of combustion; and
- wherein at least stages 1 and 2 are steam cooled, stage 3 is air cooled and stage 4 is uncooled.

5,839,268
ACTIVE HYDRAULIC ROTOR DAMPING

Robert J. Morris, Port Saint Lucie, Fla.; Ronald Marmol, Madison, Ala.; Paul E. McClure, Jupiter, Fla.; Margaret Ann Owen; Wesley B. Owen, both of Juno Beach, Fla., and Carl F. Weiss, West Palm Beach, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 4, 1995, Ser. No. 434,464

Int. Cl.^{6} F02C *7/00*

U.S. Cl. 60—39.02 **19 Claims**

1. A gas turbine engine, characterized by:

- a compressor shaft;
- a bearing having a plurality of hydraulic cells supporting said shaft, each hydraulic cell having an independent inlet for hydraulic fluid;

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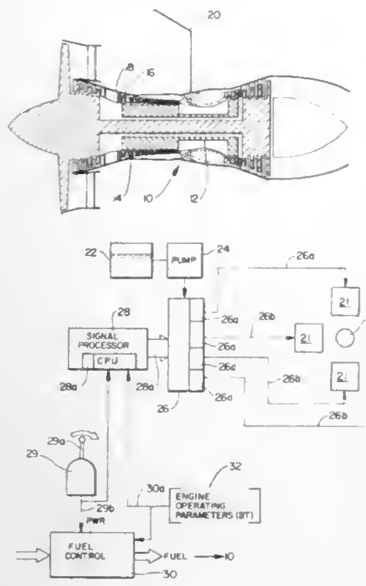


a hydraulic control for providing hydraulic fluid at a pressure to each inlet in response to bearing signals individually supplied for each hydraulic cell, the magnitude of each bearing signal determining the pressure in a hydraulic cell;

signal processing means for receiving engine signals indicating engine operating parameters, for determining from said signals a moment on said shaft, and for providing said bearing signals with individual magnitudes to create an equally, opposing moment on said shaft; and

means for providing said engine signals.

5,839,269
METHOD OF OPERATING A COMBINED GAS AND POWER STEAM PLANT

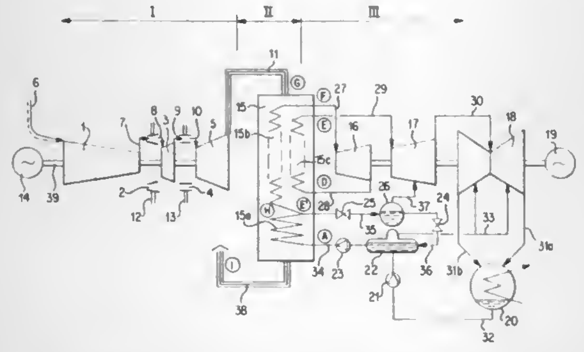
Hans Ulrich Frutschi, Riniken, Switzerland, assignor to Asea Brown Boveri AG, Baden, Switzerland

Continuation of Ser. No. 709,119, Sep. 6, 1996, abandoned. This application Nov. 26, 1997, Ser. No. 978,879

Claims priority, application Germany, Oct. 2, 1995, 195 36 839.8

Int. Cl.^{6} F02C *6/18*

U.S. Cl. 60—39.02 **15 Claims**



1. In a method for operating a power station plant having a gas-turbine group, a waste-heat steam generator arranged downstream of the gas-turbine group, and a steam cycle arranged downstream of the waste-heat steam generator, the gas-turbine group includes at least one compressor unit, at least one combustion chamber, at least one turbine and at least one generator, the exhaust gases from the at least one turbine define a heat source for a predetermined liquid quantity flowing through the waste-heat steam generator, the predetermined liquid quantity in the waste-heat generator generates steam for operating at least one steam turbine of the steam cycle, a method improvement comprising:

increasing the liquid quantity above the predetermined liquid quantity in a first heat exchange stage operating in the low temperature range of the waste-heat steam generator;

diverting a portion of the liquid above the predetermined liquid quantity at the end of the first heat-exchange stage;

directing the diverted portion of the liquid to at least one evaporation chamber and feeding steam generated in the evaporation chamber to a steam turbine;

directing the residual diverted portion of liquid in the at least one evaporation chamber to a feedwater tank and deaerator, and feeding steam generated in the feedwater tank and deaerator to a further steam turbine.

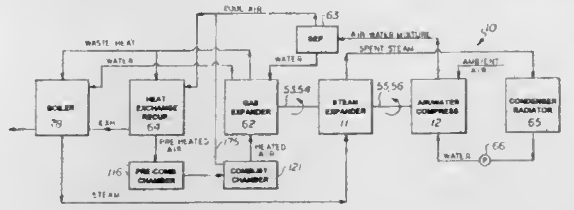
5,839,270
SLIDING-BLADE ROTARY AIR-HEAT ENGINE WITH ISOTHERMAL COMPRESSION OF AIR

Olga Jirnov, and Alexei Jirnov, both of 9105 Braeburn Valley Dr., #14, Houston, Tex. 77074

Filed Dec. 20, 1996, Ser. No. 770,990

Int. Cl.^{6} F02G *3/00;* **F02C** *6/00*

U.S. Cl. 60—39.05 **20 Claims**



1. A method for transforming thermal energy into mechanical energy utilizing a rotary air-heat apparatus and isothermal compression of air, comprising the steps of:

isothermally compressing an ambient air and water mixture in a rotary air-water compressor having a rotor;

separating said isothermally compressed air and water mixture into an air component and a water component;

preheating said separated air component in a heat exchanger to produce preheated air;

introducing a portion of said preheated air into a combustion chamber, mixing a fuel with said preheated compressed air to form a combustible mixture, igniting the mixture and discharging the product as a working fluid;

introducing said working fluid into a rotary gas expander having a cooling system and a rotor operatively connected with said rotary air-water compressor rotor;

adiabatically expanding said working fluid in said rotary gas expander to rotate said gas expander rotor and drive said air-water compressor rotor and produce useful work;

introducing a portion of said separated water component into said cooling system of said rotary gas expander;

discharging a portion of the spent working fluid expanded in said gas expander to said heat exchanger to be used as waste heat to produce said preheated air;

conducting said water from said rotary gas expander cooling system into a condenser to form cool water; and

atomizing a portion of said cool water from said condenser and mixing said atomized cool water with said ambient air and introducing it into said air-water compressor to facilitate isothermal compression of said air and water mixture.

5,839,271
QUENCH COOLER

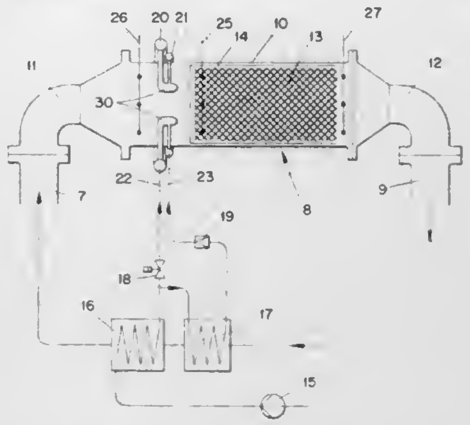
Holger Illbruck, Waldshut-Tiengen, Germany, assignor to Asea Brown Boveri AG, Baden, Switzerland

Filed Nov. 18, 1996, Ser. No. 751,719

Claims priority, application Germany, Dec. 14, 1995, 195 46 726.4

Int. Cl.^{6} F02C *7/00*

U.S. Cl. 60—39.59 **5 Claims**



1. A quench cooler for cooling a hot flowing gas, essentially comprising a cylindrical shell which is connected via a gas-inlet connection piece to a hot-gas line and via a gas-outlet connection piece to a cold-gas line and which has means for injecting water, wherein a packed column filling the cross-section of the shell through which flow occurs is arranged downstream of the water-injection means

wherein the packed column is designed as a cartridge which can be pushed into the cylindrical shell and has a separate casing.

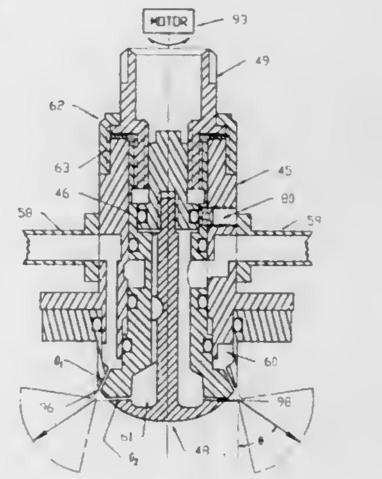
5,839,272
DUAL CONCENTRIC POPPET VALVES FOR MAINTAINING SUBSTANTIALLY CONSTANT THE RATIO OF TWO FLUID FLOWS OVER AN OPERATING RANGE OF VALVE OPENING

Hans G. Toews, East Aurora, N.Y., assignor to Moog Inc., East Aurora, N.Y.

Filed Dec. 21, 1994, Ser. No. 360,587

Int. Cl.^{6} F02K *9/00*

U.S. Cl. 60—240 **9 Claims**



1. A dual concentric poppet valve, comprising:

a body having an opening therethrough and having a sealing surface surrounding said opening;

a first member mounted in said body opening for axial movement relative to said body, said first member having a first sealing surface arranged to be moved toward and away from said body sealing surface to define a first variable-area annular orifice therebetween, said first member having a concentric opening therethrough and having a second sealing surface surrounding said first member opening;

a second member mounted in said first member opening for co-axial movement relative to said first member, said second member having a sealing surface arranged to be moved toward and away from said first member second sealing surface to define a second variable-area annular orifice therebetween; and

actuation means having a rotary motor, having a first screw-thread connection associated with said first member and operatively arranged to translate said first member relative to said body in response to operation of said motor, and having a second screw-thread connection associated with said second member and operatively arranged to simultaneously translate said second member relative to said first member in response to operation of said motor,

the pitch of each screw-thread connection being selected so that the ratio of the opening areas of said first and second orifices remains substantially constant within an operating range of valve opening.

5,839,273
METHOD FOR REDUCING POLLUTANT EMISSIONS OF A DIESEL ENGINE WITH A DOWNSTREAM OXIDATION-TYPE CATALYTIC CONVERTER

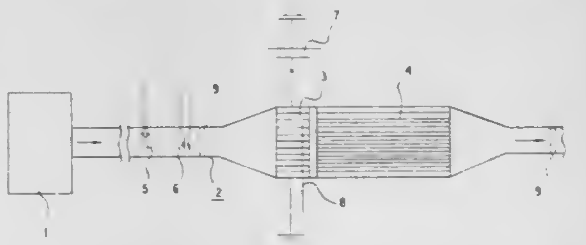
Wolfgang Maus, Bergisch Gladbach, Germany, assignor to Emitec Gesellschaft fuer Emissionstechnologie mbH, Lohmar, Germany

Filed May 30, 1996, Ser. No. 656,414

Claims priority, application Germany, Nov. 30, 1993, 43 40 742.0

Int. Cl.^{6} F01N *3/20*

U.S. Cl. 60—274 **17 Claims**



1. A method for reducing pollutant emissions, during at least one of cold starting, partial load and idling, from exhaust gas of a Diesel engine having a downstream oxidation-type catalytic converter with freely penetrable channels and an inflow side having at least one electrically heatable portion, which comprises:

heating the electrically heatable portion to a temperature at which deposited soot ignites while the exhaust gas flows through the oxidation-type catalytic converter.

5,839,274
METHOD FOR MONITORING THE PERFORMANCE OF A CATALYTIC CONVERTER USING POST CATALYST METHANE MEASUREMENTS

Donald J. Remboski; Jeffrey D. Naber, both of Dearborn, and Darren A. Schumacher, Ypsilanti, all of Mich., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 21, 1997, Ser. No. 837,629

Int. Cl.^{6} F01N *3/00*

U.S. Cl. 60—274 **15 Claims**

1. A method for monitoring and controlling the performance of a catalytic converter comprising the steps of:

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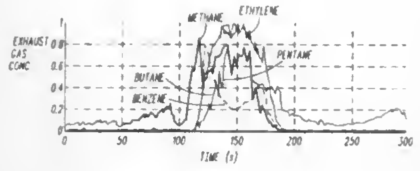
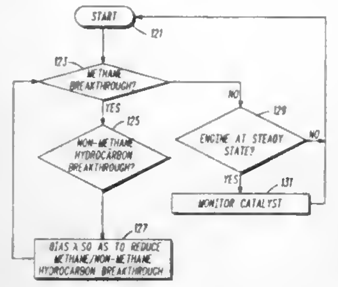



START
121
123
METHANE BREAKTHROUGH?
YES
125
NON-METHANE HYDROCARBON BREAKTHROUGH?
NO
129
ENGINE AT STEADY STATE?
NO
YES
131
MONITOR CATALYST
127
BIAS λ SO AS TO REDUCE METHANE/NON-METHANE HYDROCARBON BREAKTHROUGH

detecting the presence of methane in an exhaust gas stream exiting the catalytic converter;

detecting the presence of a plurality of non-methane hydrocarbons in the exhaust gas stream exiting the catalytic converter;

measuring a phase shift between methane and the plurality of non-methane hydrocarbons;

determining a hydrocarbon conversion efficiency;

comparing the hydrocarbon conversion efficiency with pass/fail criteria to determine an operational status of the catalytic converter; and

outputting the operational status to an operator display.

11. A method for monitoring and controlling the performance of a catalytic converter comprising the steps of:

controlling the air/fuel ratio of a feedgas entering an engine;

monitoring an exhaust gas stream exiting the catalytic converter for the presence of methane; and

upon detecting methane, reducing a fuel level in the feedgas to make the feedgas more lean.

5,839,275

FUEL INJECTION CONTROL DEVICE FOR A DIRECT INJECTION TYPE ENGINE

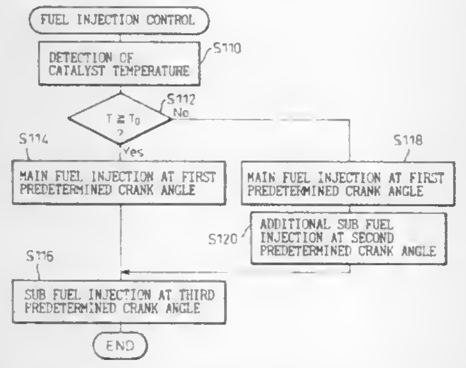
Shinya Hirota; Kazuya Kibe; Tatsuji Mizuno, all of Susono; Satoshi Iguchi, Mishima, and Toshiaki Tanaka, Numazu, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Aug. 15, 1997, Ser. No. 911,811

Claims priority, application Japan, Aug. 20, 1996, 8-218643; Aug. 20, 1996, 8-218671

Int. Cl.⁶ F01N *3/20;* **F02D** *41/34*

U.S. Cl. 60—285 **9 Claims**


FUEL INJECTION CONTROL
DETECTION OF CATALYST TEMPERATURE
S110
S112
T ≧ T0 ?
No
Yes
S114
S118
MAIN FUEL INJECTION AT FIRST PREDETERMINED CRANK ANGLE
MAIN FUEL INJECTION AT FIRST PREDETERMINED CRANK ANGLE
S120
ADDITIONAL SUB FUEL INJECTION AT SECOND PREDETERMINED CRANK ANGLE
S116
SUB FUEL INJECTION AT THIRD PREDETERMINED CRANK ANGLE
END

1. A fuel injection control device for a direct injection type engine having an exhaust passage and a NO_x catalyst arranged therein to purify NO_x in exhaust gas discharged from the engine, said device comprising:

fuel injection means for injecting fuel into a cylinder;

main fuel injection control means for controlling the injecting operation of said fuel injection means to carry out a main fuel injection at the latest at the beginning of a power stroke of the engine;

sub fuel injection control means for controlling the injecting operation of said fuel injection means to carry out a sub fuel injection at one of a power stroke and an exhaust stroke of the engine after the main fuel injection is completed to increase an amount of hydrocarbon in the exhaust gas; and

additional sub fuel injection control means for controlling the injecting operation of said fuel injection means to carry out an additional sub fuel injection after the main fuel injection is completed and before the sub fuel injection is carried out.

5,839,276

ENGINE CATALYTIC CONVERTER

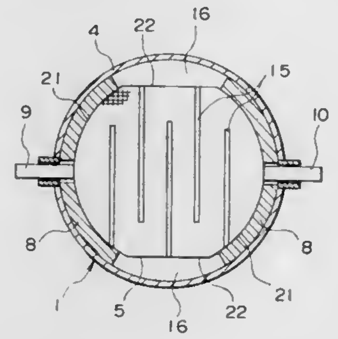
Kimiyoshi Nishizawa, Kanagawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 18, 1996, Ser. No. 588,373

Claims priority, application Japan, Feb. 2, 1995, 7-015999

Int. Cl.⁶ F01N *3/28*

U.S. Cl. 60—288 **15 Claims**



1. A catalytic converter adapted to be interposed in an engine exhaust pipe, comprising:

a cylindrical wall forming a casing having an inlet and an outlet for exhaust gas;

an upstream catalyst-coated core housed in the casing, the upstream catalyst having a flat part on its outer circumference;

a downstream catalyst-coated core housed downstream from the upstream core in the casing;

a heater for heating the upstream core; and

a first bypass passage formed between the cylindrical wall of the casing and the flat part of the upstream core so that part of the exhaust gas flowing into the inlet bypasses the upstream core and flows into the downstream core.

5,839,277

EXHAUST DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Hiroyuki Ideta; Hiroyuki Niwa, and Makoto Ichihara, all of Hamamatsu, Japan, assignors to Suzuki Motor Corporation, Shizuoka-ken, Japan

Filed Dec. 27, 1996, Ser. No. 774,363

Claims priority, application Japan, Dec. 29, 1995, 7-354261

Int. Cl.⁶ F01N *7/00*

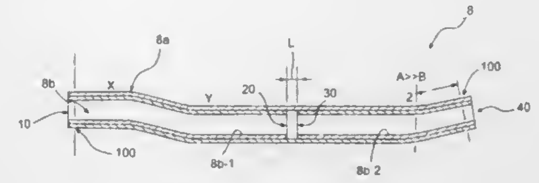
U.S. Cl. 60—322 **14 Claims**

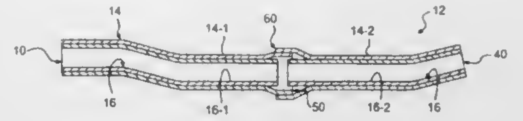
1. An exhaust device for an internal combustion engine, comprising:

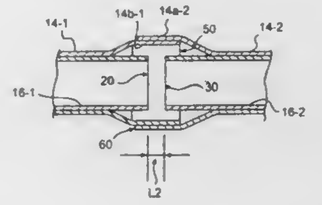
an outer exhaust pipe having a length defined by an upstream end and a downstream end;

a first inner exhaust pipe section having a length defined by an upstream and a downstream end telescopically nested within said outer exhaust pipe and having an outer surface touching the outer exhaust pipe, said downstream end of the first inner pipe section being positioned at a first location between the upstream and downstream ends of the outer exhaust piped; and

a second inner exhaust pipe section having a length defined by an upstream and a downstream end telescopically nested within said outer exhaust pipe and having an outer surface touching the outer exhaust pipe, said upstream end of the second inner pipe section being positioned at a second location between the upstream and downstream ends of the outer exhaust pipe, said second location being spaced a predetermined distance downstream of the first location.







10. An exhaust system for an internal combustion engine, comprising:

a pipe connected at the upstream end to an exhaust manifold of an internal combustion engine;

a container for containing a catalyst, having an upstream end connected to a downstream end of said pipe;

an outer exhaust pipe having a length defined by an upstream end and a downstream end, said upstream end being connected to a downstream end of the container;

a first inner exhaust pipe section having a length defined by an upstream end and a downstream end telescopically nested within said outer exhaust pipe and having an outer surface touching an inner surface of the outer exhaust pipe, said downstream end of the first inner exhaust pipe section being positioned at a first location intermediate the upstream and downstream ends of the outer exhaust pipe; and

a second inner exhaust pipe section having a length defined by an upstream end and a downstream end telescopically nested within said outer exhaust pipe and having an outer surface touching an inner surface of the outer exhaust pipe, said upstream end of the second inner exhaust pipe section being positioned at a second location spaced a predetermined distance downstream of the first location.

5,839,278

ELECTROHYDRAULIC TILTING DEVICE FOR A VEHICLE WITH A TILTING CAB

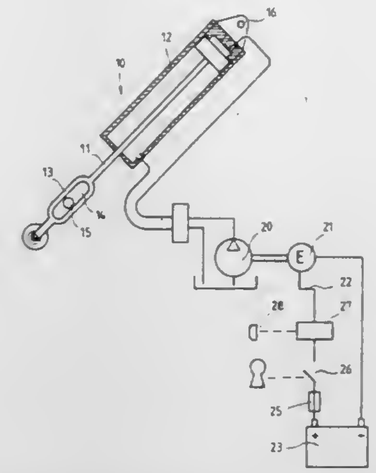
Lambertus Johannes Sonneborn, Oldenzaal, Netherlands, assignor to Applied Power Inc., Butler, Wis.

Filed Feb. 6, 1997, Ser. No. 795,879

Claims priority, application Netherlands, Feb. 27, 1996, 1002460

Int. Cl.⁶ F16D *31/02*

U.S. Cl. 60—403 **5 Claims**



1. In a vehicle having a chassis and a tiltable cab, an electrohydraulic tilting device including a pump for pumping hydraulic fluid, an electric pump drive motor for driving the pump, which pump drive motor is connected by an electrical power line to a source for electrical energy, and a hydraulic piston/cylinder unit connected to the pump, the piston/cylinder unit being designed for exerting a force which is capable of tilting the cab, the improvement wherein an overcurrent protection device is provided which automatically interrupts and subsequently maintains the interruption of the electrical power line of the pump drive motor when the electrical power taken up by the pump drive motor for a predetermined period exceeds a first threshold value which is higher than the maximum electrical power required during normal tilting of the cab, the overcurrent protection device being provided with manual reset means for ending the interruption of the power line.

5,839,279

HYDRAULIC ACTUATOR OPERATION CONTROLLER

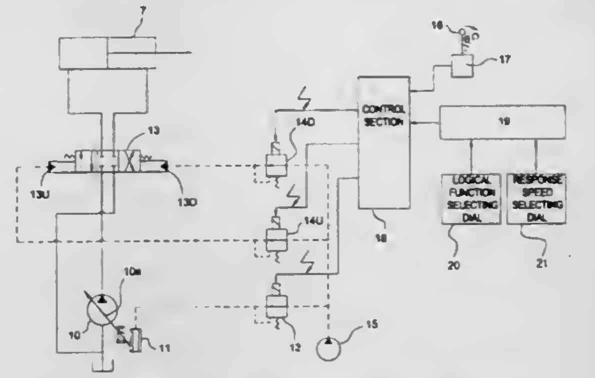
Naoyuki Moriya; Isao Murota, and Makoto Hasuike, all of Tokyo, Japan, assignors to Shin Caterpillar Mitsubishi Ltd., Tokyo, Japan

Filed Mar. 26, 1997, Ser. No. 824,346

Claims priority, application Japan, Jun. 12, 1996, 8-173009

Int. Cl.⁶ F16D *31/02*

U.S. Cl. 60—445 **8 Claims**


7
16
17
CONTROL SECTION
19
13
14D
13U
13D
14U
18
LOGICAL FUNCTION SELECTING DIAL
RESPONSE SPEED SELECTING DIAL
20
21
10a
10
11
12
15

1. A hydraulic actuator operation controller, comprising:

signal conversion means for converting an input signal that corresponds to a control input of a hydraulic actuator operating instrument, said conversion being performed according to one of a plurality of preset logical functions, wherein at least one of said preset logical functions increases the magnitude of said converted input signal relative to said input signal, and

at least one of said preset logical functions decreases the magnitude of said converted input signal relative to said input signal, and for outputting said converted input signal;

pump control means for inputting said converted input signal and outputting a pump control command to a capacity change device that regulates output of an oil pump supplying pressurized oil to a hydraulic actuator; and

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valve control means for inputting said converted input signal and outputting a valve control command to an opening-area control device that operates a control valve to control a flow rate of the pressurized oil to the hydraulic actuator.

5,839,280
FLUID-MECHANICAL ACTUATOR HAVING A PISTON WITH TWO SECTIONS

Harry Troester, Tamm; Detelf Felder; Michael Duwe, both of Berlin, and Friedhelm Buerger, Heiligenhaus, all of Germany, assignors to Daimler-Benz Aktiengesllschaft, and Berger, Boehringer & Partner, GmbH, both of Germany

Filed Jul. 28, 1997, Ser. No. 901,067

Claims priority, application Germany, Jul. 26, 1996, 196 30 218.8

Int. Cl.⁶ B60T *13/00*

U.S. Cl. 60—547.1 **11 Claims**

1. A fluid-mechanical actuator, comprising a cylinder housing; a piston guided movably in the cylinder housing; a working chamber which can be filled with a fluid being bounded by the cylinder housing and the piston; a restoring spring arranged such that the piston is displaceable in the cylinder housing counter to the effect of the restoring spring by filling the working chamber with fluid; a working linkage arranged on a side of the piston remote from the working chamber such that a force can be transmitted by the piston to the working linkage, wherein the piston has a first section comprising a ring which terminates the working chamber and a second section comprising a bushing running coaxially with the cylinder housing and being guided out of the cylinder housing in a fluid-tight manner on the side of the working chamber, and the working linkage has a supporting ring with a diameter larger than an inside diameter of the bushing, such that a force can be transmitted to the supporting ring by the piston; and an actuating linkage guided in the bushing, to be movable relative to the working linkage so that a force can be introduced into the working linkage without a force being simultaneously transmitted to the piston.

5,839,281
MOTOR BRAKING ARRANGEMENT

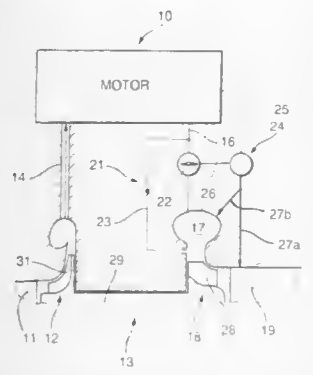
Siegfried Sumser, Stuttgart, and Erwin Schmidt, Baltmannsweiler, both of Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany

Filed Oct. 23, 1996, Ser. No. 736,030

Claims priority, application Germany, Oct. 27, 1995, 195 40 060.7

Int. Cl.⁶ F02B *37/12*

U.S. Cl. 60—602 **12 Claims**



1. A motor braking arrangement for an internal combustion engine including a turbocharger having a turbine with a turbine wheel with a back wall disposed in a turbine housing and connected to the engine by an exhaust gas pipe and a charger connected to the engine by an air intake conduit, an exhaust gas shut-off valve arranged in the exhaust gas pipe upstream of said turbine and a by-pass line extending from said exhaust gas pipe upstream of said shut-off valve and leading to a gas admission passage of said turbine adjacent said turbine wheel, said gas admission passage leading to an area of said turbine housing adjacent said turbine wheel back wall, and at least one nozzle extending from said area of said turbine housing adjacent the turbine back wall to said turbine wheel for directing said gas onto said turbine wheel.

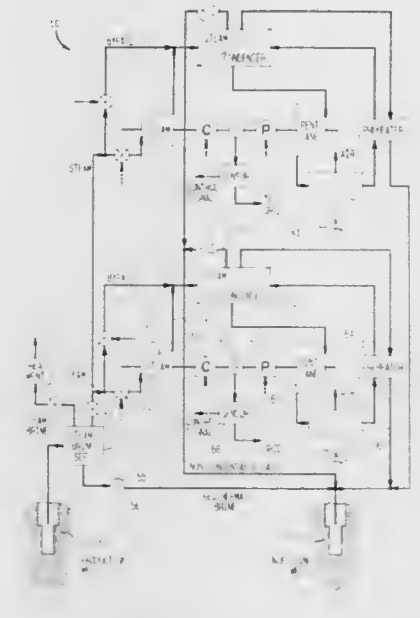
5,839,282
METHOD AND MEANS FOR USING A TWO PHASE FLUID

Lucien Y. Bronicki, Yavne; Nadav Amir, Rehovot; Alex Moritz, Holan, and Asher Elovic, Rishon Lezion, all of Israel, assignors to Ormat Industries Ltd., Yavne

Division of Ser. No. 422,656, Apr. 14, 1995, Pat. No. 5,660,042, which is a continuation of Ser. No. 952,156, Sep. 28, 1992, abandoned, which is a continuation of Ser. No. 658,303, Feb. 20, 1991, abandoned. This application Jun. 30, 1997, Ser. No. 886,172

Int. Cl.⁶ F06G *7/00*

U.S. Cl. 60—641.5 **7 Claims**



1. A power plant comprising:

a) a separator for separating a two-phase geothermal fluid into a vapor stream containing steam, and a liquid stream containing hot brine;

b) a steam turbine associated with a generator and responsive to said steam for driving the generator and producing power and expanded steam;

c) a steam condenser containing an organic fluid for condensing said expanded steam and producing steam condensate and vaporized organic fluid;

d) an organic vapor turbine associated with a generator for driving the generator and producing power and expanded organic vapor;

e) an organic fluid condenser for condensing said expanded organic vapor and returning the resulting condensate to said steam condenser;

f) a preheater interposed between the organic condenser and said steam condenser for preheating said resulting condensate before it is returned to said steam condenser; and

g) means for applying said steam condensate to said preheater for preheating said resulting condensate before it is returned to said steam condenser.

5,839,283
MIXING DUCTS FOR A GAS-TURBINE ANNULAR COMBUSTION CHAMBER

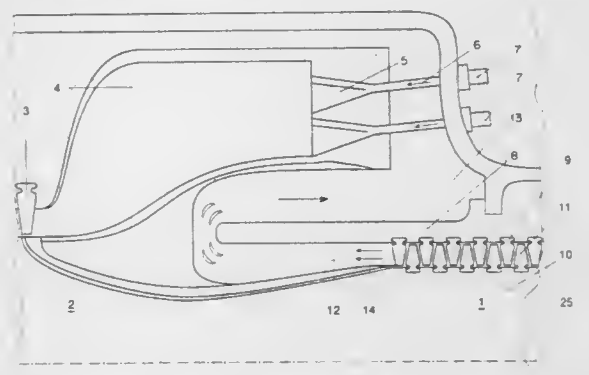
Klaus Döbbeling, Windisch, Switzerland, assignor to ABB Research Ltd., Zurich, Switzerland

Filed Nov. 18, 1996, Ser. No. 751,721

Claims priority, applicatinn Germany, Dec. 29, 1995, 195 49 143.2

Int. Cl.⁶ F23R *3/12;* **F02C** *3/00*

U.S. Cl. 60—737 **15 Claims**



1. A gas-turbine annular combustion chamber arranged downstream of a compressor comprising: a front plate with at least one row of premix burners arranged in an annular form, a plurality of combustion-air ducts, each combustion-air duct being designed as a diffuser and arranged to guide combustion-air directly downstream of a compressor outlet from guide vanes of a last compressor row to each premix burner, wherein at a downstream end of each combustion-air duct at least one longitudinal-vortex generator is disposed, at least one fuel injection means is disposed in or downstream of the longitudinal-vortex generator, and a mixing duct extending from the at least one fuel injection means to a combustion chamber, each mixing duct having a constant height (H) and a length (L) which corresponds approximately to twice the value of a hydraulic duct diameter (D) of the mixing duct.

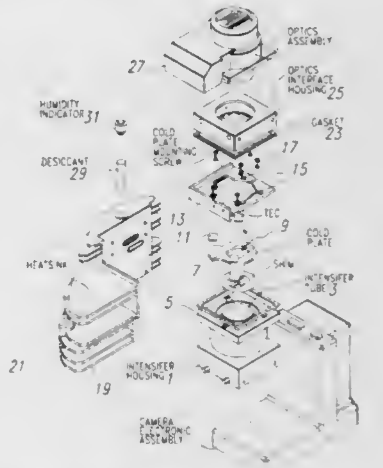
5,839,284
IMAGE INTENSIFIER TV INTEGRAL THERMAL CONTROL SYSTEM

William G. Wyatt; Kirk A. Miller, both of Plano; Richard D. DeLaMatyr, Heath, and Larry G. Taunton, Richardson, all of Tex., assignors to Raytheon TI Systems, Inc., Lewisville, Tex.

Filed Oct. 4, 1996, Ser. No. 726,256

Int. Cl.⁶ F25B *21/02*

U.S. Cl. 62—3.2 **8 Claims**



1. An apparatus, comprising:

a sealed housing;

an imaging part having a face plate which is disposed within said housing;

a lens system having a portion disposed within said housing;

a highly thermally conductive first plate disposed within said housing between said face plate and said lens system, said first plate having an aperture therethrough, and having a portion which extends around said aperture and is in thermal engagement with an annular portion of said face plate;

a highly thermally conductive second plate having a portion which is disposed within said housing generally parallel to said first plate, and having a further portion which extends outwardly through said housing to a location external to said housing, said housing having a thermal insulating portion which sealing engages said second plate and substantially prevents a transfer of heat between said second plate and said housing, said second plate having therethrough an opening which is aligned with said aperture through said first plate;

at least one thermoelectric part disposed between and engaging each of said first and second plates within said housing, said thermoelectric part being operative to transfer heat from one of said first and second plates to the other; and

a heat sink which is separate from and external to said housing, and which is thermally coupled to said second plate externally of said housing.

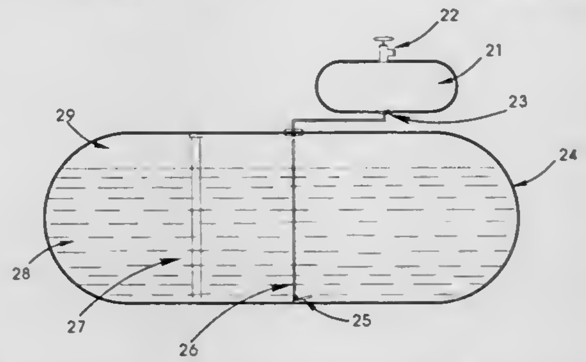
5,839,285
FUEL GAS DELIVERY SYSTEM

Duane V. Kniebes, 4612 Hampshire St., Boulder, Colo. 80301

Filed Feb. 28, 1997, Ser. No. 808,558

Int. Cl.⁶ F17C *7/04*

U.S. Cl. 62—48.1 **4 Claims**



1. A liquid storage and vapor delivery system for odorized liquefied gases comprising in combination: a storage tank for the liquid, connected by a small diameter liquid supply tube to a storage tank for the vapor, said liquid line being separated from the vapor storage tank by a conventional check valve to maintain a lower pressure in the vapor storage tank; and a vapor delivery valve located on the vapor storage tank.

5,839,286
METHOD FOR PROTECTING AN ICE MAKER FROM OPERATION FAILURE

Kun-bin Lee, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jun. 10, 1997, Ser. No. 872,395

Claims priority, application Rep. of Korea, Jun. 10, 1996, 1996-20575

Int. Cl.⁶ F25C *1/12*

U.S. Cl. 62—72 **8 Claims**

1. A method of controlling an ice making mechanism which includes a tray position for receiving water to be frozen into ice bodies, a sensor for determining whether the water is frozen and to initiate an ice-ejecting mode, a motor for rotating the tray to perform the ice-ejecting mode, a switching mechanism for indicating a state of the ice-ejecting mode, and a switch-actuating struc-

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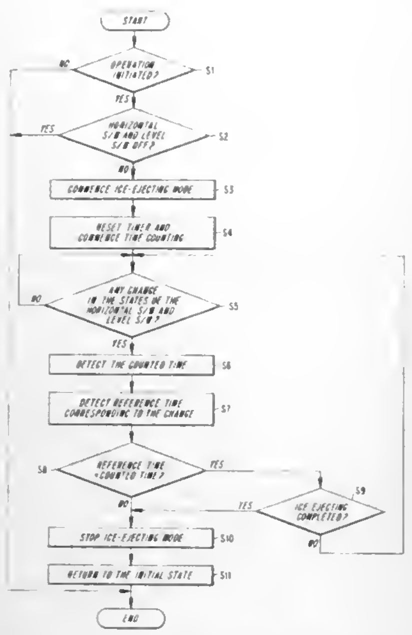
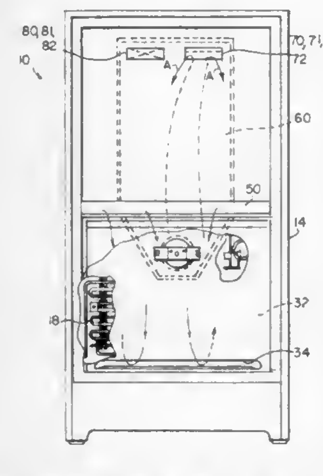

START
OPERATION INITIATED?
NO
YES
S1
HORIZONTAL S/W AND LEVEL S/W OFF?
S2
COMMENCE ICE-EJECTING MODE
S3
RESET TIMER AND COMMENCE TIME COUNTING
S4
ANY CHANGE IN THE STATES OF THE HORIZONTAL S/W AND LEVEL S/W?
S5
DETECT THE COUNTED TIME
S6
DETECT REFERENCE TIME CORRESPONDING TO THE CHANGE
S7
REFERENCE TIME <COUNTED TIME?
S8
ICE EJECTING COMPLETED?
S9
STOP ICE-EJECTING MODE
S10
RETURN TO THE INITIAL STATE
S11
END

ture driven by the motor for changing a state of the switching mechanism during the ice-ejecting mode, the method comprising the steps of:

A) detecting a state of the switching mechanism in response to the supplying of electrical power to the ice making mechanism, to determine whether the tray is in an initial upright position;
B) initiating an ice ejecting mode if it is determined in step A that the tray is not in the initial upright position;
C) counting a time period beginning from step B;
D) determining whether the state of the switching mechanism has been changed; and
E) stopping the ice-ejecting mode when a state of the switching mechanism has not changed within a reference time period.

5,839,287
SELECTABLE REFRIGERATOR OR FREEZER COMPARTMENT

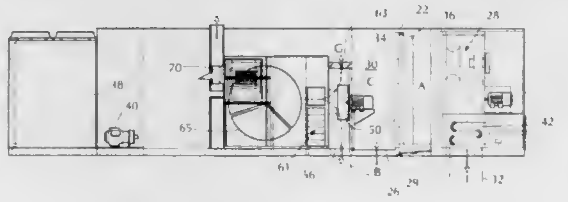
Guy C. Stormo, St. Cloud, Minn., assignor to White Consolidated Industries, Inc., Cleveland, Ohio
Filed Mar. 7, 1997, Ser. No. 813,855
Int. Cl.^{6} F25D *17/06*
U.S. Cl. 62—89 **16 Claims**



1. An operator selectable refrigerator-freezer unit comprising:
an enclosure having a plurality of enclosure walls and providing a first compartment defining a first airway opening and a second airway opening in at least one of said plurality of enclosure walls, and further providing a second compartment;
an airway providing communication between said first compartment and said second compartment through said first and second airway openings;
an air moving and cooling assembly adapted for displacing and reducing the temperature of air within said airway;
a positionable first door proximately disposed over said first airway opening;
a positionable second door proximately disposed over said second airway opening;
a temperature sensor unit adapted for sensing the temperature within said first compartment and providing a control signal representative of said temperature; and
provisions for positioning said second door relative to said second airway opening based upon said control signal provided by said temperature sensor unit.

5,839,288
AIR CONDITIONING AND DEHUMIDIFYING SYSTEM

Danny L Dotson, Adkins, Tex., assignor to Munters Corporation, Ft. Myers, Fla.
Filed Jun. 18, 1997, Ser. No. 878,127
Int. Cl.^{6} F25D *17/06*
U.S. Cl. 62—94 **23 Claims**

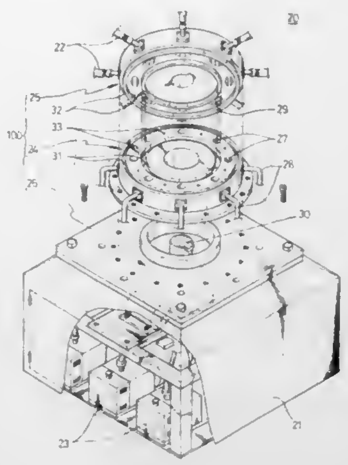


22. A method of conditioning air for an enclosure having at least one location to which it is desirable to supply heated and/or cooled air and a second location remote from said first location to which it is desirable to supply air which is dryer than that supplied to said first location; said method including the steps of drawing return air from said enclosure into a mixing chamber, drawing make up air from the enclosure into said mixing chamber to be mixed with the return air; heating and/or cooling at least a first portion of the air mixture in from the mixing chamber and supplying it to said first location; drawing a second portion of the air from the mixing chamber, drying said second portion in a desiccant wheel and supplying the dried air to said second location.

5,839,289
MULTI-STEP PRESSURE REDUCING APPARATUS AND METHOD

Nam-sik Cho, Kyungki-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea
Filed Sep. 3, 1997, Ser. No. 922,397
Claims priority, application Rep. of Korea, Sep. 4, 1996, 96-38278
Int. Cl.^{6} F25B *19/00*
U.S. Cl. 62—100 **6 Claims**

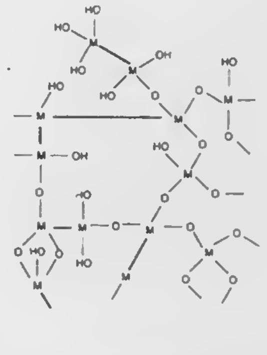
1. A multi-step pressure reducing apparatus comprising:
a plurality of vacuum pumps;
a plurality of air hoses each having first and second ends, the first end connected to a respective one of said vacuum pumps;
a fixed connection member having a plurality of first communication holes each connected to the second end of a respective one of said air hoses;
a rotating connection member rotatably engaged with said fixed connection member and having a plurality of second communication holes;



a plurality of vacuum hoses each having a first end connected to a respective one of said second communication holes and a second end adapted to be detachably connected to a vacuum-requiring part of an appliance conveyed on a conveyor; and
a rotating connection member driving portion for rotating said rotating connection member relative to said fixed connection member for alternately bringing said first communication holes into alignment with said second communication holes to intermittently conduct a vacuum through each of said vacuum hoses.

5,839,290
ORGANIC/INORGANIC COMPOSITE WICKS FOR CAPILLARY PUMPED LOOPS

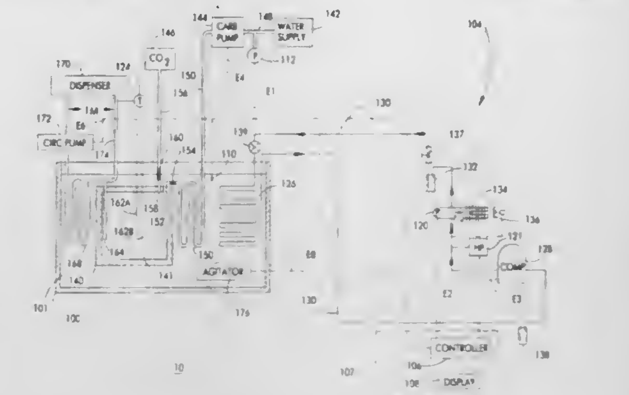
Azar Nazeri, Columbia, Md., assignor to United States of America as represented by the Secretary of the Navy, Wahington, D.C.
Filed Jan. 24, 1997, Ser. No. 787,724
Int. Cl.^{6} F28D *15/00*; F25D *15/00*
U.S. Cl. 62—119 **19 Claims**



1. An evaporator for a capillary pumped loop, comprising:
a tubular wick for containing liquid coolant centrally therein, the body of said wick being saturated with said liquid coolant;
a tubular heat exchanger for receiving said wick;
one or more vapor channels between said wick and said heat exchanger, for transporting a vapor of said coolant out of said evaporator;
wherein said tubular wick comprises a porous organic/inorganic composite.

5,839,291
BEVERAGE COOLING AND DISPENSING SYSTEM WITH DIAGNOSTICS

Zhihong (Zachary) Chang, Ballwin, Mo., assignor to Multiplex Company, Inc., St. Louis, Mo.
Filed Aug. 14, 1996, Ser. No. 696,491
Int. Cl.^{6} F25B *49/02*
U.S. Cl. 62—126 **20 Claims**



1. A cooling/dispensing system for cooling and dispensing a beverage comprising:
a cooling tank for holding a fluid:
a refrigeration system having an evaporator in the cooling tank for cooling the fluid in the tank and having a compressor connected to the evaporator for cooling the evaporator;
a beverage dispensing system including:
  a carbonator tank in heat exchange relationship with the fluid in the cooling tank, the carbonator having a first input port connected to a gas supply, having a second input port connected to a liquid supply and having a output port, the carbonator for carbonating the liquid from the liquid supply flowing through the carbonator to produce a carbonated liquid product;
  a dispenser for dispensing the beverage;
  a beverage conduit connected to the output of the carbonator and connected to the dispenser for providing the carbonated liquid product to be dispensed as the beverage: and
  a pump including a driver;
a condition sensor sensing a condition of the pump driver;
a controller responsive to the condition sensor for enabling operation of the refrigeration system and the beverage dispensing system during periods when the condition sensor indicates that the sensed condition is acceptable, said controller inhibiting operation of the refrigeration system and the beverage dispensing system during periods when the condition sensor indicates that the sensed condition is unacceptable; and
a diagnostic message display connected to the controller for displaying an error message when a sensed condition is unacceptable.

5,839,292
DEFROSTER FOR HEAT PUMP

Yun Je Hwang, Seoul, Rep. of Korea, assignor to LG Electronics, Inc., Rep. of Korea
Filed Jan. 16, 1997, Ser. No. 783,455
Claims priority, application Rep. of Korea, Aug. 31, 1996, 37511/1996
Int. Cl.^{6} F25B *41/00*
U.S. Cl. 62—152 **3 Claims**

1. A defroster for a heat pump comprising:
refrigerant drawing means for drawing a high-temperature refrigerant from an outlet of a compressor, said high-temperature refrigerant circulating in said heat pump; and
refrigerant distributing means for separately supplying both a refrigerant coming from a condenser and said high-temperature refrigerant from the compressor into an inlet of an evaporator.

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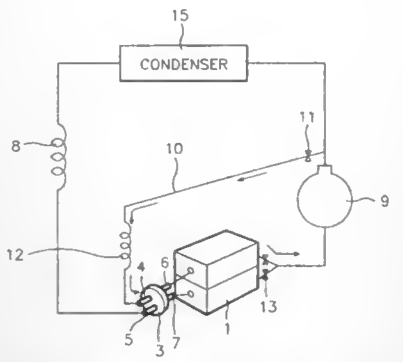


wherein said refrigerant distributing means comprises:

a cylindrical converting valve;

a first inlet tube formed at an upper portion of said cylindrical converting valve for receiving the high-temperature refrigerant drawn by said refrigerant drawing means;

a first outlet tube being level with said first inlet tube for emitting the high-temperature refrigerant into said upper portion of the evaporator;

a second inlet tube formed at a lower portion of said cylindrical converting valve for receiving the refrigerant coming from the condenser;

a second outlet tube being level with said second inlet tube for emitting the refrigerant into said lower portion of the evaporator; and

a converting plate rotating in said cylindrical converting valve for connecting said first inlet tube with said first outlet tube while connecting said second inlet tube with said second outlet tube, or for connecting said first inlet tube with said second outlet while connecting said second inlet tube with said first outlet tube, and

wherein said refrigerant distributing means alternately sends said high-temperature refrigerant and the refrigerant from the condenser into an upper portion and a lower portion of said evaporator.

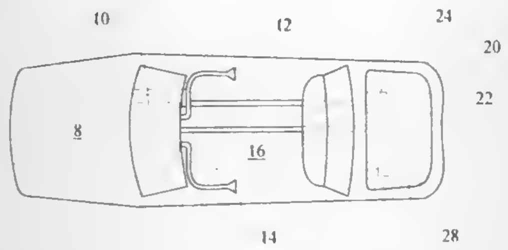
5,839,293
PROVISION OF CONDITIONED AIR TO A TRUNK OF A VEHICLE

Neil Teitelbaum, 834 Colonel By Drive, Ottawa, Ontario, Canada, K1S 5C4, and Gordon Freedman, 41 Elvaston Avenue, Nepean, Ontario, Canada, K2G 3Y1

Filed Jul. 17, 1997, Ser. No. 896,171

Int. Cl.⁶ B60H *1/32;* **B60P** *3/20*

U.S. Cl. 62—244 **14 Claims**



4. A ventilation distributing system comprising means for selectively allowing or disallowing forced air provided by a ventilator to flow to a trunk compartment of a vehicle while substantially preventing airflow from said ventilator to the passenger compartment.

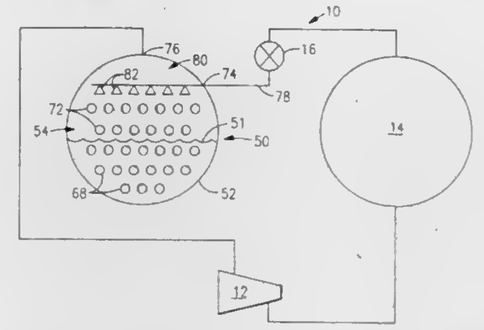
5,839,294
CHILLER WITH HYBRID FALLING FILM EVAPORATOR

Robert H. L. Chiang; Jack L. Esformes, both of Manlius, and Edward A. Huenniger, Liverpool, all of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 19, 1996, Ser. No. 752,341

Int. Cl.⁶ F25B *43/02*

U.S. Cl. 62—471 **17 Claims**



1. A vapor compression refrigeration system for cooling a liquid including a compressor, a condenser, an expansion device, and an evaporator, all of which are connected together in series to form a closed refrigerant flow loop for circulating a refrigerant therethrough, said evaporator comprising:

an outer shell having an upper end and a lower end, said shell having one refrigerant inlet and one refrigerant outlet therein;

a plurality of substantially horizontal heat transfer tubes contained within said outer shell, at least a portion of said tubes being adjacent the upper end of said shell and at least a portion of said tubes being adjacent the lower end of said shell, said tubes being adapted to have a liquid to be cooled flowed therethrough; and

means for receiving refrigerant passing to said outer shell through said refrigerant inlet and for dispensing refrigerant onto said heat transfer tubes located adjacent said upper end of said outer shell;

and wherein said closed refrigerant flow loop is configured so that the level of liquid refrigerant within said outer shell is maintained at a level such that more than twenty-five percent (25%) of said horizontal tubes are immersed in liquid refrigerant during steady state operation of said refrigeration system.

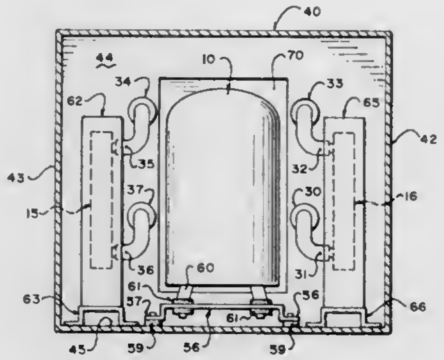
5,839,295
REFRIGERATION/HEAT PUMP MODULE

Walter E. Lehmann, Winnipeg, Canada, assignor to Frontier Refrigeration and Air Conditioning Ltd., Winnipeg, Canada

Filed Feb. 13, 1997, Ser. No. 800,197

Int. Cl.⁶ F25B *41/00*

U.S. Cl. 62—498 **18 Claims**



1. A refrigeration/heat pump module comprising:

a rectangular housing having a closed bottom, a closed top and four generally upstanding walls including a front wall and a rear wall defining a closed interior, and including a front panel in the front wall which can be removed to provide access to the closed interior;

a first inlet and a first outlet for a liquid to be heated;

a second inlet and a second outlet for liquid to be cooled;

a compressor mounted in the closed interior for compressing and pumping a refrigerant;

a condenser having a plurality of parallel plates dividing the condenser into two paths between the plates, the condenser having a third inlet for refrigerant vapor, a third outlet for refrigerant liquid, a fourth inlet connected to the first inlet for the liquid to be heated and a fourth outlet connected to the first outlet for the liquid to be heated the condenser being mounted within the closed interior;

an evaporator having a plurality of parallel plates dividing the evaporator into two paths between the plates, the evaporator having a fifth inlet for refrigerant liquid, a fifth outlet for refrigerant vapor, a sixth inlet connected to the second inlet for the liquid to be cooled, a sixth outlet connected to the second outlet for the liquid to be cooled, the evaporator being mounted within the closed interior;

an expansion valve for releasing pressure in the refrigerant, and connecting piping connecting the fifth outlet of the evaporator to the input of the compressor, for connecting the outlet of the compressor to the third inlet of the condensers for connecting the third outlet of the condenser to the expansion valve and connecting the expansion valve to the fifth inlet of the evaporator;

a capacity of the evaporator and a capacity of the condenser and a capacity of the expansion valve and a capacity of the piping begin selected relative to a capacity of the compressor such that a compression ratio of the compressor is maintained less than 4.5:1;

and a compartment for electrical components mounted immediately rearwardly of the front wall adjacent one side wall, the compartment for electric components having a front door panel which can be opened along side said front panel and separately of the front panel.

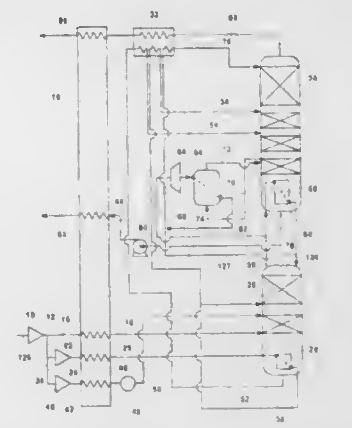
5,839,296
HIGH PRESSURE, IMPROVED EFFICIENCY CRYOGENIC RECTIFICATION SYSTEM FOR LOW PURITY OXYGEN PRODUCTION

Dante Patrick Bonaquist, Grand Island, and Susan Marie Sattan, Amherst, both of N.Y., assignors to Praxair Technology, Inc., Danbury, Conn.

Filed Sep. 9, 1997, Ser. No. 925,761

Int. Cl.⁶ F25J *3/00*

U.S. Cl. 62—650 **10 Claims**



1. A cryogenic rectification process for producing low purity oxygen by rectification of feed air, said process employing a high pressure column and a low pressure column, said process comprising the steps of:

(A) turboexpanding a flow of nitrogen-rich gas from said high pressure column to provide a cooled nitrogen-rich gas flow;

(B) condensing said cooled nitrogen-rich gas flow to a nitrogen-rich liquid against a flow of a vaporizing oxygen-rich liquid flow taken from said low pressure column;

(C) passing said nitrogen-rich liquid as a reflux flow to said low pressure column;

(D) returning said vaporizing oxygen liquid to said low pressure column; and

(E) employing energy derived from said turboexpanding step (a).

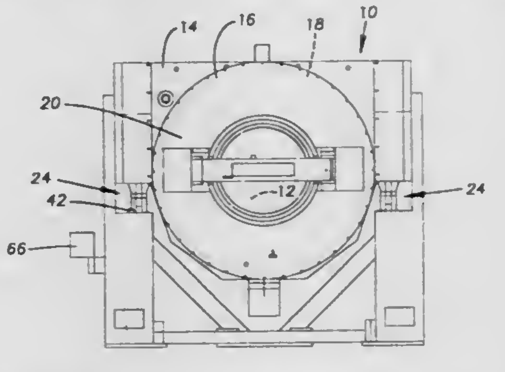
5,839,297
OUT OF BALANCE SENSOR AND CONTROL METHOD FOR A TEXTILE PROCESSING MACHINE

Mark O. Swint, Wichita Falls, Tex., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Jun. 11, 1997, Ser. No. 873,040

Int. Cl.⁶ D06F *33/02; 37/22*

U.S. Cl. 68—12.06 **2 Claims**



1. An industrial textile processing machine comprising a washing chamber supported by a yoke secured to a pedestal support, the yoke including a base plate secured to the pedestal support with a bolt having a shaft, said shaft extending through a ring-shaped piezoelectric dynamic sensor, said sensor being operable to sense vibration of said washing chamber caused by an unbalanced load.

5,839,298
DISPENSING AND DOSING DEVICE

Jacky Pierre Duquet, Herbeville, France, assignor to The Procter & Gamble Company, Cincinnati, Ohio

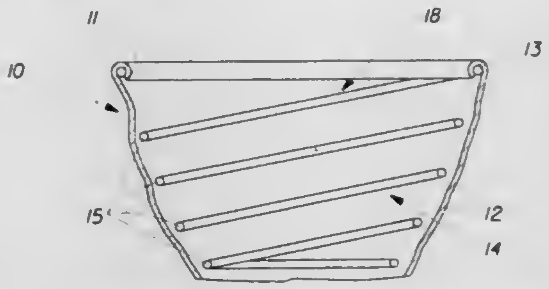
PCT No. PCT/US95/04695, § 371 Date Nov. 21, 1996, § 102(e) Date Nov. 21, 1996, PCT Pub. No. WO95/32329, PCT Pub. Date Nov. 30, 1995

PCT Filed Apr. 18, 1995, Ser. No. 737,941

Claims priority, application European Pat. Off., May 21, 1994, 94201439

Int. Cl.⁶ D06F *39/02*

U.S. Cl. 68—17 R **18 Claims**



1. A device for dosing and dispensing granular detergent compositions in a washing machine, said device comprising a pliable bag-shaped sleeve extending round an opening which remains at least partially open during the washing, and a maintaining means

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which plunges into the bag, of which one end is fastened in the region of said opening, wherein said maintaining means are collapsible and resilient.

5,839,299
PULSATOR OF WASHING MACHINE

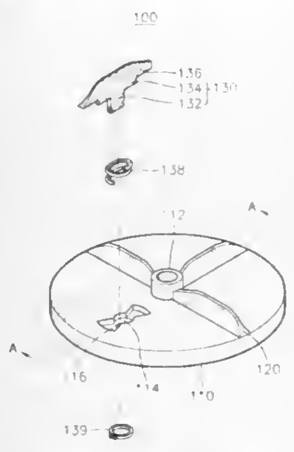
Jae-Yoll Lee, Kyungki-Do, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Feb. 28, 1997, Ser. No. 807,949

Claims priority, application Rep. of Korea, Feb. 29, 1996, 1996-3516

Int. Cl.⁶ D06F *37/00*

U.S. Cl. 68—134 **5 Claims**



1. A pulsator of a washing machine comprising:
- a rotating plate provided at a bottom portion of a washing tub and dynamically connected to a driving part of said washing machine for rotating said rotating plate, a hole extending from an upper surface to a lower surface of said rotating plate and being formed in said rotating plate;
- a plurality of vanes radially formed on an upper portion of said rotating plate at a predetermined distance apart from each other, for generating a regular washing water flow; and
- an irregular water flow generating means rotatably mounted on said rotating plate, for generating an irregular water flow.

5,839,300
PULSATOR FOR A WASHING MACHINE

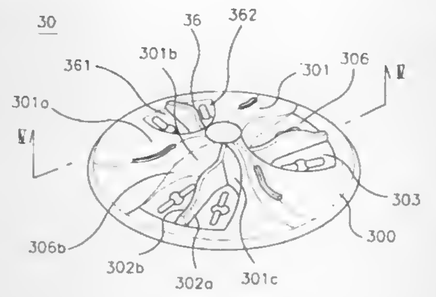
Chong-Man Yoon; Ki-Hyun Lim, both of Seoul, and Jong-Chil Lee, Incheon, all of Rep. of Korea, assignors to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Apr. 29, 1997, Ser. No. 848,255

Claims priority, applicatinn Rep. of Korea, Apr. 29, 1996, 1996 9773

Int. Cl.⁶ D06F *17/10*

U.S. Cl. 68—134 **19 Claims**



1. A pulsator for a washing machine, said pulsator comprising:
- a base plate fixed to a shaft of the washing machine to be rotated according to a rotation of the shaft; and
- a plurality of stirring blades downwardly slanted from the center of said base plate to an outer periphery thereof in a sector form on an upper surface of said base plate and for defining at least one concave collecting basin between adjacent stirring blades on the upper surface of said base plate.

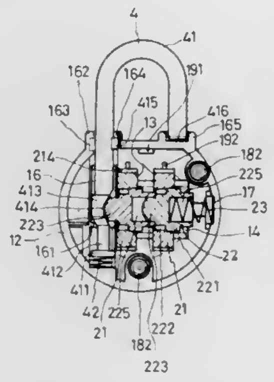
5,839,301
COMBINATION LOCK

Chung-Tung Hsu, No. 103, Wu-Kong Rd., Wu-Ku Ind. Park, Taipei Hsien, Taiwan

Filed Oct. 6, 1997, Ser. No. 944,180

Int. Cl.⁶ E05B *37/06*

U.S. Cl. 70—25 **6 Claims**



1. A combination lock, comprising:
- a housing, including a front housing portion and a rear housing portion in a butt joint relationship, said front housing portion and said rear housing portion being respectively provided with a plurality of windows having a curved portion at one side, a vertical housing slot at one side thereof, a left annular seat disposed at a top end of said housing slot at one end of each housing portion, with a right annular seat disposed at the other end, said curved portions of each housing portion being provided with wedge-shaped projections, said housing slot being provided with a stop and an oblique hole at suitable positions, said oblique hole being further provided with a spring slot at one end, said left annular seat having a seat notch, said windows of said housing portion with said wedge-shaped posts being provided with a plate positioning means;
- a dial assembly, including a plurality of dials and shafts connected in series, each dial having an inner ring provided with inner dial teeth, an outer ring with corrugated outer projections having respective markings thereon, and clearances between adjacent outer projections, said shafts being disposed in opposed curved portions of said housing portions, each shaft including a shaft post at one end, a blind shaft hole at the other end, a collar disposed intermediate said shaft post and said shaft hole and having a shaft notch at one side for engaging the corresponding wedge-shaped projection of said housing, the first of said shafts having said shaft post thereof passing through said oblique holes into said housing slots with said shaft hole thereof receiving the shaft post of an adjacent shaft, a spring disposed between the last of said shafts and said spring slot;
- a press plate, including a slot and retaining slots, and being connected to said plate positioning means for positioning said clearances;
- a latch means, including a hook and a latch spring disposed in said housing slots of said housing portions, said hook including a hook body having a hook projection thereon, a disk at a bottom end, a neck portion above said disk, a hook post of a larger diameter than that of said neck portion above said neck portion and having an oblique notch at one side, and a hook end, whereby when said dials are turned to a preset code, said hook is pulled upwardly so that said hook projection extends out of said seat notch and said shaft post of the first of said shafts causes the dial assembly to displace to one side due to the clearance between said hook notch and said neck portion so that said shaft notches engage the corresponding wedge-shaped projections; and when said hook is pressed downwardly, said hook projection enters said seat notch to cause said shaft post of the first of said shafts to fare into said hook notch so that said spring reset to bring said dial assembly to displace to the other side and cause said shaft notches to disengage from the corresponding wedge-shaped projections to achieve locking.

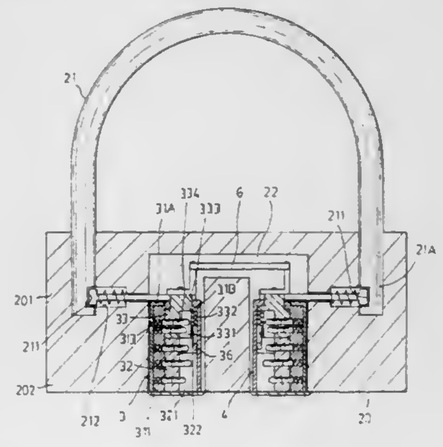
5,839,302
LOCKING DEVICE WITH TWO SIMULTANEOUSLY ACTUATED CYLINDRICAL PLUGS

Ching-Fa Chu, No. 17-3, Lane 144, Ho-Chiang St., Chang-Shan Dist., Taipei City, Taiwan

Filed Jun. 3, 1997, Ser. No. 868,014

Int. Cl.⁶ E05B *67/24*

U.S. Cl. 70—38 A **6 Claims**



1. A locking device comprising:
- a shackle having a left free end and a right free end which are laterally opposed to and spaced from each other;
- a lock body having:
  - an upper portion defining left and right blind bores for respective insertion of said left and right free ends so as to form a closed connection with said shackle,
  - a lower portion defining left and right elongated cavities respectively extending towards said upper portion and terminating to form left and right boundary walls which are transverse to and disposed between said left and right blind bores, said boundary walls defining left and right through holes respectively, and
  - an accommodation chamber interposed between said upper portion and both of said left and right boundary walls, said chamber being communicated with said elongated cavities via said through holes;
- left and right key-actuated cylindrical plugs disposed respectively in said left and right elongated cavities and rotatable respectively around a corresponding longitudinal axis relative to said corresponding cavity when actuated, each of said cylindrical plugs having a proximate end and a distal end relative to a corresponding one of said boundary walls;
- left and right cam members disposed on said proximate ends of said cylindrical plugs respectively and extending out of said through holes into said accommodation chamber, said cam members being rotated with said left and right cylindrical plugs respectively around said longitudinal axes;
- left and right spring-loaded latch bolts respectively and transversely disposed and driven to retract from being latched with said left and right free ends of said shackle respectively by said left and right cam members when said cam members are rotated with said cylindrical plugs; and
- a linkage member disposed in said accommodation chamber to couple said left and right cam members respectively at positions radially offset from said longitudinal axes so as to guard against any attempt to rotate only one of said cylindrical plugs.

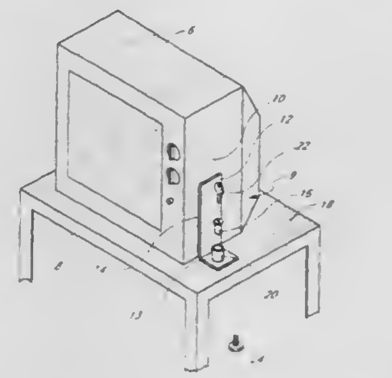
5,839,303
SECURING AND LOCKING DEVICE

John Umberg, Diamond Bar; Greg Umberg, Chino Hills, and Tanfirio J. Palmese, Aliso Viejo, all of Calif., assignors to Business Machine Security, Inc., Brea, Calif.

Filed May 23, 1997, Ser. No. 862,553

Int. Cl.⁶ E05B *69/00*

U.S. Cl. 70—58 **22 Claims**



1. A device for securing a portable item to a structure having first and second opposing surfaces and a hole therethrough, comprising:
- an attachment plate having adhesive attachment means for attaching the attachment plate to said item;
- a base plate connected to said attachment plate; and,
- locking means on the base plate for locking the base plate to a first surface of said structure by a fastener engaging the second, opposing surface of said structure, the locking means comprising a lock barrel and lock cylinder on a first surface of the support structure and engaging a securing stud shaft section of a securing stud, the stud having a section that is adapted to be adhesively secured to the second, opposing surface of the support structure to restrain movement of the stud during the engagement with the remainder of the locking means.

5,839,304
LOCKING DEVICE FOR A PARKING BRAKE

William H. Wills, 15710 SW. 40th Ter., Ocala, Fla. 34473

Continuation-in-part of Ser. No. 585,906, Jan. 16, 1996, abandoned. This application Sep. 24, 1997, Ser. No. 936,311

Int. Cl.⁶ F16K *35/00*

U.S. Cl. 70—175 **11 Claims**

1. In a vehicle having a parking brake adapted to be manually engaged by an operator moving a shaft of a parking brake valve from a retracted position wherein the parking brake is disengaged to an extended position wherein the parking brake is engaged, the parking brake valve fixedly attached to a body of the vehicle, a protrusion extending radially outward from the shaft adjacent an end thereof distal from a body of the valve, an improvement for prohibiting the parking brake from being disengaged during the persistence of a predetermined condition, the improvement comprising:
- means for attaching an electromechanical actuator and a locking member to the vehicle adjacent the parking brake valve;
- a source of electric power for energizing the actuator; and
- a sensing switch for sensing the persistence of the predetermined condition;

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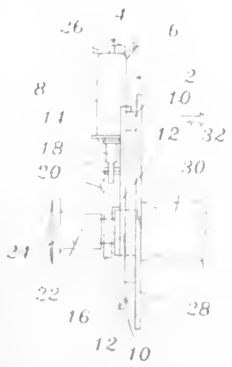


wherein the electromechanical actuator is operably connected to the locking member so that, when energized, the actuator moves the locking member from an unlocked position wherein the locking member is not interposed between the protrusion and the body of the valve into a locked position wherein the locking member is interposed between the protrusion and the body of the valve, thereby prohibiting the shaft from attaining die retracted position.

5,839,305
ELECTRICALLY OPERABLE CYLINDER LOCK

Walter John Aston, Sedgeley, England, assignor to Yale Security Products Limited, West Midlands, England

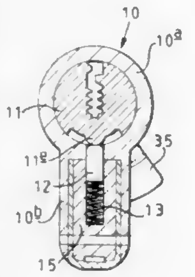
PCT No. PCT/GB95/02081, § 371 Date May 6, 1997, § 102(e) Date May 6, 1997, PCT Pub. No. WO96/07807, PCT Pub. Date Mar. 14, 1996

PCT Filed Sep. 4, 1995, Ser. No. 793,631

Claims priority, application United Kingdom, Sep. 3, 1994, 9417748

Int. Cl.⁶ E05B *49/00*

U.S. Cl. 70—278 **11 Claims**



1. A lock device comprising a body having a bore with a direction of elongation defining an axial direction for the device, a rotatable barrel in said bore, said barrel being provided with an axially extending locking slot formation, an axially extending bar slidably mounted in the body for radial movement relative to the barrel between a detent position in which the bar projects into the locking slot formation to limit turning of the barrel and a release position in which the bar is clear of said locking slot formation, a cam formation on said barrel for displacing the bar from its detent position to its release position as the barrel is turned in the body and an electromagnet energisable to retain said bar by magnetic attraction in its release position.

5,839,306
ELECTRONIC LOCK "CHIPLOCK"

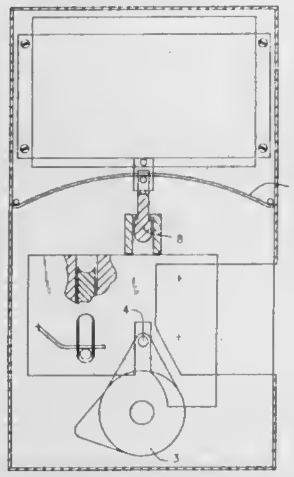
Martyn Sergeevich Nunuparov, 1133-159, Zelenograd-Moscow, Russian Federation, 103460

Continuation of Ser. No. 545,779, Nov. 9, 1995, abandoned. This application Apr. 29, 1997, Ser. No. 841,085

Claims priority, application Russian Federation, May 12, 1993, 93027411/12

Int. Cl.⁶ E05B *47/06*

U.S. Cl. 70—283 **10 Claims**



1. An electronic lock comprising:
a body;
a bar arranged shiftably disposed in said body between an open position and a closed position;
bar shifting means for transmitting an external mechanical force to said bar located in said body;
blocking means for blocking said bar shifting means, said blocking means being disposed of in said body and comprising a blocking element capable of taking one of a blocked position and deblocked position, and a return spring coupled with the blocking element;
fixing means for fixing said blocking element in one of the blocked position and deblocked position, the fixing means being kinematically coupled with said blocking element; and
said fixing means being formed by two elements, the first element secured in said body and the second element slidably mounted along a surface of said first element for fixing said blocking element in one of the blocked and deblocked positions under the action of friction forces arising between the first and second elements of the fixing means when an static electric charge is applied once to the first and second elements.

5,839,307
ELECTROMECHANICAL CYLINDER LOCK WITH ROTARY RELEASE

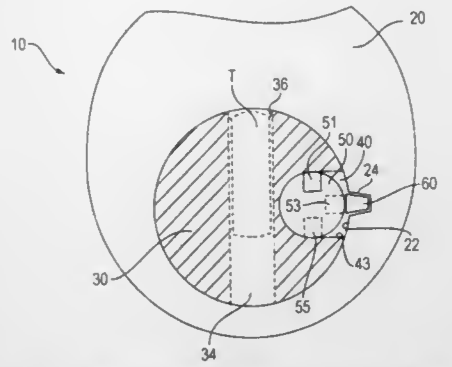
Peter Field, Salem, and Michael Lumpkin, Roanoke, both of Va., assignors to Medeco Security Locks, Inc., Salem, Va.

Filed Jun. 13, 1997, Ser. No. 874,285

Int. Cl.⁶ E05B *47/06*

U.S. Cl. 70—283 **19 Claims**

1. An electromechanical lock cylinder comprising:
an outer shell having a bore formed therein and a cavity extending from the bore into the shell;
a barrel disposed within the bore in the shell and being rotatable relative thereto;
a side bar cooperating between the shell and the barrel for selectively permitting and blocking rotation of the barrel with respect to the shell, the side bar having a first portion engaging the barrel and a second portion removably received in the cavity in the shell, the side bar being movable relative to the barrel;



wherein at least one electromechanical locking member is disposed within the barrel and is positionable in a barrel blocking position which blocks rotation of the barrel with respect to the shell, and also is positionable in a non-barrel blocking position which permits the side bar to be moved relative to the cavity in the shell to rotate the barrel with respect to the shell;
an electronically powered drive mechanism located within the barrel and cooperating with the electromechanical locking member to selectively move the locking member from the barrel blocking position to the non-barrel blocking position in which the side bar moves out of the cavity and engages the locking member to rotate the barrel and operate the lock; and
control means for activating the electronically powered drive mechanism in response to an authorized attempt to operate the lock cylinder.

5,839,308
LOCKING APPARATUS

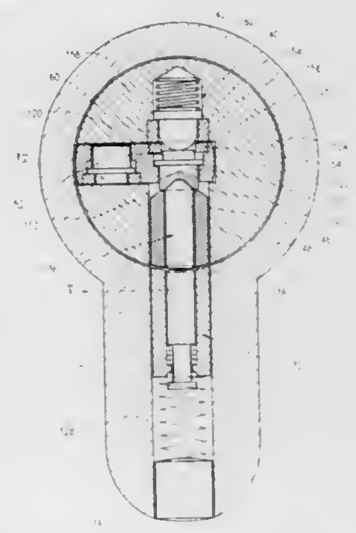
Noach Eizen, Rishon Lezion, and Dani Markbreit, Azor, both of Israel, assignors to Mul-T-Lock Ltd., Yavne, Israel

Continuation of Ser. No. 613,664, Mar. 11, 1996, Pat. No. 5,784,910, which is a continuation of Ser. No. 340,352, Nov. 14, 1994, Pat. No. 5,520,035, which is a continuation of Ser. No. 9,069, Jan. 26, 1993, abandoned. This application Oct. 30, 1997, Ser. No. 961,258

Claims priority, application Israel, Jan. 8, 1993, 104349

Int. Cl.⁶ E05B *19/08;27/06*

U.S. Cl. 70—358 **11 Claims**



1. A key and lock combination, the key comprising:
a generally-elongate shaft portion extending along a shaft axis and defining first and second generally flat oppositely-directed side surfaces, joined by edge surfaces narrower than said side surfaces, said first side surface defining a first key combination surface and a row of key cuts which define a key combination; and
at least one first movable pin element retained within the elongate shaft portion, said at least one first movable pin element extending along a first movable pin axis, said first movable pin axis being perpendicular to said shaft axis and intersecting an axis along which extends said row of key cuts, wherein said at least one movable pin element extends from said first side surface to said second side surface and is displaced axially along said first movable pin axis from said second side surface inwardly towards said first side surface, such that when said at least one first movable pin element is recessed with respect to said second side surface it protrudes outwardly from said first side surface along said row of key cuts,
and wherein said at least one movable pin element comprises a plug pin engaging portion having a face end formed with a socket of a desired depth and with a shoulder, wherein said plug pin engaging portion is engageable with a pair of telescoping pins, wherein said socket is adapted to abut one of said telescoping pins and said shoulder is adapted to abut the other of said telescoping pins; and
the lock comprising:
a housing;
a plug disposed in the housing, arranged for rotation relative thereto and defining a keyway;
a first plurality of chambers formed in the housing and a second plurality of chambers formed in the plug on one side of the keyway and being arranged such that each one of the first plurality of chambers extends coaxially with a corresponding one of the second plurality of chambers, when the plug is in a first rotational orientation relative to the housing;
wherein first pin assemblies are disposed in the first plurality of chambers and second pin assemblies are disposed in the second plurality of chambers, said first pin assemblies each being displaceable along a first pin assembly axis and said second pin assemblies each being displaceable along a second pin assembly axis; and
a third pin assembly is disposed in the plug on a side of the keyway opposite to that of the second pin assemblies and facing one of the second pin assemblies and is operative to urge said at least one first movable pin element axially outwardly from the key into engagement with one of the second pin assemblies, said third pin assembly being displaceable along a third pin assembly displacement axis which is coaxial with one of said second pin assembly axes.

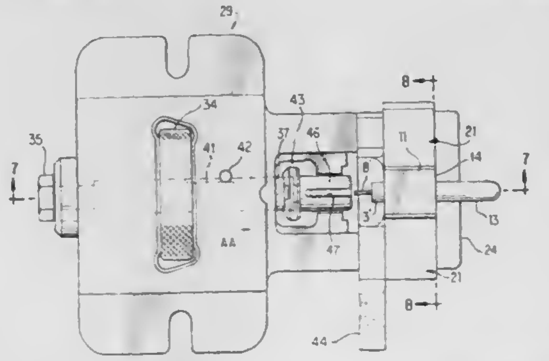
5,839,309
APPARATUS FOR HOLDING A LOCK ASSEMBLY AND SHEARING THE ASSEMBLY PINS THEREOF

Steven Albert Fantl, Colgate, and Robert Douglas Weis, New Berlin, both of Wis., assignors to Master Lock Company, Milwaukee, Wis.

Division of Ser. No. 528,175, Sep. 14, 1995. This application Nov. 25, 1997, Ser. No. 978,629

Int. Cl.⁶ E05B *27/04*

U.S. Cl. 70—493 **6 Claims**



1. The improvement in an apparatus for shearing assembly pins in a shell-plug assembly of a lock having a shell with a longitudi-

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nal shell axis and a plug with a longitudinal plug axis rotatably mounted therein, by application of a force on said plug parallel to said plug axis, comprising a frame; a recess in the frame to receive a first shell-plug assembly comprising said shell and said plug, said recess including shell holding means for holding said shell against movement during shearing; and plug translation means for translating the plug while the shell is held, the improvement comprising:

a) a holding device for holding a lock housing defined at least in part by a shell of a second shell-plug assembly therein, said holding device being connected to said frame on a side of said recess opposite said plug translation means and in communication with said recess, said holding device including a support for said lock housing positioned to align the plug of said second shell-plug assembly thereof in the path of movement of said plug translation means as it is translated in an advance direction.

5,839,310

PRESS BRAKE

Shigeru Tokai, and Masaaki Takada, both of Ishikawa, Japan, assignors to Komatsu, Ltd., Tokyo, Japan

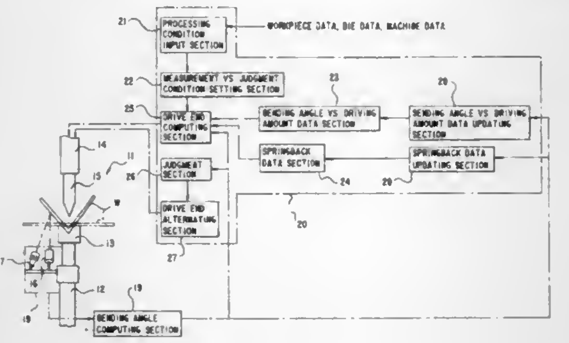
PCT No. PCT/JP95/00571, § 371 Date Sep. 12, 1996, § 102(e) Date Sep. 12, 1996, PCT Pub. No. WO95/26239, PCT Pub. Date Oct. 5, 1995

PCT Filed Mar. 27, 1995, Ser. No. 702,697

Claims priority, application Japan, Mar. 29, 1994, 6-059160

Int. Cl.⁶ B21D *5/02*

U.S. Cl. 72—31.1 **17 Claims**


21
PROCESSING CONDITION INPUT SECTION
WORKPIECE DATA, DIE DATA, MACHINE DATA
22
MEASUREMENT VS JUDGMENT CONDITION SETTING SECTION
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DRIVE END COMPUTING SECTION
BENDING ANGLE VS DRIVING AMOUNT DATA SECTION
BENDING ANGLE VS DRIVING AMOUNT DATA UPDATING SECTION
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JUDGMENT SECTION
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SPRINGBACK DATA UPDATING SECTION
24
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W
20
DRIVE END ALTERNATING SECTION
13
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19
18
BENDING ANGLE COMPUTING SECTION

1. A press brake for bending a workpiece with an upper die and a lower die that is arranged in opposing relationship with the upper die, the press brake comprising:

(a) memory means for storing information including (i) processing conditions for the workpiece, (ii) a relationship between a target bending angle for the workpiece and a springback angle of the workpiece and (iii) a relationship between a bending angle of the workpiece and an amount of driving a moveable one of the upper and lower dies;

(b) bending angle measuring means for measuring the bending angles of the workpiece during a bending process;

(c) drive end computing means for computing a provisional drive end for the movable die based on said information stored in said memory means and for computing a final drive end for the movable die based on the bending angle of the workpiece measured at the provisional drive end by said bending angle measuring means and based on said information stored in said memory means; and

(d) die driving means for driving the movable die to the final drive end after driving the movable die to the provisional drive end.

5,839,311

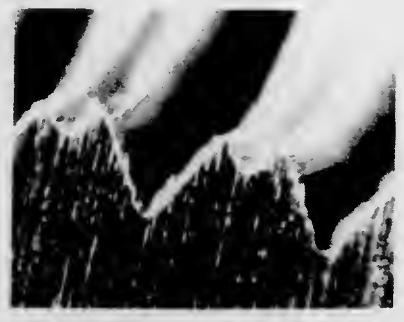
COMPOSITION TO AID IN THE FORMING OF METAL

Mark W. Grenfell, Woodbury; Dean S. Milbrath; Daniel D. Krueger, both of Stillwater; Richard M. Flynn, Mahtomedi, and Frederick E. Behr, Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Filed Sep. 17, 1996, Ser. No. 715,206

Int. Cl.⁶ B21B *45/02*

U.S. Cl. 72—42 **20 Claims**



1. A composition to aid in the forming of metal comprising a hydrofluoroether.

5,839,312

SPRING MANUFACTURING APPARATUS

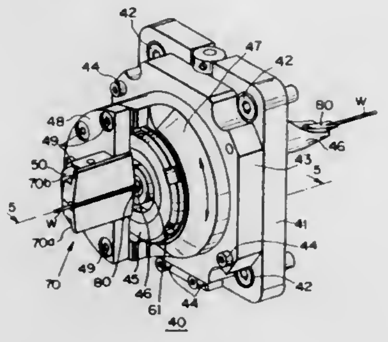
Ichiro Itaya, Tokyo, Japan, assignor to Kabushiki Kaisha Itaya Seisaku Sho, Tokyo, Japan

Filed Aug. 6, 1997, Ser. No. 908,150

Claims priority, application Japan, Aug. 23, 1996, 8-222813

Int. Cl.⁶ B21F *3/04;3/02*

U.S. Cl. 72—142 **8 Claims**



1. A spring manufacturing apparatus for forming a spring from a wire fed from an end of a wire guide, and forcibly bending or coiling the wire with the use of tools which are pointed against the wire for bending and coiling the wire, and are arranged slidably in a radial pattern toward a spring-forming space near the end of the wire guide said wire guide having an internal portion with internal walls, said wire guide having a wire feedout hole within internal walls for feeding the wire to the spring-forming space,

the apparatus comprising:

rotating means, rotatably provided in a central area of a main body of the apparatus where sliding locus of the tools intersects, for rotating the wire guide around the wire feedout hole while supporting the wire guide;

first driving means for transmitting rotation force to said rotating means;

wire-feeding means, provided in an upstream side of a wire-feeding path along a wire direction of said rotating means, for feeding the wire to the spring-forming space through the wire feedout hole by rotating the wire while gripping the wire;

second driving means for driving said wire-feeding means;

wire-gripping means, provided in said internal portion of said wire guide, for gripping the wire between the internal walls of said wire feedout hole;

third driving means for driving said wire-griping means to grip the wire; and

controlling means for controlling said first, second and third driving means at a predetermined timing, and rotating said rotating means while said wire-feeding means and said wire-gripping means grip the wire, so that the wire positioned between said wire-feeding means and wire-gripping means is temporarily twisted and a direction of the wire fed from the wire feedout hole is changed.

5,839,313

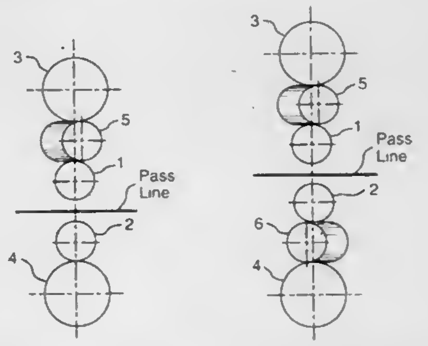
ROLLING MILL WITH INTERMEDIATE CROSSED ROLLS BACKGROUND

Vladimir B. Ginzburg, Pittsburgh, Pa., assignor to Danieli United, A Division of Danieli Corporation, and International Rolling Mill Consultants, Inc., both of Pittsburgh, Pa.

Filed Feb. 18, 1998, Ser. No. 25,620

Int. Cl.⁶ B21B *13/14;29/00;31/07*

U.S. Cl. 72—241.2 **8 Claims**



1. In a rolling mill for rolling metal strip, said mill being of the type having upper and lower work rolls and a backup roll associated with each work roll, the improvement which comprises at least one intermediate roll disposed between a work roll and a backup roll, and means to cross said at least one intermediate roll at an angle to the work rolls and the backup rolls.

5,839,314

ROLL HOUSING WITH A CLOSED FRAME CONSTRUCTION

Uwe Quitmann, Willich, Germany, assignor to Mannesmann Aktiengesellschaft, Düsseldorf, Germany

PCT No. PCT/DE95/00676, § 371 Date Aug. 15, 1997, § 102(e) Date Aug. 15, 1997, PCT Pub. No. WO96/25250, PCT Pub. Date Aug. 22, 1996

PCT Filed May 18, 1995, Ser. No. 894,867

Claims priority, application Germany, Feb. 16, 1995, 195 06 873.4

Int. Cl.⁶ B21B *39/20;31/00*

U.S. Cl. 72—252.5 **5 Claims**

1. A roll housing having a closed frame construction, comprising:

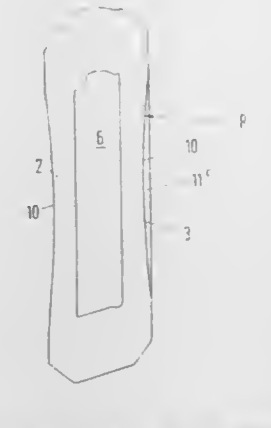
first and second housing uprights, each having an inner surface and an outer surface;

upper and lower traverses connecting upper ends and lower ends of said first and second housing uprights;

a housing window, being delimited on its sides by said inner surface of each of said first and second housing uprights, for receiving chucks for supporting bearings of rolls;

said inner surface of one of said first and second housing uprights being parallel to said inner surface of the other of said first and second housing uprights; and

said outer surface of each of said first and second housing uprights, which faces away from said housing window, receding toward said housing window between said upper and lower traverses such that a shortest distance between said inner surface and said outer surface, of each of said first and second housing uprights is at a position between said upper traverse and said lower traverses, said receding of said outer faces toward said housing window substantially reduce necking of said first and second uprights in a direction toward said housing window.



5,839,315

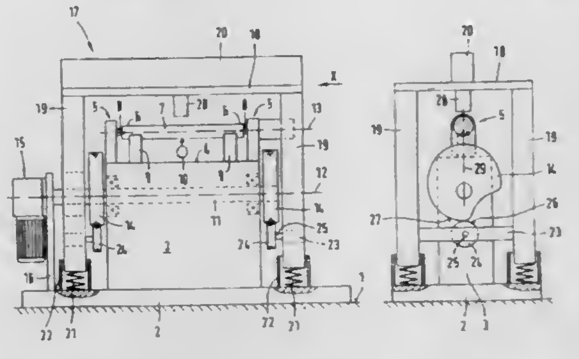
BEND-STRAIGHTENING MACHINE

Frantieek Kubik, Wiesbaden-Delkenheim, Germany, assignor to Eitel Presses, Inc., Orwigsburg, Pa.

Filed Mar. 17, 1997, Ser. No. 819,414

Int. Cl.⁶ B21D *3/16;7/06*

U.S. Cl. 72—452.7 **14 Claims**



1. A bend-straightening machine for straightening a workpiece, said machine comprising a machine table (**3**) having first and second spaced-apart side surfaces and an upper surface (**4**) extending therebetween, at least two workpiece holding fixtures (**5**) mounted to said upper surface (**4**) of said machine table (**3**), said workpiece holding fixtures (**5**) for rotatably supporting the workpiece, an inverted U-shaped bridge (**17**) having a crosspiece member (**18**) and two spaced-apart side members extending from said crosspiece member (**18**), said machine table (**3**) being interposed between said side members with said upper surface (**4**) facing said crosspiece member (**18**), said members of said bridge (**17**) being spaced from said surfaces of said machine table (**3**), a straightening ram (**28**) extending from said crosspiece member (**18**) towards said upper surface (**4**), and a drive mechanism for reversibly raising and lowering said bridge (**17**) relative to said machine table (**3**), said drive mechanism including a projection (**24**) extending from each of said side members towards corresponding said side surface of said machine table (**3**), a shaft (**11**) extending through and between said first and second side surfaces, said shaft (**11**) being supported by said machine table (**3**), a motor (**15**) directly coupled to said shaft (**11**) for rotating said shaft (**11**), a first cam disk (**14**) mounted to said shaft (**11**) adjacent said first side surface, a second cam disk (**14**) mounted to said shaft (**11**) adjacent said second side surface, and biasing means (**21**) for urging said projections (**24**) into pressing engagement with said cam disks (**14**).

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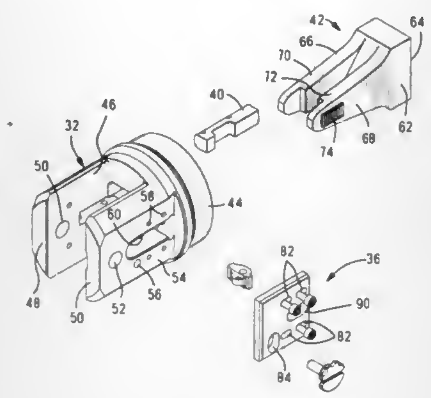
5,839,316
HAND-HELD CRIMPING TOOL

Christopher James Kolivoski, Harrisburg; Richard Lloyd Schaeffer, Jr., Carlisle, and Michael Morris, Harrisburg, all of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Filed May 28, 1997, Ser. No. 863,724
Int. Cl.^{6} H01R *43/042*
U.S. Cl. 72—453.16 **7 Claims**



1. In a hand operable tool for crimping terminals to conductors including a linear actuator having an armature; a head member attached to said linear actuator; a cam member coupled to said armature and movable within said head by said armature in a forward direction to a specific position to effect said crimping and in a reverse direction; a crimping tool coupled to said head member and operated by said cam member during movement thereof in said forward direction,

- a detection assembly coupled to said head member for detecting said specific position of said cam member as said cam member is undergoing movement in said forward direction, allowing movement of said cam member in said reverse direction only upon said cam member reaching said specific position, wherein said detection assembly comprises:
- (a) a plate coupled to said head;
- (b) a ratchet and mating pawl, one of which is coupled to said head and the other of which is coupled to and carried by said plate,
- wherein said plate is selectively movable in said forward and reverse directions to provide variable specific positions.

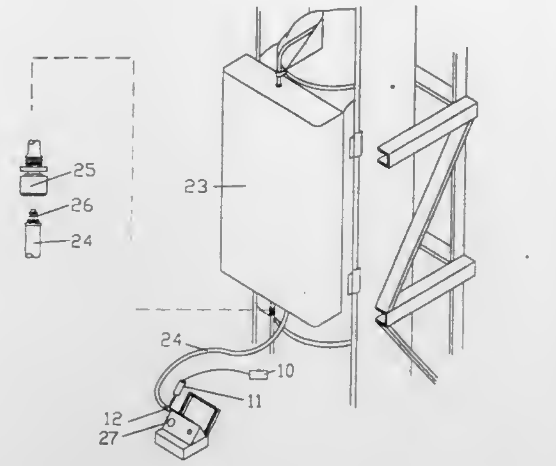
5,839,317
AUTOMATED BECKER HAMMER DRILL BOUNCE CHAMBER ENERGY MONITOR

Jack Rosenfield, Lakewood, Colo., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jun. 14, 1996, Ser. No. 673,763
Int. Cl.^{6} B25D *9/00*
U.S. Cl. 73—784 **10 Claims**

7. A system for providing analysis and evaluation of penetration test data produced by measuring cyclical bounce chamber pressure in a bounce chamber of a diesel hammer drill apparatus which delivers a succession of hammer blows to a hammer drill of the hammer drill apparatus to cause penetration of the drill into a soil bed to be tested, said system comprising:

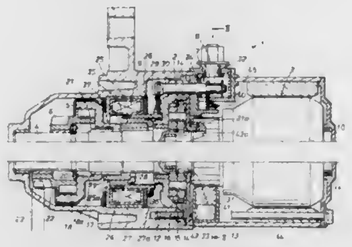
- a pressure transducer operatively connected to said bounce chamber for sensing the bounce chamber pressure and producing a corresponding pressure measurement; and
- a data logger, connected said pressure transducer, for monitoring the pressure measurements produced by said pressure transducer a plurality of times during each hammer blow, for selecting a peak pressure measurement from said pressure measurements for each hammer blow, and for storing each said selected peak pressure measurement along with the date and time of each corresponding blow.



5,839,318
COAXIAL ENGINE STARTER SYSTEM

Eiichi Kimura, Gunma-ken; Shinichi Nagashima, Tochigi-ken; Mitsuhiro Kogure, Gunma-ken; Michio Okada, Gunma-ken, and Koji Nara, Gunma-ken, all of Japan, assignors to Mitsuba Corporation, Gunma-ken, Japan

Filed May 29, 1996, Ser. No. 654,658
Claims priority, application Japan, May 29, 1995, 7-153814; May 29, 1995, 7-153815; May 29, 1995, 7-153817
Int. Cl.^{6} F02N *11/00*
U.S. Cl. 74—7 R **17 Claims**



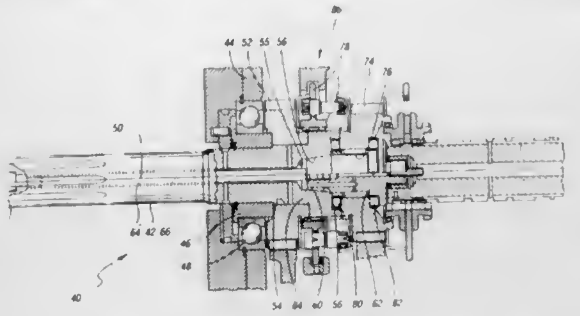
1. An engine starter, comprising:

- an electric motor;
- an output shaft disposed coaxially with respect to said electric motor in a power transmitting relationship;
- a one-way clutch assembly including an integral pinion for driving a ring gear of an engine, and including a one-way clutch having one end integrally coupled to said pinion and another end coupled to an output end of said output shaft via a helical spline, said pinion and said one-way clutch being disposed in a coaxial relationship with respect to said output shaft;
- a solenoid device comprising an annular armature and an annular energization coil surrounding said output shaft to axially drive said one-way clutch assembly;
- a switch unit disposed on a side of said solenoid device facing away form said one-way clutch assembly, and including a fixed contact and a moveable contact for selectively closing a power supply line leading to said electric motor; and
- a connecting member extending between said armature and said moveable contact.

5,839,319
SYSTEM FOR PREVENTING GEAR HOPOUT IN A COMPOUND TRANSMISSION

Brian Dutson, Manchester, England, assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 19, 1997, Ser. No. 878,739
Claims priority, application United Kingdom, Jun. 19, 1996, 9612787
Int. Cl.^{6} F16H *3/38*
U.S. Cl. 74—339 **13 Claims**



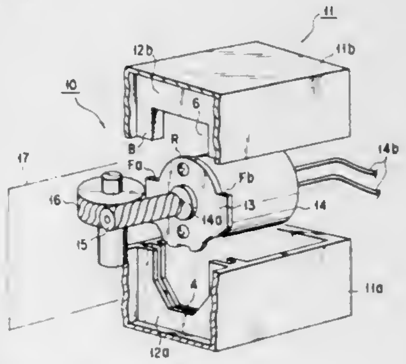
1. An improved compound transmission with reduced gear hopout, including an input shaft disposed along a central axis, a floating main shaft disposed substantially along the central axis, an auxiliary section adjacent the main shaft, and at least one countershaft parallel with and spaced from the central axis, said countershaft being operative to transmit input shaft torque to the main shaft and to facilitate "power take off" (PTO) operation, the improvement comprising:

- a splitter gear disposed on the input shaft and having a central bore formed therethrough with minimal diametral clearance with respect to the input shaft to minimize splitter gear tipping;
- said input shaft forming a central aperture therethrough along said central axis and having a rearward end, and further forming a spindle pocket along said central axis at the rearward end;
- a spindle received in said spindle pocket and having an attachment aperture formed therethrough along said central axis in communication with said central aperture;
- an attachment stud extending through said central aperture, and further extending through said attachment aperture in said spindle for rigidly securing said spindle to said input shaft; and
- a headset gear rotatably mounted on the spindle.

5,839,320
ACTUATOR

Hiroshi Komachi, Tokyo, Japan, assignor to Harada Industry Co., Ltd., Tokyo, Japan

Filed Dec. 9, 1996, Ser. No. 762,432
Claims priority, application Japan, Dec. 11, 1995, 7-321883
Int. Cl.^{6} F16H *1/16;57/02;* H05K *5/04*
U.S. Cl. 74—425 **15 Claims**



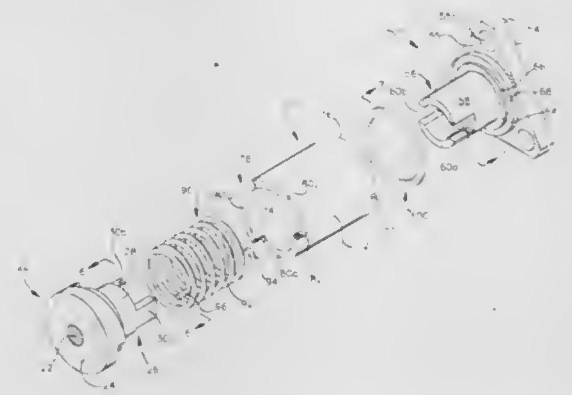
1. An actuator, comprising:

- a casing prepared by integrally bonding a first case member and a second case member which are separated from each other in an axial direction of the casing;
- bracket holding portions formed to provide a pair on the inner surfaces of said first and second case members, respectively, such that these bracket holding portions conform with each other when the first and second case members are bonded to each other;
- a motor having a mounting bracket consisting of a flat plate perpendicular to the axial direction of the casing and housed in said casing with said mounting bracket held by said bracket holding portions;
- a worm gear mounted to a rotary shaft of said motor; and
- an operating section including a worm wheel which is rotated in mesh with said worm gear so as to impart a predetermined driving force to an adjustment section of an apparatus to be controlled,
- wherein the bracket holding portion of the first case member includes a groove formed along an inner peripheral portion of said holding portion for receiving one peripheral portion of said mounting bracket of the motor, and the bracket holding portion of the second case member includes a pushing portion formed along an inner peripheral portion of said holding portion for pushing the other peripheral portion of the mounting bracket of the motor.

5,839,321
BACKLASH COMPENSATING ASSEMBLY

Alexander H. Siemons, San Francisco, Calif., assignor to Ball Screw & Actuators Co., San Jose, Calif.

Filed May 16, 1997, Ser. No. 857,972
Int. Cl.^{6} F16H *55/18;25/24*
U.S. Cl. 74—441 **20 Claims**



1. An apparatus comprising:

- a first member having a bore;
- a second member having a bore;
- the first and second members coupled to prevent relative rotation but permit relative axial movement, said bores being aligned along an axial direction;
- a sleeve positioned between the first and second members and rotatable relative to the first and second members, the sleeve having an end including a cam surface abutting a surface of one of the first and second members; and
- a resilient member secured to the sleeve and one of the first and second members, the resilient member biasing the sleeve to rotate with respect to first and second members to cause said cam surface of the sleeve to engage said surface of the one member and move said one member with respect to the other member in said axial direction.

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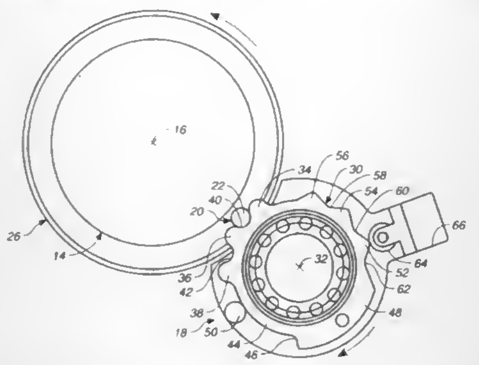
5,839,322

ROBOTIC ARM ROTATION CONTROLLER

Genco Genov, Sunnyvale, and Gou-Kin Cui, Fremont, both of Calif., assignors to Genmark Automation, Sunnyvale, Calif.
Filed Jan. 26, 1996, Ser. No. 592,225
Int. Cl.⁶ B25J *19/00*
U.S. Cl. 74—490.01 **15 Claims**



1. An apparatus for limiting rotation in a mechanism which includes at least one member having a θ-rotational motion about a Z-axis, the improvement comprising:

a stop structure carried by the mechanism and rotating with the mechanism with θ-rotational motion about the Z-axis; and

a detent structure which comprises:

a rotatable member adjacent to the stop structure, the rotatable member being mounted for free rotation about an axis parallel to the Z-axis, the rotatable member defining a plurality of detent means for sequential engagement with the stop structure as the stop structure rotates about the Z-axis;

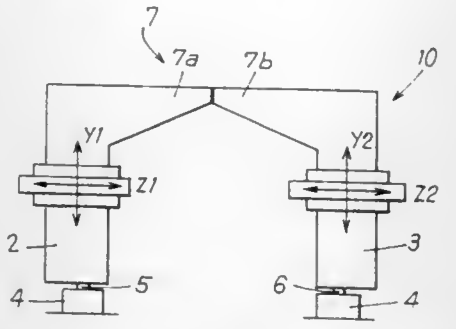
biasing means for biasing the rotatable member at a first portion of the rotatable member to deter rotation thereof, the biasing means being overcome by action of the stop structure with any one of the detent means and otherwise preventing rotation of the rotatable member; and

a stationary member adjacent the rotatable member, the stationary member being engagable with a second portion of the rotatable member to halt rotation of the rotatable member beyond a selected rotational position thereof and to act through the stop structure to stop rotation of the apparatus about the Z-axis.

5,839,323

MOVING GANTRY MACHINE HAVING UPRIGHTS MOVABLE RELATIVE TO EACH OTHER

Henri Line, Peymeinade, France, assignor to Helis S.A., Peymeinade, France
Filed Dec. 27, 1996, Ser. No. 777,396
Claims priority, application France, Dec. 29, 1995, 95 15717
Int. Cl.⁶ B23C *1/10*; B23Q *1/25*
U.S. Cl. 74—490.07 **2 Claims**



1. A moving gantry machine comprising two uprights standing on a bench via parallel slides defining a longitudinal X axis, the displacement of said uprights along said X axis being controlled by respective drive systems X_1 and X_2 under numerical control, and a cross-member interconnecting said two uprights, said gantry being capable of carrying machining heads on each upright, which heads are suitable for being displaced along Y and Z axes,

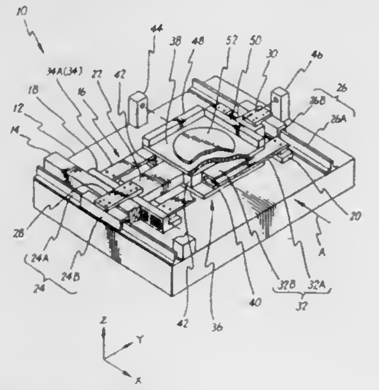
wherein the cross-member is made up of two cross-member elements carried by respective ones of the uprights and suitable for being moved relative to each other in the X direction within the limit of a given maximum offset Δ; and

wherein the drive systems X_1 and X_2 are independent of each other and are under numerical control within the limit of said offset Δ.

5,839,324

STAGE APPARATUS AND EXPOSURE APPARATUS PROVIDED WITH THE STAGE APPARATUS

Hideaki Hara, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan
Filed Mar. 28, 1996, Ser. No. 623,008
Claims priority, application Japan, Jun. 15, 1995, 7-172855
Int. Cl.⁶ G12B *5/00*
U.S. Cl. 74—490.09 **14 Claims**



1. A stage apparatus comprising:

a pedestal;

at least one first guide bar which is fixed on the pedestal;

a first movable unit which is movable in a first direction along an upper surface of the pedestal and the first guide bar;

at least one motor for driving the first movable unit; and

a vacuum-pre-loadable static pressure air bearing comprising vacuum ports and gas-ejecting ports which are formed on a surface of the first movable unit opposing to the pedestal and on another surface of the first movable unit opposing to the first guide bar, wherein, during operation, pressures of the vacuum ports are independently controllable.

5,839,325

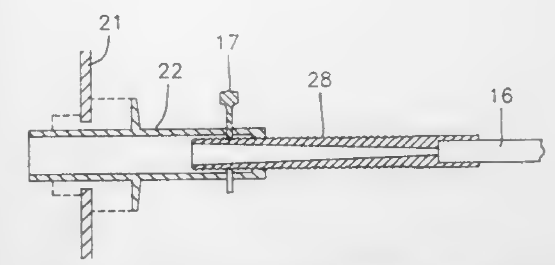
AUTOMATICALLY ADJUSTABLE CABLE-OPERATED REMOTE CONTROL

Melchor Daumal Castellon, Diputación 455, Barcelona, Spain, 08013
Continuation of Ser. No. 541,457, Oct. 10, 1995, abandoned. This application Jul. 1, 1997, Ser. No. 886,558
Claims priority, application Spain, Oct. 10, 1994, 9402114
Int. Cl.⁶ F16C *1/10*
U.S. Cl. 74—501.5 R **14 Claims**

14. An automatically adjusting cable operated remote control for a vehicle accelerator, the remote control comprising:

a cable connected to a control terminal point at a first end and a controlled element at a second end,

a cylindrical male element disposed about the cable and having a front end, a rear end, an external surface, and a first axial cavity, for receiving at one end a cable, the first axial cavity having a decreasing diameter toward the rear end of the male element, the male element further having inclined teeth provided along the external surface,



a cylindrical female element disposed about the cable and defining a second axial cavity for receiving the male element in a forward direction at a distal end having a free edge, and

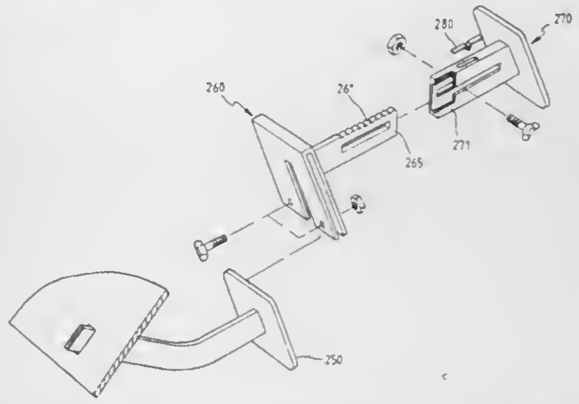
internally projecting inclined toothing such that the teeth of the male element directionally lock with the toothing of the female element, the female element further comprising a peripheral wing fastened to a fixed position on the vehicle, and

wherein the directional lock automatically adjusts the remote control by permitting the male element to be received in the forward direction by the female element upon application of a predetermined load, and wherein the directional lock further prevents the male element from moving in a reverse direction to preclude any extraction of the male element from the female element.

5,839,326

PEDAL AND PEDAL-LENGTH CONTROLLER FOR AUTOMOBILE

Young-ryeol Song, 122-907, JinheungApt., Anyang 1-dong, Anyang-city, Kyungki-do, Rep. of Korea
Division of Ser. No. 293,687, Aug. 19, 1994, abandoned. This application Jun. 7, 1996, Ser. No. 659,946
Claims priority, application Rep. of Korea, Nov. 12, 1993, 93-23754
Int. Cl.⁶ G05G *1/16*
U.S. Cl. 74—562 **6 Claims**



1. An adjustable pedal-length controller in an automobile comprising:

a pedal lever member rotatably supported to the frame of the automobile;

a pedal plate installed on the pedal lever member;

a coupling member connected to said pedal plate, said coupling member having a connection lever extending therefrom and formed with a plurality of protrusions on a top of said connection lever;

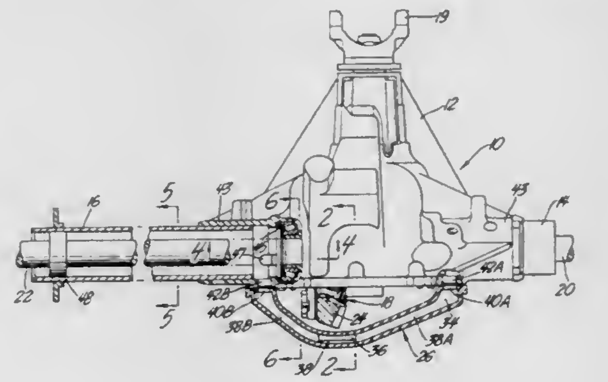
an auxiliary pedal member comprised of an auxiliary pedal plate and a hollow lever extending therefrom, said connection lever insertably coupled within said hollow lever, the hollow lever having a wall thickness and including a hole in a top portion of the hollow lever, the hole extending through said wall thickness whereby at least two of said protrusions are at least partially exposed through the hole when the connection lever is inserted into the hollow lever, said wall thickness adjacent said hole including at least one insertion slot; and

a leaf spring contained within said hole of said hollow lever and in resilient contact between said at least two protrusions, said spring coupled to said at least one insertion slot within said hole for providing said auxiliary pedal plate with the capacity to be temporarily stopped and supported at various positions of adjustment wherein said spring does not project outside of said hole of said hollow lever.

5,839,327

DRIVE AXLE ASSEMBLY WITH LUBRICANT COOLING SYSTEM

Garrett W. Gage, Goodrich, Mich., assignor to American Axle & Manufacturing, Inc., Detroit, Mich.
Filed Jul. 1, 1996, Ser. No. 673,498
Int. Cl.⁶ F16H *57/04*
U.S. Cl. 74—607 **13 Claims**



1. A drive axle asembly having a gear housing and axle tubes extending outwardly of the gear housing, a lubricant reservoir in the gear housing, a rotatable member forming part of a gear assembly rotatably rotatable member forming part of a gear assembly rotatably mounted in the gear housing, the rotatable member being at least partially disposed in lubricant in the lubricant reservoir and a lubricant cooling system, the lubricant cooling system comprising:

a lubricant passage in fluid communication with the lubricant reservoir via an inlet that is exposed to lubricant in the lubricant reservoir,

the inlet being disposed with respect to the rotatable member so that lubricant flows into the lubricant passage when the rotatable inenber rotates,

the lubricant passage having outlets adjacent inner ends of the respective axle tubes and communicating directly with the respective inner ends of the axle tubes for delivering lubricant from the lubricant passage to the respective axle tubes,

the axle tubes communicating with outlet passages that are in fluid communication with the reservoir for returning lubricant from the axle tubes to the reservoir, and

the outlets of the lubricant passage and the outlet passages being sized so that there is a flood of lubricant in the axle tubes that engages inner surfaces of the axle tubes and outer surfaces of the axle shafts when the rotatable member rotates at a predetermined minimum speed.

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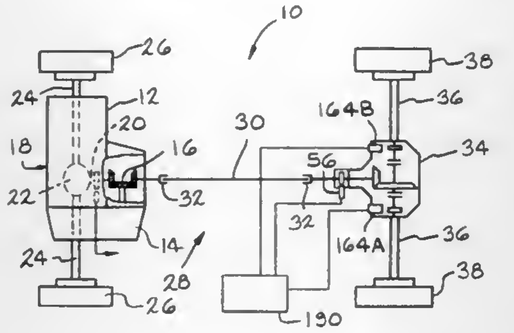
5,839,328
DIFFERENTIAL HAVING DUAL MODULATING CLUTCHES

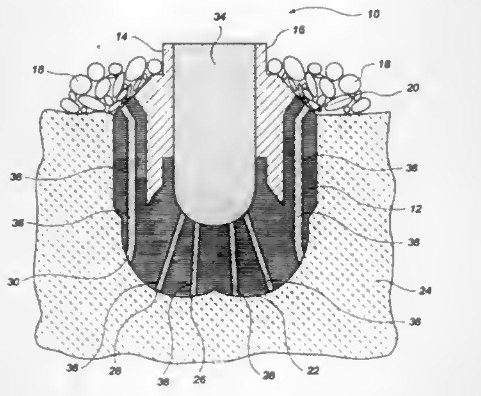
Dan J. Showalter, Plymouth, Mich., assignor to Borg-Warner Automotive, Inc., Sterling Heights, Mich.
Division of Ser. No. 612,626, Mar. 6, 1996, Pat. No. 5,690,002. This application Jul. 24, 1997, Ser. No. 900,232
Int. Cl.^{6} B60K *17/16*
U.S. Cl. 74—650 **19 Claims**



1. A differential for use in an adaptive fourwheel drive vehicle comprising, in combination,
- an input shaft,
- a drive member disposed perpendicularly to said input shaft,
- a gear set for transferring rotational energy from said input shaft to said drive member,
- a pair of output shafts aligned with said drive member and
- a pair of modulating clutch assemblies, each of said modulating clutch assemblies including a first plurality and a second plurality of interleaved clutch plates, a bell housing for engaging said first plurality of clutch plates, a collar for engaging said second plurality of clutch plates and an electromagnetic clutch operator, said pair of modulating clutch assemblies operably selectively coupling each of said output shafts with said drive member.

5,839,329
METHOD FOR INFILTRATING PREFORMED COMPONENTS AND COMPONENT ASSEMBLIES

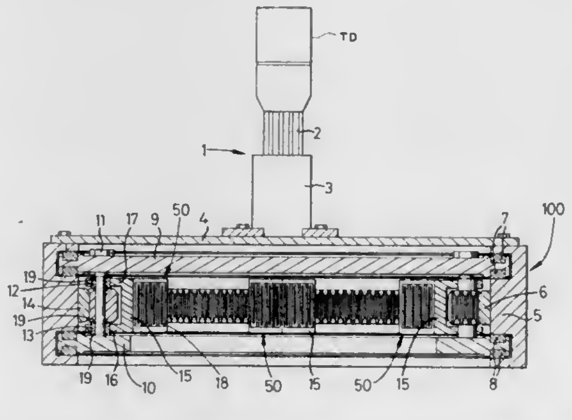
Redd H. Smith, Salt Lake City; Sidney L. Findley, West Valley City, and Trent N. Butcher, Midvale, all of Utah, assignors to Baker Hughes Incorporated, Houston, Tex.
Continuation-in-part of Ser. No. 691,863, Aug. 2, 1996, which is a continuation of Ser. No. 438,200, May 9, 1995, Pat. No. 5,544,550, which is a division of Ser. No. 213,866, Mar. 16, 1994, Pat. No. 5,433,280. This application Sep. 24, 1996, Ser. No. 719,281
Int. Cl.^{6} B21K *5/06*
U.S. Cl. 76—108.2 **41 Claims**



1. A method of infiltrating a preformed, three-dimensional component structure, comprising:
- substantially conformably supporting at least one surface of at least one three-dimensional, preformed component comprised of bonded particulates including providing a barrier of material substantially non-wettable to a selected hardenable liquid infiltrant proximate said at least one surface; and
- infiltrating said at least one preformed component with said selected hardenable liquid infiltrant.

5,839,330
MECHANISM FOR CONNECTING AND DISCONNECTING TUBULARS

Arnold Stokka, Sandnes, Norway, assignor to Weatherford/Lamb, Inc., Houston, Tex.
Filed Mar. 5, 1997, Ser. No. 812,402
Claims priority, application United Kingdom, Jul. 31, 1996, 9616094
Int. Cl.^{6} B25B *13/50*
U.S. Cl. 81—57.33 **9 Claims**

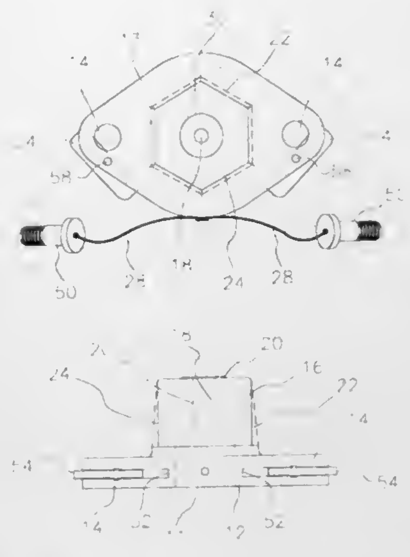


1. A mechanism for gripping a tubular, which mechanism comprises at least one jaw movable into engagement with said tubular, a support connectable to and rotatable by a top drive, a plate rotatable relative to said support, and means responsive to relative rotation between said support and said plate to displace said at least one jaw, so that, in use, when said mechanism is lowered onto a tubular, said plate engages said tubular whereafter rotation of said support in one sense creates relative rotation between said support and said plate and causes said at least one jaw to move into gripping engagement with said tubular.

5,839,331
FLANGE TIGHTENING TOOL

John W. Rocheleau, 82 Warren St., Concord, N.H. 03301
Continuation-in-part of Ser. No. 679,144, Jul. 12, 1996. This application Jul. 21, 1997, Ser. No. 897,741
Int. Cl.^{6} B25B *13/48*
U.S. Cl. 81—176.15 **7 Claims**

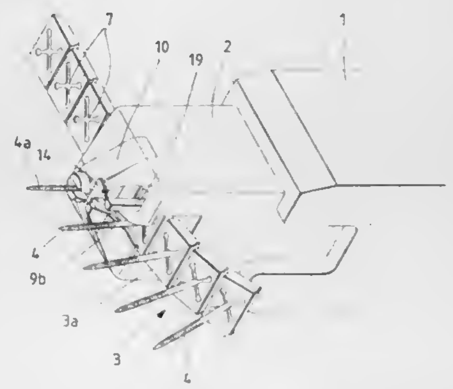
1. A flange tightening apparatus for use in securing a flange to a pipe, the flange having a size, said apparatus comprising:
- a base plate having two spaced-apart attachment openings and having a distance between the two spaced-apart attachment openings corresponding to the size of the flange, said base plate also having a flat bottom surface and a top mounting surface,
- a shoulder attached to the top mounting surface of said base plate and said shoulder having a dimension that corresponds to a wrench,
- a rotatable handle attached to said shoulder, and substantially perpendicular to the flat bottom surface of said base plate,
- two quick release disconnect mechanisms being mounted on said base plate;



- two flange mounting members, wherein the flange is connected to said base plate by each of the flange mounting members being inserted into one of the two spaced-apart attachment openings thus securely locking the flange to the base plate.

5,839,332
SCREW GUIDE IN LINKED-SCREW TIGHTENER

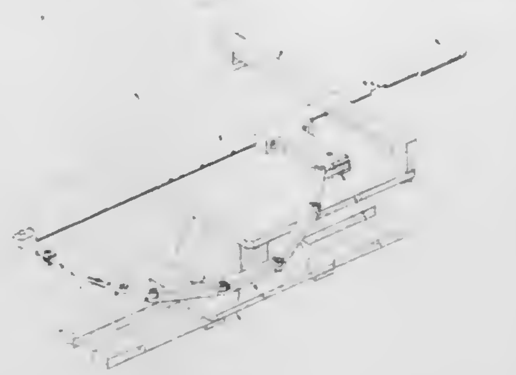
Takeo Fujiyama, and Osamu Ebisawa, both of Tokyo, Japan, assignors to Max Co., Ltd., Tokyo, Japan
Filed Apr. 19, 1996, Ser. No. 636,518
Claims priority, application Japan, Apr. 21, 1995, 7-120580; Jan. 19, 1996, 8-007750; Jan. 19, 1996, 8-007751
Int. Cl.^{6} B25B *23/04*
U.S. Cl. 81—434 **7 Claims**



1. A screw guide unit for a linked-screw tightener in which linked screws held by a coupling belt at predetermined intervals are passed through a linked-screw guide passage provided near a leading end of and across a nose portion installed movably at the leading end of a linked-screw tightener body relative to a screwing direction, a first screw is supplied into an open space between a pair of chuck pawls positioned in the substantially central part of the nose portion and capable of opening and closing in accordance with the movement of the nose portion relative to the linked-screw tightener body, and the supplied screw is driven with a driver bit, said screw guide unit comprising:
- a screw receiving port formed between the pair of chuck pawls when the pawls are in a closed position, wherein said screw receiving port opens to allow a screw held by the coupling belt to be fed into an open space between the pair of the chuck pawls; and
- a guide member disposed proximate the pair of the chuck pawls, said guide member including means for opening and closing said receiving port in conjunction with the movement of the nose portion relative to the linked-screw tightener body to hold the fed screw between the pair of the chuck pawls.

5,839,333
ARTICULATED HOLLOWING SYSTEM FOR LATHE

Hugh E. McKay, 95623 Riverway Dr., Gold Beach, Oreg. 97444
Filed Dec. 4, 1996, Ser. No. 753,998
Int. Cl.^{6} B27C *7/06*
U.S. Cl. 82—1.11 **20 Claims**



1. A method for blind cutting an internal void in a lathe turned form through a limited access opening comprising the steps of: providing a boring bar disposed by a biasing means for use on a lathe, and placing said boring bar through said limited access opening into a pre-drilled hole in said lathe turned form, and providing an adjustably fixed articulating arm with a cutting tool means extended laterally from said boring bar to permit an offset cutting action, and fixing said articulating arm to a predetermined position to permit said offset cutting action, and removing material as can be cut away to enlarge said pre-drilled hole with said cutting tool from said predetermined position of said articulating arm, and determining the position of the internally disposed cutting tool in relationship to said lathe turned form's exterior by an adjustment means during said cutting action, and repeating the above steps with successive settings, and changing the length and the angle of said articulating arm and thus incrementally changing the cutting diameter and position of said cutting tool, and cutting with said successive settings inside said turned form through said limited access opening, said internal void is successively and incrementally enlarged, and cutting to a predetermined wall thickness by said adjustment means for determining said cutting tool's internal position, and whereby said turned form will be hollowed out to said predetermined wall thickness with an internal shape that can substantially mirror the external shape of a multitude of turned form designs.

5,839,334
ORNAMENTAL ARTICLE AND METHOD OF PRODUCING THE SAME

Ichiro Yoshimura, 43-6, Shimizu-cho, Itabashi-ku, Tokyo, Japan
Filed Jan. 28, 1997, Ser. No. 789,265
Claims priority, application Japan, Apr. 26, 1996, 8-129246
Int. Cl.^{6} B23B *1/00*
U.S. Cl. 82—1.11 **3 Claims**

1. A method of producing an ornamental article, comprising the steps of:
- providing a base plate element with a three-dimensional pattern portion formed integrally on a surface thereof;
- providing a chucking member having a fitting recess, said fitting recess having a bottom face with a receiving portion formed thereon, said receiving portion complementary in shape to said three-dimensional pattern portion;
- fitting said three-dimensional pattern portion of said base plate element into said receiving portion of said chucking member;
- fixing said base plate element to said chucking member to prevent a relative movement therebetween;
- rotating said chucking member to rotate said base plate element; and

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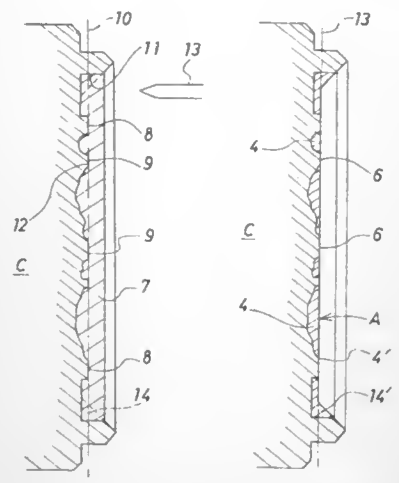
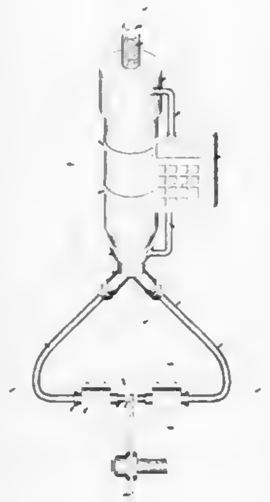


using a tool to remove a material of said base plate element until reaching a boundary plane between said base plate element and said three-dimensional pattern portion.

5,839,335
SAW BLADE LUBRICATING APPARATUS

Robert W. Tilley, 21710 Moortown Cir., Katy, Tex. 77450
Filed Nov. 1, 1996, Ser. No. 742,354
Int. Cl.⁶ B26D *7/08;* **F01M** *5/00*
U.S. Cl. 83—169 **5 Claims**



1. In combination, a sawing device having a saw blade and an apparatus for lubricating the saw blade with solid and semisolid lubricant, said apparatus comprising:

a) a single reloadable lubricant reservoir, wherein said reservoir comprises an aluminum cylindrical canister with a smooth internal bore, said internal bore being about 1½ to about 3 inches in diameter and said canister being about 3 to about 18 inches long, said canister having top and bottom ends, said top end being open for loading the canister with new lubricant, said open end having male threads, the bottom end further comprising a conical section, said conical section having a central conical aperture where lubricant exits the canister, and a female threaded canister cap attached to said canister with said male threads,

b) means for displacing said lubricant from said reservoir, said displacement means comprising a piston disposed within said canister bore, a threaded ram rotatably secured to said piston, a stepper motor, and a mechanical connection means engaging the stepper motor with the threaded ram, said engaging means causing the threaded ram to move linearly in relation to a longitudinal axis of the canister bore as the stepper motor operates, said linear ram motion causing said piston to move within said bore when movement of the piston is in the direction of the canister lubricant exit causing lubricant in the canister between the piston and the canister exit end to be displaced from the canister into the canister conical section and out the conical central aperture, the canister cap further providing a means for mounting said stepper motor and threaded ram so that when the cap is removed from the canister, the motor, threaded ram, and piston are also removed from the canister,

c) means for delivering said displaced lubricant to opposite sides of the saw blade, said delivery means comprising a "Y" tubing connection connected to said conical central aperture, two pieces of plastic tubing, each piece of tubing having two ends, one end of each piece of plastic tubing connected to each leg of the "Y" connection and the other end of each piece being open and the two open ends of the plastic tubing opposing each other with a gap between said open ends wherein said saw blade is positioned in the gap between said open ends, two clamping blocks, for holding the plastic tubing open ends in position a mounting member for mounting the clamping blocks on the opposite sides of the saw blade, said blocks having an aperture therethrough, said block apertures each having a longitudinal axis which is perpendicular to a planar axis of the saw blade, and a tubing support member received in each block aperture, said tubing support members each being constructed of stainless steel and having an internal aperture therethrough for snugly receiving the respective piece of plastic tubing, said clamping blocks each being partially split providing a means for clamping the respective tubing support member,

d) a means for controlling the lubricant delivery and delivery rate, said delivery control means comprising an electronic control means, a power supply, and wiring connecting said power supply, control means and stepper motor, further said control means providing a means for controlling the operation, direction and speed of the stepper motor and lubricant delivery rate in addition to providing a memory and means for mathematically manipulating historic and anticipated stepper motor operation and lubricant delivery rate, said control means further providing a digital readout depicting stepper motor function and lubricant delivery rate.

5,839,336
PAPER-PUNCHING DEVICE FOR USE IN AN IMAGE-FORMING APPARATUS

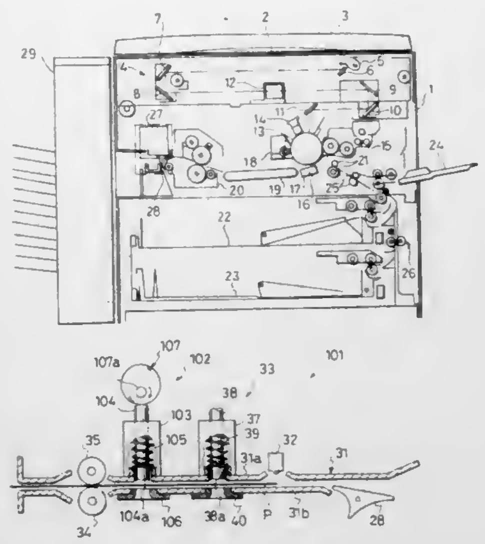
Yasuji Yamauchi, Nara; Toshio Yamanaka, Yao; Masafumi Okumura, Yamatokoriyama; Masashi Hirai, Ikoma; Kyousuke Taka, Nara; Kinji Uno, Yamatokoriyama; Yoshiharu Yoneda, Osaka, and Hirokazu Yamauchi, Uji, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 357,217, Dec. 13, 1994, abandoned. This application Dec. 17, 1996, Ser. No. 768,865
Claims priority, application Japan, Dec. 28, 1993, 5-337329; Mar. 29, 1994, 6-059304
Int. Cl.⁶ G03B *27/00;* **B26D** *7/00;5/20*
U.S. Cl. 83—167 **18 Claims**

1. A paper-punching arrangement for use in an image-forming apparatus comprising:

guiding means for guiding a sheet of paper in a predetermined direction;

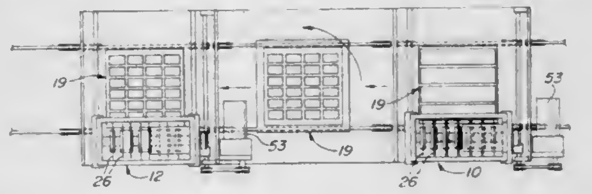
a punching device for forming a punch hole in the sheet of paper, the punching device being installed in the guiding means, said punching device including a punching blade and driving means for driving the punching blade wherein the sheet of paper is caught by the punching blade for a predetermined duration; and

transport rollers for conveying the sheet of paper at a predetermined transporting speed, the transport rollers being located on the downstream side from the punching blade in the guiding means, wherein the transport rollers slip a predetermined amount with respect to the sheet of paper when the sheet of paper is caught by the punching blade such that an amount of slippage determined by a mathematical product of the predetermined duration during which the sheet of paper is caught by the punching blade and the predetermined paper transporting speed exerted by the transport rollers is maintained equal to a predetermined value, and wherein said punching device is activated at a predetermined time determined in accordance with a thickness of the sheet of paper.



5,839,337
SEMICONDUCTOR CARRIER STRIP TRIMMING APPARATUS

H. Karl Neu, 920 Mcclesfield Rd., Furlong, Pa. 18925
Continuation-in-part of Ser. No. 430,436, Apr. 28, 1995, abandoned. This application Jun. 20, 1996, Ser. No. 671,777
Int. Cl.⁶ B65B *61/08;* **B23D** *47/04*
U.S. Cl. 83—255 **14 Claims**



14. Apparatus for separation of encapsulated devices mounted on elongated, substantially rectangular carrier strips in spaced apart relationship, said apparatus comprising:

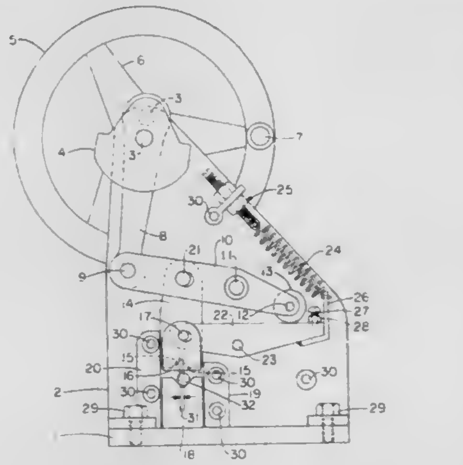
a pallet having a support surface for support of said carrier strips, said pallet including holding means for releasably maintaining said carrier strips on said support surface in spaced apart, parallel relationship;

a pair of cutter assemblies for cutting the carrier strips along first and second sets of cut lines, each of said cutter assemblies comprising a plurality of spaced apart coaxially oriented circular cutters of equal diameter, said cutters being in parallel relationship and having radially projecting cutter teeth;

first alignment means for aligning the pallet with a first cutter assembly of said pair, first operating means for operating the cutters of said first cutter assembly and for moving said first cutter assembly relative to said pallet for effecting cuts of said strip material on said support surface along said first set of cut lines, second alignment means for aligning the pallet with a second cutter assembly of said pair, pallet moving means for moving said pallet from said first alignment means to said second alignment means, and second operating means for operating the cutters of said second cutter assembly and for moving said second cutter assembly relative to said pallet for effecting cuts of said strip material on said support surface along said second set of cut lines, whereby cutting along one of said sets of cut lines effects separation of said devices and cutting along the other of said sets of cut lines effects trimming of the strip material along edges of said devices extending perpendicularly to said one set of cut lines.

5,839,338
WIRE STEEL ROPE CUTTER MACHINE

Stoil Metodiev Tcholakov, 5304 Hames Trace, Apt. 117, Louisville, Ky. 40291
Filed Sep. 25, 1996, Ser. No. 720,188
Int. Cl.⁶ B26D *1/08;7/02*
U.S. Cl. 83—375 **3 Claims**



1. A wire steel rope cutter machine for cutting a wire rope comprising:

a housing;

a pair of jaws including a stationary lower jaw fixed to said housing and an upper pressing jaw, said lower jaw having a "V"-shaped edge;

a pivotable plate operatively connected at a first end to the upper pressing jaw;

a spring operatively connected to said housing and to a second end of said pivotable plate;

a first axle attached to said housing and received through said pivotable plate distal from said ends of said pivotable plate so as to permit said pivotable plate to pivot therearound;

at least one pivotable arm having a first end operatively engaging a top of said pivotable plate;

a mechanism to actuate the machine including a connecting rod operatively connected to a second end of said pivotable arm;

a second axle attached to said housing and received through said at least one pivotable arm distal from said ends thereof so as to permit said at least one pivotable arm to pivot therearound; and

a cutting blade operatively connected to said pivotable arm for translational and pivotal movement relative to said pivotable arm, said cutting blade being connected to said pivotable arm between said axle and said connecting rod and positioned in substantially parallel relationship adjacent said pair of jaws, said cutting blade having a "V"-shaped cutting edge, wherein a tracked movement of the middle of said "V"-shaped cutting edge of said cutting blade is off-center and displaced from the middle of said "V"-shaped edge of said lower jaw of said pair of jaws when said mechanism is actuated to pivot said pivotable arm, thereby lowering said cutting blade for cutting the wire rope, and wherein the pivoting of said pivotable arm causes the pivoting of said pivotable plate so as to lower said upper pressing jaw to hold the wire rope.

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5,839,339
MITER SAW

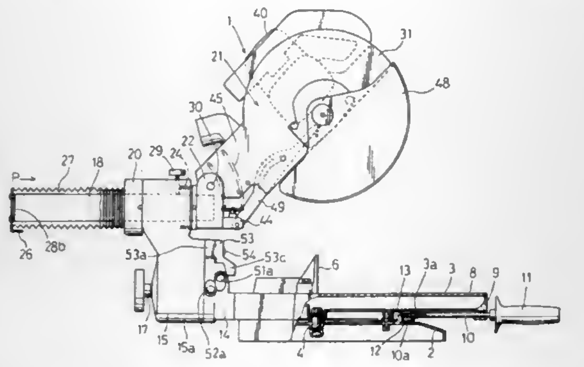
Katsuhiko Sasaki; Mitsuyoshi Niinomi, and Yoshinori Shibata, all of Anjo, Japan, assignors to Makita Corporation, Aichi-ken, Japan

Continuation of Ser. No. 660,882, Jun. 10, 1996, Pat. No. 5,660,094, which is a continuation of Ser. No. 408,163, Mar. 21, 1995, Pat. No. 5,582,089, which is a continuation of Ser. No. 63,291, May 18, 1993, Pat. No. 5,437,214. This application Aug. 25, 1997, Ser. No. 916,954

Claims priority, application Japan, May 22, 1992, 4-156010; Aug. 27, 1992, 4-252214

Int. Cl.^{6} B27B *5/36*

U.S. Cl. 83—471.3 **6 Claims**



1. Miter saw comprising:
- a base for placing a work thereon;
- a miter saw unit having a saw blade supported thereon, said miter saw unit being laterally pivotable relative to said base about a pivotal axis from a vertical position;
- a first stopper and a second stopper mounted on one and the other of said miter saw unit and said base, respectively, and operable to abut on each other in a pivotal direction of said miter saw unit for determining said vertical position of said miter saw unit;
- said first stopper being movable between a first position for abutment on said second stopper and a second position away from said first position, and said first stopper in said second position permitting said miter saw unit to pivot from said vertical position in said pivotal direction; and
- holding means for holding said first stopper in said first position and said second position when said miter saw unit is in said vertical position and a pivoted position in said pivotal direction, respectively, said holding means being operable to move said first stopper from said second position to said first position when said miter saw unit is moved from said pivoted position to said vertical position.

5,839,340
APPARATUS FOR CUTTING TUBES

Karl-Josef Esser, Mönchengladbach, Germany, assignor to Mannesmann Aktiengesellschaft, Düsseldorf, Germany

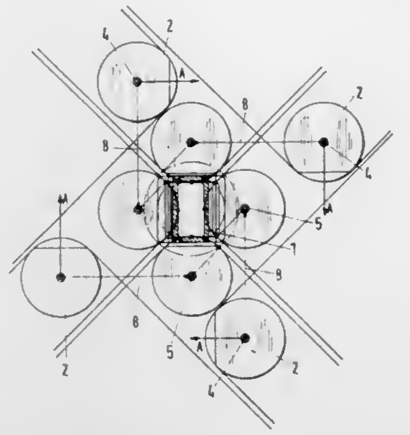
Filed Jan. 23, 1997, Ser. No. 787,937

Claims priority, application Germany, Jan. 31, 1996, 196 05 021.9

Int. Cl.^{6} B26D *1/11*

U.S. Cl. 83—483 **11 Claims**

1. An apparatus for cutting a tube having a longitudinal axis, the apparatus comprising:
- a frame for encompassing the tube;
- at least three supports supported on said frame in two vertically stacked axial directions, said supports being disposed adjacent one another in distributed fashion about the tube on a single plane and at a right angle to the tube longitudinal axis, said supports being moveable axially;
- at least one cutting head mounted on each of said supports;



- a disk milling cutter mounted to each said cutting head, each of said disk milling cutters being rotatable on a common cutting plane so as to cut through the tube when said supports are moved axially, said disk milling cutters being moveable in the same direction relative to the circumference of the tube such that each of said disk milling cutters simultaneously cuts a section of the wall cross-sectional area of the tube;
- a plurality of clamping devices arranged on said frame for securing the tube during the cutting process; and
- wherein at least two of said supports are driveable exclusively in a single axial direction during cutting of the tube.

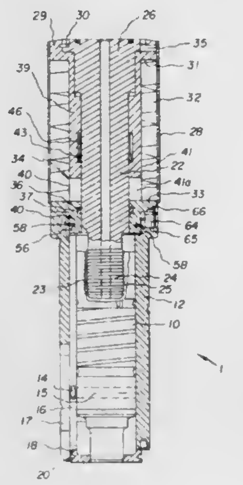
5,839,341
PUNCH UNIT

Gary E. Johnson, Ramsey, and Richard J. Schweiger, Andover, both of Minn., assignors to Mate Precision Tooling, Ramsey, Minn.

Filed Apr. 12, 1996, Ser. No. 635,256

Int. Cl.^{6} B26F *1/14*

U.S. Cl. 83—530 **26 Claims**



1. A punch unit comprising:
- a housing;
- a punch driver axially received in said housing;
- a guide bushing, the guide bushing being connected to said housing so as to be rotational relative thereto;
- connecting means for connecting the guide bushing to the housing, said connecting means comprising radial protrusions secured to the housing and disposed within a circumferential groove on the guide bushing so as to restrict disengagement of the guide bushing and the housing;
- a punch mounted in the guide bushing against rotational movement relative thereto, the punch being adjacent to the punch driver;

- spring means biasing the punch driver axially away from the guide bushing; and
- indexing means for rotationally positioning the guide bushing relative to the housing, said indexing means comprising spring biased means on one of the guide bushing or housing engaging a recess in the other of the guide bushing or housing, such that, (1) during normal operation of the punch unit, in the engaged position of the spring biased means, the housing and the guide bushing remain fixed rotationally with respect to each other and (2) for adjustment purposes, disengagement of the spring biased means allows for rotation of the guide bushing and housing relative to each other to adjust the combined length of the punch and punch driver.

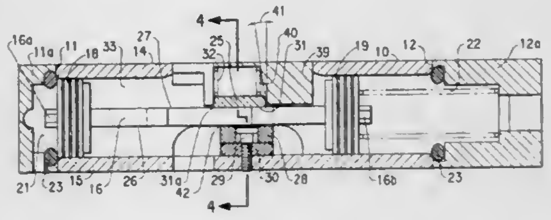
5,839,342
YARN CUTTER

Steven A. Cope; Dennis L. Frost, both of Newark, Del., and Ricky Wayne Oakley, Midlothian, Va., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 12, 1996, Ser. No. 662,893

Int. Cl.^{6} B26D *1/08*

U.S. Cl. 83—583 **13 Claims**



1. A yarn cutter comprising:
- a cutter body having a top surface and a bottom surface and comprising:
- a bore therethrough extending from a first end to a second end of the cutter body and;
- a body notch extending transversely from the top surface of the cutter body through the bore to the bottom surface of the cutter body, the body notch adapted to receive a yarn;
- a cutting means for cutting a yarn received in the body notch, comprising
  - a first cutting element having an element notch therein, the cutting element having a planar support surface, a planar cutting surface parallel with the support surface, and a cutting edge at one side of the element notch, the cutting edge positioned adjacent to a side of the body notch adjacent the first end of said bore;
  - a piston slideably fitted into the bore and engaging an end of the cutting element adjacent the first end of the bore and adapted to slide from the first end toward the second end of the bore;
  - a bearing element slideable fitted into the bore and engaging an end of the cutting element opposite the first end of the bore;
  - a second cutting element resiliently mounted in the cutter body adjacent the body notch, said second cutting element having a cutting edge and a planar surface that is parallel with and in surface-to-surface contact with the planar cutting surface of the first cutting element as the piston and first cutting element slide from the first end toward the second end of the bore, said planar surface of said second cutting element being biased against said planar cutting surface of said first cutting element and being free to align in surface-to-surface contact with the planar cutting surface of said first cutting element;
  - a support attached to the body adjacent to the body notch and opposite said second cutting element, said support engaging the planar support surface of said first cutting element to thereby resist rotation of said first cutting element due to the urging of said second cutting element as the first cutting element moves from the first end toward the second end of the bore.

5,839,343
CUTTER BAR FOR A CUTTING CYLINDER

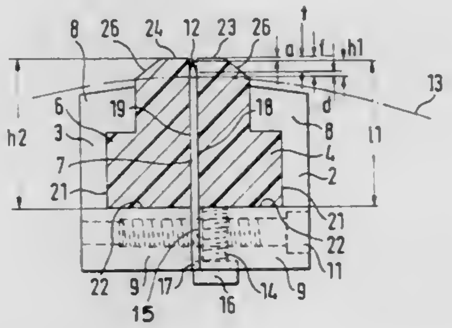
Horst Bernhard Michalik, Höchberg, and Oswald Josef Väth, Erlenbach, both of Germany, assignors to Koenig & Bauer-Albert Aktiengesellschaft, Wurzburg, Germany

Continuation of Ser. No. 501,369, Jul. 12, 1995, abandoned. This application May 19, 1997, Ser. No. 858,390

Claims priority, application Germany, Jul. 14, 1994, 44 24 919.5

Int. Cl.^{6} B26D *5/08*

U.S. Cl. 83—663 **6 Claims**



1. A cutter bar for a cutting cylinder of a folding unit of a web-fed rotary printing press to sever a paper web train into signatures, said cutter bar comprising:
- an elongated, generally flat cutter blade having a cutter edge, a cutter blade lower portion, a lower end, and cutter blade side surfaces;
- first and second clamping rails, each of said first and second clamping rails having an upper leg, a lower leg, and a central web, said central web of each of said first and second clamping rails connecting said upper leg and said lower leg and defining therewith a central cavity having an inner surface, said lower leg of each of said first and second clamping rails engaging said lower portion of said cutter blade and supporting said cutter blade; and
- first and second pressure strips interposed in said central cavities of said first and second clamping rails between said first and second clamping rails and said cutter blade and engaging said side surfaces of said cutter blade and said inner surfaces of said central cavities of said first and second clamping rails, each of said first and second pressure strips consisting of a small-celled synthetic rubber having an elastic modulus of $50 N/mm^2$ to $1000 N/mm_2$ and a hardness of 10 to 30 Shore A, each of said first and second pressure strips further having a height and a spring path, said spring path being a distance each said first and second pressure strips is compressed by engagement with a paper web during a cutting operation of said cutter bar, said spring path distance of each of said pressure strips having a ratio to said height of each of said pressure strips of between 1 to 8 and 1 to 15, each of said first and second pressure strips further having an upper pressure surface, each said upper pressure surface extending upwardly beyond said upper leg of each said first and second clamping strip and said cutter edge of said cutter blade.

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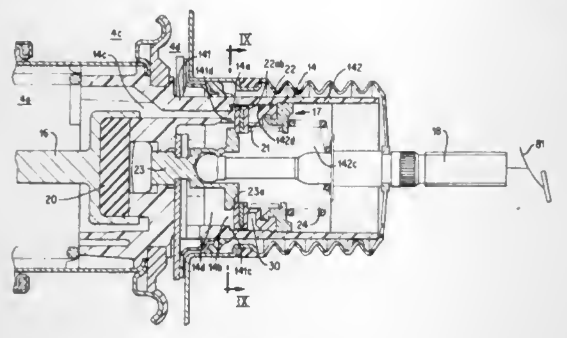
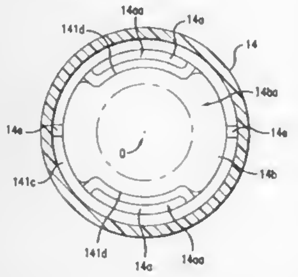
5,839,344
VACUUM SERVO UNIT FOR A VEHICLE BRAKING SYSTEM

Kaoru Tsubouchi, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan
Filed Feb. 26, 1997, Ser. No. 806,670
Claims priority, application Japan, Feb. 26, 1996, 8-038436
Int. Cl.^{6} F15B *9/10*
U.S. Cl. 91—376 R **17 Claims**

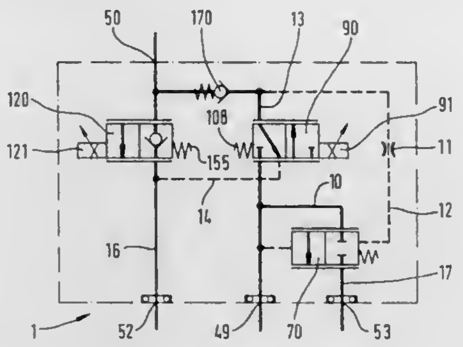




13. A vacuum servo unit for a vehicle braking system comprising:
a housing in which is defined a pressure chamber;
a movable wall member disposed in said housing for dividing said pressure chamber into a constant pressure chamber communicable with a negative pressure source and a variable pressure chamber selectively communicable with atmosphere and said constant pressure chamber;
a movable power piston connected with said movable wall member, said movable power piston having an inner peripheral surface;
a negative pressure controlling valve seat disposed in the movable power piston, said negative pressure controlling valve seat dividing a space within the movable power piston into a first space and a second space;
a vacuum path communicating said first space with said constant pressure chamber;
an air path communicating said second space with said variable pressure chamber;
an input member disposed in said base portion and axially movable upon brake actuation;
an output member outputting a propulsion force generated by said movable power piston according to movement of said movable wall member; and
a control member disposed in said cylindrical portion for cooperating with said negative pressure controlling valve seat to selectively communicate said second space with said first space or with the atmosphere according to movement of said input member with respect to said movable power piston;
a third space formed between an inner periphery of said movable power piston and an outer periphery of said control member; and
a communicating portion directly formed in said movable power piston which constantly communicates said second space with said third space.

5,839,345
HYDRAULIC CONTROL IN MONOBLOCK STRUCTURE FOR LIFTING AND LOWERING A LOAD WITH AT LEAST TWO ELECTROMAGNETICALLY ACTUATABLE PROPORTIONAL DISTRIBUTING VALVE ELEMENTS

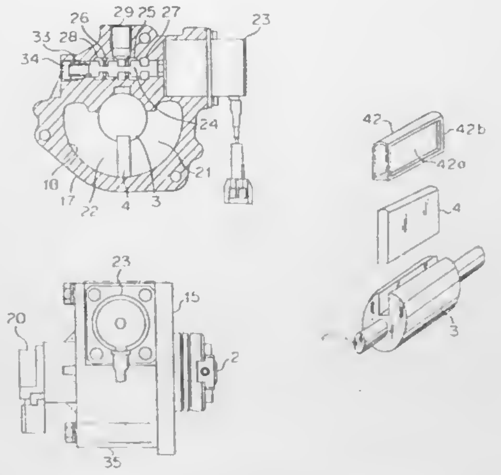
Hartmut Sandau, deceased, late of Schwieberdingen, by Roswitha Sandau and Christine Sandau, legal representatives; Werner Schumacher, Asperg; Rainer Trucksess, and Holger Lueues, both of Vaihingen/Enz, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany
Filed Jun. 23, 1997, Ser. No. 880,967
Claims priority, application Germany, Dec. 23, 1994, 44 46 145.3
Int. Cl.^{6} F15B *11/08;13/044*
U.S. Cl. 91—457 **14 Claims**



1. A hydraulic circuit in a monoblock structure for lifting and lowering a load, comprising at least two electromagnetically actuatable proportional distributing valve elements; a check valve; a pressure balance for load-independent lifting of the load as an input element; a housing accommodating at least some of said elements and having at least one pump connection, at least one consumer connection, and at least one return connection, said proportional distributing valve elements being disposed parallel to one another; electromagnetic drives seated side-by-side on a same side and at a same height, said pressure balance having a piston which is disposed coaxially next to a longitudinal slide of a first one of said proportional distributing valve elements in a bore that guides and supports both said valve elements, said longitudinal slide of said first proportional distributing valve elements being spring-loaded; and at least one component for adjusting a prestressing and bracing of a spring on said housing of a control penetrating said piston of said pressure balance.

5,839,346
ROTARY HYDRAULIC ACTUATOR INCLUDING GROOVE-LIKE FLUID SUPPLY PATHS IN A FACE OF A BRACKET

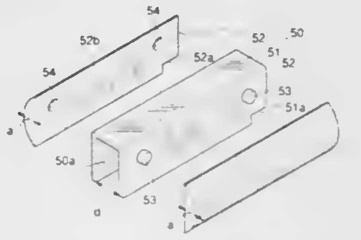
Mutsuo Sekiya, Tokyo; Katsuyuki Fukuhara, Kobe, and Masafumi Sugawara, Tokyo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 16, 1997, Ser. No. 840,759
Claims priority, application Japan, Oct. 8, 1996, 8-267603
Int. Cl.^{6} F01B *25/26*
U.S. Cl. 92—5 R **13 Claims**

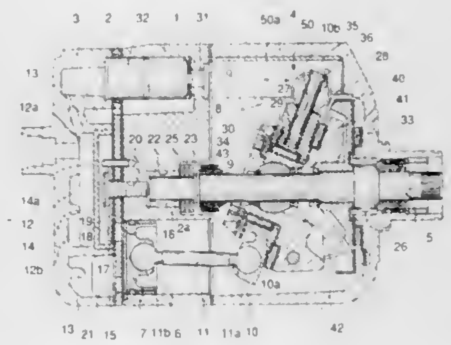


1. A rotary hydraulic actuator comprising:
a sealed vessel comprising brackets and a casing;
a partition vane attached to a shaft supported by the brackets for dividing an inside of the sealed vessel into a first pressure chamber and a second pressure chamber and pivoting the shaft by a pressure difference between the first and the second pressure chambers;
suction and exhaust hydraulic ports and a drain port installed to the casing;
a hydraulic control valve mounted to the casing for conducting a hydraulic control along with the suction and exhaust hydraulic ports and the drain port;
groove-like hydraulic pressure supply paths installed to a face of one of the brackets in contact with the casing for communicating the first pressure chamber and the second pressure chamber respectively to the suction and exhaust hydraulic ports; and
a groove-like drain path installed to a face of another one of the brackets in contact with the casing for communicating to the drain port.

5,839,347
WOBBLE PLATE COMPRESSOR WITH SWASH PLATE GUIDE MEMBER

Hiroshi Nomura; Kazuo Eitai; Minoru Kanaizuka, and Hiroyuki Ishida, all of Saitama-ken, Japan, assignors to Zexel Corporation, Tokyo, Japan
Filed Nov. 27, 1995, Ser. No. 562,931
Claims priority, application Japan, Dec. 2, 1994, 6-329375
Int. Cl.^{6} F04B *25/04*
U.S. Cl. 92—12.2 **9 Claims**

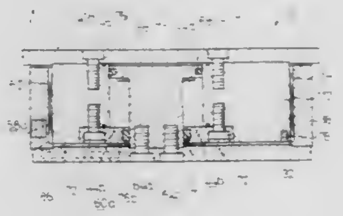


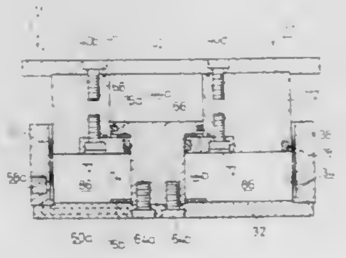


1. In a wobble plate compressor including a housing, a drive shaft, a wobble plate mounted on said drive shaft for performing wobbling motion according to rotation of said drive shaft, a guide member slidably mounted in an inner wall surface of said housing such that said guide member is rotatable about an axis parallel to said drive shaft, said guide member being formed with a linear guide groove extending in parallel with said drive shaft, and a rotation-preventing member rigidly mounted on said wobble plate and slidably inserted into said linear guide groove of said guide member for preventing rotation of said wobble plate,
the improvement wherein said guide member comprising:
guide means having a U-shaped cross-section and defining said linear guide groove therein; and
a pair of sliding means mounted on opposite sides of said guide means for sliding on said inner wall surface of said housing.

5,839,348
MOVING CYLINDER APPARATUS

Kenji Iida, Ibaraki-ken; Shuji Ono, and Ken Kobayashi, both of Kadoma, all of Japan, assignors to SMC Kabushiki Kaisha, Tokyo, and Matsushita Electric Industrial Co., Ltd., Kadoma, both of Japan
Continuation of Ser. No. 582,911, Jan. 4, 1996, Pat. No. 5,669,283. This application Jan. 21, 1997, Ser. No. 786,563
Claims priority, application Japan, Jan. 17, 1995, 7-5254
Int. Cl.^{6} F01B *15/02*
U.S. Cl. 92—117 A **26 Claims**





1. A cylinder apparatus comprising:
a base plate:
a piston fixed on top of said base plate and having a piston head and a piston rod connected thereto, wherein an end of said piston rod opposite said piston head is disposed on an upper surface of said base plate:
a cylinder body having a cylinder chamber defined on one side of said piston head and a cylinder chamber defined on another side of the piston head around said piston rod, said cylinder body being supported for reciprocating movement with respect to said base plate in axial directions of said piston, said cylinder body having a diameter greater than an axial dimension thereof which is perpendicular to said diameter;
an upper plate fixed on top of said cylinder body;
a guide member comprising a casing surrounding said cylinder body and held in slidable contact with an outer circumferential wall surface of said cylinder body for guiding the reciprocating movement of the cylinder body; n
a pair of compressed-air inlet/outlet ports defined in a side wall of said casing for introducing a fluid under pressure alternately to said cylinder chambers;
a first pair of communication passages defined in said base plate; and
a second pair of communication passages defined in said piston and connected with said first pair of communication passages,
wherein said compressed-air inlet/outlet ports communicate with said cylinder chambers through said first and second pairs of communication passages.

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5,839,349

NOISE-ABATED PUMP UNIT, IN PARTICULAR FOR CONTROLLED BRAKE SYSTEMS

Peter Volz, Wingerten, Germany, assignor to ITT Automotive Europe GmbH, Germany

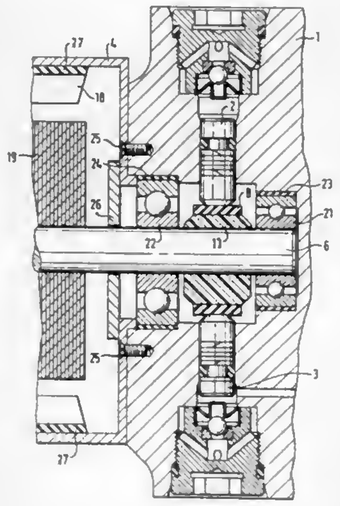
PCT No. PCT/EP93/03455, § 371 Date Jul. 19, 1995, § 102(e) Date Jul. 19, 1995, PCT Pub. No. WO94/13518, PCT Pub. Date Jun. 23, 1994

PCT Filed Dec. 8, 1993, Ser. No. 454,212

Claims priority, application Germany, Dec. 11, 1992, 42 41 827.5

Int. Cl.^{6} F01B *1/00*

U.S. Cl. 92—147 **2 Claims**



1. A pump system of the type including a driving motor and a driven radial piston pump, where at least one piston is moved so as to reciprocate in a piston bore by means of a drive shaft of the driving motor, which drive shaft is provided with an eccentric part, with the housing of the pump being connected with the housing of the driving motor by means of a detachable type of connection, comprising: at least one bearing being provided for the drive shaft of the driving motor, wherein said bearing is supported in the pump housing adjacent to the range of movement of the piston on the drive shaft and the drive shaft is supported in a bearing plate which is fastened to the housing driving motor so as to be perpendicular to the axis of the drive shaft.

5,839,350

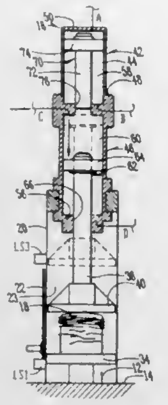
MEANS AND METHOD FOR PREPARING A CONTAINER FOR RECYCLING

Floyd R. Mefferd, 337 S. 2nd St., and Larry C. Mefferd, 525 Allen St., both of Laurens, Iowa 50554

Filed Jun. 18, 1996, Ser. Nn. 665,796

Int. Cl.^{6} F01B *7/00*

U.S. Cl. 92—152 **13 Claims**



1. A method for preparing a used oil filter and the oil therein for recycling, the used oil filter including a casing covering a filter element and containing oil therein and having an opening therein, the steps of the method comprising:

- placing the used oil filter between first and second opposing members, one of the first and second opposing members being driven by a double piston electrohydraulic boosting assembly;
- supplying approximately 115 volt power to the double piston electrohydraulic boosting assembly;
- moving said one of said first and second members toward the other of said first and second members with a force exceeding 40 tons so as to crush the casing to form a smelt-ready puck and expel a substantial amount of the oil therefrom; and

removing the smelt-ready puck from the press.

5,839,351

PISTON

Teruo Nakada, Kanagawa, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

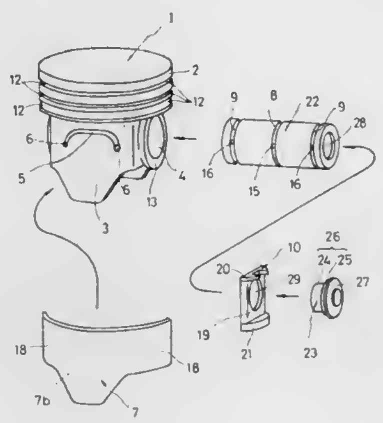
PCT No. PCT/JP96/01278, § 371 Date Feb. 3, 1997, § 102(e) Date Feb. 3, 1997, PCT Pub. No. WO97/02418, PCT Pub. Date Jan. 23, 1997

PCT Filed May 15, 1996, Ser. No. 776,584

Claims priority, application Japan, Jun. 30, 1995, 7-186551

Int. Cl.^{6} F01B *31/10*

U.S. Cl. 92—160 **10 Claims**



1. A piston comprising a piston body formed by a crown portion provided with piston ring grooves, and a skirt portion provided with bosses in which pin bores for inserting a piston pin therein are formed; outer members fitted around said skirt portion; outer member support members interposed between said bosses and said outer members and supporting said outer members so that said outer members can be moved relatively in the thrust direction; and oil grooves formed in the parts of the surface of said skirt portion which are on the thrust side and anti-thrust side, said oil grooves being formed in the positions on said skirt portion which are higher than the axis of said piston pin and lower than said piston ring grooves.

5,839,352

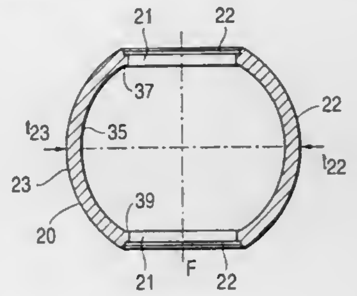
ARTICULATED PISTON

Carmo Ribeiro, Ann Arbor, Mich.; Marcos Clemente, Sao Caetano Do Sul, Brazil; Alan S. Brown, Saline, Mich.; Norbert Abraham, Sr., and Kristopher R. Bare, both of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Aug. 7, 1996, Ser. No. 689,244

Int. Cl.^{6} F01B *31/08*

U.S. Cl. 92—186 **24 Claims**



1. An articulated piston comprising:

- a piston crown having an outer surface, a peripheral pending side wall and an inner surface including a pair of pin bosses extending downwardly from said inner surface with said inner surface and said pin bosses defining a hollow cooling cavity opening downwardly and extending about a circumference of said piston crown;
- a piston skirt having a longitudinal plane containing a pair of diametrically opposed bores for receiving a wrist pin for connection to the bosses of the crown and defining a semi-cylindrical thrust surface and a semi-cylindrical non thrust surface;

wherein a thickness of said non thrust surface is less than a thickness of said thrust surface..

5,839,353

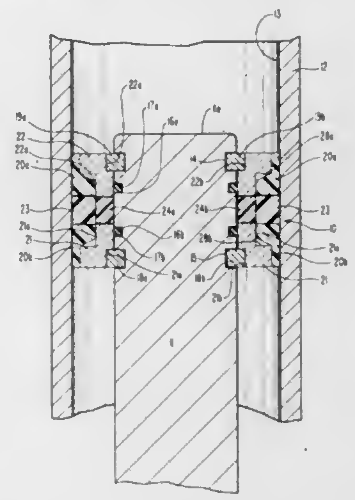
PISTON FOR A HYDRAULIC RAM AND THE LIKE AND METHOD FOR ITS ASSEMBLY ONTO A PISTON ROD

Lynn Mecham, 546 W. 800 South, Alpine, Utah 84003

Filed Jun. 19, 1997, Ser. No. 878,630

Int. Cl.^{6} F16J *1/00*

U.S. Cl. 92—258 **19 Claims**



1. A piston for mounting onto a straight rod comprising, upper and lower piston halves that are each formed to fit over and seat onto a cylindrical rod end with an inner surface of each said piston half formed to receive and seat a retaining ring means; a pair of retaining ring means one for seating in each said piston half and in a groove formed around said cylindrical rod end; a seal and spacer means that are separate units with said seal means consisting of a pair of ring segments that, when fitted together form a continuous ring seal having an outer surface for engaging and sealing against in inner cavity wall of a cylinder with said seal and spacer means for fitting between opposing surfaces of said upper and lower piston halves; and a pair of piston bearings each for fitting over and mounting onto each said piston half where each said seal and spacer means is arranged between opposing surfaces of said pair of piston halves.

5,839,354

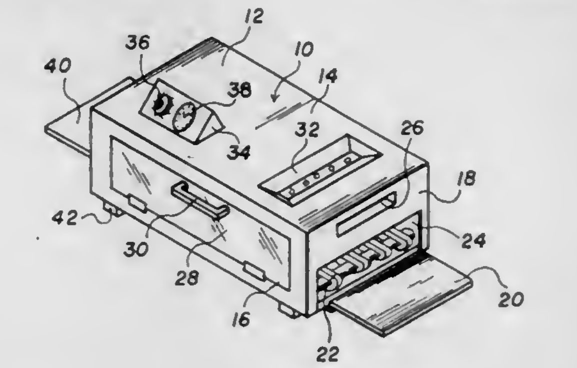
REVOLVING TOASTER APPARATUS

Alfredo Cardillo, 16751 Curtis, Roseville, Mich. 48066

Filed May 15, 1996, Ser. No. 648,364

Int. Cl.^{6} A47J *37/08*

U.S. Cl. 99—329 RT **20 Claims**



7. An electrical household toasting appliance comprising:

- a base member;
- a body member fastened to said base member, said body member having a top surface, a plurality of side walls and an entrance and an exit located on opposite longitudinal ends thereof;
- a conveyance assembly for transporting food items through said body member from an entrance to an exit at a speed;
- a plurality of planer, hinged tray members, at least one extending from each of said entrance and said exit;
- a control means for adjusting said speed of said conveyance assembly;
- a plurality of heating elements; and
- a butter application well located in said top surface of said body member and having a plurality of apertures in a lower surface thereof.

5,839,355

FRYER WITH COOKING MEDIUM LOSS PROTECTION AND ASSOCIATED METHODS OF PROTECTING FRYERS

Harold E. Faulkner, 10211 Vinemont St., Dallas, Tex. 75218

Filed Nov. 5, 1996, Ser. No. 740,960

Int. Cl.^{6} A47J *27/00;* A23L *27/00*

U.S. Cl. 99—330 **4 Claims**

1. A fryer of the type wherein food is immersed in a cooking medium heated to an elevated cooking temperature, the cooking medium being heated to the elevated cooking temperature after the fryer has been activated by connecting the fryer to an external power source, the fryer comprising:

- a generally box-shaped vat;
- a heat source disposed at least partially within said vat;
- a temperature probe disposed at least partially within said vat;
- a control circuit interconnected to said temperature probe, said control circuit having a fryer protection mode wherein said control circuit is capable of elevating a temperature of said heat source to a temperature less than a temperature at which the cooking medium burns, in response to activation of the

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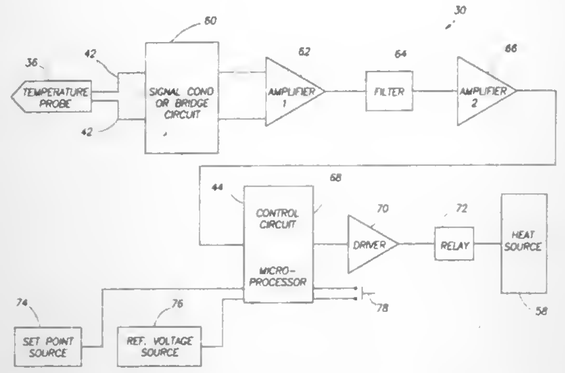


fryer, said control circuit comprising a programmable microprocessor interconnected to said probe, and a driver interconnected between said microprocessor and said heat source, said driver being capable of causing said heat source temperature to be elevated in response to a signal transmitted from said microprocessor to said driver when said control circuit is in said fryer protection mode, said microprocessor being capable of receiving a temperature indication from said probe after the fryer is activated and transmitting said signal to said driver when said temperature indication is greater than an upper limit temperature, and said microprocessor being further capable of transmitting said signal to said driver when said temperature indication is less than said upper limit temperature for an initial time period, thereby elevating said heat source temperature to said temperature less than said temperature at which the cooking medium burns in said fryer protection mode of said control circuit; and

a first switch interconnected to said microprocessor, said first switch being capable of preventing said control circuit from entering said fryer protection mode, thereby preventing said microprocessor from transmitting said signal to said driver when the fryer is activated and said probe temperature indication is less than said upper limit temperature, and said first switch being capable of permitting said control circuit to enter said fryer protection mode, thereby permitting said microprocessor to transmit said signal to said driver for said initial time period when said first switch is switched between open and closed positions thereof after the fryer is activated and when said probe temperature indication is less than said upper limit temperature.

5,839,356
AUTOMATIC BREAD MAKING MACHINE

David A. Dornbush, Prior Lake; Neal P. Barnes, Maple Grove; Michael A. Fritz, Shorewood; Troy M. Iverson, Chaska; Michael F. Meyer, Ramsey; Kevin B. Moore, Chaska; Jeffrey E. Sandahl, Howard Lake, and Jeffrey S. Duncan, Burnsville, all of Minn., assignors to American Harvest, Inc., Chaska, Minn.

Continuation-in-part of Ser. No. 297,603, Aug. 29, 1994, abandoned, which is a continuation-in-part of Ser. No. 25,919, Jul. 15, 1994, Pat. No. Des. 367,397. This application Aug. 30, 1994, Ser. No. 298,458

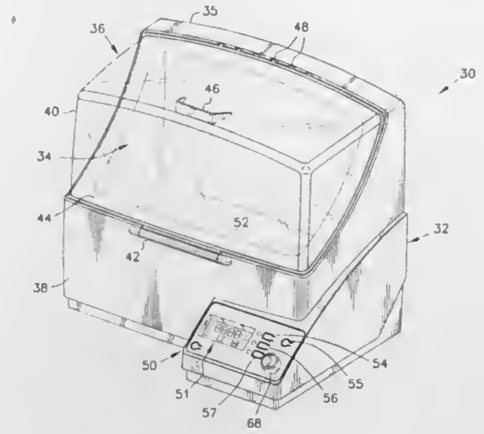
Int. Cl.^{6} A47J *27/00*

U.S. Cl. 99—331 **19 Claims**

1. A front-loading automatic bread maker for producing bread from bread ingredients, the bread maker comprising:

a housing defining a mixing and cooking chamber, the housing having a top surface with a front portion, and a front surface with upper and lower portions, the housing having an opening extending along at least an intersection between the front portion of the top surface with the upper portion of the front surface;

a cover movable between a closed position for substantially enclosing the mixing and cooking chamber and an open position proximate the lower portion of the front surface;



at least one bread pan releasably retained in the mixing and cooking chamber for receiving the bread ingredients, the at least one bread pan having a rotatable kneading blade disposed therein for kneading the bread ingredients, and wherein the at least one bread pan comprises a plurality of connected sidewalls and a top opening, the sidewalls and opening comprising:

an end wall;

a bowed sidewall having an outward bow generally parallel to a longitudinal axis;

a pair of opposing side walls generally parallel to the longitudinal axis, each of the opposing side walls having opposing internal ribs proximate the bowed sidewall, the ribs extending substantially the length of the opposing side walls and generally parallel to the longitudinal axis to form kneading surfaces, and to emulate, in cross section, the location of an overrise on the sides of a conventional slice of bread;

a generally planar side wall connected to the end wall opposite the bowed side wall so that the cross sectional area thus defined emulates the bottom, sides and overrise of a conventional slice of bread; and

an opening opposite the end wall for receiving the bread ingredients and for removal of the bread;

a motor operatively connected to the kneading blade for kneading the bread ingredients;

a heating element in the mixing and cooking chamber for baking the bread ingredients; and

control means for controlling the operation of the motor and heating element according to a bread making cycle.

5,839,357
ELECTRIC PRESSURE COOKER

Dong-Kyu Ha, and In-Hwan Joo, both of Suwon, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Mar. 14, 1997, Ser. No. 818,343

Claims priority, application Rep. of Korea, Mar. 15, 1996, 96-7044; Apr. 12, 1996, 96-11007; Jul. 18, 1996, 96-29402; Aug. 2, 1996, 96-32390

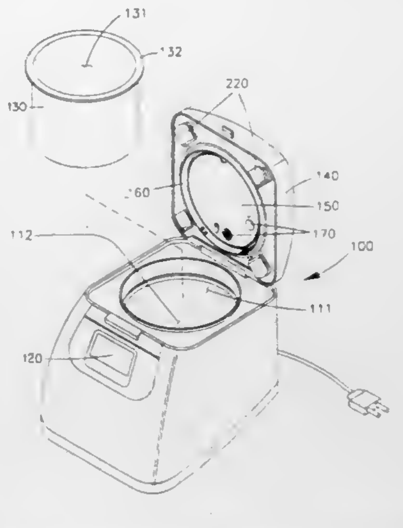
Int. Cl.^{6} A47J *27/00;27/08;27/09;* **A23L** *3/00*

U.S. Cl. 99—337 **28 Claims**

1. An electric pressure cooker, comprising:

a cooker body with a food container;

a lid for opening/closing said container;



locking means which locks or releases said lid with said container; and

driving means for driving said locking means.

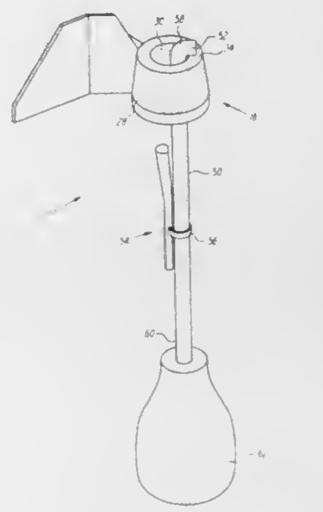
5,839,358
KNEADING PADDLE EXTRACTION DEVICE

Edward Malecki, 2225 E. Midwick Dr., Altadena, Calif. 91001

Filed Oct. 8, 1997, Ser. No. 946,874

Int. Cl.^{6} A21B *1/00;* **A21D** *8/00;* **A47J** *27/00;45/00*

U.S. Cl. 99—348 **15 Claims**



1. A kneading paddle extraction device for extracting a kneading paddle of an automatic bread-making machine, wherein the kneading paddle includes a hub with an upper surface and an aperture that extends through the hub to the upper surface of the hub, from a loaf of bread made by the machine, the extraction device comprising:

(a) a rod having a longitudinal axis, an insertion end, and a handle end; and

(b) a hook which projects outward from the insertion end of the rod, the length which the hook projects from the longitudinal axis of the rod being smaller than the diameter of the aperture of the kneading paddle.

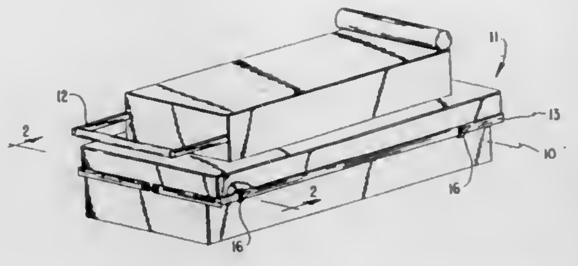
5,839,359
QUICKLY DISASSEMBLED GRILL

William D. Gardner, R.R. 4, Box 23-B Boulevard Station, Sioux City, Iowa 51109

Filed Mar. 26, 1997, Ser. No. 824,816

Int. Cl.^{6} A47J *37/06;* **A23L** *1/01*

U.S. Cl. 99—376 **5 Claims**



1. A grill usable for cooking flattened meat patties on both faces simultaneously, said grill having a lower cooking surface and an upper cooking surface movably disposed relative to said lower cooking surface, said upper cooking surface including a plate treated with a non-sticking material, said upper cooking surface also including a frame for holding said plate, said frame and said plate of said upper cooking surface being rectangular in shape, said frame having a lever type, positive latch located near each of the corners of said rectangular shape, said latches each having hooked portions releasably engaged with said plate whereby said plate is releasably held in said frame.

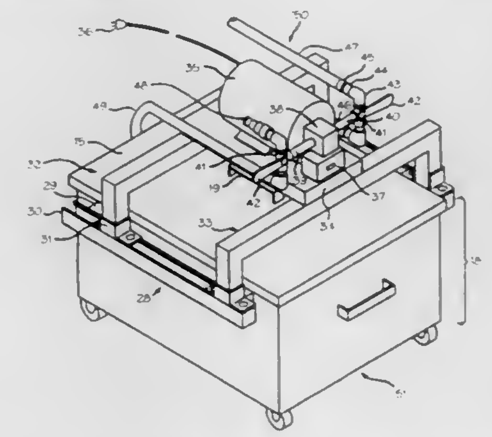
5,839,360
PROCESS OF AND SYSTEM FOR DISTRIBUTION, RECOVERY AND HANDLING OF BULK EDIBLE OIL AND OTHER FLUIDS

David R. Williams, 445 Calhoun Ave., Destin, Fla. 32540

Filed Jun. 10, 1996, Ser. No. 660,768

Int. Cl.^{6} A47J *37/00*

U.S. Cl. 99—408 **20 Claims**



1. A system for handling edible oil or other fluids for use in commercial or institutional food preparation establishments, said system comprising:

(a) storage means for storing fresh and waste fluid;

(b) pump means with an intake manifold and a discharge manifold for transferring the fresh fluid from said storage means to a catchment vessel, transferring filtered fluid from a filtering means to said catchment vessel, and transferring said waste fluid to said storage means;

(c) a first three-way valve coupled to said intake manifold for connecting a fresh fluid line and a filtered fluid intake line to said intake manifold and having a first position and a second position;

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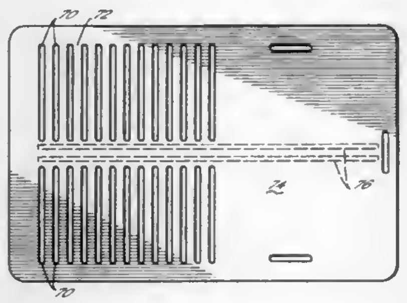
(d) a second three-way valve coupled to said discharge manifold for connecting a spent fluid disposal line and a wand dispensing line to said discharge manifold and having a first position and a second position; and,

(e) wherein when said first and second three-way valves are both in said first position, said second valve communicates said filtered fluid from said filtered fluid intake line to said wand dispensing line for dispensing into said catchment vessel; and when said first valve is in said second position and said second valve is in said first position, said first valve communicates said fresh fluid from said storage means through said fresh fluid line to said wand dispensing line; and when said first valve is in said first position and said second valve is in said second position, said second valve communicates said filtered fluid from said filtered fluid intake line to said fluid disposal line for transport to said storage means.

5,839,361
COMBINATION GRILL AND GRIDDLE COOKING SURFACE

John T. Richter, 2138 Clarkston La., Union, Ky. 41091
Continuation of Ser. No. 583,426, Jan. 5, 1996, abandoned. This application Jul. 8, 1997, Ser. No. 889,715
Int. Cl.^{6} F24C *15/16*
U.S. Cl. 99—422 **10 Claims**

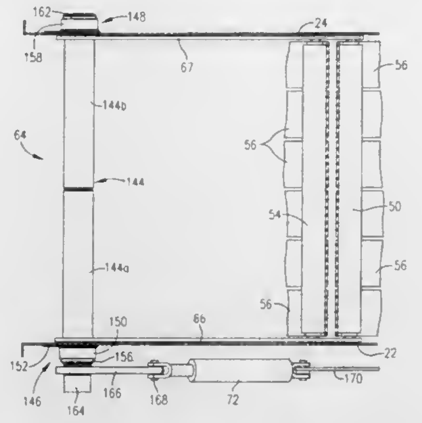


1. A cooking surface for use with a cooking kettle wherein food being prepared is positioned over a heat source, said cooking surface comprising:
- a unitary, continuous and planar sheet of stainless steel, said planar sheet comprising:
- a grill section having a continuous, planar grill surface and having a plurality of elongated parallel slots formed in the grill surface, said slots being open along their lengths;
- a griddle section having a continuous, planar griddle surface formed from a solid section of said sheet of stainless steel and being generally free of said slots;
- ventilation apertures formed proximate said griddle section which allow smoke to flow around and flavor food being prepared on said griddle section;
- said griddle surface and grill surface being contiguous between said griddle and grill sections for providing a warp-resistant cooking surface which may be easily fabricated and maintained.

5,839,362
SINGLE CYLINDER HYDRAULIC TENSION CONTROL SYSTEM FOR ROUND BALERS

Howard J. Ratzlaff, Hesston; J. Dale Anderson, Canton, and Ferol S. Fell, Newton, all of Kans., assignors to Hay & Forage Industries, Hesston, Kans.
Filed Jul. 21, 1997, Ser. No. 897,466
Int. Cl.^{6} A01F *15/07*
U.S. Cl. 100—88 **22 Claims**

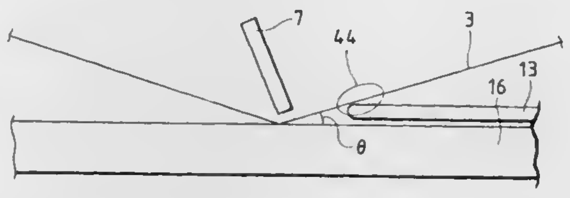
1. In a round baler having a pair of laterally spaced sidewalls between which bale formation occurs, an improved tension assembly comprising:



- a rotatable torque bar extending between the sidewalls;
- a single tensioning mechanism adjacent one of the sidewalls for supplying a yieldable resistance load in opposition to torsional loads on the torque bar so as to yieldably resist rotation of the bar;
- a load-transferring member extending inwardly from said one sidewall to operably connect the single tensioning mechanism to the torque bar at a location spaced between the sidewalls and thereby transfer the loads between the mechanism and bar.

5,839,363
METHOD AND APPARATUS FOR SEPARATING A SILK SCREEN FROM A PRINTED OBJECT

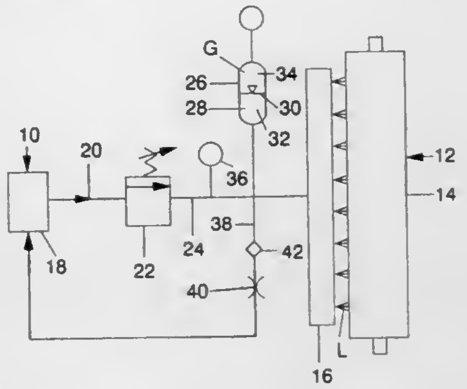
Yoshihiro Yanagisawa, Fujisawa, and Tetsuya Kaneko, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 15, 1995, Ser. No. 441,702
Claims priority, application Japan, May 16, 1994, 6-101002; May 18, 1994, 6-103594; May 10, 1995, 7-111713
Int. Cl.^{6} B41F *15/44*
U.S. Cl. 101—123 **37 Claims**



35. A screen printer with a printing table for setting an object to be printed, a screen, and a squeegee, said squeegee being arranged through said screen on said object to be printed set on said printing table, depending on screen patterns set on said screen, ink patterns being formed on said object to be printed by allowing said squeegee to move in contact with ink, said printer comprising:
- applying means for applying an external force in a direction to offset an adhesive strength of ink between said screen and said object to be printed,
- wherein said applying means is provided on both sides of a scan area by said squeegee and comprises a plurality of rigid members to be inserted between said screen and said object to be printed.

5,839,364
DAMPENING SYSTEM FOR A PRINTING PRESS

Thaddeus A. Niemiro, Lisle, and Thomas W. Orzechowski, Cicero, both of Ill., assignors to Goss Graphic Systems, Inc., Westmont, Ill.
Filed Sep. 19, 1994, Ser. No. 308,186
Int. Cl.^{6} B41F *7/30;7/26*
U.S. Cl. 101—148 **5 Claims**



1. A dampening assembly for a printing press, comprising:
- a spray bar for spraying a liquid onto a portion of the press;
- a source of the liquid;
- a pressure regulator being connected to the source by a first conduit, and being connected to the spray bar by a second conduit;
- an accumulator having a chamber communicating with the second conduit, and having a diaphragm separating the chamber into a first compartment being connected to the second conduit, and a second closed compartment being charged with an inert gas, said accumulator dampening pressure pulses of the liquid being supplied to the spray bar.

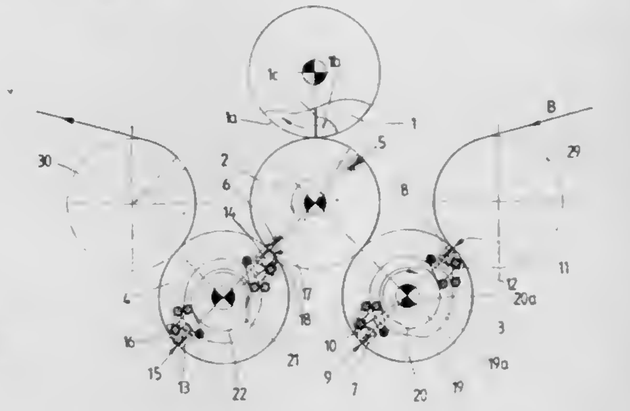
5,839,365
PRODUCT GUIDING DEVICE ON A CUTTING-CYLINDER PAIR OF A FOLDING APPARATUS OR FOLDER

Jean-Claude Calbrix, Cambronne; Philippe Herda, Longueil St. Marie, and Thierry Vauchelle, Ravenel, all of France, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Germany
Filed Jul. 23, 1997, Ser. No. 898,733
Claims priority, application France, Jul. 23, 1996, 96 09208
Int. Cl.^{6} B41F *13/56*
U.S. Cl. 101—226 **7 Claims**

1. A folder having a cutting-cylinder pair with two cutting cylinders for cutting a vertically fed material web into products, and downline transport tape lines guidable over deflecting rollers for onwardly passing the cut-off products therebetween, and comprising a product guiding device assigned to the cutting-cylinder pair and extending at least partly over the width of the material web, said product guiding device bridging a region extending from an outlet nip of the cutting cylinder pair to an inlet region of the transport tapes.

5,839,366
SHEET-FED PRINTING MACHINE

Johannes Georg Schaede, Wuerzburg, Germany, assignor to De La Rue Giori S.A., Switzerland
Filed Oct. 9, 1996, Ser. No. 727,950
Claims priority, application Switzerland, Oct. 20, 1995, 02993/95
Int. Cl.^{6} B41F *13/24*
U.S. Cl. 101—232 **8 Claims**



1. Sheet-fed printing machine for feeding sheets having a front edge comprising at least one pair of cylinders including an impression cylinder (**2**) and a cylinder (**1**) printing the image, where both cylinders (**1**,**2**) form the printing nip between them and have at least one impression segment, characterised in that the impression cylinder (**2**) has an essentially closed cylindrical circumferential surface, into which a suction strip (**5**,**6**) is inset at the beginning of each impression segment, said suction strip (**5**,**6**) for connecting to a suction air source to apply suction to the front edge of a sheet and to hold the same during conveying on the impression cylinder and during the printing process, and being disconnectable from the suction air source in order to release the sheet form the impression cylinder, and that means of transfer are provided adjacent to the impression cylinder before the printing nip for delivering a sheet to the impression cylinder (**2**) as well as behind the printing nip to take over a sheet from the impression cylinder, the means of transfer having at least one transfer cylinder (**63**,**64**) co-operating with the impression cylinder (**2**), said transfer cylinder being provided with gapless suction strips that are the same as the gapless section strips of the impression cylinder (**2**), in such a way that sheet transfer between these cylinders is exclusively effected by reciprocal control of the suction air supply to the co-operating suction strips, and that the transfer of a sheet to the impression cylinder (**2**) or to its transfer cylinder or of a sheet form the transfer cylinder (**64**) or from the impression cylinder is effected by a gripperless device comprising a sheet swing device (**68**) with suckers or a suction belt device (**70**).

5,839,367
STAMP PRESSING DEVICE METHOD FOR STAMPING AND DATA PROCESSING APPARATUS USING THE SAME

Masayoshi Hashimoto, Joyo, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Feb. 12, 1996, Ser. No. 599,930
Claims priority, application Japan, Mar. 29, 1995, 7-071276
Int. Cl.^{6} B41J *1/10*
U.S. Cl. 101—316 **10 Claims**

1. A stamp pressing device comprising:
- a housing movably supporting and housing at least two stamps;

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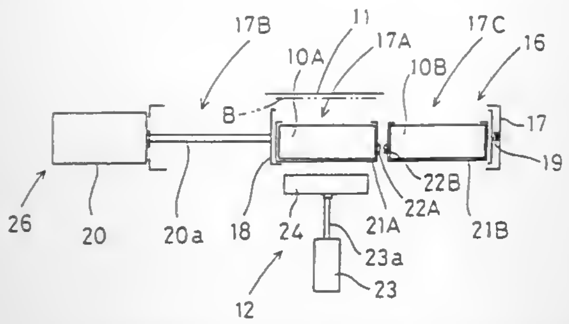


a selection mechanism cooperatively engaged with the at least two stamps, the selection mechanism positioning the at least two stamps in the housing in accordance with a selected one of the at least two stamps; and

a pressing mechanism disposed adjacent the housing, the pressing mechanism pressing the selected stamp on a sheet, wherein

the housing includes a stamping room disposed opposite to the sheet, a first room provided for a first stamp on one side of the stamping room, and a second room provided for a second stamp on the other,

the selection mechanism includes means for replacing one stamp in the stamping room with the other by moving the first and second stamps along an elongate direction in which the stamping room and the first and second rooms are disposed,

the pressing mechanism presses the stamp which is placed in the stamping room against the sheet,

the housing includes holder means for holding the first and second stamps coupled in a series, and

the replacing means includes first means for forcing the coupled stamps towards one side of the housing along the elongate direction and second means for moving the coupled stamps towards the other against the force of the first means,

whereby one of the coupled stamps is placed in the stamping room.

5,839,368
INK SUPPLY SOURCE DEVICE FOR PRINTERS BY COLLAPSIBLE INK CONTAINER ENCASED IN REINFORCING CASE WITH DISK HANDLE HAVING PRESS CLAWS

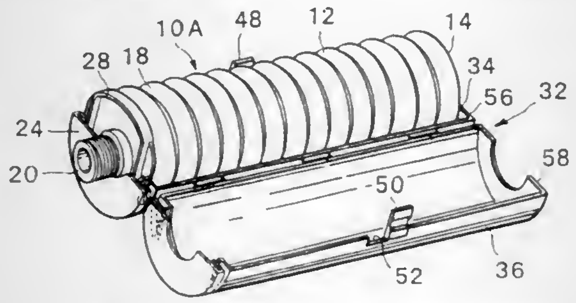
Yoshiharu Ohinata, Tokyo, Japan, assignor to Riso Kagaku Corporation, Tokyo, Japan

Filed Nov. 5, 1997, Ser. No. 964,666

Claims priority, application Japan, Nov. 6, 1996, 8-310138

Int. Cl.^{6} B41F *31/02*

U.S. Cl. 101—364 **4 Claims**



1. An ink supply source device for a printer, comprising a combination of an ink container having a flexible vessel expansible to be substantially cylindrical by ink being charged therein and contractible to substantially reduce an outer configuration thereof by the ink being discharged therefrom, a nozzle connected to an end portion of said vessel for defining an ink outlet port of said vessel, and a disk handle mounted to said nozzle, and a reinforcing case for accommodating said vessel and said disk handle of said container, wherein said disk handle has a press claw at a circumferential portion thereof so as to engage with a portion of said reinforcing case for fastening said ink container to said reinforcing case when said container is mounted into said reinforcing case.

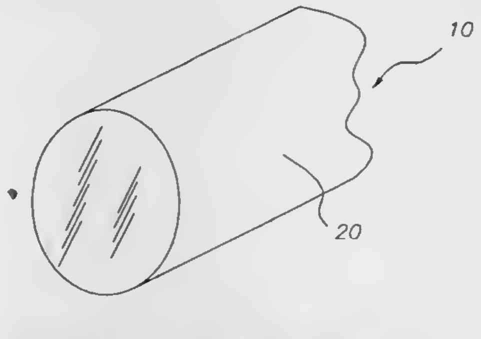
5,839,369
METHOD OF CONTROLLED LASER IMAGING OF ZIRCONIA ALLOY CERAMIC LITHOGRAPHIC MEMBER TO PROVIDE LOCALIZED MELTING IN EXPOSED AREAS

Dilip K. Chatterjee; Syamal K. Ghosh, both of Rochester, and Donald M. Korn, Penfield, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 18, 1997, Ser. No. 843,522

Int. Cl.^{6} B41C *1/10*

U.S. Cl. 101—467 **20 Claims**



1. A method of imaging comprising the steps of:

A) providing a lithographic printing member having a printing surface composed of a zirconia ceramic that is an alloy of ZrO_2 and a secondary oxide selected from the group consisting of MgO, CaO, Y_2O_3, Sc_2O_3, a rare earth oxide, and combinations thereof, said zirconia alloy ceramic having a density of from about 5.6 to about 6.2 g/cm^3, and

B) providing an image on said printing surface by imagewise exposing said printing surface to electromagnetic radiation provided by a laser under the following conditions:

an average power level of from about 0.1 to about 50 watts,
a peak power of from about 6,000 to about 100,000 watts,
a pulse rate up to 50 kHz, and
an average pulse width of from about 50 to about 500 μsec,

so as to melt the zirconia in the exposed areas of said printing surface, and to transform said printing surface from a hydrophilic to an oleophilic state or from an oleophilic to a hydrophilic state in said exposed areas of said printing surface, thereby creating a lithographic printing surface having both image areas and non-image areas.

5,839,370
FLEXIBLE ZIRCONIA ALLOY CERAMIC LITHOGRAPHIC PRINTING TAPE AND METHOD OF USING SAME

Dilip K. Chatterjee, and Syamal K. Ghosh, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

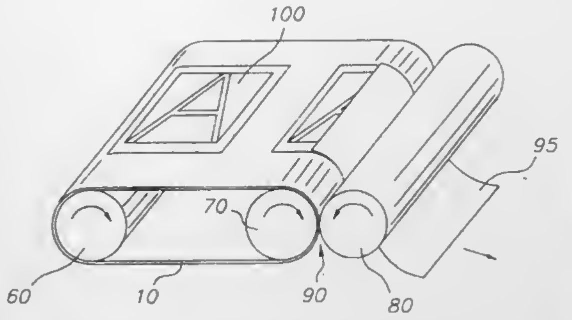
Filed Apr. 18, 1997, Ser. No. 844,292

Int. Cl.^{6} B41C *1/10*

U.S. Cl. 101—467 **21 Claims**

12. A method of imaging comprises the steps of:

A) providing a flexible lithographic printing tape having a printing surface composed of a zirconia ceramic that is an alloy of ZrO_2 and a secondary oxide selected from the group consisting of MgO, CaO, Y_2O_3, Sc_2O_3, a rare earth oxide, and a combination of any of these, said zirconia alloy ceramic having a density of from 5.6 to 6.2 g/cm^3, and said printing tape having an average thickness of less than about 5 mm, and



B) providing an image on said printing tape by imagewise exposing said printing surface to electromagnetic radiation that transforms said printing surface from a hydrophilic to an oleophilic state or from an oleophilic to a hydrophilic state, thereby creating a lithographic printing surface having both image areas and non-image areas.

5,839,371
MONO- OR TWIN-RAIL OVERHEAD CHAIN CONVEYOR

Werner Kniittel, Grosskrotzenburg, Germany, assignor to Fredenhagen GmbH & Co. KG, Germany

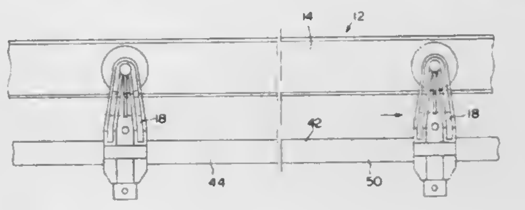
PCT No. PCT/EP95/00923, § 371 Date Sep. 5, 1996, § 102(e) Date Sep. 5, 1996, PCT Pub. No. WO95/25056, PCT Pub. Date Sep. 21, 1995

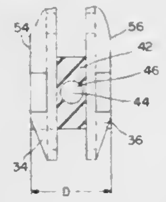
PCT Filed Mar. 13, 1995, Ser. No. 704,517

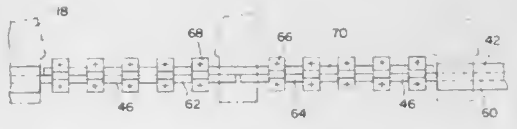
Claims priority, application Germany, Mar. 14, 1994, 9404183. U

Int. Cl.^{6} B65G *19/00*

U.S. Cl. 104—172.4 **12 Claims**







3. A mono- or twin-rail overhead chain conveyor (**10**', **12**') for transporting heavy loads having a chain track (**14**) in the form of an I-shaped profile with running gear (**18.20**) which can move along said track and having roller blocks (**26.28**) for mounting rollers (**30.32**) which are supported on said chain track, said roller blocks being connected to a traction means (**42**) for pulling said running gear and said running gear being designed for a mono-rail overhead chain conveyor in the form of loading running gear and for a twin-rail overhead chain conveyor in the form of towing running gear which interacts with loading running gear (**82**) movable on a load rail (**78**) running below said chain track, wherein

a belt having a rectangular cross-section and made of a rubber or plastic material with a single-stranded insert (**46**) of metal, glass.

5,839,372
LOAD HANDLING TROLLEY

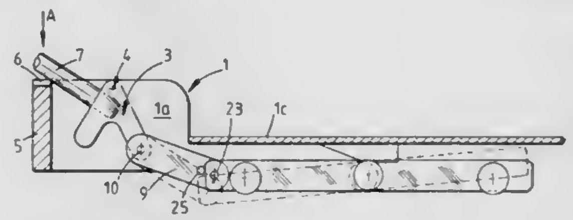
Wojciech Joseph Kordel, Cheshire, England, assignor to Joloda (International) Limited, Liverpool, United Kingdom

Filed Apr. 14, 1995, Ser. No. 423,334

Claims priority, application United Kingdom, Apr. 27, 1994, 9408312

Int. Cl.^{6} B61B *12/00*

U.S. Cl. 104—307 **13 Claims**



1. A load handling trolley comprising an elongated load engager raisable and lowerable relative to bogies via ramp and roller means when the bogies are caused to move longitudinally relative to the elongated load engager, movement of the bogies being controlled by a lever operated crank which is pivotally mounted with respect to the elongated load engager and which operates link means pivotally connected between the crank and a bogey chassis, and wherein an abutment is operable between the link means and the bogey chassis to limit the angular movement between the link means and the bogey chassis, and wherein additional angular movement of the lever operated crank beyond that required to attain the limit position is allowed for by relieving an end plate of the trolley to allow further angular movement of the crank actuating lever in the limit position, which further angular movement is translated to longitudinal movement of the bogies relative to the load engager.

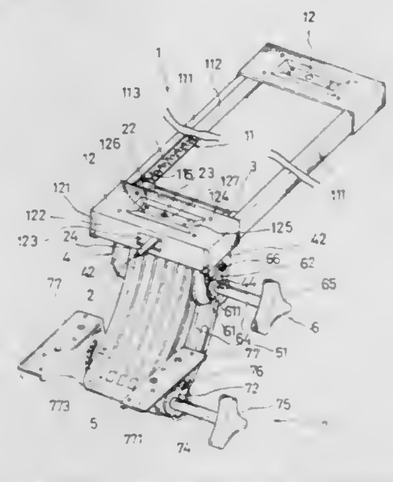
5,839,373
ADJUSTABLE KEYBOARD RACK MOUNTING STRUCTURE

Chin-Chih Lin, 2F, No. 160, Shih Ta Road, Taipei, Taiwan

Filed Dec. 31, 1997, Ser. No. 1,605

Int. Cl.^{6} A47F *5/00*

U.S. Cl. 108—140 **4 Claims**



1. An adjustable keyboard rack mounting structure comprising:

a sliding track unit, said sliding track unit comprising two parallel sliding tracks, and a front track mount and a rear track mount transversely coupled between said sliding tracks at

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front and rear sides and adapted for securing said sliding tracks to a desk top of a computer desk at a bottom side, said sliding tracks each comprised of a fixed rail defining a longitudinal sliding groove, a movable rail moved in the longitudinal sliding groove inside said fixed rail, said fixed rail having two stop walls respectively disposed at front and rear ends thereof to limit the movement of said movable rail within the longitudinal sliding groove on said fixed rail, an auxiliary rail coupled to said movable rail, said auxiliary rail having two slots near two opposite ends thereof, and a coupling plate mounted in between said movable rail and said auxiliary rail, said coupling plate having two wings respectively inserted through the slots on said auxiliary rail, said front track mount comprising two sliding grooves bilaterally disposed at a bottom side which receive the fixed rails of said sliding track unit, a vertical stop flange stopped against the fixed rails of said sliding tracks at one end, an insertion slot at the center of said vertical stop flange, a plurality of top mounting holes adapted for fastening to the desk top of the computer desk by screws, a top recess, a top center hole at the center of the said recess, and a plurality of pin holes at said top recess;

a retainer plate coupled to said front track mount, said retainer plate comprising a plurality of upright pins respectively fitted into the pin holes on said front track mount, a mounting hole fixedly secured to the top center hole on said front track mount by a screw, a projecting finger strip extended out of the insertion slot on said front track mount, and a beveled bottom flange raised from said projecting finger strip at a bottom side and disposed inside said front track mount;

a sliding plate coupled between said sliding tracks of said sliding track unit, said sliding plate comprising two horizontal side mounting flanges respectively fastened to the wings of said coupling plates of said sliding tracks, a vertical front flange, and a center through hole, the vertical front flange of said sliding plate being forced into engagement with the beveled bottom flange on said retainer plate to stop said sliding plate from a backward movement relative to the fixed rails of said sliding tracks of said sliding track unit when said sliding plate is pulled forwards, the vertical front flange of said sliding plate being disengaged from the beveled bottom flange on said retainer plate for permitting said sliding plate to be moved backwards with said movable rails of said sliding tracks along said fixed rails when said projecting finger strip is lifted with the hand;

a swivel frame pivoted to said sliding plate, said swivel frame comprising a center hole pivoted to the center through hole on said sliding plate by a rivet, and two downwardly extended side wings, each side wing of said swivel frame comprising a center pivot hole, and an arched slot;

a connecting plate coupled between the side wings of said swivel frame, said connecting plate comprising two upper pivot holes and two arched upper swing holes at one end of two opposite sides thereof, two lower pivot holes and two arched lower swing holes at an opposite end of the two opposite sides thereof;

an elevation control device, said elevation control device comprising two upper clamp units, two first packing pieces, an upper screw rod, an upper extension tube, an upper knob, and two oppositely disposed upper pivots, said upper screw rod being inserted in proper order through one first packing piece, one upper clamp unit, the arched slots on the side wings of said swivel frame, the upper swing holes on said connecting plate, the other upper clamp unit, the other packing piece and said upper extension tube, and then screwed up with said upper knob, said upper pivots being respectively inserted through respective holes on upper ends of said first packing pieces and fastened to the upper pivot holes on said connecting plate and the pivot holes on the side wings of said swivel frame, said upper clamp units being forced to clamp on said swivel frame and to fix said connecting plate and said swivel frame together when said upper knob is turned in one direction, said upper clamp units being released from said swivel frame when said upper knob is turned in the reversed direction, for permitting said connecting plate to be turned about said upper pivots to the desired elevation; and

an angle control device, said angle control device comprising two lower clamp units, two second packing pieces, a lower screw rod, a lower extension tube, a lower knob, two oppositely disposed lower pivots, and two brackets, said brackets each comprising a bearing surface adapted to hold a keyboard carrier and a keyboard on said keyboard carrier, a pivot hole and an arched slot at a vertical bottom wall thereof for coupling to the lower pivot holes and lower swing holes on said connecting plate, said lower screw rod being inserted through said second packing pieces, said lower clamp units, the arched slots on said brackets, the lower swing holes on said reinforcing plates and said lower extension tube, and then screwed up with said lower knob, said lower pivots being respectively inserted through respective through holes on said second packing pieces and the pivot holes on said brackets, and then connected to the lower pivot holes on said connecting plate, said lower clamp units being forced to clamp on said brackets and to fix said connecting plate and said brackets together when said lower knob is turned in one direction, said lower clamp units being released from said brackets when said lower knob is turned in the reversed direction, for permitting said brackets to be turned about said lower pivots to the desired elevation.

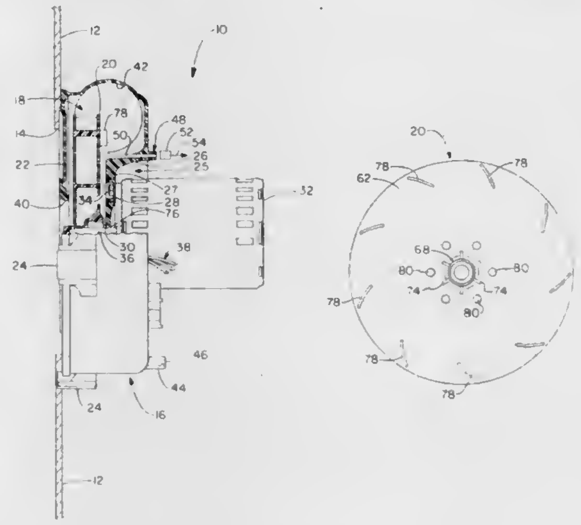
5,839,374
BLOWER FOR GENERATING STATIC PRESSURE

Michael P. Conner, Uniontown, and Randy A. Colage, Stow, both of Ohio, assignors to Ametek, Inc., Kent, Ohio

Filed Mar. 28, 1997, Ser. No. 827,553

Int. Cl.^{6} F23L *17/00*

U.S. Cl. 110—162 **13 Claims**



1. A blower for generating static pressure, comprising:

a housing;

a static pressure tap carried by said housing;

a blower fan received within said housing, said blower fan having a fan disc, and a fan ring connected to said fan disc by a plurality of vanes, said fan disc having an outer periphery and a centrally positioned hub collar and a plurality of pressure openings through said fan disc between said outer periphery and said hub collar, wherein said plurality of pressure openings generate a predictable pressure value monitored by said pressure tap when said blower fan is operational.

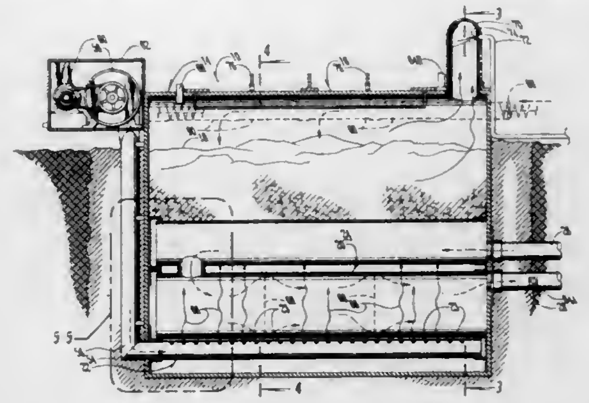
5,839,375
APPARATUS FOR BURNING ORGANIC MATERIAL

John R. Kimberlin, 3338 UTE Ave., Waukee, Iowa 50263

Filed Apr. 2, 1996, Ser. No. 626,761

Int. Cl.^{6} F23G *5/00*

U.S. Cl. 110—235 **28 Claims**



17. An apparatus for burning a fuel comprising:

a firebox having a plurality of walls defining a combustion space;

an air injector disposed within the firebox for injecting air into the firebox;

a heat exchanger disposed within the combustion space of the firebox above the air injector, the heat exchanger including a conduit through which air is forced; and

wherein the fuel to be burned is piled in the combustion space over the air injector and heat exchanger such that the fuel burns from the inside out when air is injected through the air injector.

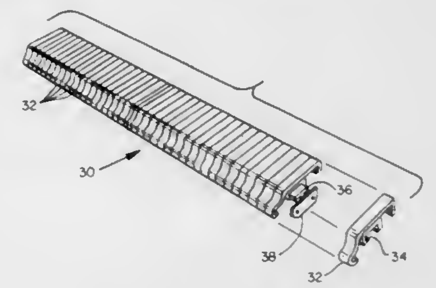
5,839,376
STOKER WITH UNIVERSAL KEY CONSTRUCTION

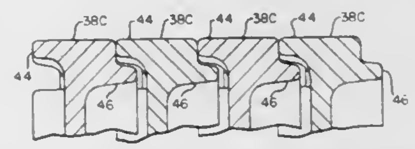
Dennis N. Barlow, Enfield, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 22, 1995, Ser. No. 578,008

Int. Cl.^{6} F23H *11/00*

U.S. Cl. 110—270 **19 Claims**





1. A key apparatus for installation on an associated arm of an associated continuous ash discharge stoker which comprises:

a mounting surface dimensioned and configured for sliding engagement with the associated arm, said mounting surface being disposed on the bottom of said key;

an upper face for receiving associated fuel to be burned:

a first side having a first contour; and

a second side having a second contour, said second contour being different than said first contour said first contour being dimensioned and configured for meshing engagement with said second contour on another associated key apparatus having an identical shape disposed in side abutting relationship.

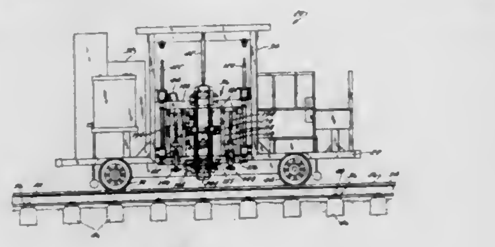
5,839,377
APPARATUS AND METHOD FOR APPLYING AND REMOVING TRANSVERSELY APPLIED ELASTIC RAIL CLIPS

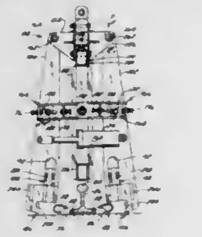
David M. Brenny, Eagle, and Gary L. Johnson, Racine, both of Wis., assignors to Racine Railroad Products, Inc., Racine, Wis.

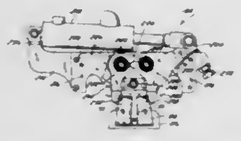
Filed Feb. 14, 1997, Ser. No. 799,156

Int. Cl.^{6} E01B *29/00*

U.S. Cl. 104—17.2 **18 Claims**







1. A clip applicator/remover machine for applying and removing a rail clip, said machine comprising:

(A) a support frame;

(B) a workarm which is supported on said support frame so as to be movable transversely with respect to a longitudinal centerline of a rail;

(C) a clip applicator tool mounted on said workarm and configured to engage the clip when said workarm moves transversely towards the longitudinal centerline of the rail; and

(D) a clip retractor tool which is mounted on said workarm and which is configured to laterally compress the clip and to move the clip transversely away from the longitodinal centerline of the rail while the clip is laterally compressed.

5,839,378
AGITATOR ASSEMBLY FOR A SEED METERING MECHANISM

John F. Stufflebeam, Romeoville; Thomas A. Olson, Bolingbrook, and Lisle J. Donham, Downers Grove, all of Ill., assignors to Case Corporation, Wis.

Filed Aug. 20, 1996, Ser. No. 700,217

Int. Cl.^{6} A01C *7/00*

U.S. Cl. 111—185 **19 Claims**

9. An agitator assembly for a seed metering mechanism including a housing having a seed reservoir wherein seeds are held, a rotatable seed disc having a circular array of throughholes to transfer seeds from the seed reservoir to a seed discharge area of the seed metering mechanism spaced from the seed reservoir, a rotary drive shaft defining an axis of rotation of said seed disc, said agitator assembly comprising a plate-like rotor member adapted to

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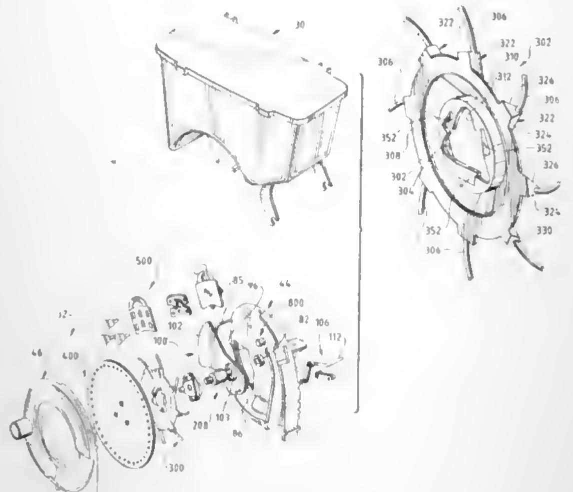


be driven by said drive shaft and a plurality of flexible arms extending outwardly from said rotor member beyond an outer periphery thereof to agitate seeds in the seed reservoir as the arms sweep through the seeds in the seed reservoir, each flexible arm being formed with a swept back configuration relative to the rotation of the rotor member.

5,839,379
APPARATUS FOR MAKING A PILLOW OR BLANKET CASE

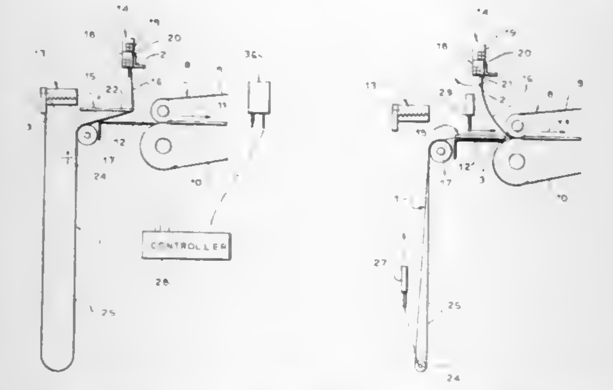
Johannes Freermann, Ochtrup, Germany, assignor to Carl Schmale GmbH & Co., Ochtrup, Germany

Filed May 1, 1997, Ser. No. 850,215

Claims priority, application Germany, May 2, 1996, 196 17 438.4

Int. Cl.⁶ D05B *13/00;21/00*

U.S. Cl. 112—10 **18 Claims**



1. An apparatus for making a case by forming a textile strip having a pair of parallel longitudinal side edges and a pair of parallel transverse end edges bridging the side edges into a rectangular pillow or blanket case having a front panel, a rear panel joined at a fold to a lower end of the front panel and lying against a rear face of the front panel, and a foldover panel joined at a fold to an upper end of the rear panel, lying against a front face of the front panel, and forming a slot opening into the case, the apparatus comprising:

- a vertically movable gripper engageable with one of the end edges of the strip;
- a support surface generally below the movable gripper;
- a conveyor extending in a horizontal transport direction and opening at an upstream end generally at the support surface;
- a vertically and horizontally movable plate above the support surface;
- respective actuators connected to the gripper and plate;
- control means connected to the actuators and conveyor for, after securing the one end edge in the gripper with the other end edge secured underneath the plate and with the strip extending from the movable gripper between the plate and the support surface,
  - pressing the plate downward against the support surface and thereby pressing the other end edge down against a central region of the strip,
  - thereafter pushing the plate into the upstream end of the conveyor and thereby forming a fold in the central region and pressing this fold into the conveyor, and
  - thereafter drawing the folded strip into the conveyor while synchronously lowering the gripper; and
- a pair of stitching heads flanking the conveyor for stitching together the longitudinal edges of the strip downstream of the conveyor.

5,839,380
METHOD AND APPARATUS FOR PROCESSING EMBROIDERY DATA

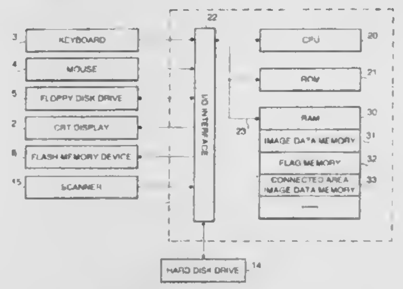
Yukiyoshi Muto, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

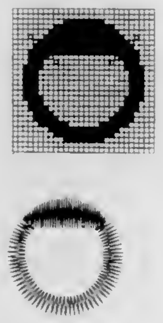
Filed Dec. 17, 1997, Ser. No. 991,873

Claims priority, application Japan, Dec. 27, 1996, 8-350275

Int. Cl.⁶ D05B *21/00;* **D05C** *9/06*

U.S. Cl. 112—102.5 **13 Claims**





6. An embroidery data processing apparatus for creating sewing data, based on image data representing an embroidery pattern, to be used for forming said embroidery pattern, said apparatus comprising:

- an area dividing system, which divides a connected area consisting of a set of connected pixels of said image data into a plurality of divided connected areas;
- a stitch type assigning system, which assigns a type of stitch to each of said divided connected areas divided by said area dividing system; and
- a data creating system, which creates sewing data for each of said divided connected areas, different algorithms being used for creating said sewing data depending on said type of stitch assigned by said stitch type assigning system.

5,839,381
EMBROIDERING MACHINE HAVING FIRST-ORDER MASS COMPENSATION

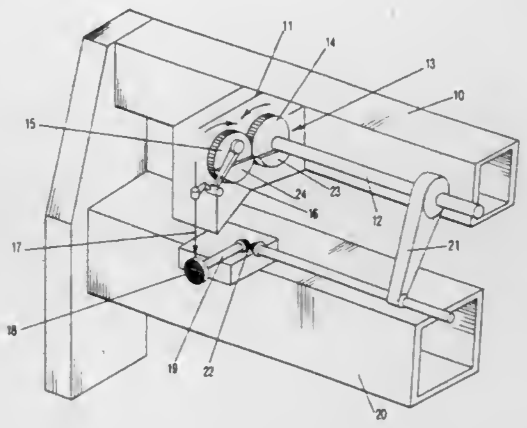
Paul Woelfle, Krefeld, Germany, assignor to S & W Engineering GmbH, Moers, Germany

Filed Jun. 13, 1997, Ser. No. 874,648

Claims priority, application Germany, Jun. 13, 1996, 196 23 530.8

Int. Cl.⁶ D05B *69/32*

U.S. Cl. 112—221 **5 Claims**



1. In an embroidering machine having a plurality of embroidering heads attached to a longitudinally extending carrier, each of said embroidering heads being provided with a needle drive mechanism for an embroidering needle that is movable in a vertical plane in said embroidering head, said needle drive mechanism being connected to a driven main shaft that is guided through said machine parallel to said longitudinally extending carrier, said needle drive mechanism comprising a drive arrangement that bridges a horizontal distance between said embroidering needle and said main shaft and includes an eccentrically disposed connecting rod means for converting rotational movement of said main shaft into longitudinal movement of a needle bar that carries said embroidering needle, the improvement wherein:

- said drive arrangement of said needle drive mechanism of said embroidering head comprises a first externally toothed gear wheel disposed on said driven main shaft and a second externally toothed gear wheel disposed on a compensating shaft that extends parallel to said main shaft, whereby said connecting rod means is eccentrically connected to one of said first and second gear wheels, wherein said teeth of said gear wheels mesh with one another, and each of said gear wheels is provided with a respective compensating mass to compensate for oscillations caused by said longitudinal movement of said needle bar in a vertical plane, said oscillations occurring in a horizontal direction transverse to said main shaft.

5,839,382
ELECTRONICALLY GEARED SEWING MACHINE

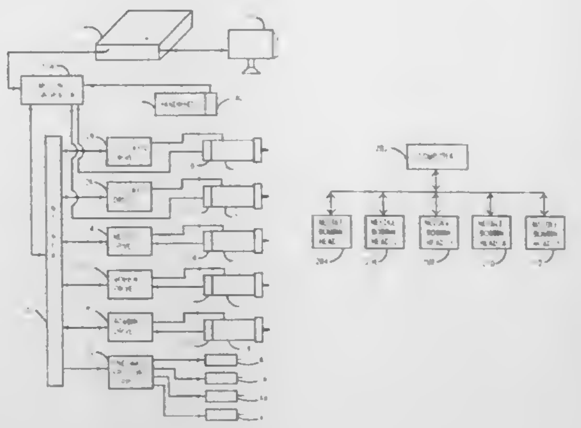
William A. Tice; Moshe Shloush; Mark E. Stapel, all of Knoxville, and Gregory A. Davis, Maynardville, all of Tenn., assignors to Tice Engineering and Sales, Inc., Knoxville, Tenn.

Continuation-in-part of Ser. No. 517,712, Aug. 21, 1995, abandoned, which is a continuation of Ser. No. 306,708, Sep. 15, 1994, Pat. No. 5,458,075. This application May 24, 1996, Ser. No. 656,037

Int. Cl.⁶ D05B *21/00;25/00*

U.S. Cl. 112—470.04 **46 Claims**

45. A multi-head sewing apparatus for performing multiple sewing operations, the apparatus comprising:



- a first sewing head having
  - a plurality of sewing parts, each part being movable through a range of positions to form continuous stitches in a material;
  - closed loop drive systems connected to each of said sewing parts for driving said sewing parts through their ranges of positions; and
  - monitors for producing monitor signals substantially continuously corresponding to the positions of said sewing parts;
- a second sewing head having
  - a plurality of sewing parts, each part being movable through a range of positions to form continuous stitches in a material;
  - closed loop drive systems connected to each of said sewing parts for driving said sewing parts through their ranges of positions; and
  - monitors for producing monitor signals substantially continuously corresponding to the positions of said sewing parts;
- a data acquisition and control system:
  - connected to each closed loop drive system of each of said first and second sewing heads;
  - for receiving monitor signals from each of said first and second sewing heads; and
  - for electronically gearing movements of multiple ones of the sewing parts for each sewing head so that said sewing parts move in concert with each other; and
- a user interface connected to said data acquisition and control system for inputting commands to control the operation of the apparatus.

5,839,383
SHIPED BASED GAS TRANSPORT SYSTEM

David G. Stenning, and James A. Cran, both of Calgary, Canada, assignors to Enron LNG Development Corp., Houston, Tex.

Continuation-in-part of Ser. No. 550,080, Oct. 30, 1995, abandoned. This application Oct. 1, 1996, Ser. No. 724,364

Int. Cl.⁶ B63B *25/00*

U.S. Cl. 114—72 **38 Claims**

1. A compressed gas storage apparatus comprising:

- a plurality of pipe coils, each of said pipe coils comprising a substantially continuous pipe coiled in plural layers, each of said plural layers including plural loops of said pipe;
- valve means adapted for selective flow connection to a source of compressed gas; and
- means for flow connecting each of said pipe coils to said valve means.

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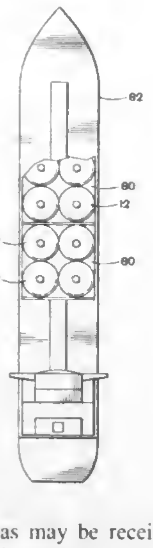
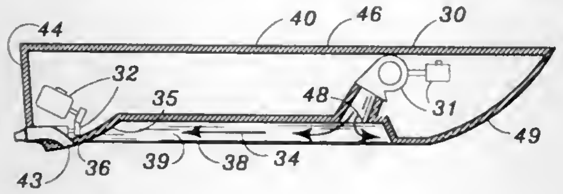


whereby compressed gas may be received through said valve means, stored in said plurality of coils and subsequently discharged from said plurality of coils through said valve means.

5,839,384
MULTIHULLED PARTIALLY AIR SUPPORTED MARINE VEHICLE

Donald E. Burg, 15840 SW. 84th Ave., Miami, Fla. 33157
Continuation-in-part of Ser. No. 728,887, Jul. 10, 1991, Pat. No. 5,176,095, and a continuation-in-part of Ser. No. 871,387, Apr. 21, 1992, abandoned, and a continuation-in-part of Ser. No. 151,253, Nov. 12, 1993, Pat. No. 5,415,120, and a continuation-in-part of Ser. No. 283,647, Aug. 1, 1994, abandoned, and a continuation-in-part of Ser. No. 347,859, Dec. 1, 1994, abandoned, and a continuation-in-part of Ser. No. 468,876, Jun. 6, 1995, Pat. No. 5,611,294, and a continuation-in-part of Ser. No. 483,791, Jun. 7, 1995, Pat. No. 5,626,669.
This application Mar. 17, 1997, Ser. No. 823,891
Int. Cl.^{6} B63B *1/38*
U.S. Cl. 114—67 A **23 Claims**

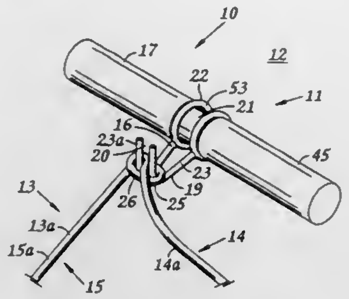


1. In an advanced marine vehicle with at least two supporting hulls that is partially supported by pressurized gas cushions where the gas cushions are restrained by gas cushion recesses built into undersides of said supporting hulls and a water surface and where said gas cushions are supplied with pressurized gas from artificial pressurization means, the improvement comprising:

the gas cushion recess in one of the supporting hulls is bordered, at least in part, by sidekeels and an aft gas restraining seal and, as seen in a calm sea surface waterline with the sidekeels proximal a bow of the supporting hull lower than the sidekeels proximal a stem of the supporting hull by up to two and three tenths (2.3) degrees, an average total divergence angle from each other of opposite outside surfaces of the supporting hull going aft from said supporting hull's bow over a forward enlarging portion of said supporting hull is less than twenty-six (26) degrees, lower portions of said sidekeels of the supporting hull, going aft from said supporting hull's bow diverge from each other over at least twenty five percent of a waterline length of said supporting hull, and the gas cushion recess enlarges in width over at least a part of its length going aft from a forward portion of said gas cushion recess.

5,839,385
TENSION APPLYING DEVICE

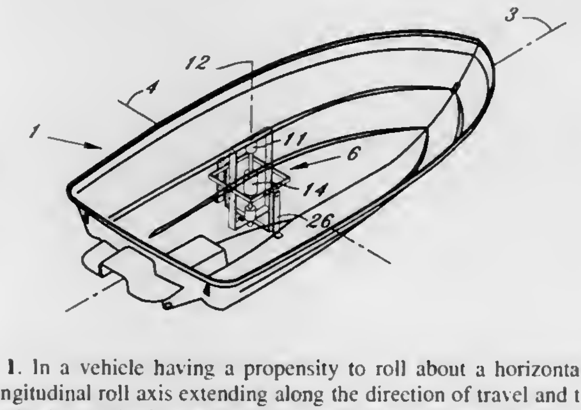
Stephen A. Hersh, 177 B Alohi Pl., Pukalani, Maui, Hi. 96768
Filed Aug. 26, 1996, Ser. No. 702,885
Int. Cl.^{6} B63H *9/04*
U.S. Cl. 114—102 **9 Claims**



1. A line tensioning device comprising a force applying means which attaches to an engagement means comprising a first hook member and a second hook member with a gap in between said hook members, said hook members being substantially parallel and having a closed end forming a connecting means for joining to the force applying means and providing for the setting of the gap between said hook members and an open end which is an attachment means for said line, said connecting means allowing said gap between said hook members to narrow and be perpendicular to said line with a fixed end attached to a load and a free end wrapped one-and-one-half times around said attachment means and terminating in said gap which narrows when said force applying means is pulled, causing said line to be tensioned and a first wrap of the line to constrict around said hook members, forcing said hook members to converge, arresting the movement of said line occupying said gap.

5,839,386
VEHICLE STABILIZING BY ROTATING MASS

Edward Frieling, 5670 Willow Creek Ct., Delray Beach, Fla. 33484, and Steven Karney, Parkland, Fla., assignors to Edward Frieling, Delray Beach, Fla.
Filed May 8, 1996, Ser. No. 646,849
Int. Cl.^{6} B63B *9/08*
U.S. Cl. 114—121 **4 Claims**



1. In a vehicle having a propensity to roll about a horizontal, longitudinal roll axis extending along the direction of travel and to pitch about a horizontal pitch axis transverse to the roll axis, a stabilizing apparatus comprising:

a gyro frame assembly mounted on the vehicle for rotation about a horizontal longitudinal, roll first axis and for rotation about a horizontal transverse pitch second axis;

independently adjustable first stop means operatively connected to the gyro frame assembly for preset limiting of the amount of rotation about the first axis independent of rotation about the second axis;

independently adjustable second stop means operatively connected to the gyro frame assembly for preset limiting of the amount of rotation about the second axis independent of rotation about the first axis;

a gyro rotor assembly rotatably mounted on the gyro frame assembly for rotation about a vertical rotor axis;

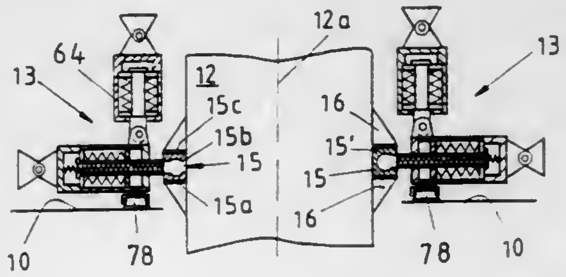
the gyro rotor assembly having a rotary mass distributed along the rotor axis such that the center of the rotary mass lies substantially on the first and second axes;

means for driving the rotary mass at gyroscopic rotational velocities; and

wherein the gyro rotor assembly resists torque on the vehicle about the roll axis and the pitch axis that exceeds the amount of rotation about the first and second axes preset by the stop means without substantial precession.

5,839,387
ARRANGEMENT FOR SUPPORTING AND CONTROLLING A VEHICLE IN RELATION TO A CORRESPONDING TURRET

Erling Myklebust, Mykelbost, Norway, assignor to I.P. Huse A.S., Haroy, Norway
PCT No. PCT/NO95/00124, § 371 Date Mar. 26, 1997, § 102(e) Date Mar. 26, 1997, PCT Pub. No. WO96/06001, PCT Pub. Date Feb. 29, 1996
PCT Filed Jul. 10, 1995, Ser. No. 793,742
Claims priority, application Norway, Aug. 19, 1994, 943078
Int. Cl.^{6} B63B *21/00*
U.S. Cl. 114—230 **24 Claims**

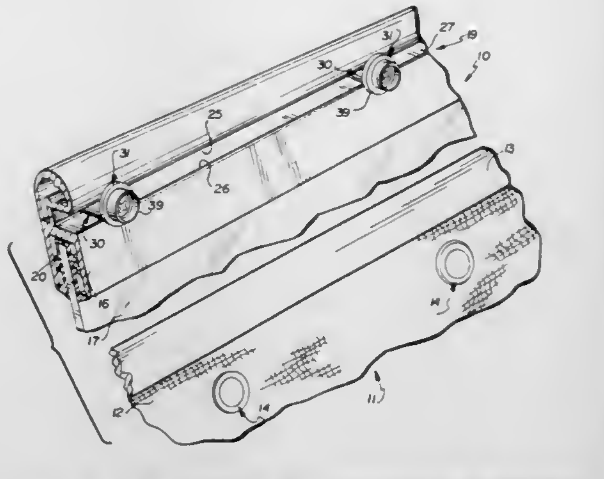


1. Arrangement for positioning a vessel relative to a turret (**12**) moored to the sea bottom and for turning the vessel around in a controlled manner about a substantially vertical turret axis (**12***a*), where the vessel can be permitted a controlled minimal movement longitudinally of and transversely of the turret axis (**12***a*) by means of a number of separate actuating means which are supported on the vessel and which are arranged in series along the periphery of the turret and where the vessel is adapted to be locked, by means of at least two opposite locking systems (**14**), in regulatable angular positions about the turret axis (**12***a*), characterised in that vertical and horizontal forces, which are transferred between vessel and turret (**12**), are adapted to be centred and relieved jointly in a defined region above the deck (**10**) of the vessel in a support ring (**15**; **15***a*',**15***b*',**15***c*') fastened to the peripheral surface of the turret (**12**) via an annular series of separate, spring-loaded bearing systems (**13**), which are fastened individually to the deck (**10**) of the vessel, the support ring (**15**;**15***a*',**15***b*',**15***c*') being slidably and tiltably mounted in the bearing systems (**13**) by means of their respective bearing members (**17**,**17**',**117**), which are arranged in ring form into a single ring of bearing members (**17**,**17**',**117**).

5,839,388
CLIP ASSEMBLY

Michael W. Vadney, Auburn, Ind., assignor to N.A. Taylor Company, Inc., Gloversville, N.Y.
Filed Jun. 24, 1997, Ser. No. 881,758
Int. Cl.^{6} B63B *17/00*
U.S. Cl. 114—361 **20 Claims**

1. A mounting assembly for a boat top, comprising:



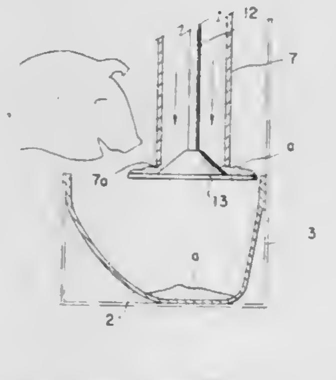
a frame for a boat windshield, said frame having an elongated channel with a first, open side, a second, closed side opposite said first side, and third and fourth closed sides extending between said first and second sides, and a lip at the intersection of each of said third and fourth sides with said first side, said channel having generally a trapezoidal configuration in cross section;

an expandable anchor disposed in said channel, and having a cross-sectional configuration and dimensions so that said anchor fits in said channel; and

an anchor-expanding fastener comprising a shank which is received by said expandable anchor and which expands said anchor when moved with respect to said anchor, and a snap fastener head, said shank extending into said channel from said first side thereof, and said snap fastener head disposed exteriorly of said channel for receipt of a snap fastener head of a boat top.

5,839,389
FEEDER FOR PIG-RAISING

Kazumi Fujii, Maebashi, Japan, assignor to Fujii Shokai Co., Ltd., Gunma, Japan
Filed Nov. 20, 1996, Ser. No. 752,915
Claims priority, application Japan, Nov. 22, 1995, 7-012394 U; Oct. 3, 1996, 8-263223
Int. Cl.^{6} A01K *5/00*
U.S. Cl. 119—53 **9 Claims**



1. A feeder for pig-raising comprising:

a feeding tank with a food outlet formed at a lower end thereof,

a suspension rod suspended within said feeding tank,

a food-quantity adjusting member comprising a conical portion having an upper end smaller in diameter than the food outlet of said feeding tank, being gradually enlarged in diameter downward, and a lower end slightly larger in diameter than the food outlet, and a disk-like portion secured to the lower end of said conical portion, said food-quantity adjusting member being disposed below said suspension rod, and

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a bottom plate, wherein a gap exists between said food-quantity adjusting member and said bottom plate,

food being supplied to said bottom plate from a gap between the food outlet of said feeding tank and an inclined peripheral surface of said food-quantity adjusting member.

5,839,390
RIDING INDICATOR

Barbara Helen Meads, Melton, United Kingdom, assignor to Janssen Pharmaceutica, N.V., Beerse, Belgium

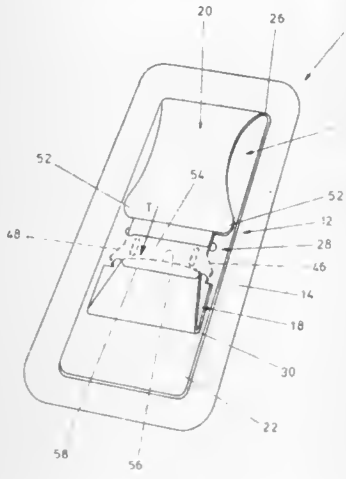
PCT No. PCT/EP94/03511, § 371 Date Apr. 4, 1996, § 102(e) Date Apr. 4, 1996, PCT Pub. No. WO95/12366, PCT Pub. Date May 11, 1995

PCT Filed Oct. 26, 1994, Ser. No. 624,452

Claims priority, application United Kingdom, Oct. 30, 1993, 9322414

Int. Cl.^{6} A01K *29/00*

U.S. Cl. 119—174 **16 Claims**



1. An apparatus for indicating when a female stock animal has been ridden by another stock animal adapted to be removably mounted on said female animal, the apparatus comprising:
- a) indicator means;
- b) said indicator means being adapted to be mounted on said female stock animal at a location where it will be directly engaged by the other stock animal during riding or mounting;
- c) said indicator means being also adapted to respond to such mounting or riding;
- d) said indicator means responding to said riding or mounting by exhibiting or producing an observable response; and
- e) said indicator means being adapted to be reset to its condition prior to such riding or mounting, whereby the apparatus can be reused;

wherein said indicator means comprises detector means for producing a visible signal by means of a mechanical signaling element which is actuated by the detector means and is movable to a signaling position and which detector means is responsive to pressure or compression or force or load or thrust applied thereto during such riding or mounting, and wherein the detector means and the mechanical signaling element comprise the same piece of flexible sheet material.

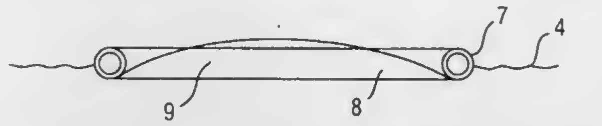
5,839,391
AQUACULTURE FARMING SYSTEM

Cam M. Shaar, Santa Barbara, Calif., assignor to Gulf Gas Marine Ltd., League City, Tex.

Division of Ser. No. 433,658, May 4, 1995. This application Oct. 31, 1996, Ser. No. 742,389

Int. Cl.^{6} A01K *61/00*

U.S. Cl. 119—212 **16 Claims**



1. A cover for an aquaculture system having a pond, said cover comprising:

one or more floating surface panels, each of said floating surface panels comprising:
- a) a floatable frame configured to float on a surface of the pond and to surround at least a portion of the pond;
- b) a flexible, water impermeable sheet disposed within the frame and peripherally attached to the frame to form a seal over the surrounded portion of the pond; and
- c) one or more drains adapted to drain water from above said water impermeable sheet to below the surface of said pond when said cover is floating on said pond.

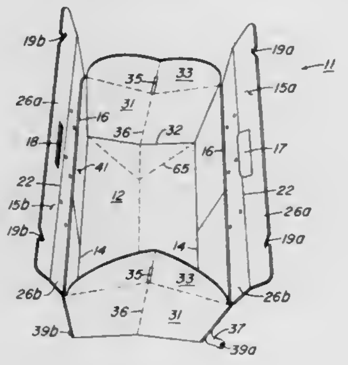
5,839,392
PET CARRIER

Bonnie M. Pemberton, 2924 6th Ave., Fort Worth, Tex. 76110, and Frank A. Wolfe, 2921 County Road 919, Burleston, Tex. 76028

Filed Mar. 12, 1997, Ser. No. 815,222

Int. Cl.^{6} A01K *29/00*

U.S. Cl. 119—498 **11 Claims**



1. A container formed from a flat, durable, flexible blank for holding a pet, comprising:
- a unitary base panel defined by a pair of end fold lines and a pair of side fold lines;
- a pair of opposed side panels extending upward from the base panel at the side fold lines and having a side flap fold line at an upper end;
- a pair of opposed end panels extending upward from the base panel at the end fold lines;
- a top joined to at least one of said side panels and said end panels;
- a handle located above the top for carrying the container with one hand;
- vent holes in at least one panel;
- a first median fold line in the base panel centered between the side panels and extending from one of the end panels to the other of the end panels for collapsing the base panel into two halves;
- a second median fold line in each end panel centered between the side panels and joining the first median fold line for collapsing the end panels into two halves; and

- a diagonal fold line extending from each corner of the base panel to the first median fold line for collapsing the base panel, side panels and end panels inward for collapsing the container from an erect position to a collapsed, generally flat position, and back to an erect position.

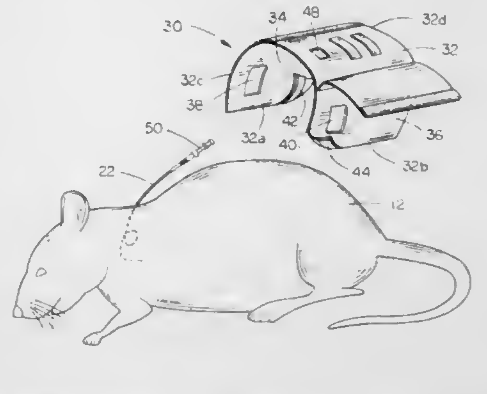
5,839,393
ANIMAL RESTRAINT JACKET

Mark E. Rupp, and Joseph S. Ulphani, both of Omaha, Nebr., assignors to Board of Regents - Univ of Ne Linc, Lincoln, Nebr.

Filed Mar. 24, 1997, Ser. No. 822,811

Int. Cl.^{6} A01K *15/04*

U.S. Cl. 119—712 **19 Claims**



1. An animal restraint jacket, comprising:
- an elongated sheet having opposing first and second ends, opposing first and second side edges, an inward surface and an outward surface;
- said sheet being formed of a fabric which is elastic in a longitudinal direction, from end to end;
- a first half of a cooperable fastener mounted on the sheet first end;
- a second half of the cooperable fastener mounted on the sheet second end, for selective cooperable connection to the fastener first half;
- a first leg hole formed in the sheet proximal to and spaced from the sheet first end;
- a second leg hole formed in the sheet proximal to and spaced from the sheet second end;
- the first and second holes located proximal to and spaced equidistant from the sheet first side edge; and
- an aperture formed through the sheet generally midway between the first and second ends, and located proximal to and spaced from the sheet first side edge.

5,839,394
SAFETY LEASH

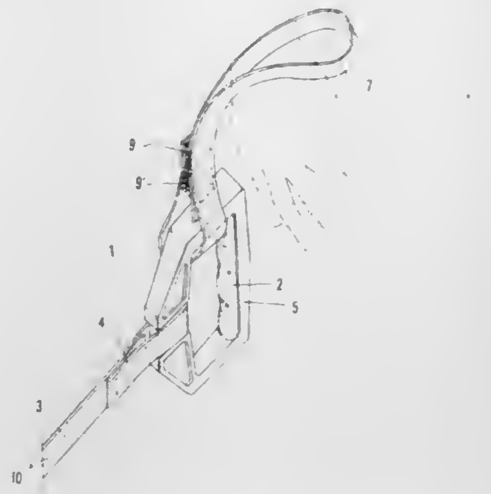
Darius Dickison, Simi Valley, Calif., assignor to Eagle West Enterprises, Simi Valley, Calif.

Filed Mar. 1, 1995, Ser. No. 396,750

Int. Cl.^{6} A01K *27/00*

U.S. Cl. 119—795 **2 Claims**

1. A shock absorbing, automatically releasing dog leash holder comprised of:
- a. a releasable loop through which a dog owner initially places his wrist;
- b. a handle to which said releasable loop and a dog leash are attached;
- c. notches in part of the handle;
- d. an elastic, grooved, semi-cylindrical, finger-indexed body which slides over said notches to form a grip and to trap air in said notches;



whereby grasping of the handle compresses the air in the notches which serves to absorb any shocks caused by sudden tugs from the dog leash.

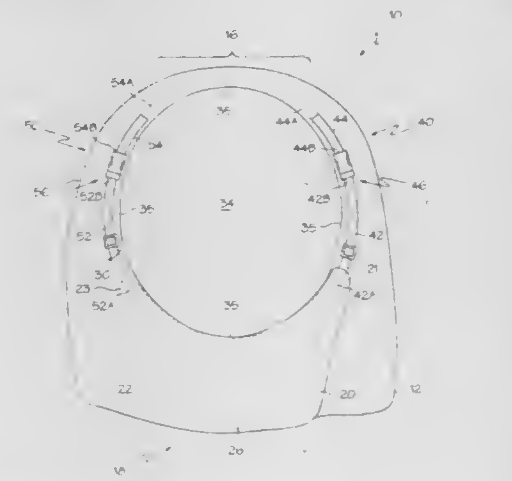
5,839,395
HORSE BLANKET

Nancy D. Kelley, and Malcolm E. Kelley, both of 3665 E. Enon Rd., Yellow Springs, Ohio 45387-1111

Filed Jul. 8, 1997, Ser. No. 889,627

Int. Cl.^{6} A01K *13/00;* **B68C** *5/00*

U.S. Cl. 119—850 **18 Claims**



1. An animal blanket comprising:
- a body of blanket material defining a major blanket portion, a wither/shoulder portion, a neckline, and a front closure portion, said front closure portion comprising
  - a first closure flap including a first closure flap end portion positioned along said neckline, and
  - a second closure flap including a second closure flap end portion positioned along said neckline; and
- a closure fastening assembly coupled to said body of blanket material, said closure fastening assembly comprising
  - a first releasable wither/shoulder attachment arranged to couple said first closure flap end portion to said wither/shoulder portion substantially along a portion of said neckline,

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a second releasable wither/shoulder attachment arranged to couple said second closure flap end portion to said wither/shoulder portion substantially along a portion of said neckline, and

a wither/shoulder attachment passage extending from an interior side of said body of blanket material to an exterior side of said body of blanket material, said wither/shoulder attachment passage being positioned substantially along said neckline outside of said first closure flap and said second closure flap to pass a portion of said second releasable wither/shoulder attachment through said body of blanket material.

5,839,396

METHOD AND APPARATUS FOR STARTING UP A CONTINUOUS-FLOW STEAM GENERATOR

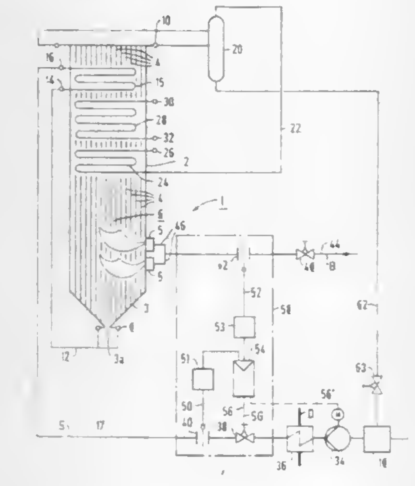
Joachim Franke, Altdorf, and Eberhard Wittchow, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 11, 1997, Ser. No. 909,217

Claims priority, application Germany, Feb. 9, 1995, 195 04 308. 1

Int. Cl.⁶ F22D *7/00*

U.S. Cl. 122—406.5 **7 Claims**



1. A method for starting up a continuous-flow steam generator of the type having a combustion chamber and a number of burners for combusting fossil fuel in the combustion chamber, the combustion chamber having a gas-tight containing wall formed of substantially vertical evaporator tubes, the method which comprises:

conducting a medium through the evaporator tubes from the bottom upwards;

supplying fuel to the burners and adjusting a firing heat capacity in the combustion chamber;

adjusting an evaporator throughput in dependence on a quantity of fuel supplied to one burner or each of the burners per unit time,

defining a full-load evaporator throughput at 100%, and setting a minimum evaporator throughput at a beginning of a start-up operation to less than 15% of the full-load evaporator throughput.

5,839,397

ENGINE COOLING SYSTEM AND CONSTRUCTION MACHINE

Shigehisa Funabashi; Yoshihiro Takada; Masatoshi Watanabe; Shinichi Shimode, all of Ibaraki-ken; Yoshio Tanito; Sotaro Tanaka, both of Ushiku; Zenji Kaneko, Tsukuba; Ichiro Hirami, Tamano; Toshio Takishita, Ibaraki-ken, and Shinichi Mihara, Tsuchiura, all of Japan, assignors to Hitachi Construction Machinery Co. Ltd., Tokyo, Japan

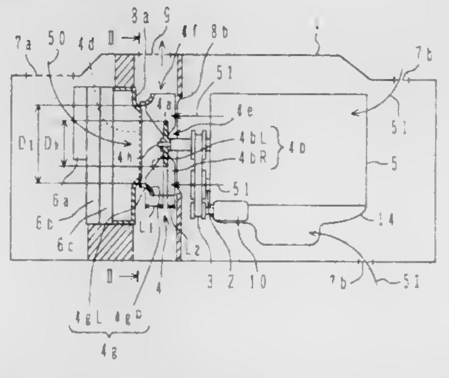
PCT No. PCT/JP96/03025, § 371 Date Jun. 17, 1997, § 102(e) Date Jun. 17, 1997, PCT Pub. No. WO97/14874, PCT Pub. Date Apr. 24, 1997

PCT Filed Oct. 18, 1996, Ser. No. 860,278

Claims priority, application Japan, Oct. 19, 1995, 7-271117

Int. Cl.⁶ F01P *7/14*

U.S. Cl. 123—41.01 **9 Claims**



1. An engine cooling system comprising at least one heat exchanger disposed in an engine room with an engine mounted therein and including a radiator for cooling water to cool said engine, and a cooling fan rotated through a rotary shaft for inducing cooling air to cool said heat exchanger, said engine, and electric equipments disposed around said engine, wherein:

said cooling fan is a centrifugal fan of a centrifugal double-impeller structure for inducing first cooling air taken into said engine room through a first air inlet port to cool said heat exchanger and second cooling air taken into said engine room through a second air inlet port to cool said engine and said electric equipments, and said centrifugal fan is constructed to meet

$$W1:W2=2:0.5\text{-}2:1.5$$

on an assumption that flow rates of said first cooling air and said second cooling air induced by said centrifugal fan are W1 and W2, respectively.

5,839,398

POWER STEERING FLUID TEMPERATURE CONTROL

Robert A. Hamilton, Rochester, Mich., assignor to TRW Inc., Lyodhurst, Ohio

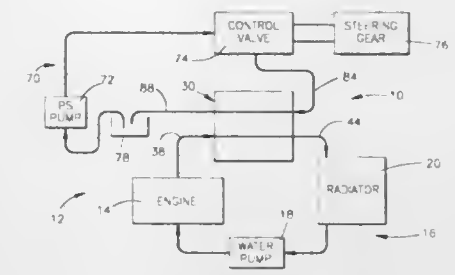
Filed Oct. 23, 1997, Ser. No. 956,573

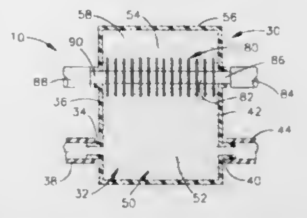
Int. Cl.⁶ F28D *7/10*

U.S. Cl. 123—41.33 **10 Claims**

1. An engine coolant de-gas bottle for use in an engine cooling system of a vehicle using liquid engine coolant, the vehicle also having a second fluid system such as a fluid power assist steering system or an engine lubricating oil system, said engine coolant de-gas bottle comprising:

wall means for maintaining a body of liquid engine coolant in said de-gas bottle; and





means for defining a second fluid passage in said de-gas bottle for enabling flow of the second fluid through said de-gas bottle in a heat-exchanging relationship with said body of liquid engine coolant in said de-gas bottle.

5,839,399

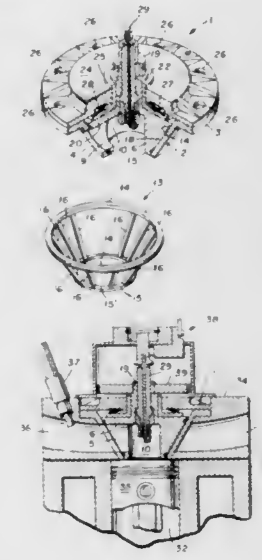
CARTRIDGE-TYPE ROTARY VALVE

Norris R. Luce, 95 Indian Creek Rd., Apt. 139, Huntsville, Ala. 35806

Filed Oct. 20, 1997, Ser. No. 954,183

Int. Cl.⁶ F01L *7/16*

U.S. Cl. 123—80 BB **24 Claims**



1. A rotary valve comprising:

a valve housing having upper and lower housing surfaces and having a housing central passage extending from said housing upper surface to said housing lower surface, at least the upper portion of said housing central passage being configured as a frusto-conical passage of decreasing diameter extending downwardly away from said housing upper surface, said housing having at least one port disposed between said upper and lower housing surfaces and communicating between said upper central passage portion and the outside of said housing;

a frusto-conical rotor having upper and lower rotor surfaces and a slanting side surface of diameter decreasing downwards away from said rotor upper surface, and configured to allow said rotor to be nestingly received in said upper central passage portion, said rotor further having a rotor passage entering said slanting side surface and exiting said rotor lower surface and positioned so that rotation of said rotor to given positions places the entry region of said rotor passage alternatively in a confronting or nonconfronting relationship with said at least one port; and

a plurality of centering barriers affixed to said slanting side surface of said rotor and extending outwardly therefrom to engage regions of said upper central passage portion to support said rotor at a standoff distance, said barriers being made of material substantially less abrasion-resistant than the confronting surfaces of said upper central passage, so that wear is substantially completely confined to said barriers.

5,839,400

INTERNAL COMBUSTION ENGINE WITH VARIABLY ACTUATED VALVES

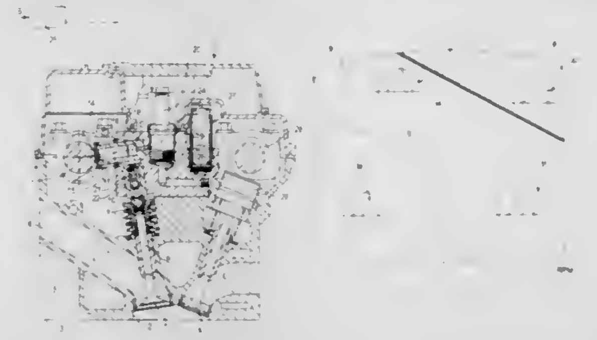
Francesco Vattaneo, Pancalieri; Marco Consani, S. Pietro Val Lemina Pinerolo, and Lorentino Macor, Beinasco, all of Italy, assignors to C.R.F. Societa' Consortile per Azioni, Turin, Italy

Filed Apr. 24, 1997, Ser. No. 847,361

Claims priority, application Italy, Apr. 24, 1996, T096A0327

Int. Cl.⁶ F01L *13/00;9/02*

U.S. Cl. 123—90.16 **5 Claims**



1. multi-cylinder internal combustion engine, comprising:

at least one intake valve and at least one exhaust valve for each cylinder, each provided with respective spring means for biasing the valve to its closed position, in order to control respective intake conduits and exhaust conduits,

a cam shaft for actuating the intake valves of the engine cylinders by means of respective tappets,

wherein each of said tappets drives the respective intake valve against the action of said biasing spring means with the interposition of hydraulic means including a chamber of fluid under pressure,

a solenoid valve for communicating said chamber of fluid under pressure to an outlet channel, in order to uncouple the tappet from the respective valve and cause the rapid closing of the latter under the action of the respective biasing spring means,

electronic control means for said solenoid valve, in order to vary the opening timing and stroke of the intake valve as a function of at least one parameter of operation of the engine,

characterized by the combination of the following features:

the engine is of the type comprising at least two intake valves for each cylinder, which control respective intake conduits,

the engine has a fuel injection feeding system and lacks of a throttle valve arranged upstream of the engine intake manifold, the air flow fed to the engine cylinders being controlled only by the intake valves of the cylinders,

the two intake valves associated with each engine cylinder are provided with two respective solenoid valves for controlling communication of the respective pressure chambers to said outlet channel, so that the two intake valves can be actuated in different ways and independently from each other,

said electronic control means are able to open a first intake valve of each cylinder of the engine only above a predetermined running condition of the engine, the second intake valve being the only valve to control the air flow fed to the cylinder below said running condition.

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the two intake conduits associated with each cylinder have specific shapes which are different and such as to favour the mixing of the air flows coming from the two intake conduits within the combustion chamber,

wherein the tappet associated with each intake valve is arranged with its axis substantially at 90° with respect to the stem of the valve and in communication with the respective pressure chamber of said hydraulic means for pressurizing the fluid therein, and

wherein a piston is slidably mounted in a cylinder disposed in axial alignment with said valve stem with one end of the piston in engagement with said valve stem and an opposite end of said piston in communication with said respective pressure chamber whereby upon movement of said tappet by said cam shaft, the fluid under pressure in said pressure chamber will cause movement of said valve to an open position.

5,839,401
INTERNAL COMBUSTION ENGINE

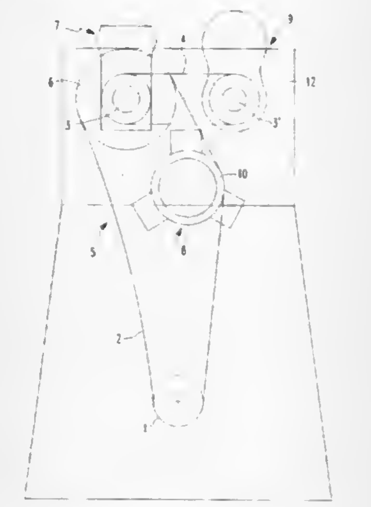
Gerhard Gruber, Backnang; Werner Hofheinz, Plochingen; Rolf Klingmann, Plüderhausen, and Johannes Schwiedessen, Esslingen, all of Germany, assignors to Daimler-Benz AG, Stuttgart, Germany

Filed Jun. 12, 1997, Ser. No. 874,492

Claims priority, application Germany, Jun. 18, 1996, 196 24 240.1

Int. Cl.⁶ F02B *39/02*

U.S. Cl. 123—90.31 **6 Claims**



1. An internal combustion engine having a front end and including a cylinder head and two camshafts and accessory units including a fuel supply pump, a high pressure fuel pump and a vacuum pump for a power brake system mounted on the front end of said engine, and drive means disposed on the front end of said engine for driving said camshafts, one of said camshafts being directly coupled to said drive means, the other camshaft being driven from said one camshaft by way of a chain or toothed belt drive, two of said pumps being coupled each to one of said camshafts so as to be driven by the drive means for said camshafts and the third pump having a drive wheel in engagement with said drive means to be directly driven thereby.

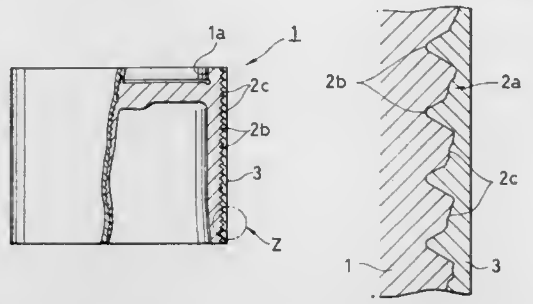
5,839,402
WEAR RESISTANT TAPPET

Akiyoshi Mori, Yokohama; Nohuo Hara, Fujisawa; Satoshi Fukuoka, Atsugi, and Tatsuo Kanzaki, Fujisawa, all of Japan, assignors to Fuji Oozx Inc., Japan

Filed Jul. 29, 1997, Ser. No. 901,982

Int. Cl.⁶ F01L *1/16*

U.S. Cl. 123—90.51 **6 Claims**



1. A tappet for an internal combustion engine, the tappet comprising:

a cylindrical body formed of an aluminum alloy,

a helical projection formed on the outer circumferential surface of the cylindrical body,

a helical groove formed adjacent to the projection on the outer circumferential surface of the cylindrical body,

a wear resistant film coating the helical projection and helical groove on the outer circumferential surface of the cylindrical body, and

said projection terminating in uneven surfaces formed at the outer circumferential surface of said cylindrical body,

said uneven surfaces imparting increased adhesion to said wear resistant coating.

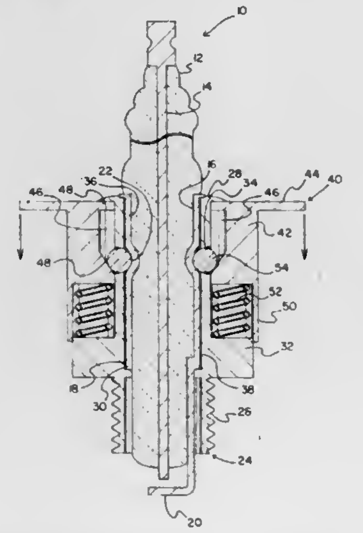
5,839,403
QUICK CHANGE PLUG

Larry D. Grant, 923 Woodlawn Dr., Colombiaville, Mich. 48421, and Jeffrey M. Aird, 2390 Maybury, New Bloomfield, Mich. 48324

Filed Jul. 21, 1997, Ser. No. 897,894

Int. Cl.⁶ H01T *13/08*

U.S. Cl. 123—169 R **5 Claims**



1. A spark plug quick release system comprising, in combination:

a spark plug having a cylindrical configuration and constructed from a material from the group of materials including ceramic and having a rod like first conductor extending between and from a top end and a bottom end of the spark plug, the spark plug further having a second sleeve conductor formed on an outer surface of the spark plug about a lower surface of the spark plug and terminating short of the bottom end thereof to define a ledge, the second conductor further having an L-shaped arm extending from a lower surface of the sleeve with a lower horizontal portion slightly spaced from the first conductor, the second sleeve conductor further having an annular detent formed therein in concentric relationship therewith above the ledge defined by the second sleeve conductor;

an adapter with a hollow cylindrical configuration having a lower end with a plurality of threaded grooves formed in an outer surface thereof for screwably coupling with a spark plug threaded mount and an upper end with an annular outwardly extending lip integrally coupled thereto and extending radially outwardly therefrom and an annular inwardly extending lip integrally coupled to an inner surface of the adapter above the threaded grooves and extending radially inwardly therefrom, the adapter further having an annular flange integrally coupled to the outer surface of the lower end and extending radially outwardly therefrom and a plurality of circular apertures formed therein and situated between the outwardly extending annular lip and annular flange, the adapter having a square cross-section between the annular lip and circular apertures, whereby the spark plug may be situated within the adapter such that the ledge thereof engages the annular inwardly extending lip of the adapter and such that there is a slight space between the inner surface of the adapter and the outer surface of the spark plug; and

a quick release assembly including a sliding tube with an annular tab integrally coupled to an outer surface thereof adjacent a top end thereof and extending radially outwardly therefrom, a plurality of cylindrical inset portions formed in an inner surface of the sliding tube with the cylindrical inset portions having an upper wall and a lower tapered wall, a downwardly extending sleeve integrally coupled to a lower end of the sliding tube and defining a continuation of the outer surface thereof, whereby the sliding tube of the quick release assembly is slidably situated about the outer surface of the spark plug with at least a pair of heat resistant springs situated between the lower end of the sliding tube and a top end of the annular flange of the adapter, wherein the downwardly extending sleeve of the sliding tube is in slidable communication with an outer surface of the annular flange of the adapter and a ball bearing is situated within each cylindrical inset portion of the sliding tube and circular aperture of the adapter, whereby the sliding tube has a lowered biased orientation with the ball bearings situated within the associated one of the cylindrical inset portions above the tapered end thereof and a raised unbiased orientation wherein the ball bearings abut the tapered ends of the associated one of the cylindrical inset portions and protrude from the corresponding circular aperture of the adapter;

whereby upon the lowering of the quick release assembly and the insertion of the spark plug within the adapter, the quick release assembly may be released such that the ball bearings engage the annular detent of the spark plug.

5,839,404
INTAKE SYSTEM IN ENGINE

Tomoyuki Numata; Masahiro Kikuchi; Satoru Oohata, and Katsuo Sasaki, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

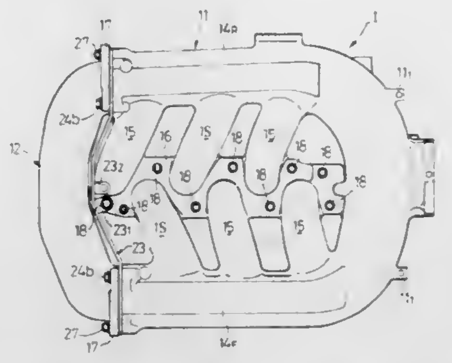
Filed Apr. 11, 1997, Ser. No. 833,957

Claims priority, application Japan, Apr. 16, 1996, 8-094194

Int. Cl.⁶ F02M *35/10*

U.S. Cl. 123—184.34 **4 Claims**

1. An intake system for an engine, said intake system comprising an intake manifold having a plurality of members coupled to one another, a mounting stay clamped between the coupled surfaces of said plurality of members and an intake manifold supporting member, for supporting said mounting stay thereon, wherein said plurality of members comprising said intake manifold include a body section having a substantially U-shaped collection intake pipe, and a connecting section for connecting said opposite ends of said body section to define an annular resonance chamber.



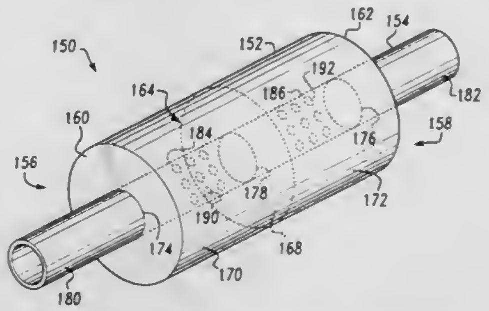
5,839,405
SINGLE/MULTI-CHAMBER PERFORATED TUBE RESONATOR FOR ENGINE INDUCTION SYSTEM

Alan Falkowski, Lake Orion; Piotr Czapski, Farmington Hills, and Dennis A. Soltis, Goodrich, all of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.

Filed Jun. 27, 1997, Ser. No. 883,774

Int. Cl.⁶ F02M *35/10*

U.S. Cl. 123—184.57 **12 Claims**



1. An engine induction system resonator, comprising:

a tube having a first diameter;

a first resonant chamber wall disposed in said tube, said resonant chamber wall and said tube together defining first and second resonant chambers;

a pipe having a second diameter smaller than said first diameter of said tube; said pipe extending axially through said tube, said pipe further having first and second ends connected to other induction system components, said pipe channeling inductive air flow therethrough; and

a plurality of perforated holes disposed along a section of said pipe housed within said tube, said plurality of perforated holes being distributed along said pipe in a manner that minimizes emitted engine noise.

5,839,406
BALANCE SHAFT SEAL RETAINER

Jeffrey D. Hall, 1216 Briar Ridge Rd., Henry, Va. 24102

Filed Sep. 30, 1997, Ser. No. 940,503

Int. Cl.⁶ F16F *15/10*; F16H *37/06*

U.S. Cl. 123—192.2 **4 Claims**

1. A balance shaft seal retainer system comprising, in

an engine timing belt assembly including a shaft rotatably coupled within a cylindrical bore formed within an engine wherein the bore has an annular indentation formed thereabout, the shaft having an exterior disk shaped pulley coupled in concentric relationship therewith and in rotatable communication with a timing belt of the timing belt assembly, the-

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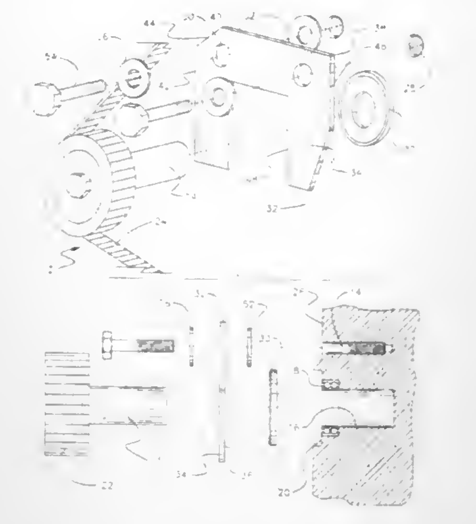


engine having a pair of threaded bores formed therein above the shaft, one of the threaded bores residing in a recess formed in the engine;

a balance shaft seal having a planar annular configuration, the balance shaft seal situated within the annular indentation about the shaft and between the pulley and the engine during use;

a balance shaft seal retainer having a planar generally square configuration with a front smooth planar face, a rear smooth planar face and a periphery formed therebetween, the periphery defined by a linear top edge, a first linear side edge perpendicularly situated with respect to the top edge with a beveled corner formed therebetween, and a second side edge with a linear top extent perpendicularly situated with respect to the top edge and a bottom extent beveled inwardly from the top extent to a bottom edge of the periphery, the bottom edge having a square cut out formed therein and in communication therewith, the balance shaft seal retainer further including a pair of apertures formed adjacent the top edge and respective sides edges of the periphery thereof;

a ring shaped spacer with a planar configuration; and

a pair of bolts for being situated within the apertures of the retainer and screwably coupled within the threaded bores of the engine with the spacer situated about one of the bolts between the retainer and engine within the recess thereof, whereby the square cut out encompasses the balance shaft seal thereby precluding the inadvertent removal of the same.

5,839,407
PISTON OF INTERNAL COMBUSTION ENGINE

Takao Suzuki, Numazu, and Asami Tsuchiya, Susono, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi-Ken, Japan

Filed Jun. 4, 1997, Ser. No. 868,517

Claims priority, application Japan, Jun. 11, 1996, 8-149406

Int. Cl.^{6} F02F *3/00*

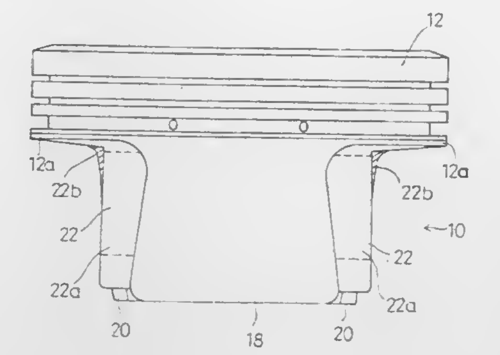
U.S. Cl. 123—193.6 **8 Claims**

1. A piston of an internal combustion engine comprising:

a piston head having an end portion, top and bottom surfaces and an outer peripheral surfacer, wherein a piston axis extends from the top surface downward to the bottom surface;

a pin boss extending from the bottom surface of the piston head, said pin boss having an end surface, a piston pin bore in a center of the pin boss and a peripheral portion on the end surface, said end surface being located within the outer peripheral surface of the piston head; and

a connecting portion extending from the peripheral portion of the pin boss to the end portion of the piston head, said connecting portion being shaped in accordance with the piston pin bore, said connecting portion having a reinforcement provided thereon, wherein the reinforcement extends across the pin boss above at least a portion of the pin bore so that a line parallel to the piston axis and extending through the pin bore intersects the reinforcement.



5,839,408
EXHAUST CONTROL APPARATUS FOR A SPARK-IGNITION TWO-STROKE INTERNAL COMBUSTION ENGINE

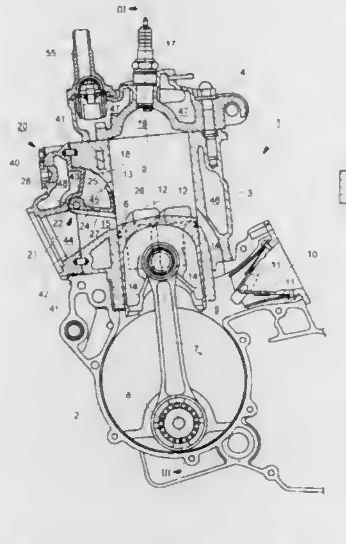
Ikuo Oike, and Kazunori Okada, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

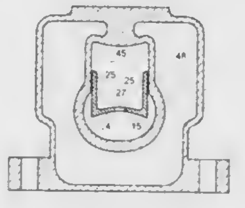
Filed Jun. 18, 1997, Ser. No. 877,904

Claims priority, application Japan, Jun. 18, 1996, 8-156721

Int. Cl.^{6} F02D *39/04*

U.S. Cl. 123—323 **17 Claims**





1. An exhaust control apparatus for a spark-ignition two-stroke internal combustion engine comprising:

an exhaust channel in communication with an exhaust port of a cylinder block;

an exhaust control valve supported for reciprocation along a cylinder centerline direction along said exhaust port for blocking at least a portion of said exhaust port on a cylinder head side thereof;

a housing depression for allowing the exhaust control valve to be withdrawn from the exhaust channel;

a space formed adjacent to the housing depression and the exhaust control valve, an increase or decrease in the volume of said space being affected by the reciprocal motion of the exhaust control valve;

a lid member connected to the cylinder block said lid member forming an inside wall of said housing depression; and

a communicating hole for allowing the space to communicate with the exhaust channel.

5,839,409
PROCESS FOR FINDING AN ADDITIONAL QUANTITY OF FUEL TO BE INJECTED DURING REINJECTION IN AN INTERNAL COMBUSTION ENGINE

Helmut Denz, Stuttgart; Manfred Pfitz, Vaihingen; Klaus Böttcher, Oberriexingen, and Alfred Kloos, Weissach, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

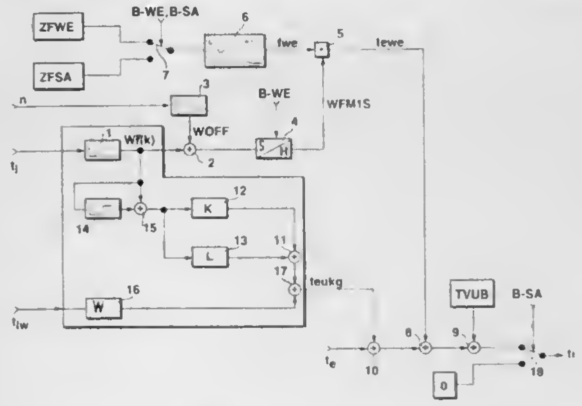
PCT No. PCT/DE96/02448, § 371 Date Oct. 6, 1997, § 102(e) Date Oct. 6, 1997, PCT Pub. No. WO97/29276, PCT Pub. Date Aug. 14, 1997

PCT Filed Dec. 18, 1996, Ser. No. 930,889

Claims priority, application Germany, Feb. 6, 1996, 196 04 136.8

Int. Cl.^{6} F02D *41/12*

U.S. Cl. 123—326 **5 Claims**



1. A method for determining an additional quantity of fuel to be injected upon a reactivation of at least one suppressed cylinder of an internal combustion engine, comprising the steps of:

determining a load-dependent wall-film quantity at a time of activation;

modulating a correction factor, the correction factor being modulated up, during a coasting deactivation time until the reactivation, with a first time constant, and being modulated down during the reactivation with a second time constant; and

multiplying the load-dependent wall-film quantity by the correction factor to determine the additional quantity of fuel.

5,839,410
IDLING CONTROL APPARATUS OF INTERNAL CONTROL ENGINE

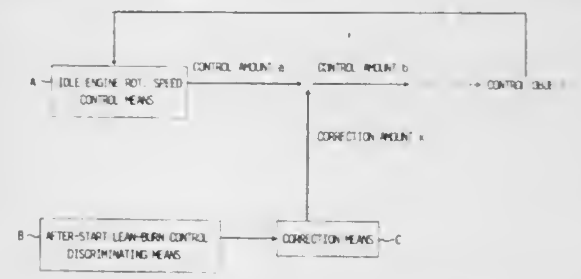
Norio Suzuki, and Kojiro Tsutsumi, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 15, 1997, Ser. No. 856,689

Claims priority, application Japan, May 17, 1996, 8-123146

Int. Cl.^{6} F02D *41/08*

U.S. Cl. 123—339.12 **6 Claims**


A
IDLE ENGINE ROT. SPEED CONTROL MEANS
CONTROL AMOUNT a
CONTROL AMOUNT b
CONTROL OBJECT
CORRECTION AMOUNT c
B
AFTER-START LEAN-BURN CONTROL DISCRIMINATING MEANS
CORRECTION MEANS
C

1. An idling control apparatus of an internal combustion engine which undergoes an after-start lean-burn control for operating said internal combustion engine at an air-fuel ratio on a lean side of a theoretical air-fuel ratio after said internal combustion engine started, comprising:

an idling engine rotational speed control means which calculates a control amount for controlling the engine rotational speed on idling to a target engine rotational speed and carries out a feedback control by said calculated control amount;

an after-start lean-burn control discriminating means for determining whether said after-start lean-burn control is carried out after starting of said internal combustion engine; and

a correcting means which calculates a correction amount for correcting said control amount calculated by said idling engine rotational speed control means based on a result of the determination by said after-start lean-burn control discrimination means, wherein the idling engine rotational speed is controlled by said control amount corrected by said correcting means.

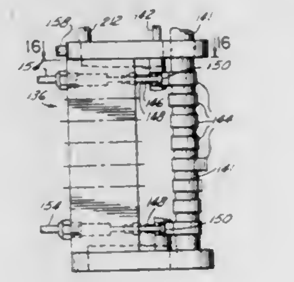
5,839,411
ROTARY FUEL PUMP AND COMBINATION FUEL INJECTOR/SPARK PLUG

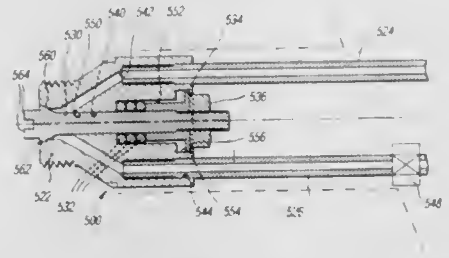
Harry Schoell, 2698 SW. 23rd Ave., Fort Lauderdale, Fla. 33312

Continuation-in-part of Ser. No. 48,821, Apr. 16, 1993, Pat. No. 5,315,967. This application Feb. 17, 1994, Ser. No. 198,434

Int. Cl.^{6} F02M *47/00;59/02;61/08*

U.S. Cl. 123—446 **11 Claims**





7. In an internal combustion engine having a crankshaft, an improvement including a rotary fuel pump and fuel injector assembly for receiving and pumping fuel into an engine cylinder of the internal combustion engine, the assembly comprising:

a rotatable camshaft mechanically coupled with the crankshaft and having an eccentric cam thereon;

a first rocker arm pivotally mounted relative to and following the eccentric cam as the cam rotates;

a cylinder having a fuel bore for receiving fuel and a fuel pump plunger bore in fluid communication with the fuel bore;

a fuel pump plunger slidably mounted in the fuel pump plunger bore and actuated by the rocker arm to reciprocate within the fuel pump plunger bore to pump surges of fuel therefrom to the fuel injector assembly;

the fuel injector assembly being in fluid communication with the fuel bore and the engine cylinder, and including:

a fuel injector housing having a housing plunger bore and an inlet bore in fluid communication with the housing plunger bore, the housing having a valve seat disposed thereon;

a fluid injector plunger reciprocating within the housing plunger bore and having a valve seat; and

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- sealing biasing means for biasing the valve seat of the fuel injector plunger against the valve seat of the housing to seal one end of the housing plunger bore;
- wherein when the inlet bore of the housing receives fuel under sufficient pressure from the fuel pump, the fuel urges the fuel injector plunger to overcome the sealing biasing means so that the valve seats separate and allow fuel to escape therebetween from the plunger bore and into the engine cylinder, and the plunger valve seat seats against the housing valve seat in response to fluid pressure from the engine cylinder.

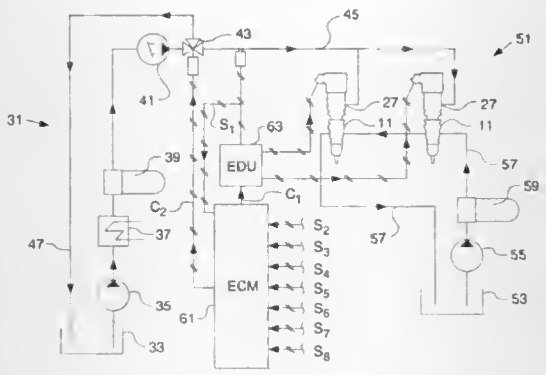
5,839,412
METHOD FOR ELECTRONIC FUEL INJECTOR OPERATION

Alan R. Stockner, and William J. Rodier, both of Metamora, Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Nov. 25, 1997, Ser. No. 978,336

Int. Cl.^{6} F02M *37/04*

U.S. Cl. 123—446 **12 Claims**



1. A method of controlling hydraulically actuated electronically controlled unit fuel injector having a stator, an armature and a flow regulating device with a first and second seat and connected to the armature, the stator, when electrically actuated, draws the armature to the stator and operates the flow regulating device to open a first valve seat to allow working fluid to operate an intensifier piston, which intensifies the pressure of fuel fed to the injector and injects the fuel into an associated cylinder of an internal combustion engine and closes a second valve seat, which when open allows working fluid to drain from the fuel injector, the method comprising the steps of:

- controlling the amount of fuel injected into the associated cylinder by regulating the pressure of the working fluid;
- adjusting the timing, duration, and amplitude of a main electrical pulse in response to changes in the working fluid pressure; and
- generating the main electrical pulse to actuate the stator and move the armature and flow regulating device to inject fuel into the associated cylinder.

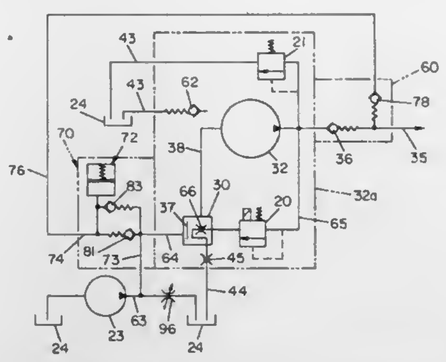
5,839,413
QUICK START HEUI SYSTEM

Richard K. Krause, Wooster, and Eric D. Ramseyer, Orrville, both of Ohio, assignors to The Rexroth Corporation, Wooster, Ohio

Filed Apr. 28, 1997, Ser. No. 846,242

Int. Cl.^{6} F02M *7/00*

U.S. Cl. 123—447 **16 Claims**



1. In an engine having a hydraulically-operated, electronically-controlled fuel injection system of the type including a fuel injector, means for supplying fuel to the injector, a high pressure pump in fluid communication through an actuating supply line with a manifold in fluid communication in turn with said injector and means for controlling the pressure of said high pressure pump separately from said fuel supply means for actuating said injector, the improvement comprising:

- a) a low pressure pump;
- b) an accumulator having an inlet and an outlet;
- c) check valve means between said inlet and said low pressure pump for charging said accumulator at a preset pressure lower that of said high pressure pump; and
- d) a make-up fluid supply line in fluid communication with said actuating supply line, said make-up supply line having a one way check valve between said accumulator outlet and said actuating supply line whereby said accumulator maintains said manifold in a primed condition at all times when said high pressure pump is inoperable.

5,839,414
FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Horst Klinger, Ludwigsburg; Uwe Kuhn, Riederich; Bernd Rosenau, Tamm; Peter Traub, Stuttgart; Thomas Goettel, Schwaikheim; Gerd Loesch, Stuttgart; Sandro Soccol, Bietigheim-Bissingen, all of Germany; Regis Blanc, Lyons, France; Andre Fromentoux, St. Pierre de Chandieu, France, and Francois Rossignol, Mornant, France, assignors to Robert Bosch GmbH, Stuttgart, Germany

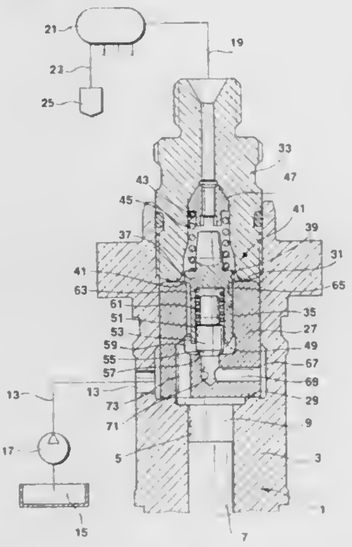
PCT No. PCT/DE96/01497, § 371 Date Jul. 25, 1997, § 102(e) Date Jul. 25, 1997, PCT Pub. No. WO97/17538, PCT Pub. Date May 15, 1997

PCT Filed Aug. 9, 1996, Ser. No. 860,588

Claims priority, application Germany, Nov. 8, 1995, 195 41 507.8

Int. Cl.^{6} F02M *37/04*

U.S. Cl. 123—467 **12 Claims**



1. A fuel injection system for internal combustion engines, comprising, a high-pressure pump (**1**), having a pump work chamber (**9**) arranged to communicate on an intake side with a fuel tank (**15**) via a supply line (**13**) and on a compression side with a common fuel rail (**21**) via a high-pressure line (**19**), said common fuel rail feeds a plurality of injection lines (**23**) that leads to individual injection valves (**25**), and said pump further having one pressure valve each in the supply line (**13**) and the high-pressure line (**19**), said valves acting to prevent a return flow of fuel out of the pump work chamber (**9**) into the supply line (**13**) and out of the high-pressure line (**19**) into the pump work chamber (**9**) and the pressure valves of the supply line (**13**) and the high-pressure line (**19**) are disposed in a common valve combination (**11**) with one pressure valve guiding the other pressure valve.

5,839,415
AIR-FUEL RATIO CONTROL SYSTEM HAVING FUNCTION OF AFTER-START LEAN-BURN CONTROL FOR INTERNAL COMBUSTION ENGINES

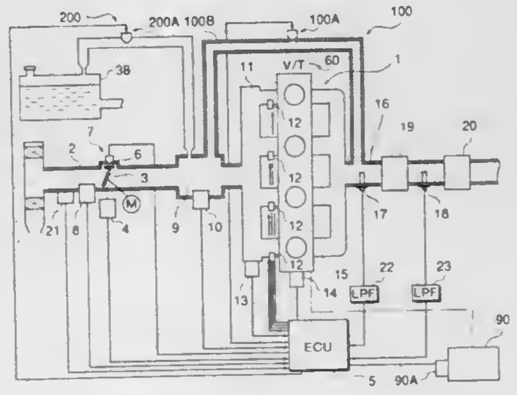
Norio Suzuki; Koichi Fujimori; Yusuke Hasegawa; Hiroki Munakata; Shusuke Akazaki, and Masuhiro Yoshizaki, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 603,278, Feb. 20, 1996, Pat. No. 5,715,796. This application Aug. 13, 1997, Ser. No. 910,903

Claims priority, application Japan, Feb. 24, 1995, 7-061784; Feb. 27, 1995, 7-038870

Int. Cl.^{6} F02D *41/06*

U.S. Cl. 123—491 **1 Claim**



1. An air-fuel ratio control system for an internal combustion engine installed on an automotive vehicle, said control system controlling an air-fuel ratio of a mixture supplied to said engine to a value leaner than a stoichiometric air-fuel ratio immediately after start of said engine, comprising:

- operating condition-detecting means for detecting operating conditions of said engine; and
- air-fuel ratio-setting means for changing said air-fuel ratio of said mixture in a continuous manner based on said operating conditions of said engine detected by said operating condition-detecting means immediately after the start of said engine,
- wherein said operating condition-detecting means detects at least one of a temperature of said engine, load on said engine, rotational speed of said engine, and a time period elapsed after the start of said engine, and
- wherein said air-fuel ratio-setting means includes control amount-setting means for setting a control amount for setting said air-fuel ratio of said mixture to said leaner value, desired control amount-setting means for setting a desired leaning control amount based on said at least one of said temperature of said engine, said load on said engine, the rotational speed of said engine, and said time period elapsed after said start of said engine detected by said operating condition-detecting means, and control amount-changing means for progressively changing said control amount from a non-correction amount to said desired leaning control amount.

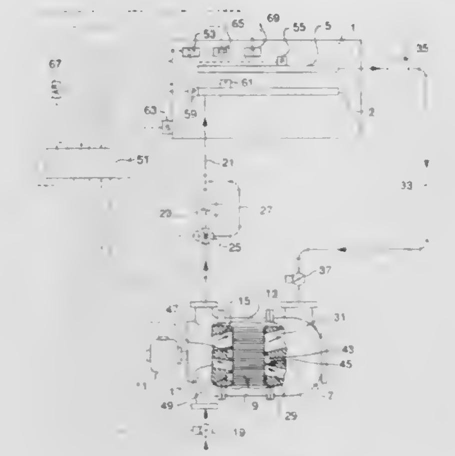
5,839,416
CONTROL SYSTEM FOR PRESSURE WAVE SUPERCHARGER TO OPTIMIZE EMISSIONS AND PERFORMANCE OF AN INTERNAL COMBUSTION ENGINE

Richard W. Kruiswyk, and Cho Y. Liang, both of Peoria, Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Nov. 12, 1996, Ser. No. 748,141

Int. Cl.^{6} F02B *33/42*

U.S. Cl. 123—559.2 **10 Claims**



1. A control system for an internal combustion engine having a liquid coolant, an intake manifold for supplying combustion air to the engine, an exhaust manifold for the high pressure exhaust gases and a fuel injection system which is adapted to vary the timing of the fuel injection and a pressure wave supercharger having a circular array of elongated chambers disposed to rotate about a central axis, a variable speed drive to rotate the circular array of elongated chambers, a low pressure combustion air duct and a high pressure combustion air duct each disposed in fluid communication with the same end of a plurality of different elongated chambers, a high pressure exhaust duct and a low pressure exhaust duct each disposed in fluid communication with the other end of a plurality of different elongated chambers, disposed between the high pressure exhaust duct and the low pressure exhaust ducts and in fluid communication with the other end of a plurality of elongated chambers is a gas pocket, the gas pocket is also in fluid communication with the high pressure exhaust duct through a flow control valve, the high pressure exhaust duct is disposed in fluid communication with the exhaust manifold via an exhaust conduit, which has a restrictor valve disposed therein, and the low pressure exhaust duct is disposed in fluid communication with the atmosphere, the high pressure combustion air duct is disposed in fluid communication with the intake manifold and the low pressure combustion air duct is disposed in fluid communication with the atmosphere and has a restrictor valve disposed therein; the control system being characterized in that, the control system automatically switches from one mode of operation to another in response to varying operating conditions and emissions requirements utilizing a plurality of maps based on fixed data points obtained from empirical data specific to the engine and pressure wave supercharger and the particular mode of engine operation to optimize engine performance and control emissions.

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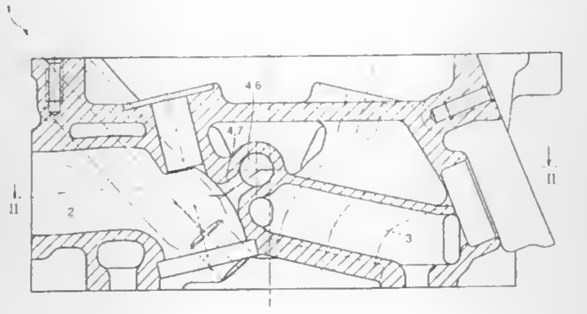
5,839,417
CAST CYLINDERHEAD OF A MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Janusz Kwiatkowski, and Eduard Zaiss, both of Stuttgart, Germany, assignors to Daimler -Benz AG, Stuttgart, Germany

Filed Aug. 26, 1997, Ser. No. 917,520
Claims priority, application Germany, Sep. 2, 1996, 196 35 535.4
Int. Cl.^{6} F02M *25/06*
U.S. Cl. 123—568 **3 Claims**

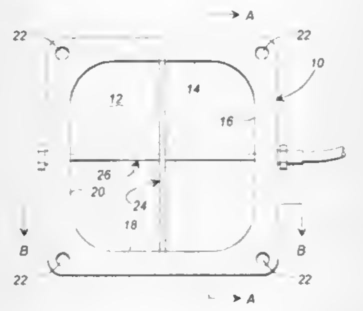


1. A cast cylinderhead of a multi-cylinder internal combustion engine, said cylinderhead including gas flow channels (exhaust gas and intake air flow channels) and at least one longitudinal gas flow passage with branch passages extending between said longitudinal gas flow passages and said gas flow channels, said gas flow channels, said at least one longitudinal gas flow passage and said branch passages all being formed by a single-piece core structure.

5,839,418
DUAL STAGE NITROUS OXIDE AND FUEL INJECTION PLATE

Barry Grant, Dahlonega, Ga., assignor to BG 300, Inc., Dahlonega, Ga.

Filed Dec. 4, 1997, Ser. No. 984,788
Int. Cl.^{6} F02B *23/00*
U.S. Cl. 123—585 **1 Claim**



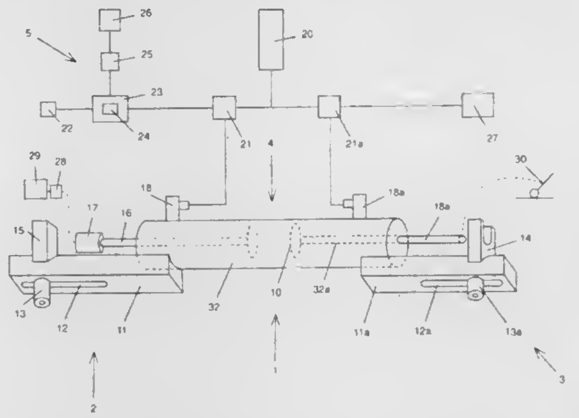
1. A fuel supply module for adding fuel and nitrous oxide to an airstream flowing from a carburetor to the intake manifold of an internal combustion engine, comprising:

- a plate member for placement between a carburetor and its intake manifold, said plate member defining an air passage therethrough sized and shaped for passing the airstream from a carburetor to an internal combustion engine, said air passage having a central axis extending parallel to the direction of flow of the gas moving through said opening;
- a first pair of elongated rectilinear spray conduits each spanning said air passage of said plate member and having their opposed end portions mounted to said plate member, said first pair of spray conduits being mounted parallel to each other and oriented one behind the other along the axis of said air passage so that one of said first pair of spray conduits is positioned upstream and the other of said first pair of spray conduits is positioned downstream with respect to each other;
- a second pair of elongated rectilinear spray conduits each spanning said air passage of said plate member and having their opposed end portions mounted to said plate member, said second pair of spray conduits being mounted parallel to each other and oriented one behind the other along the axis of said air passage so that one of said second pair of spray conduits is positioned upstream and the other of said second pair of spray conduits is positioned downstream with respect to each other;
- said second pair of spray conduits being oriented at approximately a right angle with respect to said first pair of spray conduits;
- each of said spray conduits of both pairs of spray conduits including a central passage extending internally along its length and spray openings formed laterally through said conduit from the central passage to outside said conduit;
- nitrous oxide supply means for supplying liquid nitrous oxide to said upstream spray conduits of said first and second pairs of spray conduits; and
- fuel supply means for supplying liquid fuel to said downstream spray conduits of said first and second pairs of spray conduits.

5,839,419
ADJUSTABLE AUTOMATIC THROTTLE ACTUATION CONTROLLER

Frank Hawley, La Verne, Calif., assignor to Curtis E. Rodden, Titusville, Fla.

Filed Jun. 27, 1996, Ser. No. 671,207
Int. Cl.^{6} F02D *11/08*
U.S. Cl. 123—398 **8 Claims**



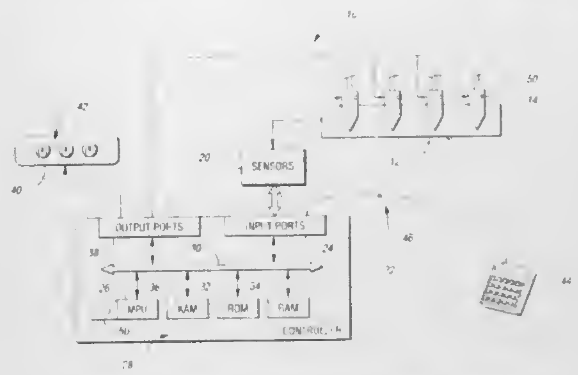
1. A starting line throttle actuation system for a race vehicle including an engine, and throttle pedal, while the throttle pedal is fully depressed, comprising:

- an electronic activation means constructed and arranged to regulate the flow of compressed gas into and out of a cylinder with a piston rod;
- a piston and cylinder assembly means with a piston rod that will open and close a throttle of a vehicle to full engine r.p.m. and a preset low engine r.p.m.;
- and a piston rod travel restricting means that will limit the distance of the piston attached to the carburetor linkage can extend from the cylinder and thereby limit the engine r.p.m., wherein activating the electronic activation means causes the piston rod to move the throttle to the preset low engine r.p.m. for allowing the vehicle to position at the starting line of a race, and releasing the activating means causes the vehicle to run at full engine r.p.m.

5,839,420
SYSTEM AND METHOD OF COMPENSATING FOR INJECTOR VARIABILITY

Eric Darvin Thomas, Canton, Mich., assignor to Detroit Diesel Corporation, Detroit, Mich.

Filed Jun. 4, 1997, Ser. No. 866,521
Int. Cl.^{6} F02M *51/00*
U.S. Cl. 123—478 **20 Claims**



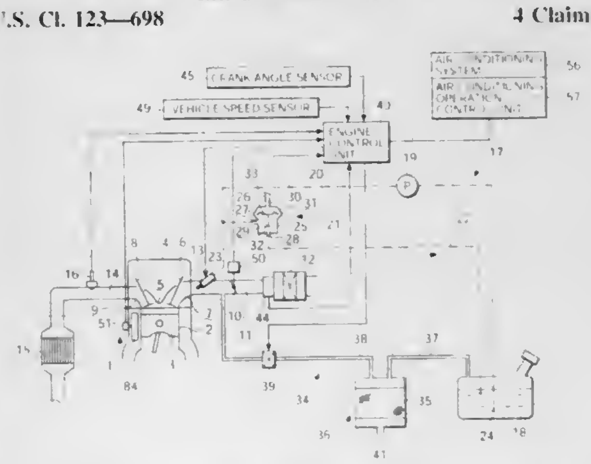
1. A method of calibrating an electronically controlled fuel injector, the method comprising the steps of:

- establishing reference energizing times which correspond to fuel injection at each of at least two predetermined engine conditions;
- determining true energizing times for the injector which correspond to fuel injection at each of the predetermined engine conditions;
- selecting one of a plurality of predetermined calibration categories for each engine condition based on each true energizing time relative to the corresponding reference energizing time;
- assigning a calibration code to the injector indicative of the calibration categories; and
- marking the injector with the calibration code.

5,839,421
EVAPORATION GAS INTERCEPTING SYSTEM FOR AUTOMOTIVE VEHICLE

Yasufumi Suzuki, Gunma-ken, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 21, 1997, Ser. No. 786,448
Claims priority, application Japan, Jan. 24, 1996, 8-010277
Int. Cl.^{6} F02D *41/00*
U.S. Cl. 123—698 **4 Claims**



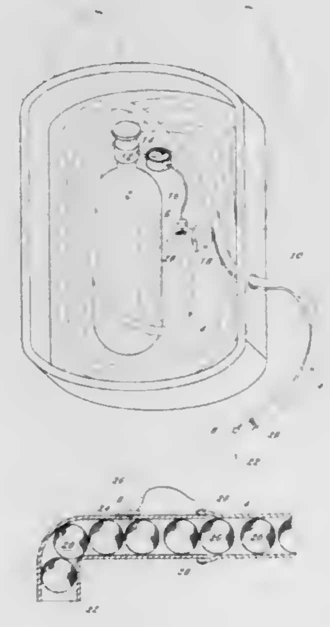
1. An evaporation gas intercepting system of an automotive vehicle having, an air conditioning system for a passenger compartment of the vehicle, operable in an inside air circulation mode or in an outside air intake mode, an engine mounted on the vehicle for driving the vehicle, an engine speed sensor for detecting engine speed and for generating an engine speed signal, an air flow meter in an air intake pipe for measuring a quantity of an intake air flow into a cylinder of the engine and for producing a load signal, fuel injection quantity calculating means responsive to said engine speed signal and said load signal for calculating a basic fuel injection quantity and for generating a basic fuel quantity signal, and air-fuel ratio detecting means for outputting an air-fuel ratio signal, said system comprising:

- air fuel ratio correction means responsive to said air-fuel ratio signal for calculating a feedback correction quantity to correct said basic fuel injection quantity and for outputting an air-fuel ratio correction signal;
- air-fuel ratio learning control means responsive to said basic fuel quantity signal and said air-fuel ratio correction signal for deriving an air-fuel ratio learning control value at a starting time of an evaporation correction and for generating an air-fuel ratio learning correction signal;
- purge setting means responsive to said engine speed signal and said basic fuel quantity signal for deriving a purge duty ratio dependent on vehicle driving conditions and for producing a purge duty ratio signal;
- evaporation setting means responsive to said air-fuel ratio correction signal, said air fuel ratio learning correction signal and said purge duty ratio signal for carrying out an evaporation correction of said fuel injection quantity to determine a corrected fuel injection quantity and for producing an evaporation correction signal; and
- control means responsive to said evaporation correction signal for changing over said air conditioning system to said inside air circulation mode when said evaporation correction signal is produced so as to prevent a fuel odor form entering said passenger compartment.

5,839,422
AUTOMATIC FEEDER FOR PROJECTILE GUN USING COMPRESSED GAS

Shell M. Ferris, 1455 Holly Heights Dr., No. 38, Fort Lauderdale, Fla. 33304

Filed May 23, 1997, Ser. No. 862,499
Int. Cl.^{6} F41B *11/02*
U.S. Cl. 124—53.5 **6 Claims**



1. An automatic projectile feeding device for a gun-like apparatus comprising:

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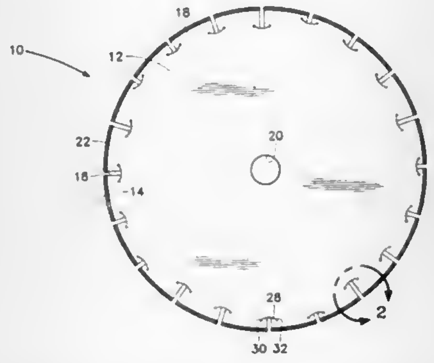
means for supplying compressed gas;
means for movably storing a plurality of projectiles;
means for removably attaching said means for movably storing to the gun-like apparatus, said means for removably attaching connected to said means for movably storing, said means for removably attaching in fluid communication with said means for movably storing and in fluid communication with said gun-like apparatus;
means for activating said means for supplying compressed gas, said means for activating connected to said means for movably storing, said means for supplying compressed gas in fluid communication with said means for movably storing when activated by said means for activating; and,
means for portably housing said means for supplying compressed gas, said means for movably storing, and said means for activating, said means for portably housing being attachable to the body of a user.

5,839,423
CUTTING DISC

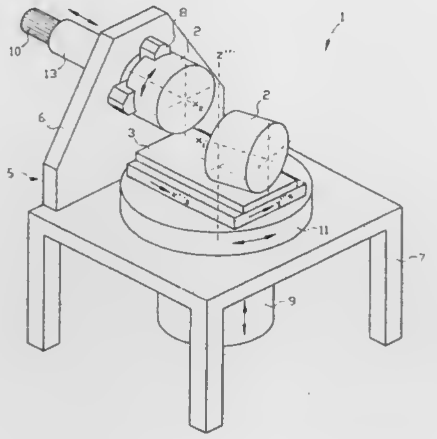
Leon D. Jones, and Kevin E. Baron, both of 1000 N. Del Norte Blvd., Oxnard, Calif. 93030
Filed Mar. 13, 1997, Ser. No. 816,306
Int. Cl.^{6} B28D *1/04*
U.S. Cl. 125—15 **3 Claims**



1. A cutting disc for cutting asphalt, concrete and stone, said cutting disc comprising:
a circular shaped body having a peripheral edge;
a plurality of radial slots formed within said body, said radial slots being spaced apart, said body defining a support segment between each directly adjacent pair of said radial slots, each said radial slot having an open outer end connecting with said peripheral edge, each said radial slot having a closed inner end, a transverse slot formed within said body and located at said closed inner end, there being a separate said transverse slot for each said radial slot, said transverse slot being less in width than said radial slot, said transverse slot being arcuate said radial slots forming a pair of corners at said inner end with said corners connecting with said transverse slot, each said corner being rounded; and
a cutting segment fixedly mounted on each said support segment at said peripheral edge, there being a separate said cutting segment for each said support segment, each said cutting segment comprising an abrasive block.

5,839,424
PROCESS FOR THE ORIENTATION OF SEVERAL SINGLE CRYSTALS DISPOSED SIDE BY SIDE ON A CUTTING SUPPORT FOR THEIR SIMULTANEOUS CUTTING IN A CUTTING MACHINE AND DEVICE FOR PRACTICING THIS PROCESS

Charles Hauser, Genolier, Switzerland, assignor to HCT Shaping System SA, Cheseaux, Switzerland
Filed Apr. 16, 1997, Ser. No. 834,418
Claims priority, application Switzerland, Apr. 16, 1996, 957/96
Int. Cl.^{6} B24D *3/00*
U.S. Cl. 125—16.02 **13 Claims**

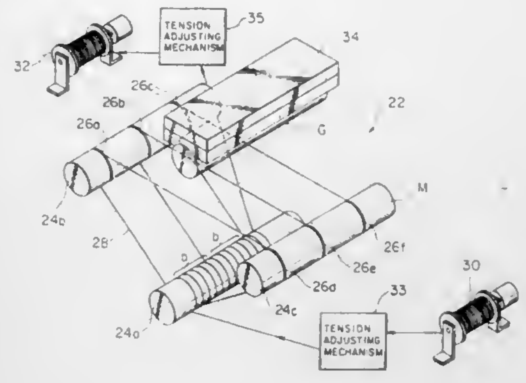


1. A method of simultaneously cutting a plurality of single crystals in a cutting machine along a predetermined cutting plane (y'',z'') comprising the steps of:
individually orienting each of a plurality of said single crystals to a predetermined orientation relative to a cutting support using a positioning device, said positioning device being located separate from said cutting machine;
individually securing said single crystals on said cutting support in accordance with said predetermined orientation;
positioning said cutting support in said cutting machine to obtain said predetermined orientation of said single crystals, wherein said positioning of said cutting support in said cutting machine is geometrically defined relative to a cutting plane (y''',z''') of said cutting machine; and
operating said cutting machine to simultaneously cut said plurality of single crystals.

5,839,425
METHOD FOR CUTTING A WORKPIECE WITH A WIRE SAW

Kouhei Toyama, Sirakawa; Etsuo Kiuchi, Gunma-ken, and Kazuo Hayakawa, Takasaki, all of Japan, assignors to Shin-Etsu Handotai Co., Ltd., Tokyo, and Mimasu Semiconductor Industry Co., Ltd., Gunma, both of Japan
Division of Ser. No. 628,038, Apr. 4, 1996, Pat. No. 5,715,807. This application Sep. 30, 1997, Ser. No. 941,759
Claims priority, application Japan, Apr. 14, 1995, 7-089101
Int. Cl.^{6} B28D *1/08*
U.S. Cl. 125—16.02 **14 Claims**

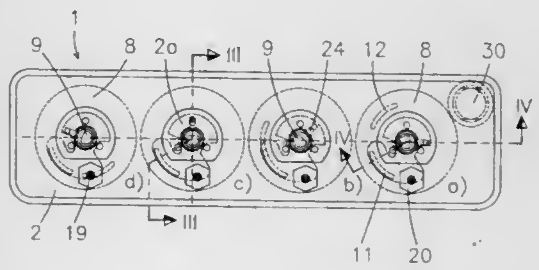
1. A method for cutting a workpiece with a wire saw having a plurality of main rollers three-dimensionally arranged with a predetermined distance between each other; and a wire running over all the main rollers to form arrays of wire portions parallel to each other between pairs of successive main rollers; the wire wrapping around all the main rollers in a ratio of one time between a pair of successive main rollers bordering a first array of wire portions to more than one time over at least one remaining main roller with a desired constant distance spaced between each of the wire portions along the pair of successive main rollers bordering the first array of wire portions, the method comprising the steps of:



driving the wire;
supplying a slurry on at least the first array of wire portions;
fixedly holding the workpiece with a workpiece holder; and
cutting the workpiece into a plurality of rods by pressing the workpiece and the first array of wire portions into contact with each other.

5,839,426
GAS DISTRIBUTION BOX TO STOVE BURNERS

Iñaki Ayastuy Aretxaga, Bergara, Spain, assignor to Fagor, S. Coop, Mondragon, Spain
Filed Nov. 26, 1997, Ser. No. 979,817
Int. Cl.^{6} F24C *3/00*
U.S. Cl. 126—39 N **2 Claims**



1. A gas distribution box for the top burners of a domestic stove comprising:
a sealed gas flow conduit positioned in a housing, said conduit includes a common inlet gas chamber and a plurality of individual outlet gas chambers, each said outlet gas chamber directs gas flow to a respective burner,
a plurality of control means to regulate the gas flow to respective burners, each said control means comprises a flow regulating valve and a valve operating shaft, a free end of said valve operating shaft extends outside said box walls; wherein
said housing comprises box walls formed with a base plate and a cover plate,
said base plate houses said valves and forms said plurality of individual outlet gas chambers,
said cover plate in cooperation with said base plate forms said common inlet chamber; and wherein
said base plate comprises end stops to limit rotation of said valve shafts.

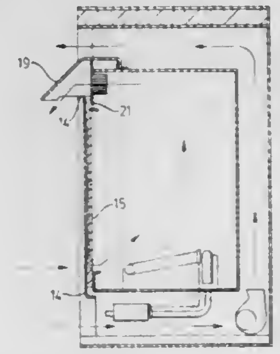
5,839,427
ARTIFICIAL EMBER BED

Joseph Shorts, Woodstock, Ga., assignor to American Gas Log Company, Inc., Lithonia, Ga.
Filed Dec. 23, 1997, Ser. No. 996,627
Int. Cl.^{6} F24C *3/00*
U.S. Cl. 126—512 **17 Claims**

1. An artificial ember bed for use within a fireplace, comprising:
a gas burner disposed within the fireplace;
a log grate positioned in the fireplace and spaced above said burner;
at least two artificial logs supported on said grate, said at least two logs being spaced from and substantially parallel to one another;
an ember bed support grate spaced above said grate in the space defined between said at least two logs, wherein at least a portion of said ember bed support grate is positioned above said burner; and
a plurality of non-combustible embers disposed on said ember bed support grate.

5,839,428
UNVENTED FUEL BURNING APPLIANCES AND DOOR THEREFORE

Wolfgang Schroeter, Midhurst; Cliff Lilley, Anten Mills, and Richard Tjart, Wyevale, all of Canada, assignors to Napoleon Systems, Inc., Barrie, Canada
Filed Mar. 18, 1998, Ser. No. 40,180
Int. Cl.^{6} F24C *3/00*
U.S. Cl. 126—512 **17 Claims**



15. An unvented fuel burning appliance comprising:
(i) a firebox having a partially enclosed front and having enclosed bottom rear, side and top surfaces;
(ii) a burner; and,
(iii) a catalytic converter positioned on the upper portion of said partially enclosed front of said firebox,
wherein exhaust gases from said burner are directed through said catalytic converter prior to exiting said firebox such that said catalytic converter eliminates or reduces harmful or noxious gases and particulate material within the exhaust gases.

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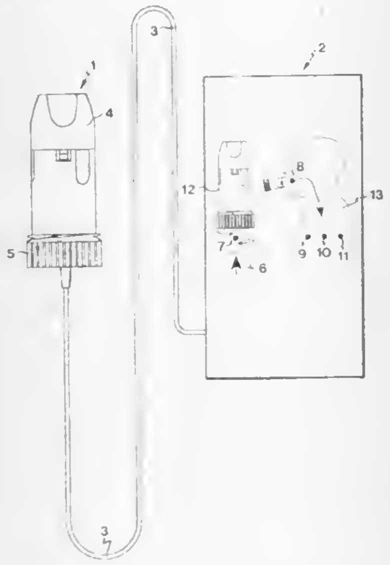
and wherein heat generated by the operation of said catalytic converter is substantially directed, by way of radiation and convection, outwardly through the front of said fireplace to reduce heat generated and maintained at the top of said firebox and thereby reduce the heating of the top surface of said appliance.

5,839,429
METHOD AND APPARATUS IN CONNECTION WITH AN INHALER

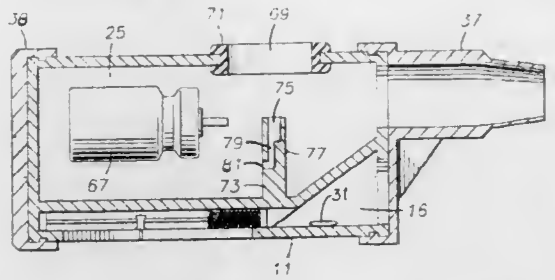
Nils Göran Marnfeldt, Blentarp, and Johan Mats Bertil Waldeck, Sandby, both of Sweden, assignors to Astra Aktiebolag, Sodertalje, Sweden
Continuation of Ser. No. 436,434, May 24, 1995, abandoned. This application Aug. 20, 1997, Ser. No. 915,121
Claims priority, application Sweden, Mar. 25, 1994, 9401020-4
Int. Cl.⁶ A61M *11/00*
U.S. Cl. 128—200.14 **3 Claims**



1. A training device for training a patient to use a breath-activated dry powder inhaler correctly, the training device comprising:
- a breath-activated dry powder inhaler that is constructed to move a dose of powdered medicament into position for inhalation when activated by a patient, and to subsequently dispense said dose when a patient applies a sufficient inspiratory flow to said inhaler;
- an activation signal constructed to indicate to a patient an instruction to activate the inhaler;
- an activation sensor constructed to detect when a patient has activated the inhaler;
- an inhalation signal constructed to indicate to a patient, after detection of inhaler activation, an instruction to inhale through the inhaler;
- an inhalation flow sensor constructed to measure the inspiratory flow rate through the inhaler; and
- a flow signal to indicate to a patient the inspiratory flow applied,
- wherein each of said activation sensor and said inhalation sensor comprises a microphone,
- wherein said activation sensor further comprises a position transducer and said activation signal comprises an indicator for indicating whether the inhaler is held in a correct position during activation.

5,839,430
COMBINATION INHALER AND PEAK FLOW RATE METER

Joseph Cama, 213 Pine St., Towanda, Pa. 18848
Filed Jan. 13, 1997, Ser. No. 785,164
Int. Cl.⁶ A61M *11/00;15/00;16/10*
U.S. Cl. 128—200.14 **12 Claims**



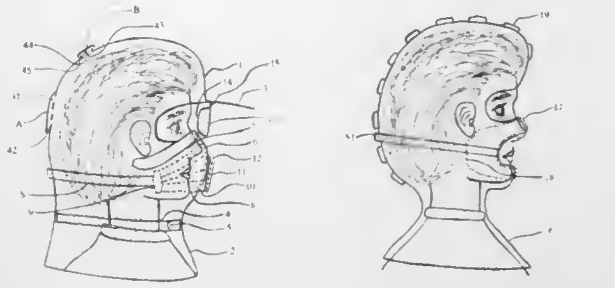
1. A personal portable respiratory care device comprising:
- a spacer component having a hollow substantially cylindrical shaped body, and an interior of the body being divided into a flow sensor housing for housing a peak expiratory flow rate meter, and an aerosol chamber into which a dose of an inhaler's content is dispensed before or during an act of inhalation by a user and which retains a portion of the dispensed dose that would otherwise rain-out in the user's mouth and throat, and the spacer body including a first mouthpiece end having two openings that separately communicate with the flow sensor housing and the aerosol chamber, and a second aerosol inlet end sealed with a second end cap having an aerosol inlet aperture, which communicates the aerosol chamber with an inhaler component;
- an inhaler component having a canister containing a pharmaceutical formulation and a metering valve that controls the dose of formulation dispersed during a single actuation of the valve, a holder for housing the canister, a nozzle fitting for receiving and directing the dose expelled from the canister on activation into the aerosol chamber and adapting the dose to an aerosol cloud for inhalation by the user;
- a peak expiratory flow rate meter component housed within the flow sensor housing of the spacer body for measuring the maximum rate at which air is expelled out of the user's lungs during the course of an explosive exhalation, and the housing having a calibrated scale, a mouthpiece port an indicator, and an expiratory port for exhausting expired air; and
- a mouthpiece at the mouthpiece end of the spacer body having a passage therethrough, and adapted for positioning the passage to be in selected communication with either one of the flow sensor housing or the aerosol chamber of the spacer body while sealing the other off.

5,839,431

Patent Not Issued For This Number

5,839,432
FACE-COVERING HOOD WITH INNER LINER AND VENT SPACE

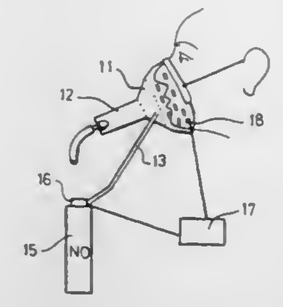
Yousef Daneshvar, 21459 WoodFarm, Northville, Mich. 48167
Continuation-in-part of Ser. No. 261,172, Jun. 13, 1994, abandoned, and a continuation-in-part of Ser. No. 179,329, Jan. 10, 1994. This application Nov. 16, 1994, Ser. No. 340,659
Int. Cl.⁶ A62B *7/10;19/00;23/02;* **A42B** *1/04*
U.S. Cl. 128—201.25 **14 Claims**



1. A flexible hood assembly for a wearer's head comprising:
- an inner hood lining made of flexible material that serves to keep a wearer's head warm in cold weather; said inner hood lining adapted to fit over and against the top, sides, back and the face of a wearer's head, including openings for eyes, nasal passages, and mouth; said inner hood lining comprising an impermeable area for encircling a wearer's nasal passages and mouth and comprising a nose-spanning portion for extending across the bridge of a wearer's nose and a chin-spanning portion for extending across a wearer's chin, and means for causing said impermeable area to be held against a wearer's face in encircling relation to a wearer's nasal passages and mouth;
- an outer hood layer made of flexible material that is air and water impermeable and adapted to fit over said inner hood lining, said outer hood layer including at least an opening for a wearer's eyes;
- a skeleton structure adapted to be disposed in covering relation to a wearer's nasal passages and mouth to space said outer hood layer from a wearer's nasal passages and mouth, and means for causing said skeleton structure to be held against a wearer's face in covering relation to a wearer's nasal passages and mouth;
- means for spacing said inner hood lining from said outer hood layer and for forming an air gap;
- means for selectively venting excess hot air accumulated in said air gap;
- transparent eye cover structure adapted to be disposed in covering relation to a wearer's eyes;
- means for preventing fogging of said transparent eye cover structure comprising a band for extending across the bridge of a wearer's nose between said inner lining and said outer layer to separate openings in the inner lining such that moisture from the nasal passages and mouth is blocked from reaching the transparent eye cover structure; and
- an exhaust system that carries exhaled air out of said hood assembly.

5,839,433
NITRIC OXIDE TREATMENT

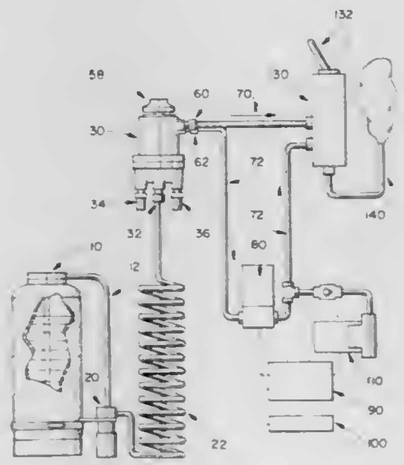
Timothy William Higenbottam, Section of Respiratory Medicine, Medical School Floor F, University of Sheffield, Beechhill Road, Sheffield, England, S10 2RX
PCT No. PCT/GB94/02229, § 371 Date Jul. 3, 1996, § 102(e) Date Jul. 3, 1996, PCT Pub. No. WO95/10315, PCT Pub. Date Apr. 20, 1995
PCT Filed Oct. 11, 1994, Ser. No. 624,613
Claims priority, application United Kingdom, Oct. 12, 1993, 9320978
Int. Cl.⁶ A61M *16/00*
U.S. Cl. 128—204.21 **22 Claims**



1. An apparatus for carrying out the treatment of a patient with nitric oxide in connection with one of a lung disease or condition of the type that can be treated by the administration of gaseous nitric oxide by inhalation, the apparatus comprising:
- means for supplying gaseous nitric oxide from a source thereof to the patient substantially free of any respiratory gas for inhalation thereby, the supply means incorporating regulator means to control the egress of nitric oxide from the source;
- means to monitor the patient's respiration; and
- control means for controlling the regulator to cause the egress from the source of a very short pulse of nitric oxide of a known, predetermined duration at a predetermined instant during an inhalation, the pulse having a duration less than a duration of the inhalation, whereby the nitric oxide is delivered specifically to the site of interest in the patient's lung.

5,839,434
METHOD AND APPARATUS FOR DISPENSING RESPIRATORY GASES

Jack Joseph Enterline, Fort Pierce, Fla., assignor to Invacare Corporation, Elyria, Ohio
Filed Nov. 16, 1993, Ser. No. 153,569
Int. Cl.⁶ A61M *16/00*
U.S. Cl. 128—204.23 **17 Claims**



1. A method for delivering a precise dose of respiratory gas upon initiation of an inspiratory effort and within less than half of the inspiratory effort comprising:
- sensing a negative effort corresponding to the initiation of inspiration in a sensing means;
- converting the sensed negative effort to an electrical signal;
- transmitting the electrical signal to a solenoid valve positioned to control a flow of respiratory gas;
- opening the solenoid valve in response to receipt of the electrical signal for an amount of time equal to less than half of the duration of the inspiratory effort; and
- delivering the dose of respiratory gas to a patient, while the solenoid valve is open, at a desired volume and at a constant flow rate.

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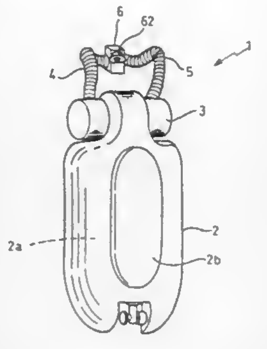
5,839,435
MOUTHPIECE UNIT FOR SEMICLOSED-CIRCUIT BREATHING APPARATUS

Shunsuke Matsuoka, and Kiyoshi Hashimoto, both of Chiha-ken, Japan, assignors to Grand Bleu, Inc., Tokyo, Japan
PCT No. PCT/JP95/02196, § 371 Date Oct. 7, 1997, § 102(e) Date Oct. 7, 1997, PCT Pub. No. WO97/15487, PCT Pub. Date May 1, 1997
PCT Filed Oct. 25, 1995, Ser. No. 860,841
Int. Cl.^{6} A62B *7/10*
U.S. Cl. 128—205.12 **2 Claims**



1. A mouthpiece unit for a semiclosed-circuit breathing apparatus constituted so that exhaled air recovered from the mouthpiece unit is regenerated by being passed through a carbon dioxide adsorption apparatus, and a mixture of the regenerated gas and a constant flow of fresh gas for inhalation supplied from a breathing gas cylinder is supplied to the mouthpiece unit as inhalation gas and surplus gas is discharged to the outside, comprising:

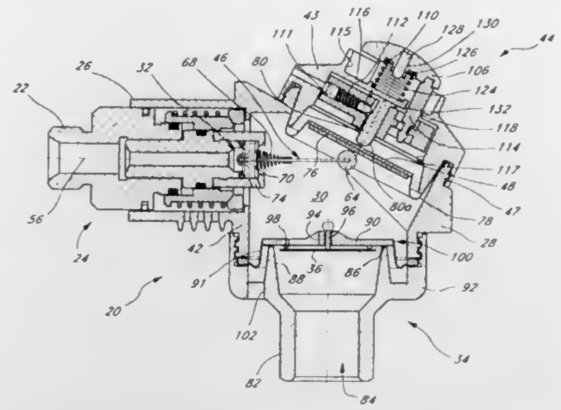
an inhaled/exhaled air circulation chamber that includes an opening in communication with an exhalation air hose for circulation of exhaled air, an opening in communication with an inhalation air hose for circulation of inhaled air, and an external opening in communication with an exterior;
a gas supply opening for supplying the inhaled/exhaled air circulation chamber with a constant flow of fresh breathing gas from the breathing gas cylinder;
a mouthpiece attached to the external opening;
a manually operated member that is maintained at an initial position by resilient force and can be shifted to a first operating position against the resilient force;
an external opening valve for opening the external opening in interlocked operation with the shift to the first operating position of the manually operated member;
a first lever for opening and closing the gas supply opening in interlocked operation with operation of the external opening valve; and
a latch lever that engages with the external opening valve when the valve is in an open state and maintains the engagement to maintain the external opening valve in the open state as long as a diver is holding the lever in the diver's mouth.

5,839,436
DEMAND VALVE WITH A REDUCED MANUAL FLOW CONTROL

Thomas F. Fangrow, Jr., Corona, and Donald G. Rulifson, Yorba Linda, both of Calif., assignors to Life Support Products, Inc., Irvine, Calif.
Continuation of Ser. No. 943,781, Sep. 11, 1992, abandoned. This application Aug. 7, 1995, Ser. No. 512,129
Int. Cl.^{6} A62B *9/02;7/04;* F16K *31/26*
U.S. Cl. 128—205.24 **18 Claims**

1. A resuscitator for supplying breathing gas to a patient, comprising:

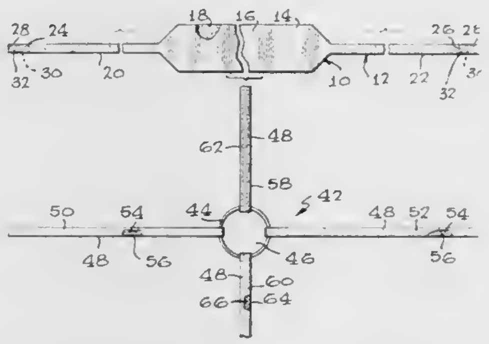
a housing having a pressure chamber with a breathing gas inlet and a breathing gas outlet for directing gas from the chamber to a patient;



a moveable element connected to the housing in a manner to move in response to pressure changes in said chamber;
a normally closed valve in said inlet controlling the flow of breathing gas into the chamber, said valve being connected to said element to open in response to movement of said element as a result of a reduction in pressure in said chamber caused by a patient's inhalation demand for breathing gas through said gas outlet;
a manually controlled actuator mounted on said housing to apply a force to said pressure responsive element to cause said element to move and open said valve; and
said actuator including structure which is responsive to a predetermined threshold pressure in said chamber applied to said element to become temporarily unable to apply any force to said element.

5,839,437
ENDOTRACHEAL TUBE ANTI-DISCONNECT DEVICE

Stephen W. Briggs, III, P.O. Box 1503, Orangevalt, Calif. 95662
Filed Oct. 28, 1997, Ser. No. 959,551
Int. Cl.^{6} A61M *16/00;* A62B *9/06*
U.S. Cl. 128—207.17 **4 Claims**



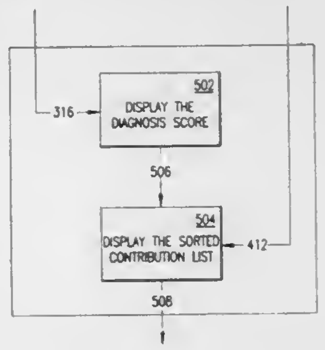
1. An improved endotrachial tube anti-disconnect device, said device comprising, in combination:

a) a flexible, resilient neck band having an elongated body having front and rear surfaces, said front surface bearing hook-receiving means, said body having having two opposite ends, each said end having front and rear surfaces, the front surface of each said end bearing a plurality of hooks adapted to be releasably passed through slots in an endotrachial tube connector and being adapted to be releasably secured to said front surface of said body to hold said connector in place against a throat; and,
b) an anti-disconnect ring assembly, said assembly comprising, in combination:
   i. a ring having a central endotracheal tube-receiving space, said ring thereby being adapted to fit around an endotracheal tube,

   ii. first and second horizontally extending flexible resilient wings connected to said ring and extending outwardly from opposite sides of said ring, said wings having front and rear surfaces, said rear surfaces of said wings bearing a plurality of hooks adapted to being releasably secured to said front surface of said body of said neck band to hold said ring against said neck band body, and,
   iii. first and second flexible resilient vertically extending arms connected to opposite top and bottom portions of said ring, said first arm having front and rear surfaces, the front surface of which bears hook-receiving means, said second arm having front and rear surfaces, the rear surface of which bears a plurality of hooks, said arms being adapted to wrap around an endotracheal tube and to releasably connect to each other to hold said endotracheal tube in place.

5,839,438
COMPUTER-BASED NEURAL NETWORK SYSTEM AND METHOD FOR MEDICAL DIAGNOSIS AND INTERPRETATION

Timothy Joseph Graettinger, Bethel Park, Pa., and Paul Alton DuBose, Hillsborough, N.C., assignors to Neuralmed, Inc., Durham, N.C.
Filed Sep. 10, 1996, Ser. No. 712,986
Int. Cl.^{6} A61B *19/00*
U.S. Cl. 128—630 **29 Claims**


502
DISPLAY THE DIAGNOSIS SCORE
316
506
504
DISPLAY THE SORTED CONTRIBUTION LIST
412
508

1. A method for diagnosis of a medical condition comprising the steps of:

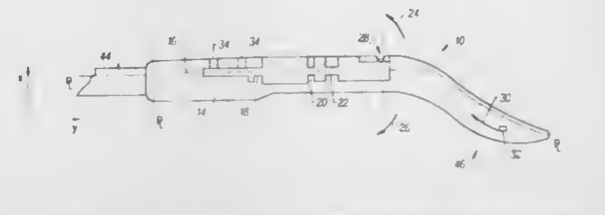
providing a plurality of input parameters representing characteristics of the medical condition;
converting said plurality of input parameters into numerical data;
inputting the numerical data to a neural network trained to detect the medical condition and determining a score indicative of the likelihood of the medical condition on the basis of the numerical data;
interpreting the numerical data to provide estimates of the contribution of input parameters to the determined score; and
displaying the determined score and the provided estimates in a human-readable form.

5,839,439
OXIMETER SENSOR WITH RIGID INNER HOUSING AND PLIABLE OVERMOLD

Steve L. Nierlich; Phillip S. Palmer, both of San Leandro; James R. Casciani, Copertinu; Mitch Levinson, Pleasanton, and Stephen J. Ruskewicz, Kensington, all of Calif., assignors to Nellcor Puritan Bennett Incorporated, Pleasanton, Calif.
Filed Nov. 13, 1995, Ser. No. 556,619
Int. Cl.^{6} A61B *5/00*
U.S. Cl. 128—633 **41 Claims**

1. An oximeter sensor comprising:

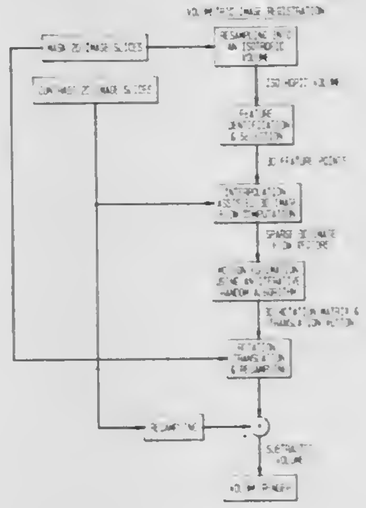
a housing formed from a material with a first rigidity;



a plurality of oximeter components mounted in said housing, including at least a light source and a light detector;
an overmolded material covering most of said housing on multiple sides of said housing, leaving openings to expose at least said light source and said light detector, said overmolding material having a second rigidity which is less than said first rigidity.

5,839,440
THREE-DIMENSIONAL IMAGE REGISTRATION METHOD FOR SPIRAL CT ANGIOGRAPHY

Shih-Ping Liou, West Windsor; Minerva M. Yeung, and Boon-Lock Yeo, both of Princeton, all of N.J., assignors to Siemens Corporate Research, Inc., Princeton, N.J.
Filed Jun. 17, 1994, Ser. No. 261,643
Int. Cl.^{6} A61B *6/00*
U.S. Cl. 128—654 **24 Claims**



1. A computer-implemented method for three-dimensional image registration in an imaging technique utilizing mask images, and respective data thereto, obtained before opacification and contrast images acquired after the injection of a contrast media bolus, said method comprising the steps of:

resampling serial axial CT mask and contrast images into respective isotropic 3D volumes;
selecting 3D feature points in said mask volume;
establishing correspondences in said contrast volume;
processing resulting sparse 3D image flow vectors by an iterative random algorithm and computing motion parameters, translation and rotation, in a least squares optimized sense that are agreed upon by at least a preset percentage of pairs whereby patient motion is found;
after patient motion is found, transforming said mask volume accordingly and subtracting it from said contrast volume; and
rendering and displaying a resulting volume.

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5,839,441

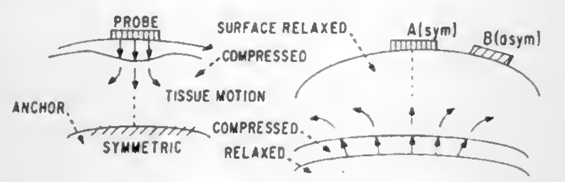
MARKING TUMORS AND SOLID OBJECTS IN THE BODY WITH ULTRASOUND

Bernard D. Steinberg, Wyndmoor, Pa., assignor to The Trustees of the University of Pennsylvania, Philadelphia, Pa.

Filed Jun. 3, 1996, Ser. No. 657,412

Int. Cl.^{6} A61B *8/00*

U.S. Cl. 128—660.04 **9 Claims**



1. A method of identifying tumors and foreign materials in soft tissue of a patient using ultrasound imaging, comprising the steps of:

- a. imaging a target soft tissue area to obtain a first ultrasonic image;
- b. displacing said target soft tissue area;
- c. imaging said displaced target soft tissue area to obtain a second ultrasonic image; and
- d. identifying whether tumors or foreign materials are present in said target soft tissue area based on changes in a speckle pattern between said first and second ultrasonic images.

5,839,442

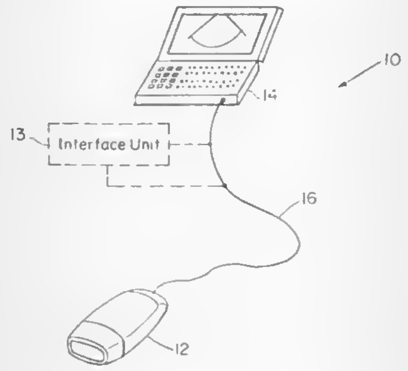
PORTABLE ULTRASOUND IMAGING SYSTEM

Alice M. Chiang, Weston, and Steven R. Broadstone, Woburn, both of Mass., assignors to TeraTech Corporation, Burlington, Mass.

Filed Jun. 29, 1995, Ser. No. 496,805

Int. Cl.^{6} A61B *8/00*

U.S. Cl. 128—661.01 **32 Claims**



1. A portable ultrasound imaging system comprising:

- a hand-held scan head housing that receives reflected ultrasonic signals from a region of interest, the hand-held scan head housing comprising:
  - an array of ultrasonic transducers that receives the reflected ultrasonic signals from the region of interest and converts the received ultrasonic signals into electrical signals, and
  - beam forming circuitry including a delay circuit within the scan head housing that receives the electrical signals from the ultrasonic transducers;
  - a summing circuit that sums the delayed electrical signals;
- a portable computer system comprising:
  - a system housing;
  - processing circuitry within the system housing that receives and processes a digital electronic representation of the region of interest from the scan head housing;
  - scan conversion circuitry within the system housing which converts polar coordinates of the digital electronic representation to rectangular coordinates,
- a display that displays an image of the region of interest,
- a keyboard that provides a user interface, and
- a battery within the system housing that powers the portable computer system and the scan head; and
- a cable connecting the scan head housing to the portable computer system housing such that a digital electronic representation of the region of interest is received by the portable computer system through the cable.

5,839,443

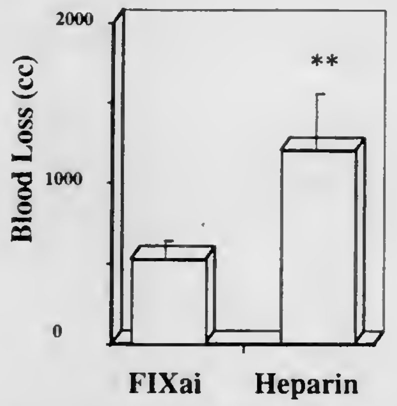
METHOD FOR INHIBITING THROMBOSIS IN A PATIENT WHOSE BLOOD IS SUBJECTED TO EXTRACORPOREAL CIRCULATION

Eric Rose, Tenafly, N.J.; David Stern, Great Neck, N.Y.; Ann Marie Schmidt, Franklin Lakes, N.J., and Talia Spanier, New York, N.Y., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Filed May 16, 1996, Ser. No. 648,561

Int. Cl.^{6} A61B *19/00*

U.S. Cl. 128—898 **10 Claims**



1. An assay to determine the anticoagulant activity of a Factor IXa compound on a subject's blood which comprises:

- (a) mixing Factor IX deficient plasma, diatomaceous earth and plasma containing the Factor IXa compound derived from the subject's blood;
- (b) incubating the resulting mixture from step (a) with an effective dose of a source of phospholipid and calcium chloride under conditions such that clot formation results; and
- (c) measuring the time necessary for clot formation in the incubate of step (b) so as to thereby determine the anticoagulant activity of the Factor IXa compound.

5,839,444

DEGLUTITION ASSISTING INSTRUMENT

Hiroyuki Komatsu; Kuniyuki Komatsu, both of Tokyo, and Shigeru Ono, Kawasaki, all of Japan, assignors to Dental Aid Co. Ltd., Tokyo, Japan

Filed May 19, 1997, Ser. No. 858,445

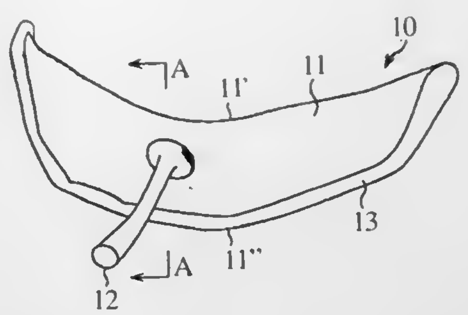
Claims priority, application Japan, Jan. 28, 1997, 9-014265

Int. Cl.^{6} A61C *5/14*

U.S. Cl. 128—859 **4 Claims**

1. A deglutition assisting instrument comprising:

- a body in a form of a thin elastic plate for being inserted into and supported in a position between an inner lower portion of a lower lip and outer surface of a lower gum in an oral cavity of a patient, and
- an operative member projecting from said body,
- wherein said instrument with said body being in said position allows closing of the lips of the patient with said operative member extending out of the oral cavity between said lips,



- wherein said body is moved following the movement of the operative member, thereby inducing a desired action in the oral cavity or giving stimulation within the oral cavity,
- wherein said body has a surface and a lower edge portion thickened and extending outwardly of said surface, wherein said thickened portion is on the same side as the operative member, and
- wherein said body is sized such that an upper edge of the body slightly beyond an upper edge of lower anterior teeth of the patient when it is placed in said position.

5,839,445

METHOD OF DIAGNOSIS OF DISEASES USING CONFOCAL MICROSCOPE

Stephen C. Kaufman, New Orleans, La., assignor to Con-S Ltd., Metairie, La.

Filed Jul. 25, 1996, Ser. No. 686,986

Int. Cl.^{6} A61B *19/00*

U.S. Cl. 128—898 **1 Claim**

1. A method of diagnosing disease in a mucus membrane comprising the following steps:

- a) placing in vivo the mucus membrane within the effective viewing area of a confocal microscope;
- b) placing an optical coupling medium between the lens of the confocal microscope and the surface of the mucus membrane;
- c) using the confocal microscope to scan at one or more levels below the surface of the mucus membrane for structures not observed in a normal mucus membrane; and
- d) comparing the visual characteristics of structures observed with corresponding visual characteristics of structures known to be associated with a disease; and
- e) where the characteristics of an observed structure substantially match the characteristics of a structure known to be associated with a disease, concluding that the disease in the mucus membrane is the disease known to be associated with the structure observed.

5,839,446

LASER PERFORATOR

Milton Waner; Stephen T. Flock, both of Little Rock, and Charles H. Vestal, Sheridan, all of Ark., assignors to Transmedica International, Inc., Little Rock, Ark.

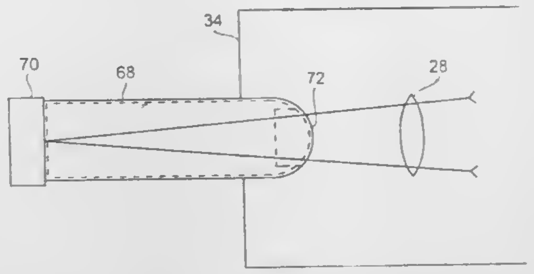
Division of Ser. No. 126,241, Sep. 24, 1993, Pat. No. 5,643,252, which is a continuation-in-part of Ser. No. 968,862, Oct. 28, 1992, abandoned. This applicatinn Jan. 17, 1997, Ser. No. 784,982

Int. Cl.^{6} A61B *17/36*

U.S. Cl. 128—898 **16 Claims**

1. A method for perforating skin without the use of a sharp object comprising the steps of

- a) focusing a laser beam in the shape of an ellipse at a surface of the skin with sufficient energy to create a hole at least as deep as a keratin layer of the skin and at most as deep as a capillary layer of the skin; and



- b) creating at least one hole, each hole having a width between 0.05 and 0.5 mm and a length equal to or less than 2.5 mm.

5,839,447

CIGARETTE FILTER CONTAINING MICROCAPSULES AND SODIUM PYROGLUTAMATE

Craig Lesser, 12475 Ridge Rd., Middletown, Calif. 95461, and Reid W. Von Borstel, 10301 S. Glen Rd., Potomac, Md. 20854

Continuation-in-part of Ser. No. 2,951, Jan. 11, 1993, abandoned, Ser. No. 363,975, Dec. 23, 1994, Pat. No. 5,501,238, Ser. No. 543,050, Oct. 13, 1995, abandoned, and Ser. No. 648,314, May 15, 1996, Pat. No. 5,746,231. This application Oct. 31, 1996, Ser. No. 739,316

Int. Cl.^{6} A24D *3/00*

U.S. Cl. 131—331 **17 Claims**

1. A tobacco smoke filter comprising a porous substrate having microcapsules dispersed in the filter, wherein the microcapsules comprise a core and a shell, and wherein the shell comprises sodium pyroglutamate.

5,839,448

ABSORBENT ARTICLES

Calvin R. Woodings, Nuneaton, United Kingdom, assignor to Courtaulds Fibres (Holdings) Limited, London, United Kingdom

PCT No. PCT/GB95/01441, § 371 Date Dec. 20, 1996, § 102(e) Date Dec. 20, 1996, PCT Pub. No. WO95/35043, PCT Pub. Date Dec. 28, 1995

PCT Filed Jun. 19, 1995, Ser. No. 765,477

Claims priority, application United Kingdom, Jun. 20, 1994, 9412311

Int. Cl.^{6} A24B *15/00*

U.S. Cl. 131—331 **12 Claims**

1. A cigarette filter comprising a filter body which comprises entangled continuous filaments of lyocell.

5,839,449

LOW CO CIGARETTE

Chandra Kumar Banerjee, Pfafftown; Timothy Brian Nestor, Winston-Salem; Jeffery Scott Gentry, Pfafftown; Elbert Curtis Jones, Jr., Sherrill's Ford; Roger Grady Hayworth, High Point, and Joanne Naomi Taylor, Germanton, all of N.C., assignors to R.J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Jan. 29, 1996, Ser. No. 593,024

Int. Cl.^{6} A24D *3/04*

U.S. Cl. 131—342 **7 Claims**

1. A smoking article comprising a rod of smokable material and a filter having a predetermined length and two ends, one end of which is attached to the rod of smokable material and the other end of which comprises the mouth end of the filter, said filter comprising a unitary filter element and having first and second filter portions, said filter element comprising steam-bonded cellulose acetate, the first filter portion being disposed adjacent the rod of

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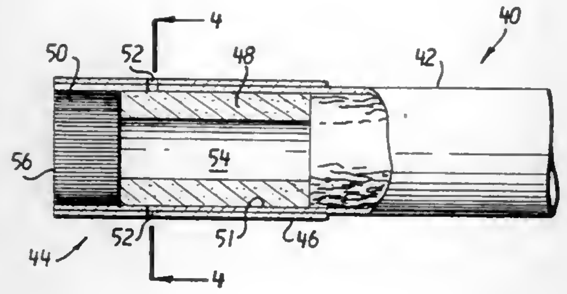
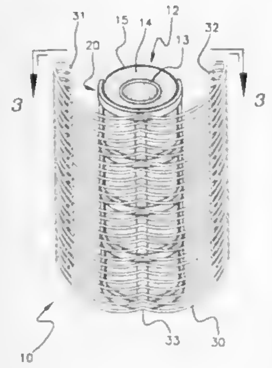


smokable material and having no substantial longitudinal pressure drop, the first filter portion including a central cavity open toward said rod and closed toward the second filter portion, the closed end of said cavity having a tapered wall terminating in a vertex at said second filter portion, the second filter portion being disposed downstream of the first filter portion adjacent the mouth end of the filter, the second filter portion having an annular region surrounding a central region of lower density than said annular region, and air dilution means disposed in said first filter portion for admitting at least 30% ventilating air into the first portion of the filter, substantially all the pressure drop across said filter being effected in said second filter portion downstream of said air dilution means.

5,839,450
HAIR CURLER

Edwina Glasscock, 3503 5th Ave. West, Palmetto, Fla. 34221
Filed Jun. 11, 1998, Ser. No. 95,974
Int. Cl.⁶ A45D *2/12*
U.S. Cl. 132—252 **15 Claims**



1. A hair curler, comprising:

an elongate tubular member having inner and outers surfaces, and a pair of opposite ends;

an elongate casing member being detachably attachable to said outer surface of said tubular member, said casing member having a plurality of ribs and a plurality of elongate strips;

each of said ribs having a pair of terminal ends and an arcuate portion, said arcuate portion of said rib having a midpoint substantially equidistant between said terminal ends of said rib;

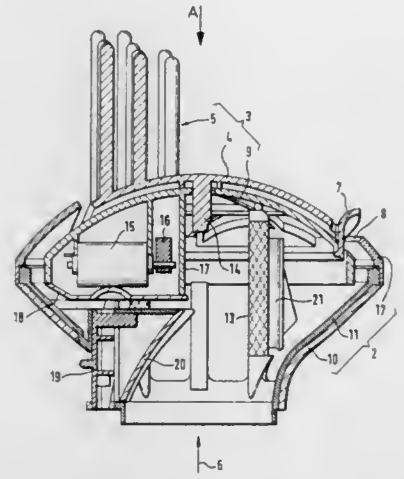
each of said elongate strips having a pair of opposite ends, each of said elongate strips being coupled to each of said ribs;

wherein said ribs are extendable around a portion of said outer surface of said tubular member such that said tubular member is held to said casing member to detachably attach said casing member to said tubular member; and

a plurality of elongate flexible strands being adapted to resemble human hair, each of said flexible strands having a pair of opposite ends and a midpoint between said ends of said flexible strand, each of said flexible strands being coupled to said casing member.

5,839,451
IMPLEMENT FOR THE TREATMENT OF HAIR

Ralf Dorber, Schmitten; Dieter Liebenthal, Maintal, and Peter Janouch, Linsengericht, all of Germany, assignors to Braun Aktiengesellschaft, Frankfurt, Germany
Filed Dec. 19, 1996, Ser. No. 769,339
Claims priority, application Germany, Aug. 16, 1996, 196 33 035.1
Int. Cl.⁶ A45D *20/50*
U.S. Cl. 132—271 **68 Claims**



1. An implement for the treatment of hair adapted to be connected with an air exit of an air-moving hair-care appliance, said implement comprising

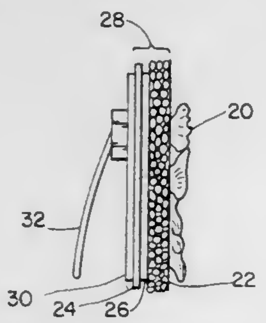
a main body adapted to be connected to said air exit and defining an upstream air entrance opening and a downstream air discharge opening,

an active body movable relative to the main body, and

an electric driver generating a motive force and mounted on the implement in operative engagement with the active body for moving the active body, said electric driver being mounted on the active body.

5,839,452
HAIR ORNAMENT

Balarie Sarwar, 4333 Latona Ave., Los Angeles, Calif. 90031
Continuation of Ser. No. 109,238, Dec. 10, 1993, abandoned. This application Jul. 21, 1995, Ser. No. 505,559
Int. Cl.⁶ A45D *8/12*
U.S. Cl. 132—275 **3 Claims**



1. A hair ornamental device in which the primary ornamental portion is made entirely of natural materials comprising:

a mounting means for attaching the device to a user's hair;

a rigid platform element attached to the mounting means made substantially of a plurality of pieces of a natural fibrous vegetable material having limited flexure and being adhered together to form said platform and having an upper platform surface and a lower platform surface said upper and lower platform surfaces defining oppositely facing surfaces of said platform element said mounting means being attached to said lower platform surface;

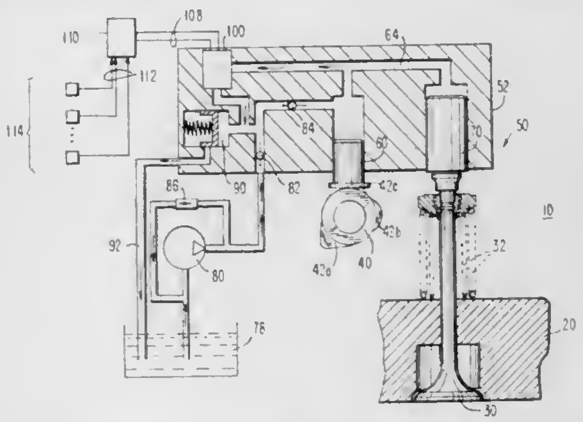
at least one decorative element attached to the upper platform surface, said at least one decorative element being of a natural material which is different from the natural material of the platform element;

inner core layer of natural vegetable material adhered to said lower platform surface;

a subplatform element of smooth natural vegetable material applied over and attached to said inner core layer defining a layer of said subplatform element material between said platform and a user's hair when said device is attached to a user's hair by the mounting means and said subplatform and inner core layer having an opening and said mounting means is attached directly to said platform through said opening.

5,839,453
INTERNAL COMBUSTION ENGINES WITH COMBINED CAM AND ELECTRO-HYDRAULIC ENGINE VALVE CONTROL

Haoran Hu, Farmington, Conn., assignor to Diesel Engine Retarders, Inc., Wilmington, Del.
Continuation of Ser. No. 772,781, Dec. 24, 1996, Pat. No. 5,680,841, which is a continuation of Ser. No. 512,528, Aug. 8, 1995, abandoned. This application Oct. 22, 1997, Ser. No. 955,509
Int. Cl.⁶ F01L *13/06*
U.S. Cl. 123—322 **27 Claims**

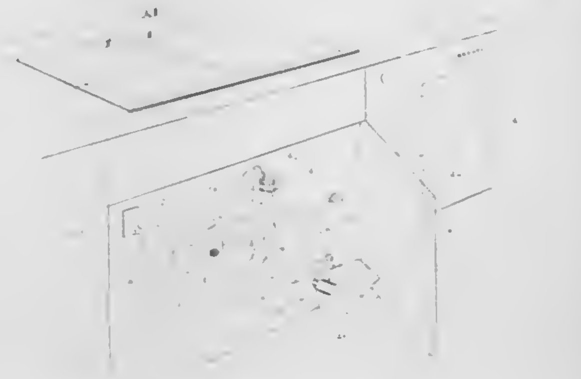


1. An internal combustion engine having a four-cycle positive power mode and including an engine cylinder valve which is selectively openable and closable, a cam having a plurality of lobes synchronized with possible openings of said engine cylinder valve, a hydraulic linkage containing hydraulic fluid operatively coupled between said cam and said engine cylinder valve for selectively responding to said lobes by causing said valve to open, and an electrically operated valve controlled by an electronic control circuitry for selectively releasing hydraulic fluid from said hydraulic linkage in order to selectively modify the openings of said engine cylinder valve in response to said lobes, said electrically operated valve being selectively operable to allow said engine cylinder valve to remain completely closed in response to any first one of said lobes and to open in response to any second one of said lobes, characterized in that said electrically operated valve is openable and closable multiple times during each time period of operation of said engine comparable to each four cycles of positive power mode operation of said engine.

22. A compression release braking system for an internal combustion engine including an engine cylinder exhaust valve which is selectively openable and closable, a cam having a lobe synchronized with a possible opening of said exhaust valve, a hydraulic linkage containing hydraulic fluid operatively coupled between said cam and said exhaust valve for selectively responding to said lobe by causing said valve to open, and a hydraulic fluid control having a plurality of different operating conditions in which the hydraulic fluid control has respective different effects on the hydraulic fluid pressure in said hydraulic linkage in response to said lobe, characterized in that said lobe is a compression release engine braking lobe synchronized with a possible compression release opening of said exhaust valve, and the hydraulic fluid control is responsive to a variable operating condition of said engine by changing said operating conditions of said hydraulic fluid control at different times during response of the hydraulic linkage to said lobe.

5,839,454
AUTOMATIC DETERGENT DISPENSER

Warren W. Matz, 13882 U.S. Hwy. 1, Juno Beach, Fla. 33408
Filed Mar. 14, 1997, Ser. No. 818,608
Int. Cl.⁶ A47L *15/44*
U.S. Cl. 134—57 D **19 Claims**



1. In combination with a dishwasher having a washing chamber and internal spray mechanism operated by water flowing through an electrically actuated inlet solenoid for cleansing of utensils placed within the chamber having detergent released through the use of a chamber mounted dispenser mechanism, an automatic detergent dispenser comprising: storage means for holding a large volume of liquid detergent; transfer means fluidly coupling said storage means to said washing chamber; and a control means electrically coupling said transfer means to said inlet solenoid and said chamber mounted dispenser mechanism;

whereby said storage means is located external said chamber wherein liquid detergent is drawn from said storage means by said transfer means upon initiation of said chamber mounted dispenser mechanism if said inlet solenoid is actuated.

5,839,455
ENHANCED HIGH PRESSURE CLEANSING SYSTEM FOR WAFER HANDLING IMPLEMENTS

Virgil Q. Turner, Sugarland; William D. Light, Richmond; Hilario T. Trevino, Needville; Richard L. Guldi, Dallas; Frank Poag, Plano, and Douglas E. Paradis, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Apr. 13, 1995, Ser. No. 422,331
Int. Cl.⁶ B08B *3/02*
U.S. Cl. 134—57 R **15 Claims**

1. A system for cleansing a substrate, comprising:

a processing chamber dimensioned to receive a substrate;

at least one cleansing medium applicator connectable to a supply of cleansing medium and disposed to direct cleansing medium under pressure at a substrate received within said processing chamber;

an exhaust conduit in fluid communication with said processing chamber a one end and connectable to a source of negative pressure at another end to evacuate cleansing medium applied to the substrate;

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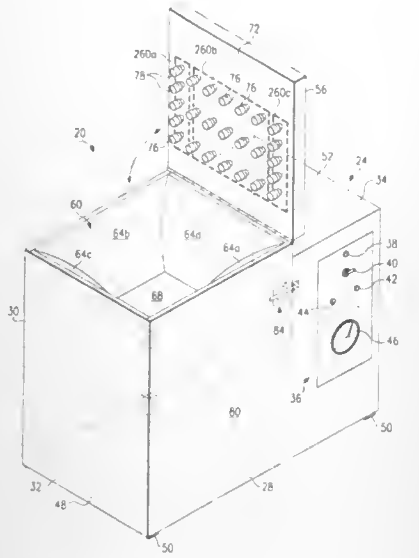


a control system operable to regulate the delivery of cleansing medium to said at least one applicator in accordance with a predetermined criterion; and

a pulse control system operable to pulse application of said cleansing medium, wherein said pulse control system provides for selection of ate least one of pulse frequency, pulse application duration, and number of application cycles of said cleansing medium.

5,839,456
WAFER WET TREATING APPARATUS

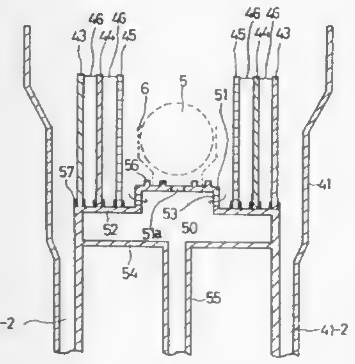
Suk Bin Han, Chungcheongbuk-do, Rep. of Korea, assignor to LG Semicon Co., Ltd., Chungcheongbuk-do, Rep. of Korea

Filed Aug. 20, 1997, Ser. No. 914,794

Claims priority, application Rep. of Korea, Dec. 24, 1996, 1996 71487

Int. Cl.^{6} B08B *3/04*

U.S. Cl. 134—104.1 **13 Claims**



1. A wafer wet treatment apparatus comprising:

a first supply/discharge line;

an outer bath connected to the first supply/discharge line;

an inner bath within the outer bath;

a second supply/discharge line connected to the inner bath;

at least one removable partition located within the inner bath and dividing the inner bath into isolated portions; and

at least one partition receiving member for holding the at least one removable partition.

5,839,457
DEVICE FOR RINSING OBJECTS

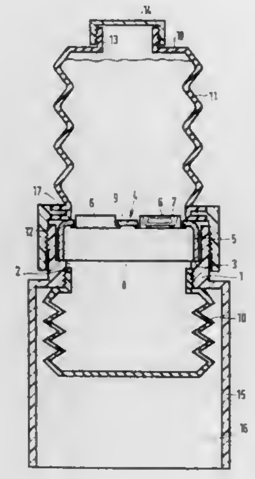
Martinus M. Rijken, Drachten, and Teunis Tel, Groningen, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 570,307, Dec. 11, 1995, abandoned. This application Jun. 25, 1997, Ser. No. 882,441

Claims priority, application European Pat. Off., Dec. 12, 1994, 94203597

Int. Cl.^{6} B08B *3/04*

U.S. Cl. 134—110 **20 Claims**



1. A device for rinsing objects, which device comprises a holder for supporting an object to be cleaned, the holder having at least two passages to the object when the object is situated in said holder in operation, at least two reservoirs for holding rinsing liquid, a first reservoir communicating with a first passage and a second reservoir communicating with a second passage, at least the first reservoir having a variable volume, wherein at least one of said first and second reservoirs is a vessel with rinsing liquid and the holder is provided with a piston which is movable in the vessel.

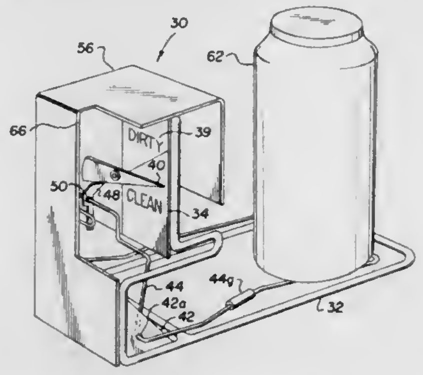
5,839,458
DISHWASHER CLEAN/DIRTY INDICATOR

Kevin James Delcarson, 3741 Ashford Dr., Bedford, Tex. 76021

Filed Aug. 22, 1997, Ser. No. 916,300

Int. Cl.^{6} A47L *15/42*

U.S. Cl. 134—113 **20 Claims**



1. A dishwasher indicating device for indicating the clean or dirty condition of items in a dishwasher, said dishwasher indicating device comprising:

a frame for mounting components of said dishwasher indicating device, said frame comprising bearing surfaces at predetermined locations;

an indicator with a latching point, said indicator for showing a user of said dishwasher the clean or dirty condition of the items in said dishwasher;

a heat activated rotational means comprising a shaft of predetermined length, said rotational means being supported by said frame and being configured for moving said indicator to a clean indicating position when heat is applied to the rotational means;

a latch configured to latch said indicator in the clean indicating position upon said application of said heat;

a release arm connected to said latch, said release arm being movable at said bearing surfaces of said frame to an unloaded position where said latch is moved away from said latching point of said indicator, allowing the indicator to move to a dirty indicating position; and

a retracting means for biasing said release arm to said unloaded position;

whereby the user of said dishwasher indicating device can determine from said indicator when the items in said dishwasher are clean or dirty.

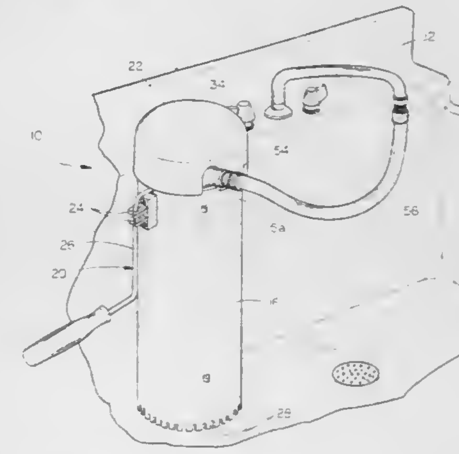
5,839,459
PAINT ROLLER CLEANING APPARATUS

William G. Bisby, 100 Parkhill Terrace Dr. #24, Fenton, Mo. 63026

Filed Oct. 13, 1997, Ser. No. 949,260

Int. Cl.^{6} B08B *3/02*

U.S. Cl. 134—138 **7 Claims**



1. A paint roller cleaning apparatus, comprising:

a hollow tubular pipe having open upper and lower ends and an interior;

a slot extending downwardly from an upper edge of the pipe, for receiving a paint roller support rod therein, the slot having a lower end;

an elongated aperture in the pipe proximal to and spaced below the upper edge and extending generally horizontally, for receiving a tubular elbow therethrough;

a spray arm connected in a generally vertical orientation within the interior of the pipe, said spray arm including a tube with a plurality of vertically aligned and vertically spaced apart spray apertures therein for spraying fluid generally horizontally from the spray arm;

the spray arm including an elbow at an upper end thereof with one end fluidly connected to an upper end of the spray arm tube, and a second end projecting through the pipe aperture and extending outwardly from the pipe

a lid removably and rotatably connected to the upper end of the pipe, for selectively enclosing the upper end of the pipe and being rotatable thereon;

said lid including a continuous depending side wall extending downwardly to substantially cover the slot;

said lid including a slot extending upwardly from a lower edge of the side wall, for receiving the projecting portion of the elbow therein and for pivoting the elbow within the aperture about a longitudinal axis of the spray arm when the lid is rotated, so as to rotate the spray arm within the pipe; and

a plurality of legs mounted on the lower end of the pipe, supporting the pipe above a support surface to permit fluid flow out of the lower end of the pipe.

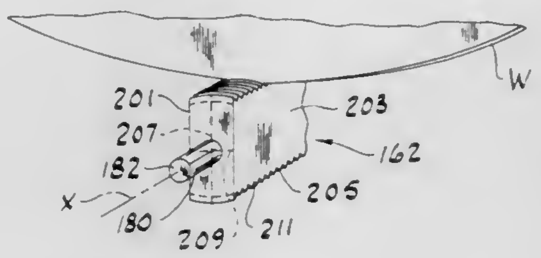
5,839,460
APPARATUS FOR CLEANING SEMICONDUCTOR WAFERS

Jing Chai, and Jackie Watson, both of St. Charles, Mo., assignors to MEMC Electronic Materials, Inc., St. Peters, Mo.

Filed Nov. 13, 1997, Ser. No. 970,129

Int. Cl.^{6} B08B *3/04*

U.S. Cl. 134—147 **23 Claims**



1. Sonic wafer cleaning apparatus for cleaning semiconductor wafers, said apparatus comprising:

a tank for containing a liquid, the tank being sized and shaped for receiving at least a portion of a semiconductor water;

a sonic energy generator for imparting sonic energy to the liquid;

a wafer holder received within the tank for holding the semiconductor wafer with at least a portion of the semiconductor wafer immersed in the liquid in the tank; and

a wafer-moving mechanism received within the tank for reciprocating and rotating the semiconductor wafer so that at least a portion of the wafer repeatedly passes through an upper surface of the liquid, said wafer-moving mechanism comprising a camming mechanism rotatably received in the tank and a drive for rotating the camming mechanism about a fixed central longitudinal axis of the camming mechanism to reciprocate and rotate the wafer, the camming mechanism including a cam body having opposing flats spaced apart on opposite sides of its longitudinal axis and opposing gripping surfaces extending between the flats, the cam body having a cross-section defining a major axis and a minor axis, the major axis of the cam body cross-section being greater than the minor axis, the gripping surfaces having a circumferentially extending groove for receiving a peripheral edge of the semiconductor wafer therein, the groove being sized for gripping the edge of the wafer as the camming mechanism rotates thereby to inhibit slippage of the wafer relative to the camming mechanism and to maintain uniform rotation and reciprocation of the wafer.

5,839,461
PROTECTIVE APPARATUS FOR WALKERS AND OTHERS

Harvey F. Lambeth, Jr., P.O. Box 637, Bolton Landing, N.Y. 12814

Filed Dec. 24, 1997, Ser. No. 998,364

Int. Cl.^{6} A61H *3/02*

U.S. Cl. 135—72 **10 Claims**

1. A personal protective apparatus for protecting a user against an attacker: said apparatus comprising

a hollow housing defining an elongated handgrip wherein said housing has an upper part, a middle part and a lower part, said housing further having a upper end and a bottom end;

an alarm means positioned within said handgrip for emitting an audible alarm;

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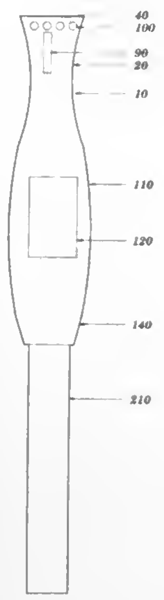
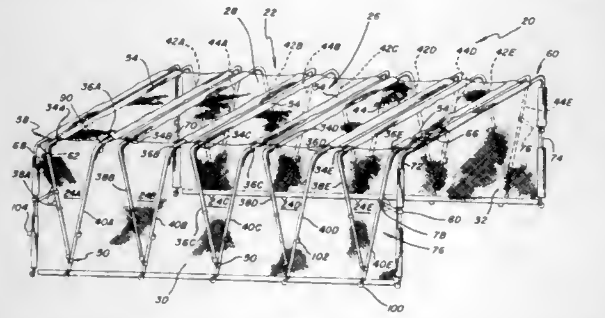


a defensive fluid means positioned within said housing for discharging a defense fluid;
an activator means positioned adjacent to said upper end of said housing for selectively activating said audible alarm means, for selectively activating said defensive fluid means and for selectively activating said alarm means and said defense fluid means;
an upward extending cavity positioned within said bottom end of said hollow housing for detachably receiving a walking stick; and
a storage means positioned within said middle part of said hollow housing for storing items by a user.

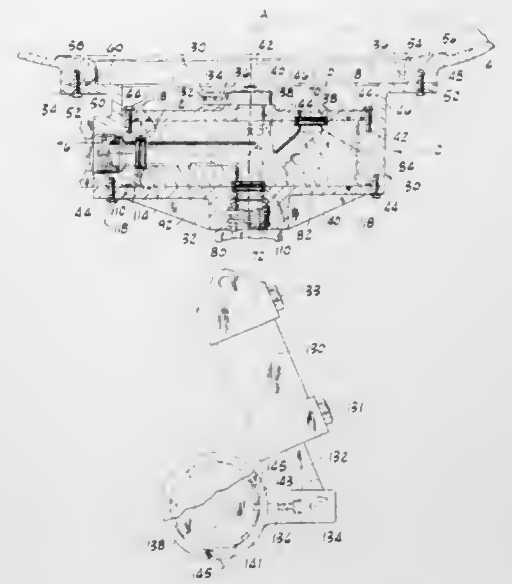
5,839,462
EXTENSIBLE AND RETRACTABLE CANOPY STRUCTURE FOR VEHICLES AND THE LIKE
Paul G. Randall, 1457 W. University Dr. #88, Mesa, Ariz. 85201
Filed May 19, 1997, Ser. No. 858,728
Int. Cl.^{6} E04H *15/44*
U.S. Cl. 135—128 **16 Claims**



1. An extensible and retractable canopy structure for vehicles and the like; the canopy structure having a longitudinal centerline and being extensible and retractable in the direction of the longitudinal centerline comprising:
a canopy support frame (**22**) comprising a plurality of extensible and retractable canopy support sections (**24**A–**24**E) including first and second end canopy support sections (**24**A and **24**E); each of the canopy support sections including a pair of upper transverse support members (**34**A–**34**E and **36**A–**36**E) extending generally perpendicular to the longitudinal centerline of the canopy structure; each of the canopy support sections (**24**A–**24**) having first and second pairs of side support members (**38**A–**38**E, **40**A–**40**E and **42**A–**42**E, **44**A–**44**E which extend in generally vertical planes along each side of the canopy structure; the side members of each of the pairs of side support members having lower portions pivotally secured to each other and upper portions rigidly secured to ends of the upper transverse support members of (**34**A–**34**E and **36**A–**36**E of the canopy support section whereby in a retracted position the side support members of each canopy support section extend substantially vertical and in an extended position the side support members of each canopy support section extend at an acute angle to each other with the upper portions of the side support members spaced apart;
the canopy support frame (**22**) including first and second canopy end frames (**58**) and (**60**), each including an upper transverse support member (**62**) and (**64**) and first and second generally vertically extending side support members; (**68**, **70**) and (**72**, **74**);
means (**56**, **60**) securing one of the upper transverse support members (**34**A and **36**E) of each of the end canopy support sections (**24**A and **24**E) to the adjacent transverse support member (**62** and **64**) of one of canopy end frames (**58** and **60**);
means (**76**) for retaining the side support members of the canopy end frames (**68**, **70** and **72**, **74**) and adjacent side support members (**38**A, **42**A and **40**E and **44**E) of the end canopy support sections (**24**A and **24**E) in a fixed, spaced relationship when the canopy structure is extended to maintain the canopy structure in an extended mode;
a canopy cover (**26**) secured to the canopy support sections (**24**A–**24**E) and the canopy end frames (**58** and **60**); the canopy cover including a roof portion (**28**) and side portions (**30** and **32**) enclosing sides of the canopy structure; and the upper transverse support members of each of the canopy support sections being secured closed to the upper transverse support members of adjacent canopy support sections by the canopy cover; and
the canopy structure having an entrance at a first end of the canopy structure with a height and a width adapted to the greater than a vehicle to be housed within the canopy structure; and canopy end cover means (**92**) for providing an end covering for the entrance to the canopy structure and permitting ingress or egress through the entrance of the canopy structure by passing through the canopy end cover means; and
the canopy structure having an inside height, an inside width and an inside length adapted to be greater than that of a vehicle to be housed within the canopy structure whereby the vehicle can be housed within the canopy structure and a vehicle door of the vehicle housed within the canopy structure can be opened within the canopy structure to permit the vehicle to be entered or exited through the vehicle door.

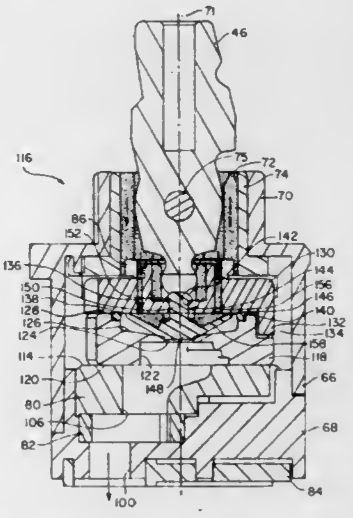
5,839,463
VALVE ASSEMBLY FOR FLUID TRANSFER SYSTEM
James B. Blackmon, Brownsboro, Ala., and Nelson E. Jones, Los Osos, Calif., assignors to McDonnell Douglas Corporation, Huntington Beach, Calif.
Filed Jun. 27, 1997, Ser. No. 883,969
Int. Cl.^{6} E03B *1/00*
U.S. Cl. 137—1 **19 Claims**

14. A method of transferring fuel from a fuel supply tank to an engine through a valve assembly comprising a housing having at least two ports formed therein, a drum rotatably mounted in the housing and having at least one passageway formed therein, said passageway having an opening located at each end thereof positioned on an outer surface of the drum for alignment with at least one of said ports in the housing, the drum being rotatable about a longitudinal axis for selective alignment of said openings with said ports according to the relative angular position of the drum, and an actuator for rotating the drum within the housing to specific angular positions, the method comprising the steps of:
rotating the drum to a filling position wherein the fuel supply tank is in fluid communication with a fuel holding tank to permit flow from the fuel supply tank to the fuel holding tank;



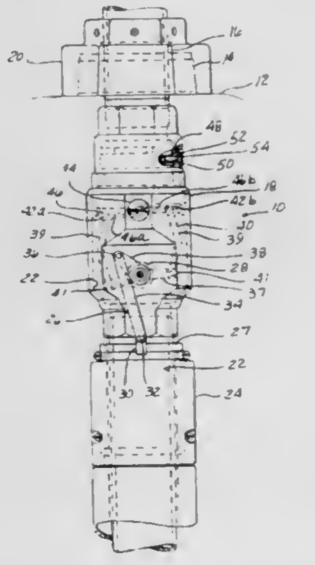
rotating the drum to a delivery position wherein the fuel holding tank is in fluid communication with the engine to permit flow from the fuel holding tank to the engine;
rotating the drum to a venting position wherein the fuel holding tank is in fluid communication with a vent to relieve pressure from the fuel holding tank before rotating the drum to its said filling position; and
rotating the drum to a pressurizing position wherein the holding tank is in fluid communication with a pressure source to pressurize the fuel in the holding tank prior to rotating the drum to its said delivery position.

5,839,464
CARTRIDGE VALVE WITH VACUUM BREAKER
Robert P. O'Hara, Huntington Beach, and Curtis S. Woolley, Carlsbad, both of Calif., assignors to Emhart Inc., Newark, Del.
Filed Jan. 9, 1997, Ser. No. 780,815
Int. Cl.^{6} E03C *1/10*
U.S. Cl. 137—218 **18 Claims**



1. A cartridge valve with a vacuum breaker, which comprises
a housing;
a first disk mounted fixedly within the housing formed with a first surface and formed with an opening therethrough;
a second disk mounted for movement within the housing and formed with a second surface on one side thereof in interfacing engagement with the first surface, and a third surface formed on a side thereof opposite the one side;
the second disk being formed with a passage therethrough which is positionable in communication with the opening formed through the first disk upon selective movement of the second disk;
a valve holder positioned adjacent the third surface of the second disk and having at least one hole formed therethrough for communication with the passage of the second disk;
a flexible valve attached to the valve holder for blocking communication between the hole of the valve holder and the passage of the second disk when the pressure of a medium in the passage is greater than the pressure of a medium in the hole and for allowing communication therebetween when the pressure in the passage is less than the pressure in the hole;
a major opening formed in the cartridge valve such that an environment outside of the cartridge valve is in communication, through the major opening, with the opening formed through the valve holder; and
a lever for moving the valve holder and which extends through the major opening formed in the cartridge valve.

5,839,465
ABOVE-GROUND TANK AUTO-LIMITER
Paul Phillips, Whitehall; Rick E. Puffer, Muskegon, and James F. Biesecker, Grand Haven, all of Mich., assignors to EBW, Inc., Muskegon, Mich.
Filed Apr. 9, 1997, Ser. No. 826,899
Int. Cl.^{6} F16K *31/26;33/00*
U.S. Cl. 137—413 **9 Claims**



1. An above ground valve assembly for preventing overfilling of a liquid storage tank via a pump connectible to a fill pipe in the top of the tank, said valve assembly comprising:
a coupling member threadably and sealingly secured to an upper end of the fill pipe;
a cylindrical valve housing having a drop tube forming a fluid flow passageway;
a single hollow cylindrical float assembly mounted at a lower end of the fill pipe and coaxially mounted along the outer surface of the valve housing for movement with the fluctuation of the fluid level in the storage tank;
first valve means disposed in the fluid flow passageway and moveable between an open position and a closed position, said first valve means having a stem at one end and a dome-shaped valve at a distal end;
actuating means for communicating movement of the float to the first valve means; and
second valve means disposed in the valve housing and moveable between an open position and a closed position, wherein said

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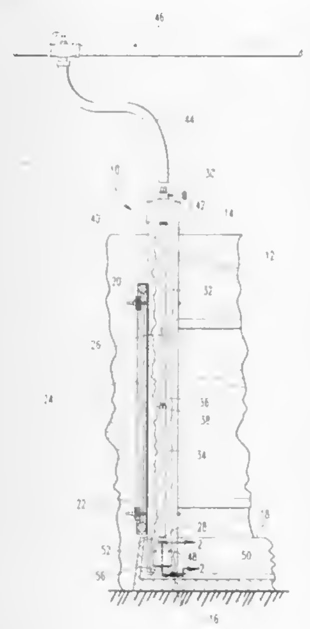
second valve means is moveable independently of said first valve means solely in response to pressure in the valve housing, the second valve means extends through the outer wall of the valve housing such that the second valve means communicates with atmospheric pressure for bleeding fluid from above the first valve means when the first valve means is in the closed position, such that the fluid is bled to the storage tank after fluid pressure is removed from the fluid flow passageway above the first valve means.

5,839,466
AUTOMATIC WATERING DEVICE

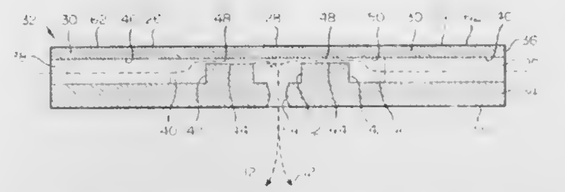
Marshall Dutter, Rte. 2, Box 100, Flora, Ind. 46929
Filed Apr. 29, 1996, Ser. No. 638,793
Int. Cl.^{6} F16K *31/34;51/00*
U.S. Cl. 137—414 **15 Claims**



11. In combination:
a reservoir; and
an automatic watering device, the automatic watering device comprising:
  an elongated hollow housing fixedly positioned relative to the reservoir and having a first open end extending into the reservoir;
  an elongated hollow pipe slidably received within said housing, said pipe having a first end extending into said housing and an opposite second end connected to a source of liquid;
  a liquid control valve including a float and having an inlet port connected to said first end of said pipe and an outlet port, said control valve responsive to a level of liquid within the reservoir acting against said float to inhibit liquid flow therethrough and otherwise permitting liquid from said source of liquid to flow from said outlet port into the reservoir, said device thereby maintaining said level of liquid within the reservoir; and
  means for securing said housing to said pipe at various locations along said pipe relative to said housing to thereby adjustably position said control valve within said housing adjacent said open end thereof.

5,839,467
MICROMACHINED FLUID HANDLING DEVICES

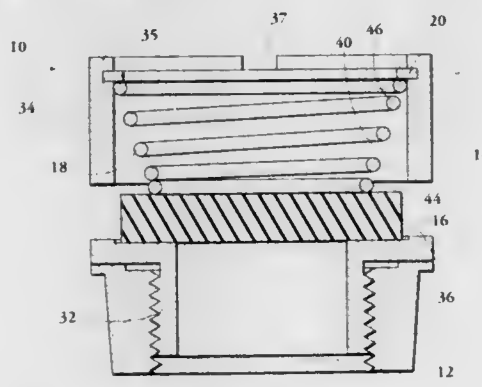
Elrie W. Saaski, Bothell, and Dale M. Lawrence, Lynnwood, both of Wash., assignors to Research International, Inc., Woodinville, Wash.
Continuation of Ser. No. 131,762, Oct. 4, 1993, abandoned.
This application Jan. 16, 1996, Ser. No. 585,951
Int. Cl.^{6} G05D *7/01*
U.S. Cl. 137—501 **35 Claims**



1. A fluid flow regulator for maintaining a fluid flow from a source of fluid within a predetermined fluid flow range, wherein said regulator comprises: a substrate; a regulator seat located on said substrate; a membrane comprising at least one mounting portion secured to said substrate, and a flexure extending over said regulator seat, wherein said flexure has a top surface and a bottom surface; a regulator gap located between said flexure's bottom surface and a top surface of said regulator seat; fluid inlet means for permitting a fluid to enter said regulator from said source of fluid and to enter said regulator gap; and fluid outlet means for permitting said fluid to exit from said regulator gap and to exit from said regulator; wherein said regulator does not comprise a coiled spring that is mounted in compression between said substrate and said flexure at a position surrounding said regulator seat; wherein, during operation of said regulator, there is a driving pressure difference of said fluid between said fluid inlet means and said fluid outlet means; wherein, in response to an increase in said driving pressure difference, said flexure bows towards said regulator seat an increased amount, to reduce the size of said regulator gap and to tend to hold said fluid flow within said predetermined fluid flow range, despite said increase in said driving pressure difference; and wherein, in response to a decrease in said driving pressure difference, said flexure bows towards said regulator seat a decreased amount, to increase the size of said regulator gap and to tend to hold said fluid flow within said predetermined fluid flow range, despite said decrease in said driving pressure difference.

5,839,468
PUMP VALVE

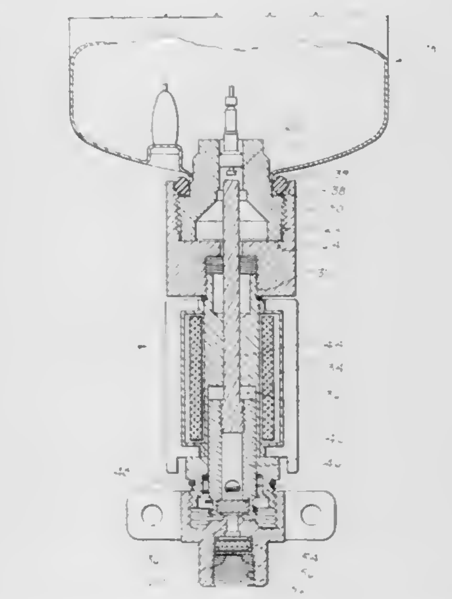
Danny K. Allred, Avant, Okla., assignor to Gene Bias, Skiatook, Okla., a part interest
Filed Oct. 6, 1995, Ser. No. 539,850
Int. Cl.^{6} F16K *25/00*
U.S. Cl. 137—454.4 **6 Claims**



1. A valve for use with a pump having a pump housing comprising:
an adapter of a character to be press fitted in said pump housing, said adapter having a longitudinal passage therethrough and an interior threaded surface in said adapter; an inlet end and an outlet end, said inlet end being adjacent the pump housing;
a valve body including a valve seat;
means for releasably attaching said valve body to said adapter including a neck on said valve body, said neck including threads which mate the threads of said interior surface of said adapter and wherein said valve seat is located exterior of said adapter and at the outlet end;
a disk positioned adjacent said valve seat;
a spring positioned adjacent said disk;
means for securing said disk and said spring to said valve body.

5,839,469
SOLENOID VALVE FOR STARTING FLUID INJECTION SYSTEM

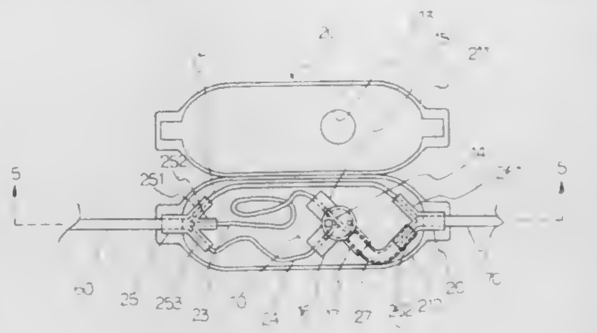
James O. Burke, Richmond, Ill., assignor to Kold Ban International, Ltd., Lake In The Hills, Ill.
Filed Feb. 12, 1997, Ser. No. 798,713
Int. Cl.^{6} F02M *1/16*
U.S. Cl. 137—550 **19 Claims**



1. A solenoid valve for a starting fluid injection system for an internal combustion system, said system comprising a pressurized starting fluid canister comprising a canister valve, said solenoid valve comprising:
  a valve body comprising a passageway, a first valve seat around the passageway, and a second valve seat around the passageway, said second valve seat adapted to form part of a seal against the canister around the canister valve;
  a solenoid coil mounted in the valve body around the passageway;
  a solenoid armature mounted in the passageway to slide between a closed position, in which the armature seals the passageway at the first valve seat and the armature allows the canister valve to close, and an open position, in which the armature opens the passageway at the first valve seat and the armature opens the canister valve;
  an orifice-defining element disposed in the passageway of the valve body near the first valve seat, said orifice-defining element limiting starting fluid flow through the passageway; and
  a filter mounted in the passageway inside the valve body between the first valve seat and the orifice-defining element;
  said solenoid coil, when engaged, moving the armature to the open position;
  said first and second valve seats positioned on opposed sides of the armature.

5,839,470
THREE-WAY STOPCOCK AND FLOW RATE CONTROL DEVICE IN USE THEREOF

Katsuhiro Hiejima, and Yosuke Naoki, both of Ohtsu, Japan, assignors to Nissho Corporation, Osaka, Japan
Filed Apr. 3, 1997, Ser. No. 832,510
Claims priority, application Japan, Apr. 10, 1996, 8-088183
Int. Cl.^{6} F16K *11/08*
U.S. Cl. 137—599 **3 Claims**



1. A flow rate control device comprising a flow rate control unit wherein a liquid flow rate is controlled by flow resistances of flow control tubes provided therein, said flow rate control unit comprising:
  a flow inlet port having an inlet and three branch outlet paths;
  a flow outlet port having an outlet and two branch inlet paths;
  a three-way stopcock comprising
    a cylindrical plug portion having a T-shape flow path provided therein which opens into the side of said cylindrical plug;
    a cylindrical housing portion having two flow inlet ports and one flow outlet port and in which the plug portion is rotatably inserted in a liquid tight fit; and
    a switch lever capable of attachably and detachably engaging with the plug portion;
    wherein said T-shape flow path of said cylindrical plug portion is arranged so as to communicate with said flow outlet port and flow inlet ports of said cylindrical housing when said cylindrical plug portion is rotated by means of said switch lever and wherein when an opening of said T-shape flow path is aligned with said flow outlet port at least one other opening of said T-shape flow path is aligned with a flow inlet port of said cylindrical housing;
  three flow rate control tubes, each connected at a first end thereof to one of each of said three branch outlet paths of said flow inlet port, one of said flow rate control tubes connected at a second end thereof to one of said two branch inlet paths of said flow outlet port and each of the remaining two flow rate control tubes connected at a second end thereof to each of said flow inlets of said three-way stopcock; and
  a connection tube connected at a first end thereof to said flow outlet of said three-way stopcock and at a second end thereof to the other of said two branch inlet paths;
  wherein a fluid delivered to said flow inlet port of said flow rate control unit flows through the flow rate control tube connected to a branch outlet path of said flow inlet port to said flow outlet port and flows through none, one or both of said remaining two flow rate control tubes connected to said three-way stopcock and to said flow outlet port according to the position of said T-shape flow path.

5,839,471
SEALING MEMBER FOR A VALVE

Tsai Chen Yang, No. 15-11, Tou Ren Lane, Tou Ren Li, Lu Gang Town, Chang Hua, Hsien, Taiwan
Filed Sep. 26, 1997, Ser. No. 938,763
Int. Cl.^{6} F16K *11/07*
U.S. Cl. 137—625.18 **3 Claims**

1. A valve comprising:

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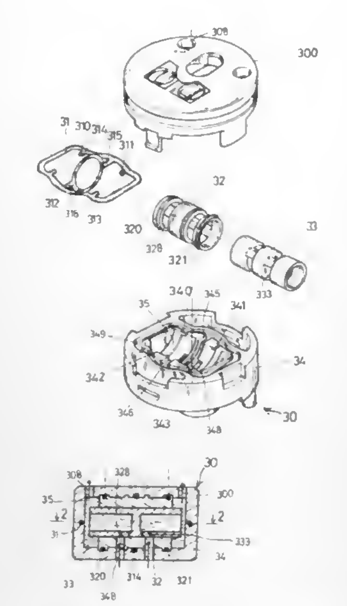


a housing including a chamber, and including a base having two inlets communicating with said chamber, and including a cover engaged on said base and having two outlets, said base including an upper portion having a peripheral groove formed around said chamber,

a sealing member engaged in said peripheral groove of said base,

a valve seat secured in said chamber of said housing and including two openings for communicating with said inlets of said base and including two end portions and a middle portion,

three sealing rings engaged on said end portions and said middle portion of said valve seat and engaged between said valve seat and said housing, a first of said sealing rings being provided between a first of said outlets and a first of said inlets for making a water tight seal between said first outlet and said first inlet, a second of said sealing rings being engaged on said middle portion of said valve seat and being provided between said inlets for making a water tight seal between said inlets, and a third of said sealing rings being provided between a second of said outlets and a second of said inlets and for making a water tight seal between said second outlet and said second inlet, and

a valve member slidably engaged in said valve seat and including two ports for communicating with said openings of said valve seat and said inlets of said base respectively.

5,839,472
VALVE MECHANISM OF A COMPRESSOR

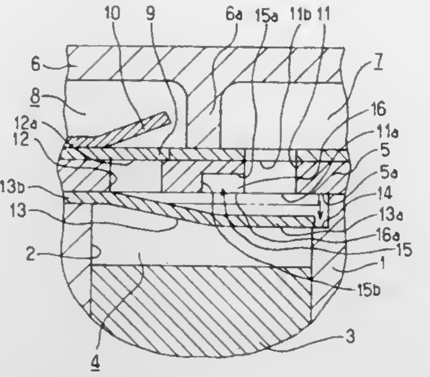
Noriyuki Shintoku; Tomoji Tarutani, and Atsuko Toyama, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Continuation of Ser. No. 495,203, Jun. 27, 1995, abandoned. This application Apr. 9, 1997, Ser. No. 838,756

Claims priority, application Japan, Jul. 13, 1994, 6-161033

Int. Cl.^{6} F16K *15/16*

U.S. Cl. 137—856 7 Claims



1. A valve mechanism for a refrigerant compressor which compressor has a compression chamber and a suction chamber, said valve mechanism comprising a valve plate for disposition between said compression and suction chambers, said valve plate comprising an inlet port formed through said valve plate for providing fluid communication from said suction chamber into said compression chamber, said inlet port having an inlet opening on one side of said valve plate for location facing said suction chamber, an outlet opening on the other side of said valve plate for location facing said compression chamber, and a suction valve disposed on said other side of said valve plate for location facing said compression chamber, said suction valve being reed-like and having a proximal portion secured to said valve plate and a flexible distal portion movable between a closed position wherein said fluid communication is shut off and an open position wherein said fluid communication is established, said valve plate comprising means for supporting said suction valve when said suction valve is in said closed position and exposed to high discharge pressure in said compression chamber, said supporting means comprising a rib formed integral with said valve plate and extending from one side of said outlet opening to an intermediate position within said outlet opening, said rib having a surface for engaging said suction valve which surface has an area no greater than about 20% of the area of said outlet opening.

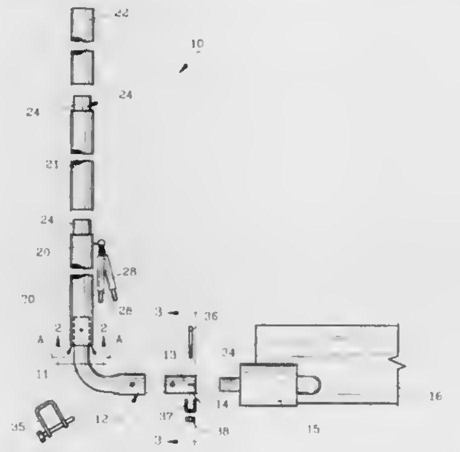
5,839,473
RV GENERATOR AUXILIARY EXHAUST SYSTEM AND METHOD

Donald R. Caine, Greensboro, and Mark R. Bailey, Madison, both of N.C., assignors to CAMCO Manufacturing Inc., Greensboro, N.C.

Continuation of Ser. No. 666,196, Jun. 20, 1996, abandoned. This application Sep. 29, 1997, Ser. No. 937,689

Int. Cl.^{6} E03B *5/00;* **F16K** *5/00*

U.S. Cl. 137—888 3 Claims



1. In an auxiliary exhaust system for an internal combustion type generator having a primary exhaust pipe extending from a horizontal muffler, the improvement comprising:

(a) a plurality of vertical exhaust stack sections, said plurality of exhaust stack sections spaced from said primary exhaust pipe, said plurality of exhaust stack sections slidably joined and in fluid communication, one to another, said plurality of exhaust stack sections perpendicular to said primary exhaust pipe, said plurality of exhaust stack sections formed from a low thermal conduction plastic;

(b) a coupler tube having an exterior width less than the interior width of said exhaust stack section, said coupler tube received internally of said exhaust stack section and radially spaced therefrom for a venturi effect, said coupler tube having a continuous outer surface within said exhaust stack section and further comprising an enlarged end, said enlarged end attached to said primary exhaust pipe, wherein said coupler tube is L-shaped; and

(c) an adaptor tube, said adaptor tube connecting the primary exhaust pipe to said enlarged end of said coupler tube, said adaptor tube defining a plurality of slots, said slots for adaptively fitting within different sized primary exhaust pipes;

whereby exhaust gases pass from said muffler into said coupler tube and are directed therethrough and into said exhaust stack section for cooling and exhaustion therefrom.

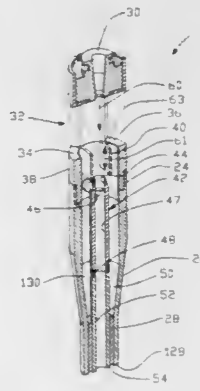
5,839,474
MIX HEAD EDUCTOR

Michael J. Greaney, Castro Valley, Calif., assignor to SC Johnson Commercial Markets, Inc., Sturtevant, Wis.

Filed Jan. 19, 1996, Ser. No. 588,802

Int. Cl.^{6} F16K *24/04*

U.S. Cl. 137—889 24 Claims



1. An eductor apparatus comprising:

an eductor housing;

a fluid inlet port;

an air gap consisting of an air gap port and a bore in the housing communicating with said air gap port, said bore and air gap port being free from obstructions, said air gap located down stream of said fluid inlet port;

a one-piece eductor located down stream of said air gap, the eductor being of separate construction from the rest of the eductor apparatus;

a rib extending from the housing and located below the air gap port so that said air gap port is unobstructed by said rib, and said rib located between the air gap and the eductor, said rib having a major dimension and a minor dimension that is smaller than the minor dimension, which major dimension extends along a direction of flow from the fluid inlet port through the bore of the air gap and to the eductor;

said eductor includes an eductor body which has an exterior surface comprising a leading portion and a trailing portion;

said eductor including a first inlet port located in said leading portion;

said eductor including a first outlet port located in said trailing portion;

said leading portion comprising an annular rounded surface extending continuously and outwardly from the inlet port to the trailing portion;

a first channel defined in said eductor body which communicates said first inlet port to said first outlet port;

said eductor including a support arm, which support arm extends at an angle from said eductor body;

said eductor including a second inlet port;

said second inlet port defined in said support arm;

a second channel defined in said support arm and which second channel communicates said second inlet port with said first channel;

a second support arm which is disposed in a direction opposite to said support arm;

wherein said first channel defines a primary fluid flow path, and a secondary fluid flow path is defined between the eductor body and the eductor housing; and

wherein said rib is positioned relative to said first inlet port of said eductor in order to permit fluid to flow from said fluid inlet port both into said first inlet port of eductor and over the exterior surface of The leading portion of said eductor.

5,839,475
METHOD AND APPARATUS FOR LINING A PIPE WITH A POLYMER LINER

Leslie Maine, Northumberland, and Kenneth Hicks, Tyne & Wear, both of United Kingdom, assignors to British Gas PLC, London, Great Britain

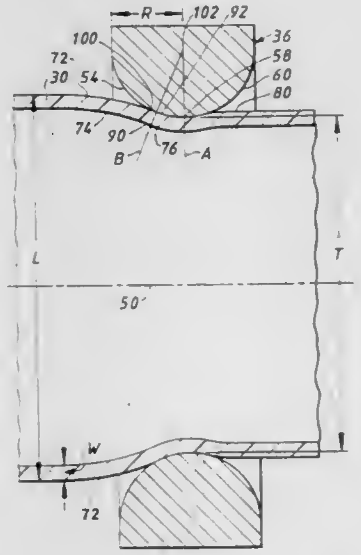
PCT No. PCT/GB95/00738, § 371 Date Feb. 24, 1997, § 102(e) Date Feb. 24, 1997, PCT Pub. No. WO95/27168, PCT Pub. Date Oct. 12, 1995

PCT Filed Mar. 31, 1995, Ser. No. 702,455

Claims priority, application United Kingdom, Mar. 31, 1994, 9406516

Int. Cl.^{6} F16L *55/16*

U.S. Cl. 138—98 10 Claims



1. A method of lining a pipe with a polymer liner comprises pulling the liner through a die to reduce its diameter and through the pipe and on removal of the pulling load allowing the liner to revert to at least the minimum internal diameter of the pipe, the liner having a maximum diameter before the die and a minimum diameter in the die and the die having an aperture which is symmetrical with respect to a central, longitudinal axis and comprising in the direction in which the liner is passed, an entry, a throat and an exit, the diameter of the aperture in said direction decreasing over said entry to a minimum at said throat and increasing over said exit, the liner having an intermediate diameter after the die and before the liner enters the pipe, the force of pulling being such as partially to restrain die swell of the liner after its emergence from the throat and the liner bending towards said axis and in so doing presenting a convex outer surface, when viewed in a sectional plane extending longitudinally of the liner and containing said axis, and then the liner bending away from the axis and in so doing presenting a concave outer surface, when viewed in said plane, the liner continuously bending through its minimum diameter as it passes the throat and thereafter undergoing die swell resulting in said intermediate diameter, which enters the pipe, characterised in that said entry, when viewed in said plane, is convex over substantially an entire axial length between where the liner first contacts the die after bending inwardly and said throat

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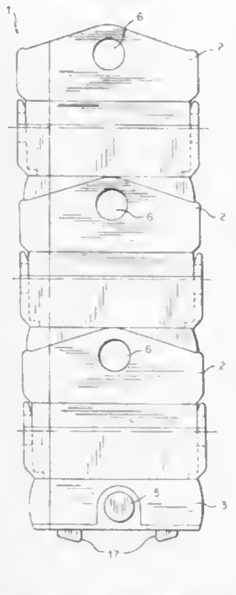
and said liner substantially continuously engages said die over substantially the entire axial length.

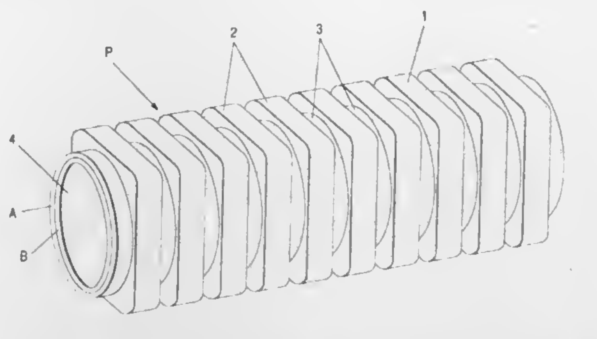
5,839,476
CABLE GUIDE
Günter Blase, Bergisch Gladbach, Germany, assignor to Igus Spritzgussteile Fur Die Industrie GmbH, Cologne, Germany
PCT No. PCT/DE94/00085, § 371 Date Aug. 9, 1996, § 102(e) Date Aug. 9, 1996, PCT Pub. No. WO94/18735, PCT Pub. Date Aug. 18, 1994
PCT Filed Jan. 27, 1994, Ser. No. 495,457
Claims priority, application Germany, Feb. 1, 1993, P 43 02 757.1
Int. Cl.⁶ F16L *27/04*
U.S. Cl. 138—120 **6 Claims**



1. Cable guide comprising of articulated individual components (**2, 3**) which are open at the front and made of elastomeric plastic, where articulation axes (**7, 8**) of the components (**2, 3**) run transversely to the longitudinal axis of the cable guide (**1**) and the individual components are linked together, at least in sections, with articulation axes (**7, 8**) of two adjacent components (**2, 3**) are positioned at 90° to one another, characterised in that two different, alternating basic shapes are included for the components (**2, 3**) in the section concerned, each of which has an openable wall element which extends across the entire length of the component concerned and is positioned in such a way that the openable wall elements of adjacent components (**2, 3**) with offset articulation axes (**7, 8**) are located on the same side of the cable guide (**1**), with each component (**2, 3**) having opposing holes (**6**) and matching opposing pins (**5**) in order to form an articulated connection with two adjacent components (**2, 3**) and one component (**3**) having a cover (**12**), which constitutes the openable wall element of this component (**3**), provided with a hole (**6**) and the adjacent component (**2**) having a cover (**11**), which constitutes the openable wall element of this component (**2**), provided with a pin (**5**).

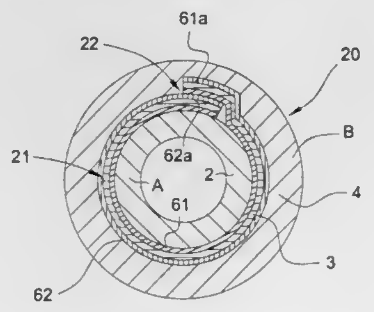
5,839,477
CORRUGATED RESIN PIPE
Teluo Murayama, Osaka, Japan, assignor to Totaku Industries, Inc., Osaka, Japan
Filed Apr. 9, 1997, Ser. No. 838,538
Claims priority, application Japan, Apr. 10, 1996, 8-114173
Int. Cl.⁶ F16L *11/00*
U.S. Cl. 138—121 **24 Claims**

1. A corrugated pipe, comprising:



a pipe wall having an external shape and an internal shape, said external shape comprising alternating sectionally rectangular wall portions and sectionally circular wall portions, said internal shape comprising a substantially linear circular-cylindrical surface, said pipe wall comprising a material selected from the group consisting of synthetic resin and rubber.

5,839,478
COLD-FORMABLE COMPOSITE PIPE
Thierry Colcombet, St Cyr Au Mont D'Or, and Alain Grandouiller, Saint-Etienne, both of France, assignors to M.R. Industries, Saint Chamond, France
PCT No. PCT/FR95/00210, § 371 Date Sep. 23, 1996, § 102(e) Date Sep. 23, 1996, PCT Pub. No. WO95/22712, PCT Pub. Date Aug. 24, 1995
PCT Filed Feb. 22, 1995, Ser. No. 696,942
Claims priority, application France, Feb. 22, 1994, 94 02343
Int. Cl.⁶ F16L *9/14*
U.S. Cl. 138—141 **13 Claims**



1. A cold-formable composite pipe including from the inside outward

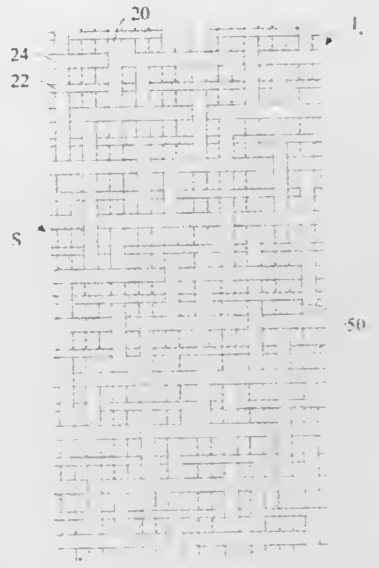
an inner tube, made of a first thermoplastic material, obtained by extrusion

a reinforcement including a continuous metal tape surrounding the inner tube with overlapping of its edges while defining a connecting joint between them, and thus forming a tubular metal sheath, said metal tape being bonded to the inner tube by a first adhesive,

an outer sheath, made of a second thermoplastic material which has a chemical nature which is different from that of the first thermoplastic material, obtained by extrusion, bonded to the reinforcement by a second adhesive compatible with the second thermoplastic material,

whereby the joint places opposite one another a first inner strip of the first adhesive and a second inner strip of the second adhesive, the first adhesive being compatible with the first thermoplastic material, wherein the first and second inner strips of the joint, which are bonded to each other, are crosslinked or co-crosslinked chemically and thus form a coherent bond.

5,839,479
PAPERMAKING FABRIC FOR INCREASING BULK IN THE PAPER SHEET
Thomas Gulya, Raleigh, N.C.; Samuel H. Herring, Appleton, and Walter P. Wright, Larsen, both of Wis., assignors to Asten, Inc., Charleston, S.C.
Continuation of Ser. No. 627,409, Apr. 4, 1996, abandoned. This application Mar. 26, 1997, Ser. No. 832,314
Int. Cl.⁶ D03D *13/00*
U.S. Cl. 139—383 A **12 Claims**

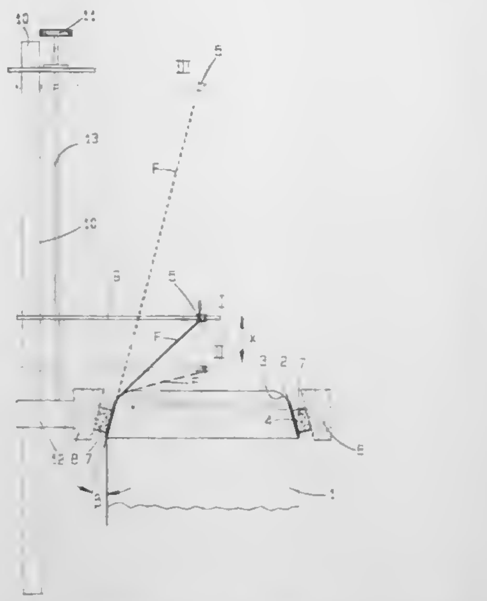


1. A single layer papermaking fabric which imparts bulk to a paper product and has a sheet side and a machine side is comprised of:

a system of machine direction (MD) filaments selectively interwoven with a system of cross-machine direction (CD) filaments having alternating smaller and larger filaments, the MD filaments and the larger CD filaments define maximum float lengths on opposite sides of the fabric that differ by no more than one filament of the other system and the smaller CD filaments are woven in a repeat pattern that includes passing under at least two adjacent MD filaments and over at least one MD filament so that the length of an exposed portion of the smaller CD filaments on the sheet side of the fabric is within two MD filaments of the length of an exposed portion of the smaller CD filaments on the machine side of the fabric such that sheet side areas of paper bulking depressions are defined.

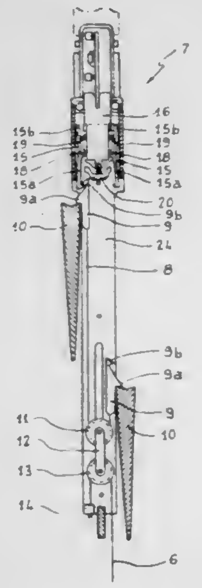
5,839,480
THREAD STORAGE DEVICE WITH ADJUSTABLE THREAD EYE AND BRAKE RING
Alberto Gustavo Sarfati, Como, Italy, assignor to Sobrevin Société de brevets industriels-Etablissement, Vaduz, Liechtenstein
Continuation of Ser. No. 431,047, Apr. 28, 1995, Pat. No. 5,582,214. This application Oct. 30, 1996, Ser. No. 739,651
Claims priority, application Germany, May 2, 1994, 44 15 331.7
Int. Cl.⁶ D03D *47/36*
U.S. Cl. 139—452 **1 Claim**

1. A thread storage device according to claim 1, wherein the storage drum is stationary: and



a winding arm is movable around the drum, said winding arm constitutes means for providing the supply of thread on the storage drum.

5,839,481
PROCEDURE AND A SELECTOR DEVICE OF THE MOVABLE HOOKS OF A SHED-FORMING MECHANISM AND A JACQUARD TYPE LOOM FORCE BALANCING OF HOOKS IN A JACQUARD LOOM
Dario Bassi, Chaponnay, and Jean-Paul Froment, Doussard, both of France, assignors to Staubli Lyon, Chassieu, France
Filed Jul. 30, 1997, Ser. No. 903,301
Claims priority, application France, Aug. 6, 1996, 96 10083
Int. Cl.⁶ D03C *3/20*
U.S. Cl. 139—455 **10 Claims**



1. A device for the selection of moveable hooks of a shed-forming mechanism of a Jacquard type loom, comprising: at least one hook displaced by a knife between an upper dead point position wherein said hook may be immobilized by a selector device and a lower dead point position, and elastic stop means which engages said at least one hook in a vicinity of said upper dead point position, said stop means exerting on said at least one hook a force (F_3) tending to push said at least one hook towards the lower dead point position.

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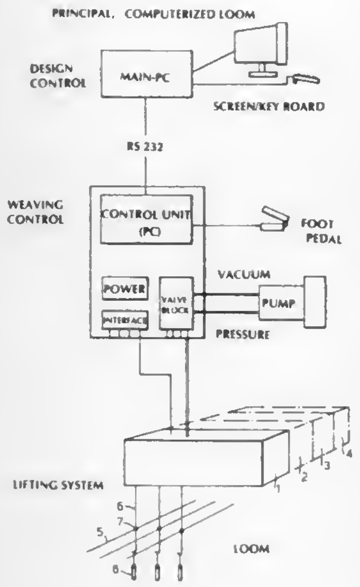
5,839,482

ELECTRO-PNEUMATIC LOOM SHEDDING SYSTEM

Viheke Vestby, Royse; Petter Muren, Kolsås, and Ole Christian Tronrud, Sokna, all of Norway, assignors to Digital Weaving Norway AS, Royse, Norway
PCT No. PCT/NO95/00017, § 371 Date Jul. 18, 1997, § 102(e) Date Jul. 18, 1997, PCT Pub. No. WO96/23092, PCT Pub. Date Aug. 1, 1996
PCT Filed Jan. 23, 1995, Ser. No. 860,710
Claims priority, application Norway, Nov. 26, 1993, 934278
Int. Cl.^{6} D03C *3/22;13/00;* D03D *29/00*
U.S. Cl. 139—456 3 Claims



1. A shedding apparatus for being fitted onto a loom for controlling up and down movement of warp-carrying lifting rods to form a filling insertion shed, said apparatus comprising:

a cylinder block having an upper and lower end face and a plurality of throughgoing cylinder bores extending between said faces;

a piston in each cylinder bore, said pistons having an upper end face and a lower end face and carrying a weighted lifting rod extending down from said cylinder block;

a common air chamber on top of said cylinder block, said common air chamber having a plurality of openings towards and corresponding to said cylinder bores;

a solenoid-operated valve in each of said openings on top of each cylinder bore; and

means for providing negative and positive pressure in said common air chamber,

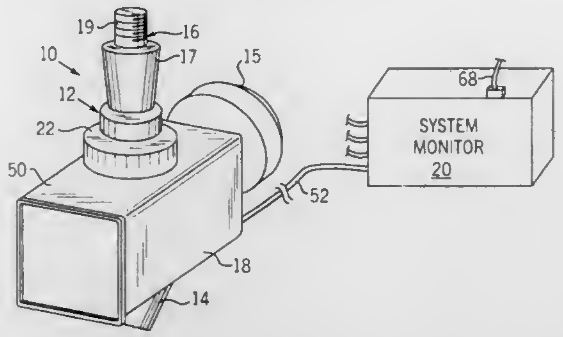
wherein said solenoid-operated valve comprises a valve housing, an internal valve chamber in said valve housing, a valve seat in said valve chamber dividing said valve chamber in an upper and lower part, said lower part being in open communication with the corresponding cylinder bore, a valve member in said lower part of the valve chamber, a solenoid on top of said valve housing, said solenoid having an armature stem extending into the valve chamber and being connected to said valve member, and an open communication between said upper part of the valve chamber and said common chamber,

such that atmospheric pressure will act on the pistons on their lower ends, said pistons being arranged to leak air between said upper and lower piston end faces.

5,839,483

BEVERAGE DISPENSER WITH SERVING TIME MONITOR

Richard Lee Rejret, Watertown; Jeffrey Hale, Hartland, and Larry D. Powers, Watertown, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio
Filed Mar. 6, 1997, Ser. No. 812,460
Int. Cl.^{6} B65B *1/04;3/04*
U.S. Cl. 141—1 17 Claims



1. A method for monitoring operation of a beverage tap which has a valve that controls flow of a beverage into a serving container and which has a device that provides an electrical signal indicative of whether the beverage tap is open or closed, the method comprising the steps of:

receiving the electrical signal;

utilizing the electrical signal to measure how long the beverage tap is open to produce a tap open time measurement;

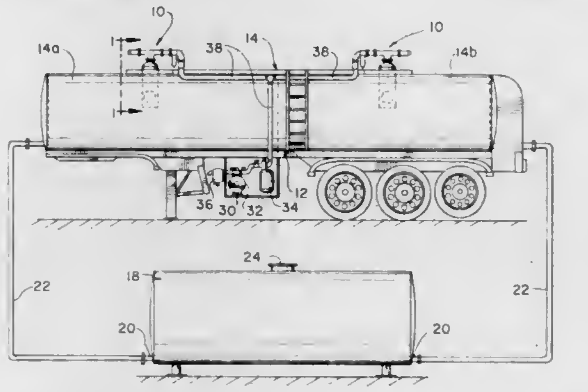
determining from the tap open time measurement a quantity of serving containers have been filled with the beverage by dividing the tap open time measurement by a typical pour time to produce a quotient which indicates how many serving containers have been filled with the beverage; and

in response to the determining step, storing in memory a count of how many serving containers have been filled with the beverage.

5,839,484

VACUUM TRANSFER SYSTEM AND METHOD FOR FOOD GRADE PRODUCT

Marcus J. Engle, 1732 Beltline Rd., Sauk Centre, Minn. 56378
Filed Apr. 15, 1996, Ser. No. 632,558
Int. Cl.^{6} B65B *3/00*
U.S. Cl. 141—65 37 Claims



1. A method for transferring a liquid food grade product between a first vessel to a second vessel by means of vacuum, the second vessel having a submersible liquid inlet/outlet and an air inlet/outlet, comprising the steps of:

(1) when filling the second vessel:

(a) providing a fluid coupling from the first vessel to the second vessel liquid inlet/outlet;

(b) venting the first vessel to a fluid source;

(c) fluidly unsealing the second vessel at the second vessel liquid inlet/outlet;

(d) drawing a vacuum in the second vessel by means of activation of a vacuum source operably coupled to the second vessel air inlet/outlet and through the fluid coupling, thereby drawing a vacuum in the first vessel;

(e) providing a first vacuum operated check valve means disposed between the vacuum source and the second vessel; and

(f) providing a second valve means disposed between the vacuum source and the second vessel;

(g) fluidly sealing the second vessel liquid inlet/outlet when a selected volume of food grade product has been transferred to the second vessel;

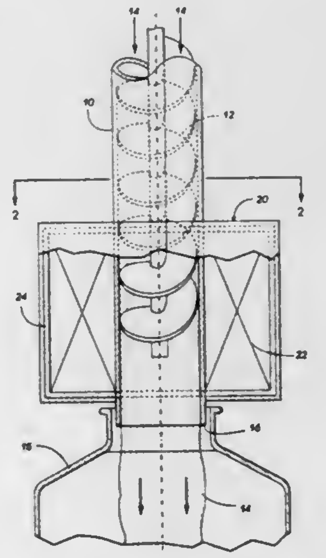
(h) removing the vacuum from the second vessel after fluidly sealing the second vessel liquid inlet/outlet;

whereby the food grade product is drawn from the first vessel through the fluid coupling and thence through the second vessel submersible liquid inlet/outlet into the second vessel, the food grade product in the first vessel being displaced by fluid from the fluid source the first vacuum operated check valve means and the second valve means acting to isolate the liquid food grade product from the vacuum source.

5,839,485

ELECTROMAGNETIC VALVE AND DEMAGNETIZING CIRCUIT

Paul M. Wegman, Pittsford; Mikhail Vaynshteyn, Rochester, both of N.Y., and David M. Korvick, Oklahoma City, Okla., assignors to Xerox Corporation, Stamford, Conn.
Filed Oct. 12, 1995, Ser. No. 540,993
Int. Cl.^{6} B65B *1/04*
U.S. Cl. 141—129 20 Claims



20. A method for controlling filling a container, comprising:

placing a first container to be filled in filling relationship to a fill tube;

moving a magnetic material from a source thereof through the fill tube to fill the first container with the material;

applying a magnetic force to the material in the fill tube once the first container is filled by activating an electromagnetic valve, the magnetic force being sufficient to hold the material in place in the fill tube;

removing the first container;

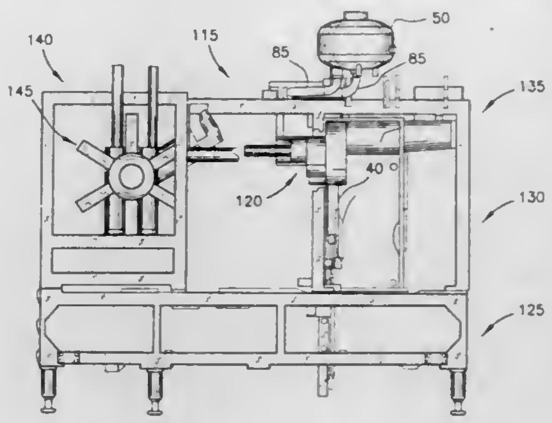
placing a second container to be filled in filling relationship to the fill tube; and

removing the magnetic force applied to the material by deactivating the electromagnetic valve so that the material can move through the fill tube and into the second container.

5,839,486

FILL SYSTEM INCLUDING A FILL PUMP POSITIONING SYSTEM

Jonathan P. Buesing, Maplewood, Minn., assignor to Tetra Laval Holdings & Finance, SA, Pully, Switzerland
Filed Mar. 28, 1997, Ser. No. 825,135
Int. Cl.^{6} B65B *43/42*
U.S. Cl. 141—177 8 Claims



1. An apparatus for use in a filling system, the apparatus comprising:

conveying means for transporting containers to be filled in a conveying direction;

a fill pump system arranged above the conveying means;

a mounting bracket having a plate for adjustably positioning the fill pump system along the conveying direction;

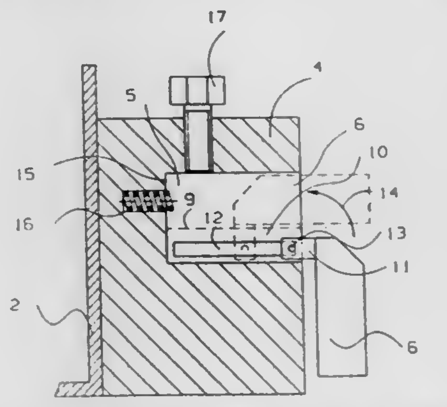
a motor carriage connected to the fill pump system and including a plate portion; and

a plurality of mounting posts, each post having a notch formed therein to receive the plate portion of the motor carriage.

5,839,487

SAFETY FILLING DEVICE FOR ANESTHETIC EVAPORATORS

Stefan Moll; Uwe Bausch; Stefan Linke; Dirk-Stefan Reichert; Karl-Ludwig Gippert, all of Lübeck, and Wolfgang Falb, Krummesse, all of Germany, assignors to Drägerwerk Aktiengesellschaft, Lübeck, Germany
Filed Oct. 22, 1996, Ser. No. 734,829
Claims priority, application Germany, Apr. 6, 1996, 196 13 827.2
Int. Cl.^{6} A61M *16/18*
U.S. Cl. 141—326 5 Claims



1. A safety filling device for filling a liquid anesthetic into a reservoir of an anesthetic-metering device, comprising:

a receiving device which has an inlet opening, said receiving device having channels, which are located within said inlet opening;

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a closing member including a closing piece wherein said channels, which are located within said inlet opening are closed for filling by said closing member;

an essentially rigid guide lever provided in a connection area between said receiving device and said closing member; and

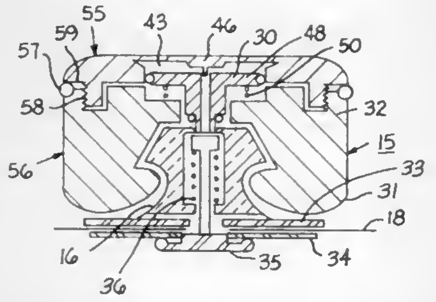
a hinge connection for axially displacing said guide lever within said inlet opening and for a rotary movement of the said guide lever outside the said inlet opening.

5,839,488

HANDS-OFF LOW-AIR-LOSS QUICK-CONNECT QUICK-DISCONNECT FAST-FILL DUNNAGE BAG FILLING VALVE-NOZZLE ASSEMBLY AND SYSTEM

Gerald L. Peters, 1201 Sand Bar Ferry Rd., Beech Island, S.C. 29841

Filed May 29, 1997, Ser. No. 865,108
Int. Cl.⁶ F16K *15/20*
U.S. Cl. 141—347 **23 Claims**



1. A quick connect dunnage bag filling valve system, comprising in combination:

an air filling valve fitting for mating with a dunnage bag inflation valve fitting protruding from a dunnage bag for actuating said inflation valve and inflating said dunnage bag, said inflation valve fitting having a housing stem coaxially surrounding an axially movable valve mechanism spring biased to retain air in the dunnage bag and corresponding interlocking housing stem structure adapted to receive and align the inflation valve fitting with a mating air filling valve assembly for overcoming spring bias of the axially movable valve mechanism and for introducing pressurized air into the dunnage bag, and

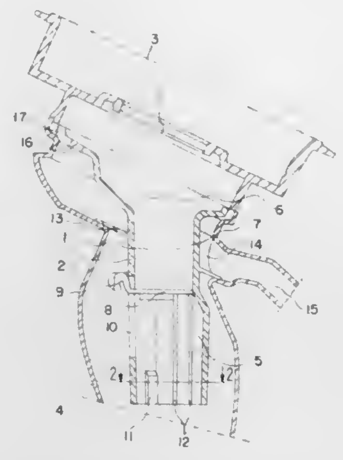
a housing for the air filling valve assembly defining a nozzle and air inlet opening further having interlocking engagement structure adapting the air filling valve to move the nozzle laterally from a direction substantially normal to the axially movable valve mechanism of the inflation valve into aligned interfitting engagement with said inflation valve suitable for introducing air into the dunnage bag.

5,839,489

FILLING ADAPTOR FOR A FUEL TANK

Patrick Ganachaud, Laval; Jacques Turpin, Carquefou; Eddy Maignan, and Jean-Philippe Rolinat, both of Laval, all of France, assignors to Solvay (Société Anonyme), Brussels, Belgium

Filed Nov. 6, 1996, Ser. No. 744,862
Claims priority, application Belgium, Nov. 6, 1995, 09500913
Int. Cl.⁶ B65B *1/04*
U.S. Cl. 141—382 **9 Claims**



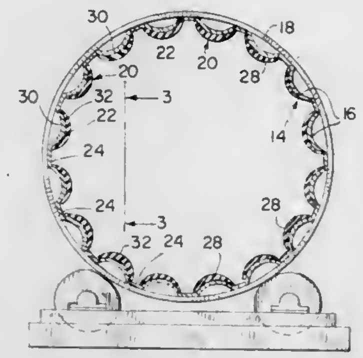
1. A filling adaptor for a fuel tank, including a tubular body having a first open end communicating upstream with a filling orifice and a second open end communicating downstream with a filler pipe, said tubular body having an internally frustoconical final portion whose cross-section decreases in a downstream direction, a cone vertex angle which is no greater than 10° and a smallest internal diameter which is equal to or slightly greater than an external diameter of a spout of a filler nozzle to be inserted into the adaptor, the adaptor further comprising a stop at a downstream end of the tubular body for preventing further insertion of the filler nozzle into the adaptor.

5,839,490

RUBBER LINING FOR CORRUGATED DEBARKING DRUM

Edward Kiedaisch, Keokuk, Iowa, and Thomas E. McGrew, Riverton, Utah, assignors to Svedala Industries, Inc., Waukesha, Wis.

Filed Mar. 17, 1998, Ser. No. 42,816
Int. Cl.⁶ B02C *17/22*
U.S. Cl. 144—208.9 **22 Claims**



1. In a corrugated debarking drum having a continuously undulating outer wall with an interior surface including an axially extending concave portion, an improvement comprising:

a liner including:

an elastomeric compressible body having a leading edge, a trailing edge, an inner surface positioned over the concave portion and an outer surface opposite the inner surface; and

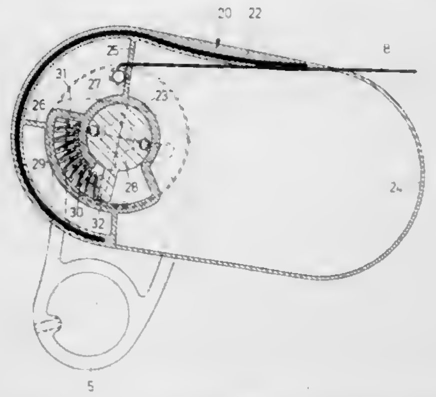
a support secured to the body and bonded to the interior surface without perforating the outer wall.

5,839,491

AWNING, FOR EXAMPLE JOINT-ARM AWNING WITH RAIN-PROOF BLIND

Sven Kröner, Mettingen, and Bernhard Wessels, Rheine, both of Germany, assignors to Schmitz-Werke GmbH + Co., Emsdetten, Germany

Filed Jul. 11, 1997, Ser. No. 893,618
Claims priority, application Germany, Jul. 25, 1996, 296 12 905 U
Int. Cl.⁶ E04F *10/00*
U.S. Cl. 160—22 **5 Claims**



1. An awning for a joint-arm awning, comprising joint arms (**11**) disposed on a support pipe (**1**), an inclination of the support pipe (**1**), the joint arms (**11**) and the joint arms (**11**) relative to the support pipe (**11**) being adjustable, and a rain-proof blind (**20**) covering an awning cloth (**8**) extending between a drop-out pipe (**15**) and a cloth roll (**9**) disposed on a cloth shaft (**6**), and a portion of the cloth roll (**9**) and the drop-out pipe (**15**), when the drop-out pipe (**15**) is retracted,

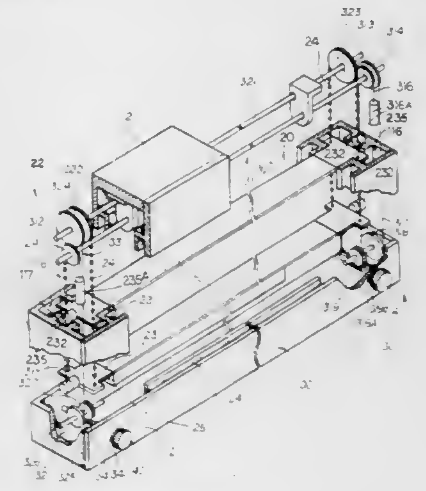
wherein the rain-proof blind (**20**) is mounted pivotally and biased by at least one spring (**30**) and gravity in a direction toward an upper side of the awning cloth (**8**) so that the rain-proof blind (**20**) rests on the upper side of the awning cloth (**8**) at any inclination of the adjusted joint-arm.

5,839,492

WINDOW APPARATUS WITH BUILT IN SHADING DEVICE

Hai Tee Young, P.O. Box 6301, Rosemead, Calif. 91770

Filed Apr. 14, 1997, Ser. No. 839,688
Int. Cl.⁶ E06B *3/32*
U.S. Cl. 160—107 **18 Claims**



1. A window apparatus, comprising:

a window framework which comprises a first pair of parallel frames which are two symmetrical U-shaped vertical frames, a second pair of parallel frames which are two symmetrical U-shaped frames perpendicularly mounted between two top ends and two bottom ends of said first pair of parallel frames respectively to define a window framework, and a pair of transparent boards which are parallelly mounted on said framework to define a receiving chamber therebetween, wherein each said first pair of frames has two parallel walls and an end wall perpendicularly extended between two outer sides of said two parallel walls, two inner sides of said two parallel walls of each said first frame have two longitudinal first recesses provided respectively, wherein an operation chamber is defined between said two first recesses and said end wall, each of said second pair of frames having two parallel walls and en end wall perpendicularly extended between two outer sides of said parallel walls, two inner sides of said two parallel walls of each said second frame having two longitudinal second recesses provided thereon respectively, wherein a spacing chamber is defined between said two second recesses and said end wall, so that said four first recesses of said two first frames and said four second recesses of said two second frames form a first and a second periphery receiving recess to receive four edges of each of said transparent boards respectively for mounting said two transparent boards on said window framework, wherein said receiving chamber is a space formed between said two transparent boards;

a shading device which comprises a plurality of parallel slats and a supporting device for mounting said slats inside said receiving chamber, wherein said supporting device comprises a pair of supporting chains and a plurality of supporters connected to said ends of said slats respectively, each said supporting chains extending along said operation chambers of said two vertical first frames respectively, wherein said plurality of supporters are equally spaced and hanged by engaging with said pair of supporting chains respectively so as to parallelly support said plurality of slats within said receiving chamber; and

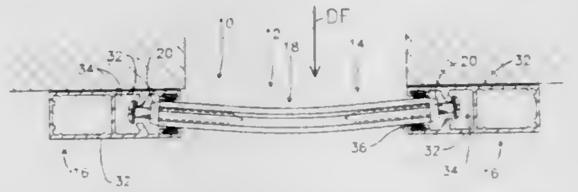
a control device for adjusting said slats to a predetermined displacing angle, gathering said slats toward a side of said window framework, and distributing said slats over said receiving chamber.

5,839,493

ROLLING SHUTTER AND RETENTION ASSEMBLY

James R. Quasius, Clearwater, Fla., assignor to Valco Enterprises, Ltd., Tampa, Fla.

Filed Feb. 14, 1997, Ser. No. 800,308
Int. Cl.⁶ E06B *9/08*
U.S. Cl. 160—133 **12 Claims**



1. A shutter system for a portal opening such as a window or door comprising:

a flexible barrier having an inner surface and an outer surface including a plurality of interlocking flexible barrier slats,

a mounting assembly having a guide track disposed on each side of the portal opening, each said guide track including a pair of guide track sides each having an inner guide track surface,

a retention assembly to retain said flexible barrier to said mounting assembly when an extreme force is exerted against said inner or outer surface of said flexible barrier, said retention assembly comprising:

a first retention means including a first retention member having an inner retention member surface extending outwardly from said corresponding inner guide track surface of each said guide track and away from the portal opening -

to cooperatively form a retention slot therebetween, said inner retention member surface being inclined relative to said corresponding inner guide track surface to form an acute angle therebetween; and

a second retention means including a stop element having a retention engaging surface attached to opposite ends of said flexible barrier, each said first retention member further including a retention engaging contact formed on the inner end portion thereof to initially engage said corresponding retention engaging surface closest to the direction of a displacement force when the displacement force causes said flexible barrier to flex to secure said flexible barrier to said mounting assembly.

5,839,494

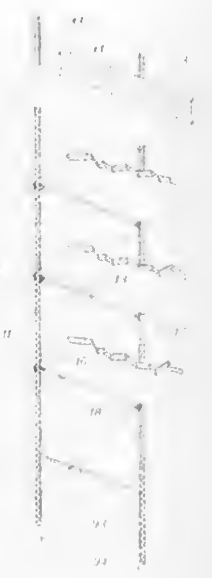
BOTTOM AND TOP STACKING VENETIAN TYPE BLIND WITH FIXED HEADRAIL TILT

Ren Judkins, 46 Newgate Rd., Pittsburgh, Pa. 15202

Continuation-in-part of Ser. No. 972,852, Nov. 18, 1997, which is a continuation of Ser. No. 661,192, Jun. 10, 1996, Pat. No. 5,692,552, which is a continuation of Ser. No. 384,136, Feb. 6, 1995, Pat. No. 5,573,051. This application Dec. 27, 1997, Ser. No. 998,509

Int. Cl.⁶ E06B *9/30*

U.S. Cl. 160—167 R **21 Claims**



1. A venetian type blind comprising:

a bottomrail;

a plurality of slats above the bottomrail, each slat having an inside edge and an outside edge and a first pair of oppositely disposed slots one slot on the outside edge and one slot on the inside edge and a second pair of oppositely disposed slots one slot on the inside edge and one slot on the outside edge, the first pair of slots being laterally spaced apart from the second pair of slots;

a movingrail above the plurality of slats

a headrail above the movingrail, the bottomrail and the plurality of slats;

at least two pairs of movingrail lift cords attached to the movingrail and passing through the headrail;

a first ladder having opposite cord type rails and rungs extending therebetween, the rails positioned near the first pair of slots and connected to the bottomrail;

a first pair of lift cords adjacent to the first ladder, and connected to the bottomrail, one lift cord running through slots in the inside edge of the slats and one lift cord running in the slots on the outside edge of the slats, the first pair of lift cords passing through the movingrail and the headrail;

a second ladder having opposite cord type rails and rungs extending therebetween, the rails positioned near the second pair of slots and connected to the bottomrail,

a second pair of lift cords adjacent to the second ladder, and connected to the bottomrail, one lift cord running through slots in the inside edge of the slats and one lift cord running though the outside edge of the slats the second pair of lift cords passing through the movingrail and the headrail; and

a tilt mechanism attached to the headrail to which tilt mechanism the lift cords are connected and to which tilt mechanism the pairs of movingrail lift cords are attached wherein the tilt mechanism moves the movingrail lift cords in each pair of movingrail lift cords in opposite directions and together at the tilt mechanism and moves the rails of the ladders and the lift cords in each pair of lift cords together and in opposite directions adjacent the slats when the blind is changed from an open position to a closed position.

5,839,495

METHOD OF MANUFACTURING ROLL FOR HOT ROLLING

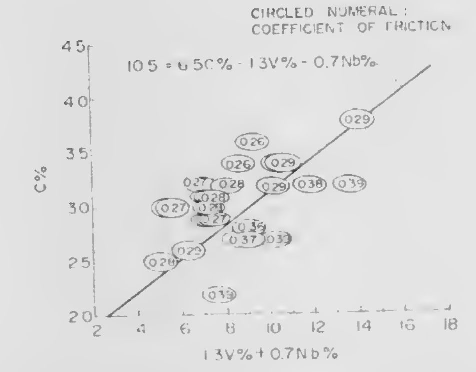
Kenji Ichino; Tomoya Koseki, and Yoshitaka Sawa, all of Aichi, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Division of Ser. Nu. 494,971, Jun. 26, 1995, Pat. No. 5,674,171. This application Sep. 18, 1997, Ser. No. 932,691

Claims priority, application Japan, Jun. 29, 1994, 6-168643; Feb. 14, 1995, 7-047958

Int. Cl.⁶ B23P *15/00*

U.S. Cl. 164—95 **6 Claims**



1. A method of manufacturing a roll for hot rolling, said method comprising the steps of:

centrifugally casting an outer layer material consisting essentially, as analyzed in weight percent, of 2.5–4.0% C, 6.0–20% Cr, 3.0–10.0% V, 0.6–5.0% Nb, 2.0–15% Mo, 3.0% or below Si, 3.0% or below Mn, C, V, Nb and Cr satisfying a following formula (1):

$$10.5(\%) \leqq 6.5 \cdot C(\%) - 1.3 \cdot V(\%) - 0.7 \cdot Nb(\%) \leqq 2 \cdot Cr(\%) - 2(\%) \qquad (1)$$

and the balance being Fe and incidental impurities;

centrifugally casting graphite steel containing 0.5% or above of C as an intermediate layer; and

casting an axis material,

wherein C is present in said intermediate layer in an amount which satisfies a following formula (2):

$$C\ (\text{intermediate layer}) \geqq 2.0 - 0.5\ (C - 0.2\ V - 0.11\ Nb)\ (\text{outer layer}) \qquad (2).$$

5,839,496

COMPOSITE MATERIAL HAVING ANTI-WEAR PROPERTY AND PROCESS FOR PRODUCING THE SAME

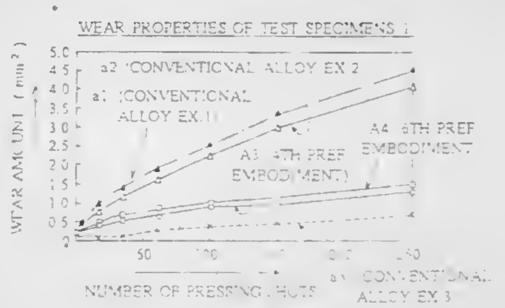
Satoru Kito, Aichi-ken; Masahito Ito; Fuminori Matuda, both of Toyota; Eiki Takeshima, Ichikawa; Yasuji Tanaka, Ichikawa; Takahiro Fujii, Ichikawa, and Kenjiro Izutani, Ichikawa, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, and Nisshin Steel Co., Ltd., both of Japan

Division of Ser. No. 258,635, Jun. 10, 1994, Pat. No. 5,641,454, which is a continuation-in-part of Ser. No. 31,093, Mar. 11, 1993, abandoned. This application Nov. 8, 1996, Ser. No. 746,386

Claims priority, application Japan, Mar. 13, 1992, 4-55366; Aug. 24, 1992, 4-246053; Aug. 24, 1992, 4-246054; Sep. 3, 1992, 4-235729; Oct. 29, 1993, 5-272423; Oct. 29, 1993, 5-272429; Nov. 12, 1993, 5-283647

Int. Cl.⁶ C22C *13/02;* **B22D** *19/14*

U.S. Cl. 164—97 **32 Claims**



1. A process for producing a composite material having an anti-wear property, comprising the steps of:

providing metallic particles for dispersion strengthening, the metallic particles being at least one group of metallic particles selected from the group consisting of Fe particles and Fe alloy particles;

adding said metallic particles to a molten low melting point Sn alloy having a melting point of from 80° to 280° C. in an amount of from 10 to 50% by volume; and

casting said low melting point Sn alloy with said metallic particles added thereto.

5,839,497

VERTICAL DIE-CASTING METHOD AND APPARATUS

Kiyoshi Fujino, and Minoru Okamura, both of Yamaguchi, Japan, assignors to U-Mold Co., Ltd., Japan

PCT No. PCT/JP97/00888, § 371 Date Nov. 13, 1997, § 102(e) Date Nov. 13, 1997, PCT Pub. No. WO97/34719, PCT Pub. Date Sep. 25, 1997

PCT Filed Mar. 19, 1997, Ser. No. 952,790

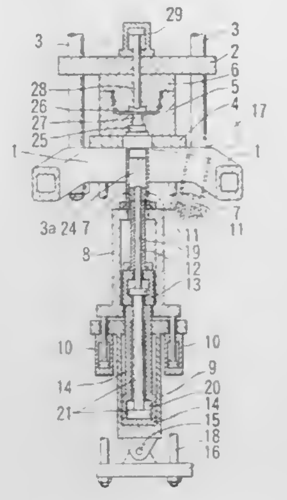
Claims priority, application Japan, Mar. 19, 1996, 8-062606; Apr. 18, 1996, 8-096771

Int. Cl.⁶ B22D *17/12;17/22*

U.S. Cl. 164—113 **13 Claims**

1. A vertical die casting method comprising

using a vertical die casting apparatus having a lower stationary mold, an upper movable mold, a casting unit in which a vertical casting sleeve having a casting plunger therein is detachably mounted on a casting port under said stationary mold, a frustoconical vertical gate arranged above said casting port in said stationary mold to be coaxial with said casting port and having a diameter smaller than that of said casting port, said gate having a maximum-diameter portion on its lower side and a minimum-diameter portion on its upper side, and an interior cooling pressure pin having a diameter slightly smaller than a minimum diameter of said gate and capable of moving downward from a lower surface of said movable mold into at least said minimum-diameter portion of said gate, said casting plunger being constituted by an outer plunger and



an interior cooling inner plunger arranged in an axial portion of said outer plunger to be inserted into said gate,

advancing said casting plunger to cast and charge a melt from said casting port into a mold cavity through said gate, thereafter causing said inner plunger to project from said outer plunger, and inserting said casting plunger to a portion under said minimum-diameter portion in said gate to push said melt, and

subsequently, moving said pressure pin downward to a portion near said minimum-diameter portion in said gate to push said melt again, moving said casting sleeve and said casting plunger downward when a mold product in said cavity and a biscuit are solidified, and further moving said pressure pin downward to cut apart said biscuit from said mold product between an inner surface of said gate and an outer circumferential surface of said pressure pin, thereby letting said biscuit to fall.

7. A vertical die casting apparatus having a lower stationary mold, an upper movable mold, a casting unit in which a vertical casting sleeve having a casting plunger therein is detachably mounted on a casting port under said stationary mold, a frustoconical vertical gate arranged above said casting port in said stationary mold to be coaxial with said casting port and having a diameter smaller than that of said casting port, said gate having a maximum-diameter portion on its lower side and a minimum-diameter portion on its upper side, and a pressure pin having a diameter slightly smaller than a minimum diameter of said gate and capable of moving downward from a lower surface of said movable mold into at least said minimum-diameter portion of said gate, wherein

said casting plunger is constituted by an outer plunger and an inner plunger slidably arranged in an axial portion of said outer plunger, said inner plunger has a diameter smaller than a maximum diameter of said gate and is caused to project from an upper surface of said outer plunger, after casting, to be inserted into said gate, and a coolant passage is formed in each of said inner plunger, said outer plunger, and said pressure pin.

5,839,498

METHOD FOR CONNECTING CORES BY CHARGING CONNECTING SAND INTO THEM

Nagato Uzaki, Toyohashi; Masayoshi Kasazaki; Hisashi Harada, both of Hoi-gun, and Kazuo Sugimoto, Toyokawa, all of Japan, assignors to Sintokogio, Ltd., Nagoya, Japan

Filed Feb. 19, 1997, Ser. No. 804,028

Claims priority, application Japan, Feb. 23, 1996, 8-061983; Feb. 23, 1996, 8-061984

Int. Cl.⁶ B22D *33/04*

U.S. Cl. 164—137 **7 Claims**

1. A method for connecting a plarality of cores in an assembly through adjacent surfaces of the cores by charging connecting sand

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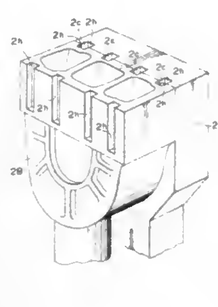
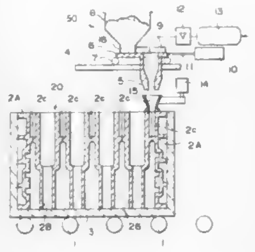




into cavities formed between the adjacent surfaces of adjacent ones of the cores, comprising the steps of:

(a) positioning a hopper nozzle that contains a predetermined amount of connecting sand therein in one of a set of indexed positions above the cavities; and

(b) after step (a), supplying compressed air into the hopper nozzle, thereby projecting and charging the connecting sand from the hopper nozzle into a set of at least one of the cavities.

5,839,499

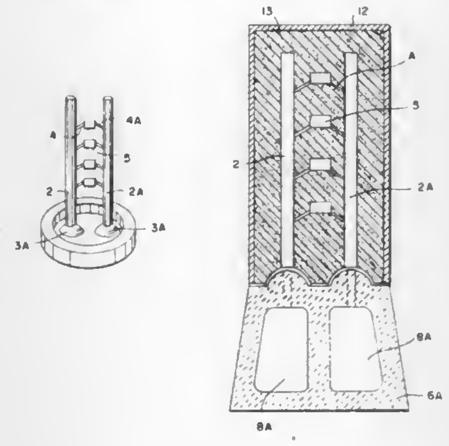
ONE-SHOT MULTI-COLOR GOLD CASTING APPARATUS AND CASTING TREE

Gevork Sarkisyan, 2800 Montrose Ave. 201, Lacrescenta, Calif. 91214, and Ashot Sarkissian, 3930 Los Feliz BL. 110, Los Angeles, Calif. 90027

Division of Ser. No. 834,918, Apr. 7, 1997, which is a continuation-in-part of Ser. No. 510,743, Dec. 16, 1996, abandoned. This application May 20, 1998, Ser. No. 81,868

Int. Cl.^{6} B22C *7/02;9/04*

U.S. Cl. 164—244 **3 Claims**



1. An apparatus for simultaneous casting of a multi-color piece comprising:

a casting mold including:

a base having a first inlet and a second inlet;

a first stem-shaped cavity continuing upward from said first inlet;

a second stem-shaped cavity continuing upward from said second inlet;

at least one model cavity corresponding to the shape of said multi-color piece;

a first sprue-shaped cavity connecting said model cavity to said first stem-shaped cavity; and

a second sprue-shaped cavity connecting said model cavity to said second stem-shaped cavity;

a ceramic crucible having a first chamber and a second chamber, adapted to mate with said base so that a first metallic substance melted in said first chamber can be introduced into said first inlet and a second metallic substance melted in said second chamber can be introduced into said second inlet;

said first metallic substance having a color different from that of said second metallic substance; and

a two-head torch designed for simultaneously heating each of said chambers.

3. A casting tree for simultaneous casting of a multi-color piece comprising:

a flexible base having a first inlet and a second inlet;

a first fusible stem attached to said first inlet;

a second fusible stem attached to said second inlet;

at least one fusible model of said multi-color piece;

a first fusible sprue connecting said fusible model to said first stem; and

a second fusible sprue connecting said fusible model to said second stem.

5,839,500

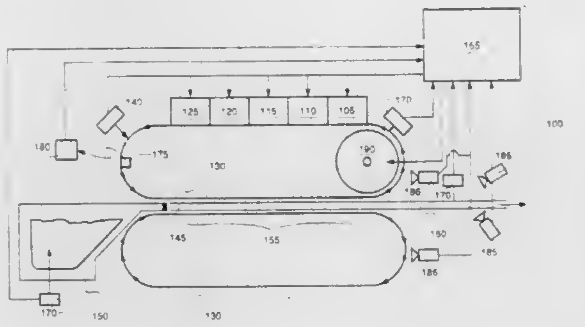
METHOD FOR IMPROVING THE QUALITY OF CONTINOUSLY CAST METAL

Rudolf Roder, and Marcel Witschi, both of Thun, Switzerland, assignors to Lauener Engineering, Ltd., San Antonio, Tex.

Division of Ser. No. 221,213, Mar. 30, 1994, Pat. No. 5,697,423. This application Dec. 16, 1997, Ser. No. 992,645

Int. Cl.^{6} B22D *11/06;11/22*

U.S. Cl. 164—414 **10 Claims**



1. An apparatus for cooling a molten metal in a continuous caster, comprising:

(a) a movable mold having a casting surface with a length in the x-direction and a width in the y-direction;

(b) temperature sensors disposed in said mold;

(c) temperature sensors in fixed locations relative to said caster;

(d) means for contacting said mold with cooling fluid comprising:

(i) an enclosure;

(ii) nozzles disposed in said enclosure;

(iii) means for providing a vacuum in said enclosure;

(iv) means for collecting cooling fluid;

(v) means for controlling cooling fluid flowrates through said nozzles in both the x-direction and y-direction along the casting surface of said mold; and

(vi) means for controlling cooling fluid temperatures;

(e) means for cleaning said casting surface of said mold comprising:

(i) means for dislodging debris from said casting surface of said mold;

(ii) means for containing debris dislodged from said casting surface; and

(iii) means for collecting said dislodged debris;

(f) means for applying a coating to said casting surface of said mold; and

(g) a controller.

5,839,501

CASTING ROLL FOR A PLANT FOR CONTINUOUS CASTING ONTO ONE OR BETWEEN TWO ROLLS

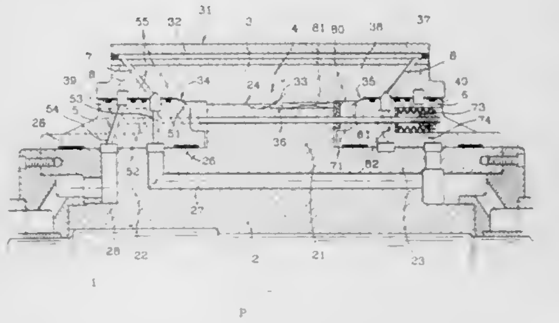
Pierre Delassus, Locon; François Mazodier, Saint-Etienne; Jean-Marie Pelletier, Bethune, and Gérard Raisson, Nevers, all of France, assignors to Unicor-Sacilor, France, and Thyssen Stahl Aktiengesellschaft, Germany

Filed Feb. 20, 1997, Ser. No. 803,313

Claims priority, application France, Feb. 29, 1996, 96 02652

Int. Cl.^{6} B22D *11/06*

U.S. Cl. 164—428 **11 Claims**



1. Casting roll for a plant for continuous casting of metals onto one or between two such rolls, this roll including a hub (**2**) and a shell (**3**) which are arranged coaxially, and two flanges (**5**, **6**) for supporting and radially centering the shell on the hub,

characterized in that each flange includes a frustoconical part (**51**, **61**) which cooperates with a corresponding frustoconical surface (**34**, **35**) of the bore in the shell, the said frustoconical surface being located in a region (A) where the internal diameter variations of the shell, due to the thermal expansion deformations, are substantially zero.

5,839,502

METHOD OF CONTINUOUS CASTING

Kenzo Ayata; Hideo Mori, both of Kakogawa; Susumu Ishiguro, Takasago, and Masaki Nitta, Kakogawa, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Nov. 12, 1996, Ser. No. 746,492

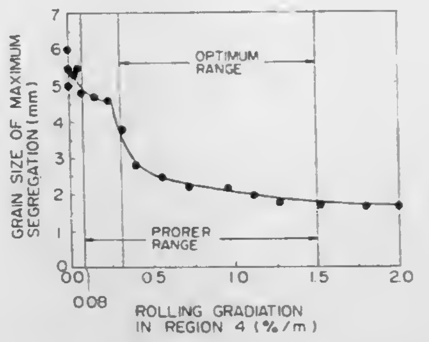
Claims priority, application Japan, Feb. 19, 1996, 8-031009; Apr. 2, 1996, 8-080214

Int. Cl.^{6} B22D *11/12;* **B21B** *1/46*

U.S. Cl. 164—476 **4 Claims**

1. A method of continuous casting by which a continuously cast strand having wide equiaxed crystal zone at the axial center portion thereof is drawn while being rolled down between confronting rolls, comprising the sequential steps of:

rolling down a casting so as to compensate the total amount of volume contraction by solidification and cooling of cast strand in a region from the position where the solid phase ratio at the central portion of the casting is 0.2 to the position where the solid phase ratio is 0.9; and



continuously rolling down the casting at a ratio so that the rolling down gradient (%/m) corresponding to the ratio of the amount of rolling down (%) to the original thickness of the cast strand per unit length thereof in the drawing direction thereof is between 0.08%/m and 1.50%/m until solidification is finished.

5,839,503

METHOD AND CONTINUOUS CASTING FACILITY FOR GUIDING CONTINUOUSLY CAST METAL

Fritz-Peter Pleschiutschnigg, Duisburg, Germany, assignor to Mannesmann Aktiengesellschaft, Düsseldorf, Germany

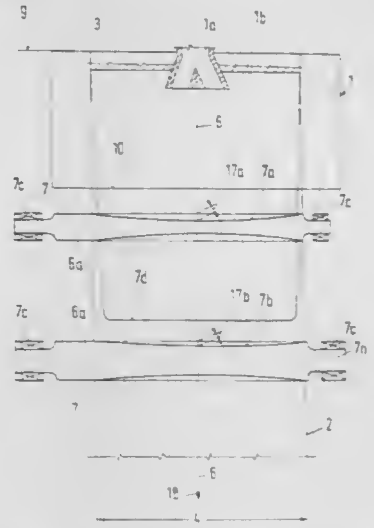
PCT No. PCT/DE95/00094, § 371 Date Jul. 29, 1996, § 102(e) Date Jul. 29, 1996, PCT Pub. No. WO95/20448, PCT Pub. Date Aug. 3, 1995

PCT Filed Jan. 20, 1995, Ser. No. 682,708

Claims priority, application Germany, Jan. 28, 1994, 44 03 045.2

Int. Cl.^{6} B22D *11/128;11/14;11/04*

U.S. Cl. 164—484 **15 Claims**



1. A continuous casting installation for guiding a cast strand, comprising:

a continuous casting mold having a height and an outlet opening, the continuous casting mold comprising a pair of cooled first side plates and second side plates having arranged between the first side plates, the first side plates having cambered surfaces, that extend vertically from a vertical point located in an upper 80% of the mold height up to and including the mold outlet opening, the cambered surfaces of the first side plates being configured to have a concave shape that extends horizontally from a first one of the second side plates to a second one of the second side plates, the second plates being narrow-side plates; and

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a strand guide stand having support roll pairs arranged downstream of the continuous casting mold and constructed to have a contour shape confirms to cambered shape of the first side plate surfaces.

5,839,504

PRECISION CASTING TITANIUM ALUMINIDE

Kenji Matsuda, Matsudo, Japan, assignor to Ishikawajima-Harima Heavy Industries Co., Ltd., Tokyo, Japan

Division of Ser. No. 17,563, Feb. 16, 1993, abandoned. This application Nov. 29, 1993, Ser. No. 158,658

Claims priority, application Japan, Feb. 19, 1992, 4-69832

Int. Cl.^{6} B22D *21/00;27/04*

U.S. Cl. 164—516 **16 Claims**

1. A method of precision casting an article, comprising the steps of:

(A) preparing a titanium aluminide including by weight 31.5–33.5% of Al, 1.5–2.3% of Fe, one of 1.5–2.1% Nb and 3.7–4.8% Nb and 0.07–0.12% of B with the remainder being Ti and inevitable impurities;
(B) melting the titanium aluminide;
(C) pouring the melt into a mold; and
(D) cooling the melt in the mold such that the melt temperature is lowered to about 800°–1,000° C. in about 20 minutes, whereby beta phase is precipitated around gamma particles and coarse lamellar particles are not produced.

5,839,505

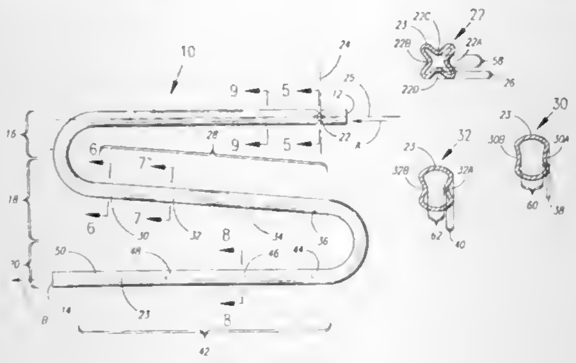
DIMPLED HEAT EXCHANGE TUBE

Richard M. Ludwig, Tulsa, and Richard J. Davis, Broken Arrow, both of Okla., assignors to AAON, Inc., Tulsa, Okla.

Filed Jul. 26, 1996, Ser. No. 690,367

Int. Cl.^{6} F28F *13/12*

U.S. Cl. 165—109.1 **19 Claims**



1. A heat exchange tube comprising:

an S-shaped tube provided with an inlet end and an opposite outlet end,
two pairs of opposing and inwardly extending entry dimples being provided in a wall of said tube adjacent said inlet end, said two pairs of opposing and inwardly extending entry dimples being provided approximately perpendicular to each other in a single plane and said plane being approximately perpendicular to a longitudinal axis of a first segment of the tube,
a first series of opposing and inwardly extending dimple pairs being provided in the wall of said tube along a second segment of said tube,
a first series of opposing and inwardly extending dimple pairs being provided in a wall of said tube along a second segment of said tube,
said first series of opposing and inwardly extending dimple pairs being graduated in depth so that a first dimple pair of the first series which is located adjacent to said first segment of the tube has a smaller depth than a depth of a last dimple pair of the first series which is located adjacent to a third segment of said tube.

5,839,506

AIR CONDITIONER MINIMIZING DIFFERENCES IN RIGHT AND LEFT TEMPERATURES

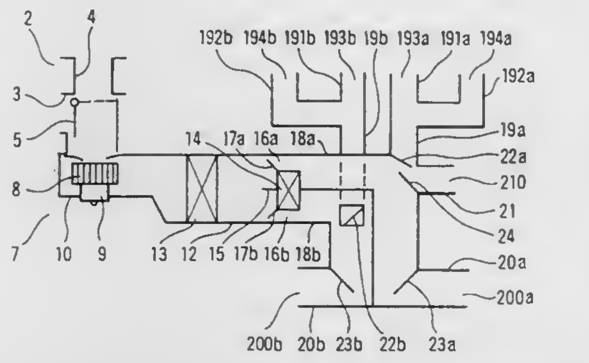
Yuji Honda, Okazaki, and Katsuhiko Samukawa, Obu, both of Japan, assignors to Denso Corporation, Kariya, Japan

Filed Dec. 9, 1996, Ser. No. 762,706

Claims priority, application Japan, Dec. 12, 1995, 7-323123

Int. Cl.^{6} F25B *29/00*

U.S. Cl. 165—203 **13 Claims**



1. An air conditioner for a vehicle having a passenger compartment, comprising:

a first duct forming a first air passage for introducing air toward a first air conditioning zone in said passenger compartment;
a second duct for forming a second air passage for introducing air toward a second air conditioning zone in said passenger compartment;
first temperature adjusting means for adjusting a temperature of air in said first air passage according to a position thereof;
second temperature adjusting means for adjusting a temperature of air in said second air passage according to a position thereof, independently of said first temperature adjusting means;
temperature controlling means for controlling said first temperature adjusting means so as to set a deviation between target positions and actual positions of said first temperature adjusting means within a range from a negative predetermined value to a positive predetermined value and for controlling said second temperature adjusting means so as to set a deviation between target positions and actual positions of said second temperature adjusting means within a range from a negative predetermined value to a positive predetermined value; and
shifting means for shifting one of said target positions of said first and second temperature adjusting means in a deviated direction where an actual position of the other temperature adjusting means is deviated from said target position of the other temperature adjusting means such that a relative deviated amount in the respective temperature adjusting means becomes smaller than the range from the negative predetermined value to the positive predetermined value.

8. An air conditioner for a vehicle having a passenger compartment, comprising:

a first duct forming a first air passage for introducing air toward a first air conditioning zone in said passenger compartment;
a second duct for forming a second air passage for introducing air toward a second air conditioning zone in said passenger compartment;

first temperature adjusting means for adjusting a temperature of air in said first air passage according to a position thereof;
second temperature adjusting means for adjusting a temperature of air in said second air passage according to a position thereof, independently of said first temperature adjusting means;
temperature controlling means for controlling said first temperature adjusting means so as to set a deviation between target positions and actual positions of said first temperature adjusting means within a range from a negative predetermined value to a positive predetermined value and for controlling said second temperature adjusting means so as to set a deviation between target positions and actual positions of said second temperature adjusting means within a range from a negative predetermined value to a positive predetermined value; and
setting means for setting one of said target positions of said first and second temperature adjusting means to actual positions of the other temperature adjusting means under a condition where temperatures of air blown into said first air conditioning zone and said second air conditioning zone are substantially same.

5,839,507

HOUSEHOLD REFRIGERATOR

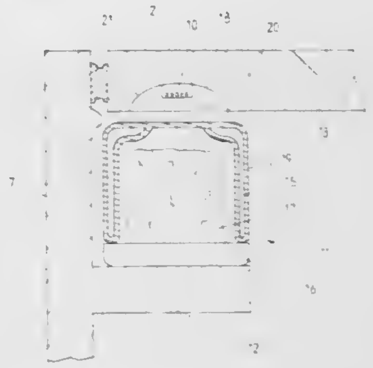
Michael Hamish Jensen, Auckland, New Zealand, assignor to Fisher & Paykel Limited, Auckland, New Zealand

Filed May 2, 1997, Ser. No. 850,195

Claims priority, application New Zealand, May 3, 1996, 286508

Int. Cl.^{6} F25D *23/04*

U.S. Cl. 165—263 **9 Claims**



7. A refrigerator comprising:

an open fronted cabinet enclosing, but for said open front, a refrigeration space,
a door connected to said cabinet to cover said open front when closed and to give access to said refrigerated space when open,
a refrigeration system to refrigerate said refrigeration space,
an enclosed subcompartment, said subcompartment supported on the door of said refrigerator, and
a light source in said cabinet, said light source located in said cabinet proximate to said subcompartment with said door closed, said light source being adapted to illuminate the contents of said refrigerator with said door open, and with said door closed is substantially blocked from illuminating the contents of said refrigerator by said enclosed subcompartment.

5,839,508

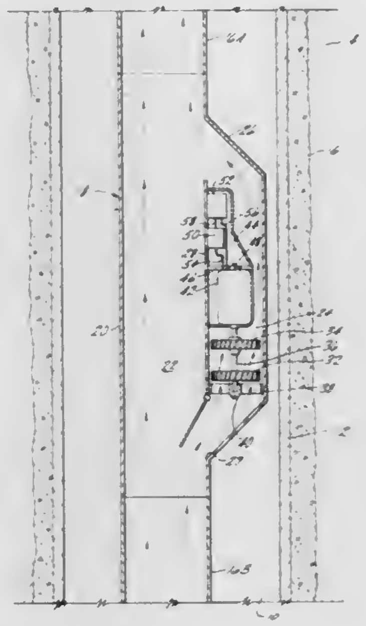
DOWNHOLE APPARATUS FOR GENERATING ELECTRICAL POWER IN A WELL

Paulo Tubel, The Woodlands; Michael Wayne Holcombe, Katy; John L. Baugh, Houston; Albert A. Mullins, II, Humble, all of Tex., and Robert Chapman Ross, Newmachar, Scotland, assignors to Baker Hughes Incorporated, Houston, Tex.

Continuation-in-part of Ser. No. 386,480, Feb. 9, 1995, Pat. No. 5,597,042. This application Jun. 19, 1996, Ser. No. 668,053

Int. Cl.^{6} E21B *43/00*

U.S. Cl. 166—65.1 **54 Claims**



1. An electrical energy generating apparatus for generating electricity downhole in a well, comprising:

a primary flow passageway and side passageway laterally displaced from said primary passageway; and
an electrical generating device positioned, at least in part, in said side passageway, said electrical generating device adapted to generate electricity in response to fluid flowing through said side passageway.

5,839,509

METHOD AND APPARATUS FOR GATHERING LIQUID SAMPLE USING A SUBMERSIBLE PUMP

Roger Peterson, Country Rd. 375, Old Ocean, Tex. 77463

Continuation-in-part of Ser. No. 692,018, Aug. 2, 1996. This application Feb. 7, 1997, Ser. No. 795,147

Int. Cl.^{6} E21B *43/12*

U.S. Cl. 166—264 **40 Claims**

12. A method for acquiring liquid sample from a reservoir comprising the steps of:

(a) providing a submersible pump comprising an inlet port controlled by a first check valve, a control port, and a chamber;
(b) applying a vacuum to said control port thereby creating a reduced pressure within said chamber, and

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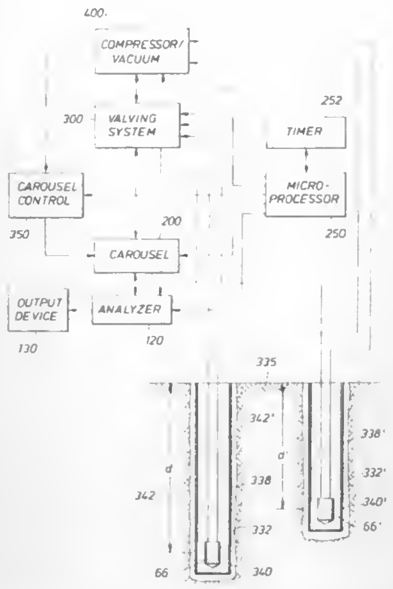


(c) flowing liquid, within which said pump is submerged, into said chamber when a head pressure exerted by said liquid opens said first check valve by exceeding the difference of a cracking pressure of said first check valve and said reduced chamber pressure.

5,839,510
CONTROL OF PARTICULATE FLOWBACK IN SUBTERRANEAN WELLS

Jim D. Weaver; Philip D. Nguyen; James R. Stanford, all of Duncan; Bobby K. Bowles, Comanche; Steven F. Wilson, Duncan; R. Clay Cole, Dunacn; Mark A. Parker, Duncan, and Brahmadeo T. Dewprashad, Norman, all of Okla., assignors to Halliburton Energy Services, Inc., Duncan, Okla.

Continuation-in-part of Ser. No. 725,368, Oct. 3, 1996, Pat. No. 5,787,986, which is a continuation-in-part of Ser. No. 510,399, Aug. 2, 1995, Pat. No. 5,582,249, which is a continuation-in-part of Ser. No. 412,668, Mar. 29, 1995, Pat. No. 5,501,274. This application Jan. 14, 1997, Ser. No. 783,050

Int. Cl.^{6} E21B *33/138;43/04;43/267*

U.S. Cl. 166—276 **25 Claims**

1. A method of treating a subterranean formation comprising the steps of:

introducing a particulate-containing fluid suspension into a subterranean formation;

admixing with at least a portion of said particulate in said fluid suspension a liquid or solution of a tackifying compound whereby at least a portion of said particulate is at least partially coated by said compound;

admixing with at least a portion of said particulate in said fluid suspension a hardenable resin whereby at least a portion of said particulate is at least partially coated by said resin;

depositing the tackifying compound and hardenable resin coated particulates in the subterranean formation; and

flowing back fluid from the formation whereby the tackifying compound coated particulate retards movement of at least a portion of the particulate within said formation and said hardenable resin subsequently consolidates at least a portion of the particulate within said formation.

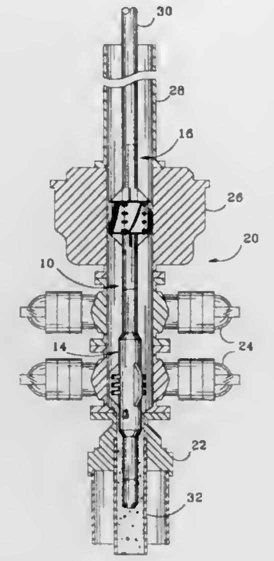
5,839,511
BLOWOUT PREVENTER WASH-OUT TOOL

Donald L. Williams, 202 Holstein La., Youngsville, La. 70592

Filed Jun. 6, 1997, Ser. No. 870,208

Int. Cl.^{6} E21B *37/00*

U.S. Cl. 166—312 **8 Claims**



1. A tool for washing out oil and gas well blowout preventer stacks comprising:

a) a first drill string sub joint;

b) a brush assembly attached to said drill string sub joint;

c) a second drill string sub joint threadably connected to said first drill string sub joint having fins and a plurality of nozzles; and

d) an end cap threadably connected to said second drill string joint opposite said first sub joint.

5,839,512
ADJUSTABLE CASING HANGER WITH CONTRACTIBLE LOAD SHOULDER AND METAL SEALING RATCH LATCH ADJUSTMENT SUB

Steven Robert Malone, East Kilbride; Gavin Thomas Reilly, Lanarkshire, and Sean McAvoy, Coatbridge, all of Scotland, assignors to FMC Corporation, Chicago, Ill.

Filed Dec. 6, 1996, Ser. No. 761,457

Claims priority, application United Kingdom, Dec. 14, 1995, 9525512

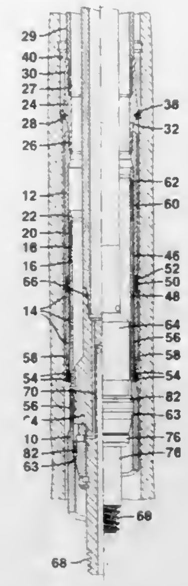
Int. Cl.^{6} E21B *33/043*

U.S. Cl. 166—348 **12 Claims**

1. An adjustable casing hanger comprising a first tubular component having an end connection attachable to the upper end of a casing string in use;

a second tubular component securable to the first component, the relative axial position in which the first component is secured to the second component being adjustable to vary the vertical position at which the casing string is supported; and

a load shoulder radially movable between an expanded position in which in use it supports the second component on a co-operating landing surface and a contracted position in which it allows passage of the shoulder both up and down past the landing surface.



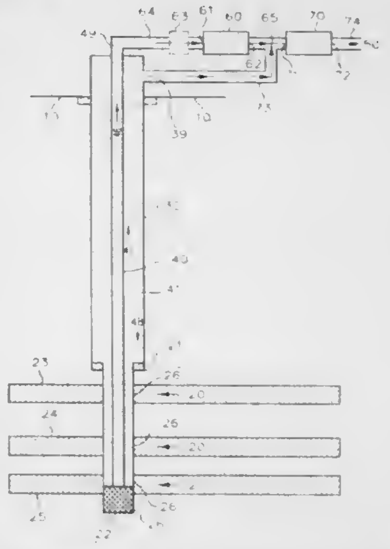
5,839,513
COMPRESSOR-ASSISTED ANNULAR FLOW

Kirk L. Czirr, Farmington, N. Mex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 22, 1997, Ser. No. 861,928

Int. Cl.^{6} E21B *43/12*

U.S. Cl. 166—370 **15 Claims**



10. A method comprising: (a) providing an inner conduit designated a production tubing into a producing formation of a hydrocarbon-producing well within and in coaxial arrangement with an outer conduit thereby forming a tubing/casing annulus wherein said outer conduit is formed by a well casing; (b) securely connecting a first compression means to said inner conduit; (c) securely connecting a second compression means to said tubing/casing annulus; and (d) recovering the hydrocarbon through said inner conduit and said tubing/casing annulus using said first compression means and said second compression means wherein said casing extends from the surface to a desired depth in said well; said production tubing has a smaller diameter than said casing; said production tubing extends above said casing to provide a surface outlet for said production tubing; said tubing/casing annulus extends below the surface for fluid communication with said producing formation at its lower end; and both the production tubing outlet and the tubing/casing outlet at the surface is in fluid communication with said producing formation.

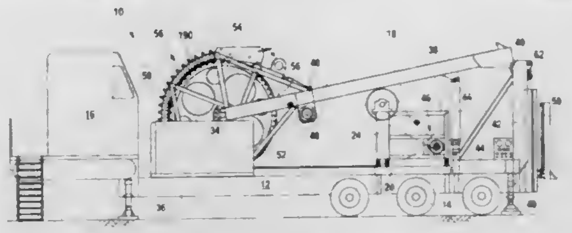
5,839,514
METHOD AND APPARATUS FOR INJECTION OF TUBING INTO WELLS

Thomas C. Gipson, Cisco, Tex., assignor to Fleet Cementers, Inc., Cisco, Tex.

Filed May 23, 1997, Ser. No. 862,745

Int. Cl.^{6} E21B *19/22*

U.S. Cl. 166—384 **11 Claims**



1. An apparatus for injecting coiled tubing into a hole in the earth's surface comprising:

a frame having a front end and a back end;

a tubing storage spool removably mounted on said frame at said back end and having said coiled tubing stored thereon;

a mast pivotally mounted on said frame;

an injector reel rotatably mounted on said mast, said injector reel pivotable from a first stored position at said front end to a second tubing injecting position;

a drive mechanism attached to said injector reel to rotate said injector reel; and

a hold down assembly mounted around a portion of the circumference of said injector reel for exerting a pressure against said coiled tubing over more than 90° of said injector reel when said injector reel is in said second operative position and said coiled tubing is directed between said hold down assembly and said circumference of said injector reel to provide positive engagement of said tubing by said injector reel when said injector reel is being rotated to pull said tubing off of said tubing storage spool or return said tubing to said tubing storage spool.

11. A method of retrieving a length of coiled tubing and storing said tubing on a tubing storage spool comprising:

rotating a reel;

exerting pressure against more than 90° of the circumference of said reel while running said tubing around a portion of said circumference to exert pressure against said tubing to cause positive engagement of said tubing by said reel; and

routing said tubing off of said reel onto said tubing storage spool, said tubing storage spool mounted on a cradle vertically and horizontally adjustable to accept varying spool widths and diameters.

5,839,515
SLIP RETAINING SYSTEM FOR DOWNHOLE TOOLS

Yusheng Yuan, Houston; Douglas W. Davison, Pearland, both of Tex., and Kevin T. Berscheidt, Duncan, Okla., assignors to Halliburton Energy Services, Inc., Duncan, Okla.

Filed Jul. 7, 1997, Ser. No. 888,719

Int. Cl.^{6} E21B *33/129*

U.S. Cl. 166—387 **20 Claims**

11. A method of retaining at least one set of a plurality of slip segments about a downhole tool apparatus having a mandrel comprising:

a) providing each slip with at least one groove on an outer face thereof;

b) installing a frangible retaining member in the at least one groove located within the slip segments; and

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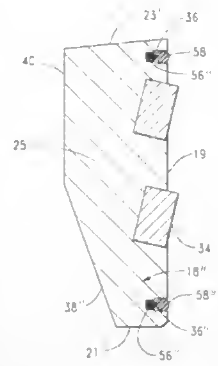


c) installing an elastic member proximate to the retaining member in the at least one groove located within the slip segments.

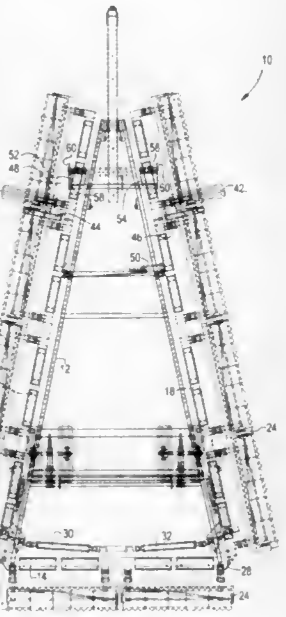
5,839,516
FOLDING FRAME ASSEMBLY FOR A ROLLING HARROW IMPLEMENT HAVING A TRANSPORT POSITION IN WHICH THE MAIN FRAME IS UPWARDLY PIVOTED AND THE WING FRAMES ARE FORWARDLY PIVOTED

Loren G. Arnold, Tucson, Ariz., and David R. Smith, Fort Jennings, Ohio, assignors to Unverferth Manufacturing Co., Inc., Kalida, Ohio

Continuation of Ser. No. 613,722, Mar. 12, 1996, abandoned. This application Apr. 14, 1997, Ser. No. 833,223

Int. Cl.⁶ A01B *63/00*

U.S. Cl. 172—456 **15 Claims**



1. A folding frame assembly for soil-cultivating equipment used in cultivating a field surface when moving in a primary direction of travel, the folding frame assembly having a weight, a lowered full working position and an upwardly-directed fully folded transport position, the folding frame assembly comprising:

a support frame having a back side, and a main retractable wheel assembly;

a main frame for carrying a soil-cultivating assembly, and having a front side, a first side, and a second side, the first side being opposite the second side and the front side being pivotally connected to the back side of the support frame for pivoting the main frame between said full working position and said fully folded transport position;

a first wing frame for carrying a first wing soil-cultivating assembly, and pivotally connected to the first side of the main frame for pivoting the first wing frame between said full working position and said fully folded transport position:

a second wing frame for carrying a second wing soil-cultivating assembly, and pivotally connected to the second side of the main frame for pivoting the second wing frame between said full working position and said fully folded transport position;

wherein, in said fully folded transport position, the main retractable wheel assembly is positioned in contact with said field surface, the main frame is upwardly pivoted relative to said support frame and supported by the support frame, and the first wing frame and second wing frame are each forwardly oriented and supported by said support frame so that each said soil-cultivating assembly is out-of-contact with said field surface;

wherein, in said full working position, said main wheel assembly is retracted out of contact with said field surface, the main frame is downwardly pivoted relative to said support frame to a lowered position, and the first wing frame and second wing frame are each in a lowered position, so that each said soil-cultivating assembly is in contact with said field surface;

wherein the main retractable wheel assembly further comprises a secondary apparatus connecting the main retractable wheel assembly and the main frame, the secondary apparatus acting between the retractable wheel assembly and the main frame for moving the main retractable wheel assembly between said full working position and said fully folded transport position, wherein, in said fully folded transport position, the main retractable wheel assembly is positioned proximate a center of balance of the folding frame assembly and forwardly of said full working position so as to support most of the weight of said folding frame assembly on said main retractable wheel assembly during transport:

wherein the first wing frame includes a first retractable wheel assembly;:

the second wing frame includes a second retractable wheel assembly:

the main retractable wheel assembly further comprises a main lift apparatus connecting the main retractable wheel assembly to the main frame;

the first retractable wheel assembly further comprises a first lift apparatus connecting the first retractable wheel assembly to the first wing frame: and

the second retractable wheel assembly further comprises a second lift apparatus connecting the second retraction wheel assembly to the second wing frame:

wherein the main lift apparatus, the first lift apparatus, and the second lift apparatus, respectively, operate to vertically adjust the main frame, the first wing frame, and the second wing frame with respect to the field surface between said full working position wherein each said wheel assembly is out-of-contact with said field surface, and an intermediate position wherein each said wheel assembly is in contact with said field surface:

wherein the main frame further comprises a first wing pivoting apparatus connected to the first wing frame for pivoting the first wing frame between the full working position and the fully folded transport position, and a second wing pivoting apparatus connected to the second wing frame for pivoting the second wing frame between the full working position and the fully folded transport position, wherein the first and second wing frames are upwardly-oriented relative to said support frame in said fully folded transport position:

wherein the support frame further comprises a main folding apparatus connected to the main frame for pivoting the main frame between the full working position and said fully folded transport position;

wherein each said apparatus is a hydraulic cylinder.

5,839,517
VIBRATION ISOLATOR FOR HAND-HELD VIBRATING DEVICES

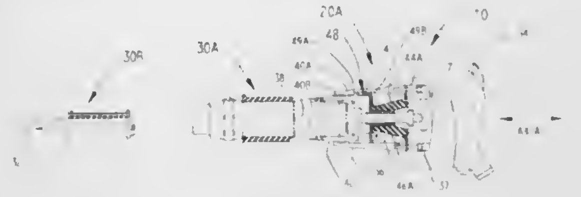
James T. Gwinn, and Robert H. Marjoram, both of Erie, Pa., assignors to Lord Corporation, Cary, N.C.

PCT No. PCT/US93/12271, § 371 Date Jul. 26, 1995, § 102(e) Date Jul. 26, 1995, PCT Pub. No. WO94/16864, PCT Pub. Date Aug. 4, 1994

Continuation-in-part of Ser. No. 9,695, Jan. 27, 1993, abandoned. This PCT application Dec. 16, 1993, Ser. No. 663,155

Int. Cl.⁶ B25D *17/24*

U.S. Cl. 173—162.2 **22 Claims**



1. A vibration isolator for use on a hand held vibrating device for reducing the mechanical vibration imparted to the user, said vibrating device including a handle for grasping by the user and a tool body, said vibration isolator comprising:

a resiliently deformable element attachable between said handle and said tool body, said element being resiliently deformable in a length direction to shorten under application of load, said element including a buckling section which is resiliently bendable laterally to the length direction under application of load, wherein said element has a varying spring rate which is greater at an undeformed length of said element than at a shortened length within an operating range of said element, so that said spring rate and a corresponding force to displace said handle relative to said tool are less within said operating range as compared to said spring rate and to a displacement force at the undeformed length of said element so that mechanical vibration imparted to said handle from said tool body within said operating range is absorbed.

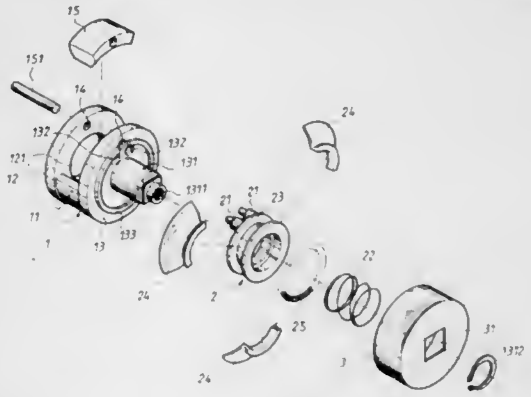
5,839,518
CENTRIFUGAL FORCE-CONTROLLED COUPLING SWITCH MECHANISM FOR AN ELECTRIC DRILL

Shibata Setsuko, 5-14-7-505, Higashi-Ohi, Shinagawa-Ku, Tokyo, Japan

Filed Jul. 16, 1997, Ser. No. 895,030

Int. Cl.⁶ B23Q *5/00*

U.S. Cl. 173—176 **1 Claim**



1. A centrifugal force-controlled coupling switch mechanism coupled between a reversible motor shaft of a reversible motor and an output shaft for controlling transmission of rotary driving power from said reversible motor to said output shaft, comprising:

a rotary base having an outer race, an inner race, a hemispherical shell axially connected between said outer race and said inner race, and an eccentric block turned about a pivot pin between said outer race and said inner race at an eccentric location, said inner race comprising a backwardly extended stepped center tube coupled to the reversible motor shaft of said reversible motor, and two insertion holes bilaterally disposed adjacent said pivot pin, said eccentric block being forced into engagement with a fixed coupling block of said output shaft for permitting said output shaft to be turned with said rotary base when said eccentric block receiving a centrifugal force during the rotary motion of said rotary base,

a cap mounted around the stepped center tube of said rotary base and secured thereto by a clamp and covered on one side of said inner race; and

clutch means mounted around the stepped center tube of said rotary base within said cap and adapted to control the engagement between said eccentric block of said rotary base and the fixed coupling block of said output shaft, said clutch means comprising a clutch body having an annular groove around the periphery and two forwardly extended locating pins adapted for inserting into the insertion holes of said rotary base to disengage said eccentric block from the fixed coupling block of said output shaft, a plurality of smoothly curved actuating plates fastened to the annular groove of said clutch body by a spring retainer, and spring means connected between said cap and said clutch means, said smoothly curved actuating plates being forced by a centrifugal force to expand and to push said clutch body backwards in disengaging its locating pins from said eccentric block for permitting said eccentric block to be forced into engagement with the fixed coupling block of said output shaft by the centrifugal force when said rotary base is turned with said clutch body by the reversible motor shaft of said reversible motor, said spring means imparting a forward pressure to said clutch body causing the locating pins of said clutch body to be retained inserted into said insertion holes of said rotary base to disengage said eccentric block from the fixed coupling block of said output shaft.

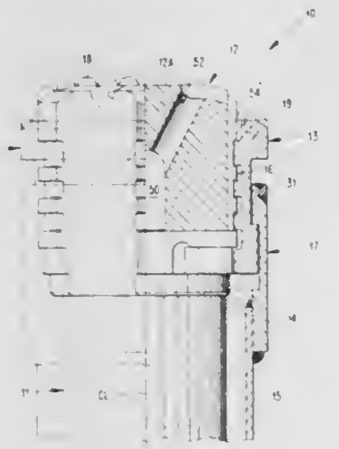
5,839,519
METHODS AND APPARATUS FOR ATTACHING A CASING TO A DRILL BIT IN OVERBURDEN DRILLING EQUIPMENT

Angelo Lee Spedale, Jr., Cypress, Tex., assignor to Sandvik AB, Sandviken, Sweden

Filed Nov. 8, 1996, Ser. No. 746,268

Int. Cl.⁶ E21B *4/14*

U.S. Cl. 175—57 **14 Claims**



1. Overburden drilling apparatus for drilling a hole, comprising:

a drill bit body defining a longitudinal axis of rotation and including a cutting face at a longitudinal front end of the body, and a connection section at a longitudinal rear end thereof adapted for connection with a percussive unit; and

a generally cylindrical casing shoe adapted for attachment with a casing:

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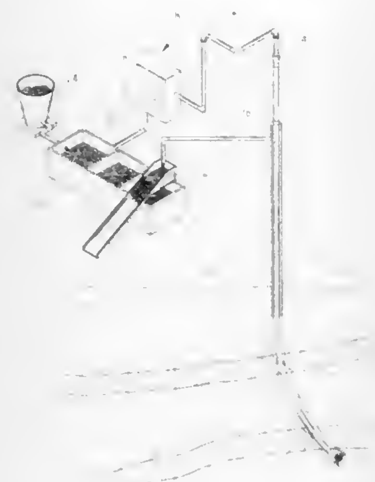
- the drill bit body including a radially outwardly extending longitudinally forwardly facing first wall, said casing shoe including a radially inwardly extending longitudinally rearwardly facing second wall facing the first wall to be engaged and longitudinally advanced thereby during a drilling operation;
- the casing shoe comprising two substantially identical semicylindrical halves, and an endless substantially circular ring extending coaxially around the halves to hold the halve together.

5,839,520
METHOD OF DRILLING WELL BORES

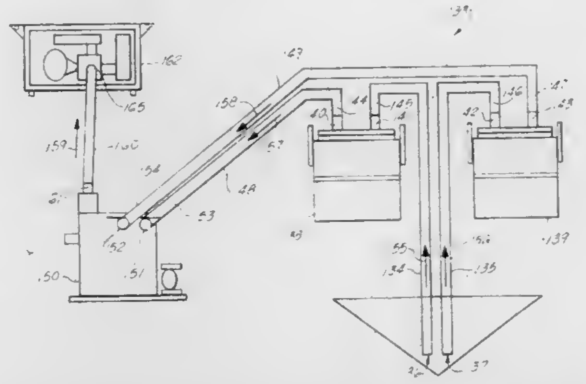
Bonnie Blue Maillet, 130 Oak Leaf Dr., Lafayette, La. 70503
Filed Oct. 3, 1996, Ser. No. 724,779
Int. Cl.^{6} E21B *7/04;31/00;* C09K *7/00*
U.S. Cl. 175—61 12 Claims



1. A method of decreasing the tortuosity of a highly deviated well bore, the method comprising:
- providing a drill string having a bottom hole assembly containing:
  - a directional sub attached to said drill string; a drilling motor operatively associated with said directional sub; and, a bit responsive to said drilling motor;
- pumping a drilling fluid down said drill string;
- rotating said bit so that a well bore is created, said rotation developing tortuosity between the drill string and the well bore;
- building the angle of inclination so that a deviated section is created;
- preparing a pill comprising: at least 20 pounds per barrel of spherical beads, said beads having a diameter of at least 800 microns;
- pumping said pill within said well bore to the area of tortuosity;
- drilling the horizontal section;
- preparing a sweep comprising: 50 pounds of spherical beads, said beads having a diameter of 800 microns;
- pumping said sweep within said well bore to said horizontal portion, and wherein the step of pumping the drilling fluid down the drill string includes creating a mud cake upon the well bore, said mud cake having a thickness of at least 1000 microns.

5,839,521
OIL AND GAS WELL CUTTINGS DISPOSAL SYSTEM

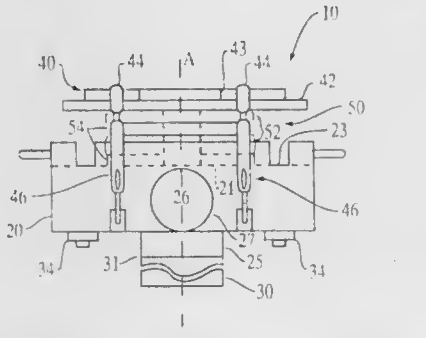
Gary H. Dietzen, 110 Stonewood Cir., Lafayette, La. 70508
Continuation-in-part of Ser. No. 729,872, Oct. 15, 1996, which is a continuation-in-part of Ser. No. 416,181, Apr. 4, 1995, Pat. No. 5,564,509, which is a continuation-in-part of Ser. No. 197,727, Feb. 17, 1994, Pat. No. 5,402,857. This application Mar. 10, 1997, Ser. No. 813,462
Int. Cl.^{6} F21B *21/06;* B09B *5/00*
U.S. Cl. 175—66 25 Claims



1. A method of removing drill cuttings from an oil and gas well drilling platform that uses a drill bit supported with a drill string and a well drilling fluid during a digging of a well bore, comprising the steps of:
- a) separating drill cuttings from the well drilling fluid on the drilling platform so that the drilling fluids can be recycled into the well bore during drilling operations;
- b) transmitting the cuttings to a materials trough having an interior;
- c) sectioning the separated drill cuttings with a suction line having an intake end portion that can be positioned at the materials trough;
- d) transmitting the drill cuttings via the suction line to a pair of tanks that each have an interior and at least one access opening for communicating with the tank interior;
- e) sequentially forming a vacuum within the holding tank interiors with a blower that is in fluid communication with each tank interior; and
- f) using a third tank to selectively control the vacuum within the tank interiors.

5,839,522
SLURRY DIVERTER

John F. Allyn, 270 Ashpohtag Rd., and Walter G. Allyn, 260 Ashpohtag Rd., both of Norfolk, Conn. 06058
Continuation-in-part of Ser. No. 667,355, Jun. 18, 1996. This application Sep. 16, 1997, Ser. No. 931,595
Int. Cl.^{6} E21B *33/00*
U.S. Cl. 175—209 20 Claims

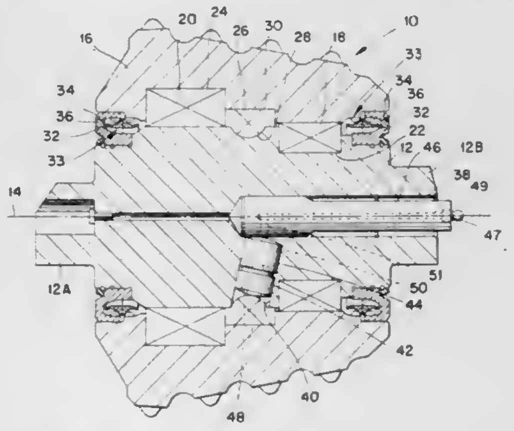


1. A slurry diverter for use in well drilling of the type in which a drill shaft is rotated to drill an axis-defining bore in the ground and in which pressurized air and/or other fluids are passed into the bore whereby slurry is forced out of the bore during drilling, said slurry diverter comprising:

- an enclosed housing having a top end which defines a first aperture and an upper surface, said housing defining a second aperture which permits entry of slurry from the bore into said housing, said first and second apertures being aligned with the bore axis for permitting the drill shaft to pass therethrough during drilling, and said housing further defining an exit port for permitting slurry to exit said housing whereby the slurry can be diverted away from said bore;
- at least one flexible wiper disposed above said upper surface, said wiper having a central aperture which is coaxially disposed with said first housing aperture and which permits the drill shaft to pass therethrough during drilling while said wiper makes sealing contact with the drill shaft such that substantially none of the slurry entering said housing can pass through said first housing aperture;
- a clamp assembly for clamping said wiper to said housing such that rotation of the drill shaft during drilling does not cause rotation of said wiper;
- a wiper-compressing member axially spaced from said upper surface of said housing top end, said member defining a member-aperture aligned with the bore axis for permitting the drill shaft to pass therethrough during drilling; and
- at least one releasable clamp extending between said wiper-compressing member and said housing such that actuation of the clamp causes said wiper-compressing member to apply a compressive force to said wiper whereby said wiper is maintained against said upper surface of said housing.

5,839,523
METHODS AND APPARATUS FOR LUBRICATING A ROTARY CUTTER

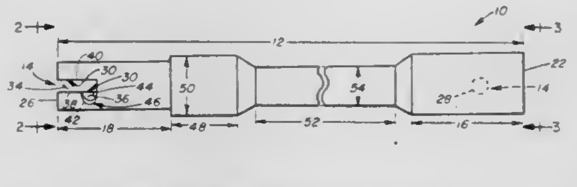
Stig-Åke Brolund, Houston, Tex., assignor to Sandvik AB, Sandviken, Sweden
Filed Aug. 12, 1997, Ser. No. 909,659
Int. Cl.^{6} E21B *10/22*
U.S. Cl. 175—228 10 Claims



1. A rotary cutter comprising:
- a shaft adapted to be mounted on a support and defining a longitudinal axis, the shaft including a first bore extending inwardly into the shaft from a first port at an outer surface of the shaft, and a second bore extending from the first bore to a second port at the outer surface of the shaft;
- an outer roller body having cutting elements being mounted on the outer surface of the shaft for rotation relative thereto about the axis, the second port being situated between the shaft and the roller body;
- an axial locking means disposed between the shaft and roller body for locking the roller body against axial movement relative to the shaft, the second bore communicating with the axial locking means at the second port;
- bearings disposed between the shaft and the roller body for rotatably mounting the roller body on the shaft, the bearings communicating with the second port;
- a spacer disposed in the second bore for spacing the locking means from the first bore;
- a retainer disposed in the first bore and extending across the second bore sufficiently to retain the spacer therein, while maintaining communication between the first and second bores; and
- a flexible diaphragm disposed adjacent an outer end of the retainer for forming a grease seal across the first bore;
- the bearings and first and second bores containing lubricating grease;
- the flexible diaphragm being flexible inwardly in response to external pressure applied thereto from the first port, and flexible outwardly in response to internal thermal expansions of grease.

5,839,524
QUICK RELEASE LOCKING DRILL ROD AND ASSEMBLY

Paul C. Sanford, P.O. Box 1071, Elbow Lake, Minn. 56531
Filed May 21, 1997, Ser. No. 859,978
Int. Cl.^{6} E21B *17/02*
U.S. Cl. 175—320 17 Claims



1. A quick release locking drill rod, comprising:
- (a) a sleeve having opposite first and second end portions, said first end portion having a first diameter and an open first end, said second end portion having a second diameter and an open second end, said first diameter being greater than said second diameter, said first end portion of said sleeve of one said rod being for receiving said second end portion of said sleeve of another said rod therein; and
- (b) means for quick release locking said first end portion of said sleeve of one said rod to said second end portion of said sleeve of another said rod, said quick release locking means including
  - (i) an internal cross pin disposed in said first end portion of said sleeve and being spaced inwardly from said open first end and spaning said first diameter thereof, said internal cross pin having opposite ends attached to opposite sides of said first end portion of said sleeve, and
  - (ii) a pair of diametrically opposed L-shaped slots defined in respective opposite sides of said second end portion of said sleeve, said pair of diametrically opposed L-shaped slots of said sleeve of one said rod adapted for releasably retaining said internal cross pin of said sleeve of another said rod upon insertion of said internal cross pin into and rotation of said internal cross pin within said pair of diametrically opposed L-shaped slots of said sleeve of said one rod.

5,839,525
DIRECTIONAL DRILL BIT

Carl M. Hoffmaster; Tim P. Beaton, and Keith Terry, all of Houston, Tex., assignors to Camco International Inc., Houston, Tex.
Filed Dec. 23, 1996, Ser. No. 771,000
Int. Cl.^{6} E21B *10/00;* B21K *5/04*
U.S. Cl. 175—375 19 Claims

1. A rotary drill bit for drilling subsurface formations, comprising:
- a bit body having a crown portion and a shank portion, extending from the crown portion, for connection to a drill string; and

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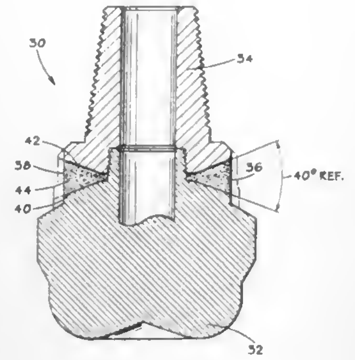


breaker slots in the bit body formed at the intersection of the crown portion and the shank portion.

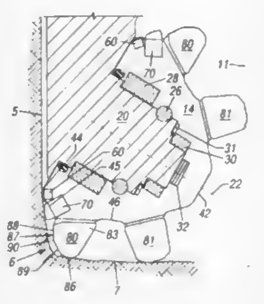
5,839,526
ROLLING CONE STEEL TOOTH BIT WITH ENHANCEMENTS IN CUTTER SHAPE AND PLACEMENT

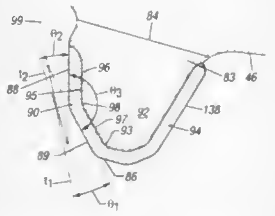
Dennis NMI Cisneros, Kingwood; Scott D. McDonough, Houston; James C. Minikus, Spring, and Chris E. Cawthorne, The Woodlands, all of Tex., assignors to Smith International, Inc., Houston, Tex.

Filed Apr. 4, 1997, Ser. No. 833,418

Int. Cl.^{6} E21B *10/16*

U.S. Cl. 175—431 **66 Claims**





1. A steel tooth bit for cutting a borehole in accordance to a gage curve, the bit having a bit axis and comprising:

- at least one rolling cone cutter having a cone axis, a heel surface generally facing the borehole sidewall, and a conical surface generally facing the borehole bottom;
- gage row cutter elements disposed in a circumferential gage row on said cone cutter in a region between said heel surface and said conical surface and having cutting surfaces that extend to full gage;
- steel teeth disposed in a circumferential first inner row on said cone cutter;
- wherein a plurality of said steel teeth include a gage facing surface and a cutting tip that is off the gage curve a first predetermined distance for cutting the borehole bottom, and a knee on said gage facing surface for cooperatively cutting the corner of the borehole in concert with said gage row cutter elements.

5,839,527
MULTI-AXLE STEERING SYSTEM FOR VEHICLES

Dieter Elser, Essingen, and Klaus Rief, Leinzell, both of Germany, assignors to ZF Friedrichshafen AG., Friedrichshafen, Germany

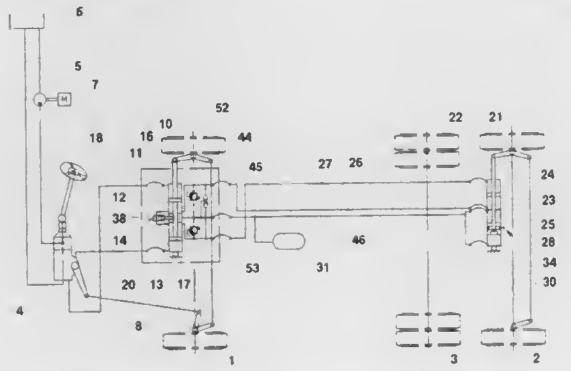
PCT No. PCT/EP95/01417, § 371 Date Oct. 21, 1996, § 102(e) Date Oct. 21, 1996, PCT Pub. No. WO95/29087, PCT Pub. Date Nov. 2, 1995

PCT Filed Apr. 15, 1995, Ser. No. 727,528

Claims priority, application Germany, Apr. 22, 1994, 44 14 161.0

Int. Cl.^{6} B62D *7/00*

U.S. Cl. 180—24.01 **15 Claims**



1. A multi-axle steering system for vehicles comprising a steering gear for a first steering axle having steered wheels and with hydrostatic steering for a second steering axle having steered wheels,

- wherein a master cylinder having two work chambers and being disposed on the first steering axle and a slave cylinder having two work chambers and being disposed on the second steering axle, the four work chambers being connected with each other by means of pressure lines and which elements together constitute the hydrostatic steering,
- wherein the second steering axle has a centering device for the return of the steered wheels of the second steering axle to a straight-ahead running position,
- the improvement comprising
  - the two work chambers of the master cylinder are provided with equal effective surfaces, and
  - a device for the automatic synchronization of the movement of the master cylinder and the slave cylinder is provided on the master cylinder, by means of which device a connection between only the two work chambers of the master cylinder can be made when the steered wheels of the first steering axle are in or near the straight-ahead running position.

5,839,528
DETACHABLE MOTORIZED WHEEL ASSEMBLY FOR A GOLF CART

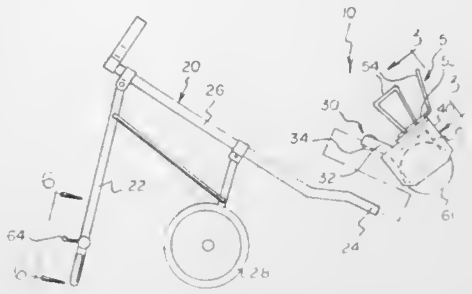
John E. Lee, 3103 Lindenlea Drive, Mississauga, Ontario, Canada, L5C 2C3

Filed Sep. 30, 1996, Ser. No. 723,342

Int. Cl.^{6} B62D *51/04*

U.S. Cl. 180—16 **10 Claims**

1. A power drive apparatus for moving a golf bag cart having a pair of oppositely disposed and laterally spaced apart wheels and a longitudinally-extending supporting frame member having a rear end section, said apparatus comprising:



- a support framework for attachment to the rear end section of a supporting frame member of said golf bag cart behind said laterally-spaced apart wheels;
- means for removably attaching said support framework to said rear end section, at least part of said attaching means being connected to said support framework; and
- drive means mounted on said support framework for moving said golf bag cart along the ground, said drive means including a drive wheel rotatably mounted to said support framework and a motor operatively connected to said drive wheel for rotating same, wherein in use of said apparatus, said drive wheel is mounted substantially rearwardly of said spaced apart wheels; and
- a golf bag support device attached to the support framework, the support device including three substantially rigid support loops, the support loops having a first section disposed outwardly from a top of the support framework substantially perpendicular to the drive wheel, the support loops further having a second section projecting upwardly from the first section to form an obtuse angle between the first section and the second section, one of said support loops extending generally rearwardly from the top of the support framework and the other two support loops extending in generally opposite lateral directions from the top of the support framework for producing a basket for receiving and embracing a lower end of a golf bag mounted on the golf bag cart : and
- wherein said attaching means includes a securing mechanism attachable to said rear end section of the supporting frame member and a cooperating attachment member connected to said support framework and adapted to slidably engage said securing mechanism in order to attach said support framework to said golf bag cart: and
- wherein said securing mechanism is a slotted bar having a movable locking pin mounted thereon and said attachment member is a U-shaped member having a closed end and an open end, said closed end being secured to said support framework and said open end sized to slidably receive said slotted bar, and wherein said U-shaped member has an aperture adapted to receive said locking pin when said U-shaped member is full engaged with said slotted bar.

5,839,529
ELECTRICALLY POWERED DRIVE TRAIN AND VEHICLE

Michael T. DePaoli, 6980 East Sahuaro #2059, Scottsdale, Ariz. 85254

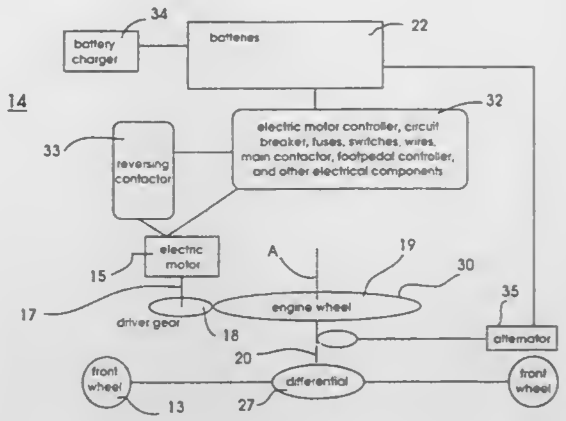
Filed Jul. 2, 1996, Ser. No. 674,427

Int. Cl.^{6} B60K *1/00*

U.S. Cl. 180—65.1 **9 Claims**

1. An electric vehicle comprising:

- a body;
- motive means coupled to the body for moving the body;
- a differential carried by the body and coupled to the motive means for imparting motion to the motive means; and
- a drive train carried by the body, the drive train including:
  - an electric motor;
  - an engine wheel having a central axis of rotation, an outer edge and a diameter;
  - a driver gear driven by the electric motor and engaging the outer edge of the engine wheel for driving the engine wheel, the driver gear having a diameter which is smaller than the diameter of the engine wheel;
  - a crank shaft fixedly attached to the engine wheel at the axis of rotation for rotation therewith, and coupled to the differential, the crank shaft having a diameter smaller than the diameter of the engine wheel and wherein the engine wheel is carried above the differential in a horizontal orientation with the crank shaft extending vertically downward and directly coupled to the differential; and
- a portable power source coupled to the electric motor.



5,839,530
PROCESS FOR OPERATING A DRIVE UNIT FOR VEHICLES OR DRIVE UNIT

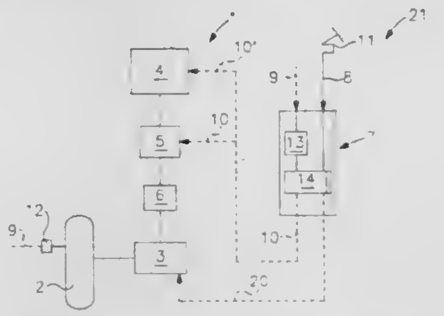
Bernd Dietzel, Syrgenstein, Germany, assignor to Voith Turbo GmbH & Co. KG, Heidenhein, Germany

Filed Mar. 27, 1997, Ser. No. 824,994

Claims priority, application Germany, Mar. 27, 1996, 196 12 034.9

Int. Cl.^{6} B60K *1/00*

U.S. Cl. 180—65.4 **20 Claims**



1. A process for operating a drive unit for a vehicle having a set of drive wheels and

- at least one electric motor driving said drive wheel at least indirectly, said drive unit including and
- a generator mechanically coupled with the internal combustion engine and said electric motor, and
- which generates a signal representative of a quantity characterizing
- an actuating device a driver's request for a change in the state of motion of the vehicle comprising the steps of:
  - sensing at least one quantity which represents a driving state of the vehicle;
  - manipulating said actuating device in order to prescribe a driver's request regarding the motion of the vehicle;
  - determining at least one quantity which describes the present driving state at least indirectly of the vehicle;
  - comparing the quantity describing the present driving state with at least one fixed prescribable comparative value, said comparative value a prescribed value of a quantity representing said vehicle at one of standstill, low speed, and drive power, and motor rpm, wherein
  - if the fixed prescribable comparative value is not reached, a prescribed value for a drive torque to be exerted on the drive wheels is assigned to the quantity describing the driver's request, and correspondingly triggering at least one

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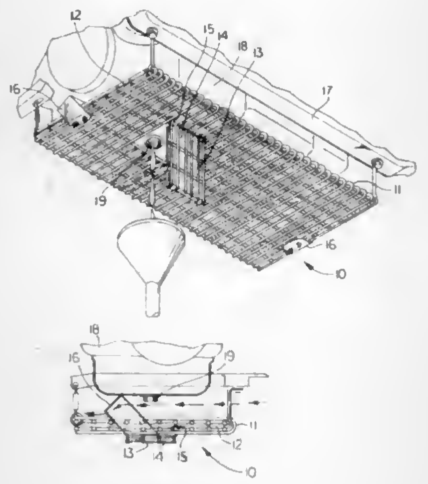
setting quantity for a setting device for setting this same drive torque at the electric motor, wherein

if the fixed prescribable comparative value is exceeded, then a prescribed value for power to be conveyed to the drive wheels is assigned to the quantity describing the driver's request, and correspondingly, triggering at least one setting quantity for a setting device for setting this same drive power at one of the electric motor and generator.

5,839,531
UNDER VEHICLE OIL CATCHER

Cecil McGee, 1804 Franklin Dr., Newton, N.C. 28658
Filed Aug. 30, 1996, Ser. No. 705,752
Int. Cl.^{6} B62D *25/20*
U.S. Cl. 180—69.1 **7 Claims**



2. A disposable oil-absorbent drip pad assembly adapted for suspension under the chassis of a motor vehicle, said assembly comprising a support surface for support of an oil-absorbent pad, characterized in that said assembly comprises an air deflector mounted to said support surface so as to be positioned between said pad and said chassis, said air deflector adapted to direct air moving between said support surface and said chassis against said pad when said motor vehicle is moving forwards.

5,839,532
VACUUM WALL WALKING APPARATUS

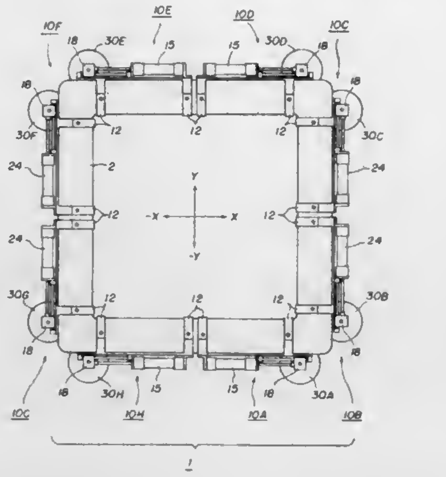
Takeo Yoshiji, and Kuniaki Okuma, both of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 21, 1996, Ser. No. 620,018
Claims priority, application Japan, Mar. 22, 1995, 7-063232; Mar. 23, 1995, 7-063787; Mar. 23, 1995, 7-063788
Int. Cl.^{6} B60B *39/00;* B25J *5/00;* B63B *9/00;* B62D *51/06*
U.S. Cl. 180—164 **22 Claims**

1. A vacuum wall walking apparatus comprising:

(a) a support frame defining an inner opening, wherein the support frame includes at least one flexible member arranged in a generally rectangular configuration, wherein said flexible member is composed of plurality of hollow elements connected together at opposite ends by a plurality of connecting fittings so as to jointly form an annular shape;

(b) a plurality of leg mechanisms mounted on the support frame;

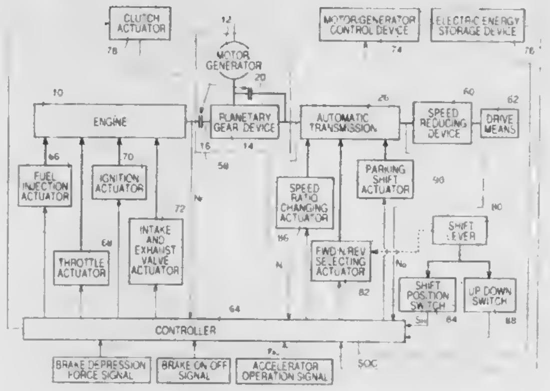
(c) a plurality of suction cups attached to fore ends of the respective leg mechanisms; and



(d) elastomeric means for allowing the frame to resiliently bend in general conformance to a profile defined by a curved surface traversed by the wall walking apparatus.

5,839,533
APPARATUS FOR CONTROLLING ELECTRIC GENERATOR OF HYBRID DRIVE VEHICLE TO CONTROL REGENERATIVE BRAKE DEPENDING UPON SELECTED DEGREE OF DRIVE SOURCE BRAKE APPLICATION

Tsuyoshi Mikami, Toyota, and Yutaka Taga, Aichi-ken, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Apr. 10, 1997, Ser. No. 834,859
Claims priority, application Japan, Apr. 11, 1996, 8-089440
Int. Cl.^{6} B60L *1/02*
U.S. Cl. 180—165 **11 Claims**



1. An apparatus for controlling a drive source brake force to be applied to a hybrid drive vehicle comprising a drive wheel, a drive power source for driving said drive wheel, and a transmission, said drive power source including an engine operated by combustion of a fuel and an electric motor operated with an electric energy, and said transmission being disposed in a power transmitting path between said engine and said drive wheel, said apparatus comprising:

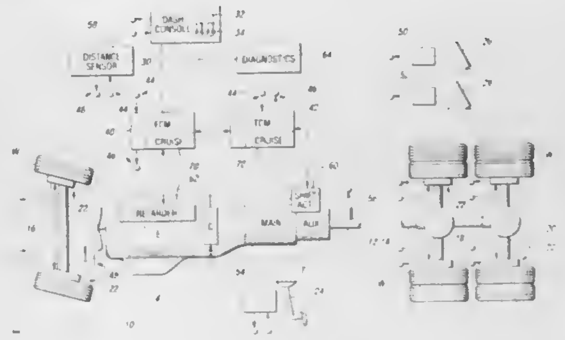
manually operated means for selecting one of a plurality of different degrees of application of a drive source brake to said hybrid drive vehicle;

electric generator driven by a kinetic energy of the hybrid drive vehicle to generate an electric energy and apply as said drive source brake a regenerative brake force corresponding to the generated electric energy to the vehicle; and

electricity generation control means for controlling said electric energy generated by said electric generator so as to produce a regenerative brake force in agreement with one of a plurality of regenerative data maps which simulate engine braking be said engine operated by combustion of a fuel through said transmission, depending upon the degree of application of the drive source brake selected by said manually operated means.

5,839,534
SYSTEM AND METHOD FOR INTELLIGENT CRUISE CONTROL USING STANDARD ENGINE CONTROL MODES

Shubhayu Chakraborty, Wixom, Mich., and William J. Mack, Clemmons, N.C., assignors to Eaton Vorad Technologies, LLC, San Diego, Calif.
Filed Mar. 1, 1995, Ser. No. 396,640
Int. Cl.^{6} B60K *31/00*
U.S. Cl. 180—169 **13 Claims**



1. A system for controlling vehicle speed to maintain a desired following distance in a vehicle with an engine controlled by an electronic control module having a plurality of engine control modes selectable via a communications interface, the system comprising:

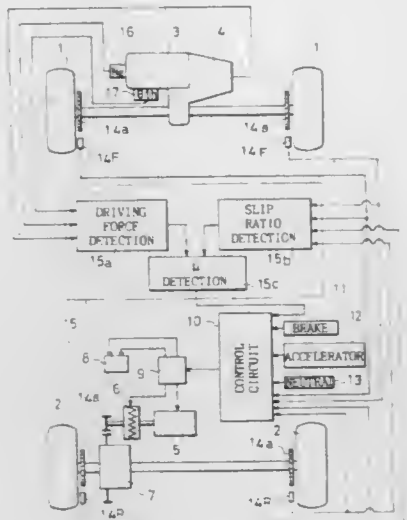
a sensor for detecting a forward vehicle and determining an inter-vehicle distance between the vehicle and the forward vehicle; and

control logic in communication with the sensor and in communication with the electronic control module for effecting a distance control mode when the forward vehicle is detected, the distance control mode including selecting at least one device for effecting a change in the vehicle speed based on the inter-vehicle distance and the desired following distance, determining a desired vehicle parameter value based on the inter-vehicle distance and the desired following distance, selecting one of the plurality of engine control modes via the communications interface, and communicating the desired vehicle parameter value to the electronic control module via the communications interface to control the vehicle speed, wherein the control logic is further operative to select one of the plurality of engine control modes based on a predetermined time interval so as to periodically switch between at least two of the plurality of engine control modes.

5,839,535
FRONT WHEEL- AND REAR WHEEL-DRIVE VEHICLE AND APPARATUS FOR DETECTING COEFFICIENT OF FRICTION ON ROAD SURFACE

Kentarou Arai, Saitama-ken, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha
Filed Apr. 17, 1996, Ser. No. 633,643
Claims priority, application Japan, May 1, 1995, 7-107511
Int. Cl.^{6} B60K *28/16*
U.S. Cl. 180—197 **5 Claims**

1. A front wheel- and rear wheel-drive vehicle in which either the front wheels or the rear wheels are driven by an engine and the other thereof are driven by an electronic motor, said vehicle comprising:



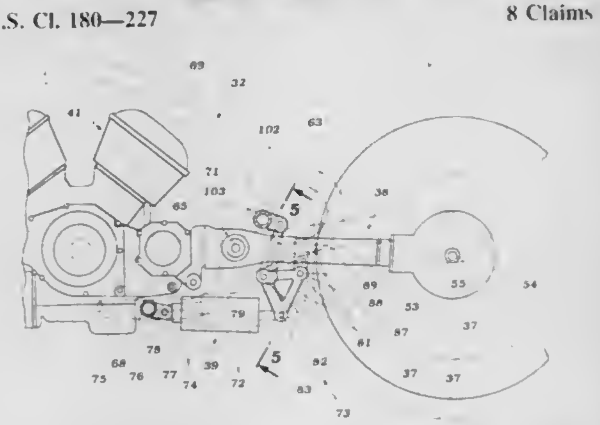
a detecting device for detecting a coefficient of friction on a road surface during running of the vehicle; and

control means for controlling said electric motor when the vehicle subsequently starts in a condition in which the coefficient of friction on the road surface is equal to or smaller than a predetermined value,

wherein said detecting device for detecting the coefficient of friction on the road surface comprises: means for detecting a driving force of wheels to be driven by said engine; means for detecting a slip ratio of said wheels; and means for obtaining the coefficient of friction on the road surface based on a correlation between the driving force and the slip ratio.

5,839,536
MOTORCYCLE SUSPENSION SYSTEM

Toyoji Tanaka, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan
Filed Sep. 3, 1996, Ser. No. 712,255
Claims priority, application Japan, Sep. 7, 1995, 7-230491
Int. Cl.^{6} B62D *61/02*
U.S. Cl. 180—227 **8 Claims**



1. A rear suspension for a motorcycle having a frame assembly, a trailing arm having a forward pivotal connection to said frame assembly and carrying a rear wheel at a rearward portion thereof for suspension travel of said rear wheel relative to said frame assembly upon pivotal movement of said trailing arm, a telescopic suspension unit having a pair of relatively movable elements for cushioning of suspension travel of said rear wheel, a bellcrank having a first pivotal connection to one of said suspension unit elements, said bellcrank having a second pivotal connection to said trailing arm, spaced generally upwardly and rearwardly of said first pivotal connection, said bellcrank having a first arm portion extending between said first and said second pivotal connections said bellcrank having a third pivotal connection to said frame

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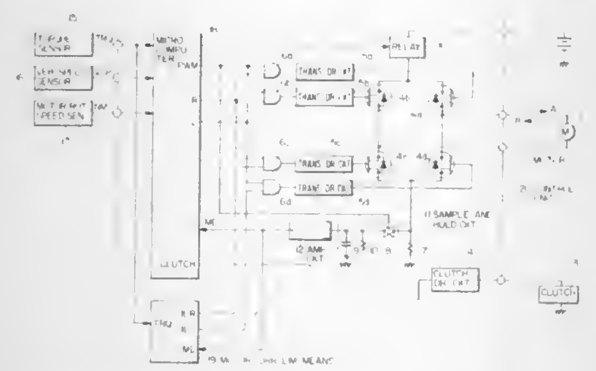
assembly formed forwardly and upwardly of said first pivotal connection for effecting movement of said one suspension element upon movement of said rear wheel relative to said frame assembly, said bellcrank having a second arm portion extending between said first and said third pivotal connections, said first pivotal connection lying below said second and said third pivotal connections, and means for providing a connection between the other of said suspension unit elements and said frame for loading said suspension unit.

5,839,537

ELECTRIC POWER STEERING CONTROL SYSTEM

Kazuhisa Nishino; Yuji Takatsuka, and Shun-Ichi Wada, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 21, 1995, Ser. No. 532,014
Claims priority, application Japan, Mar. 9, 1995, 7-049897
Int. Cl.⁶ B62D *5/04*
U.S. Cl. 180—443 **28 Claims**



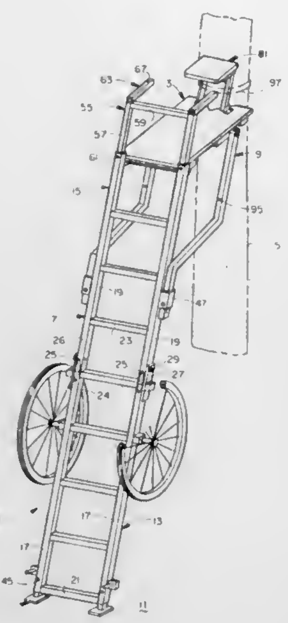
19. An electric power steering control system, comprising:
a torque sensor which detects a steering force;
an electric motor which produces an auxiliary steering force;
a motor current sensor which detects a motor current driving said electric motor;
a motor current controller which determines a motor current value and a driving direction of said electric motor required by said electric motor at least in accordance with said steering force, to thereby control said motor current; and
a motor current limiter operatively coupled to said motor current controller for limiting said motor current responsive to said steering force and said motor current value, said motor current limiter including a comparator which determines whether the motor current is above a predetermined amperage and which outputs a signal for inhibiting said motor current when said motor current is above the predetermined amperage.

5,839,538

FOLDABLE PORTABLE TREE STAND

Dennis R. Magyar, 427 Allen St., Mayville, Wis. 53050
Filed Nov. 17, 1995, Ser. No. 560,364
Int. Cl.⁶ A01M *31/02*
U.S. Cl. 182—20 **15 Claims**

1. A foldable portable tree stand comprising:
a. a bottom ladder section having upper and lower ends;
b. a top ladder section having upper and lower ends;
c. hinge means for enabling the top and bottom ladder sections to collapse and unfold relative to each other;
d. wheel means mounted to the bottom ladder section for transporting the foldable portable tree stand over the ground;
e. platform means connected to the upper end of the top ladder section for rotating between a working position and a folded position; and

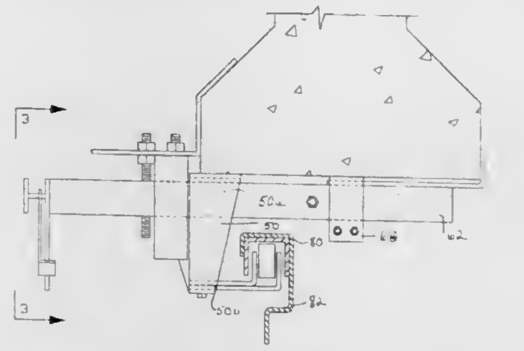


f. beam means for selectively pivoting to a support mode to cooperate with the top ladder section to support the platform in the working condition thereof, and to a storage mode when the top and bottom ladder sections are collapsed, and to a transport mode to cooperate with the bottom ladder section when the top and bottom ladder sections are collapsed to provide handles for transporting the foldable portable tree stand over the ground, wherein the beam means comprises a pair of double-angled beams each having a center section and first and second oppositely extending end sections, wherein both end sections are angled with respect to the center section, the first end sections being pivotally attached to the platform, the second end sections being retained to the top ladder section when the double-angled beams are in the support mode thereof, the first end sections being held to the bottom ladder section when the double-angle beams are in the transport mode thereof.

5,839,539

SCAFFOLD HANGAR CONSTRUCTION

John Smith, Box 45, Dover, Ohio 44622
Filed Aug. 28, 1992, Ser. No. 937,226
Int. Cl.⁶ E01B *25/24*
U.S. Cl. 182—150 **6 Claims**

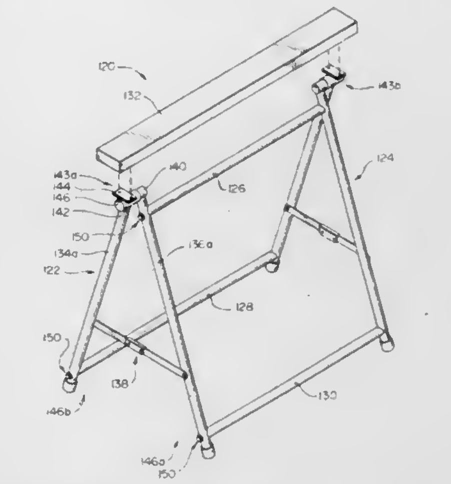


1. Scaffold hanger construction including an elongated tubular member, a roller member supported by the tubular member below the tubular member and between an inner and outer end of said tubular member and, a flange engaging arm adjustably mounted to the tubular member adjacent to the tubular member inner end, a head member adapted to engage a beam of a bridge flange, said head member being adjustably attached to the tubular member, a spring-biased block member slidably mounted within the tubular member and connected to the head member through adjustment means, lock means connected to the block, and said head member being adapted to engage alternately either a bridge I-beam or a concrete box beam and locked into engagement therewith for supporting a roller member beneath the bottom flange of the bridge beam.

5,839,540

COLLAPSIBLE FOLDING SAWHORSE

Douglass L. Russell, 5336 Neilsen Ave., Ferndale, Wash. 98248
Continuation of Ser. No. 430,588, Apr. 28, 1995, Pat. No. 5,647,455. This application Mar. 7, 1997, Ser. No. 813,868
Int. Cl.⁶ F16M *11/00*
U.S. Cl. 182—153 **6 Claims**

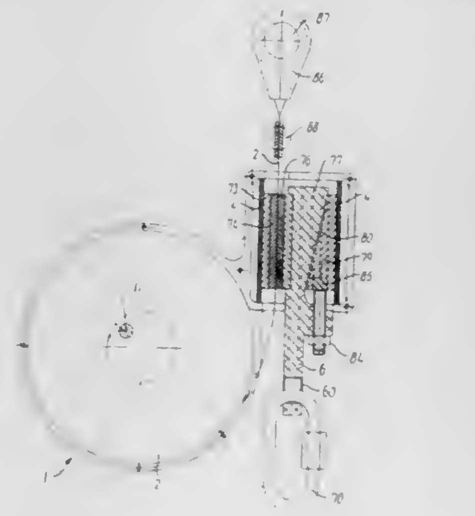


1. A folding sawhorse for supporting a workpiece on a cutting surface, comprising:
first, second, third, and fourth leg members each having an upper end and a lower end;
first, second, third, and fourth separate hinge members rigidly attached to upper ends of the first, second, third, and fourth leg members, respectively;
a plurality of spacing members, where at least one spacing member is connected between the first and fourth leg members to form a first rigid structure and at least one spacing member is connected between the second and third leg members to form a second rigid structure;
a cutting member fastened to at least one of the hinge members, where the cutting surface is formed by a surface of the cutting member; and
at least one locking assembly extending between the first and second rigid structures; wherein
the first hinge member cooperates with the second hinge member to form a first hinge assembly;
the third hinge member cooperates with the fourth hinge member to form a second hinge assembly;
the first and second hinge assemblies allow the first rigid structure to rotate relative to the second rigid structure about a hinge axis between a first position and a second position;
the locking assembly allows the first and second rigid structures to be selectively locked in the first position or unlocked such that they may be rotated from the first position into the second position;
the second and third hinge members are received within the first and fourth hinge members to form the first and second hinge assemblies, respectively;
the first, second, third, and fourth hinge members are substantially horizontal when assembled to form the first and second hinge assemblies; and
the second and third hinge members have an external diameter of a first predetermined dimension and the first and fourth hinge members have an internal diameter of a second predetermined dimension, where the first predetermined dimension is slightly smaller than the second predetermined dimension and the second and third hinge members extend at least partially into the first and third hinge members, respectively, to form the first and second hinge assemblies.

5,839,541

DEVICE FOR LOWERING A LOAD ALONG A METAL BAND

Alain Francois Jeron, Copenhagen, and Torben Lindhoft Jensen, Ishoj, both of Denmark, assignors to ERJ Management APS, Greve Strand, Denmark
PCT No. PCT/DK94/00284, § 371 Date Jun. 2, 1995, § 102(e) Date Jun. 2, 1995, PCT Pub. No. WO95/02432, PCT Pub. Date Jan. 26, 1995
PCT Filed Jul. 12, 1994, Ser. No. 397,228
Claims priority, application Denmark, Jul. 12, 1993, 0836/93
Int. Cl.⁶ A62B *1/20*
U.S. Cl. 182—192 **10 Claims**



1. A lowering device for lowering a load having a mass along a metal band, the lowering device comprising:
a flat metal band;
a brake housing including a brake mechanism, the brake mechanism having first and second brake shoes, at least one of said first and second brake shoes acting on the metal band, the metal band passing through the brake housing, said at least one of said first and second brake shoes having a fixed surface being pressed against the metal band by a force depending on the mass of the load to frictionally engage with the metal band;
a load wedge for suspending the load at an attachment point, the load wedge being movably accommodated in the brake housing and which, in the brake mechanism, converts a pull substantially in the longitudinal direction of the metal band to a pressure acting on the metal band through said at least one of said first and second brake shoes; and
said first brake shoe being arranged stationarily with respect to the brake housing, and said second brake shoe being arranged to be acted upon by said load wedge.

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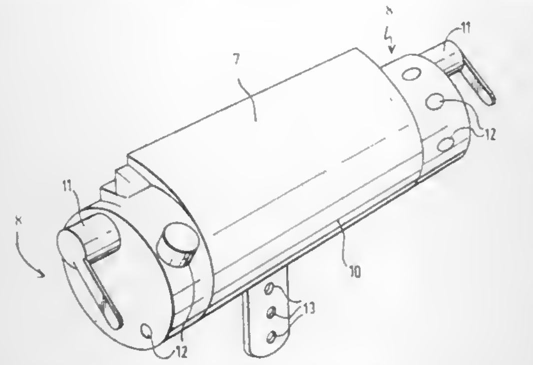
5,839,542
INDUSTRIAL TRUCK WITH AN OPERATING CONSOLE

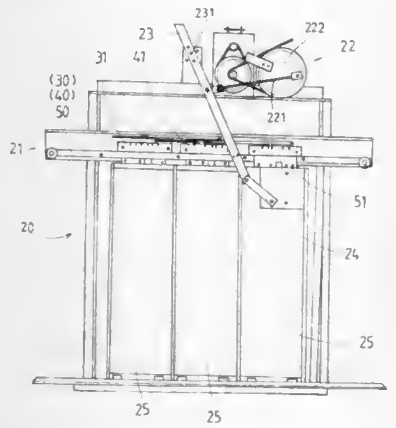
Gert Seng, Reutligen, and Burkhard Fritz, Metzingen, both of Germany, assignors to Wagner Fordertechnik, Germany
Filed Sep. 28, 1995, Ser. No. 534,930
Claims priority, application Germany, Sep. 29, 1994, 44 34 909.2; Oct. 20, 1994, 44 37 568.9
Int. Cl.^{6} B66F *9/06*
U.S. Cl. 187—222 **4 Claims**



1. An industrial truck comprising a lifting framework, a driver's stand secured to the lifting framework, a load picking device mounted on a load side of the driver's stand, and at least one operating console disposed in the area of the driver's stand, the operating console embodied as an elongated standing seat having opposed ends and oriented so that an operator-faces towards the load side when leaning back on the console, wherein the operating console has truck controls and wherein the elongated standing seat has a central horizontally elongated padded part which is arcuate about an axis of elongation and the truck controls of the operating console are disposed on the ends of the operating console.

5,839,543
ELEVATOR DOOR CONTROL MECHANISM

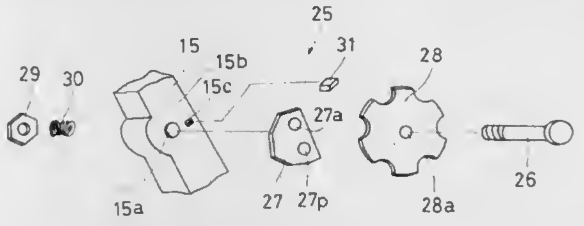
Tai Tien Chiu, P.O. Box 63-99, Taichung, Taiwan
Filed Feb. 7, 1997, Ser. No. 796,996
Int. Cl.^{6} B66B *13/06*
U.S. Cl. 187—324 **2 Claims**



1. An elevator comprising:
a housing including three door panels,
a casing secured on top of said housing and including a board and three tracks,
a lever pivotally secured to said casing at a pivot axle and including a first end secured to a first of said door panels for moving said door panels,
means for swinging said lever and for moving said door panels,
three slides slidably engaged on said tracks, a first of said slides being located close to said board of said casing, a second of said slides being located between said first slide and a third of said slides, said door panels being coupled to said slides respectively for allowing said door panels to be moved in response to said slides respectively, and
means for coupling said slides together and for allowing said slides to be slided one relative to the other, said coupling means including a beam secured on top of said first slide and having two pulleys, a bar secured on top of said second slide and having two pulleys, a first wire engaged on said pulleys of said first slide and coupled to said board and said second slide for guiding said second slide to move relative to said first side and for guiding said first slide to move relative to said board, and a second wire engaged on said pulleys of said second slide and coupled to said beam and said third slide for guiding said third slide to move relative to said second slide.

5,839,544
BRAKE LEVER HAVING A RAPID BRAKE SHOE CLEARANCE ADJUSTING MECHANISM

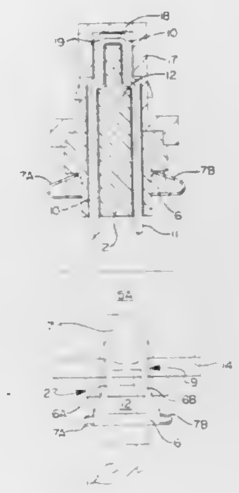
Kazuhisa Yamashita, Sakai, Japan, assignor to Shimano Inc., Sakai, Japan
Filed May 19, 1997, Ser. No. 858,710
Int. Cl.^{6} G05G *9/00;7/00*
U.S. Cl. 188—24.9 **12 Claims**



1. A brake lever mechanism comprising:
a base member (**15**) formed with a cable guide and said base member having a pivot axis (**22**) defined at a generally fixed position on said base member, said pivot axis being spaced apart from said cable guide;
a lever arm (**20**) formed with a handle portion (**20***b*) and a support portion (**20***a*), said support portion mounted for pivotal movement on said base member about said pivot axis from a brake dis-engagement position to a brake engagement position;
an adjusting mechanism (**25**) mounted on said base member and being spaced apart from said pivot axis, said adjusting mechanism having a pin (**26**) extending through said base member, an actuation member (**28**) and a cam member (**27**), said cam member and said actuation member being fixed to said pin for rotation about a pin axis defined by said pin, said pin axis and said pivot axis being generally parallel, said cam member having at least three differing cam surfaces each of said cam surfaces configured to define a differing one of said brake dis-engagement position, said cam member being disposed adjacent to an outer surface of said base member outside of said base member, said actuation member being adjacent to said cam member outside of said base member and being spaced apart from said base member with said cam member being disposed between said actuation member and said outer surface of said base member for contact with a portion of said lever arm,
wherein said actuation member is configured such that said cam member and said actuation member may be rotated in response to contact movement by a single finger of a band of a bicyclist riding a bicycle having the brake lever mechanism attached thereto.

5,839,545
BRAKE WEAR SENSOR SYSTEM WITH MOUNTING CLIP

David M. Preston, 4551 Ennismore, Clarkston, Mich. 48346, and G. Clark Fortune, 34746 Bunker Hill Dr., Farmington Hills, Mich. 48331
Filed May 27, 1997, Ser. No. 863,651
Int. Cl.^{6} F16D *66/02;* **B60R** *25/10*
U.S. Cl. 188—1.11 L **14 Claims**

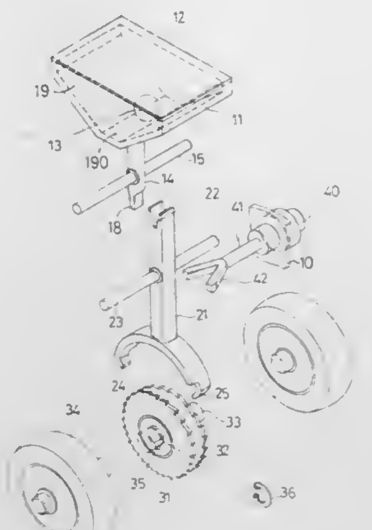


1. A brake wear sensor for first and second brake pads mounted to a brake table of a vehicle brake assembly, the sensor designed to be mounted through an opening slot formed in the brake table between the first and second brake pads so that an electrical conductor forming a part of the wear sensor is rubbed against by a rotating brake drum when the first and second brake pads reach a thickness less than a predetermined limit, the wear sensor comprising:
a sensor housing;
a housing cap adapted to fit over a portion of said sensor housing thereby forming a channel for allowing the conductor to be passed therethrough, said conductor is disposed in said channel between said sensor housing and said housing cap;
a spring clip adapted to retain said sensor housing cap in proper position relative to said brake table, said spring clip having at least one clip arm engaging said brake table to prevent movement in one direction and at least one preload spring engaging said housing cap to prevent movement in an opposite direction, said spring clip thereby providing positive retainment of said sensor housing and said housing cap to said brake table.

5,839,546
SAFETY LOCKING DEVICE FOR VEHICLE

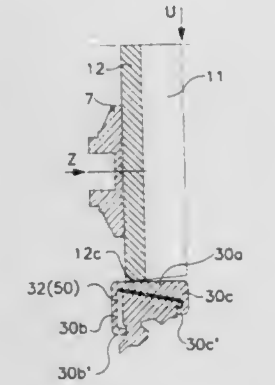
Jason Yan, No. 118-38, Hsin Chern Road, Taiping City, Taichung Hsien, Taiwan
Filed Nov. 12, 1997, Ser. No. 967,921
Int. Cl.^{6} B62D *39/00;* **B62C** *7/02*
U.S. Cl. 188—69 **7 Claims**

1. A safety locking device for locking a vehicle and for preventing the vehicle from moving down a hill, said safety locking device comprising:
a housing for securing to the vehicle,
a beam rotatably secured in said housing at a shaft and including an upper portion and a bottom portion,
at least one wheel provided below said beam for engaging with a supporting ground,
means for maintaining said beam at a position perpendicular to the supporting ground, said beam being tilted relative to said housing when said housing is tilted relative to the supporting ground, and
ratchet means for engaging with said wheels and for stopping said wheels when said beam is tilted by said maintaining means.



5,839,547
APPLICATION ARRANGEMENT FOR A DISC BRAKE

Dieter Bieker, Oberaudorf, Germany, assignor to Knorr Bremse Systeme Fur Nutzfahrzeuge GmbH, Munich, Germany
PCT No. PCT/DE95/00210, § 371 Date Oct. 17, 1996, § 102(e) Date Oct. 17, 1996, PCT Pub. No. WO95/32370, PCT Pub. Date Nov. 30, 1995
PCT Filed Feb. 17, 1995, Ser. No. 727,676
Claims priority, application Germany, May 20, 1994, 44 17 783.6
Int. Cl.^{6} F16D *55/00*
U.S. Cl. 188—73.31 **19 Claims**



1. Application arrangement for a disc brake including a brake lining compartment having two lateral guide surfaces extending in an application direction for guiding a brake Lining displaced by the application arrangement, said brake lining being supported on a respective outlet-side guide surface when it rests against a brake disc during braking, wherein the respective guide surface of the brake lining compartment comprises:
a rigid plate on either a wall surface of the brake lining compartment or on a lateral edge of the brake lining and disposed so that it can be displaced with respect to the wall surface in the application direction along a predetermined path; and
a surface of the plate facing the wall surface of the brake lining compartment being an oblique plane sloping down in the application direction.

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5,839,548

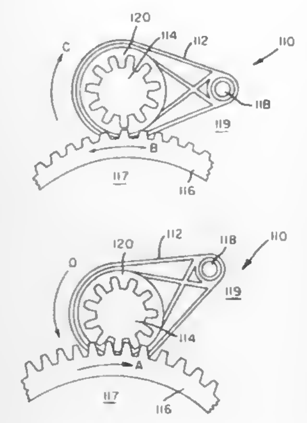
MOTION CONTROL DEVICE FOR ROTARY DAMPERS

Eric G. Parker, Elgin, and Steven L. Bivens, Kankakee, both of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Continuation-in-part of Ser. No. 550,380, Oct. 30, 1995, Pat. No. 5,690,184. This application Sep. 9, 1996, Ser. No. 708,816

Int. Cl.⁶ F16D *63/00*

U.S. Cl. 188—82.1 **18 Claims**



1. A one-way damping system, comprising:

a closure housing;

a closure member movably mounted upon said closure housing for movement in a first direction toward an opened position with respect to said closure housing, and for movement in a second direction toward a closed direction with respect to said closure housing;

gear means, comprising a gear rack portion having a plurality of gear teeth defined thereon, fixedly mounted upon said closure member for movement with said closure member as said closure member is moved between said opened and closed positions with respect to said closure housing;

rotary damper means movably mounted upon said closure housing for movement between a first position at which said rotary damper means is operatively engaged with said gear means of said closure member for damping the movement of said closure member when said closure member is moved in said first direction toward said opened position with respect to said closure housing, and a second position at which said rotary damper means is operatively disengaged from said gear means of said closure member for permitting undampened movement of said closure member when said closure member is moved in said second direction toward said closed position with respect to said closure housing; and

means operatively connected to said rotary damper means for engaging said gear rack portion and said gear teeth of said gear means so as to cause said rotary damper means to be moved to said first position at which said rotary damper means is operatively engaged with said gear means of said closure member and thereby dampen said movement of said closure member in response to said closure member being moved in said first direction toward said opened position with respect to said closure housing, and for engaging said gear rack portion and said gear teeth of said gear means so as to cause said rotary damper means to be moved to said second position at which said rotary damper means is operatively disengaged from said gear means of said closure member, so as to permit undampened movement of said closure member, in response to said closure member being moved in said second direction toward said closed position with respect to said closure housing.

5,839,549

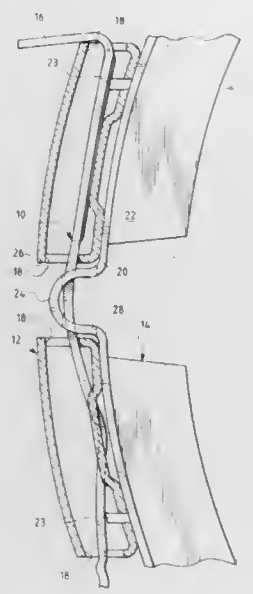
BRAKE SHOE ASSEMBLY AND KEY FOR RAILWAY VEHICLES

Carl E. Tack, Jr., Oak Park, Ill., assignor to TransDyne, Inc., Chicago, Ill.

Continuation of Ser. No. 681,215, Jul. 22, 1996, abandoned. This application Oct. 14, 1997, Ser. No. 950,309

Int. Cl.⁶ F16D *65/04*

U.S. Cl. 188—243 **1 Claim**



1. A railway brake assembly comprising a brake shoe, and brake shoe head means for supporting the brake shoe, and key means driven under tension between said brake head means and said brake shoe for attaching said brake shoe to said brake shoe head means, said key means being composed of cold work hardenable austenitic stainless steel, said austenitic stainless steel having a carbon content below about 0.2%, a chromium content in excess of 17%, and a nickel content of at least 8%.

5,839,550

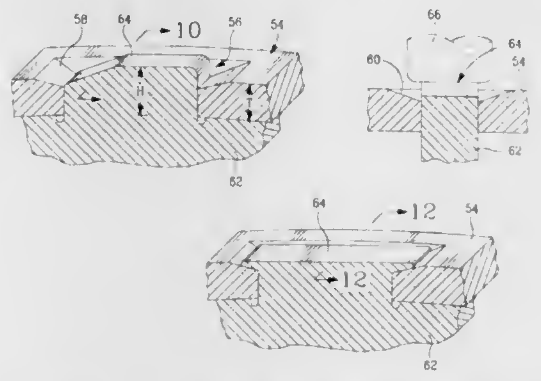
BRAKE SHOE ASSEMBLY AND METHOD OF FORMING

Christopher A. Redgrave, Portage; Michael L. Silvasi, Kalamazoo; Ralph W. Larson, Olivet, all of Mich.; Steven T. Renaud, Tecumseh, and Larry F. Koscielski, LaSalle, both of Canada, assignors to Easton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 294,120, Aug. 22, 1994, Pat. No. 5,695,026. This application Sep. 16, 1996, Ser. No. 714,221

Int. Cl.⁶ F16D *65/04*

U.S. Cl. 188—250 D **19 Claims**



1. A method of forming a brake shoe assembly, said method comprising:

precision stamping out of steel a net shaped web blank having a semi-circular outer peripheral edge provided with a plurality of tabs projecting radially outward therefrom;

precision stamping out of steel a table member having a plurality of apertures formed therein sized to tightly receive and corresponding in spacing to the tabs on the web blank;

bending the table member to form a semi-cylindrical segment;

assembling the web and table causing the web tabs and table apertures to interlock, locating the parts temporarily together; and

hot staking the plurality of the tab and aperture pairs together by resistance heating the tabs to a temperature sufficient to form austenite, but below a corresponding grain coarsening temperature limit, for a sufficiently short time so that the joint will be substantially self quenched resulting in the formation of martensite and bainite within the tabs thereby increasing the strength and toughness of the joints, wherein the resulting joints do not extend substantially beyond the outer semi-cylindrical surface of the table.

5,839,551

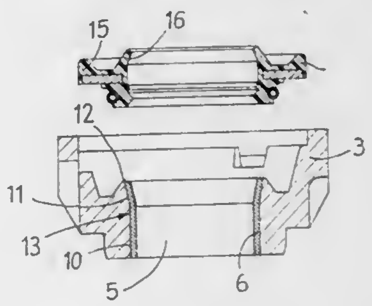
PISTON AND PISTON-ROD GUIDE UNIT FOR HYDRAULIC SHOCK ABSORBERS

Christian Cesaraccio, Montbeliard, France; Jordi Macarulla Bombardo, Bellaterra, Spain; Jesús Acedo Rosas, Barcelona, Spain, and Antonio Romero Fernandez, Vilassar de Mar, Spain, assignors to Sintermetal, S.A., Ripollet, Spain

Filed May 13, 1996, Ser. No. 645,593

Int. Cl.⁶ F16F *9/36*

U.S. Cl. 188—322.17 **7 Claims**



1. A piston and piston-rod guide unit for a hydraulic shock absorber, said unit comprising a piston (1) having a piston rod and a piston-rod guide, wherein said piston-rod guide (2) comprises an annular piece (3) provided with a central orifice (5) for passage of the piston rod and an elastic sealing ring (4); wherein said piston (1) consists of a single piece (7) formed by a body of revolution having a convex generatrix and an anti-friction piston coating (9) at least partially coating an external surface of said single piece, said piston coating has a uniform piston coating thickness; and wherein the central orifice (5) of the annular piece (3) has an internal wall and a guide coating (6) at least partially coating said internal wall, said guide coating (6) has a uniform guide coating thickness equal to that of said piston coating (9), said guide coating has a coating composition which is the same as that of said piston coating and said coating compositions of said guide coating and of said piston coating reduce friction and improve wear resistance.

5,839,552

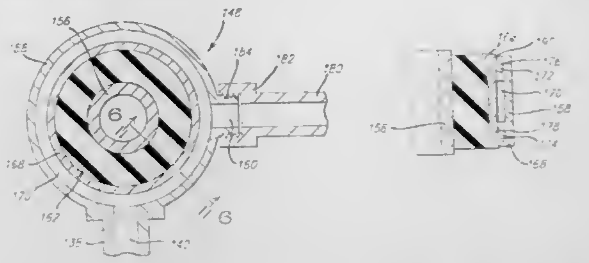
METHOD AND APPARATUS FOR DELIVERING FLUID AND OR ELECTRIC SIGNALS

Bart Vandewal, Alken, Belgium, and Yoram Guy, Ann Arbor, Mich., assignors to Tenneco Automotive Inc., Lake Forest, Ill.

Division of Ser. No. 445,173, May 19, 1995, abandoned. This application Jun. 18, 1997, Ser. No. 878,420

Int. Cl.⁶ 116F *9/00*

U.S. Cl. 188—321.11 **4 Claims**



1. A telescopic cylinder disposed between a first member and a second member of an automotive vehicle, said telescopic cylinder communicating with a source of fluid external to said telescopic cylinder, said telescopic cylinder comprising:

a piston rod having an axially extending bore operable to receive said fluid;

a mount for securing said telescopic cylinder to one of said first and second members of said automotive vehicle, said mount comprising:

a first annular member attached directly to said piston rod;

a second annular member surrounding said first annular member, said first annular member and said second annular member defining a channel extending between said source of fluid and said piston rod;

at least one sealing member disposed between said first annular member and said second annular member, said sealing member minimizing leakage of said fluid from said channel;

an elastomeric bushing disposed within said first annular member; and

a fastening member disposed within said elastomeric bushing, said fastening member being adapted to secure said telescopic cylinder to said one of said first and second members.

5,839,553

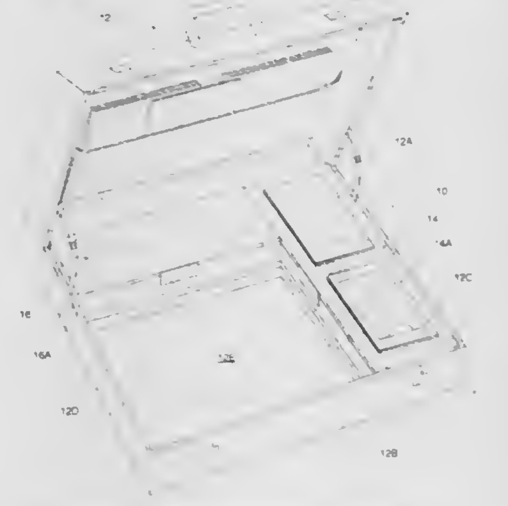
BRIEFCASE ORGANIZER

Robert E. Dorsam, 1508 Turk Rd., Warrington, Pa. 18976

Filed Jul. 29, 1996, Ser. No. 688,636

Int. Cl.⁶ A45C *13/02*

U.S. Cl. 190—109 **2 Claims**



1. An apparatus for organizing items, comprising:

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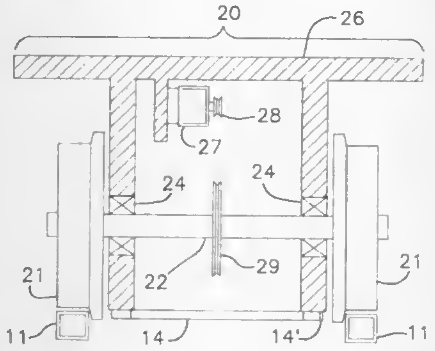
a. a briefcase having a hinge end, an opening end, a first side and a second side;
b. a first case configured to fit snugly between the hinge end and the opening end of the briefcase, adjacent the first side of the briefcase;
c. a second case configured to fit snugly between the second side of the briefcase and the first case, adjacent the hinge end of the briefcase, leaving a contiguous open volume for use within the briefcase;
d. a first tray configured to fit within the first case, the first tray having fixed compartments within for storing such items; and
e. a second tray configured to fit within the second case, the second tray having a variable compartmentalization means within for storing such items.

5,839,554
POWER COLLECTOR FOR INDUCTIVE POWER TRANSFER

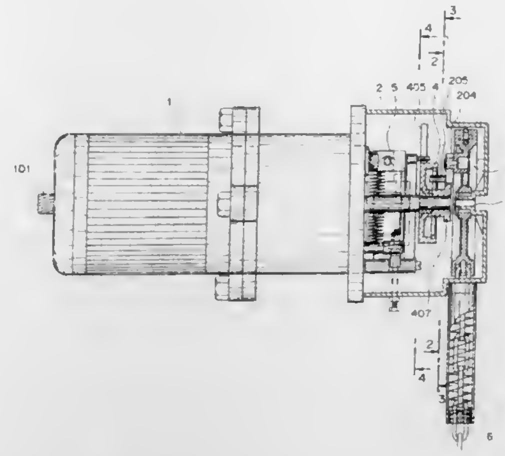
Peter Bruce Clark, Warkworth, New Zealand, assignor to Auckland UniServices Limited, Auckland, New Zealand
PCT No. PCT/NZ93/00030, § 371 Date Nov. 2, 1995, § 102(e) Date Nov. 2, 1995, PCT Pub. No. WO94/25304, PCT Pub. Date Nov. 10, 1994
PCT Filed May 3, 1993, Ser. No. 545,723
Int. Cl.⁶ B60L *9/00*
U.S. Cl. 191—10 **10 Claims**



1. An inductive power transfer system comprising:
a source of alternating electric power having an operating frequency;
a resonant primary for generating a magnetic field from said source of alternating current;
a vehicle having at least one inductive power collector mounted thereon;
wherein said inductive power collector comprises at least one capacitance and at least one coil of one or more windings for intercepting the magnetic field from said resonant primary, and at least one electrical load,
wherein the at least one capacitance is in series with the coil and the load, and the reactance of the series capacitance is substantially equal to the sum of (a) the inductive reactance of the coil at the operating frequency and (b) the mutual reactance of the coupling between the resonant primary and the at least one coil of the power collector, and
wherein there is no parallel resonance effect.

5,839,555
AUTOMATIC CLUTCH TYPE CHAIN PULLING MECHANISM FOR A MOTOR ROLLING DOOR

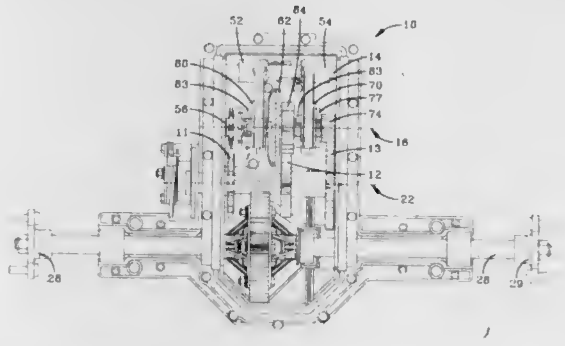
Tsung-Wen Hsieh, 1st Fl. No. 15, Alley 3, Lane 217 Chung-Hsiao E. Rd., Sec. 3, Taipei, Taiwan
Filed Nov. 6, 1996, Ser. No. 746,123
Int. Cl.⁶ F16D *67/00;* **E05F** *15/00*
U.S. Cl. 192—8 R **6 Claims**



1. An automatic clutch type chain pulling mechanism for a motor rolling door mounted at one side of a motor and enclosed in a housing, said mechanism actuating a cam pin of a drum brake assembly which assembly is actuated during motor operation by a solenoid plunger of a solenoid to release the brake of the drum brake assembly so as to permit rotation of the motor shaft, said chain pulling mechanism comprising:
a releasing rod mechanism, an intermediate disk for actuating the releasing rod mechanism, and a chain sprocket rotatable by a chain for actuating said intermediate disk, wherein said chain sprocket is mounted for rotation on said housing.

5,839,556
CONNECTING MECHANISM AND METHOD FOR CONNECTING TRANSMISSION COMPONENTS OF AN OFF-THE-ROAD VEHICLE

Paul Alexander Crawford, and Douglas Frederick Edwards, both of Medina, Ohio, assignors to MTD Products Inc, Cleveland, Ohio
Filed Jan. 31, 1997, Ser. No. 791,193
Int. Cl.⁶ F16D *11/14;21/00*
U.S. Cl. 192—48.91 **5 Claims**

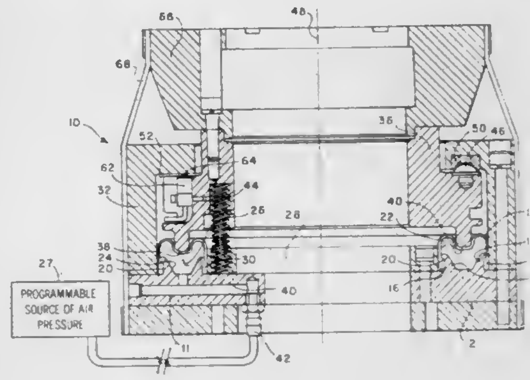


1. A connecting mechanism comprising:
a first gear having first and second teeth;
a second gear having a first hole;
a clutch collar having first and second sides, said clutch collar also having first and second openings;
a first pin located within said first opening of said clutch collar, said first pin selectively operatively received between said first and second teeth of said first gear; and,
a second pin located within said second opening of said clutch collar, said second pin selectively operatively received within said first hole of said second gear.
4. A connecting mechanism comprising:
a sprocket having first and second sets of teeth that are axially spaced, said first set of teeth for selectively connecting to an associated chain, said second set of teeth having first and second teeth;
a clutch collar having first and second sides and a first opening;

a first pin located within said first opening of said clutch collar, said first pin selectively operatively received between said first and second teeth of said second set of teeth of said sprocket.

5,839,557
ANNULAR CROSS-SECTIONED CLUTCH ASSEMBLY FOR CONNECTING A TOOL TO A ROBOTIC ARM

Peter E. McCormick, Dallas, Tex., assignor to EOA Systems, Inc., Dallas, Tex.
Filed Dec. 6, 1996, Ser. No. 761,208
Int. Cl.⁶ F16D *7/02*
U.S. Cl. 192—56.32 **3 Claims**

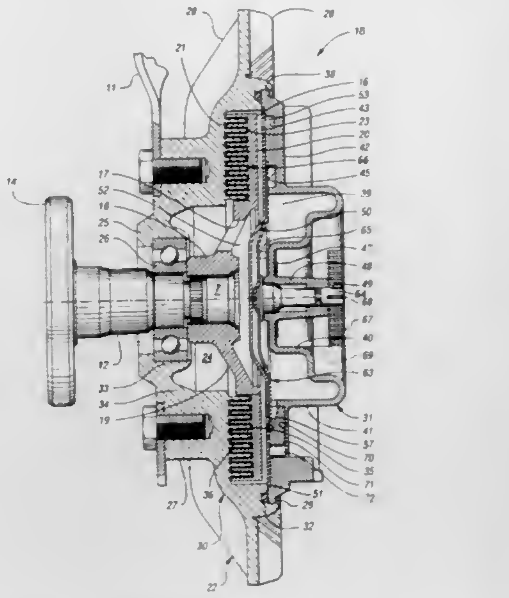


1. A clutch assembly for connecting a paint gun to the end of a robotic arm, comprising:
a diaphragm-mounting plate adapted to be connected on an outer side to the end of the robotic arm;
an annular diaphragm mounted to the diaphragm-mounting plate, the diaphragm having an inner surface, the inner surface forming a pressure tight chamber with the diaphragm-mounting plate for connection to a programmable source of air pressure;
a clutch plate having an annular diaphragm-engagement surface engaged with a central portion of the diaphragm;
springs between the clutch plate and the diaphragm-mounting plate to bias the clutch plate away from the diaphragm-mounting plate in conjunction with air pressure in the chamber;
means for establishing a normal position of the clutch assembly;
means for forming physical limits of travel of the clutch plate with respect to the diaphragm-mounting plate;
means for generating an electrical signal in response to movement of the clutch plate away from the normal position; and,
with the diaphragm-mounting plate having inwardly-extending diaphragm-mounting walls on an inner side, and with inner portions of the diaphragm-mounting walls forming the chamber.

5,839,558
VISCOUS FAN CLUTCH WITH ENGAGE PORT LOCK

Lawrence Craig Kennedy, Kettering, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Jun. 25, 1997, Ser. No. 882,476
Int. Cl.⁶ F16D *35/02*
U.S. Cl. 192—58.62 **8 Claims**

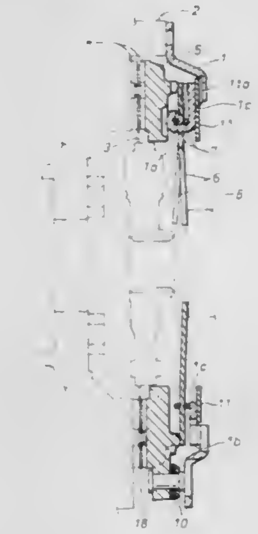
1. A clutch comprising:
an input element including an input shaft with a clutch plate engaged with the input shaft to rotate in concert therewith, the clutch plate having an annular disk portion with a clutch plate set of lands and grooves;
a housing including a body supported on the input shaft by a bearing with a body set of lands and grooves mating with the



clutch plate set of lands and grooves, with a cover included as part of the housing and engaged with the body wherein the cover includes a pocket;
a pump plate captured between the cover and the body separating out a working chamber, the pump plate including an engage port and a pump-out port positioned further radially outward in the pump plate than the engage port;
a control arm normally closing the engage port and being rotatable to open the engage port; and
a slide-block carried in the pocket with a spring biasing the slide block toward engagement with the control arm wherein the slide-block locks the control arm against rotation when the clutch is inactive.

5,839,559
WEAR COMPENSATING FRICTION CLUTCH

Hiroshi Uehara, Osaka, Japan, assignor to Exedy Corporation, Japan
Filed Apr. 3, 1997, Ser. No. 831,887
Claims priority, application Japan, Apr. 4, 1996, 8-108339
Int. Cl.⁶ F16D *13/75*
U.S. Cl. 192—70.25 **5 Claims**



5. A friction clutch, comprising:
a diaphragm spring which resiliently urges a pressure plate into engagement with a clutch facing when the clutch is engaged.

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said pressure plate being connected to a clutch cover and resiliently urged away from said clutch facing;
- a fulcrum member which supports a fulcrum point of said diaphragm spring, said fulcrum member including a pair of annular wire members interposing said fulcrum point of said diaphragm spring;
- a resilient support member extending from said clutch cover which supports said fulcrum member with respect to said clutch cover and has said annular wire members secured thereto, said resilient support member including an annular disk and connecting pieces connecting said annular disk to a remaining part of said clutch cover the annular disk and the connecting pieces forming a monolithic unit, said resilient support member having a flexibility which withstands a normal release load but yields to a release load substantially greater than said normal release load, said yielding movement of said resilient support member producing a corresponding gap therein; and

a wedge resiliently biased to fill said gap;

wherein an increase in said release load resulting from wear in said clutch facing creates said gap, and said wedge fills said gap so as to shift said diaphragm spring to a new position corresponding to progress in said wear without substantially changing an operating point of said diaphragm spring.

5,839,560
FRICTION CLUTCH WITH A DETACHABLY FASTENED CLUTCH HOUSING

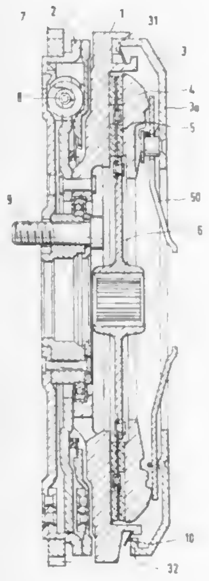
Jörg Sudan, Niederwerrn, Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Germany

Filed Jun. 20, 1996, Ser. No. 666,900

Claims priority, application Germany, Jun. 21, 1995, 195 22 458.2

Int. Cl.^{6} F16D *13/50*

U.S. Cl. 192—70.27 **18 Claims**



1. A friction clutch assembly for a transmission of a motor vehicle, said friction clutch assembly comprising:
- a flywheel assembly, said flywheel assembly having an axis of rotation and defining an axial direction parallel to the axis of rotation;

said flywheel assembly having a circumference disposed concentrically about the axis of rotation;
- a clutch housing;
- a clutch disc;
- a pressure plate;
- a clutch mainspring;

said clutch disc, said pressure plate, and said clutch mainspring being disposed substantially within said clutch housing;

said clutch disc being disposed axially between said pressure plate and said flywheel assembly;

said clutch mainspring being disposed adjacent said pressure plate and axially opposite said clutch disc;

said clutch housing being disposed adjacent said pressure plate;

a plate spring to attach said flywheel assembly to said clutch housing.

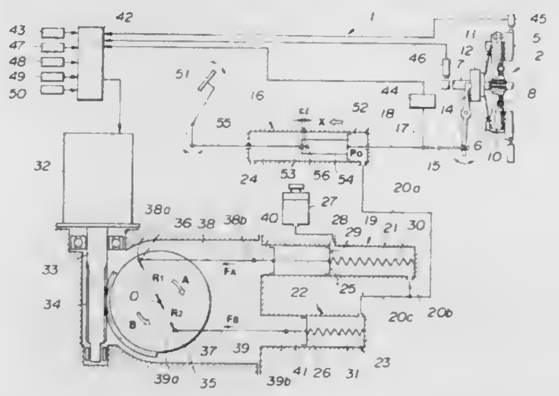
5,839,561
AUTOMATIC CLUTCH SYSTEM

Masanori Koda, Kanagawa, and Yoshiyuki Watanabe, Tokyo, both of Japan, assignors to Unisia Jecs Corporation, Atsugi, Japan

Filed Apr. 17, 1997, Ser. No. 842,822

Int. Cl.^{6} B60K *41/28;* **F16D** *29/00*

U.S. Cl. 192—90 **15 Claims**



1. An automatic clutch system for controlling engagement and disengagement between an engine and a transmission in a vehicle, said automatic clutch system comprising:
- a first friction element of the engine;
- a second friction element of the transmission;
- a spring biasing said first friction element so as to establish the engagement between said first and second friction elements;
- an operating cylinder interconnected with said first friction element, said operating cylinder being operated to disengage said first friction element from said second friction element by receiving hydraulic oil;
- a master cylinder fluidly communicated with said operating cylinder;
- an auxiliary cylinder disposed parallel with said master cylinder and fluidly communicated with said operating cylinder; and
- a rotor driven by a motor, said rotor including first and second connecting points which are oppositely disposed with respect to a rotation axis of said rotor, the first connecting point being interconnected with said master cylinder and the second connecting point being interconnected with said auxiliary cylinder, a distance between the second connecting point and the rotation axis being smaller than a distance between the first connecting point and the rotation axis.

5,839,562
LINEAR DRIVE FOR DISPLACING A COMPONENT, IN PARTICULAR AN AIRCRAFT WING COMPONENT

Manfred Fischer, Markdorf, Germany, assignor to ZF Friedrichshafen AG, Friedrichshafen, Germany

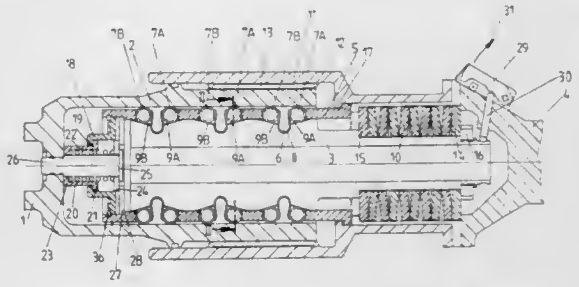
PCT No. PCT/EP96/00332, § 371 Date Jul. 3, 1997, § 102(e) Date Jul. 3, 1997, PCT Pub. No. WO96/24005, PCT Pub. Date Aug. 8, 1996

PCT Filed Jan. 27, 1996, Ser. No. 860,784

Claims priority, application Germany, Feb. 1, 1995, 195 03 051.6

Int. Cl.^{6} F16P *5/00;* **B64C** *13/28*

U.S. Cl. 192—143 **17 Claims**



1. A linear drive for displacing a component, in particular an aircraft wing component, comprising an input part driving an output part; an uncoupling device being provided between said input part and said output part which interrupts a connection between said input part and said output part when a predetermined force is exceeded;
- wherein said input part has a freewheel outer part which is connected, via a freewheel inner part, with said output part; a tubular freewheel cage is situated between said freewheel outer part and said freewheel inner part, said tubular freewheel cage has a plurality of pockets which house clamping members prestressed by control springs so that they can move in an axial direction; and
- a pair of inclined ramps are coordinated with each pocket situated along said tubular freewheel cage; and at least one spring assembly is disposed between said freewheel inner part and said output part for generating an axial prestress.

5,839,563
COIN DISCRIMINATING APPARATUS

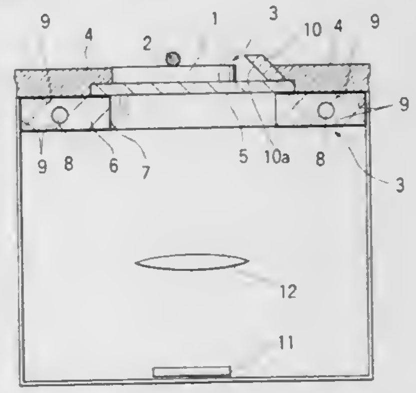
Masataka Takahashi, Matsudo, Japan, assignor to Laurel Bank Machines Co., Ltd., Tokyo, Japan

Filed Mar. 12, 1997, Ser. No. 820,413

Claims priority, application Japan, Mar. 28, 1996, 8-074900; Feb. 21, 1997, 9-37838

Int. Cl.^{6} G07D *5/10*

U.S. Cl. 194—328 **18 Claims**



1. A coin discriminating apparatus comprising irradiating means for projecting light onto a coin, light receiving means for optically detecting light reflected by the coin and producing pattern data of the coin, a mirror member provided on one side portion of the coin along the coin passage at a predetermined angle with an axis of the coin for reflecting light reflected from a side surface of the coin and leading the light to the light receiving means, and a coin discriminating means for discriminating the coin based on first pattern data produced by detecting light reflected from a lower surface of the coin and second pattern data produced by detecting light reflected by the side surface of the coin.

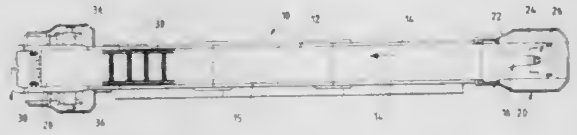
5,839,564
ADJUSTABLE YOKE ASSEMBLY

Michael S. Cox, Fayetteville, W. Va., assignor to Long-Airdox Company, Blacksburg, Va.

Continuation of Ser. No. 725,028, Oct. 2, 1996, abandoned, which is a division of Ser. No. 350,305, Dec. 6, 1994, abandoned. This application Jul. 25, 1997, Ser. No. 903,264

Int. Cl.^{6} B65G *65/02*

U.S. Cl. 198—303 **16 Claims**



1. An adjustable height yoke assembly for connecting a bridge conveyor and a mobile bridge carrier in a continuous haulage system in underground excavations, said yoke assembly comprising:
- a male yoke assembly including a coupling member carried on a horizontally extending male yoke plate, said male yoke plate supported on a dolly positioned over a conveyor and adapted for movement upon a mobile bridge carrier; and
- a female yoke assembly including a generally horizontally extending female yoke plate including a complimentary coupling mechanism for pivotally connecting said female yoke plate and said male yoke plate, said female yoke plate supported by an attachment frame including a series of vertically aligned apertures adapted to receive attachment bolts to adjustably secure said female yoke assembly to said bridge conveyor.

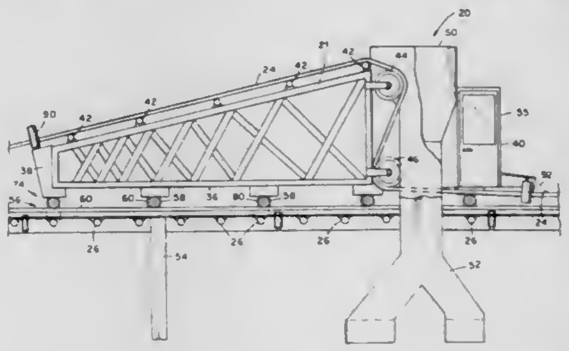
5,839,565
BELT TRIPPER SYSTEM FOR USE WITH AN ENDLESS CONVEYOR BELT AND RELATED IMPROVEMENTS

Robert M. McFall, P.O. Box 1282, Clintwood, Va. 24228

Filed Nov. 6, 1996, Ser. No. 744,591

Int. Cl.^{6} B65G *47/46*

U.S. Cl. 198—364 **40 Claims**



1. In a belt tripper system for discharging particulate material from the upper run of an endless conveyor belt wherein the belt is conveyed along the length of a conveyor support system, and elongated guiding means are provided which extend along the length of the conveyor support system, and the belt tripper system includes a belt tripper including a frame which cooperates with the

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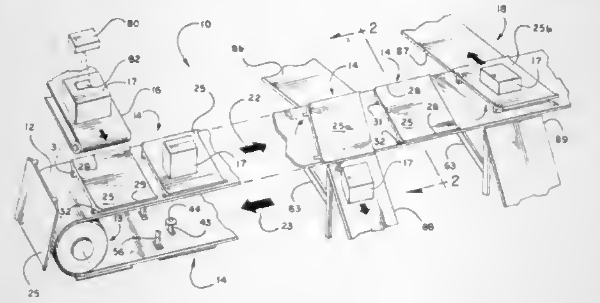
guiding means for movement along the length thereof and first and second rollers across which the upper run of the belt is routed in sequence so that the belt is conveyed back beneath itself as it moves between the first and second rollers so that particulate material is permitted to fall from the upper run of the belt after moving across the first roller, the improvement characterized in that:

the belt is substantially comprised of an elastomeric material which permits the belt to flex laterally in the event that the guiding means includes a laterally-curved section along its length.

5,839,566
BELT-CARRIED TILT TRAY SORTER

Henri Bonnet, Atlanta, Ga., assignor to United Parcel Service of America, Inc., Atlanta, Ga.
Filed Aug. 30, 1996, Ser. No. 705,617
Int. Cl.⁶ B65G *47/38*
U.S. Cl. 198—370.04 **17 Claims**

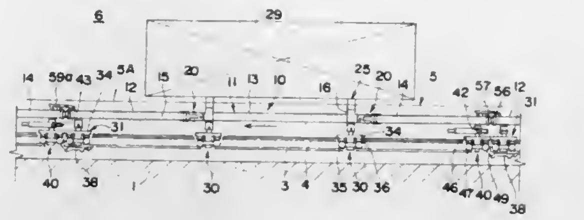


15. A tilt tray sorting system, comprising:
a conveyor belt;
at least one tray spanning a centerline of said belt, said tray defining at least one left foot defining a left tilt axis, and at least one right foot defining a right tilt axis spaced across said centerline from said left tilt axis, said feet elevating a central portion of said tray above said belt;
an L-shaped left actuator comprising a left lifting arm lying between said belt and said tray adjacent to said left foot, and joined to a left trigger arm extending down through a left opening in said belt;
an L-shaped right actuator comprising a right lifting arm lying between said belt and said tray adjacent to said right foot, and joined to a right trigger arm extending down through a right opening in said belt;
a link attached to said tray approximately along said centerline of said belt, and extending down through a retractor opening in said belt;
a spring retained between a lower end of said link and said belt, said spring operative to urge said tray into a position wherein both said left and right feet are engaging said belt; and
means for selectively moving a trip member into the path of said left trigger arm or said right trigger arm.

5,839,567
CONVEYING SYSTEM

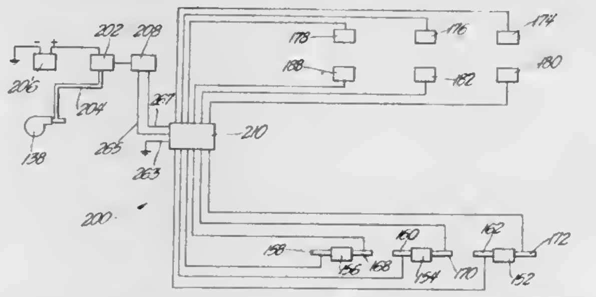
Hisashi Kyotani, Osaka; Takashi Okamura, Katano, and Kiyoshi Hamano, Moriguchi, all of Japan, assignors to Daifuku Co., Ltd., Japan
Filed Jan. 16, 1996, Ser. No. 584,319
Claims priority, application Japan, Apr. 20, 1995, 7-094080; May 30, 1995, 7-130901
Int. Cl.⁶ B65G *17/32*
U.S. Cl. 198—683 **11 Claims**

1. A conveying system comprising guide rails disposed along a conveying path having curved sections, a plurality of transport cars each having a longitudinal axis and each being movably supported from said guide rails, and a friction feeder along said conveying path for the moving of said transport cars, said transport cars each comprise (i) a main body having a front end and a rear end and being movably supported from said guide rails by guidance means, (ii) a support on the main body of each of said transport cars for objects to be conveyed, said main body having a plurality of elongated, unitary movable bodies each having a front and rear end, (iii) coupling means located at said front and rear end of said movable bodies for joining said elongated, unitary movable bodies to allow a relative yielding motion between said bodies at said curved sections, each of said coupling means being vertically and horizontally swingable, said movable bodies being vertically and horizontally swingably joined to one another by said coupling means and selectively coupling adjacent ones of said movable bodies directly to each other to form a continuous conveying structure along said longitudinal axis, said movable bodies each having a front end and a rear end, said movable bodies each having a lateral driven face along said longitudinal axis, said support for objects to be conveyed being provided on one of said movable bodies of each transport car, and wherein said friction feeder comprises a feed roller adapted to act on said driven faces, and a motor for driving said feed roller.



5,839,568
RECIPROCATING FLOOR CONVEYOR CONTROL SYSTEM

Gary R. Clark, 3777 Waconda Rd., NE., Gervais, Oreg. 97026
Continuation of Ser. No. 439,476, May 11, 1995, abandoned, which is a continuation of Ser. No. 192,500, Feb. 7, 1994, abandoned. This application Mar. 10, 1997, Ser. No. 815,322
Int. Cl.⁶ B65G *25/00*
U.S. Cl. 198—750.5 **21 Claims**



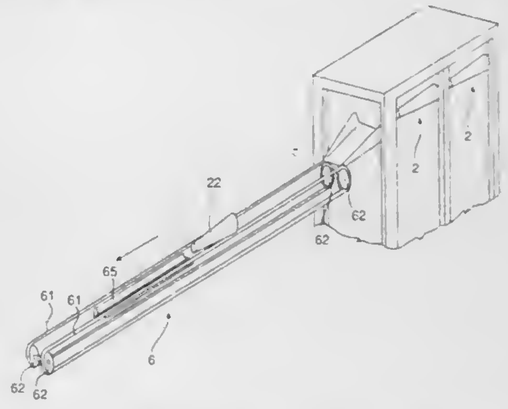
1. A reciprocating floor conveying and control system including a frame, a plurality of floor slats supported by the frame and moveable along parallel linear paths relative to the frame; a first hydraulic fluid linear actuator, having a first port and a second port, connected to the frame and at least one floor slat; a second hydraulic fluid linear actuator, having a first port and a second port, connected to the frame and at least one other floor slat; a source of hydraulic fluid under pressure; a hydraulic fluid sump connected to the source of hydraulic fluid under pressure; a first solenoid operated valve assembly connected to the source of hydraulic fluid and to the first linear actuator and having a first position in which the first port is connected to the source of hydraulic fluid under pressure and the second port is connected to the sump, and having a second position in which the first port is connected to the sump and the second port is connected to the source of hydraulic fluid under pressure and wherein the first solenoid operated valve

assembly is operable to direct hydraulic fluid to the first linear actuator to reciprocate the first linear actuator back and forth; a second solenoid operated valve assembly connected to the source of hydraulic fluid and to the second linear actuator and having a first position in which the first port is connected to the source of hydraulic fluid under pressure and the second port is connected to the sump, and having a second position in which the first port is connected to the sump and the second port is connected to the source of hydraulic fluid under pressure and wherein the second solenoid operated valve assembly is operable to direct hydraulic fluid to the second linear actuator to reciprocate the second linear actuator back and forth; a front sensor supported by the frame and associated with the first linear actuator that is operable to indicate that the first linear actuator is in a front position; a rear sensor supported by the frame and associated with the first linear actuator that is operable to indicate that the first linear actuator is in a rear position; a front sensor supported by the frame and associated with the second linear actuator that is operable to indicate that the second linear actuator is in a front position; a rear sensor supported by the same and associated with the second linear actuator that is operable to indicate that the second linear actuator is in a rear position; a logic control unit connected to the first solenoid operated valve assembly, to the second solenoid operated valve assembly, to the front and rear sensors associated with the first linear actuator, and to the front and rear sensors associated with the second linear actuator and wherein the logic control unit is operable to control the first solenoid operated valve assembly and the second solenoid operated valve assembly to direct hydraulic fluid to the first linear actuator and the second linear actuator in a predetermined sequence that results in material supported on the floor slats moving toward one end of the floor slats; and

wherein the logic control unit sends a signal to shift the first solenoid operated valve assembly between its first and second positions only when one of the front and rear sensors associated with the first linear actuator is closed and the other is open and one of the front and rear sensors associated with the second linear actuator is closed and the other is open, where none of said valve assemblies are switched between their first and second positions unless each of said linear actuator, is in one of their first and second positions.

5,839,569
METHOD OF CONVEYING TUBES ON A TEXTILE MACHINE AND DEVICE FOR CARRYING OUT THE METHOD

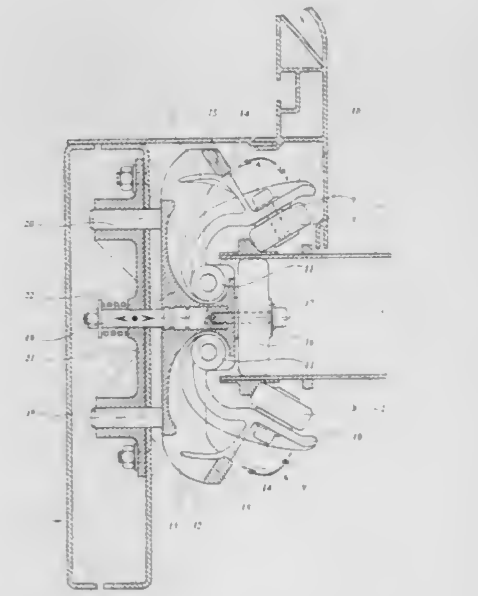
Zdenek Spindler, B. Nemcove; Zbynek Vencl, Mazankova, and Vojtech Novotny, Dukelska, all of Czech Rep., assignors to Rieter Elitex A.S. Usti nad Orlici, Czech Rep.
Filed Aug. 23, 1995, Ser. No. 518,429
Claims priority, application Czech Rep., Aug. 24, 1994, 2055-94
Int. Cl.⁶ B65G *15/10*
U.S. Cl. 198—817 **6 Claims**



1. A method for transporting cylindrical or conical tubes on a textile machine, said method comprising placing the tubes on a moving conveyor device such that the tube rests only on the moving conveyor device along two opposite and parallel lines of contact along the lengthwise circumference of the tubes, the parallel lines of contact also parallel to a conveying direction of the conveyor device, the moving conveyor device having spaced apart belt members with an upper surface contacting the tubes and a lower surface, said method further comprising supporting the moving conveyor device with a trough shaped support element disposed below the conveyor device and extending generally along the conveying path so that the trough-shaped support element supports the conveyor device along the conveying path while allowing a bottommost circumferential surface of the tube to extend below the conveying device, the trough shaped element having lateral sides which are shaped to the contour of the lower surfaces of the belt members and an intermediate arcuate portion which is spaced from the bottommost circumferential surface of the tube.

5,839,570
CONVEYOR

Martinus Johannes Maria Vertogen, Zeeland, and Jacobus Marie van den Goor, Nuenen, both of Netherlands, assignors to Vanderlande Industries Nederland B.V., Veghel, Netherlands
Filed Dec. 7, 1995, Ser. No. 568,501
Claims priority, application Netherlands, Dec. 9, 1994, 9402081
Int. Cl.⁶ B65G *15/02*
U.S. Cl. 198—831 **6 Claims**



1. A conveyor, which comprises:
an endless conveyor belt having a curved portion;
a frame having two rollers journalled thereon and oriented so as to form an angle therebetween, said endless belt being guided around said rollers and at least one of said rollers being drivable during operation;
a plurality of guide rollers;
a collar located in proximity with an edge portion of said belt and located on an outer side of said curved portion, said collar being engageable with said guide rollers;
a support supporting said guide rollers, said support being movable parallel to a portion of said belt;
a spring acting on said support and moving said support in a manner such that the guide rollers supported by said support are pressed against the collar; and
a pivot axis about which one of said guide rollers is pivotable from an operative position cooperating with said collar in a

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direction away from said belt wherein said pivot axis is positioned beside the belt, as seen in a longitudinal direction of said pivot axis.

5,839,571

CONVEYOR BELT JOINTING DEVICE AND METHOD FOR MAKING SAME

Horst Jakob, Deaux, France, assignor to ASER, Saint-Chamond, France

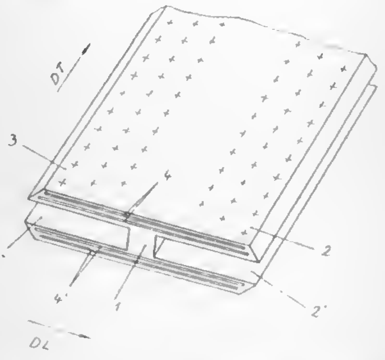
PCT No. PCT/FR97/00047, § 371 Date Sep. 5, 1997, § 102(e) Date Sep. 5, 1997, PCT Pub. No. WO97/26466, PCT Pub. Date Jul. 24, 1997

PCT Filed Jan. 10, 1997, Ser. No. 913,055

Claims priority, application France, Jan. 17, 1996, 96 00465

Int. Cl.^{6} B65G *17/00*

U.S. Cl. 198—844.2 **13 Claims**



1. A junction device for a conveyor band, said device being generally H-shaped, made up with a central part (**1**) or core, and with two pairs of wings (**2**, **2'**; **3**, **3'**) approximately parallel, forming one single piece with the central part to which they are connected on each side of the central part, each of the pairs of wings adapted to be fixed to each end (E) of the conveyor band respectively inserted in a space between the wings of the two pairs of wings and approximately in abutment against the central part (**1**), two reinforcement elements (**4**, **4'**) being embedded in the flexible and elastic constituent material of the junction device, a first of said two reinforcement layers extending in the upper wing (**2**) of one pair of wings (**2**, **2'**) and in the upper wing (**3**) of the other pair of wings (**3**, **3'**), a second reinforcement element (**4'**) extending in the lower wing (**2'**) of one pair of wings (**2**, **2'**) and in the lower wing (**3'**) of the other pair of wings (**3**, **3'**), the constituent material of the junction device adhering to the reinforcement elements (**4**, **4'**) wherein each of said reinforcement elements (**4**, **4'**) is made up of at least two layers (N' N", . . .) of cables (**6** or **7**) having a high resistance to tensile stress and being inherently unextensible or slightly extensible, wherein said reinforcement elements are arranged in parallel planes, with a space provided between the layers, the cables (**6** or **7**) of each of the two layers (N', N", . . .) being parallel to each other while the cables of a first of said two layers is perpendicular to the cables of a second of said two layers in a plan view, and cables of each of said two layers forming an acute angle α with the longitudinal direction.

5,839,572

STORAGE BAG WITH SOAKER PAD

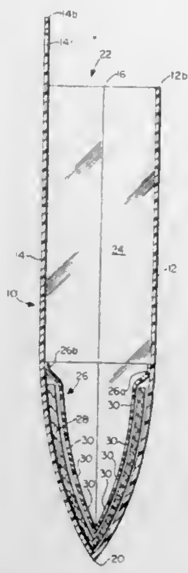
James W. Yeager, 505 Cumberland Rd. E., Mobile, Ala. 36608

Continuation-in-part of Ser. No. 632,320, Apr. 15, 1996, Pat. No. 5,660,868, which is a continuation of Ser. No. 276,882, Jul. 18, 1994, abandoned, which is a continuation of Ser. No. 909,106, Jul. 1, 1992, abandoned. This application Dec. 12, 1996, Ser. No. 762,869

Int. Cl.^{6} B65D *81/26*

U.S. Cl. 206—204 **39 Claims**

1. A storage bag with soaker pad, said storage bag comprising:



a. a bag having a front and rear panel constructed from plastic film, said front and rear panels being closed along a fold at one end to form a bottom of said bag, said bag being open at the opposite end for receipt of goods to be stored in said bag;

b. an enclosure for containing and confining liquids emanating from goods stored inside said bag, said enclosure is less than half the length of the combined length of said front panel and said rear panel of said bag, said enclosure being folded to form a bottom fold and two walls, said enclosure being connected by continuous seams at all of its edges to the inside surface of both of said front and rear panels of said bag, said enclosure being connected to said bag such that said bottom fold of said enclosure is adjacent to said bottom fold of said bag, said walls of said enclosure are contiguous with the bottom portion of both of said front and rear panels, and the only connection between said enclosure and said bag other than said continuous seams are such that there is space between said walls of said enclosure and the inside surface of said bottom portion of both of said front and rear panels, said enclosure having a plurality of spaced apart perforations therein for conveying said liquids through said enclosure to said space between said walls of said enclosure and the interior surface of said bottom portion of said front and rear panels to which said enclosure is connected, and

c. a pad for absorbing said fluids that are located in said space between said walls of said enclosure and the interior of said bottom portion of said front and rear panels to which said enclosure is connected, said pad being located in said space between said walls of said enclosure and the interior surface of said bottom portion of said front and rear panels to which said enclosure is connected, said pad being smaller in volume than said space between said walls of said enclosure and the interior surface of said bottom portion of said front and rear panels to which said enclosure is connected, said enclosure totally enclosing said pad to define a first reservoir and a second reservoir for containing and confining said liquids,
   i. said first reservoir comprising said pad, and
   ii. said second reservoir comprising a sump, said sump being the portion of said space between said walls of said enclosure and the interior surface of said bottom portion of said front and rear panels to which said enclosure is connected that is not occupied by said pad.

10. A material for making storage bags with absorbent pads comprising:

a. a bag film with a first and a second longitudinal edge and a top end and a bottom end;

b. an enclosure material with a first and a second longitudinal edge, a top end and bottom end, and containing a plurality of spaced apart perforations, said enclosure material being substantially narrower than said bag film and having said first and second edges connected to the surface of said bag film along continuous seams located a substantial distance away from said edges of said bag film; and

c. a plurality of absorbent pads spaced at bag intervals and located in the space between said bag film and said enclosure material and said continuous seams.

17. A method for making storage bags with absorbent pads comprising:

a. advancing together a plastic bag film and a web of perforated plastic film material, both with first and second longitudinal edges, forwardly in a bag making direction, said web of perforated web material being substantially narrower than said bag film;

b. providing a plurality of soaker pads and placing said pads between said perforated plastic web material and said bag film at bag intervals;

c. bringing the web of said bag film into contact with said perforated web material and connecting said first and second longitudinal edges of said perforated web material to the surface of said bag film at locations that are a substantial distance away from said edges of said bag film thereby creating a soaker pad web material with an enclosure space between said bag film and said perforated web material and said connections between said bag film and said perforated web material for containing said pad;

d. folding said soaker pad web material to form opposing walls; and

e. cross sealing and cutting off enough of said folded soaker pad web material to create said bag with a front wall and a back wall and said enclosure space for containing said soaker pad.

24 A storage bag with soaker pad, said storage bag comprising:

a. a bag having a front and rear panel constructed from plastic film, said front and rear panels being closed along a fold at one end to form a bottom of said bag, said bag being open at the opposite end for receipt of goods to be stored in said bag;

b. enclosure for containing and confining liquids emanating from goods stored inside said bag, said enclosure is less than half the length of the combined length of said front panel and said rear panel of said bag, said enclosure being connected by continuous seams at all of its edges to the inside surface of said bag, and the only connection between said enclosure and said bag other than said continuous seams are such that there is space between said walls of said enclosure and the inside surface of said panel to which said enclosure is connected, said enclosure having a plurality of spaced apart perforations therein for conveying said liquids through said enclosure to said space between said walls of said enclosure and the interior surface of said panel to which said enclosure is connected, and

c. pad for absorbing said fluids that are located in said space between said walls of said enclosure and the interior of said panel to which said enclosure is connected, said pad being located in said space between said walls of said enclosure and the interior surface of said panel to which said enclosure is connected, said pad being smaller in volume than said space between said walls of said enclosure and the interior surface of said bag to which said enclosure is connected, said enclosure totally enclosing said pad to define a first reservoir and a second reservoir for containing and confining said liquids,
   i. said first reservoir comprising said pad, and
   ii. said second reservoir comprising a sump, said sump being the portion of said space between said walls of said enclosure and the interior surface of said bag to which said enclosure is connected that is not occupied by said pad.

30. A storage bag with soaker pad, said storage bag comprising:

a. a bag having a front and rear panel constructed from plastic film, said bag being closed at one end to form a bottom of said bag, said bag being open at the opposite end for receipt of goods to be stored in said bag;

b. an enclosure for containing and confining liquids emanating from goods stored inside said bag, the length of said enclosure being substantially less than the combined length of said front panel and said rear panel of said bag, said enclosure being connected by continuous seams at all of its edges to the inside surface of at least one of said panels of said bag, said enclosure being contiguous with said panel of said bag to which said enclosure is connected, and the only connection between said enclosure and said bag other than said continuous seams are such that there is sufficient space between said enclosure and the inside surface of said panel of said bag to which said enclosure is connected for confining said liquids, said enclosure having a plurality of spaced apart perforations therein for conveying said liquids through said enclosure to said space between said enclosure and the interior surface of said panel of said bag to which said enclosure is connected, and

c. a pad for absorbing said fluids that are located in said space between said enclosure and the interior surface of said panel of said bag to which said enclosure is connected, said pad being located in said space between said enclosure and the interior surface of said panel to which said enclosure is connected, said pad being smaller in volume than said space between said enclosure and the interior surface of said panel to which said enclosure is connected, said enclosure totally enclosing said pad to define a first reservoir and a second reservoir for containing and confining said liquids,
   i. said first reservoir comprising said pad, and
   ii. said second reservoir comprising a sump, said sump being the portion of said space between said enclosure and the interior surface of said panel to which said enclosure is connected that is not occupied by said pad.

5,839,573

ASSEMBLY FOR KEEPING SUBSTANCES OF A MIXTURE SEPARATE UNTIL USE

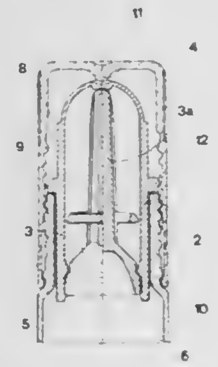
Emilio Morini, Colorno, Italy, assignor to Bormioli Rocco & Figlio S.p.A., Parma, Italy

Filed Nov. 28, 1997, Ser. No. 980,294

Claims priority, application Italy, Sep. 22, 1995, MO95 A 000128

Int. Cl.^{6} B65D *81/32*

U.S. Cl. 206—221 **4 Claims**



1. An assembly for keeping different substances of a mixture separate up until use, comprising: a container (**1**) provided with a mouth (**1***a*) on which mouth (**1***a*) a capsule (**2**) is inserted, which capsule (**2**) is made of a deformable material and is internally hollow; said capsule (**2**) being provided with an aperture (**2***a*) turned inwardly of the container (**1**) when the capsule (**2**) is inserted on the container (**1**);

a cap (**3**) provided with an appendage (**3***a*) and inserted in the capsule (**2**) in such a way as to close said capsule (**2**) in a first conformation of the assembly; a pressure on said capsule (**2**) causing a deformation thereof which interacts with the appendage (**3***a*), whereupon said assembly assumes a second conformation in which the cap (**3**) leaves the aperture (**2***a*) open:

characterized in that it comprises a cover (**4**) arranged on the container (**1**) in such a way as to close the capsule (**2**), and constrained to the mouth (**1***a*) of the container (**1**) by means of a threaded coupling; said cover (**4**) being able to interact, following a movement in axial direction, with said capsule (**2**), causing said capsule (**2**) to deform; means for connecting being provided for fixing the cover (**4**) either in the first

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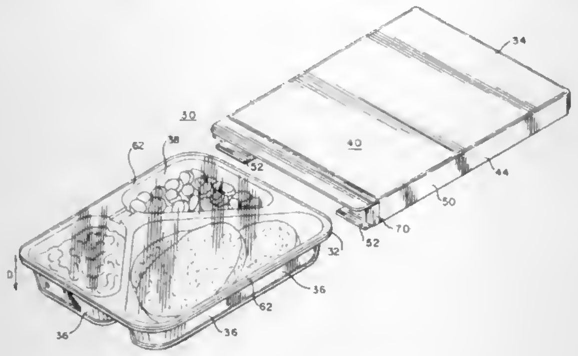
conformation of the assembly, in which said cover (4) is constrained to the container (1) and does not interact with the capsule (2), or in the second conformation of the assembly, in which said cover (4) is constrained to the capsule and interacts there-with.

5,839,574
FROZEN FOOD TRAY AND CARTON ENSEMBLE

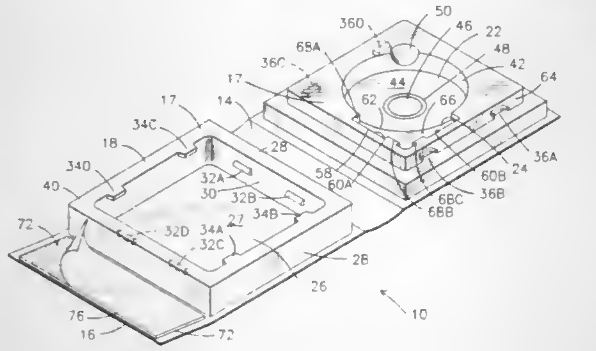
Matthew W. Lorence, and James E. Grace, both of Omaha, Nebr., assignors to ConAgra, Inc., Omaha, Nebr.
Filed Dec. 1, 1995, Ser. No. 566,011
Int. Cl.^{6} B65D *43/00*
U.S. Cl. 206—216 **48 Claims**



1. A carton for enclosing an object, comprising:
a top face defining a plane and comprising a first edge, a second edge, a third edge and a fourth edge;
a first side panel attached to said first edge and angled relative to said plane;
a second side panel attached to said second edge and angled relative to said plane;
a third side panel attached to said third edge and comprising a planar portion which is parallel to and offset from said plane;
a fourth side panel attached to said fourth edge;
wherein said first, second, third and fourth side panels each have an unattached edge, said unattached edges are coplanar and define an opening which is substantially parallel to said planar portion.

5,839,575
CONTAINER FOR FLAT ARTICLES

Allen R. Blanco, 12040 Race Track Rd., Tampa, Fla. 33626
Filed Apr. 29, 1997, Ser. No. 841,735
Int. Cl.^{6} B65D *69/00*
U.S. Cl. 206—232 **12 Claims**

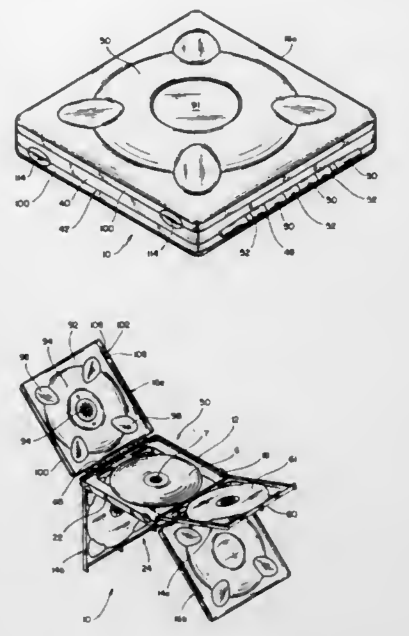


1. A receptacle for receiving, packaging, and displaying relatively flat articles, which receptacle is opened and closed in book form, comprising:
a flexible outside cover of printable paperboard material;
a binding means of the outside cover being integral to the cover and centrally located to allow the receptacle to function in the book form for folding to a closed position whereby said receptacle may be sealed for the packaging, shipping and storing and further for unfolding to an open position for viewing and use of the flat articles;
an inner container of the receptacle consisting of a pair of cooperative opposing quadrilateral trays spaced apart by a width of the binding means constructed of a one piece vacuum formed polyvinyl chloride rigid material heat sealed to the outside cover and formed to receive and retain the articles, wherein a first of the trays is a quadrilateral cavity defined by a first upstanding wall for holding printed materials through a plurality of ribs located laterally on an inner surface of the first upstanding wall and a second of the trays defined by a second upstanding wall having a first lower circular cavity for holding compact disks by press fitting the compact disks at a circular inner aperture of the compact disks over a spindle located about a center point of the circular cavity, the spindle acting in cooperation with a circular ridge concentric to the spindle for accepting a circular recessed under sector of the compact disks and a second upper partially quadrilateral cavity for holding floppy disks through a plurality of vertically inward extending projections spaced on an inner surface of an upper dog leg sector of the second upstanding wall, whereby the floppy disks act to cooperatively overlay the compact disks commencing at an arced sector of the partially quadrilateral cavity connecting end points of the dog leg sector, the arced sector further defined by a circumference of the recessed circular cavity intercepting the partially quadrilateral cavity; and
a sealing means integral to the cover along a first side common to the quadrilateral trays and opposing the binding means at a second side, consisting of at least one foldable adhesive flap at an open end of the receptacle along the first side, wherein the flap is of quadrilateral dimensioned configuration conforming to the open end for sealing the receptacle in the closed position in cooperation with a plurality of flanges located around a perimeter of the inner surface of the first upstanding wall of the quadrilateral tray for engagement to a plurality of coordinately placed notches located peripherally on an outside upper surface of the second upstanding wall of the partially quadrilateral tray further functioning to secure the receptacle for packaging, shipping and storing.

5,839,576
DISK STORAGE APPARATUS

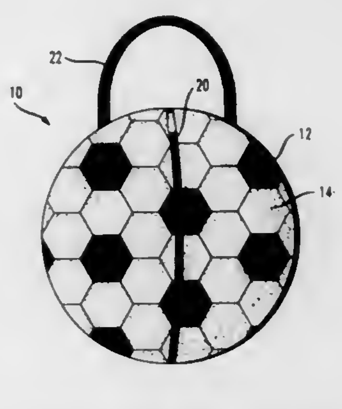
Young S. Kim, Cupertino, Calif., assignor to Inno Design, Inc., Palo Alto, Calif.
Filed Sep. 29, 1997, Ser. No. 939,378
Int. Cl.^{6} B65D *85/30*
U.S. Cl. 206—308.1 **14 Claims**

1. A disk storage apparatus for retaining a plurality of disks comprising:
a base having spaced first and second edges and third and fourth edges extending between said first and second edges;
at least one first retaining frame pivotally coupled to said base vicinal one of said edges thereof;
at least one second retaining frame pivotally coupled to said base vicinal another of said edges thereof;
a third retaining frame pivotally coupled to said base vicinal one of said edges thereof;
a fourth retaining frame pivotally coupled to said base vicinal another of said edges thereof; and
a plurality of disk retainers adapted to engage a disk, at least one of said disk retainers being mounted to each of said retaining frames.



5,839,577
BAG FOR HOLDING ATHLETIC ARTICLES

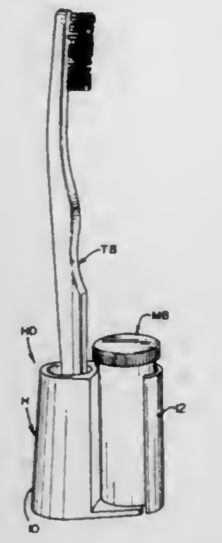
Mark Friedler, 311 E. 72nd St., New York, N.Y. 10023
Filed Jun. 9, 1997, Ser. No. 871,281
Int. Cl.^{6} B65D *85/00*
U.S. Cl. 206—315.1 **15 Claims**



1. A bag for holding athletic articles, comprising
an outer shell having an exterior surface and an interior surface, said outer shell configured in the shape of an athletic ball and including a securable opening for inserting and removing articles therefrom, said interior surface provided with a first strip of fastening means, said outer shell having handle for holding and transporting said bag; and
a removable inner lining disposed within said outer shell and having an opening which corresponds with said opening in said outer shell, said removable inner lining having an exterior surface and an interior surface, said exterior surface provided with a second strip of fastening means for mating engagement with said first strip of fastening means on said interior surface of said outer shell, said inner lining configured to be positioned against said interior surface of said outer shell such that said inner lining conforms to the shape of said outer shell.

5,839,578
HEALTH IMPROVEMENT DEVICE FOR MODIFIYING A DAILY BEHAVIOR BY REMINDING A PERSON TO TAKE MEDICATION

Allan R. Avery, New Canaan, and Lawrence H. Bernstein, Storrs, both of Conn., assignors to Rxtra Inc., Norwalk, Conn.
Filed Mar. 24, 1997, Ser. No. 822,756
Int. Cl.^{6} B65D *83/10*
U.S. Cl. 206—362.2 **20 Claims**



1. A health improvement device for modifying a daily behavior by reminding a person to take medication, comprising:
a) a generally vertically upstanding housing including first and second adjoining sections;
b) said first section including means for removably holding an instrument for use in a daily activity;
c) said second section including means for holding a material to be taken by a person; and
d) said second section including an opening substantially across the front thereof for allowing continuous visual inspection of said material in said second section;
e) wherein when a person reaches to use said instrument, the person is reminded to take said material due to the proximity of said material holding means.

5,839,579
SLEEVE TOOL KIT

Grace Lee, 58, Ma Yuan West St., Taichung, Taiwan
Filed Apr. 6, 1998, Ser. No. 55,448
Int. Cl.^{6} B65D *85/28*
U.S. Cl. 206—378 **2 Claims**

1. A sleeve tool kit comprises:
a tool box,
a recess interior formed in the tool box,
a block seat inserted in the recess interior,
the block seat comprising two opposite balls disposed on two opposite ends of the block seat, and a plurality of positioning protrusions disposed on an outer periphery of the block seat,
the tool box further comprising two opposite ball-shaped grooves formed in the tool box, two opposite round holes formed in the tool box, two opposite guide grooves formed in the tool box, and two opposite toothed semicircular grooves formed in the tool box,
the opposite ball-shaped grooves formed on two opposite ends of the recess interior,
the opposite round holes formed on the opposite ends of the recess interior,
the opposite guide grooves formed on the opposite ends of the recess interior,

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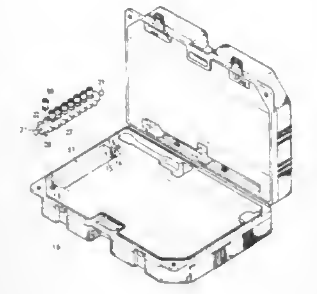
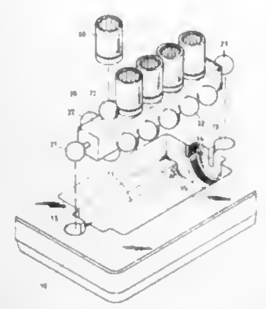




the opposite toothed semicircular grooves formed on the opposite ends of the recess interior,

each of the opposite round holes communicating with the respective opposite ball-shaped groove,

each of the opposite guide grooves communicating with the respective opposite ball-shaped groove and the respective opposite toothed semicircular groove, and

each of the opposite balls inserted in the respective opposite ball-shaped groove via the respective opposite round hole and the respective opposite guide groove.

5,839,580
TOOL HOLDER FOR ELONGATE TOOLS

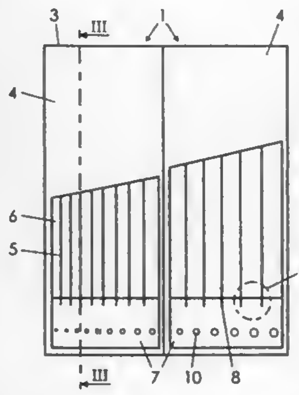
Guenter H. Budert, Bachhagel, Germany, assignor to Knoblauch, Georg, Giengen, Germany

Filed Jul. 10, 1997, Ser. No. 890,241

Claims priority, application Germany, Aug. 29, 1996, 296 14 905 U

Int. Cl.^{6} B65D *85/20*

U.S. Cl. 206—379 **7 Claims**



1. A tool holder for elongate tools, in particular for drill bits, with two holder parts which are connected to one another in an articulated manner on one long side and can be swung open or closed like a book,

1.1. each holder part (**1**) having a rear wall (**2**), four side walls (**3**) and an open front side (**4**),

1.2. receiving shafts (**6**) for the tool which is to be received being provided in each holder part (**1**), and being formed by mutually parallel crosspieces (**5**) which project forwards from the rear wall (**2**) of the holder part (**1**),

1.3. a flap (**7**), which extends transversely over the receiving shafts (**6**), in each holder part (**1**) covering part of the open front side (**4**) and part of each of the crosspieces (**5**),

1.4. the flap (**7**), in its bottom region, being fixedly or releasably arranged with the holder part (**1**) such that it can pivot, and

1.5. the flap (**7**), in its top region, being connected to the crosspieces (**5**) and/or the side walls (**3**) of the holder part (**1**) by a clamping or latching connection.

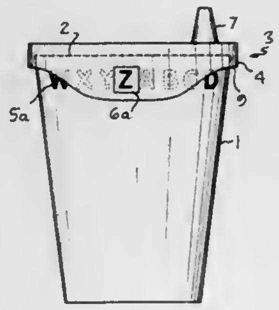
5,839,581
SPILL-RESISTANT DRINKING VESSEL WITH INDICIA

Douglas Vagedes, 3677 Hathaway Rd., Union, Ky. 41091

Filed Aug. 14, 1997, Ser. No. 911,163

Int. Cl.^{6} B65D *47/06*

U.S. Cl. 206—459.1 **6 Claims**



1. A child's drinking vessel, comprising:

a cup with a top edge;

a lid rotatably carried on said cup, said lid having a periphery and an overhanging lip extended from said periphery;

a drinking spout rising from the surface of said lid;

a plurality of indicia being carried by one of said cup and said lid around the periphery of either said cup or said lid; and

an indicator identifying a specific indicia when said lid is rotated to align said indicator with said indicia whereby a drinker can identify their cup and distinguish it from cups of other drinkers;

wherein said indicator is carried on said cup; and

said plurality of indicia are carried on said lid around its periphery.

5. A child's drinking vessel, comprising:

a cup with a top edge;

a lid rotatably carried on said cup, said lip having an overhanging lip;

a drinking spout rising from the surface of said lid;

the alphabet carried by said lid around the periphery of said lid's top surface; and

an indicator carried on said cup at a distance from said cup's top edge so as not to be obscured by said lid when said lid is fitted to said cup.

6. A child's drinking vessel comprising:

a cup with a top edge;

a lid rotably carried on said cup, said lid having a periphery and an overhanging lip extended from said periphery;

a drinking spout rising from the surface of said lid;

a plurality of indicia being carried around the periphery of said cup;

an indicator on said overhanging lip of said lid indicator identifying a specific indicia when said lid is rotated to allign said indicator with said indicia whereby a drinker can identify their cup and distinguish it from the cups of other drinkers said indicator comprising a window through said overhanging lip of said lid.

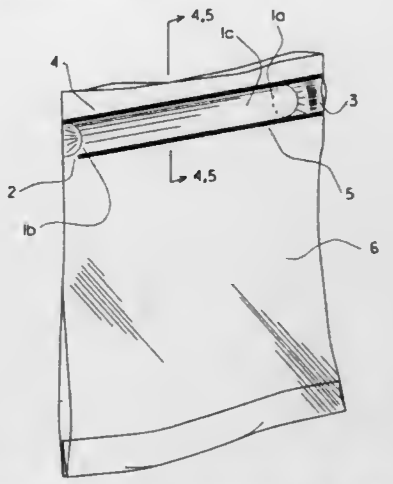
5,839,582
SELF VACUUM STORAGE BAG

William P. Strong, 2244 Bard Ct., Cocoa, Fla. 32926, and Robert P. Mueller, 3596 S. Atlantic Ave., Cocoa Beach, Fla. 32931

Filed Dec. 30, 1997, Ser. No. 513

Int. Cl.^{6} B65F *81/20*

U.S. Cl. 206—524.8 **1 Claim**



1. A flexible air tight sealing type storage bag having a storage compartment therein, wherein the improvements comprise:

a pump chamber defined by a pump chamber sleeve made of plastic or other flexible type material incorporated between at least one upper seal and one lower seal which maintains an outward bowed shape except when compressed,

a suction port located towards one end of the lower seal permitting air and other gases to flow from the storage compartment into the pump chamber,

a one-way valve located at the end opposite the suction port and made of plastic or other flexible type material and which valve is formed when the upper and lower seals are engaged and which valve is designed to open only when the pump chamber is compressed,

and the pump chamber which is formed when the upper and lower seals are engaged.

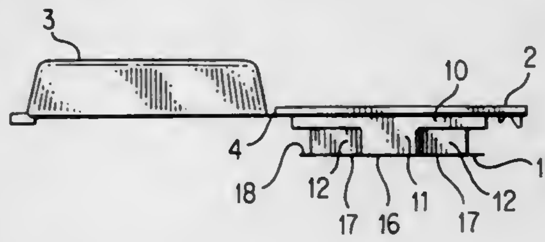
5,839,583
PACKAGING

Peter Pope, Balcombe; Michael Pearse, East Grinstead; Martin Marshall, Huntington, and Richard Edward Pytches, Farndon, all of England, assignors to Duracell Batteries, Ltd., Crawley, United Kingdom

Filed Jun. 25, 1997, Ser. No. 882,654

Int. Cl.^{6} B65D *73/02*

U.S. Cl. 206—704 **7 Claims**



1. A package comprising:

a base with a plurality of pockets, adapted to receive articles therein; and

a unitary element of flexible sheet material including a spine portion adhered to said base, article covering portions comprising a portion of said flexible sheet connected to the spine portion and extending over the respective pockets, the covering portions being adhesively connected to the articles received in the pockets and being stripable from said articles;

a cover over said covering portions of said flexible sheet, said cover being non-adhering to said covering portions of said flexible sheet and removable therefrom.

5. A method of packaging articles comprising the steps of:

(i) providing a base having a plurality of separate pockets for accommodating respective articles;

(ii) loading articles into the pockets by means of an automated filling machine; and

(iii) applying a unitary element of flexible sheet material over the base and the articles loaded into the pockets by means of an automated labelling machine, the element including a portion adhesively attached to the base, and article covering portions adhesively attached to the respective articles.

6. A method of packaging batteries comprising the steps of:

(i) providing a base having a plurality of pockets for accommodating respective batteries;

(ii) simultaneously loading batteries into the pockets; and

(iii) applying a unitary element of flexible sheet material over the base and batteries loaded into the pockets, the element being applied by an automated labelling machine, and the element including a portion adhesively attached to the base, and battery covering portions adhesively attached to the respective batteries.

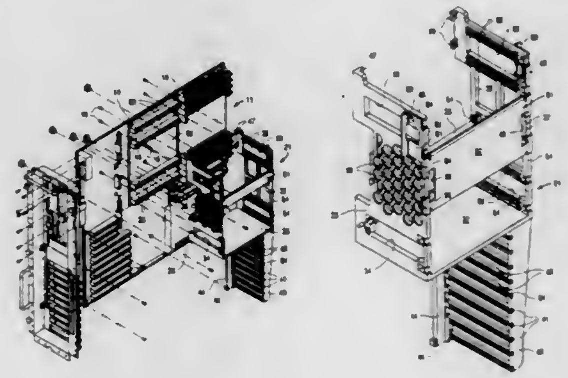
5,839,584
MOTHERBOARD STIFFENER AND GUIDE FOR PROCESSOR MODULES AND PCI CARDS

Daniel Derrick Gonsalves, Hudson, N.H.; Robert Antonnucio, Burlington, Mass.; William Izzicupo, Windham, N.H.; James Carney, Peperell, Mass.; Mark Pugliese, Shrewsbury, Mass.; Joseph Spano, North Reading, Mass.; Mathew Palazola, Glouster, Mass., and David Desilets, Hopkington, Mass., assignors to Sun Microsystems, Inc., Mountian View, Calif.

Filed Jun. 9, 1997, Ser. No. 871,277

Int. Cl.^{6} H05K *7/14*

U.S. Cl. 211—41.17 **8 Claims**



1. A stiffener and guide for a motherboard having sockets into which electronic elements are plugged comprising substantially parallel sides having elements for attachment to first edges of said sides to the motherboard, said sides having opposed edge guides for the electronic elements whereby the elements may be slid into contact with the sockets, and a transverse member engaging second edges of said sides opposite said first edges to stiffen said sides and hold said sides in parallel relationship.

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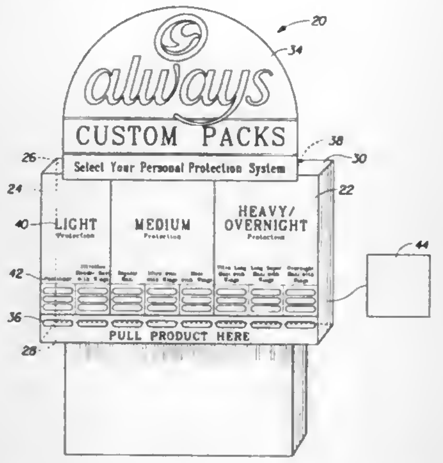
5,839,585
METHOD FOR DISPERSING ABSORBENT ARTICLES

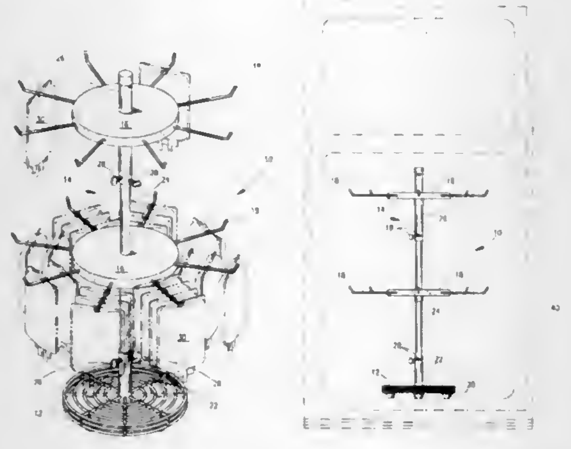
Carolyn Jeanne Miller, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnatl, Ohio
Continuation of Ser. No. 656,941, May 30, 1996, abandoned. This application Nov. 7, 1997, Ser. No. 962,888
Int. Cl.^{6} A47F *7/00*
U.S. Cl. 211—49.1 **12 Claims**



1. A method for dispensing absorbent articles of different types for use by individuals, said method comprising the steps of:
- a) providing a supply of at least two different types of absorbent articles, said absorbent articles being packaged in packages containing between 2 and 9 absorbent articles per package, inclusive;
- b) providing a dispensing device, said supply of at least two different types of absorbent articles being housed within said dispensing device; and
- c) providing said dispensing device with means for allowing an individual to select one or more types of absorbent articles housed within said dispensing device.

5,839,586
I. V. BAG CAROUSEL ORGANIZER

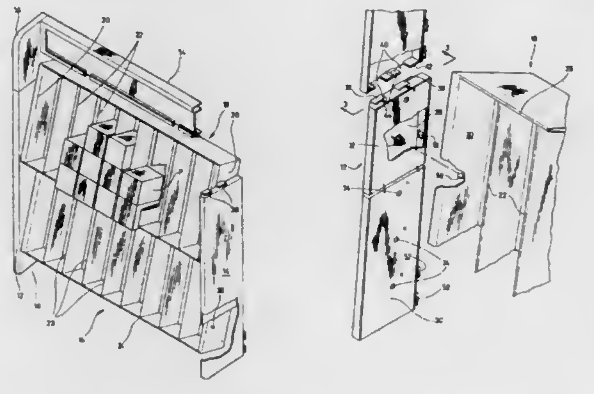
Norman A. Smith, 2575 Saint Nick Ave., New Orleans, La. 70131
Continuation-in-part of Ser. No. 492,255, Jun. 22, 1995, abandoned. This application Jul. 21, 1997, Ser. No. 897,143
Int. Cl.^{6} A47F *7/00*
U.S. Cl. 211—163 **6 Claims**



1. A method of organizing I.V. Bags comprising the steps of:
- a) loading a carousel means, for organizing I.V. Bags, comprising:
  - i) a support base having wheels attached thereto;
  - ii) a vertical tubular member attached to said support base;
  - iii) at least one circular member, rotatable relative to said vertical member, positionable at intervals along said vertical tubular member; and
  - iv) a plurality of hanger arms attached to said rotatable circular member, said hanger arms being structurally sufficiently to support a plurality of liquid filled I.V. bags; and
- b) transporting said loaded carousel means via said wheels from a pharmacy to a nursing station.

5,839,587
LENS DISPLAY SYSTEM

Gary Robert Gress, Don Mills, and Lindsay James Lummiss, Scarborough, both of Canada, assignors to CDA Industries Inc., Scarborough, Canada
Filed Apr. 4, 1997, Ser. No. 833,130
Int. Cl.^{6} A47F *5/00*
U.S. Cl. 211—59.2 **11 Claims**

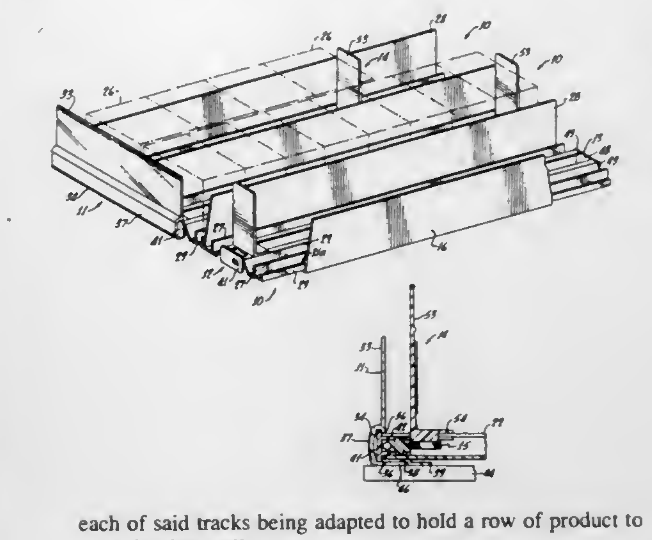


1. A lens display assembly, which in turn comprises;
- left and right hand end members having inwardly and outwardly facing surfaces;
- support means on said end members for supporting said end members generally upright;
- interlock attachment means on said inwardly facing surfaces of said end members in alignment with one another, and spaced axially apart along the length of said end members by equal spacings;
- transverse shelf members adapted and shaped to extend between said end members;
- interlock securing means formed at opposite ends of said shelf members, interlockable with said interlock attachment means on said end members, whereby said shelf members can be supported transversely between said end members and with said shelf members in spaced apart relation;
- lens display supports on said shelf members, for supporting lenses along the length of said shelf members; and,
- support leg members attachable to said end members, at lower ends thereof, and adapted to support said end members at an inclined angle when said leg members are standing on a level surface.

5,839,588
TRACK SYSTEM FOR FEEDING OF PRODUCT AT POINTS OF SALE

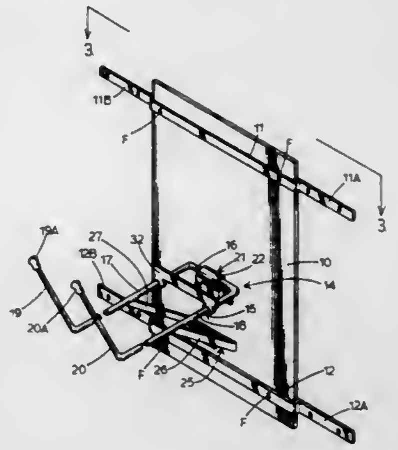
Terry B. Hawkinson, 105 Vixen Ct., Austin, Tex. 78734
Filed Dec. 26, 1996, Ser. No. 773,067
Int. Cl.^{6} A47F *5/00*
U.S. Cl. 211—59.3 **13 Claims**

1. A product supporting and feeding system, which comprises:
- (a) a shelf,
- (b) a plurality of elongate tracks disposed on said shelf in parallel relationship to each other,
  - each of said tracks being adapted to hold a row of product to be fed forwardly,
  - said tracks being closely adjacent each other, said tracks having outer ends,
- (c) means to interlock longitudinal edges of at least some of said tracks with longitudinal edges of adjacent tracks, and
- (d) a front stop and connector element mounted on said outer ends of said tracks perpendicular to said tracks,
  - said front stop and connector element preventing product from going out said outer ends of said tracks unless intentionally removed by a person,
  - said front stop and connector element aiding in connection and positioning of said tracks relative to each other.



5,839,589
EQUIPMENT HOLDER

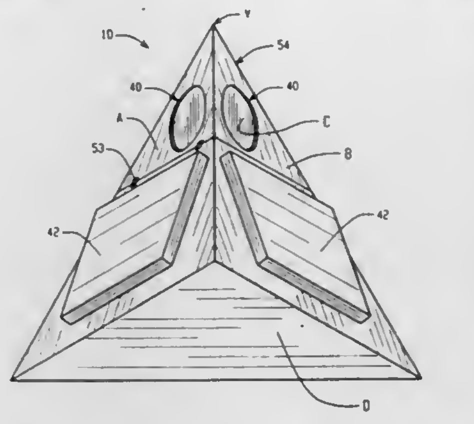
Todd H. Hillard, RR #1 Box 67A, Shickshinny, Pa. 18655
Filed Dec. 11, 1995, Ser. No. 570,699
Int. Cl.^{6} A47F *7/00*
U.S. Cl. 211—70.6 **3 Claims**



1. A hanger for equipment comprises; a support plate, a wire like U-shaped support element removably secured to said support plate, said U-shaped support element having a pair of angularly inclined upstanding free end portions, said angularly inclined upstanding free end portions are in spaced parallel relation to one another, an apertured mounting bracket pivotally secured to said U-shaped support element comprising, a cylindrical wire engagement fitting with a mounting arm extending therefrom registerable in said support plate, a resilient clip extending between said U-shaped support elements and a support frame extending from said U-shaped support elements engageable on said support plate, said support plate having elongated mounting brackets with apertures therealong extending across and beyond said separate support plate.

5,839,590
PYRAMIDAL RECEPTACLES

Douglas S. Weiner, Twinsburg, Ohio, assignor to Pyram-Ad Corporation, Twinsburg, Ohio
Filed Aug. 25, 1995, Ser. No. 519,296
Int. Cl.^{6} B65D *6/16*
U.S. Cl. 206—577 **16 Claims**



1. A foldable advertising display stand and receptacle in the shape of a pyramid having an interior cavity within walls which form the pyramid shape, the display stand and receptacle comprising,
- a first triangular pyramid wall,
- a second triangular pyramid wall attached along a fold line to a first edge of the first pyramid wall,
- a third triangular pyramid wall attached along a fold line to a second edge of the first pyramid wall, and
- each of said walls foldable along respective fold lines and relative to the attached wall to form a pyramid, and
- edges of walls abutting in the pyramid formation and not connected by a fold line lockingly engaged, and
- at least one of the triangular pyramid walls having within an expanse of the wall between three edges of the wall a circuitous edge which defines a generally circular opening through the single layer thickness of the wall, through which the interior cavity is accessible, the wall being a single layer thickness about the circuitous edge which defines the generally circular opening.

5,839,591

Patent Not Issued For This Number

5,839,592
PLASTIC CLOSURE

Thomas H. Hayes, Loveland, Ohio, assignor to Anchor Hocking Packaging Co., Lancaster, Ohio
Filed Jun. 9, 1995, Ser. No. 488,874
Int. Cl.^{6} B65D *53/04*
U.S. Cl. 215—230 **20 Claims**

1. A disk for a composite closure, said disk adapted to fit over and seal a container opening, said opening having a rim;
- said closure comprising a polymeric disk having a flexibility effective to allow it to conform to the surface configuration of said rim to provide a tight seal without application of a separate sealing gasket;
- said disk comprising an upper layer laminated to a lower layer wherein said lower layer softer than said upper layer; and
- said disk having a flexibility of at least 5 GPa^{-1} mm^{-3} at 85°–90° C. and wherein said lower layer has a softening temperature lower than the softening temperature of said upper layer;

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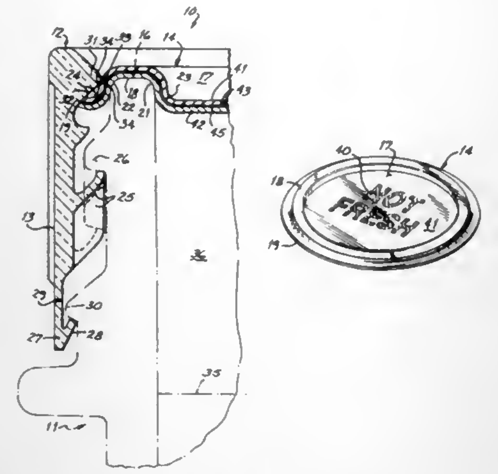


said disk further incorporating an intermediate oxygen barrier layer and an oxygen-sensitive indicating substance between said oxygen barrier layer and said lower layer.

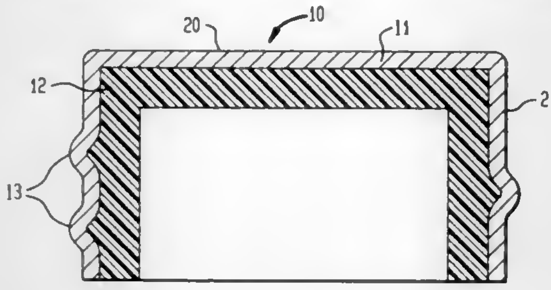
5,839,593
OXYGEN ABSORBING CONTAINER CAP LINER

George E. McKedy, Williamsville, N.Y., assignor to Multiform Desiccants, Inc., Buffalo, N.Y.

Continuation of Ser. No. 695,542, Aug. 12, 1996, abandoned, which is a continuation-in-part of Ser. No. 471,573, Jun. 6, 1995, abandoned. This application Jul. 14, 1997, Ser. No. 892,014

Int. Cl.^{6} B65D *53/04*

U.S. Cl. 215—349 **4 Claims**



1. A container cap comprising:

a base portion having a perimeter;

a substantially cylindrical portion extending perpendicularly from said perimeter of said base portion and defining an inner surface of said container cap; and

an entirely uncovered resin liner disposed in direct contact with said inner surface of said container cap and adhered to said inner surface with sufficient contact force to avoid additional mechanical sealing mechanisms, said liner having an oxygen absorbent dispersed throughout,

whereby said container cap is adapted to seal an opening in a container and to absorb oxygen within said container.

5,839,594
THRUWAY ELECTRICAL OUTLET BOX SYSTEM

Bruce Barbour, 2106 First Ave., Elizabethtown, N.C. 28337

Filed Mar. 30, 1998, Ser. No. 50,172

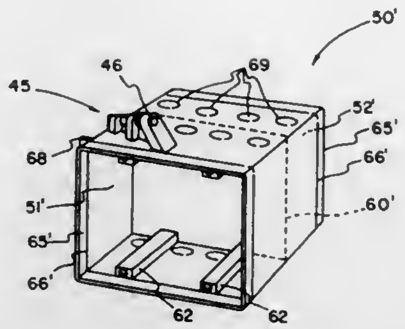
Int. Cl.^{6} H02G *3/00*

U.S. Cl. 220—3.7 **8 Claims**

1. An electrical outlet box system comprising:

a plurality of generally box-shaped structures of unitary construction, said box-shaped structures having openings at both ends thereof and being dimensioned to extend entirely through an internal wall of a building and to present on opposite faces of said wall said opening for the installation of electrical outlets and switches, said box-shaped structures including internal partitioning means so as to divide said structures into a pair of compartments arranged in back-to-back relation such that said openings are oppositely directed; and

length adjusting means including at least one extension member being integrally formed about the peripheral edge of said openings, said extension members being defined by peripherally extending score lines such that said extension members may be broken away from said structures to adjust the overall length thereof.



5,839,595
INK CONTAINER AND MANUFACTURING METHOD THEREFOR

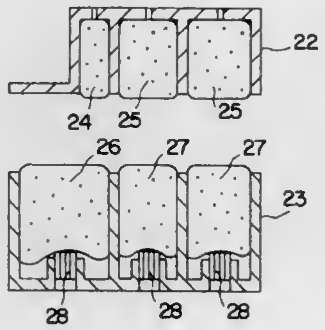
Toshihiko Ujita, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 21, 1996, Ser. No. 604,561

Claims priority, application Japan, Feb. 21, 1995, 7-031274

Int. Cl.^{6} B65D *73/00*

U.S. Cl. 220—4.21 **5 Claims**



1. An ink container for storing the ink to be supplied to an ink jet head, comprising:

an ink container shell having at least a first shell portion and a second shell portion;

first and second porous members disposed in said ink container, said first and second porous members being separate members contacted to each other, and being disposed respectively within the first shell portion and the second shell portion, the first porous member and the second porous member containing the ink to be supplied to the ink jet head;

wherein the first shell portion containing the first porous member is provided with an ink supplying portion, at which said ink container is connected to the ink jet head;

wherein the second shell portion containing the second porous member is provided with an air vent; and

wherein the first shell portion and the second shell portion are joined to form said ink container.

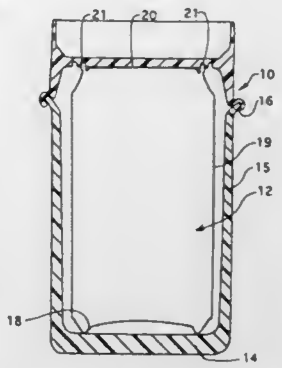
5,839,596
CUP TOP AND CAN ADAPTER

Scott M. Zahn, 927 Tall Timber Rd., Nisswa, Minn. 56468, and Mark C. Zahn, 1391 Danielson Rd., Brainerd, Minn. 56401

Filed Dec. 17, 1996, Ser. No. 779,246

Int. Cl.^{6} B65D *45/02*

U.S. Cl. 220—256 **20 Claims**



1. A beverage dispensing mug for receiving a beverage can having a top edge portion, comprising:

a mug base having a bottom wall and a side wall extending upwardly from said bottom wall and defining a can receiving cavity, said side wall including a top edge;

a mug top having a connection edge for selective connecting engagement with said top edge, a top wall having an inner surface facing said can receiving cavity when said connection edge is in connecting engagement with said top edge and a mug top side wall extending between said connection edge and said top wall, said mug top side wall including a bottom edge defining said connection edge and a top free edge defining a dispensing lip wherein said top wall is joined with said mug top side wall between said bottom edge and said top free edge so that said dispensing lip is spaced above said top wall and further wherein said connection edge and said top edge are configured and adapted for selective snap fit engagement with one another without threads;

said inner surface including a seal member forming a seal with said can top edge portion when said beverage can is in said cavity and said connection edge is in connecting engagement with said top edge; and

a beverage dispensing opening in said top wall.

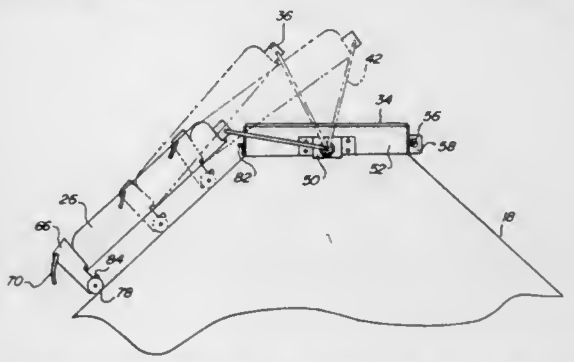
5,839,597
STORAGE BIN WITH RETRACTABLE LID ASSEMBLY

John William Marttila, Milford, Ind., assignor to CTB, Inc., Milford, Ind.

Filed Oct. 19, 1995, Ser. No. 545,340

Int. Cl.^{6} B65D *43/26*

U.S. Cl. 220—264 **25 Claims**



1. An agricultural storage bin for storing bulk agricultural materials, the agricultural storage bin having a retractable lid assembly for covering an opening in the agricultural storage bin, said agricultural storage bin comprising:

a conically shaped portion extending from said opening;

a cylindrical sidewall portion extending from said conically shaped portion operable to contain the bulk agricultural material received by the agricultural storage bin;

a lower funnel shaped portion extending from said cylindrical sidewall portion operable to guide the bulk agricultural material to ah outlet portion;

a lid for covering the opening in said conically shaped portion, said lid having a first surface facing the agricultural storage bin when said lid covers the opening in said conically shaped portion, and a second surface opposite said first surface; and

a retraction mechanism, said retraction mechanism coupled to said lid and said bin to close and open said opening, said retraction mechanism operating to move said lid upwardly away from said opening, and sliding downwardly along said conically shaped portion, wherein said first surface of said lid remains substantially facing the agricultural storage bin during retraction of said lid from the opening in the agricultural storage bin.

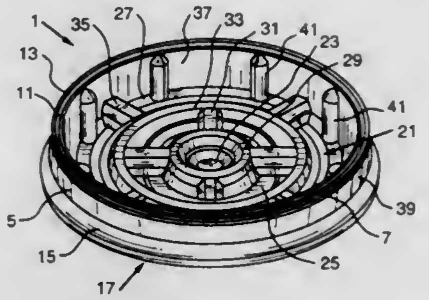
5,839,598
COMBINATION LID AND SPILL TRAY

Donald J. Mitchell, Wellsburg, W. Va., assignor to Eagle Manufacturing Company, Wellsburg, W. Va.

Continuation-in-part of Ser. No. 520,080, Aug. 28, 1995, Pat. No. 5,590,802. This application Jun. 24, 1996, Ser. No. 668,734

Int. Cl.^{6} B65D *1/36;45/34*

U.S. Cl. 220—321 **12 Claims**



1. A combination lid and spill tray comprising:

a circular lid, formed by blow molding of a thermoplastic resin, having a top wall with a downwardly depending skirt about the periphery thereof, said downwardly depending skirt having a hollow;

said top wall formed from a pair of upper and lower circular walls, said pair of upper and lower walls being fused together at predetermined locations so as to form in said lower wall a central fused circular recess, a plurality of circumferentially spaced first fused arcuate channels, spaced from said recess, and a plurality of circumferentially spaced second fused arcuate channels circumferentially offset from and spaced from said first channels;

said pair of upper and lower walls forming a first circular hollow section between said recess and said plurality of first fused arcuate channels, first radial hollow sections between said plurality of first fused arcuate channels, a second circular hollow section between said plurality of first fused arcuate channels and said plurality of second fused arcuate channels, and second radial hollow sections between said plurality of second fused arcuate channels communicating with the hollow of said downwardly depending hollow skirt.

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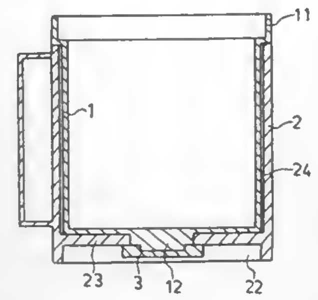
5,839,599
STRUCTURE OF CUP

Jung Chuang Lin, P.O. Box 82-144, Taipei, Taiwan
Filed Oct. 31, 1996, Ser. No. 741,558
Int. Cl.^{6} B65D *8/06*
U.S. Cl. 220—410 4 Claims



1. A cup comprising:

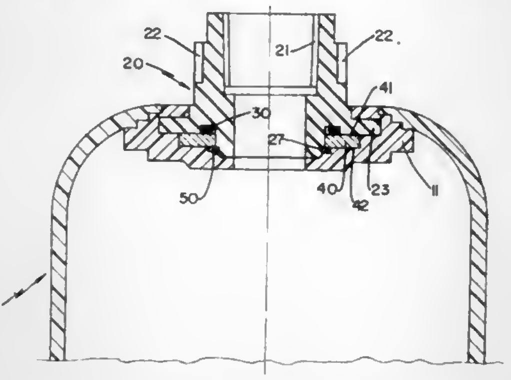
a bowl-like cup shell made from transparent material, having a bottom wall defining a top receiving chamber and a bottom chamber, and a circular center through hole through the center of said bottom wall;

a bowl-like cup body mounted within the top receiving chamber of said cup shell, having a top flange raised around the periphery of a top open side thereof and stopped above said cup shell outside said top receiving chamber, and a stepped, cylindrical bottom coupling projection downwardly raised from a bottom close side thereof and inserted through the center through hole of the bottom wall of said cup shell; and

a circular cap fastened to the bottom coupling projection of said cup body and disposed in the bottom chamber of said cup shell to secure said cup body to said cup shell, permitting said cup body to be turned in the center through hole of the bottom wall of said cup shell, said circular cap having a circular recessed hole at one side coupled to the bottom coupling projection of said cup body.

5,839,600
PLASTIC CONTAINER FOR PRESSURIZED FLUIDS

Guilherme José Pires Moreira; Ramon Fernandez Gandara, both of São Paulo, and Mário da Fonseca, Jr., Santana do Pamalba, all of Brazil, assignors to Fibrasynthetica do Brasil Ltda., Sao Paulo, Brazil
PCT No. PCT/BR96/00067, § 371 Date Sep. 17, 1997, § 102(e) Date Sep. 17, 1997, PCT Pub. No. WO97/26481, PCT Pub. Date Jul. 24, 1997
PCT Filed Dec. 18, 1996, Ser. No. 930,467
Claims priority, application Brazil, Jan. 17, 1996, 9600459
Int. Cl.^{6} B65D *1/16*
U.S. Cl. 220—560.04 10 Claims



1. A plastic container for pressurized fluids, presenting a hollow body (**10**) in plastic material, with the side wall thereof comprising at least one annular mounting portion (**11**) with the internal peripheral region thereof fixed around a nozzle shaped as a tubular metallic insert (**20**), characterized in comprising:

an annular sealing means (**30**), seated against a respective annular external seat (**26**) of the metallic tubular insert (**20**);

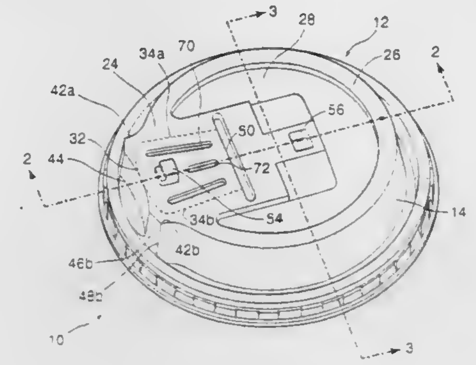
a connecting ring (**40**) in plastic material fusible with the body (**10**) of the container, mounted externally to the tubular metallic insert (**20**), so as to axially press the annular sealing means (**30**) against a respective annular external seat (**26**) of the tubular metallic insert (**20**);

a retention means (**50**) provided with at least one of the parts defined by the tubular metallic insert (**20**) and connecting ring (**40**) and acting against the other of said parts, to maintain the connecting ring (**40**) pressing the annular sealing means (**30**) axially and constantly with a predetermined force;

an extension of the peripheral internal region of the annular mounting portion (**11**) of the body (**10**) being fused with the connecting ring (**40**) already mounted on the respective tubular metallic insert (**20**), so as to incorporate the connecting ring (**40**) to the wall of the body (**10**) of the container.

5,839,601
DISPOSABLE DOME LID FOR DRINKING CUPS

Hugh Van Melle, Mississauga, Canada, assignor to Amhil Enterprises, Mississauga, Canada
Filed Dec. 18, 1996, Ser. No. 768,810
Int. Cl.^{6} A47G *19/22*
U.S. Cl. 220—712 18 Claims



1. A disposable dome lid for placement onto a drinking cup having an opening at its upper end, said opening being defined by a substantially circular cup rim whose upper extremity lies substantially in a single plane;

wherein said disposable dome lid is vacuum formed from extruded plastics sheet material, and comprises:

a substantially circular planar top surface, a side surface depending downwardly from said top surface, and a downwardly facing cup rim engaging recess formed near the outer periphery of said disposable dome lid;

wherein said cup rim engaging recess is defined at its outer side by a substantially circular, downwardly depending apron, and its inner side by a downwardly directed recess side wall;

wherein said recess side wall and said side surface both extend downwardly into an upwardly facing recess, and intersect at the bottom thereof;

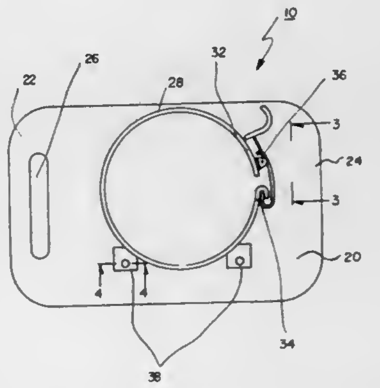
wherein said substantially circular plan top surface is above said cup rim engaging recess;

wherein a portion of said substantially circular top surface is displaced and extends outwardly and terminates at a lower lip engaging surface having a side edge at each side thereof, and wherein said lower lip engaging surface depends downwardly from said top surface and merges at each side edge with said side surface, and is above said cup rim engaging recess; and

wherein a depressed "U"-shaped hinge is formed in said top surface and is spaced away from and substantially parallel to said lower lip engaging surface, and fault lines are stamped into said substantially planar top surface to define a tear-back flap which, when torn back, will fold backwardly at said "U"-shaped hinge and will thereby define a drink-through opening in said top surface in a region thereof adjacent said lower lip engaging surface.

5,839,602
BUCKET SECURING DEVICE

Janet R. Mowry, R.D. 1 Box 220, Clarksburg, Pa. 15725-9705
Filed Feb. 2, 1998, Ser. No. 16,957
Int. Cl.^{6} B65D *23/10*
U.S. Cl. 220—737 5 Claims



1. A bucket securing device comprising in combination:

a planar support having a first end and a second end and an intermediate extent therebetween, an oblong aperture formed through the first end for use in carrying the support;

a flexible metallic ring having a first end, a second end and an intermediate extent therebetween, the first end of the ring having a pivot mount secured thereto, the second end of the ring being arcuate in shape, the ring having an interior surface and an exterior surface, the interior surface having a layer of rubber formed thereon, a pair of securing pads integral with the ring;

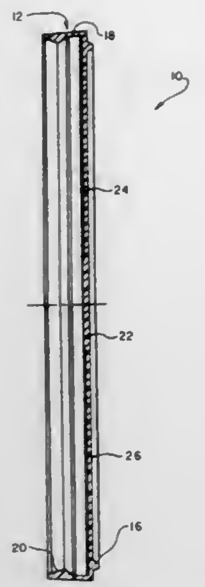
the ring being secured to an upper surface of the support by way of a pair of rivets, each of the rivets secured through the base and one of the securing pads;

a latch for use in bringing together to two ends of the ring, the latch having an interconnecting band with a first end which is interconnected with the pivot mount of the first end of the ring, the interconnecting band also having a second arcuate end with is interconnected to the arcuate second end of the ring, the latch further including a pivotal latch member which is secured proximate to the first end of the interconnecting band, the pivotal latch member having a first disengaged orientation wherein the first and second ends of the ring are spaced from one another, the latch also having a second engaged orientation wherein the interconnecting band serves to bring together the first and second ends of the ring.

5,839,603
LIGHTWEIGHT PEEL-TOP CAN LID

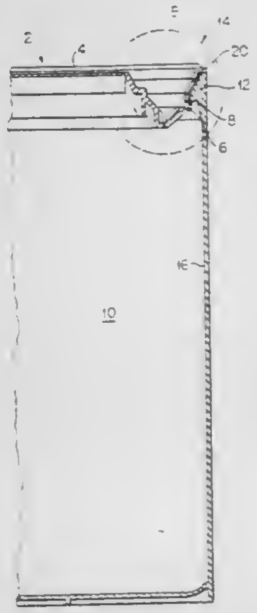
Robert J. Smith, Edinboro, and Jay C. Fidorra, Erie, both of Pa., assignors to Erie County Plastics Corporation, Corry, Pa.
Filed Sep. 11, 1997, Ser. No. 927,714
Int. Cl.^{6} B65D *41/16*
U.S. Cl. 220—782 20 Claims

1. A molded plastic closure comprising a perimeter rim structure with a center panel surrounded by and connected to said rim structure, said center panel including a plurality of substantially uniform thickness sectors and a plurality of substantially tapered thickness sectors, each of said sectors being defined by two radii extending from a center of said center panel outwards and at least one arc therebetween.



5,839,604
LID HAVING FLEXIBLY HINGED WALL PORTIONS AND CONTAINER THEREFOR

Moshe Straussman, Ramat Gan, Israel, assignor to Amraz Ltd., Ashdod, Israel
PCT No. PCT/US95/06692, § 371 Date May 14, 1997, § 102(e) Date May 14, 1997, PCT Pub. No. WO95/32128, PCT Pub. Date Nov. 3, 1995
PCT Filed May 25, 1995, Ser. No. 737,795
Claims priority, application Israel, May 25, 1994, 109789
Int. Cl.^{6} B65D *41/16*
U.S. Cl. 220—789 7 Claims



1. A lid for containers having an inner rim along the perimeter of the container wall, said lid comprising:

a substantially flat central portion, a trough-shaped edge portion comprising a rigid inner wall, a rigid outer wall and a rigid bridge element connecting the inner and outer walls, the central portion, inner wall, outer wall and bridge element having respective defined thicknesses, means disposed on the

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outer wall for sealingly engaging the inner rim of the container, characterized in that the central portion of the lid is integrally and flexibly hinged to the inner wall of the edge portion, and the bridge element is integrally and flexibly hinged to both the inner wall and the outer wall, said integral and flexible hinges are of a thickness less than the respective thicknesses of the elements that they connect, so that when a vertical force is applied to the lid from inside the container, the rigid bridge element translates the vertical force exerted on the under side of the lid into a lateral force exerted on the rigid outer wall of the edge portion, thus maintaining the seal between said lid and said container.

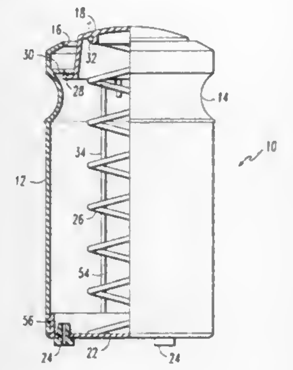
5,839,605
CUP DISPENSER

Frederick Hadtke, New Providence, and Jonathan Rush, Phillipsburg, both of N.J., assignors to Fort James Corporation, Richmond, Va.

Filed Mar. 1, 1996, Ser. No. 609,476

Int. Cl.^{6} A47F *1/00*

U.S. Cl. 221—59 **21 Claims**



1. A cup dispenser comprising;
- a housing having an open end and a closed end defining a cup receiving cavity;
- a cup support means reciprocally positioned in said cup receiving cavity for supporting at least one cup received in said cup receiving cavity;
- biasing means for biasing said cup support means towards said open end;
- guide means for guiding said cup support means within said housing, said guide means including axially extending substantially diametrically opposed rails and a cup restraining means for restraining outward movement of said at least one cup; and
- stopping means positioned adjacent said guide means and spaced inward from said cup restraining means for stopping outward movement of said cup support means.

5,839,606
METHOD/APPARATUS FOR SEPARATING WIRE HEALDS

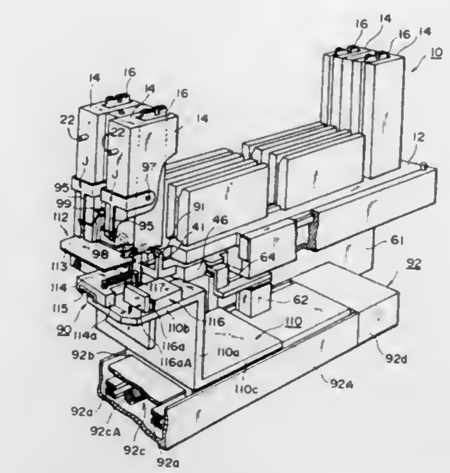
Kazunori Kuroyanagi, Inasa-gun, Japan, assignor to Hamamatsu Photonics K.K., Hamamatsu, Japan

Filed Feb. 7, 1997, Ser. No. 796,577

Claims priority, application Japan, Feb. 9, 1996, 8-024176; May 8, 1996, 8-113787; May 8, 1996, 8-113799; May 9, 1996, 8-114894

Int. Cl.^{6} B23Q *7/04;* **D03J** *1/14*

U.S. Cl. 221—212 **12 Claims**



1. A method for drawing an arbitrary wire heald from a group of wire healds, comprising the steps of:
- inserting a drawing pin located on a notch portion of a magnetic head into a guide hole formed on one side ring portion of said wire heald:
- moving said magnetic head in a longitudinal direction of the wire heald after magnetically attracting said ring portion;
- drawing the lowermost wire heald as hooked on said drawing pin;
- in state wherein a pair of front and rear floating rods extending vertically are inserted in respective guide holes of paired ring portions formed at the both ends of said wire healds, pushing up a lower end face of a front floating rod with a notch face provided on the notch portion of the magnetic head; and
- moving the magnetic head horizontally with maintaining contact of said lower end face of the front floating rod with the notch portion of the drawing pin after inserting the drawing pin into the ring portion of the lowermost front floating rod.

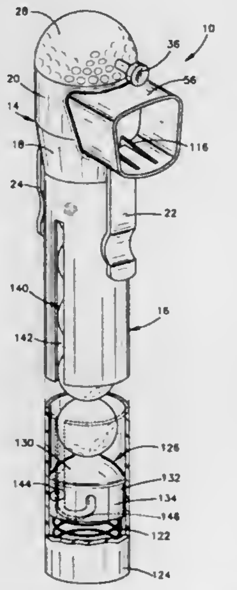
5,839,607
GOLF BALL STORING AND DISPENSING DEVICE

Scott D. Swanson, 8466 N. Lockwood Ridge Rd., Suite 210, Sarasota, Fla. 34243

Filed May 23, 1997, Ser. No. 862,894

Int. Cl.^{6} B65H *1/08*

U.S. Cl. 221—231 **13 Claims**



1. A golf ball dispensing device for use in storing and dispensing of golf balls comprising:
- a tubular member for storing a plurality of golf balls in a stacked configuration having an upper portion at one end of said tubular member and a base at the other end of said tubular member;
- a cap, having a periphery, an interior surface and an exterior surface, is fixedly attached along said periphery to said upper portion of said tubular member, said cap having opposing support arms extending downwardly from said interior surface into said upper portion, said cap having an aperture therethrough;
- a ball trap member for retaining the top golf ball of the plurality of stacked golf balls, said ball trap member housed within said cap and said upper portion and positioned between and pivotally connected at a pivot connection to said opposing support arms;
- a ball ejector assembly secured to said cap interior and pivotally connected to said ball trap member, said ball ejector assembly movable from a set position wherein said ball trap member retains a golf ball, to an extended position wherein said ball trap member rotates about said pivot connection to release the golf ball;
- a nozzle opening formed in said upper portion of said tubular member and positioned below a push button and substantially aligned with the golf ball retained by said ball trap member;
- a lever pivotally connected to said ball trap member for urging the top golf ball through said nozzle opening substantially simultaneously when said ball trap member releases the top golf ball;
- a spring biased piston for urging a stacked plurality of golf balls against said ball trap member such that the dispersed top golf ball is replaced.

5,839,608
STRETCH-ACTIVATED CONTAINER

Gunilla Elsa Gillberg-LaForce, Roswell, Ga., assignor to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

Continuation of Ser. No. 493,766, Jun. 22, 1995, Pat. No. 5,741,564. This application Jan. 30, 1997, Ser. No. 791,277

Int. Cl.^{6} B67D *3/00;* **B65D** *35/08*

U.S. Cl. 222—1 **19 Claims**

1. A method of dispensing a liquid which comprises:
- providing a fluid-tight container adapted to contain a liquid, wherein at least a portion of the container comprises a material which is initially in an unstretched condition so that the material is impervious to liquids or both gases and liquids, said material being constructed of a film that, when stretched b manual forces external to said material, forms a plurality of surface-connected Pores to allow liquids and gases to penetrate said material so that liquids and gases will pass into or out of said container at a controlled rate depending on the amount of external stretching force applied to said material;
- providing a liquid in the fluid-tight container; and
- stretching the container.

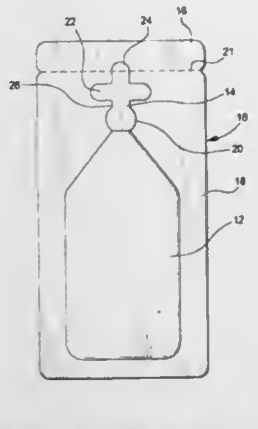
5,839,609
THERMOFORMED PACK WITH RIDGE VALVE

Issac Zakensberg, Scotch Plains, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 27, 1997, Ser. No. 921,926

Int. Cl.^{6} B65D *37/00;35/28*

U.S. Cl. 222—107 **16 Claims**



1. A thermoformed pack having a body portion and a valve portion, said body portion terminating at one end in said valve portion, said body portion and said valve portion being closed by a substantially planar top wall having a thickness less than that of said body portion and said valve portion, said valve portion having a dispensing opening sealed by a breakaway tab, a first recess chamber and a second recess chamber separated by a separating ridge, said top wall contacting said separating ridge and being sufficiently flexible to extend into each of said first chamber and said second chamber, said first recess chamber, said second recess chamber and said substantially planar top wall closing said valve portion upon the removal of said breakaway tab and the absense of a dispensing force on said body portion.

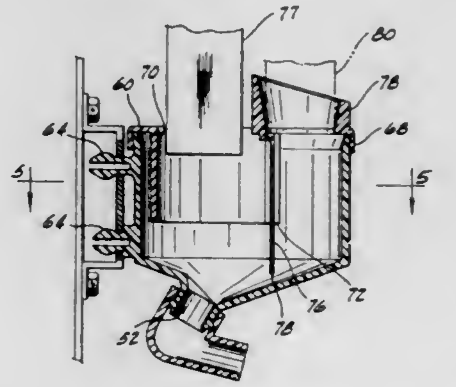
5,839,610
INGREDIENT MIXING BOWL AND MOISTURE REDUCTION SYSTEM FOR A VENDING MACHINE

Robert J. Reese, St. Charles, and Franklin D. Newkirk, Florissant, both of Mo., assignors to Crane Co., Stamford, Conn.

Filed Oct. 14, 1997, Ser. No. 949,573

Int. Cl.^{6} B67D *5/56;83/00*

U.S. Cl. 222—129.3 **13 Claims**



1. An ingredient mixing apparatus for a beverage vending machine, comprising:
- an ingredient mixing bowl having an upper portion and a lower portion, the upper portion having a substantially vertical wall formed of a surface of revolution and the lower portion having a generally conically shaped inner wall with an outlet spout;
- a divider wall extending into the mixing bowl through the upper and lower portions with side walls extending substantially adjacent the vertical wall of the upper portion, a lower end of the divider wall extending adjacent the conically shaped lower wall so as to substantially divide the bowl into first and second sections without inhibiting the flow of liquid along the conically shaped lower wall;
- means for injecting a measured amount of liquid into the mixing bowl so as to cause it to circulate about at least a portion of the conically shaped lower wall before entering the outlet spout;
- means for introducing a measured amount of ingredient into the first section of the mixing bowl so as to mix with the liquid in the mixing bowl and exit the outlet spout therewith; and
- means for causing a suction on the second section of the mixing bowl so as to remove moisture and ingredient laden air from the mixing bowl during mixing of the liquid and ingredient therein.

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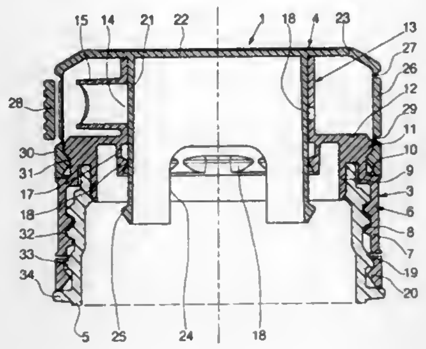
5,839,611

DISPENSER FOR REMOVING A FLUID FROM A CONTAINER

Jacques Obadia, Paris, and Bernard Guglielmini, Crimolois, both of France, assignors to Rical S.A., Longvic, France
PCT No. PCT/FR96/00486, § 371 Date Sep. 24, 1997, § 102(e) Date Sep. 24, 1997, PCT Pub. No. WO96/30273, PCT Pub. Date Oct. 3, 1996
PCT Filed Apr. 1, 1996, Ser. No. 894,919
Claims priority, application France, Mar. 31, 1995, 95 03840
Int. Cl.^{6} B67D *5/33*
U.S. Cl. 222—153.14 **10 Claims**



1. Dispenser for drawing off a fluid product held in a container (2) which includes a fixed piece (3) comprising a part (6) for attachment to the container, which part is extended toward the outside of the container by a pouring part (13) of cylindrical general shape, open at its two axial ends and pierced by a lateral fluid outlet orifice (14), a movable piece (4) comprising a closure part (21) of cylindrical general shape fitted tightly in the pouring part (13) of the fixed piece (3) open at its internal axial end, closed at its external axial end and pierced by a lateral fluid outlet orifice (24), and a top part (22, 23) enabling the movable piece (4) to be gripped and operated from the outside, the movable piece (4) being mounted so as to be able to move in axial translation and in rotation in the fixed piece (3), the fixed piece (3) and the movable piece (4) including means (11, 26, 29, 30, 31) designed to define a first axial position of the movable piece with respect to the fixed piece, in which position the lateral orifices (14, 24) of the two pieces are axially offset so as not to be able to be brought into coincidence, and means (18, 25) for defining a second axial position of the movable piece with respect to the fixed piece, in which position the lateral orifices (14, 24) of the two pieces can be brought into coincidence by rotating the movable piece, characterized in that the said first axial position of the movable piece (4) is the position in which the movable piece (4) has been pushed fully into the fixed piece (3) and the said second axial position is the position in which the movable piece (4) has been extracted from the fixed piece (3), in that the first axial position of the movable piece (4) is defined by a tamperproofing strip (26) which, until it has been torn off, connects the top part (22, 23) of the movable piece (4) to the fixed piece (3) and in that the second axial position of the movable piece is defined by snap-fastening means (18, 25) designed to allow rotation of the movable piece (4) in this second axial position.

5,839,612

CAULKING DISPENSING DRILL ATTACHMENT

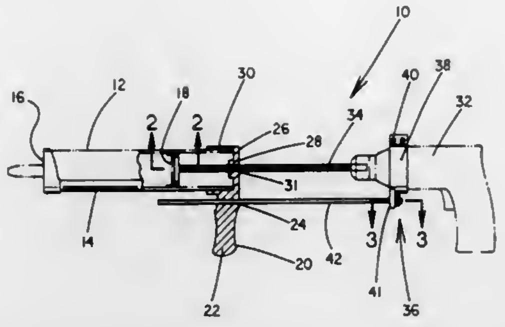
Glendal Roy Burke, 199 Johnny Rigney Rd., State Line, Miss. 39362
Filed May 7, 1998, Ser. No. 74,090
Int. Cl.^{6} B67D *5/46*
U.S. Cl. 222—333 **6 Claims**

2. A mechanized caulking material dispensing device for use with a conventional drill comprising:

a caulking tube including a cylinder with a front end face having a nozzle formed thereon and a rear end face slidably situated within the cylinder for dispensing caulking material from the nozzle upon the insertion of the rear end face within the cylinder;

a caulking tube mounting handle releasably coupled to the cylinder and having a grip mounted thereon; and

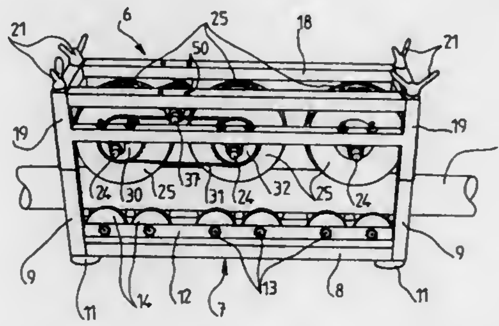
a drill having an elongated threaded drill bit having an inboard end releasably coupled to a motor of the drill, an outboard end abutting the rear face of the caulking tube, and an intermediate extent threadedly engaged with a threaded aperture of the caulking tube mounting handle for inserting the rear face of the caulking tube into the cylinder upon the actuation of the motor of the drill by way of a trigger.



5,839,613

DEVICE FOR PUSHING A TUBE OF PLASTICS MATERIAL FOR INTERNALLY CASING A METAL PIPING TO BE RENOVATED

Alain Marcout, Chaponost; Marcel Teillaud, Neuville-Sur-Saone, and Yves Berger, La Mulatiere, all of France, assignors to Gaz De France, Paris, France
Filed Mar. 14, 1997, Ser. No. 816,428
Int. Cl.^{6} B65H *20/00*
U.S. Cl. 226—176 **8 Claims**



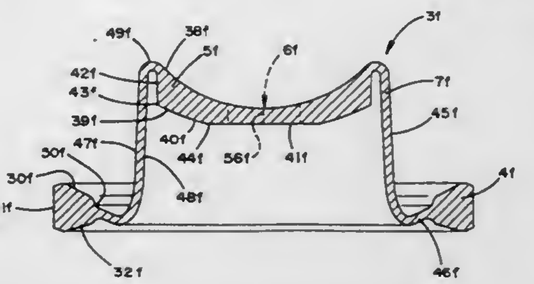
1. A device for casing a piping interior by providing a tubing of plastics material inside of the piping, comprising a portable frame made from two subframes that include an upper and lower subframes which are independent from one another and which are adapted to be assembled to each other in a separable manner, a first train of wheels carried by the lower subframe and comprising a plurality of rollers each having a peripheral surface with a peripheral groove therein, said rollers being juxtaposed in a longitudinal vertical mean plane of the lower subframe while extending in a parallel relationship such that the peripheral grooves form a convex support for the tubing, a second train of wheels carried by the upper subframe and comprising a plurality of wheels each having a peripheral surface which is made of a material adapted to frictionally engage the tubing, the wheels of the second train being juxtaposed in a longitudinal vertical mean plane of the upper subframe while extending in a parallel relationship, and drive means associated with the upper subframe for rotatably driving the wheels of the second train, wherein, when the upper subframe is assembled to the lower subframe, the longitudinal vertical mean planes coincide and the first and second trains of wheels maintain

the tubing between them longitudinally so that when the wheels of the second train are rotatably driven, the tubing is advanced continuously in an axial direction into the pipe.

5,839,614

DISPENSING PACKAGE

Paul E. Brown, Midland, Mich., assignor to Aptar Group, Inc., Crystal Lake, Ill.
Continuation-in-part of Ser. No. 240,264, May 10, 1994, Pat. No. 5,439,143, which is a continuation of Ser. No. 804,086, Dec. 6, 1991, Pat. No. 5,213,236. This application Jul. 28, 1995, Ser. No. 508,472
Int. Cl.^{6} B67D *5/06*
U.S. Cl. 222—185 **44 Claims**



1. A dispensing package for fluid products, comprising:

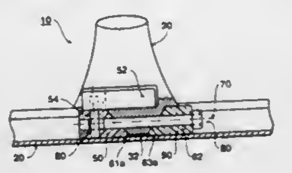
a container shaped to retain a selected fluid product therein, and having a discharge opening; and

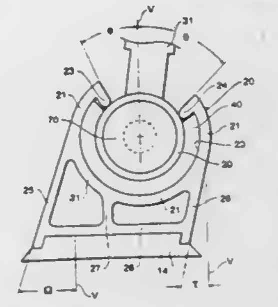
a dispensing valve for controlling the flow of the fluid product from said container, having a marginal portion sealing about the discharge opening of said container, a head portion including a central area with an orifice which opens to permit fluid flow therethrough in response to a predetermined discharge pressure within said container, and closes to shut off fluid flow therethrough upon removal of the predetermined discharge pressure, and a generally J-shaped connector sleeve having a resiliently flexible construction with a first leg portion thereof connected with said marginal portion, and a second leg portion thereof connected with said head portion; said first and second leg portions being mutually oriented at an acute included angle, and joining one another at an arcuate portion which facilitates movement of said head portion when dispensing product from said container.

5,839,615

TRACK MOUNT SYSTEM

Ralph D. Ray, Boulevard; Richard L. Ireland, Upland, and Jon Apogee, Mira Loma, all of Calif., assignors to Sport Carriers, Inc., Grand Terrace, Calif.
Continuation of Ser. No. 333,003, Nov. 1, 1994, Pat. No. 5,551,617. This application Aug. 19, 1996, Ser. No. 699,170
Int. Cl.^{6} B60R *9/045*
U.S. Cl. 224—321 **4 Claims**





1. A track mount system for a vehicle carrier comprising an elongated track,

a guide slidably retained within said track,

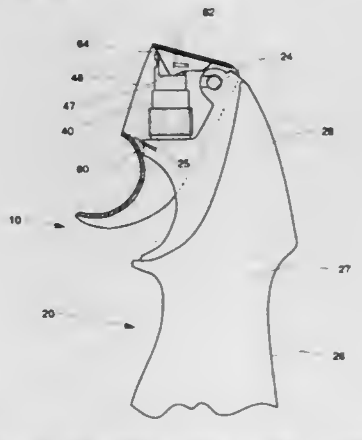
an end support adapted to slidably receive a crossbar, and

a pedestal extending from said end support into said track and rotatably connecting to said guide to compensate for the fall-away slope of a vehicle roof as said guide and said pedestal slide longitudinally along said track, said pedestal comprising a first inclined surface, said track mount system further comprising a locking member operably connected to said pedestal, said locking member having a second inclined surface opposing said first inclined surface.

5,839,616

BLOW MOLDED CONTAINER HAVING PIVOTAL CONNECTOR FOR AN ACTUATION LEVER

Aram Jesse Irwin, Portland, Oreg.; Gerard Laurent Buisson, Cincinnati, Ohio, and Reuben Earl Oder, Union, Ky., assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Aug. 14, 1997, Ser. No. 911,591
Int. Cl.^{6} B05B *9/043*
U.S. Cl. 222—321.8 **19 Claims**



1. A package for dispensing a liquid product comprising:

(a) a hollow, one-piece integral container body including an upper portion and a closed bottom end, said upper portion including an integral extension and a neck finish, said integral extension extending upward from said upper portion, and said neck finish having an aperture therethrough; and

(b) a pivotal connection on said integral extension, said pivotal connection located above said aperture of said neck finish; and

(c) a pump device attached to said aperture, said pump device having a first contact surface; and

(d) an actuation lever pivotally connected to said container body at said pivotal connection allowing arcuate movement of said actuation lever, said actuation lever having a second contact surface which cooperates with said first contact surface enabling said actuation lever to apply an operating force upon said pump device during said arcuate movement in order to dispense said liquid product.

5,839,617

PUMP DISPENSER

Miro S. Cater, Daytona Beach, Fla., and Earnest E. Bliss, III, Perrysburg, Ohio, assignors to Owens-Illinois Closure Inc., Toledo, Ohio
Filed Jul. 29, 1997, Ser. No. 902,027
Int. Cl.^{6} G01F *11/04*
U.S. Cl. 222—321.9 **16 Claims**

1. A pump dispenser adapted to be mounted on a container comprising:

a. a stepped tubular body,

b. a stepped tubular piston having a wall and telescoping reciprocably inside the stepped tubular body to define a pump

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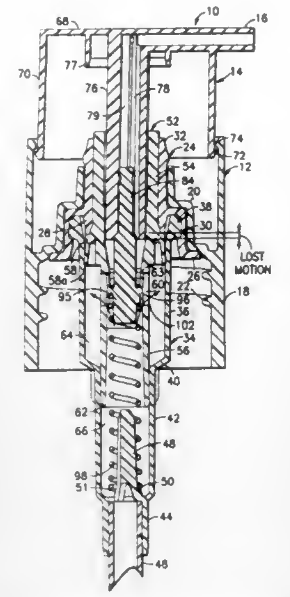
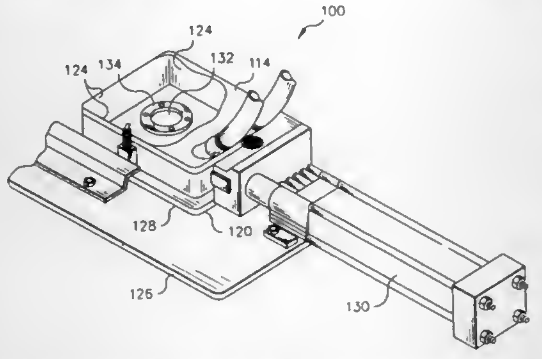


chamber, the piston being formed with aperture means in the wall communicating between inside the tubular piston and the pumping chamber,

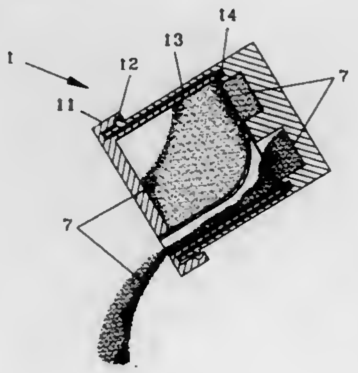
c. a stem having an upper portion, and a sealing head disposed in the stepped tubular piston and adapted to occupy a first position closing the aperture means above the head and exposing the aperture means below the head to define an intake path from inside the piston, and a second position closing the aperture means below the head and exposing the aperture means above the head to define a discharge path upward between the upper portion of the stem and the piston,
d. a spring disposed compressively between the stem and body and urging the stem upward into first position, and
e. a lost-motion means between the stem and piston whereby downward movement of the stem will first depress the head from first to second position and then move the stem and piston downward in unison inside the tubular body.

5,839,618
MATERIALS FEEDER EQUIPMENT
Dilip K. Chatterjee, and Syamal K. Ghosh, both c/o Eastman Kodak Company, 343 State St., Rochester, N.Y. 14650
Filed Oct. 28, 1996, Ser. No. 736,850
Int. Cl.^{6} G01F *11/10*
U.S. Cl. 222—361 **10 Claims**



1. An improved materials feeder equipment, comprising:
a feeder box having a first opening to receive materials, a base having a second opening for releasing said materials, means for controllably releasing materials from said second opening, and sidewalls surrounding the base for containing the materials;
a plate-like surface in sliding contact with the base of the feeder box;
means for slidably moving the feeder box along the plate-like surface between a first position and a second position;
wherein said base has a first-sliding contact portion comprising tetragonal zirconia ceramic and said plate-like surface has a second-sliding contact portion comprising zirconia-alumina ceramic composite.

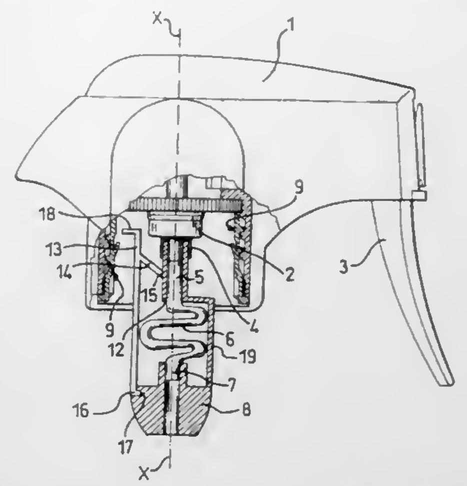
5,839,619
MEASURING DISPENSER
Randy Robert Willer, 43929 5th Street E., Lancaster, Calif. 93531
Filed Mar. 24, 1997, Ser. No. 826,106
Int. Cl.^{6} G01F *11/10*
U.S. Cl. 222—368 **3 Claims**



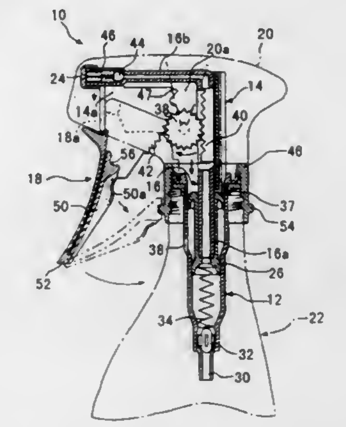
1. A device for dispensing measured amounts of granular material comprising:
a base element having a side wall into which a container element having a wall of length substantially the same as the side wall is inserted and retained by a means for retaining wherein the base element and the container element are of cylindrical construction and may be rotated relative to each other;
the base element having a base element top end which is open and a base element bottom end containing a plurality of measuring chambers for receipt of a granular material;
the container element having a dispensing channel which is open at a dispensing channel bottom end and at a dispensing channel top end wherein the dispensing channel is constructed such that it may be aligned with one of the measuring chambers at the base element bottom end; and
a container element bottom end having a fill opening defined therein opposite the dispensing channel.

5,839,620
ATOMIZER WITH SUCTION TUBE PROVIDED WITH BALLAST WEIGHT
Piero Battegazzore, Alessandria, Italy, assignor to Guala Dispensing S.r.l., Alessandria, Italy
Filed Mar. 27, 1997, Ser. No. 825,106
Claims priority, application European Pat. Off., Mar. 27, 1996, 96830155
Int. Cl.^{6} B67D *5/42*
U.S. Cl. 222—382 **13 Claims**

1. Manually operated atomizer for liquids comprising an operating member, a dispenser to suck the liquid from a container which can be grasped with one hand, connecting means to fix the dispenser to the neck of the said container, a suction connector on the dispenser facing the container, the said suction connector defining the vertical axis of the dispenser, and a suction tube whose free end is immersed in the liquid in the container and whose other end is connected to the said suction connector of the dispenser, and a ballast weight connected to the free end of the said suction tube, the said suction tube being retractable and extendable, retaining means, which can be released when required, engaged with the said ballast weight to keep, when engaged, the said tube retracted towards the dispenser and the said ballast weight locked to the dispenser.

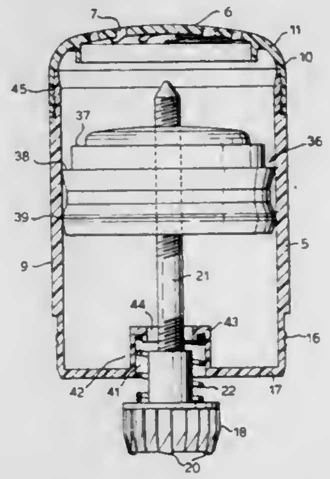


5,839,621
PUMP DISPENSER
Tetsuya Tada, Tokyo, Japan, assignor to Mistlon Technology B.V., Rotterdam, Netherlands
Filed Apr. 25, 1997, Ser. No. 845,172
Claims priority, application Japan, Apr. 26, 1996, 8-131191
Int. Cl.^{6} B67D *5/40;* **B05B** *9/043*
U.S. Cl. 222—383.1 **4 Claims**



1. A pump dispenser comprising a housing, a bottle cap fitted to a mouth of a container, an inflow passage of liquid, a cylinder continuous with the inflow passage, a trigger, a piston capable of reciprocating within the cylinder in interlocking with pivoting motion of the trigger, for pumping and compressing the liquid, and an outflow passage having at its extremity an orifice through which the compressed liquid is discharged; wherein
said cylinder is positioned on a vertical axis along the direction in which the liquid is pumped, said piston being substantially L-shaped including a vertical flow passage and a horizontal flow passage continuous with the vertical flow passage and serving as an outflow passage of the liquid, said piston having at a lower end of the vertical flow passage a skirt-like sealing piece integrally formed therewith and capable of being in sliding contact with the inner surface of the cylinder, said piston being arranged and supported in such a manner as to be vertically movable in the direction of axis corresponding thereto; and wherein
said housing is fixedly arranged on the upper portion of the cylinder and rotatably supporting a pair of pinions capable of meshing with a pair of racks formed integrally along the vertical flow passage of the piston; said trigger having a pair of sector gears formed integrally therewith and capable of meshing with the pair of pinions, the upper end of the trigger being pivoted to the housing at the associated position; and wherein
the pivoting motion of the trigger is capable of being converted into a reciprocating movement of the piston on a vertical axis along the axis of the cylinder, by way of rotation of the pair of pinions interlocking with the pivotal motion of the trigger, and further rectilinear movement of the pair of racks in the vertical direction is attendant on the rotation of the pair of pinions.

5,839,622
DISPENSING PACKAGE
David Huw Bicknell, Marlborough; Stephen James Carter, Wetherby, and Ron Kartupelis, Aylesbury, all of United Kingdom, assignors to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.
Filed Sep. 26, 1996, Ser. No. 720,280
Claims priority, application United Kingdom, Oct. 27, 1995, 9521992
Int. Cl.^{6} A45D *40/04;40/06;* **B67D** *5/42*
U.S. Cl. 222—390 **11 Claims**



1. A dispensing package for cream compositions comprising:
(a) a container body having a longitudinal central axis;
(b) the container body defining a storage chamber for the composition;
(c) an opening in the container body for discharging the composition;
(d) a fixed cam opposite said opening having teeth orientated tangentially to said longitudinal axis;
(e) a rotatable cog mounted on said cam having a plurality of ratchet teeth engageable with the teeth of said fixed cam;
(f) the cog being provided with external peripheral cams orientated parallel with said longitudinal axis;
(g) a spindle mounted on said cog and extending along said central longitudinal axis between the cog and the opening;
(h) an elevator mounted on said spindle and displaceable between the cog and the opening to dispense the composition through the opening;
(i) a pawl oriented transverse to the longitudinal axis and engageable with said peripheral cams to rotate the cog and spindle on the fixed cam,
(j) an actuator button attached to said pawl to urge the pawl against the peripheral cam; and
(k) a spring mounted between the cog and the elevator to bias the cog against the fixed cam;
wherein upon actuation of the button, the cog and spindle ride on the fixed cam with a reciprocating motion which is transferred to the elevator via the spindle.

5,839,623

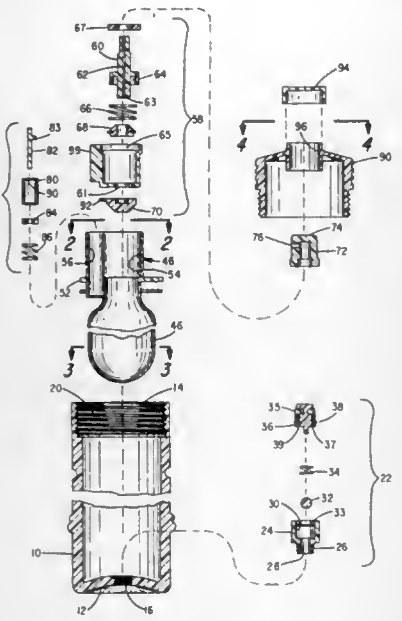
REUSABLE PRESSURE SPRAY CONTAINER

Christopher D. Losenno; Gino L. Losenno, both of Edina, and William M. Mower, Plymouth, all of Minn., assignors to Pure Vision International, L.L.P., Minneapolis, Minn.

Filed Jul. 29, 1996, Ser. No. 688,657

Int. Cl.^{6} B65D *83/00*

U.S. Cl. 222—402.1 **8 Claims**



1. A spray bottle for dispensing a liquid product as an aerosol, comprising:

(a) an outer container having a generally closed bottom, an open top and a generally cylindrical, rigid, wall extending therebetween;

(b) an inner container for containing the liquid product, the inner container having a compliant body portion defining a collapsible chamber, said inner container being supported from a relatively rigid valve holder member, the valve holder member including means for suspending the inner container within the wall of the outer container;

(c) first valve means for allowing the introduction of a pressurizing gas into a space between said compliant body of the inner container and the rigid wall of the outer container;

(d) second valve means for selectively allowing the pressurizing gas and the liquid product to mix and flow out from a nozzle orifice on the second valve means as an aerosol; and

(e) a cap secured to the open top of the outer container, the cap including a bore for receiving the nozzle orifice therethrough while holding the valve holder assembly in place.

5,839,624

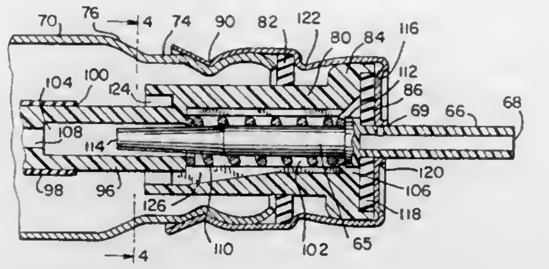
HORIZONTAL RELEASE AEROSOL CANISTER

Kevin L. Parsons, Appleton, Wis., assignor to Armament Systems and Procedures, Inc., Appleton, Wis.

Filed Apr. 16, 1996, Ser. No. 632,907

Int. Cl.^{6} B65D *83/14*

U.S. Cl. 222—402.19 **12 Claims**



1. An aerosol canister for use in any orientation including horizontally, the canister having a container with a first and a second end defining a chamber therebetween, the chamber being adapted to be charged with a chemical irritant fluid and a pressurized gaseous dispersant and an improved nozzle associated with the first end of the container for releasing the chemical irritant fluid when activated, the improved nozzle comprising:

a. a nozzle body having a through aperture, the nozzle body adapted for mounting on said first end of the container;

b. a valve assembly mounted in the through aperture of the nozzle body and movable between a closed position for sealing the chamber and an open position for releasing the chemical irritant fluid from the container;

c. a tubular member coupled to the nozzle body and in fluid communication with the valve assembly for introducing chemical irritant fluid at the second end of the container into the through aperture of the nozzle body; and

d. the nozzle body further provided with a means for bypassing the tubular member to introduce the chemical irritant fluid adjacent said first end of the container directly into the through aperture of the nozzle body, the bypassing means including an annular recess about the nozzle body and an entry to the annular recess, the entry to the annular recess being located directly proximate to the first end of the container so as to allow the container to be substantially emptied of the chemical irritant fluid.

5,839,625

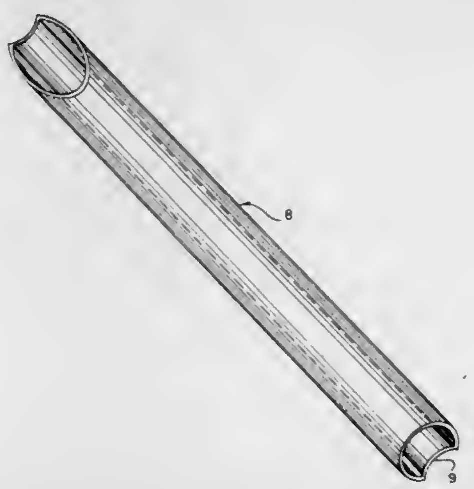
EXTRUDED FLUTED INSERT DISPENSING TUBE

Paul A. Braginetz, Staunton, Va., assignor to David L. Pullin, Staunton, Va., and James G. O'Boyle, Washington, D.C.

Filed Jul. 17, 1997, Ser. No. 896,169

Int. Cl.^{6} B67D *5/60;3/00;* **B65B** *1/04*

U.S. Cl. 222—464.1 **7 Claims**



1. In combination, a fluted dispensing tube and a container having a bottom wall and a neck portion, said fluted dispensing tube comprising a tube having a longitudinally extending recess formed on an exterior surface of a side wall of the tube, said recess extending to at least a first end portion of said tube to thereby form a fluted tube, said tube being inserted through said neck portion into said container, a second end portion of the tube being spaced in close proximity to the bottom wall of the container, at least one inwardly extending shoulder integral with a side wall of the container neck portion engaging the exterior surface of the fluted tube at the first end portion thereof, to thereby frictionally hold the fluted tube wholly contained in said container, said flute providing a vent and a pouring port for the container, whereby when pouring liquid out of the container, the liquid flows initially through the tube and flute, until the level of liquid goes below the second end portion of the tube when the liquid flows only through the flute, to thereby provide a continuous, rather than a turbulent, flow of liquid from the container.

5,839,626

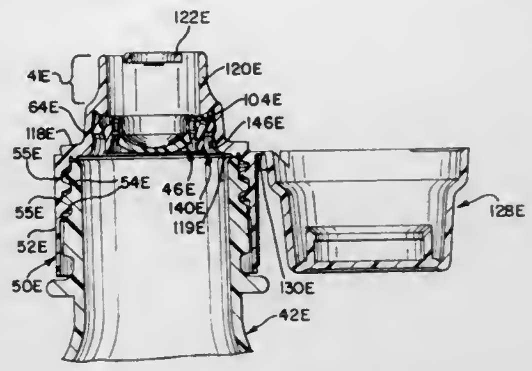
VALVE-CONTROLLED DISPENSING CLOSURE WITH DISPERSION BAFFLE

Richard A. Gross, Oconomowoc, and Bruce M. Mueller, Brookfield, both of Wis., assignors to AptarGroup, Inc., Crystal Lake, Ill.

Continuation-in-part of Ser. No. 627,468, Apr. 4, 1996, Pat. No. 5,676,289. This application Oct. 3, 1997, Ser. No. 943,558

Int. Cl.^{6} B65D *5/72*

U.S. Cl. 222—494 **5 Claims**



1. A closure for a container having an opening, said closure comprising:

a base for mounting to said container around said opening;

a dispensing valve disposed across said base and defining an orifice which opens to permit flow therethrough in response to increased pressure within said container and closes to shut off flow therethrough upon removal of the increased pressure; and

an upper member on said base spaced outwardly of said valve, said upper member defining at least one dispensing aperture.

5,839,627

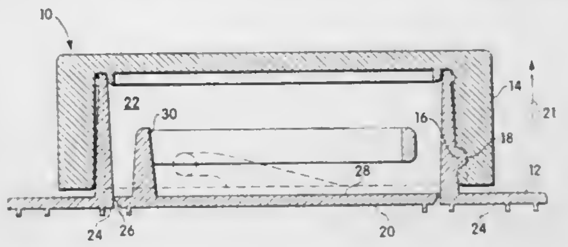
CONTAINER HAVING IMPROVED RECLOSABLE POUR SPOUT MOUNTED THEREON AND PROCESS THEREFOR

William D. Hicks, 5 Parkview Ave., Queensbury, N.Y. 12804, and William J. Shea, Jr., 23 Pineknoll Rd., Lenox, Mass. 01240

Continuation of Ser. No. 355,124, Nov. 7, 1994, abandoned. This application Feb. 3, 1997, Ser. No. 807,102

Int. Cl.^{6} B65D *47/10*

U.S. Cl. 222—541.9 **30 Claims**



10. A container for holding and dispensing pourable material having a container body having an exterior surface, an interior surface, the distance between the exterior surface and the interior surface defining the thickness of the container body, the container also having an interior for receiving pourable material;

a reclosable pour spout secured to the exterior surface of the container, the reclosable pour spout comprising:

a base member having oppositely positioned firs and second sides, and a aperture extending therethrough, the second side of the base member being the side which may be secured to the surface of the container;

an extension connected to and extending axially away from the first side of the base member, the extension having an aperture formed and extending therethrough which intersects with and corresponds to the aperture in the base member;

a membrane seal positioned in the vicinity of the intersection of the extension and the second side of the base member, the membrane seal having a periphery which is smaller than the aperture in the base member, the membrane seal being attached to the base member around its periphery by a frangible connection so that the membrane seal may be detached from the reclosable pour seal, the membrane seal being of a thickness less than the extent of the extension and having first and second opposed surfaces, the first surface being on the side of first side of the base member, the second side being approximately in the plane of the second side of the base member; and,

the second surface of the base member and the second side of the membrane seal each being attached to the exterior surface of the container, whereby when the frangible connection is broken, the membrane seal may be removed from the pour spout through the aperture formed in the extension.

5,839,628

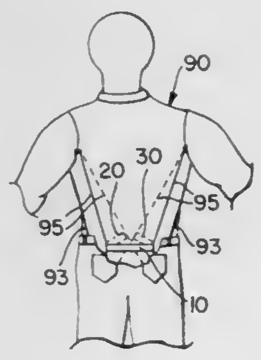
FOLDING ATTACHMENT FOR SHIRT BACKS

Jeffrey E. Freese, 3401 Townsend Blvd. #1206, Jacksonville, Fla. 32277

Filed Apr. 1, 1997, Ser. No. 829,843

Int. Cl.^{6} A41I *33/00;43/00*

U.S. Cl. 223—37 **16 Claims**



1. A folding attachment device for shirt backs, the device comprising a first wing member having a free end and a joined end, a second wing member having a free end and joined end, and a central member having a first end and a second end, said first wing member, said second wing member and said central member being composed of a thin, stiff material, said joined end of said first wing member being hingedly connected to said first end of said central member and said joined end of said second wing member being hingedly connected to said second end of said central member by hinge members, and attachment means to attach said device to the lower back portion of a shirt, where said central member, said first wing member and said second wing member each have a longitudinal axis and said hinge members are non-perpendicular to said longitudinal axis of said central member, such that said first wing member longitudinal axis and said second wing member longitudinal axis are nonparallel to said central member longitudinal axis when said hinge members are folded.

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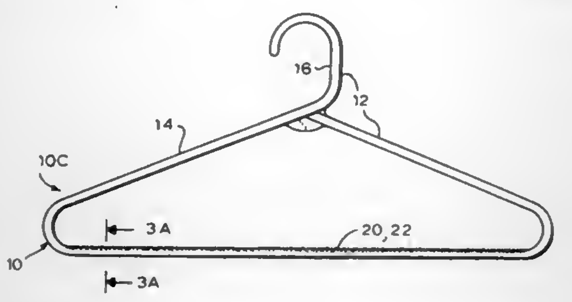
5,839,629
COLOR-CODED HANGER ASSEMBLY AND APPARATUS FOR MAKING SAME

Andrew Zuckerman, Forest Hills, N.Y., assignor to Carlisle Plastics, Inc., North Bergen, N.J.

Filed Jun. 9, 1997, Ser. No. 871,282

Int. Cl.^{6} A47G *25/14*

U.S. Cl. 223—85 **3 Claims**



1. A color-coded hanger assembly comprising:
(A) a hanger including an injection molded hanger body formed of plastic of a first color and a hook for suspending said hanger body; and
(B) a spray coating of a second color contrasting with said first color, said spray coating being disposed in at least one or more selected areas of said hanger body adapted to receive and support clothing and enhancing the friction between said selected areas and clothing placed thereon;
said second color being mottled or speckled, thereby to provide a spotted or blotched appearance;
said second color indicating the areas of said hanger body on which clothing is to be placed by the user for enhanced frictional engagement.

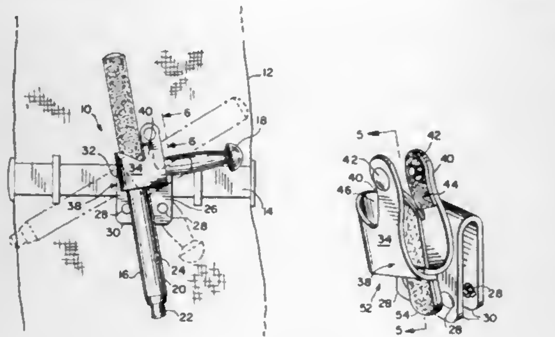
5,839,630
BATON HOLDER

Jacqueline M. Dunstan, and Gary M. Grundy, both of 604 Aspen St., South Milwaukee, Wis. 53172

Filed Oct. 20, 1997, Ser. No. 954,502

Int. Cl.^{6} A45F *5/00*

U.S. Cl. 224—197 **7 Claims**



1. A side-handled baton holder comprising:
a belt loop to loop around a service belt having first and second downwardly extending free ends secured together by a fastening means; and
a holster rotatingly coupled to the belt loop to support a side-handled baton, the holster including,
a handle cradle to support a side handle of the side-handled baton,
a first tab coupled to and extending upwardly from an outer surface of the handle cradle,
a second tab coupled to and extending upwardly from an inner surface of the handle cradle,
a securing means coupled to the first and second tabs at an upper end thereof to provide when the securing means is in a secured position, a closed loop surrounding the handle together with the handle cradle and the first and second tabs,
a shaft cradle to support the shaft of a side-handled baton in the form of a loop coupled to and extending from an outer edge of the handle cradle to an inner edge of the handle cradle and having an opening at a lower edge thereof to allow a lower portion of the baton to pass through; and
a swivel coupled to an inner surface of the baton holster and an outer surface of the belt loop to couple the baton holster and belt loop while providing relative rotational movement of the two.

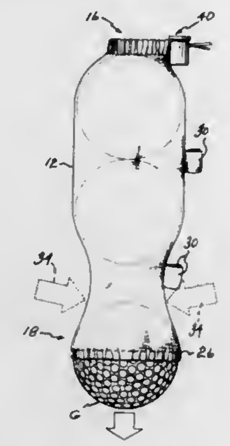
5,839,631
CLOTH GOLF BALL HOLDER

Luc Hebert, 5345 Rang des Etangs, and Monique Hebert, 2856 Principal, both of St. Jean Baptiste, Quebec, Canada, JOL 2B0

Filed May 14, 1997, Ser. No. 856,221

Int. Cl.^{6} A45F *5/00*

U.S. Cl. 224—251 **4 Claims**



1. A holder for at least one golf ball, said holder comprising a cylindrical sleeve having an open first end and an open second end;
said sleeve being formed of a flexible fabric sheet material having first and second side marginal edges, said first and second side marginal edges of said flexible fabric sheet material being secured together along an axial length of said sleeve;
said open first end of said sleeve having a channel formed adjacent thereto, a drawstring within said channel to substantially close said open first end,
said open second end of said sleeve having a second channel formed adjacent thereto,
an elastic material within said second channel, said elastic material narrowing said open second end to a diameter less than the diameter of said at least one golf ball, said elastic material permitting said open second end to expand to permit the removal of said at least one golf ball therethrough and to reduce said open second end to a diameter less than the diameter of said at least one golf ball after said at least one golf ball has been removed therethrough, and
tee retaining means comprising at least one loop of elastic material retained between said first and second side marginal edges of said sheet material.

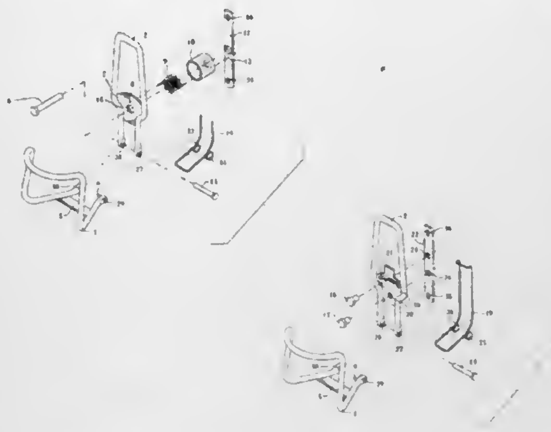
5,839,632
ROTATABLE WATER BOTTLE HOLDER

Yohai Koday, 7317 Brentwood Rd., Philadelphia, Pa. 19151

Filed Aug. 26, 1997, Ser. No. 917,534

Int. Cl.^{6} B62J *11/00*

U.S. Cl. 224—414 **6 Claims**



1. A water bottle holder for attachment to a frame member of a bicycle, said holder comprising:
(a) a cage element for receiving and retaining a water bottle;
(b) cage element support means secured to the cage element for mountable attachment to the frame member, said cage element support means comprising an elongated slot;
(c) means to moveably mount the cage element support means in a horizontal plane over and parallel to the frame member, said means to moveably mount the cage element support means comprises pin means extending through the slot, whereby the cage element support means and the cage element are rotatably moveable from side to side about means within the horizontal plane over the frame member.

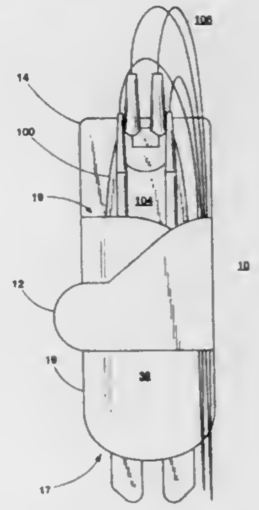
5,839,633
MULTIMETER BELT HOLSTER

Steven William Fisher, Edmonds, Wash., assignor to Fluke Corporation, Everett, Wash.

Filed Jul. 29, 1997, Ser. No. 902,511

Int. Cl.^{6} A45F *3/00*

U.S. Cl. 224—675 **5 Claims**



1. A multimeter holster, comprising:
(a) a rear member having an upper portion and a lower portion wherein said upper portion is folded back on said lower portion to form a channel for receiving a belt;
(b) a front member attached to said lower portion to form a pocket, said pocket comprising a top opening to receive said multimeter; and
(c) a horizontal member fixedly attached at one end to said lower portion and having a free end that wraps laterally around said pocket and releasably attaches to said front member wherein said horizontal member captures test leads from said multimeter in a closed position.

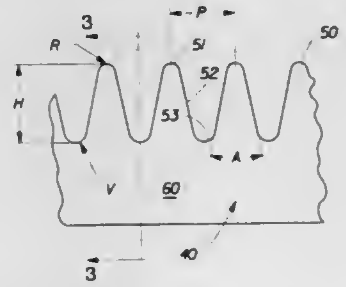
5,839,634
BLADE FOR SEVERING SHEET MATERIALS

Ricky Alan Pollard, Moscow; Randy Allen Eyre, Sardinia, and Charles John Berg, Jr., Wyoming, all of Ohio, assignors to The Procter & Gamble Co., Cincinnati, Ohio

Filed Jan. 27, 1997, Ser. No. 789,360

Int. Cl.^{6} B26F *3/02*

U.S. Cl. 225—39 **20 Claims**



20. A carton for containing and dispensing a sheet material, said carton comprising:
(a) a substantially enclosed carton having two side walls, two end walls, a bottom wall, and a lid;
(b) a web of sheet material contained within said carton; and
(c) a blade for severing sheet materials, said blade comprising a blade body and a plurality of radiused, non-sharpened teeth extending outwardly from said blade body, said teeth each having at least one tooth parameter selected from the group consisting of a tooth radius less than about 0.005 inches, a tooth pitch of less than about 0.050 inches, and a tooth thickness of less than about 0.006 inches, and combinations thereof, said blade being affixed to said carton such that said sheet material may be contacted with said blade when a portion of said sheet material is drawn out of said carton to sever said portion from a remaining portion of said sheet material within said carton.

5,839,635
CURVED-ANGLE CLEAVING OF OPTICAL FIBERS

Charles M. Mansfield; Gordon Wiegand; Martin G. Afflerbaugh, and Suzanne T. Zochowski, all of Austin, Tex., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 213,974, Mar. 15, 1994, abandoned. This application Oct. 23, 1996, Ser. No. 734,794

Int. Cl.^{6} C03B *37/16*

U.S. Cl. 225—96.5 **3 Claims**

1. An apparatus for cleaving optical fiber, comprising:
first and second pairs of optical fiber clamps separated by a first predetermined distance;
a flaw producing device adapted to introduce a flaw in an optical fiber clamped in said clamps; and
a force applying device adapted to apply a substantially concentrated cleaving force to said optical fiber at a second predetermined distance from said first pair of clamps, said flaw producing device being located between said force applying device and said second pair of optical fiber clamps at a third predetermined distance from said force applying device;

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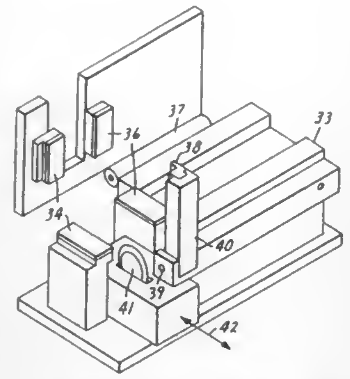


wherein said first predetermined distance is greater than said second predetermined distance which is greater than said third predetermined distance, said first, second and third predetermined distances having been selected to produce a curved-angle cleave in said optical fiber;

wherein said force applying device comprises a formed hammer; and

wherein said formed hammer comprises a dual hammer piece, having a first hammer structure formed to apply a substantially concentrated force to said optical fiber displaced from said flaw to effect curved-angle cleaving of said optical fiber, and a second hammer structure formed to apply a distributed force to said optical fiber centered about said flaw to effect square cleaving of said optical fiber.

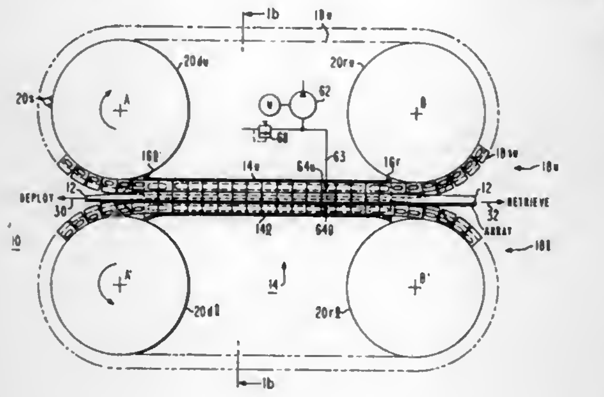
5,839,636
SUCTION-OPERATED LINEAR TRACTION DRIVE FOR UNDERWATER HANDLING OF TOWED ARRAYS

Lewis Werner Fleischmann, Randallstown, Md., assignor to Lockheed Martin Corporation, Binghamton, N.Y.

Filed Feb. 22, 1996, Ser. No. 605,415

Int. Cl.^{6} B65H *23/18;20/00*

U.S. Cl. 226—4 **15 Claims**



1. A handler for a hose-like device, said handler comprising:

an elongated channel defining an interior cross-section, first and second ends, and a suction port;

a pump coupled to said suction port for creating a negative pressure in said interior of said channel;

a train of suction heads extending at least through said channel, each of said heads including a face portion which is shaped to conform to the exterior of said hose-like device, each of said heads also including a channel which allows said negative pressure to be communicated to said face, whereby, when said hose-like device lies within said handler, said hose-like device is drawn into intimate contact with said face of each of said suction heads to which said negative pressure is applied, each of said suction heads being hingedly coupled to adjacent suction heads of said train for articulation relative thereto;

drive means coupled to said train of suction heads for moving said train of suction heads longitudinally through said channel, drawing said hose-like device lying within said handler therewith.

5,839,637
ELECTRONIC COMPONENTS FEEDER

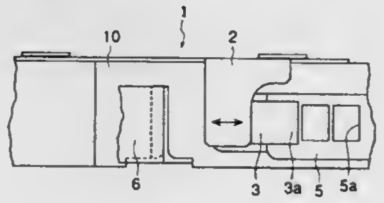
Takeshi Kanai, Gunma-ken, Japan, assignor to Sanyo Electric Co., Ltd., Osaka-Fu, Japan

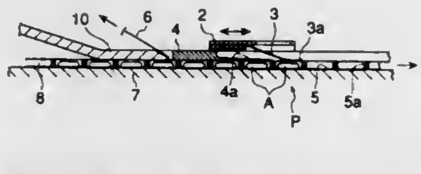
Filed Jun. 25, 1997, Ser. No. 882,167

Claims priority, application Japan, Jun. 28, 1996, 8-188512

Int. Cl.^{6} B65H *20/00;57/06;* **B65G** *65/04*

U.S. Cl. 226—128 **11 Claims**





1. In an electronic components feeder including a carrier tape for carrying electronic components thereon forward to a sucking position, said carrier tape being formed therein with a plurality of recesses for accommodating said electronic components, respectively, and advanced intermittently with said electronic components contained in said recesses, a suppressor arranged at a location backward of said sucking position for preventing said electronic components from jumping out of said recesses, and a shutter arranged for sliding contact with said carrier tape such that said shutter is capable of being moved forward and backward along length of said carrier tape to open and close each of said recesses in said sucking position,

the improvement wherein said shutter has a forward end portion larger in width than a width of said each of said recesses and is formed by a plate spring extending obliquely toward said carrier tape for suppressing said carrier tape, and

wherein said suppressor has a shutter-receiving portion extending toward said sucking position for receiving said shutter when said shutter is moved backward to open said each of said recesses in said sucking position.

5,839,638
PNEUMATIC TRIM NAILER

John C. Ronn, Mount Prospect, Ill., assignor to Illinois Tool Works Inc, Glenview, Ill.

Filed Jun. 26, 1997, Ser. No. 883,087

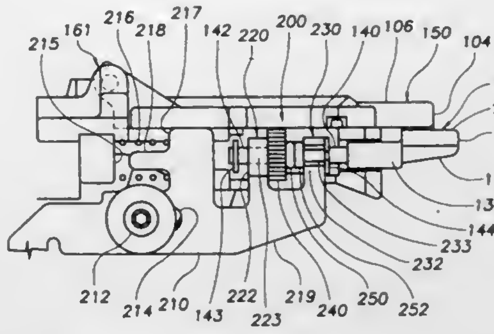
Int. Cl.^{6} B25C *1/04*

U.S. Cl. 227—8 **20 Claims**

1. A fastener driving tool having an actuatable tool controlling mechanism, the fastener driving tool comprising:

a nose-piece with a channel for guiding a fastener driven therefrom into a workpiece, the nose-piece having an end, a top side, an underside, and opposing sides;

a work contacting element having a top side with a recess, a bottom side, substantially opposing sides, and a tip, portions of the underside and portions of the opposing sides of the nose-piece disposed in the recess of the work contacting element to slidably retain the work contacting element to the nose-piece, the tip of the work contacting element biased to protrude forwardly beyond the end of the nose-piece;



the work contacting element coupled to the tool controlling mechanism, the work contacting element slidable back and forth along the underside of the nose-piece, parallel to the channel of the nose-piece, to actuate and de-actuate the tool controlling mechanism,

whereby the location of the work contacting element along the underside of nose-piece provides for improved visibility of the nose-piece.

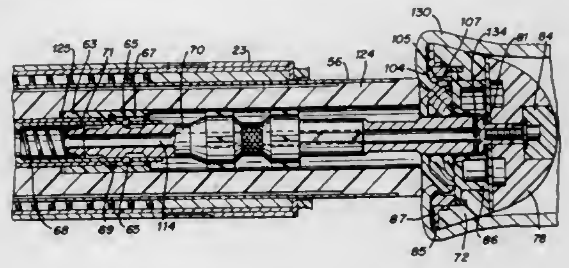
5,839,639
COLLAPSIBLE ANVIL ASSEMBLY AND APPLICATOR INSTRUMENT

Jude S. Sauer; Alex Kobilansky, both of Pittsford; Theodore J. Tiberio, Hilton, and Jeffrey M. Shaw, Livonia, all of N.Y., assignors to LaserSurge, Inc., Rochester, N.Y.

Filed Aug. 17, 1995, Ser. No. 516,474

Int. Cl.^{6} A61B *17/068*

U.S. Cl. 227—175.1 **17 Claims**



10. An installation system for laparoscopic insertion of an anvil assembly within a patient comprising:

an anvil assembly having a shaft member with mounting means at a proximal end thereof and an anvil member at a distal end thereof;

a snap cap axially slidable along said shaft member for securing a tissue section against a proximal end of said anvil member; and,

an installation tool member having a proximal end and a distal end, said installation tool member including means at said distal end for engaging said mounting means of said anvil assembly, said installation tool further having a first actuation member for advancing said snap cap against said proximal end of said anvil member.

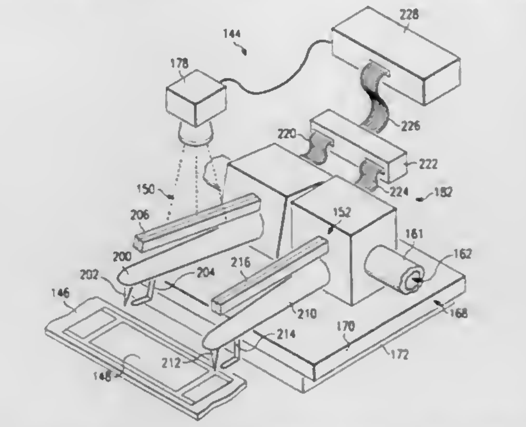
5,839,640
MULTIPLE-TOOL WIRE BONDER

Clark D. Kinnaird, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 23, 1996, Ser. No. 735,617

Int. Cl.^{6} H01L *21/60*

U.S. Cl. 228—4.5 **18 Claims**



1. A method of manufacturing an apparatus for automatically forming ball bonds to interconnect fine wires between bond pads on a semiconductor chip and a lead frame, the method comprising the steps of:

providing a computer for controlling the interconnecting;

coupling a vision system to the computer for electronically sensing the location of the semiconductor chip;

forming a tool head having a first tool for applying bonds in a first direction and a second tool for applying bonds in a second direction;

attaching the tool head to a positioning system.

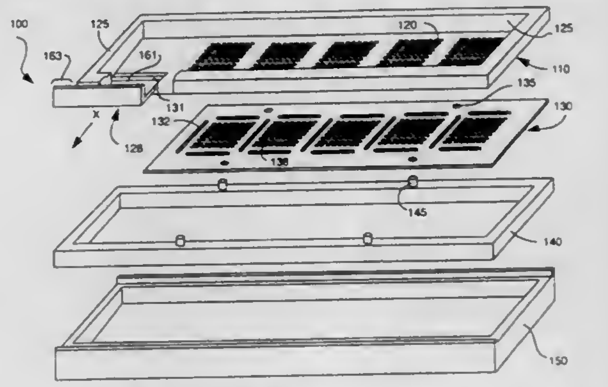
5,839,641
APPARATUS FOR PLACING AND ALIGNING SOLDER BALLS ONTO SOLDER PADS ON A SUBSTRATE FOR MANUFACTURING IC DEVICES

Kun-Tang Teng, Hsinchu, Taiwan, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan

Continuation-in-part of Ser. No. 521,313, Aug. 30, 1995, abandoned. This application Mar. 13, 1997, Ser. No. 816,504

Int. Cl.^{6} B23K *3/06;* **H01L** *21/60*

U.S. Cl. 228—41 **11 Claims**



1. A solder ball placement and alignment apparatus for placing and aligning a plurality of solder balls onto a plurality of solder pads on a multi-chip substrate, comprising:

a placement tray having a plurality of alignment cavities disposed on an underside thereof, having a plurality of placement through holes, each corresponding to one of said plurality of solder pads and each being larger than the diameter of said solder balls, and having a solder ball gate, said solder ball gate covering an opening in said placement tray in a second position and uncovering said opening in a first position;

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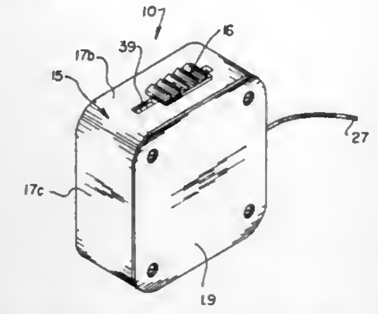
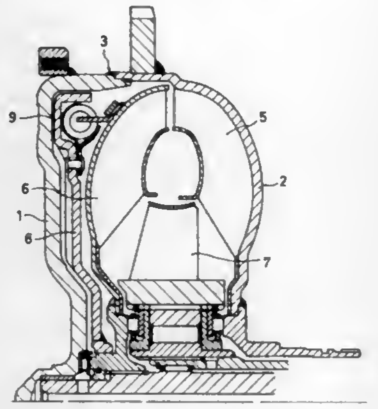
means associated with said placement tray for controlling movement of said solder ball gate; and
a base seat for positioning beneath the multi-chip substrate with the substrate positioned between said base seat and said placement tray, said base seat having a plurality of alignment pins corresponding to said alignment cavities.

5,839,642
HAND-HELD SOLDER WIRE DISPENSER
Chris Tait, 581 Roanoke Rd, Kelowna BC, Canada, V1Y 7K6
Filed Apr. 3, 1997, Ser. No. 832,445
Int. Cl.^{6} B23K *3/06*
U.S. Cl. 228—41 **12 Claims**



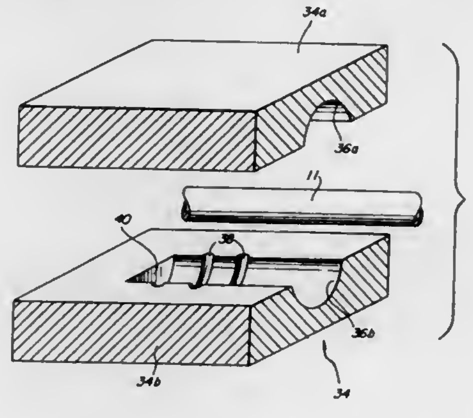
1. A hand-held solder wire dispenser comprising:
a housing having a plurality of side walls and top and bottom end walls, said walls defining a housing cavity;
a spool of solder wire rotationally mounted in the housing cavity, said solder wire having a free end extending through a dispensing aperture in one of said side walls; and
actuation means mounted on another of said side walls for unrolling solder wire from the spool and causing movement of the solder wire through said dispensing aperture, said actuation means mounted for sliding movement longitudinally on said another side wall.

5,839,643
METHOD OF WELD-RECOUPLING FRONT COVER AND PUMP SHELL OF TORQUE CONVERTER
Koji Inoue, and Takashi Ogai, both of Hamamatsu, Japan, assignors to Kabushiki Kaisha Yutaka Giken, Hamamatsu, Japan
Filed May 8, 1997, Ser. No. 853,388
Claims priority, application Japan, Jun. 17, 1996, 8-155527
Int. Cl.^{6} B23K *31/02*
U.S. Cl. 228—119 **3 Claims**



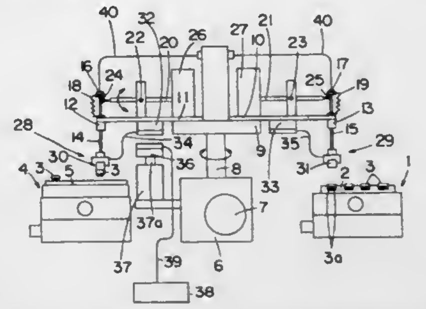
1. A method of weld-recoupling a front cover and a pump shell of a torque converter, said torque converter having a weld-coupling portion which is formed by fitting an inner peripheral surface of an end portion of one of the front cover and the pump shell to a lower-step surface of a stepped portion formed on an outer peripheral surface of an end portion of the other thereof and then welding them together while abutting an end surface of said end portion of said one thereof with a stepped surface of said stepped portion of the other thereof, said method comprising the steps of:
cutting said weld-coupling portion down to a level of said lower-step surface of the other thereof in such a predetermined cutting width as to evenly cut a front cover side and a pump shell side of said weld-coupling portion in order to separate the front cover and the pump shell apart;
fitting a new replacement of said one thereof to said lower-step surface of said stepped portion of said end portion of the other thereof that has been cut, said new replacement having an end portion whose length is larger by said predetermined cutting width than that of said end portion of said one thereof that has been cut; and
thereafter coupling the front cover and the pump shell together by welding them again while abutting an end surface of said end portion of said new replacement with a stepped surface of said end portion of the other thereof that has been cut.

5,839,644
METHOD OF COUPLING AND FORMING COPPER FITTINGS WITH SOLDER THEREIN
John W. L. Windle, c/o C & G, 16650 Harbor Blvd., A-1, Fountain Valley, Calif. 92708
Division of Ser. No. 224,807, Apr. 8, 1994, abandoned. This application Sep. 5, 1995, Ser. No. 523,285
Int. Cl.^{6} B23K *1/20;31/02;* **B21B** *17/02*
U.S. Cl. 228—168 **9 Claims**



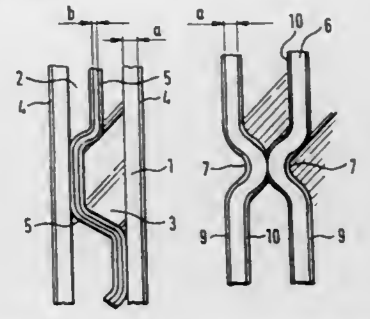
4. A method of fabricating a copper fitting comprising the steps of:
providing a substantially flat, elongated die having an elongated cylindrical hollow, said hollow having at least one annular depression disposed about a periphery thereof;
placing a predetermined size portion of copper tubing having an external surface and an internal diameter in said hollow;
providing a first mandrel sized to form a snug fit with the internal diameter of said tubing, said first mandrel further provided with an annular ring forming means complementary to said annular depression and located in an end of said first mandrel;
inserting said first mandrel into said tubing such that said annular ring forming means is in substantial alignment with said at least one annular depression in said hollow with a portion of said copper tubing held therebetween;
actuating said annular ring forming means into contact with said internal diameter of said copper tubing;
rotating said first mandrel within said internal diameter of said copper tubing, with said annular ring forming means pressed into said internal diameter of said copper tubing, to form at least one annular cavity in the internal diameter of said copper tubing; and
withdrawing said first mandrel from said tubing.

5,839,645
BONDING MACHINE OF ELECTRONIC COMPONENTS AND BONDING METHOD THEREOF
Yasuto Onitsuka, Fukuoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Sep. 26, 1996, Ser. No. 718,974
Claims priority, application Japan, Sep. 29, 1995, 7-253192
Int. Cl.^{6} B23K *31/02*
U.S. Cl. 228—180.22 **7 Claims**



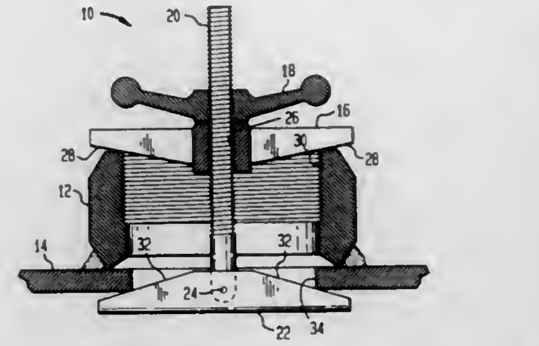
1. A method for bonding electronic components to a substrate comprising the steps of:
a) positioning a tool to a loading position above an electronic component wherein a first terminal which supplies electric current to said tool is positioned concurrently;
b) holding said component by said tool;
c) concurrently moving a) said tool from said loading position toward a substrate and b) said first terminal at an installation position occupied by a second terminal;
d) supplying electric current to said first terminal when said first terminal comes in contact with said second terminal so as to supply electric current to said tool;
e) bonding said component on said substrate by means of said tool energized with electricity;
f) releasing said electronic component from said head, and
g) moving said head away from said substrate.

5,839,646
PROCESS FOR MANUFACTURING HARD-SOLDERED ALUMINUM HEAT EXCHANGERS
Bernd Duda, Muehlacker; Klaus Lorenz, Stuttgart, and Cord Voelker, Backnang, all of Germany, assignors to Behr GmbH & Co., Stuttgart, Germany
Filed Dec. 23, 1996, Ser. No. 771,921
Claims priority, application Germany, Dec. 22, 1995, 195 48 244.1
Int. Cl.^{6} B23K *1/19;31/02;101/14*
U.S. Cl. 228—183 **12 Claims**



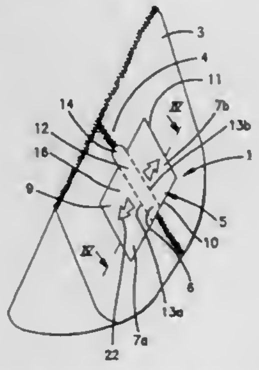
1. A process for manufacturing hard-soldered aluminum heat exchangers comprising depositing a solder-containing layer and a non-corroding fluxing agent on exterior surfaces of flat tubes and, after a drying via heating in an inert atmosphere, causing a connection of beads pressed-in laterally by approximately half an interior width on said flat tubes, resulting in a continuous supporting wall, the process further comprising the steps of:
using welded flat tubes made of an Al-alloy as said flat tubes; and
providing on said exterior surfaces of said flat tubes a first coating of an AlSi alloy and, on said interior surfaces, a second coating of an AlSi alloy with an addition of from 0.2 to 1.5% Mg.

5,839,647
WELDING CLAMP FOR PIPE FITTINGS
Donald A. Orne, Butte, Mont., assignor to MSE Technology Applications, Inc., Butte, Mont.
Filed Jul. 22, 1997, Ser. No. 898,224
Int. Cl.^{6} B23K *37/04*
U.S. Cl. 228—212 **6 Claims**



1. A clamp assembly for clamping a fitting onto a pipe to facilitate welding therebetween, which assembly comprises:
a threaded bolt member;
a threaded nut member adapted to be engaged with the threaded bolt member;
a positioning member adapted to be slidably engaged with the bolt member along a central axis of the positioning member;
the positioning member having tapered arms extending from the central axis thereof; and
a tapered toggle member adapted to be pivotally engaged with an end of the bolt member.

5,839,648
DEVICE FOR EASY OPENING OF FLEXIBLE FILM PACKAGING HAVING A LINE OF WEAKNESS IN TEARING; A PACKET CONSTITUTED BY A CONTENTS AND PACKAGING PROVIDED WITH SUCH A DEVICE; AN EASY OPENING PATCH FOR SUCH A DEVICE; A METHOD OF MAKING SUCH A PACKET
Jean-Luc Brigand, Gan, and Jean-Luc Sornay, Bailly, both of France, assignors to Bongrain S.A., Guyancourt, and Grace S.A., Epernon, both of France
Filed Jun. 14, 1996, Ser. No. 663,718
Claims priority, application France, Jun. 14, 1995, 95 07086
Int. Cl.^{6} B65D *33/00*
U.S. Cl. 229—87.05 **17 Claims**



1. In combination, an easy opening device and flexible film, serving as packaging, having a line of weakness in tearing, the

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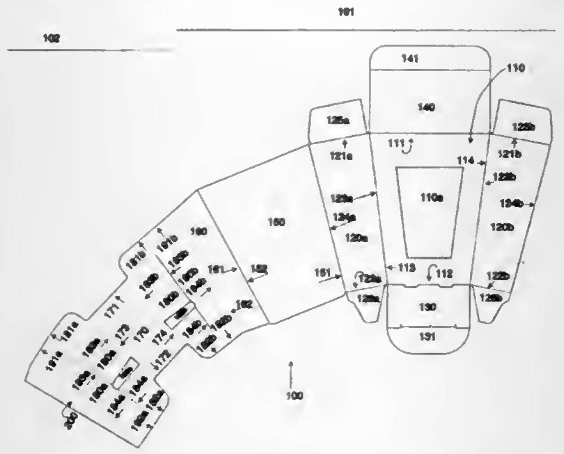
device comprising a patch that is flexible and substantially inextensible, in the form of a label, which patch is applied to an outside face of the film astride the line of weakness, and includes, over said line, separation means for separating the patch into two parts, which means are normally inactive when the packaging is closed and are made active by the user exerting sufficient pulling force; means for bonding the film to the patch on either side of the line of weakness and in register with the two parts; and means for enabling at least one of the two parts to be grasped manually so as to make it possible, once the separation means have been activated, to move the two parts apart from each other and open the packaging.

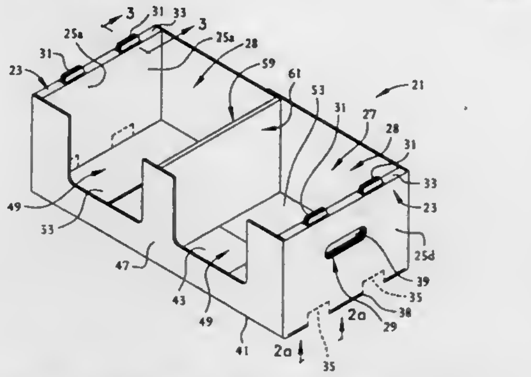
5,839,649
TRAPEZOIDAL CARTONS WITH AN INNER PARTITION
Mitchell Clark, Great Neck Long Island, N.Y., assignor to Union Camp Corporation, Wayne, N.J.
Filed Jun. 18, 1997, Ser. No. 878,303
Int. Cl.^{6} B65D *5/00*
U.S. Cl. 229—114 **7 Claims**



4. A one piece trapezoidal carton with an inner partition for packaging an article comprising:
- (A) a trapezoidal carton section having:
  - (a) trapezoidal front and back wall panels;
  - (b) first and second trapezoidal side wall panels connecting the front and back wall panels;
  - (c) a rectangular bottom panel closing the bottom of the carton;
  - (d) a rectangular top panel including a top closing flap for closing the top of the carton; and
  - (e) a trapezoidal glueable side panel, having a first and second side, attached to the inside of the first side wall panel, wherein the first side of the trapezoidal glueable side panel extends from the back wall panel; and
- (B) an inner partition section having:
  - (a) a trapezoidal center partition;
  - (b) a pair of trapezoidal cradling partitions, each extending from a side of the center partition;
  - (c) first and second trapezoidal supporting partitions, each extending from a side of one of the trapezoidal cradling partitions; and
  - (d) a trapezoidal glueable partition, attached to the inside of the second side wall panel, extending from a side of the second trapezoidal supporting partition;

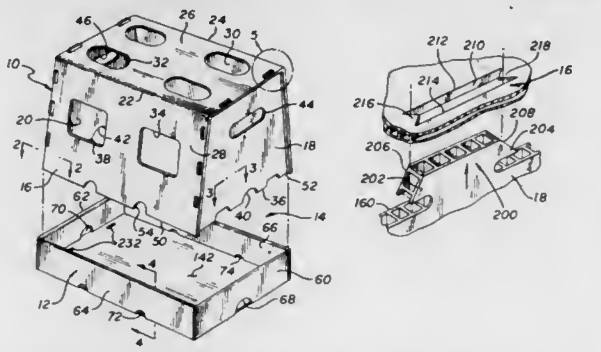
wherein a side of the first trapezoidal supporting partition in the inner partition section extends from the second side of the trapezoidal glueable side panel in the trapezoidal carton section to form the one piece carton.

5,839,650
STACKABLE CONTAINER
Phil B. Sheffer, Thomasville, Pa., assignor to Triangle Container Corporation, Philadelphia, Pa.
Filed Mar. 7, 1997, Ser. No. 814,731
Int. Cl.^{6} B65D *25/04*
U.S. Cl. 229—120.11 **17 Claims**



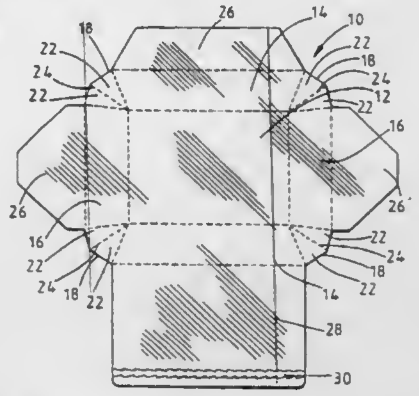
15. A container comprising a plurality of panels positioned to form a bottom, front, back and opposing sides, the sides having a first edge and a second edge extending substantially horizontally, at least one of the sides having a projection extending from the first edge and projection engaging means located on the second edge;
- a pair of folded integral partition flaps having a pair of opposite transverse edges, one of said flaps being folded along an axis on one of said transverse edges to form first and second tabs extending on opposite sides of the axis in substantially opposite directions, the first and second tabs extending generally outwardly from planes coincident with the partition flaps.

5,839,651
ASPARAGUS BOX
William G. Teags, Cave Creek, and Mark G. Wordekemper, Phoenix, both of Ariz., assignors to Advanced Package Engineering, Inc., Phoenix, Ariz.
Filed May 15, 1997, Ser. No. 856,884
Int. Cl.^{6} B65D *43/08*
U.S. Cl. 229—125.32 **11 Claims**



5. An asparagus box for receiving, storing and shipping freshly cut asparagus, said asparagus box comprising in combination:
- (a) a wrap formed of a sheet of corrugated plastic material;
- (b) a pair of opposed heads having opposed side edges, a top edge and a bottom edge formed of a sheet of corrugated plastic material for defining in combination with said wrap said asparagus box;
- (c) a plurality of tabs extending from each of said opposed side edges and said top edge of each head of said pair of heads, each of said tabs including opposed overhangs; and
- (d) a plurality of slots disposed along opposed edges of said wrap corresponding to each of said tabs, each said slot including a pair of opposed triangular shaped ends, each end of said opposed ends having an apex for restraining disengagement of said tab from said slot by interfering with said overhang upon withdrawal of said tab after penetrable insertion of said overhang of said tab through said slot.

5,839,652
BOX FOR FOOD PRODUCTS
Amit Ben-Haim, London, United Kingdom, assignor to Fold-Pak Europe Limited, Great Britain
PCT No. PCT/GB95/01695, § 371 Date Mar. 27, 1997, § 102(e) Date Mar. 27, 1997, PCT Pub. No. WO96/02426, PCT Pub. Date Feb. 1, 1996
PCT Filed Jul. 18, 1995, Ser. No. 765,999
Claims priority, application United Kingdom, Jul. 18, 1994, 9414445.8
Int. Cl.^{6} B65D *5/54*
U.S. Cl. 229—240 **6 Claims**



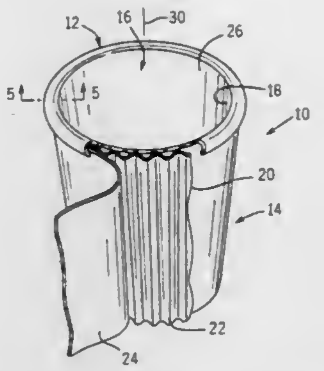
1. A box (**20**) for food products suitable for microwaving comprising:
- a base (**12**);
- side walls (**14**, **16**) extending upwards from the base and being continuous around corners of the box, the side walls including a first side wall and other side walls;
- a lid (**28**) extending from the first side wall, the lid having a periphery;
- flaps (**26**) extending from each of the other side walls;

wherein said box is erected and sealed and the flaps (**26**) are folded inwards firstly and the lid (**28**) is adhered to said flaps around the periphery, the lid (**28**) having a line of weakness whereby a major portion of the lid (**28**) can be opened, characterized in that the lid (**28**) is provided with a tear-off strip (**30**) which upon removal allows gases to escape from the box during heating whilst the lid remains secured to the flaps (**26**); and
- the box including an opening defined by the area between the side walls proximate the folded flaps, wherein each folded flap (**26**) extends substantially midway across the opening of the box to reduce leakages therefrom.

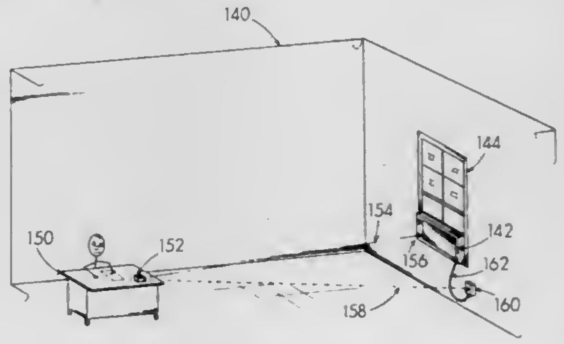
5,839,653
CONTAINER WITH CORRUGATED WALL
Robert B. Zadravetz, 5087 Horizon Ct., West Bend, Wis. 53095
Continuation of Ser. No. 682,826, Jul. 12, 1996, abandoned. This application May 23, 1997, Ser. No. 862,231
Int. Cl.^{6} B65D *3/06;3/22*
U.S. Cl. 229—403 **4 Claims**

1. A container comprising:
- a bottom wall; and
- an upstanding wall curved along a circumferential direction attached at a lower edge to the bottom wall, the upstanding includes an inner paper layer, an outer paper layer and a center corrugated paper layer sandwiched between the inner paper layer and the outer paper layer and having flutes across the circumferential direction, at least one of the inner paper layer and the outer paper layer having circumferential plasticity accommodating changes in inner and outer circumference of the upstanding wall when the upstanding wall is curved from a flat pre-assembled blank;

wherein the outer paper layer is creped paper.



5,839,654
PORTABLE AIR COMFORT SYSTEM THERMOSTAT ENABLING PERSONAL LOCALIZED CONTROL OF ROOM TEMPERATURE
Harold J. Weber, Holliston, Mass., assignor to Innova Patent Trust, Centerville, Mass.
Filed Feb. 5, 1996, Ser. No. 596,457
Int. Cl.^{6} G05D *23/00;* **F23N** *5/20*
U.S. Cl. 236—47 **20 Claims**



1. A supplementary temperature control method providing for a localized zone control of an ambient room temperature produced by an unitary air conditioning system equipped with an integral temperature control thermostat, comprising steps of:
- setting the integral temperature control thermostat to a first bound temperature as an operational limit;
- placing a physically unconstrained portable thermosensor in an occupant determinable local zone location within a usually remote portion of a room relative with the unitary air conditioning system and usually proximate with the occupant;
- first presetting a first temperature response threshold level for the portable thermosensor;
- sensing local zone ambient temperature in the occupant determined said local zone location;
- sending a first encoded wireless control signal when change in the sensed local zone temperature increases above the first temperature response threshold level;
- remotely receiving the encoded said wireless control signal;
- sourcing a.c. electric power through an electric receptacle device;

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fitting the unitary air conditioning system with an electric cord and electric plug device;
interjoining the electric plug device, an electric switching device and the electric receptacle device;
turning-ON the electric switching device in automatic response to the remotely received said wireless control signal to admit a flow of the a.c. electric power between the electric receptacle device and the electric plug device; and,
thereby modulating operation of the unitary air conditioning system to produce a a cooling of the ambient local zone temperature in response to the remotely received said encoded wireless control signal.

5,839,655

HOT-WATER HEATING SYSTEM

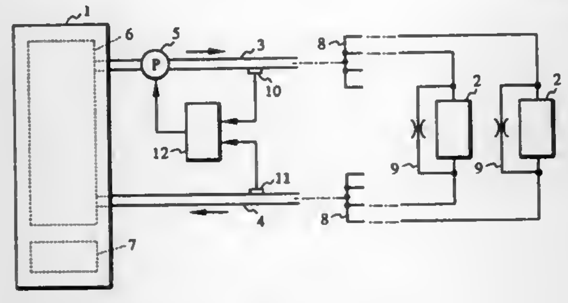
Koji Iritani, Kawagoe, Japan, assignor to Sunpot Co., Ltd., Saltama-ken, Japan

Filed Jul. 1, 1997, Ser. No. 886,232

Claims priority, application Japan, Jul. 1, 1996, 8-171370

Int. Cl.^{6} F24D *3/00*

U.S. Cl. 237—8 A **5 Claims**



1. A hot-water heating system comprising:
a heater for producing hot water;
a heat radiator;
a supply pipe for supplying them hot water from said heater to said heat radiator;
a return pipe for returning said heat radiator to said heater;
a circulation pump for circulating the hot water from said heater successively through said supply pipe, said heat radiator, and said return pipe;
a supply pipe temperature sensor for detecting the temperature of the hot water flowing through said supply pipe;
a return pipe temperature sensor for detecting the temperature of the hot water flowing through said return pipe; and
a control unit for controlling said circulation pump to reduce an output rate thereof as the difference between the temperatures of the hot water detected by said supply pipe temperature sensor and said return pipe temperature sensor is reduced.

5,839,656

DEVICE FOR HEATING AND CIRCULATING FLUID FOR VEHICLES

Susumu Yamano, Kusatsu; Norio Yoshida, Moriyama; Naomi Goto, Otsu, and Minoru Fukumoto, Nara, all of Japan, assignors to Matsushita Electric Industrial Co.,Ltd., Japan

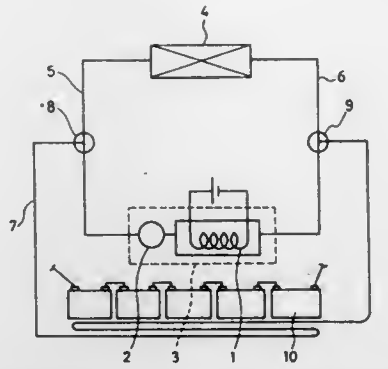
Filed May 30, 1997, Ser. No. 866,222

Claims priority, application Japan, Jun. 21, 1996, 8-161326

Int. Cl.^{6} B60H *1/02*

U.S. Cl. 237—12.3 B **3 Claims**

1. A heating device for heating and circulating a fluid to heat batteries and a passenger compartment for electric vehicles (EV) and hybrid electric vehicles (HEV), said heating device comprising:
heating means comprising an electric heater to provide a heat source being electrically generated and independent from a motor of said EV and HEV;



a car room-heating exchanger having an annular connection to said heating means by a fluid passage; and
a bypass passage communicating with said fluid passage and adjacent to said batteries so that said batteries are heated by the passage of heated fluid through said bypass passage.

5,839,657

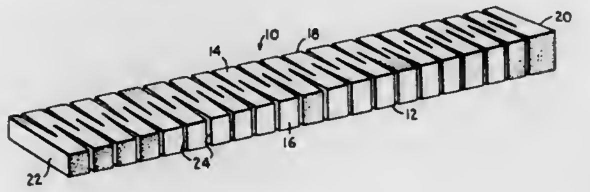
METHOD AND STRUCTURE FOR CREATING TERRAIN GRADE FOR ARTIFICIAL LANDSCAPES

C. Dwayne Fulton, Lake Rd 54-56, Woodland Cove, Lot 36, and David L. Osment, Lake Rd 54-56, Alona Point, Lot 5B, both of Osage Beach, Mo. 65065

Filed Jan. 9, 1997, Ser. No. 780,852

Int. Cl.^{6} A63H *18/04*

U.S. Cl. 238—10 E **17 Claims**



1. A method of creating an incline for a roadbed on an artificial landscape, said method comprising:
coupling to a generally planar base in a desired location a first flexible section of a given length, said section having a generally planar horizontally extending bottom abutting said base substantially along its entire length a generally planar top extending at a non-zero angle relative to said bottom where said bottom is coupled to said base and first and second side walls having a series of channels extending into said section that allow said section to be positioned in a radius.

5,839,658

METHOD OF RETROFITTING IRRIGATION CONTROL SYSTEMS

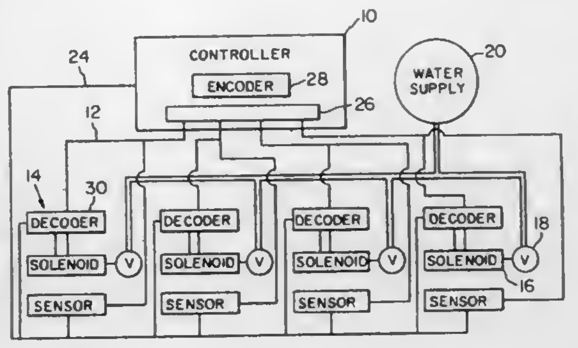
Larry C. Sarver, 108 Fairway Landings Dr., Canonsburg, Pa. 15317

Filed Sep. 27, 1996, Ser. No. 720,301

Int. Cl.^{6} B05B *17/00*

U.S. Cl. 239—1 **11 Claims**

1. A method of retrofitting an existing irrigation system comprising the steps of:
a) providing an existing irrigation system having a control circuit, a water supply, a plurality of valve assemblies in fluid communication with said water supply, said control circuit having a centralized controller, a plurality of independent valve control lines directly extending between said controller and each of said valve assemblies and a return control line extending from each of said valve assemblies directly to said controller;



b) installing a terminal strip within said controller connecting each of said valve control lines together, wherein each said valve control line receives the same signal from said controller;
c) installing a control signal encoder within said controller; and
d) installing a control signal decoder in series with each of said valve assemblies.

5,839,659

CAPILLARY ROOT ZONE IRRIGATION SYSTEM

Eric Stewart Atholl Murray, New South Wales, Australia, assignor to Grain Security Foundation Ltd, New South Wales, Australia

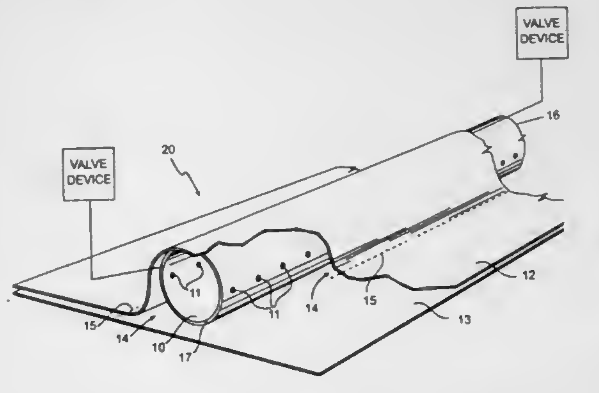
PCT No. PCT/AU95/00496, § 371 Date Oct. 23, 1996, § 102(e) Date Oct. 23, 1996, PCT Pub. No. WO96/04780, PCT Pub. Date Feb. 22, 1996

PCT Filed Aug. 14, 1995, Ser. No. 727,567

Claims priority, application Australia, Aug. 12, 1994, PM7439

Int. Cl.^{6} B05B *15/00;* **A01G** *25/06;27/00*

U.S. Cl. 239—1 **28 Claims**



1. An underground capillary system for providing fluids to the root zone of plants growing in soil, the system comprising:
a conduit with a plurality of perforations, said conduit sandwiched between an upper layer of a capillary cloth and a lower layer of at least one of a capillary cloth and a fluid-impermeable material;
means for joining the upper layer and the lower layer so as to form a linearly-extending pocket, the pocket retaining said conduit, the upper layer and the lower layer together forming a combined layer which extends away from the linearly-extending pocket so as to provide a region consisting of said combined layer capable of moving fluids away from or towards the conduit; and
a connection means for one end of the conduit so as to allow for a supply of fluids including at least one of water, solutions and gases to the conduit.

5,839,660

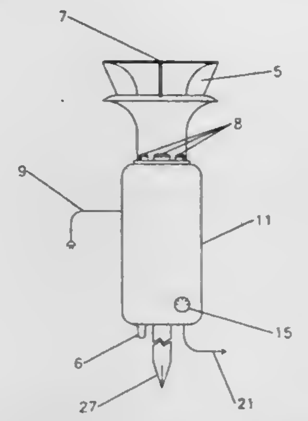
AUXILIARY SPRINKLER SYSTEM CONTROLLER TO MAINTAIN HEALTHY TURF WITH MINIMUM WATER USAGE

Paul Morgenstern, and John F. McJunkin, both of 3703 Alexander Dr., Austin, Tex. 78749

Filed Jun. 11, 1997, Ser. No. 872,964

Int. Cl.^{6} A01G *25/00;27/00*

U.S. Cl. 239—63 **6 Claims**



6. An auxiliary sprinkler control system comprising:
a) a body means
b) a central processor unit and associated electronic circuitry in said body;
c) an external water measuring means communicating with said central processor;
d) evapotranspiration rate data for turf for each month of a year for specific zip code areas loaded in said central processor;
e) a program means in said central processor to interrupt a sprinkler for one day when a daily running total of water added with a maximum of one fourth of an inch per day taken into account exceeds a daily running total of said evapotranspiration rate data with daily rainfall taken into account as a maximum of one fourth of an inch per day; and
f) a user adjustable means in said body to allow a user to adjust said expected evapotranspiration rate to allow said auxiliary system to allow addition of sufficient of said water to produce a lush turf growth.

5,839,661

SOLENOID VALVE AND FUEL INJECTOR FOR INTERNAL COMBUSTION ENGINE USING THE SAME

Takashi Iwanaga, Toyohashi, Japan, assignor to Denso Corporation, Japan

Filed Dec. 5, 1996, Ser. No. 759,632

Claims priority, application Japan, Dec. 5, 1995, 7-316370

Int. Cl.^{6} F02M *47/02*

U.S. Cl. 239—88 **4 Claims**

1. A fuel injector comprising:
a fuel injector comprising:
(1) a solenoid-operated valve including
(a) a valve body,
(b) a valve seat formed within said valve body through which a fluid passage communicating between a high-pressure fuel inlet and a low-pressure fuel outlet extends,
(c) a valve member disposed within said valve body movable in a given direction, said valve member having a valve head which selectively engages and disengages said valve seat according to movement of said valve member in the given direction to establish and block fluid communication between the high-pressure fuel inlet and the low-pressure fuel outlet, said valve member having formed therein a chamber,
(d) a sliding member disposed within the chamber of said valve member slidably in the given direction to define a pressure balancing chamber,

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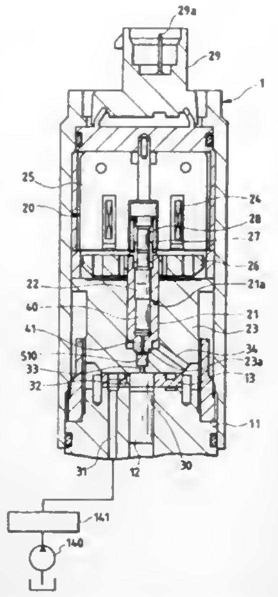


(e) urging means for urging said valve member into constant engagement of the valve head with said valve seat,
(f) a solenoid-operated mechanism urging said valve member out of engagement of the valve head with said valve seat against an urging force produced by said urging means to establish the fluid communication between the high-pressure fuel inlet and the low-pressure fuel outlet.
(g) a flow restricting passage formed within the valve head, said flow restricting passage constantly communicating between the pressure balancing chamber and the high-pressure fluid inlet and also communicating between the pressure balancing chamber and the low-pressure fluid outlet when the valve head of said valve member is brought into disengagement from said valve seat,
(h) a first pressure-energized surface formed on the valve head of said valve member on which fluid pressure produced by fluid flowing from the high-pressure fuel inlet acts to produce a first force urging the valve head of said valve member into disengagement from said valve seat, and
(i) a second pressure-energized surface formed in said valve member on which fuel pressure within the pressure balancing chamber acts to produce a second force urging the valve head of said valve member into engagement with said valve seat, the second force being substantially equal to the first force;

(2) an injector body having a spray nozzle for spraying the fuel supplied from the high-pressure fuel inlet;
(3) a fuel supply passage formed in said injector body which communicates between the high-pressure fuel inlet and the spray nozzle;
(4) an injector valve member disposed slidably within said injector body;
(5) injector valve urging means for urging said injector valve member to block fluid communication between said fuel supply passage and the spray nozzle constantly;
(6) a pressure control chamber defined within said injector body to which a portion of said injector valve member is exposed, said pressure control chamber communicating with the high-pressure fuel inlet and also communicating with the low-pressure fuel outlet through the valve seat of said solenoid-operated valve when the valve head of the valve member is out of engagement with the valve seat of said solenoid-operated valve to produce a change in fuel pressure within said pressure control chamber which acts on the portion of said injector valve member for establishing the communication between said fuel supply passage and the spray nozzle;
(7) a first fuel flow restricting passage formed between said fuel supply passage and said pressure control chamber; and
(8) a second fuel flow restricting passage formed between said pressure control chamber and the valve seat of said solenoid-operated valve, a flow area of said second fuel flow restricting passage being greater than that of said first fuel flow restricting passage,

wherein if the diameter of said first fuel flow restricting passage is defined as d_1, the diameter of said second fuel flow restricting passage is defined as d_2, a first pressure-energized area of said injector valve member on which the fuel within said pressure control chamber acts in a first direction is defined as A_Q, a second pressure-energized area of said injector valve member on which the fuel supplied from said fuel supply passage acts in a second direction opposite the first direction is defined as A_N, a minimum required injection pressure of the fuel sprayed from the spray nozzle is defined as P_{IL}, and a pressure required for urging said injector valve member so as to establish the communication between said fuel supply passage and the spray nozzle is defined as P_O, the following relation is satisfied:

$$d_2/d_1 > (A_Q \times P_{IL}/\{A_N \times (P_{IL}-P_O)\}-1)^{1/4}$$

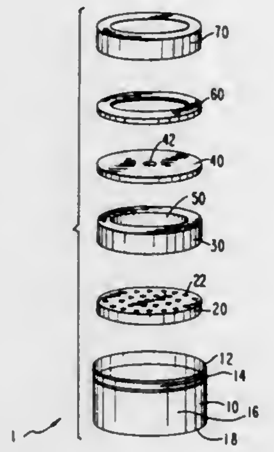
5,839,662
WATER DISTRIBUTION SYSTEM WITH VARIABLE WATER-SAVING DIFFUSERS

Stephen Leon; Eric Leon, and David Leon, all of Fort Lauderdale, Fla., assignors to Water Management Equipment Ltd., Boca Raton, Fla.

Continuation-in-part of Ser. No. 745,614, Nov. 7, 1996. This application Mar. 18, 1997, Ser. No. 819,743

Int. Cl.⁶ B05B *3/00*

U.S. Cl. 239—208 **21 Claims**



1. A water-saving diffuser, comprising:
a chamber portion having a hollow conduit for allowing water to pass therethrough, the hollow conduit including an upper hollow section and a middle hollow section having a relatively smaller diameter than a diameter of the upper hollow section;
a distributor disk having a central aperture for restricting water flow, the distributor disk being positioned within the upper hollow section of the chamber portion; and
an accelerator portion having a plurality of apertures therein for producing a multiple-stream water output, the accelerator portion attached to the chamber portion,
wherein the distributor disk and the accelerator portion delineate a chamber region within the chamber portion, the chamber region having a height that is smaller than its diameter.

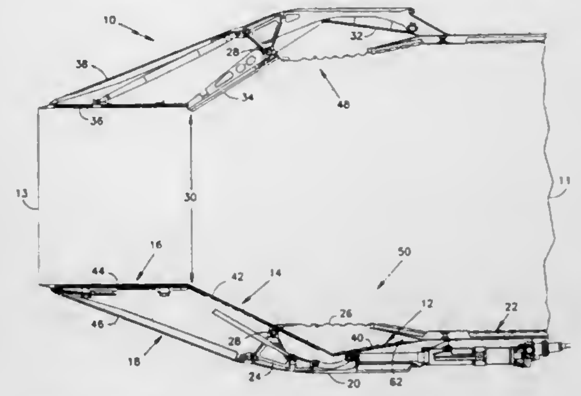
5,839,663
GAS TURBINE EXHAUST NOZZLE FLAP AND FLAP SEAL APPARATUS

D. Andrew Broadway, Anderson, S.C.; Raymond J. Bruchez, Jr., Jupiter, and Martin C. Lady, Palm Beach Gardens, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 23, 1996, Ser. No. 685,323

Int. Cl.⁶ B05B *12/00*

U.S. Cl. 239—265.35 **10 Claims**



1. An exhaust nozzle for a gas turbine engine, comprising:
a plurality of flaps, each said flap having a seal surface with depressions disposed therein, said flaps pivotly attached to a structure disposed within the engine;
wherein adjacent flaps overlap along said seal surfaces, and movement of said nozzle causes relative motion between said adjacent flaps; and
an abradable coating, attached to said seal surfaces, wherein contact between adjacent flaps causes said abradable coating to abrade, leaving said abradable coating in said depressions within said seal surfaces to which said abradable coating is attached.

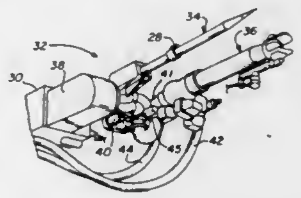
5,839,664
FLUID DISCHARGE NOZZLE ASSEMBLY

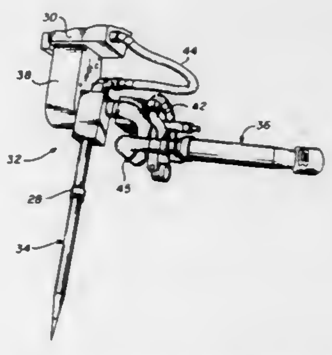
Robert G. Relyea, Dallas, Tex., assignor to Crash Rescue Equipment Service, Inc., Dallas, Tex.

Filed Jul. 31, 1996, Ser. No. 688,901

Int. Cl.⁶ A62C *31/00;* **B05B** *15/08*

U.S. Cl. 239—271 **8 Claims**





1. In an aerial boom system for a fire-fighting vehicle that has a discharge nozzle assembly mounted on the outer end of an aerial boom and a fluid conduit for supplying fire-retardant fluid to the nozzle assembly, the fluid discharge nozzle assembly enhancing the ability to extinguish fire within an enclosure and comprising:
an elongated hollow piercing nozzle mounted on the outer end of said aerial boom with its longitudinal axis in a first position essentially parallel to the longitudinal axis of said aerial boom and coupled to the fluid conduit, said piercing nozzle having movement only in a vertical plane from its first position and having at least one orifice therein for expelling said fire-retardant fluid;
an elongated foam/water nozzle pivotally mounted on the outer end of the boom for movement between a first position with its longitudinal axis essentially parallel to and spaced vertically from the longitudinal axis of said piercing nozzle to a second position essentially perpendicular to its first position;
a switch controlled valve assembly for selectively coupling said fluid in said fluid conduit either to said piercing nozzle or to said foam/water nozzle when a first switch is in a first position or a second position, respectively; and
first motor means for driving said foam/water nozzle from its first position to its second position, said motor means being coupled to said valve assembly control switch such that, when said first switch is in said first position, said valve assembly couples fluid to said piercing nozzle and said motor means is automatically energized to move said foam/water nozzle to its second position with its longitudinal axis essentially perpendicular to the longitudinal axis of said piercing nozzle.

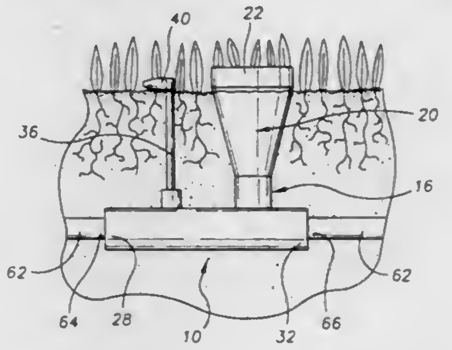
5,839,665
SPRINKLER SYSTEM

Adrian G. DiVittorio, 1509 Ridgeland Rd., E. Mobile, Ala. 36695

Filed Jul. 11, 1997, Ser. No. 891,589

Int. Cl.⁶ B05B *7/30*

U.S. Cl. 239—310 **18 Claims**



1. A sprinkler system comprising:
multiple lawn chemical distributing assemblies, each lawn chemical distributing assembly including:
a pipe connector member having a water flow passageway formed through said length thereof;
a ball valve assembly having a ball valve seal positioned within said water flow passageway of said pipe connector member and an elongated actuator shaft extending perpendicularly from said pipe connector member and terminating in an actuator handle, said ball valve seal being positionable into a first position allowing the flow of water through said water flow passageway of said pipe connector member and into a second position blocking said flow of water through said water flow passageway of said pipe connector member;
an exteriorly threaded reservoir connector having a chemical dispersal passageway formed therethrough and into connection with said water flow passageway of said pipe connector member;
a cone shaped in-ground chemical reservoir member, said chemical reservoir member having chemical holding cavity, a fill opening rimmed by an externally threaded cap engag-

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ing lip, and an internally threaded pipe connection portion companionately threaded to engage said exteriorly threaded reservoir connector, said reservoir member being attachable to said exteriorly threaded reservoir connector in a manner such that said externally threaded cap engaging lip is positioned a distance above said pipe connector member equal with said actuator handle of said elongated actuator shaft;

a filter screen sized to fit within said internally threaded pipe connection portion; and

an internally threaded sealing cap companionately threaded to engage said externally threaded cap engaging lip.

5,839,666
ADJUSTABLE-SPRAY NONLIMING SHOWER HEAD

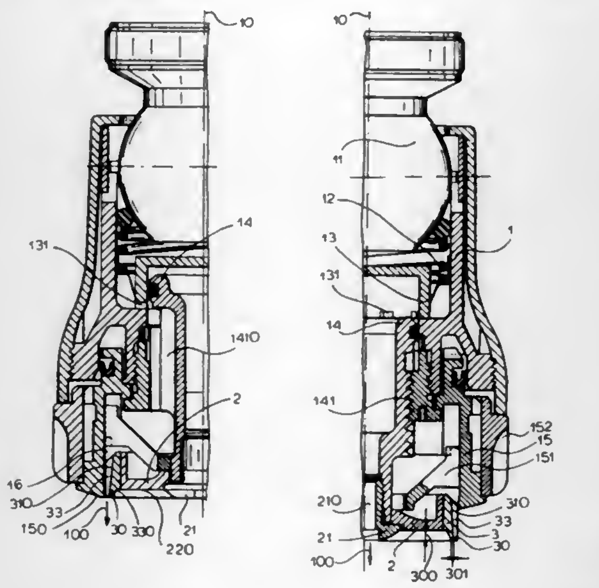
Bruno Heimann, Fröndenberg, and Gerd Scherzberg, Wetter, both of Germany, assignors to Friedrich Grohe Ag, Hemer, Germany

Filed Apr. 29, 1997, Ser. No. 841,276

Claims priority, application Germany, May 25, 1996, 196 21 220.0

Int. Cl.^{6} B05B *1/32*

U.S. Cl. 239—439 **19 Claims**



1. A shower head comprising:

a body forming a rear compartment pressurizable with water and a forwardly open mouth having an inner periphery; and

an end disk generally closing the mouth, extending perpendicular to an axis, and having an elastically deformable outer rim formed with a plurality of axially throughgoing and radially outwardly open grooves opening rearwardly into the compartment and radially outwardly closed by the body, the rim further forming an annular and elastically deformable lip projecting axially past a downstream face of the disk and a downstream end of the body, the grooves also being formed in the lip.

5,839,667
PENDENT-TYPE DIFFUSER IMPINGEMENT WATER MIST NOZZLE

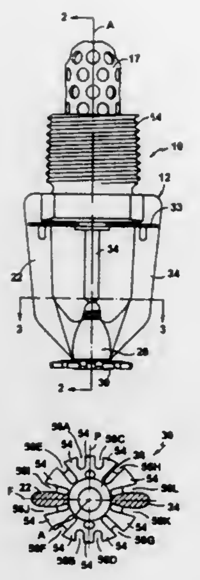
Michael A. Fishcer, West Kingston, R.I., assignor to Grinnell Corporation, Cranston, R.I.

Filed Mar. 12, 1997, Ser. No. 815,839

Int. Cl.^{6} B05B *1/26*

U.S. Cl. 239—498 **19 Claims**

1. A pendent-type diffuser impingement water mist fire protection nozzle comprising:



a body defining an orifice and an outlet for flow of water from a source,

said orifice defining an axis, and

said outlet being disposed generally coaxial with said orifice, and

a diffuser disposed generally coaxial with said axis of said orifice and defining a diffuser inner surface positioned for impingement of the flow of water thereupon and an opposite outer surface,

said diffuser comprising a plurality of tines distributed about a diffuser periphery and defining a plurality of openings therebetween, and

said diffuser inner surface defining at least one channel extending along said inner surface toward a predetermined region of said diffuser periphery, said channel being positioned to collect at least a portion of the water impinging thereupon and to divert collected water toward said predetermined region of said diffuser periphery.

5,839,668
MICRO-SPACER METERING APPARATUS EMPLOYING MULTI-CAVITY DISC AND PNEUMATIC EJECTION HEAD FOR FLAT PANEL DISPLAY ASSEMBLY

John C. Varney, Indialantic; Judson P. Costas, Port St. Lucie; Paul R. Nemeth, Melbourne, and Ty R. Olmstead, Palm Bay, all of Fla., assignors to Accudyne Corporation, Palm Bay, Fla.

Filed Jan. 29, 1996, Ser. No. 593,734

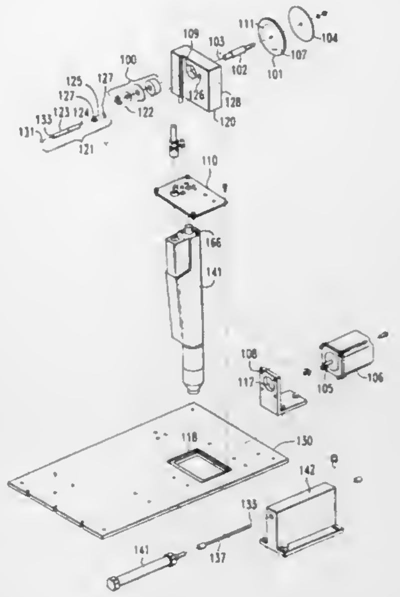
Int. Cl.^{6} B05B *5/00*

U.S. Cl. 239—690 **16 Claims**

1. An apparatus for supplying a measured quantity of particulate elements to a particulate element dispersing device comprising:

a first element having a first surface containing a plurality of cavities distributed therein;

a particulate element storage device which stores a plurality of said particulate elements and has an opening adjacent to said first surface of said first element in which said plurality of cavities are distributed, such that relative movement between said first element and said particulate element storage device causes said cavities in said first surface of said first element and said opening of said particulate element storage device to be brought into mutual overlapping relationship, thereby exposing said cavities to particulate elements stored in said particulate element storage device, said particulate element storage device being operative to urge particulate elements stored thereby against said first surface of said cylinder, and into said cavities as said cavities and said opening of said particulate element storage device are brought into mutual overlapping relationship, whereby particulate elements stored



in said storage device are transferred therefrom to said cavities of said first element; and

a particulate element ejection head having a first port, which is arranged to direct a fluid against said first surface of said first element in which said plurality of cavities are distributed, and a second port which is arranged to receive particulate elements ejected from said cavities by the direction of said fluid thereagainst, such that, as said first port of said particulate element ejection head is brought adjacent to said cavities in said first surface of said first element, fluid directed by said first port of said ejection head against said first surface of said first element enters said cavities containing pariculate elements and causes particulate elements therein to be ejected from said cavities into said second port of said particulate element ejection head for transfer therethrough to said particulate element dispersing device, and wherein

said first element comprises a rotatable wheel having said first surface containing said plurality of cavities circularly distributed about an axis of rotation of said wheel, and wherein

particulate element storage device comprises a cylinder which stores said particulate elements and has a first end thereof pressed against said wheel, and a piston inserted into said cylinder and biasing particulate elements stored therein against said first surface of said wheel.

5,839,669
METHOD AND APPARATUS FOR POWDER SPRAYING

Gunter Börner, Mühlhausen; Hans-Christoph Nienburg, Heidelberg; Helmut Böhme, Nussloch; Jörg Sopka, Schwetzingen, and Wolfgang Kleber, Dresden, all of Germany, assignors to ABB Research Ltd, Zuerich, Switzerland

Filed Oct. 7, 1996, Ser. No. 726,815

Claims priority, application Germany, Oct. 5, 1995, 195 37 089.9

Int. Cl.^{6} B05B *5/00*

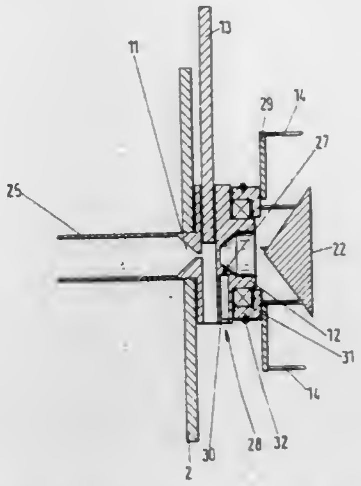
U.S. Cl. 239—704 **7 Claims**

1. A method for spraying a fluidized powder, which comprises:

a) introducing compressed air into a first chamber of a two-chamber fluidizing container, the container being closed except for a nozzle, an air inlet and an air outlet;

b) introducing powder through a closable powder feed orifice into a second chamber;

c) feeding the compressed air from the first chamber through a frit into the second chamber of the two-chamber fluidizing container forming a fluidized powder bed having a given air pressure;



d) maintaining suitable pressure conditions of the given air pressure in the second chamber by regulating valves in the air inlet and outlet;

e) extracting the fluidized powder from the vicinity of the fluidized bed and feeding the fluidized powder to the nozzle, controlling the extracting step by regulating the given air pressure; and

f) electrically charging the fluidized powder emerging from the two-chamber container through the nozzle.

5,839,670
PNEUMATIC IMPACT PULVERIZER, FINE POWDER PRODUCTION APPARATUS, AND TONER PRODUCTION PROCESS

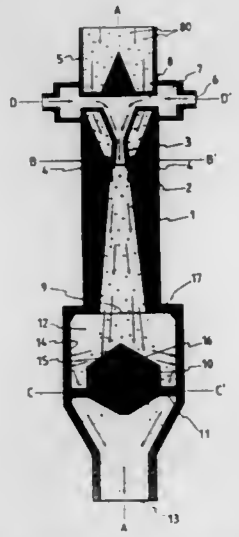
Kazuhiko Omata, Satte; Hitoshi Kanda, Yokohama; Momosuke Takaichi, Nagareyama; Satoshi Mitsumura, Yokohama, and Kazuyuki Miyano, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 375,173, Jan. 18, 1995, Pat. No. 5,577,670, which is a continuation of Ser. No. 912,695, Jul. 13, 1992, abandoned. This application May 1, 1996, Ser. No. 640,633

Claims priority, application Japan, Jul. 16, 1991, 3-199901; Jul. 16, 1991, 3-199902; May 8, 1992, 4-116176

Int. Cl.^{6} B02C *19/06*

U.S. Cl. 241—5 **12 Claims**



1. A process for producing toner using pneumatic classifying means and pneumatic impact pulverizing means,

the pneumatic classifying means having a classifying chamber for classifying powder into at least fine powder and coarse powder;

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the pneumatic impact pulverizing means having an accelerating tube for carrying and accelerating coarse powder fed with high-pressure gas and a pulverizing chamber for further pulverizing coarse powder, a back end of the accelerating tube provided with a coarse powder feed port for feeding coarse powder to the accelerating tube, the pulverizing chamber equipped with an impact member having an impact surface opposed to an opening plane of an outlet of the accelerating tube, the pulverizing chamber having a side wall against which the pulverized powder of coarse powder that has been pulverized with the impact member collides to further pulverize, the closest distance, L_1, between the side wall and a margin of the impact member is shorter than the closest distance, L_2, between a front wall of the pulverizing chamber opposed to the impact surface and the margin of the impact member, and in the pulverizing chamber, pulverization of coarse powder and further pulverization of the pulverized coarse powder are carried out with the impact surface of the impact member and the side wall, and further wherein a high-pressure gas ejection nozzle is provided in the back end of the accelerating tube, with the coarse powder feed port being formed around the high-pressure gas ejection nozzle and the coarse powder being fed from the coarse powder feed port to the accelerating tube, said process comprising the steps of:

melting and kneading a mixture containing at least a binder resin and a colorant;

cooling the kneaded mixture;

pulverizing the cooled mixture using a pulverizer to produce a pulverized mixture;

classifying the pulverized mixture into at least coarse powder and fine powder using the pneumatic classifying means;

feeding the coarse powder to the pneumatic impact pulverizing means;

further pulverizing the classified coarse powder using the pneumatic impact pulverizing means and producing a fine powder material;

feeding the pulverized powder back to the pneumatic classifying means;

classifying the fine powder material using the pneumatic classifying means and producing fine powder; and

using the classified fine powder to produce toner for developing electrostatic images.

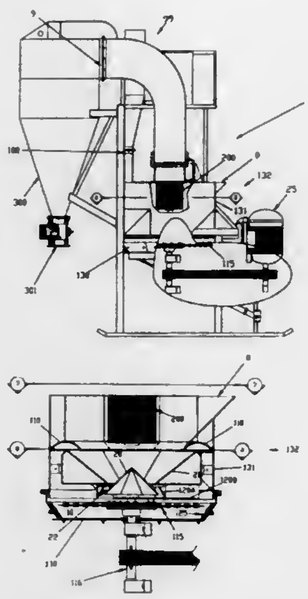
5,839,671
DEVICE AND METHOD FOR COMMINUTION

John Sand, West Vancouver; Jon Emmerson Martin, Surrey, and Jeremy Jonathan Clarke-Ames, Richmond, all of Canada, assignors to Spectrasonic Disintegration Equipment Corp., Richmond, Canada

Filed Oct. 19, 1996, Ser. No. 732,979

Int. Cl.^{6} B02C *13/00*

U.S. Cl. 241—24.1 **13 Claims**



12. A method of comminuting raw material comprising the steps:

(a) inputting raw material along a central axis;

(b) extending a stationary blade outwardly from said central axis and disposing a wall around said stationary blade, an inner surface of said wall being proximate the distal end of said blade;

(c) creating an air flow rising from said wall;

(d) propelling the raw material to violently impact against said blade at a position inside and spaced from said wall and then outwardly against the surface of said wall;

(e) lifting substantially all of the impacted raw material by said rising air flow; and

(f) separating the lifted raw material between lighter and heavier particles thereof and then directing the heavier particles to perform steps (d), (e) and (f) again while permitting the lighter particles to rise.

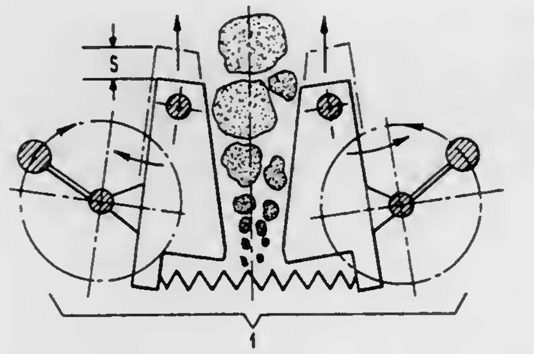
5,839,672
CRUSHING PROCESS

Leonid P. Zarogatsky, and Vladimir Ya. Turkin, both of St. Petersburg, Russian Federation, assignors to Rustec, Inc., Camden, N.J.

Filed May 24, 1996, Ser. No. 653,293

Int. Cl.^{6} B02C *1/06*

U.S. Cl. 241—30 **3 Claims**



1. A process for crushing materials comprising feeding materials to be crushed between two crushing jaws, said crushing jaws having a crushing force controlled by a means capable of providing synchronous vibration of each crushing jaw with respect to each other so that the crushing jaws move toward each other at an increasing velocity which reaches its maximum at a point of closest convergence of the crushing jaws; moving the crushing jaws toward each other at an increasing velocity which reaches its peak when the jaws impact with the materials to be crushed; moving the crushing jaws upward vertically; and discharging the crushed materials.

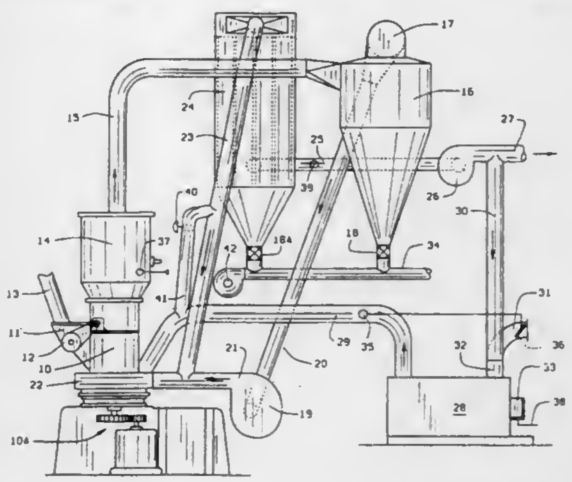
5,839,673
APPARATUS FOR GRINDING MATERIAL

Robert M. Williams, 16 La Hacienda, Ladue, Mo. 63124

Filed Sep. 10, 1996, Ser. No. 711,532

Int. Cl.^{6} B02C *23/26*

U.S. Cl. 241—48 **5 Claims**



1. In apparatus for grinding material the combination which comprises:

a) a first material transporting circuit including a material grinding mill having a material receiving inlet, a ground material outlet connected into a material collecting cyclone separator, and circulating fan means connected to said cyclone separator and said mill to effect movement of ground material into said cyclone separator and return fluid means to said mill;

b) a second transporting circuit connected between said circulating fan means and said mill, a bag house having an inlet for circulating fluid and an outlet for ground material fines, and an exhaust fan connected to said bag house and open to the exterior;

c) heat supply means having an inlet connection to said exhaust fan and an outlet connected into said mill to supply heat to the material in said grinding mill; and

d) bypass means connected between said heat supply means in advance of said mill and said bag house for introducing heat to said bag house for maintaining bag house temperature level above a dew point temperature in said bag house.

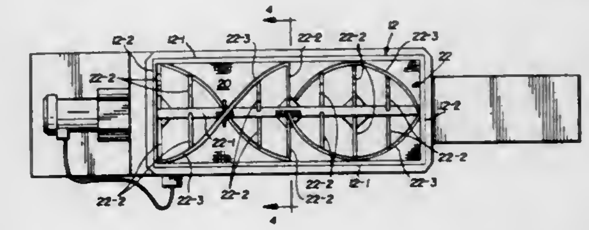
5,839,674
APPARATUS AND PROCESS FOR DECOMPRESSING BLOCKS OF PARTICULATE MATERIALS SUCH AS BLOCKS OF COMPRESSED HORTICULTURAL MATERIALS

C. Mitchell Ellis, 7461 Lott Rd., Wilmer, Ala. 36587

Filed Feb. 5, 1997, Ser. No. 795,512

Int. Cl.^{6} B02C *19/00*

U.S. Cl. 241—73 **10 Claims**



1. Apparatus for breaking blocks of compressed particulate material comprising:

a breaking chamber in which blocks of compressed particulate material are broken to form an uncompressed mass of the particulate material;

a rotary breaker disposed in the breaking chamber to cause the blocks to tumble against one another therewithin and thereby form the uncompressed mass of particulate material; and

a screen disposed in said breaking chamber below said rotary breaker to allow said uncompressed mass of particulate material to pass therethrough, wherein

said rotary breaker includes,

(i) a central axle,

(ii) at least one spirally oriented breaker bar concentrically disposed relative to said central axle,

(iii) support arms radially extending from said central axle and rigidly interconnecting said central axle and said spirally oriented breaker bar, and

(iv) generally triangularly shaped lift teeth associated with said support arms and oriented in the direction of rotation of said rotary beaker.

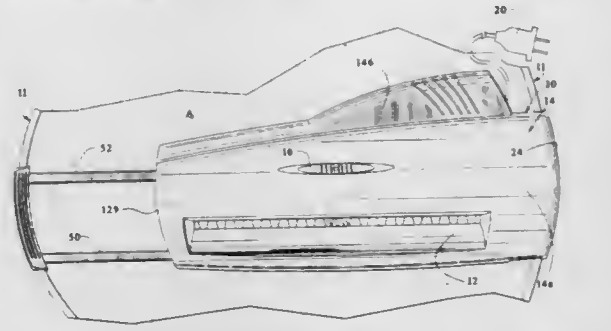
5,839,675
SHREDDER SUPPORT ASSEMBLY AND HOUSING

Todd Henreckson, Gurnee; Tim Bohn, Hoffman Estates, and Mark Dziersk, Chigago, all of Ill., assignors to General Binding Corporation, Northbrook, Ill.

Filed Oct. 2, 1996, Ser. No. 720,579

Int. Cl.^{6} B02C *18/16*

U.S. Cl. 241—100 **19 Claims**



1. A support arm arrangement for a paper shredder mountable to waste paper baskets comprising:

a first support portion extending from one side of the paper shredder; and

a second support portion extending from an opposite side of said paper shredder, said first and second support portions having first and second vertically arranged guides, respectively, which are arrangeable on outside surfaces of said waste paper baskets, at least one of said vertically arranged guides defining an arcuately shaped recess capable of selectively receiving a linear edge of one waste paper basket and a non-linear edge of another waste paper basket, and having an arcuate surface arranged for abutting the outside surfaces of the waste paper baskets.

5,839,676
CUTTING MACHINE FOR EXTRACTION OF SILAGE FROM FLAT SILOS

Wilhelm Bevermann, Bad Laer, Germany, assignor to B. Strautmann & Söhne GmbH & Co., Bad Laer, Germany

Filed Sep. 18, 1996, Ser. No. 715,617

Claims priority, application Germany, Sep. 22, 1995, 295 15 146.3; Mar. 28, 1996, 196 12 363.1

Int. Cl.^{6} A01F *29/08*

U.S. Cl. 241—101.76 **21 Claims**

1. A cutting machine for attachment to an implement for extraction of silage from flat silos, comprising:

a frame having an underside and so secured to an implement as to be swingably movable upwardly and downward, said frame being formed with elastic attack points for attachment to the implement;

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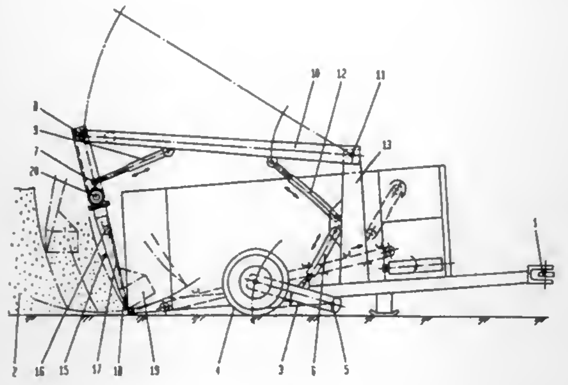
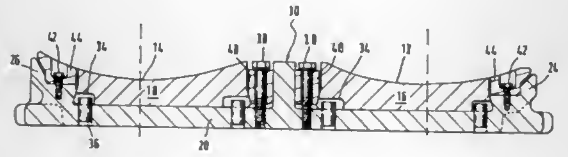


a cutter assembly positioned at the underside of the frame; and at least one vibrator for oscillating the cutter assembly for enhancing a cutting action thereof.

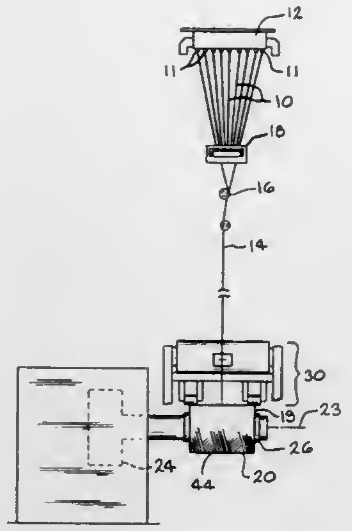
5,839,677
TRACK FOR MILLS
Norbert Guerard, Esneux, Belgium, assignor to Magotteaux International, Vaux-Sous-Chevremont, Belgium
Filed Apr. 28, 1997, Ser. No. 847,679
Claims priority, application Luxembourg, Apr. 30, 1996, 88753
Int. Cl.⁶ B02C *15/00*
U.S. Cl. 241—291 **6 Claims**



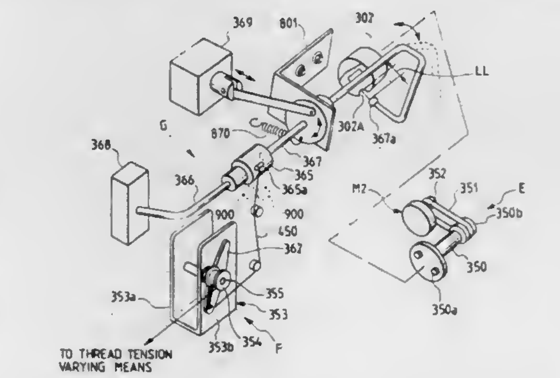
1. Track for mills comprising:
a series of inner wearing segments and a series of outer wearing segments with a high resistance to wear, the upper surface of which defining two concentric circular runway paths moving beneath milling rollers in order to mill material tipped out onto the track, wherein said inner and said outer wearing segments are fixed separately and removably to a sole with an outer edge and an inner edge defining a housing for the wearing segments, said sole further including a projecting middle rib in the shape of an arc of a circle separating the inner wearing segments from the outer wearing segments.

5,839,678
METHOD OF CONTROLLING FLAT SPOTS IN A ZERO TWIST YARN
Larry J. Huey, North Augusta, S.C., and Michael B. Fazio, Newark, Ohio, assignors to Owens-Corning Fiberglas Technology, Inc., Summit, Ill.
Filed Jul. 16, 1996, Ser. No. 683,015
Int. Cl.⁶ B65H *54/00;55/04;* **D02G** *1/20*
U.S. Cl. 242—18 R **20 Claims**

15. The method of collecting a strand comprising rotating a collet to wind the strand into a package, traversing the strand from end to end of the package so that the strand is wound in a helical pattern on the package, contacting the package with a roller bail at edge portions at each end of the package, pressing the package with the roller bails, thereby causing the strand to flatten as it is wound in the edge portions to create a strand having periodically occurring flat spots, and controlling the flattening of the strand by controlling the pressure of the roller bails on the package and by controlling the flattening of the strand by controlling the speed of the traverse of the strand.

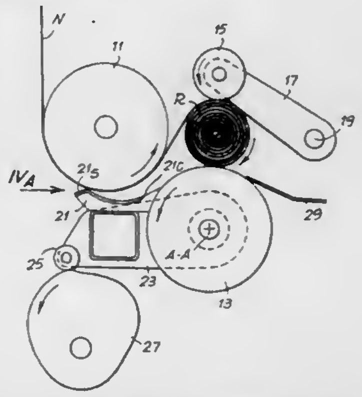


5,839,679
BOBBIN THREAD WINDING APPARATUS
Kazunori Katayama; Hiroyuki Tomioka, and Toshinobu Shinozuka, all of Tokyo, Japan, assignors to Juki Corporation, Tokyo, Japan
Filed Oct. 25, 1995, Ser. No. 548,237
Claims priority, application Japan, Oct. 26, 1994, 6-285932; Feb. 8, 1995, 7-043452; Feb. 27, 1995, 7-065140
Int. Cl.⁶ B65H *75/32;63/00;54/18;* **D05B** *57/10*
U.S. Cl. 242—21 **17 Claims**



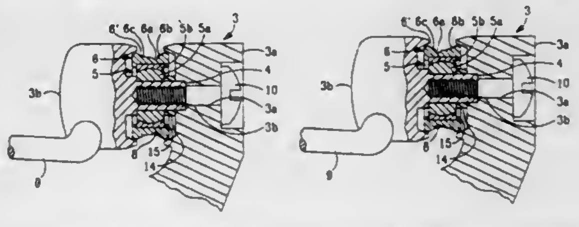
1. A bobbin thread winding apparatus comprising:
a bobbin case having an opening along the circumferential edge thereof;
a bobbin having a bobbin shaft on which a bobbin thread is wound, said bobbin being rotatably disposed in the bobbin case;
bobbin drive means for turning the bobbin in the bobbin case;
insertion means for inserting the tip of the bobbin thread supplied from a thread supply source into the bobbin case through the opening of the bobbin case;
bobbin drive control means for controlling the bobbin drive means wherein the bobbin thread inserted into the bobbin case is entwined round the bobbin shaft with the turn of the bobbin; and
thread winding detecting means, connected to the bobbin drive control means, for detecting the start of winding of the bobbin thread twisted round the bobbin shaft by detecting an increase in the speed at which the bobbin thread is drawn from said thread supply, wherein the bobbin thread that is inserted into the bobbin case through the opening of the bobbin case is entwined round the bobbin shaft, with the turn of the bobbin driven by the bobbin drive means, and the twisting of the bobbin thread round the bobbin shaft is detected in response to the output signal of the thread winding detecting means.

5,839,680
MACHINE AND METHOD FOR THE FORMATION OF CORELESS LOGS OF WEB MATERIAL
Guglielmo Biagiotti, Lucca, Italy, assignor to Fabio Perini, S.p.A., Lucca, Italy
Division of Ser. No. 523,280, Sep. 5, 1994, Pat. No. 5,690,296, which is a division of Ser. No. 90,519, Jul. 13, 1995, Pat. No. 5,639,046. This application Sep. 4, 1997, Ser. No. 923,615
Claims priority, application Italy, Jul. 21, 1992, FI92A0149; Feb. 15, 1993, FI93A0022
Int. Cl.⁶ B65H *18/28*
U.S. Cl. 242—160.1 **2 Claims**



1. A log of reeled web material without core or central winding tube, and without central hole, wherein the web material has a plurality of turns and wherein the innermost of said turns have a winding density almost constant and higher than the winding density of the more external turns.

5,839,681
FISHLINE GUIDE MECHANISM FOR SPINNING REEL
Kyoichi Kaneko, Tokyo, Japan, assignor to Daiwa Seiko, Tokyo, Japan
Continuation of Ser. No. 550,766, Oct. 31, 1995, abandoned, which is a division of Ser. No. 503,880, Jul. 18, 1995, Pat. No. 5,547,139, which is a continuation of Ser. No. 136,695, Oct. 15, 1993, abandoned. This application Sep. 4, 1996, Ser. No. 707,823
Claims priority, application Japan, Oct. 16, 1992, 4-78162; Dec. 10, 1992, 4-090555 U
Int. Cl.⁶ A01K *89/01*
U.S. Cl. 242—231 **11 Claims**



1. A fishline guide mechanism for guiding a fishline, said fishline guide mechanism comprising:
a bail support member; and
a guide roller supported by said bail support member and rotatable about an axis, said guide roller having a fishline guide main portion in the form of an annular groove for receiving a fishline therein, and a fishline auxiliary portion adjacent to said fishline guide main portion for guiding said fishline to fall within said annular groove, said auxiliary portion adjoining said annular groove at a retaining edge extending around the entire circumference of said guide roller,
wherein said annular groove is asymmetrically located nearer to a first axial end of said guide roller than a second opposite axial end of said guide roller.

5,839,682
FISHING REEL WITH REMOVABLE SIDE COVER ASSEMBLY
Hyunkyu Kim, Broken Arrow, Okla., assignor to Zebco Corporation, Tulsa, Okla.
Filed Jul. 12, 1996, Ser. No. 679,506
Int. Cl.⁶ A01K *89/015*
U.S. Cl. 242—314 **19 Claims**

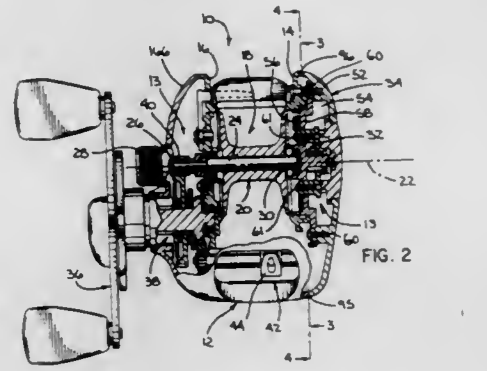


FIG. 2

1. A fishing reel comprising:
a frame having first and second laterally spaced parts between which a line storage space is defined;
a spool around which a supply of line can be wrapped, -
first means cooperating between the spool and frame to allow the spool to be moved laterally through one of the first and second frame parts selectively between a) an operative position wherein the spool is supported for rotation relative to the frame about a first laterally extending axis and b) a separated position;
a side cover assembly; and
second means cooperating between the side cover assembly and frame for mounting the side cover assembly to the frame for movement relative to the frame between a) a first position and b) a second position,
said side cover assembly in the first position maintaining the spool in the operative position and in the second position allowing the spool to be moved from the operative position to the separated position,
said second cooperating means comprising means for mounting the side cover assembly to the frame for pivoting movement about a second axis between the first and second positions,
said second cooperating means comprising a first stop surface on the frame and a second stop surface on the side cover assembly, the first and second stop surfaces being spaced from the first axis, said first and second stop surfaces abutting to each other as the side cover assembly is moved from the second position into the first position to prevent movement of the side cover assembly from the second position to beyond the first position.

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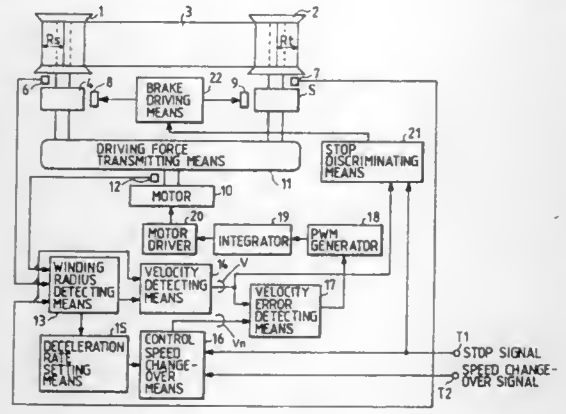
5,839,683
APPARATUS FOR CONTROLLING TAPE SPEED

Masayuki Kijima; Hideo Nishijima; Kaneyuki Okamoto, all of Hitachinaka; Takeo Ohkouchi, Ibaragi-ken, and Yukinobu Tada, Ebina, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 27, 1996, Ser. No. 708,097
Claims priority, application Japan, Sep. 8, 1995, 7-231020
Int. Cl.^{6} B65H *59/38;* **G11B** *15/46;23/42*
U.S. Cl. 242—334.2 **5 Claims**


1
3
2
Rs
Rt
6
4
8
BRAKE DRIVING MEANS
22
9
7
S
DRIVING FORCE TRANSMITTING MEANS
21
STOP DISCRIMINATING MEANS
11
12
MOTOR
10
20
MOTOR DRIVER
19
INTEGRATOR
18
PWM GENERATOR
WINDING RADIUS DETECTING MEANS
VELOCITY DETECTING MEANS
14
V
VELOCITY ERROR DETECTING MEANS
17
13
15
DECELERATION RATE SETTING MEANS
CONTROL SPEED CHANGE-OVER MEANS
16
Vn
T1
STOP SIGNAL
SPEED CHANGE-OVER SIGNAL
T2

1. A tape speed control apparatus based on the reel drive for taking up a tape to a take-up reel from a tape supply reel, comprising:
tape running means for causing the tape to run at a higher speed than an ordinary playback speed;
speed detector means for detecting a tape running speed;
winding radius detecting means for detecting a winding radius of the tape supply reel;
deceleration rate setting means for setting a deceleration rate based on said winding radius of the tape supply reel;
decelerating means for decelerating the tape speed in said deceleration rate in response to an input of a stop command signal; and
running stop means for stopping the tape being run when the tape speed detected by said speed detecting means is decelerated to a preset speed VL after said input of the stop command signal.

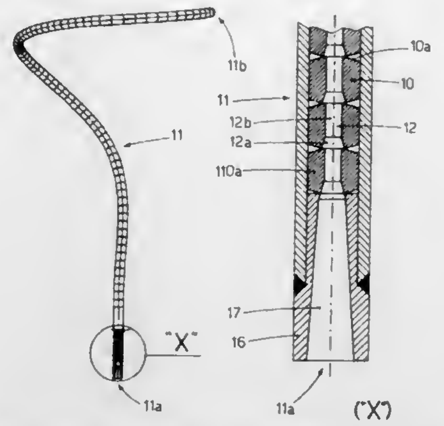
5. A tape speed control apparatus based on a reel drive for taking up a tape to a take-up reel from a supply reel, comprising:
tape running means for causing the tape to run at a higher speed than an ordinary playback speed;
speed detector means for detecting a tape running speed;
generating means for generating a data representing a wound tape-quantity on the supply reel;
deceleration means for decelerating the tape speed based on said data in response to a stop command signal; and
running stop means for stopping the tape being run when the tape speed detected by said speed detecting means becomes lower than a preset speed.

5,839,684
LINED PIPE FOR FORMING SPIRALS FOR SPIRALLING MACHINES AND THE RELATIVE RECONDITIONING METHOD

Alfredo Poloni, Fogliano Di Redipuglia, and Fausto De Marco, Remanzacco, both of Italy, assignors to Danieli & C. Officine Meccaniche SPA, Buttrio, Italy

Filed Aug. 29, 1997, Ser. No. 921,041
Claims priority, application Italy, Sep. 26, 1996, UD96 A 000181
Int. Cl.^{6} B21C *47/00*
U.S. Cl. 242—361 **20 Claims**

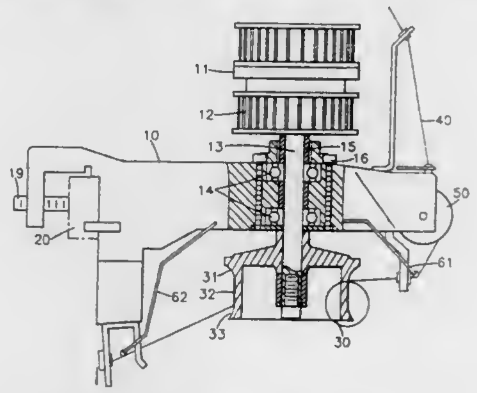
1. A lined spiral-forming pipe (**11**) for a spiral-forming head of spiralling machines for metallic wire, comprising a plurality of wear-resistant inserts having an inner hollow through which the metallic wire passes and an outer surface connecting with the inner surface of the spiral-forming pipe (**11**), wherein the wear-resistant inserts (**10**) are substantially all alike with a substantially annular conformation with a longitudinal dimension ("1") mating with the minimum radius of curvature of the spiral-forming pipe (**11**), and have rounded front faces (**10***a*) at least partly convex and an inner through hollow (**12**) comprising a first lead-in segment (**12***a*) to introduce the metallic wire and a second following segment (**12***b*) which is substantially cylindrical.



5,839,685
ANTI-STATIC THREAD FEEDING WHEEL FOR KNITTING MACHINERY

Jen Hui Chen, 4FL. 27, Lane 160, Hsin Sheng S. Rd., Sec. 1, Taipei, Taiwan

Continuation of Ser. No. 670,114, Jun. 25, 1996, abandoned, which is a continuation-in-part of Ser. No. 507,677, Jul. 25, 1995, abandoned. This application Oct. 27, 1997, Ser. No. 960,107
Int. Cl.^{6} B65H *71/00;51/30;* **D04B** *15/48*
U.S. Cl. 242—366 **1 Claim**



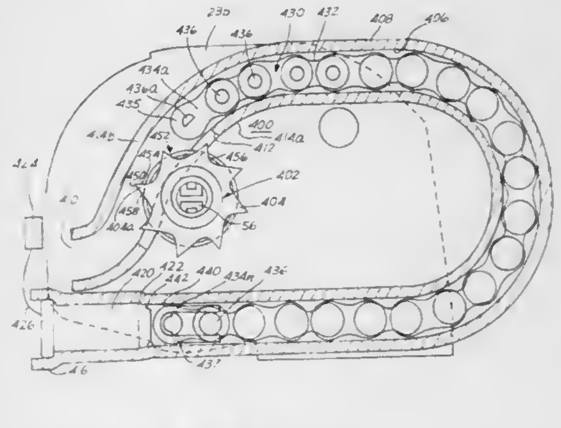
1. An improved thread feeding wheel assembly for use on a knitting machine including
a body having a substantially cylindrical middle portion with projecting rims projecting from opposite ends of the substantially cylindrical middle portion, said cylindrical body made from an aluminum alloy;
a mounting base for mounting the body, a pulley driven by a belt for rotation, an engagement/disengagement means for coupling power transmission from the belt to the pulley, a shaft coupled between the pulley and the body to transmit the pulley rotation to the body;
the mounting base including a bottom bearing, a bottom sleeve, a top bearing, a top sleeve, and a circular metal piece which in combination are used to mount the body, the shaft, and the pulley in common;
the improvement comprising:

a layer of aluminum oxide formed on said middle portion of said body, said layer having a thickness of 50 μm, an electrical resistance of 2×10^{15} to 5×10^{15} Ω/cm^2 at 20° C., and a hardness of RC30–RC60 according to the Rockwell Hardness Scale, the aluminum oxide layer having an outer surface; and,
a layer of polytetrafluoroethylene on the outer surface of the aluminum oxide layer, the layer of polytetrafluoroethylene having an outer surface with a frictional coefficient of approximately 0.08,
whereby the thickness, hardness and electrical resistance of the layer of aluminum oxide have the effect of preventing generation of static-electricity when high-speed thread is running through the thread feeding wheel.

5,839,686
CHAIN DRIVEN PRETENSIONER AND RETRACTOR

Niels Dybro, Utica; Jason Raines, Harrison Township., both of Mich.; Harjeet Gill, Windsor, Canada, and Harold John Miller, III, Troy, Mich., assignors to AlliedSignal Inc., Morristown, N.J.

Filed Oct. 12, 1995, Ser. No. 542,370
Int. Cl.^{6} A62B *35/00;* **B65H** *75/48*
U.S. Cl. 242—374 **12 Claims**

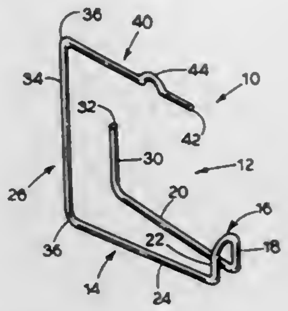


1. An apparatus (**20**, **400**) comprising:
first driven means (**402**) including a driven toothed gear operatively linked to a spool of a retractor (**20**) to rotate the spool (**24**) in a direction of retraction to cause a seat belt (**31**) wound thereabout to retract;
a drive housing (**408**) for defining an arcuate drive passage (**406**) having a first end in close proximity to one side of the gear and a second end in close proximity to an opposite side of the gear;
flexible first drive means (**430**, **432**), slidingly positioned within the drive passage, including a length of chain having a first chain link (**435**) initially maintained out of engagement with the gear and pushed into engagement with the gear upon activation of a pyrotechnic gas source, the chain including a plurality of chain links within the drive passage, the chain extending rearwardly and prior to activation of the gas source the chain extends rearwardly generally to the location of the gas source;
the pyrotechnic gas source, positioned within the second end of the drive passage and operatively linked to a rear end of the chain for pushing the chain through the drive passage into engagement with the gear thereby causing the gear to rotate.

5,839,687
MEANS AND METHOD FOR TRANSFERRING FISHING LINE FROM A STORAGE SPOOL TO A FISHING REEL ON A FISHING ROD

William E. Magnafici, 115 Sunset Dr., Amboy, Ill. 61310

Filed Feb. 14, 1997, Ser. No. 801,913
Int. Cl.^{6} B65H *75/38*
U.S. Cl. 242—404.3 **3 Claims**



1. A device for transferring fishing line from a storage spool to a fishing reel comprising: a one-piece hanger element for releasably and rotatably mounting a spool of fishing line on a fishing rod adjacent to a reel of that fishing rod, the spool having a central bore therethrough with the central bore having an inner diameter, said hanger element including a U-shaped body having
(1) a central section, a first arm on one end thereof and a second arm on another end thereof, the first arm and the central section being adapted to fit through the central bore in the spool, said first arm being U-shaped and having first and second legs which are spaced apart from each other at one end of each leg, said second arm including a first section and a second section with said first and second sections being spaced apart from each other, the central section including first and second flexible portions connecting said first arm to said second arm, said first flexible portion being connected at one end thereof to the one end of the first leg of said U-shaped first arm and at another end thereof to one end of the first section of said second arm, said second flexible portion being connected at one end thereof to the one end of the second leg of said U-shaped first arm and at another end thereof to one end of the second section of said second arm, said first and second portions being spaced apart from each other and being spaced apart from each other farther from each other adjacent to said second arm than they are adjacent to said first arm to converge in a V-shape toward each other from said second arm to said first arm, the spacing adjacent to said second arm being larger than the inner diameter of the central bore and the spacing adjacent to the first arm being less than the inner diameter of the central bore whereby the first and second portions flexibly engage the spool to apply holding force from the hanger element to the spool adjacent to the central bore when the hanger element is in place on the spool,
(2) said first arm being located so the first and second legs of said first arm abut one face of the spool when said hanger element is in place on the spool,
(3) said second arm being located so the first and second sections of said second arm abut a second face of the spool when said hanger element is in place on the spool, and
(4) a shoulder on the second section of said second arm located to abut a rim of the spool when said hanger element is in place on the spool and to abut an element of the fishing rod to prevent the spool from moving towards the fishing reel as fishing line is removed from the spool and loaded onto the fishing reel, the shoulder on said second arm being spaced from the connection between said second flexible portion and the second section of the second arm and extending toward said first arm, said shoulder including a distal end spaced from said second arm and a rod-engaging hump between said second arm and the distal end of said shoulder, said shoulder being shorter than said central section whereby the distal end of said shoulder is located between the faces of the spool when the hanger element is in place on the spool.

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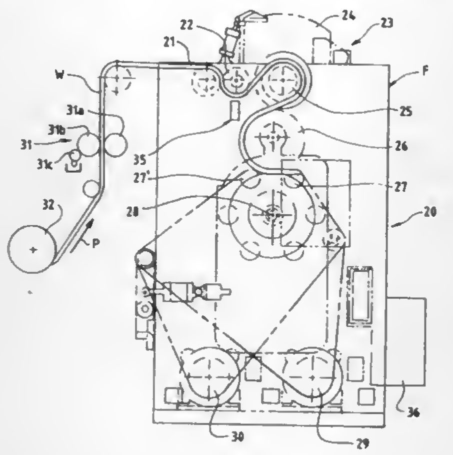
5,839,688
METHOD AND APPARATUS FOR PRODUCING A ROLL OF BATHROOM TISSUE OR KITCHEN TOWELING WITH A PATTERN BEING REPEATED BETWEEN EACH PAIR OF TRANSVERSE PERFORATIONS

James E. Hertel; Lawrence D. Mikulsky, and Richard J. Vigneau, all of Green Bay, Wis., assignors to Paper Converting Machine Co., Green Bay, Wis.

Filed Aug. 8, 1997, Ser. No. 907,572

Int. Cl.^{6} B65H *35/04*

U.S. Cl. 242—523.1 **24 Claims**



1. A rewinder for cyclically winding logs of bathroom tissue or kitchen toweling with a pattern repeated between each pair of adjacent lines of transverse perforation, comprising a frame having knife-carrying perforation means, winding means, phase actuation-equipped cutoff means and means for advancing a pattern-equipped extensible web along a path toward said perforation means, a detector a on said frame for sensing the position of each pattern relative to the position of the perforation means, a controller on said frame for adjusting said perforation means to insure that each perforation is between pattern positions including means for generating a perforator knife position feed back signal, and means operably associated with said controller and cutoff means for adjusting said cutoff means to stay in time with perforations to provide a preselected count of patterns in each winding cycle.

5,839,689
AIR BOX FOR WEB CARRIER ROLLS AND HAVING A CONNECTING WALL

Jens Krüger, Heidenheim; Rudolf Beisswanger, Steinheim, and Walter Kaipf, Haunsheim, all of Germany, assignors to Voith Sulzer Papiermaschinen GmbH, Heidenheim, Germany

Filed Oct. 18, 1996, Ser. No. 733,526

Claims priority, application Germany, Oct. 19, 1995, 195 387 972.7

Int. Cl.^{6} B65H *18/14*

U.S. Cl. 242—542 **16 Claims**

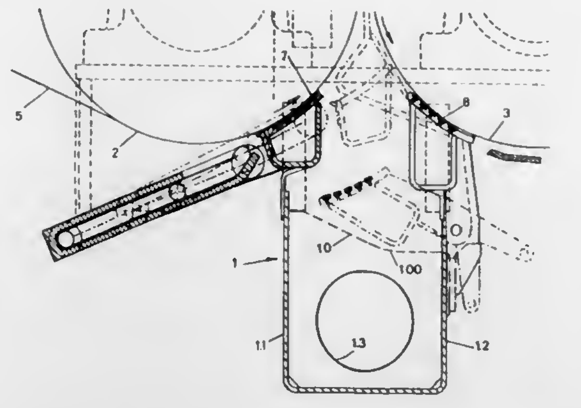
1. An air box for a carrier-roll winding machine having first and second neighboring carrier rolls which are adapted to support a reel thereon on which a web is wound, the carrier rolls being positioned near each other, the air box comprising:

respective first and second side walls for being disposed beneath the first and second carrier rolls, one of the side walls being for positioning so as to be generally sealed at each of the carrier rolls, and the side walls being spaced apart to define an open area in the air box;

a base of the air box joining the side walls and having a length;

a connection for feeding air into the air box; and

a connecting wall in the air box above the base, extending between the side walls within the open area in the air box, substantially along the length of the base, and positioned for receiving thereon paper which falls into the air box, as when the web tears.



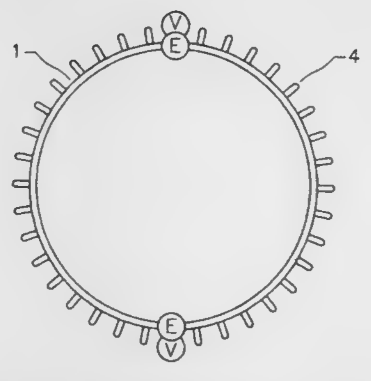
5,839,690
INERTIAL ACCELERATION AIRCRAFT

David John Blanchette, P.O. Box 1839 Betts St. NE., Alburquerque, N. Mex. 87112

Continuation-in-part of Ser. No. 535,915, Jun. 11, 1990, abandoned. This application Feb. 22, 1996, Ser. No. 697,354

Int. Cl.^{6} B64C *27/00;39/06*

U.S. Cl. 244—6 **7 Claims**



1. An aircraft comprising:

at least one means for sustaining said aircraft;

at least one means for controlling the course of the translocational motion of said aircraft as a whole;

at least one means for accumulating within said aircraft motion which is of a form other than that of translocational motion of said aircraft as a whole;

at least one means for transforming said motion which is of a form other than that of translocational motion of said aircraft as a whole into motion which is of the form of said translocational motion of said aircraft as a whole;

wherein said aircraft is structured, as a whole, generally, particularly, purposefully, in the arrangements relative to one another of the principle elements of said aircraft, and in the provisions for the operation of said principle elements of said aircraft, to provide for, facilitate, augment, increase, and maximize the capacity of said aircraft to increase the rate of said translocational motion of said aircraft by the means of transforming said motion which is of a form other than that of translocational motion of said aircraft as a whole into motion which is of the form of said translocational motion of said aircraft as a whole.

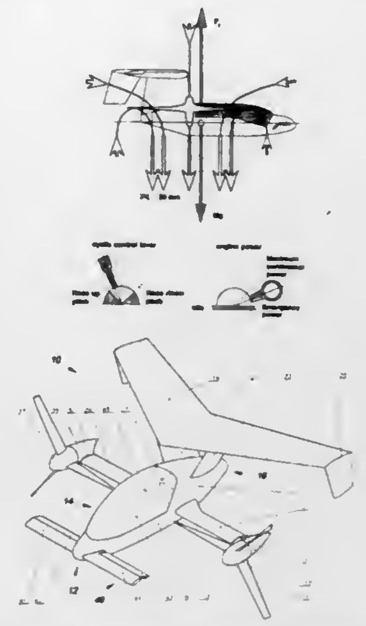
5,839,691
VERTICAL TAKEOFF AND LANDING AIRCRAFT

Jean Soulez Lariviere, 74 rue de Rome, Paris, France, 75008

Filed May 22, 1996, Ser. No. 651,582

Int. Cl.^{6} B64C *29/00*

U.S. Cl. 244—7 R **31 Claims**



1. A vertical takeoff and landing aircraft, comprising:

a) a fuselage having a forward end and a rearward end;

b) a wing mounted on and extending from said rearward end;

c) a horizontal stabilizer mounted on said forward end;

d) a pair of opposed booms independent of said wing and extending laterally of said fuselage between said wing and horizontal stabilizer;

e) each boom having an end distal of said fuselage to which is mounted a propeller nacelle carrying an unshrouded propeller having an axis of rotation, each nacelle being freely pivotable about a pivoting axis, each propeller having a plurality of propeller blades;

f) engine means for driving said propellers;

g) each propeller nacelle being pivotable between a first position wherein said axis of rotation is approximately horizontal and a second position wherein said axis of rotation is approximately vertical; and

h) brake means for restraining free pivoting movements of said nacelles, whereby release of said brake means permits free pivoting of said nacelles.

5,839,692
SPLAYABLE AIRCRAFT NOSE LANDING GEAR

Harry C. Ralph, Kirkland, Wash., and Ian Robert Bennett, Cheltenham, England, assignors to The Boeing Company, Seattle, Wash.

Filed Jun. 13, 1997, Ser. No. 874,689

Int. Cl.^{6} B64C *25/12*

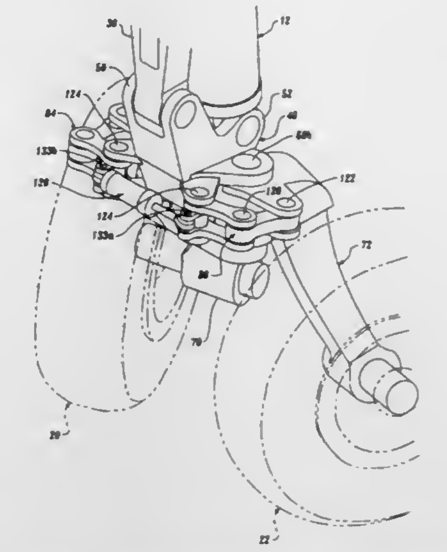
U.S. Cl. 244—102 SL **8 Claims**

1. A landing gear assembly for an airplane, comprising:

an elongate strut having a first end and a second end longitudinally spaced therefrom, said first end being attached to said airplane for swinging movement of said strut between an extended position for taxiing and landing of said airplane and a retracted position;

elongate first and second hub assemblies each having first and second ends, at least one wheel journaled to each of said second ends, said first ends of said hub assemblies being attached to said second end of said strut for outward and sideward swinging movement thereof between a first position wherein said wheels are parallel to each other and a second position wherein said first and second hub assemblies are splayed to an angle from each other to permit stowage of said landing gear within said airplane with minimal intrusion when said landing gear is in said retracted position; and

splaying means pivotally attached between said second end of said strut and said first ends of said first and second hub assemblies for selectively locking and pivoting said hub assemblies between and into said first and second positions.



5,839,693
AIRCRAFT REFUELING SYSTEM

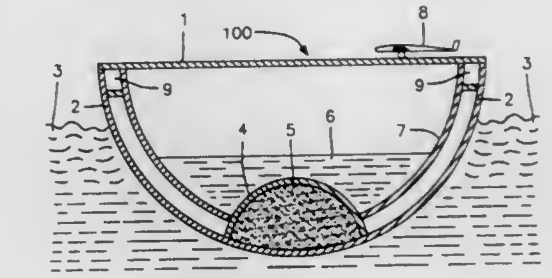
Michael Stalaw, 25 Hapoel Street, Herzeliya, Israel, and Ilana Hecht, 51 Hickory Ln., Closter, N.J. 07624

Filed Feb. 28, 1997, Ser. No. 808,431

Claims priority, application United Kingdom, Mar. 20, 1996, 9605800

Int. Cl.^{6} B64F *1/28;* **B63B** *35/53*

U.S. Cl. 244—114 R **8 Claims**



1. A cellular refuelling system for refuelling aircraft in mid-ocean, said cellular refuelling system comprising

at least two floating refuelling stations spaced at substantially equal distances along a trans-oceanic flight path, each of the stations including

an at least partial spherical container hull forming a fuel tank,

means for propelling said container hull to maintain a constant defined geographic location without anchoring to the ocean floor,

at least one runway supported by said container hull for take off and landing of aircraft,

ballast located greater than twenty meters below sea level and above the ocean floor for stabilizing a top of said container hull, and

means for maneuvering said container hull so that said runway may be oriented with respect to the direction of the wind.

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5,839,694
LUGGAGE COMPARTMENT SYSTEM ESPECIALLY FOR A PASSENGER AIRCRAFT

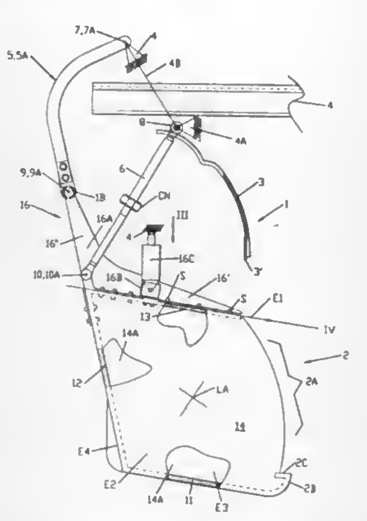
Olaf Bargull, Berlin, and Bernd Roessner, Rosengarten, both of Germany, assignors to Daimler-Benz Aerospace Airbus GmbH, Hamburg, Germany

Filed Dec. 12, 1996, Ser. No. 763,532

Claims priority, application Germany, Dec. 12, 1995, 195 46 302.1

Int. Cl.⁶ B64D *11/00*

U.S. Cl. 244—118.1 **12 Claims**



1. A luggage compartment system comprising a fixed ceiling support structure (**4**) in an aircraft, said system further comprising a plurality of luggage compartment shells (**2**) for holding luggage, each of said shells including a bottom wall (**11**), a rear wall (**12**), a top surface (**13**), and an open front (**2A**), said shells further including a common longitudinal axis (LA), each of said two end walls (**14**, **14A**) extending substantially perpendicularly to said longitudinal axis, said top surface (**13**) of each shell defining a first reference plane (E1), said end walls (**14**, **14A**) defining second and third reference planes (E2, E3), said system further comprising a lifting and lowering mechanism including at least one four-bar linkage with four journals (**7**, **8**, **9**, **10**) for each of said shells (**2**), said four journals pivoting said four-bar linkage to said fixed support structure (**4**) and to its respective shell (**2**) of said plurality of shells, at least three of said four journals being positioned above said first reference plane (E1) of each shell and one of said four journals being positioned so that space axially outside said second and third reference planes is free of any of said four journals, whereby neighboring shells substantially abut each other in a direction of said longitudinal axis (LA).

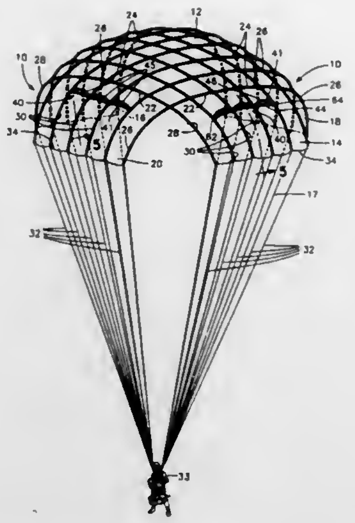
5,839,695
CRUCIFORM PARACHUTE DESIGN

Elek Puskas, Mt. Holly, N.J., assignor to Para-Flite, Inc., Pennsauken, N.J.

Filed May 20, 1996, Ser. No. 650,946

Int. Cl.⁶ B64D *17/02*

U.S. Cl. 244—145 **20 Claims**



1. A canopy for a cruciform parachute comprising a generally square central section and four lateral arms attached thereto and extending therefrom; said central section and said arms both made from a zero or near zero porosity fabric and said arms having a length less than 75% of the width of the generally square central section; said arms each having an unobstructed opening in the upper portion thereof inwardly of its edges for venting air outwardly and downwardly from underneath said canopy.

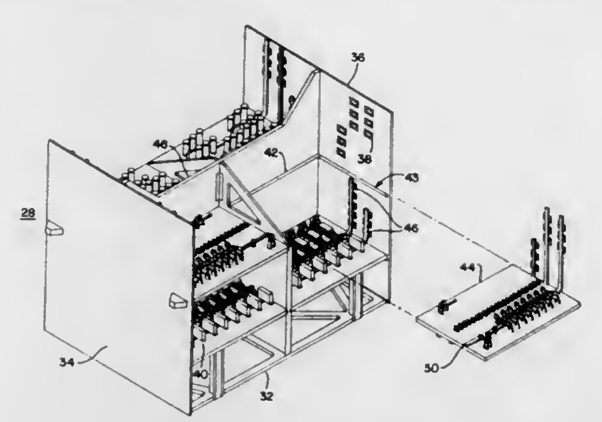
5,839,696
MODULAR PAYLOAD ARRANGEMENT

Glenn Caplin, Manhattan Beach; James W. Schultz, El Segundo; Romeo Santos, Jr., Los Angeles, and Gary M. York, Gardena, all of Calif., assignors to Hughes Electronics Corporation, Los Angeles, Calif.

Filed Dec. 22, 1995, Ser. No. 577,437

Int. Cl.⁶ B64G *1/22;* **B64C** *1/06*

U.S. Cl. 244—159 **10 Claims**



1. A modular spacecraft structure, comprising:
a payload structure having a mechanical interface;
radiator panel having a thermal interface;
a shelf adapted to detachably attach to the payload structure at the mechanical interface, the shelf is adapted to have a heat-generating hardware mounted thereon; and
a heat pipe mounted on the shelf and adapted to detachably, thermally connect the heat-generating hardware to the payload structure and to detachably thermally connect to the thermal interface when the shelf is mechanically attached to the payload structure.

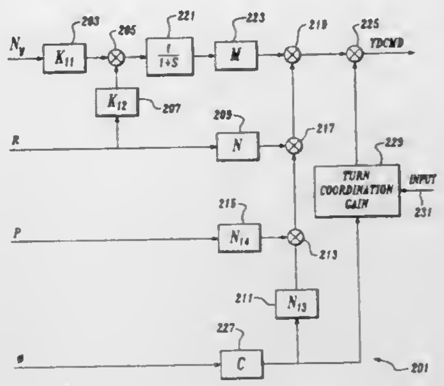
5,839,697
METHOD AND APPARATUS FOR TURN COORDINATION GAIN AS A FUNCTION OF FLAP POSITION

Chuong B. Tran, Lynnwood, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 14, 1996, Ser. No. 645,616

Int. Cl.⁶ G05D *1/08*

U.S. Cl. 244—195 **7 Claims**



1. A method of setting the turn coordination gain for the yaw damper of an aircraft during a turn, the method comprising the steps of:
- (a) referring to a turn coordination gain schedule, said turn coordination gain schedule correlating a plurality of turn coordination gains only with a plurality of flap position settings;
- (b) determining the flap position setting of said aircraft during said turn;
- (c) determining a preferred turn coordination gain as the turn coordination gain correlating to said flap position setting; and
- (d) setting the turn coordination gain for the yaw damper to said preferred turn coordination gain.

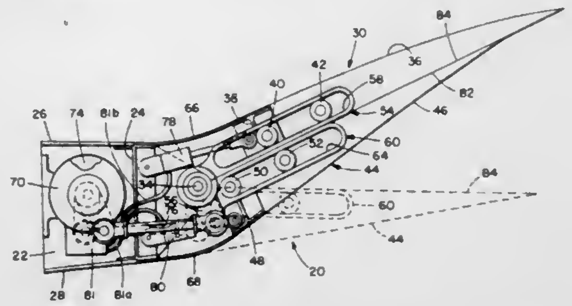
5,839,698
CONTROL SURFACE CONTINUOUS SEAL

Joseph C. Moppert, Torrence, Calif., assignor to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Oct. 23, 1997, Ser. No. 958,717

Int. Cl.⁶ B64C *9/06*

U.S. Cl. 244—217 **11 Claims**



10. A continuous skin and seal airfoil comprising:
a rigid structural wing box located centrally chordwise and extending spanwise and including a spanwise extending spar, an upper skin surface and a lower skin surface;
an upper control surface pivotally mounted on said spar for movement about a spanwise extending axis between an elevated position and a lowered position, said upper control surface including an upper skin surface;
a lower control surface pivotally mounted on said wing box for movement about a spanwise extending axis between an elevated position and a lowered position, said lower control surface including a lower skin surface;
an upper seal member extending spanwise and between and fixed to said wing box and to said upper control surface, respectively, so as to be substantially coplanar with said upper skin surfaces thereof;
a lower seal member extending spanwise and between and fixed to said wing box and to said lower control surface, respectively, so as to be substantially coplanar with said lower skin surfaces thereof;
actuating means for moving said upper control surface and said lower control surface, respectively, between an elevated position and a lowered position;
positioner means for maintaining said upper and lower seals in a substantially zero tension state as said upper and lower control surfaces are moved by said upper and lower control surface actuators, respectively, between the elevated and the lowered positions.

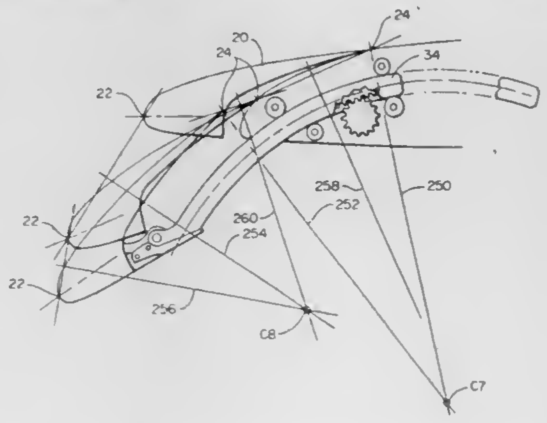
5,839,699
LEADING EDGE SLAT/WING COMBINATION

Wayne T. Bliesner, 22521 - 138th Ave. SE., Snohomish, Wash. 98290

Continuation of Ser. No. 150,374, Nov. 10, 1993, Pat. No. 5,544,847. This application Aug. 12, 1996, Ser. No. 695,614

Int. Cl.⁶ B64C *3/44;3/55*

U.S. Cl. 244—214 **1 Claim**



1. A method of designing and manufacturing a slat/fixed wing combination comprising:
- a. providing a slat/fixed wing combination design comprising:
  - i. a fixed wing having a leading edge portion, an upper surface comprising a concealed forward nose and upper surface portion, and a main upper surface portion located rearwardly of the concealed forward nose and upper surface portion, and also a lower surface;
  - ii. a slat having a leading edge, a trailing edge, and a forward and upper surface portion extending from said leading edge to said trailing edge, said slat being mounted to said leading edge portion of the fixed wing in a manner to be movable between three positions, namely:
    - 1) a fist cruise position where the slat is immediately adjacent to the fixed wing leading edge portion to conceal said concealed forward and upper surface portion;
    - 2) a second intermediate take-off/climb position where the slat is located forwardly of the cruise position, and the trailing edge of the slat is adjacent to said forward and upper concealed surface portion; and
    - 3) a third high lift position where the slat is moved forwardly and downwardly from the second position with the trailing edge of the slat forming an aerodynamic gap with the leading edge portion of the fixed wing;
  - iii. said fixed wing having a fixed wing outer contour envelope contained within said upper and lower surfaces of said fixed wing;
  - iv. a slat actuating mechanism comprising a substantially circularly curved carrier track means having a forward end

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to which the slat is mounted with a substantially fixed angular orientation relative to said track means, said track means having an arcuate lengthwise track axis extending in a substantially circular curve along said track means, said track means being mounted for movement along said track axis from a rear cruise position where the flap is positioned in the first cruise position, to an intermediate track position where the slat is positioned in said second intermediate position, and a forward high lift position where the slat is located in said third high lift position;

v. said track means having a track structural and operating envelope having a maximum width dimension generally perpendicular to said lengthwise track axis and a maximum length dimension extending along said lengthwise track axis, said track means being arranged relative to said outer surface contour envelope of said fixed wing in a manner that in the cruise position the track structural envelope is positioned substantially entirely within the outer surface contour envelope of the fixed wing;

b. defining for said concealed forward nose and upper surface portion a design tolerance envelope within which said concealed forward and upper surface portion can be positioned and contoured for proper performance;

c. defining for each of the leading edge and trailing edge of said slat design tolerance envelopes in which the leading edge and trailing edge of the slat can be positioned in the first, second and third positions of the slat;

d. defining a position of said carrier track means so that a center of curvature of the track axis is at a center location area and the track structural and operating envelope is located within the fixed wing outer contour envelope;

e. defining a position of said slat go that in being moved by the carrier track means from the first to the second and to the third slat positions, both the leading edge and the trailing edge of the slat are within their respective design tolerance envelopes at the first, second and third positions, and the arcs defined by the paths of travel of the leading edge and trailing edge of the slat have centers of rotation within the center location area and coincident with the center of the track axis;

f. defining the contours of the forward nose and upper concealed surface portion of the fixed wing within its design tolerance envelope in a manner to provide proper aerodynamic performance of said slat/fixed wing combination with said slat in said first, second and third positions;

g. positioning said carrier track means in a manner that a center of curvature of the track axis is at a center location area and the track structural and operating envelope is located within the fixed wing outer contour envelope;

h. positioning said slat so that in being moved by the carrier track means from the first to the second and to the third slat positions, both the leading edge and the trailing edge of the slat are within their respective design tolerance envelopes at the first, second and third positions, and the arcs defined by the paths of travel of the leading edge and trailing edge of the slat have centers of rotation within the center location area and coincident with the center of the track axis; and

i. contouring the forward nose and upper concealed surface portion of the fixed wing within its design tolerance envelope in a manner to provide proper aerodynamic performance of said slat/fixed wing combination with said slat in said first, second and third positions.

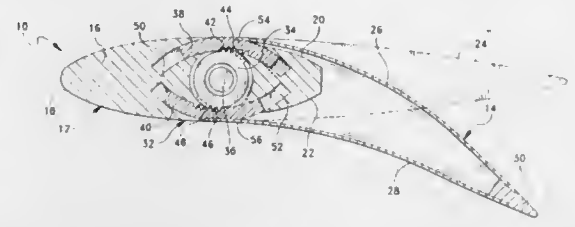
5,839,700
ARTICULATED FIN

William H. Nedderman, Jr., Middletown, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 3, 1996, Ser. No. 668,605
Int. Cl.^{6} B64C *3/48*
U.S. Cl. 244—219 11 Claims

1. An articulated fin comprising:

a nose section having a forwardly positioned nose block;



a tail section movably attached to the nose section and extending rearwardly therefrom, said tail section having an upper flexible control surface and a lower flexible control surface; and

means for applying compressive and tensile forces on the upper and lower flexible control surfaces, said compressive and tensile force applying means bending the tail section upwardly upon applying a tensile force on the upper flexible control surface and a compressive force on the lower flexible control surface, and bending the tail section downwardly upon applying a compressive force on the upper flexible control surface and a tensile force on the lower flexible control surface, said compressive and tensile force applying means comprises a gear means movable with respect to and mounted on the nose block for applying the compressive and tensile forces on the upper and lower flexible control surfaces;

wherein said gear means comprises:

an actuating gear extending transversely with respect to the direction of the articulated fin; and

a pair of oppositely positioned upper and lower gear segments slidably attached to the nose block, said upper and lower gear segments each having teeth formed on their inwardly facing surface, said teeth being in meshed relationship with teeth formed on the actuating gear, said upper flexible control surface being attached to the upper gear segment at its forward end, and said lower flexible control surface being attached to the lower gear segment at its forward end, said actuating gear, when driven in a clockwise direction, moving said upper and lower gear segments clockwise for moving said tail section downwardly, and, when driven in a counterclockwise direction, moving said upper and lower gear segments counterclockwise for moving said tail section upwardly.

5,839,701

Patent Not Issued For This Number

5,839,702
FLEXIBLE CABLE MANAGEMENT SYSTEM

Roger Jette, 17 Prospect St., Babylon, N.Y. 11702

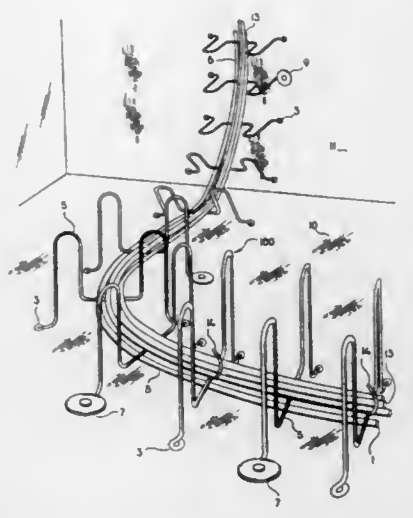
Filed Apr. 25, 1996, Ser. No. 637,390
Int. Cl.^{6} F16L *3/22*
U.S. Cl. 248—49 24 Claims

1. A modular cable support system, which comprises:

a series of support sections, each support section including an elongate flexible spine member, and a plurality of support members attached to the elongate flexible spine member along the length thereof, the plurality of support members positioned relative one another to permit substantial bending by hand of the elongate flexible spine member in either a vertical or horizontal direction;

at least some of the plurality of support members defining a partially enclosed area having a bottom surface disposed below an opening configured and dimensioned to receive a plurality of cables therein;

a plurality of extended portions directed away from the opening and terminating at a point below the bottom surface of the partially enclosed area to facilitate positioning the cable support system a distance away from a surface upon which the cable support system may be positioned; and

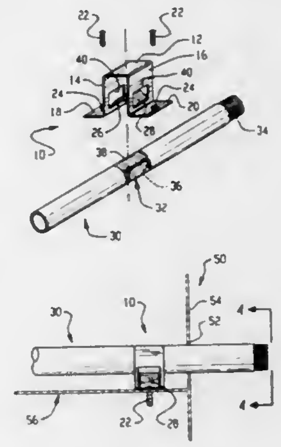


means for connecting the series of support sections.

5,839,703
ANTI-ROTATION BRACKET

Robert D. Tesar, Independence, Ohio, assignor to Perfection Corporation, Madison, Ohio

Filed Feb. 27, 1997, Ser. No. 807,670
Int. Cl.^{6} F16L *3/08*
U.S. Cl. 248—65 14 Claims



1. A bracket for preventing rotation of a pipe in an appliance, the bracket comprising:

a U-shaped member having a base, a first leg, and a second leg, the first and second legs having substantially equal lengths, and the first and second legs adapted to be spaced to receive therebetween a rectangular section of a pipe;

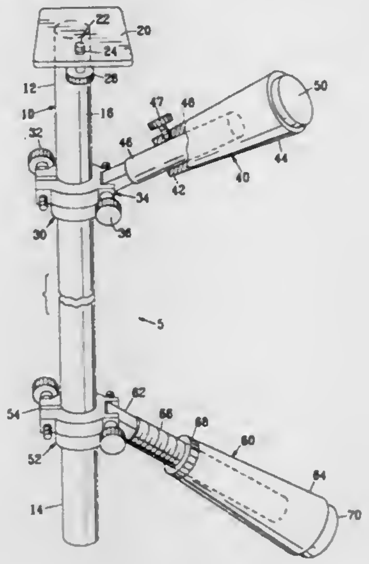
an attachment mechanism for securing the U-shaped member to the appliance, the attachment mechanism including a friction fit member which is attached to an end of the U-shaped member and is adapted to be configured to fit in a non-rotatable friction fit into an opening in a rear panel of the appliance, the friction fit member having a passage therethrough which is aligned with a space between the first and second legs such that a pipe may extend through the passage in the friction fit member and through the space between the first and second legs; and,

at least one clip extending from each of the first and second legs inward towards an opposite one of the first and second legs, the at least one clip of each of the first and second legs configured to engage the pipe and to prevent rotation of the rectangular section of the pipe with respect to the bracket, the clips on the first and second legs being formed by a U-shaped cut in the first and second legs and bending a portion in the center of the U-shaped cut inward towards an opposite one of the first and second legs.

5,839,704
CAMERA SUPPORT DEVICE

Morris Appleman, 4563 Deselis, Encino, Calif. 91316

Filed Jul. 24, 1997, Ser. No. 899,540
Int. Cl.^{6} F16M *11/04*
U.S. Cl. 248—178.1 20 Claims



1. A camera mount device comprising:

A. a vertical rod having a top end, an opposing bottom end and a length;

B. a camera platform attached to the top end of said vertical rod, said camera platform having a means for securing a photographic camera or similar device on to said camera platform;

C. a vertically positionable bracket slidably mounted to said vertical rod between the top end and bottom end of said vertical rod such that said bracket may be positioned along the length of said vertical rod and rotated laterally about said vertical rod, said bracket having a means for locking said bracket in place along said vertical rod;

D. an upper support arm having a first end, an opposing second end, a length and a longitudinal axis;

E. an upper pad mounted to the second end of said upper support arm; and

F. a means for attaching the first end of said upper support arm to said vertically positionable bracket.

G. a lower support arm having a first end, an opposing second end, a longitudinal axis, and a length, said lower support arm being slidably mounted at its first end to said vertical rod between said vertically positionable bracket and said bottom end of said vertical rod;

H. a means for locking said lower support arm in a fixed position along said vertical rod; and

I. a lower pad mounted to the second end of said lower support arm.

5,839,705
COLLAPSIBLE DISPLAY SYSTEM

Lester A. LaMotte, Burnsville, Minn., assignor to Xtra Lite Display Systems, Inc., Burnsville, Minn.

Filed Oct. 28, 1996, Ser. No. 738,876
Int. Cl.^{6} F16M *11/24*
U.S. Cl. 248—165 15 Claims

1. A readily assembled knock-down, self-supporting display stand for exhibiting display devices including banners and photo murals comprising:

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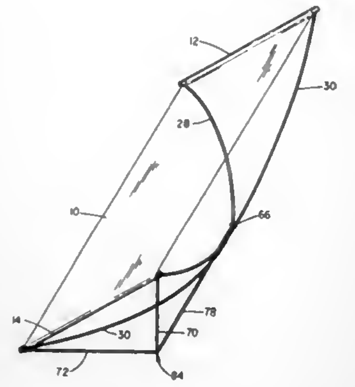
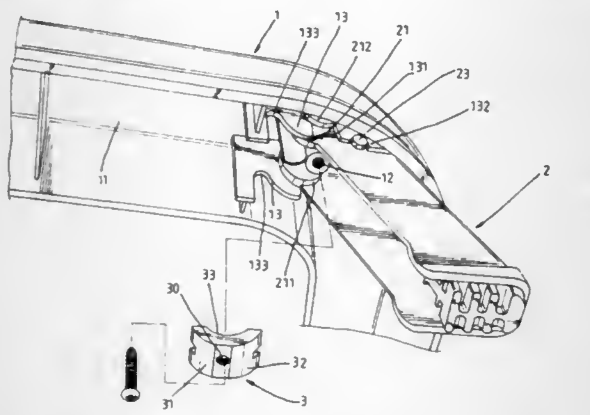


- (a) a pair of hollow mounting tubes comprising upper and lower mounting tubes for carrying opposite ends of a display device and having an internal diameter;
- (b) a pair of elongate flexible hollow strut members for connecting to and spacing said pair of hollow mounting tubes and thereby adapted to maintain a display device carried therebetween in tension, said strut members designed to cross behind said display device forming an X pattern;
- (c) a stand base comprising said lower mounting tube and a pair of hollow base tube members, each of the hollow base tube members having a first end designed to be connected to one end of said lower mounting tube and having a second end;
- (d) elongate, adjustable, hollow stabilizing tube member having an upper end connected near the crossing point of the strut members and a lower end connected to the second end of said base tube members; and
- (e) retaining strap extending about the junction of said pair of strut members and connected with the upper end of said stabilizing tube member.

5,839,706
FOLDING COLLAPSIBLE STAND MOUNTING STRUCTURE FOR A BABY WALKER

Kun-Hei Liu, 2F., No. 32, Lane 200, Tung Hwa Street, Taipei, Taiwan

Filed Jul. 16, 1997, Ser. No. 895,478
Int. Cl.^{6} F16M ***11/16; 11/42***
U.S. Cl. 248—188 **1 Claim**



1. A folding collapsible stand mounting structure comprising:

a base frame having a bottom chamber, a pair of parallel locating plates suspending in said bottom chamber, and a downward screw tube suspending in said bottom chamber between said locating plates, said locating plates having a respective first locating notch, a respective second locating notch, and a respective downwardly extended coupling hole spaced between the respective first locating notch and the respective second locating notch;

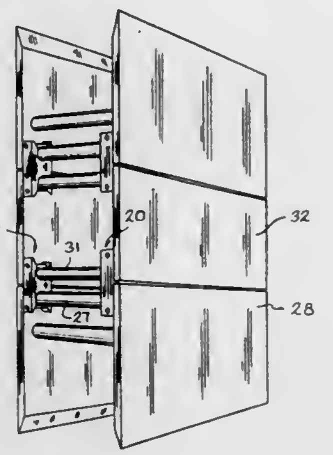
an arched locating block fixedly fastened to said base frame between said parallel locating plates, said arched locating block comprising, a screw hole in the middle connected to said screw tube of said base frame, and an inside wall portion smoothly curved inwards; and

a stand pivoted to said base frame and turned between a first position in which said stand is received within said bottom chamber of said base frame, and a second position in which said stand is extended out of said base frame outside said bottom chamber, said stand comprising a coupling head of substantially U-shaped cross section pivoted to said parallel locating plates of said base frame, two headed pivots raised from two opposite sides of said coupling head and respectively coupled to the coupling holes of said parallel locating plates, two locating rods bilaterally raised from said coupling head, and two circular blocks bilaterally raised from said coupling head on the inside and disposed in contact with the inside wall portion of said arched locating block, said locating rods of said stand being forced into engagement with said first locating notches of said parallel locating plates when said stand is turned to said second position, said locating rods of said stand being forced into engagement with said second locating notches of said parallel locating plates when said stand is turned to said first postion.

5,839,707
TRENCH SHIELD STACKING DEVICE

Luther Bradford Barringer, Richfield, N.C., assignor to Efficiency Production, Inc., Mason, Mich.

Filed Mar. 22, 1996, Ser. No. 621,125
Int. Cl.^{6} A47B ***96/06***
U.S. Cl. 248—214 **2 Claims**

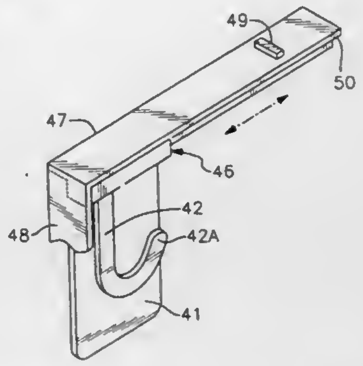


1. In a trench shield stacking bracket adapted to safely, quickly and easily facilitate the stacking of trench shields having an upper edge comprising:

- (a) an elongate hollow body frame, said body frame defining a pair of spaced apart trench shield spreader bar engaging walls having upper and lower portions, said trench shield spreader bar engaging walls defining upwardly opening trench shield spreader bar engaging slots in the upper portions thereof, said trench shield spreader bar engaging walls defining downwardly opening trench shield spreader bar engaging slots in the lower portions thereof in opposed spaced-apart register with said upwardly opening trench shield spreader bar engaging slots;
- (b) means to selectively retain trench shield spreader bars selectively positioned within said slots during trench shield stacking operations; and
- (c) stabilizer plate means provided on one of said trench shield spreader bar engaging walls, said stabilizer plate means extending outwardly from said wall intermediate said upper and lower spreader bar engaging slots so as being adapted to selectively engage the upper edge of a trench shield wall.

5,839,708
HOLDER FOR EYEGLASSES

Eugene Seach, 2379 Henn-Hyde Rd., NE., Warren, Ohio 44484
Continuation-in-part of Ser. No. 445,224, May 18, 1995, Pat. No. 5,699,990. This application Oct. 14, 1997, Ser. No. 949,852
Int. Cl.^{6} A47F ***5/00***
U.S. Cl. 248—309.1 **2 Claims**

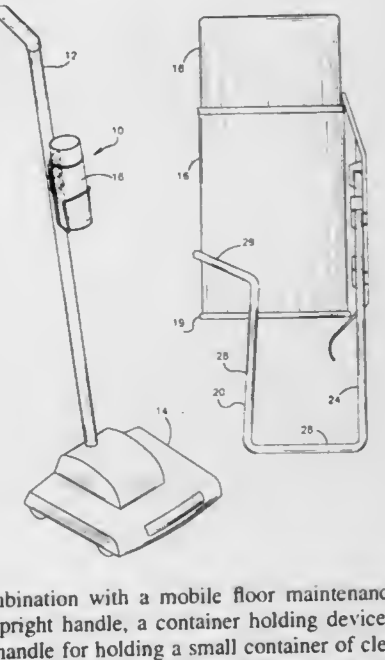


1. An eyeglass holder for supporting a pair of eyeglasses in a removably secured relation thereto, comprising, a generally rectangular substantial rigid planar backing plate member, an eyeglass engagement bracket pivotally extending from said backing plate, means for resiliently urging said engagement bracket against said backing plate, said eyeglass engagement bracket having an angular offset end portion for initial engagement with said eyeglasses, an elongated T-shaped support element having a cover plate extending therefrom and intersecting said eyeglass holder for mounting said eyeglass holder in suspended relation to a mounting surface, said eyeglass engagement bracket and said backing bracket for surrounding an ear piece of said pair of eyeglasses.

5,839,709
HOLDING DEVICE FOR CONTAINERS OF MAINTENANCE FLUIDS IN ATTACHMENT WITH AN UPRIGHT HANDLE OF A MOBILE FLOOR MAINTENANCE APPARATUS

John R. Leonard, 2745 Gibson Dr., Rocky River, Ohio 44116

Filed Apr. 14, 1997, Ser. No. 839,451
Int. Cl.^{6} A47K ***1/08***
U.S. Cl. 248—311.2 **6 Claims**



1. In combination with a mobile floor maintenance apparatus having an upright handle, a container holding device attached to the upright handle for holding a small container of cleaning maintenance material, where the container holding device comprises:

a vertically orientated molded plastic body structure having an inward surface engaging the upright handle, the body structure adapted to be secured to the upright handle and having attachment means for locking the holding device to the upright handle of the maintenance apparatus;

the body structure supporting an outwardly disposed formed support means extrusion holder for supporting the fluids container in an upright direction, the formed support means being a particularly formed extrusion member having upper opposed distal ends secured to the body structure, each distal end having a top bend forming a downwardly depending vertical member, the two downwardly depending vertical members being laterally spaced and each in locking engagement with the body structure, each downwardly depending vertical member having an inner bottom bend forming an outwardly directed bottom horizontal member adapted to support the bottom of the fluids container, each horizontal member having an outer bottom bend forming an outer upright member disposed vertically and adapted to engage the outer vertical walls of the fluids container, where each outer upright member has an outer upper bend forming a common transverse arcuate member interconnecting with each outer upright member to form a formed support means, where the transverse arcuate member is adapted to engage the upper part of the fluids container disposed within the formed support means;

the body structure having an upwardly extending, outwardly orientated impinging member for engaging the upper portion of the fluids container held within the extrusion holder, and a lower downwardly depending, outwardly directed, lower impinging member sufficiently resilient to retract inwardly to secure by friction engagement the lower part of the fluids container within the extrusion holder, where the upper impinging member and the lower impinging member maintain the fluid container in an upright direction secured within the formed support means in use and permit insertion and removal of the fluids container; and

where the body structure of the holding device contains locking means securing the laterally spaced downwardly depending vertical members of the extrusion support means to the body structure, where the locking means comprises a first molded locking means for securing one of the depending vertical members and a second molded locking means for securing the other depending vertical member, where the first and second molded locking means each comprises an upper lock and a lower lock, where the upper lock and the lower lock are laterally opposed to lock engage the respective depending vertical member between the laterally opposed upper and lower locks, where each upper lock is L shaped and each lower lock is L shaped, and each L shaped lock structure securely engages the respective depending vertical member by friction engagement between the laterally opposed upper and lower L shaped structures.

5,839,710
CONCEALABLE VARIABLE SIZE VEHICLE CONTAINER HOLDER WITH FLEXIBLE BAND

Gary Lee Hubbard, Sterling Heights, Mich., assignor to Ford Global Technologies, Inc., Dearborn, Mich.

Filed May 5, 1997, Ser. No. 851,395
Int. Cl.^{6} A47K ***1/08***
U.S. Cl. 248—311.2 **17 Claims**

1. A variable size container holder concealable within a cavity in an automotive vehicle, comprising:

a tray movable between a retracted position retracted into the cavity and an extended position extending from the cavity;

at least one container receiving portion adjacent an edge of the tray; and

a flexible band mounted for movement, when the tray is in the extended position, between a taut position substantially flush with the edge of the tray and a container holder position drawn laterally away from the container receiving portion, the

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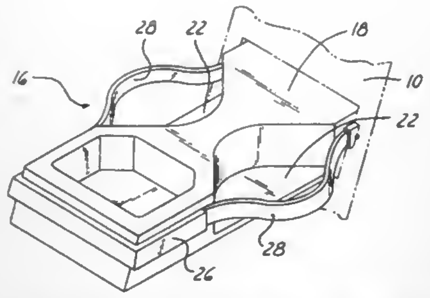


band comprising a substantially flat metal band having a rubber coating therearound for gripping a vertically extending surface of a container so as to bias the container in place within the container receiving portion.

5,839,711
HOLDER FOR BEVERAGE CONTAINER

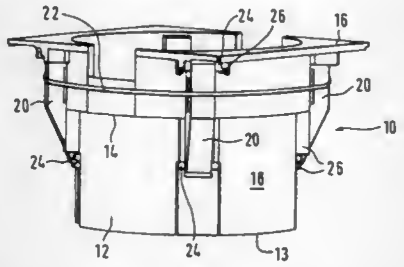
Torsten Bieck; Christiane Ziegler, both of Waldachtal; Rüdiger Widulle, München, and Carsten Lange, Wolnzach, all of Germany, assignors to Fischerwerke, Artur Fischer GmbH & Co. KG, Waldachtal, Germany

Filed Apr. 9, 1997, Ser. No. 831,618

Claims priority, application Germany, Apr. 11, 1996, 296 06 583 U

Int. Cl.^{6} A47K *1/08*

U.S. Cl. 248—313 **7 Claims**



1. A holder for a beverage container, comprising a body having a container receptacle for receiving a beverage container; at least one holding jaw; a spring element pressing said at least one holding jaw into said container receptacle, said at least one holding jaw having a supporting surface; and pivoting and linear bearing means attaching said holding jaw to said body, said spring element being formed as an open circular ring which engages around said container receptacle.

5,839,712
PEN HOLDER FOR VERTICAL AND HORIZONTAL HOLD

Chin-Chi Wang, 35-4, Lu Ti Street, Pan Chiao City, Taipei Hsien, Taiwan

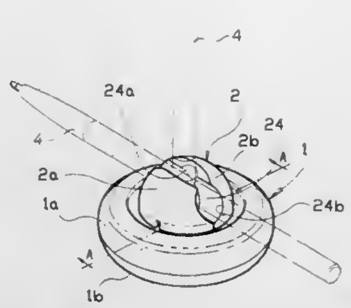
Filed Apr. 3, 1997, Ser. No. 825,745

Int. Cl.^{6} A47F *7/00*

U.S. Cl. 248—316.2 **8 Claims**

1. A pen holder for holding a pen vertically or horizontally, comprising:

a base, including
  an upper part, shaped like a circular pan turned upside down, having a concentric hole and a periphery, and
  a lower part, shaped like a circular pan, with a bottom and a periphery, with a hollow, concentric shaft extending upwards from said bottom, said shaft having a top side, which is open, said lower part having a plurality of upward extending radial ribs on said bottom, said periphery of said upper part being attached to said periphery of said lower part;



an insertion part, vertically rotatably mounted on said base, said insertion part being made of two halves, each of said halves further comprising
  a half plate with an upper side and a horizontal longitudinal axis, and
  a quarter ball, attached to said upper side of said half plate, with a polar axis parallel to said longitudinal axis and a concave side opposite thereto,
  wherein said longitudinal axes of said two halves coincide and wherein said two halves both have guiding parts for gliding against each other along said longitudinal axes and are oriented in a way that said concave sides of quarter balls face each other; and
two springs, each of said two springs mounted on one of said halves, pressing against said periphery of said lower part, such that said two halves of said insertion part are pressed together, leaning against each other.

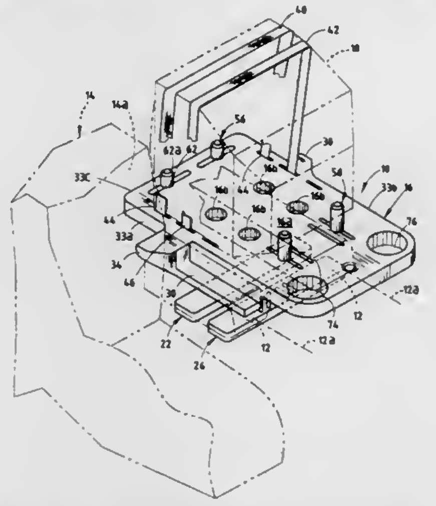
5,839,713
SUPPORT FOR ENTERTAINMENT EQUIPMENT

Carroll Wright, 3605 Chamberlain, SE., Grand Rapids, Mich. 49508

Filed Dec. 5, 1997, Ser. No. 985,459

Int. Cl.^{6} A47B *91/00*

U.S. Cl. 248—346.01 **20 Claims**



1. A support for securing entertainment equipment to a fixed member, the fixed member including a longitudinal extent and a vertical extent, said support comprising:

a base member having a support surface for supporting entertainment equipment thereon, the base member including adjustable restraint or at least vertically coupling said base member to the fixed member, a lateral restraint for restraining the lateral movement of said base member along the longitudinal extent of the fixed member, and a moment restraint for restraining said base member from overturning on the fixed member, said adjustable restraint including a transverse member for extending under the longitudinal extent of the fixed member and at least one connecting member adjustably and releasably securing said transverse member to said base member; and

at least one restraining device for securing the entertainment equipment to said base member.

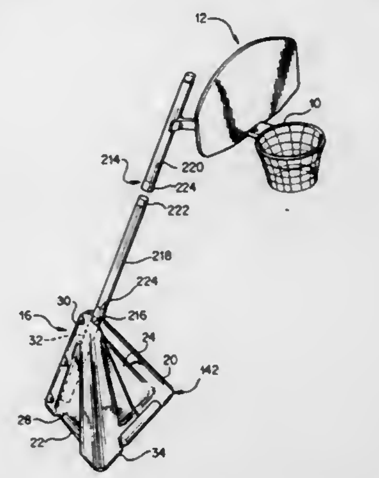
5,839,714
BASKETBALL BACKBOARD SUPPORT ASSEMBLY

James N. Fitzsimmons, Waukesha; David A. Allen, Pewaukee; Randy R. Schickert, Kewaskum, and Michael A. Niver, Waukesha, all of Wis., assignors to Huffy Corporation, Miamisburg, Ohio

Continuation of Ser. No. 56,664, May 3, 1993, abandoned, which is a continuation-in-part of Ser. No. 721,187, Jun. 26, 1991, Pat. No. 5,207,407. This application Nov. 22, 1995, Ser. No. 612,636

Int. Cl.^{6} F16M *13/00*

U.S. Cl. 248—519 **41 Claims**



1. A basketball assembly comprising, in combination,

a base having a plurality of generally vertical side walls and a base face extending between said sidewalls, and said base face and one of said side walls defining a forward edge, said base also including a ballast receiving portion,
a pole having spaced apart ends, and
means for supporting one end of said pole on said base with said pole extending at an angle to the vertical in overlapping relationship with said base face and with the other end extending over and beyond said forward edge.

5,839,715
MEDICAL ADAPTER HAVING NEEDLELESS VALVE AND SHARPENED CANNULA

Karl R. Leinsing, Raleigh, N.C., assignor to Alaris Medical Systems, Inc., San Diego, Calif.

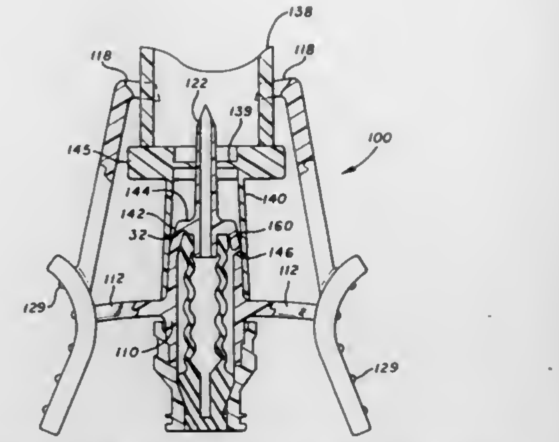
Continuation-in-part of Ser. No. 705,061, Aug. 29, 1996, Pat. No. 5,676,346, which is a continuation of Ser. No. 442,025, May 16, 1995, abandoned. This application Feb. 2, 1997, Ser. No. 794,404

Int. Cl.^{6} F16K *37/28*

U.S. Cl. 251—149.1 **40 Claims**

1. A medical adapter for interconnecting a pierceable site with a male fluid connector, comprising:

a body having a first end and a second end;
a sealed needleless site located at the first end of the body, having a fluid flow port for receiving the male fluid connector;



a sharpened cannula located at the second end of the body, the cannula having a sharpened tip;
an internal fluid channel interconnecting the fluid flow port of the needleless site with the sharpened cannula so that fluid may flow between the two;
a first clip arm mounted to the body, the first clip arm extending to the tip of the sharpened cannula and having a distal end;
a claw at the distal end of the first clip arm facing in the direction of the sharpened cannula, the arm and the claw protecting the sharpened tip; and
a handle mounted to the first clip arm such that applying sufficient force to the handle will cause the claw of the first clip arm to move away from the sharpened cannula tip.

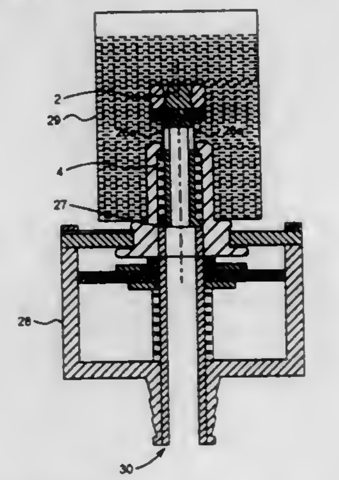
5,839,716
DEVICE FOR TRANSFERRING LIQUID UNDER SIMPLE OR ACCELERATED GRAVITY BY MEANS OF A VALVE

Didier Marrel, Vaugneray, France, assignor to VRM France, France

Filed May 16, 1997, Ser. No. 857,336

Int. Cl.^{6} F16L *37/28*

U.S. Cl. 251—149.6 **1 Claim**



1. A device for transferring liquid under simple or accelerated gravity from a container comprising

a tubular stopper having an axial bore,
said tubular stopper having at a front end an external thread matching a size of a tapped drain hole of said container;
a normally closed check valve having at least one lateral orifice and a return spring, said check valve being received in the axial bore of said tubular stopper so that the lateral orifice of said check valve is within said axial bore during a closed position;
said check valve having a head with a complementary extension at one end and an external flange at an opposite end.

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an inner face of the external flange of said check valve retaining said return spring against an inner flange of the tubular stopper and an outer face of said external flange capable of receiving a tube thrust into the bottom end of said tubular stopper to open said check valve; and

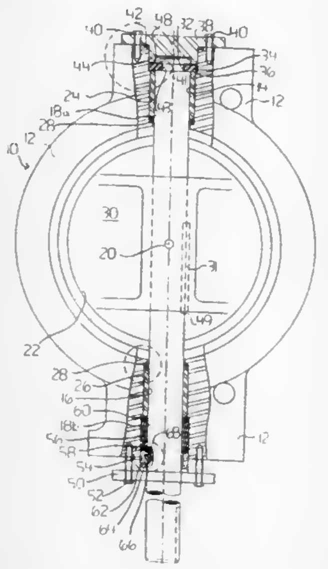
axial linking means comprising an annular groove on a neck of said check valve to receive a matching-sized annular gasket; and

a semi-rigid tubular member, complementary in shape to the head of said check valve, wherein said semi-rigid tubular member is engaged in and snapped over the complementary extension of the head of said check valve so that said annular gasket is firmly retained against a seat of the front end of said tubular stopper.

5,839,717
VALVE WITH IMPROVED SHAFT RETAINER

Kurt R. Feigel, 1227 - 110A St., Edmonton, Alberta, Canada, T6J 6N6

Filed Mar. 25, 1997, Ser. No. 823,166
Int. Cl.^{6} F16K *1/22*
U.S. Cl. 251—305 9 Claims



1. A butterfly valve, comprising:

a valve body having first and second opposed coaxial transverse bores for receiving a shaft and a longitudinal flow passageway extending through the valve body;

a shaft mounted in the first and second transverse bores, the shaft having first and second ends, the first end being journalled in the first transverse bore and the second end being journalled in the second transverse bore;

a disc mounted on the shaft across the longitudinal flow passageway, whereby rotation of the disc opens and closes the longitudinal flow passageway;

a groove extending around the shaft at the first end of the shaft;

a ring mounted coaxially within the first transverse bore and secured against axial movement by first means limiting inward axial movement and second means limiting outward axial movement, the ring extending radially inward into the groove; and

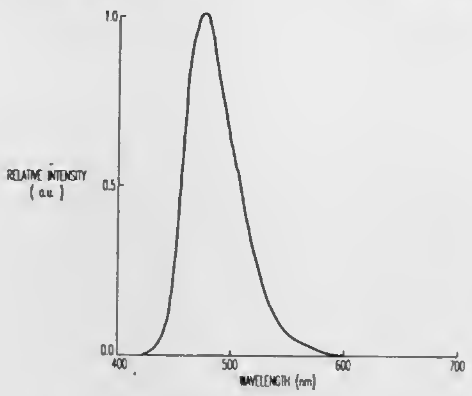
the ring being axially thinner than the groove is axially wide to provide play for the ring in the groove;

whereby play between the shaft and the valve body is accommodated by play between the ring and shaft and not between the ring and the valve body.

5,839,718
LONG PERSISTENT PHOSPHORESCENCE PHOSPHOR

Takashi Hase, Succasunna; Susumu Omatoi, Morris Township, both of N.J., and Takao Ouchi, Ninomiya-machi, Japan, assignors to USR Optonix Inc., Hackettstown, N.J., and Kasei Optonix, Ltd., Odawara, Japan

Filed Jul. 22, 1997, Ser. No. 898,424
Int. Cl.^{6} C09K *11/59;11/66;11/06*
U.S. Cl. 252—301.4 F 19 Claims



1. A long persistent phosphorescence phosphor comprising:

i) a europium-activated long persistent phosphorescence silicate phosphor of the formula (I),

$$m(Sr_{1-a}M^1_a)O\cdot n(Mg_{1-b}M^2_b)O\cdot 2(Si_{1-c}Ge_c)O_2: Eu_xLn_y \quad (I)$$

wherein M^1 is Ba, M^2 is at least one element selected from the group consisting of Be, Zn and Cd, Ln is at least one element selected from the group consisting of Sc, Y, La, Ce, Pr, Nd, Sm, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, B, Al, Ga, In, Tl, Sb, Bi, As, P, Sn, Pb, Ti, Zr, Hf, V, Nb, Ta, Mo, W, Cr and Mn, $m(Sr_{1-a}M^1_a)O\cdot n(Mg_{1-b}M^2_b)O\cdot 2(Si_{1-c}Ge_c)O_2$ being a host material for the phosphor, Eu serving as an activator, and Ln serving as a coactivator,

wherein
$0\leqq a\leqq 0.8$,
$0\leqq b\leqq 0.2$,
$0\leqq c\leqq 0.2$,
$1.5\leqq m\leqq 3.5$,
$0.5\leqq n\leqq 1.5$,
$1\times10^{-5}\leqq x\leqq 1\times10^{-1}$ (g·atm per mole of the host material),
$1\times10^{-5}\leqq y\leqq 1\times10^{-1}$ (g·atm per mole of the host material),

comprising at least one halogen atom selected from the group consisting of F, Cl, Br and I in an amount of $1\times10_{-5}$ to $1\times10_{-1}$ g·atm per mole of the host material; and

ii) an organic fluorescent pigment which is deposited on the surface of said europium-activated long persistent silicate phosphor.

5,839,719
PNEUMATIC STRUT FOR A MOTOR VEHICLE WITH AN ADJUSTABLE LIMIT POSITION

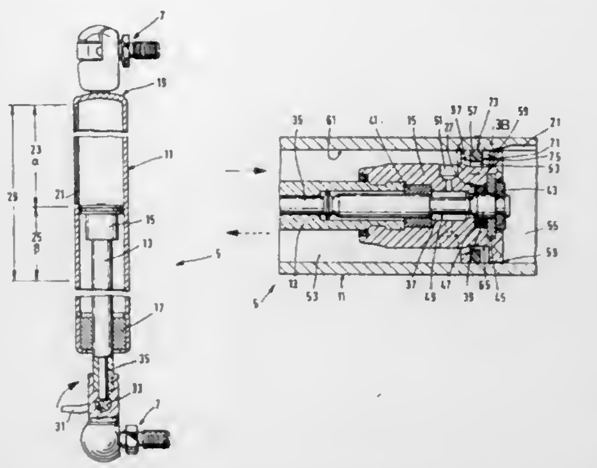
Hans-Josef Hosan, Neuwied; Castor Fuhrmann, Brachtendorf, and Hans-Klaus Schnitzius, Rheinbrohl, all of Germany, assignors to Stabilus GmbH, Koblenz, Germany

Filed Dec. 20, 1996, Ser. No. 777,703
Claims priority, application Germany, Dec. 21, 1995, 195 48 139.9
Int. Cl.^{6} F16F *9/44;9/02*
U.S. Cl. 267—64.12 19 Claims

1. A gas spring fastened rotationally to a vehicle body and fastened to a vehicle tailgate to be opened, whereby the gas spring acts as a lifting mechanism for an opening range of the tailgate, said gas spring comprising:

a cylinder comprising a gas charge under pressure;

the cylinder comprising a base on one end and a seal-guide unit on another end;



a piston rod being configured to be displaced axially;

the piston rod being positioned by the seal-guide unit concentric to the cylinder;

a piston being disposed on the piston rod to divide the cylinder into two working chambers;

the cylinder comprising a first segment and a second segment;

the opening range of the tailgate having a first opening angle range and a second opening angle range;

the piston rod being configured to be displaced axially in the first segment of the cylinder to move the vehicle tailgate in the first opening angle range;

the gas charge being configured to exert a thrust force on the piston rod cross section to displace the piston rod in the first segment of the cylinder;

the second opening angle range of the vehicle tailgate corresponding to movement of the vehicle tailgate beyond the first opening angle range;

the piston rod being configured to be displaced axially in the second segment of the cylinder to move the vehicle tailgate in the second opening angle range;

the piston comprising an arrangement to stop displacement of the piston rod in the second segment of the cylinder to stop the vehicle tailgate in any position in the second opening angle range;

a valve system to connect the two working chambers;

a bypass opening being configured to be active upon the piston rod being disposed in the first segment of the cylinder;

the valve system comprising a connecting channel with a directionally dependent pilot valve disposed between the two working chambers to permit flow from a first of the two working chambers to a second of the two working chambers and to limit flow from the second working chamber to the first working chamber;

the valve system comprising a piston valve;

the piston valve having an open position and a closed position;

the open position of the piston valve being configured to permit the piston rod to be displaced in the second segment of the cylinder to permit movement of the vehicle tailgate in the second opening angle range;

a valve tappet being disposed to move the piston valve into the open position; and

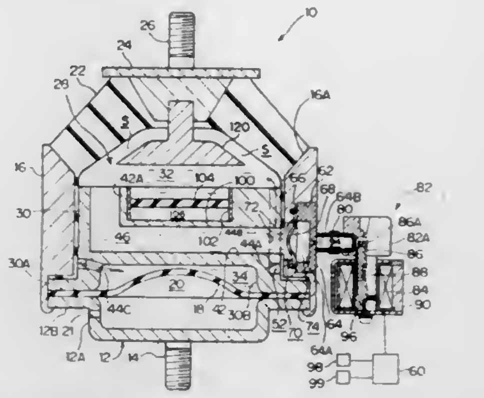
an external actuation mechanism to actuate the valve tappet to open the piston valve and to permit closing of the piston valve.

5,839,720
VIBRATION ISOLATING APPARATUS

Hiroshi Kojima, Yokohama, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Jul. 16, 1996, Ser. No. 680,848
Claims priority, application Japan, Jul. 19, 1995, 7-183059
Int. Cl.^{6} F16F *13/26;13/00;* B60K *5/12*
U.S. Cl. 267—140.14 15 Claims

1. A vibration isolating apparatus, comprising:



a first mounting member connected to one of a vibration generating portion and a vibration receiving portion;

a second mounting member connected to the other of the vibration generating-portion and the vibration receiving portion;

an elastic body which is provided between said first mounting member and said second mounting member and deforms when vibration is generated;

a partitioning member mounted between the first mounting member and the second mounting member;

a main fluid chamber which is formed so as to be expandable and contractible with said elastic body serving as a portion of a partition wall and said partitioning member providing a further portion of the partition wall of said main fluid chamber, said main fluid chamber filled with fluid;

a deformable elastic membrane also forming a portion of the partition wall of said main fluid chamber and seated in one of the elastic body and the partitioning member;

a gas chamber which is disposed opposite to said main fluid chamber with said elastic membrane interposed therebetween and which is filled with gas and hermetically sealed;

a first sub-fluid chamber communicating with said main fluid chamber via a first restricting passage;

a first deformable diaphragm forming a portion of a partition wall of said first sub-fluid chamber;

a first air chamber which is disposed opposite to said first sub-fluid chamber with said first diaphragm interposed therebetween and which is filled with gas and hermetically sealed;

a second sub-fluid chamber communicating with said main fluid chamber via a second restricting passage through the partitioning member;

a second deformable diaphragm forming a portion of a partition wall of said second sub-fluid chamber;

a second air chamber which is disposed opposite to said second sub-fluid chamber with said second diaphragm interposed therebetween and which is filled with gas; and

a switching valve which can be set in an open state in which said second air chamber communicates with an outside air or in a closed state in which communication between said air chamber and the outside air is not allowed.

5,839,721
MOVABLE WORKBENCH AND AN ASSEMBLY LINE DEVICE USING THE WORKBENCH

Masaaki Kobayashi, Nagano-ken, Japan, assignor to Narakawa Industry Co., Ltd., Nagano-ken, Japan

PCT No. PCT/JP96/02364, § 371 Date Jun. 24, 1997, § 102(e) Date Jun. 24, 1997, PCT Pub. No. WO97/07940, PCT Pub. Date Mar. 6, 1997

PCT Filed Aug. 22, 1996, Ser. No. 817,920
Claims priority, application Japan, Aug. 25, 1995, 7-216832
Int. Cl.^{6} B23Q *1/64*
U.S. Cl. 269—57 9 Claims

1. A movable workbench for movement along a rail comprising:

a work board having a top surface and a bottom surface; and

a first and a second caster attached to the bottom surface of the work board, at least the first caster comprising:

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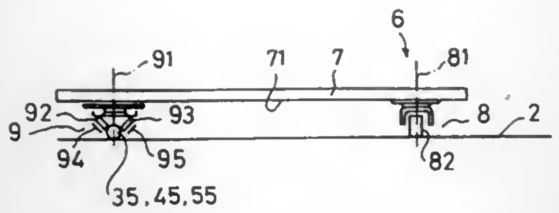


- an attachment plate mounted on the bottom surface of the work board;
- a rotary plate supported by said attachment plate in such a way as to rotate freely about an axis of rotation perpendicular to the bottom surface of the work board; and
- a pair of rollers supported by the rotary plate, the rollers having axes of rotation intersecting at an angle of less than 180°, the rollers being adapted to roll along the rail.

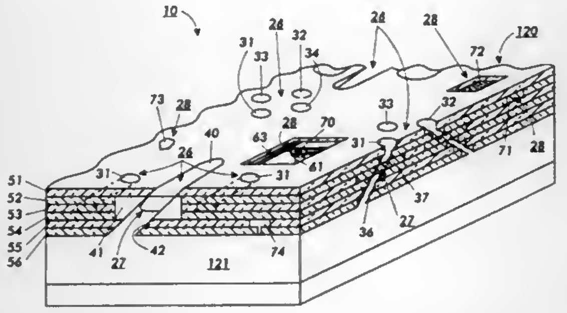
5,839,722
PAPER HANDLING SYSTEM HAVING EMBEDDED CONTROL STRUCTURES

Andrew A. Berlin, San Jose; Patrick C. P. Cheung, Castro Valley; David K. Biegelsen, Portola Valley; Warren B. Jackson, San Francisco, and Mark H. Yim, Palo Alto, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 26, 1996, Ser. No. 756,153

Int. Cl.⁶ B65H *29/24*

U.S. Cl. 271—265.02 **4 Claims**



1. A fluid flow transport system for moving a flexible object, the system comprising
- a fluid pressure source
- a conveyor having at least one laminate composed of a dielectric base material impregnated with a resin, the conveyor being positioned in fluid contact with the fluid pressure source,
- an array of microactuators at least partially embedded in the laminate of the conveyor, with each microactuator having a component movable with respect to the dielectric base material to control fluid flow from the fluid pressure source, and
- a plurality of metallic electrical connections photolithographically formed on the laminate and electrically connected to the microactuators.

5,839,723
MULTI-LAYER MAZE ASSEMBLY

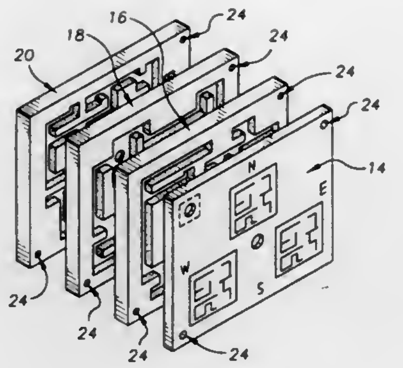
Charles R. Grimes, 325 Lake Holley Cir., Defuniak Springs, Fla. 32433

Filed Nov. 5, 1997, Ser. No. 964,931

Int. Cl.⁶ A63F *7/04*

U.S. Cl. 273—109 **16 Claims**

1. A multi-layer maze assembly comprising:
- a maze ball;
- a top cover member having a ball insertion opening sized to allow passage therethrough of said maze ball, and two securing apertures;



- a first maze level member including first interconnected maze channels, two securing apertures, and a first maze ball pass through aperture that is sized to allow passage therethrough of said maze ball;
- a second maze level member including second interconnected maze channels, two securing apertures, and a second maze ball pass through aperture that is sized to allow passage therethrough of said maze ball;
- a third maze level member including third interconnected maze channels, two securing apertures, and a third maze ball pass through aperture that is sized to allow passage therethrough of said maze ball; and
- two maze assembly securing screws of each of sufficient length to pass through aligned securing apertures of said top cover member, said first maze level member, said second maze level member, and said third maze level member;
- said ball insertion opening being in connection with said first interconnected maze channels;
- said first maze ball pass through aperture being in connection with said second interconnected maze channels;
- said second maze ball pass through aperture being in connection with said third interconnected maze channels;
- said third maze ball pass through aperture being in connection with said exterior of said multi-layer game assembly.

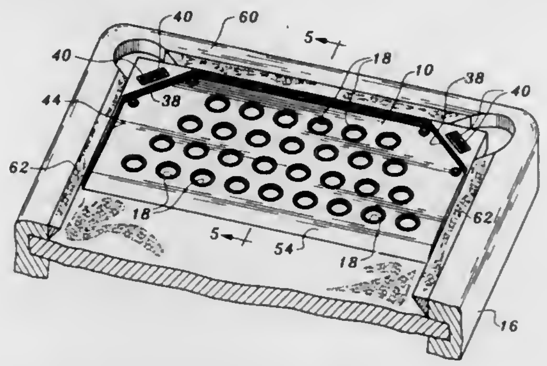
5,839,724
PORTABLE TARGET GAME APPARATUS

Felix Juan Bunac, Jr., 8032 Pocket Rd., #263, Sacramento, Calif. 95831

Filed Nov. 20, 1997, Ser. No. 974,937

Int. Cl.⁶ A63B *67/00*

U.S. Cl. 273—127 R **3 Claims**



1. Portable target game apparatus comprising, in combination:
- a board positionable on a support, said board having a substantially flat, upwardly directed ball support surface defining a plurality of target holes for receiving balls rolled onto said ball support surface, said ball support surface having indicia thereon located adjacent to said target holes designating game or score values assigned to said target holes and said board including a board front, a board back, and board sides, said target holes being spaced from one another and spaced from said board front, said board back, and said board sides, said ball support surface being inclined and said board front located lower than said board back when said board is positioned on a support;
- a straight back wall attached to said board and extending substantially vertically upwardly from said ball support surface and linearly along said board back;
- straight side walls attached to said board and extending substantially vertically upwardly from said ball support surface and linearly along said board sides, said side walls being disposed at right angles to said back wall and parallel to one another;
- resilient material connected to said back wall and said side walls engageable by balls rolled onto said ball support surface from said board front to redirect movement of said balls on said ball support surface;
- a pair of double-ended straight connector walls attached to said board and extending substantially vertically upwardly from said ball support surface, each connector wall of said pair of connector walls connected at the ends thereof to, extending between, and diagonally disposed with respect to one of said side walls and said back wall, and resilient material connected to said connector walls and extending between the ends thereof engageable by balls rolled onto said ball support surface from said board front to redirect movement of the balls;
- a ball entry rams attached to said board at said board front and having a ramp surface adjacent to said ball support surface and inclined upwardly in the direction of said ball support surface; and
- a plurality of resilient bumper members connected to said board with a resilient bumper member extending upwardly from said ball support surface immediately adjacent to each of the ends of said connector walls for impact by balls on said ball support surface received from said ball entry ramp and capable of redirecting the motion of said balls after impact along said ball support surface toward any of said target holes.

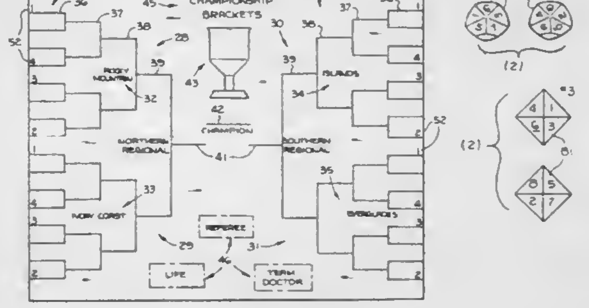
5,839,725
APPARATUS AND METHOD OF PLAYING A BOARD GAME SIMULATING TEAMS PLAYING IN A TOURNAMENT

Andrew D. Conway, 1310 Cedar Lake Rd., Lake Villa, Ill. 60046

Filed Oct. 28, 1996, Ser. No. 740,304

Int. Cl.⁶ A63F *3/00*

U.S. Cl. 273—244 **19 Claims**



1. A board game comprising,
- a game board for use by a plurality of board players and having markings thereon including,
- groups of bracket team lines at opposite ends of the board, the groups being opposed to each other, and each group including an outer tier representing individual ROUND #1 team lines, and, tapering progressively inwardly toward each other toward the center of the board, additional tiers of successively lesser numbers of team lines, representing victor teams, to a center position representing a single champion team,
- the game also including,
- team pieces separate from the board, representing teams,
- groups of dice for rolling by the board players for establishing numbers for determining progress of the team pieces over the board in playing a game thereon between teams.

5,839,726
CASINO TABLE GAME

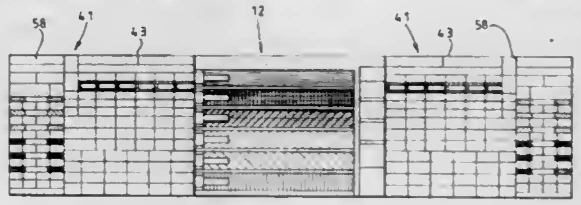
John Martin Luise, West Midlands, England, assignor to Mark Solo Limited, Birmingham, United Kingdom

Filed Nov. 12, 1996, Ser. No. 745,745

Claims priority, application United Kingdom, Aug. 28, 1996, 9617891

Int. Cl.⁶ A63F *3/00*

U.S. Cl. 273—246 **23 Claims**



15. A game board comprising:
- a playing portion having an identification of a plurality of competitors and a graphical representation of a length of a race, the length of the race being divided into equal distant segments;
- a wager portion having a first betting area for bets on the final outcome of the race, the first betting area including at least one row identifying at least one of the plurality of competitors and at least one column representing a bet on the final outcome of the race; and
- the wager portion further including a second betting area for bets on the outcome of any roll of the dice, the second betting area including at least one row identifying at least one of the plurality of competitors and at least one column representing a bet on the outcome of a roll of the dice.

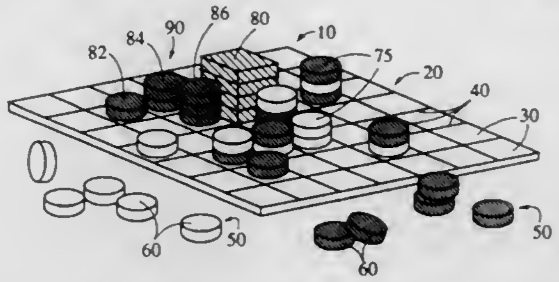
5,839,727
GAME AND A METHOD OF PLAYING A BOARD GAME

Douglas S. Stillinger, 15360 Robin Ann La., Monte Sereno, Calif. 95030

Filed Oct. 13, 1994, Ser. No. 322,230

Int. Cl.⁶ A63F *3/00*

U.S. Cl. 273—271 **9 Claims**



1. A method of playing a game on a playing field having a pattern of adjacent defined areas, where the game is played by at least two players, each player having a distinguishable set of a plurality of playing pieces, the method comprising:
- a first player placing a first playing piece from a first set of playing pieces on a defined area in the playing field,
- a second player placing a first playing piece from a second set of playing pieces on any defined area in the playing field unoc-

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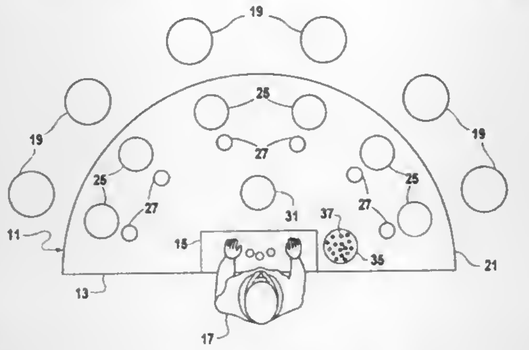
cupied by the first playing piece of the first player, or the second player stacking the first playing piece from the second set of playing pieces on the first playing piece of the first player, thus creating a stack of playing pieces,

continuing play by each player in turn either placing a playing piece from that player's respective first or second set of playing pieces on a defined area unoccupied by another playing piece, stacking the playing piece on another playing piece already placed on a defined area, or stacking the playing piece on an existing stack of playing pieces,

repeating the step of continuing play until a series of a predetermined number of stacks is formed, where each stack in the series is adjacent at least one other stack in the series, where the top playing piece in each stack is from the same set of playing pieces, and where each stack in the series consists of one playing piece more or one playing piece less or the same number of playing pieces as each other stack to which it is adjacent, at which time the player whose set of playing pieces is on the top of each stack in the series is declared the winner.

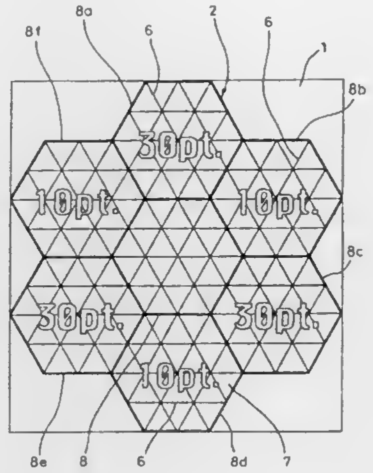
5,839,728
METHOD OF PLAYING A DICE CASINO GAME
Ming Pan Kao, 5263 Corinne Ct., #74, Las Vegas, Nev. 89103
Filed Aug. 6, 1997, Ser. No. 910,492
Int. Cl.^{6} A63F *3/00*
U.S. Cl. 273—274 **18 Claims**



14. A process for playing a game of chance comprising the steps of:
- (a) providing each player with a requisite number of dice;
- (b) providing a dealer with the requisite number of dice;
- (c) each player placing a bet;
- (d) having each player roll their respective dice;
- (e) having the dealer roll the dice provided the dealer after all players have rolled;
- (f) calculating a point total for each player and for the dealer based upon their respective rolled dice;
- (g) comparing the point total of each player with the point total of the dealer;
- (h) setting rewards on the comparison of point totals between each player and the dealer, wherein the point total of a player is greater than the point total of the dealer; and
- (i) rewarding successful bets and the dealer collecting unsuccessful bets in accordance with step (h).
- (j) setting rewards on the comparison of point totals with an array of wildcard values.

5,839,729
BOARD GAME AND PLAYING PROCESS
Masato Watanabe, 147-4 Arahata, Tokorozawa-shi, Saitama 359, Japan
Filed Mar. 10, 1997, Ser. No. 814,470
Claims priority, application Japan, Jun. 3, 1996, 8-139810
Int. Cl.^{6} A63F *3/00*
U.S. Cl. 273—276 **15 Claims**

1. A playing process of playing a board game, comprising:



a preparing step of preparing a game board having a regular pattern of a predetermined number of unit equilateral triangles defined by regularly arranged grid lines, said regular pattern comprising a frame formed by a plurality of said unit equilateral triangles;

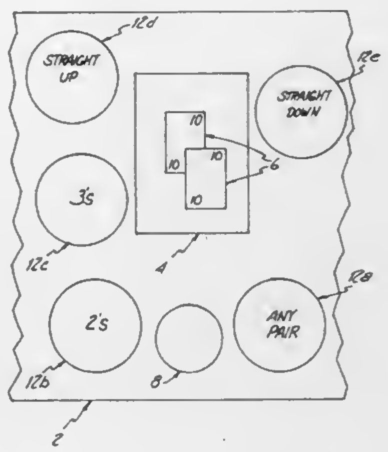
a distributing step of distributing a predetermined set of playing pieces among players so that each player has a predetermined subset of playing pieces, each of said playing pieces being in a form of a polygonal figure which can be superimposed on the pattern so that each side of the polygonal figure lies on one of the grid lines, each of said playing pieces belonging to one of a number of groups into which said playing pieces are classified by shape, the playing pieces of each group being identical in shape and size with one another, the playing pieces of each group being different in shape and size from the playing pieces of any other group; and

a forming step of forming a polygonal mosaic on the board by allowing each player in turn to place one piece on the board in such a manner that an entirety of one side of a newly placed piece adjoins one side of the polygonal mosaic on the board and that each side of the newly placed piece lies on one of the grid lines;

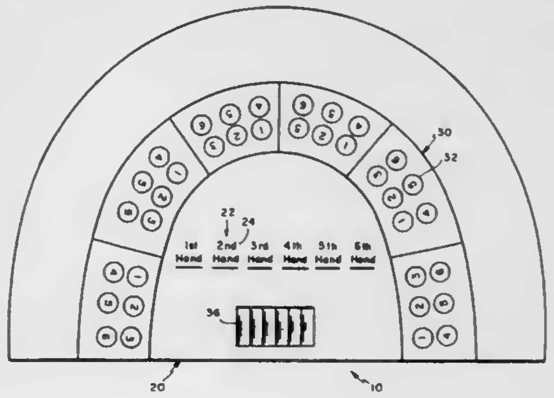
wherein said forming step comprises a first sub-step of allowing a first piece to be placed on the board if the first piece is within the frame and each side of the first piece lies on one of the grid lines.

5,839,730
CONSECUTIVE CARD SIDE BET METHOD
Russell C. Pike, Las Vegas, Nev., assignor to Shuffle Master, Inc., Eden Prairie, Minn.
Filed May 22, 1996, Ser. No. 651,117
Int. Cl.^{6} A63F *1/00*
U.S. Cl. 273—292 **21 Claims**

1. A method of providing an additional wagering opportunity in a casino game which utilizes standard playing cards, comprising the steps of:
- (a) a player making a first wager to participate in the casino game;
- (b) a player optionally making a second wager to participate in a side bet that a predetermined sequence of cards will be dealt to the player, wherein participation in the side bet will not interfere with a player's strategy in the casino game;
- (c) a dealer dealing a plurality of cards to the player;
- (d) if the dealing of the plurality of cards follows a predetermined sequence of cards, the player wins a predetermined amount, wherein the predetermined sequence of cards includes dealing consecutive cards of equal value, each card having an individual value of between two and five, and the combined value of the predetermined sequence is less than twelve; and
- (e) the dealer completing the play of the game.

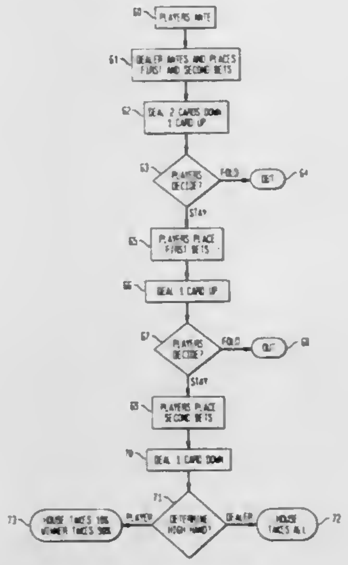


5,839,731
METHOD AND APPARATUS FOR PLAYING A CASINO GAME
John Feola, Medford, Mass., assignor to New Vision Gaming and Development, Inc., Medford, Mass.
Continuation-in-part of Ser. No. 720,560, Sep. 30, 1996, Pat. No. 5,664,781. This application Mar. 17, 1997, Ser. No. 819,606
Int. Cl.^{6} A63F *1/00*
U.S. Cl. 273—292 **18 Claims**



1. A method of playing a card game with at least one standard deck of 52 playing cards, said method comprising the steps of:
- (a) selecting a stud poker game;
- (b) successively dealing said cards to build up a plurality of hands thereof, each of said hands having a wagering subset of said cards;
- (c) prior to and during said dealing, at least one player sporadically wagering on selected ones of said hands;
- (d) at least one of said hands having a winning combination of said cards in said wagering subsets after said dealing is complete; and
- (e) any of said wagers identifying said at least one of said hands constituting a winning wager.

5,839,732
METHOD OF PLAYING A CASINO POKER GAME
Janice R. Guidi, Ventnor, N.J., assignor to Select Video, Inc., Atlantic City, N.J.
Filed May 8, 1997, Ser. No. 852,926
Int. Cl.^{6} A63F *1/00*
U.S. Cl. 273—292 **10 Claims**



1. A method of playing a game of poker among one or more players and a dealer, comprising the steps of:
- (a) each player placing a wager equal to an ante amount;
- (b) the dealer placing a wager equal to a total bet amount;
- (c) the dealer dealing one or more portions of a poker hand to each player and to the dealer;
- (d) providing each player with a choice, after each portion of said poker hand has been dealt, between folding, in which case said wagers of that player are surrendered and that player leaves the game, and wagering an additional amount, in which case that player continues playing the game, wherein a sum of said ante amount and said additional amounts for each player equals said total bet amount;
- (e) the dealer dealing a final portion of a poker hand to each player continuing to play the game and to the dealer to complete the poker hands; and
- (f) determining which of said hands has the highest poker rank, and if said hand is held by a player, awarding a predetermined percentage of a sum of said ante amounts and said additional amounts wagered to said player.

5,839,733
PORTABLE GOAL AND METHOD
T. Wayne Meeks, and Dixie M. Meeks, both of P.O. Box 1115, Seneca, S.C. 29679
Filed Nov. 6, 1996, Ser. No. 746,118
Int. Cl.^{6} A63B *63/00*
U.S. Cl. 273—400 **8 Claims**

1. A portable goal comprising:

an elongated bar made from a structural section;

legs for supporting the bar in an elevated horizontal position on a playing field with the legs in transversely spaced upright relation thereon;

a support member for positioning on a lower end of each of the legs extending rearwardly therefrom providing a stable base for the goal on the playing field;

a first bracket for providing a hinged connection joining each of said legs in spaced relation on the bar including

a horizontal connection joining an end of the bar;

a vertical connection integral with said horizontal connection extending downwardly joining a leg; and

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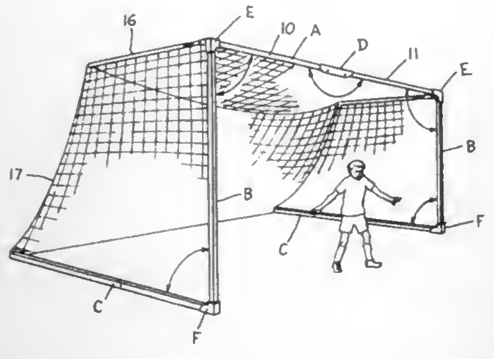


a horizontal pin in said vertical connection about which said legs are folded inwardly against said horizontal bar;

a second bracket for providing a hinged connection for joining the support members to a lower end of said legs extending rearwardly therefrom including

- a vertical connection joining a lower end of said leg;
- a horizontal connection integral with the vertical connection extending rearwardly joining said horizontal support member;and
- a horizontal pin in said horizontal connection about which said horizontal support members are folded upwardly against respective legs;

whereby said legs and support members may be joined together in aligned side by side relation for transport and thereafter folded on the respective hinged connections for erecting the goal on a playing field.

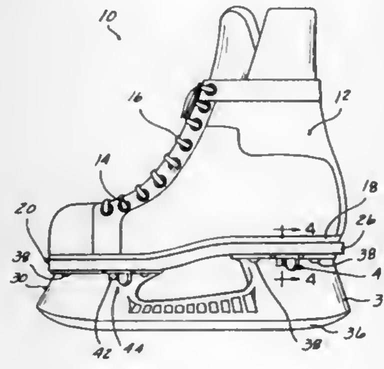
5,839,734
CONVERTIBLE SKATE

Paul M. Steinhauser, Jr., Davison, Mich., assignor to Victor Posa, Grand Blanc, Mich., a part interest

Continuation of Ser. No. 367,795, Dec. 30, 1994. This application Sep. 30, 1997, Ser. No. 941,351

Int. Cl.^{6} A63C *17/18*

U.S. Cl. 280—7.13 **26 Claims**



1. A skate comprising:

a shoe body having a peripheral sole edge;

an adapter carried on the shoe body, the adapter having a central portion and a peripheral sidewall depending from the central portion, the peripheral sidewall extending substantially in registry with at least a portion of the peripheral sole edge; and

an attachment mountable in the adapter in registry with the depending sidewall of the adapter.

5,839,735
SKATE PROVIDING VENTILATION

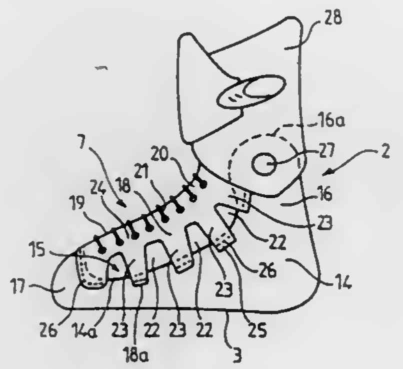
Louis Benoit, La Balme De Sillingy, France, assignor to Salomon S.A., Metz-Tessy, France

Filed Oct. 21, 1996, Ser. No. 735,391

Claims priority, application France, Oct. 27, 1995, 95 12908

Int. Cl.^{6} A63C *17/04;* A43B *5/04*

U.S. Cl. 280—11.22 **24 Claims**



1. Skate comprising:

an external sole;

a frame with an upper plate, said external sole being affixed to said upper plate of said frame;

a gliding device arranged along said frame;

an upper having a shape to receive a foot, said upper extending from said sole upwardly toward an ankle of the foot, said upper comprising:

- a first portion extending upwardly from said sole and extending from a toe area to a heel area to constitute a lower shell made of a generally rigid first material, said lower shell having a longitudinally extending peripheral edge defining a longitudinal opening;
- a second portion comprising a vamp, said vamp being positioned above a forefoot and extending on opposite lateral sides of said upper and defining a longitudinally extending slit between said opposite lateral sides, said vamp having a peripheral edge, at least a portion of said peripheral edge of said vamp being affixed to said peripheral edge of said lower shell, said second portion being made of a second material having a greater flexibility than said first material, at least one of said first portion and said second portion having a ventilating portion positioned within a limit demarcating said longitudinal opening; and
- a tightening device attached to said vamp to tighten the foot in the upper of the skate, said tightening device being distinct from said ventilation portion.

5,839,736
IN LINE SKATE CONSTRUCTION

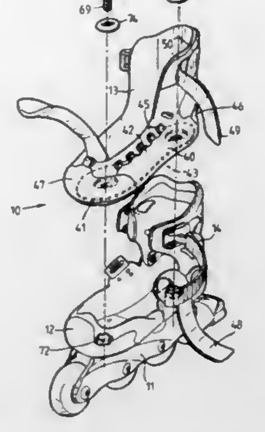
Shin Khoo Chiu, North Point, and Kai Nin So, Happy Valley, both of Hong Kong, assignors to Marco Skates Limited, Chaiwan, Hong Kong

Filed Feb. 12, 1997, Ser. No. 799,794

Int. Cl.^{6} A63C *17/00*

U.S. Cl. 280—11.22 **4 Claims**

1. In an in-line skate construction including a wheel mounting chassis, a foot frame carried by said chassis, a cuff pivotally mounted upon said foot frame, and a shoe element mounted upon said foot frame, the improvement comprising: means for detachably interconnecting said shoe element upon said foot frame, said means including a plurality of aligned openings in said shoe, said foot frame and said chassis; and manually operable fastening means extending through said aligned openings accessible from the interior of said shoe at a first end thereof to secure the shoe element to said chassis.



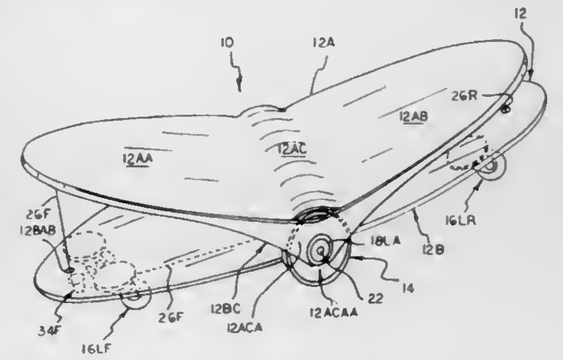
5,839,737
SELF PROPELLED SKATEBOARD

Leszek Kruczek, 48 Driggs Ave., #2L, Brooklyn, N.Y. 11222

Filed Jan. 9, 1997, Ser. No. 780,275

Int. Cl.^{6} B62M *1/04*

U.S. Cl. 280—11.115 **20 Claims**



1. A self propeller skateboard (**10**) comprising:

A) a deck (**12**) which comprises:

- I) an upper deck (**12**A) consisting of upper deck front (12AA) and an upper deck back (**12**AB) separated by an upper deck middle (**12**AC) having an upper deck middle support (12ACA) with an upper deck middle support opening (12ACAA), the upper deck front (**12**AA) and the upper deck back (**12**AB) are angled in an upward direction from the upper deck middle (**12**AC), and
- ii) a lower deck (**12**B) consisting of a lower deck front (12BA) having a lower deck front slit (12BAA) and a lower deck front opening (12BAB) therein, a lower deck back (12BB)having a lower deck back slit (12BBA) and a lower deck back opening (12BBB) therein, and a lower deck middle (12BC) having a lower deck middle opening (12BCA) therein;

B) a transmission (**14**) suspendedly mounted within the lower deck middle opening (12BCA) which comprises:

- l) a drive shaft (**22**),
- ii) a left spool (**24**L) having a left spool opening (**24**LB) through which the drive shaft (**22**) is mounted, the left spool (**24**L) is securely fastened to a spool left housing (**28**L) of a spool housing (**28**), the left spool (**24**L) is driven by a left spool band spring (**24**LA) attached thereto, the left spool (**24**L) comprises a left spool ratchet pin (**24**LC) having a left spool ratchet (**24**LE) pivotally mounted thereon, the left spool (**24**L) further comprises a left spool ratchet plate (**24**LD) securely mounted on the drive shaft (**22**), the left spool ratchet (**24**LE) engages the left spool ratchet plate (**24**LD) functioning to prevent backward directional travel of the self propeller motorized skateboard (**10**), and
- iii) a right spool (**24**R) having a right spool opening (**24**RB) through which the drive shaft (**22**) is mounted, the right spool (**24**R) is securely fastened to a spool right housing (**28**L) of a spool housing (**28**), the right spool (**24**R) is driven by aright spool band spring (**24**RA) attached thereto, the right spool (**24**R) comprises a right spool ratchet pin (**24**RC) having a right spool ratchet (**24**RE) pivotally mounted thereon, the right spool (**24**R) further comprises a right spool ratchet plate (**24**RD) securely mounted on the drive shaft (**22**), the right spool ratchet (**24**RE) engages the right spool ratchet plate (**24**RD) functioning to prevent backward directional travel of the self propeller motorized skateboard (**10**);

C) at least one castor wheel (**16**) mounted on a bottom of each of the lower deck front (12BA) and lower deck back (12BB);

D) a left drive wheel (**18**L) and a right drive wheel (**18**R) securely fastened to the drive shaft (**22**);

E) a front cable puny (**34**F) mounted on a bottom of the lower deck front (12BA) and a rear cable pully (**34**R) mounted on a bottom of the lower deck rear (12BB);

F) a front cable (**26**F) securely attached at one distal end to the drive shaft (**22**) and securely attached at an opposite distal end to the upper deck front (12AA), the front cable (**26**F) is guided within the front cable puly (**34**F) through the lower deck front slit (12BAA) and the lower deck front opening (12BAB) and a rear cable (**26**R) securely attached at one distal end to the drive shaft (**22**) and securely attached at an opposite distal end to the upper deck rear (12AB), the rear cable (**26**R) is guided within the rear cable pully (**34**R) through the lower deck rear slit (12BBA) and the lower deck rear opening (12BBB), the front cable pully (**34**F) and the rear cable pully (**34**R) function to rotate the drive shaft when pressure is applied on the upper deck front (12AA) and upper deck back (12AB); and

G) a left mounting bracket (32L) having a left mounting bracket bushing (32LA) and a right mounting bracket (32R) having a right mounting bracket bushing (32RA) are securely fastened to opposite sides of the lower deck middle (12BC), the drive shaft (**22**) is rotatably mounted within the left mounting bracket bushing (32LA) and the right mounting bracket bushing (32RA).

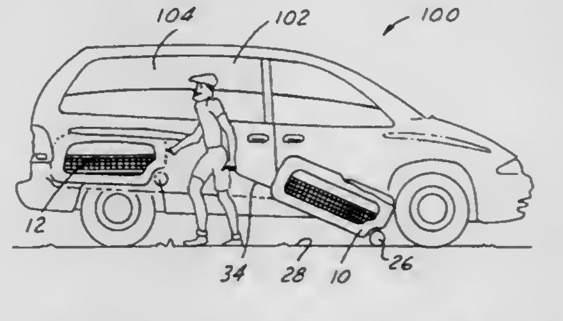
5,839,738
WHEELED COOLER MODULE WITH STORAGE FOR VEHICLE

L. John Ozark, Gross Pointe Woods, Mich., assignor to Chrysler Corporation, Auburn Hills, Mich.

Filed Jan. 3, 1996, Ser. No. 582,249

Int. Cl.^{6} B62B *1/10;1/14*

U.S. Cl. 280—30 **11 Claims**



1. A wheeled cooler module for a passenger van having a passenger compartment defining a rear cargo space, a wheeled cooler module, comprising:

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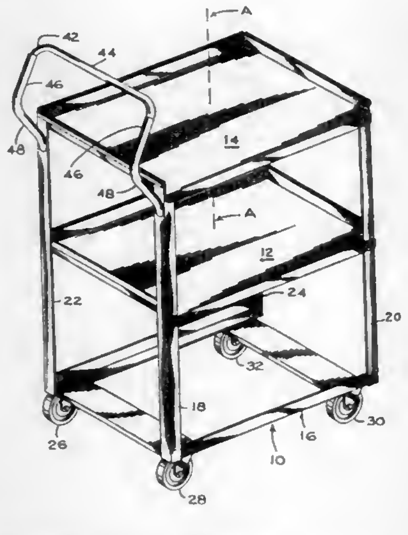
a generally parallelepiped-shaped hollow body defining a front portion and a rear portion, the hollow body formed with an open end formed in the rear portion of the body and defining a bin chamber extending into the body from the open end;
a non-refrigerated storage bin slidably engaged with the body for reciprocating movement within the storage bin chamber between a housed position, wherein the storage bin is substantially within the body, and an access position, wherein the storage bin extends outwardly from the body such that items within the bin are exposed;
at least one rolling element rotatably engaged with the front portion of the body for facilitating rollable transport of the body;
a refrigerated cavity for holding items to be cooled therein;
a rigid flat tray handle slidably engaged with the body for reciprocating movement between a housed position, wherein the tray handle does not extend beyond the body, and an extended position, wherein the tray handle extends beyond the rear portion of the body such that the tray handle can be grasped to tilt the body for rolling the body on the wheels, wherein the tray handle defines a top surface formed with at least one depression for receiving an object therein, and the rear portion of the body defines a top surface formed with at least one depression for receiving an object therein; and
an electrically-powered refrigeration system disposed in the body in thermal contact with the refrigerator cavity for cooling the cavity.

5,839,739
ERGONOMIC UTILITY CART

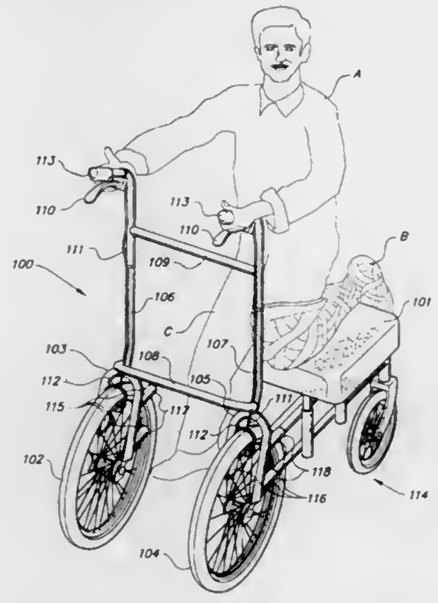
Lonnie M. Shannon, Colgate; Nancy A. Guss, Milwaukee; Thomas J. Kazmerchek, St. Francis; Kent C. Schlienger, Wauwatosa; Raymond H. Donovan, Hales Corners, and Arun Garg, Brown Deer, all of Wis., assignors to Lakeside Manufacturing, Inc., Milwaukee, Wis.
Continuation-in-part of Ser. No. 22,874, May 13, 1994, Pat. No. Des. 362,528. This application Sep. 19, 1995, Ser. No. 530,674
Int. Cl.^{6} B62B *3/00*
U.S. Cl. 280—47.35 **9 Claims**



1. A portable utility cart comprising:
a plurality of horizontal shelves aligned uniformly about and at right angels to a vertical shelving axis;
a plurality of post members arranged between and spacing said shelves, said post members coupled to the comers of each of said shelves;
a handle coupled to a proximate pair of said post members, said handle having a substantially horizontal member joining a first grasping portion to a second grasping portion, each said grasping portion upwardly disposed inward one to another at an angle of about 10° and inclined toward said shelving axis at an angle of about 15°; and
a plurality of casters each coupled to a bottom end of said post members.

5,839,740
CART FOR INJURED PERSONS

Jerral C. Seeger, 6142 Thrall Ave., Vicksburg, Mich. 49097
Filed Nov. 26, 1997, Ser. No. 979,174
Int. Cl.^{6} B62B *3/02*
U.S. Cl. 280—87.021 **17 Claims**

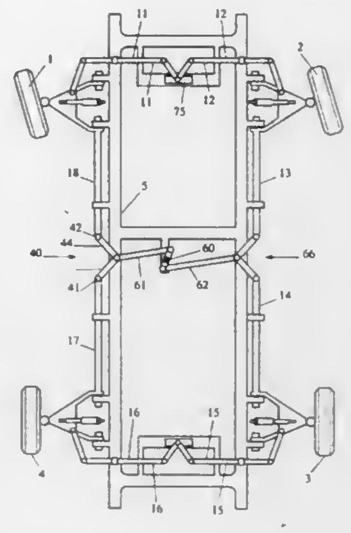


1. A cart for a person with an injured leg comprising:
a front right fork and a front left fork;
a front right wheel mounted on said front right fork, and a front left wheel mounted on said front left fork;
a right handle bar attached to and extending upward from said front right fork, and a left handle bar attached to and extending upward from said left right fork; and
a leg support assembly including a rear wheel, a leg support surface, and means for removably attaching said leg support assembly to one of said front right fork or said front left fork; wherein
said leg support assembly is attached to said right fork when the injured leg is a right leg; and
said leg support assembly is attached to said left fork when the injured leg is a left leg.

5,839,741
SUSPENSION WITH INTERCONNECTED TORSION BARS

Christopher Brian Heyring, Eagle Bay, Australia, assignor to Kinetic Limited, Dunsborough, Australia
PCT No. PCT/AU95/00135, § 371 Date Nov. 12, 1996, § 102(e) Date Nov. 12, 1996, PCT Pub. No. WO95/25020, PCT Pub. Date Sep. 21, 1995
PCT Filed Mar. 15, 1995, Ser. No. 704,660
Claims priority, application Australia, Mar. 15, 1994, PM4489
Int. Cl.^{6} B60G *11/18;21/045;21/05*
U.S. Cl. 280—124.106 **32 Claims**

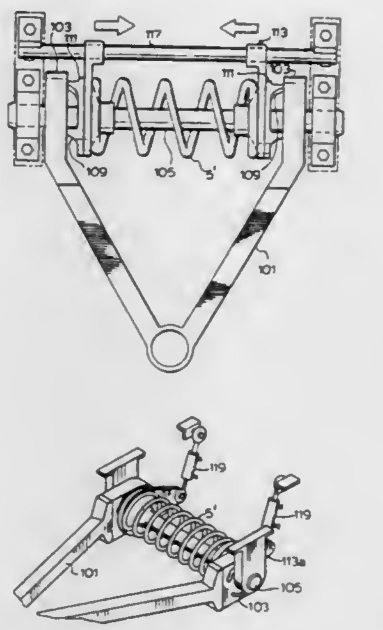
1. A vehicle suspension system comprising one pair of laterally spaced forward wheel assemblies and one pair of laterally spaced rear wheel assemblies together supporting a vehicle body, each wheel assembly including a wheel and a wheel mounting connecting the wheel to the vehicle body for movement in a generally vertical direction with respect to the body;
respective first mechanical coupling means interconnecting the forward pair of wheel assemblies and interconnecting the rear pair of wheel assemblies, second mechanical coupling means respectively interconnecting longitudinally adjacent pairs of said wheel assemblies on each side of the vehicle;
said first and second mechanical coupling means being adapted to effect in response to movement of a said wheel assembly in the generally vertical direction a movement of the other wheel assemblies connected to said wheel assembly by one of the first and one of the second mechanical coupling means in a substantially opposite direction relative thereto, each said second mechanical coupling means also being arranged to generate a movement substantially proportional to the average movement of the two wheels connected thereto on one side of the vehicle; and
transfer means provided to transfer said generated movement of one second mechanical coupling means to the other second mechanical coupling means on the opposite side of the vehicle, said transfer means also being adapted to transfer forces between the second mechanical coupling means on one side of the vehicle and the second mechanical coupling means on the opposite side of the vehicle such that roll movements acting on the vehicle body are reacted by the second mechanical coupling means on each side of the vehicle,
whereby said vehicle suspension system provides support and roll attitude control of the vehicle body to thereby provide independent control of roll and four wheel bounce stiffnesses and maintain substantially consistent loading on all wheels during axle articulation and thereby maintain traction on all wheels.



5,839,742
CAM OPERATED VEHICLE SUSPENSION SYSTEM

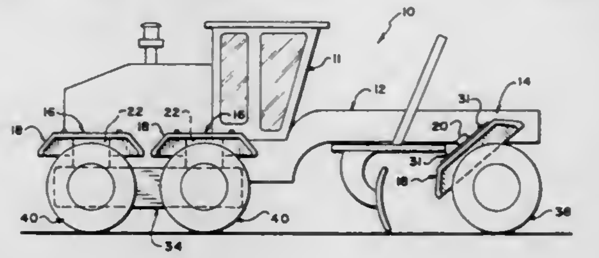
Laurence J. Holt, 8859 Concession 4, Uxbridge, Ontario, Canada, L0C 1E0
PCT No. PCT/CA95/00570, § 371 Date Jun. 7, 1996, § 102(e) Date Jun. 7, 1996, PCT Pub. No. WO96/11815, PCT Pub. Date Apr. 25, 1996
PCT Filed Oct. 6, 1995, Ser. No. 656,357
Claims priority, application Canada, Oct. 12, 1994, 2117945
Int. Cl.^{6} B60G *3/20;11/14*
U.S. Cl. 280—124.134 **10 Claims**

1. A suspension system for a wheeled vehicle comprising:
(a) a wheel and hub assembly;
(b) a vehicle body relatively much heavier than the wheel and hub assembly;
(c) an energy storage medium interposed between the wheel and hub assembly and the vehicle body; and
(d) means to releasably store energy in the energy storage medium upon relative movement between the wheel and hub assembly and the vehicle body; wherein:
the energy storage medium and the means to releasably store energy in the energy storage medium are constructed as a self-contained module; and
the means to releasably store energy comprises:
(a) means to convert vertical motion of the wheel and hub assembly to motion of a control arm connected to both the wheel and hub assembly and the energy storage medium; and
(b) means to convert the rotary motion of the control arm to non-linear axial motion of the energy storage medium, said means including cam surfaces profiled to provide a non-linear wheel rate relationship between force and displacement of the wheel.



5,839,743
GRADER FENDERS

Frank Weinkauf, Naicam, Canada, assignor to Fenderco Enterprises Ltd., Naicam, Canada
Filed Aug. 21, 1996, Ser. No. 701,044
Int. Cl.^{6} B62D *25/16*
U.S. Cl. 280—154 **17 Claims**

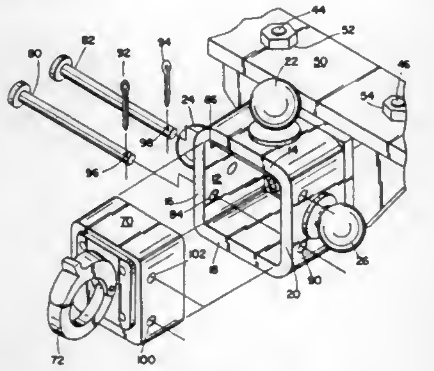


1. A fender assembly for a road grader wheel, said assembly comprising:
a fender of resilient synthetic plastic material configured to extend over a part of the periphery of the wheel; and
a bracket comprising:
a standard comprising a substantially flat plate;
standard mounting means at a bottom end of the standard for securing the standard to a part of the grader that is adjacent the wheel and movable with the wheel, the standard mounting means comprising a portion of the plate configured to engage a substantially flat bolt flange of a drive wheel chain

case of the grader and bolt holes in the plate for alignment with bolt holes in the bolt flange; and
fender mounting means at a top end of the standard for fastening the fender to the standard.

5,839,744
VEHICLE TOWING HITCH

Thomas V. Marks, R. D. # 9 Box 546, Greensburg, Pa. 15601
Filed Jun. 7, 1996, Ser. No. 661,406
Int. Cl.^{6} B62D *53/00*
U.S. Cl. 280—416.4 **1 Claim**

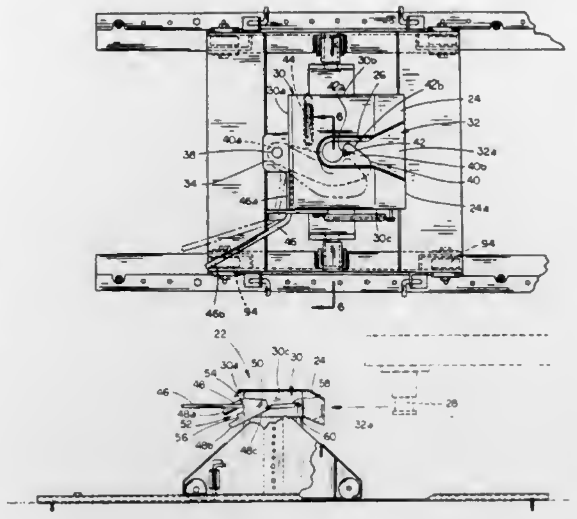


1. A vehicle towing hitch which comprises:
a. a hollow polygonal tubular section having opposing ends and multiple side walls surrounding said hollow portion;
b. a towball mounted on the radially outward side of at least three of said side walls;
c. a vehicle mounting fixture for providing connection between a vehicle and said tubular section;
d. co-operating means of rotatable attachment between said mounting fixture and said tubular sections;
e. spring loaded means for releasable holding said mounting fixture and said tubular section in a fixed position one to the other;
f. a pintle hook mounted on a pintle block;
g. co-operating elements of telescopic engagement between said pintle block and said tubular section;
h. releasable means for holding said pintle block telescopically engaged to said tubular section;
i. said rotatable attachment between said mounting fixture and said tubular section comprising a plate attached to and covering one end of said tubular member;
j. a central perforation through said plate and stud means connected to said mounting fixture and extending through said perforation;
k. fastener means on said stud means to hold said tubular section to said mounting fixture.

5,839,745
LOCK MECHANISM FOR FIFTH WHEEL HITCH

Lyle L. Cattau, 2900 "O" Plz., Omaha, Nebr. 68107; Fred P. Smith, 228 S. Scenic Dr., Alpine, Utah 84004, and Larry D. Larcom, 1625 "A" W. 980 S., Orem, Utah 84058
Filed Jul. 31, 1996, Ser. No. 688,734
Int. Cl.^{6} B62D *53/10;53/12*
U.S. Cl. 280—434 **4 Claims**

1. In combination:
a fifth wheel hitch including a pedestal supporting a housing with a hitch plate affixed to the top thereof;
the hitch plate including a forwardly extending slot formed in a rearward edge thereof for receiving a depending pin of a trailer;
the housing including a forwardly extending channel therein aligned with the slot in the hitch plate to receive the trailer pin projecting through the hitch plate slot;

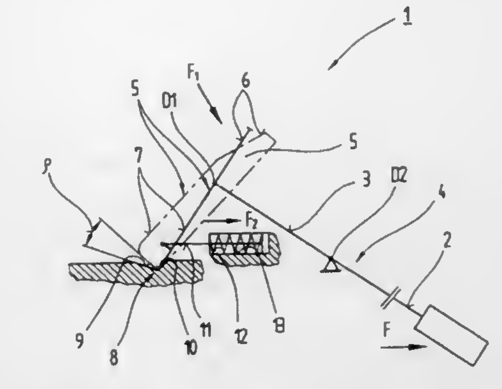


said channel including a bottom, opposing side walls, and a forward end wall; and
hook means operably mounted on said housing for selectively engaging a pin within the channel and preventing rearward movement of the pin from the channel, said hook means being operable between engaged and disengaged positions;
said hook means including an opening in one of said channel side walls, extending generally parallel to the channel bottom, for receiving the hook member therethrough;
said hook means further including a hook member pivotally mounted on said housing for movement between an engaged position with a hook arm projecting through said channel opening and into the channel to retain a trailer pin between the channel forward end wall and the hook arm, and a disengaged position with the hook arm pivoted outwardly from the engaged position;
a handle having a first end affixed to the hook means for movement therewith, and a second end projecting freely from the hook means, for moving the hook means between the engaged and disengaged positions;
biasing means connected between the hook member and the housing to urge the hook member towards the engaged position;
a lock plate pivotally mounted to the housing for movement between first and second positions;
said lock plate including a forward edge having a rearwardly extending throat formed between upper and lower legs;
a first catch formed in the throat for selectively retaining the handle pivoted in the disengaged position;
a second catch formed in the throat for selectively retaining the handle pivoted in the engaged position;
said lock plate pivotally mounted for selective movement between the first position with the first catch engaged with said handle and a second position with the second catch engaged with the handle.

5,839,746
SKI BRAKE

Max Luitz, Blaichach/Bihlerdorf, Germany, assignor to Atomic Austria GmbH, Altenmarkt, Austria
PCT No. PCT/AT96/00114, § 371 Date May 2, 1997, § 102(e) Date May 2, 1997, PCT Pub. No. WO97/04842, PCT Pub. Date Feb. 13, 1997
PCT Filed Jun. 28, 1996, Ser. No. 836,905
Claims priority, application Austria, Aug. 1, 1995, 1315/95
Int. Cl.^{6} A63C *7/10*
U.S. Cl. 280—605 **25 Claims**

1. A ski brake to be mounted on a ski and comprising
at least one brake arm having a free end and arranged so as to be pivotable about a first axis from a readiness position into a braking position and back, said first axis being arranged to extend substantially in parallel to a ski upper side and at a right angle to a longitudinal axis of the ski when the ski brake is mounted to a ski,

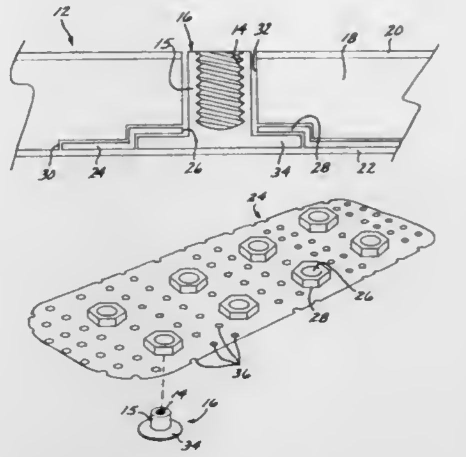


a pedal plate pivotably connected with said brake arm via a second axis extending in parallel to said first axis, said pedal plate having an end-side latching portion and an opposite side,
a roller journaled on the latching portion of said pedal plate,
at least one spring biassing said pedal plate to urge said brake arm into the braking position,
said pedal plate being capable of being brought into the readiness position against the biassing force of the spring by being pressed down, said free end of said brake arm in said readiness position being lifted to be generally level with the pedal plate, and said end-side latching portion of said pedal plate in said braking position being supported on a supporting surface fixed relative to the ski when the ski brake is mounted to the ski, the pedal plate on the side opposite the latching portion being extended beyond said second axis so as to form an actuation portion for releasing the latching portion of said pedal plate from said supporting surface when pressing down said pedal plate, said supporting surface having an associated pedal plate abutment surface fixed relative to the ski in the mounted state of the ski brake, and extending approximately at a right angle to said supporting surface and forming a latching indentation together with said supporting surface for latching of said latching portion of said pedal plate, said roller latchingly engaging in said latching indentation, safety-unlatching of said latching portion of said pedal plate occurring against the biassing force of said spring acting on the pedal plate if a pre-determined maximum force acts on said brake arm.

5,839,747
BINDING ANCHOR

Bernard Gervasoni, Corona, Calif., assignor to Thermal Snowboards, Inc., Corona, Calif.
Filed Jan. 22, 1996, Ser. No. 589,717
Int. Cl.^{6} A63C *9/00;11/26*
U.S. Cl. 280—611 **15 Claims**

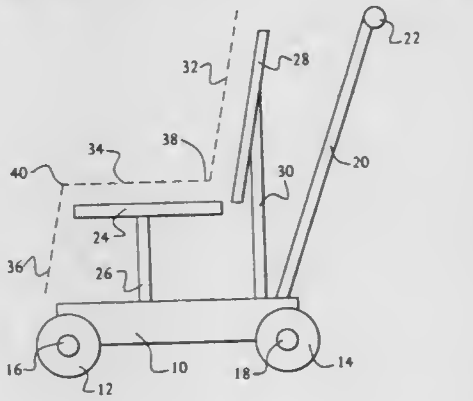
1. A ski device having an anchoring system incorporated therein for mounting a binding thereto, comprising:
a ski having a core disposed therein;
a flexible, stamped backing plate, disposed within the ski below said core, said plate having countersunk holes formed therein, each said countersink having a non-circular shape; and
a plurality of rigid inserts, each having an internally threaded shank extending through one of said holes in said plate and



each insert having a head of a cross-section greater than said shank and configured to cooperate with the countersink so as to preclude rotation of said insert.

5,839,748
CONVERTIBLE STROLLER

Joan Cohen, 10 Shalimar La., Maple Glen, Pa. 19002
Filed May 17, 1993, Ser. No. 62,274
Int. Cl.^{6} B62B *3/02*
U.S. Cl. 280—648 **16 Claims**



1. A child stroller which is convertible between a sitting condition, in which it is adapted to carry a child in a normal sitting position, and a standing condition, in which it is adapted to carry a child in a standing position, comprising:
a frame;
a plurality of wheels rotatably mounted to the frame, the wheels supporting the frame above the ground when they are in contact with the ground;
a seat which in the stroller's sitting condition is secured to the frame generally horizontally at a height above the ground sufficient to enable a child to sit upon the seat in a normal sitting position; and
a step which in the stroller's standing condition is secured to the frame generally horizontally at a height above the ground which is lower than the height of the seat in the stroller's sitting condition,
wherein in said sitting condition said seat is disposed so as to preclude a child from standing on said step.

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5,839,749
CASTER ANGLE CONTROL SYSTEM FOR VEHICLES

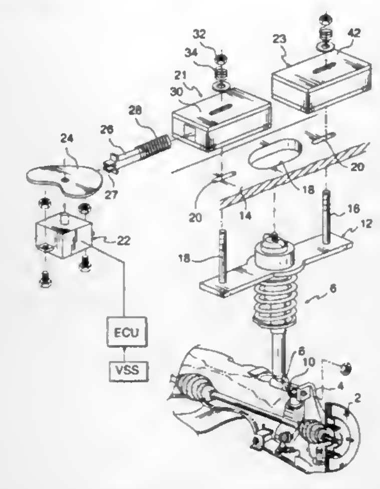
Dong Jo Lyu, Jungsan-ri, Rep. of Korea, assignor to Hyundai Motor Company, Seoul, Rep. of Korea

Filed Jul. 22, 1996, Ser. No. 684,823

Claims priority, application Rep. of Korea, Jul. 21, 1995, 1995-21581

Int. Cl.^{6} B62D *17/00*

U.S. Cl. 280—661 **8 Claims**



1. A caster angle control system for a vehicle, comprising:
- a vehicle speed sensor (VSS) constructed and arranged to sense a speed of the vehicle and generate a speed signal corresponding thereto;
- an electronic control unit (ECU) constructed and arranged to generate a control signal in accordance with said speed signal generated by said VSS;
- a strut assembly having a first end pivotally mounted on a knuckle arm and a second end connected to a portion of the vehicle, said strut assembly being arranged to define a caster angle; and
- a caster control device constructed and arranged to control said caster angle by causing said strut assembly to pivot about said first end of said strut assembly in accordance with said control signal generated by said ECU, wherein said caster control device comprises:
  - an actuator connected to said ECU and operated according to said control signal;
  - a cam constructed and arranged to be rotatably driven by said actuator; and
  - a reciprocating movement member constructed and arranged to be reciprocally driven by rotation of said cam, said reciprocating movement member driving said pivotal movement of said strut assembly about said second end of said strut assembly.

5,839,750
LEAF SPRING WHEEL SUSPENSION SYSTEM

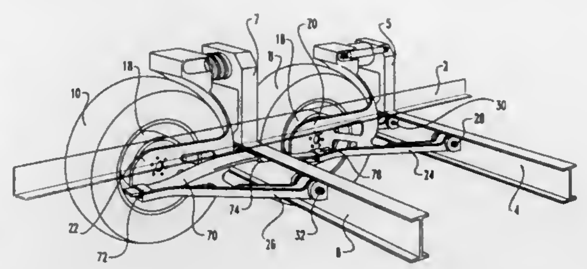
E. Dallas Smith, Indianapolis, Ind., assignor to DBX Engineering Corporation, Indianapolis, Ind.

Filed Jan. 31, 1997, Ser. No. 792,972

Int. Cl.^{6} B60G *5/053;3/14;11/36;11/46*

U.S. Cl. 280—683 **38 Claims**

13. A wheel suspension system for a vehicle frame comprising:
- a wheel;
- a wheel support attachable to the vehicle frame and pivotable about a first horizontal axis between an uppermost position and a lowermost position, said wheel support including means for rotatably supporting said wheel about a second axis parallel to the first axis, said wheel support having first and second portions spaced laterally from one another and spaced longitudinally from the second axis, said first and second portions pivotally attaching said wheel support to the vehicle frame;



- a leaf spring for biasing said wheel support to a position between the uppermost and lowermost positions, said leaf spring being coupled to the vehicle frame, a portion of said leaf spring being received by said wheel support; and
- biasing means in addition to said leaf spring for biasing said wheel support to a position between the uppermost and lowermost positions, said biasing means being positioned above the first and second axes.

5,839,751
GAS BAG PASSENGER RESTRAINT MODULE

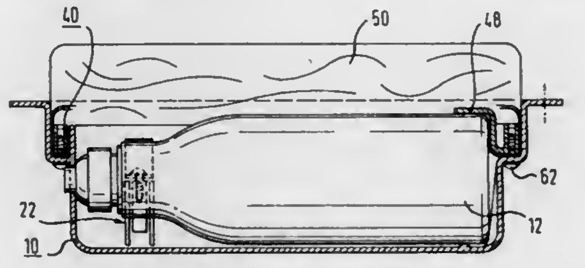
Joachim Lutz, Schechingen, Germany, assignor to TRW Occupant Restraint Systems GmbH, Alfdorf, Germany

Filed Aug. 2, 1996, Ser. No. 692,874

Claims priority, application Germany, Aug. 4, 1995, 195 28 754.1

Int. Cl.^{6} B60R *21/16*

U.S. Cl. 280—728.2 **9 Claims**



1. A gas bag passenger restraint module having a housing, an inflation device located in said housing, said inflation device providing a volume of pressurized gas upon actuation, and a folded gas bag with an attachment section fixed to said housing and defining and inflation aperture, wherein:
- said inflation device has a cylinder-shaped pressurized gas container;
- said housing has a trough-shaped base to accommodate the pressurized gas container and a box-shaped upper section;
- said attachment section of the gas bag being provided with an attachment frame;
- said attachment frame being inserted in said box-shaped upper section of the housing; and
- an accommodation for a neck part of said pressurized gas container being provided in the housing and providing a support with a strap which is connected by self-tapping screws to support studs formed on the housing.

5,839,752
AIR BAG COVER AND MANUFACTURING METHOD THEREOF

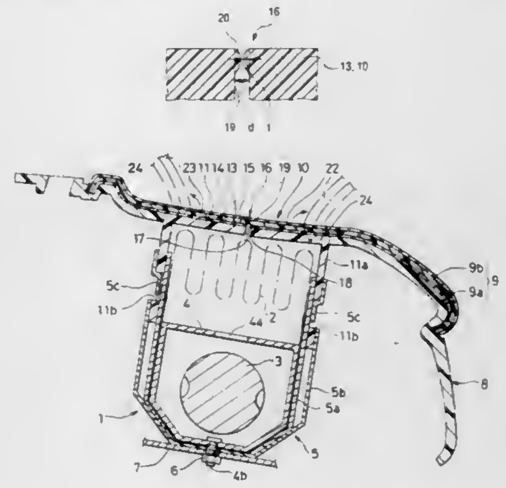
Chiho Yamasaki, Kasugai-gun; Chiharu Totani, Gifu; Shigehiro Ueno, Kasugai; Akiyoshi Nagano, Ama-gun; Tetsuya Fujii, Nishikasugai-gun; Kenichi Furuta, Tajimi, and Yukihiko Horiba, Konan, all of Japan, assignors to Toyoda Gosei Co., Ltd., Aichi-ken, Japan

Filed Sep. 20, 1996, Ser. No. 717,157

Claims priority, application Japan, Sep. 22, 1995, 7-224832

Int. Cl.^{6} B60R *21/20*

U.S. Cl. 280—728.3 **16 Claims**



1. An air bag cover for covering an air bag comprising:
- a main body portion including
  - a plurality of holes provided at a breakable portion of the main body portion, said breakable portion severing upon inflation of the air bag; and
  - a protrusion formed on an inner circumference of each of said holes in such a manner that the protrusion closes at least a portion of an opening of the associated hole.

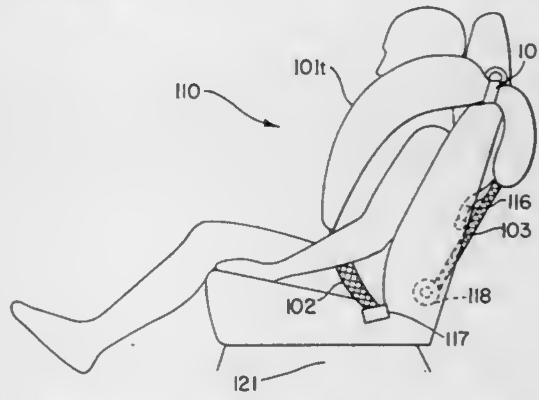
5,839,753
INFLATABLE TUBULAR TORSO RESTRAINT SYSTEM

Gershon Yaniv, Scottsdale, Ariz.; David J. Romeo, Etna, Wyo.; Dirk J. Hardtmann, Phoenix, and Lindley W. Bark, Chandler, both of Ariz., assignors to Simula Inc., Phoenix, Ariz.

Filed Mar. 31, 1997, Ser. No. 829,750

Int. Cl.^{6} B60R *21/18*

U.S. Cl. 280—733 **50 Claims**



1. A seat restraint system on a vehicle seat in a vehicle comprising:
- (a) an inflatable torso belt which assumes a flat configuration and which acts as a conventional torso section of a seat belt prior to inflation, having an inflatable portion of a first length, said inflatable portion, upon inflation, forming a relatively large diameter tube having a second length, said second length being at least about 20% less than the first length;
- (b) a buckle assembly, wherein a first portion of the buckle assembly is attached to the torso belt and wherein a second portion of the buckle assembly is anchored to the vehicle;
- (c) a lap belt attached to the first portion of the buckle assembly;
- (d) a first inertial reel attached to the lap belt anchored to the vehicle, said first inertial reel locking on impact to prevent payout of the lap belt;
- (e) a second inertial reel anchored to the vehicle and attached to the inflatable torso belt, said second inertial reel locking on impact to prevent a payout of the torso belt,

wherein:
- the torso belt is designed such that, after inflation, a portion of the inflatable torso belt lies over the top of the vehicle seat,
- the inflatable portion of the torso belt passes through a constraint, such that portions of the torso belt on both sides of the constraint are inflatable, and
- the inflatable portion is not vented after inflation, and such that the inflatable portion of the torso belt lying over the top of the vehicle seat would push an occupant of the seat down into the seat, thus controlling the position of the occupant during a collision.

5,839,754
MULTIPLE STAGE AIRBAG GAS GENERATOR

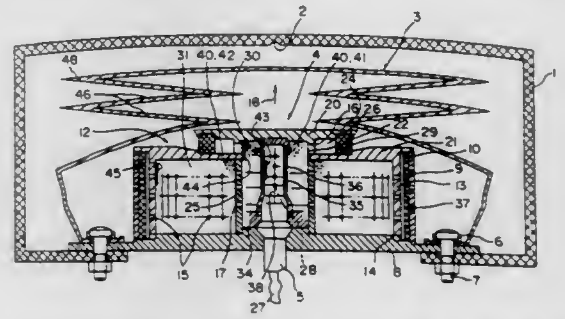
Klaus Schlüter, Eckental; Wolfgang Schwarz, Nürnberg; Gerd Kuscher, Mühlheim; Eugen Feuerstake, Eltersdorf; Martin Klöber, Heideck; Karl-Heinz Schneider, Röthenbach, all of Germany; Kiyoshi Honda; Seiichiroh Kobayashi, both of Saitama-ken, Japan, and Junichi Kishimoto, Fukushima-ken, Japan, assignors to Honda R&D Co. Ltd., Shimotakanezawa, and Nippon Koki Co. Ltd., Tokyo, both of Japan

Filed Jun. 6, 1996, Ser. No. 659,493

Claims priority, application Germany, Jun. 8, 1995, 195 20 847.1

Int. Cl.^{6} B60R *21/26*

U.S. Cl. 280—736 **3 Claims**



1. A gas generating apparatus for an automobile air bag having a cover; comprising a first chamber containing first gas generating agents; an igniter which is actuated when an automobile crash is detected to ignite said first gas generating agents; first passage means communicating said first chamber with said air bag and metallic foil covering said first passage means;
- a second chamber containing second gas generating agents extending about said first chamber; gas bores communicating said second chamber with said first chamber; second passage means communicating said second chamber with said air bag and metallic foil covering said second passage means;
- said igniter upon being actuated causing said first gas generating agents in said first chamber to ignite to generate a first gas rupturing the metallic foil covering said first passage means and a portion of said first gas flowing into said air bag through said first passage means, and a further portion of said first gas flowing into said second chamber to ignite the second gas generating agents to generate a second gas rupturing the metallic foil covering said second passage means and flowing into said air bag, said first passage means being differently

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sized relative to the gas bores between said first and second chambers and the positioning of the rupturable metallic foil over said first and second passage means causing said cover to be torn open to facilitate expansion of said air bag after the first gas in said first chamber has reached a maximum pressure and said second gas in said second chamber reaches a maximum pressure after said cover has been torn open and at a time delay caused by a difference in the sizes between the first passage means and the gas bores between said first and second chambers.

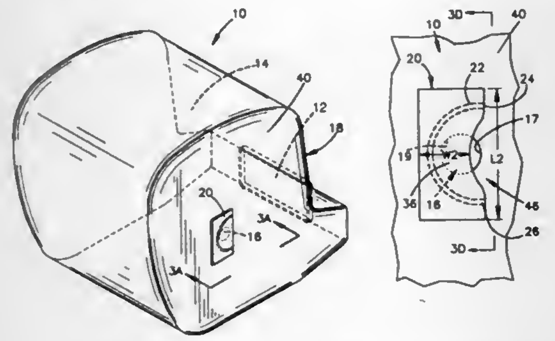
5,839,755
METHOD AND APPARATUS FOR RESTRAINING A VEHICLE OCCUPANT

Roy C. Turnbull, Troy, Mich., assignor to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Mar. 3, 1994, Ser. No. 205,534

Int. Cl.^{6} B60R *21/30*

U.S. Cl. 280—739 **8 Claims**



1. An inflatable air bag for, when inflated, restraining a vehicle occupant, said air bag comprising:

air bag material having an outer surface and an inner surface, said inner surface defining a chamber into which inflation fluid is directed to inflate said air bag,

said air bag material including a surface extending between said outer and inner surface and defining an opening for venting inflation fluid from said chamber;

a panel lying on said outer surface of said air bag material, said panel comprising at least a first single continuous piece of elastic material having a length and a width and completely overlying said opening in said air bag material;

said elastic material being stretchable in response to inflation fluid pressure in said chamber, said elastic material being stretchable from an unstretched first length in which a central portion of said elastic material completely blocks said opening to a stretched second length in which said central portion of said elastic material stretches and moves away from said opening to unblock said opening and thereby allows inflation fluid to be vented through said opening, said stretched second length being greater than said unstretched first length; and,

means for fixedly securing said elastic material of said panel to said outer surface of said air bag material and for causing, during pressure relief, the panel elastic material to deform and whereby through this deformation, a width or length dimension and elastic material associated with the width or length dimension shorten and whereby through this shortening of the width or length dimension, the associated elastic material of the width or length dimension goes from completely covering the opening to a shortened length or width which at least partially uncovers the opening.

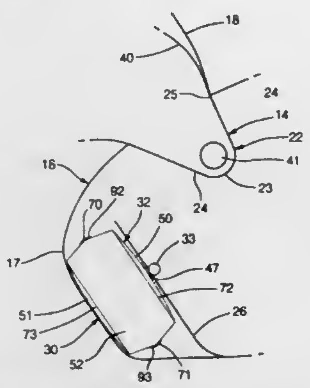
5,839,756
INFLATABLE BLADDER

David Patrick Schenck, Miamisburg, and Brian Joseph Thompson, Fairborn, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 3, 1997, Ser. No. 794,726

Int. Cl.^{6} B60R *21/16*

U.S. Cl. 280—743.1 **12 Claims**



1. An inflatable restraint system for protection of an occupant in a vehicle, the inflatable restraint system comprising:

an inflator for generating inflator gas; and

a bladder inflatable upon generation of gas by the inflator, the bladder including a forward panel, a rearward panel, and a pair of opposing end panels extending between and interconnecting the forward and rearward panels;

the forward and rearward panels each including an upper edge, a lower edge, and opposing side edges extending generally perpendicular to the upper and lower edges and wherein each of the panels includes four angled corner edges extending between the respective upper and side edges and lower and side edges and wherein the angled corner edges extend at a predetermined initial corner angle relative to the upper and lower edges.

5,839,757
PROTECTION DEVICE FOR COMBINATION VEHICLES

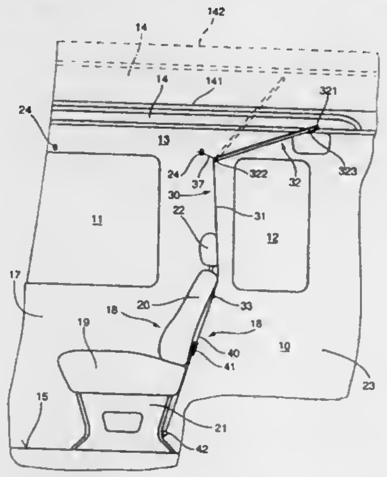
Eberhard Hennig von Lange, Sindelfingen, and Georgios Tsilchorozidis, Stuttgart, both of Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany

Filed May 14, 1997, Ser. No. 856,027

Claims priority, application Germany, May 15, 1996, 196 19 642.6

Int. Cl.^{6} B60R *21/06*

U.S. Cl. 280—749 **20 Claims**



1. Protection device for combination vehicles for separating a passenger compartment containing seats from a cargo space situated behind it in the driving direction, having a safety net which spans at least the area between the upper edge of the seat backrests and the vehicle roof and which is fastened on an upper transverse tube extending along the vehicle width and a lower transverse tube which is parallel thereto, and having belt straps which are applied to the lower transverse tube and have belt buckles for the tensioning of the lower transverse tube in the downward direction,

wherein the upper transverse tube is an upper frame part of an approximately trapezoidal tube frame whose lower frame part is parallel thereto and rests loosely behind the safety net, as viewed in the driving direction, and

wherein the tube frame is fastened in the area of the lower frame part by means of self-aligning fastening elements on the vehicle at a distance from the vehicle roof which is smaller than the frame height.

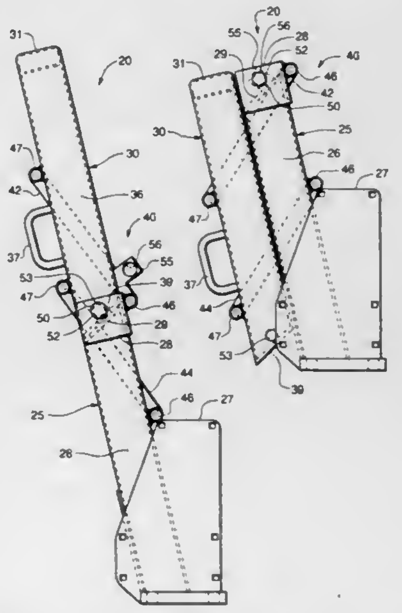
5,839,758
ROLL-OVER PROTECTIVE SYSTEM FOR TRACTORS

Edwin O. Finch, Philadelphia, Pa.; Fidel A. Martinez, and Jaime A. Sandoval, both of Queretaro, Mexico, assignors to New Holland North America, Inc., New Holland, Pa.

Filed Mar. 3, 1997, Ser. No. 811,443

Int. Cl.^{6} B60R *21/13*

U.S. Cl. 280—756 **16 Claims**



1. In a tractor having a frame supported on a rear axle; an operator's seat positioned proximate to said rear axle; and a roll-over protection apparatus mounted on said rear axle rearwardly of said operator's seat, an improved roll-over protection apparatus comprising:

a fixed lower section attached to said rear axle;

a movable upper section alignable with said lower section and movable relative thereto between a raised operative position and a lowered inoperative position; and

a four-bar linkage mechanism connecting said upper section to said lower section to permit said upper section to be pivotally moved relative to said lower section.

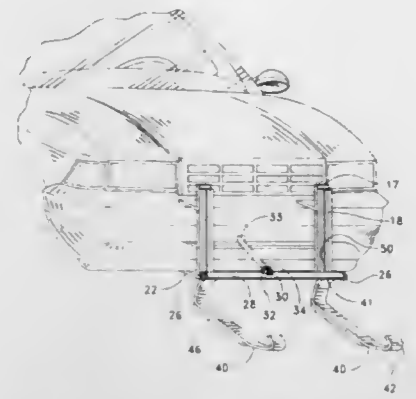
5,839,759
VEHICLE CAPTURE DEVICE

Kevin A. Trigo, 49 Carriage Dr., Lincoln, R.I. 02865

Filed Mar. 6, 1997, Ser. No. 812,272

Int. Cl.^{6} B60D *1/04;1/36;1/54;* **B60R** *25/00*

U.S. Cl. 280—762 **6 Claims**



1. In combination with a chase vehicle having a front end, a capture device mounted at the front end of said chase vehicle for positively engaging portions of an undercarriage of a fleeing vehicle positioned in front of and in close adjacent contact to said chase vehicle, said capture device comprising means for attachment to the front end of the chase vehicle and at least one movable arm having an inner end and a forward end and having an upwardly extending terminal hook portion at said forward end, said arm in turn mounted on said front end and movable from a storage position to an extended first operable position wherein said arm extends outwardly and forwardly from said chase vehicle front end and beneath the undercarriage of the fleeing vehicle and subsequently to a second operable position elevated from said first operable position wherein said hook portion is capable of entrapping portions of the undercarriage of the fleeing vehicle, said hook portion having inner and outer surfaces and being open at said inner surface with said open inner surface oriented towards said chase vehicle front end in the storage position and upwardly in said operable positions, and actuation means for moving said arm from said storage position to said first operable position and subsequently to said second operable position, wherein said at least one movable arm comprises a pair of movable arms mounted in spaced lateral position upon an assembly in turn attached to a frame in turn attached to the front end of the chase vehicle, said frame including a pair of laterally spaced upright members having upper and lower ends respectively and each of said members having a front surface facing away from said chase vehicle front end, said arms each attached to said assembly at points adjacent to the lower ends of said upright members and in general lateral alignment therewith, said arms being respectively positioned in front of said upright members in said storage position.

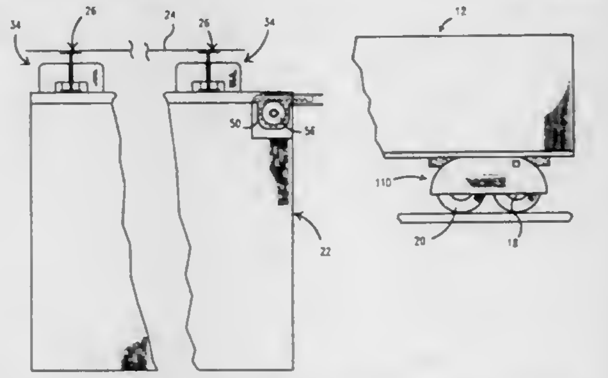
5,839,760
TRAILER MOUNTED ACCESSORIES

Douglas M. Johnson, 7148 E. Brainerd Rd., Chattanooga, Tenn. 37421

Filed Nov. 6, 1996, Ser. No. 743,876

Int. Cl.^{6} B60R *9/00*

U.S. Cl. 280—768 **18 Claims**



1. A mounting system for removeably mounting an accessory on a conventional load-carrying elongated trailer, said trailer having a longitudinal axis having a body supported by wheel mounted tires

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for being transported on a road, said trailer including a floor and a plurality of longitudinally spaced apart transversely extending floor supporting substantially I-shaped beams disposed beneath said floor, said I-shaped beams having a cross sectional configuration including upper and lower flanges connected together by a central web for structurally supporting said floor, said accessory comprising a body member having a plurality of longitudinally) spaced apart latch assemblies, each latch assembly comprising a fixed latch member and a moveable latch member, said fixed latch members being fixedly mounted to said body at predetermined longitudinally spaced locations means for mounting each moveable latch member offset transversely from the corresponding fixed latch member and moveable longitudinally relative thereto, each of said fixed latch members having a configuration including a longitudinally extending leg having a free end, the free ends of all of said fixed latch members projecting in a same direction, each of said moveable latch members having a configuration including a longitudinally extending leg having a free end, the free ends of all said moveable latch members projecting in a same direction which is opposite to the direction of the free ends of said fixed latch members and means for moving said moveable latch members together to clamp the lower flanges of selected ones of said between fixed latch members and moveable latch members of said plurality of latch assemblies to secure the accessory to the trailer.

5,839,761
ARRANGEMENT FOR REDUCING TIRE/ROAD NOISE

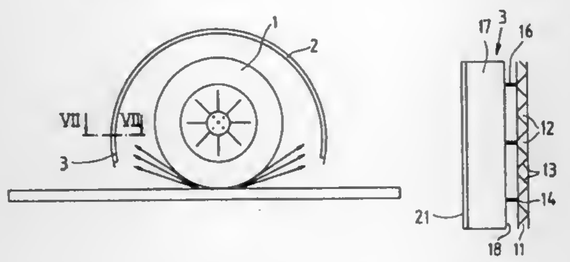
Thomas Dodt, Hanover, Germany, assignor to Continental Aktiengesellschaft, Hanover, Germany

Filed Dec. 8, 1995, Ser. No. 569,663

Claims priority, application Germany, Dec. 8, 1994, 44 43 678.5

Int. Cl.^{6} B62B *9/16;* **B32B** *33/00;7/00*

U.S. Cl. 280—851 **11 Claims**



1. An arrangement for reducing tire/road noise caused by a moving motor vehicle having a wheel box, the arrangement comprising:

an external spray water protective lining adapted to be mounted in said wheel box or on a mud flap attached so as to be suspended from said wheel box; and,

said lining being defined by a composite layer assembly including:

a layer component for absorbing sound;

an outer mechanically stable spray protective plate adjacent said layer component so as to protectively cover said layer component and adapted to face the tire;

said protective plate defining a structural non-smooth, non-planar surface facing the tire for dissipating the energy of water thrown up from the road and for reducing spray mist and being made of an impact resistant material to protect said layer component from mechanical damage including damage from stones thrown up from the road; and,

said protective plate having a plurality of through openings formed therein whereby said protective plate is permeable to road noise and water.

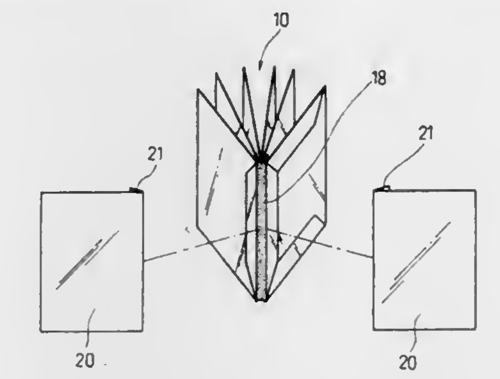
5,839,762
STRUCTURE OF BOOK PAGE

Lee Ho-Chou, P.O. Box 55-175, Talchung, Taiwan

Filed Jun. 27, 1997, Ser. No. 884,404

Int. Cl.^{6} B42D *1/00;* **B41L** *43/00;* **B31B** *1/62*

U.S. Cl. 281—38 **8 Claims**



1. A structure of book page for binding a book or album comprising:

an elongate sheet composed of a plurality of continuous sections each including a wide rectangular portion and a narrow rectangular portion abutting each other and divided by a pair of vertical folding lines, a pair of flap members respectively abutting each end of the wide rectangular portion and divided by a pair of transverse folding lines, a trapezoidal indentation incised in an outward end of a last wide rectangular portion of said elongate sheet;

said pair of flaps of each wide rectangular portion and said narrow rectangular portions being folded upward and attached to an upper surface of said wide rectangular portions along the pair of transverse folding lines and one of the vertical folding lines, said each continuous section being folded downward along the other vertical folding lines so as to complete a gathering of continuous double-layer pages by which a trapezoidal concave strip is defined by the trapezoidal indentations formed in an inside margin of each of the outmost pages.

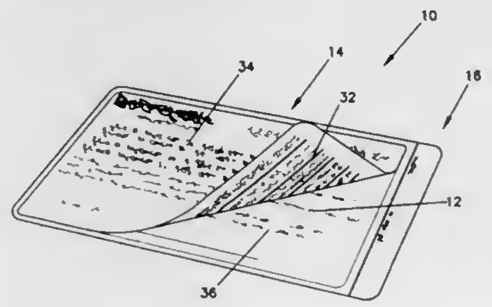
5,839,763
SECURITY CARD AND METHOD OF MANUFACTURE

Duncan McCannel, 3615 Great Oaks Cir., Eagan, Minn. 55123

Filed Sep. 26, 1996, Ser. No. 721,426

Int. Cl.^{6} B42D *15/00*

U.S. Cl. 283—109 **7 Claims**



1. A security card comprising:

a peel away cover including a top film and a first transparent film, wherein the first transparent film includes a surface having information printed thereon, said surface having information printed thereon being adhered to the top film;

a card base including a plastic substrate having a top surface and a second transparent film adhered to the top surface of the plastic substrate; and

clean release adhesive releasably adhering the first transparent film of said peel away cover to the second transparent film of said card base.

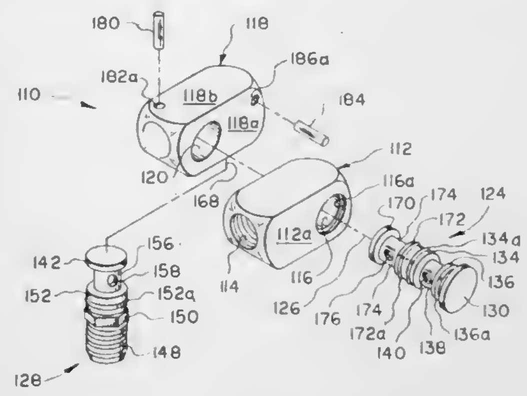
5,839,764
AIR LINE CONNECTOR

Richard A. Heidelberger, Wheatfield, N.Y., assignor to Dynabrade, Inc., Clarence, N.Y.

Filed Jan. 7, 1997, Ser. No. 779,898

Int. Cl.^{6} F16L *27/02*

U.S. Cl. 285—276 **23 Claims**



1. In an air line connection including a hose block having a first passageway for connection to a source of air under pressure, and a second passageway disposed in flow communication with said first passageway; a connector block having a third passageway adapted for alignment with said second passageway and a fourth passageway disposed in flow communication with said third passageway; pivot means having first and second ends received within said second and third passageways, respectively, for connecting said hose and connector blocks for pivotal movement about an axis aligned with said second and third passageways; first and second attaching means for attaching said first and second ends of said pivot means to said hose and connector blocks, respectively, for preventing separating movement of said hose and connector blocks in a direction aligned with said axis; a connector means received within said fourth passageway for connection to an air operated device; and third attaching means for attaching said connector means to said connector block; the improvement comprising in combination:

said second attaching means includes a first locking pin supported by said connector block and engaging with said pivot means for retaining said pivot means within said third passageway, said pivot means has an annular groove disposed in said third passageway, said first locking pin has opposite ends and an intermediate portion, said connector block has a first pair of mounting openings connected into said third passageway, said opposite ends of said first locking pin are supported by said connector block within said first pair of mounting openings, and said intermediate portion of said first locking pin engages said pivot means within said annular groove thereof; and

said third attaching means includes a second locking pin supported by said connector block and engaging with said connector means for retaining said connector means within said fourth passageway, said connector means has an annular groove disposed within said fourth passageway, said second locking pin has opposite ends and an intermediate portion, said connector block has a second pair of mounting openings connected into said fourth passageway, said opposite ends of said second locking pin are supported by said connector block within said second pair of mounting openings, and said intermediate portion of said second locking pin engages said connector means within said annular groove thereof.

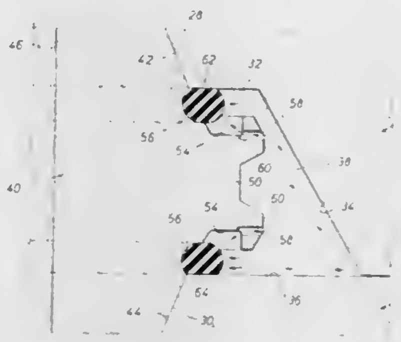
5,839,765
METAL SEAL RING FOR TUBULAR JOINT

Robert H. Carter; William M. Taylor, and Gerald S. Baker, all of Houston, Tex., assignors to Cooper Cameron Corporation, Houston, Tex.

Filed Nov. 1, 1996, Ser. No. 742,468

Int. Cl.^{6} F16L *17/08;17/10*

U.S. Cl. 285—334.2 **16 Claims**



7. In a tubular joint for a pair of tubular members having hubs in end to end relation with inner end tapered sealing surfaces thereon, a seal ring between said hubs having outer tapered sealing surfaces thereon in mating relation with said inner end sealing surfaces on said hubs to form a primary seal, and means for securing said hubs together in sealing relation with said seal ring; the improvement comprising:

secondary seal means positioned on said seal ring between said hubs radially outwardly of said tapered sealing surfaces and including fluid responsive means to permit fluid flow outwardly from said seal ring past said secondary seal means and to prevent fluid flow inwardly past said secondary seal means.

5,839,766
DOOR CONTROL SYSTEM AND RELEASE MECHANISM

Nelson A. Iannuzzi, 96 S. Cedar St., and George M. Mehalshick, R.R. 2 Box 93N Woodlawn Park, both of Hazleton, Pa. 18201

Division of Ser. No. 153,590, Nov. 17, 1993, Pat. No. 5,576,581. This application Nov. 22, 1996, Ser. No. 754,976

Int. Cl.^{6} E05C *1/06*

U.S. Cl. 292—144 **4 Claims**

1. A latch for a movable fire stop of a release mechanism in a fire control system comprising:

a metallic casing having an inside wall;

a first opening adjacent the inside wall of the casing forming with the wall an open area in the form of a slot having dimensions adapted to receive a latch plate having dimensions such that its width is greater than its thickness and its length is greater than its width;

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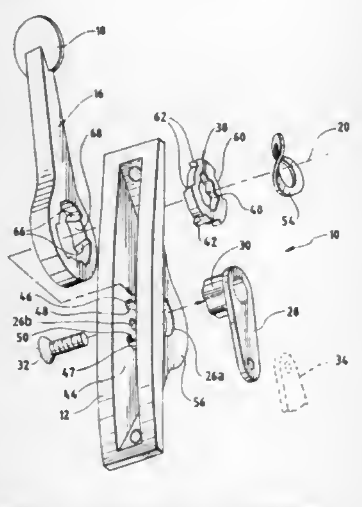
- a second opening in the casing which intersects with a third opening in the form of a bore, one end of which bore terminates in one side of the first opening and the other end of which terminates below the intersection of the second opening with the third opening and adapted to contain a resilient member;
- a latch pin mounted in the third opening at the end intersecting with the first opening for engaging the latch plate, a resilient member mounted in the third opening at the end opposite the latch pin and below the intersection of the second opening with the third opening, the latch pin having a detent opening in one side;
- a lever means accommodated in the second opening for biasing the latch pin and releasing an end link of the latch plate, the lever means being adapted to pivot on a pivot pin; and
- a lever biasing means connected with an end of the lever means for moving the end of the lever means to bias the latch pin against the resilient member.

5,839,767
PICK-RESISTANT LOCK ACTUATOR

Stephen M. Piltingsrud, Owatonna, Minn., assignor to Truth Hardware Corporation, Owatonna, Minn.
Filed Mar. 7, 1997, Ser. No. 812,599
Int. Cl.⁶ E05B *3/00*
U.S. Cl. 292—336.3 **35 Claims**

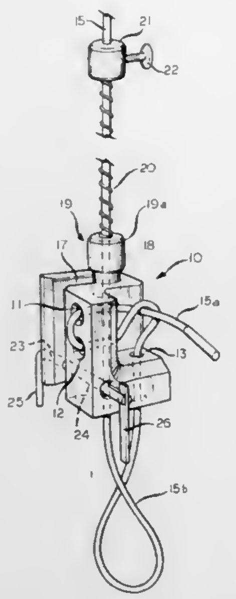


1. An actuator for a window lock, comprising:
- a drive member secured for pivoting about an axis;
- a pivotable actuator link having a radial portion operatively connectable to a window lock for operating a lock in response to pivoting of the actuator link;
- a pivot link substantially secured for pivoting with said actuator link and said drive member, said pivot link having a stop member which in a first position is secured against pivoting and in a second position freely pivots about said axis;
- means for biasing said pivot link toward said first position; and means for biasing said pivot link toward said second position when a pivoting force is applied to said drive member.

5,839,768
CABLE LOOP FORMING AND HOISTING DEVICE

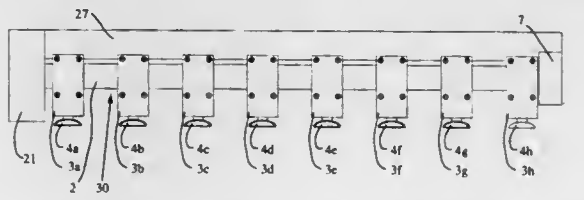
Gary E. Wackerly, 310 Lincoln Ave., Canton, Ohio 44708
Filed Apr. 7, 1997, Ser. No. 833,574
Int. Cl.⁶ B66C *1/12;* **F16G** *11/14*
U.S. Cl. 294—74 **10 Claims**

1. A cable retaining device for forming a cable loop around an article to be lifted or restrained, said device comprising, in combination, a cable having at least one free end, a cable knot block having a generally rectangular shape, a pair of similar parallel holes in an upper region of said block, a third hole in said block located at right angles to said pair of parallel holes, all said holes having a slightly greater diameter than the cable diameter adapted to receive the free end portion of said cable in fixed relation, a continuous lineal slot in said block formed parallel to said third hole to receive an intermediate portion of said cable beyond a sized lifting loop, said slot having a slightly greater width than said cable diameter, an enlarged recessed circular area formed in an upper terminating region of said slot, and a circular keeper member surrounding said cable fitted within said enlarged recessed area of said slot for positive retention of said cable therein.



5,839,769
EXPANDING GRIPPER WITH ELASTICALLY VARIABLE PITCH SCREW

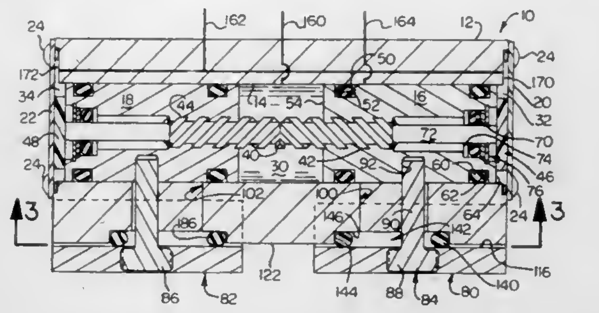
Alexander H. Slocum, Bow, N.H., and R. Scott Ziegenhagen, II, San Jose, Calif., assignors to Kinetrix, Inc., Bedford, N.H.
Filed Oct. 3, 1996, Ser. No. 726,069
Int. Cl.⁶ B65B *35/38*
U.S. Cl. 294—87.1 **17 Claims**



1. Semiconductor processing equipment incorporating apparatus for varying the spacing between a plurality of points, the apparatus comprising:
- a) a shaft;
- b) a plurality of bodies each having an inner surface encircling and facing the shaft at points along the length of the shaft, the plurality of bodies defining the said plurality of points;
- c) a compliant material disposed between the shaft and the plurality of bodies; and
- d) wherein one of the shaft and the inner surfaces of the plurality of bodies contains variable lead threads engaging the compliant material such that the lead of the thread is different at the plurality of points.

5,839,770
ROBOTIC GRIPPER

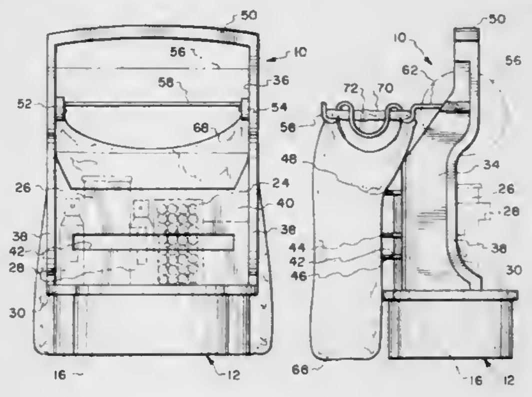
Theodore S. Zajac, Jr., and Brian K. Thompson, both of Elyria, Ohio, assignors to Zaytran, Inc., Elyria, Ohio
Filed Jun. 26, 1997, Ser. No. 883,507
Int. Cl.⁶ B25J *15/08*
U.S. Cl. 294—88 **21 Claims**



1. An apparatus for moving members into engagement with a workpiece comprising:
- a body including a surface defining a bore;
- first and second pistons located in the bore and movable toward and away from each other in response to the application of fluid pressure to opposite sides of the pistons;
- a first member connected to the first piston through a first opening in the body and slidable with respect to the body to move into engagement with the workpiece;
- a second member connected to the second piston through a second opening in the housing and slidable with respect to the body to move into engagement with the workpiece;
- resilient seals between the body and the first and second members to limit fluid flow between the first and second openings and the surrounding environment;
- and a purge passage connecting the first and second openings with a third opening in the exterior of the body, the third opening being adapted to be connected selectively to one of a source of fluid under pressure and a vacuum to control the direction of movement of debris in the first and second openings.

5,839,771
TOTE FOR CLEANING SUPPLIES

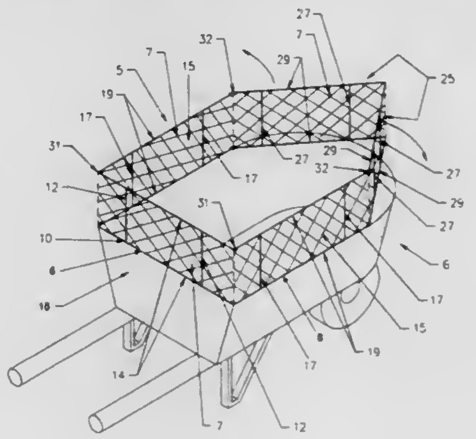
Robert A. DeMars, 5000 N. Parkway Calabasas, Suite 233, Calabasas, Calif. 91302
Filed Nov. 19, 1996, Ser. No. 752,656
Int. Cl.⁶ B65D *85/62*
U.S. Cl. 294—146 **4 Claims**



1. A tote for cleaning utensils and supplies comprising:
- a base having an internal compartment formed by an enclosing wall located about a bottom wall, said base having an open top, said base having an exterior wall surface;
- a pair of upstanding sidewalls having a bottom edge fixed to said base, said sidewalls extending from said base and located in a spaced apart relationship forming a space therebetween, said upstanding sidewalls having a top edge, a handle secured to said top edge of both said sidewalls and extending therebetween;
- a back wall extending between said upstanding sidewalls, said back wall being in alignment with a portion of said enclosing wall, said back wall having a back side and a front side, said front side being in alignment with said internal compartment, said back side being in alignment with said exterior wall surface;
- a hanger mounted on each said sidewall, said hanger adapted to support a bag in an open configuration which is to rest against said back side of said back wall; and
- a bracket mounted on each said sidewall and located within said space, said brackets being in alignment, said brackets located directly adjacent said handle, said brackets adapted to support a roll of paper towels.

5,839,772
CARRYING BIN WALL EXTENDER

Bruce B. Toole, 323 Pine Needle Dr., Hampstead, N.C. 28443
Filed Sep. 26, 1996, Ser. No. 721,218
Int. Cl.⁶ G62D *27/00*
U.S. Cl. 296—32 **13 Claims**



1. An attachment to increase the capacity for a wheelbarrow type carrying bin that rolls on at least one wheel and unloads by a rotational tipping around the wheel axis comprising:
- (a) at least four frames;
- (b) a barrier attached to each of said frames;
- (c) means for adjustably connecting said frames to each other at corners of said frames so as to form a fence-like structure of adjustable width and length with at least one of said means for adjustable connection constructed so as to easily connect and disconnect so that at least one of said frames may disconnect from a point of connection to swing open in a gate like manner, whereby the wheelbarrow type carrying bin, when rotated for emptying, will do so in the direction of the frame that disconnects to swing open in a gate like manner so that none of said frames form a barrier to emptying said wheelbarrow type carrying bin; and,
- (d) means for removably attaching at least three of said frames to a wheelbarrow type carrying bin.

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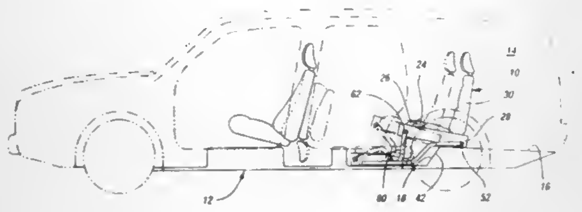
5,839,773
ROLLING STOWABLE SEAT

Marcel Ban, Troy, and Alan Sturt, W. Bloomfield, both of Mich., assignors to Lear Corporation, Southfield, Mich.

Filed Oct. 15, 1997, Ser. No. 950,934

Int. Cl.^{6} B60N *2/36*

U.S. Cl. 296—65.09 **6 Claims**



1. A seat mounted within a vehicle having a compartment that is converted between a passenger configuration and a cargo carrying configuration, the compartment having a floor that defines a recess and a right wheel housing and a left wheel housing on opposite sides of the floor, said seat comprising:

- a lower seat assembly having a front portion and a rear portion;
- a seat back assembly pivotally connected to the lower seat assembly;
- a right rail secured to the right wheel housing, said right rail defining a first channel;
- a left rail secured to the left wheel housing, said left rail defining a second channel;
- a right side shiftable element connected to the rear portion of the lower seat assembly and received in the first channel of the right rail for movement along the first channel;
- a left side shiftable element connected to the rear portion of the lower seat assembly and received in the second channel of the left rail for movement along the second channel;
- a right link arm pivotally connected on an upper end to the front portion of the lower seat assembly and pivotally connected to the floor;
- a left link arm pivotally connected on an upper end to the front portion of the lower seat assembly and pivotally connected to the floor;
- a right locking pin associated with the right link arm that selectively locks the right link arm to the right rail;
- a left locking pin associated with the left link arm that selectively locks the left link arm to the left rail;
- said seat being converted from the passenger configuration to the cargo carrying configuration by pivoting the seat back assembly onto the lower seat assembly, disengaging right and left locking pins from the right and left rails, respectively, shifting the lower seat assembly forward by moving the right and left side shiftable elements forward in the first and second channels, respectively, and pivoting the upper ends of the right and left link arms forward and downward until the lower seat assembly is received in the recess formed in the floor of the vehicle.

5,839,774
ANTI-BUFFET SCREEN DEVICE FOR AN OPEN MOTOR VEHICLE AND METHOD OF MAKING SAME

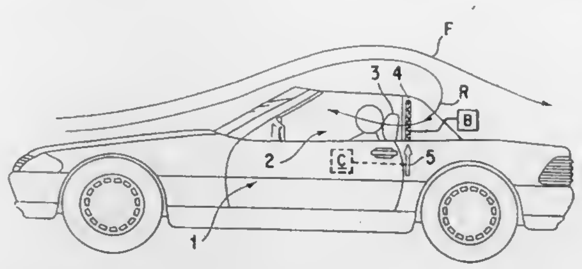
Albert Hack, and Wolfgang Odebrecht, both of Sindelfingen, Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

Filed Jan. 12, 1998, Ser. No. 5,825

Claims priority, application Germany, Jan. 11, 1997, 197 00 739.2

Int. Cl.^{6} B60J *1/20*

U.S. Cl. 296—91 **36 Claims**



1. Anti-buffet screen device for an open motor vehicle with at least one anti-buffet screen associated with at least one seat position of a vehicle interior, wherein said anti-buffet screen has a heat-transfer device associated with it, said heat transfer device being flat in shape extending over a portion of an active surface of the anti-buffet screen.

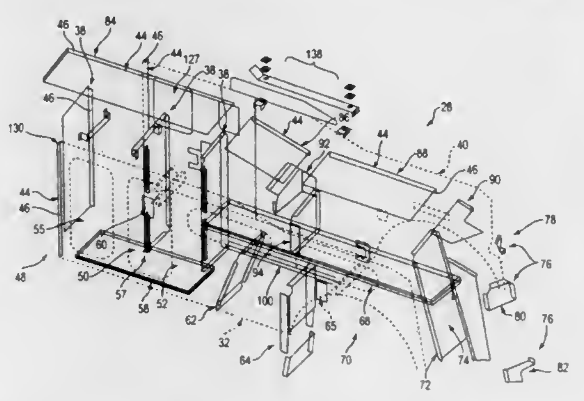
5,839,775
LIGHTWEIGHT RUST-RESISTANT BODY ASSEMBLY FOR TOW TRUCKS AND A METHOD OF MANUFACTURE

Charles E. Young, Falling Waters, W. Va., and James J. Bartel, Southfield, Mich., assignors to Jerr-Dan Corporation, Greencastle, Pa.

Filed Nov. 7, 1995, Ser. No. 551,785

Int. Cl.^{6} B60P *3/12*

U.S. Cl. 296—183 **52 Claims**



1. A body unit, for attachment to a truck chassis, comprising an exterior panel attached to a structural unit, wherein the structural unit comprises:

- a structural front panel with at least one flange formed on at least one edge;
- a plurality of storage compartment panels attached to the structural front panel, each of the plurality of storage compartment panels having at least one flange formed on at least one edge;
- a structural back panel, with at least one flange formed on at least one edge, attached to the plurality of storage compartment panels; and
- a structural top panel, with at least one flange formed on at least one edge, attached to the structural front panel and attached to the structural back panel; and
- wherein the structural front panel, the structural back panel, the structural top panel, and the plurality of storage compartment panels are attached by adhesive disposed on each flange to form the structural unit and define at least one storage compartment.

5,839,776
STRUCTUAL SUB-ASSEMBLY

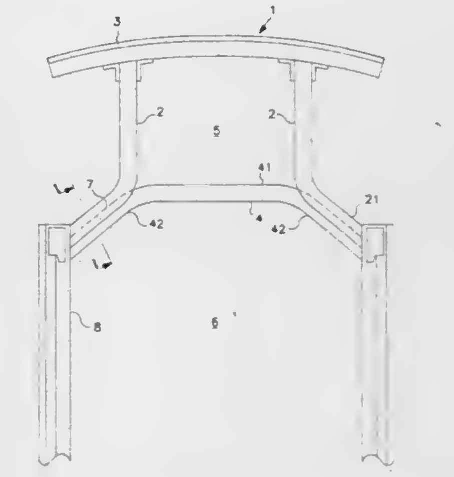
Edvin List Clausen, Tønder, Denmark, and Peter Gundlach, Raufoss, Norway, assignors to Norsk Hydro a.s., Oslo, Norway

Continuation of Ser. No. 507,312, Oct. 18, 1995, abandoned. This application Jan. 17, 1997, Ser. No. 786,101

Claims priority, application Norway, Feb. 22, 1993, 930618

Int. Cl.^{6} B62D *27/00*

U.S. Cl. 216—188 **9 Claims**



1. A structural assembly at a front or rear of a vehicle frame, said assembly comprising:

- a longitudinal member extending in a longitudinal direction of said vehicle frame, said longitudinal member having a part extending at an angle to said longitudinal direction;
- a transverse member extending transversely of said longitudinal direction, said transverse member including a central part and an end part extending angularly relative to said central part and extending to said longitudinal direction at an angle substantially equal to said angle of said part of said longitudinal member;
- said part of said longitudinal member and said end part of said transverse member being aligned and joined to form a nested joint that extends at said angle to said longitudinal direction;
- a side member extending in said longitudinal direction of said vehicle frame; and
- said part of said longitudinal member and said end part of said transverse member of said nested joint extending toward and being joined to said side member, thereby forming a triple joint connection between said longitudinal member, said transverse member and said side member, with said nested joint providing distribution of load between said longitudinal and transverse members.

5,839,777
SUPPORT OF A BODY STRUCTURE OF A VEHICLE AND PROCESS FOR MANUFACTURING SAME

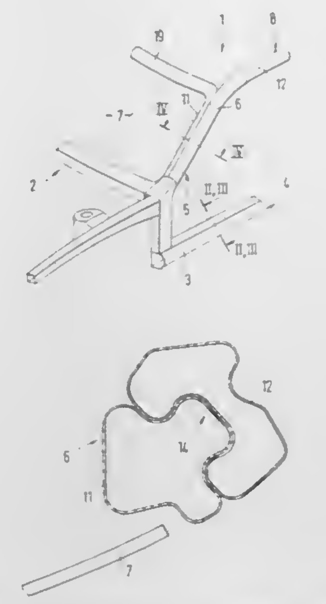
Josip Vlahovic, Bietigheim-Bissingen, Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Weissach, Germany

Filed May 10, 1996, Ser. No. 644,825

Claims priority, application Germany, May 26, 1995, 195 19 353.9

Int. Cl.^{6} B62D *25/00*

U.S. Cl. 296—205 **10 Claims**



1. Support of a body structure of a vehicle which is formed by hydraulic expanding internal high-pressure deforming, wherein the support is composed, at least along a partial area of its longitudinal course, of at least two hydraulically expanded, parallel extending hollow profiles which are form-lockingly connected with one another.

5,839,778
LOCKING ASSEMBLY FOR RELEASABLY LOCKING A VEHICLE ROOF

Kurt Schaible, Aidlingen; Eckart Schuler, Sindelfingen; Bernhard Schenk, Böblingen; Ralf Mertin, Herdecke; Günter Ellenbeck, Gelsenkirchen, and Holger Seel, Aidlingen, all of Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany

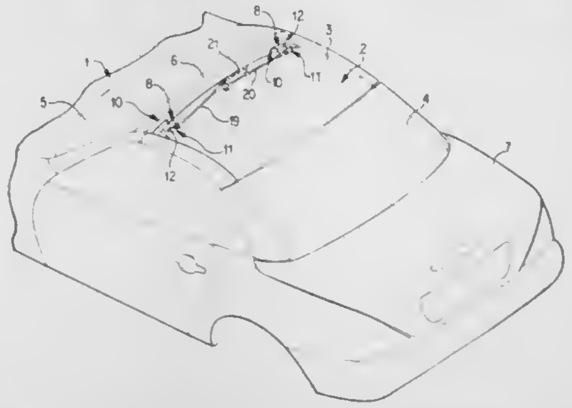
PCT No. PCT/EP96/00841, § 371 Date Oct. 28, 1996, § 102(e) Date Oct. 28, 1996, PCT Pub. No. WO96/27509, PCT Pub. Date Sep. 12, 1996

PCT Filed Mar. 1, 1996, Ser. No. 702,639

Claims priority, application Germany, Mar. 3, 1995, 195 07 431.9

Int. Cl.^{6} B60J *7/185*

U.S. Cl. 296—224 **6 Claims**



1. A locking arrangement for the releasable fastening of a vehicle roof on an immovable vehicle body part, comprising:

- at least one hook lock having interacting connecting members arranged on the vehicle roof and on the vehicle body part, one of the connecting members constituting a locking hook, and another of the connecting members constituting a locking pin behind which the associated locking hook is configured to reach with a hook end, wherein a pivotal connection is at an end of the locking hook which is opposite the hook end, on the end of a reversible swivel-driven lever having an end connected with the locking hook for displacing the locking-

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hook between an unlocking position and a locking position in a longitudinal vehicle direction and in a transverse direction such that the hook end is moved between a hooked position and a unhooked position,

means operatively associated with the locking hook for controlling the transverse displacement of the hook end, and

interacting positioning means arranged on the vehicle roof and on the vehicle body part such that the locking hook avoids weight forces of the vehicle roof, whereby the transverse displacement of the hook end is controlled by a displacement guiding of the locking hook such that the locking hook is disposed between end areas thereof,

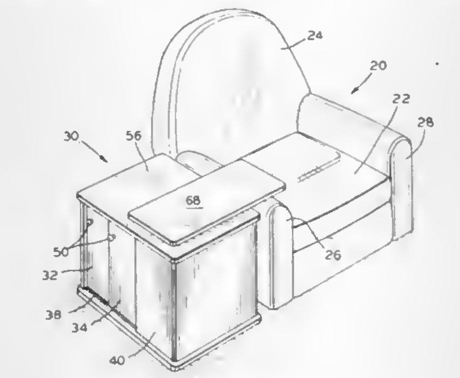
wherein the lever is movable about a swivel shaft which, in a locked position of the hook lock, is proximate to an imaginary line extending between the end of the locking hook and the pivotally connected end of the locking hook.

5,839,779

Patent Not Issued For This Number

5,839,780
CABINET AND TABLE ASSEMBLY FOR USE WITH SEATING APPARATUS

Ford B. Cauffiel, 4126 Nantucket Dr., Toledo, Ohio 43623
Filed Jan. 31, 1997, Ser. No. 790,726
Int. Cl.^{6} A47B *39/00*
U.S. Cl. 297—135 **29 Claims**

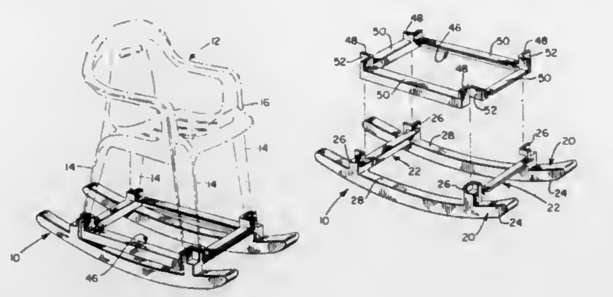


1. In combination, seating apparatus supported on a floor, a cabinet having a top supported on the floor near one side of said seating apparatus, a movable table above the top of said cabinet, support means supporting an end portion of said table and extending downwardly through a first opening in said top, engaging means in said cabinet engaging a lower portion of said support means, a second opening in said top spaced from said first opening, said second opening optionally providing means to receive said support means and thereby enable said support means, said table and said cabinet to be placed on an opposite side of said seating apparatus, and a counterweight in said cabinet spaced from said engaging means to counterbalance the weight of said table and any load thereon.

5,839,781
LAWN CHAIR ROCKER BASE SYSTEM

Ronnie D. Knape, Rte. 4, Box 533, Alvin, Tex. 77511
Filed Dec. 4, 1997, Ser. No. 985,072
Int. Cl.^{6} A47C *3/029;13/10*
U.S. Cl. 297—258.1 **16 Claims**

1. A lawn chair rocker base system for converting a lawn chair having four legs that support a seat into a rocking chair, the lawn chair rocker base system comprising:



a rocker base assembly; and

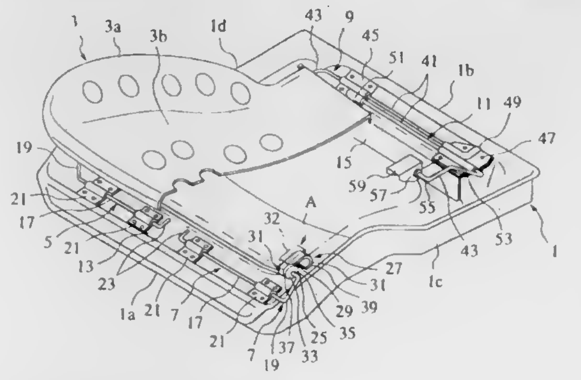
a chair locking structure;

said rocker base assembly including two rocker members that are spaced apart and secured together by two rigid spacer bars, each rocker member including a curved rocker rail and two chair foot receiving structures, each chair foot receiving structure including a planar chair foot receiving surface and a chair foot insertion opening;

said chair locking structure including four locking channel members supported in a spaced rectangular configuration having four corners by four structural spacer bars, each of said four locking channel members having an L-shaped cross-section, an interior of each of said four locking channel members being oriented away from a center of said rectangular configuration, said chair locking structure being sized such that each of said four locking channel members is simultaneously positionable adjacent to one of said chair foot receiving structures.

5,839,782
TORSION-BAR EQUIPPED VIBRATION ABSORBING-SEAT DEVICE

Takayoshi Kashiwamura; Akira Homma; Nozomu Munemura, all of Yokohama; Toshimichi Hanai, Yokosuka; Kazuhito Kato, Yokohama, and Kozo Yamaura, Fujisawa, all of Japan, assignors to NHK Spring Co., Ltd., Kanagawa-ken, Japan
Filed Mar. 12, 1996, Ser. No. 614,247
Claims priority, application Japan, Mar. 15, 1995, 7-055897
Int. Cl.^{6} B60N *2/00*
U.S. Cl. 297—337 **6 Claims**



6. A seat device comprising:

a seat member for receiving a seating load;

a bracket member responsible for a total load of the seat member including the seating load;

a cushion frame member mounted on a floor;

a torsion bar member secured at a base end thereof to the cushion frame member, the torsion bar member having a spring portion twistable about a plurality of mutually non-parallel axes;

an integral member comprising a collar fitted on a free end of said torsion bar member and a flange extending in a radial direction of the collar, the integral member having said bracket member loosely fitted on the collar wherein:

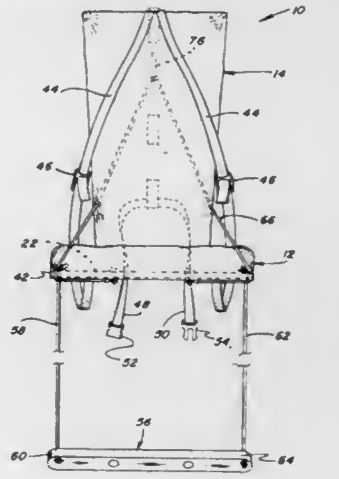
the flange prevents the bracket member from hitting against the spring portion of the torsion bar member; and

the bracket member being in a varied position relative to the integral member as the seating load varies within a range including a minimum load predetermined for a non-seated condition of the seat member, and an average load predetermined for probable seated conditions of the seat member; and

a variation absorbing means for absorbing a variation of a relative position between the minimum load and the average load so as to have the bracket member brought into a surfacial contact with the collar and the flange, as the seating load is varied to the average load.

5,839,783
PORTABLE GROUND-BASED SEAT

Jeffrey E. Black, 4727 Cree La., Cleveland, Tenn. 37312
Filed Jun. 6, 1997, Ser. No. 870,787
Int. Cl.^{6} B60N *2/02*
U.S. Cl. 297—380 **13 Claims**



8. A portable ground-based seat adapted for carrying by the user, the seat comprising:

a back structure, a seat structure, and seat structure support means;

the back structure including a top portion, a bottom portion, a front face, and a rear face;

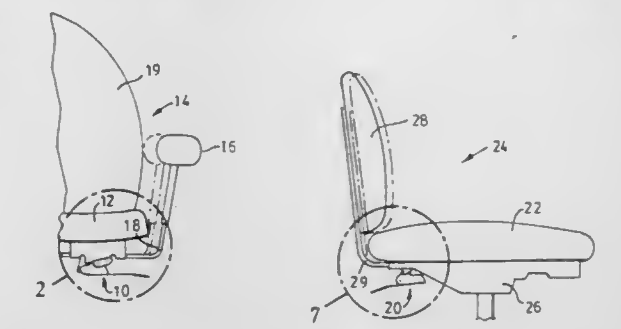
the seat structure including a front portion, a rear portion, a top face and a bottom face, the rear portion of the seat structure pivotally connected to the bottom portion of the back structure to allow relative rotation of the two structures;

the seat structure support means extending between the back structure and the seat structure, the seat structure support means positionable for preventing rotation of the seat structure downward and away from the back structure when a person is seated in the portable seat, the seat structure support means further positionable for allowing the seat structure to be positioned substantially parallel to the back structure such that the bottom face of the seat structure lies adjacent the rear face of the back structure; and

a cable support member connected to the rear face of the back structure, wherein the seat structure support means includes a cable having a first side connected at a first location on the seat structure and a second side connected at a second location on the seat structure, the cable including a mid point engaging the cable support member on the rear face of the back structure.

5,839,784
CHAIR CONTROL

William R. Breen, Etobicoke, Canada, assignor to Nightingale Inc., Mississauga, Canada
Filed May 29, 1997, Ser. No. 864,821
Claims priority, application Canada, Mar. 27, 1997, 2201253
Int. Cl.^{6} B60N *2/22;2/46*
U.S. Cl. 297—383 **20 Claims**

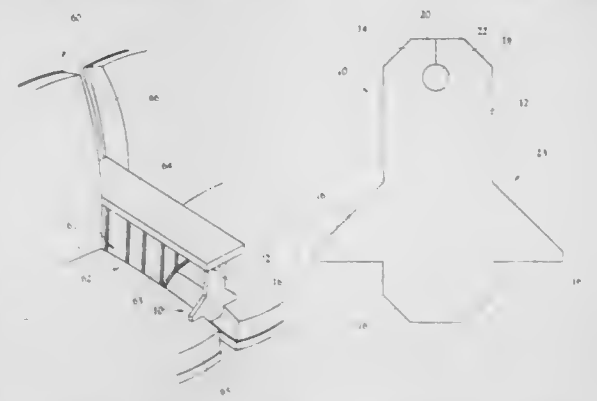


1. A chair control for adjusting the position of a chair armrest or back having a transverse support bar for mounting the armrest or back, the chair control comprising:

a mounting bracket having a slot for slidably retaining said support bar therein to permit longitudinal position adjustment thereof; the mounting bracket including a first pivot pin spaced transversely of the support bar; a rigid lever pivotally mounted on said pivot pin, the lever having a first end portion adapted to pivot into frictional engagement with the support bar and a second end portion remote therefrom; the mounting bracket having a second pivot pin spaced from the first pivot pin; a toggle linkage having a central pivot and opposed links coupled respectively between the lever second end portion and the second pivot pin, so that transverse reciprocal movement of said central pivot causes the lever first end portion to pivot into and out of engagement with the support bar; and means for releasably retaining the toggle linkage in a locked position where the lever first end portion is in engagement with the support bar.

5,839,785
THEATER SEAT HOLD-DOWN DEVICE

Vickie B. Miller, and Terry A. Miller, both of 1218 Oak Park Ave., Maryville, Tenn. 37803
Filed Mar. 7, 1995, Ser. No. 399,571
Int. Cl.^{6} A47C *7/54*
U.S. Cl. 297—411.2 **8 Claims**



1. A theater seat hold-down device for maintaining a seat member of at least one conventional theater seat in a substantially horizontal orientation, said conventional theater seat including an a disposed on either side of a seat member, said armrest assembly including an armrest support, the conventional theater seat further including a biasing device for biasing the seat member in a

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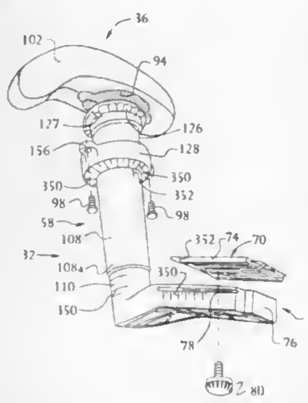
substantially vertical orientation when the seat member is not use, said theater seat hold-down device comprising:

an elongated member adapted to extend between an armrest assembly and a seat member, said elongated member defining an armrest assembly engagement portion and a seat engagement portion, said armrest assembly engagement portion being configured to engage the armrest assembly and said seat engagement portion being configured to engage at least one seat member adjacent to the armrest assembly such that the seat member is maintained in a substantially horizontal orientation, said elongated member defining at least two beveled corners diagonally opposed one from another.

5,839,786
ADJUSTABLE ARMREST

Sava M. Cvek, Cambridge, Mass., assignor to Stylex, Inc., Delanco, N.J.
Filed Jun. 6, 1997, Ser. No. 870,970
Int. Cl.⁶ A47C *7/54*
U.S. Cl. 297—411.35 23 Claims



1. An armrest assembly for connection to a chair which armrest assembly can pivot through a plurality of locations in a plane that is generally parallel to the seat of the chair, comprising

a first member, said first member being for connection to said chair,

an armrest assembly,

said armrest assembly being supported by said first member, means connected to said armrest assembly and to said first member for enabling said armrest assembly to pivot relative to said first member in a plane that is generally parallel to the seat of said chair,

said means connected to said armrest assembly comprises a plurality of circumferentially disposed detents and a yieldable means, each of said detents corresponding to one of said locations of said armrest assembly in said plane, and

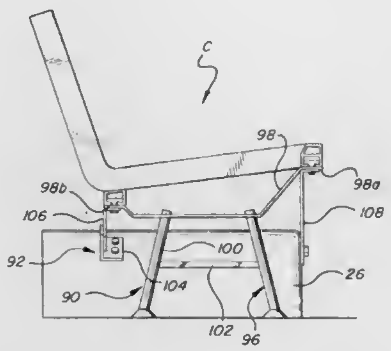
said yieldable means is selectively engagable with at least one of said detents for releasably retaining said armrest assembly in one of said locations,

a collar, said collar being disposed around said first members, said collar being movable relative to said first member with said armrest assembly, said collar including means for connecting it to said armrest assembly so that it is movable with said armrest assembly relative to said first member through a range of movement, and

said detents and said yieldable means are connected to said armrest assembly and said collar.

5,839,787
SEAT ASSEMBLY FOR MASS TRANSIT VEHICLE

Richard C. Magnuson, Kentwood, and Michael E. Phillips, Jenison, both of Mich., assignors to American Seating Company, Grand Rapids, Mich.
Division of Ser. No. 726,919, Oct. 7, 1996, Pat. No. 5,655,816, which is a continuation of Ser. No. 312,825, Sep. 24, 1994, abandoned. This application Jul. 21, 1997, Ser. No. 896,738
Int. Cl.⁶ A47C *5/10*
U.S. Cl. 297—452.2 4 Claims



1. A seating assembly for installing in a transit vehicle comprising:

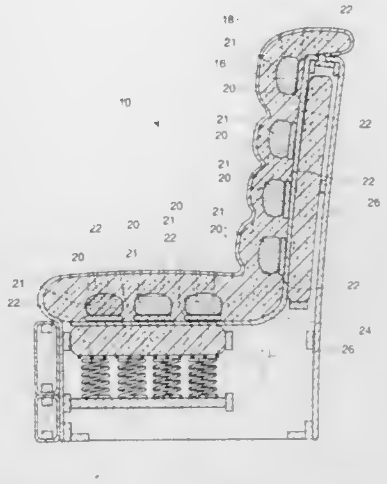
a seat frame including spaced side rails each having a front end, a front cross rail extending between the front ends of the side rails and immovably secured to the front ends, and a rear cross rail extending between the side rails rearwardly of the front cross rail, each cross rail having a channel structure defining a transversely extending groove and a transversely extending slot in a lower wall of the channel structure beneath the groove providing access to the groove;

a support bracket having an upper end defining spaced front and rear apertures; and

front and rear fastener assemblies mounted at spaced front and rear locations on the upper end portion of the support bracket in association with the front and rear apertures and each including a nut having a configuration which slidably fits in the groove of a respective cross rail, and a bolt having a head and a threaded shank extending upwardly through a respective aperture in the upper end portion of the support bracket and through the slot in the lower wall of the respective channel structure for threaded connection with the respective nut, the fastener assemblies being operative in response to loosening of the threaded connections between the nuts and bolts to allow transverse adjustment of the support member relative to the cross rails and operative in response to tightening of the threaded connections to clamp the support bracket to the cross rails in any position of relative transverse adjustment along the grooves, each groove and slot coacting to define a T configuration, each nut having a T configuration in transverse cross section matching the T configuration of the respective groove and slot and including a head portion positioned slidably in the respective groove and a shank portion positioned slidably in the respective slot, each nut having an oblong configuration in plan view including a minor dimension, sized to pass through the respective slot with the nut secured to the threaded shank of the bolt in a first angular orientation, and a major dimension, sized to enable end edges of the head portion of the nut to engage side walls of the respective groove, each fastener assembly further including friction means interposed between the nut and the threaded shank of the bolt operative to cause the nut to turn with the bolt in the absence of resistance to nut rotation, whereby, after the nut has been passed upwardly on the threaded shank of the bolt through the slot, the bolt may be rotated to rotate the nut to a second angular orientation in which the end edges engage the side walls of the groove.

5,839,788
ARTICLE OF FURNITURE WITH AN IMPROVED INNER SUPPORT SYSTEM

Moses Orr, III, 701 B Temple Rd., Ladson, S.C. 29456, assignor to Moses Orr, III, Ladson, S.C.
Filed Mar. 4, 1997, Ser. No. 805,919
Int. Cl.⁶ A47C *7/74*
U.S. Cl. 297—452.41 12 Claims

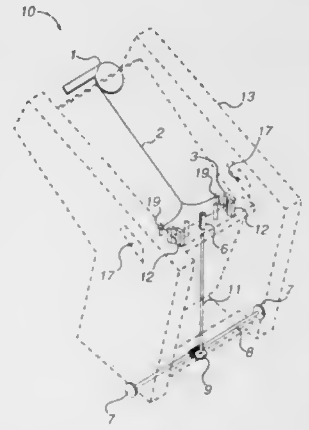


1. An article of furniture comprising:

a. at least one flexible enclosure within the furniture and positioned for receiving weight of a person resting on the furniture;
b. the enclosure containing a liquid therein;
c. a heating element within a cover the cover positioned adjacent the enclosure;
d. a water-resistant liner positioned generally beneath the cover and generally beneath the enclosure when the article of furniture is upright; and
e. cushioning material positioned generally beneath the liner when the article of furniture is upright.

5,839,789
BELT TENSIONER FOR CHILD SAFETY SEAT

Emil M. Koledin, 4935 Lakeview Dr., Hermitage, Pa. 16148
Filed Jun. 26, 1997, Ser. No. 883,321
Int. Cl.⁶ A47D *15/00*; A62B *35/00*; B60R *22/34*
U.S. Cl. 297—476 17 Claims



1. An apparatus for securely fastening a child safety seat within a vehicle having a seat belt, the apparatus comprising:

a belt receiver member for engaging a first portion of the seat belt;

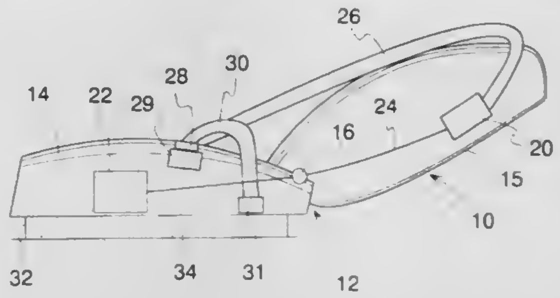
a tensioning device, said tensioning device operatively engaging said belt receiver member for imparting a rotary motion thereto for tensioning the seat belt;

a pinch clamp positioned along the direction of travel of said belt for clamping a second portion of the seat belt; and

a clamp release lever operatively connected to said pinch clamp.

5,839,790
REMOTE MECHANICAL SENSOR AND SEAT BELT RETRACTOR OPERATED THEREBY

Gerald Arthur Doty, Auburn Hills, Mich., assignor to Takata Inc., Auburn Hills, Mich.
Filed Jun. 6, 1995, Ser. No. 467,076
Int. Cl.⁶ A47C *31/00*
U.S. Cl. 297—478 8 Claims



2. A seat belt retractor apparatus having a remote sensing of predetermined accelerations and operation of the retractor apparatus upon such sensing, said retractor apparatus comprising:

a seat belt retractor mounted at a first location and having a spring biased reel to rewind webbing thereon and having a blocking mechanism movable between a release position allowing webbing to protract from the reel and a locking position preventing protraction of the webbing;

a remote actuator for actuating the retractor between blocked and unblocked positions;

a vehicle-sensitive inertia operator in the remote actuator responsive to vehicle accelerations/decelerations;

a web-sensitive inertia operator in the seat belt retractor to operate the reel blocking mechanism in response to predetermined webbing acceleration;

a connector between the remote actuator and the retractor for actuating the reel blocking mechanism to its locking position by at least one of the remote, vehicle-sensitive and web-sensitive inertia operators; and

wherein the connector comprises a rotatable cable connected to the web-sensitive inertia operator to rotate the web-sensitive operator until predetermined acceleration is reached.

5,839,791

Patent Not Issued For This Number

5,839,792
CHILD SAFETY BELT DEVICE

Seong-Gon Baik, 260-14, Sinwon-dong, Deokyang-ku, Koyang-shi, Kyoungki-do, 412-070, Rep. of Korea
Filed Apr. 25, 1997, Ser. No. 847,477
Claims priority, application Rep. of Korea, May 27, 1996, 1996-13229 U
Int. Cl.⁶ B60R *22/00*
U.S. Cl. 297—483 2 Claims

1. A child safety belt device used in combination with a safety belt, said device comprising:

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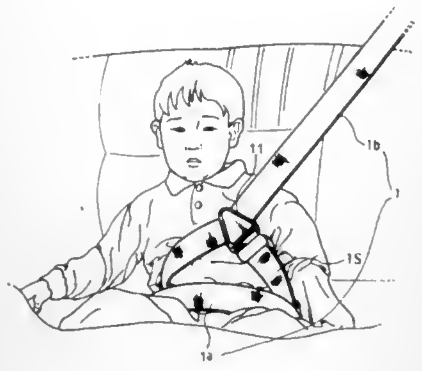


- a fixing portion for fixing said device to the safety belt, said fixing portion being detachably fixed to a waist band of the safety belt, wherein said fixing portion includes a body, a hole formed in an upper portion of said body, whereby the band is attached to the fixing portion, side supporting members formed at the sides of said body, a groove formed at one of the side supporting members, a hinge hole formed in the center portion of the other side supporting member, and a bottom plate having hinge parts that are formed at opposite sides of said bottom plate, the bottom plate being detachably installed between the hinge hole and groove by inserting the hinge parts in the hinge hole and groove, forming a hinge, wherein the waist band is sandwiched between the body and the bottom plate when the fixing portion is attached to the safety belt;
- a link portion being attached to a shoulder band of the safety belt;
- a band for connecting said fixing portion with said link portion, said band being adjustable in length; and
- a stopper mounted on said band for keeping the length of said band in place.

5,839,793

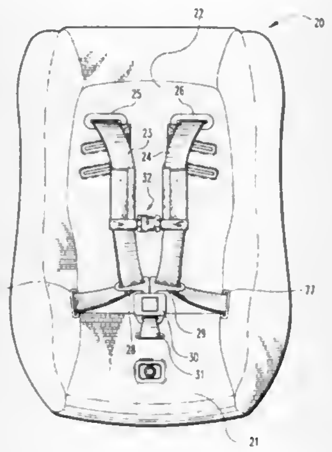
CHILD SEAT HARNESS CLIP

David D. Merrick, Indianapolis; Peter E. Miller, Noblesville, and Gerald W. Thompson, Fishers, all of Ind., assignors to Indiana Mills & Manufacturing, Inc., Westfield, Ind.

Filed Apr. 15, 1996, Ser. No. 623,695

Int. Cl.⁶ A47C *31/00*

U.S. Cl. 297—484 **13 Claims**



1. A connector for holding a first web and second web together comprising:

- a first guide for receiving a first web;
- a second guide for receiving a second web;
- a first connector pivotally connected to said first guide;
- a second connector pivotally connected to said second guide and releasably lockable with said first connector to limit relative motion between said first guide and said second guide;
- said first guide and said second guide each include a main body with a side wall and a bottom wall joined together, said bottom wall of each guide has a slot through which said first web and said second web extend respectively through said first guide and said second guide, said slot sized to limit twisting of said first web and said second web;
- each main body includes a hinge connecting said first guide and said second guide respectively thereto;
- each main body also includes an interior wall fixed to said bottom wall and positioned inwardly of said side wall forming an upwardly opening cavity; and
- a first web sock and a second web sock to slidably receive respectively said first web and said second web which extend into said upwardly opening cavity of each main body being fixedly mounted thereto.

5,839,794

AUTOMATIC FILLING DEVICE FOR FIBRE CARTRIDGE AND/OR FIBRE CASSETTES OF BRUSH MANUFACTURING MACHINES

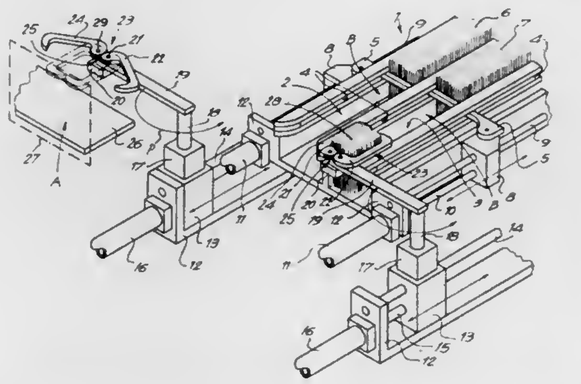
Leonel Polydore Boucherie, Izegem, Belgium, assignor to Firma G.B. Boucherie, naamloze vennootschap, Izegem, Belgium

Filed Mar. 13, 1997, Ser. No. 816,597

Claims priority, application Belgium, Mar. 13, 1996, 09600222

Int. Cl.⁶ A46D *1/04*

U.S. Cl. 300—7 **14 Claims**



1. An automatic filling apparatus for fiber cartridges and fiber cassettes of a brush manufacturing machine, comprising: at least two fiber ducts each including a supply point; at least one take-up point for bundles of fibers; and an individual pair of fiber gripping tongs for each of said fiber ducts, each of said pairs of tongs movable between said take-up point and said supply point of said respective fiber duct.

5,839,795

VARIABLE OUTER DIAMETER WHEEL FOR VEHICLES

Yutaka Matsuda, and Kaoru Shimizu, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

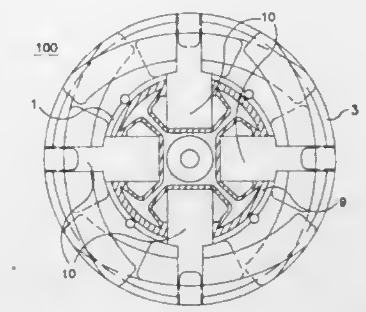
Continuation of Ser. No. 377,019, Jan. 20, 1995, abandoned. This application Oct. 24, 1996, Ser. No. 740,092

Claims priority, application Japan, Jan. 28, 1994, 6-008250; May 12, 1994, 6-098514

Int. Cl.⁶ B60B *15/00*

U.S. Cl. 301—5.1 **22 Claims**

1. A vehicle having variable outer diameter wheels, each wheel comprising:



- a supporting part having an internal fluid supply passage and a plurality of penetrating holes disposed radially around a side wall of said supporting part and connected to said fluid supply passage;
- a plurality of sliders, each disposed in a respective one of said penetrating holes, said sliders forming overlapping wheel peripheral parts;
- and moved by fluid supplied to said fluid supply passage in a direction so that the outer diameter of said variable outer diameter wheel enlarges; and
- an axle for coupling said wheel to said vehicle.

5,839,796

WHEEL COVER FOR USE IN AUTOMOBILE

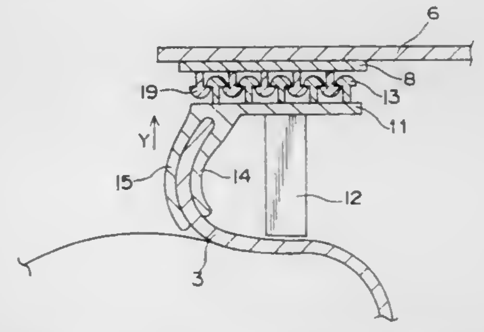
Takashi Ichikawa, and Yasuhide Narita, both of Aichi-ken, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi-ken, Japan

Filed Aug. 16, 1996, Ser. No. 700,554

Claims priority, application Japan, Aug. 21, 1995, 7-211628; Aug. 25, 1995, 7-217044; Mar. 14, 1996, 8-057823; Mar. 14, 1996, 8-057826

Int. Cl.⁶ B60B *7/10*

U.S. Cl. 301—37.31 **6 Claims**



1. A wheel cover for a wheel of an automobile comprising:

- a disc-shaped wheel cover body;
- a plurality of clips, each clip includes a planar member and a first and second wall sandwiching a rim flange of the wheel, each wall includes a free end and a fixed end, said first wall includes a first curved portion with a first orientation and a first curvature, said second wall includes a second curved portion with a second orientation and a second curvature, said planar member is disposed adjacent to each fixed end of said first and second walls, said first curvature and said first orientation are substantially equal to said second curvature and said second orientation so that each free end of each wall is substantially aligned in a parallel manner with the other free end, the clips are fixed at positions proximate to a peripheral edge of the disc-shaped wheel cover body, with the clips spaced at predetermined intervals;
- a plurality of first engaging means disposed at positions proximate to a peripheral edge of an underside of the disc-shaped wheel cover body, with the first engaging means spaced at predetermined intervals in the circumferential direction of the disc-shaped wheel cover body; and
- second engaging means disposed on a planar member of each clip so that the second engaging means engages the first engaging means, said first and said second engaging means include deformable mushroom-shaped projections whereby said clips provide increased mechanical efficiency for attachment to the rim flange of the wheel.

5,839,797

Patent Not Issued For This Number

5,839,798

SPIN SUPPRESS CONTROL DEVICE FOR VEHICLE DISTINCTIVE OF DEGREE OF EMERGENCY THEREOF

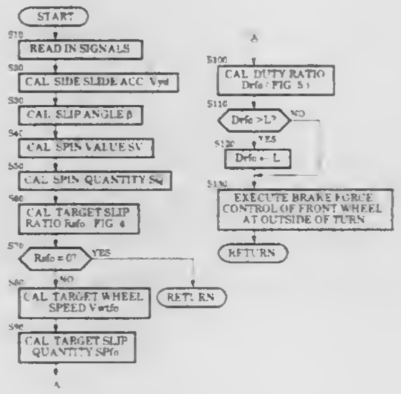
Shirou Monzaki, Mishima; Shoji Inagaki, Numazu; Akio Okada, and Hiroshi Kawaguchi, both of Mishima, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 15, 1996, Ser. No. 680,044

Claims priority, application Japan, Aug. 8, 1995, 7-222586; Oct. 2, 1995, 7-278339

Int. Cl.⁶ B60T *8/32*

U.S. Cl. 303—146 **5 Claims**



1. A spin suppress control device of a vehicle having a vehicle body, front left and right wheels, and a steering means for steering the front left and right wheels for a turn of the vehicle, comprising a means for making a first time spin state estimation of the vehicle body indicating a need of a spin suppress control and a second time spin state estimation of the vehicle body indicating a need of a spin suppress control in succession to said first time spin state estimation, a brake means for applying a variable braking force to each of the front left and right wheels, and a means for controlling said brake means to apply a braking force to one of the front left and right wheels at the outside of the turn, wherein said brake control means controls said brake means so as to apply a first time braking force to the front wheel at the outside of the turn with a first limit of speed of application according to said first time spin state estimation and a second time braking force to the front wheel at the outside of the turn with a second limit of speed of application according to said second time spin state estimation, said second limit of speed of application being made greater than said first limit of speed of application when said second time spin state estimation occurs within a predetermined proximity of said first time spin state estimation.

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5,839,799

BEHAVIOR CONTROL DEVICE OF VEHICLE BASED UPON MONITORING MOVEMENT OF REAR WHEELS

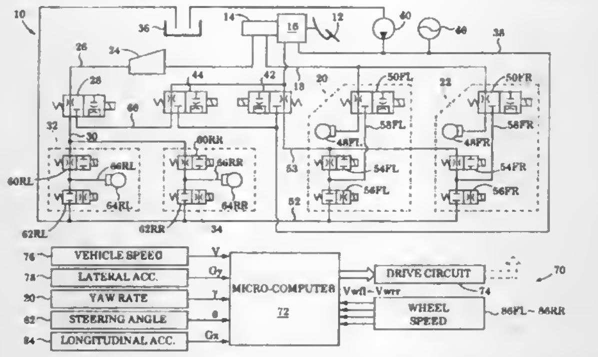
Yoshiki Fukada, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Oct. 2, 1996, Ser. No. 725,317

Claims priority, application Japan, Oct. 6, 1995, 7-286417

Int. Cl.^{6} B60T *8/32*

U.S. Cl. 303—146 **13 Claims**



1. A behavior control device for a vehicle including a vehicle body, front left, front right, rear left and rear right wheels, steering means for steering said front left and front right wheels, and brake means for selectively variably braking each of said front left, front right, rear left and rear right wheels, comprising:

means for detecting vehicle speed;

means for detecting steering angle of said front left and front right wheels;

means for detecting slip angle of at least one of said rear left and rear right wheels;

means for calculating a target value of said slip angle based upon parameters related with turn behavior of the vehicle including at least the vehicle speed detected by said vehicle speed detecting means and the steering angle detected by said steering angle detecting means; and

control means for calculating a value of yaw moment to be applied to the vehicle body such that, when the calculated value of the yaw moment is applied to the vehicle body, the slip angle detected by said slip angle detecting means conforms to said target value thereof calculated by said target slip angle calculation means, said control means operating said brake means so as to variably brake a selected one or ones of said wheels in order to apply the calculated value of the yaw moment to the vehicle body.

5,839,800

BRAKING CONTROL SYSTEM FOR ELECTRIC AUTOMOBILE

Hisamitsu Koga; Naotake Kumagai; Tomiji Owada; Nobuya Furukawa; Masaaki Kato, and Nobuyuki Kawamura, all of Tokyo, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP95/02471, § 371 Date Nov. 12, 1996, § 102(e) Date Nov. 12, 1996, PCT Pub. No. WO96/17741, PCT Pub. Date Jun. 13, 1996

PCT Filed Dec. 4, 1995, Ser. No. 687,489

Claims priority, application Japan, Dec. 6, 1994, 6-302523

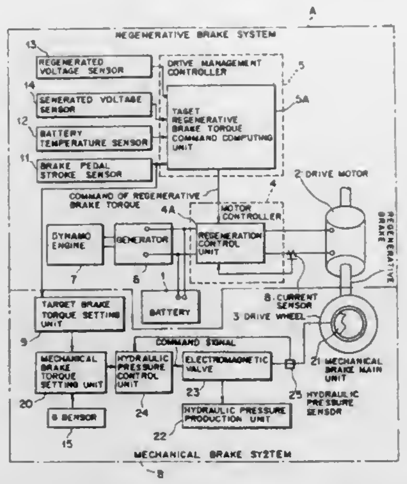
Int. Cl.^{6} B60T *13/74*

U.S. Cl. 303—152 **8 Claims**

1. A braking control system for an electric automobile, said braking control system combining a use of regenerative braking by a motor and mechanical braking by a mechanical brake system upon application of brakes, comprising:

brake pedal stroke detection means for detecting a stroke of a brake pedal;

target braking force setting means for setting a target braking force on a basis of the brake pedal stroke detected by said brake pedal stroke detection means;


A
REGENERATIVE BRAKE SYSTEM
13
REGENERATED VOLTAGE SENSOR
DRIVE MANAGEMENT CONTROLLER
5
5A
14
GENERATED VOLTAGE SENSOR
12
BATTERY TEMPERATURE SENSOR
TAGET REGENERATIVE BRAKE TORQUE COMMAND COMPUTING UNIT
11
BRAKE PEDAL STROKE SENSOR
2 DRIVE MOTOR
COMMAND OF REGENERATIVE BRAKE TORQUE
4
4A
MOTOR CONTROLLER
DYNAMO ENGINE
GENERATOR
REGENERATION CONTROL UNIT
REGENERATIVE BRAKE
7
6
1
BATTERY
8 CURRENT SENSOR
3 DRIVE WHEEL
TARGET BRAKE TORQUE SETTING UNIT
9
COMMAND SIGNAL
MECHANICAL BRAKE TORQUE SETTING UNIT
HYDRAULIC PRESSURE CONTROL UNIT
ELECTROMAGNETIC VALVE
21 MECHANICAL BRAKE MAIN UNIT
20
23
25 HYDRAULIC PRESSURE SENSOR
G SENSOR
24
HYDRAULIC PRESSURE PRODUCTION UNIT
15
22
MECHANICAL BRAKE SYSTEM
B

regeneration control means for setting a target regenerative braking force on a basis of the brake pedal stroke detected by said brake pedal stroke detection means, and controlling regenerative braking by said motor in accordance with said set target regenerative braking force;

deceleration detecting means for detecting a deceleration of the automobile; and

mechanical braking control means for controlling operation of said mechanical braking system, after initiation of the regenerative braking, in accordance with a difference between said target braking force and an actual braking force determined based on the detected deceleration from said deceleration detecting means.

5,839,801

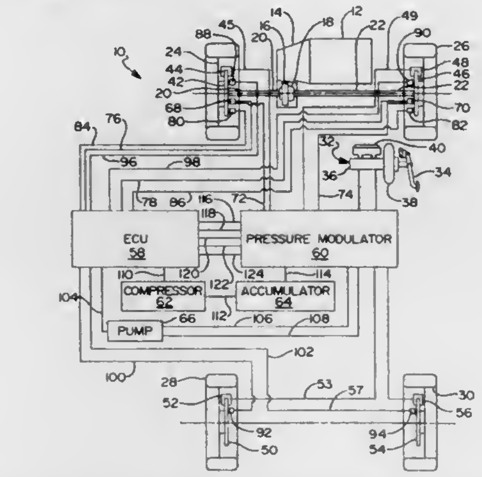
VARIABLE TIRE PRESSURE TRACTION CONTROL ENHANCEMENT

Steven C. Ferguson, Orion, Mich., assignor to ITT Manufacturing Enterprises, Inc., Wilmington, Del.

Filed Apr. 4, 1997, Ser. No. 833,156

Int. Cl.^{6} B60T *8/88*

U.S. Cl. 303—191 **9 Claims**



1. A traction enhancement system for a vehicle comprising:

an electronic controller;

a drive axle having first and second axle shafts;

first and second pneumatic tire and wheel assemblies with each defining a pneumatic chamber having pressurized air therein and rotatably fixed to the first and second axle shafts respectively;

a first rotary speed sensor located at one of the first tire and wheel assembly and a part that rotates substantially in unison with the first tire and wheel assembly and the first sensor being electrically connected to the electronic controller wherein the first rotary speed sensor provides an electrical signal corresponding to the rotary speed of the first tire and wheel assembly;

a second rotary speed sensor located at one of the second tire and wheel assembly and a part that rotates substantially in unison with the second tire and wheel assembly and the second sensor being electrically connected to the electronic controller wherein the second rotary speed sensor provides an electrical signal corresponding to the rotary speed of the second tire and wheel assembly;

a first wheel brake operably resisting rotation of the first tire and wheel assembly;

a second wheel brake operably resisting rotation of the second tire and wheel assembly;

a source of pressurized air connected to the pneumatic chambers;

an air pressure sensor located and configured to monitor the pressure of air within the pneumatic chamber of one of the tire and wheel assemblies and the air pressure sensor being electrically connected to the controller;

a vehicle speed sensor electrically connected to the controller; and

the electronic controller including means for selectively controlling the pressure within the pneumatic chambers responsive to signals from the rotary speed sensors and from the air pressure sensor, means for selectively applying the first and second wheel brakes, and means for determining slippage of the tire and wheel assemblies using the electrical signals from the rotary speed sensors, wherein one of the first and second tire and wheel assemblies slips at a vehicle speed less than a predetermined first threshold speed, the pressure in the slipping tire and wheel assembly is decreased to improve traction and the wheel brake associated with the slipping wheel and tire assembly is intermittently applied to develop drive torque at the other of the first and second wheels.

5,839,802

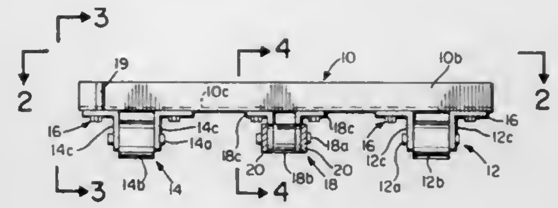
LIGHT WEIGHT TRACK SYSTEM FOR TRACKED VEHICLE

Kerney T. Sheets, P.O. Box 771, Duplessis, La. 70728

Filed Feb. 25, 1997, Ser. No. 805,420

Int. Cl.^{6} B62D *55/08*

U.S. Cl. 305—52 **20 Claims**



1. A light weight track system for use on a buoyant amphibious vehicle, the vehicle having a superstructure supported by two pontoons, the pontoons having an outer surface including a flat horizontal top surface and a flat horizontal bottom surface and two flat inclined surfaces connecting each end of said flat horizontal top surface to each end of said flat horizontal bottom surface, said track system comprising:

a. a plurality of two-ended treads connected by a single continuous drive chain assembly around said outer surface of each of said pontoons, said drive chain assembly comprising a plurality of rotatable drive rollers, each of said drive rollers being rotatably connected to the approximate center of each of said treads and to adjacent drive rollers by rigid chain links to form a continuous drive chain extending completely around the outer surface of each of said pontoons, each tread having an idler roller rotatably connected thereto adjacent to each end thereof, which idler roller contacts said surface of said pontoon to support said tread, each of said treads having a spacer member connected thereto which extends from said tread to a point closely adjacent to an adjacent tread, and

b. a channel connected to said flat horizontal top surface and said flat horizontal bottom surface of each of said pontoons for receipt of said drive rollers, at least one of said treads on each of said pontoons having a wiper connected thereto which extends downward from said tread on each side of said channel to a point closely adjacent to said top surface of said pontoon.

5,839,803

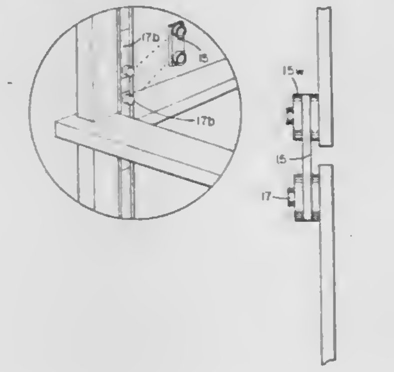
LOCKING SYSTEM FOR MODULAR LATERAL AND VERTICAL STACKING FILES

Anthony R. Lizell, 108 Old Oak Tree Rd., Landsdale, Pa. 19446

Filed Oct. 15, 1996, Ser. No. 730,055

Int. Cl.^{6} A47B *87/00*

U.S. Cl. 312—107.5 **21 Claims**



1. A modular stacking file comprising:

a first drawer module comprising a cabinet portion and at least one drawer, said drawer being selectively slidable relative to the cabinet portion between an open position and a closed position, the first drawer module further comprising a lock bar portion having at least one transverse protrusion and means for mounting the lock bar portion to the cabinet portion for translatory movement relative to the cabinet portion in first and second opposite directions between first and second positions;

a second drawer module comprising a cabinet portion and at least one drawer, said drawer being selectively slidable relative to the cabinet portion between an open position and a closed position, the second drawer module further comprising a lock bar portion having at least one transverse protrusion and means for mounting the lock bar portion to the cabinet portion for translatory movement relative to the cabinet portion in first and second opposite directions between first and second positions;

means for aligning and connecting the first and second drawer modules such that the lock bar portion of the first drawer module is aligned with the lock bar portion of the second drawer module;

a connecting plate having two openings, each opening adapted to receive one of the protrusions formed on the lock bar portion so that the connecting plate can be secured to both the lock bar portion of the first drawer module and the lock bar portion of the second drawer module so as to join the respective lock bar portions as a single unitary lock bar assembly that moves as one piece; and

wherein the connecting plate has two longitudinally spaced openings, each opening including an elastomeric inner surface having a dimension that is less than the dimension of the protrusion.

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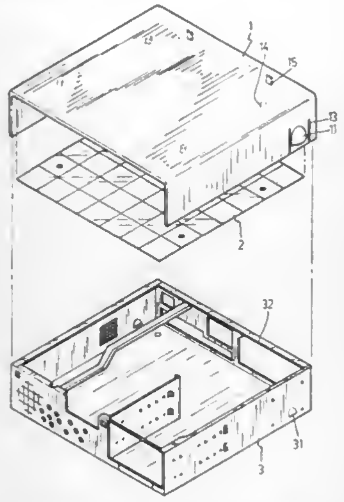
5,839,804
COMPUTER MAINFRAME HOUSING

Hsin Chien Ho, 20F-1, 268, Sec. 1, Wen-Hua Road, Pan Chiao City, Taipei, Taiwan

Filed Jul. 22, 1997, Ser. No. 898,404

Int. Cl.^{6} H05K *5/00*

U.S. Cl. 312—223.2 **2 Claims**



1. A computer mainframe housing comprising:

a metal casing having an opening at one side, first and second retainer blocks respectively projecting outwardly from two opposite lateral side walls of the casing at two opposite sides of said opening, and a rear flange projecting forwardly from a rear wall of the casing;

a plastic cover having a top wall arranged to cover the opening of said metal casing, two opposite lateral side walls respectively extending from two opposite sides of the top wall of the cover at right angles, a plurality of stop rods extending from the top wall of the cover, two handles respectively projecting outwardly from the two opposite lateral side walls of the cover, two pairs of slits, one pair of slits being respectively formed in each of the two opposite lateral side walls, with the slits of each pair being formed at two opposite sides of each of said handles to enable movable sections of said opposite lateral side walls of said cover, together with said handles, to be respectively pulled outwards, and third and fourth retainer blocks respectively projecting inwardly from said movable sections of said opposite lateral side walls of said cover,

wherein said third and fourth retainer blocks respectively engage said first and second retainer blocks to secure the plastic cover to the metal casing, and wherein when said movable sections and handles are pulled outwards, the third and fourth retainer blocks are also moved outwards, at which point the third and fourth retainer blocks disengage the first and second retainer blocks to enable the plastic cover to be removed from the metal casing.

5,839,805

Patent Not Issued For This Number

5,839,806
SUPPORT AND DRAWER STRUCTURE OF DRAWER TYPE STORAGE SHELF

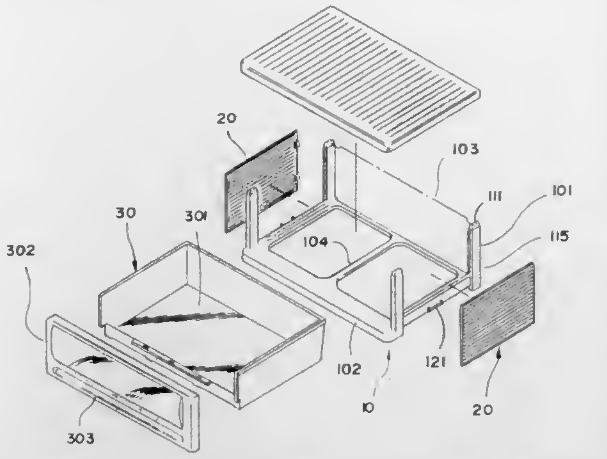
Ching-Rong Liu, No. 10, Sung-Chiang N. Road, Chung-Li City, Taiwan

Filed May 30, 1997, Ser. No. 865,417

Int. Cl.^{6} A47B *43/00*

U.S. Cl. 312—257.1 **1 Claim**

1. A support structure of a drawer type storage shelf, comprising:



a main body integrally injection molded from plastic formed by a plurality of vertical rods and horizontal rods, a backing plate and a bracing rod, said main body having a front, a rear and two sides, said horizontal rods being longitudinal and transverse horizontal rods forming a bottom frame of said main body with four corners, said vertical rods being provided at said four corners of said bottom frame;

said vertical rods each including a top having a protruding with a slightly smaller diameter and an engagement piece on an exterior surface of said protruding and each including a bottom having a slipping over engagement portion and a recess conforming with said engagement piece, said slipping over engagement portion being fittedly slippable over a protruding of another support;

said vertical rods each including a protruding locating flange on an inner opposite side thereof such that said locating flanges of said vertical rods located at said front of said main body extend rearward and said locating flanges of said vertical rods located at said rear of said main body extend forward, said located flanges each having a plurality of locating holes;

said transverse horizonal rods each having an engaging portion provided on an external side thereof at a lower edge of said locating flanges;

said backing plate being connected between said vertical rods located at said rear of said main body and said bracing rod being connected between said longitudinal horizontal rods; and

two side plates each having an interior surface defined by a top edge, a bottom edge and two side edges, each of said side plates having a plurality of engaging hooks on said inner surface near said side edges and an engaging member on said inner surface near said bottom edge, said engaging hooks and said engaging members being positioned to correspond to said locating holes and said engaging portions, respectively, such that said engaging hooks engage said locating holes, said engaging members engage said engaging portions and said side plates are fixed between said vertical rods when said side plates are placed on said sides of said main body.

5,839,807
DEVICE WITH MICRO-FILTERS FOR SELECTING COLORS AND IMAGES

Piero Perlo, Sommariva Bosco, Italy, assignor to C.R.F. Societa Consortile per Azioni, Turin, Italy

Filed Nov. 12, 1996, Ser. No. 744,144

Claims priority, application Italy, Nov. 9, 1995, T095A0906

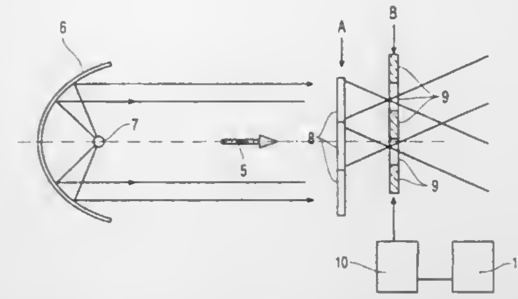
Int. Cl.^{6} G03B *21/14*

U.S. Cl. 353—38 **13 Claims**

1. Device for selecting colours or images in a polychromatic light beam, comprising:

means for generating a polychromatic light beam,

a plurality of micro-lenses integrated in a thin transparent plate, having the function of generating a plurality of partial polychromatic beams,



a plurality of coloured micro-filters or image micro-cells, having size and cross-section adapted to the cross-section of the micro-lenses, so that to each micro-lens there correspond at least two micro-filters or micro-cells,

actuator means to cause a relative movement between the micro-lenses and the coloured micro-filters or image micro-cells, which operates in such a way that a relative movement between the micro-lenses and the micro-filters enables a light pattern to be selected for generating light beams, having different characteristics comprised of at least one of shape, polarisation and vergence at the outlet of the device.

5,839,808
PROJECTION OPTICAL SYSTEM

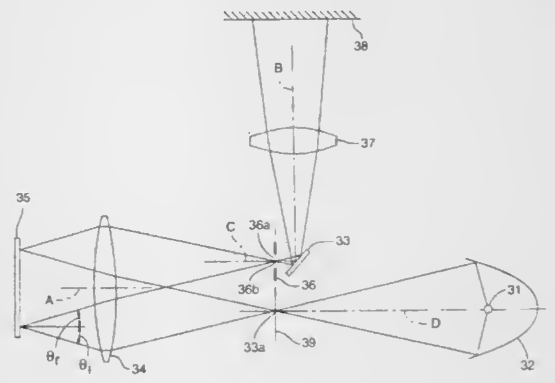
Motoo Koyama, Kawasaki; Yuji Manabe, Kamakura, and Ikuo Mori, Kawasaki, all of Japan, assignors to Nikon Corporation, and Nippon Hoso Kyoki, both of Tokyo, Japan

Continuation-in-part of Ser. No. 535,629, Sep. 28, 1995, abandoned. This application Jul. 26, 1996, Ser. No. 687,890

Claims priority, application Japan, Sep. 28, 1994, 6-257281

Int. Cl.^{6} G03B *21/28*

U.S. Cl. 353—97 **15 Claims**



1. A projection system, comprising:

(a) a light source operable to produce a light-source image and an illumination light flux propagating from the light-source image;

(b) a light valve situated such that the illumination light flux can be incident on the light valve, the light valve being operable to convert the incident illumination light flux into a modulated light flux propagating from the light valve;

(c) a front lens system having a front optical axis, and a screen-side focal surface on which the light-source image is situated, the front lens system being situated relative to the light-source image and the light valve so as to cause the illumination light flux from the light-source image to be incident on the light valve and to refract the modulated light flux from the light valve to propagate on a propagation axis parallel to the front optical axis to converge on the screen-side focal surface of the front lens system;

(d) a stop defining an aperture concentric with the converged modulated light flux on the screen-side focal surface;

(e) a rear lens system having a rear optical axis, the rear lens system being situated relative to the front lens system so as to transmit the modulated light flux propagating from the aperture to a projection screen; and

(f) a mirror disposed so as to reflect the modulated light flux, divergently propagating from the aperture, to the rear lens system.

5,839,809
INDICATING INSTRUMENT

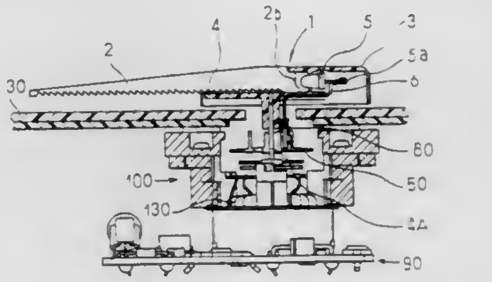
Tadaaki Ishimaru; Teruaki Araki, both of Kariya, and Tsutomu Yoshikawa, Chita-gun, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Division of Ser. No. 517,606, Aug. 22, 1995, abandoned. This application Jul. 25, 1996, Ser. No. 686,018

Claims priority, application Japan, Sep. 30, 1994, 6/237628; Nov. 2, 1994, 6/270003; Jan. 24, 1995, 7/9002; Feb. 9, 1995, 7/21913; Jul. 5, 1995, 7/169965

Int. Cl.^{6} G01D *11/28*

U.S. Cl. 362—23 **12 Claims**



1. An indicator for an indicating instrument including an internal driving unit, a driving shaft driven by said driving unit, a light emitting element and an electric source, said indicator further comprising:

a light conductive pointer having a light receiving portion and an illuminating surface;

a fixture, having a center of rotation connected to said driving shaft, for securing said light receiving portion of said pointer adjacent to said light emitting element;

a cap-shaped cover disposed on said fixture for holding said pointer and said light emitting element in a space formed between said cover and said fixture in place; and

a connecting member for connecting said light emitting element and said electric source;

wherein said illuminating surface of said light conductive pointer comprises a matted portion disposed on an upper surface of said pointer to scatter light emitted therein, thereby providing uniform illumination.

5,839,810
DISPLAY GAUGE

Walter Hersel, Wannweil; Ralf Mueller-Sybrichs, Ditzingen; Derk Oreans, Leonberg, and Bernhard Friedl, Renningen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

PCT No. PCT/DE95/01664, § 371 Date Apr. 17, 1997, § 102(e) Date Apr. 17, 1997, PCT Pub. No. WO96/19713, PCT Pub. Date Jun. 27, 1996

PCT Filed Nov. 25, 1995, Ser. No. 809,319

Claims priority, application Germany, Dec. 20, 1994, 44 45 482.1; Apr. 22, 1995, 195 14 902.5

Int. Cl.^{6} G01D *11/28*

U.S. Cl. 362—29 **10 Claims**

1. A display gauge, comprising:

a support plate;

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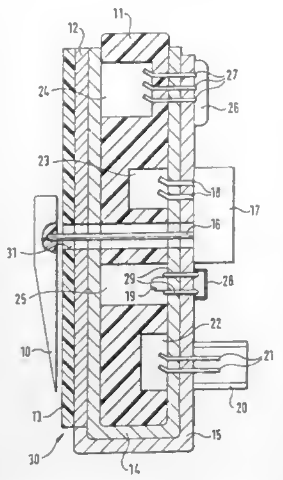
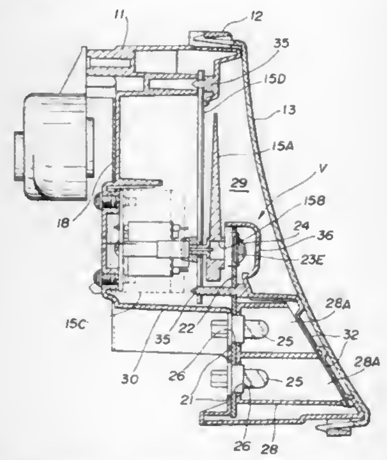


a partially transparent dial face adapted to be illuminated arranged on a first side of the support plate;
an electroluminescent display arranged between the dial face and the first side of the support plate, the electroluminescent display including an electroluminescent layer and an electrically conductive layer arranged on a common support layer, the common support layer and the electrically conductive layer extending from the first side of the support plate onto a second side of the support plate; and
electrical components arranged on the second side of the support plate and connected to the electroluminescent display.

5,839,811
AUTOMOTIVE METER ASSEMBLY

Koichi Shimura, Taipei, Taiwan, assignor to Kansei Corporation, Omiya, Japan

Filed Feb. 19, 1997, Ser. No. 803,181
Claims priority, application Japan, Feb. 19, 1996, 8-030915
Int. Cl.^{6} G01D *11/28*
U.S. Cl. 362—30 **9 Claims**

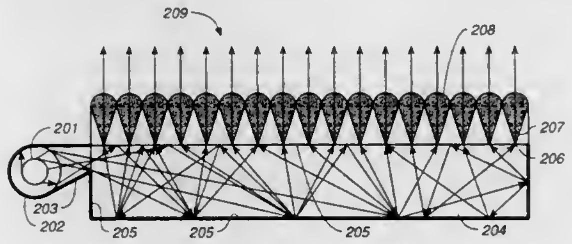


1. A meter assembly comprising:
a meter case including rear and front housings which are coupled, said front housing having an opening formed therethrough;
a meter unit installed in said meter case, said meter unit including a dial board facing toward the opening of said front housing, a transparent pointer movable over said dial board and a light emitting unit located in front of said pointer to emit a light to illuminate the transparent pointer from within, said light emitting unit including a light emitting diode emitting a light toward a base portion of said transparent pointer, and a raised part of a rigid printed circuit board which supports said light emitting diode while providing an electric connection therebetween; and
a semitransparent dark cover which covers the opening of said front housing,
wherein said rigid printed circuit board is formed with socket openings for holding lamps and said rear housing is formed with openings which are mated with said socket openings in such a manner that the lamps can be removed through the openings.

5,839,812
FLAT PARALLEL LIGHT SOURCE

Shichao Ge; Xi Huang, both of San Jose, Calif., and Xiaoqin Ge, Hanzhou, China, assignors to GL Displays, Inc., Saratoga, Calif.

Filed Jul. 18, 1995, Ser. No. 503,588
Int. Cl.^{6} G01D *11/28*
U.S. Cl. 362—31 **17 Claims**



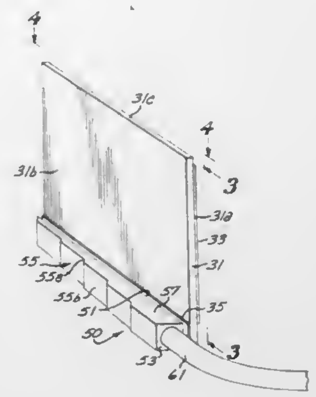
1. A flat device for supplying parallel light, comprising:
a hot cathode fluorescent lamp;
a diffuse reflective chamber with high reflectance walls receiving light from the light source;
an array of holes at a surface of the diffuse reflective chamber;
an array of light reflective cones adjacent to the surface; each of said cones having a pointed end and a non-pointed end; and
an array of convex lenses adjacent the non-pointed ends of the cones;
wherein each of the cones is substantially aligned along a common axis with a corresponding lens in the array of lenses and is between the corresponding lens and a corresponding hole in the array of holes;
wherein light from the light source passes into diffuse reflective chamber, and then through said holes into said cones and through said lenses to provide parallel output light wherein said fluorescent lamp is further enclosed within a glass pipe, said pipe defining a vacuum chamber therein for housing said lamp to reduce heat loss from the fluorescent lamp, to increase the efficiency of the fluorescent lamp and to thermally insulate the fluorescent lamp from an environment.

5,839,813
THIN REAR COMBINATION LAMP SYSTEM

Ronald T. Smith, Corona Del Mar, Calif., assignor to Delco Electronics Corporation, Kokomo, Ind.

Filed Oct. 2, 1996, Ser. No. 720,582
Int. Cl.^{6} F21V *7/04;* B60Q *1/00*
U.S. Cl. 362—32 **12 Claims**

1. An exterior lamp system for a vehicle, comprising:
a light source for providing a plurality of light beams;
a plurality of optical fiber channels responsive to said light source for providing a plurality of optical fiber channel outputs;
a plurality of LCD switches for controlling the transition of light in the optical fiber channels;

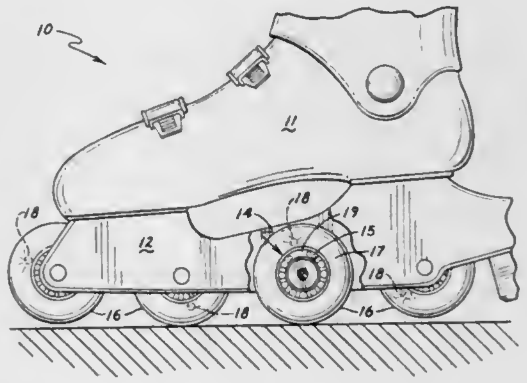


a plurality of exterior lamps respectively responsive to said optical fiber channel outputs for projecting light received from said optical fiber channels to provide respective exterior lamp outputs.

5,839,814
MINIATURE CENTRIFUGAL LIGHTING ASSEMBLY

Thomas J. Roberts, 884 Maple St., Spring Lake Park, Minn. 55432

Continuation of Ser. No. 91,625, Jul. 15, 1993. This application Mar. 4, 1996, Ser. No. 610,496
Int. Cl.^{6} A63C *17/26*
U.S. Cl. 362—78 **8 Claims**

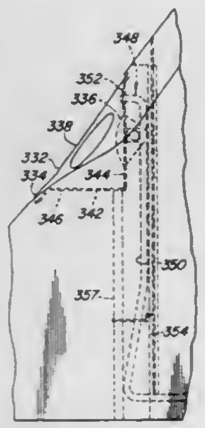


6. A lighted wheel for an in-line skate, comprising:
a generally solid elastomeric tire portion having an axis of rotation, said tire portion having one of a transparent and translucent light transmission character;
a lighting module comprising a light emitting diode, at least one battery, a switch and conductor means providing an electrical circuit through said diode, batteries and switch, said lighting module positioned wholly within said tire portion in weight-balanced relationship about said axis of rotation, whereby the weight of said lighting module is generally equivalent to the weight of elastomeric tire member displaced by said lighting module.

5,839,815
HEADLIGHT ENCLOSURE FOR A MONOCOQUE LOCOMOTIVE

Allen Carl Bieber; Gail Leroy Detar, both of Erie, and Geoffrey Perkins, North East, all of Pa., assignors to General Electric Company, Erie, Pa.

Division of Ser. No. 704,212, Aug. 28, 1996, Pat. No. 5,673,627, which is a division of Ser. No. 590,799, Jan. 24, 1996, Pat. No. 5,577,449, which is a division of Ser. No. 442,244, May 15, 1995, Pat. No. 5,535,680, which is a continuation of Ser. No. 263,369, Jun. 20, 1994, abandoned. This application May 5, 1997, Ser. No. 850,464
Int. Cl.^{6} B60Q *1/00;* F21V *29/00*
U.S. Cl. 362—80 **5 Claims**

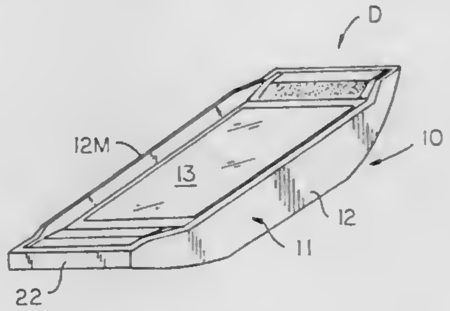


1. A headlight assembly for a locomotive having a frontal nosepiece and a crew compartment positioned aft of the nosepiece, the assembly comprising:
a frontal transparent pane flush mounted with the nosepiece;
a rearward housing, the pane mounted to a front of the housing to form a generally sealed enclosure isolated from the crew compartment;
air supply means extending into the enclosure to supply a desired flow rate of pressurized air into the enclosure; and
air exit means extending into the enclosure for allowing air to flow out of the enclosure.

5,839,816
ROAD MARKER

Zoltan A. Varga, London; Murray B. Corless, Springfield, and John D. Pinnock, London, all of Canada, assignors to ATSI, LLC, Dunkirk, N.Y.

Filed Dec. 13, 1995, Ser. No. 571,790
Claims priority, application Canada, Jul. 13, 1995, 2153819
Int. Cl.^{6} E01F *9/00*
U.S. Cl. 362—153.1 **33 Claims**



1. A road marker for insertion into a road surface to an elevation flush or below that of the road surface, comprising:
an elongated housing extending along a longitudinal axis between first and second ends, said housing further having a pair of opposing side walls with upper margins wherein said

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upper margins are at an elevation below that of the road surface, said housing having a plenum in one of said first and second ends; and
light dispensing means disposed in said plenum and configured to dispense light toward said one of said first and second ends opposite said plenum.

5,839,817

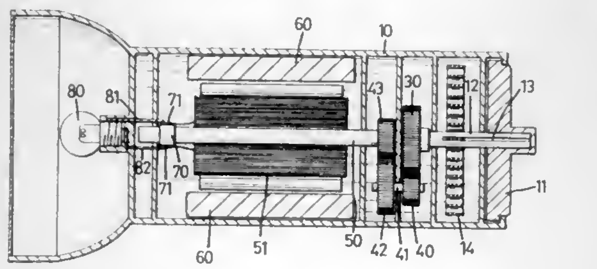
DYNAMO-POWERED TORCH

Ming-Chih Wei, No. 1-16, Pang Po, 13 Lin, Le Shan Tsun, Kuei Shan Hsing, Taipei Hsien, Taiwan

Filed Sep. 23, 1997, Ser. No. 935,413

Int. Cl.^{6} B60Q *1/00*

U.S. Cl. 362—192 **2 Claims**



1. A dynamo-powered torch comprising:
a cylindrical hollow body having a front end and a rear end;
an axle rotatably supported within the body at the rear end thereof, the axle having a knob mounted at one end thereof so as to be rotatably disposed at the rear end of the body, a spiral power spring mounted around the axle, a substantially Z-shaped clamp securely mounted on the axle proximate the other end thereof so as to be driven by the spring, and a first gear mounted on the axle, the first gear having a circular recess defined within one face to receive the clamp, the periphery of the recess being configured as a unidirectional ratchet to engage the clamp;
a drive shaft rotatably supported within the body, the drive shaft having a second gear mounted at one end thereof, the second gear being circumferentially engaged with the first gear, and a third gear mounted at the other end thereof and driven by the drive shaft;
a dynamo having a spindle rotatably supported within the body, the spindle having a fourth gear mounted thereon, the fourth gear being circumferentially engaged by the third gear so that the dynamo is driven by the spring through the axle, the clamp, and the first through fourth gears;
a bulb mounted within the front end of the body; and
two conductor strips electrically connecting the dynamo to the bulb.

5,839,818

CAPPED ELECTRIC LAMP AND LIGHTING SYSTEM COMPRISING A REFLECTOR AND AN ASSOCIATED CAPPED ELECTRIC LAMP

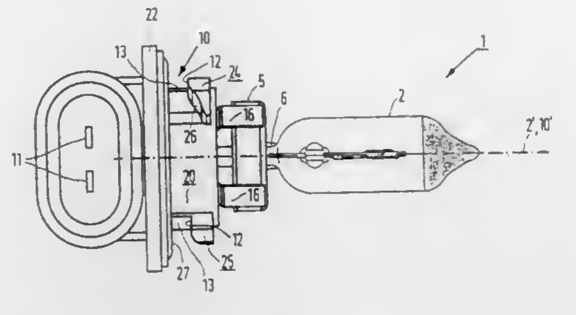
Cornelis J. Janson, Eindhoven, Netherlands, and Hans-Ulrich Rienäcker, Stolberg, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 24, 1996, Ser. No. 718,792

Claims priority, application European Pat. Off., Sep. 25, 1995, 95202579

Int. Cl.^{6} H01R *33/00*

U.S. Cl. 362—226 **17 Claims**



1. A capped electric lamp comprising:
a light-transmitting lamp vessel which is closed in a vacuumtight manner;
an electric element accommodated in the lamp vessel;
current conductors electrically connected to the electric element and issuing from the lamp vessel to the exterior;
a lamp cap having an axis and contacts and securely fastened to the lamp vessel, said contacts being electrically connected to the current conductors,
said lamp cap having first circumferentially distributed reference surfaces facing in a direction parallel to the axis and second reference surfaces facing the axis on one side thereof, while the electric element occupies a predetermined axial position relative to the first reference surfaces and a predetermined position in directions transverse to the axis relative to the second reference surfaces,
the lamp cap having fixed thereto a resilient member which acts transversely to the axis opposite the second reference surfaces.

5,839,819

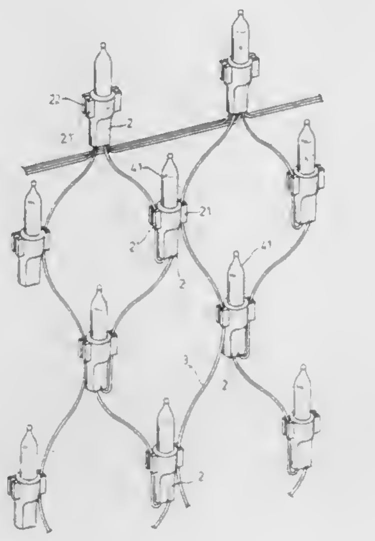
LIGHT BULB HOLDERS FOR A DECORATIVE LIGHT STRING NET

Wun Fang Pan, No. 125, Lane 99, Pu Ting Road, Hsinchu, Taiwan

Filed Jul. 10, 1997, Ser. No. 889,757

Int. Cl.^{6} F21P *1/00*

U.S. Cl. 362—252 **1 Claim**



1. A light bulb holder for use in a decorative light string net and having an open end for receiving a lamp base therein, said light bulb holder comprising a tubular body and a pair of flexible base members extending from each of two opposing sides thereof, each of said pair of base members being disposed in spaced parallel relationship to define a groove therebetween, each of said pair of base members having an arcuate wall surface disposed in facing relationship one with respect to the other to define a C-shaped cross-sectional contour of said groove for retaining an electrical wire therein.

5,839,820

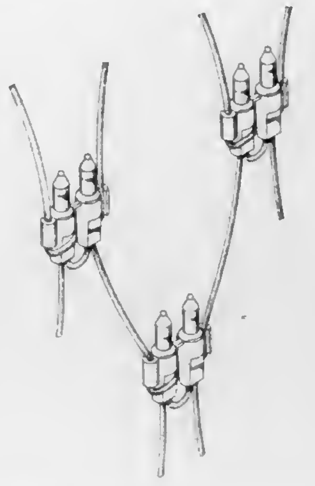
CHRISTMAS LAMP

Shun-Feng Huang, No. 13, Lane 84, Nei Hu Road, Hsin-Chu City, Taiwan

Filed Oct. 28, 1997, Ser. No. 958,136

Int. Cl.^{6} F21P *1/00*

U.S. Cl. 362—252 **1 Claim**



1. A Christmas lamp comprising two lamp sockets, formed integrally connected with each other and a lamp respectively inserted in each said lamp socket, each said lamp socket having a C-shaped wire clamp formed at an outer side of each said lamp socket, and a bridge formed between upper ends of said two lamp sockets, for connecting said two lamp sockets with each other, lead wires of said two lamp sockets connected in series, said two lamps being not necessarily of the same standard so that one Christmas lamp may have two sockets with two lamps.

5,839,821

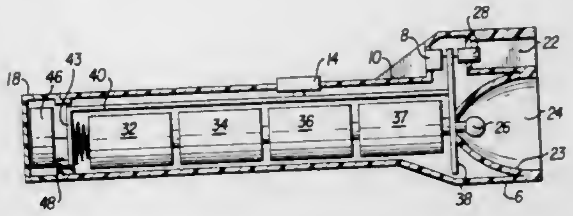
FLASHLIGHT WITH FORWARD LOOKING SENSING OF THERMAL BODIES

Bruce A. LeZotte, 266 Santa Margarita St., Menlo Park, Calif. 94025

Filed Dec. 23, 1996, Ser. No. 772,381

Int. Cl.^{6} F21V *33/00*

U.S. Cl. 362—253 **22 Claims**



9. A device for emitting light comprising:
a housing including an electrical control mechanism;
a light source, connected to said control mechanism, for emitting light;
a detector, connected to said control mechanism for detecting emissions and producing output signals;
a first selecting mechanism, connected to said control mechanism, for activating and deactivating said light source, and for activating and deactivating said detector;
a display, connected to said control mechanism, for presenting visual information representative of said output signals;
a speaker, connected to said control mechanism for presenting audio information representative of said output signals; and
a second selecting mechanism, connected to said control mechanism, for directing said output signals to one of said display and said speaker.

5,839,822

SPOTLIGHTS

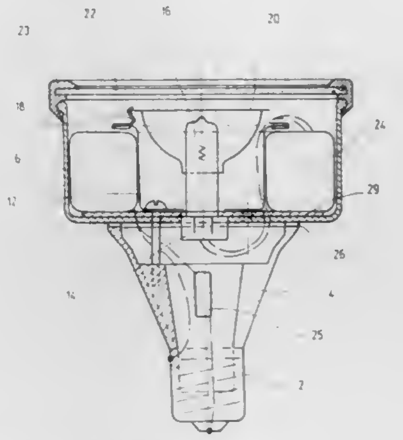
Walter Oechsle, 2 Halcyon Dr., Glen Waverley 3150, Australia

Continuation-in-part of Ser. No. 507,207, Jul. 26, 1995, abandoned. This application Mar. 6, 1996, Ser. No. 611,889

Claims priority, application Australia, Sep. 7, 1994, 71669; Jan. 17, 1996, 42011/96

Int. Cl.^{6} F21V *29/00*

U.S. Cl. 362—264 **17 Claims**



1. A low-voltage spotlight comprising:
a weatherproof casing having at a rear end portion a base for engagement within the socket of a mains voltage PAR38 outdoor spotlight and at a forward end portion a removable light-transmitting cover, a metal reflector, and a lampholder for mounting a removable low-voltage halogen light source within the reflector, so that light from the light source is reflected by the reflector through the cover; and
means within said weatherproof casing for reducing an incoming voltage to a required voltage for the light source so that the low-voltage halogen light source can be used in a PAR38 lampholder in substitution for a mains voltage PAR38 spotlight.

5,839,823

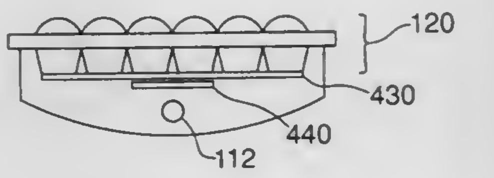
BACK-COUPLED ILLUMINATION SYSTEM WITH LIGHT RECYCLING

Janpu Hou, Somerset; Waltraud Rosalie Unger, Glen Rock, and Jerry Wayne Kuper, Martinsville, all of N.J., assignors to AlliedSignal Inc., Morris Township, N.J.

Filed Mar. 26, 1996, Ser. No. 622,131

Int. Cl.^{6} F21V *5/00*

U.S. Cl. 362—327 **8 Claims**



1. An illumination system comprising:
(a) a light source;
(b) a reflector located in close proximity to the light source;
(c) a light-directing assembly in close proximity to the light source and comprising a plurality of microprisms, each microprism comprising an input surface that admits light radiating from the light source, an output surface distal from and parallel to the input surface, and at least one sidewall disposed between and contiguous with the input and output surfaces and forming an obtuse tilt angle with respect to the input surface and further positioned for effecting total reflection of

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the light rays received by the input surface, the sidewalls of the microprisms defining interstitial regions between the microprisms;

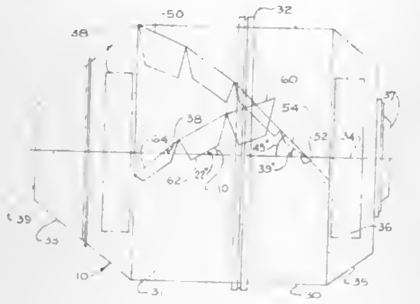
(d) at least one blocking means positioned to block the passage of light through the sidewalls; and

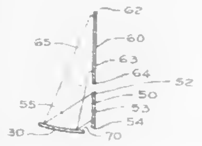
(e) an optical means, located between the light source and the light-directing assembly, for reducing the transmission of light from the light source to the light-directing assembly.

5,839,824
CONCRETE MIXER

James A. Backman, 4887 Sutton La., Greendale, Wis. 53129, and Todd A. Sherbinow, 613 N. West Ave., Waukesha, Wis. 53186

Filed Mar. 11, 1996, Ser. No. 614,961
Int. Cl.^{6} B28C *5/20;* **B01F** *9/06*
U.S. Cl. 366—59 **18 Claims**





1. A concrete mixing mechanism including a mixing shell defining a chamber located therein for receiving material to form concrete, the concrete mixing mechanism comprising:

at least a first blade mechanism and at least a second blade mechanism;

said first blade mechanism and said second blade mechanism being mounted in said chamber and being spaced away from a wall of said chamber;

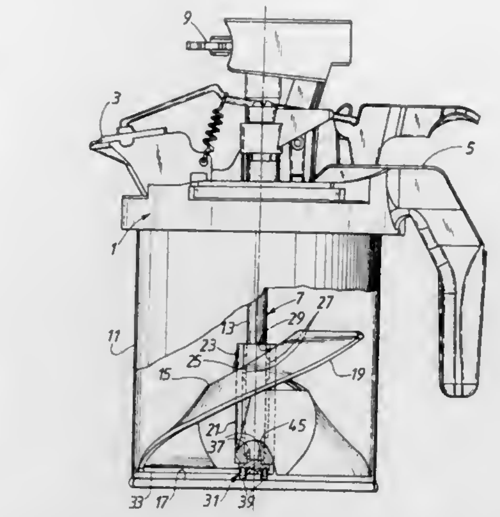
said first blade mechanism being substantially helical in shape, generally mounted circumjacent to at least one portion of said second blade mechanism, and having a pitch capable of moving at least a portion of said material in a first predetermined direction;

said second blade mechanism having a pitch spatially oriented so that it is capable of moving at least a portion of said material in a second predetermined direction generally counter to said first predetermined direction.

5,839,825
AGITATOR LID FOR A CAN OF COLORING SUBSTANCE ON PAINT-AGITATION MACHINES

Alain Krzywdziak, Orleans la Source, France, assignor to F.A.S., Orleans Cedex, France

Filed Jul. 23, 1997, Ser. No. 899,234
Claims priority, application France, Jul. 23, 1996, 96 09218
Int. Cl.^{6} B01F *7/24*
U.S. Cl. 366—247 **11 Claims**

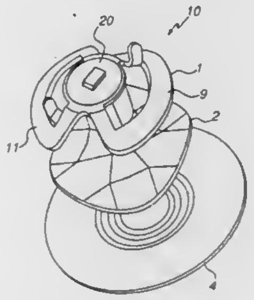


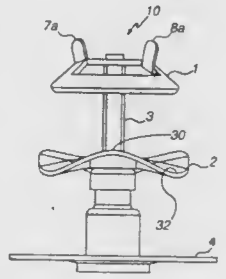
1. An agitator lid for a can of coloring substance on paint-agitation machines of the type comprising an agitator spindle (7) mounted so as to be free in translation relative to the lid, said spindle including an axial rod (13) which is driven in rotation and mounting a lower agitation blade (15), the agitator spindle (7) implementing a butt-type application on the base (17) of the can under the thrust of the blade during agitation, wherein the agitator spindle (7) includes at a lower end, an end piece (31) for application on the base of the can, said end piece being mounted so as to be free in rotation on the agitator spindle (7) and being provided with at least three lower projecting elements (39) adapted to come into contact, via one and the same plane perpendicular to the spindle, with the surface of the base (17) of the can.

5,839,826
STIRRING DEVICE FOR A BLENDER HAVING DUAL BLADES

Harold Z. Eubanks, Leakesville, Miss., assignor to Sunbeam Products, Inc., Delray Beach, Fla.

Filed Jan. 10, 1997, Ser. No. 778,144
Int. Cl.^{6} B01F *7/26*
U.S. Cl. 366—315 **7 Claims**





1. An agitator for use in a mixing device for mixing ingredients throughout a fluid, comprising:

at least one top aerating blade, said at least one top blade having a plurality of generally upwardly extending portions and apertures adjacent thereto for drawing fluid downwardly into the mixing device and aerating the fluid;

at least one lower wavy blade, said at least one lower blade being formed from a solid blank but for a central hub so that rotation of said lower blade limits homogenization of the ingredients;

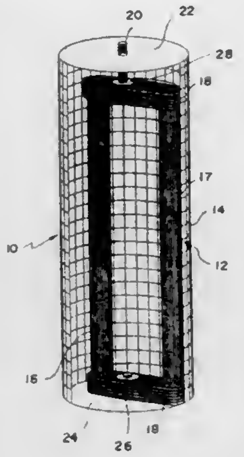
a shaft having an upper and lower end, said shaft engaging said at least one top blade and said at least one lower wavy blade at said upper end such that rotation of said shaft rotates said at least one top blade and said at least one lower wavy blade; and

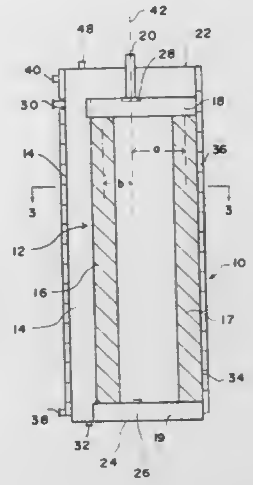
a base plate for engaging said shaft at said lower end, said base plate suitably sized to engage the mixing device.

5,839,827
AGITATING ELEMENT FOR MIXING APPARATUS AND THE MIXING APPARATUS EQUIPPED WITH THE AGITATING ELEMENT

Toshio Ogata, and Noboru Iwata, both of Okayama, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Mar. 12, 1997, Ser. No. 820,349
Claims priority, application Japan, Mar. 28, 1996, 8-074379
Int. Cl.^{6} B01F *7/28;7/32*
U.S. Cl. 366—325.94 **8 Claims**





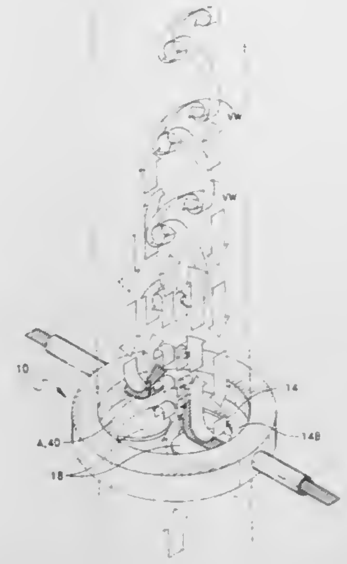
4. A polymerization apparatus, comprising: a mixing vessel which is substantially in the form of a cylinder and defines an axis of rotation; and a polymerization agitating element, said polymerization agitating element comprising at least two bars in the form of a column or a cylinder and at least one connecting member which connects said at least two bars to each other to form said polymerization agitating element such that loci of said at least two bars do not essentially coincide with each other when said at least two bars are rotated around the axis of the mixing vessel, and also such that a distance between the axis of the vessel and a center between the innermost and outermost of said at least two bars is in the range between 6% and 12% of the inside diameter of the vessel.

5,839,828
STATIC MIXER

Robert W. Glanville, 381 Metacom Ave., Bristol, R.I. 02809

Filed May 19, 1997, Ser. No. 858,822
Int. Cl.^{6} B01F *5/06*
U.S. Cl. 366—340 **8 Claims**

1. In combination with a hollow tubular conduit defining an internal longitudinal passageway wherein said conduit includes an internal wall surface, a static mixing device positioned in said conduit and within a fluid stream having a longitudinal flow direction within said passageway, comprising; a circular flange radially inwardly extending into said passageway at a generally normal angular relationship to said conduit internal wall surface, said flange having a central opening within the same plane as said flange for passage of said fluid stream therethrough and defined by an inner peripheral edge of said flange, said flange having a generally flat upstream surface for frictional abutting contact with said fluid stream prior to passing through said opening, said central opening in turn being inwardly spaced from said conduit internal wall surface a material distance in the order of approximately one third of the radius of said conduit, said device further including at least two opposed spaced apart flaps radially inwardly projecting

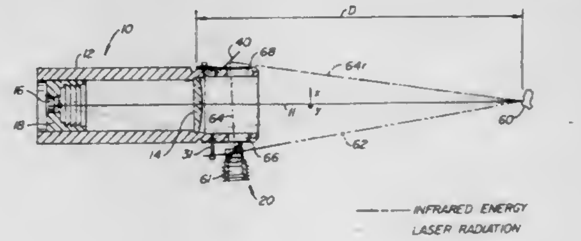


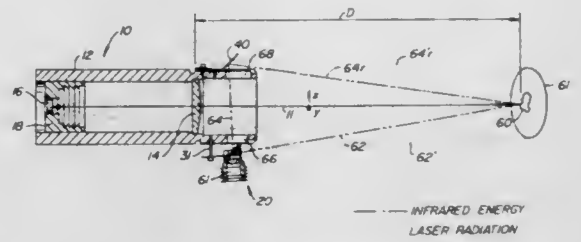
from said flange and cooperatively forming said central opening with said flange inner peripheral edge and wherein said flaps are inclined at an angle to said internal wall surface in the direction of said fluid stream.

5,839,829
AIMING ADJUSTMENT TECHNIQUE FOR A DUAL LIGHT SOURCE AIMING MECHANISM OF AN INFRARED HEAT SENSOR

Timothy J. Litvin, Santa Cruz, and Ronald P. Briars, Campbell, both of Calif., assignors to Raytek Subsidiary, Inc., Santa Cruz, Calif.

Division of Ser. No. 278,310, Jul. 21, 1994, Pat. No. 5,626,424.
This application Jan. 30, 1997, Ser. No. 791,685
Int. Cl.^{6} G01K *1/00;15/00;* **G01J** *5/02;* **G01B** *11/00*
U.S. Cl. 374—121 **3 Claims**





1. A method of adjusting aiming light for an infrared heat sensor, comprising the steps of:

providing an infrared heat sensor included in the interior cavity of a body, the body having an exterior surface and first and second beam openings along said exterior surface, the infrared heat sensor having an optical axis, a focus distance and a focus area, said infrared heat sensor generating a measurement signal having a magnitude indicating the temperature of a target site oriented along the optical axis;

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mounting a mirror assembly to the body and displaced in a first direction from the optical axis, the mirror assembly including a mirror having a mirror surface;

mounting a beam splitter on the body and displaced in a second direction from the optical axis, the beam splitter receiving a beam of aiming light and splitting the beam into a first part and a second part, the second part being directed at the mirror surface through said first and second beam openings;

providing a heat source at the target site;

aligning the optical axis of said sensor to pass through the heat source and target site by orienting the body toward said heat source and target site so that the magnitude of the heat sensor measurement signal responsive to said heat source is maximized;

adjusting the orientation of the beam splitter so that the first part of the beam of aiming light is directed at a first predetermined location relative to the target site; and

adjusting the orientation of the mirror assembly so that the second part of the beam of aiming light is reflected off the mirror surface and directed at a second predetermined location relative to the target site.

5,839,830

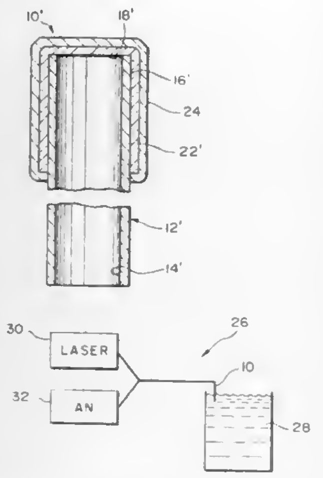
PASSIVATED DIAMOND FILM TEMPERATURE SENSING PROBE AND MEASURING SYSTEM EMPLOYING SAME

Jack P. Young, Oak Ridge, and Gleb Mamantov, Knoxville, both of Tenn., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Continuation of Ser. No. 308,855, Sep. 19, 1994, abandoned. This application Mar. 21, 1997, Ser. No. 822,147

Int. Cl.^{6} G01K *11/00;13/00;1/10;1/12*

U.S. Cl. 374—161 **17 Claims**



1. A temperature sensing probe, comprising:

no more than one optical fiber for transmitting an excitation radiation of a given wavelength; and

cover means, disposed in the path of the excitation radiation and over at least a portion of the optical fiber, for producing a Raman signal in response to the excitation radiation, wherein the optical fiber is used to transmit the Raman signal produced in response to the excitation radiation,

and wherein the Raman signal changes in accordance with changes in the temperature of the cover means.

5,839,831

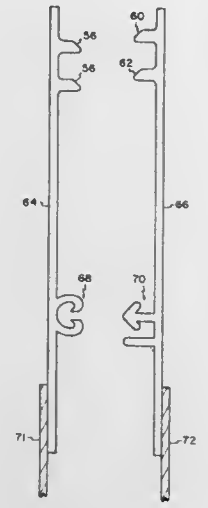
FLEXIBLE PACKAGE HAVING IMPROVED GRIPPER RIDGES AND METHODS THEREOF

Randolph A. Mazzocchi, Greenville, Wis., assignor to Reynolds Consumer Products, Inc., Appleton, Wis.

Filed Feb. 6, 1997, Ser. No. 795,675

Int. Cl.^{6} B65D *33/16*

U.S. Cl. 383—65 **12 Claims**



1. A reclosable package comprising:

(a) an outer enclosure including a surrounding wall portion, a product-supporting bottom, and a reclosable mouth opposing the product-supporting bottom; the wall portion including an interior surface oriented toward an interior of the package and an opposite exterior surface;

(b) a closure arrangement secured to the wall portion and adjacent to the mouth to allow selective opening and closing of the mouth; and

(c) a first gripper ridge secured to the interior surface of the wall portion, the first gripper ridge including:

  (i) first and second opposite walls; each of said first and second walls being oriented normal to the interior surface of the wall portion;

    (A) the first wall including a first extended end and having a first length;

    (B) the second wall including a second extended end and having a second length; the first length being greater than the second length; the first wall being closer to the closure arrangement than the second wall; and

  (ii) an end surface extending between the first and second extended ends;

    (A) the end surface arranged and configured to form a first gripping end perceptible to touch as oriented toward the closure arrangement.

5,839,832

WRAPPING DEVICE

Junichi Hagino, Toyonaka, Japan, assignor to Packs Co. Ltd., Osaka, Japan

Division of Ser. No. 363,376, Dec. 23, 1994, Pat. No. 5,655,842. This application May 7, 1997, Ser. No. 852,537

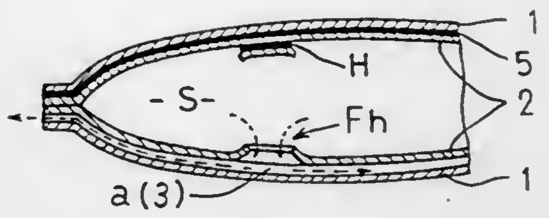
Claims priority, application Japan, Dec. 28, 1993, 5-335696; Sep. 14, 1994, 6-219903; Oct. 24, 1994, 6-257981

Int. Cl.^{6} B65D *33/01*

U.S. Cl. 383—101 **2 Claims**

1. A wrapping bag comprising

a pair of laminates having peripheral edges which are heat fused together to form an inner space of said bag, each laminate comprising an inner layer and an outer layer which are bonded together by bonding means, said inner layers being in mutually facing relationship.



a communicating passage formed between said inner layer and said outer layer of one of said laminates where said bonding means is interrupted, and

a heat fused spot formed by partially heat fusing said inner layers together across said inner space, said heat fused spot being located where said bonding means is interrupted, whereby,

when pressure of said inner space builds up, said heat fused spot becomes separated to break open one of said inner layers and consequently to communicate said inner space and said communicating passage with each other.

5,839,833

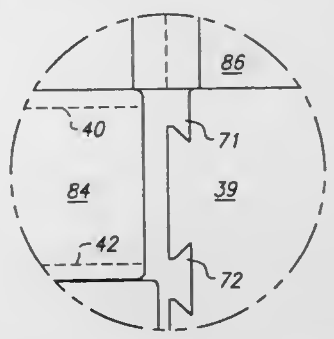
HYDRODYNAMIC BEARING HAVING LUBRICANT PARTICLE TRAPS

Yan Zang, Milpitas, Calif., assignor to Quantum Corporation

Filed Mar. 26, 1996, Ser. No. 622,644

Int. Cl.^{6} F16C *32/06;33/74*

U.S. Cl. 384—107 **22 Claims**



1. A hydrodynamic bearing assembly comprising:

a shaft;

a sleeve including an opening for receiving at least a portion of the shaft and allowing for relative rotation between the shaft and the sleeve;

a lubricant positioned within the opening in the sleeve, the relative rotation between the sleeve and the shaft generating and imparting a centrifugal force to the lubricant;

a hydrodynamic journal bearing defined between at least a portion of the shaft and at least a portion of the sleeve; and

a journal particle trap mounted in the sleeve for receiving and entrapping particles which may exist in the lubricant proximate the journal bearing, the journal particle trap including a journal trap inlet which is positioned adjacent to the journal bearing, so that the particles and lubricant exiting the hydrodynamic journal bearing are forced directly into the trap by the centrifugal force imparted by the relative rotation of the sleeve and the shaft wherein the particle trap, including the trap inlet, is defined by a substantially annular channel which is beveled, so that a width of the channel is smallest approximate to the trap inlet.

5,839,834

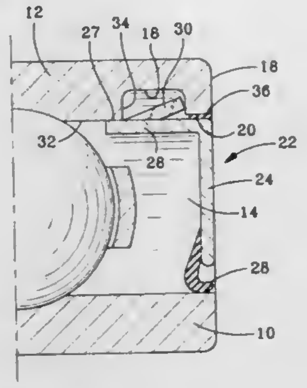
BEARING AND BEARING SEAL

Salvatore Acampora, Jr., Bristol, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed Sep. 30, 1996, Ser. No. 722,710

Int. Cl.^{6} F16C *33/78*

U.S. Cl. 384—484 **6 Claims**



1. An antifriction bearing comprising:

an inner ring;

an outer ring having an inside surface of greater inside diameter than the diameter of the outside surface of the inner ring thereby providing an inner ring-outer ring annulus, said outer ring having an annular groove axially spaced from the axial end of the outer ring by an axially extending portion of the outer ring inside surface;

a metal ring in the inner ring-outer ring annulus, said metal ring having an axially extending portion having an outside diameter slightly less than the inside diameter of said portion of the inside surface of the outer ring which axially spaces the annular groove from the axial end of the outer ring and a plurality of circumferentially separated resilient locking members adapted to extend into a portion of the outer ring annular groove and securely lock the metal ring in the inner ring-outer ring annulus when the metal ring is inserted such that the outer ring annular groove provides a lubricant reservoir; and

an elastomeric ring on the metal ring in sealing engagement with that portion of the inside surface of the outer ring which axially spaces the annular groove from the axial end of the outer ring such that the lubricant reservoir of the outer ring annular groove is open to the inner ring-outer ring annulus.

5,839,835

SELF-ALIGNING BALL BEARING

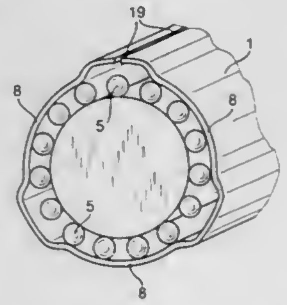
Alexander Zernickel; Herbert Erhardt, both of Herzogenaurach, and Rainer Lutz, Markt Erlbach, all of Germany, assignors to Ina Walzlager Schaeffler KG, Herzogenaurach, Germany

Filed Sep. 16, 1997, Ser. No. 932,144

Claims priority, application Germany, Nov. 26, 1996, 196 48 854.0

Int. Cl.^{6} F16C *19/08*

U.S. Cl. 384—497 **8 Claims**



1. A self-aligning ball bearing, adapted for use on a steering shaft (7) of an automotive vehicle, comprising a substantially

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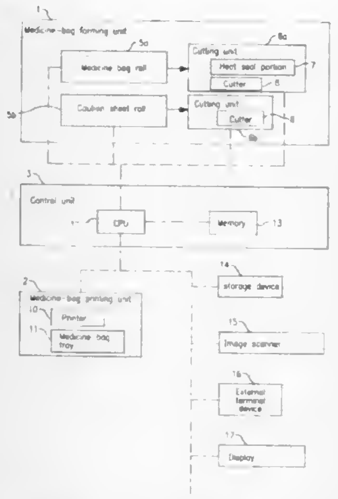
spherical raceway (**2**) in an outer bearing ring (**1**) and a double-track raceway (**4**) for two rows of balls (**5**) in an inner bearing ring (**3**), at least one peripheral section of at least one of the substantially spherical raceway (**2**) and the double-track raceway (**4**) comprises an elastic raceway convexity (**8**) which deviates from a circular shape such that at least two adjacent bearing balls (**5**) are radially prestressed between the raceway convexity (**8**) and the other of the substantially spherical raceway (**2**) and the double-track raceway (**4**).

5,839,836
PRINTING APPARATUS FOR MEDICINE BAG

Shoji Yuyama; Keita Yasuoka; Sakae Tsuji, and Hiroyasu Hamada, all of Toyonaka, Japan, assignors to Yuyama, Mfg. Co., Ltd., Toyonaka, Japan
Filed Oct. 21, 1996, Ser. No. 734,183
Claims priority, application Japan, Oct. 19, 1995, 7-308103
Int. Cl.⁶ B41J *5/30*
U.S. Cl. 400—62 **3 Claims**



1. A printing apparatus for printing on medicine bags, said apparatus comprising:

storage means for storing print data concerning drugs in correspondence to individual patient data in units of drug identification data corresponding to respective drugs;

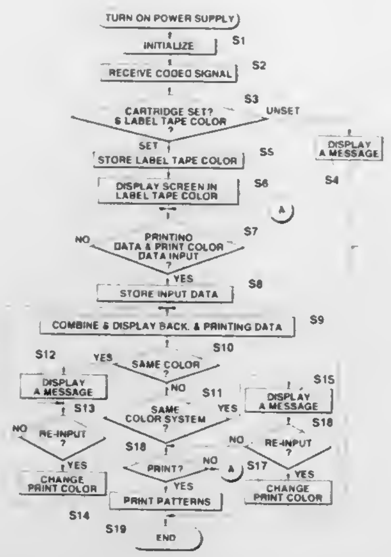
reading means for reading pertinent print data from said storage means based on drug identification data included in prescription data for individual patients;

print data selecting means for selecting print data corresponding to an individual patient based on the patient data included in the prescription data from the print data read by said reading means; and

printing means for printing the print data selected by said print data selection means.

5,839,837
PRINTERS WHICH DISPLAY THE COLOR OF A PRINTING MEDIUM

Hiroki Takehara, Fussa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Oct. 9, 1996, Ser. No. 727,975
Claims priority, application Japan, Oct. 13, 1995, 7-290547
Int. Cl.⁶ B41J *11/00*
U.S. Cl. 400—76 **6 Claims**



1. A printer comprising:

a cartridge accommodating unit for exchangeably accommodating therein any one of a plurality of different cartridges, each cartridge containing a label tape as a printing medium and a color printing ink tape which contains a plurality of different color inks, and each cartridge having a shape which varies depending on a color of the label tape;

a detection unit for detecting the shape of a given one of plurality of different cartridges which is accommodated in said cartridge accommodating unit;

a determining unit determining the color of the label tape contained in the cartridge accommodated in said accommodating unit based on the detected shape of the cartridge detected by said detection unit;

an input unit for inputting printing data including at least one of character and symbol data, and for inputting print color data which specifies a print color of the printing data;

a data storage unit for storing the printing data and the print color data input by said input unit;

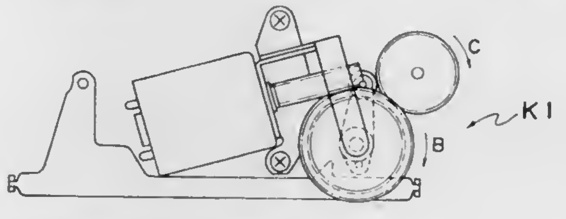
a display unit having a color display screen;

a display control unit causing the color display screen of the display unit to display a background of the printing data in the color of the label tape determined by said determining unit, and to display on the background the printing data stored in said data storage unit in the color specified by the print color data stored in said data storage unit; and

a printing unit for printing the printing data stored in said data storage unit on the label tape contained in the cartridge accommodated in said cartridge accommodating unit using the ink tape contained in the cartridge, said printing data being printed in the print color specified by the print color data stored in said data storage unit.

5,839,838
IMAGE PRINTER

Tetsuya Hokamura, Osaka; Masami Nakagawa, Hirakata; Takayuki Kawamura, Kadoma, and Takashi Koike, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Oct. 22, 1997, Ser. No. 956,124
Claims priority, application Japan, Oct. 25, 1996, 8-283613; Oct. 30, 1996, 8-287883; Apr. 30, 1997, 9-112188; Apr. 30, 1997, 9-112189
Int. Cl.⁶ B41J *23/34*
U.S. Cl. 400—185 **4 Claims**



1. An image printer comprising:

a printing means for printing dye on a recording medium;

a dye medium take-up means for taking up a dye medium to which the dye is applied;

a first power transmission means for transmitting power to the dye medium take-up means;

a recording medium transporting means for transporting the recording medium;

a drive means for driving the dye medium take-up means and the recording medium transporting means, which can be driven forwardly and reversely;

a pivotal means which is pivotal in response to rotation of the recording medium transporting means;

a second power transmission means for transmitting power from the recording medium transporting means to the first power transmission means, which is mounted on the pivotal means;

an urging means for bringing the recording medium transporting means into contact with the pivotal means so as to transmit driving force of the recording medium transporting means to the pivotal means; and

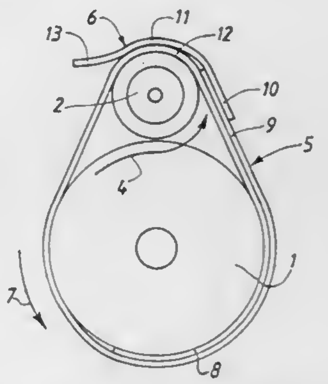
a preventive means for selectively preventing the second power transmission means from coming into contact with the first power transmission means;

wherein when the drive means is driven in a first direction, driving force of the drive means is transmitted to the recording medium transporting means so as to not only transport the recording medium in a first direction but pivot the pivotal means towards the first power transmission means through the recording medium transporting means, whereby the second power transmission means is brought into contact with the first power transmission means so as to drive the dye medium take-up means by power of the drive means such that the dye medium is taken up by the dye medium take-up means;

wherein when the drive means is driven in a second direction, driving force of the drive means is transmitted to the recording medium transporting means so as to not only transport the recording medium in a second direction but pivot the pivotal means away from the first power transmission means through the recording medium transporting means, whereby the second power transmission means is spaced away from the first power transmission means such that the dye medium take-up means is not driven.

5,839,839
INK-FILM REFILL FOR HEAT-TRANSFER PRINTER

Michel Brot, Argenteuil, and Alex Kuhn, Auvers Sur Oise, both of France, assignors to SAGEM SA, Paris, France
Filed Jan. 31, 1997, Ser. No. 792,734
Claims priority, application France, Feb. 2, 1996, 96 01278
Int. Cl.⁶ B65D *85/66*
U.S. Cl. 400—242 **3 Claims**



1. An ink-film refill for a heat-transfer printer, comprising:

a film dispenser-roll;

a receiving mandril for affixing a free end of the ink-film, roll and mandril resting against each other and having their axes substantially mutually parallel; and

adhesive means for keeping the roll and the mandril resting against each other with their axes substantially mutually parallel, the adhesive means including at least one non-adhesive end forming a gripping zone in order to break the adhesive bond between roll and mandril and render them mutually free;

wherein said adhesive means comprise:

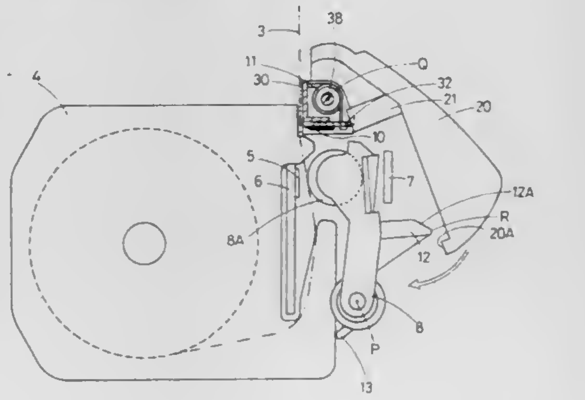
a ribbon enclosing an assembly comprising the dispenser roll and the receiving mandril, the ribbon having an overlapping end and an overlapped end mutually overlapping to form an overlapping portion of the ribbon, and

a tab with an adhesive deposited at a first end of the tab and at a middle zone of the tab for adhering to the overlapping portion of the ribbon and to a non-overlapping portion of the ribbon, the tab having a second end free of adhesive and comprising said gripping zone;

wherein the first end of the tab is in contact with the overlapping end of the ribbon and the middle zone of the tab is in contact with an emerging portion of the non-overlapping portion of the ribbon.

5,839,840
TAPE PRINTING APPARATUS

Isao Kawano, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Sep. 23, 1997, Ser. No. 935,672
Claims priority, application Japan, Sep. 26, 1996, 8-254280
Int. Cl.⁶ B41J *11/00*
U.S. Cl. 400—621 **13 Claims**



1. A tape printing apparatus comprising:

a main body having a tape receiving part;

a cover member for opening and closing the tape receiving part;

a tape cassette having a print tape therein, the tape cassette being set in the tape receiving part;

a platen mechanism movable between an operational position and a home position according to a closing and opening operation of the cover member, the platen mechanism feeding the tape from the tape cassette;

a print head for printing on the print tape fed by the platen mechanism;

a blade for cutting the print tape after printed by the print head;

a holding member for covering the blade slidably therein between a cutting position and a holding position;

a resilient member for biasing the blade toward the holding position;

a lever for pressing the blade toward the cutting position; and

a stopper member formed on the platen mechanism, which comes into contact with the lever when the platen mechanism is in the home position according to opening of the cover member and sets a lock mode that the blade is held in the holding position.

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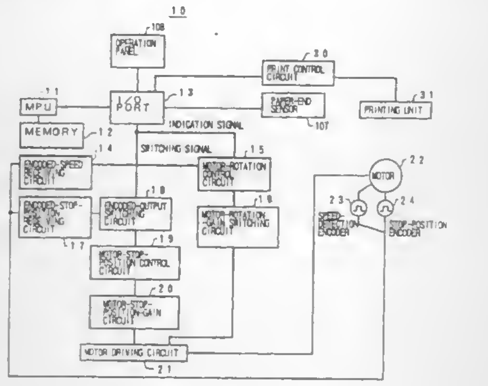
5,839,841
PRINTED DEVICE WITH PAPER-SHIFT CONTROL ADAPTABLE TO DIFFERENT PAPER SIZES
Takashi Inui, and Tamotsu Nishiura, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan
Filed Sep. 12, 1997, Ser. No. 928,471
Claims priority, application Japan, Mar. 19, 1997, 9-066913
Int. Cl.⁶ B41J *29/18*
U.S. Cl. 400—708 **12 Claims**



1. A device for printing on a continuous sheet, said device comprising:

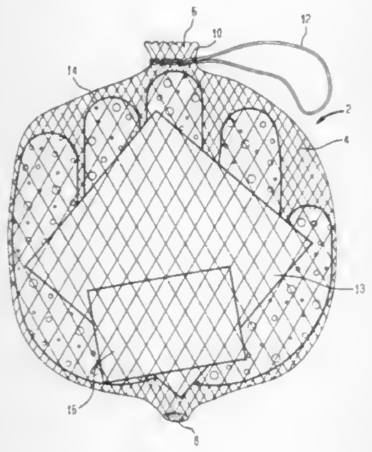
a motor for carrying said continuous sheet;

switching means for switching a minimum unit of control of said motor depending on a paper size of said continuous sheet;

position-detection means for detecting a rotational position of said motor; and

stop-control means for controlling said motor to stop at a position matching a selected minimum unit of control based on said rotational position of said motor detected by said position-detection means.

5,839,842
CLEANSING SYSTEM INCLUDING A TOILET BAR AND SPONGE SUPPORTED WITHIN A POROUS POUCH
Jill Dene Wanat, New York, N.Y., and Howard Bruce Kaiserman, Haworth, N.J., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.
Filed Feb. 17, 1998, Ser. No. 25,179
Int. Cl.⁶ A47K *7/02*
U.S. Cl. 401—201 **8 Claims**



1. A cleansing kit for children to practice good hygiene comprising:

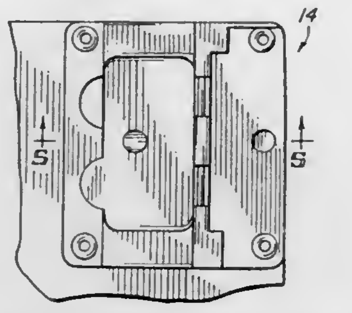
(i) a closable pouch formed of an open cell material;

(ii) a closed cell sponge held within the pouch;

(iii) a toilet bar supported within the pouch; and

(iv) a sheet of instructions on use of components of the kit.

5,839,843
COMBINATION BOOK AND HOLEPUNCH ASSEMBLY
Mark A. Bedol, 3423 Yankton Ave., Claremont, Calif. 91711
Filed Apr. 4, 1997, Ser. No. 833,292
Int. Cl.⁶ B42F *3/00*
U.S. Cl. 402—4 **10 Claims**



1. A combination book and holepunch assembly, comprising:

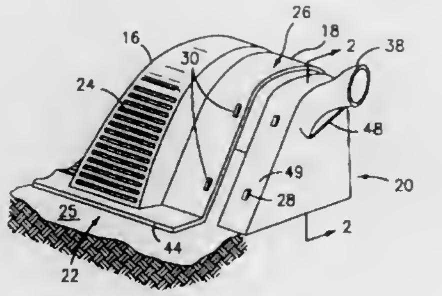
a book having a substantially flat portion thereon; and

at least one holepunch assembly securely attached to said flat portion, said at least one holepunch assembly, comprising:

a) a first rigid plate securely connected to said flat portion, said first rigid plate having an opening formed therethrough; and

b) a second rigid plate rotatably connected to said first rigid plate, said second rigid plate including a punching element, said punching element being sized and spaced to align with said opening in said first plate when said second plate is rotated away from a first position to a second position so as to provide a holepunching capability when paper is inserted between said first plate and said second plate.

5,839,844
LEACHING CHAMBER ENDPLATE
James M. Nichols, Old Saybrook, and Bryan A. Coppes, Clinton, both of Conn., assignors to Infiltrator Systems, Inc., Old Saybrook, Conn.
Filed Jun. 12, 1995, Ser. No. 489,693
Int. Cl.⁶ E02B *13/00; 13/02*
U.S. Cl. 405—43 **15 Claims**



15. An elongate the end of an arch shape leaching leaching chamber use for disposing liquids in soil, comprising:

an arch shape portion adapted to connect to end close the end of a leaching chamber;

the arch shape portion having a vertical outer wall, a spaced apart inner wall, and opposing sidewalls connecting the inner and outer walls, the combination of walls forming a vertically running channel within the arch shape portion for guiding liquids downwardly therein;

the outer wall having an opening near the top thereof, for passage of liquids into the channel from outside the chamber;

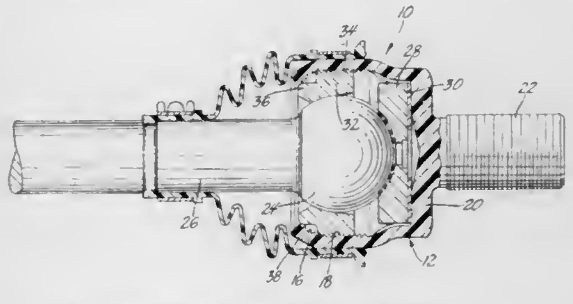
the inner wall having an opening near the lower end thereof, to enable liquids to pass from the channel into the interior of a chamber;

a base extending laterally from the bottom of the outer wall to the vicinity of the plane of the inner wall;

a duct, attached to the upper end of the outer wall in communication with the hole and channel, extending from the outer wall to an end comprising a duct inlet, adapted to receive a pipe carrying liquid into the leaching chamber;

wherein, the elevation of the top of the duct inlet is higher than the elevation of the top of the arch shape portion.

5,839,845
ADJUSTABLE TORQUE PIVOT JOINT
Jeffrey L. Kincaid, Clarkston; Brian A. Mattila, Fenton, both of Mich.; Thomas J. Miller, Alden, N.Y., and Kenneth G. Kraft, Warren, Mich., assignors to American Axle & Manufacturing, Detroit, Mich.
Continuation-in-part of Ser. No. 595,689, Feb. 2, 1996, abandoned. This application Nov. 21, 1996, Ser. No. 754,546
Int. Cl.⁶ F16C *11/06*
U.S. Cl. 403—135 **19 Claims**



1. An adjustable torque pivot joint comprising:

a housing having a portion that is internally threaded and a deformable lip,

a stud having a ball head that is retained in the housing so that the stud rotates and angulates with respect to the housing,

a first bearing seat in the housing engaging an end of the ball head of the stud,

a second bearing seat in the housing engaging an opposite end of the ball head of the stud, and

a threaded plug that threadably engages the internally threaded portion of the housing and that has a peripheral, out of round, outwardly facing tool engaging surface for screwing the threaded plug to an adjusted position in the housing so that the bearing seats are biased into engagement with the ball head with desirable torque characteristics, and

the deformable lip engaging and encircling the outwardly facing tool engaging surface of the plug in a deformed state to maintain and to prevent tampering with the adjusted position of the threaded plug.

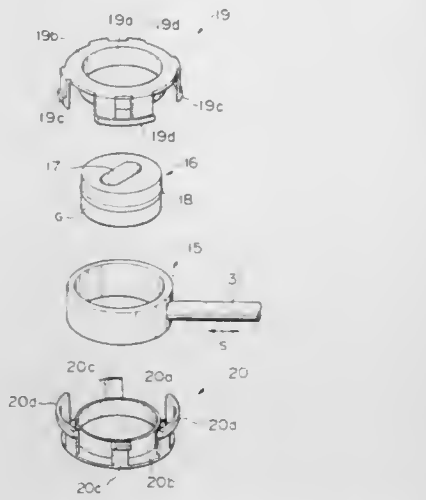
5,839,846
JOINT STRUCTURE FOR CONTROL CABLE
Tatsuo Shimada, Amagasaki; Keizo Tani; Tomoyuki Tokunaga, both of Utsunomiya; Yuichi Tanii, Sagamihara; Shuichi Hannya, Fujisawa; Takehiro Kuroda, Atsugi, and Masao Matsumoto, Yokohama, all of Japan, assignors to Nippon Cable System Inc., Takarazuka, and Nissan Motor Co., Ltd., Yokohama, both of Japan
Filed Apr. 5, 1996, Ser. No. 628,209
Claims priority, application Japan, Apr. 7, 1995, 7-082892
Int. Cl.⁶ F16C *11/10*
U.S. Cl. 403—164 **16 Claims**

1. A joint structure for a control cable, which is adapted to transmit motion from a gear shifting lever to a manual transmission lever, the joint structure comprising:

an annular member adapted to be connected to the control cable;

a columnar sleeve received in the annular member, the sleeve having an elongated through hole;

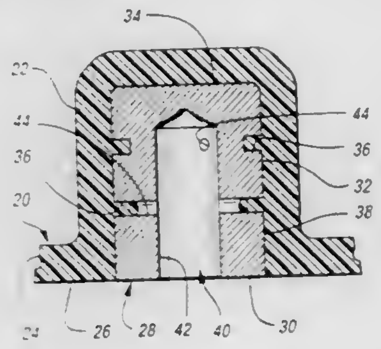
a pair of bushes of elastic material rotatably supporting the sleeve relative to the annular member, each of the bushes having a cylindrical member received between the sleeve and the annular member, the cylindrical members being received from opposite ends of the annular member;



engaging means for holding both of said bushes in position relative to the annular member, while allowing the annular member and the bushes to rotate together relative to the columnar sleeve; and

positioning means for positioning the sleeve relative to the annular member, the positioning means being formed on one of the sleeve and the bushes.

5,839,847
MOLDED ARTICLE WITH CAPTURED FASTENERS
Jayant D. Patel, Lake Forest, Calif., assignor to McDonnell Douglas Corporation, St. Louis County, Mo.
Filed Feb. 21, 1997, Ser. No. 801,852
Int. Cl.⁶ B29B *13/00*
U.S. Cl. 403—269 **13 Claims**



1. An article molded from a formable material, the article comprising:

a molded body having a first molded surface; and

a fastener within the molded body, the fastener including a base surface portion, a side surface portion, and an internal passage connecting the base surface portion to the side surface portion,

wherein a first section of the passage adjacent to the side surface portion is filled with the formable material to mechanically capture the fastener within the molded body, wherein the side surface portion includes a first recess, and the first section opens into the first recess.

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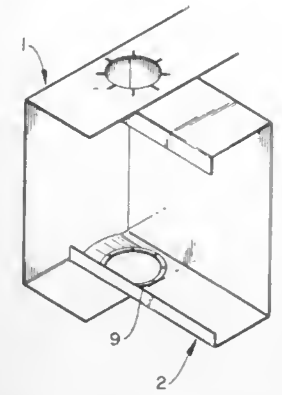
5,839,848
JOINING METAL MEMBERS

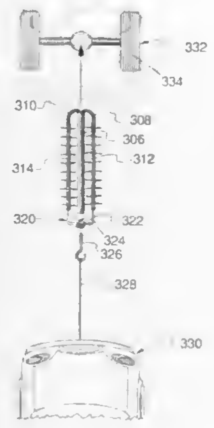
Kimmo J Sahramaa, 11301 S. Shore Rd., Reston, Va. 22090
Filed Dec. 30, 1996, Ser. No. 777,036
Int. Cl.^{6} F16B *21/00; 7/04*
U.S. Cl. 403—282 **18 Claims**



1. An interconnected assembly of formed metal members in frame structures comprising:
- first and second members;
- said first member having at least a first preformed hole;
- said second member having at least a first preformed collar;
- said hole surrounds said collar; and
- said collar being bent onto said first member whereby said first and second members are fastened together.

5,839,849
MECHANICAL TIRE DEFLATING DEVICE

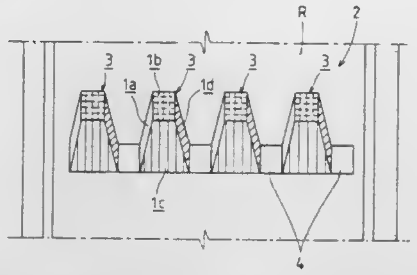
David R. Pacholok, 1815 W. Higgins Rd., Sleepy Hollow, Ill. 60118, and Charles A. Kuecker, 326 Devron Cir., Cary, Ill. 60013
Filed Feb. 21, 1997, Ser. No. 804,399
Int. Cl.^{6} E01F *13/12;* **B60R** *25/00*
U.S. Cl. 404—6 **8 Claims**



1. A pin spring tire deflating device having a stored position and a deployed position, the tire deflating device, comprising:
- (a) a pinned mounting bar, a first spike bar, a second spike bar and a pin mechanism;
- (b) the first spike bar and the second spike bar being movably connected to the pinned mounting bar;
- (c) the pin mechanism serving to hold the first spike bar and the second spike bar in the stored position relative to the pinned mounting bar; and
- (d) the pin mechanism serving to release the first spike bar and the second spike bar to the deployed position relative to the pinned mounting bar.

5,839,850
ROAD TRAFFIC SIGN OF SOLID GRAPHIC PATTERN

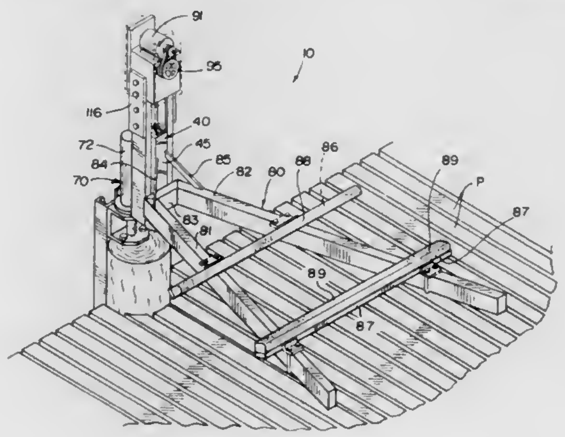
Kazuhiro Noguchi, Takatsuki; Nobuhisa Deki, Kyoto; Takeshi Nagata, Takatsuki, and Yohei Inagaki, Hirakata, all of Japan, assignors to Sekisui Jushi Kabushiki Kaisha, Osaka, Japan
Filed Dec. 31, 1996, Ser. No. 775,645
Claims priority, application Japan, May 13, 1996, 8-118031
Int. Cl.^{6} E01F *9/04*
U.S. Cl. 404—9 **13 Claims**



1. A road traffic sign of a solid graphic pattern, being a road traffic sign having a marking pattern divided in a plurality of sections formed tightly on the road, the road sign comprising first and second sections, the first section having a first lightness and being visible when viewed from a selected direction, the second section being adjacent to and substantially coplanar with the first section, the second section having a second lightness that is different than the first lightness and being visible when viewed from the selected direction, the first and second sections forming a two-dimensional marking pattern with a visual image of the marking pattern in a solid figure, when viewed from the selected direction, having a three-dimensional appearance.

5,839,851
PERSONAL WATERCRAFT LIFT

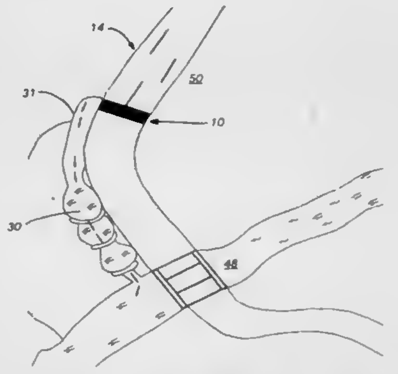
Lynn P. Norfolk; David Charles Peterson, Jr., both of Edgewater; Ronald Price Ranere, Chesapeake Beach; Russell V. Welton, Grasonville; Martin Johnson, Crofton, and John David Augustine, Laurel, all of Md., assignors to Norfolk Fabrication, Inc., Mayo, Md.
Filed Apr. 22, 1997, Ser. No. 838,014
Int. Cl.^{6} B63C *3/06; 1/02*
U.S. Cl. 405—3 **29 Claims**

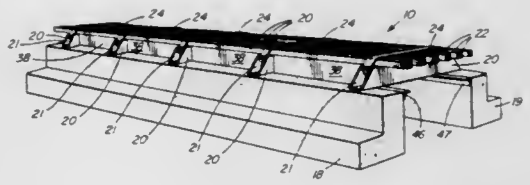


1. A lift particularly adapted to selectively elevate and lower an object and effect rotational displacement of the object in an elevated position comprising an upper elongated member and a lower elongated member, said upper elongated member being located above said lower elongated member with a lower end portion of said upper elongated member being adjacent an upper end portion of said lower elongated member, said upper and lower elongated members each having a longitudinal axis, said longitudinal axes being substantially aligned in a first position of said upper and lower elongated members and being in substantially offset parallel relationship in a second position of said upper and lower elongated members, a carriage carrying means for supporting an object; said carriage being slidable along said upper and lower end portions between a first upper position carried by said upper elongated member, a second lower position carried by said lower elongated member and a medial position spanning said upper and lower elongated members; and means for effecting relative rotation of said upper and lower elongated members about a substantially vertical axis when said carriage is in said first position whereby an object supported by said supporting means can be rotatably displaced between at least first and second arcuately spaced locations.

5,839,852
ROAD SPILLWAY

Jack Mattson, Site H, Comp. 2, R.R. #1 Hazelton, B.C, Canada, V0J 1Y0
Filed May 28, 1996, Ser. No. 654,221
Claims priority, application Canada, May 31, 1995, 2150623
Int. Cl.^{6} E02B *13/00;* **E01D** *15/12;* **E01C** *9/08*
U.S. Cl. 105—36 **26 Claims**

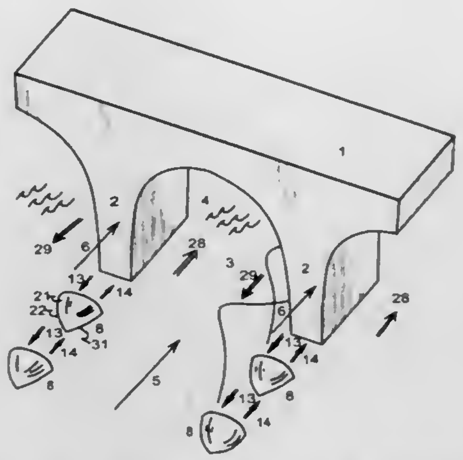




1. A road spillway for preventing roadway runoff from contaminating a waterway comprising:
- a) a ditch formed across a road at a location between a downslope of the road and the waterway, the road having a surface for driving on;
- b) solid supports removably positionable on opposite sides of the ditch and generally below the surface of the road;
- c) a porous deck resting on the solid supports and spanning the ditch, the deck having a top for driving on generally at the level of the surface of the road, the deck comprising:
  - (i) a plurality of span members spanning the ditch, wherein the span members removably rest on the solid supports and extend generally below the surface of the road; and
  - (ii) a plurality of spaced-apart deck members positioned above and attached to the span members; and.
- d) a settling pond in fluid communication with the ditch.

5,839,853
BUOYANT MATTER DIVERTING SYSTEM

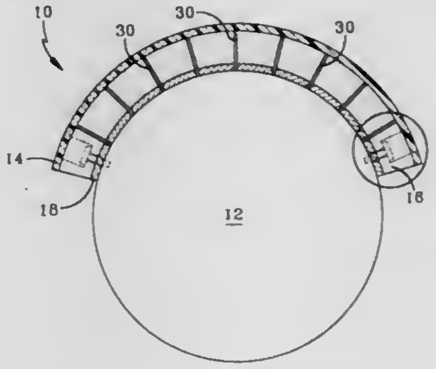
M. Leonard Oppenheimer, 8308 Marcie Dr., Pikesville, Md. 21208, and W. Selden Saunders, 223 Hopkins Rd., Baltimore, Md. 21212
Continuation-in-part of Ser. No. 770,116, Oct. 2, 1991, Pat. No. 5,478,167. This application Jun. 6, 1995, Ser. No. 470,810
Int. Cl.^{6} E02B *15/04*
U.S. Cl. 405—60 **14 Claims**



1. A device for directing the flow of buoyant contaminants in a stream, said stream having a surface and a stream bed, so as to reduce impact of said buoyant contaminants with at least one downstream structure, comprising one or more vortex generators for generating vortices in the placed so as to deflect said buoyant contaminants from a path which would otherwise have resulted in impact with said downstream structure stream.

5,839,854
FENDER PROTECTIVE STRUCTURE FOR CURVED SURFACES

Robert Michael Streszoff, Wilmington; Philip Paul Brady, LeLand, and Keith Highland, Wilmington, all of N.C., assignors to Duramax, Inc., Middlefield, Ohio
Filed Nov. 21, 1995, Ser. No. 560,779
Int. Cl.^{6} E02B *3/26*
U.S. Cl. 405—215 **8 Claims**



1. A fender for protecting a curved structure having a generally longitudinal axis from the impact of a moving object, the fender comprising from bottom to top:
- a resilient layer for attachment to the curved structure, said resilient layer comprising a rubber polymer alloy; and
- a plastic layer attached to said resilient layer,
- wherein said resilient layer has a depth extending from the bottom of said resilient layer to said plastic layer, and a plurality of notches extending generally parallel to the longitudinal axis and substantially through the depth of said resil-

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ient layer, for relieving internal compressive forces due to bending of the fender to thereby allow said fender to conform to the shape of the curved structure and to facilitate expansion of said resilient layer upon impact from a moving object to provide energy absorption characteristics.

5,839,855
FACING ELEMENT FOR A STABILIZED EARTH STRUCTURE

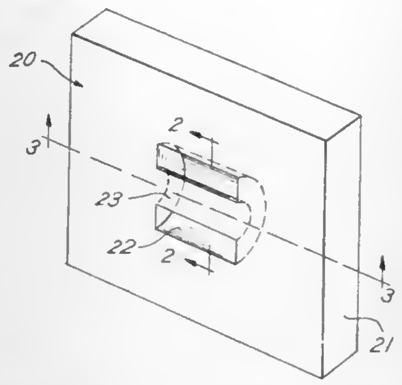
Peter Anderson, North Reading, Mass.; Michael Joseph Cowell, Leesburg, Va.; Jean-Marc Jailloux, Sannoix, France, and Pierre Segrestin, Falls Church, Va., assignors to Societe Civile des Brevets Henri C. Vidal, LePecq, France

Filed Jul. 31, 1996, Ser. No. 690,487

Claims priority, application United Kingdom, Aug. 18, 1995, 9516957; Feb. 29, 1996, 9604307

Int. Cl.^{6} E04B *2/02*

U.S. Cl. 405—262 **24 Claims**



1. A facing element for use in a stabilized earth structure, said element being molded or cast from a material to provide a main body with a rear surface, the rear surface of the facing element being provided with a molded or cast recess having an integrally molded or cast connecting member of said material around which may be passed an earth stabilizing member.

5,839,856
BORING TOOL

Wolfgang Hintze, Essen, and Günther Ruther, Marl, both of Germany, assignors to Widia GmbH, Essen, Germany

PCT No. PCT/DE94/00561, § 371 Date Nov. 2, 1995, § 102(e) Date Nov. 2, 1995, PCT Pub. No. WO94/29054, PCT Pub. Date Dec. 22, 1994

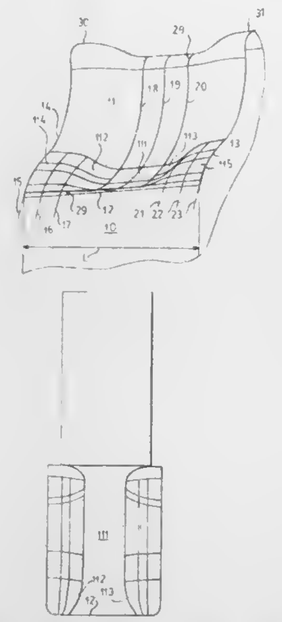
Continuation-in-part of Ser. No. 549,690, Nov. 2, 1995, abandoned. This PCT application May 10, 1994, Ser. No. 847,691

Claims priority, application Germany, Jun. 3, 1993, 43 18 479.0

Int. Cl.^{6} B23B *27/22*

U.S. Cl. 407—114 **16 Claims**

1. A rotary boring tool having a body formed with:
- a main cutting edge extending transversely of the direction;
- a pair of side cutting edges extending backward in the direction from ends of the main cutting edge;
- a substantially planar front face extending substantially perpendicular to the direction from the main cutting edge; and
- a curved cutting face extending backward in the direction from the main cutting edge between the side cutting edges and formed in turn with
  - a respective raised side crest at each side edge spaced backward in the direction from the main cutting edge,
  - a depressed central region between the side crests and extending forward generally to the main cutting edge,
  - a respective side flank between the crests, merging smoothly with each of the crests and with the central region, and extending generally to the main cutting edge, and



- a twisted land extending along the main cutting edge between same and the crests, central region and side flanks, and forming with, the front face a face angle that has an apex at the cutting edge and that increases steadily from each side edge toward a center of the main cutting edge.

5,839,857
CUTTING INSERT

Jose Agustin Paya, Mülheim, Germany, assignor to Widia GmbH, Essen, Germany

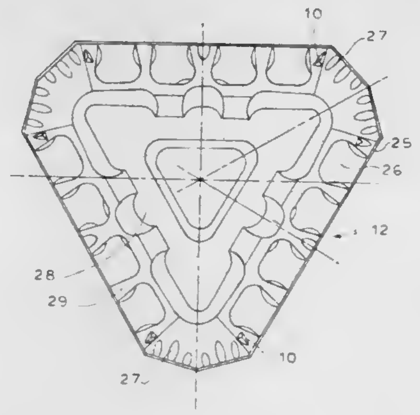
PCT No. PCT/DE95/00552, § 371 Date Dec. 13, 1996, § 102(e) Date Dec. 13, 1996, PCT Pub. No. WO95/35178, PCT Pub. Date Dec. 28, 1995

PCT Filed Apr. 21, 1995, Ser. No. 765,045

Claims priority, application Germany, Jun. 17, 1994, 4422312.9

Int. Cl.^{6} B23B *27/22*

U.S. Cl. 407—114 **18 Claims**



1. A cutting insert formed with:
- a cutting surface;
- a side surface joining the cutting surface at a cutting edge;
- a wedge-shaped chip-shaping element formed on and raised above the cutting surface and having
  - a width that increases uniformly away from the cutting edge,
  - a pair of generally planar side flanks extending at an acute angle to each other, ascending away from the cutting surface away from the cutting edge, and defining a upper edge extending toward the cutting edge and rounded along its full length, and

  - a generally planar rear flank descending from the side flanks toward the cutting surface away from the cutting edge and forming with the cutting surface an angle of between 15° and 40°.

5,839,858
CUTTING INSERT, ESPECIALLY FOR MILLING

Jose Agustin Paya, and Thomas Braun, both of Mülheim, Germany, assignors to Widia GmbH, Essen, Germany

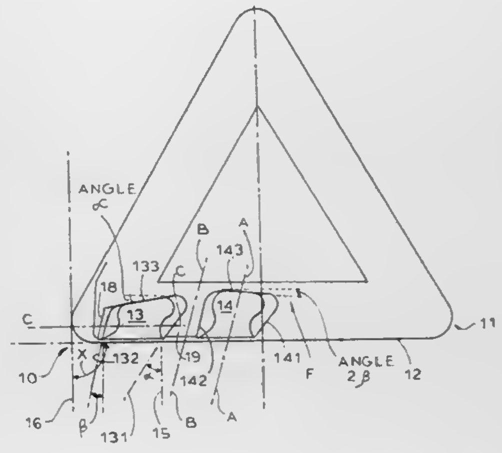
PCT No. PCT/DE95/00435, § 371 Date Oct. 16, 1996, § 102(e) Date Oct. 16, 1996, PCT Pub. No. WO95/29784, PCT Pub. Date Nov. 9, 1985

PCT Filed Mar. 29, 1995, Ser. No. 727,498

Claims priority, application Germany, May 3, 1994, 44 15 453.4; Jun. 7, 1994, 44 19 839.6

Int. Cl.^{6} B23C *5/20*

U.S. Cl. 407—115 **17 Claims**



1. A cutting insert for material-removing machining, said insert formed with:
- a cutting edge extending between two cutting corners:
- a cutting face;
- a plurality of recesses arranged in a row along the cutting edge, each recess widening rearward away from the cutting edge and having a respective pair of lateral edges extending transversely of the cutting edge; and
- a raised rib having a longitudinal axis extending transversely of the cutting edge parallel to one lateral edge of a respective pair of one and other lateral edges where in said one lateral edge being closer to one of the cutting corners of the recess closest to one of the two cutting corners.

5,839,859
CUTTING TOOL MATING SURFACES HAVING A V-SHAPE CROSS-SECTION

Hiroshi Shimomura, and Syoji Takiguchi, both of Gifu-ken, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

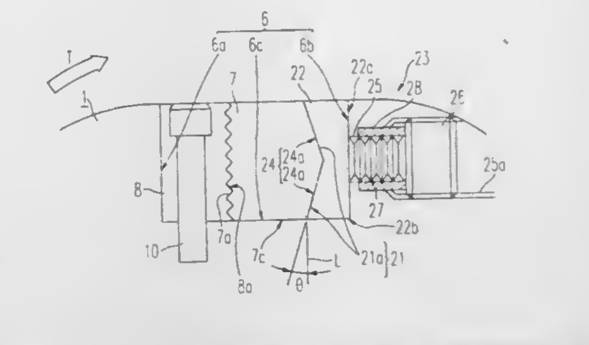
Filed Sep. 4, 1997, Ser. No. 923,540

Claims priority, application Japan, Sep. 6, 1996, 8-257551

Int. Cl.^{6} B23B *51/00*

U.S. Cl. 408—158 **5 Claims**

1. A cutting tool comprising:
- a conical main body rotating along an axis and having a groove formed in a peripheral surface of the cone;
- a slider having a cutting-blade chip and slidably mounted in said groove;
- a spacer mounted between one side face of said groove and one side face of said slider;



- a plate disposed between said another side face of said slider and another side face of said groove, said plate and said another side face of said slider being provided with mating surfaces having a V-shape cross-section: and
- means for applying a pressing force to said plate in a direction substantially perpendicular to said one side face of said groove.

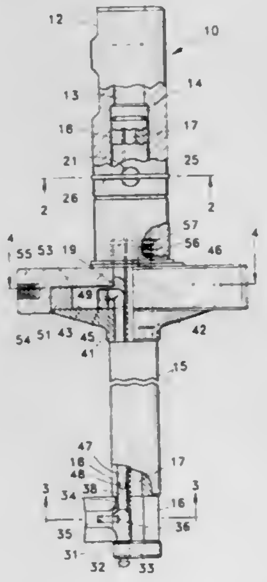
5,839,860
INTERTIALLY ACTIVATED SPOTFACING AND COUNTERBORING TOOL

Rudolph Steiner, Fairport, N.Y., assignor to R. Steiner Technolgoies, Inc., Fairport, N.Y.

Filed Dec. 31, 1996, Ser. No. 775,576

Int. Cl.^{6} B23B *51/00*

U.S. Cl. 408—180 **12 Claims**



1. A tool, comprising
- a cylindrical holder having on one end thereof a shank section disposed to be attached to a machine tool spindle operable to effect rotation of said holder selectively in opposite directions about its axis,
- a cutter mounted on said holder adjacent the opposite end thereof for movement between an inoperative position within a recess in said holder, and an operative position in which the cutter projects laterally from said holder to an operative, cutting position,
- a cutter activating member mounted on said holder for rotation therewith, and for limited movement relative thereto between first and second limit positions, respectively,
- means connecting said cutter to said activating member for movement thereby between said operative and inoperative positions thereof upon movement of said member between its first and second limit positions, and

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means mounting an intertial member on said holder for rotation therewith, and for limited movement relative thereto upon change in the direction of rotation of said holder.

said mounting means including means frictionally coupling said activating member to said inertial member for movement therewith and operative to effect movement of said activating member from one to the other of said limit positions thereof upon movement of said inertial member relative to said holder.

5,839,861

GEAR-CUTTING MACHINE WITH EMERGENCY POWER SUPPLY

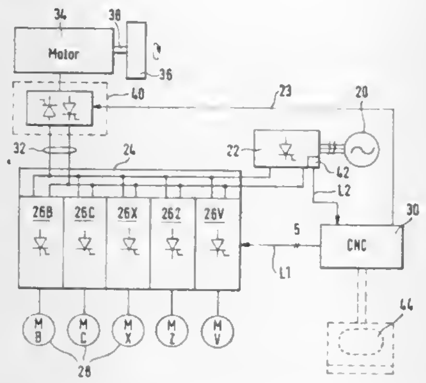
Joachim Schuon, Buchenberg, Germany, assignor to Liebherr Verzahntechnik GmbH, Germany

Filed Feb. 27, 1997, Ser. No. 810,933

Claims priority, application Germany, Feb. 28, 1996, 296 03 668 U

Int. Cl.^{6} B23F *1/00*

U.S. Cl. 409—2 **4 Claims**



1. A machine tool, in particular a gear-cutting machine, having a plurality of electric driving motors each for adjusting a respective axis of said machine tool, and one actuator provided for each respective driving motor, said actuator being connected to a direct-current source supplied from a network and controlled by an NC controller, said machine tool further comprising a monitoring device which detects a significant drop in line voltage and provides a corresponding signal to said NC controller, and an emergency power supply, connected to said network, which, upon a significant drop in line voltage, supplies at least one of said actuators with enough electric energy to permit controlled stopping of said driving motor corresponding to said respective actuator;

wherein said direct-current source is a dc intermediate circuit, said actuators of said driving motors are provided for adjusting respective axes, and a motor of said emergency power supply is connected to said d.c. intermediate circuit.

5,839,862

MACHINE TOOL WITH SPINDLE HEAD PIVOTABLE ABOUT TWO AXES

Hideki Hayashi; Kazumichi Aoki, and Tadashi Sano, all of Shizuoka, Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Japan

Filed Jul. 15, 1997, Ser. No. 892,633

Claims priority, application Japan, Jul. 26, 1996, 8-198035

Int. Cl.^{6} B23C *1/12*

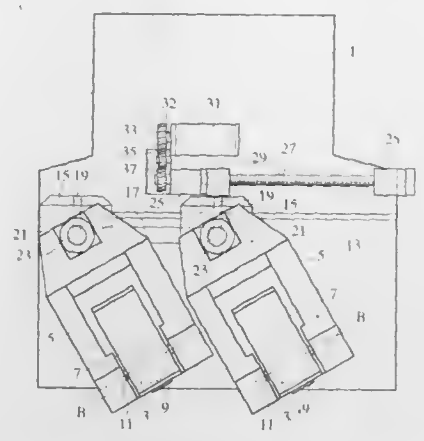
U.S. Cl. 409—201 **4 Claims**

1. A machine tool, comprising:

a base member being movably provided on the machine tool;

a retaining member being swingably attached to the base member by a support shaft, the retaining member having an end describing a circular arc when the retaining member swings;

a spindle head attached onto the retaining member;



a first slider movably mounted on the base member, the first slider reciprocating in a first direction parallel to a chord of the circular arc;

a second slider movably mounted on the first slider, the second slider reciprocating in a second direction perpendicular to the first direction;

a connecting shaft for pivotably connecting the retaining member to the second slider; and

a drive system for linearly driving the first slider in the first direction.

5,839,863

HANDTRUCK PARKING DEVICE FOR SECUREMENT ON A TRANSPORT VEHICLE

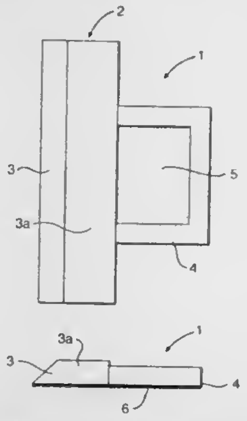
Lars Johansson, Kumla, Sweden, assignor to AB Volvo, Gothenburg, Sweden

Continuation of Ser. No. 553,384, Apr. 26, 1996, abandoned. This application Apr. 18, 1997, Ser. No. 839,939

Claims priority, application Sweden, Jun. 9, 1993, 9301973

Int. Cl.^{6} B60P *7/135*

U.S. Cl. 410—66 **6 Claims**



1. A parking device for parking a wheeled handtruck on the floor of a transport vehicle so as to prevent accidental movement of the handtruck on the floor during movement of the transport vehicle, said parking device comprising a frame unit having a bottom support surface for resting on said floor, two frame parts including an elongated, first frame part, having a top support surface and first and second sides, a beveled surface formed on said first side and extending to said top support surface for facilitating movement of a handtruck onto the parking device; and a second frame part joined to the first frame part at said second side and enclosing a cavity for receiving at least one wheel of a handtruck, whereby said top support surface is supporting the remaining main-wheel part of a handtruck, said first frame part further having two ends extending outwardly of the joinder of the second frame part to the first frame part.

5,839,864

LOCKING SYSTEM FOR CONTAINER-CARRYING TRAILER

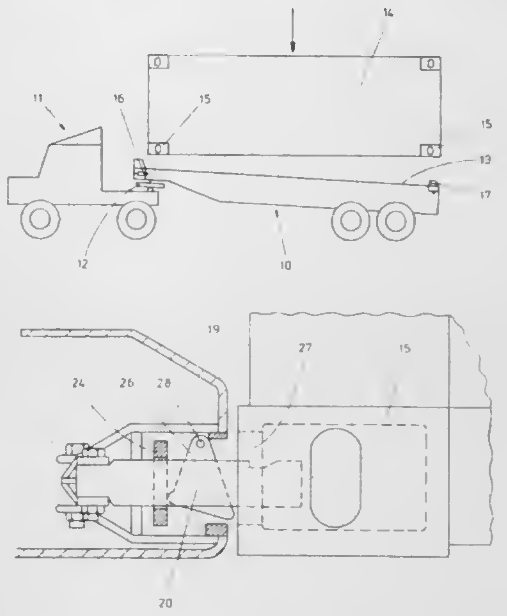
Stephen Kenneth Reynard, 17 Uanum Avenue, Sowerby, Thirsk, Y07 1RU, England

Filed Mar. 13, 1997, Ser. No. 815,930

Claims priority, application United Kingdom, Mar. 15, 1996, 9605532

Int. Cl.^{6} B60P *7/08*

U.S. Cl. 410—69 **7 Claims**



1. A locking device for locking a container to a trailer comprising:

a housing;

a bolt mounted in the housing for linear movement between an extended locking position and a withdrawn unlocking position;

an actuator coupled with the bolt and operable in order to move the bolt from the locking position to the unlocking position when it is required to unload the container from the trailer;

a latch mounted in the housing and being movable between first and second positions, the latch in the first position being arranged for engagement with the bolt so as to retain the bolt in the unlocking position, the latch in the second position being arranged such that the bolt is free to move relative to the latch between the locking and unlocking positions;

means for biasing the bolt towards the locking position;

a cam arrangement mounted on the housing and moveable between an actuatable position in which the cam projects from the housing so as to be in the path of loading movement of the container, and an at least partly withdrawn position relative to the housing and to which the cam is moveable when engaged during the loading movement of the container;

the cam arrangement and the latch being configured whereby a) on movement of the cam from the actuatable position to the at least partly withdrawn position by the loading movement of a container the latch moves to the second position allowing the bolt to move under its biasing to the locking position, b) on subsequent movement of the bolt to its unlocking position while the container is maintained on the trailer, the latch moves to its first position maintaining the bolt in the unlocking position, and c) an unloading the container from the trailer the cam arrangement is biased into the actuatable position by the latch.

5,839,865

DEVICE FOR THE NONSKID TRANSPORT OF OBJECTS ON LOADING SURFACES OF MOTOR VEHICLES

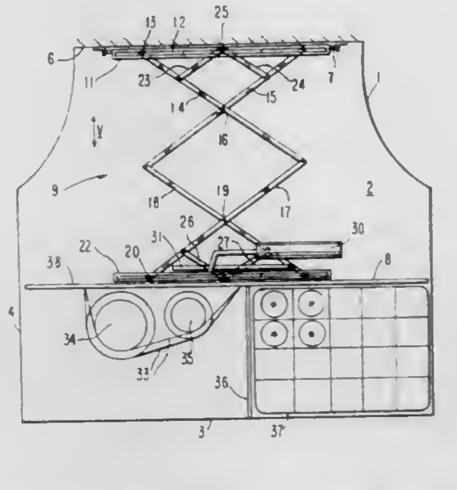
Ernst Schmidt, Adolf-Lins-Strasse 1, 34628, Willingshausen, Germany

Filed Apr. 15, 1996, Ser. No. 631,989

Claims priority, application Germany, Apr. 13, 1995, 295 06 079 U; Apr. 25, 1995, 295 06 922 U

Int. Cl.^{6} B60P *7/14*

U.S. Cl. 410—127 **9 Claims**



1. A device for fastening on a motor vehicle with a loading surface (**2**) and a boundary wall (**6**) for the nonskid transport of objects (**32. 37**), comprising a mounting element (**7**) to be fastened on the boundary wall (**6**); a holding element (**8**); a scissor-type mechanism (**9**) connecting the holding element (**8**) with the mounting element (**7**), said scissor-type mechanism (**9**) including a first pair of crossing levers (**14. 15**) hingedly connected with each other at a first common central hinge point (**16**) and a second pair of crossing levers (**17. 18**) hingedly connected with each other at a second common central point (**19**), each of said levers (**14. 15. 17. 18**) having a first and a second end, wherein the first ends of the levers (**14. 15**) of said first pair are hinged to said mounting element (**7**), wherein the first ends of the levers (**17. 18**) of said second pair are hinged to said holding element (**8**), wherein the second ends of the levers (**14. 15**) of said first pair are hinged to the second ends of respective ones of the levers (**17. 18**) of said second pair, and wherein the arrangement is such that said scissor-type mechanism (**9**) allows movement of the holding element (**8**) along a path back and forth with respect to the mounting element (**7**); and fixing means associated with said scissor-type mechanism (**9**) for fixing the holding element (**8**) in any desired position along said path of said back and forth movement.

5,839,866

MECHANICAL OVERLOAD PROTECTION DEVICE

Terje Moen, Sandnes, Norway; Erik Peter V. Eriksen, The Woodlands, Tex., and Tarald Gudmestad, Naerbo, Norway, assignors to Weatherford/Lamb, Inc., Houston, Tex.

PCT No. PCT/NO95/00174, § 371 Date May 27, 1997, § 102(e) Date May 27, 1997, PCT Pub. No. WO96/11344, PCT Pub. Date Apr. 18, 1996

PCT Filed Sep. 29, 1995, Ser. No. 809,829

Claims priority, application Norway, Oct. 5, 1994, 943718

Int. Cl.^{6} F16B *31/00;* **F16D** *9/00;* **F16L** *35/00*

U.S. Cl. 411—5 **6 Claims**

1. An overload protection device which comprises a body, a thread spiral which extends along said body and is connected thereto, said thread spiral having two opposed spaced-apart side faces including a first side face and a second side face, and means

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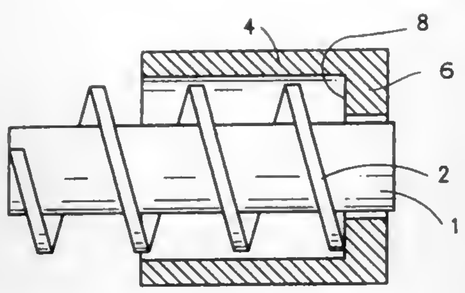


to facilitate progressive shearing of said thread spiral from said body when said thread spiral is subjected to a shearing force exceeding a predetermined value.

5,839,867

WALL SUPPORT AT A MOUNTING FRAME

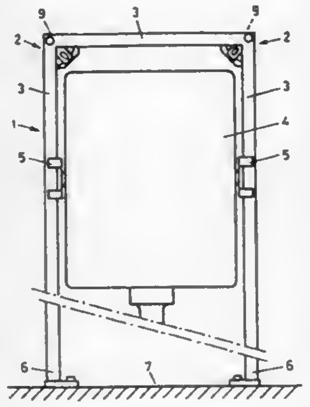
Peter Schmucki, Eschenbach; Silvio Marti, Rapperswil, and Alfred Mahler, Jona, all of Switzerland, assignors to Geberit Technik AG, Jona, Switzerland

Filed Jan. 27, 1997, Ser. No. 791,476

Claims priority, application Switzerland, Jan. 25, 1996, 194/96

Int. Cl.^{6} F01B *9/12*

U.S. Cl. 411—337 **12 Claims**



1. A wall support for sanitary devices, the support comprising:
a mounting frame formed of a hollow member, said member defining an opening;
a connecting piece positioned on said mounting frame and secured to said opening of said member, said connecting piece being formed as a threaded bolt and including a free end extending from said mounting frame;
an insertion piece positioned in said mounting frame and adjacent said opening of said member, said insertion piece connecting said connecting piece to said opening of said member, said connecting piece and said insertion piece form a construction unit which is pre-mountable with said mounting frame; and
a wall fastening means for fixation to a building wall and connectable to said free end of said connecting piece, said wall fastening means includes a wall angle-iron and a covering angle-iron, said covering angle-iron is axially fixed and rotatably connected to said wall angle-iron.

5,839,868

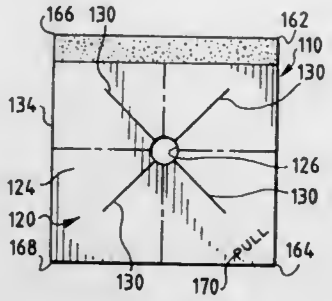
TEARABLE RETAINER

Harvey V. Kloian, 3521 W. Elmwood Ave, Wilmette, Ill. 60191

Filed Jul. 15, 1997, Ser. No. 893,025

Int. Cl.^{6} F16B *21/18;43/00*

U.S. Cl. 411—533 **19 Claims**



1. A tearable retainer for temporarily retaining and positioning a washer along the length of a threaded element, said retainer comprising:
a generally planar member formed from a manually tearable material, said member defining a generally centralized circular opening whose periphery is defined within the periphery of said member, said member including a plurality of equal length slits cut into said member, and wherein said member further defines a plurality of arcuately formed segments defined between adjacent slits at the periphery of said opening for slidably engaging an exterior surface of said threaded element beneath said washer thereby retaining said washer along the length of said threaded element, and
wherein at least one major surface of said member includes adhesive for releasably holding a stack of members in an overlying relationship relative to each other prior to use, said adhesive permitting removal of one of said members from the stack.

5,839,869

SEAMING APPARATUS

Peter Leslie Moran, Fairford; Robin Fergusson; David Livingstone, both of Royston; Paul Simms, Silsen, and Nicholas Charles Martinek, Huddersfield, all of United Kingdom, assignors to CarnaudMetalbox plc, United Kingdom

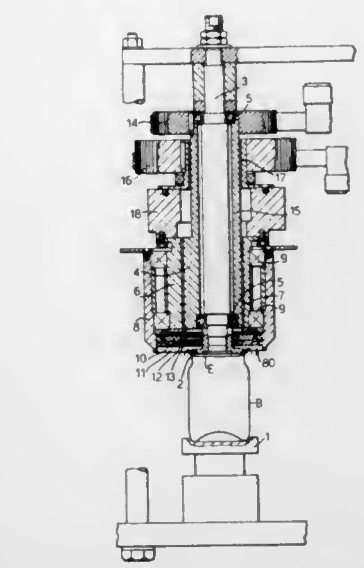
Filed Nov. 2, 1995, Ser. No. 552,360

Claims priority, application United Kingdom, Nov. 3, 1994, 9422228

Int. Cl.^{6} B21D *51/32*

U.S. Cl. 413—31 **17 Claims**

1. Apparatus for seaming a container end to an open end of a container body in at least first and second seaming operations comprising:
means for supporting a container body:
a seaming chuck for supporting a container end in place on the container body;
means for progressively folding peripheral portions of the container body and the container end together to form a seam; said means for progressively folding being an annular seaming tool having at least first and second axially spaced annular seaming profiles on an inner surface of said annular seaming tool which surrounds the container end, drive means for providing relative rolling movement between the annular seaming tool and the container end to progressively form a seam, the drive means drives the annular seaming tool to gyrate around the container end, and means for causing relative axial movement between the container end and the annular seaming tool from a first relative axial position in which the first annular seaming profile can contact the container end to perform the first seaming operation to at least a second relative axial position in which the second annular seaming profile can contact the container end to perform the second seaming operation.



5,839,870

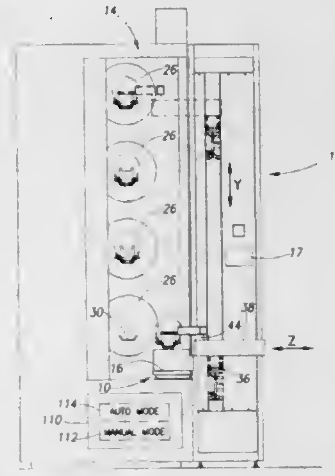
TRANSFER SYSTEM FOR USE WITH A HORIZONTAL FURNACE

George E. Niemirowski, South Lane; Adam F. Niemirowski, Grapevine; John M. Harrell, Waxahachie, and P. V. Patel, South Lake, all of Tex., assignors to Novus Corporation, Carrollton, Tex.

Filed Mar. 13, 1996, Ser. No. 614,868

Int. Cl.^{6} F27D *3/06*

U.S. Cl. 414—150 **17 Claims**



1. An apparatus for transferring containers to multiple furnaces that substantially reduces a risk of cross-contamination between furnaces, comprising:
means for holding a container, said means for holding having a plurality of distinct positions for holding the container, each of the distinct positions associated with one of the multiple furnaces, wherein the means for holding comprises:
a base; and
a spindle rotatable mounted to the base such that rotation of the spindle in 1/n increments presents n separate distinct positions for holding a container;
means for actuating the means for holding between the plurality of n separate distinct positions;
means for monitoring the means for holding to determine a presently active distinct position and for generating a signal indicating the active distinct position; and
a controller for activating the means for actuating to move to the n distinct position associated with a furnace in response to a request for an operation involving the furnace and the signal indicating the active distinct position.

5,839,871

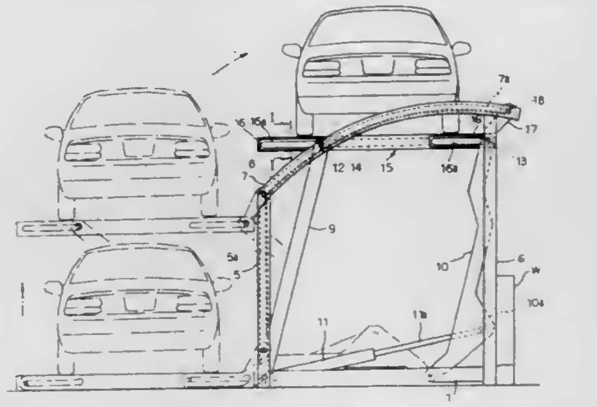
DOUBLE-PALLET PARKING GARAGE

Moon Hak Namgung, 409-25, Shipjung 2 dong, Bupyung-ku, Incheon, Rep. of Korea, 403-132

Filed May 14, 1997, Ser. No. 856,094

Int. Cl.^{6} E04H *6/06*

U.S. Cl. 414—228 **5 Claims**



1. A double-pallet parking apparatus for automobiles in a parking garage, comprising:
a pair of base frames having opposed ends and oriented generally horizontal to a ground surface of the parking garage, said base frames being spaced apart and substantially parallel to one another;
a ground pallet horizontally slidable on said base frames;
a first actuating cylinder for moving said ground pallet between an entrance position and a lower parking position;
a pair of generally parallel guide columns fixedly positioned proximate to the first ends of said base frames;
a pair of generally parallel support columns fixedly positioned proximate to the second ends of said base frames;
a first pair of turning links having lower ends pivotally mounted to the first ends of said base frames;
a second pair of turning links having lower ends pivotally mounted to the second ends of said base frames;
a liftable platform positioned on upper ends of said turning links; and
a second actuating cylinder for operating said second pair of turning links;
wherein a turning motion of said turning links moves said liftable pallet between the entrance position and the upper parking position; and
wherein the liftable pallet are moveable in a generally arcuate path between said guide columns and said support columns and is moveable in a generally vertical path along said guide columns thereby significantly reducing the operating area of the parking apparatus.

5,839,872

APPARATUS FOR TRANSFERRING CARGOES

Yukihiro Goto, and Yoshihiko Yamada, both of Inuyama, Japan, assignors to Daifuku Co., Ltd., Japan

Filed Oct. 7, 1994, Ser. No. 320,440

Claims priority, application Japan, Oct. 7, 1993, 5-251894; Oct. 7, 1993, 5-251895; Oct. 8, 1993, 5-252642

Int. Cl.^{6} B65G *1/00*

U.S. Cl. 414—280 **16 Claims**

1. A cargo transfer apparatus, comprising

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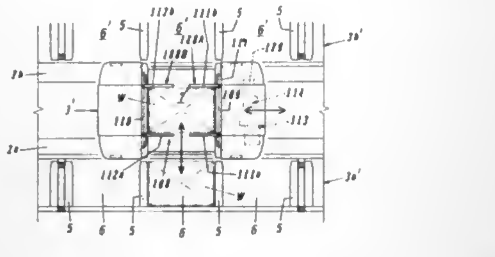
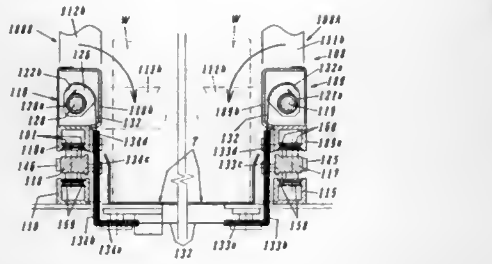




(i) a cargo platform for supporting cargo having respective front and rear faces, the cargo being transferred from said platform and thereto along a horizontal transfer path between the platform and a shelf, the transfer path defining a transferring direction of the cargo and having a left and a right side, and said platform having a front end and a rear end,

(ii) a traverser having a forward and rearward end, the traverser being disposed along at least one said side of the transfer path and having a retracted position along said cargo platform and being extendable from its retracted position to and into the shelf,

(iii) a first drive for reciprocating said traverser along the transfer path,

(iv) a pair of transfer arms for pushing one of two opposing front and rear faces of the cargo relative to said transferring direction, toward and away from said cargo platform, each transfer arm being attached respectively to the forward and rearward ends of said traverser, said arms being spaced from each other by a distance greater than the length between the two opposing front and rear faces of the cargo relative to said transferring direction, each of said transfer arms having a free end, an upright resting position, and a lowered active position where the free end projects over the transfer path, and

(v) a second drive for moving said transfer arms between their resting positions and their active positions.

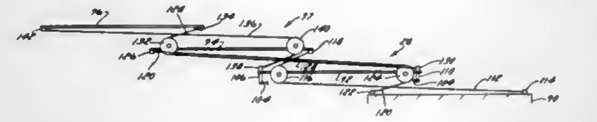
5,839,873
STORAGE AND RETRIEVAL MACHINE WITH PRE-TENSIONED SHUTTLE GUIDES

Kurt M. Lloyd, Pewaukee, Wis., and Lamar A. Jones, Sandy, Utah, assignors to HK Systems, Inc., New Berlin, Wis.

Filed Mar. 28, 1996, Ser. No. 623,407

Int. Cl.^{6} B65G *1/00*

U.S. Cl. 414—280 **14 Claims**



9. A shuttle assembly for a storage and retrieval machine, said shuttle assembly comprising:

(1) first and second vertically-spaced plates;

(2) a rail which is attached to said first plate and which is located between said first and second plates;

(3) a main support bar which is attached to said second plate and which extends substantially in parallel with said rail; and

(4) a shuttle guide roller assembly including

 (A) a guide roller which is supported on said main support bar so as to be rotatable about a vertical axis, so as to engage said rail, and so as to be capable of limited transverse movement with respect to said main support bar, and

 (B) a spring which resiliently biases said guide roller towards said rail.

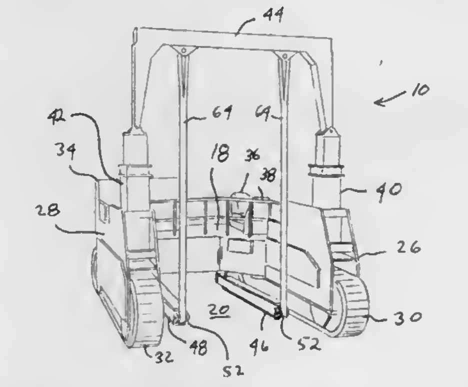
5,839,874
CASK TRANSPORTER WITH BOTTOM LIFT CAPABILITY

Roger L. Johnston, Muskeqo, Wis., assignor to J & R Engineering Co., Mukwonago, Wis.

Continuation-in-part of Ser. No. 250,378, May 27, 1994. This application May 7, 1996, Ser. No. 646,035

Int. Cl.^{6} B60P *3/00*

U.S. Cl. 414—459 **19 Claims**



1. A transporter for transporting a ventilated storage cask of the type having a pair of substantially parallel air channels, comprising:

a pair of substantially parallel, substantially horizontal beams receivable in the air channels of the ventilated storage cask, each of the beams having first and second ends;

a first lift mechanism coupled to the first ends of the beams for raising and lowering the first ends of the beams;

a second lift mechanism coupled to the first lift mechanism and operable to lift and lower in the same direction, at substantially the same time and at substantially the same rate as the first lift mechanism; and

a selectively engageable coupling for coupling the second ends of the beams with the second lift mechanism after the second ends of the beams have been inserted through the air channels of the cask so that the first and second lift mechanisms can simultaneously lift the beams in a substantially horizontal orientation and thereby lift the cask for transport.

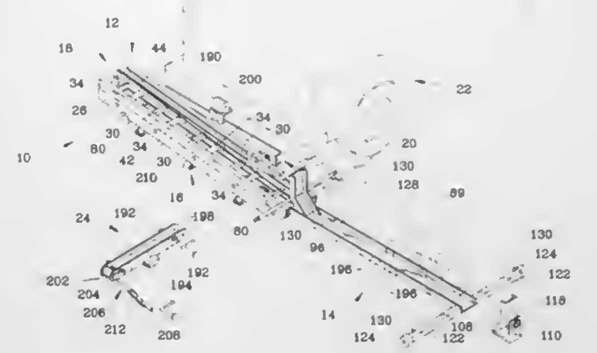
5,839,875
VEHICLE TRANSPORTING DEVICE

Bob C. Miller, and Jeffrey B. Miller, both of 8601 SE. Bristol Way, Jupiter, Fla. 33458

Continuation-in-part of Ser. No. 884,311, Jun. 27, 1997. This application Sep. 3, 1997, Ser. No. 922,801

Int. Cl.^{6} B60P *9/00*

U.S. Cl. 414—462 **15 Claims**



1. A carrier for transporting a motorcycle within a flatbed of a pickup truck, said carrier comprising:

a mounting assembly for removably securing the carrier to the flatbed;

a conveyor assembly secured to said mounting assembly, said conveyor assembly including a friction reducing support surface, a rigid support beam connected to a first side beam and a second side beam, a plurality of rotatable shafts extending between said first and second side beams, and directing means for guiding a docking unit along said rotatable shafts;

said docking unit for wheeled support of said motorcycle, said docking unit having a wheel support surface defined by a width, a length, and two opposing sidewalls, said wheel support surface operatively associated with said friction reducing support surface of said conveyor assembly;

pivoting means for rotating said conveyor assembly with respect to said mounting assembly;

control means for moving said docking unit along a longitudinal length of said conveyor assembly; and

a locking means for securing said conveyor assembly with respect to said mounting assembly;

whereby said conveyor assembly is pivoted allowing said docking unit to be placed on the ground, allowing for the positioning of a motorcycle thereon, wherein said conveyor assembly provides for retraction of said docking unit for placing said motorcycle into a raised position permitting lockable securement for use during transporting.

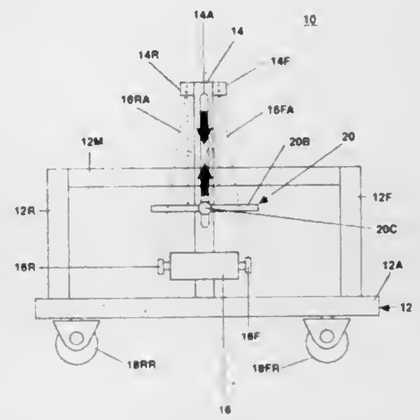
5,839,876
LIFT AND ROTATE DOLLY

Cornelius McCarthy, and Charles Bacella, both of 3223 Whitney Ave., Brooklyn, N.Y. 11229

Filed Aug. 26, 1996, Ser. No. 702,907

Int. Cl.^{6} B66F *9/06*

U.S. Cl. 414—590 **11 Claims**



1. A lift and rotate dolly (**10**) comprising:

A) a frame (**12**) which comprises a frame bed (**12A**) having a right-rear castor wheel (**18RR**), left-rear castor wheel (**18LR**), right-front castor wheel (**18RF**), and left-front castor wheel (**18LF**) mounted thereon, the frame (**12**) further comprises a frame front stanchion (**12F**) securely fastened at a bottom distal end to a front end of the frame bed (**12A**), the frame (**12**) further comprises a frame rear stanchion (**12R**) securely fastened at a bottom distal end to a rear end of the frame bed (**12A**), the frame (**12**) further comprises a frame middle connector (**12M**) securely fastened at a front distal end to a top distal end of the frame front stanchion (**12F**) and securely fastened at a rear distal end to a top distal end of the frame rear stanchion (**12R**), the frame bed (**12A**) is in the range from three to five feet in length;

B) a mast (**14**) securely mounted at a bottom distal end to the frame bed (**12A**), the mast (**14**) is vertically aligned and the frame bed (**12A**) is horizontally aligned forming a perpendicular angle therebetween, the mast (**14**) further comprises a mast slot (**14A**) positioned on a front side therein, the mast (**14**) comprises a mast front pulley (**14F**) rotatably mounted at a top front distal end of the mast (**14**) and a mast rear pulley (**14R**) rotatably mounted at a top rear distal end of the mast (**14**), the mast (**14**) has a height in the range from six to nine feet, the frame middle connector (**12M**) is securely fastened at a middle to the mast (**14**);

C) a lift (**20**) slidably mounted on the mast (**14**), the lift (**20**) comprises a lift pin (**20**) securely fastened at a front end to a lift plate (**20B**), the lift pin (**20**) is pivotally fastened at a rear end to a lift mast sleeve (**20C**) which is slidable mounted within the mast (**14**), the lift pin (**20**) is positioned through the mast slot (**14A**) and is slidable therein;

D) a winch (**16**) securely mounted on a rear side of the mast (**14**), the winch (**16**) comprises a winch rear pulley (**16R**) having a winch rear pulley cable (**16RA**) securely attached at a rear distal end thereon and movably positioned on the mast rear pulley (**14R**), the winch rear pulley cable (**16RA**) is securely attached at a front distal end to a rear side of the lift plate (**20B**), the winch (**16**) further comprises a winch front pulley (**16F**) having a winch front pulley cable (**16FA**) securely attached at a rear distal end thereon and movably positioned on the mast front pulley (**14F**), the winch front pulley cable (**16FA**) is securely attached at a front distal end to a front side of the lift plate (**20B**).

5,839,877
SUCTION HOLDING ASSEMBLY FOR LEAD FRAMES

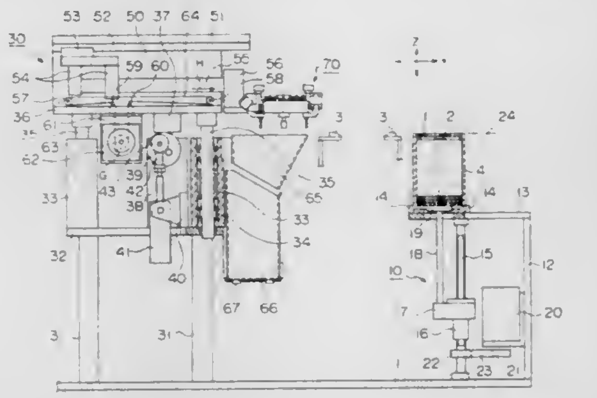
Eiji Kikuchi, Musashi Murayama; Kouhei Suzuki, Tachikawa, and Hideki Okajima, Mitaka, all of Japan, assignors to Kabushiki Kaisha Shinkawa, Tokyo, Japan

Filed Jul. 10, 1996, Ser. No. 677,511

Claims priority, application Japan, Jul. 13, 1995, 7-199311

Int. Cl.^{6} B65G *59/04*

U.S. Cl. 414—797 **6 Claims**



1. A suction holding assembly for lead frames which holds lead frames accommodated in a lead frame magazine by suction and places said lead frames on guide rails and said lead frames have a length and a width and edge portions, comprising a suction holder, a plurality of lead frame suction nozzles disposed in at least two parallel rows on said suction holder, and means for moving said suction holder in a vertical direction and in a horizontal Y direction which is perpendicular to an X direction that is a conveying direction of said guide rails so that said edge portions of each lead frame with respect to a direction of one of said length and width of said lead frame are held by suction.

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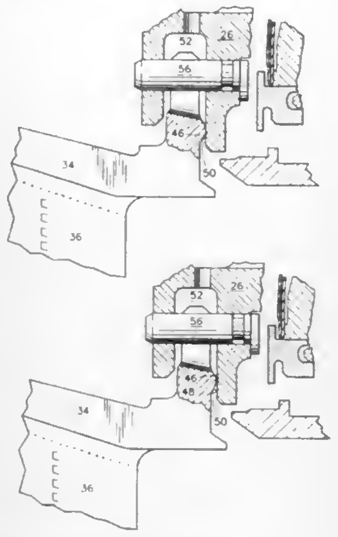
5,839,878
GAS TURBINE STATOR VANE

Mark Stefan Maier, Palm City, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sep. 30, 1996, Ser. No. 724,532

Int. Cl.^{6} F01D *1/02*

U.S. Cl. 415—209.2 **6 Claims**



1. A stator vane segment, comprising:
a first platform;
a second platform;
an airfoil, extending between said first and second platforms;
a first sealing flange, extending out from and stationary with said first platform, said first sealing flange having an aft facing first arcuate seal surface;
wherein said vane segment may pivot about said first arcuate seal surface to accommodate movement of said stator vane segment.

4. A stator vane assembly, comprising:
a plurality of stator vane segments, each segment comprising,
  a first platform;
  a second platform;
  an airfoil, extending between said first and second platforms;
  a first sealing flange, extending out from and stationary with said first platform,
having an aft facing first arcuate seal surface;
a first support ring, having a first slot;
a second support ring, having a second slot;
wherein said first sealing flange is received in said first slot, and said first sealing flange may pivot within said first slot about said first arcuate seal surface.

5,839,879
CENTRIFUGAL BLOWER

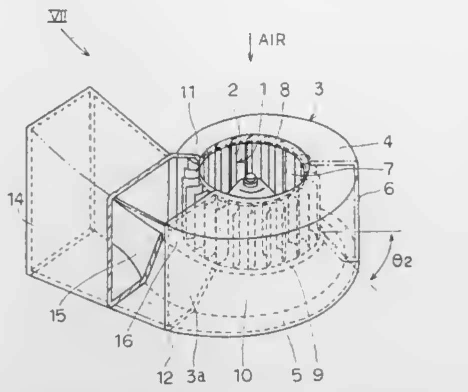
Teruhiko Kameoka, Okazaki; Koji Ito, Nagoya, and Kouji Matsunaga, Kariya, all of Japan, assignors to Denso Corporation, Kariya, Japan

Filed Nov. 27, 1996, Ser. No. 757,189

Claims priority, application Japan, Dec. 5, 1996, 7-316916

Int. Cl.^{6} F04D *29/44*

U.S. Cl. 415—206 **4 Claims**



1. A centrifugal blower comprising:
a motor;
a centrifugal fan driven by the motor for drawing air into its rotational axial direction and blowing air out to its radial direction; and
a scroll casing for holding the centrifugal fan therein and defining an air passage around the centrifugal fan, the scroll casing having a scroll shape with a scroll starting position at a most upstream portion of the air passage and a scroll ending position at a downstream portion thereof from which the air passage further stretches in its tangential direction, the scroll casing including an air outlet disposed at the most downstream portion of the air passage, a lower scroll casing portion disposed at a motor side of the scroll casing, an upper scroll casing portion disposed at a side of the scroll casing opposite the motor and having an air inlet, and a side scroll casing portion connecting the upper and the lower scroll casing portions; wherein
the lower scroll casing portion includes a partially circular ring-shaped face disposed to face the centrifugal fan at the motor side, a sloped face connected to the ring-shaped face and sloped outwardly in the radial direction, and a base face connecting the sloped face and the side scroll casing, said ring-shaped face extending tangentially from the scroll ending position longitudinally to the air outlet;
a cross sectional area of the air passage becomes larger from the scroll starting position to the air outlet;
the sloped face warps from the scroll ending position to the air outlet to form a curve surface so that an angle defined by the intersection of the sloped face and the ring-shaped face gradually increases from less than 90° at the scroll ending position to approximately 90° at a point between the scroll ending position and the air outlet; and
a curved line defined by the connection between the base face and the sloped face includes a first portion angled radially inward from the scroll ending position and a second portion blending generally tangentially to the sloped face, said first portion and said second portion defining an inflection point at their intersection.

5,839,880
BEARING UNIT, DRAINAGE PUMP AND HYDRAULIC TURBINE EACH INCORPORATING THE BEARING UNIT, AND METHOD OF MANUFACTURING THE BEARING UNIT

Ryoji Okada, Ibaraki-ken; Kooji Aizawa, Hitachi; Masayuki Yamada; Kenji Otani, both of Tsuchiura; Kunio Takada, Ibaraki-ken; Mitsuaki Haneda, Ibaraki-ken, and Toshihiro Yamada, Ibaraki-ken, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 197,312, Feb. 16, 1994, Pat. No. 5,458,460, which is a division of Ser. No. 34,379, Mar. 18, 1993, Pat. No. 5,346,316. This application Jul. 18, 1995, Ser. No. 503,627

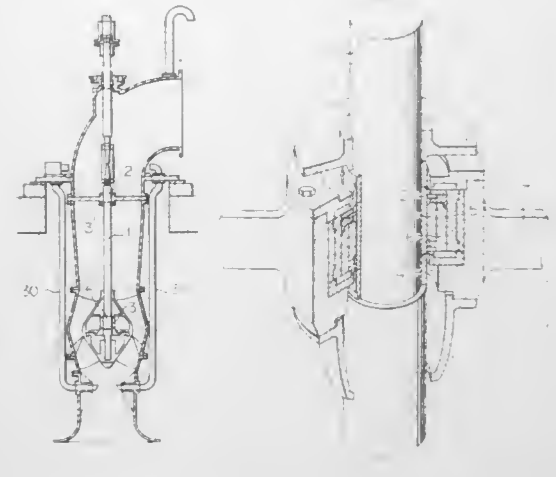
Claims priority, application Japan, Mar. 18, 1992, 4-091571

The portion of the term of this patent subsequent to Oct. 17, 2012, has been disclaimed.

Int. Cl.^{6} F04D *29/04*

U.S. Cl. 415—229 **2 Claims**

1. A method of manufacturing a coated member with a coating formed by any one of the high speed flame spraying method, the explosive spraying method, the plasma spraying method and the laser spraying method, the method comprising the following steps of:
heat treating an object member to be coated, thereafter applying the coating to said object member by one of the above spraying method, the coating comprising a main component of WC and a binder material consisting of at least one of Ni. Cr and Co; and
heating the coated member at a temperature of from 300° C. to 550° C. for not less than one and a half hours.



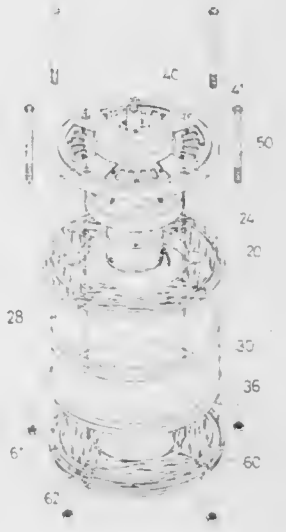
5,839,881
CEILING FAN HAVING A SHOCK ABSORBING MEMBER

Jack Yu, No. 109-1, Avenue 6, Lane 164, Tzong Sa Road, Da Du Hsiang, Taichung Hsien, Taiwan

Filed Apr. 10, 1997, Ser. No. 843,681

Int. Cl.^{6} F04D *29/52;29/64*

U.S. Cl. 416—5 **2 Claims**



1. A ceiling fan housing comprising:
a body including an upper and outer peripheral flange, said body including a bottom and outer peripheral flange and including a bottom plate having an annular groove for engaging with said bottom and outer peripheral flange of said body and for allowing said bottom plate to be secured to said body,
a disc including a bore and including a lower surface having a first peripheral groove for engaging with said upper and outer peripheral flange of said body, said disc including an upper surface having a second peripheral groove,
a cover including a lower and outer peripheral flange for engaging with said second peripheral groove of said disc, and
means for securing said body to said cover and for allowing said disc to form a shock absorbing member.

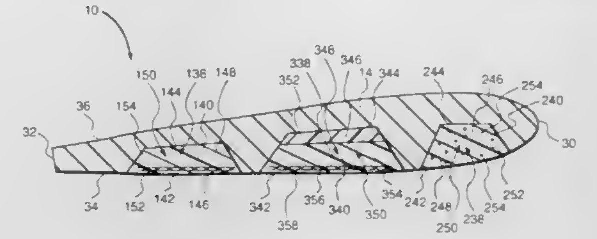
5,839,882
GAS TURBINE BLADE HAVING AREAS OF DIFFERENT DENSITIES

Scott Roger Finn, Niskayuna; Ravindra Kumar Pandey; John James Fitzgerald, both of Clifton Park, and William Elliot Bachrach, Saratoga Springs, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 25, 1997, Ser. No. 837,880

Int. Cl.^{6} F01D *5/28*

U.S. Cl. 416—229 A **15 Claims**



1. A gas turbine blade comprising:
a) a shank portion;
b) a metallic airfoil portion attached to said shank portion and having a pressure side and a suction side, wherein at least one of said pressure and suction sides includes at least one surface recess, wherein said at-least-one surface recess has a void volume, an open top, and a closed bottom, and wherein said void volume has adjacent first and second regions; and
c) filler material disposed in and bonded to said at-least-one surface recess and generally completely filling said void volume, wherein said filler material as a whole has a lower average mass density than that of said metallic airfoil portion as a whole, wherein said filler material in said first region has a higher average modulus of elasticity than that of said filler material in said second region, and wherein said first and second regions together fill at least half of said void volume.

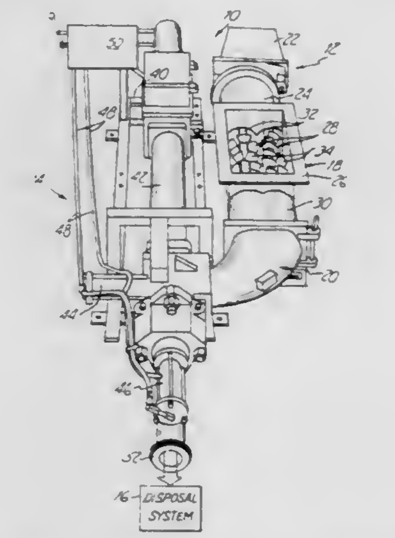
5,839,883
SYSTEM AND METHOD FOR CONTROLLING A MATERIALS HANDLING SYSTEM

Lawrence P. Schmidt, Lino Lakes, Minn., and Harry K. Crow, Ridgefield, Conn., assignors to Schwing America, Inc., White Bear Lake, Minn.

Filed May 22, 1996, Ser. No. 651,344

Int. Cl.^{6} F04B *49/00;15/02*

U.S. Cl. 417—63 **22 Claims**



1. A method for controlling operation of a materials handling system having a feed system which delivers material to a positive displacement pump, the positive displacement pump having an

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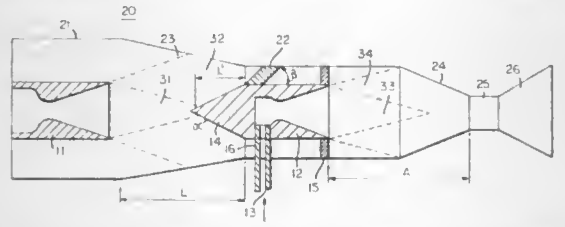
inlet for receiving material delivered by the feed system and an outlet through which material is pumped, the feed system including a feeder which forces material through a transition housing to the inlet of the positive displacement pump, the method including:
sensing pressure in the transition housing; and
providing a control signal to the feed system to control operation of the feed system as a function of the sensed pressure.

5,839,884
SUPERSONIC JET PUMP DEVICE WITH TWO DRIVE NOZZLES

Alfred E. Beylich, Aachen, Germany, assignor to Mannesmann AG, Düsseldorf, Germany
PCT No. PCT/DE95/01160, § 371 Date Mar. 18, 1997, § 102(e) Date Mar. 18, 1997, PCT Pub. No. WO96/06285, PCT Pub. Date Feb. 29, 1996
PCT Filed Aug. 18, 1995, Ser. No. 776,988
Claims priority, application Germany, Aug. 18, 1994, 44 30 574.5
Int. Cl.^{6} F04F *5/44*
U.S. Cl. 417—196 **14 Claims**

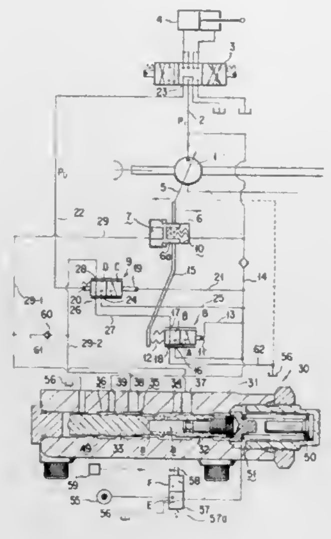


1. A supersonic device through which a fluid flows comprising:
an elongated tubular housing (**20**) including a plurality of cylindrical parts;
a first drive nozzle (**11**) having an exit opening through which a first propellant is directed and being disposed within a first one (**21**) of said plurality of cylindrical parts of said housing (**20**);
a second drive nozzle (**12**) having a leading end and an exit opening through which a second propellant is directed and being disposed within a second one (**22**) of said plurality of cylindrical parts of said housing (**20**) axially and in tandem with said first drive nozzle (**11**), said second drive nozzle (**12**) including a displacement body (**14**) positioned on the leading end of the second drive nozzle; and
a conical first mixer part (**23**) defining a first mixing zone (**32**) therein, said first mixer part (**23**) disposed adjacent said first one (**21**) of said plurality of cylindrical parts; and
wherein said displacement body (**14**) extends partially into said conical first mixer part (**23**) and shape of said displacement body reduces losses in compression pulses which occur in said conical first mixer part in response to the first propellant.

5,839,885
CAPACITY CONTROL APPARATUS FOR A VARIABLE CAPACITY HYDRAULIC PUMP

Yosuke Oda; Kenji Morino, and Naoki Ishizaki, all of Oyama, Japan, assignors to Komatsu Ltd., Tokyo, Japan
PCT No. PCT/JP95/01839, § 371 Date Feb. 27, 1997, § 102(e) Date Feb. 27, 1997, PCT Pub. No. WO96/08652, PCT Pub. Date Mar. 21, 1996
PCT Filed Sep. 14, 1995, Ser. No. 776,526
Claims priority, application Japan, Sep. 14, 1994, 6-219921
Int. Cl.^{6} F04B *49/00*
U.S. Cl. 417—213 **13 Claims**

1. A capacity control apparatus for a variable capacity hydraulic pump having a capacity control member driveable in a first direction for increasing capacity of said hydraulic pump and in a second direction for reducing capacity of said hydraulic pump, said apparatus comprising:

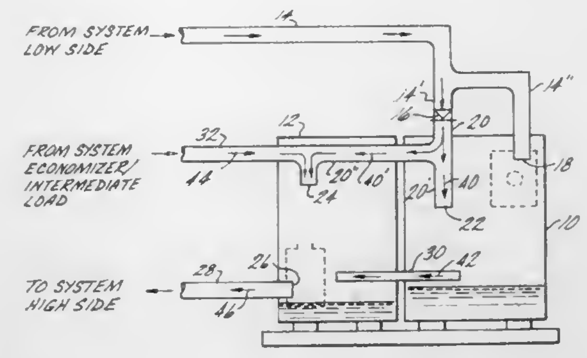


a capacity control cylinder having a capacity control piston connected for driving the capacity control member of the variable capacity hydraulic pump, and a large diameter chamber and a small diameter chamber which are disposed at both sides of said capacity control piston, respectively, said larger diameter chamber being connected such that when a pressure fluid is supplied into said large diameter chamber, said piston is driven in said second direction and said small diameter chamber being connected such that when a pressure fluid is supplied into said small diameter chamber, said piston is driven in said first direction;
a passage in which said small diameter chamber is allowed to communicate with a pump discharge path;
at least one control valve for selectively communicating said large diameter chamber with one of a pump pressure discharge path and a reservoir; and
a variable throttle valve provided in a passage in which said large diameter chamber is allowed to selectively communicate with one of said pump pressure discharge path and said reservoir.
said variable throttle valve being switched into a first state in which a throttled area of aperture that is in inverse proportion to a self discharge pressure of said pump discharge path is established and into a second state in which a predetermined throttled area of aperture that is independent of said self discharge pressure is established in response to an external signal.

5,839,886
SERIES CONNECTED PRIMARY AND BOOSTER COMPRESSORS

David N. Shaw, 200 D Brittany Farms Rd., New Bristain, Conn. 06053
Filed May 10, 1996, Ser. No. 644,744
Int. Cl.^{6} F04B *3/00*
U.S. Cl. 417—250 **29 Claims**

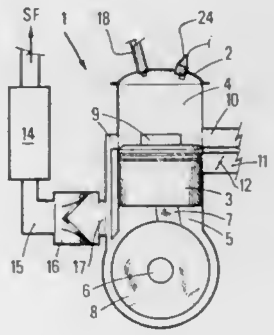
1. A compressor system comprising:
a first compressor having a high side sump, said first compressor having an inlet and an outlet; and



a second compressor having a low side sump, said second compressor having an inlet and an outlet, said first compressor being connected in series with said second compressor.

5,839,887
INTERNAL-COMBUSTION ENGINE HAVING A SPECIFIC-PURPOSE PRESSURE STORAGE TANK

Pierre Duret, Sartrouville, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France
Filed Jul. 7, 1995, Ser. No. 499,507
Claims priority, application France, Jul. 8, 1994, 94-08602
Int. Cl.^{6} F04B *17/05*
U.S. Cl. 417—364 **5 Claims**

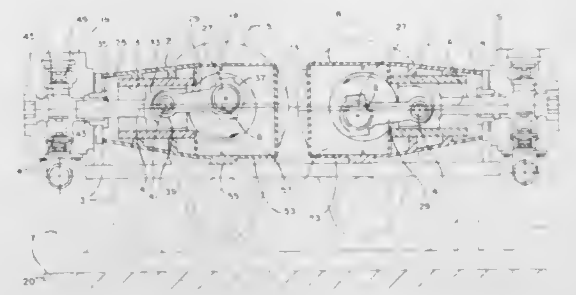


1. An internal-combustion engine having at least one piston sliding in a cylinder, at least one combustion chamber, an engine crankcase, a compressed air or gas storage tank connected to a volume in the engine crankcase compressed by the motion of said piston via a connection means provided with a nonreturn device allowing a gas at a pressure at most equal to that of the engine crankcase to be stored in said tank, a passage connecting said tank to a further device, said passage not being connected, downstream of said tank, to a combustion chamber, whereby the gas under pressure fulfills a purpose other then that related to the feeding of a combustion chamber, and a means for amplifying a force by using a differential pressure between an atmospheric pressure or underpressure and the pressure in said tank.

5,839,888
WELL SERVICE PUMP SYSTEMS HAVING OFFSET WRIST PINS

Curtis Harrison, Benbrook, Tex., assignor to Geological Equipment Corp., Fort Worth, Tex.
Filed Mar. 18, 1997, Ser. No. 819,918
Int. Cl.^{6} F04B *23/04*
U.S. Cl. 417—521 **3 Claims**

1. A system of pumps for use in servicing wells, comprising:
a) a first pump and a second pump;
b) each of the first and second pumps comprising:



i) a housing having a cylinder which has a cylinder axis, the housing having a first end and a second end;
ii) a plunger having a crosshead that is reciprocally carried in the cylinder for movement between a suction stroke and an exhaust stroke;
iii) a manifold mounted to the second end of the housing and being adjacent to the cylinder for supplying and delivering liquid acted on by the plunger;
iv) a crankshaft mounted rotatably in the housing and having a crankshaft axis that is perpendicular to the cylinder axis;
v) a connecting rod having a crankshaft end that is connected to the crankshaft and a crosshead end that is connected to the crosshead of the plunger by way of a wrist pin for reciprocating the plunger in response to the rotation of the crankshaft, the crankshaft end having a center line;
vi) the crankshaft axis being coplanar with the cylinder axis while the wrist pin of the connecting rod is offset from the cylinder axis;
c) the first and second pumps being arranged together so that the first end of the first pump housing is adjacent to the first end of the second pump housing;
d) the first pump has the first pump wrist pin located offset in a first direction from the first pump cylinder axis such that as the first pump plunger moves through its exhaust stroke the crankshaft end of the first pump connecting rod is located on the same side of the first pump cylinder axis as the first pump wrist pin; while the second pump has the second pump wrist pin located offset in a second direction from the second pump cylinder axis such that as the second pump plunger moves though its exhaust stroke the crankshaft end of the second pump connecting rod is located on the same side of the second pump cylinder axis as the second pump wrist pin.

5,839,889
INFINITELY VARIABLE VANE-TYPE HYDRAULIC MACHINE

Lawrence R. Folsom, and Clive Tucker, both of Pittsfield, Mass., assignors to Folsom Technologies, Inc., Pittsfield, Mass.
Continuation-in-part of Ser. No. 93,192, Jul. 13, 1993, Pat. No. 5,423,183, which is a continuation-in-part of Ser. No. 640,645, Jan. 14, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 478,947
Int. Cl.^{6} F03C *2/22*; F04C *2/344*
U.S. Cl. 418—31 **5 Claims**

1. A hydraulic machine having a continuously variable displacement, comprising:
a vane rotor having a plurality of radial vanes thereon and a connection for a torque transmitting shaft;
a cam ring supported in a position surrounding said vane rotor and having an interior surface facing said vane rotor, said interior surface and said vane rotor defining therebetween a working volume swept by said vanes;
said cam ring having flexible portions therearound capable of flexing radially when inwardly directed radial forces are exerted thereon to change the shape of said swept volume within said cam ring;
a control mechanism having an adjustable force generating device bearing against a force exerting member engaged with

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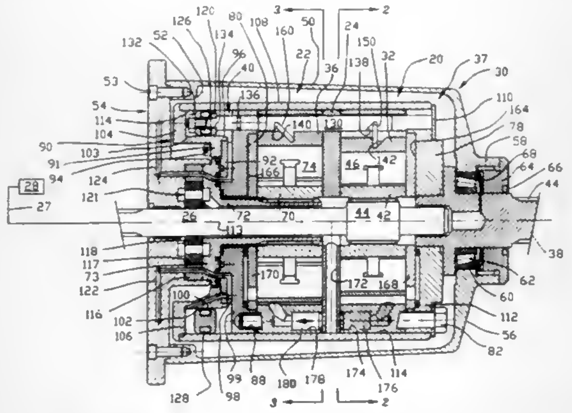
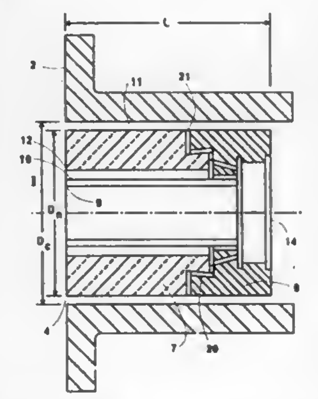


said cam ring for exerting a squeezing force on said ring to distort the cross-sectional shape of said cam ring and said swept volume within said cam ring;

said adjustable force generating device including a rod having a wedge-shaped notch therein, and said force exerting member including a toggle having one end fitted into said notch and an opposite end engaged in a wedge shaped notch in an abutment on said cam ring;

whereby said cross-sectional shape of said cam ring swept by said vanes may be continuously adjustable by said control mechanism thereby continuously adjusting the displacement of said vane rotor per revolution thereof.

5,839,890
CONDENSATION FREE NOZZLE
William Joseph Snyder, Ossining, N.Y., assignor to Praxair Technology, Inc., Danbury, Conn.
Filed Sep. 19, 1996, Ser. No. 715,721
Int. Cl.⁶ F23C *5/00*
U.S. Cl. 431—8 **8 Claims**



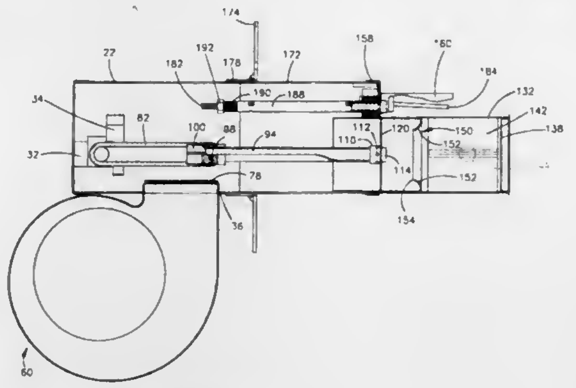
1. A nozzle for injecting gas into a combustion chamber, comprising:

an annular body having a central bore with an inlet end and an outlet end,

a ceramic tubular member positioned in the central bore for receiving a first gas stream at the inlet end and discharging the first gas stream at an outlet end, said tubular member having an outer surface defining an annular passage between the annular body and the tubular member, said annular passage having a radial width extending between the inlet end and outlet end for passing a second gas stream received at the inlet end, wherein said tubular member has a wall thickness less than or equal to the radial width of the annular passage;

means connecting said central bore and said annular passage to a common source of gas, means for discharging a flow of gas from said annular passage at a velocity substantially less than that discharged from said central core for reducing the transfer of heat between the annular body and the gas contained in the tubular member.

5,839,891
POWER GAS BURNER
Richard D. Cook, Avon, Ohio, assignor to Beckett Gas, Inc., North Ridgeville, Ohio
Filed Jan. 13, 1997, Ser. No. 782,778
Int. Cl.⁶ F23D *3/40*
U.S. Cl. 431—7 **27 Claims**



1. A gas burner comprising:

a burner housing having an interior;

an air blower having an outlet communicating with the interior of the burner housing;

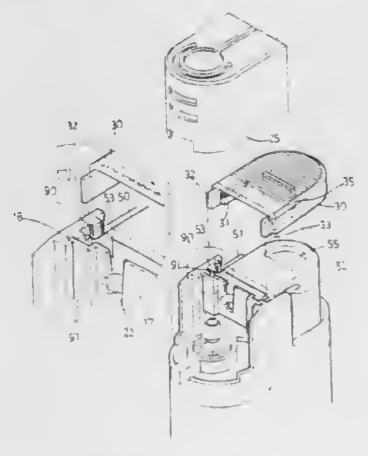
a gas distribution manifold having an inlet for receiving gas and an outlet for emitting gas in a generally radial direction;

a baffle disposed adjacent to the outlet of the manifold and extending in a generally radial direction with respect to a longitudinal axis of the manifold, the baffle including a plurality of openings disposed around the manifold outlet wherein air from the air blower mixes with gas emitted radially from the manifold outlet and passes through the openings in the baffle;

a diffuser disposed adjacent to the baffle for contacting the mixed gas and air passing through the baffle; and

a combustion head located adjacent to the burner housing in communication with the interior of the burner housing, the combustion head including perforations for emitting mixed gas and air.

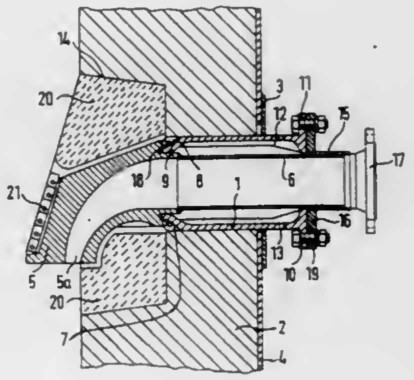
5,839,892
ELECTRONIC LIGHTER WITH A SAFETY DEVICE
Ing Feng Hwang, No. 2, Lane 22, Sec. 2, Rd., Shan-shi Taichung, Taiwan
Filed Mar. 26, 1996, Ser. No. 622,713
Int. Cl.⁶ F23D *11/36*
U.S. Cl. 431—153 **2 Claims**



1. An improved electronic lighter with a safety device of the type consisting of a liquid gas container and a seat provided on a top end of said gas container, said seat having a gas nozzle and a piezo-electric element disposed thereon, said improvement comprising:

a control press button means for controlling said piezo-electric element, said control press button means consisting of an upper cover and a press cylinder capable of slidable engagement, said press cylinder being a hollow structure having two hook-like ends which may be movably inserted into a pair of second guide slots located slightly to the back of a pair of first guide slots of an electrode plate of said piezo-electric element, said upper cover having two hook-like ends at a front end thereof for matching said hook-like ends of said press cylinder such that said hook-like ends of said upper cover are retained by a step portion near an upper end of each of said second guide slots when the lighter is not in use, a spring element being disposed between said upper cover and said press cylinder such that, after said upper cover is moved backwardly so that said hook-like ends thereof lap over said hook-like ends of said press cylinder in said second guide slots, said upper cover and said press cylinder may be pressed downwardly to press said spring element to achieve ignition.

5,839,893
HOT BURNING NOZZLE WITH A CHANGE PIPE
Udo Leibling, Bingen, Germany, assignor to Agrichema Materialflusstechnik GmbH, Germany
PCT No. PCT/EP96/04928, § 371 Date Jul. 17, 1997, § 102(e) Date Jul. 17, 1997, PCT Pub. No. WO97/19309, PCT Pub. Date May 29, 1997
PCT Filed Nov. 11, 1996, Ser. No. 860,708
Claims priority, application Germany, Nov. 17, 1995, 295 18 283.0
Int. Cl.⁶ F27D *23/00*
U.S. Cl. 432—75 **13 Claims**



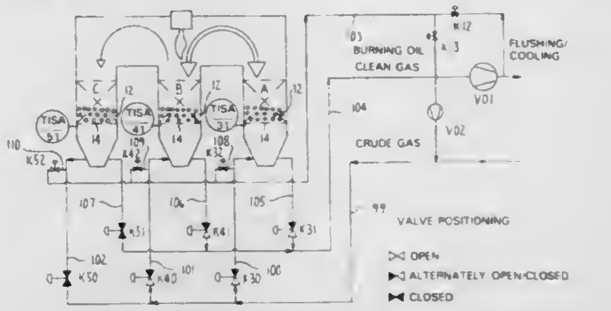
1. An apparatus for replaceably disposing a hot burning or expanding guide nozzle mounted in a wall of an industrial reaction chamber or a furnace, said furnace wall having a thickness, an inner side and an outer side, said nozzle removing cakings and bankings of material build-up on the inside wall of said furnace by the use of an air blast device, said apparatus comprising:

a change pipe disposed in said furnace wall, said change pipe having one end extending from said outer side of said furnace wall and an opposite end extending over part of said thickness of said furnace wall toward said inner side of said furnace wall;

a nozzle mouthpiece mounted in said wall and having one end attached to said opposite end of said change pipe, said nozzle mouthpiece further having a pass-through pipe extending from said one end of said nozzle mouthpiece through said change pipe and through and past said outer side of said furnace wall in a direction away from said inner side for connection with said air blast device, the end of said pass-through pipe extending beyond said change pipe and being provided with a threaded portion; and

a sleeve threadably connected to said threaded portion of said pass-through pipe for fixing said nozzle mouthpiece and pass-through pipe with respect to said change pipe.

5,839,894
METHOD FOR THE THERMAL DEDUSTING OF REGENERATIVE AFTERBURNING SYSTEMS WITHOUT THE RELEASE OF CONTAMINANTS AND WITHOUT INTERRUPTION OF THE MAIN EXHAUST GAS STREAM
Johannes Schedler, Mittergrabenweg 72, A-8010 Graz, and Heimo Thalhammer, Josef-Posch-Strasse 123, A-8052 Graz, both of Austria
Filed Aug. 16, 1996, Ser. No. 700,630
Claims priority, application Austria, Aug. 17, 1995, 1386/95
Int. Cl.⁶ F27D *17/00*
U.S. Cl. 432—181 **7 Claims**



1. A method for thermally dedusting components of a regenerative afterburning system without the release of contaminates, comprising the steps of:

providing an afterburning system with at least three regeneration towers that are connected to a common combustion chamber, wherein each said regeneration tower is filled with ceramic components;

employing at least two of said regeneration towers in a crude gas cleaning process by supplying a first one of said regeneration towers with crude gas to be cleaned, burning the crude gas in the combustion chamber to obtain clean gas and drawing the clean gas through a second one of said regeneration towers and cyclically alternating the process so that crude gas is supplied to the second said regeneration tower and the clean gas is drawn through the first said regeneration tower;

heating the at least one remaining regeneration tower so that contaminants on the ceramic components are burned off into an exhaust gas by forcing a stream of heated air from the combustion chamber into the at least one remaining regeneration tower;

drawing the exhaust gas from the at least one remaining regeneration tower and mixing the exhaust gas with the crude gas that is supplied to the at least two regeneration towers;

allowing the temperature of the at least one remaining regeneration tower to rise to between 400° and 600° C.; and

cooling the at least one remaining regeneration tower with the clean gas produced by the afterburning system.

5,839,895
APPARATUS AND METHODS FOR THE VIBRATIONAL TREATMENT OF ORAL TISSUE AND DENTAL MATERIALS
Cotesworth P. Fishburne, Jr., 1144 India Hook Rd. Suite F, Rock Hill, S.C. 29732
Continuation of Ser. No. 305,180, Sep. 13, 1994, Pat. No. 5,639,238. This application Jun. 16, 1997, Ser. No. 876,214
Int. Cl.⁶ A61C *1/07*
U.S. Cl. 433—118 **14 Claims**

1. An apparatus for use in the treatment of oral tissue, comprising:

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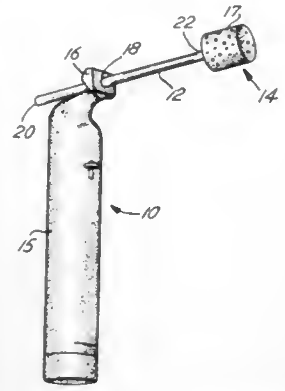


- a) a vibrator, said vibrator including a shaft mounting structure;
- b) a shaft, said shaft defining a first end and a second end wherein the first end is adapted to be mounted to said vibrator at the shaft mounting structure that vibrational motion is transferred to said shaft; and
- c) a soft absorbent pad mounted on said second end of said shaft, whereby when the pad is put on said oral tissue the pad massages the tissue as a result of the vibrating motion, said pad further including an anesthetic for application to oral tissue.

5,839,896

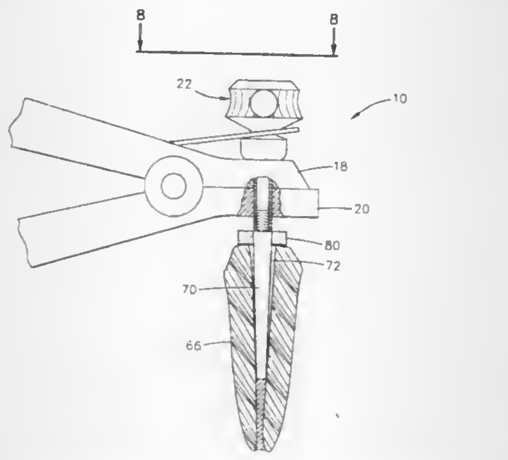
DENTAL POST EXTRACTOR APPARATUS

Teresa R. Hickok, Bonita, and Clifford J. Ruddle, Santa Barbara, both of Calif., assignors to San Diego Swiss Machining, Inc., Chula Vista, Calif.

Filed Mar. 19, 1998, Ser. No. 44,115

Int. Cl.^{6} A61C *3/14*

U.S. Cl. 433—159 20 Claims



1. A dental tool apparatus for use in the removal of a dental post, the apparatus comprising in combination:

- a pliers defined by a pair of pivotally connected levers having a first end for mounting a post connector and a second end having means for applying a force to said connector;
- a substantially elongate post connector defined by a shaft having a proximal end with attachment means at said proximal end for attachment to a lever device, and a distal end having an open bore having a stepped diameter and self taping threads in said bore at said end for engaging and threading onto a dental post.

5,839,897

DRILL FOR THE INSERTION OF A DENTAL IMPLANT

Sylvain Bordes, 109, cours de la République, Mestras F 33470, France

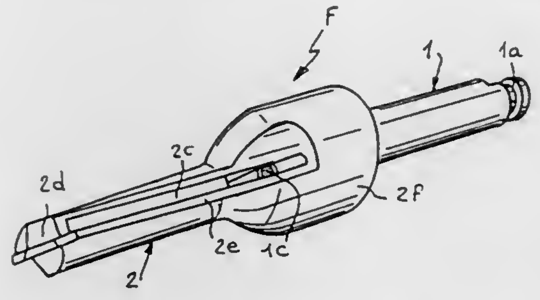
PCT No. PCT/FR94/00224, § 371 Date Aug. 31, 1995, § 102(e) Date Aug. 31, 1995, PCT Pub. No. WO94/20247, PCT Pub. Date Sep. 15, 1994

PCT Filed Feb. 28, 1994, Ser. No. 513,932

Claims priority, application France, Mar. 1, 1993, 93/02620

Int. Cl.^{6} A61C *3/02*

U.S. Cl. 433—165 6 Claims



1. A drill for the insertion of a dental implant comprising:

- a rotational drive portion in the form of a metal rod with a first end and a second end, wherein said first end has a shape for coupling to a drilling apparatus,
- an active cutting portion made of plastic overmolded on said second end of the rotational drive portion, and
- a metal insert portion coupled to said active cutting portion to serve as a sharp edge for the active cutting portion.

5,839,898

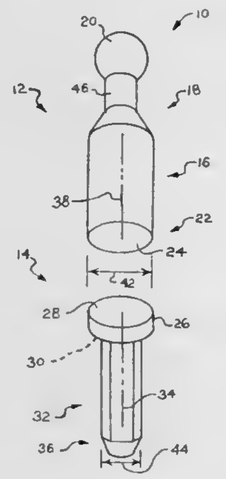
BALL RETAINER

Americo Fernandes, 3 Carmarthen Blvd., Winnipeg, Manitoba, Canada, R3P 083

Filed Jun. 4, 1997, Ser. No. 869,415

Int. Cl.^{6} A61C *8/00*

U.S. Cl. 433—173 8 Claims



1. A ball retainer for reproducing therefrom a reproduced, permanent implant member intended to support a tooth prosthesis on an anchor implant in the jaw of a person, comprising:

- an anchoring member having a platform having a flat upper surface and a lower surface, and a keyed shank fixed to and depending from said lower surface; and
- a prosthesis engagement member comprising a column having a proximal end and a distal end, and a ball fixed to said proximal end, said distal end of said column having a flat bottom surface terminating said prosthesis engagement member,

said anchoring member and said prosthesis engagement member being separate from and unjoined to one another.

5,839,899

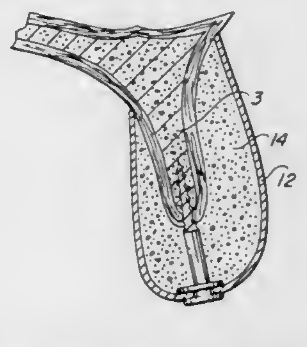
METHOD AND APPARATUS FOR GROWING JAW BONE UTILIZING A GUIDED-TISSUE REGENERATION PLATE SUPPORT AND FIXATION SYSTEM

Dane Q. Robinson, 8330 E. Captain Dreyfus, Scottsdale, Ariz. 85260

Filed Mar. 1, 1996, Ser. No. 609,870

Int. Cl.^{6} A61C *8/00*; A61F *2/28*; A61L *31/00*

U.S. Cl. 433—215 24 Claims



1. A method of growing bone in order to increase the volume of the bony ridge of the maxilla or mandible by creating a protected and supported space between the underside of the gum tissue and the jaw bone which is protected from outside chewing forces, muscular or tissue pressure, or any other premature loading by utilizing a guided-tissue regeneration plate support and fixation system, which method comprises:

- A) fixing a bone screw to the jaw bone, the bone screw including a head configured as a receiver cap to receive and intimately mate with a guided-tissue regeneration plate, the bone screw being further characterized in that:
  - 1) it is fabricated from a bio-compatible material selected from the group including titanium, chromium cobalt alloy and polytetrafluoraethylene-coated surgical steel; and
  - 2) is configured with an undercut area on the head of the bone screw in order to snappingly receive the centrally located aperture and thus securely retain the guided-tissue regeneration plate;
- B) securing a perforated guided-tissue regeneration plate to the jaw bone, which guided-tissue regeneration plate is pliable, easily bendable and moldable, but keeps its shape after being molded, the guided-tissue regeneration plate being further characterized in that it is fabricated from a bio-compatible material selected from the group including titanium, chromium cobalt alloy and polytetrafluoraethylene-coated surgical steel and has a periphery and a generally centrally located aperture for the purpose of intimate attachment and direct fixation to the bone screw head, thereby creating an indirect fixation of the guided-tissue regeneration plate to the jaw bone and a direct fixation of the bone screw to the jaw bone, the perforations being characterized in that they are of sufficient size as to promote the exchange of nutrients and blood supply across the guided-tissue regeneration plate;
- C) coupling the guided-tissue regeneration plate to the bone screw to thereby establish a protected space for bone growth such that the bone screw head functions as a receiver cap configured to receive and to be intimately mated with the guided-tissue regeneration plate while at the same time supporting and securing the guided-tissue regeneration plate in a tenting fashion a predetermined distance from the bony ridge; and
- D) waiting for bone to grow in the resulting protected space.

5,839,900

DENTAL PROSTHESIS WITH COMPOSITE SUPPORT SHELL AND COATING, PREIMPREGNATED FABRIC PART, MANUFACTURING METHOD AND MACHINE

Gilles Billet, 32, Avenue d'Haussez, F-38500 Voiron, Bruno Clunet-Coste, Rue Tolvon, F-38960 Saint-Etienne-de-Crossey, and Bernard Maneuf, Hameau de Vouise, F-38500 Voiron, all of France

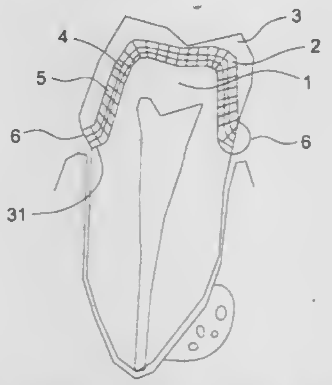
PCT No. PCT/FR94/01119, § 371 Date Mar. 22, 1996, § 102(e) Date Mar. 22, 1996, PCT Pub. No. WO95/08300, PCT Pub. Date Mar. 30, 1995

PCT Filed Sep. 26, 1994, Ser. No. 619,732

Claims priority, application France, Sep. 24, 1993, 93/11414

Int. Cl.^{6} A61C *5/08*

U.S. Cl. 433—218 39 Claims



1. A dental prosthesis comprising a support shell designed to cover a natural, implant or artificial stump, and an external finishing coating covering the support shell, wherein the support shell is composed of a composite material comprising an armature of fibers embedded in a matrix, and in that the coating is composed of at least one layer of a material at least one essential component of which is of the same nature as at least one essential component of the matrix.

5,839,901

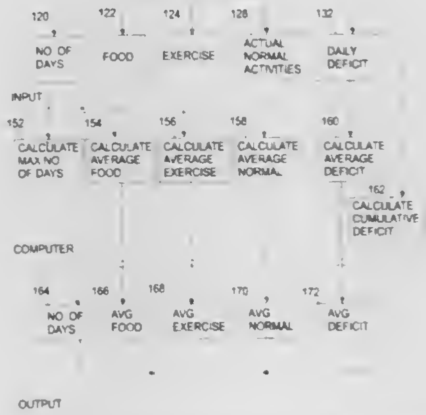
INTEGRATED WEIGHT LOSS CONTROL METHOD

Kip M. Karkanen, 256 Castle Glen Rd., Walnut Creek, Calif. 94595

Filed Oct. 1, 1997, Ser. No. 943,043

Int. Cl.^{6} G06F *19/00*

U.S. Cl. 434—127 20 Claims



1. A method for reducing or increasing an individual's actual weight, the method comprising the steps of:

- a) planning a daily Calories Expended, and a daily Calories Intake, for calculating a Plan Calorie Deficit and a Plan Ending Weight;

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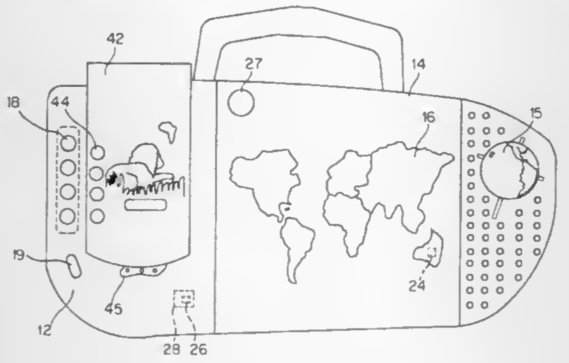
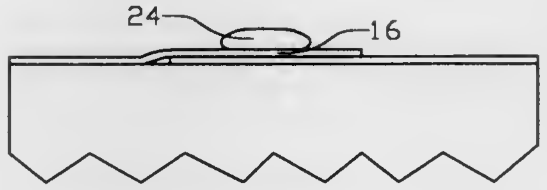
b) recording an Actual Date, an Actual Food Calories and an Actual Exercise Calories into a database daily;
c) calculating an Actual Normal Activity Calories from steps (a) and (b) daily;
d) calculating an Actual Calorie Deficit from steps (b) and (c) daily;
e) calculating an Actual Forecast Weight Change from steps (a), (b) and (d) daily;
f) calculating an Actual Forecast Weight from steps (b) and (e) daily;
g) calculating the daily Plan Weight from steps (a) and (b) daily;
h) calculating an Actual Average Food Calories from the daily Actual Food Calories, an Actual Average Exercise Calories from the daily Actual Exercise Calories, an Actual Average Normal Activity Calories from the daily Actual Normal Activity Calories, an Actual Average Calorie Deficit from the daily Actual Calorie Deficit and the Cumulative Actual Forecast Weight Change from the daily Actual Forecast Weight Change from steps (b), (c), (e) and (f);
i) calculating an Actual Average Calorie Density from step (h);
j) calculating the Plan Calorie Deficit and Plan Ending Weight;
k) adjusting eating and exercising habits to move toward and achieve the Plan Calorie Deficit;
l) repeating steps (b) through (k) daily until Plan Ending Weight is reached.

5,839,902
ELECTRONIC GEOGRAPHY TEACHING DEVICE
Michael C. Wood, Emeryville, Calif., assignor to Knowledge Kids Enterprises, Inc., Emeryville, Calif.
Filed Jan. 31, 1997, Ser. No. 791,989
Int. Cl.^{6} G09B *3/00*
U.S. Cl. 434—130 **15 Claims**



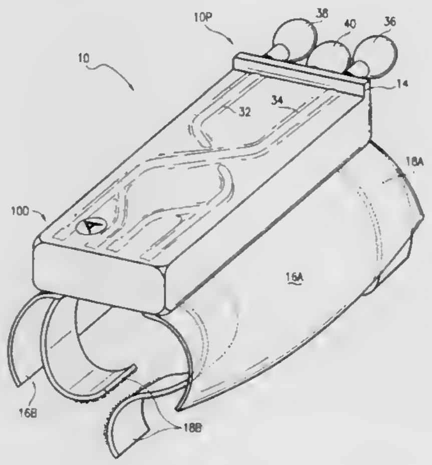
1. An interactive learning device, comprising:
(a) a map, including a plurality of map locations;
(b) a plurality of indicia, selectable from within the map, respectively corresponding to individual map locations;
(c) an output;
(d) a reader configured to identify a removable medium depicting an entity; and
(e) a processing circuit, configured to receive the identity of the medium from the reader, to associate the depicted entity with one of the locations, and in response to a selection of one of the locations, to compare the selected location to the associated location and cause the output to produce an affirmative acknowledgment if the selected location matches the associated location.

5,839,903
PLAYING AID STRIPS
Gary Thompson, and Mike Blackburn, both of P.O. Box 8185, Fremont, Calif. 94537-8185
Continuation-in-part of Ser. No. 499,757, Jul. 7, 1995, Pat. No. 5,613,855. This application Mar. 24, 1997, Ser. No. 823,274
Int. Cl.^{6} A63B *69/00*
U.S. Cl. 434—247 **7 Claims**



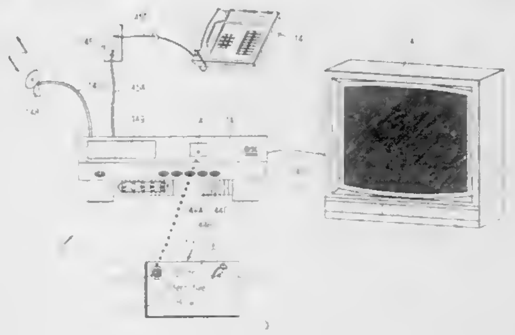
1. A playing aid device comprising:
at least one elongated strip of durable material adapted to simulate field markings,
each of at least one said strip includes fastening means at each terminal end thereof so that multiple units of said device may be joined together to mark a line of any length desired by a user,
said fastening means being constructed such that multiple strips may be secured by the user without the use of tools, said fastening means being hook-and-loop devices and a grommet secured by an anchor device, and
joints formed when two strips are joined together are further secured by means of a weighted bag placed thereon.

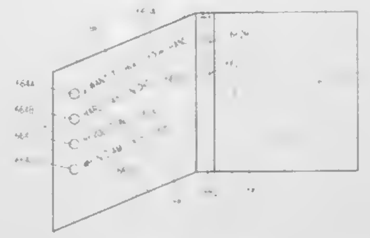
5,839,904
PHLEBOTOMY TRAINING DEVICE
Ellen A. Bloom, 8475 Shadow Ct., Coral Springs, Fla. 33071
Filed Oct. 9, 1997, Ser. No. 947,735
Int. Cl.^{6} G09B *23/28*
U.S. Cl. 434—268 **14 Claims**



1. A phlebotomy training device for use in teaching venipuncture techniques, said device comprising:
a core member having a proximal end, a distal end, and top and bottom surfaces, said top surface defining at least one channel therein;
vein simulating resilient tubing received within said channel;
a fillable fluid reservoir in fluid communication with said tubing;
skin simulating membrane cover disposed over said core member top surface; and
means connected to said core member, for attaching said core member to a human arm.

5,839,905
REMOTE CONTROL FOR INDICATING SPECIFIC INFORMATION TO BE DISPLAYED BY A HOST DEVICE
Peter M. Redford, Los Gatos, and Donald S. Stern, San Jose, both of Calif., assignors to TV Interactive Data Corporation, San Jose, Calif.
Division of Ser. No. 269,492, Jul. 1, 1994, Pat. No. 5,624,265. This application Oct. 31, 1995, Ser. No. 550,976
Int. Cl.^{6} G09B *5/00*
U.S. Cl. 434—307 R **41 Claims**



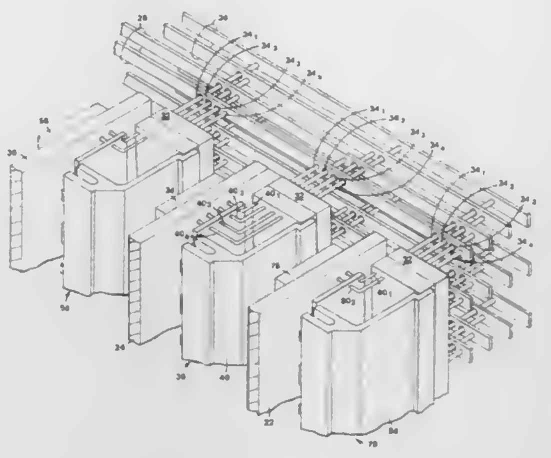


1. A remote control for remotely controlling a display of information by a host device comprising:
a housing capable of removably holding a removable storage media, said removable storage media being suitable for use in a host device;
remote control circuitry supported by said housing, said remote control circuitry comprising a signal transmitter capable of transmitting a wireless signal, said signal controlling information displayed by said host device; and
a button physically attached to said housing, said button operatively coupled to a switch;
a switch output line connecting said switch to said remote control circuitry; and
a label formed of at least one of text and graphic content, said label being located on one of said housing and said button, said label being visually associated with said button, said label being indicative of specific information;
wherein said specific information is retrieved from said removable storage media and displayed by the host device in response to said wireless signal.

39. A remote control for remotely controlling a display of information by a host device, said remote control comprising:
a structure;
remote control circuitry supported by said structure, wherein during operation said remote control circuitry transmits a wireless signal carrying a predetermined code that identifies specific information content to be retrieved from a storage media and displayed by the host device.

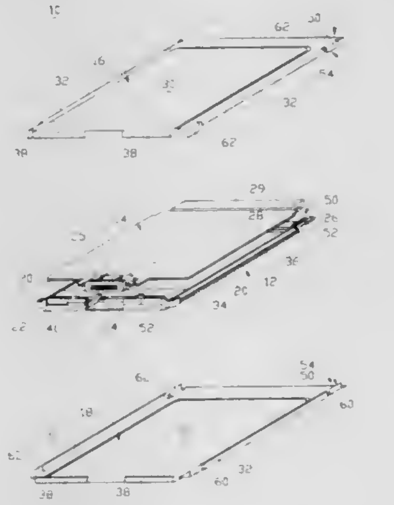
5,839,906
DATA STORAGE SYSTEM
Eli Leshem, Brookline, Mass., assignor to EMC Corporation, Hopkinton, Mass.
Filed Sep. 28, 1995, Ser. No. 535,450
Int. Cl.^{6} H01R *9/09*
U.S. Cl. 439—61 **5 Claims**

1. A computer/disk storage system interface, comprising:



disk controller, CPU controller, and cache memory printed circuit boards;
a backplane having a pair of buses for interconnecting the disk controller, CPU controller and cache memory printed circuit boards, the backplane having columns of electrical connectors, each electrical connector having a plurality of rows of pins, one portion of the pins in each row being electrically connected to one bus and the other portion of the pins being electrically connected to the other bus; and
wherein each printed circuit board has an electrical connector adapted to connect with the backplane electrical connectors, the number of pins in each row of the cache memory printed circuit board electrical connector being the same as the number of pins in each row of the backplane electrical connector and the number of pins in each row of the controller printed circuit board electrical connector being less than the number of pins in the row of pins in the backplane electrical connector.

5,839,907
STRUCTURE OF CARD
Cheng Wang Kuo, Taipei Hsien, Taiwan, assignor to Hon Hai Precision Ind. Co., Ltd., Taipei Hsien, Taiwan
Filed Feb. 3, 1997, Ser. No. 794,754
Int. Cl.^{6} H01R *9/09*
U.S. Cl. 439—76.1 **4 Claims**



1. An I/O card comprising:
a frame defining at least a cavity;
a PC board positioned on the frame with at least one connector adapted to be received within said cavity;
cover means protectively enclosing the frame and the PC board;
coupling means for fastening the cover means to the frame; and

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at least one guidance/reinforcement device extending vertically with regard to the frame, said guidance/reinforcement device including alignment slot means in the frame and alignment tab means on the cover means, the alignment tab means comprising an inner alignment tab extending from a first cover of said cover means in a first direction into the slot means and an outer alignment tab extending from a second cover of said cover means in a second direction into the slot means, said second direction being opposite to the first direction, said inner alignment tab being closer to a center line of the I/O card than the outer tab.

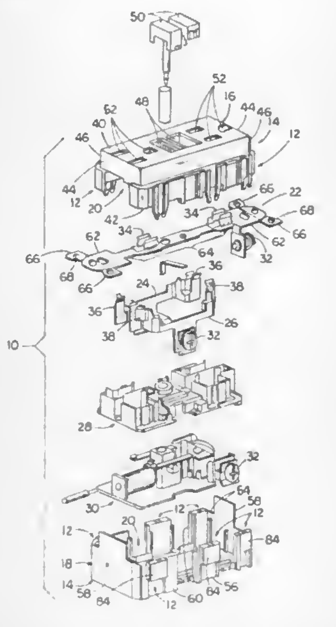
5,839,908
MULTI-CONTACT ELECTRICAL TERMINAL FOR ELECTRICAL RECEPTACLE ASSEMBLY

Nelson Bonilla, West Haven, and Thomas J. Vigorito, Fairfield, both of Conn., assignors to Hubbell Incorporated, Orange, Conn.

Filed Oct. 17, 1997, Ser. No. 953,451

Int. Cl.⁶ H01R *13/648*

U.S. Cl. 439—107 **9 Claims**



1. A multi-contact electrical terminal for an electrical receptacle assembly, said terminal comprising:

(a) a body member defining a central passageway for receiving a male prong of an electrical plug;

(b) said body member including

(i) a pair of space apart upper opposed portions disposed along opposite sides of said central passageway for receiving the male prong of the electrical plug therebetween to make an initial electrical contact therewith upon a partial insection of the male prong into said central passageway, each one of said pair of upper opposed portions having a slightly shallow V-shaped configuration formed at a middle section thereof and disposed such that the distance between said upper portions at said middle sections is the closest distance between said spaced-apart upper opposed portions so as to facilitate insertion of the male prong into said terminal

(ii) a pair of spaced apart lower opposed portions disposed along opposite sides of said central passageway for receiving the male prong of the electrical plug therebetween to make a subsequent electrical contact therewith after said initial electrical contact is made with said pair of spaced apart upper opposed portions such that a complete insertion of the male prong of the electrical plug into the central passageway provides electrical contact of the male prong with at least four separate spaced apart portions of said body member of said electrical terminal, each one of said pair of lower opposed portions having a slightly shallow V-shaped configuration formed at a middle section thereof and disposed such that the distance between said lower portions at said middle sections is the closest distance between said spaced-apart lower opposed portions so as to facilitate removal of the male prong inserted in said terminal and

(iii) a pair of opposite support straps disposed between said upper and lower opposed portions and connected to one of said pairs of upper and lower opposed portions such that partial insertion of the male prong of the electrical plug through said central passageway between said upper opposed portions causes said upper opposed portions to move away from one another as said lower opposed portions move toward one another and such that the complete insertion of the male prong of the electrical plug through said central passageway causes said upper opposed portions to move toward one another as said lower opposed portions are moved away from one another by the male prong to thereby provide said electrical contact of the male prong of the electrical plug with said four separate spaced apart portions of said body member of said electrical terminal.

5,839,909
SHUTTER DEVICE FOR CLOSING OFF THE COMPARTMENTS OF A POWER SOCKET

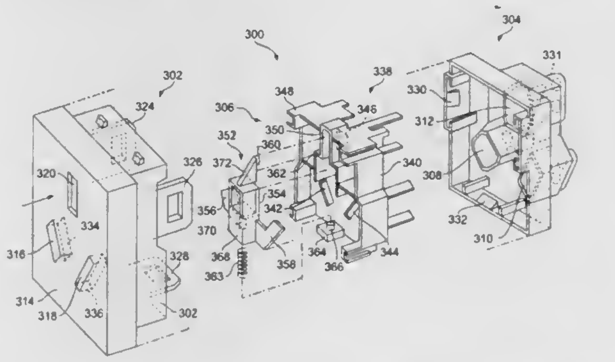
Ennio Calderara, Cuasso Al Piano, and Gianmaria Carabelli, Induno Olona, both of Italy, assignors to Bticino, S.p.A., Italy

Filed Nov. 15, 1996, Ser. No. 751,145

Claims priority, application Italy, Jul. 30, 1996, MI96A1630

Int. Cl.⁶ H01R *13/44*

U.S. Cl. 439—137 **8 Claims**



1. A protective shutter assembly for closing off a compartment of a power socket, said power socket having a front plate with first and second essentially rectangular front apertures for accessing live compartment and a neutral compartment, respectively of said power socket, the protective shutter being positioned between the front plate and the compartments and comprising:

a shutter piece moveable along a direction of translation between a first, rest position in which the front apertures are closed and a second, operational position in which the front apertures are opened, said first and second front apertures having first and a second longitudinal axes, respectively, inclined at an angle to the direction of translation of said shutter piece; the shutter piece having first and second arms which, in the first, rest position, are disposed behind the first and second front apertures, respectively, and first and a second edges, respectively, extending essentially parallel with respect to the first and second longitudinal axes, respectively, said first and second edges passing over the first and second front apertures, respectively, during a movement between said first rest position and said second, operational position; and

wherein said power socket has a third front aperture in said front plate for accessing ground compartment, and wherein said shutter piece has an associated elastic position retention device and a third arm which, in the first, rest position, is disposed in front of the third front aperture, the third arm being provided with an inclined plane forming, with the plane defined by the front plate, an angle such that a force applied to the inclined plane exerts a force tending to move the shutter piece from the first, rest position to the second, operational position in opposition to said elastic position retention device.

5,839,910
COAXIAL CONNECTOR WITH IMPEDANCE CONTROL

Andrew Graham Meller, Vlijmen; Michel Gerardus Pardoel, ED Mierlo, and Bernardus Lambertus Franciscus Paagman, Schijndel, all of Netherlands, assignors to Berg Technology, Inc., Reno, Nev.

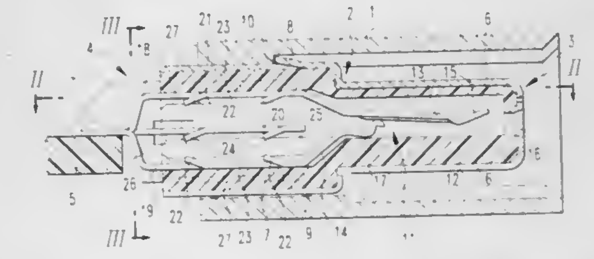
PCT No. PCT/NL94/00300, § 371 Date Jul. 17, 1996, § 102(e) Date Jul. 17, 1996, PCT Pub. No. WO95/16292, PCT Pub. Date Jun. 15, 1995

PCT Filed Nov. 29, 1994, Ser. No. 652,441

Claims priority, application Netherlands, Dec. 6, 1993, 9302115

Int. Cl.⁶ H01R *29/00*

U.S. Cl. 439—188 **12 Claims**



1. Coaxial connector provided with at least one electrical contact element having a contact side in the form of a coaxial inner and outer contact member for making contact with a further connector, and having a connection side in the form of connection ends, which extend from the inner and outer contact member, for connecting electrical wiring, there is disposed in the connector a body of electroconductive material which extends between the connection ends and is electrically separated therefrom and the body of electrocondeutive material consists of at least one electrical conductor surrounded by electrically non-conductive material and the body of electroconductive material is plate-shaped.

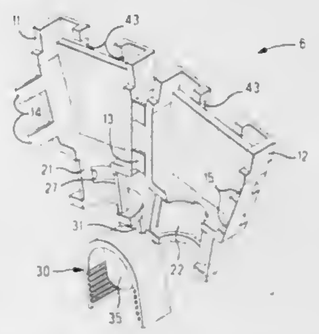
5,839,911
ADJUSTABLE AND RELEASABLE STRAIN RELIEF

Jeffrey Allen Dinkel, Greensboro, N.C., assignor to The Whitaker Corporation, Wilmington, Del.

Filed Jan. 24, 1997, Ser. No. 790,355

Int. Cl.⁶ H01R *13/58*

U.S. Cl. 439—470 **19 Claims**



1. A strain relief for an electrical connector which is terminated to a plurality of wires extending from the connector in a wire bundle, the strain relief comprising:

a housing which is mountable on the electrical connector, a barrel connected to the housing and arranged for nesting the wire bundle, the barrel including first and second barrel members which are movable from an open position for receiving the wire bundle therein, to a closed position wherein the wire bundle is straddled by the first and second barrel members, a clamp which is applicable to the barrel to effect gripping of the wire bundle within the barrel, the clamp including a U-shaped member having a pair of arms that are cooperable with one of the first and second barrel members to hold the clamp to the barrel, and a tongue extending from a base of the U-shaped member between the pair of arms, the tongue being cooperable with the one barrel member to engage the wire bundle therebetween.

5,839,912
ELECTRICAL PLUG-AND-SOCKET CONNECTION

Peter Schekalla, and Roman Seutschniker, both of Wuppertal, Germany, assignors to Delphi Automotive Systems Deutschland GmbH, Wuppertal, Germany

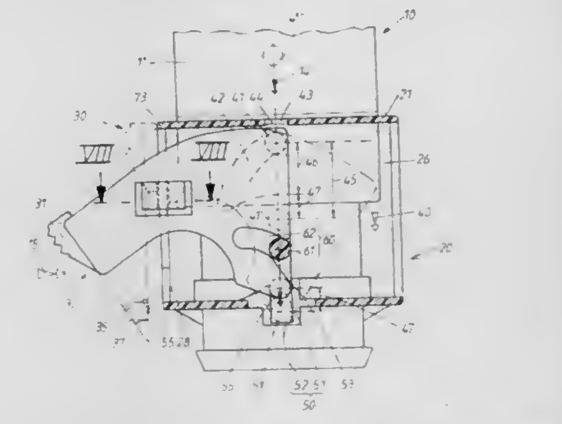
PCT No. PCT/DE95/01607, § 371 Date Jul. 3, 1996, § 102(e) Date Jul. 3, 1996, PCT Pub. No. WO96/18202, PCT Pub. Date Jun. 13, 1996

PCT Filed Nov. 18, 1995, Ser. No. 676,274

Claims priority, application Germany, Dec. 6, 1994, 44 43 349.2

Int. Cl.⁶ H01R *13/62*

U.S. Cl. 439—157 **10 Claims**



1. An electrical plug-and-socket connection comprising two detachable connecting parts (**10**, **20**), and further including a laterally extensible slide (**30**) secured to one of the connecting parts and constructed and arranged to axially couple together (**40**) and decouple (**40'**) the two detachable connecting parts so that in a connector coupled position the connecting parts are locked together and wherein one of the connecting parts includes a socket housing (**21**) with electrical contacts (**22**) fitted therein and the socket housing (**21**) including a lateral receiving fixture (**26**) with control means for the slide (**30**), while the other connecting part (**10**) includes a complementary plug housing (**11**) axially guideable in the socket housing (**21**), the plug housing having electrical mating contacts (**12**) fitted in said plug housing and having at least one laterally protruding coupling journal (**41**), and the slide (**30**) having a profiled coupling channel (**42**) for receiving the coupling journal (**41**) of the plug housing (**11**) and for movement of the slide between a connector coupled position and a connector decoupled position, and so that in the connector decoupled position the plug housing (**11**) can be axially inserted and withdrawn (**14**) by the coupling journal (**41**) into and from the open end (**44**) of the coupling channel (**42**) of the slide (**30**),

and, in the connector coupled position the plug housing (**11**) is in a retracted locked position in the socket housing (**21**), the contacts (**22**) are electrically connected to the mating contacts (**11**) and the coupling journal (**41**) is axially overlapped by the coupling channel (**42**).

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wherein between the slide (**30**) and the socket housing (**21**) there are disposed two different control means (**50**, **60**), which determine a translatory (**55**) pivot motion (**35**) of the slide (**30**) in the socket housing (**21**),

the first control means forming an axial control mechanism (**50**) having an essentially linear axial groove (**52**) on the socket housing (**21**) and a radial bearing cam (**51**) on the slide (**30**), which, in addition to its translation motion (**55**) in the axial groove (**52**), simultaneously determines the pivot bearing (**53**) for the pivot motion (**35**) of the slide (**30**),

and the second control means forming a tilt control mechanism (**60**) having control parts configured, as a sliding block (**61**) and, as a sliding block guide (**62**), the sliding block guide (**62**) being curved according to the combined pivot-translation motion (**35**, **55**) of the slide (**30**),

and wherein the coupling channel (**42**) is an arc segment, which essentially solely determines the lever-like pivot motion (**35**) of the slide (**30**) and which is disposed in relation to the pivot bearing (**53**) of the slide on the same lever arm side (**36**) as the tilt control mechanism (**60**) of said slide and the axial arc height of which determines only a part-stroke (**46**) of the coupling and decoupling motions (**40**, **40'**) between the plug housing (**11**) and the socket housing (**21**),

wherein the plug housing (**11**), by virtue of its coupling journal (**41**) reaching into the arc segment (**42**), forms together with the slide a unit (**16**) which is movable in translation motion within the socket housing and which allows an axial residual stroke (**47**) for the coupling and decoupling of the connector parts.

5,839,913
EDGE CONNECTOR HAVING LATCHES FOR MULTIPLE DAUGHTER BOARDS

Tadahiro Fumikura, Ichikawa, Japan, assignor to The Whitaker Corporation, Wilmington, Del.

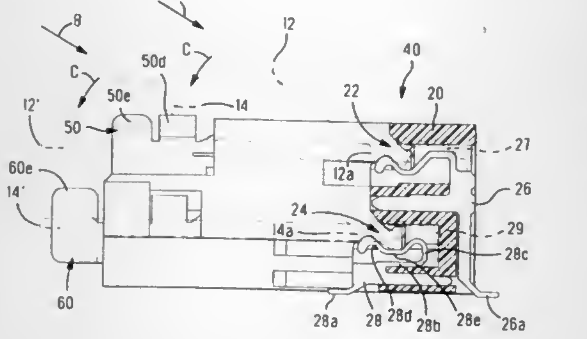
PCT No. PCT/US96/07797, § 371 Date Feb. 18, 1997, § 102(e) Date Feb. 18, 1997, PCT Pub. No. WO97/00545, PCT Pub. Date Jan. 3, 1997

PCT Filed May 28, 1996, Ser. No. 793,831

Claims priority, application Japan, Jun. 15, 1995, 7-149041

Int. Cl.^{6} H01R *13/62*

U.S. Cl. 439—326 **2 Claims**



1. An edge connector for interconnecting a plurality of daughter boards with a mother board, the edge connector including a housing having a plurality of adjacent board-receiving openings each configured to receive an edge portion of a respective one of the daughter boards, the daughter boards being insertable first in a common linear insertion direction and then being pivotable about their respective edge portions from respective upstream to downstream positions in a common pivoting insertion direction, a plurality of terminals disposed in the housing for electrically interconnecting respective conductive pads on the edge portions of the daughter boards with the mother board, and a plurality of latch members attached to the housing and associated with respective ones of the openings, the latch members being operable to retain the daughter boards in their respective said openings when the daughter boards are pivoted to their respective downstream positions, and the latch members being releasable to allow reverse pivoting of the daughter boards, characterized in that:

releasing the latch members associated with a relatively downstream one of the openings operates to release the latch members associated with relatively upstream ones of the openings.

5,839,914
CONNECTOR FOR DETECTING INCOMPLETE INSERTION OF TERMINAL

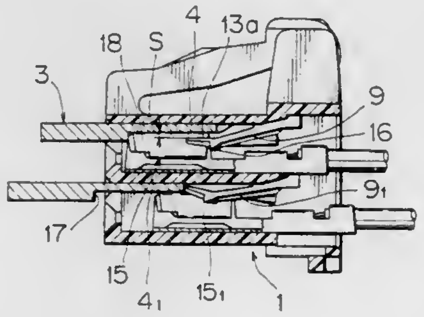
Tamio Watanabe; Toru Nagano, and Sakai Yagi, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed May 17, 1996, Ser. No. 649,204

Claims priority, application Japan, May 22, 1995, 7-122498

Int. Cl.^{6} H01R *3/00*

U.S. Cl. 439—488 **4 Claims**



1. A connector for detecting incomplete insertion of a terminal comprising:

a connector housing having at least one terminal receiving chamber for said terminal;

at least one resilient supporting piece extending into said at least one terminal receiving chamber of said connector housing;

at least one guide groove for insertion of an incomplete insertion detecting finger of an inspecting pin to detect incomplete insertion of said terminal, wherein said at least one guide groove is formed as a part of a resilient supporting piece bending space along a wall of said connector housing so that said at least one resilient supporting piece is capable of bending upwardly into said at least one guide groove in order to confront an end of said incomplete insertion detecting finger of said inspecting pin which has been inserted into said at least one guide groove of said at least one terminal receiving chamber of said connector housing;

at least one space provided between a bottom of said at least one guide groove and a top surface of a tip end of said at least one resilient supporting piece; and

at least one pick up surface for guiding said incomplete insertion detecting finger formed at an opening of said guide groove, wherein said at least one pick up surface is tapered inwardly towards said at least one terminal receiving chamber in a direction of insertion of said inspecting pin into said at least one guide groove.

5,839,915
LOCK DETECTING STRUCTURE OF CONNECTOR

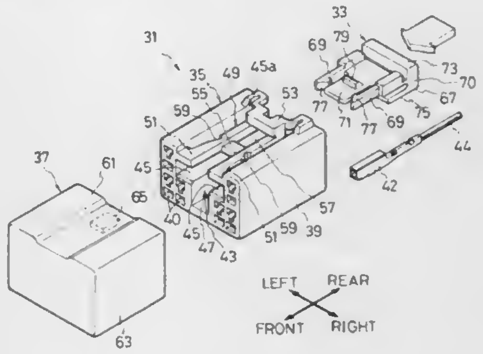
Rhodri Ford, Hertfordshire, England, and Masanori Tsuji, Shizuoka-ken, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Continuation of Ser. No. 435,035, May 5, 1995, abandoned. This application Mar. 14, 1997, Ser. No. 816,999

Claims priority, application Japan, May 10, 1994, 6-096343

Int. Cl.^{6} H01R *3/00*

U.S. Cl. 439—489 **7 Claims**



1. An electrical connector assembly comprising:

a first connector housing having a connector lock projection;

a second connector housing having a deformable lock arm integral with the second connector housing; and

a lock detecting member for detecting whether the connector lock projection of the first connector housing is lockingly engaging an intermediate lock projection on of the deformable lock arm of the second connector housing, the lock detecting member including:

at least one deformable detection arm,

an engage projection on the deformable detection arm, the engage projection engaging a latching portion of the deformable lock arm of the second connector housing while the lock detecting member is inserted in the second connector housing, and

a deformable support plate joined with the deformable detection arm and carrying a disengage projection in spaced relation to the engage projection, the disengage projection pushed by the connector lock projection of the first connector housing to deform the deformable detection arm and thereby disengage the engage projection from the latching portion of the deformable lock arm when the first connector housing and the second connector housing are mated with the connector lock projection lockingly engaging intermediate lock projection on the deformable lock arm, thereby permitting withdrawal of the lock detecting member from the second connector housing.

5,839,916
DEVICE FOR CONNECTING A FLAT CABLE TO A WIRING BOARD

Masamitsu Chishima, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Japan

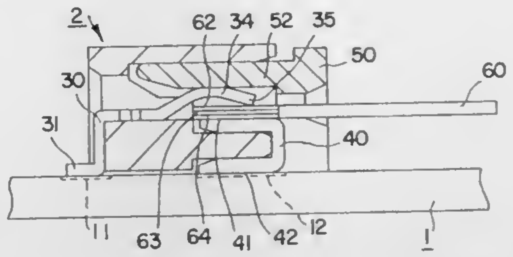
Filed May 9, 1995, Ser. No. 437,364

Claims priority, application Japan, May 31, 1994, 6-142667

The portion of the term of this patent subsequent to May 9, 2015, has been disclaimed.

Int. Cl.^{6} H01R *9/07*

U.S. Cl. 439—495 **11 Claims**



1. A device for connecting a flat cable to a wiring board wherein said cable comprises a first insulating layer, a shield foil layer thereon, a central insulation layer on said shield foil layer, a plurality of conductors parallel to each other on said central layer, and a second insulating layer on said plurality of conductors, said cable terminating in a connecting end, said first layer and said second layer terminating at points spaced longitudinally away from said connecting end, thereby providing exposed portions of said plurality of conductors and said shield layer,

said device comprises a housing and a slide adapted to enter therein, said housing having a plurality of cavities corresponding to said conductors, said cavities extending forwardly in communication with an insertion space, a plurality of fixed terminals, corresponding to said cavities, one of said fixed terminals in each of said cavities,

each of said fixed terminals comprising a wiring board contact, projecting rearwardly out of one of said cavities, a pressing element in said insertion space, and a terminal contact forward of said pressing element, said pressing element spaced apart from an inner surface of said insertion space,

a holder in said housing having a first contact forming an electrical connection with said wiring board, said holder having a second contact adjacent said insertion space on a side of said pressing portion away from said inner surface,

said exposed portions located between said pressing portion and said second contact, a slide plate between said pressing element and said inner surface, said slide plate urging said pressing element toward said second contact whereby said wiring board contact, said pressing element, said terminal contact are electrically connected to each of said conductors, and said first contact and said second contact are in electrical connection with said shield layer,

said wiring board carrying a plurality of circuit contacts corresponding to said plurality of said conductors and in electrical contact with said wiring board contacts, said wiring board carrying a ground contact corresponding to said first contact and in electrical contact therewith, said ground contact connected to ground.

5,839,917
CONNECTOR FOR FLAT CABLE

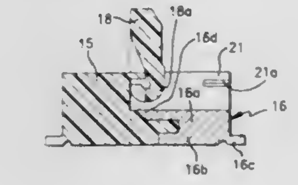
Wataru Takahashi, Tokyo, and Kenichi Hatakeyama, Iwate, both of Japan, assignors to NEC Corporation, Tokyo, Japan

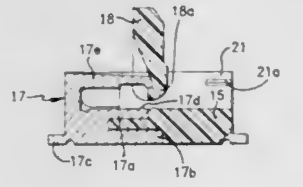
Filed Sep. 18, 1996, Ser. No. 714,299

Claims priority, application Japan, Sep. 18, 1995, 7-238881

Int. Cl.^{6} H01R *23/66*

U.S. Cl. 439—495 **9 Claims**





1. A connector for a flat cable comprising:

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a housing comprising a rectangular-shaped base portion defined by first and second sides opposite to each other and third and fourth sides opposite to each other, and first and second side walls provided on said third and fourth sides;

a plurality of first contacts, each of which has a first contact convex and a first lead terminal, said first contacts laterally extending from said first side toward said second side, said first lead terminals projecting from said first side outwardly, said first contact convex portions being provided at inner and top end portions of said first contacts, said first contact convex portions face upwardly, said first contacts being aligned at a first pitch to form a first line parallel to said first and second sides;

a plurality of second contacts, each of which has a second contact convex and a second lead terminal, said second contacts laterally extending from said second side toward said first side, said second lead terminals projecting from said second side outwardly, said second contact convex portions being provided at inner and top end portions of said second contacts, said second contact convex portions face upwardly, said second contacts being aligned at a second pitch to form a second line parallel to said first line, said second line being adjacent to said first line, and each of said second contact convex portions being positioned along said second line to correspond to an intermediate position between adjacent two of said first contact convex portions along said first line so that said first and second contact convex portions alternate with one another; and

a lever being pivotally provided to said side walls of said housing, said lever having an engaging portion which is spaced over said first and second contact convex portions for sandwiching a flat cable between said engaging portion and said first and second contact convex portions.

5,839,918
IC CARRIER

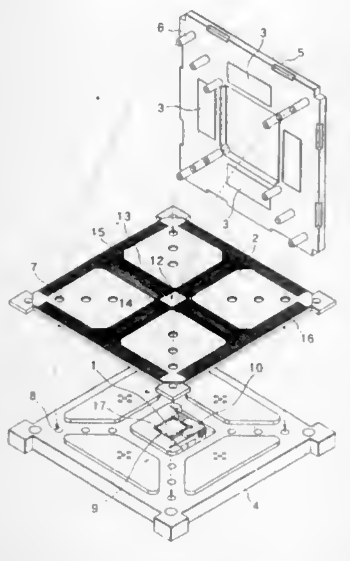
Noriyuki Matsuoka, Yokohama, Japan, assignor to Yamaichi Electronics Co., Ltd., Tokyo, Japan

Filed Aug. 7, 1996, Ser. No. 692,067

Claims priority, application Japan, Aug. 23, 1995, 7-237634

Int. Cl.^{6} H01R *9/09*

U.S. Cl. 439—526 **4 Claims**



1. An IC carrier for retaining an IC and a wiring sheet in an opposed relation so that electrical connection is achieved between said IC and a socket through said wiring sheet, said IC carrier comprising a slip-preventive sheet capable of suppressing a lateral displacement of said wiring sheet with respect to said IC by exerting a surface pressure to said wiring sheet.

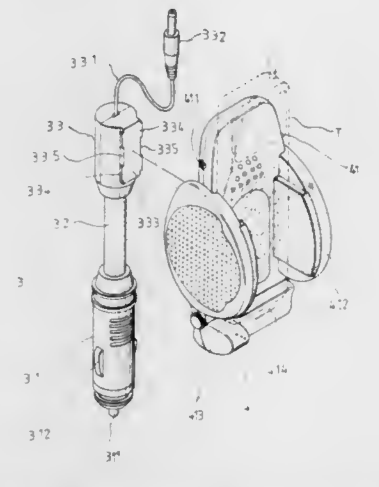
5,839,919
IN-CAR USED MOBILE PHONE FIXING SEAT ASSEMBLY TO WHICH OTHER ELECTRICAL APPLIANCES ARE ADDIBLE

Tonny Chen, Changhua, Taiwan, assignor to E. Lead Electronic Co., Ltd., Changhua, Taiwan

Filed Feb. 6, 1997, Ser. No. 795,664

Int. Cl.^{6} H01R *13/627*

U.S. Cl. 439—529 **7 Claims**



1. An in-car used mobile phone fixing seat assembly to which other electrical appliances are addible, said fixing seat assembly comprising an electrically conductive flexible supporting member and a mobile phone fixing seat, wherein:

one end of the supporting member is connected to a cigarette lighter plug for inserting into a lighter socket of a car, wherein positive and negative contacts of said cigarette lighter plug electrically contact with positive and negative contacts of said lighter socket, the other end of the supporting member having a connecting section for engaging with the fixing seat, wherein a wire connected with a plug extends from one side of said connecting section for inserting into a socket of said fixing seat for electrically transmitting power supplied by said cigarette lighter plug; and

the fixing seat has a receptacle for receiving a mobile phone and peripheral electrical equipments.

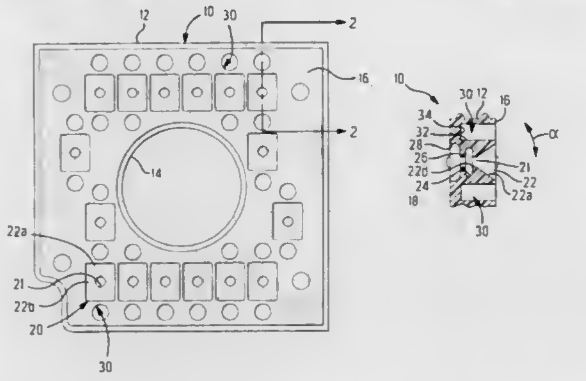
5,839,920
ELECTRICAL CONNECTOR SEAL

Garold Michael Yurko, Greensboro; John Rudell Bussard, and Mark Dwayne Andersen, both of Kernersville, all of N.C., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Dec. 6, 1995, Ser. No. 569,407

Int. Cl.^{6} H01R *13/40*

U.S. Cl. 439—587 **24 Claims**



1. A seal for sealingly receiving and engaging an electrical conductor terminated to an electrical contact, comprising:

at least one sealing unit, said sealing unit includes a contact receiving aperture comprising a front section, said front section comprises face surfaces which are offset at respective offset angles relative to said contact receiving aperture, a portion of said face surfaces are adjacent to a recess zone, said recess zone is offset at an angle relative to said contact receiving aperture, and said recess zone offset angle is relatively larger than the offset angle of at least one of said face surfaces.

5,839,921
TERMINAL EXTRACTING ASSEMBLY

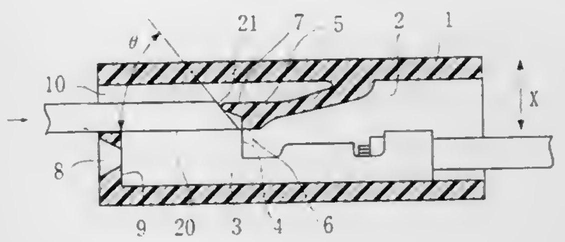
Makoto Yamanashi, Shizuoka-ken, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Oct. 10, 1996, Ser. No. 728,605

Claims priority, application Japan, Oct. 13, 1995, 7-265709

Int. Cl.^{6} H01R *13/40*

U.S. Cl. 439—595 **7 Claims**



1. A terminal extracting assembly comprising:

a connector including:

a connector housing having a terminal accommodating chamber formed to accommodate a terminal therein:

a tool hole formed at a front end of said connector housing;

a flexible lance formed in said terminal accommodating chamber, said flexible lance having a free end extending toward said front end, whereby said flexible lance is capable of bending in a direction of height of said terminal accommodating chamber;

an engagement projection formed at a part of said free end of said flexible lance to project toward a direction of bending thereof, said engagement projection having a first sliding point, said engagement projection being engageable with a shoulder of the terminal;

a leading projection formed at a part of said free end of said flexible lance to project toward said front end, said leading projection having a second sliding point;

and

a terminal extracting tool insertable into said terminal accommodating chamber in an insertion direction through said tool hole for releasing an engagement of said engagement projection of said flexible lance with the terminal, said terminal extracting tool including a leading end provided with a slanted face which is inclined with respect to the insertion direction;

wherein an angle θ of said slanted face is established to be equal to or more than an angle α of a tangential line linking the second sliding point on said leading projection with the first sliding point on said engagement projection, both of said sliding points being included within a range of a height H of said slanted face;

wherein said angle α is an angle defined by said tangential line and the insertion direction of said terminal extracting tool.

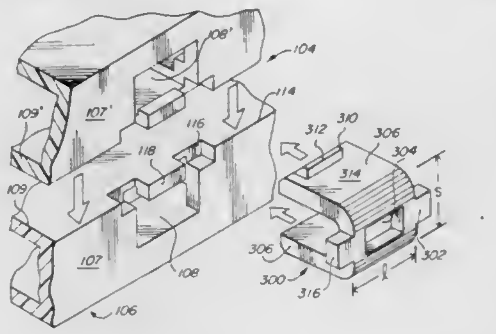
5,839,922
110 WIRING BLOCK INTERLOCK AND INTERLOCKED BLOCKS UTILIZING SUCH

Stephen A. Orlando, Longboat Key, Fla., and Walter R. Schwer, Westerly, R.I., assignors to Ortronics, Inc., Pawcatuck, Conn.

Filed Mar. 24, 1997, Ser. No. 822,517

Int. Cl.^{6} H01R *9/22*

U.S. Cl. 439—717 **13 Claims**



1. A 110 wiring block module comprising:

(a) a wire-indexing face including at least one wire-indexing strip to accommodate a plurality of wire pairs,

(b) a frame having two parallel rails positioned on opposite sides of said wire-indexing face,

wherein each wire indexing strip is parallel to and between said rails, and each of said rails have a face wall with at least two openings spaced along the length thereof, and an inner wall substantially perpendicular to said face wall with locking tabs thereon aligned with said openings engageable with one leg of a U-shaped locking device inserted through said openings to lock therein the one leg of the U-shaped locking device.

5,839,923
CONNECTOR WITH TERMINAL WITHDRAWAL STOPPER

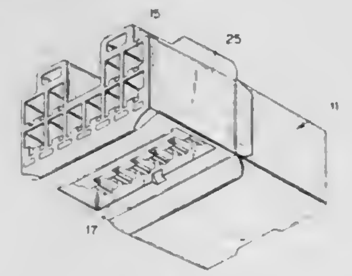
Kazuyuki Yoshida, Tokyo, Japan, assignor to The Furukawa Electric Co., Ltd., Tokyo, Japan

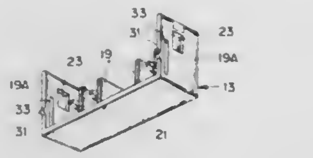
Filed Dec. 20, 1996, Ser. No. 770,786

Claims priority, application Japan, Dec. 22, 1995, 7-335254

Int. Cl.^{6} H01R *13/436*

U.S. Cl. 439—752 **4 Claims**





1. The combination of a connector with a terminal withdrawal stopper in which said connector includes:

a housing defined by generally rectangularly disposed walls and having terminal sockets in which terminals are to be accommodated, and lock pieces engageable with terminals installed in said terminal sockets for preventing withdrawal of said terminals therefrom, and

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a terminal withdrawal stopper having plug pieces insertable into said terminal sockets in a direction orthogonal to the direction of inserting said terminals therein for engaging said lock pieces to prevent withdrawal of said terminals from said sockets,

and means for installing said terminal withdrawal stopper in said connector in stages including a temporary engagement stage in which said plug pieces are partially installed in said connector housing and a full engagement stage in which said plug pieces of said terminal withdrawal stopper engage said lock pieces in said housing to prevent removal of said terminals from said sockets, said means comprising:

said walls of said housing including a wall containing slots for reception of said plug pieces in a direction orthogonal to the direction of said terminal sockets, and side walls each having a projection formed on the inside surface thereof,

said plug pieces of said terminal withdrawal stopper including outside plug pieces containing windows so disposed to enable rims thereon to engage said projections to set said terminal withdrawal stopper in said temporary engagement stage in said housing with said plug pieces out of engagement with said housing lock pieces,

a projecting rim on each housing side wall at a position below said terminal sockets, and

a ridge on each outside plug piece engageable with said projecting rim to limit the extent of insertion of said terminal withdrawal stopper to said temporary engagement stage in said housing,

said projecting rims and said ridges being releasably engageable to permit movement of said terminal withdrawal stopper to said full engagement stage in said housing with said plug pieces in engagement with said housing lock pieces.

5,839,924

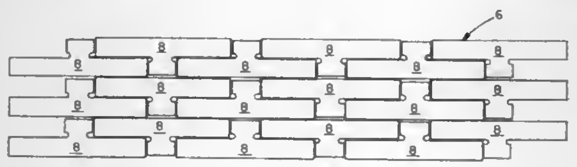
BATTERY CONNECTOR WITH CONDUCTIVE COATING

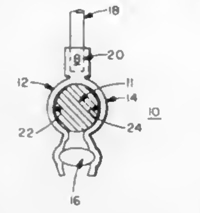
John D. Ritson, Granby, Conn., assignor to John D. Ritson, Granby, Conn.

Continuation-in-part of Ser. No. 414,419, Apr. 3, 1995, Pat. No. 5,586,919. This application Dec. 19, 1996, Ser. No. 769,955

Int. Cl.⁶ H01R *4/38*

U.S. Cl. 439—757 **15 Claims**





1. A releasable connector for electrically connecting a cable to a generally cylindric battery post comprising:

a body portion adapted for substantially surrounding and clamping the connector to a generally cylindric battery post;

a cable attachment portion connected to said body portion for conducting electricity between said body portion and a cable;

the structure of said body portion being comprised solely of a strip of sheet metal configured to create opposed partially cylindrical section shapes with juxtaposed free ends normally inwardly biassed in compression towards one another for clamping about a substantially cylindric battery post;

said structure of said body portion further being configured in the region of each said free end to receive a means for moving apart through rotation the normally inwardly biassed partially cylindrical section shapes from one another from an otherwise compressing condition about a battery post; and

wherein the strip of sheet metal being coated with a thin layer of electrically conductive corrosion resistant material.

5,839,925

ELECTRICAL RECEPTACLE TERMINALS

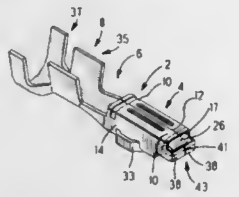
Reginald John Simmons, South Harrow, Great Britain, assignor to The Whitaker Corporation, Wilmington, Del.

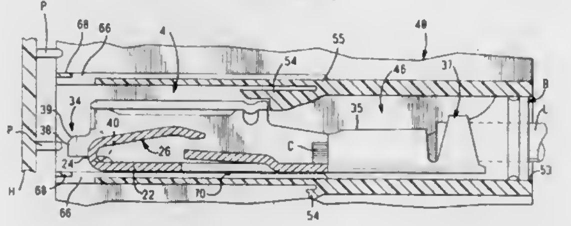
Filed Sep. 13, 1996, Ser. No. 713,622

Claims priority, application United Kingdom, Sep. 29, 1995, 9519884

Int. Cl.⁶ H01R *11/22*

U.S. Cl. 439—852 **8 Claims**





1. An electrical receptacle terminal for reception in a cavity in an insulating housing, the terminal having a rear portion for connection to an electrical conductor and a forward receptacle portion for mating with a male contact member, the receptacle portion comprising a pair of spaced, opposed side walls connected by a contact spring support base, and a contact spring joined to the forward end of the support base by a forwardly bowed bight and extending therefrom obliquely rearwardly, the terminal characterized in that the forward end portion of the contact spring support base and a portion of the bight adjacent thereto are laterally enlarged to provide a sledge of greater width than the remainder of the bight and having laterally projecting runners with smooth rolled undersides for sliding on respective wall surfaces of the cavity, which are spaced from one another by approximately the width of the remainder of the bight.

5,839,926

AIRBOAT SYSTEMS AND METHODS FOR INCREASING ENGINE EFFICIENCY WHILE REDUCING TORQUE AND NOISE

Bruce Kaye, Inverness, Fla., assignor to K-Way Engineering, Inc., Cocoa, Fla.

Continuation of Ser. No. 50,911, Apr. 21, 1993, Pat. No. 5,807,149. This application Aug. 12, 1997, Ser. No. 910,074

Int. Cl.⁶ B63H *7/02*

U.S. Cl. 440—37 **15 Claims**

1. An airboat construction, comprising:

a boat hull having a forward bow, an opposing aft stern and gunwales extending between the bow and the stern;

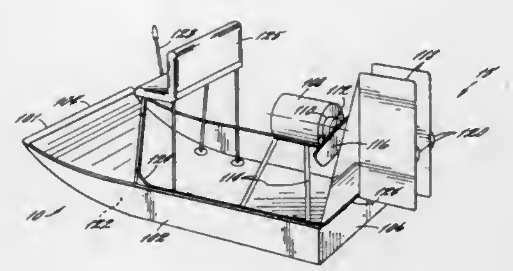
an engine supported by the hull between the gunwales, the engine including an aft-facing first end with a rotatable drive shaft extending from the first end in an aft direction toward the stern;

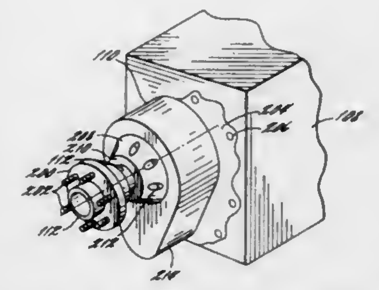
a transmission housing fitted directly to the first engine end, without any intervening spacers in order to withstand extreme gyroscopic forces, the transmission housing having a lower portion through which the engine drive shaft rotatably extends, the transmission housing also having an upper portion above the lower portion;

a propeller shaft having a first section extending through and rotatably supported by the upper portion of the transmission housing, and a second section extending away from the engine and aft toward the stern;

an assembly of multiple gears rotatably fitted within the transmission housing and mechanically coupled with the engine drive shaft and the propeller shaft for rotating the propeller shaft in response to rotation of the engine shaft; and

a propeller fitted to the extremity of the second section of the propeller shaft.





5,839,927

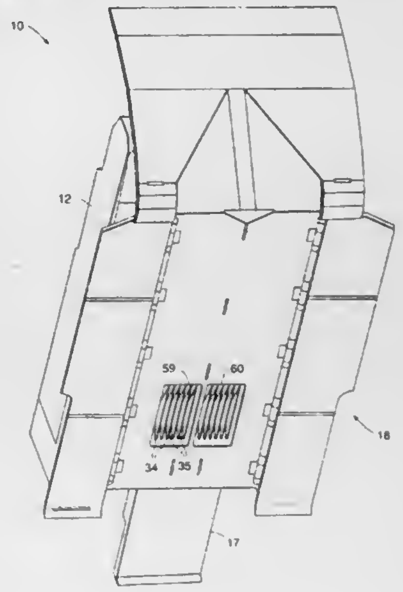
WATER JET SYSTEM

Mark Anthony Thomas, San Jose, Calif., and John G. Stricker, Berlin, Md., assignors to United Defense, LP, Arlington, Va.

Filed Oct. 31, 1996, Ser. No. 741,798

Int. Cl.⁶ B63H *11/117*

U.S. Cl. 440—43 **14 Claims**



1. A water jet system, comprising:

a water jet housing, with an inlet and an outlet;

an impeller, comprising:

an impeller drive shaft; and

a first row of impeller blades around the impeller drive shaft;

a plurality of cantilever bars with a first end and a second end, wherein the first end is mechanically connected to the housing at the inlet of the water jet housing and wherein the second end is spaced apart from the water jet housing by a distance of between 0.5 inches and 2 inches;

a shaft housing surrounding part of the impeller drive shaft, wherein the shaft housing extends into the water jet housing, wherein shaft housing has an elliptical cross section;

a first set of bearings for supporting the impeller drive shaft, and mechanically connected to the water jet housing;

a second set of bearings for supporting the impeller drive shaft and mechanically connected to the water jet housing;

a stator mechanically connected to the water jet housing, wherein the stator is located between the water jet housing outlet and the first row of impeller blades; and

a third set of bearings for supporting the impeller drive shaft, and mechanically connected to the stator, and wherein the first row of impeller blades is located between the second set of bearing and the third set of bearings.

5,839,928

SHIFTING MECHANISM FOR OUTBOARD DRIVE

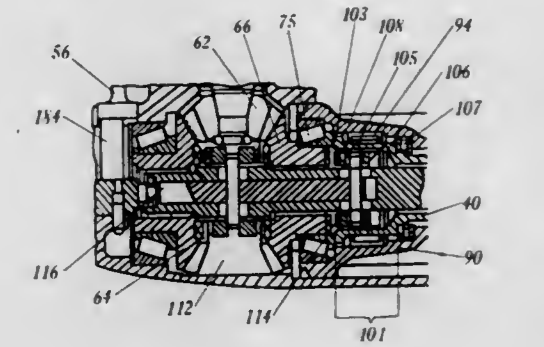
Yoshikazu Nakayasu, and Akihiro Onoue, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 652,951, May 24, 1996, abandoned, which is a continuation of Ser. No. 420,655, Apr. 12, 1995, Pat. No. 5,520,559, which is a continuation of Ser. No. 158,611, Nov. 29, 1993, Pat. No. 5,449,306. This application Nov. 12, 1996, Ser. No. 748,026

Claims priority, application Japan, Nov. 28, 1992, 4-341197

Int. Cl.⁶ B63H *23/08*

U.S. Cl. 440—75 **22 Claims**



1. A transmission for a marine outboard drive comprising a first driven gear and a corresponding first clutch coupled to a first propulsion shaft, a second clutch positioned with said first driven gear interposed between said first clutch and said second clutch said first driven gear being supported by a first bearing assembly, said propulsion shaft extending through a bearing carrier along a drive axis with a second bearing assembly journalling a portion of said first propulsion shaft within said bearing carrier, said first propulsion shaft including at least one thrust flange positioned between said first bearing assembly and a third bearing assembly, said thrust flange of said first shaft is arranged to act against said first bearing assembly and against said third bearing assembly to take thrust loadings in opposite axial directions.

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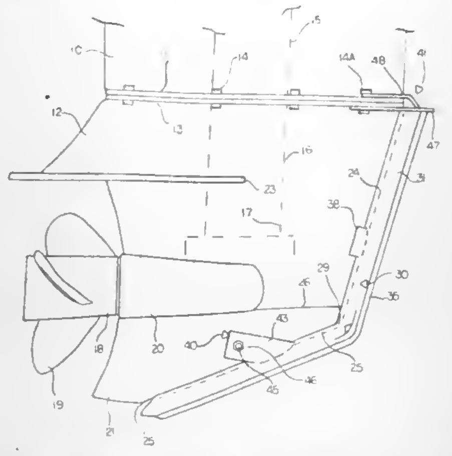
5,839,929
PROTECTION DEVICE FOR THE LOWER GEAR HOUSING OF A BOAT MOTOR

Gerald M. Cousins, Box 3000, Lac du Bonnet, Manitoba, Canada, R0E 1A0

Filed Jan. 20, 1998, Ser. No. 9,189

Int. Cl.^{6} B63H *5/16*

U.S. Cl. 440—76 **11 Claims**



1. A housing protection member for use with a gear housing of a boat motor and propeller drive assembly comprising:
  an upper housing portion containing a drive shaft;
  a lower housing portion containing a gear assembly and mounting a propeller;
  the upper housing portion having a substantially horizontal bottom mounting flange;
  the lower housing portion having a substantially horizontal top mounting flange bolted to the bottom mounting flange;
  the lower housing portion having a bottom vertical scag plate underneath the propeller and extending downwardly therefrom in a plane longitudinal of an axis of the propeller to a bottom apex, the scag plate having a front edge;
  the lower housing portion having a front edge lying in the plane of the scag plate substantially contiguous with the front edge thereof and extending from the scag plate substantially to the upper mounting flange;
  the housing protection member comprising:
    an elongate rigid protection bar arranged to lie in the plane of the front edge forwardly of the front edge and having a rear bar edge arranged to engage the front edge of the lower housing portion and the scag plate and a front bar edge extending forwardly therefrom;
    a top mounting plate rigidly attached to and extending rearwardly from the bar for engaging one or both of the top and the bottom mounting flanges, the top plate having at least one bolt hole for attachment to the bolts connecting the top and bottom mounting flanges to hold the top plate in place;
    and a pair of side mounting plates rigidly attached to and extending rearwardly from the bar at the scag plate for engaging respective sides of the scag plate for attachment thereto.

5,839,930
ENGINE LUBRICATING SYSTEM FOR WATERCRAFT

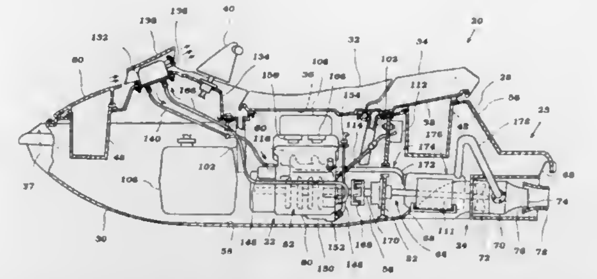
Masayoshi Nanami, and Toshiyuki Hattori, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Shizuoka-ken, Japan

Filed Mar. 14, 1997, Ser. No. 818,614

Claims priority, application Japan, Mar. 15, 1996, 8-059384; Aug. 29, 1996, 8-228666

Int. Cl.^{6} B63H *21/10*

U.S. Cl. 440—88 **20 Claims**



1. A watercraft having a water propulsion device powered by a four-cycle internal combustion engine, said engine mounted in an engine compartment defined by a deck connected to a hull of said watercraft, said watercraft including a maintenance opening in said deck for accessing said engine in said engine compartment, said engine having a dry-sump type lubrication system including an oil reservoir positioned external of said engine, an oil supply line extending from said reservoir to said engine, a pump for supplying oil through said supply line to said engine, an oil collector positioned at a bottom of said engine, a return line extending from said engine to said oil reservoir, and an oil filter positioned at other than said bottom of said engine for access from said maintenance opening, and through which lubricating oil is passed for filtering.

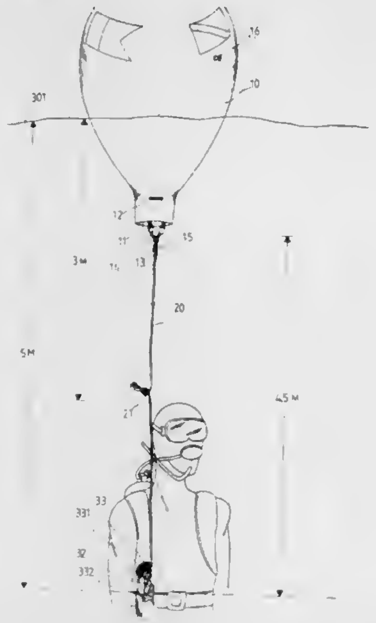
5,839,931
SAFETY STOP ANCHOR

Steve S. Shieh, No. 480, Chung Shan North Road, Section 5, Taipei, Taiwan

Filed Apr. 24, 1998, Ser. No. 63,728

Int. Cl.^{6} B63B *22/16*

U.S. Cl. 441—6 **3 Claims**



1. A safety stop anchor comprising a buoy, a length of fixing rope, and a storage pocket:
  said buoy being preferably an oval or spherical bag and having a bottom opening to serve as a gas inlet, a plurality of through holes being spaced around a lower portion of said buoy at a distance from said bottom opening, a fastening string being threaded through said through holes from inside of said bottom opening for holding a first swivel hook below said bottom opening;
  said fixing rope including first and second loop ends and having a length about 4.5 meters, said first loop end of said fixing rope being connected to a swivel hook portion of said first swivel hook below said bottom opening of said buoy, said second loop end of said fixing rope being connected to a first fixed hook which is in turn connected to a fixed link provided in said storage pocket, a second swivel hook being connected to a divisional point on said fixing rope, so that a distance about 3 meters is defined between said second swivel hook and a water surface; and
  said storage pocket defining a rectangular space for storing said buoy in a deflated and folded form, a fixed link being fixedly and firmly connected at one lower end to an inner bottom edge of said storage pocket for said first fixed hook on said fixing rope to connect thereto, a back piece of said storage pocket extending upward to form a flap of said storage pocket, male-type velcro tape being provided over an inner surface of said flap to detachably engage with female-type velcro tape provided at an upper front outer portion of said storage pocket, so that said storage pocket is openably closed by said flap, a first strap being lengthwise connected at two ends to an outer back surface of said storage pocket to define a passage between said first strap and said pocket for a second strap with velcro-taped ends to transversely extend therethrough, and a second fixed hook being connected to an upper end of said first strap:
  whereby when a diver needs to adapt himself or herself to a dropped pressure at a suitable depth below the water surface before he or she returns to the water surface, said buoy can be inflated under water to float on water surface with said first fixed hook at said second loop end of said fixing rope or said second swivel hook on said divisional point of said fixing rope connected to said fixed link in said storage pocket while said pocket is fixedly connected to a proper position on the buoyancy control wearing by the diver, such that the diver may stay at safety decompression stop or stops under water in a relaxed condition.

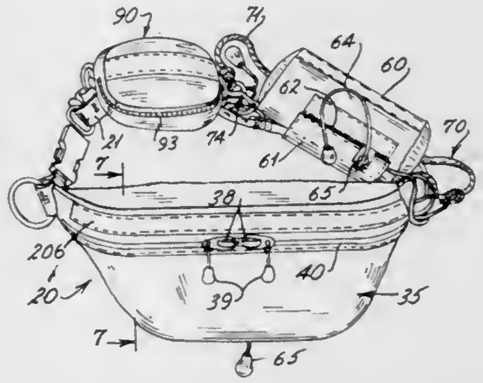
5,839,932
MULTI-PURPOSE AQUATIC RESCUE GEAR

William D. Pierce, 1436 Banbury Rd., Raleigh, N.C. 27607, and Kenney J. Pierce, Jr., 955 Opal St., San Diego, Calif. 92109

Filed Sep. 4, 1997, Ser. No. 923,409

Int. Cl.^{6} B63C *9/00*

U.S. Cl. 441—80 **19 Claims**



1. A portable life-saving apparatus for use in aquatic environments comprising:
  a waist pack including a belt for encircling a body and having a first pouch attached thereto in which an inflatable life-saving belt and lifting harness is enclosed in a deflated condition;
  a tether strap mounted to said inflatable life-saving belt and lifting harness and to said belt;
  a first manual release means for selectively detaching said life-saving belt and lifting harness from said belt;
  a second pouch mounted to said belt in which a throw line is stored; and
  a second manual release means connected to said belt for selectively detaching said throw line from said belt.

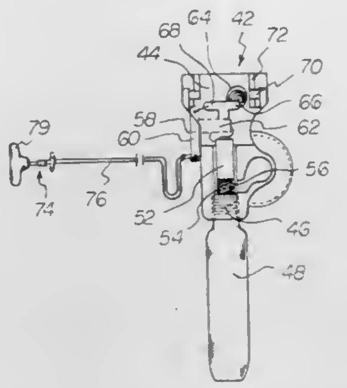
5,839,933
INFLATABLE LIFE VEST

Claude D. Davis, Sr., and Douglas M. Edsall, both of 315 Holly Manor Rd., Catonsville, Md. 21228

Filed Aug. 14, 1997, Ser. No. 911,561

Int. Cl.^{6} B63C *9/19*

U.S. Cl. 441—94 **8 Claims**



1. An inflatable life vest comprising, in combination:
  a vest constructed from a polyester mesh material and including a rear portion and a front portion halved by a central slit, the slit having a zipper formed thereon for allowing the selective coupling of the halves of the front portion with a lip coupled along the central slit adjacent the zipper with a pile fastener mounted thereon for releasably coupling to another pile fastener mounted on an opposite half of the front portion of the vest adjacent the central slit, the vest further comprising a collar extending upwardly from a rear portion of a neck opening formed in the vest;
  a plurality of cargo pockets coupled to a lower extent of both halves of the front portion of the vest, each pocket having a lid coupled along a top edge thereof with a pile fastener situated thereon for releasably coupling with another pile fastener situated on a front face of the pocket;
  an inflatable bladder comprising a rear portion with a generally rectangular configuration and a pair of front portions each with a generally square configuration, the front portions coupled along rear edges thereof to the rear portion thereby defining a neck aperture, a top surface of the bladder having pile fasteners coupled thereto for releasably coupling with a plurality of pile fasteners positioned on an interior of the vest, wherein the front and rear portions of the bladder reside in an upper half of the vest;
  an air actuation mechanism including a mounting assembly attached to the top surface of one of the front portions of the inflatable bladder and situated within the vest, the mounting assembly including a threaded opening in communication with the inflatable bladder thereby equipped for releasably receiving a cylindrical pressurized air canister, a valve slidably situated above the threaded opening with a pin coupled to a bottom surface thereof and a spring situated between the valve and the threaded opening, the valve having a first unbiased orientation wherein the pin sits distant the threaded opening and a second biased orientation wherein the pin resides within the threaded opening for effecting the release of air from the pressurized air canister, the mounting assembly further including a lever pivotally attached to the mounting assembly and adapted to transfer the valve to the second biased orientation upon the pivoting thereof;
  an automatic air actuator including a motor coupled to the mounting assembly and an interconnection member having a first end eccentrically coupled to the motor and a second end attached to the lever, the motor adapted to pivot the lever of the mounting assembly upon the actuation thereof, the automatic air actuator further including a water switch adapted to actuate the motor upon the detection of water;
  a manual air actuator including a pull cord having a first end coupled to the lever of the mounting assembly and a second end extending through an aperture formed in the vest with a

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handle coupled thereto, whereby the pull cord is adapted to pivot the lever of the mounting assembly upon the pulling thereof; and

a manual pump having a hemispherical configuration with a planar surface mounted to one of the front portions of the inflatable bladder on a half of the front portion of the vest the manual pump adapted for inflating the bladder upon the repeated depression thereof.

5,839,934
MANUFACTURE OF FIELD EMISSION ELEMENT HAVING EMITTER SELF-ALIGNED WITH SMALL DIAMETER GATE OPENING

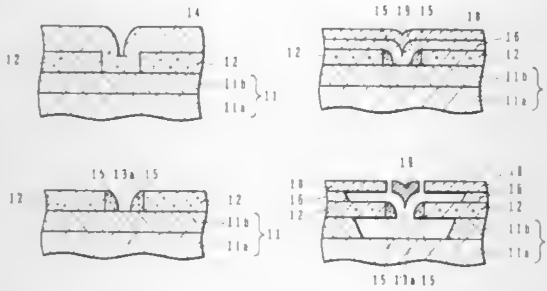
Atsuo Hattori, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan

Filed Aug. 20, 1996, Ser. No. 700,010

Claims priority, application Japan, Aug. 25, 1995, 7-240723

Int. Cl.⁶ H01J *9/02*

U.S. Cl. 445—24 6 Claims



1. A method of manufacturing a field emission type element comprising the steps of:

forming a first gate electrode material film on a substrate;

selectively etching said first gate electrode material film to form a gate opening having a substantially vertical side wall;

forming a second gate electrode material film on said first gate electrode material film formed with said gate opening;

anisotropically etching said second gate electrode material film to form a side spacer on the side wall of said gate opening;

reacting the exposed surface of said first gate electrode material film and said side spacer under a reactive ambient to form a film comprising a material selected from a group consisting of oxide and nitride having a cusp with a sharp edge over said gate opening;

forming an emitter electrode material film on said oxide or nitride film to form a tip of a field emission emitter in said cusp; and

removing said oxide or nitride film around said field emission emitter.

5,839,935
METHOD FOR MAKING SHADOW MASK FOR COLOR PICTURE TUBE

DongHee Han, Suwon; Hwanchul Rho, Kyungki-do, and Jaemyung Kim, Suwon, all of Rep. of Korea, assignors to Samsung Display Devices Co., Ltd., Suwon, Rep. of Korea

Filed Jul. 24, 1996, Ser. No. 686,148

Claims priority, application Rep. of Korea, Nov. 8, 1995, 1995-40314

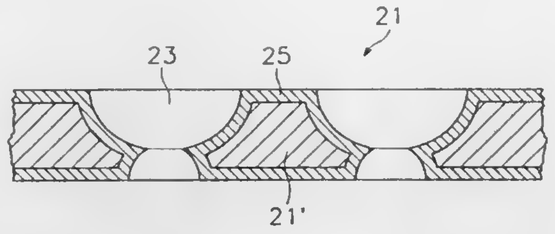
Int. Cl.⁶ H01J *29/07*

U.S. Cl. 445—47 8 Claims

1. A method for making a shadow mask for a color picture tube, comprising the steps of:

pressing a flat AK steel plate to form an AK steel shadow mask;

surrounding the AK steel shadow mask with minute metal particles; and



heating the AK steel shadow mask surrounded with the minute metal particles in a neutral or reduction heating furnace, thereby forming an alloy layer on a surface of the AK steel shadow mask.

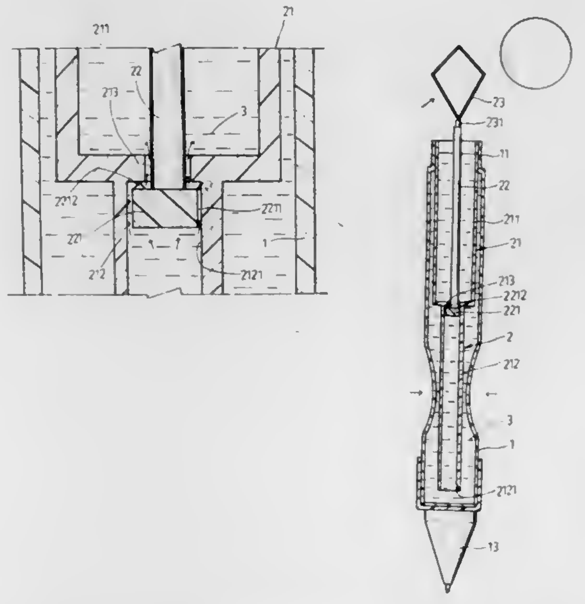
5,839,936
PRESSURE-ACTUATED BUBBLE BLOWING TOY

Mo-Hsin Lin, 5th Fl., No. 4, Lane 7, Pao Kao Road, Hsintien, Taipei Hsien, Taiwan

Filed Aug. 7, 1997, Ser. No. 908,274

Int. Cl.⁶ A63H *33/28*

U.S. Cl. 446—16 2 Claims



1. An improved pressure-actuated bubble blowing toy, comprising:

a container; and

an insert mounted within said container, said insert being formed by a cylinder having an upper portion, a lower portion and a stop ring therebetween, a piston which is movable between a lowered position and a raised position within said cylinder, said piston having an upper end and a lower end, and a film forming ring connected to said upper end of said piston;

wherein at said lower end of said piston has a base plate having a plurality of raised portions on an upper surface thereof, said raised portions providing passages when said base plate contacts said stop ring such that pressure used to actuate said piston forces liquid to enter said upper portion of said cylinder through said passage when said piston is in said raised position; and

wherein said lower portion of said cylinder has a rail on an inner wall thereof and said base plate has a cut portion on a side thereof, said cut portion of said base plate of said piston being aligned with said rail so that said piston is movable between said lowered position and said raised position substantially without rotation of said piston.

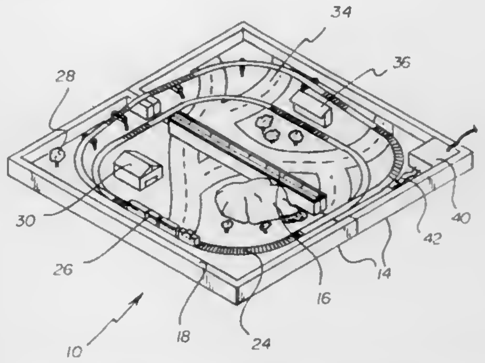
5,839,937
PORTABLE MODEL RAILROAD

Richard Roy Thomas, 201 Serpentine La., Islandia, N.Y. 11722

Filed Mar. 19, 1997, Ser. No. 820,160

Int. Cl.⁶ A63H *33/04;19/28;* **E01B** *23/00*

U.S. Cl. 446—75 1 Claim



1. A portable model railroad assembly comprising, in combination:

a foldable enclosure being formed by a pair of tray members, each of the tray members having an upwardly extending peripheral wall with an elongated interior portion, the enclosure having a hinge secured between upper edges of the interior portions of the upper extending peripheral wall, one of the tray members having a U-shaped handle secured to an exterior edge thereof, a pair of cooperating locking members disposed on the exterior edges of the tray members for closing the tray members in a folded orientation;

a track system being fixedly attached to and extending around the pair of tray member, the track system adapted to receive a model train thereon, the track system including ends situated adjacent to an intersection of the tray members with male portions for receiving female Portions of an interconnect track when the tray members are in an open orientation;

scenery and landscaping items being fixedly disposed on the pair of trays, the items including trees, houses, mountains, roads and a train station; and

a transformer secured to one of the tray members, the transformer adapted for coupling with an electrical outlet, the transformer having wiring coupled with the track system for operation of the model train thereon.

5,839,938
MODULAR-DESIGN TOY SYSTEM

Stefan Manthei, Fürth/Bay, and Werner Schön, Obermichelbach, both of Germany, assignors to Geobra Brandstätter GmbH & Co KG, Zirndorf, Germany

Filed Feb. 22, 1996, Ser. No. 605,790

Claims priority, application Germany, Feb. 25, 1995, 195 06 701.0

Int. Cl.⁶ A63H *33/10*

U.S. Cl. 446—120 23 Claims

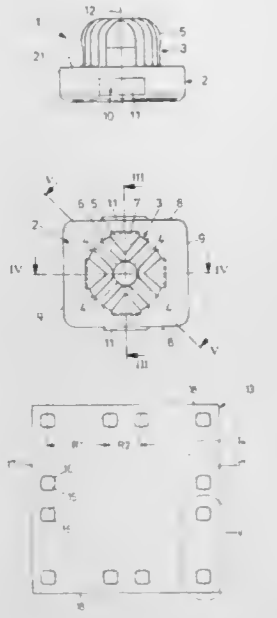
1. A modular-design toy system comprising snap-fastener connecting elements and building elements of plastic material, which are releasably attachable to each other by the snap-fastener connecting elements,

wherein each of the connecting elements (**1**) includes a basic body (**2**) having a generally polygonal shape with top and bottom sides and lateral edges

first snap-in elements (**3**) in the form of slit pins on one side of the basic body for easily releasable attachment to corresponding first locking recesses (**15**) on the building elements (**13**), and

second snap-in devices (**10**) formed by snap-in projections (**11**) on lateral edges of the basic body (**2**) of the connecting element,

wherein the building elements include



second locking recesses (**20**) having substantially the polygonal shape and, on two lengthwise sides opposite to each other, rear recesses (**21**) co-operating with the snap-in projections (**11**) of the second snap-in device.

5,839,939
MOVING TOY THAT PROTRUDES FROM AND RETREATS INTO A BODY

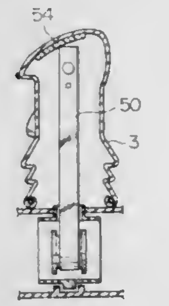
Ichiro Ohi, Tokyo, Japan, assignor to Tomy Company, Ltd.

Filed Jun. 9, 1997, Ser. No. 871,882

Claims priority, application Japan, Aug. 9, 1996, 8-007981 U

Int. Cl.⁶ A63H *30/00;11/06:3/36*

U.S. Cl. 446—175 15 Claims



1. A moving toy comprising:

a body;

a movable member supported within the body and disposed adjacent an opening in the body; and

a driving assembly coupled with the movable member, the driving assembly driving the movable member to protrude from and retreat into the body, the driving assembly including:

a motor,

a rotary disk member coupled with the motor for rotation about an axis, the rotary disk member defining a rotary surface,

a plate-shaped elastic member having a first end connected to the rotary surface of the rotary disk member at a position spaced radially from the axis and a second end connected to the movable member,

a guide member coupled with the body and engaging the elastic member into a curved "L" shape and guiding the elastic member to flex along the curved "L" shape, and

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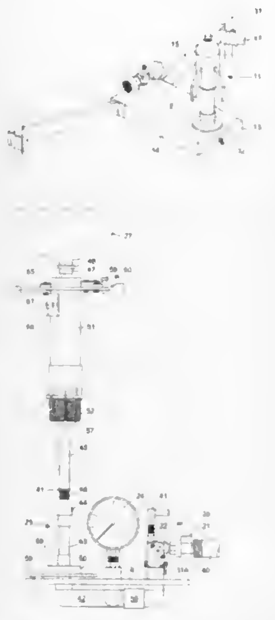
a control member communicating with the motor, the control member controlling the motor to control a position of the movable member.

5,839,940
PRESSURIZED GAS/WATER ROCKET AND LAUNCHER THEREFOR

Gary E Ensmenger, 18064 First Ave., Orlando, Fla. 32820
Filed Jan. 27, 1997, Ser. No. 791,468
Int. Cl.^{6} A63H *27/26*
U.S. Cl. 446—212 **8 Claims**



1. A liquid jet propelled rocket launcher and rocket toy, which comprises:

a launcher having a housing which has at least two legs hingedly secured at one end of said housing whereby said legs are capable of being angled outwardly substantially horizontally, each of the legs having bracket means at their opposite end for vertically adjustably retaining a vertical leg whereby said launcher may be tilted;

said launcher having upstanding a first fluid connector means and a second fluid connector means, said first connector means being adapted and constructed for a water supplying hose connection and said second connector means being adapted and constructed for an air supplying hose;

said first fluid connector and said second fluid connector means fluidly connected together to a fluid conduit;

said fluid conduit terminating near the other end of said housing in a vertical fluid conduit extending above said housing;

said vertical fluid conduit having a flange connector means on said housing concentric about said vertical fluid conduit, a first tube mounted in said flange connector means;

said vertical fluid conduit terminating below said first tube, said first tube being of a larger diameter than said vertical fluid conduit;

said first tube having a pair of horizontally disposed side slits oppositely disposed at substantially near an uppermost end portion of said first tube;

a releasable restraining means mounted about said uppermost end portion of said first tube and having elongated bar means which extends tangentially into each of said slits, said elongated bar means having spring means at oppositely disposed end portions adapted to tension said end portions together, a latch mechanism at substantially the other end of said bar means whereby to lock said bar means together under tension;

a standpipe vertically and fluidly connected to said vertical fluid conduit and extending above said first tube;

a rocket;

said rocket having a reservoir, said reservoir having a downwardly extending neck portion terminating in a mouth, said mouth being snugly concentric with said standpipe, said mouth extending into said first tube, said standpipe extending into said reservoir and terminating distally from said neck portion;

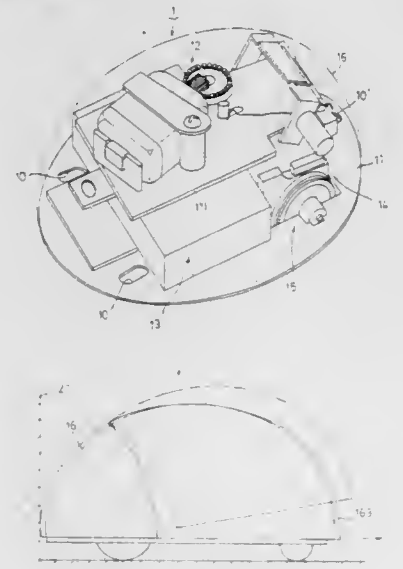
said neck portion having a radially outwardly extending flange;

said elongated bar means adapted and constructed to have portions thereof in contact with a portion of the upper surface of each flange on a side opposite to said mouth when said latch means is in latching condition whereby said releasable restraining means prevents vertical ascent of said rocket;

said latch mechanism being adapted and constructed whereby it may be unlatched by a lanyard which is attached thereto and may be pulled horizontally in opposite directions to remove the restraints on said rocket.

5,839,941
TOY CAR WITH A SWINGING UNIT WHICH SWINGS WHILE THE CAR IS IN MOTION

Hwa-Lo Chen, 5F, No. 56, Chin-Chiang St., Chung-Cheng Dist., Taipei City, Taiwan
Filed Aug. 26, 1997, Ser. No. 918,489
Int. Cl.^{6} A63H *17/40*
U.S. Cl. 446—442 **4 Claims**



1. A toy car comprising:

a chassis:

a power supplying mechanism disposed on said chassis;

a cover attached to a top surface of said chassis;

a swinging unit mounted swingably on said cover;

a cam wheel disposed rotatably on said chassis;

a driving wheel unit disposed rotatably on said chassis;

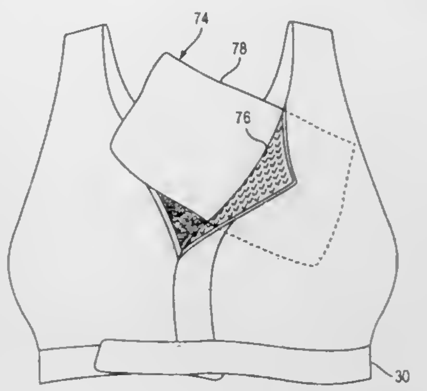
a transmission disposed between said power supplying mechanism and said cam wheel and between said power supplying mechanism and said driving wheel unit so as to rotate said driving wheel unit and said cam wheel by actuation of said power supplying mechanism and so as to reverse rotational direction of said driving wheel unit and said cam wheel upon collision of said car with a stationary object;

a follower unit interconnecting said swinging unit and said cam wheel so as to rotate said swinging unit between a first position and a second position relative to said cover upon rotation of said cam wheel on said chassis in a first direction; and

a pushing unit for positioning said swinging unit at a third position relative to said cover upon rotation of said cam wheel on said chassis in a second direction which is opposite to said first direction.

5,839,942
POST-PARTUM BREAST ENGORGEMENT BRA

Michael Miller, Boca Raton, Fla., assignor to International Medical Supplies, Inc., Reno, Nev.
Continuation of Ser. No. 361,834, Dec. 22, 1994. This application Jul. 18, 1996, Ser. No. 683,466
Int. Cl.^{6} A41C *3/00*
U.S. Cl. 450—58 **10 Claims**



1. A bra supporting and compressing breasts comprising:

a garment having a lower edge; and

a compressing member disposed along the lower edge comprising

a first connecting member attached to a first position along a perimeter of the lower edge,

a second connecting member attached to a second position along the perimeter of the lower edge opposable to the first connecting member,

the first connecting member being connectable to the second connecting member at a selectable position along the second connecting member such that a girth of the garment is selectively changeable thereby providing adjustable compression of the breasts,

said bra including one of a cooling member and warming member in adjoining relationship with said bra, said member including a container enclosing a cooling and warming solution, said member being formable when frozen such that the member is conformable substantially to a shape of a body of the wearer of the bra, with said member being removably positionable inside said bra, said garment further comprising an inside layer and an outside layer in adjoining relationship with said inside layer, said bra further including a right end and a left end adjacent to the right end, the right end and the left end defining a separation in the support, a third connecting member attached to the right end, and a fourth connecting member attached to the left end opposable to the third connecting member, the third connecting member being selectively connectable to the fourth connecting member.

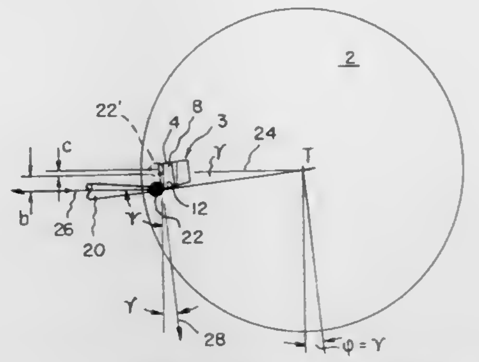
5,839,943
METHOD OF AND APPARATUS FOR TRUING CUTTER HEADS

Hermann J. Stadtfeld, Rochester, N.Y., assignor to The Gleason Works, Rochester, N.Y.
Filed Aug. 16, 1996, Ser. No. 698,834
Int. Cl.^{6} B24B *3/06*
U.S. Cl. 451—8 **11 Claims**

1. A method of truing cutting tools of the type comprising a plurality of stick-type cutting blades releasably secured in a cutter head, said cutting blades having a cutting edge and a cutting side relief surface oriented at a relief angle, said method comprising:

providing a truing apparatus comprising a cutting tool spindle and a measuring probe capable of offset movement in a first direction and in/out feed movement in a second direction,

mounting said cutting tool to said spindle,



positioning said probe with respect to said cutting side relief surface of a cutting blade whereby said cutting side relief surface is substantially parallel to said offset movement in said first direction,

probing said cutting side relief surface to provide a position reading,

recording the said position reading,

comparing said recorded position with a predetermined position, and,

(a) if said recorded position is within a pre-set tolerance range of said predetermined position,

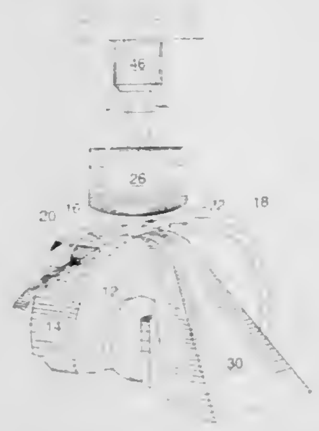
indexing said cutting tool to another cutting blade, or,

(b) if said recorded position is outside of a pre-set tolerance range of said predetermined position,

axially adjusting the position of said cutting blade in said cutter head by an amount to reposition said cutting side within said preset tolerance range.

5,839,944
APPARATUS DETERMINISTIC MAGNETORHEOLOGICAL FINISHING OF WORKPIECES

Stephen David Jacobs, Pittsford, N.Y.; William Kordonski; Igor Victorovich Prokhorov, both of Minsk, Belarus; Donald Golini, Rochester, N.Y.; Gennadii Rafailovich Gorodkin, Minsk, Belarus, and Tvasta David Strafford, Rochester, N.Y., assignors to Byelocorp, Inc., New York, and University of Rochester, Rochester, both of N.Y.
Division of Ser. No. 543,426, Oct. 16, 1995, Pat. No. 5,795,212. This application Jul. 14, 1997, Ser. No. 891,763
Int. Cl.^{6} B24B *49/00; 1/00*
U.S. Cl. 451—8 **47 Claims**



1. An apparatus for finishing a workpiece surface using magnetorheological fluid, comprising:

a continuous movable carrier surface;

a nozzle for depositing magnetorheological fluid from a magnetorheological fluid source on the carrier surface;

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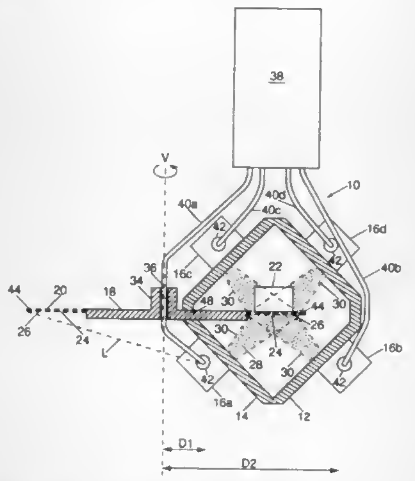
a workpiece holder for holding the workpiece and positioning a portion of the workpiece surface near the carrier surface to define a converging gap therebetween, said carrier surface being movable past said workpiece such that the magnetorheological fluid flows through said gap;
a magnet for applying a magnetic field at said gap to stiffen the magnetorheological fluid flowing through said gap defining a work zone for creating a transient finishing tool for engaging and causing material removal at a portion of the workpiece surface;
means for moving the workpiece or the work zone relative to the other to expose different portions of the workpiece surface to the work zone for predetermined time periods to selectively finish said portions of said workpiece surface in predetermined degrees;
a collector for collecting magnetorheological fluid having flowed through the gap from the carrier surface; and
recirculating means for returning the magnetorheological fluid to the magnetorheological fluid source.

5,839,945
ROTATABLE BLAST CLEANING CONVEYING SURFACE AND APPARATUS

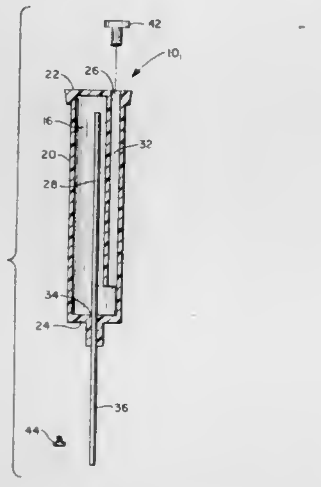
Charles Perry Elliott, Guelph, Canada, assignor to Blast Cleaning Products Ltd., Oakville, Canada
Filed Nov. 5, 1996, Ser. No. 740,922
Claims priority, application Canada, Jul. 4, 1996, 2180503
Int. Cl.⁶ B24C *3/08*
U.S. Cl. 451—82 **6 Claims**



1. A blast cleaning apparatus, comprising:
a blast cleaning chamber;
a conveying means comprising a conveying surface having an outer periphery, said conveying surface being rotatable about a vertical axis into, through and out of the blast cleaning chamber to convey through the cleaning chamber a workpiece to be cleaned, said vertical axis extending through a central hole in said conveying means, said conveying surface having a plurality of openings therethrough, said openings being separated by a separating material;
a blast cleaning means located below said conveying surface and oriented to direct abrasive cleaning material upwardly at said workpiece while said workpiece is inside said blast cleaning chamber, said blast cleaning means having an inlet for receiving said abrasive cleaning material;
supply means located above said conveying surface from which said abrasive cleaning material is supplied to said blast cleaning means; and
feed means through which said abrasive cleaning material is delivered under gravity from said supply means to said blast cleaning means, said feed means extending from said supply means to the inlet of said blast cleaning means and being inclined at an angle equal to or greater than a minimum angle of inclination required for said abrasive cleaning material to flow freely under gravity through said feed means;
wherein said feed means directs abrasive cleaning material through said central hole in said conveying means and the inlet of the blast cleaning means is positioned such that an angle of inclination of a straight line between said inlet and a point on the periphery of the conveying surface is less than said minimum angle of inclination.

5,839,946
HANDHELD APPARATUS FOR PROPELLING PARTICULATE MATTER AGAINST A SURFACE OF A PATIENT'S TOOTH, AND METHOD

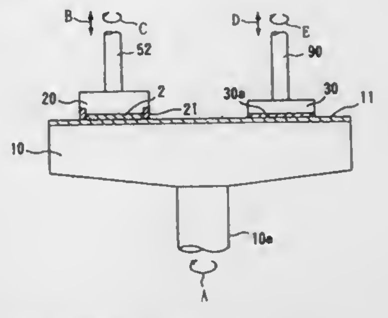
Reuben Hertz, 2717 E. Oakland Park Blvd., Ft. Lauderdale, Fla. 33306
Filed Aug. 21, 1995, Ser. No. 517,379
Int. Cl.⁶ B24C *7/00*
U.S. Cl. 451—90 **30 Claims**



1. Handheld apparatus for propelling particulate matter against a surface of a patient's tooth, comprising:
a chamber having a sidewall, a first end wall at a one end of the chamber and a second end wall at an opposite end of the chamber;
a gas-receiving port in the first end wall;
a gas-delivery conduit disposed within the chamber and extending in fluid communication from the gas-receiving port towards the second end wall;
a discharge port in the second end wall;
a discharge conduit disposed within the chamber and extending in fluid communication from the discharge port towards the first end wall;
an elongate particle-directing tube disposed external the chamber, a proximal end of the particle-directing tube in fluid communication with the discharge port;
wherein:
the gas-delivery conduit abuts and is contiguous with both the sidewall and the first end wall of the chamber.

5,839,947
POLISHING APPARATUS

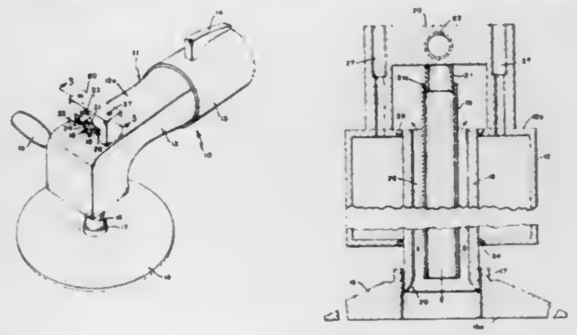
Norio Kimura, Fujisawa; Kunihiko Sakurai, Yokohama; Tetsuji Togawa, Chigasaki; Seiji Katsuoka, Atsugi, and Toyomi Nishi, Yokohama, all of Japan, assignors to Ebara Corporation, Tokyo, Japan
Filed Feb. 5, 1997, Ser. No. 795,511
Claims priority, application Japan, Feb. 5, 1996, 8-044199; Mar. 19, 1996, 8-090569
Int. Cl.⁶ B24B *5/00;29/00*
U.S. Cl. 451—288 **14 Claims**



1. A polishing apparatus comprising:
a turntable having a polishing surface thereon;
a top ring for holding a workpiece to be polished and pressing the workpiece against said polishing surface on said turntable, said top ring being movable between a polishing position inside of said turntable and a standby position; and
a first device for keeping at least a lower surface of said top ring wet while said top ring is in said standby position, said first device comprising one of a nozzle for supplying a cleaning liquid to at least said lower surface of said top ring, and a container filled with a cleaning liquid for immersing therein at least said lower surface of said top ring.

5,839,948
RIGHT ANGLE SANDERS FOR WET SANDING

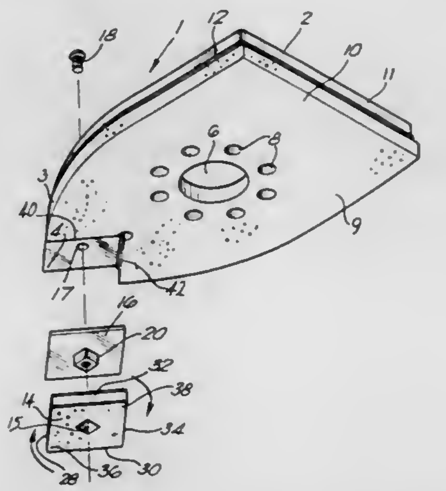
John W. Kronberg, Chesire, Conn., assignor to American Stonecrafters, Inc., Wallingford, Conn.
Filed Aug. 27, 1996, Ser. No. 697,588
Int. Cl.⁶ B24B *23/02;55/02*
U.S. Cl. 451—353 **9 Claims**



1. A power sander useful for wet sanding and polishing comprising:
a housing having an upper surface and a bottom surface;
a tubular rotatable shaft having an inside diameter and an upper end extending through the upper surface of the housing and a lower end extending through and projecting from the bottom surface of the housing to which a sanding disk is secured thereto, the disk having an opening therein to allow water to flow therethrough;
means for rotating the shaft; and
a tube having an upper end and a bottom end, which tube is smaller in outside diameter than the inside diameter of the tubular shaft and extending axially through the upper surface of the housing and the shaft and having a water inlet end at the upper end of the tube and a water outlet end at the bottom end of the tube wherein the tube forms an annular opening between the inside of the shaft and the outside of the tube which annular opening extends to the upper surface of the housing; and
means for introducing water into the upper end of the tube and wherein the water exits the bottom end of the tube and floods the disk and if there is a blockage or over pressurization, the water is diverted and flows upward through the annular opening toward the upper surface of the housing and, if excessive, water will flow out from the annular opening onto the upper surface of the housing.

5,839,949
SANDER WITH MULTIPLE-LAYERED PLATEN

Michael Martin, Darlington, and Eric Cockburn, Durham, both of United Kingdom, assignors to Black & Decker Inc., Newark, Del.
Filed Oct. 3, 1996, Ser. No. 725,365
Claims priority, application United Kingdom, Oct. 4, 1995, 9520255
Int. Cl.⁶ B24B *23/00*
U.S. Cl. 451—356 **11 Claims**



1. A sander with multiple-layered platen, which comprises:
a platen assembly to which motion can be applied;
the platen assembly having a first surface in a given plane which is adapted to receive a prescribed sheet material;
the platen assembly having a detachable second surface attachable to the platen assembly by a fabric fastener attachment means and located in the given plane adjacent and independent of the first surface, the second surface being adapted to receive the prescribed sheet material;
a detachable fastening structure assembled with the plater assembly and the second surface for detachably securing the second surface with the platen assembly independently of the first surface; and
the prescribed sheet material being an abrasive sheet in assembly with the first and second surfaces and having a corresponding detachable portion which is defined by a perforated line and which is shaped generally in the configuration of the second surface.

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5,839,950
PORTABLE POWER GRINDER

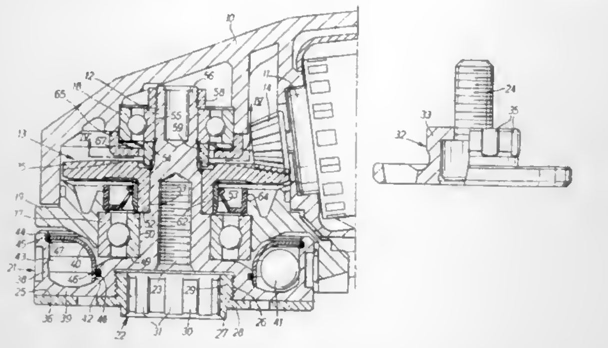
Jan Krister Johansson Edling, Älvsjö, and Sten Herman Olsson, Enskede, both of Sweden, assignors to Atlas Copco Tools AB, Nacka, Sweden

Filed May 1, 1997, Ser. No. 846,843

Claims priority, application Sweden, May 7, 1996, 9601735

Int. Cl.⁶ B24B *13/20*

U.S. Cl. 451—359 **6 Claims**



1. Portable power grinder for operating a wheel type grinding tool, comprising a housing (**10**), a rotation motor (**11**) and an output spindle (**12**) connected to said motor (**11**) and arranged to carry a grinding tool, said output spindle (**12**) being formed with a threaded coaxial bore (**23**) for receiving a grinding tool clamping screw (**24**) and with a radially extending support flange (**25**) for backing the grinding tool as the latter is attached to said output spindle (**12**), wherein said output spindle (**12**) is provided with an exchangeable grinding tool support element (**28**) attached to said support flange and comprising a radial flange (**36**) arranged to be sandwiched between the grinding tool and said support flange (**25**), a coaxial through opening (**30**) for said clamping screw (**24**) and a coaxial forwardly directed tubular neck portion (**27**) for centering engagement with a corresponding opening in the grinding tool.

5,839,951
SEPARATOR FOR BLASTING APPARATUS

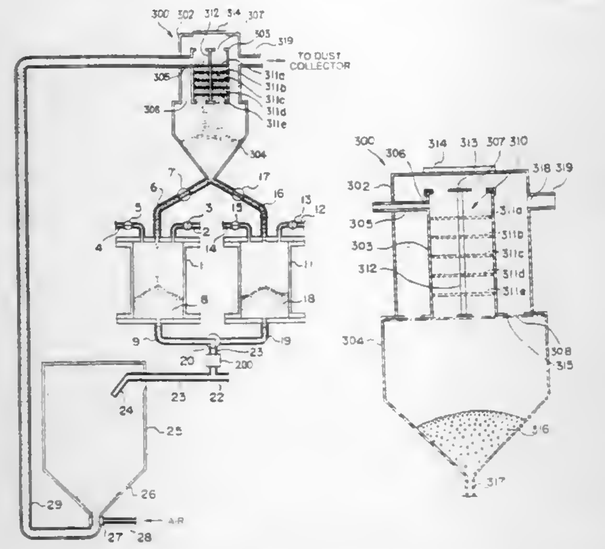
Naoyoshi Tomioka, Tokyo, Japan, assignor to Rich Hill, Inc., Tokyo, Japan

Division of Ser. No. 564,290, Dec. 21, 1995. This application Apr. 9, 1997, Ser. No. 835,429

Claims priority, application Japan, Apr. 22, 1994, 6-106278; Apr. 22, 1994, 6-106279; Apr. 22, 1994, 6-108280

Int. Cl.⁶ B24B *57/00*

U.S. Cl. 451—446 **7 Claims**



1. A particle separator for use in a blasting apparatus, comprising:

- a separating chamber;
- an outer chamber provided at the outside periphery of the separating chamber;
- an intake port extended from the separating chamber for blowing reclaimable abrasive particles and peeled particle dust obtained after blasting with compressed air into the separating chamber;
- a diffusion member disposed inside of the separating chamber for diffusing the reclaimable abrasive particles and peeled particle dust, said diffusion member consisting of five punched metal sheets, laminated vertically and having a predetermined space between said sheets;
- an exhaust port provided adjacent a top part of a side wall of the outer chamber for exhausting the peeled particle dust and the compressed air from the separating chamber; and
- a reclaimable abrasive particles accommodating tank disposed at the bottom part of the separating chamber.

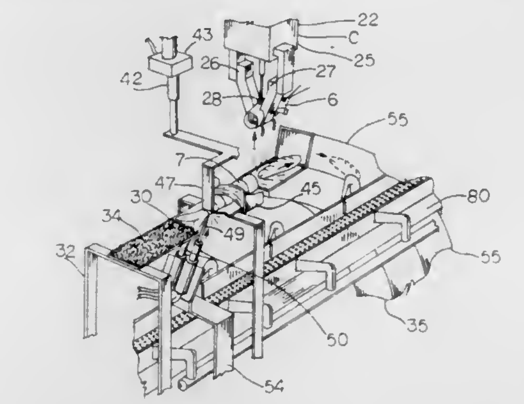
5,839,952
METHOD AND DEVICE FOR PROCESSING CRUSTACEANS

Daniel J. Pollingue, 2119 Monroe St., LaPorte, Ind. 46350

Filed Aug. 7, 1996, Ser. No. 694,489

Int. Cl.⁶ A22C *29/02*

U.S. Cl. 452—8 **26 Claims**



1. An apparatus for removing meat from a crayfish having a head portion and a tail portion, comprising:

- a frame;
- a pair of clamps movably mounted to said frame, said clamps including means for operating said clamps for causing one of said clamps to grip the head portion of the crayfish and the other clamp to grip the tail portion of the crayfish;
- a first actuator cooperating with said pair of clamps for moving one of said pair of clamps toward the other clamp thereby disrupting the bond between the tailmeat and the shell and facilitating the removal of the tailmeat from the shell;
- a second actuator for moving either of said pair of clamps away from the other clamp thereby separating the head portion of the crayfish from the tail portion while retaining the tailmeat in the shell of the tail portion; and
- extraction means for extracting the tailmeat from the tail portion.

5,839,953
AIR-DIRECTION ADJUSTING APPARATUS FOR AIR-CONDITIONING EQUIPMENT

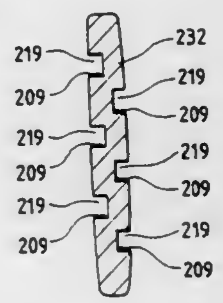
Satoru Kotoh, Hyogo; Kiyoshi Sakuma, Shizuoka; Takayuki Yoshida, Shizuoka; Hiromi Sano, Shizuoka; Katuyuki Aoki, Shizuoka; Shin'ichi Suzuki, Shizuoka; Hideaki Koizumi, Shizuoka; Kaoru Yamamoto, Shizuoka; Kunio Matsushita, Shizuoka; Kenichi Unno, Shizuoka, and Tomoko Oguma, Shizuoka, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 202,258, Feb. 25, 1994, Pat. No. 5,660,588. This application May 7, 1997, Ser. No. 853,181

Claims priority, application Japan, Mar. 5, 1993, 5-045142; Aug. 24, 1993, 5-209419

Int. Cl.⁶ F24F *13/15*

U.S. Cl. 454—313 **15 Claims**



2. An air-direction adjusting apparatus in an air-conditioning equipment, which comprises two sets of guide vanes which are disposed respectively to the left and right of a blow-outlet and in which the two sets of vanes can make rotational movement in opposite directions to thereby change the air direction and form a narrow space between the two sets of vanes, wherein at least the end guide vanes which are next to each other are provided with a plurality of dew-receiving cavities in their surfaces.

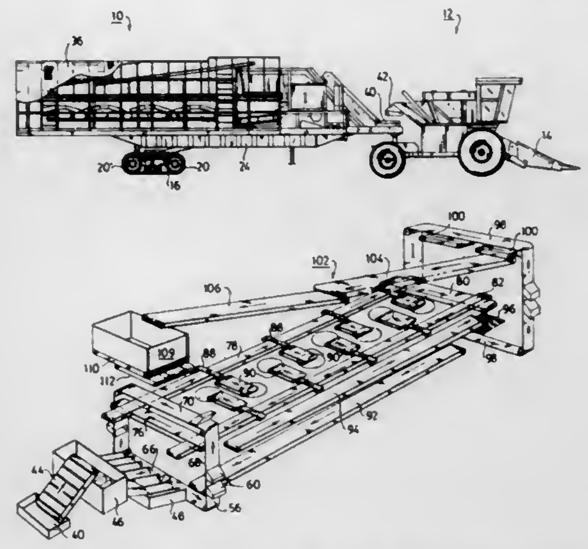
5,839,954
SWEET CORN PROCESSING SYSTEM

Alvin J. Schloesser; Christopher M. Schloesser, both of Watertown, Wis., and Jon F. Mollnow, Perry, N.Y., assignors to Byron Enterprises Inc., Byron, N.Y.

Filed Oct. 23, 1996, Ser. No. 740,039

Int. Cl.⁶ A01D *45/02;* A01F *11/06*

U.S. Cl. 460—45 **22 Claims**



21. An integrated system in a machine movable along corn rows in a corn field for picking and processing ears of sweet corn, comprising:

- a) an undercarriage;
- b) means mounted on said undercarriage for supporting it and moving it along the ground;
- c) a corn head harvester mounted on a forward portion of said undercarriage and having a plurality of row pickers for stripping corn ears from a plurality of rows of planted corn substantially simultaneously;
- d) a husking bed mounted on said undercarriage for receiving whole ears of corn from said corn head harvester and removing the husks therefrom;
- e) means for conveying the ears from said corn head harvester to said husking bed;
- f) a plurality of kernel cutting machines mounted on said undercarriage for removing kernels from husked ears of corn;
- g) means for distributing husked ears to said cutting machines so that any one ear may be presented to any one of said plurality of kernel cutting machines, said distributing means including means for shunting husked ears past any of said kernal cutting machine's not ready to receive said ears and for presenting said shunted ears to any other of said kernal cutting machines, said ears being thus recirculable by said distributing means past all of said cutting machines as needed until accepted for kernal tting by any of said machines; and
- h) means for collecting kernels cut by said cutting machines.

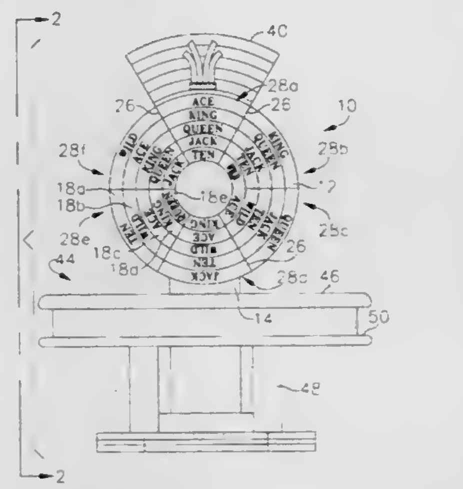
5,839,955
SPINNING WHEEL GAME AND DEVICE THEREFORE

Barbara Mangano, and Mark Casburn, both of 3100 E. Kingspoint, Las Vegas, Nev. 89120

Filed Nov. 13, 1996, Ser. No. 746,605

Int. Cl.⁶ A63F *9/24*

U.S. Cl. 463—16 **34 Claims**



1. A device for playing a game of chance using representations of selected playing cards comprising:

- a display representing five areas;
- means in each area for representing spaced indicia of an Ace, King, Queen, Jack, Ten and a wild symbol;
- means for randomly selecting an indicia from each area to display as a combination outcome; and
- means for a player of the device to place a wager upon at least one anticipated outcome, said wagers representing anticipated winning outcomes of,
  - (i) a selected Ace, King, Queen, Jack, and Ten combination,
  - (ii) five wild symbols,
  - (iii) five of a kind,
  - (iii) four of a kind,
  - (iv) a full house,
  - (v) a straight,
  - (vi) three of a kind,
  - (vii) two pair, and
  - (viii) a pair.

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5,839,956

GAME PLAY MEDIA LENDING MACHINE AND GAMING HOUSE MANAGEMENT SYSTEM

Takatoshi Takemoto, Tokyo, Japan, assignor to Kabushiki Kaisha Ace Denken, Tokyo, Japan

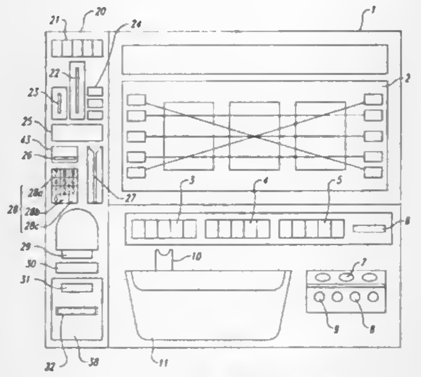
PCT No. PCT/JP94/00356, § 371 Date Sep. 7, 1995, § 102(e) Date Sep. 7, 1995, PCT Pub. No. WO94/20179, PCT Pub. Date Sep. 15, 1994

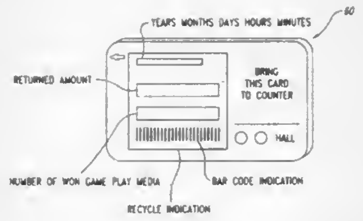
PCT Filed Mar. 7, 1994, Ser. No. 513,914

Claims priority, application Japan, Mar. 9, 1993, 5-047925

Int. Cl.⁶ G07F *17/34*

U.S. Cl. 463—25 **13 Claims**




YEARS MONTHS DAYS HOURS MINUTES
60
RETURNED AMOUNT
BRING THIS CARD TO COUNTER
HALL
NUMBER OF WON GAME PLAY MEDIA
BAR CODE INDICATION
RECYCLE INDICATION

3. A game play media lending machine which enables a player to use a credit card for lending game play media, comprising:

- game play media dispensing means for accepting a request for dispensing game play media and dispensing game play media in response to the number of game play media to be dispensed corresponding to a specified dispensing amount of money;
- a credit card reader for reading information registered on a credit card containing identification data;
- identification information input means for inputting identification information to be compared with the identification data;
- amount setting means for setting a lending amount of money spent for a player to play a game for an inserted credit card;
- control means for determining whether or not the identification information input through said identification information input means matches the identification data read by said credit card reader, if they match, said control means for causing said game play media dispensing means to dispense game play media within the range of the lending amount set through said amount setting means;
- means for storing the credit card identification information and the lending amount;
- means for calculating by subtracting the dispensing amount from a remainder, beginning with the setup lending amount as an initial remainder, each time a dispensing request is made, to update said remainder;
- means for storing a plurality of adjustment card type recording media; and
- an issuing machine for taking out the adjustment card type recording media one at a time from said storage means, recording the calculated remainder as a return amount on the adjustment card type recording medium, and issuing it.

5,839,957

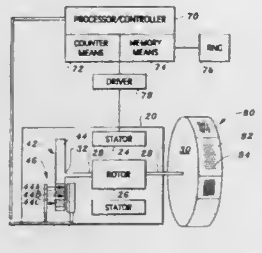
STEPPING MOTOR DRIVEN REEL MECHANISM HAVING AN ENCODER MEANS INTEGRALLY FORMED ON THE MOTOR: APPARATUS AND METHOD

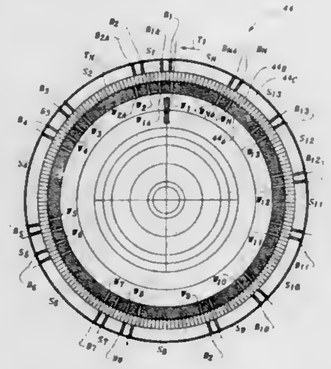
Richard Schneider; Jay Stone, and Thomas Miner, all of Las Vegas, Nev., assignors to Casino Data Systems, Las Vegas, Nev.

Filed Sep. 30, 1996, Ser. No. 723,851

Int. Cl.⁶ G07F *17/34*

U.S. Cl. 463—20 **15 Claims**





5. An apparatus for assessing position of at least one reel vis-a-vis reward obligations based on a position of said reel, comprising in combination:

- indicia means operatively coupled to a motor,
- said indicia means including a plurality of coded sectors, each sector having a unique identity,
- said one reel operatively coupled to said motor,
- sensing means addressing said indicia means,
- means to power said motor and communicating with said sensor,
- and random number generating means interposed between said sensing means and said power means to control reel position as a function of said coded sectors.

5,839,958

VOICE SYNTHESIZED BRIDGE BIDDING MODULE AND METHOD OF USING SAME

Ruth Ozarow, 373 Fearrington Post, Pittsboro, N.C. 27312

Filed Feb. 24, 1997, Ser. No. 803,691

Int. Cl.⁶ A63F *9/22*

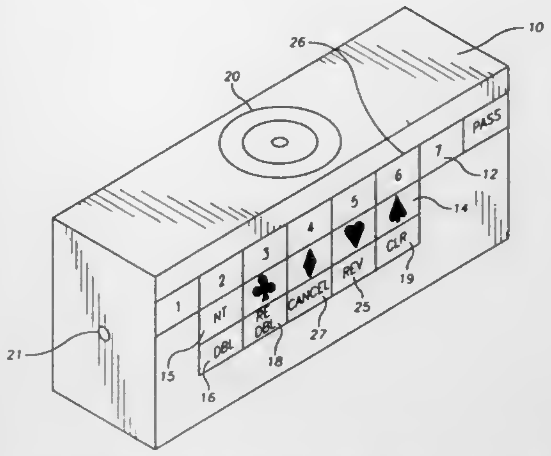
U.S. Cl. 463—35 **16 Claims**

1. Apparatus for use in bidding of a bridge game, comprising:

a) a module including means for entering a bridge bid,

b) means for converting said bridge bid to a digital representation,

c) means for storing said digital representation, and



d) means for converting said digital representation to a vocalized linguistic output whereby said bid is audibly transmitted from said module.

5,839,959

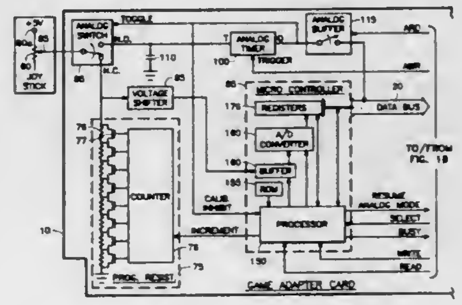
JOYSTICK GAME ADAPTER CARD FOR A PERSONAL COMPUTER

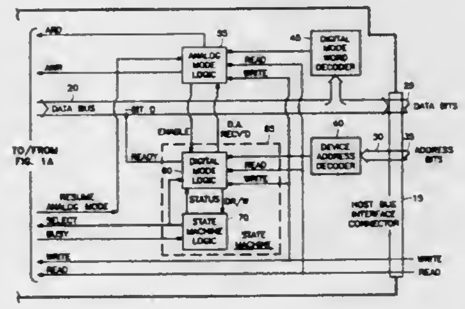
Michael H. Pelkey, Simi Valley, Calif., assignor to Pacific Digital Peripherals, Inc., Simi Valley, Calif.

Filed Mar. 26, 1996, Ser. No. 625,519

Int. Cl.⁶ A63F *9/24*

U.S. Cl. 463—36 **28 Claims**





1. A game adapter card for interfacing with a host bus of a host central processing unit (CPU) and a game joystick comprising a variable resistor having a bias voltage input and a wiper output, said game adapter card comprising:

- a programmable resistor connected in series between said wiper output of said joystick and a voltage return terminal;
- an analog-to-digital converter (ADC) having a digital output and an analog input coupled to a connection point between said wiper output and said programmable resistor;
- means for providing data transfer from said digital output to said host bus;
- means for incrementing the resistance of said programmable resistor whenever said digital output falls below a predetermined minimum digital value.

5,839,960

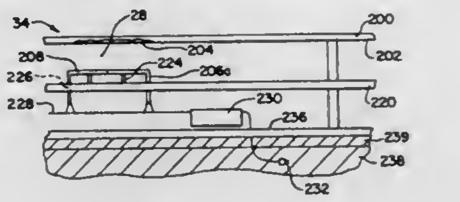
TABLE FOR PLAYING A GAME OF CHANCE

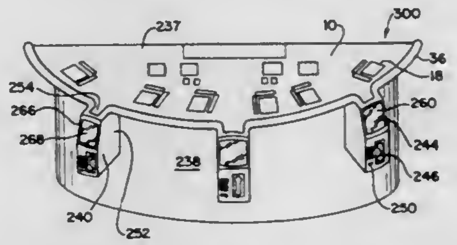
Anthony C. Parra, 1101 Iroquois Ave., Suite 1204, and Debra L. Parra, 1101 Iroquois Ave., Suite 1209, both of Naperville, Ill. 60563

Division of Ser. No. 441,046, May 15, 1995, Pat. No. 5,573,248. This application Aug. 14, 1996, Ser. No. 696,465

Int. Cl.⁶ A63F *3/00*; A47B *25/00*

U.S. Cl. 463—41 **11 Claims**





1. A table for the playing of a game of chance, the table comprising:

- an upper transparent leaf including designations which upon illumination delineate areas for the playing of a selected game of chance;
- a lower leaf disposed below the upper leaf having a plurality of lamps disposed thereon for illuminating the designations;
- the upper and lower leaves defining an interchangeable top portion of the table;
- the top portion configured to be removeably replaceable so that a different selected game of chance is provided by replacing the upper and lower leaves with upper and lower leaves having different designations and lamps, respectively.

5,839,961

BEARING ARRANGEMENT FOR A DRIVE SHAFT

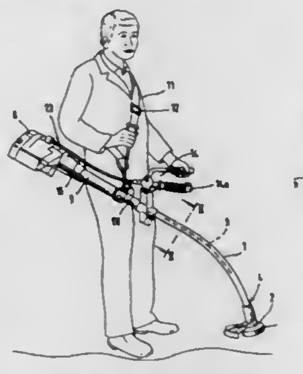
Bernd Andress, Erdmannhausen, Germany, assignor to Andreas Stihl, Waiblingen, Germany

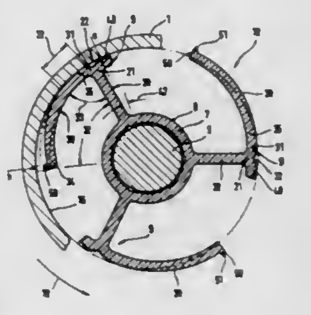
Filed Jun. 12, 1997, Ser. No. 873,639

Claims priority, application Germany, Jun. 15, 1996, 196 23 921.4

Int. Cl.⁶ F16C *1/06*

U.S. Cl. 464—52 **18 Claims**





1. A bearing arrangement for a drive shaft connecting a work tool to a drive unit, the arrangement comprising:

- a protective tube defining a longitudinal axis and having an inner wall surface extending in a peripheral direction about said longitudinal axis;

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a bearing structure mounted in said protective tube and having a bearing sleeve for accommodating said drive shaft therein and said bearing sleeve having an outer periphery;

said bearing structure further including a plurality of longitudinally running supporting ribs extending from said outer periphery to act on said inner wall surface to hold said bearing sleeve approximately centered in said protective tube;

each of said supporting ribs including a radial leg extending approximately radially from said bearing sleeve and a peripheral leg extending axially of said radial leg and approximately in said peripheral direction;

said radial leg having an outer radial end portion facing toward said inner wall surface so as to leave a gap (a) therebetween;

said peripheral leg extending from said radial leg at said outer radial end portion and being supported on said inner wall surface; and,

said peripheral leg being joined to said radial leg at an angle of less than 90°.

5,839,962
TORSIONAL OSCILLATION DAMPER

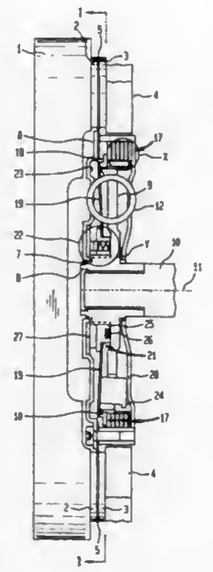
Ulrich Rohs, Düren, and Dietmar Heidingsfeld, Aachen, both of Germany, assignors to Patentverwertungsgesellschaft Rohs Voigt mbh, Düren, Germany

Filed Mar. 24, 1997, Ser. No. 823,530

Claims priority, application Germany, Mar. 22, 1996, 196 11 268.0; Jan. 31, 1997, 197 03 534.4

Int. Cl.⁶ F16D *1/12;* F16F *15/30*

U.S. Cl. 464—68 **10 Claims**



1. A torsional oscillation damper, comprising:

a primary part;

a secondary part rotatable with respect to the primary part;

spring means disposed tangentially between the primary part and the secondary part for resiliently connecting the primary part with the secondary part;

friction-applying means positioned between the primary part and the secondary part for damping torsional oscillations in dependence on a rotational speed; and

actuating means so acting on the friction-applying means that a damping action decreases with increasing rotational speed, said actuating means including at least one actuator connected to a centrifugal governor and conjointly rotating with the primary or secondary parts, with the centrifugal governor acting on the friction-applying means in axial direction.

5,839,963
PLAY APPARATUS FOR CHILDREN'S PLAYGROUNDS OR THE LIKE

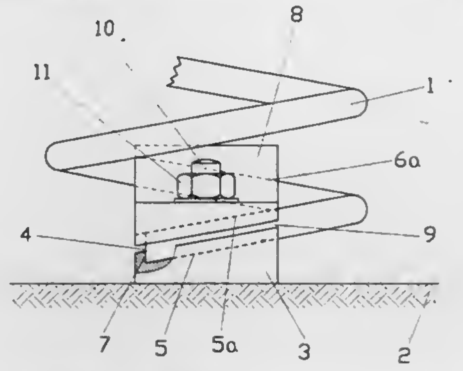
Hans-Walter Zingel, Mogendorf, and Manfred Plugge, Finnentrop, both of Germany, assignors to ABC-Team Spielplatzgeräte GmbH, Ransbach-Baumbach, and Thema-Federn GmbH & Co. KG, Finnentrop, both of Germany

Filed Aug. 28, 1997, Ser. No. 921,989

Claims priority, application Germany, Aug. 29, 1996, 196 34 945.1

Int. Cl.⁶ A63G *13/08*

U.S. Cl. 472—104 **8 Claims**



1. A play apparatus for children's playgrounds or the like, the apparatus comprising a helical spring having a cross-section, an inclination and first and second ends, the first end of the helical spring being perpendicularly secured to a firm base, a support member adapted to support a user thereon being attached to the second end of the helical spring, a base plate being mounted at least one of between the first end of the helical spring and the base and between the second end of the helical spring and the support member, wherein the base plate has two grooves with a sector-shaped cross-section corresponding to the cross-section of the helical spring, the grooves being arranged offset and spaced from each other on a level of half of the inclination of the helical spring, further comprising a clamping plate mounted so as to be clamped against the base plate, the clamping plate also having two grooves corresponding to and arranged opposite the grooves of the base plate, wherein the end of the helical spring is received essentially without deformation in the grooves between the base plate and the clamping plate.

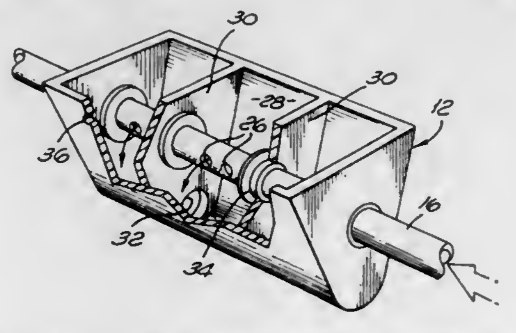
5,839,964
WATER TOY RELEASE MECHANISM

Elliot Rudell, Torrance; George Foster, Long Beach, and Joseph Cernansky, Palos Verdes Estates, all of Calif., assignors to Elliot A. Rudell, Torrance, Calif.

Filed Mar. 3, 1997, Ser. No. 808,476

Int. Cl.⁶ A63G *21/18*

U.S. Cl. 472—117 **13 Claims**



1. A water toy that periodically dumps a volume of water provided by a source of water, comprising:

a stand that includes a center bar which has an opening in fluid communication with the source of water; and,

a trough that is pivotally connected to said center bar said trough having a cavity that receives water which flows through said opening of said center bar until the water reaches a certain level, wherein said cavity is offset from said center bar so that said trough automatically pivots about said center bar to release a volume of water.

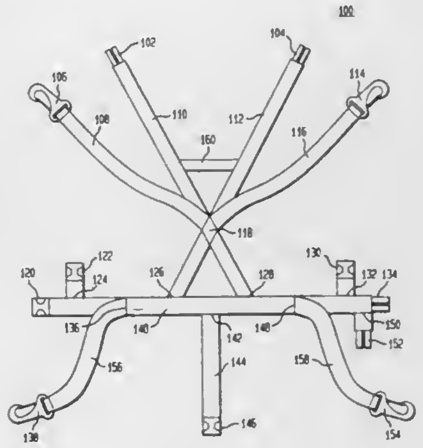
5,839,965
CHILD SWING HARNESS

Lora Mullins, 1589 Windsor Dr., Charleston, W. Va. 25311

Filed Dec. 8, 1997, Ser. No. 986,995

Int. Cl.⁶ A63G *9/00*

U.S. Cl. 472—118 **19 Claims**



1. A child swing harness for supporting a child on a swing, the swing having a swing seat and a first swing line and a second swing line wherein the swing seat is suspended by the first swing line and the second swing line, comprising:

a waist strap having a front, back, first side, second side, and a means for attaching and removing said waist strap around the child's waist such that when said waist strap is placed around the child's waist, said front of said waist strap adapted to locate in the child's front, said back of said waist strap adapted to locate in the child's back, said first side of said waist strap adapted to locate at the child's side, and said second side of said waist strap is located at the child's other side;

a first shoulder strap having a first front end and a first back end, said first front end connected to said front of said waist strap, said first back end connected to said back of said waist strap, such that when the child swing harness is placed on the child, said first shoulder strap runs from the child's front to the child's back over a first shoulder of the child;

a second shoulder strap having a second front end and a second back end, said second front end connected to said front of said waist strap, said second back end connected to said back of said waist strap, such that when the child swing harness is placed on the child, said second shoulder strap runs from the child's front to the child's back over a second shoulder of the child;

a swing stabilizer strap having a front end, a back end and a means for attaching and removing said swing stabilizer strap under the swing seat, said front end connected to said front of said waist strap, said back end connected to said back of said waist strap, such that when the child swing harness is placed on the child, said swing stabilizer strap runs from the child's front to the child's back under the swing seat;

a first top stabilizer having a first top harness end and a first high connection means for connecting said first top stabilizer to the first swing line at a first high connection point, said first top harness end connected to said first shoulder strap; and

a second top stabilizer having a second top harness end and a second high connection means for connecting said second top stabilizer to the second swing line at a second high connection point, said second top harness end connected to said second shoulder strap.

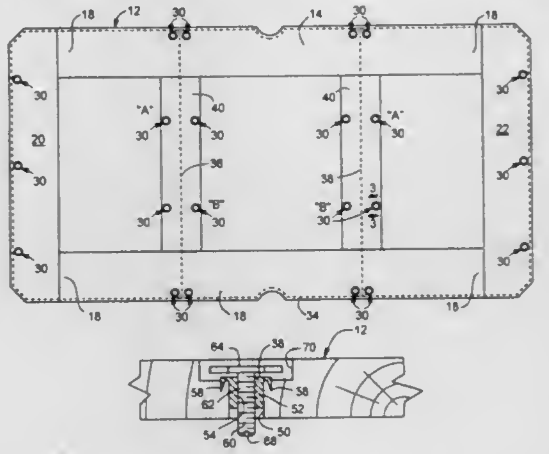
5,839,966
SLATE LEVELING SYSTEM FOR A BILLIARD TABLE

Marvin Eisenhauer, Antioch, Ill., and William R. McCormick, Kenosha, Wis., assignors to Brunswick Bowling & Billiards, Bristol, Wis.

Filed Sep. 29, 1997, Ser. No. 939,312

Int. Cl.⁶ A63J *3/00*

U.S. Cl. 473—29 **12 Claims**



1. A billiard table comprising:

a base frame adapted to be supported above an underlying terrain by legs, said base frame having an upper, top plate of generally rectangular configuration;

a slate bed made up of at least two slate sheets with planar upper surfaces and in generally side by side, abutting relation and overlying said top plate;

a plurality of nuts secured to said top plate at predetermined locations thereon; and

a plurality of leveling screws, one for each nut, each leveling screw including a threaded shank threadably received in the associated nut, and a radially outward directed flange at one end of the shank at the interface of said top plate and said slate sheets and engaging one of said slate sheets;

whereby through rotation of said leveling screws, the corresponding slate sheet may be selectively raised, lowered or tipped to cause said planar surfaces to be co-planar in a perfectly horizontal plane.

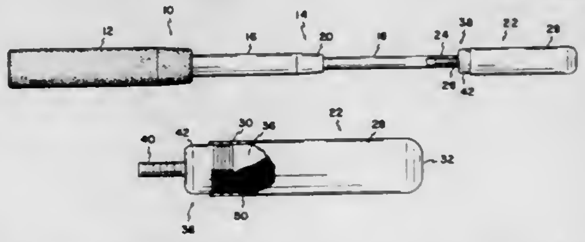
5,839,967
IMPACT BATON HAVING FREE-FLOW MATERIAL AND METHODS THEREOF

Douglas A. Moe, Appleton, Minn., assignor to Baton Kinetics Incorporated, Appleton, Minn.

Filed Mar. 3, 1997, Ser. No. 808,475

Int. Cl.⁶ F41B *15/02*

U.S. Cl. 473—47.2 **15 Claims**



5. An impact baton for use in law enforcement to induce a fluid shock wave, the baton comprising:

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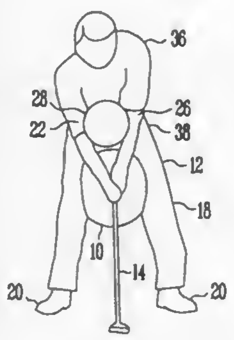
(a) a handle adapted to allow for gripping by a user;
(b) a striking member in extension from said handle; and
(c) a tip removably mounted to said striking member; said tip including:
  (i) a housing having a wall and first and second opposite ends defining a cavity; said first end being closed, and said second end being selectively openable and closable; said cavity having a first volume;
  (ii) a connector including a housing-engaging end and an opposite, baton-engaging end; said connector including:
    (A) a first threaded attachment at said housing-engaging end constructed and arranged to secure said connector to said housing at said second end of said housing and close said second end; and
    (B) a second threaded attachment at said baton-engaging end constructed and arranged to secure said connector to said striking member; and
  (iii) a quantity of dense, flowable, particulate material within said cavity; said quantity only occupying a partial amount of said first volume of said cavity.

10. An impact baton according to claim **5**, wherein:
(a) said handle is axially aligned with said striking member.

5,839,968
CLUB SWING TRAINING METHOD AND APPARATUS THEREFOR

Frank A. Latella, Wilton, Conn., assignor to TheraGolf, Ltd., White Plains, N.Y.
Filed Jan. 16, 1996, Ser. No. 585,094
Int. Cl.⁶ A63B *69/36*
U.S. Cl. 473—219 **36 Claims**

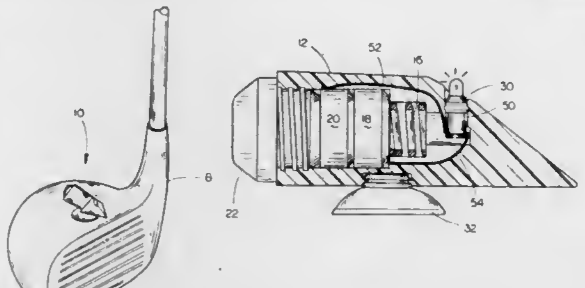


32. Training apparatus for training for a sport requiring swinging of an elongated sports implement gripped between a player's hands while standing upright, the sports implement being swung backwardly in a backswing motion and forwardly in an opposed downswing motion to project a projectable object in a forward direction with respect to the player, the backswing motion being executed with a shifting of weight from one foot to the other and the downswing motion being executed with a shifting of weight back to the one foot, the training method comprising repeated performance by a trainee of at least one swing drill, the at least one swing drill including execution of the following steps:
  a) gripping a swingable elongated training implement between the hands;
  b) gripping a first body spacer object between the legs to steady the lower body during the swing drill;
  c) gripping a second body spacer object between the arms to help position the training implement during the swing drill; and
  d) swinging the training implement in a backswing motion and an opposed downswing motion to simulate the required sports swing with a shifting of weight from one foot to the other and back to the one foot;

wherein each of steps b) and c) is executed, either separately or together, while executing step d) which training apparatus comprises:
  i) a first body spacer object grippable between the legs;
  ii) a second body spacer object grippable between the elbows; and
  iii) instructional material regarding the training method.

5,839,969
GOLF SWING TRAINING DEVICE

Mark A. Klouda, 1214 Wright Ave., Sioux City, Iowa 51109
Filed May 19, 1997, Ser. No. 858,641
Int. Cl.⁶ A63B *69/36*
U.S. Cl. 473—220 **4 Claims**

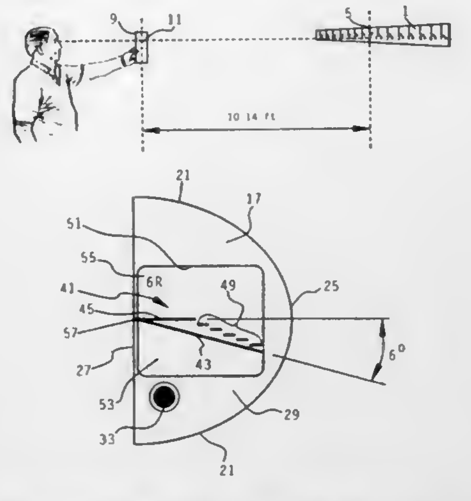


1. A golf club including a golf swing training device attached to the upper surface of the head of the club said device comprising:
  a housing having a pointed front end and a blunt rear end with an elongate body there between forming a shape that does not add significant weight and does not interfere with the aerodynamics of the golf club, an enlarged cylindrical cavity extending from said blunt end at least partially through said elongate body, a reduced diameter cylindrical cavity axially aligned with said enlarged cylindrical cavity and extending at least partially into said pointed front end, and a vertical slot formed in the pointed front end and intersecting with the reduced diameter cylindrical cavity;
  a light source disposed within said vertical slot for projecting a light upwardly from said vertical slot;
  a power source disposed within said enlarged cylindrical cavity;
  means for selectively placing said power source into electrical contact with said light source; and
  a suction cup affixed to the bottom of said housing for attaching the training device to the upper surface of the head of a golf club.

5,839,970
MALLET-TYPE PUTTER AND EYE PREDOMINANCE DETERMINING METHOD FOR GOLFERS

Samuel Lombardo, 12329 Tesoro Ct., San Diego, Calif. 92128
Filed Jan. 13, 1997, Ser. No. 782,347
Int. Cl.⁶ A63B *69/36;53/04*
U.S. Cl. 473—252 **16 Claims**

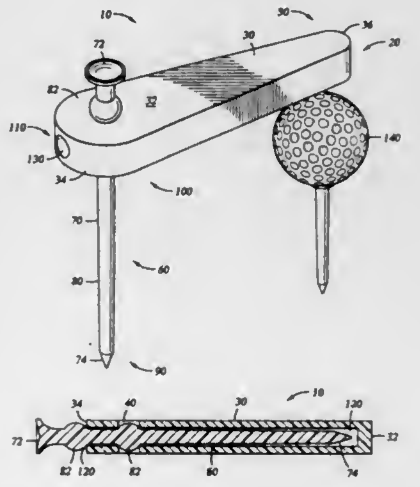
3. A putter alignment system, comprising:
  a) a mallet-type golf putter including a broad head comprised of a bottom surface for contact with the putting surface, said surface bounded by a pair of upstanding side walls, an upstanding rear wall, a planar front putting face with a center point marked thereon, and a top surface, all said surfaces and said walls joined together along their respective contacting marginal edges;
  b) an elongated shaft having a grip at one end and being joined to said putter head at the other end for the golfer to grasp and swing during the putting sequence;
  c) a long straight indicia line set on said top surface of said putter head, for viewing by the golfer during the putting sequence, said line beginning at the top of said center point of said club head and extending rearward toward the top rear of said club head, at an angle to the perpendicular of said club face that matches the golfer's degree of eye predominance, to align putts that are ten feet or longer in distance from the golf ball to the cup;



  d) a short straight indicia line, beginning at the top of said center point of said club head, perpendicular to the plane of said front putting face of said putter and extending rearward a shorter distance than said long straight indicia line, to align putts shorter than ten feet at a distance from the golf ball to the cup determined by the degree of eye predominance; and,
  e) a series of short alternating straight dashed lines beginning at the end of said short line and sweeping rearward in a curved arc to eventually become parallel with said long line, for aligning putts of intermediate distances, between ten feet and the distance from which the short indicia line would be used.

5,839,971
GOLF SWING TRAINING DEVICE

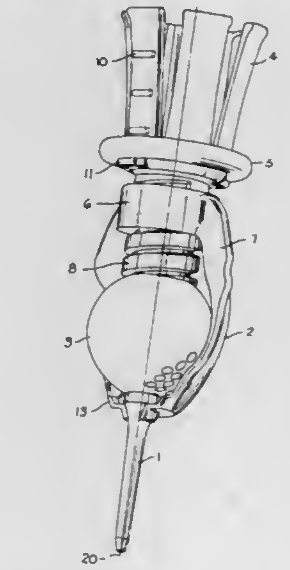
Joseph M. Downing, 14718 Hartaway La., Cypress, Tex. 77429
Filed Jun. 25, 1997, Ser. No. 882,325
Int. Cl.⁶ A63B *69/36*
U.S. Cl. 473—263 **7 Claims**



1. A golf swing training device comprising: swing restriction means for defining a golf swing area through which a proper golf swing may pass when striking a golf ball;
  said swing restriction means comprises a guide arm having a connecting end and adapted to extend directly over the golf ball in spaced proximal relation thereto;
  said guide arm positioned to provide sufficient clearance for a properly swung golf club to pass there below without striking said guide arm;
  focus means for focusing a user's eyes and concentration on the golf ball and the golf swing area;
  support means having a top end and a bottom end for maintaining the required relative position of said swing restriction means and said focus means to the golf ball;
  connecting means for removably and selectively connecting said guide arm to said top end;
  said guide arm including a connecting cavity extending vertically therethrough proximal said guide arm connecting end;
  said guide arm constructed of a resilient material;
  at least one enlarged portion on said support mean proximal said top end;
  said at least one enlarged portion having a cross sectional diameter that is slightly greater than the diameter of said connecting cavity;
  said connecting means comprising the insertion of said support mean through and the retention of said support mean within said guide arm connecting cavity;
  so that said support mean may be selectively positioned through said connecting cavity which, due to the resiliency of said guide arm, may be passed through said connecting cavity beyond said at least one enlarged portion; and
  so that said at least one enlarged portion maintains the relative position of said guide arm to said support mean above said enlarged portion thereby defining an operational position when so connected.

5,839,972
GOLF BALL AND TEE POSITIONING AND RETRIEVAL DEVICE

Cari A. Swanson, 612 Brae Burn Dr., Augusta, Ga. 30907
Continuation-in-part of Ser. No. 811,966, Mar. 5, 1997, abandoned. This application Oct. 24, 1997, Ser. No. 956,110
Int. Cl.⁶ A63B *57/00*
U.S. Cl. 473—286 **12 Claims**



1. A golfer's accessory for positioning and retrieving golf balls and tee, comprising in combination:
  a generally cylindrical shaped coupling unit with coaxially arranged clamping members arranged about a cylindrical axis for attachment about a handle of a golf club disposed at one end and a cylindrical tube with male threads on the outer surface disposed at an opposite end, said cylindrical tube having an end opening shaped to seat upon a golf ball, and
  a mating golf ball and tee receptacle unit having mating female thread disposed at one end within a cylindrical collar for mating coaxially with the threaded cylindrical tube along the cylindrical axis to move coaxially along the cylindrical axis, and a scoop shaped receptacle extending from the collar toward an opposite end presenting a substantially semi-spherical concave surface for receiving and retaining a golf ball removably thereinto with a diameter of the golf ball aligned with said cylindrical axis and said end opening of the

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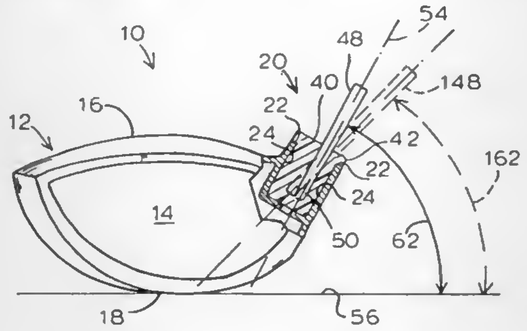
cylindrical tube whereby rotation of the mating receptacle unit will serve to retain the golf ball and clamp it in the scoop shaped receptacle.

5,839,973
GOLF CLUB HEAD WITH ENLARGED HOSEL

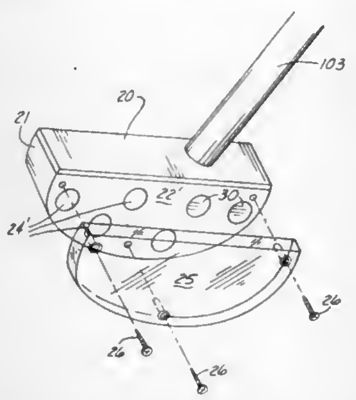
Al Jackson, 2590 Pioneer Ave., Vista, Calif. 92083
Continuation-in-part of Ser. No. 58,549, Aug. 19, 1996. This application Nov. 8, 1996, Ser. No. 745,215
Int. Cl.^{6} A63B *53/02*
U.S. Cl. 473—305 **15 Claims**



1. A golf club for use in striking a golf ball, the club comprising:
an elongate shaft having a mounting end;
a golf club head attached to the shaft, the head including a face for striking a golf ball and including a hosel for receiving the mounting end of the shaft; and
an insert operatively connected to the shaft and the head,
wherein the hosel includes a hollow interior for encompassing the mounting end of the shaft and receiving the insert for attaching the head to the shaft, the hollow interior being substantially larger than the mounting end of the shaft so that the face of the head can be selectively oriented relative to the shaft by changing the orientation of the shaft relative to the hosel.

5,839,974
GOLF PUTTER CONSTRUCTION

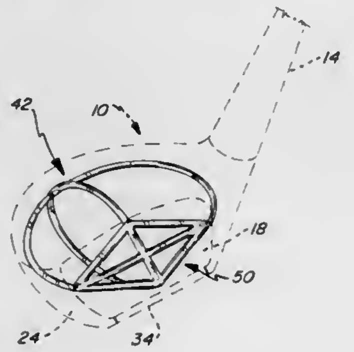
William F. McAllister, 8416 Westridge, Raytown, Mo. 64138
Filed Jun. 26, 1997, Ser. No. 883,612
Int. Cl.^{6} A63B *53/08*
U.S. Cl. 473—337 **1 Claim**



1. A golf putter construction for a putter head member having a putter head body provided with a generally vertical putter face having an upper portion and a lower portion wherein the putter construction consists of:
a plurality of cylindrical apertures formed in the generally vertical putter face and extending into the putter head body wherein said plurality of apertures are generally horizontally aligned along the lower portion of the vertical putter face;
a plurality of insert members dimensioned to be selectively received in said plurality of cylindrical apertures wherein each of said insert members comprise a generally cylindrical weighted element; and
an impact cover plate which is fixedly secured to the vertical putter face to captively secure selected insert members within selected apertures in the vertical putter face wherein said impact cover plate is transparent; whereby the user can visually determine the location of the selected insert members within the selected apertures in the vertical putter face without the necessity of removing the impact cover plate.

5,839,975
ARCH REINFORCED GOLF CLUB HEAD

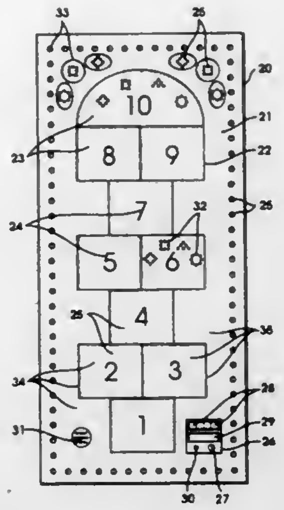
·Harry C. Lundberg, Ramsey, N.J., assignor to Black Rock Golf Corporation, Englewood, Colo.
Filed Oct. 15, 1997, Ser. No. 950,425
Int. Cl.^{6} A63B *53/04*
U.S. Cl. 473—346 **7 Claims**



1. A golf club head comprising:
a hollow body including a top wall, a sole plate spaced from and opposite said top wall, a striking plate interconnecting said top wall and sole plate along forward edges thereof, and an arcuate side wall interconnecting said top wall, sole plate and striking plate, said side wall defining toe, heel and rear portions, said top wall, side wall, striking plate and sole plate being integrated to define closure to said hollow body, a reinforcing ribbed primary superstructure with first and second arcuate ribs integral with said walls and sole plate, said first arcuate rib protruding inwardly and extending across said top wall, said rear portion of the side wall and said sole plate and having ends adjacent to upper and lower positions on said striking plate, said second arcuate rib comprised of an inwardly protruding rib extending along said side wall in a plane substantially perpendicular to a plane encompassing said first arcuate rib, said first and second arcuate ribs intersecting at said back portion of the side wall and said second arcuate rib having ends adjacent to heel and toe positions on said striking plate, and a base superstructure protruding inwardly from said striking plate interconnecting the ends of said first and second arcuate rib structures, all of said ribs having a depth dimension that is no greater than the width dimension.

5,839,976
GAME MAT APPARATUS

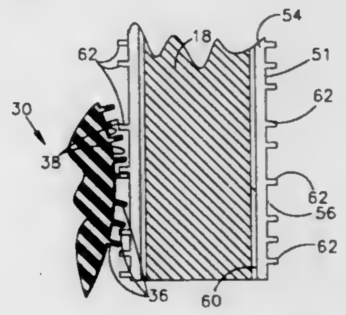
Elsie A. Darr, 2511 Lakin Ave., Great Bend, Kans. 67530
Filed Oct. 9, 1996, Ser. No. 731,065
Int. Cl.^{6} A63B *67/00*
U.S. Cl. 473—414 **18 Claims**



1. An electronic game apparatus comprising;
two layers of flexible, moisture resistant material affixed together forming a mat, said mat having a tapered edge and being of sufficient thickness as to lie flat, said mat comprising an upper surface having graphics and art work forming a game playing pattern;
a plurality of lights on the surface of the mat including at least some of said lights located around the surface of the mat;
an electronic control unit for selecting and performing different game functions secured to the mat, said electronic control unit including means for selectively operating and changing said lights for predetermined periods of time in response to different functions selected and performed by the electronic control unit, and an actuator button for causing the control unit to selectively operate said lights to indicate the game mat is activated;
said electronic control unit including a sound generating means for generating sounds and music in response to the different functions selected and performed by the electronic control unit;
said electronic control unit including means for input, analyzing, and reporting information received in the electronic control unit in response to different functions selected and performed by the electronic control unit; and
said electronic control unit including means for indicating players and player's scores in response to different functions selected and performed by the electronic control unit.

5,839,977
APPLIQUE FOR A HOCKEY STICK

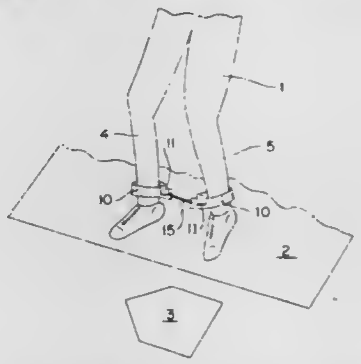
Alexander M. Maurer, and Richard A. Maurer, both of 13075 Portsmouth Dr., Carmel, Ind. 46032
Filed Jun. 26, 1995, Ser. No. 494,417
Int. Cl.^{6} A63B *67/00*
U.S. Cl. 473—446 **15 Claims**



12. An applique for placement on a hockey stick for improving the engagement of the hockey stick blade with a game piece, said game piece having a cylindrical vertically extending peripheral surface, said surface having an orderly array of recesses therein, said applique comprising
(1) a base member having a first surface and a second surface,
(2) means for adhesively attaching the second surface to the hockey stick blade, and
(3) an ordered array of substantially non-deforming protrusions extending above the first surface for engaging the game piece surface,
wherein the protrusions are generally hemispherical in shape, and are sized for engaging the recesses in said game piece surface.

5,839,978
BASEBALL TRAINING DEVICE FOR PROPER HITTING MOVEMENT SEQUENCE

Matthew J. Evangelist, 1236 Harrison St., Philadelphia, Pa. 19124
Continuation of Ser. No. 647,305, May 9, 1996, abandoned. This application Jun. 24, 1997, Ser. No. 881,669
Int. Cl.^{6} A63B *69/40*
U.S. Cl. 473—458 **3 Claims**



1. A baseball training device adapted to be secured around a user's ankles, said training device comprising:
a pair of straps,
each strap being defined by an elongated main section said tab section being integral with one end of and substantially perpendicular to said main section, and a tab section,
each said main section having a first fastener portion attached adjacent its other end,
each said tab section a second fastener portion complementary to said first fastener portion and attached thereof;
a resilient band having opposite ends,
each of said ends being secured respectively to the other end of a main section.

5,839,979
BAT FOR BALL GAME

Nicolas De Genty, 9 rue des Roses, 25460 Etupes, France
PCT No. PCT/FR93/00874, § 371 Date May 11, 1994, § 102(e) Date May 11, 1994, PCT Pub. No. WO94/07571, PCT Pub. Date Apr. 14, 1994
PCT Filed Sep. 13, 1993, Ser. No. 240,723
Claims priority, application France, Oct. 2, 1992, 92 12111
Int. Cl.^{6} A63B *49/00*
U.S. Cl. 473—464 **11 Claims**

1. A bat, for playing a ball game, comprising:

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a unitary single piece elastic sleeve being closed at one end thereof and open at the other end, for insertion of a player's hand therein, and having front and back sides for respectively overlying a front and back of a player's hand when inserted in said sleeve;

said front and back sides of said sleeve both having a substantially planar central portion, defining a striking surface, and a peripheral portion integrally formed with said central portion, the peripheral portion of each side being connected to the peripheral portion of the other side along the entire periphery thereof except for at the open end of said sleeve;

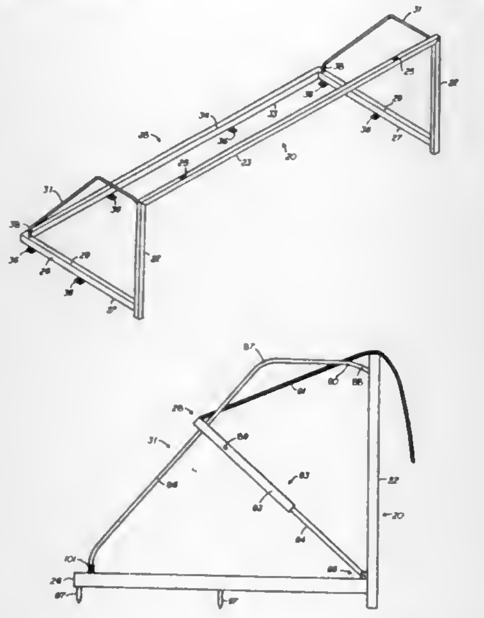
said central portions being more rigid than said peripheral portions, so that when a player's hand is inserted in said sleeve, said peripheral portions are resiliently stretched, and said sleeve grips such a player's hand for retaining such a player's hand in said sleeve, and said central portions remain substantially planar;

wherein a depression in an inner surface of said front side of said sleeve, said depression being sized and shaped to at least partially receive a player's palm therein to facilitate retention of a slayer's hand in said sleeve;

a free edge of the open end of said sleeve having an inwardly facing, relative to the sleeve, rounded, convex profile that, when a player's hand is inserted in said sleeve, faces the player's hand; and at least one of the sides of said sleeve has inwardly extending U-shaped folds formed therein, said folds are spaced inwardly from the periphery of said sleeve and are adjacent to and on either side of said open end of said sleeve, said folds converge as they approach said open end and releasable closure means are located adjacent to and outside of each fold, relative to said open end, to, when a player's hand is inserted in said sleeve, close said open end on the player's wrist and retain said sleeve on the player's hand.

5,839,980
SOCCER GOAL ASSEMBLY AND APPARATUS

Hossein Kendy, 2737 Brassie Dr., Glenview, Ill. 60025
Filed Jun. 6, 1997, Ser. No. 870,912
Int. Cl.^{6} A63B *63/00*
U.S. Cl. 473—478 **20 Claims**



1. A soccer goal, comprising:

a goal frame including a pair of vertical posts having upper and lower ends and a cross bar disposed between the upper ends of the vertical posts;

a housing connected to the lower ends of the vertical posts and extending substantially orthogonally from the vertical posts; and

a net frame pivotable between the goal frame and the housing, the net frame having a horizontal member and a pair of extensible arms extending from either end of the horizontal member to a pair of pivots attached to a structure selected from the housing and the goal frame;

wherein the length of each of the extensible arms changes as the net frame is pivoted between the goal frame and the housing.

5,839,981
PROJECTILE ACTIVATED WATER RELEASE GAME

Elliot Rudell, Torrance; Joseph Cernansky, Palos Verdes Estates, and George Foster, Long Beach, all of Calif., assignors to Elliot A. Rudell, Torrance, Calif.
Filed Sep. 2, 1997, Ser. No. 922,158
Int. Cl.^{6} A63B *63/08*
U.S. Cl. 473—480 **3 Claims**

1. A toy, comprising:

a pole;

a backboard attached to said pole;

a basketball hoop attached to said backboard;

a ball that is projected through said basketball hoop;

a container that contains a fluid;

a latch that engages said container, said latch moves between an engaged position and a disengaged position, wherein said container releases the fluid when said latch is in the disengaged position;

a ratchet that is moved to a released position to move said latch to the disengaged position; and,

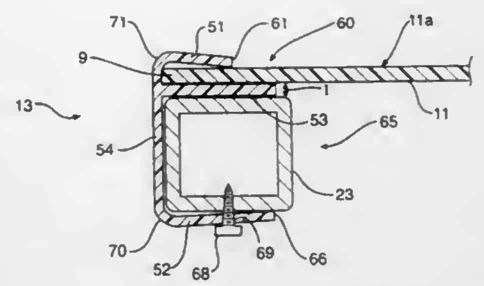
a trigger that is located adjacent to said basketball hoop and is actuated to move said ratchet to the released position when said ball is projected through said basketball hoop and engages said trigger.

5,839,982
STEEL FRAMED BASKETBALL BACKBOARD WITH PLASTIC RETAINER AND METHOD OF MAKING SAME

Clement F. Hying, Menomomee Falls; Randy R. Schickert, Kewaskum, and Ronald A. White, N. Prairie, all of Wis., assignors to Huffy Corporation, Miamisburg, Ohio
Continuation-in-part of Ser. No. 593,321, Jan. 31, 1996, abandoned. This application Nov. 1, 1996, Ser. No. 742,873
Int. Cl.^{6} A63B *63/08*
U.S. Cl. 473—481 **43 Claims**

1. A basketball backboard comprising:

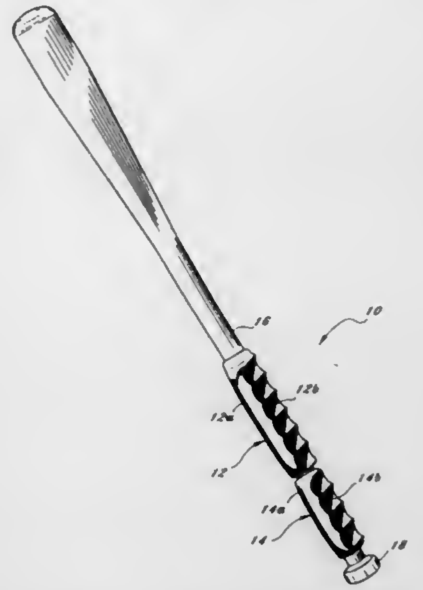
a rebound member having a rebound surface and a peripheral edge surrounding said rebound surface; and



a support member including a plastic retainer and a frame, said retainer having a cross section defining a first slot configured to receive a portion of said frame and a second slot configured to receive at least a portion of said peripheral edge of said rebound member.

5,839,983
ADJUSTABLE GRIPS FOR A BALL BAT

Robert M. T. Kramer, 1011 SW. 29th Ave., Fort Lauderdale, Fla. 33312
Continuation-in-part of Ser. No. 187,308, Jan. 25, 1994, abandoned, which is a continuation-in-part of Ser. No. 89,712, Jul. 9, 1993, abandoned. This application Dec. 29, 1995, Ser. No. 581,455
Int. Cl.^{6} A63B *59/06*
U.S. Cl. 473—568 **12 Claims**



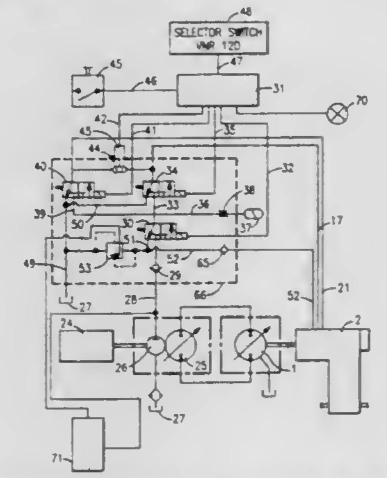
1. An adjustable grip having two independently adjustable members, one for each hand of a batter, for a ball bat for the alignment of the knuckles of each hand of the batter, for proper wrist roll and for increasing the gripping power of the batter and for reducing vibration, sting, and blistering on the hands of the batter, comprising:

a first resilient body member sized in length approximately at least a hand width for being grasped by one hand of said batter, said first body member having an inside cylindrical passage sized in diameter such that said first body member fits movably snug around an exterior surface of a lower hand-held portion of a ball bat, said first body member being essentially immovable when manually squeezed and having an exterior portion sized to fit the grip of a hand when batting, said first body member having an integrally formed frictional surface disposed on the exterior portion for increasing gripping power between the hand and the first body member exterior portion, said first body member having a continuous longitudinal raised straight surface portion for knuckle alignment integrally formed as part of said exterior surface of said first body member, said longitudinal raised surface portion extending between a first end and a second end of said first body member, said longitudinal raised portion engageable by all four fingers of one hand when said first body member is grasped by one hand; and

a second resilient body member sized approximately in length at least a hand width for being grasped with the other hand of the batter, said second body member including a cylindrical channel longitudinally disposed therethrough, the diameter of said second body member channel being sized such that said second body member fits movably snug around the exterior surface of the lower hand-held portion of a ball bat, said second body member being essentially immovable when manually squeezed and including an exterior portion having an integrally formed frictional surface disposed on the exterior portion to insure frictional contact between the hand and the exterior surface of said second body member, said second body member having a longitudinal raised straight surface portion for knuckle alignment integrally formed as a portion of an exterior surface of said second body member, said second body member longitudinal raised surface portion extending between a first end and a second end of said second body member, said second body member longitudinal raised portion engageable by all four fingers of the hand when said second body member is grasped by the hand, whereby the first body member and the second body member are movable independently of each other upon said ball bat for adjusting the grip to the batter for each hand, independent of the other hand.

5,839,984
FAILSAFE BRAKE SYSTEM FOR A MOTOR VEHICLE, IN PARTICULAR FOR A HYDROSTATIC CONSTRUCTION MACHINE

Egon Mann; Helmut Eymüller; Eduard Heilig, and Jürgen Legner, all of Friedrichshafen, Germany, assignors to ZF Friedrichshafen AG, Friedrichshafen, Germany
PCT No. PCT/EP95/02581, § 371 Date Jan. 2, 1997, § 102(e) Date Jan. 2, 1997, PCT Pub. No. WO96/01383, PCT Pub. Date Jan. 18, 1996
PCT Filed Jul. 4, 1995, Ser. No. 765,881
Claims priority, application Germany, Jul. 6, 1994, 44 23 651.4
Int. Cl.^{6} F16H *61/12;47/04*
U.S. Cl. 475—83 **14 Claims**



1. A drive system for a motor vehicle having a prime mover (diesel motor **24**), a hydrostatic gear comprising a variable displacement pump (**25**), a variable displacement motor (**1**), a feed pump (**26**) and an electro-hydraulic transmission control via gearshift valves (**34**, **40**) for changing gears of the drive system, and a brake switching valve (**30**) for actuating a brake of a powershiftable transmission;

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wherein said brake switching valve (**30**) is connected by gearshift lines (**33**, **39**) with said gearshift valves (**34**, **40**), and when said brake switching valve (**30**) is in a first switching position a accumulator (**37**) is filled with hydraulic fluid and when said brake switching valve (**30**) is in a second switching position a connection is made from said accumulator (**37**) to a pressure chamber (**20**) of the brake (**14**).

5,839,985
DIFFERENTIAL APPARATUS HAVING A THRUST WASHER

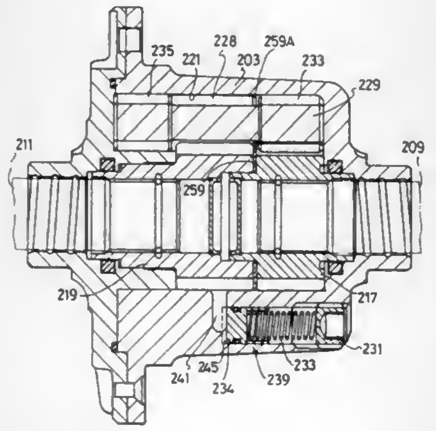
Masao Teraoka, Tochigi-ken, Japan, assignor to Tochigi Fuji Sangyo Kabushiki Kaisha, Japan

Filed Aug. 17, 1994, Ser. No. 291,778

Claims priority, application Japan, Aug. 18, 1993, 5-204263; Aug. 20, 1993, 5-206344

Int. Cl.^{6} F16H *48/26*

U.S. Cl. 475—90 **15 Claims**



1. A differential apparatus, comprising:
a differential casing rotatable by an external power;
a first shaft rotatably supported by said differential casing;
a second shaft rotatably supported by said differential casing;
a first side gear formed integrally and rotatable with said first shaft within said differential casing;
a second side gear formed integrally and rotatable with said second shaft within said differential casing;
a body of viscous fluid filling said differential casing;
a helical pinion gear assembly having a first pinion pair of a first helical pinion gear and a second helical pinion gear rotatably fitted in a first pinion housing hole and a second pinion housing hole, respectively both said first and second pinion housing holes formed in said differential casing, said helical pinion gear assembly being geared between said first and second side gears within said differential casing for generating a differential limiting force by gearing between said helical pinion gear assembly and said first and second side gears, as the viscous fluid is pressured and circulated within said differential casing by a gear pumping action of said helical pinion gear assembly caused by a differential motion between said first and second side gears, said first helical pinion gear being formed with a first gear portion in mesh with said first side gear, a second gear portion, and an intermediate opening portion formed between the first and second gear portions, said second helical pinion gear being formed with a third gear portion in mesh with the second gear portion of said first helical pinion gear and said second side gear; and
a splitting washer fixed to a groove formed in said second helical pinion gear, at a boundary between a part of the third gear portion thereof in mesh with said second side gear and another part of the third gear portion in mesh with the second gear portion of said first helical pinion gear.

5,839,986
DIFFERENTIAL DEVICE WITH DISCONNECT

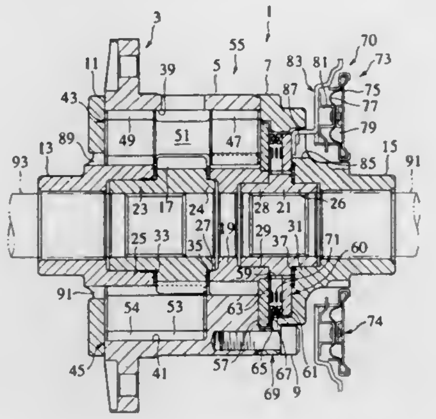
Nobushi Yamazaki, Tochigi-ken, Japan, assignor to Tochigi Fuji Sangyo Kabushiki Kaisha, Japan

Filed Jul. 15, 1997, Ser. No. 893,606

Claims priority, application Japan, Jul. 23, 1996, 8-193497; Aug. 30, 1996, 8-230576

Int. Cl.^{6} F16H *48/10;* **B60K** *23/08*

U.S. Cl. 475—230 **11 Claims**



1. A differential device comprising:
a differential case rotated by driving force of an engine, into which a first axle shaft and a second axle shaft are inserted coaxially with a rotational axis thereof;
a differential gear mechanism located in said differential case, and having a first side gear located coaxially with said rotational axis and a second side gear located coaxially with said rotational axis and connected to said second axle shaft to rotate together therewith, the differential gear mechanism distributing the driving force of the engine inputted through said differential case between said first and second side gears;
a sleeve located in said differential case and connected to said first axle shaft to rotate together therewith;
a connecting mechanism located in said differential case and connecting said first side gear and said sleeve in such a way that disconnecting is possible, the connecting mechanism not transmitting rotation of said first side gear to said sleeve in a first state where said first side gear and said sleeve are separated, and transmitting the rotation of said first side gear to said sleeve in a second state where said first side gear and said sleeve are connected; and
an operating mechanism operating said connecting mechanism and switching said connecting mechanism between said first state and said second state.

5,839,987
CONTROL SYSTEM FOR CHANGING THE TIME PERIOD AT WHICH TORQUE IS INCREASED AS A FUNCTION OF THE TIME PERIOD AT WHICH A CLUTCH IS DISENGAGED

Kazutomo Sawamura; Hisashi Igarashi; Yoshiharu Saito, and Kenichiro Ishii, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

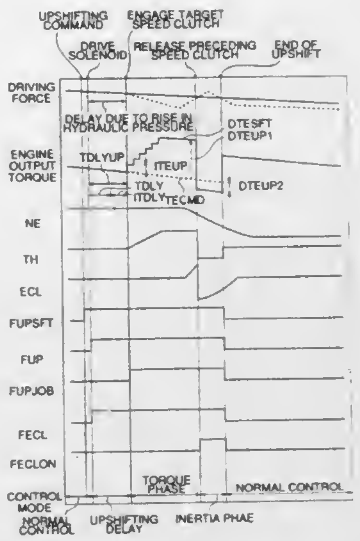
Filed Apr. 28, 1997, Ser. No. 848,579

Claims priority, application Japan, Apr. 30, 1996, 8-132775

Int. Cl.^{6} F02D *41/04*

U.S. Cl. 477—107 **6 Claims**

1. A control system for an internal combustion engine for an automotive vehicle, said engine having an automatic transmission having a plurality of speed clutches, and engine output torque-increasing means operable during an upshift of said automatic transmission, for increasing output torque of said engine so as to reduce a shock generated during said upshift, the control system comprising:



measuring means for measuring time periods over which respective ones of said speed clutches of said automatic transmission have been disengaged; and
timing-changing means for changing timing of increasing said output torque of said engine during said upshift of said automatic transmission, based on one of said time periods measured by said measuring means over which one of said speed clutches of said automatic transmission to be selected for said upshift has been disengaged.

5,839,988
CONTROL SYSTEM OF AUTOMATIC TRANSMISSION

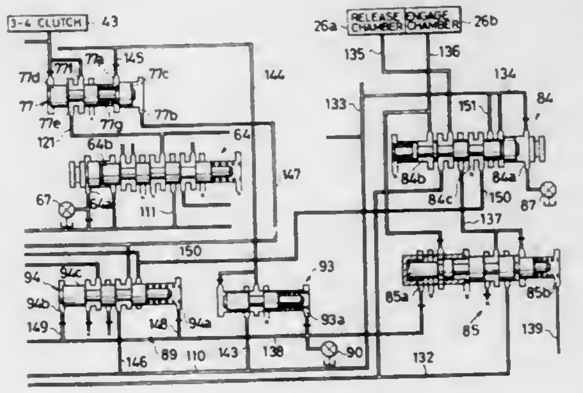
Toshihisa Marusue, Hiroshima; Takuji Fujiwara; Kazunori Enokido, both of Hiroshima-ken; Tatsutoshi Mizobe, Hiroshima; Hiroaki Yokota, Higashi-Hiroshima, and Shinya Kamada, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima-ken, Japan

Continuation-in-part of Ser. No. 213,790, Mar. 16, 1994. This application May 25, 1994, Ser. No. 248,895

Claims priority, application Japan, May 31, 1993, 5-154203

Int. Cl.^{6} F16H *61/04*

U.S. Cl. 477—130 **20 Claims**



1. A control system of an automatic transmission comprising:
a torque converter,
a lock-up clutch for directly connecting an input member and an output member of the torque converter,
a pressure control valve which changes a hydraulic pressure to modify an engaging force of the lock-up clutch and an engaging force of a frictional element,
a pressure regulator, disposed on an engaging passage which supplies a hydraulic pressure to engage said frictional element, for adjusting a primary pressure and producing an output hydraulic pressure corresponding to a control pressure introduced into a control port of the pressure regulator, and
a control pressure supply device for introducing the control pressure, which is controlled by the pressure control valve, into the control port of the pressure regulator.

5,839,989
CONTROL SYSTEM FOR THROTTLE RELEASED SHIFTING BY SYNCHRONOUS THROTTLE CONTROL OF AN INTERNAL COMBUSTION ENGINES

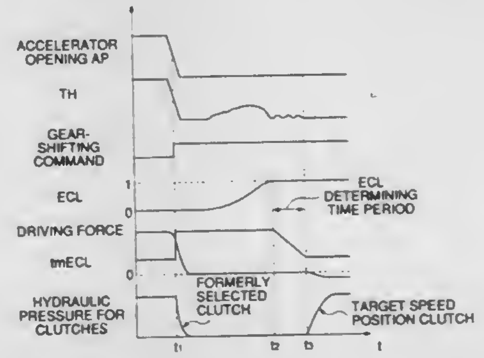
Yoshiharu Saito; Kazutomo Sawamura, and Tetsuya Ono, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 28, 1997, Ser. No. 848,518

Claims priority, application Japan, Apr. 30, 1996, 8-132776

Int. Cl.^{6} F16H *59/30*

U.S. Cl. 477—143 **4 Claims**



1. A control system for an internal combustion engine for an automotive vehicle, said vehicle having an accelerator pedal, and an automatic transmission, said automatic transmission having a plurality of speed clutches, said speed clutches each having an input side and an output side, said engine having an intake passage, and a throttle valve arranged in said intake passage, the control system comprising:
accelerator position-detecting means for detecting release of said accelerator pedal;
command-issuing means for issuing a command instructing gear shifting of said automatic transmission;
neutral position-setting means responsive to said command issued by said command-generating means, for setting said automatic transmission into a neutral position when said accelerator position-detecting means detects said release of said accelerator pedal;
throttle valve opening control means for controlling opening of said throttle valve such that rotational speed of said output side of one of said speed clutches to be selected for said gear shifting and rotational speed of said input side thereof become substantially equal to each other, when said automatic transmission is held in said neutral position by said neutral position-setting means; and
clutch control means operable upon detection that said rotational speed of said output side of said one of said speed clutches and said rotational speed of said input side thereof become substantially equal to each other, for engaging said one of said speed clutches.

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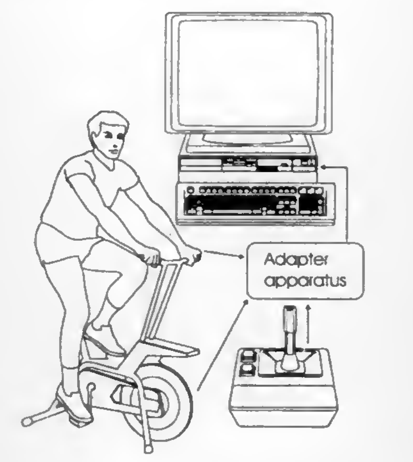
5,839,990
APPARATUS FOR CONNECTING AN EXERCISE BICYCLE TO A COMPUTER

Antero J. Virkkala, Pyörätie 14B, FIN-01280 Vantaa, Finland
Filed Sep. 13, 1996, Ser. No. 710,244
Claims priority, application Finland, Apr. 14, 1994, 941202
Int. Cl.^{6} A63B *69/00*
U.S. Cl. 482—8 **13 Claims**



1. A computer adapter apparatus for connecting a computer or video game system to an exercise bicycle, having two states such as idling and pedaling, said apparatus comprising:

input means for receiving input signals indicating the rate of physical exercise performed by a user of the exercise bicycle;

output means for communicating with a computer or video game system having an interface for a joystick, via that joystick interface; and

converter means for driving said output means; said converter means comprising an element having a resistance which varies in response to said input signal; said converter means being arranged for converting said two states of said exercise bicycle into three states of computer gaming, braking, coasting and acceleration, respectively corresponding to rear, middle and forwards positions of the joystick;

said converter element being non-linear, in such a way that:

input signals indicating pedaling said exercise bicycle at speeds lower than a certain cross-over value are converted to a resistance higher than the resistance of a joystick in its middle position, such resistance being equivalent to pulling the joystick backwards,

input signals indicating pedaling the exercise bicycle at a speed equal to this cross-over value are converted to a resistance equal to the resistance of a joystick in its middle position, and

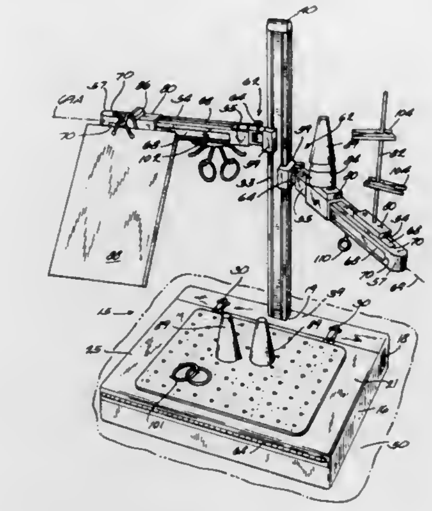
input signals indicating pedaling the exercise bicycle at speeds higher than a certain cross-over value are converted to a resistance lower than the resistance of a joystick in its middle position, such resistance being equivalent to pushing the joystick forwards

said converter means being configured such that the maximum speed of the exercise bicycle is a speed at which the apparatus outputs a resistance which is equal to the resistance of said joystick when said joystick is pushed fully forward; and

the cross-over speed at which the apparatus outputs a resistance equal to the resistance of a joystick in its middle position being less than one half of the maximum speed, making less than one half of the range of possible pedaling speeds equivalent to various degrees of braking and more than one half of the range of possible pedaling speeds equivalent to various degrees of acceleration.

5,839,991
PORTABLE OCCUPATIONAL THERAPY DEVICE

Timothy L. Hall, 3204 Sherman Rd., Oconto, Wis. 54143
Filed Nov. 12, 1996, Ser. No. 747,261
Int. Cl.^{6} A63B *26/00;21/00;* **A61H** *1/00*
U.S. Cl. 482—23 **18 Claims**



18. A therapy device comprising:

a base;

a standard supported by the base; and

at least one adjustable arm the at least one adjustable arm adjustable in at least two directions and having

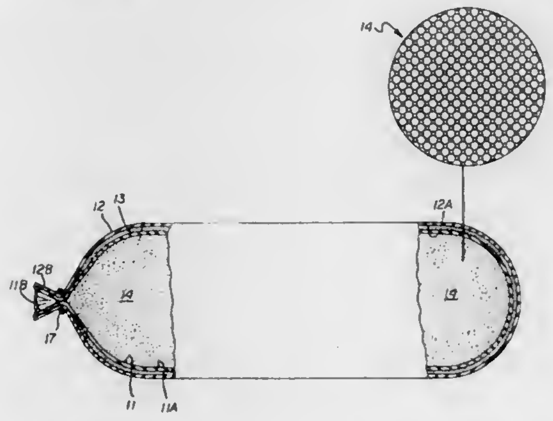
first and second ends, the first end having means for being slidably mounted to the standard, and

fastening means for removably securing occupational therapy exercise items, the fastening means positioned longitudinally along the at least one arm and covering at least 20% of the surface area of the at least one arm;

wherein the base, standard, and adjustable arm are connectable to form a device with which occupational therapy exercises can be performed.

5,839,992
RESILIENT WRIST SUPPORT AND THERAPEUTIC HAND EXERCISER

Lester Phillips, Houston, Tex., assignor to Gayla Industries, Inc., Houston, Tex.
Continuation-in-part of Ser. No. 678,660, Jul. 11, 1996, Pat. No. 5,718,655. This application Aug. 14, 1997, Ser. No. 911,295
Int. Cl.^{6} A63B *23/16*
U.S. Cl. 482—49 **5 Claims**



1. A resilient wrist support and therapeutic hand exerciser device for supporting the wrist of a person performing repetitive tasks with their wrist, hand and fingers, such as using a computer mouse and typing on a keyboard, and for exercising the muscles of the wrist, hand, fingers and forearm of the user, the device comprising:

an inner bladder formed of resilient material;

an outer bladder formed of resilient material superposed on said inner bladder;

a thin layer of powder disposed between an exterior surface of said inner bladder and an interior surface of said outer bladder to prevent said surfaces from sticking together, to reduce friction therebetween, and allow relative sliding movement between said inner and outer bladder surfaces; and

a mass of tiny spheres contained within said inner bladder having a particle size of from about 70 to about 140 U.S. standard mesh (about 0.0083" dia. to about 0.0041" dia.) and having the consistency and appearance of fine powder, said tiny spheres providing low resistance to relative particle movement by rolling on each other upon an increase or decrease in pressure applied to said device; wherein

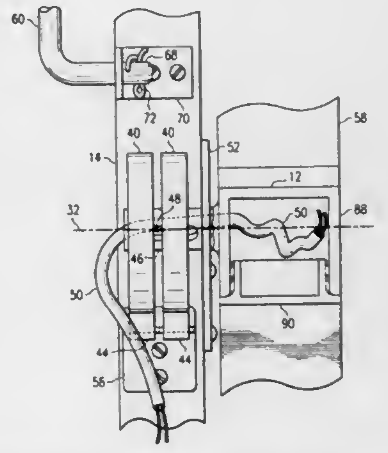
when placed on a flat surface beneath the wrist of a user, the weight of the user's wrist causes said device to deform slightly such that the underside of the device flattens against the flat surface and its top side engages and conforms to the shape of the underside of the wrist to form a comfortable cradle-like support; and

as the downward pressure of the wrist increases or decreases, said tiny spheres roll on each other and the resiliency of said bladders allows said device to maintain said cradle-like conforming engagement with the wrist, and as the wrist is moved relative to the flat surface, said tiny spheres roll on each other to allow said device to smoothly roll between the wrist and the flat surface and provide a smooth massaging effect on the wrist while maintaining said cradle-like supporting engagement therewith; and

when held in the palm of the user's hand and subjected to an alternating squeezing and releasing action, the resiliency of said bladders and said tiny spheres rolling on each other allow said device to be compressed and to resume its natural shape smoothly and quickly to exercise the muscles of the hand, fingers, wrist, and forearm of the user.

5,839,993
ARTICULATING STABILIZER FOR A FOLDING TREADMILL

Gary Tom Fox, Winona, Tex., assignor to Keys Fitness Products, Inc., Dallas, Tex.
Filed Jul. 8, 1997, Ser. No. 889,671
Int. Cl.^{6} A63B *22/02*
U.S. Cl. 482—54 **23 Claims**



1. A treadmill which folds for storage and unfolds for operation on a floor, the treadmill comprising:

a. a main frame structure;

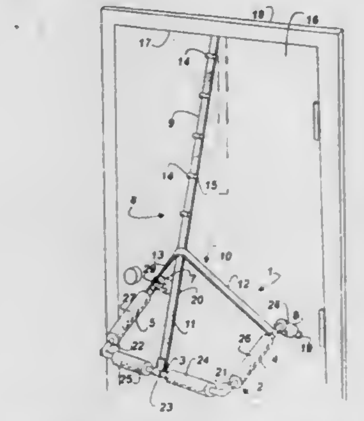
b. a pivoting frame which supports a conveyor and pivotally mounts to the main frame structure along a main pivot axis such that a user may pivot the pivoting frame between a substantially vertical position and a substantially horizontal position;

c. an articulating structure which connects to the main frame structure; and

d. an articulating mechanism which, upon moving the pivoting frame between the vertical position and the horizontal position, automatically articulates the articulating structure between a stored, retracted position and an extended position in which the treadmill is stabilized.

5,839,994
PORTABLE MUSCULATURE EXERCISING DEVICE

Steven D. Elbogen, 5059 Newport Ave., #104, San Diego, Calif. 92107
Filed Mar. 24, 1997, Ser. No. 823,521
Int. Cl.^{6} A63B *1/100*
U.S. Cl. 482—91 **8 Claims**



1. A musculature exercising device which comprises:

a U-shaped grab-bar having a central portion, and two parallel arms projecting in a common orthogonal direction from opposite ends of said central portion; and

a harness comprising a hanging tail having a free distal end said tail including protrusions spaced apart along a length of said tail and a proximal end, a yoke comprising at least two strap sections each of said sections being attached at one extremity to said proximal end of the tail, and at an opposite extremity to said grab-bar,

whereby when said tail is positioned over a closed door, one of said protrusions prevent said tail from sliding out from between the top edge of the door and the lintel of the door frame, thereby supporting said exercise device against said door.

5,839,995
MULTI-FUNCTIONAL HEALTH DEVICE

Ko-Chuan Chen, 7F-2, No. 95-8 Chang Ping Road Sec.1, Taichung, Taiwan
Filed Oct. 23, 1995, Ser. No. 546,965
Int. Cl.^{6} A63B *21/00;* **A61H** *1/00*
U.S. Cl. 482—92 **12 Claims**

1. The multi-exercise health apparatus for disabled people, the apparatus comprising:

a frame having a lower frame and an upper frame;

said frame supporting a plurality of exercise structure for exercising various parts of the user's body;

said lower frame being generally rectangular in shape with four corners, a front side, a back side, and a central reinforcement extending between the front side and the back side;

each corner of said lower frame having an upright extending generally upward to support said upper frame;

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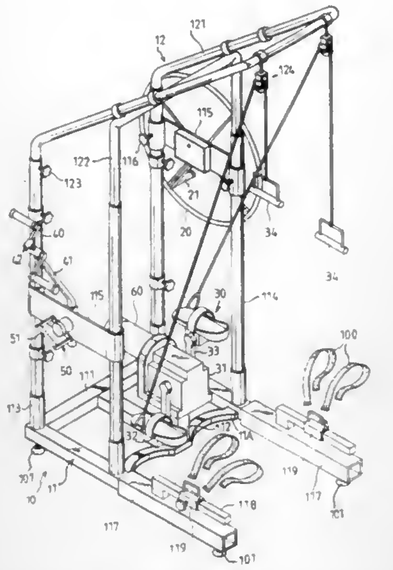
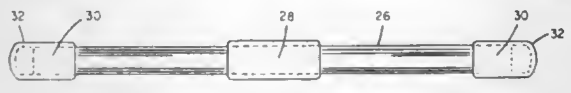


- a first cross bar adjustably mounted to a first front and back pair of said uprights to support at least one of said plurality of exercise structure at a selectable height;
- a second cross bar adjustably mounted to a second front and back pair of said uprights to support at least one of said plurality exercise structure at a selectable height;
- said upper frame comprising a first and a second U-shaped rod;
- each said U-shaped rod having a pair of free ends releasably engaged to a respective pair of said uprights located on said lower frame;
- said first U-shaped rod bent at its ends to allow said second U-shaped rod to support said first U-shaped rod;
- a wheelchair securing means located on the front side of said lower frame to secure a user's wheelchair into a position for accessing at least one of said plurality of exercise structure;
- said wheelchair securing means comprising a pair of extensions extending parallel from the front said of said lower frame; and
- each said extension having an L-shaped member on an upper surface, a retaining ring displacably secured to said L-shaped member, and at least one belt for releasably fastening a wheelchair to said retaining ring, whereby the user is able to engage at least one of said exercise structure from the wheelchair and the wheelchair is releasably secured between said pair of extensions.

5,839,996
DEVICE FOR PERFORMING EXERCISES

Uriah Ray Gooding, 1816 Northcliff Dr., Charlotte, N.C. 28216
Filed Feb. 12, 1997, Ser. No. 797,934
Int. Cl.^{6} A63B *21/06*

U.S. Cl. 482—106 **2 Claims**

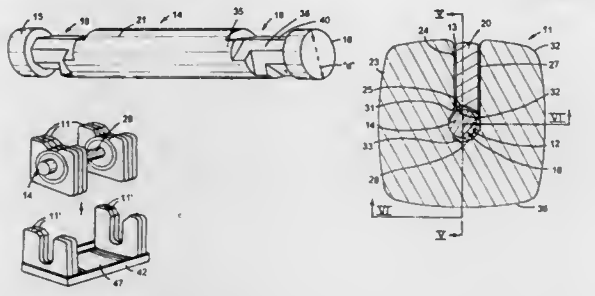


1. A device for performing exercises, comprising: a tubular pole having a central portion, intermediate portions and two end portions, the end portions each having an outer diameter; a gripping sleeve encircling the tubular pole between the intermediate portions; and a non-spherical end encapsulating member having an interior diameter and an exterior diameter frictionally and non-threadably engaging each of the two end portions, each member having a smooth, cylindrical hollow interior, a closed end and an open end, the open end of each member encapsulating an end portion of the tubular pole; and a weight held entirely within each encapsulating member interior between the closed end of the encapsulating member and the end of the tubular pole, wherein the weight height is less than the end encapsulating member interior diameter.

5,839,997
WEIGHT-LIFTING APPARATUS AND METHOD

Mark R. Roth, Holly; Jon D. Schiff, and Thomas M. Truran, both of St. Joseph, all of Mich., assignors to Premise Group LLC, St. Joseph, Mich.
Filed Jan. 22, 1998, Ser. No. 10,863
Int. Cl.^{6} A63B *21/075*

U.S. Cl. 482—107 **19 Claims**

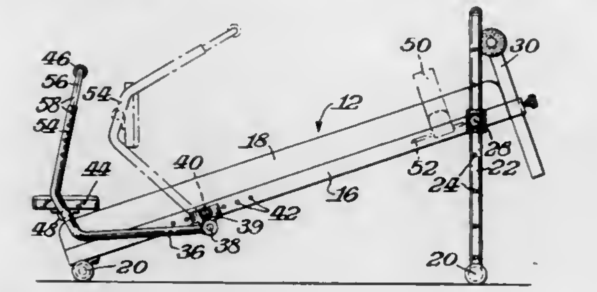


1. A dumbbell comprising:
- a plurality of paired weights, each of the paired weights having an axial hole and a transverse opening extending from the hole to a perimeter of the weight;
- a bar including a rotatable shaft, the shaft rotatably engaging the holes of the paired weights; and
- means on the opposing ends of the shaft for engaging selected pairs of weights as the shaft is rotated between corresponding selected angular positions and for disengaging non-selected pairs of weights as the shaft is rotated between the selected angular positions by allowing the shaft travel out of the openings of non-selected pairs of weights.

5,839,998
COMBINATION SLANT BOARD AND ABDOMINAL ROCKER

William T. Wilkinson, P.O. Box 73, Salem, N.J. 08079
Filed Sep. 18, 1996, Ser. No. 710,510
Int. Cl.^{6} A63B *23/02*

U.S. Cl. 482—140 **29 Claims**

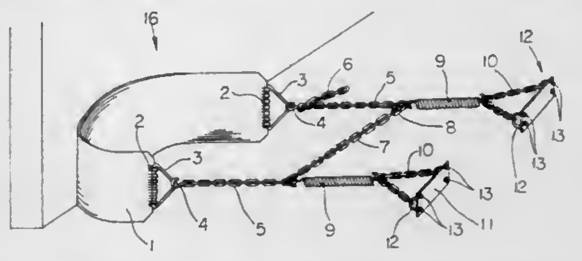


20. A combination exercise device comprising a slant board and an abdominal rocker, said slant board comprising a rigid body support having a first one end and a second other end, elevating structure connected to said first end for elevating said first end above said second end to incline said body support, said abdominal rocker being located at said second end, said abdominal rocker including an open frame made of rod type members including two base sections, each of said base sections pivoted to a different side of said slant board, said base sections being connected to each other by a rod type member having a grip section, said grip section and said base sections being pivotally movable along an arc, said rocker including a neck rest connected to said frame, said neck rest being separate and distinct from said body support, said neck rest being mounted on an elongated rod type member which is mounted between said base sections below said grip section, said neck rest being located within the arc resulting from the pivotal movement of said grip section and said base sections, and the radial distance from said grip section to the pivot location of said base sections to said slant board being greater than the radial distance from said pivot location to the outer edge of said slant board at said second other end wherein the user lies in a substantially supine position on said slant board, positions the user's neck on said neck rest, grips the grip section and performs abdominal exercises.

5,839,999
CALF AND FOOT EXERCISE DEVICE

Kenneth A. Pflugner, 55131 Willowcreek Dr., Mishawaka, Ind. 46545
Filed Mar. 24, 1997, Ser. No. 822,663
Int. Cl.^{6} A63B *21/02*

U.S. Cl. 482—146 **3 Claims**



1. A new and improved calf and foot arch exercising device comprising: a flexible belt having a first end and a second end, positionable around the lower back of the user and subjected to tension; a first stirrup securable around the first foot of said user by said tension; and a second foot stirrup securable around the second foot of said user by said tension; a first resilient counter-force tension mechanism connected between said first foot stirrup and said first belt end; a second resilient counter-force tension mechanism connected between said second foot stirrup and said second belt end; a first substantially non-elastic collapsible linkage connected between said first foot stirrup and said first belt end; a second substantially non-elastic collapsible linkage connected between said second foot stirrup and said second belt end; a first adjusting open hook end connected between said first belt end and said first collapsible linkage; a second adjusting open hook end connected between said second belt end and said second collapsible linkage; and a cross member having links; said cross member having a first end secured to said first collapsible linkage at a point closer to said first foot stirrup than to said first belt end; said cross member having an adjustable second end formed by an open link selectively located on any link of said links in said cross member, thus becoming said adjustable second end; said open link hooked to said second collapsible linkage at a point 90 degrees to a corresponding location on said first collapsible linkage thereby hooking said first collapsible linkage and said second collapsible linkage together to prevent said foot stirrups from spreading apart while said device is in use.

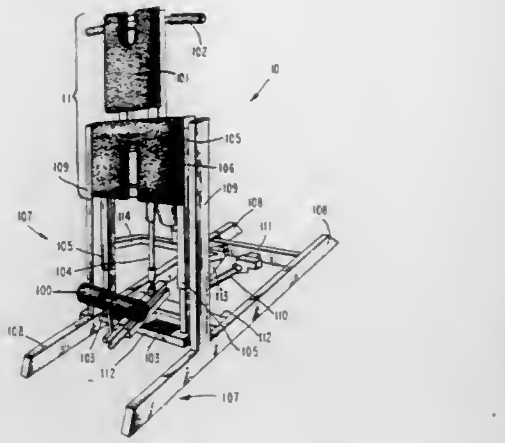
5,840,000

Patent Not Issued For This Number

5,840,001
THERAPY EXERCISE TABLE

Robert M. Schedel, 2405 W. 170th St., Torrance, Calif. 90504
Filed Mar. 24, 1997, Ser. No. 823,095
Int. Cl.^{6} A63H *1/02*

U.S. Cl. 482—142 **17 Claims**



1. A positionable therapeutic table arrangement comprising, in combination:
- a base;
- a platform rotatible mounted to said base, said platform having a pelvis support portion and an upper body support portion which may be rotated in tandem from at least a near vertical position to a horizontal position in relation to the floor upon which said therapeutic table is installed;
- a foot rest platform moveably supported below said pelvis support portion of said platform whereby said foot rest platform is positionable to near floor level for easy mounting by a user and thereafter said foot rest platform and user are vertically positionable in relation to said pelvis support portion of said platform;
- a leg-locking arrangement slidably mountable to said foot rest platform to secure the user to said platform for said vertical as well as any subsequent positioning of the user;
- platform positioning means whereby said platform may be rotated to a selected attitude from a near vertical through horizontal to a selected attitude and maintained securely at the preselected attitude;
- upper body support positioning means whereby said upper body support portion of said platform may be positioned from said selected attitude to a preselected distance away from the user whereby the user may perform a selected exercise, thereafter said upper body support may be repositioned to support the user in said preselected attitude whereafter said platform positioning means may be engaged to position the user back to the initial vertical position so that the foot rest may then be lowered and padded leg locking unclamped to allow the user to exit the device by stepping away without having to dismount from the selected, non-vertical position of the platform.

5,840,002
SUBSTANTIALLY RECTANGULAR-BOTTOMED CONTAINER, AND APPARATUS AND METHOD FOR MANUFACTURING SAME

Thomas W. Happ, Boswell, Ind., assignor to Stone Container Corporation, Chicago, Ill.
Filed Mar. 29, 1996, Ser. No. 625,412
Int. Cl.^{6} B31B *1/26;* B26D *3/08*

U.S. Cl. 493—399 **2 Claims**

1. A method for manufacturing a container deployable from a substantially flat, collapsed configuration to a substantially rectangular-bottomed configuration, said method comprising the steps of:
- supplying a web of paper material;
- forming the web into a continuous tube, wherein the tube is provided with a front panel portion, an opposing back panel portion, and two gussetted side panel portions between and interconnecting the front and back panel portions,
- the continuous tube having a longitudinal axis extending substantially parallel to a direction of travel of the continuous tube;
- scoring each of said gusseted side panel portions and said front and back panel portions with a first transverse score line, extending across the formed tube in a direction perpendicular to the longitudinal axis of the continuous tube for forming a peripheral edge of said substantially rectangular bottom upon

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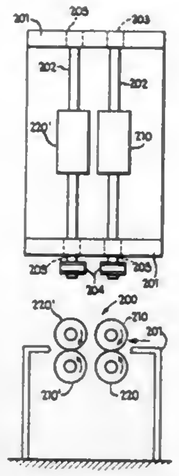
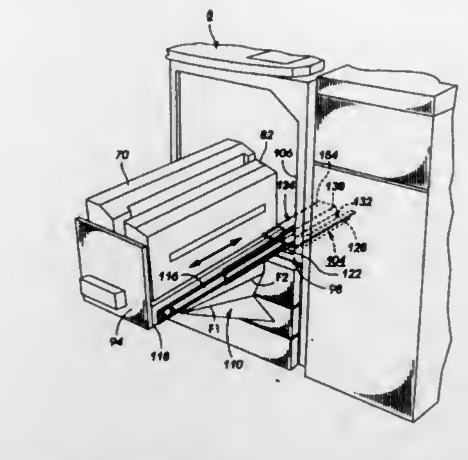




said deployment of a formed container, said first transverse score line being formed by pressing a scoring implement in a first direction into said front panel portion towards said back panel portion; and

scoring each of said gusseted side panel portions and said front and back panel portions with a second transverse score line, extending across the formed tube in a direction perpendicular to the longitudinal axis of the continuous tube substantially juxtaposed over said first transverse score line, at substantially the same longitudinal position along the formed tube as said first transverse score, said second transverse score line being formed by pressing a scoring implement in a second direction into said back panel portion towards said front panel portion, the second transverse score line being formed at a location along the bag forming path downstream from the location at which the first transverse score line is formed,

said congruent juxtaposed first and second transverse score lines serving to facilitate deployment of a formed said container from a substantially flat, collapsed configuration to a substantially rectangular-bottomed configuration;

severing the scored, continuous tube into discrete tube portions;

forming a gussetted pinch-bottom in each successive discrete tube portion to preliminarily form formed container blanks prior to articulation of the substantially rectangular bottom;

folding and sealing each successive formed container blank into a container.

5,840,003
STALLED SHEET FOLDING AND FLATTENING APPARATUS IN AN ELECTROSTATOGRAPHIC MACHINE

Murray O. Meetze, Jr., Rochester; Kenneth G. Christy, Webster; Arthur H. Kahn, Cohocton, and Thomas P. Lambert, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 11, 1997, Ser. No. 837,027
Int. Cl.^{6} B31B *1/26;* **B30B** *3/02*

U.S. Cl. 493—405 **9 Claims**

1. In a sheet handling machine having a frame, and a cut sheet handling system including a sheet path, a stalled sheet folding and flattening apparatus for reducing a sheet stalled between a withdrawable and a fixed component of the sheet handling system into a shape and size suitably enabling reliable removal of the stalled sheet through a relatively narrow gap between the withdrawable and fixed components of the sheet handling system, the stalled sheet folding and flattening apparatus comprising:

(a) a fixed component of the sheet handling system connected to the machine frame and having a first section of the sheet path;

(b) a withdrawable component of the sheet handling system mounted to the frame and having a sheet flattening side defining a relatively narrow gap between a fixed surface within the machine and said withdrawable component, said withdrawable component including a nip for gripping a trail end of a sheet stalled between the withdrawable component and the fixed component, and a second section of the sheet path, said second section adjoining said first section of the sheet path; and

(c) a sheet folding device mounted to said fixed component and including a generally U-shaped portion having a sheet contact compound surface for contacting and deflecting an edge of a sheet, stalled between the withdrawable component and the fixed component, into a first fold having a first fold line, when said withdrawable component while gripping the trail end of the stalled sheet is being pulled out of the machine, said sheet contact compound surface (i) defining a slot forming a part of said first section of the sheet path, and (ii) having a first radius of curvature defining a concave first surface for deflecting and folding an edge of the stalled sheet to form a first fold line, and a second radius of curvature defining a convex second surface for guiding the deflected and folded sheet out of said slot.

5,840,004
CUSHIONING CONVERSION MACHINE AND METHOD

Richard O. Ratzel, Westlake, Ohio, assignor to Ranpak Corp., Concord Township, Ohio

Continuation-in-part of Ser. No. 386,355, Feb. 8, 1995, which is a continuation-in-part of Ser. No. 337,929, Nov. 10, 1994, Pat. No. 5,607,383, which is a continuation-in-part of Ser. No. 326,782, Oct. 20, 1994, abandoned, which is a continuation-in-part of Ser. No. 279,150, Jul. 22, 1994, Pat. No. 5,593,376. This application Jun. 7, 1995, Ser. No. 484,000
Int. Cl.^{6} B31D *5/00*

U.S. Cl. 493—352 **22 Claims**

1. A cushioning conversion machine for converting a sheet-like stock material into a cushioning product; said machine comprising:

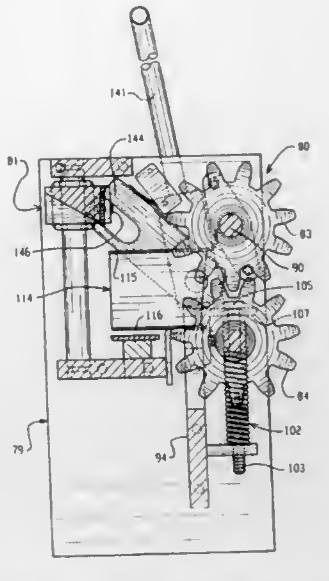
a forming assembly which forms the sheet-like stock material into a three-dimensional strip;

a housing defining a cutting zone through which the strip advances;

a feed assembly, positioned downstream of the forming assembly and at least partially enclosed within the housing, which advances the sheet-like stock material through the forming assembly and through the cutting zone; and

a manual cutting assembly, positioned downstream of the feed assembly, which cuts the strip into sections of a desired length;

wherein the cutting assembly includes a blade and a handle which moves the blade between a first position whereat the strip may advance through the cutting zone and a second position whereat the strip will be cut in the cutting zone;



wherein the housing encloses the blade of the cutting assembly and wherein the handle of the cutting assembly is positioned outside of the housing for manual manipulation; and

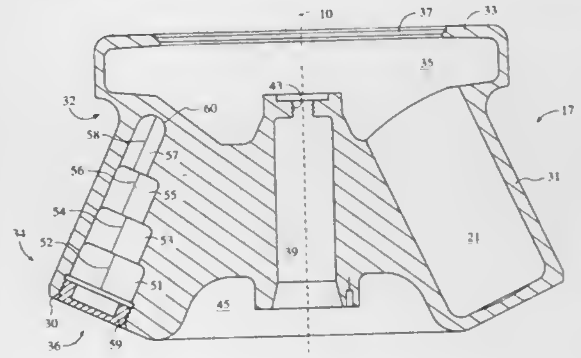
wherein the handle is mechanically coupled to the blade whereby movement of the handle from a first position to a second position translates into movement of the blade from its first position to its second position.

5,840,005
CENTRIFUGE WITH INERTIAL MASS RELIEF

Winston H. H. Lowe, Sunnyvale, and Thomas L. Johnson, Fremont, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation-in-part of Ser. No. 721,165, Sep. 26, 1996, abandoned. This application Jun. 11, 1997, Ser. No. 873,063
Int. Cl.^{6} B04B *5/02*

U.S. Cl. 494—16 **26 Claims**



1. A rotor for centrifugation of a sample container, the rotor comprising,

a mass of material having rotational symmetry about a central spin axis and a peripheral wall extending from an upper truncation level to an underside,

a plurality of holes for receiving the sample containers defined by orifices in the mass of material extending from the truncation level toward the underside, and

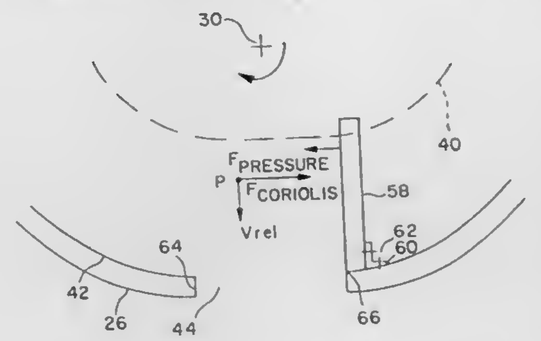
a plurality of relief zones defined by apertures in the mass of material extending from the underside toward the truncation level and terminating in a closed end facing the truncation level, the relief zones having end caps sealing the underside.

5,840,006
FEED ACCELERATOR SYSTEM INCLUDING ACCELERATING VANE APPARATUS

Woon Fong Leung, Norfolk, and Ascher H. Shapiro, Jamaica Plain, both of Mass., assignors to Baker Hughes Incorporated, Houston, Tex.

Continuation of Ser. No. 815,432, Dec. 31, 1991, abandoned. This application Aug. 20, 1993, Ser. No. 110,324
Int. Cl.^{6} B04B *1/20*

U.S. Cl. 494—53 **8 Claims**



1. A feed accelerator system for use in a centrifuge, the system comprising

a conveyor hub rotatably mounted about an axis substantially concentrically within a rotating bowl, the hub including an inside surface and an outside surface,

at least one helical blade mounted to the outside surface of the conveyor hub, the blade having a plurality of turns,

an accelerator secured within the conveyor and including a distributor having a distributor surface,

a feed pipe mounted substantially concentrically within the conveyor hub for delivering a feed slurry to the centrifuge, the feed pipe including a discharge opening, positioned proximate to the distributor surface,

at least one feed slurry passageway between the inside surface of the conveyor hub and the outside surface of the conveyor hub, and

a vane apparatus associated with the passageway and disposed between two adjacent turns of the helical blade, the vane apparatus which is substantially planar extends outwardly from the passageway relative to the axis and is disposed primarily along the trailing edge of the feed slurry passageway but remains open in the direction of rotation so as to direct feed slurry exiting the vane apparatus circumferentially in the direction of rotation.

5,840,007
DECANTER CENTRIFUGE FOR PRODUCING CAKE WITH REDUCED MOISTURE CONTENT AND HIGH THROUGHPUT

Woon-Fong Leung, Sherborn, and Ascher H. Shapiro, Jamaica Plain, both of Mass., assignors to Baker Hughes Incorporated, Houston, Tex.

Continuation of Ser. No. 594,989, Jan. 31, 1996, Pat. No. 5,695,442, which is a continuation-in-part of Ser. No. 468,205, Jun. 6, 1995, Pat. No. 5,643,169. This application Jun. 13, 1997, Ser. No. 874,187
Int. Cl.^{6} B04B *1/20;11/00*

U.S. Cl. 494—53 **16 Claims**

1. A decanter centrifuge comprising:

a bowl rotatable about a longitudinal axis, said bowl having a cake discharge opening at one end and a liquid phase discharge opening, said bowl having a cylindrical portion and an imperforate beach portion between said cylindrical portion and said cake discharge opening, a beach area being provided on an inner surface of said bowl at said beach portion;

a conveyor having at least a portion disposed inside said bowl for rotation about said longitudinal axis at an angular speed

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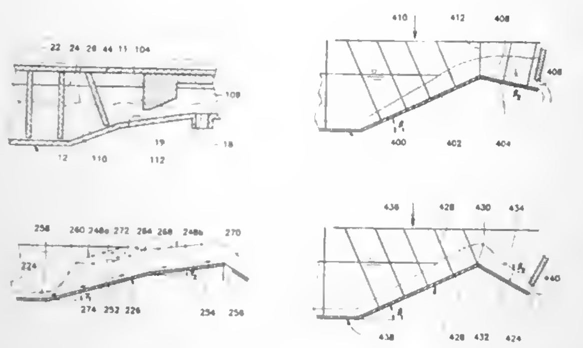


different from an angular rotational speed of said bowl, said conveyor including a helical screw disposed inside said bowl for scrolling a deposited solids cake layer along said inner surface of said bowl towards said cake discharge opening;

a feed element extending into said bowl and said conveyor for delivering a feed slurry into a pool inside said bowl; and

a flow control structure disposed inside said bowl in said beach area proximate to said cake discharge opening for impeding a flow of cake along said beach area towards said cake discharge opening to thereby produce cake with reduced moisture content,

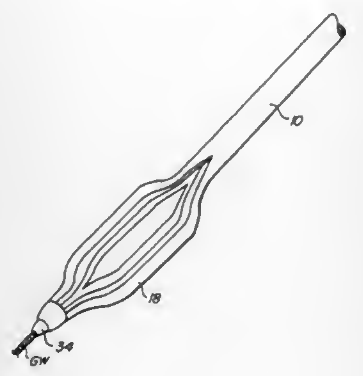
said beach area including a first section of a steep slope and a second section of a less steep slope for maintaining a high throughput of cake towards said cake discharge opening in opposition to the impedance provided by said flow control structure said second section being located between said first section and said cake discharge opening, said first section having a diameter which decreases at a first rate with axial displacement towards said cake discharge opening, said second section having a diameter which changes at a second rate with axial displacement towards said cake discharge opening, said second rate being less than said first rate.

5,840,008
RADIATION EMITTING SLEEVE CATHETER AND METHODS

Enrique J. Klein, and Aaron V. Kaplan, both of Los Altos, Calif., assignors to LocalMed, Inc., Palo Alto, Calif.

Filed Nov. 13, 1995, Ser. No. 555,457
Int. Cl.^{6} A61N ***5/00***

U.S. Cl. 600—3 **37 Claims**



1. A radiation-emitting device adapted for use in combination with a balloon catheter having a balloon at a distal end said device comprising:

structure which is adapted to be removably securable over the balloon and expansible upon balloon inflation, and wherein the balloon-securable structure is collapsible upon balloon deflation; and

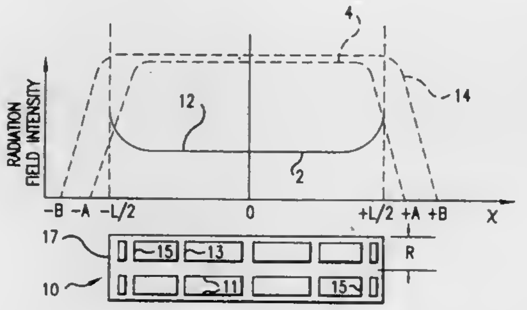
a radioactive source on or within the balloon-securable structure.

5,840,009
RADIOISOTOPE STENT WITH INCREASED RADIATION FIELD STRENGTH AT THE ENDS OF THE STENT

Robert E. Fischell, Dayton, Md.; David R. Fischell, Fair Haven, N.J., and Tim A. Fischell, Nashville, Tenn., assignors to IsoStent, Inc., Belmont, Calif.

Filed Dec. 5, 1995, Ser. No. 567,138
Int. Cl.^{6} A61N ***5/00***

U.S. Cl. 600—3 **10 Claims**



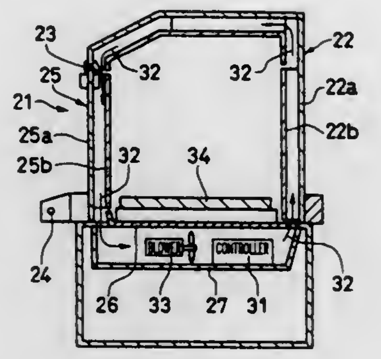
1. A radioisotope stent comprising a generally cylindrical, thin-walled, metal structure, the stent having an end region near each end of the stent and a central region located generally at the longitudinal center of the stent, the stent including a radioactive material which is a radioisotope, the radioisotope being fixedly joined to the metal of the stent, the stent also having a greater amount of a radioisotope per unit length of the stent at the end regions of the stent compared to a lesser amount of radioisotope per unit length at the central region of the stent.

5,840,010
INCUBATOR

Shinichi Kobayashi; Eiji Koike; Kazunori Miyagawa, and Kazuo Matubara, all of Tokyo, Japan, assignors to Atom Medical Corporation, Tokyo, Japan

Filed Apr. 9, 1997, Ser. No. 835,658
Claims priority, application Japan, Apr. 12, 1996, 8-115618
Int. Cl.^{6} A61G ***11/00***

U.S. Cl. 600—22 **2 Claims**



1. An incubator comprising:

a hood having a side surface formed with an opening portion and a door attached to said opening portion;

a rest table coupled to said incubator and which is movable between an inside and an outside of said hood through said opening portion when said door is open; and

air curtain forming means for injecting an air stream flowing downward along said opening portion from an upper portion of said opening portion.

5,840,011
IMPLANT FOR SUSPENSION OF THE URINARY BLADDER IN CASES OF INCONTINENCE OF URINE IN WOMEN

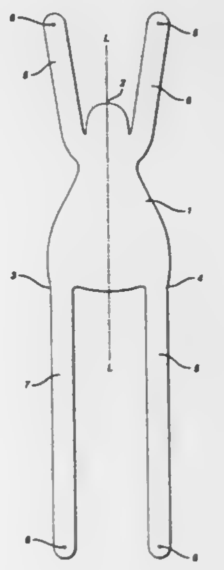
Susanne Landgrebe, Norderstedt, and Lothar Schilder, Hamburg, both of Germany, assignors to Ethicon, Inc., Somerville, N.J.

Filed Nov. 25, 1996, Ser. No. 756,082

Claims priority, application Germany, Nov. 17, 1995, 195 44 162.1

Int. Cl.^{6} A61F ***2/02***

U.S. Cl. 600—30 **7 Claims**



1. An implant for suspension of the urinary bladder useful in treating urinary incontinence, comprising a flat, flexible base structure having a top, a bottom and opposed sides; two elongated first projections extending from the top of and in the same plane as the base structure (**5**, **6**); and two second projections (**7**, **8**) extending from the bottom of the base structure, the two first projections (**5**, **6**), running on opposite sides of a longitudinal axis (L—L) of the base (**1**) and the two second projections (**7**, **8**) running on opposite sides of the longitudinal axis (L—L) of the base (**1**), said two first projections separated by a space and said two second projections separated by a space;

wherein the base structure is constructed symmetrically to the longitudinal axis (L—L) of the base (**1**);

wherein the two first projections (**5**, **6**) are shorter than the two second projections (**7**, **8**), and

wherein the base (**1**) is substantially triangularly shaped, wherein said top which is arcuate, said top having opposed sides and the two first projections (**5**, **6**) extend from the base (**1**) on opposed sides of the top through which the longitudinal axis (L—L) of the base (**1**) runs, but at a distance therefrom, wherein there is a continuous space between the sides of each first projection and the sides of the arcuate top such that the arcuate support the bladder neck and the proximal urethra; and,

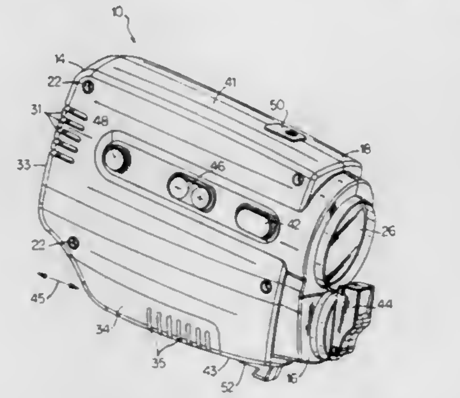
wherein the two first projections (**5**, **6**) extend at an acute angle, which is less that 20°, with respect to the longitudinal axis (L—L) of the base (**1**), and in that the two second projections (**7**, **8**), extend from the bottom of the base (**1**) such that they are essentially parallel to the longitudinal axis (L—L) of the base (**1**).

5,840,012
DIAGNOSTIC INSTRUMENT SUPPORTING SYSTEM

Allan I. Krauter, Syracuse; Michael Kehoskie, Jordan; Jon R. Salvati, Skaneateles Falls; Scott Ryan, Skaneateles; Deborah A. Laun, Syracuse, and Frank J. Witkowski, III, Marcellus, all of N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Nov. 13, 1996, Ser. No. 748,375
Int. Cl.^{6} A61B ***1/00***

U.S. Cl. 600—102 **10 Claims**



1. A diagnostic instrument system comprising:

a diagnostic instrument, said instrument having a housing including an interior, an illumination system arranged within said interior for illuminating a target, and a video camera system adjacently arranged within said interior relative to said illumination system for viewing the illuminated target;

at least two supporting fixtures, said supporting fixtures each having a handle portion engageable with different surfaces of said housing for attachment thereto; and

means for releasably attaching said housing to each one of said supporting fixtures, wherein each of said handle portions include releasable connecting means for mating with the housing to mechanically support said diagnostic instrument to provide electrical and video connection therewith.

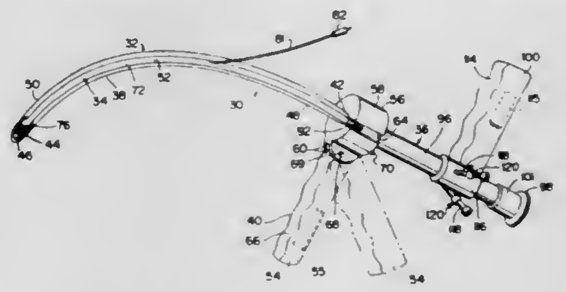
5,840,013
METHOD OF INTRODUCING A TUBULAR MEMBER AT A SITE IN THE BODY

Jai S. Lee, 1205 Clearfield Cir., Lutherville, Md. 21093, and InBae Yoon, 2101 Highland Ridge Dr., Phoenix, Md. 21131

Division of Ser. No. 214,527, Mar. 18, 1994, Pat. No. 5,645,519. This application Dec. 17, 1996, Ser. No. 768,241

Int. Cl.^{6} A61B ***1/04***

U.S. Cl. 600—114 **42 Claims**



1. A method of introducing a tubular member at a site in the body utilizing an instrument for introducing a tubular member at a site in the body comprising the steps of

inserting a blade of a blade assembly of the instrument in the body;

retracting anatomical tissue with a distal end of the blade to expose the site in the body;

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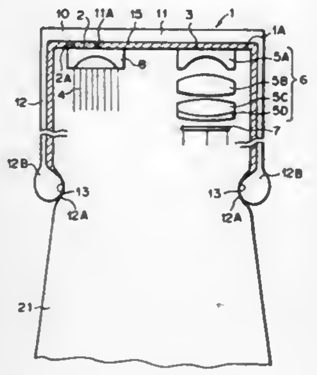
- moving a tubular member and a remote viewing device of the instrument distally relative to and along the blade toward the site in the body while the distal end of the blade retracts the anatomical tissue;
- guiding distal movement of the tubular member and the remote viewing device along the blade such that the tubular member and the remote viewing device are guided toward the site in the body;
- positioning a distal end of the tubular member and a distal end of the remote viewing device at the site in the body; and
- visualizing positioning of the distal end of the tubular member at the site in the body with the remote viewing device from a location external of the body.

5,840,014
ENDOSCOPE

Hitoshi Miyano, and Chikara Yamamoto, both of Omiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan
Filed Dec. 19, 1997, Ser. No. 994,748
Claims priority, application Japan, Jan. 14, 1997, 9-017612
Int. Cl.^{6} A61B *1/00*
U.S. Cl. 600—125 **4 Claims**

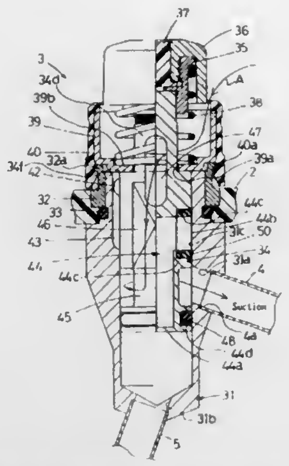


1. An endoscope inserting portion comprising:
- a front end face having an illumination window and a viewing window;
- a detachable protective covering for covering the inserting portion;
- wherein said detachable protective covering is disposed in proximity to the front end face;
- a space between the front end face and the detachable covering; and
- a transparent material for purging air from the space between the front end face and the detachable covering.

5,840,015
APPARATUS FOR CONTROLLING A SUCTION PASSAGE IN AN ENDOSCOPE

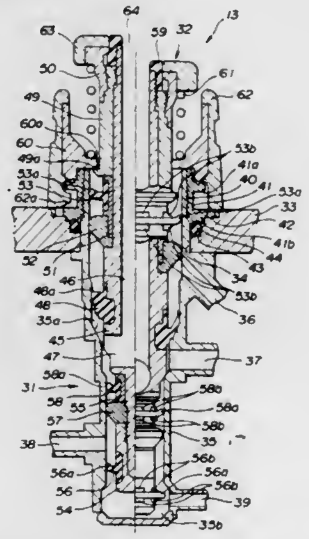
Takayuki Ogino, Tokyo, Japan, assignor to Asahi Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 14, 1996, Ser. No. 615,890
Claims priority, application Japan, Mar. 17, 1995, 7-058509
Int. Cl.^{6} A61B *1/12*
U.S. Cl. 600—159 **8 Claims**

1. An endoscope with an apparatus for controlling a suction passage in the endoscope, comprising:
- a cylinder connected between an insertion pipe, on an insertion side of said endoscope, and a suction pipe, on a suction side of said endoscope;
- a piston provided in said cylinder to move in an axial direction thereof to selectively connect or disconnect said insertion pipe and said suction pipe, said suction pipe and said cylinder having mating open ends at a position opposed to an outer periphery of said piston;
- a communication passage provided in said piston to connect said insertion pipe and said suction pipe when said piston is in an operative position, said communication passage having an open end at said outer periphery of said piston; and
- an annular seal member provided on said piston to surround said open end of said communication passage to establish a watertight connection between said open end of said communication passage and said end of said suction pipe, a central axis of said annular seal being normal to a central axis of said piston.



5,840,016
LINE CHANGEOVER DEVICE FOR ENDOSCOPE

Seiji Kitano, Hachioji; Hideo Ito, Akishima; Tsutomu Ishiguro, Hachioji; Yoshiyuki Tanii, Hamura; Satoshi Nakagawasai, Tokyo, and Yasuhito Kura, Hino, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Jun. 7, 1996, Ser. No. 659,932
Claims priority, application Japan, Oct. 24, 1995, 7-275948
Int. Cl.^{6} A61B *1/12*
U.S. Cl. 600—159 **18 Claims**

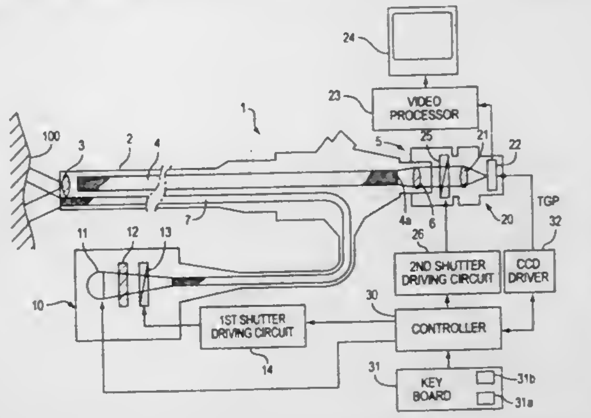


1. A line changeover device for an endoscope, comprising a cylinder, and a piston which is fitted and inserted into the cylinder in a retractable manner, for changing over a line which is arranged in the endoscope,

wherein a seal member which is abutted against said cylinder to retain at least one of water tightness and gas tightness with respect to the cylinder is fixedly provided on an outer periphery of said piston, and a strength reinforcement is provided on at least a part between an outer periphery of said seal member and an inner periphery thereof, wherein said seal member has a deformable portion which deforms, when said piston is fitted into said cylinder, at an end portion of said strength reinforcement located on said outer periphery of said seal member.

5,840,017
ENDOSCOPE SYSTEM

Koichi Furusawa, and Rensuke Adachi, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 1, 1996, Ser. No. 691,911
Claims priority, application Japan, Aug. 3, 1995, 7-198287
Int. Cl.^{6} A61B *1/06*
U.S. Cl. 600—160 **8 Claims**

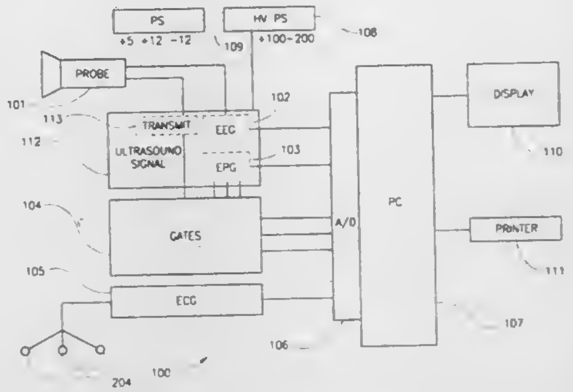


1. An endoscope system for examining organic tissue, comprising:
- a light source that emits excitation radiation having a component that generates persistent fluorescence in the organic tissue;
- an image receiving device that detects said persistent fluorescence and that outputs images formed from said persistent fluorescence;
- an endoscope that guides said excitation radiation to the organic tissue and that guides said persistent fluorescence to said image receiving device;
- first shutter means for controlling a transmission of said excitation radiation from said light source to the organic tissue;
- second shutter means for controlling a transmission of said persistent fluorescence from said organic tissue to said image receiving device;
- a control circuit that controls said first shutter means and said second shutter means, said control circuit controlling said second shutter means to start transmitting said persistent fluorescence to said image receiving device immediately after said first shutter means stops transmitting said excitation radiation to the organic tissue.

5,840,018
NON-INVASIVE REAL TIME DIAGNOSIS OF MIGRAINE

David Michaeli, Ashkelon, Israel, assignor to INTA Medics Ltd., Israel
Filed May 28, 1997, Ser. No. 864,579
Int. Cl.^{6} A61B *5/00;8/06*
U.S. Cl. 600—300 **18 Claims**

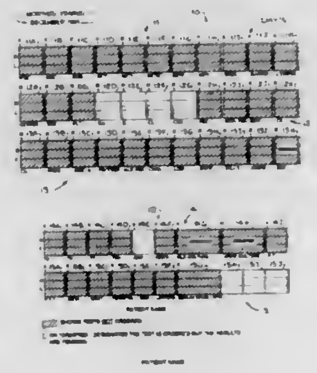
1. A method of real-time determination of variations in effective diameter of cranial blood vessels, thereby to provide an indication of migraine activity, which comprises:
- determining the blood flow rate to the brain of a subject;
- determining the intracranial blood flow rate in selected blood vessels; and



- comparing said intracranial blood flow rate with said determined blood flow rate to the brain thereby to determine a change in said intracranial blood flow rate relative to said blood flow rate to the brain, indicating a corresponding change in the effective diameter of the preselected blood vessel.

5,840,019
GRAPHIC PRESENTATION CHART OF MEDICAL TESTS FOR A PATIENT

Jeffrey F. Wirebaugh, 7320 Red Maple Dr., Holland, Ohio 43528
Filed Jan. 31, 1997, Ser. No. 791,610
Int. Cl.^{6} A61B *5/00*
U.S. Cl. 600—300 **18 Claims**



1. A method for producing a graphic presentation chart of medical tests for a patient comprising the steps of:
- (a) ordering a plurality of medical tests for a patient;
- (b) obtaining numerical medical test data for the plurality of medical tests;
- (c) converting the numerical test data for the plurality of medical tests into a graphic form; and
- (d) displaying the graphic form for the plurality of medical tests in a graphic presentation chart, the graphic presentation chart including at least one horizontally extending row having a plurality of individual boxes each of the boxes provided with first indicia to indicate a name of the ordered medical tests, second indicia to indicate an associated date for the ordered medical tests, third indicia to indicate test results for the ordered medical tests, fourth indicia to indicate a value for the test results for the ordered medical tests, fifth indicia to indicate non-ordered medical tests for a patient, and sixth indicia to indicate ordered medical tests for the patient which tests results are not available.

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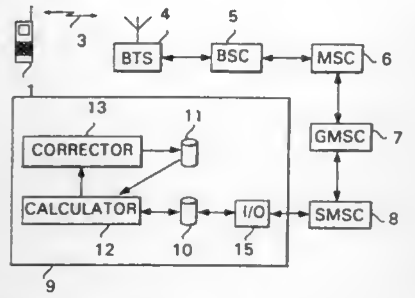
5,840,020
MONITORING METHOD AND A MONITORING EQUIPMENT

Pekka Heinonen, and Harri Okkonen, both of Espoo, Finland, assignors to Nokia Mobile Phones, Ltd., Finland
Filed Feb. 5, 1997, Ser. No. 795,206
Claims priority, application Finland, Feb. 12, 1996, 960637
Int. Cl.^{6} A61B *5/00*
U.S. Cl. 600—309 · **7 Claims**



1. A method for predicting the glucose level in a patient's bloods, the method comprising the steps of:
formulating an adaptive mathematical model about the behavior of the patient's blood glucose level, the model taking into account at least the patient's diet, medication and physical strain and providing predictive values;
providing the patient with means for utilizing said mathematical model, so that the patient can himself monitor and predict the effect of the treatment he is to follow on the behavior of his blood glucose level; and
comparing the predictive values provided by the model to measured glucose levels and correcting the mathematical model on the basis of the result of said comparison.

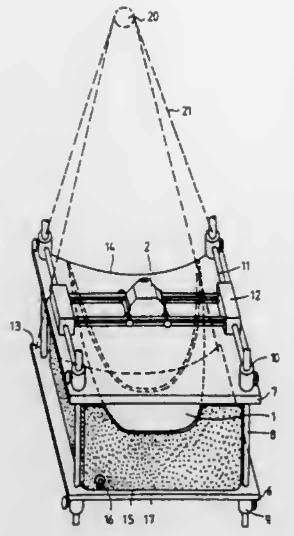
5,840,021

Patent Not Issued For This Number

5,840,022
METHOD FOR IMAGING DISPLAY OF A PART OF THE HUMAN BODY

Kari Richter, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany
PCT No. PCT/DE94/00301, § 371 Date Sep. 22, 1995, § 102(e) Date Sep. 22, 1995, PCT Pub. No. WO94/21189, PCT Pub. Date Sep. 29, 1994
PCT Filed Mar. 18, 1994, Ser. No. 530,364
Claims priority, application Germany, Mar. 22, 1993, 43 09 597.6
Int. Cl.^{6} A61B *5/05*
U.S. Cl. 600—407 **20 Claims**

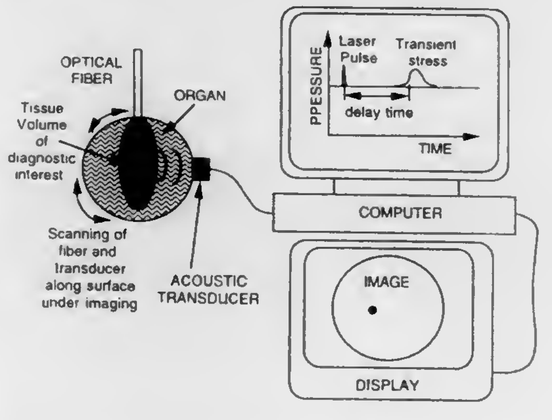
1. A method for examining a female mammary gland comprising the steps of:
maintaining a mammary gland in a fixed position;
introducing primary ultrasound radiation into said mammary gland along a selected spatial direction while said mammary gland is in said fixed position, said primary ultrasound radiation being reflected by said mammary gland and thereby producing echo signals at respective locations within said mammary gland;
receiving said echo signals, each received echo signal having echo signal parameters associated therewith;
displaying said echo signals dependent on at least one of said echo signal parameters in a presentation identifying an origination of said echo signals within the mammary gland relative to a selected spatial orientation reference, said presentation containing information about said mammary gland;



obtaining further signals from said mammary gland produced by a technique selected from the group consisting of x-ray radiography, thermography and diaphanography, with said mammary gland maintained in said fixed position; and
displaying said further signals in said presentation, using said spatial orientation reference, together with said echo signals, said further signals containing further information about said mammary gland, at least some of said further information being different from said information in said presentation of said echo signals.

5,840,023
OPTOACOUSTIC IMAGING FOR MEDICAL DIAGNOSIS

Alexander A. Oraevsky, 5038 Lymbar Dr., Houston, Tex. 77096; Steven L. Jacques, 4302 Compton Clr., Bellaire, Tex. 77401, and Rinat O. Esenaliev, 7600 Kirby, Apt. 401, Houston, Tex. 77030
Filed Jan. 31, 1996, Ser. No. 594,758
Int. Cl.^{6} A61B *8/00*
U.S. Cl. 600—407 **28 Claims**

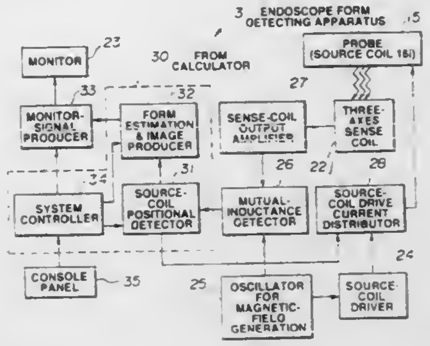


12. An imaging system for biomedical diagnostics comprising:
a pulsed optical source to produce a pressure profile confined in a volume of tissue of diagnostic interest;
a light delivery system for delivery of radiation to said tissue of diagnostic interest;

at least one acoustic detector to detect said pressure profile in said volume of tissue of diagnostic interest;
an electronic system for recording and processing of said detected pressure profile; and
a computer with software for image reconstruction and analysis of said detected pressure profile.

5,840,024
ENDOSCOPE FORM DETECTING APPARATUS IN WHICH COIL IS FIXEDLY MOUNTED BY INSULATING MEMBER SO THAT FORM IS NOT DEFORMED WITHIN ENDOSCOPE

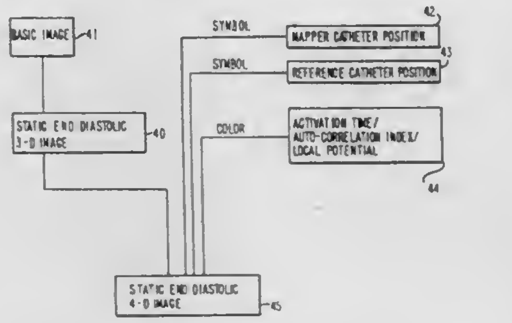
Akira Taniguchi, Hachioji; Nobuyuki Matsuura, Hino, and Yasuo Miyano, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 281,668, Jul. 28, 1994, abandoned. This application Mar. 13, 1997, Ser. No. 816,884
Claims priority, application Japan, Oct. 18, 1993, 5-260148; Oct. 18, 1993, 5-260149; Apr. 21, 1994, 6-083291; Jun. 20, 1994, 6-137468
Int. Cl.^{6} A61B *5/05*
U.S. Cl. 600—424 **83 Claims**


3 ENDOSCOPE FORM DETECTING APPARATUS
5
23
MONITOR
30 FROM CALCULATOR
PROBE (SOURCE COIL 16i)
27
33
32
MONITOR-SIGNAL PRODUCER
FORM ESTIMATION & IMAGE PRODUCER
SENSE-COIL OUTPUT AMPLIFIER
THREE-AXES SENSE COIL
26
22
28
31
34
SYSTEM CONTROLLER
SOURCE-COIL POSITIONAL DETECTOR
MUTUAL-INDUCTANCE DETECTOR
SOURCE-COIL DRIVE CURRENT DISTRIBUTOR
24
CONSOLE PANEL
35
25
OSCILLATOR FOR MAGNETIC-FIELD GENERATION
SOURCE-COIL DRIVER

1. An endoscope position detecting apparatus comprising:
an endoscope having a flexible insertion part which is insertable into an object to be examined, said endoscope having illumination-light emitting means for emitting an illumination light toward a forward end of said insertion part, and an objective optical system for observing an illuminated subject;
magnetic-field generating means having a magnetic-field generating element for generating a magnetic field around the circumference of said magnetic-field generating element by application of a drive signal;
magnetic-field detecting means including a magnetic-field detecting element for detecting a magnetic field which is generated by said magnetic-field generating element;
fixing means for fixing one of said magnetic-field generating element and said magnetic-field detecting element within said insertion part and insulating said fixed element by an insulating member such that a form of said fixed element is not deformed;
the other of said magnetic-field generating element and said magnetic-field detecting element which is not fixed within said insertion part is installed at a known position out of said object to be examined; and
position estimation means for estimating a position of said fixed element which is arranged within said insertion part, with respect to the known position out of said object to be examined, based on a detecting signal which is detected by said magnetic-field detecting element.

5,840,025
APPARATUS AND METHOD FOR TREATING CARDIAC ARRHYTHMIAS

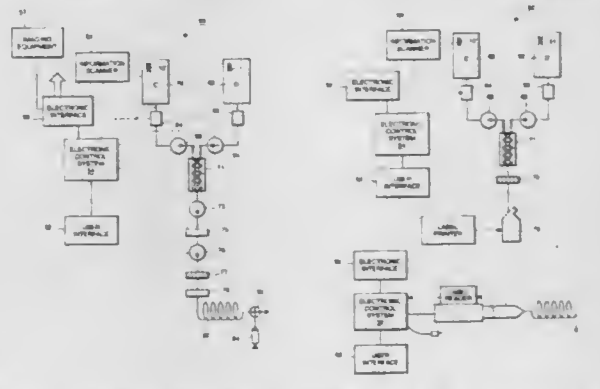
Shlomo Ben-Haim, Haifa, Israel, assignor to Biosense, Inc., Miami, Fla.
Continuation of Ser. No. 738,896, Oct. 28, 1996, Pat. No. 5,713,946, which is a continuation of Ser. No. 490,122, Jul. 12, 1995, Pat. No. 5,568,809, which is a continuation of Ser. No. 311,598, Sep. 23, 1994, abandoned, which is a division of Ser. No. 94,539, Jul. 20, 1993, Pat. No. 5,391,199. This application Nov. 21, 1997, Ser. No. 975,234
Int. Cl.^{6} A61B *5/06*
U.S. Cl. 600—424 **85 Claims**


BASIC IMAGE
41
SYMBOL
MAPPER CATHETER POSITION
42
SYMBOL
REFERENCE CATHETER POSITION
43
STATIC END DIASTOLIC 3-D IMAGE
40
COLOR
ACTIVATION TIME/ AUTO-CORRELATION INDEX/ LOCAL POTENTIAL
44
STATIC END DIASTOLIC 4-D IMAGE
45

1. A method for intrabody mapping, comprising:
positioning a probe inside the body of a subject;
placing one or more transmitting elements on a surface of the body;
applying an electrical current to drive the transmitting elements;
receiving a first signal at the probe responsive to the position of the probe relative to the transmitting elements; and
receiving a second signal at the probe responsive to a physiological activity in the body adjacent to the probe.

5,840,026
PATIENT SPECIFIC DOSING CONTRAST DELIVERY SYSTEMS AND METHODS

Arthur E. Uber, III, Pittsburgh; Alan D. Hirschman, Glenshaw; Thomas R. Welch, Gibsonia, and Rosemary Almon-Martin, Saxonburg, all of Pa., assignors to Medrad, Inc., Pittsburgh, Pa.
Filed Sep. 21, 1994, Ser. No. 309,820
Int. Cl.^{6} H61M *5/00*
U.S. Cl. 600—431 **60 Claims**



1. A system for injection of a patient with a fluid medium in a medical imaging procedure, the combination comprising:
(a) a source of image contrast fluid medium at a selected concentration:
(b) pressurizing means in operative association with the fluid medium to pressurize the fluid medium for patient infusion;
(c) electronic control means for calculating flow rate and concentration of the fluid medium based on characteristic data of

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the patient, said electronic control means being connected to said pressurizing means for setting initial fluid medium pressure based on said characteristic data of the patient, and for adjusting concentration of the fluid medium during injection based on said characteristic data of the patient;

(d) imaging means for recording the image contrast fluid medium injected into the patient.

5,840,027

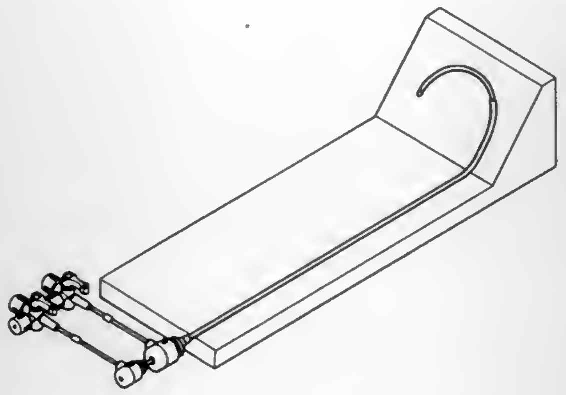
GUIDING INTRODUCER SYSTEM FOR USE IN THE RIGHT ATRIUM

John F. Swartz, Tulsa, Okla.; John D. Ockuly; John J. Fleischhacker, both of Minnetonka, Minn., and James A. Hassett, Bloomington, Minn., assignors to Daig Corporation, Minnetonka, Minn.

Division of Ser. No. 333,759, Nov. 3, 1994, Pat. No. 5,628,316, which is a continuation-in-part of Ser. No. 146,744, Nov. 3, 1993, Pat. No. 5,427,119. This application Jul. 29, 1996, Ser. No. 681,669

Int. Cl.^{6} A61B *5/00*

U.S. Cl. 600—433 **8 Claims**



1. A guiding introducer system to be used in the right atrium of a human heart comprising a precurved cardiac chamber inner guiding introducer and a precurved cardiac chamber outer guiding introducer wherein said guiding introducers are used in combination in a chamber of the heart whereby the guiding introducers are structurally stabilized to enhance their rigidity to assist in the control of their movement within the chamber of the heart.

5,840,028

ULTRASONIC DIAGNOSTIC EQUIPMENT

Noriyoshi Chubachi; Hiroshi Kanai, and Yoshiro Koiwa, all of Sendai, Japan, assignors to Japan Science and Technology Corporation, Saitama, Japan

Filed Jan. 21, 1997, Ser. No. 786,797

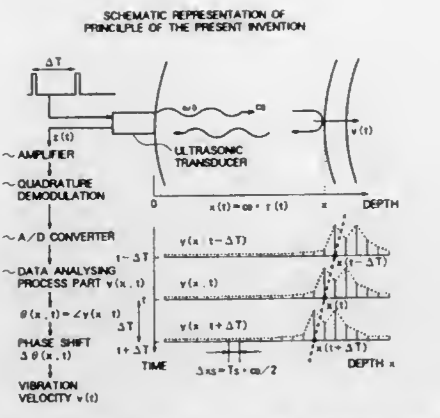
Claims priority, application Japan, Jun. 24, 1996, 8-163418

Int. Cl.^{6} A61B *8/00*

U.S. Cl. 600—437 **10 Claims**

1. Ultrasonic diagnostic apparatus for measuring the position of an object having a vibratory motion of a large amplitude and having a small vibration which is superimposed on the large amplitude vibratory motion in a living body by transmitting an ultrasonic wave to the object, detecting a reflected ultrasonic wave from the object, and analyzing the reflected ultrasonic wave, the apparatus comprising:

a large amplitude motion analyzing means for deciding an instantaneous position of the object based on a detected amplitude and phase of the reflected wave, said large amplitude motion analyzing means tracking a reflected position of the object; and



a small vibration analyzing means for measuring the small vibration of the object by calculating a changing distance of the object's position based on succeeding reflected positions of the object.

5,840,029

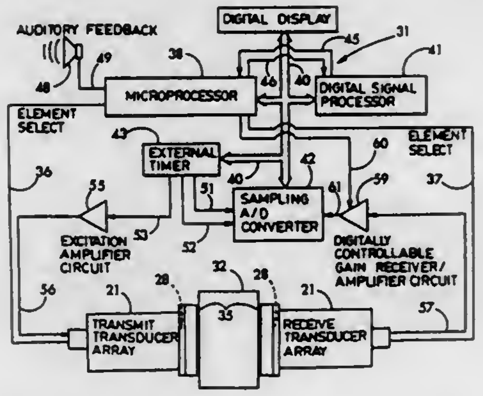
IMAGING ULTRASONIC DENSITOMETER

Richard B. Mazess, Madison; Richard F. Morris, Stoughton, and Scott A. Wiener, Mount Horeb, all of Wis., assignors to Lunar Corporation, Madison, Wis.

Continuation-in-part of Ser. No. 466,495, Jun. 6, 1995, Pat. No. 5,603,325, which is a continuation-in-part of Ser. No. 397,027, Mar. 1, 1995, Pat. No. 5,483,965, which is a continuation of Ser. No. 72,799, Jun. 4, 1993, abandoned, which is a continuation-in-part of Ser. No. 895,494, Jun. 8, 1992, Pat. No. 5,343,863, which is a continuation-in-part of Ser. No. 772,982, Oct. 7, 1991, Pat. No. 5,119,820, which is a continuation of Ser. No. 343,170, Apr. 25, 1989, Pat. No. 5,054,490, which is a continuation-in-part of Ser. No. 193,295, May 11, 1988, Pat. No. 4,930,511. This application Feb. 4, 1997, Ser. No. 795,025

Int. Cl.^{6} A61B *8/00*

U.S. Cl. 600—437 **17 Claims**



5. An imaging ultrasonic bone apparatus comprising:

at least one ultrasonic transducer positionable about a bony member to measure a plurality of acoustic signals passing through different locations within the bony member;

an electronic data processor operating according to a stored program to:

(i) receive the measured plurality of acoustic signals and process the signals to determine a plurality of member variables related to the properties of bone in the bony member at the different locations in the bony member;

(ii) analyze the plurality of member variables to identify a measurement region of interest in the bone;

(iii) determining a region of interest member parameter based on the member variables associated with the measurement region of interest identified in (ii); and

a display communicating with the data processor to output the region of interest member parameter.

5,840,030

ULTRASONIC MARKED CARDIAC ABLATION CATHETER

Bozidar Ferek-Petric; Branko Breyer, and Ivo Cikes, all of Zagreb, Croatia, assignors to Sulzer Osypka GmbH, Grenzach-Wyhlen, Germany

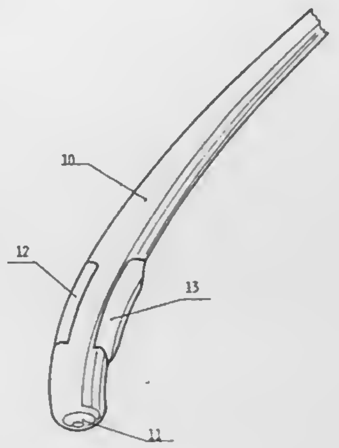
PCT No. PCT/EP94/04252, § 371 Date Jun. 21, 1996, § 102(e) Date Jun. 21, 1996, PCT Pub. No. WO95/17131, PCT Pub. Date Jun. 29, 1995

PCT Filed Dec. 21, 1994, Ser. No. 666,508

Claims priority, application Croatia, Dec. 22, 1993, P 931513A; Dec. 22, 1993, P 931514A

Int. Cl.^{6} A61B *8/00*

U.S. Cl. 600—439 **46 Claims**



1. A cardiac ablation device comprising

an axially elongated catheter body (**10**, **28**, **31**, **35**, **41**, **57**, **60**, **71**) for implantation in the human heart and having an ablation electrode (**12**, **34**, **40**, **55**, **64**, **70**) adapted for contacting the heart;

said catheter body including an ultrasonic transducer assembly (**13**, **36**, **42**, **58**, **62**, **72**) at a location adjacent to said ablation electrode;

said catheter body including two electrical conductors (**46**, **49**), which are provided with terminals at the proximal end of the catheter, and which are adapted for transmitting a high frequency electrical signal to and from said transducer assembly (**42**) and for transmitting an ablation signal to said electrode (**40**);

said transducer assembly (**13**, **36**, **42**, **58**, **62**, **72**) being adapted to produce, in a direction radial to said axially elongated body at the location of the transducer assembly, a directional acoustic ultrasonic field (**29**, **32**, **65**) when supplied with said high frequency electrical signal and said ablation electrode (**12**, **34**, **40**, **55**, **64**, **70**) being adapted to produce in a direction radial to said axially elongated catheter body at the location of the transducer assembly, a directional electric ablation field (**30**, **33**, **66**) when supplied with said ablation signal; and

said transducer assembly and said ablation electrode being arranged in a predetermined mutual positional relationship so that the radial direction in which said electric ablation field is produced is exactly determined relative to the radial direction in which said acoustic ultrasonic field is produced.

5,840,031

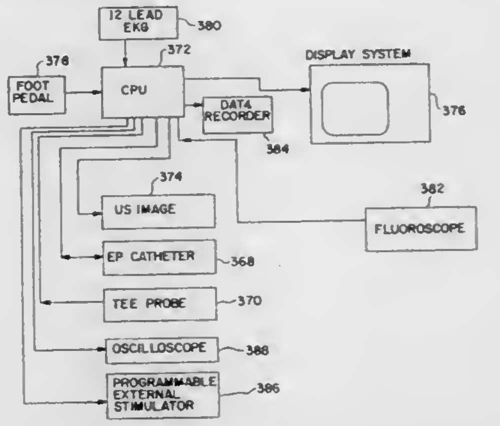
CATHETERS FOR IMAGING, SENSING ELECTRICAL POTENTIALS AND ABLATING TISSUE

Robert J. Crowley, Wayland, Mass., assignor to Boston Scientific Corporation, Boston, Mass.

Division of Ser. No. 86,523, Jul. 1, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 475,896

Int. Cl.^{6} A61B *8/00*

U.S. Cl. 600—440 **27 Claims**



1. A catheter system, comprising:

an elongated, flexible catheter constructed to be inserted into a body of a living being;

an imaging system constructed and arranged to provide information from which a graphical representation of an internal structure within said body of said living being may be created, said imaging system comprising an ultrasound device incorporated into said elongated, flexible catheter,

a data collection system, at least partially located on a distal portion of said elongated, flexible catheter, constructed and arranged to produce a plurality of items of data corresponding to a respective plurality of locations within said internal structure,

a central processing unit, electrically connected to said imaging system and said data collection system, said central processing unit configured and arranged to simultaneously record said information provided by said imaging system and said plurality of items of data provided by said data collection system, to create said graphical representation of said internal structure from said information provided by said imaging system, and to super-impose onto said graphical representation said plurality of items of data provided by said data collection system, said plurality of items of data being superimposed at locations on said graphical representation that represent said respective plurality of locations within said internal structure corresponding to said plurality of items of data, and

a graphic display system, electrically connected to said central processing unit, and constructed to display said graphical representation onto which said plurality of items of data are super-imposed.

5,840,032

METHOD AND APPARATUS FOR THREE-DIMENSIONAL ULTRASOUND IMAGING USING TRANSDUCER ARRAY HAVING UNIFORM ELEVATION BEAMWIDTH

William T. Hatfield, Schenectady, N.Y.; Todd Michael Tillman, West Milwaukee, Wis.; Douglas G. Wildes, Ballston Lake, and Richard Y. Chiao, Clifton Park, both of N.Y., assignors to General Electric Company, Milwaukee, Wis.

Filed May 7, 1997, Ser. No. 852,264

Int. Cl.^{6} A61B *8/00*

U.S. Cl. 600—443 **20 Claims**

1. A system for three-dimensional imaging of an ultrasound scattering medium in an object volume, comprising:

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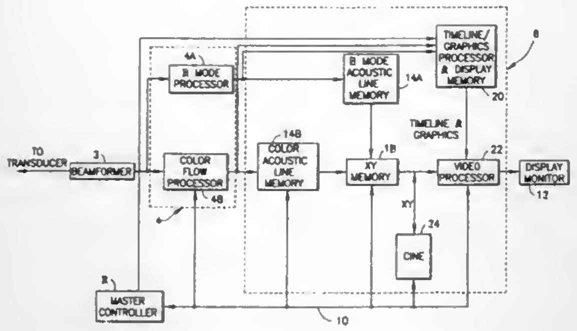


an ultrasound transducer array for transmitting ultrasound beams and detecting ultrasound echoes reflected in the object volume at predetermined sample volumes, said array comprising a first multiplicity of transducer elements arranged in a central row, a second multiplicity of transducer elements arranged in a first outer row, and a third multiplicity of transducer elements arranged in a second outer row, said central row being between said first and second outer rows, a first multiplicity of signal leads respectively connected to said first multiplicity of transducer elements, and a second multiplicity of signal leads respectively connected to said second and third multiplicities of transducer elements;

first means for focusing said first multiplicity of transducer elements on sample volumes in a near field;

second means for focusing said second and third multiplicities of transducer elements on sample volumes in a far field, said near field being located between said far field and said array;

first means for deriving a first set of pixel data from electrical pulses produced by said central row of transducer elements in response to detection of ultrasound transmitted by said central row and reflected by the scattering medium in near-field sample volumes;

second means for deriving a second set of pixel data from electrical pulses produced by said central row and said first and second outer rows of transducer elements in response to detection of ultrasound transmitted by said central row and said first and second outer rows and reflected by the scattering medium in far-field sample volumes;

means for forming vector data comprising pixel data from said first set and pixel data from said second set;

memory means for storing said vector data;

means for retrieving a set of vector data from said memory means corresponding to a volume of interest in the object volume;

means for projecting said vector data set onto a first image plane, thereby forming a projected data set representing a first projected image;

a display monitor; and

means for displaying said first projected image on said display monitor.

5,840,033

METHOD AND APPARATUS FOR ULTRASOUND IMAGING

Yasuhito Takeuchi, Tokyo, Japan, assignor to GE Yokogawa Medical Systems, Limited, Tokyo, Japan

Filed May 16, 1997, Ser. No. 857,450

Int. Cl.^{6} A61B *8/00*

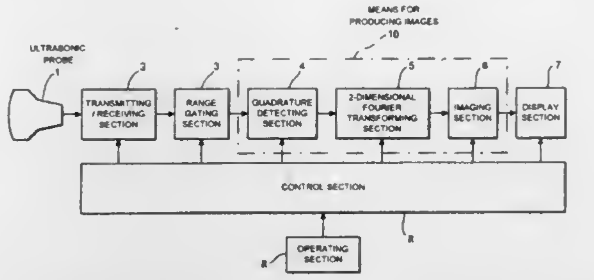
U.S. Cl. 600—443 **8 Claims**

1. An ultrasonic imaging method comprising the steps of:

defining a solid bearing angle subtending an object to be imaged;

dividing said solid bearing angle into a plurality of small solid bearing angles;

transmitting an ultrasonic wave into an interior of a subject having said object therein for each of said plurality of small solid bearing angles;


MEANS FOR PRODUCING IMAGES
10
ULTRASONIC PROBE
1
2
3
4
5
6
7
8
8'
TRANSMITTING / RECEIVING SECTION
RANGE GATING SECTION
QUADRATURE DETECTING SECTION
2-DIMENSIONAL FOURIER TRANSFORMING SECTION
IMAGING SECTION
DISPLAY SECTION
CONTROL SECTION
OPERATING SECTION

receiving concurrently a plurality of echoes from said object in each of said plurality of small solid bearing angles; and

producing an image of said object at a predetermined depth thereof.

5,840,034

ULTRASONIC IMAGING METHOD AND ULTRASONIC DIAGNOSTIC APPARATUS

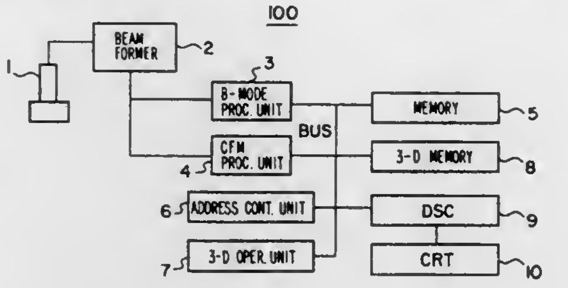
Shinichi Amemiya; Hiroshi Hashimoto; Koji Miyama, and Sei Kato, all of Tokyo, Japan, assignors to GE Yokogawa Medical Systems, Limited, Tokyo, Japan

Filed Mar. 6, 1997, Ser. No. 812,767

Claims priority, application Japan, May 10, 1996, 8-115922

Int. Cl.^{6} A61B *8/00*

U.S. Cl. 600—444 **12 Claims**



1. An ultrasonic diagnostic apparatus comprising:

an ultrasonic probe for scanning planes of an object;

data acquisition means for acquiring ultrasonic beam data by moving said ultrasonic probe in a direction substantially perpendicular to said planes;

an ultrasonic beam data memory for storing ultrasonic beam data;

a three-dimensional operation circuit for generating three-dimensional ultrasonic beam data by use of said ultrasonic beam data stored in said ultrasonic beam data memory so as to display a three-dimensional ultrasonic image of said object viewed from a desired line of sight;

a digital scan converter for converting scans of said three-dimensional ultrasonic image to be displayed; and

display means for displaying said three-dimensional ultrasonic image.

5,840,035

METHOD FOR THE SPECTROSCOPIC EXAMINATION OF A BIOLOGICAL TISSUE

Hans Heusmann, München, and Jochen Kölzer, Putzbrunn, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

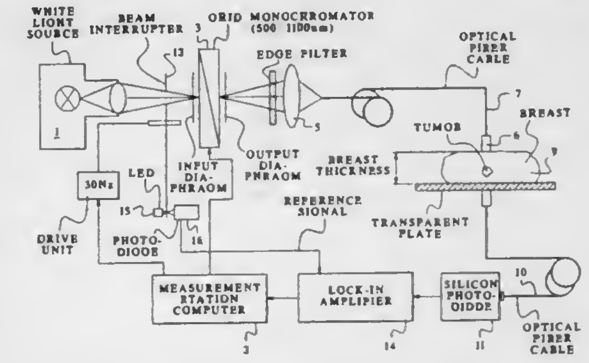
PCT No. PCT/DE96/00151, § 371 Date Aug. 6, 1997, § 102(e) Date Aug. 6, 1997, PCT Pub. No. WO96/24836, PCT Pub. Date Aug. 15, 1996

PCT Filed Feb. 1, 1996, Ser. No. 875,842

Claims priority, application Germany, Feb. 7, 1995, 195 04 174.7

Int. Cl.^{6} A61B *6/00*

U.S. Cl. 600—477 **5 Claims**



1. Method for the spectroscopic examination of a biological tissue comprising the steps of:

(a) irradiating a tissue region with non-ionizing radiation having an intensity $I_0(\lambda)$ and a wavelength λ while varying said wavelength;

(b) registering a spectrum $I(\lambda)$ from an element selected from the group consisting of a transmission spectrum and a reflection spectrum by an element selected from the group consisting of measuring the intensity of the radiation transmitted by the tissue and radiation reflected by the tissue dependent on the wavelength λ;

(c) employing an analytical function to approximately describe a quantity from an element selected from the group consisting of said spectrum $I(\lambda)$, said spectrum $I(\lambda)/I_0(\lambda)$ normed to the incident radiation intensity, and log $\{I(\lambda)/I_0(\lambda)\}$, said analytical function having a Beer-Lambert dependency on a first parameter describing the absorption properties of the tissue and a second parameter representing a slice thickness, the first parameter being dependent on identified concentrations c_i of a plurality i of selected tissue components employed as fit parameters as well as on specific absorption coefficients $\alpha_i(\lambda)$ according to the relationship

$$\mu_a(\lambda) = \sum_i c_i \cdot \alpha_i(\lambda).$$

with an average path length $L(\lambda)$ of the photons in the tissue comprising the second parameter; and

(d) comparing the identified concentration c_i to reference values.

5,840,036

BLOOD PRESSURE MEASURING APPARATUS

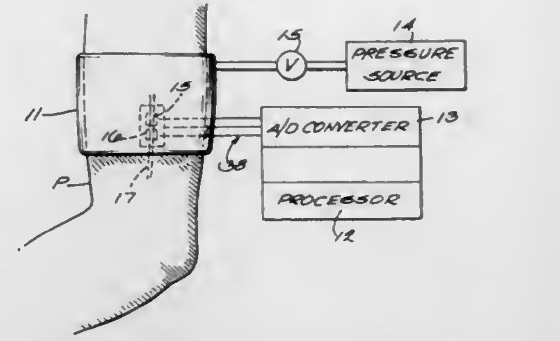
Paul Richard Voith, Milwaukee, Wis., assignor to Marquette Electronics, Inc., Milwaukee, Wis.

Division of Ser. No. 377,628, Jan. 25, 1995, Pat. No. 5,649,535. This application Mar. 4, 1997, Ser. No. 810,425

Int. Cl.^{6} A61B *5/02*

U.S. Cl. 600—493 **14 Claims**

1. A transducer for use with a blood pressure measuring system having means for applying pressure to a patient's artery to arrest blood flow in the artery and for releasing the pressure wherein a signal occurs when the pressure applied by the pressure applying



means is reduced sufficiently to permit the commencement of intermittent blood flow in the artery, said signal having a wavelength, said transducer including first and second signal responsive means for sensing the signal occurring upon the commencement of blood flow in the artery, said first and second responsive means being spaced apart a distance equal to about one-quarter of the wave length of the signal associated with the commencement of blood flow as the pressure on the artery is reduced.

5,840,037

SPHYGMOMANOMETER

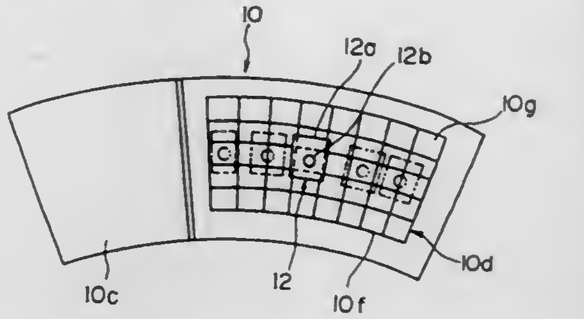
Osamu Tochikubo, Kanagawa, and Shigehiro Ishizuka, Saitama, both of Japan, assignors to A & D Company, Limited, Tokyo, Japan

PCT No. PCT/JP96/01751, § 371 Date Jul. 22, 1997, § 102(e) Date Jul. 22, 1997, PCT Pub. No. WO97/49332, PCT Pub. Date Dec. 31, 1997

PCT Filed Jun. 25, 1996, Ser. No. 793,336

Int. Cl.^{6} A61B *05/00*

U.S. Cl. 600—499 **5 Claims**



1. A cuff for a sphygmomanometer adapted for attachment to an appointed part of a patient and adapted for compression of an artery, comprising a hard curved plate retained between an inside cloth and outside cloth sewed to each other, an engaging fastener fixed on an outer surface of said outside cloth, an air bag fixed at an inner circumferential side of said inside cloth and having an inside and an outside, and a photoelectric sensor installed between the inside and outside of said air bag, wherein said photoelectric sensor includes a reflection plate secured at the inside part of said air bag and a light receiving element and a light emitting element which are provided at the outside part of said air bag.

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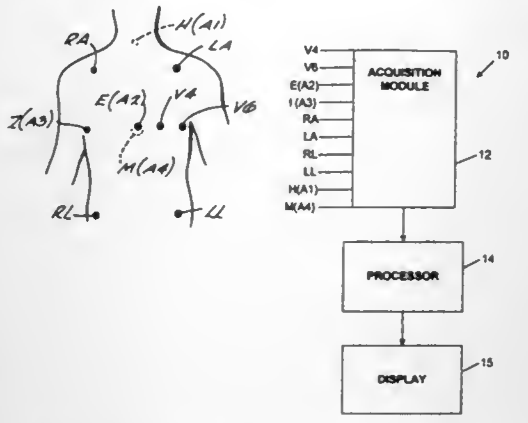
5,840,038
METHOD AND APPARATUS FOR SIGNAL AVERAGING AND ANALYZING HIGH RESOLUTION P WAVE SIGNALS FROM AN ELECTROCARDIOGRAM

Qiuzhen Xue, Germantown, and Shankara Reddy, Cedarburg, both of Wis., assignors to Marquette Medical Systems, Inc., Milwaukee, Wis.

Filed May 29, 1997, Ser. No. 865,155
Int. Cl.^{6} A61B *5/0452*
U.S. Cl. 600—512 **29 Claims**



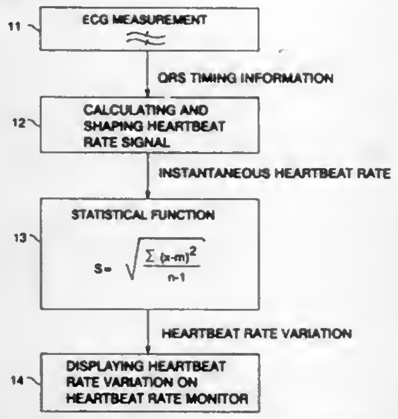
1. A method of averaging the P wave portion of ECG signals comprising the steps of,

sensing human ECG signals having at least a QRS portion and a P wave portion,
detecting the QRS portion of the ECG signals,
suppressing the QRS portion of the ECG signals,
generating a P wave detection function from the P wave portion of the ECG signals,
cross correlating the detection functions of the P wave portions of the ECG signals, and
averaging the cross correlated P wave detection function signals.

5,840,039
METHOD AND APPARATUS IN CONNECTION WITH MEASURING THE HEARTBEAT RATE OF A PERSON

Ilkka Heikkilä, Oulu, Finland, assignor to Polar Electro Oy, Kempele, Finland

PCT No. PCT/FI95/00714, § 371 Date Jun. 27, 1997, § 102(e) Date Jun. 27, 1997, PCT Pub. No. WO96/20641, PCT Pub. Date Jul. 11, 1996
PCT Filed Dec. 28, 1995, Ser. No. 860,502
Claims priority, application Finland, Dec. 29, 1994, 946164; May 31, 1995, 952656
Int. Cl.^{6} A61B *5/0456*
U.S. Cl. 600—519 **24 Claims**


11
ECG MEASUREMENT
QRS TIMING INFORMATION
12
CALCULATING AND SHAPING HEARTBEAT RATE SIGNAL
INSTANTANEOUS HEARTBEAT RATE
13
STATISTICAL FUNCTION
$S = \sqrt{\frac{\sum (x-m)^2}{n-1}}$
HEARTBEAT RATE VARIATION
14
DISPLAYING HEARTBEAT RATE VARIATION ON HEARTBEAT RATE MONITOR

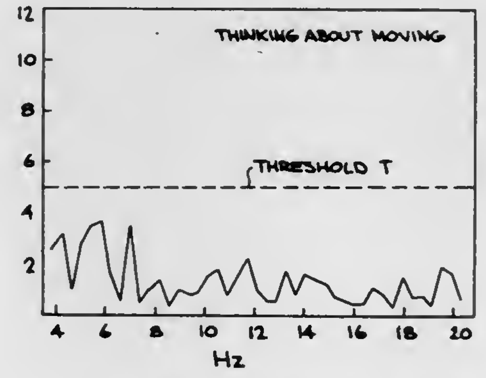
1. A method in connection with measuring the heartbeat rate of a person, comprising the following steps:

measuring the ECG signal of the person and the timing moment of at least one ECG signal waveform,
calculating the average heartbeat rate from the ECG signal,
providing, by means of a mathematical function, real-time heartbeat rate variation information proportional to one of the magnitude of the heartbeat rate variation, the total power of a spectrum derived from the heartbeat rate and the partial power of a spectrum derived from the heartbeat rate, and
displaying in real time said heartbeat rate variation information.

5,840,040
ENCEPHALOLEXIANALYZER

Eric L. Altschuler, Livermore, and Farid U. Dowla, Castro Valley, both of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Dec. 18, 1992, Ser. No. 993,050
Int. Cl.^{6} A61B *5/00*
U.S. Cl. 600—545 **18 Claims**



1. Method of producing a communication or control signal using the mu wave from the brain of a person, comprising:

monitoring the mu wave from the brain of the person;
producing changes in the mu wave by performing movement or movement rehearsal by the person of a particular body part or parts of the person to attenuate the mu wave of the person in a selected pattern from the value of the mu wave when the person is neither moving nor thinking of moving;
measuring said mu wave attenuation from the brain of the person caused by movement or movement rehearsal of said body part or parts of the person;
converting said measured mu wave attenuation to a communication or control signal by signal processing the measured mu wave to obtain a power spectrum and comparing the peak power spectrum value to a predetermined threshold value.

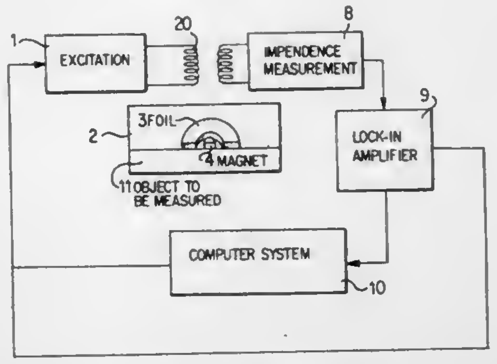
5,840,041
DEVICE FOR MEASURING THE MECHANICAL PROPERTIES OF BIOLOGICAL TISSUE

Erwin Petter, St.-Ingberterstrasse, and Jörg-Uwe Meyer, Rheinstrasse, both of Germany, assignors to Fraunhofer-Gesellschaft zur Foerderung der angewandten Forschung e.V., Munich, Germany

Filed Mar. 14, 1997, Ser. No. 816,996
Claims priority, application Germany, Sep. 16, 1994, 44 33 104.5
Int. Cl.^{6} A61B *5/05*
U.S. Cl. 600—547 **21 Claims**

1. An apparatus for measuring the mechanical properties of biological tissue comprising:

a device for generating a magnetic field by means of a coil system;
a device for mechanically exciting the tissue by means of a permanent magnet as the actuator and a conductive foil as a sensor; and
a device for measuring any change in impedance, wherein said sensor is inductively coupled to said coil system.



5,840,042
METHOD OF PREDICTING BODY COMPOSITION IN PREPUBERTAL CHILDREN INFECTED WITH HUMAN IMMUNODENFICIENCY VIRUS

Stephen M. Arpadi; Mary Horlick, both of New York; Donald P. Kotler, New Rochelle, all of N.Y.; Richard N. Pierson, Englewood, N.J.; John Thornton, Mahopac, N.Y., and Jack Wang, Edgewater, N.J., assignors to St. Luke's-Roosevelt Hospital, New York, N.Y.

Filed May 16, 1997, Ser. No. 857,390
Int. Cl.^{6} A61B *5/05*
U.S. Cl. 600—547 **6 Claims**

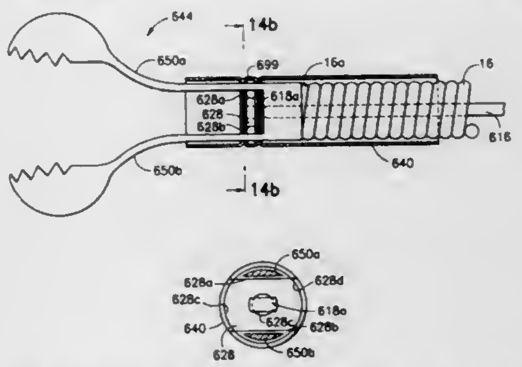
1. A method for predicting fat free mass (FFM) and total body water (TBW) of a prepubertal child infected with human immunodeficiency virus (HIV), comprising the steps of:

measuring a height of said child;
measuring total body resistance of said child; and
predicting fat free mass (FFM) and total body weight (TBW) of said child using said height and said total body resistance.

5,840,043
JAW ASSEMBLY FOR AN ENDOSCOPIC INSTRUMENT

Matthew A. Palmer, Miami; Charles R. Slater, Fort Lauderdale; Vincent A. Turturro, Miramar; Matthew S. Solar, Cooper City; Saul Gottlieb, Miami; Jose L. Francese, Miami Springs, and John Jairo Damarati, Miami, all of Fla., assignors to Symbiosis Corporation, Miami, Fla.

Continuation of Ser. No. 440,327, May 12, 1995, Pat. No. 5,645,075, which is a continuation-in-part of Ser. No. 189,937, Feb. 1, 1994, Pat. No. 5,542,432. This application Jul. 7, 1997, Ser. No. 888,567
Int. Cl.^{6} A61B *10/00;17/28*
U.S. Cl. 600—564 **8 Claims**



1. An endoscopic instrument having proximal and distal portions, comprising:

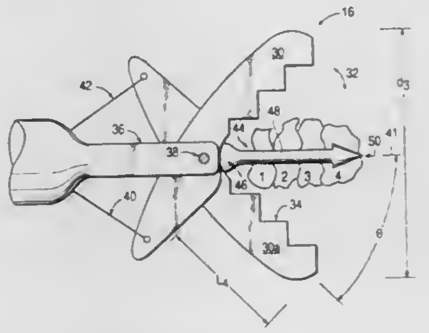
a) a hollow tube member having a proximal end and a distal end;
b) first and second end effectors each having arms biased away from each other, each of said arms being coupled to said distal end of said hollow tube member;
c) a cylindrical member slidably disposed over said distal end of said hollow tube member;
d) an actuator having a proximal end and a distal end, said actuator extending through said hollow tube member; and
e) coupling means for coupling said distal end of said actuator to said cylindrical member for causing said cylindrical member to move relative to said first and second end effectors so as to cause said cylindrical member, in a first position, to extend over at least a portion of said first and second end effectors so as to force said arms of said first and second end effectors toward each other and assume a relatively closed position, and, in a second position, to permit said first and second end effectors to extend away from each other and assume a relatively open position, wherein,

said coupling means comprises a disk segment coupled to said distal end of said actuator, said disk segment being coupled to said cylindrical member by a crimp in said cylindrical member.

5,840,044
MULTIPLE BIOPSY SAMPLING FORCEPS

Alyssa J. Dassa, Chestnut Hill, and Bruce H. Diamond, Brookline, both of Mass., assignors to Boston Scientific Corporation, Watertown, Mass.

Continuation of Ser. No. 129,653, Sep. 30, 1993, abandoned. This application Apr. 3, 1996, Ser. No. 626,918
Int. Cl.^{6} A61B *5/00*
U.S. Cl. 600—567 **33 Claims**



1. A device for obtaining tissue samples from a site within a body, said device constructed for severing and storing multiple samples without withdrawing said device from the body, said device having a flexible proximal portion constructed to follow a nonlinear path to said site and a distal portion constructed with a jaw arrangement that can be opened and closed to sever a tissue sample, said device comprising:

an elongated multiple sampling element in the space encompassed by said jaw arrangement, said sampling element having a length, and said element including a distal end portion with a tissue-piercing profile and a proximal end fixed to the distal portion of said device to maintain said element in an orientation extending generally distally to facilitate tissue piercing as said device is urged toward a tissue surface,
a retaining protrusion between said proximal end and said distal end portion of said multiple sampling element having a diameter greater than a diameter of a portion of said multiple sampling element for preventing stored sample on said portion of said element proximal of said retaining protrusion from moving distally when said jaw arrangement is opened to sever a successive sample from said surface, and
a storage section located proximally of said protrusion and having a length adapted to store multiple samples impaled upon said element, said length of said storage section being a majority of said length of said sampling element, and a

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majority of said length of said storage section being located proximally of said protrusion.

5,840,045

Patent Not Issued For This Number

5,840,046

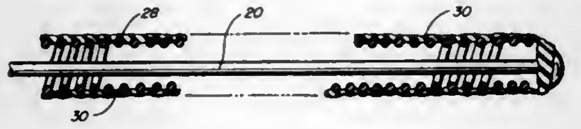
GUIDEWIRE HAVING HYDROPHILIC COATING

Mark E. Deem, San Francisco, Calif., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Jun. 21, 1996, Ser. No. 665,973

Int. Cl.^{6} A61B *5/00*

U.S. Cl. 600—585 **8 Claims**



1. A guidewire comprising:
a core wire having a proximal end and a distal end;
a coil disposed over a distal portion of the core wire, wherein the coil comprises a helically wound filament having a plurality of successive turns spaced-apart by a distance of from 15% to 50% of the width of the filament; and
a polymeric coating bridging the space between successive turns of the helical filament of the coil, wherein said space allows the coating to flex and accommodate bending of the coil without significant loss of pliability.

5,840,047

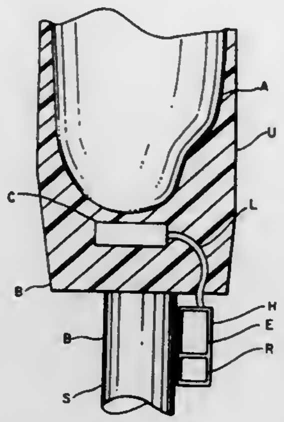
SENSOR DEVICE FOR MONITORING A PROSTHETIC DEVICE

David M. Stedham, Reno, Nev., assignor to Prosthetic Sensing Technologies, LLC, Reno, Nev.

Filed Apr. 16, 1996, Ser. No. 632,965

Int. Cl.^{6} A63B *5/103;* **A61F** *2/60*

U.S. Cl. 600—587 **11 Claims**



1. A sensor device for monitoring a relative position of prosthetic device fitted to a residual portion of a limb of an amputee with respect to the residual portion of the limb, said sensor device comprising a battery power supply, proximity sensor means for generating a position signal indicative of a relative position of said prosthetic device with respect to said residual portion without contact with said residual portion, said proximity sensor means being beld in said prosthetic device at a position adjacent said residual portion and being electrically connected to the battery power supply, and an alarm means for signaling the amputee when the prosthetic device is located in said at least one position.

5,840,048

SKIN BRUSH MASSAGE METHOD

Chia-Yu Cheng, Shanghai, Switzerland, assignor to Jun Sui Kan Sei Cosmetics International Limited, Virgin Islands (Br.)

Filed Jan. 24, 1996, Ser. No. 590,784

Int. Cl.^{6} H61H *9/00;* **A61N** *1/00;* **A61H** *21/00*

U.S. Cl. 601—18 **8 Claims**

1. A method of treating the skin by a specific massage procedure using one or more brushes, said method comprising the steps of:
i) providing facial and body massaging brushes having bristles,
ii) applying a skin cleansing product to specific designated areas of a person's body and face prior to brush massage,
iii) applying a clockwise brush massage to stimulate said specific designated areas of said body and face by said bristles for a predetermined period of time while being subjected to a shower of water,
iv) performing said step (iii) in a specific sequence of said designated areas in compliance with a network of acupuncture points, said method improving blood circulation and simultaneously providing an exfoliation of skin tissue, said specific sequence of massage including the following sequential order of said main designated body areas:
a) the hands of the user,
b) the head and the neck of the user,
c) the shoulders and back of the user,
d) the face and the neck of the user,
e) the chest and the stomach of the user,
f) the arms,
g) the legs and the feet of the user, and
h) the feet and leg.

5,840,049

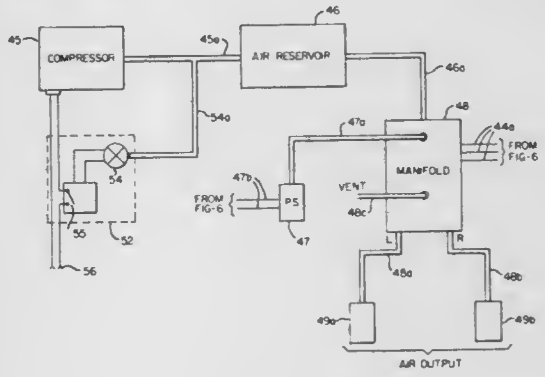
MEDICAL PUMPING APPARATUS

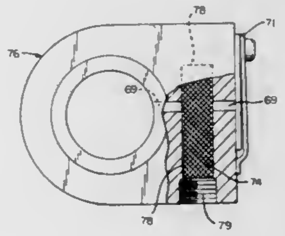
David Malcolm Tumey, Huber Heights, and Robert Louis Cartmell, Bellbrook, both of Ohio, assignors to Kinetic Concepts, Inc., San Antonio, Tex.

Filed Sep. 7, 1995, Ser. No. 524,606

Int. Cl.^{6} A61H *23/04*

U.S. Cl. 601—149 **8 Claims**





1. A medical device for applying compressive pressures against a patient's limb extremity comprising:
an inflatable bag to be fitted upon the limb extremity. said bag having at least one air bladder adapted to engage at least one portion of the limb extremity; and
an air supply mechanism for applying pressurized air to said at least one bladder such that a compressive pressure is applied upon the at least one portion of the limb extremity, said air supply mechanism including an electrically powered fluid compressor for providing said pressurized air and a reservoir for storing pressurized air from said compressor, said compressor comprising:
a housing,
a piston mounted in said housing for drawing air into and forcing air out of said housing, and
an exhaust valve assembly mounted on said piston, said assembly including an exhaust valve and an exhaust filter. said exhaust valve being disposed so that the air pressurized by said compressor must pass through said exhaust valve before being forced out of said housing, and said exhaust filter being disposed so that the air pressurized by said compressor must sass through said exhaust filter before passing through said exhaust valve.

5,840,050

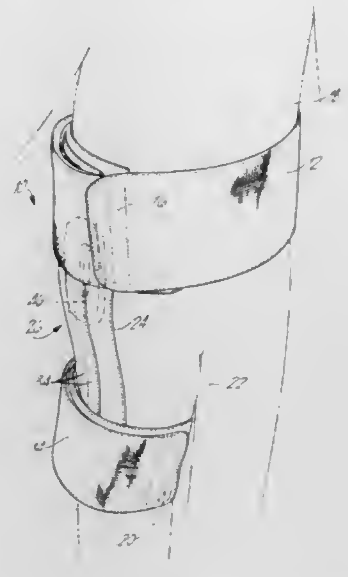
POST-OPERATIVE HIP BRACE

Max Lerman, 1950 Carla Ridge, Beverly Hills, Calif. 90210

Filed Sep. 23, 1996, Ser. No. 717,841

Int. Cl.^{6} A61F *5/00*

U.S. Cl. 602—19 **17 Claims**



1. A post-operative hip brace for preventing hip dislocation during recovery of a patient comprising:
a waist strap adjustably positionable around the waist of the patient;
a leg strap adjustably positionable above the knee around the upper leg of the patient;
a vertically extending, generally flat hip support connected between the waist strap and the leg strap; and
a plurality of vertically extending and horizontally spaced apart malleable stays each removably contained on an exterior surface of the hip support, extending across the width of the patient's hip region and shaped to a configuration to match the shape of the patient's hip region in the area traversed by the spaced apart stays, the stays extending along the outside of the patient's upper leg and terminating at lower ends adjacent the leg strap spaced above the knee joint, the stays extending across the width of the patient's upper leg and shaped to a configuration to match the upper leg configuration traversed by the spaced apart stays, the stays retaining their shaped configuration and providing a level of rigid support for cooperating to resist hip adduction and flexion of the upper leg about the hip joint while allowing free bending of the knee joint to permit walking by the patient.

5,840,051

FLEXIBLE BACK, NECK AND SHOULDER BRACE

Harold E. Towsley, 1821 Greenstone Dr., New Haven, Ind. 46774

Continuation-in-part of Ser. No. 519,082, Aug. 24, 1995, Pat. No. 5,669,873. This application Aug. 18, 1997, Ser. No. 912,728

Int. Cl.^{6} A61F *5/00*

U.S. Cl. 602—19 **22 Claims**

1. An externally applied non-invasive spinal column appliance adapted to span a plurality of vertebrae comprising:
a plurality of generally longitudinally aligned rigid members;
means pivotably coupling adjacent pairs of rigid members for relative angular movement about a bending moment axis;
means for selectively restricting the angular movement of each pivotably coupled pair about the bending moment axis includ-

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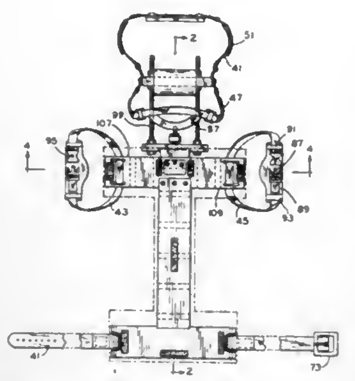


ing means engaging each of the adjacent rigid members for pulling the adjacent rigid members angularly toward one another; and

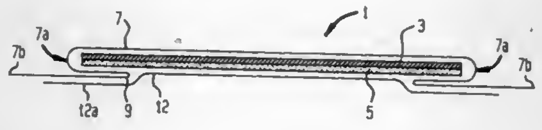
strap means for encircling portions of a patient's body to secure the rigid members to the body and to transfer bending moment forces to the patient's spinal column.

5,840,052
ADHESIVE DRESSING APPLICATOR

Owen L. Johns, Madeira Beach, Fla., assignor to Bertek, Inc., St. Albans, Vt.

Filed Jan. 27, 1995, Ser. No. 379,863
Int. Cl.^{6} A61F *5/00*

U.S. Cl. 602—54 **53 Claims**



1. A wound dressing comprising a dressing layer for application to the skin or mucosa of a host, said dressing layer having a first surface and a second surface, a bio-compatible adhesive layer on said first surface of said dressing layer, a support layer on said second surface of said dressing layer, said support layer including an extending portion extending around to said first surface of said dressing layer, and a separate protective layer on said first surface of said dressing layer, wherein said extending portion of said support layer is interposed between an edge portion of said first surface of said dressing layer and said separate protective layer to thereby facilitate removal and separation of said protective layer from said wound dressing while retaining said dressing layer on said support layer, and wherein said extending portion of said support layer is folded back upon itself to form a gripping portion for removal of said support layer from said dressing layer after said dressing layer has been applied to said skin or mucosa of said host, at least part of said extending portion being interposed between said folded gripping portion and said edge portion of said first surface.

5,840,053
DEVICE FOR FOOT STABILIZATION

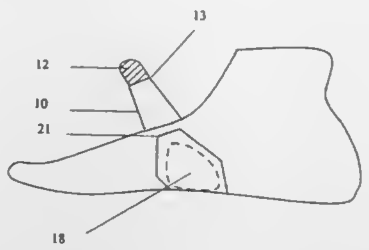
Ivar E. Roth, Corona del Mar, Calif., assignor to American Arch LLC, Newport Beach, Calif.

Continuation of Ser. No. 324,257, Oct. 17, 1994, abandoned. This application Oct. 5, 1995, Ser. No. 539,426
Int. Cl.^{6} A61F *5/30*

U.S. Cl. 602—66 **9 Claims**

1. A device for stabilizing either a left or right foot and limiting pronation and heel spur syndrome, the foot having a longitudinal arch with a plantar aspect having medial and lateral regions defined by the longitudinal axis of the foot, comprising:

a flexible strap of an elastic material having first and second ends for wrapping around the foot;



a fastener for temporarily securing ends of said strap together on the foot; and

an elastomeric pad formed of a material that substantially regains its original thickness after compression and has an edge surface and inwardly tapered sides extending from said edge surface generally in the direction of a longitudinal axis of the pad toward a narrow end of the pad, said pad being fixed to an inner surface of said strap for absorbing energy and defending against shock, at a position on said strap in proximity to the first end of said strap and oriented with the narrow end of said pad facing said first end of the strap such that when said strap and pad are applied to the foot, and said pad is disposed under said longitudinal arch exclusively outside the lateral region of the plantar portion of the longitudinal arch, the longitudinal axis of said pad is approximately perpendicular to the longitudinal axis of the foot, and said tapered portion of said pad is disposed from the longitudinal axis of the foot toward the medial region of the longitudinal arch to minimize effects of pronation.

9. A method of treating a foot by limiting pronation and heel spur syndrome, the foot having a longitudinal arch with a plantar aspect having medial and lateral regions defined by the longitudinal axis of the foot, comprising

wrapping the foot with an elastic strap, the strap bearing an elastomeric pad formed of a material that substantially regains its original thickness after compression and has an edge surface and inwardly tapered sides extending from said edge surface generally in the direction of a longitudinal axis of the pad toward a narrow end of the pad, said pad being fixed to an inner surface of said strap for absorbing energy and defending against shock; and

positioning on said strap on the foot such that said pad is disposed under said longitudinal arch exclusively outside the lateral region of the plantar portion of the longitudinal arch, the longitudinal axis of said pad is approximately perpendicular to the longitudinal axis of the foot, and said tapered portion of said pad is disposed from the longitudinal axis of the foot toward the medial region of the longitudinal arch to minimize effects of pronation.

5,840,054
METHOD FOR OBSTRUCTING LACRIMAL CANALICULI WITH INFUSABLE SOLUTION OR DISPERSION

Takashi Hamano, Osaka; Teruo Miyata, and Takeshi Ogawara, both of Tokyo, all of Japan, assignors to Koken Co., Ltd., Tokyo, Japan

Filed Jun. 21, 1995, Ser. No. 493,282
Claims priority, application Japan, Jun. 24, 1994, 6-143623
Int. Cl.^{6} A61F *9/00*

U.S. Cl. 604—8 **18 Claims**

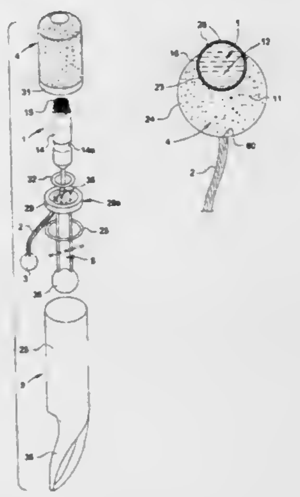
1. A method for occluding a lacrimal canaliculi comprising injecting a solution into the lacrimal canaliculi, wherein the solution is physiologically acceptable, in a fluid form sufficient for injection through a needle at the time of injection, and changes in response to conditions in the lacrimal canaliculi into a solid form after injection.

5,840,055
DISPOSABLE DEVICE FOR TRANSFER OF AN ACTIVE LIQUID INTO AN INTRACORPOREAL CAVITY

Jean-Claude Sgro, Dijon, France, assignor to Bernard Chaffringeon, Saint-Sulpice, Switzerland

PCT No. PCT/FR95/01521, § 371 Date Jul. 15, 1997, § 102(e) Date Jul. 15, 1997, PCT Pub. No. WO96/15724, PCT Pub. Date May 30, 1996
PCT Filed Nov. 17, 1995, Ser. No. 817,945
Claims priority, application France, Nov. 21, 1994, 94 14249
Int. Cl.^{6} A61F *13/20;5/44;* **A61M** *1/00*

U.S. Cl. 604—11 **22 Claims**



1. A disposable device for transfer of an active liquid into an intracorporeal cavity comprising:

a central element comprising an interior and an exterior surface, wherein the central element is able to contact the inside of said intracorporeal cavity;

an absorbent peripheral element arranged around the central element, wherein the peripheral element absorbs liquid and bears sealingly against mucous membranes of said intracorporeal cavity;

a temporary protective covering, sealed with respect to the liquids, that prevents fluid communication between the peripheral element and the interior surface of the central element, wherein the peripheral element and the central element are arranged to communicate with one another in said intracorporeal cavity, once the temporary protective covering has been withdrawn;

a source of the active liquid contained in the central element or the peripheral element;

a means for recovering the active liquid, which has circulated in the intracorporeal cavity, said means being contained in the peripheral element or the central element, respectively;

a transport element for transporting the active liquid that has circulated in the intracorporeal cavity, said transport element having an elongate shape and continuing at one end with the central element or the peripheral element; and

an outer element for extemporaneous analysis of a constituent of a body fluid present in the intracorporeal cavity, mixed with the active liquid, wherein the outer element is arranged at a free end of the transport element.

5,840,056
IONTOPHORESIS ELECTRODE

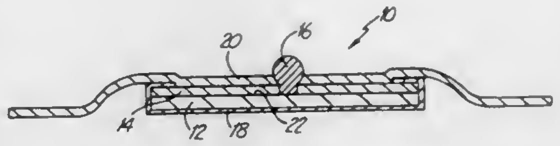
Ljiljana Atanasoska, Edina, Minn., assignor to Empi, Inc., St. Paul, Minn.

Filed Jun. 15, 1995, Ser. No. 490,847
Int. Cl.^{6} A61N *14/30*

U.S. Cl. 604—20 **74 Claims**

1. An iontophoresis electrode comprising:

a reservoir;



means for scavenging hydrogen ions without releasing ions, the means for scavenging hydrogen ions located in working relation with and immobilized with respect to the reservoir; and

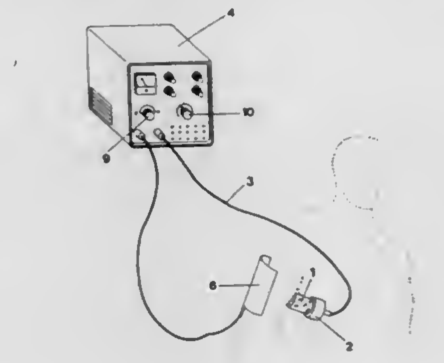
an electrical connection in electrical communication with the reservoir.

5,840,057
DEVICE FOR IONTOPHORETIC PHYSIOTHERAPY WITH FROZEN MEDICAMENT CRYSTALS

Alessandro Aloisi, via Colombo 10, 95030 Mascalucia CT, Italy

PCT No. PCT/IT95/00010, § 371 Date Aug. 7, 1996, § 102(e) Date Aug. 7, 1996, PCT Pub. No. WO96/22810, PCT Pub. Date Aug. 1, 1996
PCT Filed Jan. 27, 1995, Ser. No. 687,528
Int. Cl.^{6} A61N *1/30*

U.S. Cl. 604—20 **12 Claims**



1. An iontophoretic physiotherapy device comprising;

an electrode holder holding a frozen medicament crystal electrode containing a frozen medicament wherein the frozen medicament crystal electrode is to be placed on a first area of the skin of a patient,

wide surface electrode electrode is adapted to be placed on a second area of the skin of a patient, and

an apparatus for generating a periodical electrical current through the frozen medicament crystal electrode and the electrode.

5,840,058
INFUSION PUMP WITH DISPOSABLE TUBING AND SIZE INDICATING MEANS

David Ammann, Alpharetta, and Luis Garcia-Verona, Duluth, both of Ga., assignors to Alphamed Incorporated, Norcross, Ga.

Filed Dec. 2, 1996, Ser. No. 758,967
Int. Cl.^{6} A61M *1/00*

U.S. Cl. 604—30 **30 Claims**

1. An apparatus, comprising:

(a) a tubing set comprising flexible pump tubing of a size adapted for a specific flow rate, a housing having a fluid channel therethrough and comprising size identification means, the size identification means adapted to identify the flexible pump tubing size, and the housing permanently connected to the flexible pump tubing; and

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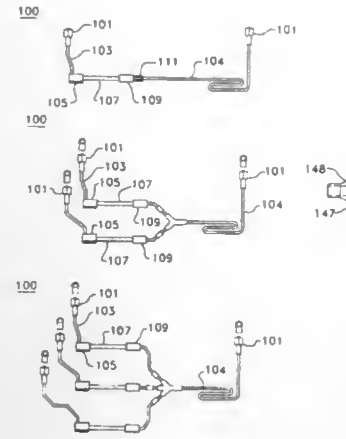


(b) a pump adapted to receive the housing and the flexible pump tubing portion of the tubing set, the pump comprising means for reading the identification means on the housing when the housing and the flexible tubing are received within the pump.

5,840,059

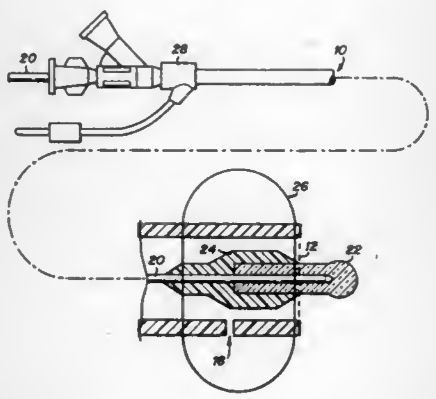
THERAPEUTIC AND DIAGNOSTIC AGENT DELIVERY

Keith L. March, Carmel, Ind.; Michael Aita, Sunnyvale; Randy Kesten, Mountain View, both of Calif., and Craig Smith, Bronxville, N.Y., assignors to CardioGenesis Corporation, Santa Clara, Calif.; Indiana University Foundation, Bloomington, Ind., and Columbia University, New York, N.Y.

Filed Jun. 7, 1995, Ser. No. 483,512

Int. Cl.^{6} A61M *31/00*

U.S. Cl. 604—53 **7 Claims**



1. A method for treating a patient's heart comprising the steps of:

a) providing a tissue ablation means to form a channel within a wall of the patient's heart which includes a myocardial layer and means to deliver a therapeutic or diagnostic agent into a channel formed by the channel forming means;

b) positioning the channel forming means against a desired region of the heart wall;

c) activating the channel forming means to form a channel in the wall of the patient's heart;

d) withdrawing at least in part the channel forming means from the thus formed channel,

e) delivering the agent into the channel.

5,840,060

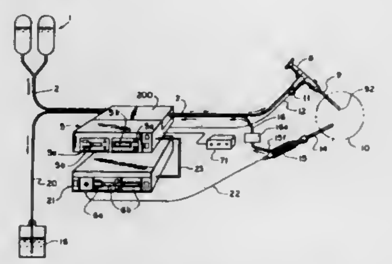
FLUID MANAGEMENT SYSTEM

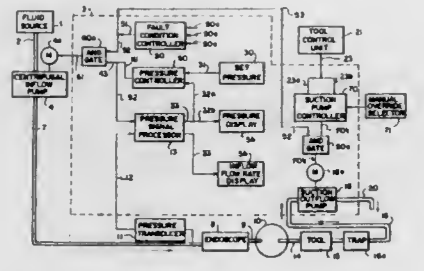
David G. Beiser, Brookline; Steven B. Woolfson, Boston, both of Mass., and Kenneth W. Krause, Sandown, N.H., assignors to Smith & Nephew, Inc., Memphis, Tenn.

Division of Ser. No. 255,281, Jun. 7, 1994, abandoned, which is a continuation of Ser. No. 867,981, Apr. 13, 1992, abandoned, which is a continuation-in-part of Ser. No. 748,249, Aug. 21, 1991, abandoned, and Ser. No. 838,465, Feb. 19, 1992, abandoned, which is a continuation-in-part of Ser. No. 748,249. This application Jun. 7, 1995, Ser. No. 486,607

Int. Cl.^{6} A61M *31/00*

U.S. Cl. 604—66 **11 Claims**





1. A disposable plastic pump cassette for supplying liquid under pressure to a body cavity and simultaneously aspirating liquid from the body cavity in an endoscopic surgical procedure, comprising:

a housing, including a pair of tubing holders being structured and arranged to hold a length of resilient tubing therebetween;

an inflow pump in said housing;

an inlet conduit within said housing being structured and arranged to supply liquid to said inflow pump;

an outlet conduit within said housing being structured and arranged to deliver liquid under pressure from said inflow pump; and

a resilient tubing being held between said tubing holders in an arrangement leaving a portion of said resilient tubing exposed sufficient to allow crimping of said exposed portion, wherein a liquid aspirated from a body cavity can flow through said resilient tubing during the endoscopic procedure, and wherein crimping of said exposed portion of said resilient tubing restricts a flow of said liquid aspirated from said body cavity.

5,840,061

EJECTION APPARATUS FOR THE HIGH PRESSURE EJECTION OF A LIQUID

Andreas Menne, Meersburg; Wolfgang Merkle, Linnich; Manfred Schulz, Oberlingen, all of Germany, and Denis Klopfenstein, Morges, Switzerland, assignors to Ferton Holding, Delemont, Switzerland

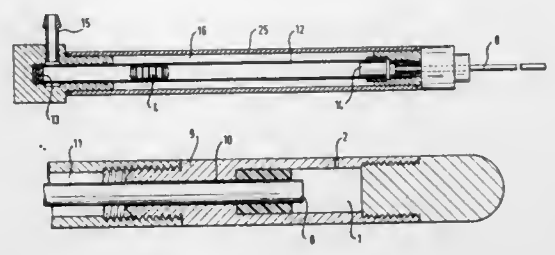
PCT No. PCT/EP96/02072, § 371 Date Jan. 15, 1997, § 102(e) Date Jan. 15, 1997, PCT Pub. No. WO96/36381, PCT Pub. Date Nov. 21, 1996

PCT Filed May 14, 1996, Ser. No. 765,790

Claims priority, application Germany, May 15, 1995, 295 07 987 U

Int. Cl.^{6} A61M *5/30*

U.S. Cl. 604—68 **28 Claims**



1. Ejection apparatus for the high pressure ejection of a liquid, comprising:

(a) a pressure chamber for containing the liquid;

(b) an ejection opening communicating between an outside and an inside of the pressure chamber;

(c) a working piston displaceable in the pressure chamber from a first position at a beginning of a working stroke to second position at an end of the working stroke, having (1) a first end defining a first volume within the pressure chamber when the working piston is at the first position and displacing a second volume when the working piston moves from the first position to the second position, the first volume being substantially larger than the second volume, and (2) having a second end distal from the first end; and

(d) a drive for driving the working piston including (1) an impact member for elastically impacting the second end of the working piston to cause the working piston to move from the first to the second position, and (2) means for accelerating the impact member to impact the working piston, wherein the impact member is not driven after an elastic impact with the working piston.

5,840,062

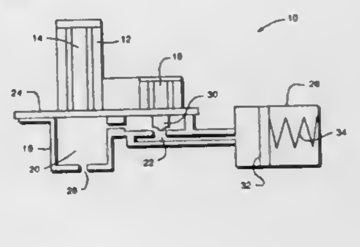
SOLID STATE FLUID DELIVERY SYSTEM

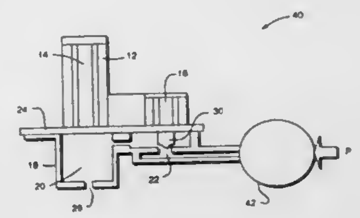
Anand V. Gumaste, 7 Ardsley Ct., Robbinsville, N.J. 08691; Andrew L. Abrams, 26 Imperial Ave., Westport, Conn. 06880, and Scott Fleming, 18 Riverview Dr., Ewing, N.J. 08628

Filed Nov. 8, 1995, Ser. No. 555,207

Int. Cl.^{6} A61M *5/30*

U.S. Cl. 604—68 **22 Claims**





1. An apparatus for the rapid and repeatable delivery of small quantities of a fluid to an intended target, comprising:

at least one first housing having walls defining a dispensing chamber for said fluid, and at least one nozzle element defined in one of said walls for the discharge of said fluid; and

at least one second housing communicating with said first housing, said second housing comprising pump means comprising at least one piezoelectric element in fluid communication with said first housing for forcing a predetermined quantity of said fluid out of said dispensing chamber and through said at least one nozzle element, said second housing being detachable from said first housing, and actuation means for exciting said pump means to force said fluid out of said dispensing chamber.

5,840,063

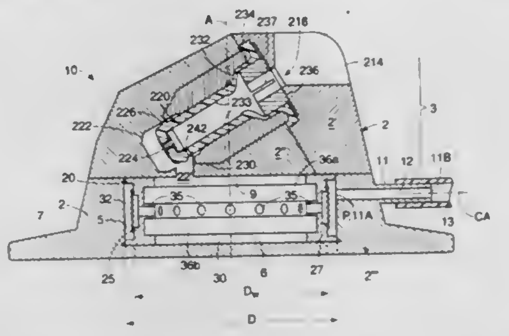
SEPTUMLESS IMPLANTABLE TREATMENT MATERIAL DEVICE

Christopher J. Flaherty, Topsfield, Mass., assignor to Programmable Pump Technologies, Inc., New York, N.Y.

Division of Ser. No. 475,773, Jun. 7, 1995, Pat. No. 5,702,363. This application Jun. 3, 1997, Ser. No. 868,389

Int. Cl.^{6} A61M *5/00*

U.S. Cl. 604—93 **14 Claims**



1. An implantable access device comprising:

A. a biocompatible housing having at least one septumless resealable entry port and an internal substantially cylindrical reservoir in the housing, said reservoir being defined by a lateral surface extending about a central axis and a bottom surface and being in communication with said entry port;

B. an outlet extending through said housing along an outlet channel axis from a point on said lateral surface of said reservoir, and

C. a filter assembly disposed in said reservoir, said filter assembly including a substantially cylindrical fluid permeable first wall interior to and spaced apart from said lateral surface of said reservoir, said first wall establishing a first annular chamber between said first wall and said lateral surface and a first reservoir chamber interior to said first wall, said first annular chamber and said first reservoir chamber being in fluid communication only through said first wall, and said outlet being in direct fluid communication with said first annular chamber.

5,840,064

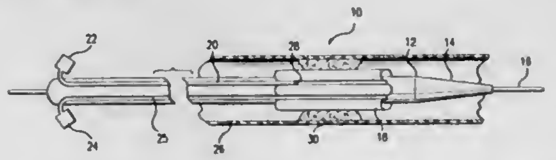
METHOD AND APPARATUS FOR TREATING STENOSIS OR OTHER CONSTRICTION IN A BODILY CONDUIT

Samuel F. Liprie, Lake Charles, La., assignor to United States Surgical Corporation, Norwalk, Conn.

Continuation-in-part of Ser. No. 220,681, Mar. 31, 1994, Pat. No. 5,556,389, and Ser. No. 316,500, Sep. 30, 1994, Pat. No. 5,618,266. This application Apr. 15, 1996, Ser. No. 632,150

Int. Cl.^{6} A61M *29/00*

U.S. Cl. 604—96 **13 Claims**



1. A device for treating an occlusion or a constriction in a vessel or other conduit in the body, comprising:

a flexible, elongated, hollow catheter having a distal end and a proximal end;

an inflatable ribbed balloon encircling a portion of said catheter proximate to said distal end, said ribbed balloon forming at

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least one pair of lobes defining longitudinal perfusion grooves between said lobes, said grooves allowing liquid to flow around said at least one pair of lobes through said longitudinal grooves when said ribbed balloon is inflated; and

a discontinuous membrane covering at least a portion of said longitudinal grooves and affixed between said at least one pair of said lobes.

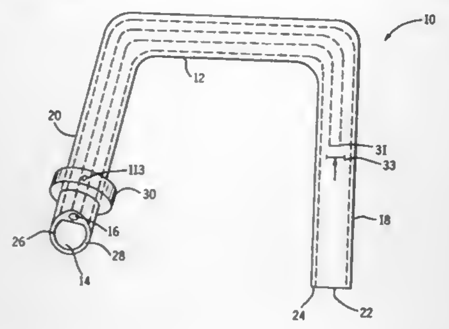
5,840,065
FEEDING TUBE AND METHOD

Donald J. Goldhardt, Grove City; John D. Hall, Croton; William H. Hirsch, Gahanna, and Jeffrey R. Ross, Dublin, all of Ohio, assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Oct. 11, 1996, Ser. No. 729,607

Int. Cl.^{6} A61M *29/00*

U.S. Cl. 604—96 **5 Claims**



1. A feeding tube comprising:

a tube having an internal end portion and an external end portion, an external terminal end positioned on said external end portion, said tube defining a feeding lumen therethrough from said external end portion to said internal end portion, a fillable retaining member mounted on said internal end portion of said tube, said tube defining a filling lumen extending from an internal point on said internal end portion to an external point on said external end portion, said external point spaced from said external terminal end, said filling lumen in fluid communication with an interior of said retaining member, said filling lumen in fluid communication with an external environment of said tube only at said internal point.

5,840,066
INFUSION CATHETER

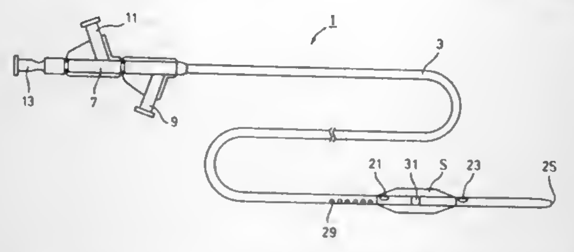
Takehisa Matsuda, Minou; Nobumasa Tsutsui, Nagoya, and Jun Inada, Kasugai, all of Japan, assignors to Tokai Kobunshi Kagaku Kabushikigaisha, Nagoya, Japan

Filed Oct. 22, 1996, Ser. No. 735,135

Claims priority, application Japan, Oct. 26, 1995, 7-278992

Int. Cl.^{6} A61M *29/00*

U.S. Cl. 604—96 **13 Claims**



1. An infusion catheter for supplying medicine upstream of a lesion formed in a blood vessel following expansion of a balloon, said infusion catheter comprising:

an elongate catheter shaft having a proximal end, a distal end, a first lumen for supplying and removing a fluid medium from a balloon, and a second lumen having a medicine discharge port for supplying medicine to the blood vessel, and both the first and second lumens being supported by the catheter shaft;

a balloon being located adjacent to the distal end of said catheter shaft but spaced therefrom, said balloon communicating with said first lumen and being inflatable and contractible such that said balloon inflates when the fluid medium is supplied to said balloon and contracts when the fluid medium is removed from said balloon;

a blood passage being provided in said catheter shaft for bypassing blood passed both said balloon and said medicine discharge port, said blood passage having a first opening located between the proximal end of said catheter shaft and said balloon and a second opening being located between said balloon and the distal end of said catheter shaft; and

the medicine discharge port being located between said balloon and the second opening of said blood passage such that during use, the medicine is introduced into the blood vessel proximate the lesion but spaced from the second opening of said blood passage thereby facilitating the medication to medicate the lesion.

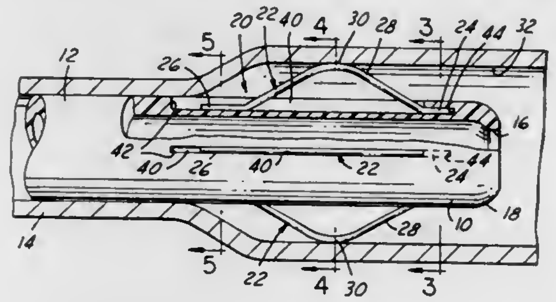
5,840,067
CENTERFLOW CATHETER

Ramon Berguer, 5865 Bloomfield Glens, West Bloomfield, Mich. 48322, and Farshad Malekmehr, 1321 Orleans St. #2001, Detroit, Mich. 48207

Filed Feb. 28, 1997, Ser. No. 808,393

Int. Cl.^{6} A61M *29/00*

U.S. Cl. 604—104 **5 Claims**



1. In combination, an intravascular catheter provided with an outlet end portion having a tip formed with an orifice, and a device for supporting the outlet end portion of the catheter within a blood vessel while a treating agent is delivered into the blood vessel through the orifice at the tip of said outlet end portion, said device comprising frame structure carried by and projecting radially outwardly from said outlet end portion of the catheter for engagement with the blood vessel to support said outlet end portion centrally within the blood vessel with the tip out of contact with the blood vessel, said frame structure comprising a plurality of radially outwardly projecting frame elements mounted on said outlet end portion of the catheter in angularly spaced relation thereabout, said frame elements being in the form of identical, elongated, flexible, resilient, wire struts extending lengthwise of said outlet end portion of the catheter, each said wire strut having a distal end adjacent to the tip of the catheter, a proximal end more remote from said tip, and a generally V-shaped, radially outwardly projecting mid-portion having an apex adapted to rest on a wall of the blood vessel, the mid-portion of each said wire strut being passively collapsible radially inwardly solely under the influence of radial pressure, and each said wire strut being independent of the other wire struts and free of manipulation or activation by an operator or a remote power source.

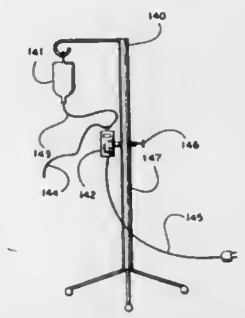
5,840,068
RAPID INFUSION SYSTEM

Richard G. Cartledge, 1800 Wesleyan Dr., 16, Macon, Ga. 31210

Filed Feb. 28, 1996, Ser. No. 608,291

Int. Cl.^{6} A61M *37/00*

U.S. Cl. 604—131 **15 Claims**



1. A method for rapid infusion of a physiologic fluid into the venous system of a patient, comprising the steps of:

a. providing a reservoir of a physiologic, fluid to be infused into a patient; and

b. propelling the physiologic fluid from the reservoir into the venous system of a patient by an adjustable flow/rate portable infusion mechanism having a pump drive means for driving a pump means, said pump means being separable from the drive means.

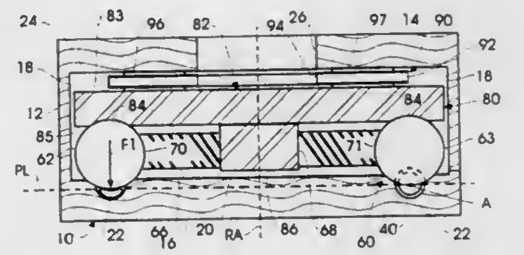
5,840,069
IMPLANTABLE PERISTALTIC PUMP TECHNIQUES

Reginald D. Robinson, Brooklyn Park, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 4, 1996, Ser. No. 627,985

Int. Cl.^{6} A61M *37/00;1/00;* F04B *43/09;43/12*

U.S. Cl. 604—131 **28 Claims**



1. A peristaltic pump for an implantable medical device comprising in combination:

a pump tube for holding a liquid to be pumped, said tube defining an axis lying along a path;

a first race for supporting said tube in a first plane;

roller means for compressing said tube at one or more points along said path in a direction non-parallel to said first plane, said roller means comprising at least one spherical roller and a spacer for guiding said at least one roller along said path; and

means for driving said roller means relative to said tube along said path, whereby said liquid is moved through said tube.

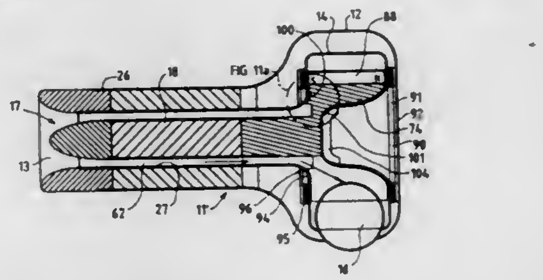
5,840,070
SEALLESS ROTARY BLOOD PUMP

Richard K. Wampler, Granite Bay, Calif., assignor to Kriton Medical, Inc., Citrus Heights, Calif.

Continuation-in-part of Ser. No. 603,536, Feb. 20, 1996, Pat. No. 5,695,471. This application Aug. 13, 1997, Ser. No. 910,375

Int. Cl.^{6} A61M *37/00*

U.S. Cl. 604—131 **34 Claims**



1. A sealless blood pump, comprising:

a pump housing, having an inlet tube on one end and an impeller casing on the other end, said casing including a outlet;

a rotor mounted for rotation within said housing, said rotor having an elongated shaft portion and an impeller attached to said shaft portion, said impeller being located within said impeller casing;

radial magnetic bearings carried by said shaft portion, and radial magnetic bearings carried by said housing for maintaining said shaft portion of said rotor within said inlet tube of said housing;

a rotor motor, said motor including a plurality of permanent magnets carried by said impeller and a motor stator including an electrically conductive coil located within said housing; and

a ring of back iron fixed to said casing to aid in completing a flux return path for said permanent magnets.

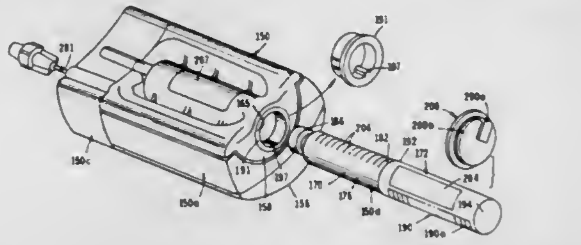
5,840,071
FLUID DELIVERY APPARATUS WITH FLOW INDICATOR AND VIAL FILL

Marshall S. Kriesel, St. Paul; Steven M. Arnold, Minnetanka; James Garrison, South Minneapolis, and Farhad Kazemzadeh, Bloomington, all of Minn., assignors to Science Incorporated, Bloomington, Minn.

Filed Dec. 18, 1996, Ser. No. 768,663

Int. Cl.^{6} A61M *37/00*

U.S. Cl. 604—132 **21 Claims**



1. A device for use in infusing medicinal fluid into a patient at a controlled rate comprising:

(a) a base having a receiving chamber formed therein;

(b) a hollow cannula mounted within said receiving chamber of said base;

(c) stored energy means for forming, in conjunction with said base a fluid reservoir having an inlet in communication with said hollow cannula and an outlet, said stored energy means comprising at least one distendable member superimposed over said base, said member being distendable as a result of pressure imparted by the fluids to be infused, to establish internal stresses, said stresses tending to move said member toward a less distended configuration;

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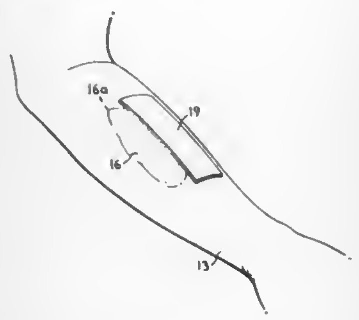
(d) fill means receivable within said receiving chamber of said base for filling said fluid reservoir;
(e) an outlet port in communication with said outlet of said fluid reservoir for dispensing fluids from the device; and
(f) fluid actuated indicator means disposed intermediate said fluid outlet of said reservoir and said outlet port for visually indicating fluid flow from said fluid reservoir.

5,840,072
ADHESIVE TAPE APPLICATION TO HUMAN SKIN

Martin R. Carey, 924 N. 82nd Ter., Apt. B, Kansas City, Kans. 66112

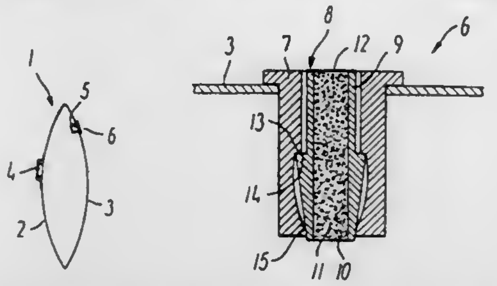
Filed Jun. 1, 1993, Ser. No. 69,722
Int. Cl.^{6} A61M *35/00*
U.S. Cl. 604—290 **14 Claims**



1. A process of treating human body exposure to noxious chemicals including such from plants such as poison ivy and poison sumac including the steps of:
(1) as soon as contact with a noxious, oily, chemical agent is noted, including the beginning or maturation of a reaction thereto, first defining as well as possible the limits of the affected or exposed area(s);
(2) providing strips of adhesive tape of a sufficient length to extend at least the length of the defined affected area and sequentially applying said strips longitudinally parallel or substantially parallel to one another with at least some overlap thereof whereby to, as swiftly as possible, cover the entire defined affected area adhesive side in;
(3) after the application of at least one, more or many strips of adhesive tape to cover the defined contaminated zone to be treated, first, gently, then more harshly, rubbing and scratching the outer surface of the entire tape, whereby to force essentially its entire adhesive side against the entire defined affected skin area;
(4) maintaining the initial cover, blanket or body of tape in place on the said defined affected area until at least some perspiration or visible body fluid, plant oils or combinations thereof are generated thereunder, thus to aid in the transfer of contaminated substances from the skin to the adhesive of the tape;
(5) when noticeable perspiration and/or liquifaction of any sort (contaminating liquids, contaminating oils, skin liquids, skin oils, skin fragments carried thereby, combinations thereof etc.) have appeared or collected under the tape, removing the body of the tape application from the overlaid area in such manner as to not contact any other part of the exposed individual's skin with the working (adhesive) side of the tape;
(6) examining the state of the defined exposure zone of skin to determine the status of the infestation from (a) pre-skin reaction, (2) through inflammation, (3) through formation of blisters or vesicles to (4) presence of areas of weeping or bleeding blisters and/or vesicles;
(7) if such are present, then repeat the tape application in single or multiple sequences until the skin surface liquids are substantially cleared from the area.

5,840,073
FILTER ARRANGEMENT FOR A COLLECTION BAG FOR BODY EXUDATES

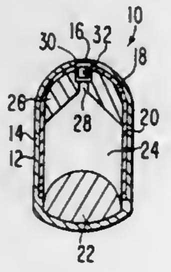
Hans Olsen, Hørsholm, Denmark, assignor to Coloplast A/S, Espergaerde, Denmark
PCT No. PCT/DK95/00387, § 371 Date Mar. 20, 1997, § 102(e) Date Mar. 20, 1997, PCT Pub. No. WO96/10378, PCT Pub. Date Apr. 11, 1996
PCT Filed Sep. 28, 1995, Ser. No. 809,252
Claims priority, application Denmark, Sep. 30, 1994, 1135/94
Int. Cl.^{6} A61F *5/44*
U.S. Cl. 604—333 **18 Claims**



1. The combination of a collection bag for body exudates having a wall which includes a vent and a filter arrangement received in said vent and comprising a filter holder secured to said wall of the bag at said vent, said filter holder having one end facing the interior of the bag and having a through-bore forming a passage from said one end to the exterior of the bag and a removable filter insert for replaceable arrangement in said bore, said insert having an inner end and engagement means to engage said filter holder in a use position, said filter holder having means for engagement with said engagement means on said filter insert for fixing said filter insert in a use position, the said filter holder engagement means including means for preventing the said filter insert from being withdrawn from said filter holder, and a elastically resilient clamping member at said one end of said filter holder and adapted to form a seal around said filter insert in said use position while allowing the insert to be pushed from the outside through the bore of said filter holder into the interior of the bag.

5,840,074
METHOD AND APPARATUS FOR DELIVERING FIRST AGENT FOLLOWED BY SECOND AGENT

Atul Devdatt Ayer, Palo Alto; James B. Eckenhoff; Jeremy C. Wright, both of Los Altos, and Anthony L. Kuczynski, Palo Alto, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.
PCT No. PCT/US90/07598, § 371 Date Jun. 2, 1992, § 102(e) Date Jun. 2, 1992, PCT Pub. No. WO91/10423, PCT Pub. Date Jul. 10, 1991
Continuation-in-part of Ser. No. 463,109, Jan. 10, 1990, Pat. No. 5,045,082. This PCT application Dec. 21, 1990, Ser. No. 852,248
The portion of the term of this patent subsequent to Sep. 3, 2008, has been disclaimed.
Int. Cl.^{6} A61K *9/22*
U.S. Cl. 604—892.1 **23 Claims**



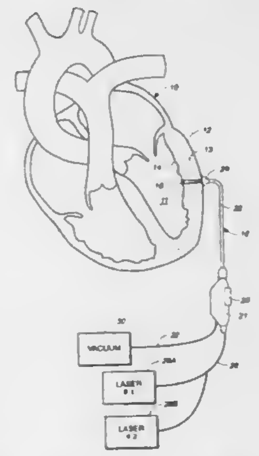
1. A single dispensing device for delivering a beneficial agent to an environment of use over an extended period of time, said dispensing device comprising:

(a) a first agent delivery means for making a first beneficial agent formulation quickly available to the environment of use, said first agent delivery means comprising:
  (1) a first beneficial agent formulation which comprises at least one beneficial agent, and which releases said beneficial agent within the environment of use substantially throughout the time prior to the release of a second beneficial agent formulation; and
  (2) retaining means for retaining the first beneficial agent formulation in contact with a second agent delivery means while exposing the first beneficial agent formulation and the second agent delivery means to the environment of use; and
(b) a second agent delivery means for continuous and prolonged delivery of a second beneficial agent formulation to the environment of use, said second agent delivery means comprising:
  (1) a wall that surrounds and defines an internal lumen, the wall comprising a composition that is permeable to the passage of fluid and substantially impermeable to the passage of beneficial agent;
  (2) a second beneficial agent formulation in the lumen that provides a dispensable formulation including at least one beneficial agent to the environment of use;
  (3) an expansion means in the lumen for displacing said second beneficial agent formulation from the interior of the lumen to the environment of use after exposure to the environment of use; and
  (4) an exit means in the dispensing device for delivery of said second beneficial agent formulation to the environment of use.

5,840,075
DUAL LASER DEVICE FOR TRANSMYOCARDIAL REVASCULARIZATION PROCEDURES

Richard L. Mueller, Byron, and Stuart D. Harman, San Jose, both of Calif., assignors to Eclipse Surgical Technologies, Inc., Sunnyvale, Calif.

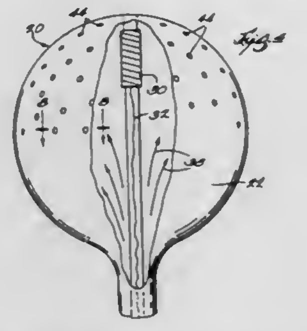
Filed Aug. 23, 1996, Ser. No. 702,024
Int. Cl.^{6} A61B *17/36*
U.S. Cl. 606—7 **19 Claims**



1. A method for revascularizing a patient's heart comprising the steps of:
providing access to a ventricle chamber sidewall of the patient's heart for an optical fiber means connected at its proximal end to laser source means and having a distal end for emitting laser energy at selected intervals;
manipulating and placing the fiber means' distal end near a surface of the ventricle location;
activating the laser source means during a first time period to provide an initial laser emission at a first power level at a target area on the surface of the ventricle;
activating the laser source means during a second time period following the first time period to provide a second laser emission at a second power level that creates an opening in the ventricle at the target area without causing substantial bleeding at the opening;
moving the optical fiber means axially forward through the opening; and
reactivating the laser source means at the second power level to form a revascularizing channel or an ablated pocket within myocardium.

5,840,076
TISSUE HEATING AND ABLATION SYSTEMS AND METHODS USING ELECTRODE STRUCTURES WITH DISTALLY ORIENTED POROUS REGIONS

David K. Swanson, Mountain View; Dorin Panescu, Sunnyvale; James G. Whayne, Saratoga; Russell B. Thompson, Los Altos, and Patrick M. Owens, Cupertino, all of Calif., assignors to EP Technologies, Inc., Sunnyvale, Calif.
Filed Apr. 12, 1996, Ser. No. 631,356
Int. Cl.^{6} A61B *17/39*
U.S. Cl. 606—34 **79 Claims**



1. A porous electrode assembly for ablating body tissue comprising a structure having a wall comprising a distal region and a proximal region, the wall having an exterior peripherally surrounding an interior area, the wall adapted to selectively assume an expanded geometry having a first maximum diameter and a collapsed geometry having a second maximum diameter less than the first maximum diameter,
a medium containing ions substantially filling the interior area when the wall is in the expanded geometry, and
an element for electrically coupling the medium to a source of electrical energy,
wherein the wall includes a porous section sized to pass ions contained in the medium to thereby enable ionic transport of electrical energy sufficient to ablate tissue from the source through the medium and porous section to the exterior of the wall, the porous section occupying more of the distal region of the wall than the proximal region.

5,840,077
UTERINE MANIPULATING ASSEMBLY FOR LAPAROSCOPIC HYSTERECTOMY

Jimmy M. Rowden, Olathe, Kans.; John E. Heaton, Kansas City, Mo.; Charles H. Koh, Mequon, Wis., and Kerry L. Blair, Olathe, Kans., assignors to Blairden Precision Instruments, Inc., Lenexa, Kans.
Continuation-in-part of Ser. No. 324,656, Oct. 18, 1994, Ser. No. 325,907, Oct. 19, 1994, Pat. No. 5,520,698. This application Oct. 17, 1995, Ser. No. 544,163
Int. Cl.^{6} A61B *17/42*
U.S. Cl. 606—112 **12 Claims**

1. A colpotomy assembly adapted for insertion into a vaginal cavity for use in female pelvic surgical procedures employing the inflation of an abdominal cavity with a gas to facilitate the accessability to and visibility of female pelvic organs, said assembly comprising:
an elongated shaft member presenting a proximal end and a distal end, said distal end of said shaft configured to be inserted into the vagina;
a shaft handle mounted in pivotal relationship to said proximal end;

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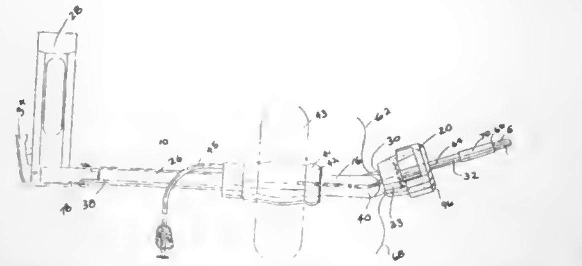


a vaginal extender having structure for bearing against a patient's vaginal fornix to provide an anatomical landmark for use in making colpotomy incisions from the abdominal cavity into the vagina; said extender attached at a joint to said shaft distal end; said extender operatively coupled to said shaft handle for articulation of said extender relative to said frame; and

sealing means associated with said shaft and operable to form a seal with the vaginal cavity to prevent an inadvertent deflation of the abdominal cavity following an incision that permits the flow of gas from the abdominal cavity to the vaginal cavity.

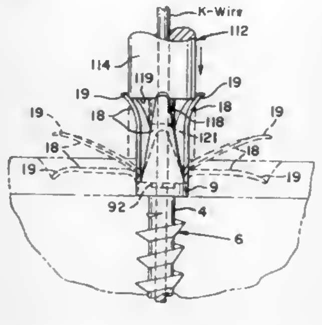
4. The assembly of claim **1**, wherein said sealing means comprises a vaginal occluder having an annular cuff releasably mounted in circumscribing relationship around said shaft member, said vaginal occluder being inflatable to inhibit the passage of fluid through the vaginal cavity.

5. The assembly of claim **4**, further comprising a tip mount mounted to said distal end of said shaft and a tip carried on said tip mount configured to engage a uterus and wherein the vaginal extender receives said tip mount and said tip.

6. The assembly of claim **5**, wherein said vaginal occluder includes a main body having a first end thereof retained between said tip mount and said vaginal extender to inhibit the passage of fluid therebetween.

5,840,078
METHOD AND APPARATUS FOR MECHANICAL ATTACHMENT OF SOFT TISSUE TO BONE TISSUE

Paul Yerys, 30 Merrick Ave., East Meadow, N.Y. 11554
Filed Mar. 1, 1995, Ser. No. 396,570
Int. Cl.^{6} A61B *17/00*
U.S. Cl. 606—151 **23 Claims**



1. A metallic rivet for attaching soft tissue to bone tissue, comprising:

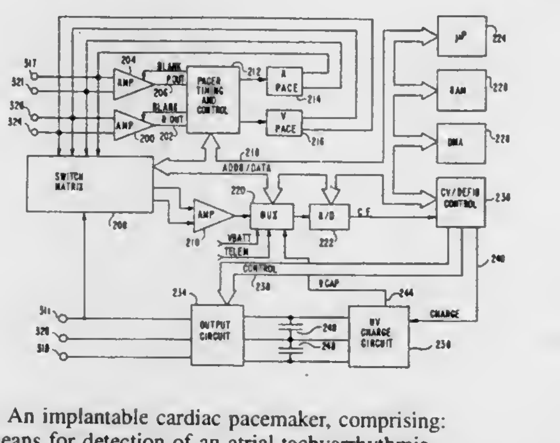
a) an elongated cylindrical tubular unitary body symmetrical about a longitudinal axis and including an exteriorly threaded shank portion having a conically tapered distal end portion and a cylindrical integral head at its proximal end and a clamp portion integral with said head and including a plurality of circumferentially spaced longitudinally extending arcuate lugs the free end of each of which is flared radially outwardly, and

b) a triangular drive recess formed in said head and oriented so that each apex thereof corresponds circumferentially with an associated arcuate lug;

c) each said lug being configured generally as an isosceles triangular member having its base integral to said head and its apex end flared radially outwardly to form a surface inclined to the longitudinal axis of the cylindrically tubular unitary body, said apexes of the generally triangular lugs being arranged in a circular array spaced axially from said head, the arcuate spacing between said apexes substantially corresponding to the arcuate length of the base integral with the head.

5,840,079
METHOD AND APPARATUS FOR TREATMENT OF ATRIAL FIBRILLATION

Eduardo N. Warman, Maple Grove, and Luc R. Mongeon, Minneapolis, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.
Filed Mar. 27, 1997, Ser. No. 827,401
Int. Cl.^{6} A61N *1/39*
U.S. Cl. 607—4 **18 Claims**



1. An implantable cardiac pacemaker, comprising:

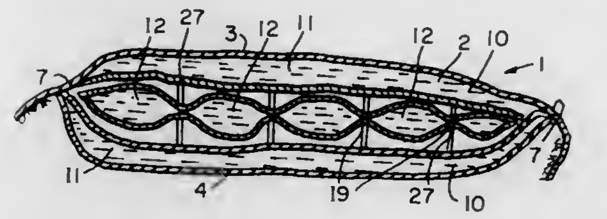
means for detection of an atrial tachyarrhythmia.

means for delivering ventricular pacing pulses at a basic pacing rate in the absence of detected atrial tachyarrhythmia; and

means responsive to detection of atrial tachyarrhythmia for temporarily delivering ventricular pacing pulses at a rate lower than the basic pacing rate.

5,840,080
HOT OR COLD APPLICATOR WITH INNER ELEMENT

Mary Der Ovanesian, 6650 Coolidge St., Hollywood, Fla. 33024
Filed Aug. 15, 1996, Ser. No. 689,899
Int. Cl.^{6} A61F *7/00*
U.S. Cl. 607—114 **20 Claims**



1. A heat transfer device for heating and cooling a surface, the device comprising:

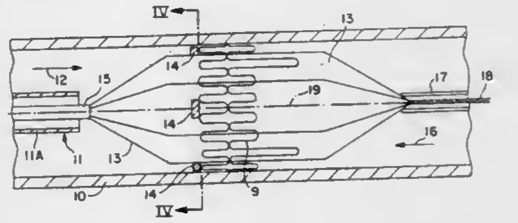
an envelope formed of first and second double-walled sheets, the sheets having broad faces and joined together on at least all but one edge;

each double-walled sheet formed of an inner and an outer panel of flexible, liquid-impermeable webbing, the panels joined together on all edges to define therebetween a volume that contains a first high thermal capacity material that is not rigid at about zero degrees centigrade; and

a space defined by the inner panels of the two double-walled sheets, the space containing therein a second high thermal capacity material, the space being separate from said volume so that the first and second high thermal capacity materials cannot mix.

5,840,081
SYSTEM AND METHOD FOR IMPLANTING CARDIAC VALVES

Henning Rud Andersen, Dalvangen 37A, DK-8270 Hoejbjerg; John Michael Hasenkam, Aprilvej 8, DK-8210 Aarhus V, and Lars Lyhne Knudsen, RudolfWulffsgade 6,4, DK-8000 Aarhus C, all of Denmark
Continuation of Ser. No. 569,314, Dec. 8, 1995, abandoned, which is a continuation of Ser. No. 352,127, Dec. 1, 1994, abandoned, which is a division of Ser. No. 261,235, Jun. 14, 1994, Pat. No. 5,411,552, which is a continuation of Ser. No. 961,891, Jan. 11, 1993, abandoned. This application Feb. 19, 1997, Ser. No. 801,036
Claims priority, application Denmark, May 18, 1990, 1246/90
Int. Cl.^{6} A61F *2/24*
U.S. Cl. 623—2 **8 Claims**



1. A system for implanting a valve in a body channel having an inner wall, the system comprising:

a radially collapsible and expandable cylindrical stent;

a radially collapsible and expandable valve mounted to the stent; and

a catheter for introducing and securing the valve in the body channel, the catheter comprising an expandable member about which the cylindrical stent may be positioned together with the valve, fastening means on the expandable member on which the stent may be mounted to the expandable member, and a channel extending through the catheter for injecting a fluid into the expandable member so as to expand the expandable member from a collapsed profile suitable for introduction into the body channel to an expanded profile in which the stent engages the inner wall of the body channel so as to secure the valve therein.

5,840,082

Patent Not Issued For This Number

5,840,083
IMPLANT DEVICE HAVING BIOCOMPATIABLE MEMBRANE COATING

Vijoleta Lucija Bronislava Braach-Maksvytis, New South Wales, Australia, assignor to F.B. Rice & Co., New South Wales, Australia
Continuation of Ser. No. 450,230, May 25, 1995, abandoned, which is a continuation of Ser. No. 721,431, Jul. 3, 1991, Pat. No. 5,443,955. This application Nov. 15, 1996, Ser. No. 749,670
Claims priority, application Australia, Jan. 27, 1989, PJ2441; Jan. 30, 1989, PJ2469; Jan. 30, 1989, PJ2470
Int. Cl.^{6} A61F *2/02*
U.S. Cl. 623—11 **8 Claims**

1. A device or implantation in a mammalian body, the device being coated with a membrane comprising a closely packed array of self-assembling amphiphilic molecules in which at least a portion of the self-assembling amphiphilic molecules comprise a receptor molecule conjugated with a supporting entity, the receptor molecule having a receptor site, the receptor molecule being selected from the group consisting of antibodies and antibody fragments Fab and $F(ab')_2$; the supporting entity being selected from the group consisting of a lipid head group, a hydrocarbon chain(s), a cross-linkable molecule and a membrane protein; the supporting entity being conjugated with the receptor molecule at an end remote from the receptor site and in a manner such that the receptor site is at or projects from the surface of the membrane remote from the device, the receptor molecule being such that the attachment of specific cells to the membrane is enhanced or avoided.

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5,840,084

DYE BATH AND METHOD FOR REACTIVE DYEING

Otto Bella, Tryon, N.C.; Calvin M. Wicker, Jr., Spartanburg, and Robert B. Login, Simpsonville, both of S.C., assignors to Sybron Chemicals, Inc., Birmingham, N.J.

Filed Nov. 22, 1996, Ser. No. 755,055

Int. Cl.^{6} D06P *1/382;1/384*

U.S. Cl. 8—549 **65 Claims**

1. An aqueous dye bath, containing metal ion impurities, for dyeing a fabric, the dye bath comprising a reactive dye, a neutral salt present in an amount effective for salting out the dye on the fabric, and a phosphate-free and silicate-free alkali composition for promoting reaction of the dye on the fabric, the alkali composition consisting essentially of a water soluble base selected from the group consisting of alkali metal hydroxide, alkali metal carbonate and mixtures thereof, wherein the base is present in an amount sufficient to yield a dye bath pH of about 11 to about 12 at an alkali composition concentration of about 0.1 wt % to about 1 wt % in the dye bath, and an aminopolycarboxylate sequestrant in an amount sufficient to sequester the metal ion impurities and prevent destructive reactive dye hydrolysis in the dye bath.

5,840,085

PROCESS FOR REMOVING SODIUM CHLORIDE AND POTASSIUM SALTS FROM ASH COLLECTED FROM A SODA RECOVERY BOILER

Kikuo Tokunaga; Masakazu Tateishi; Michimasa Yagi; Takayuki Maeda, all of Nagasaki, and Yoshihisa Arakawa, Tokyo, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1995, Ser. No. 538,790

Claims priority, application Japan, Dec. 15, 1994, 6-311462

Int. Cl.^{6} B01D *9/02;* **C01D** *5/16*

U.S. Cl. 23—297 **3 Claims**

1. A process for treating the ash from a soda recovery boiler, the ash made from predominantly sodium sulfate admixed with sodium carbonate, sodium chloride, potassium chloride, potassium carbonate, comprising the steps of:

(a) converting most of the carbonate in said ash to sulfate by adding an amount of water and sulfuric acid, while maintaining the temperature of the slurry above about 30° C.,

the amount of water sufficient to dissolve a portion of the sodium salts and a majority of the potassium and chloride salts to form a slurry;

(b) creating a mother liquor and cooling the solution to a temperature below 20° C. by adding water and/or ice to precipitate sodium sulfate dihydrate or heptahydrate, without precipitating potassium chloride, sodium chloride, and potassium sulfide; and

(d) separating the sodium sulfate dihydrate or heptahydrate formed in step and discharging the mother liquor containing a majority of chloride salts and potassium salts from the system.

5,840,086

METHOD FOR MANUFACTURING PACKAGED SOLID ELECTROLYTIC CAPACITOR

Katsuhiro Takami, and Nobutoshi Kodama, both of Kyoto, Japan, assignors to Rohm Co., Ltd., Kyoto, Japan

Filed Apr. 4, 1996, Ser. No. 627,608

Claims priority, application Japan, Apr. 5, 1995, 7-080141; May 19, 1995, 7-120945; Mar. 21, 1996, 8-063601

Int. Cl.^{6} H01G *9/00;* **G01R** *31/26;* **H01L** *21/66*

U.S. Cl. 29—25.03 **8 Claims**

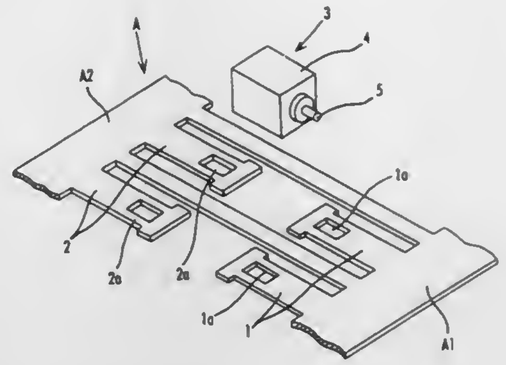
1. A method for manufacturing a packaged solid electrolytic capacitor, comprising steps of:

(a) electrically connecting an anode bar of a capacitor element with an anode lead terminal of a lead frame having said anode lead terminal and a cathode lead terminal;

(b) detecting a degree and a direction of an inclination of said capacitor element with respect to said anode lead terminal and pressing and deforming a portion of said anode lead terminal corresponding to the direction of the inclination when the degree of said inclination exceeds a value; and

(c) packaging said capacitor element part by synthetic resin.

7. The manufacturing method according to claim 1, wherein a through hole is formed at the tip of said anode lead terminal at the same time when said anode lead terminal of said lead frame is formed.



5,840,087

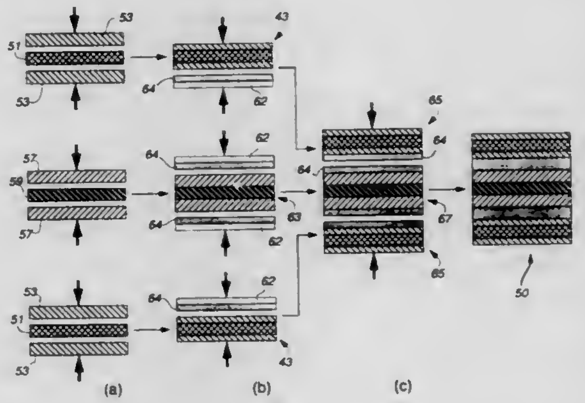
METHOD FOR MAKING LAMINATED RECHARGEABLE BATTERY CELLS

Antoni S. Gozdz, Tinton Falls, and Paul C. Warren, Far Hills, both of N.J., assignors to Bell Communications Research, Inc., Morristown, N.J.

Filed Sep. 18, 1996, Ser. No. 710,481

Int. Cl.^{6} H01M *10/00*

U.S. Cl. 29—623.3 **2 Claims**



1. A method of laminating a layered assembly of rechargeable battery cell elements comprising at least one polymer matrix composition element wherein said assembly is heated to soften said at least one polymer composition element to a laminatable condition and said heated assembly is progressively compressed between a pair of rollers opposedly biased radially toward contact

characterized in that

a) a pair of subassemblies is formed wherein each such subassembly comprises said at least one polymer matrix composition element which comprises a layer having a first surface removably affixed to a carrier substrate and

the other surface laminated to its contiguous assembly element to thereby form said laminate subassembly;

b) the carrier substrates of said subassemblies are removed; and

c) the first surfaces of said composition layers thereby exposed are placed in contact with one another to form an assembly to be laminated.

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5,840,088
ROTOGRAVURE PROCESS FOR PRODUCTION OF PATTERNED ABRASIVE SURFACES

Wenliang Patrick Yang, Ballston Lake; Gwo Shin Swei, East Amherst; Kevin Bruce Allen, Latham, and Paul Wei, Amherst, all of N.Y., assignors to Norton Company, Worcester, Mass.

Filed Jan. 8, 1997, Ser. No. 780,750
Int. Cl.^{6} B24D *3/34;11/00*

U.S. Cl. 51—295 **21 Claims**

1. A process for the production of a coated abrasive comprising a pattern of abrasive/binder composites adhered to a backing material said process comprising:

(a) applying by a rotogravure technique, a layer of a formulation comprising a mixture of abrasive grits and a curable resin binder in a pattern of isolated structures, said formulation having a viscosity at a shear rate of 10^3 sec^{-1} of from 10,000 to 1,000 cp.;

(b) after deposition of the formulation on the backing material, increasing the viscosity of at least the surface layers of the deposited formulation so as to maintain the isolation of the structures; and

(c) curing the binder component of the formulation to retain said pattern of isolated structures on said backing.

5,840,089
METHOD OF MAKING AN ABRASIVE ARTICLE

Jason A. Chesley, Hudson, Wis.; Donald R. Bell, White Bear Township, Minn.; Harold E. Rude, Roseville, Minn.; William F. Sheffield, Oakdale, Minn.; David F. Slama, Vadnais Heights, Minn., and Alan N. Stephens, Warwickshire, United Kingdom, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 614,887, Mar. 13, 1996, Pat. No. 5,667,540, which is a division of Ser. No. 181,193, Jan. 13, 1994, Pat. No. 5,505,747. This application Jul. 29, 1997, Ser. No. 902,531
Int. Cl.^{6} B24D *11/00*

U.S. Cl. 51—295 **52 Claims**

1. A method of making an abrasive article, comprising the steps of:

a) forming a substrate having opposed first and second major surfaces, the substrate including a plurality of hooking stems projecting from the first major surface, the hooking stems each including a distal end;

b) deforming the distal end of each hooking stem to provide each hooking stem with a hooking portion to enable the hooking stem to releasably hook an opposed engaging structure; and

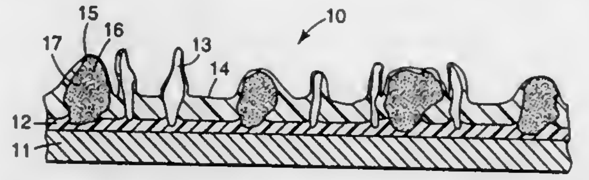
c) bonding a plurality of abrasive particles to the second major surface of the substrate with a bonding material.

5,840,090
HIGH PERFORMANCE ABRASIVE ARTICLES CONTAINING ABRASIVE GRAINS AND NONABRASIVE COMPOSITE GRAINS

Kwok-Lun Ho, Woodbury, and Walter L. Harmer, Arden Hills, both of Minn., assignors to Minnesota Mining and Manufacturing, St. Paul, Minn.

Division of Ser. No. 545,874, Oct. 20, 1995, Pat. No. 5,702,811. This application Sep. 15, 1997, Ser. No. 929,556
Int. Cl.^{6} B24D *3/34*

U.S. Cl. 51—295 **5 Claims**



1. A method for making a coated abrasive article comprising the steps of:

(a) applying a make coat binder precursor to a backing;

(b) applying a plurality of abrasive grains and nonabrasive composite grains to said make coat binder precursor, wherein said nonabrasive composite grains comprise a plurality of inorganic nonabrasive particles bonded together by a binder selected from the group consisting of a metal salt of a fatty acid, colloidal silica, and combinations thereof, wherein the average particle size of said abrasive grains is a value x in micrometers, and the average particle size of the nonabrasive composite grains is a value y in micrometers, where the numerical value of the ritio y/x ranges from about 0.5 to about 2; and

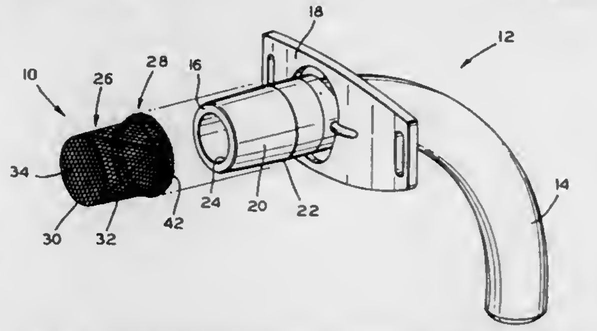
(c) curing said make coat binder precursor to adherently bond thereto said plurality of abrasive grains and nonabrasive composite grains.

5,840,091
SMOG AND DUST FILTER FOR A TRACHEOSTOMY TUBE

Samuel E. Strong, Toledo, Ohio, assignor to Steve Culpepper, Bowling Green, Ohio

Continuation of Ser. No. 501,803, Jul. 13, 1995, abandoned. This application Jun. 9, 1997, Ser. No. 871,868
Int. Cl.^{6} B01D *46/00*

U.S. Cl. 55—385.1 **6 Claims**



1. A filter for a tracheostomy tube having an insertion end for insertion into an individual and a tubular open end, comprising:

(a) a securing means for engaging an outer periphery of the open end of the tracheostomy tube while the insertion end of the tracheostomy tube is inserted into an individual; and

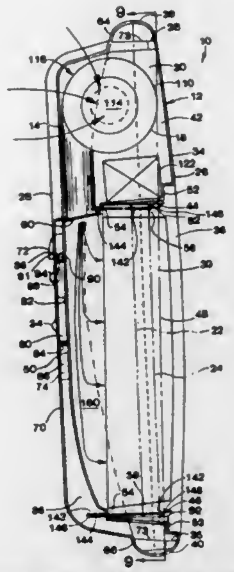
(b) a filter element having two or more layers of net material forming a stiff, generally dome shaped filtering section, said layers being randomly aligned to create a micro porous membrane, said filter element being attached to said securing means so that as said securing means is placed over the tracheostomy tube the filtering section covers the open end, whereby said micro porous membrane separates airborne contaminants from an airstream upon inhalation by the individual through the tracheostomy tube.

5,840,092
AIR TREATMENT SYSTEM

Bradley G. Rick, Belmont, Mich., and John F. O'Connor, Jr., New Hartford, Conn., assignors to Amway Corporation, Ada, Mich.

Filed Jun. 11, 1996, Ser. No. 661,590
Int. Cl.^{6} B01D *35/30*

U.S. Cl. 55—472 **21 Claims**



1. An air treatment system comprising:

a housing defining an interior space having an inlet chamber and on outlet chamber, said housing defining a blower opening providing communication between said inlet chamber and said outlet chamber; said outlet chamber including a plenum wall, said housing further defining an outlet opening through which air is expelled from said outlet chamber;

a blower mounted within said space for moving air from said inlet chamber into said outlet chamber and through said outlet opening, said blower moving said air into said outlet chamber in a direction; and

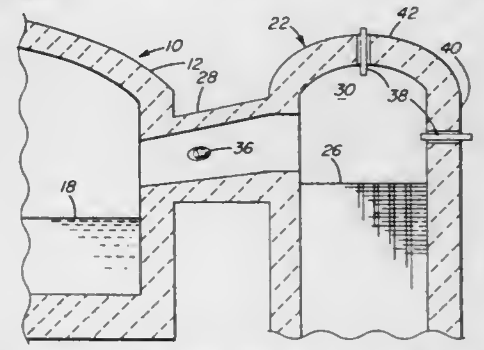
a filter element mounted within said outlet chamber, said filter element including a face spaced apart from said plenum wall of said outlet chamber to define a plenum therebetween, said face extending substantially parallel to said direction, said plenum receiving air from said blower and including a cross-sectional area; said filter element disposed between said plenum and said outlet opening whereby air flowing from said plenum to said outlet opening must flow through said filter, said plenum wall curved such that said cross-sectional area is progressively reduced away from said blower opening, said curve being substantially nonlinear and having a progressively diminishing radius away from said blower opening selected to provide uniform air pressure over said face of said filter element.

5,840,093
METHOD OF CONTROLLING ACCUMULATION OF SODIUM SULFATE ON THE CHECKER PACKING OF A REGENERATOR

Yih-Wan Tsai, Pittsburgh, and Walter W. Scott, Wexford, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 6, 1996, Ser. No. 761,266
Int. Cl.^{6} C03B *5/237*

U.S. Cl. 65—27 **19 Claims**



1. A method of controlling build-up of sodium sulfate in the checker structure of a regenerator of a cross-fired regenerative-type glass melting furnace, wherein glass batch materials are melted within said furnace by combustion of fuel which produces exhaust gas that is drawn through said regenerator and heats said checker packing, and wherein sodium sulfate gas from said melted glass is carried with said exhaust gas through said regenerator and said sodium sulfate gas condenses and accumulates within said regenerator on a portion of said checker packing, restricting gas flow through said portion of said checker packing, comprising;

selectively heating a section within said regenerator whicb includes said portion of said checker packing to a temperature sufficient to melt said sodium sulfate, while

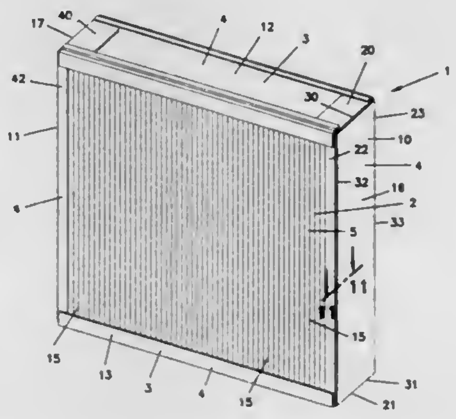
minimizing any additional heating of remaining sections within said regenerator.

5,840,094
AIR FILTER ELEMENT; ASSEMBLY; AND, METHOD

Richard J. Osendorf, West St. Paul; Brad Alan Terlson, Maple Grove; Wallace Ronald Saldin, Bloomington; Eugene Joseph Takach, Jr., Eden Prairie, and Timothy John Smith, Minneapolis, all of Minn., assignors to Donaldson Company, Inc., and Honeywell, Inc., both of Minneapolis, Minn.

Continuation of Ser. No. 738,276, Oct. 25, 1996, abandoned, which is a continuation-in-part of Ser. No. 690,549, Jul. 31, 1996, abandoned. This application Nov. 12, 1997, Ser. No. 967,115
Int. Cl.^{6} B01D *46/10;29/07*

U.S. Cl. 55—497 **16 Claims**



1. A filter assembly comprising:

(a) first and second, opposite, separate frame members;

(i) each frame member comprising an elongate extension having first and second sides;

(b) a filter element removably and replaceably secured to said first and second frame members; said filter element comprising:

(i) a filter media member; and,

(ii) first and second, opposite, end panels; said filter member being secured in extension between said first and second end panels;

(A) each one of said first and second end panels having first and second engagement portions hingedly secured thereto:

(c) each frame member having a filter element panel engagement arrangement on a side thereof opposite from a side directed toward said filter media member; and

(d) said filter element being releasably secured to said first and second, opposite, frame members, by selected engagement between said engagement portions of said end panels and said panel engagement arrangement of each frame member; and said filter element being selectively removable and replaceable from said first and second frame members by selected disengagement between said engagement portions of said end panels and said panel engagement arrangement of each frame member.

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5,840,095
METHOD AND APPARATUS FOR PRODUCING FLAT METAL POWDER DIRECTLY FROM MELT

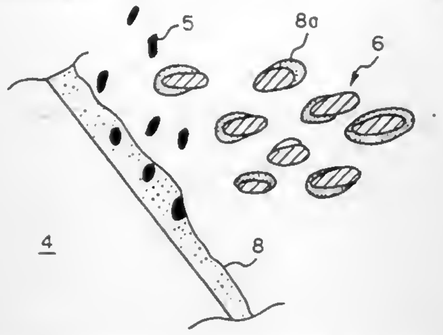
Taizo Kawamura; Yoshio Harakawa, and Hitoshi Yamaguchi, all of Tokyo, Japan, assignors to Teikoku Piston Ring Co., Ltd., and Research Development Corporation, both of Kawaguchi, Japan

Continuation of Ser. No. 355,264, Dec. 8, 1994, abandoned. This application Aug. 2, 1996, Ser. No. 691,260

Claims priority, application Japan, Dec. 9, 1993, 5-309442

Int. Cl.^{6} B22F *9/08*

U.S. Cl. 75—334 **5 Claims**



1. A method for producing a flat powder of a metal, which comprises:

applying a film of an anti-sticking agent to the cooling surface of a rotating cooling body;

spraying finely divided droplets of liquid metal onto the cooling surface of the rotating cooling body, to which a film of the anti-sticking agent has been applied, to solidify the liquid metal and form the flat powder;

and separating the thus formed flat powder from said cooling surface,

said anti-sticking agent consisting essentially of at least one liquid which is selected from the group consisting of lower fatty acids, and at least one solid selected from the group consisting of higher fatty acids.

5,840,096
PROCESS FOR THE PRODUCTION OF POLARIZING GLASS

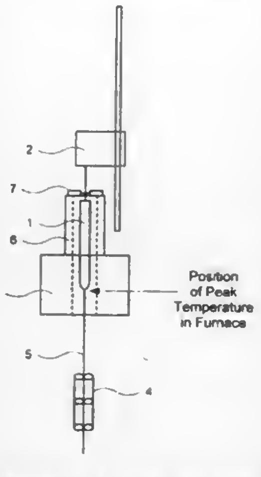
Hidemi Tajima, Tokyo; Takeshi Takahashi, Yamanashi; Yukari Miyashita, and Yoshihiko Matsuoka, both of Tokyo, all of Japan, assignors to Hoya Corporation, Japan

Filed Dec. 27, 1995, Ser. No. 578,942

Claims priority, application Japan, Dec. 27, 1994, 6-325062

Int. Cl.^{6} C03B *23/037;* C03C *23/00*

U.S. Cl. 65—30.1 **9 Claims**



1. A process for producing a polarizing glass article containing shape-anisotropic metallic particles dispersed in an oriented state therein, which comprises:

drawing a glass preform containing metallic halide particles dispersed therein to elongate said metallic halide particles while viscosity of the glass is held above 2×10^6, but below 7×10^7 poises, to obtain a glass having a thickness of 2 mm or less;

cooling the drawn glass under conditions which avoid re-spheroidization of the elongated metallic halide particles and breakage of the drawn glass; and

subjecting the drawn glass to reducing treatment so that a part or all of the metallic halide particles are reduced to metallic particles.

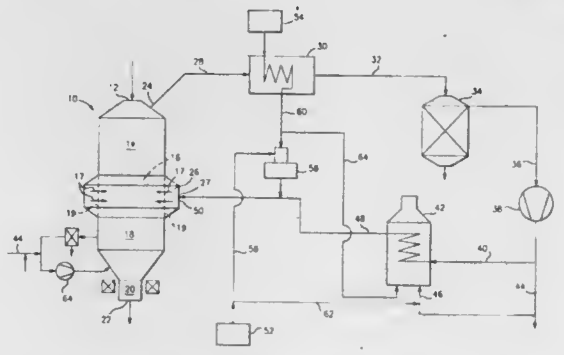
5,840,097
METHOD FOR DIRECT REDUCTION OF OXIDES

Oscar G. Dam, Puerto Ordaz, Venezuela, assignor to Xera Technologies Ltd., Grand Cayman, Cayman Islands

Continuation-in-part of Ser. No. 603,922, Feb. 22, 1996, Pat. No. 5,702,246. This application Sep. 24, 1996, Ser. No. 718,770

Int. Cl.^{6} C21B *13/02*

U.S. Cl. 75—505 **26 Claims**



1. A method for direct reduction of oxides; comprising the steps of:

providing a furnace having a reduction zone and a reforming zone defined substantially adjacent to said reduction zone and communicating with said reduction zone through at least one nozzle for infecting a reformed gas into said reduction zone wherein said reduction zone and said reforming zone are separated by a refractory wall;

feeding metal oxides to said reduction zone;

feeding a gas mixture comprising methane and an oxygen source to said gas reforming zone to provide a reformed gas comprising hydrogen and carbon monoxide;

contacting said oxides and said reformed gas in said reduction zone to provide reduced metal oxides and a top gas; and

treating said top gas so as to provide said gas mixture.

5,840,098
MEMBRANE GENERATORS HAVING HIGH FLEXIBILITY

Christian Barbe, Fontenay aux Roses; Jean-Renaud Brugerolle, Paris, and Guy Salzgeber, Bretonneux, all of France, assignors to L'Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation Des Procedes Georges Claude, Paris Cedex, France

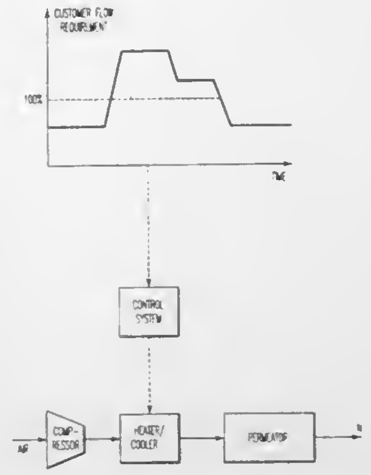
Continuation of Ser. No. 709,226, Jun. 3, 1991, abandoned. This application Jun. 22, 1994, Ser. No. 264,197

Int. Cl.^{6} B01D *46/46;53/22*

U.S. Cl. 95—18 **27 Claims**

1. A process for adjusting a nominal flow of product nitrogen gas from a membrane skid, which comprises adjusting a set point of a compressed feed stream temperature to said skid, said compressed feed stream being air or a mixture containing mainly nitrogen and oxygen,

said adjusted nominal flow of nitrogen being obtained from a constant flow supply, and wherein compressor output is not reduced during said process.



5,840,099
PROCESS FOR THE REMOVAL OF WATER, CO_2, ETHANE AND C_3+ HYDROCARBONS FROM A GAS STREAM

Wilbur Clymer Kratz, Macungie; Timothy Christopher Golden, Allentown, both of Pa., and Mohammad Ali Kalbassi, Walton-on-Thames, United Kingdom, assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Sep. 16, 1997, Ser. No. 931,045

Int. Cl.^{6} B01D *53/047*

U.S. Cl. 95—101 **9 Claims**

1. A process for the selective removal of water, CO_2, ethane and C_3+ hydrocarbons from a gas stream in order to produce a purified gas stream, said process comprising the step of contacting the gas stream at elevated pressure with an adsorbent material consisting exclusively of one or more compounds which are basic (i.e. compounds which, when contacted with a pH neutral aqueous solution, cause such solution to have a pH greater than 7.0) and which are mesoporous (i.e. compounds which have moderately small pores providing a surface area less than 500 m^2/g).

5,840,100
APPARATUS FOR PURIFYING HOT FLUE GAS AND FOR RECEIVING THERMAL ENERGY THEREFROM

José P. Arencibia, Jr., P.O. Box 401, 3646 Station Ave., Center Valley, Pa. 18034

Division of Ser. No. 527,050, Sep. 12, 1995, Pat. No. 5,658,361. This application Aug. 18, 1997, Ser. No. 914,597

Int. Cl.^{6} B01D *47/06*

U.S. Cl. 95—225 **4 Claims**

1. A method for purifying a hot flue gas flow and for recovering thermal energy from a hot flue gas flow, comprising the steps of:

(a) flowing particulate-containing hot flue gas into a boiler having a gas side and a water side in heat exchange relation;

(b) simultaneously cooling the flue gas in the gas side and heating water in the water side to produce steam;

(c) conducting the steam to a power generator;

(d) conducting cooled flue gas to a purification chamber having spray nozzles for removing fine particulate from the flue gas;

(e) scrubbing the cooled flue gas in countercurrent flow with water from the spray nozzles;

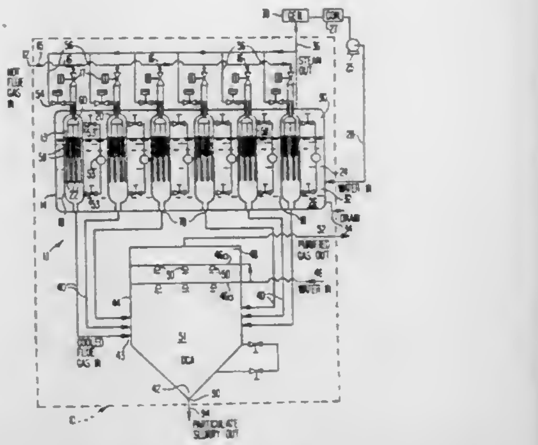
(f) removing scrubbed flue gas from an upper portion of the purification chamber;

(g) removing particulate from a lower portion of the purification chamber;

(h) stopping the flow of hot flue gas to the gas side when the heat exchange relation drops below a predetermined minimum heat exchange capacity due to particulate fouling;

(i) injecting an inert gas into the gas side after stopping the flow of hot flue gas to remove the particulate fouling; and

(j) terminating the injection of the inert gas and restarting the flow of hot flue gas to the gas side after a predetermined period of time sufficient for the heat exchange relation to exceed the predetermined minimum heat exchange capacity.



5,840,101
METHOD AND APPARATUS FOR TREATMENT OF AN ENDLESS WEB OF MATERIAL WITH VACUUM

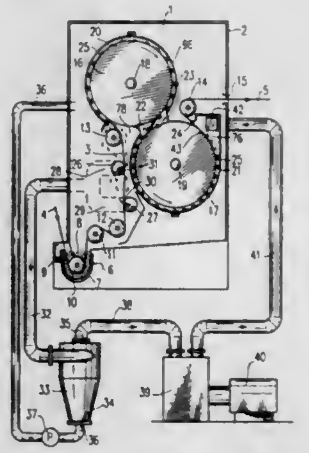
Walter Keller, Willich, Germany, assignor to WET TEX Maschinenbau GmbH, Tönisvorst, Germany

Continuation-in-part of Ser. No. 542,389, Oct. 12, 1995. This application May 13, 1996, Ser. No. 645,171

Claims priority, application Germany, May 27, 1995, 195 19 551.5

Int. Cl.^{6} B01D *19/00*

U.S. Cl. 95—258 **19 Claims**



1. A method of treatment of an endless web of textile material comprising

guiding the endless web over a first rotating roller and a second rotating roller, disposed in series in advance moving direction of the endless web disposed within a treatment chamber for drying the endless web, and wherein the second rotating roller is a rear rotating roller;

withdrawing generated exhaust vapors;

separating the withdrawn and generated exhaust vapors in a separator into gas and liquid;

returning the liquid resulting in the separator into the treatment chamber;

passing the gases resulting in the separator to a vacuum generator;

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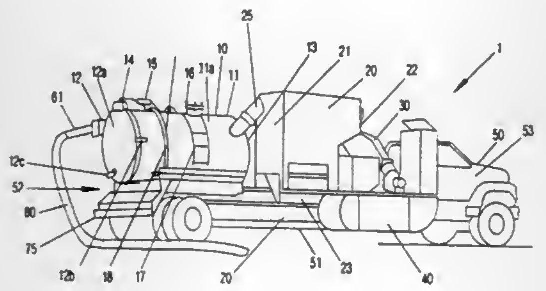
returning the gases, released by the vacuum generator at a discharge region of the endless web in the area of the rear rotating roller, into a treatment region.

5,840,102
MOBILE PNEUMATIC MATERIAL TRANSFER MACHINE

Hilton G. McCracken, P.O. Box 667, Bernalillo, N. Mex. 87004
Filed Mar. 31, 1997, Ser. No. 832,611
Int. Cl.⁶ B01D *50/00*
U.S. Cl. 95—268 **22 Claims**



1. An apparatus for collecting and transferring materials, comprising:

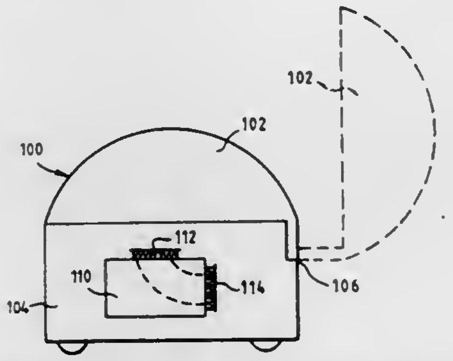
a foundation;
vacuum means mounted upon said foundation for collecting materials in an air stream;
container means, pivotally bracketed to said foundation, for receiving collected materials, said container means comprising a vacuum inlet, means for separating a first portion of the collected materials from the air stream, and an exhaust outlet;
means for raising and lowering said container means with respect to said foundation;
means, mounted upon said foundation apart from said container means, for filtering said air stream, said means for filtering comprising a filter inlet connectable to said exhaust outlet of said container means, and further comprising a means for transmittiing a filtered air stream from said filtering means;
automatic means for disconnecting and reconnecting said filter inlet from said exhaust outlet of said container means when said container means is raised and lowered, respectively; and
exhaust means operably connected to said vacuum means for reducing noise during the collecting of materials,
wherein said vacuum means is operably connected to said means for filtering, and said container means, said filtering means, said vacuum means, and said exhaust means are all mounted on a mobile conveyance.

18. A method of collecting and transferring materials, comprising:

generating an air stream;
collecting materials in the air stream;
receiving collected materials in a container, the container comprising a vacuum inlet and an exhaust outlet;
separating a first portion of the collected materials from the air stream in the container;
filtering the air stream with a filter unit comprising a filter inlet connected the exhaust outlet of the container means;
transmitting a filtered air stream to an air exhaust;
raising the container to dump collected materials therefrom and to automatically disconnect the filter inlet from the container exhaust outlet;
lowering the container to reconnect the filter inlet with the container exhaust outlet; and
reducing noise in the exhaust.

5,840,103
VACCUM CLEANER AND A FILTER ASSEMBLY THEREFOR

James Dyson, Little Somerford, United Kingdom, assignor to Notetry Limited, Wiltshire, United Kingdom
PCT No. PCT/GB95/02723, § 371 Date Jul. 8, 1997, § 102(e) Date Jul. 8, 1997, PCT Pub. No. WO96/15709, PCT Pub. Date May 30, 1996
PCT Filed Nov. 22, 1995, Ser. No. 836,497
Claims priority, application United Kingdom, Nov. 24, 1994, 9423756
Int. Cl.⁶ B03C *3/36*
U.S. Cl. 96—61 **3 Claims**

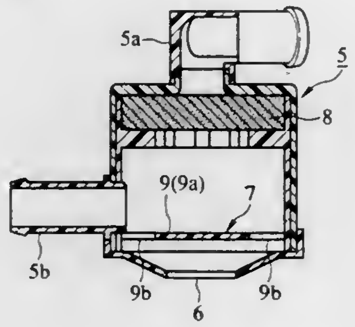


1. In a vacuum cleaner comprising an airflow path, dirt and dust collecting means arranged in the airflow path, a motor or fan unit for causing air to flow along the airflow path the improvement which comprises;

a movable cover covering a casing containing the dirt and dust collecting means which is cyclonic and containing the motor or fan unit with a first filter arranged upstream of the motor or fan unit and a second filter arranged downstream of the motor or fan unit during use, wherein air flows from the collecting means into the motor or fan unit through the first filter and away from the motor or fan unit through the second filter, wherein when the cover is opened, both filters are visible to the user and wherein the filters can be replaced when the filters have collected dust and dirt.

5,840,104
CANISTER STRUCTURE FOR AUTOMOBILE

Takashi Hashimoto; Tomoyuki Sato; Junichi Hanai, and Kei Orita, all of Kanagawa-ken, Japan, assignors to Nissan Motor Co., Ltd., Kanagawa, Japan
Filed Dec. 18, 1996, Ser. No. 768,454
Claims priority, application Japan, Dec. 19, 1995, 7-330509; Sep. 3, 1996, 8-233323
Int. Cl.⁶ B01D *53/04*
U.S. Cl. 96—135 **12 Claims**



1. A canister structure associated with a fuel tank and an engine of an automobile for absorbing fuel vapor in the fuel tank and supplying the fuel vapor into the engine together with a purge air, said canister structure comprising:

a canister body connected to the fuel tank through a vapor pipe and also connected to the engine through a feed pipe, said canister body being filled up with absorbents for absorbing the fuel vapor;
a purge pipe connected to said canister body from the under side for introducing the purge air into said canister body; and
a separator for removing moisture contained in the purge air, to which said purge pipe is connected downwardly, said separator being provided, on a bottom side thereof, with an air inlet of which diameter is larger than that of said purge pipe, said diameter of said air inlet being smaller than an inner diameter of said separator.

5,840,105
FIRE RESISTANT COATINGS FOR CELLULOSIC MATERIALS

Jack G. Helmstetter, Brick, N.J., assignor to LOC Systems, Ltd., Lavallette, N.J.
Continuation-in-part of Ser. No. 673,036, Jul. 19, 1996, abandoned. This application Dec. 17, 1997, Ser. No. 992,726
Int. Cl.⁶ C09D *5/18;* **C09K** *21/02*
U.S. Cl. 106—18.12 **4 Claims**

1. A fire resistant coating for application on the surface of cellulosic manufactured building materials, said coating comprising 1) 10 to 25% by weight of sodium silicate, 2) 15 to 30% by weight of water, 3) 12 to 28% by weight of pure white clay, and 4) 15 to 35% by weight of fine mica.

5,840,106
WATER-BASED PIGMENTED INKS

Larry R. Krepski, White Bear Lake; Richard J. Kuo, St. Paul; Prabhakara S. Rao, Maplewood, and Terrance P. Smith, Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Nov. 13, 1995, Ser. No. 556,336
Int. Cl.⁶ C09D *11/02*
U.S. Cl. 106—20 R **32 Claims**

1. A water-based pigmented ink which comprises an suspension of:

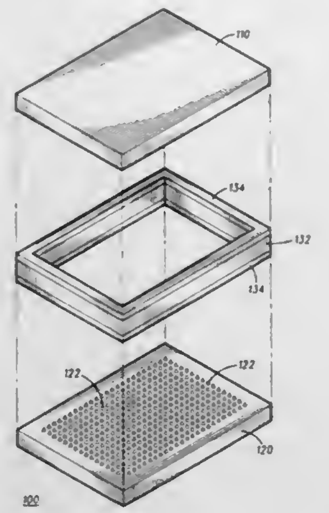
a) pigment particles, and
b) a dispersant which comprises a reaction product of an alkenyl azlactone with an N-substituted amino acid compound which, subsequent to reaction, has been ring-opened using an amine.

5,840,107
BINDER SOLUTION FOR A SEALING COMPOSITION AND METHOD OF USE

Bernardo B. Salibay, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Mar. 25, 1998, Ser. No. 47,766
Int. Cl.⁶ C09D *101/28;* **C03C** *8/24;* **B65B** *31/32*
U.S. Cl. 106—180.1 **38 Claims**

1. A binder solution comprising:

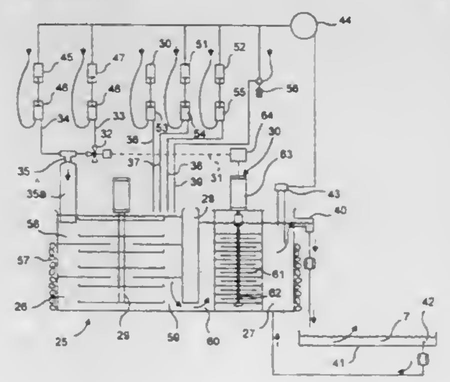
about 40–50 wt. % butyl carbitol acetate;



about 40–50 wt. % alpha-terpineol;
about 1–5 wt. % ester alcohol; and
about 1–5 wt. % binder.

5,840,108
METHOD AND APPARATUS FOR CONTINUOUS PREPARATION OF CORRUGATING ADHESIVE

George C. Karras, 35 W. 65th St., New York, N.Y. 10023
Continuation-in-part of Ser. No. 687,648, Jul. 26, 1996, abandoned. This application Jun. 5, 1997, Ser. No. 869,689
Int. Cl.⁶ C09J *103/02*
U.S. Cl. 106—211.1 **8 Claims**



1. A method for producing a corrugating adhesive in low volume at a continuous rate substantially corresponding to a rate of adhesive use in a corrugating apparatus, comprising:

providing a first rate controlled stream of basic agent;
providing a second rate controlled stream of a raw starch slurry;
admixing the first and a variable portion of the second rate controlled streams to form a third rate controlled stream and feeding the third rate controlled stream to a first chamber, a balance of the second rate controlled stream added to the first chamber;
simultaneously adding a boron containing compound stream to the first chamber, and simultaneously optionally adding an additional raw starch slurry stream and a water stream to the first chamber, each added to the first chamber in a rate proportional to the flow rate of either the first rate controlled stream or the second rate controlled stream;
mixing the streams together in the first chamber as they pass therethrough to form an adhesive;
providing a second chamber, adjacent to the first chamber;
locating a viscosity sensor in the second chamber;
passing the adhesive at a rate corresponding to a combined rate of addition of the streams added to the first chamber to the second chamber;

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measuring a viscosity of the adhesive using the viscosity sensor and generating a control signal therefrom;
adjusting the rate of the variable portion of the second rate controlled stream in response to the control signal to adjust the adhesive viscosity; and, supplying the adhesive to the corrugating apparatus.

5,840,109

MIXTURES OF BITUMEN AND OLEFIN POLYMERS SUITABLE FOR MODIFYING BITUMENS

Vittorio Braga, and Franco Sartori, both of Ferrara, Italy, assignors to Montell North America Inc., Wilmington, Del.
Filed Feb. 21, 1997, Ser. No. 804,724
Claims priority, application Italy, Feb. 23, 1996, M196A0348
Int. Cl.^{6} C09D *195/00*

U.S. Cl. 106—273.1 **8 Claims**

1. A mixture comprising bitumen and at least one polymer selected from (A) an essentially atactic propylene homopolymer, (B) an amorphous propylene copolymer with a C_4–C_{10} α-olefin, and (C) an amorphous propylene copolymer with ethylene; said polymers (A) and (B) having the following characteristics:
intrinsic viscosity (η) : greater than 1 dl/g;
% (r)–% (m)>0, where % (r) is the percentage of the syndiotactic dyads, and % (m) is the percentage of the isotactic dyads;
less than 2% of the CH_2 groups are contained in the $(CH_2)_n$ sequences where $n \geqq 2$; and
Bernoulli index (B)=1±0.2;
said copolymer (C) having the following characteristics:
the quantity of propylene in the copolymer (%P) expressed in mole percentage, and the EPE/(EPE+PPE+PPP) triad ratio satisfy the following equation:

$$0.01\%\,P+EPE/(EPE+PPE+PPP)\geqq 1;$$

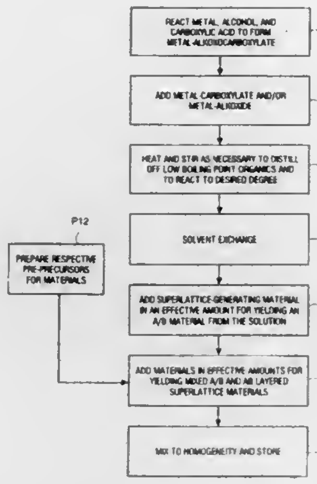
and less than 2% of the CH_2 groups are contained in the $(CH_2)_n$ sequences where n is an even number.

5,840,110

INTEGRATED CIRCUITS HAVING MIXED LAYERED SUPERLATTICE MATERIALS AND PRECURSOR SOLUTIONS FOR USE IN A PROCESS OF MAKING THE SAME

Masamichi Azuma; Carlos A. Paz De Araujo, and Larry D. McMillan, all of Colorado Springs, Colo., assignors to Symetrix Corporation, Colorado Springs, Colo., and Matsushita Electronics Corporation, Japan
Division of Ser. No. 406,374, Mar. 17, 1995, which is a continuation-in-part of Ser. No. 965,190, Oct. 23, 1992, abandoned. This application May 10, 1996, Ser. No. 644,453
Int. Cl.^{6} C09D *5/00;5/24*

U.S. Cl. 106—287.18 **18 Claims**


REACT METAL, ALCOHOL, AND CARBOXYLIC ACID TO FORM METAL-ALKOXIDCARBOXYLATE
P3
ADD METAL CARBOXYLATE AND/OR METAL-ALKOXIDE
P4
HEAT AND STIR AS NECESSARY TO DISTILL OFF LOW BOILING POINT ORGANICS AND TO REACT TO DESIRED DEGREE
P6
SOLVENT EXCHANGE
P8
P12
PREPARE RESPECTIVE PRE-PRECURSORS FOR MATERIALS
ADD SUPERLATTICE-GENERATING MATERIAL IN AN EFFECTIVE AMOUNT FOR YIELDING AN A/B MATERIAL FROM THE SOLUTION
P10
ADD MATERIALS IN EFFECTIVE AMOUNTS FOR YIELDING MIXED A/B AND AB LAYERED SUPERLATTICE MATERIALS
P14
MIX TO HOMOGENEITY AND STORE
P16

1. A method of making a precursor solution for use in manufacturing thin-film ferroelectric materials, said method comprising the steps of:
providing a plurality of polyoxyalkylated metal moieties including an A-site metal moiety, a B-site metal moiety, and a superlattice-generator metal moiety;
combining said respective metal moieties in effective amounts for yielding, upon drying and annealing of said precursor solution, a layered superlattice material having a plurality of collated layers in a sequence including an A/B layer having an A/B ionic subunit cell, a superlattice-generator layer, and an AB layer having an AB octahedral ionic subunit cell different from said A/B ionic subunit cell; and
mixing said respective metal moieties to substantial homogeneity in a solvent to provide said solution.

5,840,111

NANODISPERSE TITANIUM DIOXIDE, PROCESS FOR THE PRODUCTION THEREOF AND USE THEREOF

Gerhard Wiederhöft, Krefeld; Kai Bütje; Peter-Joachim Barenthien, both of Duisburg; Michael Bödiger, Dormagen, and Heinrich Alberts, Odenthal, all of Germany, assignors to Bayer AG, Germany
Filed Nov. 8, 1996, Ser. No. 744,421
Claims priority, application Germany, Nov. 20, 1995, 195 43 204.5
Int. Cl.^{6} C09C *1/36*

U.S. Cl. 106—436 **25 Claims**

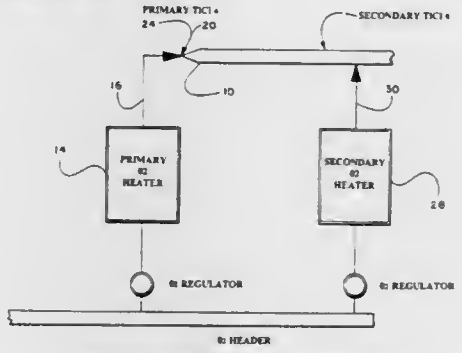
1. A particulate nanodisperse titanium dioxide having a maximum particle size distribution of between 1 and 10 nm, determined by means of an ultracentrifuge, containing less than 0.1 wt. % of carbon in the form of organic compounds or residues, and having a transparency of at least 99% measured in a 5 wt. % aqueous/hydrochloric acid solution between 400 and 700 nm in 180°/d geometry at a layer thickness of 10 μm.

5,840,112

METHOD AND APPARATUS FOR PRODUCING TITANIUM DIOXIDE

A. J. Morris, Oklahoma City, Okla.; J. C. Magyar, Ackerman; G. D. Wootten, Columbus, both of Miss., and W. A. Yuill, Edmond, Okla., assignors to Kerr McGee Chemical Corporation
Filed Jul. 25, 1996, Ser. No. 687,280
Int. Cl.^{6} C09C *1/36*

U.S. Cl. 106—442 **27 Claims**



SCHEMATIC FOR OXYGEN FLOW FOR SECONDARY OXYGEN TEST

1. A process for the production of titanium dioxide comprising reacting titanium tetrachloride with oxygen at a pressure at atmospheric pressure or above and at a reaction temperature of at least about 1290° F. in an oxidation reactor, the oxygen being introduced into the reactor at a first inlet point before any titanium tetrachloride is introduced and at least one further inlet point, the titanium tetrachloride introduced into the reactor being heated to a temperature of less than about 800° F. prior to introduction and the ratio of titanium tetrachloride to oxygen at the start of the oxidation reaction being between at least about 0.65 and about 1.2.

5,840,113

TREATED CLAY PRODUCT, METHODS OF MAKING AND USING AND PRODUCTS THEREFROM

Gary M. Freeman; Carl J. Marshall, Jr.; Walter O. Lackey, and Thomas J. Lynch, all of Macon, Ga., assignors to J.M. Huber Corporation, Edison, N.J.
Division of Ser. No. 841,367, Apr. 30, 1997. This application Apr. 14, 1998, Ser. No. 59,375
Int. Cl.^{6} C09C *1/42*

U.S. Cl. 106—487 **14 Claims**

1. A method of preparing a hydrous, waterwashed kaolin clay feedstock to be used as a clay substrate which is surface treated with a methylene acceptor, a methylene donor and a functional silane to form a treated clay product comprising the steps of:
a) obtaining a crude kaolin clay;
b) blunging the crude clay into a clay slurry to form a clay feedstock by adding an amount of a dispersant to maintain a specific overall surface charge value more positive than about −22 millivolts as measured at a pH of 7 by zeta potential determination on the clay feedstock after degritting and fractionation.

5,840,114

HIGH EARLY-STRENGTH-ENHANCING ADMIXTURE FOR PRECAST HYDRAULIC CEMENT AND COMPOSITIONS CONTAINING SAME

Ara Avedis Jeknavorian; Ahmad Arfaei, both of Chelmsford; Neal Steven Berke, N. Chelmsford, all of Mass.; David Charles Darwin, Columbia; Ellis Martin Gartner, Silver Spring, both of Md.; Leslie Ann Jardine, Ipswich, Mass.; James Franklin Lambert, Chestnut Hill, Mass., and Lawrence Reeder Roberts, Acton, Mass., assignors to W. R. Grace & Co.-Conn., New York, N.Y.
Continuation-in-part of Ser. No. 493,046, Jun. 21, 1995, abandoned, Ser. No. 493,036, Jun. 21, 1995, Ser. No. 504,089, Jul. 19, 1995, Pat. No. 5,634,966, and Ser. No. 505,985, Jul. 24, 1995, Pat. No. 5,665,158. This application May 17, 1996, Ser. No. 648,970
Int. Cl.^{6} C04B *22/08;24/04*

U.S. Cl. 106—802 **20 Claims**

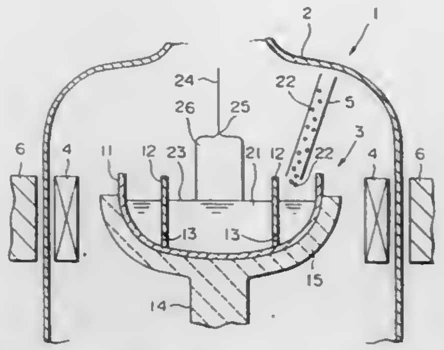
1. A cement admixture for achieving high early strength comprising: (1) a calcium salt; and (2) a copolymer comprising a carbon-containing backbone having (a) pendant cement-anchoring members and (b) pendant oxyalkylene groups attached to the backbone by linkages selected from the group consisting of amide and imide.

5,840,115

SINGLE CRYSTAL GROWTH METHOD

Hiroaki Taguchi; Takashi Atami; Hisashi Furuya, all of Tokyo, and Michio Kida, Omiya, all of Japan, assignors to Zag Ltd., Rosh Haayin, Israel
Filed Jan. 10, 1997, Ser. No. 781,818
Claims priority, application Japan, Jan. 12, 1996, 8-004406
Int. Cl.^{6} C30B *15/04*

U.S. Cl. 117—18 **8 Claims**



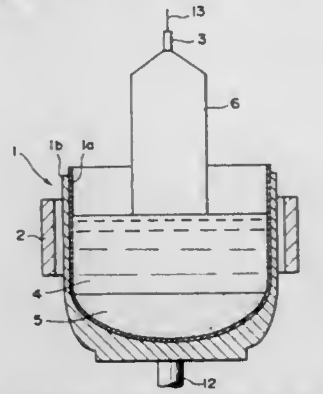
1. A method of growing a single crystal of semiconductor using a CZ growth technique, having a first step wherein a single crystal of semiconductor is pulled while a source material is supplied continuously to maintain a constant amount of semiconductor melt, and a second step wherein the supply of source material is halted, and the single crystal of semiconductor is pulled using residual melt from said first step.

5,840,116

METHOD OF GROWING CRYSTALS

Takayuki Kubo, Nishinomiya, Japan, assignor to Sumitomo Sitix Corporation, Amagasaki, Japan
Continuation of Ser. No. 413,617, Mar. 30, 1995, abandoned. This application Sep. 19, 1997, Ser. No. 933,987
Claims priority, application Japan, Mar. 31, 1994, 6-063614
Int. Cl.^{6} C30B *15/12*

U.S. Cl. 117—20 **9 Claims**



1. In a process of growing single crystals by the double-layered CZ method in which the upper part of material in a crucible is heated to form a molten layer, and a solid layer is formed with its lower part, a seed crystal is made to contact a surface of said molten layer then pulled up to grow a crystal, which is characterized by applying a low magnetic field of between 100 Oe and 500 Oe to said molten layer to produce crystals of uniform oxygen concentration in the radial and crystal growing directions.

5,840,117

METHOD FOR SURFACE FLATTENING A CRYSTAL SUBSTRATE

Kunihiro Sakamoto, and Atsushi Ando, both of Tsukuba, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan
Filed Aug. 23, 1996, Ser. No. 702,036
Claims priority, application Japan, Sep. 28, 1995, 7-250270
Int. Cl.^{6} C30B *33/04*

U.S. Cl. 117—62 **7 Claims**

1. A method for surface flattening a crystal substrate, comprising:
a. processing a surface of a silicon single crystal substrate, the surface deviating by 0.1° or less from the (001) plane, so as to form a processed zone thereon which is an obstacle to the

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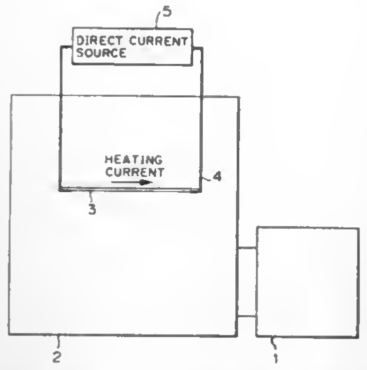


movement of surface steps present on the surface of the silicon single crystal substrate and which is adjacent to a preselected region having a surface to be flattened when viewed on an atomic level;

b. holding the substrate processed in step (a) in a chamber having an adjustable degree of vacuum so that the substrate has a temperature which is controlled by direct-current passage and heating; and

c. heating the substrate to move the surface steps along the substrate from the preselected region and gather the surface steps in the processed zone, thereby forming a flat surface in the preselected region of the substrate when viewed on the atomic level.

5,840,118
LASER PROCESS SYSTEM AND METHOD OF USING THE SAME

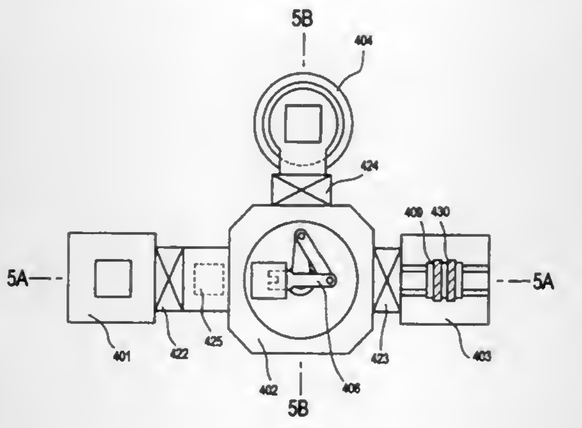
Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa-ken, Japan

Filed Dec. 18, 1995, Ser. No. 574,184

Claims priority, application Japan, Dec. 19, 1994, 6-335042

Int. Cl.⁶ C30B *31/20*

U.S. Cl. 117—103 21 Claims



1. A method of manufacturing a semiconductor device comprising the steps of:

preparing a semiconductor film over a substrate;

directing a pulsed laser beam toward said semiconductor film to heat a first portion of the semiconductor film wherein said pulsed laser beam has an elongated cross section at said semiconductor film extending in one direction and said first portion corresponds to said elongated cross section;

selectively heating a second portion of the semiconductor film by using a different heat source from said pulsed laser beam simultaneously as the heating of said first portion wherein said second portion extends in parallel to said first portion and is adjacent to said first portion;

moving said substrate relative to said pulsed laser beam and said different heat source in a direction orthogonal to said one direction.

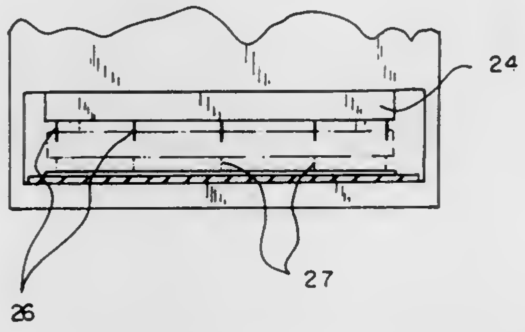
5,840,119
FLUORIDE ENRICHED SUGARLESS GUM SYSTEM

Michael Louis Stefanello, and Richard Timothy Stefanello, both of 26 Second Ave., East Rockaway, N.Y. 11518

Filed Mar. 19, 1996, Ser. No. 617,636

Int. Cl.⁶ A23G *3/20*

U.S. Cl. 118—13 1 Claim



1. A fluoride enriched sugarless gum apparatus comprising, in combination:

liquid fluoride;

a fluoride applicator machine including an essentially hollow main housing with a rectangular slot, a conveyor belt being positioned through the slot and main housing, the main housing having means to rotate the conveyor belt, an upper plate being operatively coupled within the main housing above the conveyor belt for oscillating up and down during operation, the upper plate having a liquid fluoride reservoir therein the liquid fluoride therein and a plurality of downwardly extending injectors in fluid communication with said reservoir for engaging gum on the conveyor belt and allow the liquid fluoride to pass through and into the gum;

means for forming a plurality of sugarless chewing gum sticks having a planar generally rectangular configuration, each gum stick containing a gum base of between about 10% and 80% by weight and selected from the group consisting of synthetic gums, natural gums, and natural elastomers, each gum stick further including glycerin as a softening agent, a mixture of natural flavors and artificial flavors as sweetening agent and a bulking agent, means for positioning in an operative orientation the gum sticks on an upper surface of said conveyor belt for movement through the slot and within the fluoride applicator machine, means for moving said upper plate downward thereby causing the injectors to penetrate the sticks of gum and force liquid fluoride within the gum sticks; and

means for wrapping a plurality of foil wrappers, each wrapper sized and shaped to be wrapped around an individual stick of gum thereby forming foil wrapped gum sticks, means for forming a plurality of sleeves each of said sleeves formed in a generally rectangular configuration with a hollow interior, means for positioning said foil wrapped gum sticks in said sleeves, means for forming a plurality of outer casings each formed in a generally rectangular configuration with a hollow interior, means for positioning six sticks of gum within the hollow interior of each outer casing in a stored orientation, each outer casing having an upper region including a tear away strip with a pull tab to facilitate opening of the outer casing.

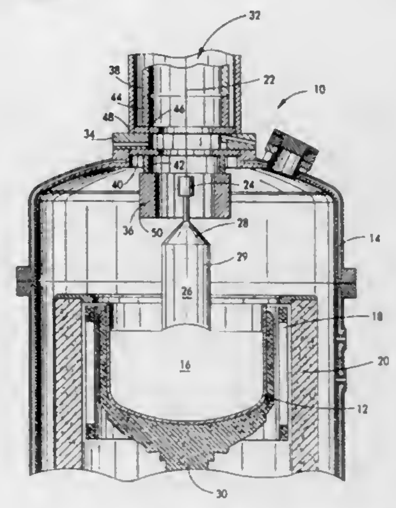
5,840,120
APPARATUS FOR CONTROLLING NUCLEATION OF OXYGEN PRECIPITATES IN SILICON CRYSTALS

Kyong-Min Kim, St. Charles; Roger W. Shaw, Kirkwood; Sadasivam Chandrasekhar, and Richard G. Schrenker, both of Chesterfield, all of Mo., assignors to MEMC Electronic Materials, Inc., St. Peters, Mo.

Filed Jan. 22, 1996, Ser. No. 589,612

Int. Cl.⁶ C30B *35/00*

U.S. Cl. 117—208 17 Claims



1. An apparatus for producing a silicon single crystal grown by a Czochralski process, the apparatus comprising:

a hollow growth chamber;

a quartz crucible disposed within the growth chamber;

means for pulling a growing silicon single crystal upward from a silicon melt retained in the crucible;

a crystal chamber above the growth chamber for receiving the crystal as it is pulled;

means for joining the growth chamber and the crystal chamber;

a first heating member defining a passageway through which the crystal is pulled for preventing formation of oxygen precipitate nucleation centers in the crystal until the crystal has been pulled through the passageway, the first heating member being disposed at least partially within the growth chamber; and

a second heating member defining a passageway through which the crystal is pulled for controlling the formation of the oxygen precipitate nucleation centers in the crystal, the second heating member being disposed within the crystal chamber.

5,840,121
APPARATUS FOR PRODUCING ENCAPSULATED SEEDS

Yasushi Kohno, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Aug. 28, 1996, Ser. No. 704,830

Claims priority, application Japan, Aug. 29, 1995, 7-220276

Int. Cl.⁶ A23G *3/00*

U.S. Cl. 118—13 5 Claims

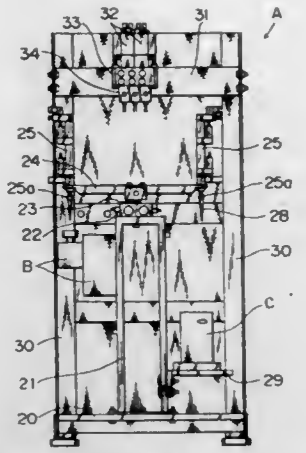
1. An apparatus for producing encapsulated seeds comprising:

a seed-supplying mechanism connected to a gel-discharging mechanism;

said seed-supplying mechanism comprising:

- a rotary member;
- an actuator attached to said rotary member;
- a suction tip vertically movably driven by said actuator;
- a rotary drive means for driving said rotary member such that said suction tip is moved between a seed-attracting position and a seed-releasing position; and
- a seed vessel containing seeds to be attracted to said suction tip, wherein said seed vessel is disposed corresponding to said seed-attracting position;

said gel-discharging mechanism, which is disposed corresponding to said seed-releasing position, comprising:



a gel flow channel filled with a gel;

a piston-insertion hole communicating with said gel flow channel;

a piston reciprocatably inserted into said piston-insertion hole, wherein said piston, when moving in a forward direction, pressurizes said gel inside of said gel flow channel and, when moving in a rearward direction, causes an additional gel to flow into said gel flow channel;

a nozzle plunger with a hollow portion axially extended therethrough, wherein said nozzle plunger opens a valve when said gel inside of said gel flow channel is pressurized to allow said gel to be discharged, a portion of said gel which has been discharged dropping by said gel's own weight and a remainder of said gel which has been discharged forming a layer of said gel that closes said hollow portion at a lower end thereof;

a drive means for reciprocating said piston, wherein at said seed-attracting position said suction tip vacuum-attracts a seed from said seed vessel of said seed-supplying mechanism and at said seed-releasing position, said suction tip is moved downwardly by said actuator into said hollow portion of said nozzle plunger to release said seed attracted thereto on said layer of said gel; and

wherein said suction tip is located at a position inside of said hollow portion of said nozzle plunger so that a front end thereof is close to, but kept apart from, said layer of said gel.

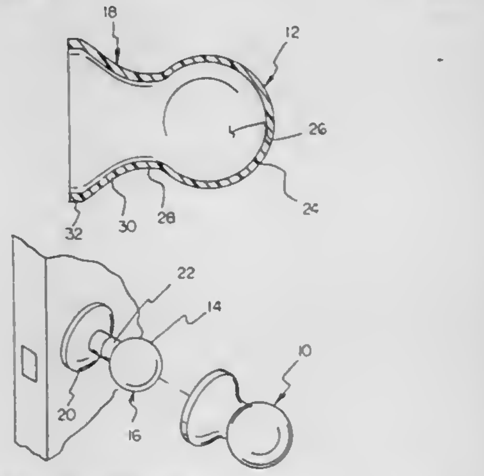
5,840,122
DOOR KNOB COVER

Dennis C. Williams, 2426 Clearbrook Dr., Missouri City, Tex. 77459

Filed Apr. 25, 1997, Ser. No. 840,990

Int. Cl.⁶ B05C *11/11*

U.S. Cl. 118—505 1 Claim



1. A door knob cover comprising:

a knob cover means for positioning over a spherical knob portion of a door knob, wherein the knob cover means com-

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prises a substantially spherical envelope formed of a resilient material, the spherical envelope defining a knob cavity within which a spherical knob portion of a door knob can be received, the spherical envelope of the knob cover means capable of being resiliently deformed so as to permit insertion of the spherical knob portion of the door knob into the knob cavity with a resilient contraction of the spherical envelope about the spherical knob portion of the door knob operating to secure the knob cover means over the spherical knob portion of the door knob;

an escutcheon cover means integrally formed with the knob cover means and extending from the knob cover means for positioning over an escutcheon portion and shaft portion of the door knob, wherein the escutcheon cover means comprises a cylindrical neck portion projecting from an annular opening directed through the spherical envelope of the knob cover means, the cylindrical neck portion continuing into a truncated conical neck portion projecting from the knob cover means and increasing in diameter relative to the cylindrical neck portion such that the truncated conical neck portion is of a first diameter at a juncture of the cylindrical neck portion and the truncated conical neck portion and tapers to a second diameter spaced from the junction of the cylindrical neck portion and the truncated conical neck portion, wherein the second diameter is substantially greater than the first diameter to define the truncated conical shape of the truncated conical neck portion;

said escutcheon cover means further comprising a cylindrical portion projecting from the truncated conical neck portion, diameter of the cylindrical portion equal to the second diameter such that the shaft portion of the door knob can be received within the cylindrical neck portion of the escutcheon cover means, with the truncated conical neck portion and the cylindrical portion of the escutcheon cover means cooperating to effect coextensive enclosure of an escutcheon portion of the door knob;

said escutcheon cover means comprised of a substantially resilient material, wherein the escutcheon cover means can be expanded during placement of the door knob cover onto a door knob such that resilient contraction of the escutcheon cover means provides frictional engagement of the escutcheon cover means around the escutcheon portion of the door knob.

5,840,123

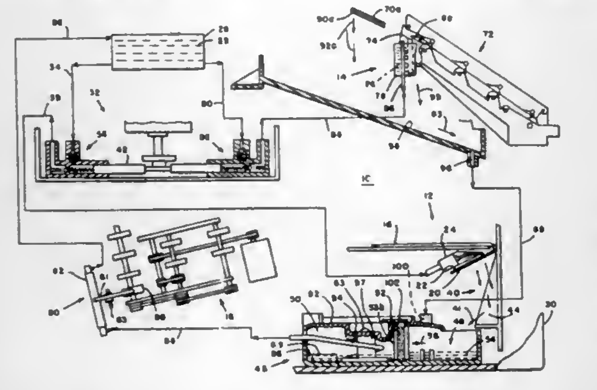
MAILING SYSTEM MOISTENER APPARATUS WITH RECIRCULATING EXCESS MOISTENING FLUID

Russell W. Holbrook, Middlebury, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed May 22, 1992, Ser. No. 887,040

Int. Cl.⁶ B05C *11/00*; B43M *3/00*

U.S. Cl. 118—603 **9 Claims**



1. An improved moistening apparatus for moistening the glue line of an envelope flap, said glue line being along the edge of the envelope and having a generally uniform cross-sectional width, comprising:

support means for causing said envelope flap to be partially open and for causing said envelope to travel in a first direction;

a nozzle applicator slidably mounted to said support means for slidable displacement of said nozzle in a second direction generally perpendicular to said first direction and further mounted such that said nozzle is between said envelope and said envelope flap;

pump means for causing moistening fluid to be delivered to and through said nozzle; and,

control means for causing said pump to deliver a given volume of moistening fluid to said nozzle and for causing said nozzle to displace in said second direction such that said nozzle is opposite said glue line of said envelope as said envelope is displaced in said first direction further such that said moistening fluid is applied by said nozzle evenly to said glue line;

wherein the improvement comprises:

a moistening fluid supply tank for containing said moistening fluid;

said pump means having means for obtaining said moistening fluid from said moistening fluid supply tank;

excess moistening fluid collection means including:

a baffle extending in said second direction throughout the displacement range of said nozzle such that said envelope flap is between said nozzle and said baffle;

an excess moistening fluid collection tank positioned with respect to said baffle for collecting excess moistening fluid deposited on said baffle; and

said pump means having means for pumping said collected moistening fluid from said excess moistening fluid collection means to said moistening fluid supply tank;

wherein said excess moistening fluid collection tank comprises a first section for accumulating excess moistening fluid from said nozzle and a second section, said second section connected to said moistening fluid supply tank to enable excess moistening fluid from said second section to be pumped into said moistening fluid supply tank.

5,840,124

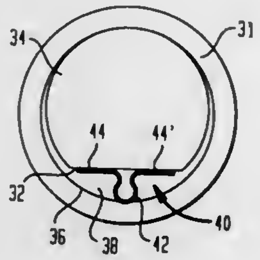
WAFER CARRIER WITH FLEXIBLE WAFER FLAT HOLDER

Alexander I. Gurary, Bridgewater; Scott Beherrell, Phillipsburg, and Vadim Boguslavskiy, Somerville, all of N.J., assignors to Emcore Corporation, Somerset, N.J.

Filed Jun. 30, 1997, Ser. No. 884,743

Int. Cl.⁶ C23C *16/00*

U.S. Cl. 118—726 **63 Claims**



1. Apparatus for mounting wafers having an upper surface during epitaxial deposition onto said upper surface of said wafers in a reactor, said apparatus comprising a wafer carrier for holding said wafer during said epitaxial deposition, said wafer carrier including a depressed region for accommodating said wafer and maintaining said wafer on said wafer carrier during said epitaxial deposition, and a positioning member located in said depressed region for maintaining the position of said wafer within said depressed region during said epitaxial deposition without interfering with said epitaxial deposition onto said upper surface thereof, said positioning member comprising a flexible wire including a central head portion and a pair of extending wing portions for contacting said wafer, whereby said flexible wire can maintain said position of said wafer within said depressed region during variations in temperature within said reactor by deforming to accommodate differences in the linear expansion of said wafer carrier and said wafer.

5,840,125

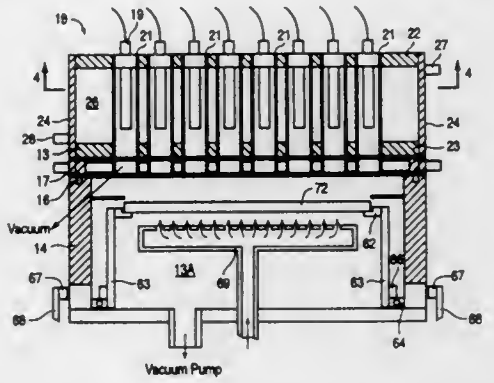
RAPID THERMAL HEATING APPARATUS INCLUDING A SUBSTRATE SUPPORT AND AN EXTERNAL DRIVE TO ROTATE THE SAME

Christian M. Gronet, and James F. Gibbons, both of Palo Alto, Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Division of Ser. No. 131,830, Oct. 5, 1993, Pat. No. 5,487,127, which is a division of Ser. No. 882,656, May 13, 1992, Pat. No. 5,317,492, which is a division of Ser. No. 781,632, Oct. 24, 1991, Pat. No. 5,155,336, which is a continuation of Ser. No. 467,808, Jan. 19, 1990, abandoned. This application Jul. 28, 1995, Ser. No. 508,601

Int. Cl.⁶ C23C *16/00*

U.S. Cl. 118—730 **2 Claims**



1. An apparatus for the rapid thermal processing of a substrate in a processing chamber, comprising:

a circular support for a single substrate spaced from the walls of said chamber, said support having a support surface for the substrate;

a plurality of radiant energy sources positioned on a first side of the substrate;

reflectors associated with said radiant energy sources to direct radiant energy to the substrate to radiate predetermined regions of the first side of the substrate with a pattern of radiation intensity;

an injection head located on a second side of the substrate to pass a processing gas thereto;

a bearing assembly that supports the circular support so that the circular support can be rotated, said bearing assembly having a plurality of magnets mounted thereon and said bearing assembly positioned on the second side of the substrate;

a drive ring external to said chamber having a plurality of magnets mounted thereon providing a magnetic field coupled between said bearing assembly magnets and said drive ring magnets; and

a drive for rotating said drive ring, thereby rotating the circular support inside said chamber.

5,840,126

WASHING/DRYING METHOD UTILIZING SONICATION

Ichiro Yoshida; Hiroshi Iida; Shuzo Kawashima; Fukuji Kuroiwa, all of Nagano; Isamu Ito, Suzaka; Satoru Asanome, and Toshiji Fujimori, both of Nagano, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

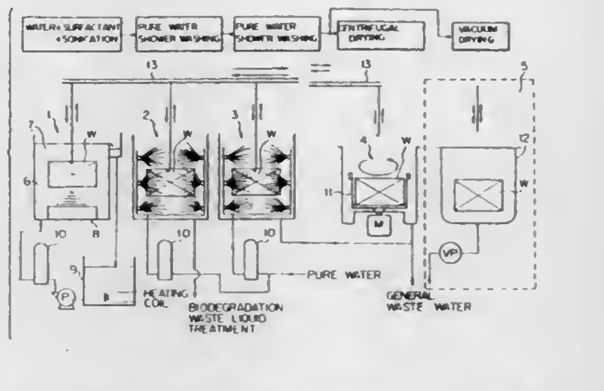
Continuation of Ser. No. 5,329, Jan. 15, 1993, Pat. No. 5,361,789, which is a division of Ser. No. 691,915, Apr. 26, 1991, Pat. No. 5,203,927. This application Apr. 12, 1994, Ser. No. 226,675

Claims priority, application Japan, May 1, 1990, 2-116439

Int. Cl.⁶ B08B *3/12*

U.S. Cl. 134—1 **22 Claims**

1. A method for washing/drying a material having a surface, comprising the steps of:


WATER+SURFACTANT +SONICATION
PURE WATER SHOWER WASHING
PURE WATER SHOWER WASHING
CENTRIFUGAL DRYING
VACUUM DRYING
PURE WATER
HEATING COIL
BIODEGRADATION WASTE LIQUID TREATMENT
GENERAL WASTE WATER
P
VP

(a) a first washing step wherein the material is washed in an aqueous solution containing a surfactant having a water repellency;

(b) concurrently with step (a). applying sonication to the solution to remove contamination from the surface of the material;

(c) allowing at least one molecular layer of surfactant to form on the surface of the material during the first washing step;

(d) a second washing step wherein the material is rinsed with pure water; and

(e) drying the material.

5,840,127

SURFACE TREATING AGENTS AND TREATING PROCESS FOR SEMICONDUCTORS

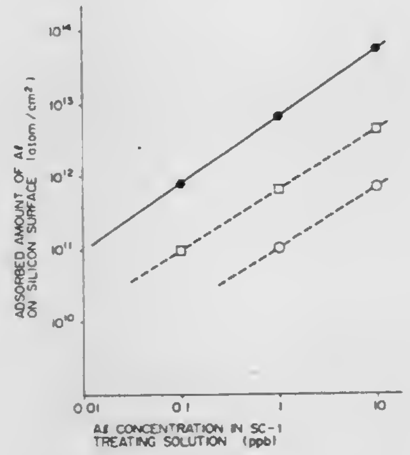
Ichiro Hayashida, and Masahiko Kakizawa, both of Kawagoe, Japan, assignors to Wako Pure Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 370,194, Jan. 9, 1995, Pat. No. 5,580,846. This application Jul. 22, 1996, Ser. No. 685,008

Claims priority, application Japan, Jan. 28, 1994, 06-026291

Int. Cl.⁶ B08B *3/00*

U.S. Cl. 134—2 **4 Claims**



1. A process for treating semiconductor surfaces, which comprises a step of cleaning surfaces of semiconductors with a semiconductor surface treating agent comprising an inorganic or organic alkali, hydrogen peroxide and water as major components, and a step of rinsing the resulting surfaces with ultra-pure water, wherein at least one of the semiconductor surface treating agent and the ultra-pure water contains a complexing agent having three or more $-\overset{\text{O}}{\text{C}}-\overset{\text{OH}}{\text{N}}-$ groups in the molecule or a salt thereof and in addition to said complexing agent a chelating agent for removing Fe having one or more phosphonic acid groups or a salt thereof in the molecule or an oxidized form thereof, or a polyphosphoric acid or a salt thereof.

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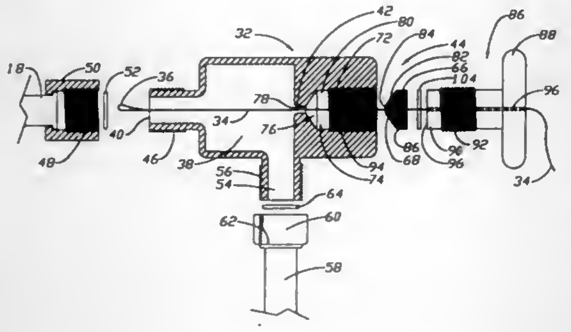
5,840,128

WATER SERVICE LINE CLEANING DEVICE AND METHOD

Michael A. Imig, 531 Country La., Beecher, Ill. 60401-0263
Filed Jun. 19, 1996, Ser. No. 667,958
Int. Cl.^{6} B08B *9/03;9/00;1/00;* **F16L** *45/00*
U.S. Cl. 134—8 **34 Claims**



1. An apparatus for removing an obstruction within a pressurized fluid service pipeline, comprising:
- a flexible rod;
- a module for connecting to said service pipeline in which the module defines a channel and a first opening in which the first opening communicates with and between the service pipeline and the channel and permits said channel to receive said pressurized fluid from said pipeline in which said module defines a second opening which communicates with and between the channel and with an outside of said module;
- a flexible seal having an opening and in which said seal abuts said module such that the opening of said seal is aligned with said second opening of the module for receipt of said flexible rod inserted through said opening of said seal to engage said obstruction in said pipeline, said flexible seal engages said flexible rod inserted through the opening of said seal to inhibit said pressurized fluid in said channel from moving along said flexible rod to said outside of said module; and
- means for compressing at least a portion of said flexible seal to flex against said flexible rod inserted through the opening of the seal further inhibiting said pressurized fluid from passing from said channel along the flexible rod to the outside of the module.

5,840,129

HESITATION FREE ROLLER

Albert M. Saenz; David L. Thrasher, both of Santa Clara; Wilbur C. Krusell, and William G. Drapak, both of San Jose, all of Calif., assignors to Ontrak Systems, Inc., San Jose, Calif.
Division of Ser. No. 275,639, Jul. 15, 1994, abandoned. This application Aug. 6, 1996, Ser. No. 692,594
Int. Cl.^{6} C03C *23/00;* **B08B** *7/00;* **A47L** *15/00;25/00*
U.S. Cl. 134—2 **7 Claims**

1. A method of rotating a substrate comprising:
- contacting said substrate with a roller, said roller having a V-shaped groove that contacts an edge of said substrate;
- pinching said substrate with said roller to increase the friction between said substrate and said roller, wherein said v-shaped groove pinches said edge of said substrate; and
- turning said roller while pinching said substrate to thereby rotate said substrate.

5,840,130

CLEANING OF THE WATER/STEAM CIRCUIT IN A ONCE-THROUGH FORCED-FLOW STEAM GENERATOR

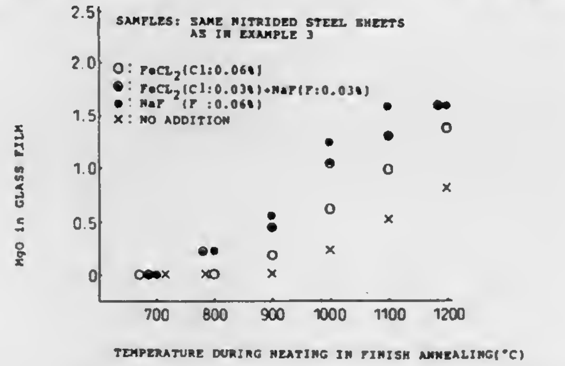
Erhard Liebig, Ditzingen, Germany, and Christoph Ruchti, Uster, Switzerland, assignors to Asea Brown Boveri AG, Baden, Switzerland
Filed Nov. 12, 1996, Ser. No. 747,404
Claims priority, application Germany, Nov. 28, 1995, 195 44 225.3
Int. Cl.^{6} B08B *9/00;* **F22B** *37/18;37/48*
U.S. Cl. 134—22.15 **8 Claims**

1. A method for cleaning the water/steam circuit of a combined gas/steam power plant which has a gas turbine circuit and a steam turbine circuit, the waste gases from a gas turbine transmitting their residual heat to a steam turbine via the working medium flowing in a once-through forced-flow steam generator, said once-through forced-flow steam generator comprising an economizer an evaporator, and a superheater, and a separation bottle connected between said evaporator and said superheater, comprising the steps:
- conveying a larger quantity of water than necessary in a full-load mode through said economizer and said evaporator via a feed pump, the quantity of water being selected such that wet steam passes into said separation bottle;
- separating the water fraction of the steam, together with all the impurities contained therein, in said separation bottle; and
- drawing off said water fraction together with said impurities via a clarifying line.

5,840,131

PROCESS FOR PRODUCING GRAIN-ORIENTED ELECTRICAL STEEL SHEET HAVING EXCELLENT GLASS FILM AND MAGNETIC PROPERTIES

Kenichi Yakashiro, Fukuoka; Hotaka Honma, Chiba; Maremizu Ishibashi, Fukuoka; Akira Sakaida, Fukuoka; Tomoji Kumano, Fukuoka; Koji Yamasaki, Fukuoka; Katsuro Kuroki, Fukuoka, and Osamu Tanaka, Fukuoka, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan
PCT No. PCT/JP95/02346, § 371 Date May 15, 1997, § 102(e) Date May 15, 1997, PCT Pub. No. WO96/15291, PCT Pub. Date May 23, 1996
PCT Filed Nov. 16, 1995, Ser. No. 836,593
Claims priority, application Japan, Nov. 16, 1994, 6-282292; Nov. 16, 1994, 6-282293; Nov. 16, 1994, 6-282294; Dec. 13, 1994, 6-309162; Dec. 13, 1994, 6-309163
Int. Cl.^{6} H01F *1/18*
U.S. Cl. 148—122 **10 Claims**



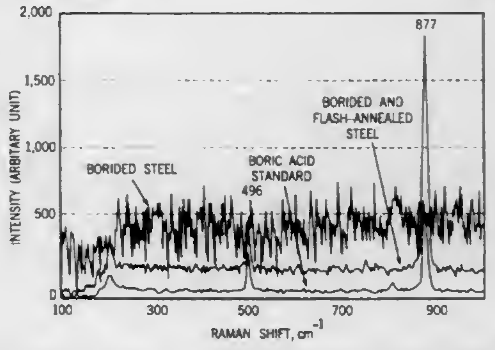
1. A process for producing grain-oriented electrical steel sheet comprising:
- coating a decarburization annealed electrical steel sheet with an annealing separator;
- then finish annealing the annealing separator coated electrical steel sheet;
- then coating the finish annealed electrical steel sheet with an insulating coating agent;
- then baking the insulating coating agent coated electrical steel sheet;

said process further comprising,
- said annealing separator agent coated onto said decarburization annealed electrical steel sheet comprising a slurry containing MgO wherein 100 parts by weight MgO added to said slurry contains F in an amount of at least 0.005 parts by weight, and total halogen in the form of F, Cl, Br or I in a total amount of 0.015 to 0.120 parts by weight in terms of F, Cl, Br or I.

5,840,132

LUBRICATED BORIDE SURFACES

Ali Erdemir, Naperville, Ill.; Cuma Bindal, Sakarya, Turkey, and G. R. Fenske, Downers Grove, Ill., assignors to ARCH Development Corporation, Chicago, Ill.
Filed Apr. 24, 1996, Ser. No. 640,288
Int. Cl.^{6} C23C *8/04*
U.S. Cl. 148—280 **24 Claims**

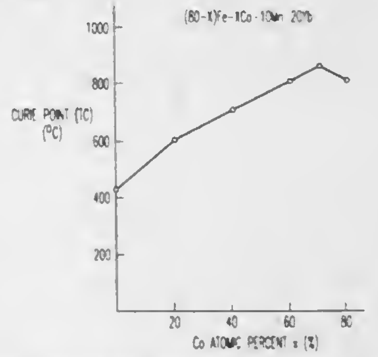


1. A method of using a reduced boride compound to lubricate a surface of a metallic article, comprising:
- providing a metallic article treated with a reduced boron compound disposed on the surface of the metallic article, the reduced boron compound forming an exterior surface;
- annealing said metallic article at a temperature between about 400° C. and about 1000° C. in an oxidizing atmosphere for a time sufficient for diffusion of boron to the exterior surface: and
- exposing the exterior surface to ambient air to form a layer of boric acid for improved lubricity for the metallic article.

5,840,133

PERMANENT MAGNET

Yoshiaki Takahashi, Room No. 206 Arisukawa Residence 14-1, 5-Chome, Minamiazabu Monato-ku, Tokyo, Japan
PCT No. PCT/JP96/01544, § 371 Date Feb. 7, 1997, § 102(e) Date Feb. 7, 1997, PCT Pub. No. WO96/42093, PCT Pub. Date Dec. 27, 1996
PCT Filed Jun. 6, 1996, Ser. No. 776,652
Claims priority, application Japan, Jun. 8, 1995, H07-274951
Int. Cl.^{6} H01F *1/053*
U.S. Cl. 148—301 **20 Claims**

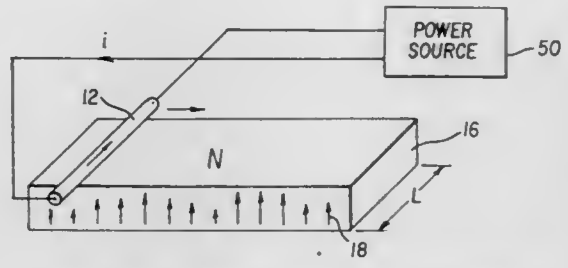


1. A sintered anisotropic permanent magnet, comprising an Fe—Mn—R alloy, said permanent magnet containing:
- 5–35 atomic % R, wherein R is at least one member selected from the group consisting of Yb, Er, Tm and Lu,
- 1–25 atomic % Mn,
- Fe and Co, in an atomic ratio of Co:Fe of 0.1–50%.

5,840,134

FUNCTIONALLY GRADIENT PERMANENT MAGNET ACTUATORS

Edward Paul Furlani, Lancaster; Syamal Kumar Ghosh, and Dilip Kumar Chatterjee, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Division of Ser. No. 720,402, Sep. 30, 1996, Pat. No. 5,716,461. This application Jun. 26, 1997, Ser. No. 883,057
Int. Cl.^{6} H01F *1/057*
U.S. Cl. 148—302 **6 Claims**

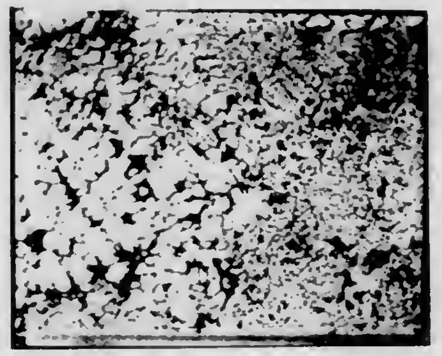


1. A functionally gradient permanent magnet comprising:
- a slab of alloy comprising a rare earth-transition metal-boron alloy; and
- areas of diffused transition metal positioned at points along the length of at least one surface of said slab of alloy.

5,840,135

ALUMINUM-BERYLLIUM ALLOYS HAVING HIGH STIFFNESS AND LOW THERMAL EXPANSION FOR MEMORY DEVICES

Larry A. Grant, Saratoga, Calif.; James M. Marder, Shaker Heights, Ohio, and Wayne L. Wright, San Jose, Calif., assignors to Brush Wellman Inc., Cleveland, Ohio
Division of Ser. No. 587,135, Jan. 16, 1996, Pat. No. 5,578,146, which is a continuation of Ser. No. 333,942, Nov. 3, 1994, abandoned, which is a continuation of Ser. No. 156,356, Nov. 23, 1993, abandoned, which is a continuation of Ser. No. 770,187, Oct. 2, 1991, abandoned. This application May 2, 1996, Ser. No. 643,082
Int. Cl.^{6} C22C *21/00*
U.S. Cl. 148—405 **1 Claim**



1. A rotatable armset of an actuator having a bore for rotating about an actuator shaft for positioning a head of the actuator radially across a disk of a disk drive, wherein the armset is a one piece unit entirely comprised of an alloy consisting essentially of about 40% to about 95% beryllium and the balance essentially aluminum, the alloy having a microstructure of randomly distrib-

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uted crystals of aluminum-rich and beryllium-rich phases, and having isotropic properties of high stiffness and low coefficient of thermal expansion.

5,840,136
TEMPERATURE-RAISING BAINITE FORMING PROCESS

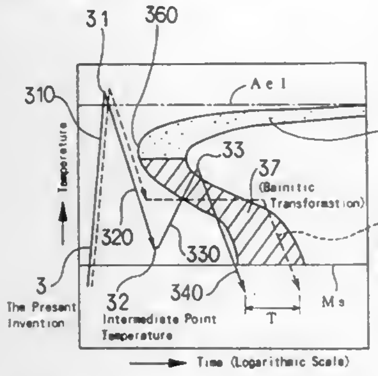
Michio Maruki; Kouji Ohbayashi, both of Anjo, and Takatoshi Suzuki, Aichi-ken, all of Japan, assignors to Aisin AW Co., Ltd., Japan

Filed Mar. 4, 1997, Ser. No. 811,147

Claims priority, application Japan, Mar. 5, 1996, 8-078263

Int. Cl.^{6} C21D *9/00*

U.S. Cl. 148—664 **20 Claims**



1. A process for treating a steel object to form a bainite structure therein, comprising:

heating the steel object to a first temperature higher than an austenitic transformation point temperature;

quenching the steel object to an intermediate point temperature higher than a martensitic transformation point temperature during a quenching interval starting with discontinuation of said heating;

reheating the steel object from the intermediate point temperature to a second temperature in a range of bainitic transformation to form the bainitic structure, said quenching interval ending with initiation of said reheating and without the temperature of the steel object going below said intermediate point temperature;

discontinuing said reheating before the austenitic transformation point temperature is reached; and

cooling the steel object.

5,840,137
PNEUMATIC TIRE WITH IMPROVED SNOW AND ICE TRACTION

Shingo Futamura, Wadsworth, Ohio, assignor to Bridgestone Corporation, Tokyo, Japan

Division of Ser. No. 983,190, Nov. 30, 1992, abandoned. This application Apr. 28, 1995, Ser. No. 430,578

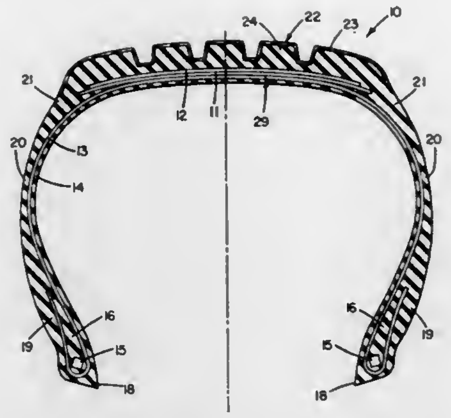
Int. Cl.^{6} B60C *11/00*

U.S. Cl. 152—209 R **8 Claims**

1. A pneumatic tire having a composite tread structure, said composite tread structure providing a road engaging surface and a plurality of grooves and comprising:

an inner rubber layer providing said road engaging surface and defining said grooves; and

an outer rubber layer having a thickness in the range of from about 0.01 inches to about 0.25 inches and providing an original road engaging surface, over said inner layer, carried within said grooves and covering said grooves defined within said inner layer, wherein said outer rubber layer provides a low modulus at −20° C. and said inner rubber layer provides a high modulus at −20° C.; said inner layer is thicker than said outer layer; and, the average glass transition temperature of said high modulus rubber is higher than about −60° C., said moduli being measured by the application of compressional stress of 0.45 MPa and dynamic sinusoidal stress of ±0.3 MPa imposed on the static stress and the average glass transition temperature of the rubber in said outer layer is at least 10° C. lower than the average glass transition temperature of the rubber in said inner layer; said outer and inner layers containing synthetic rubber; wherein wet snow and ice traction is provided by said low modulus, lower average glass transition temperature rubber, while said high modulus, higher average glass transition temperature rubber provides wet and dry traction and wherein wet snow and ice traction continues to be provided after said low modulus, lower average glass transition temperature rubber is worn from said road engaging surface.



5,840,138
WATERBORNE RADIAL FIRST HARMONIC MARKING OF TIRES

Ramendra Nath Majumdar, Hudson, and Robert Calevich, Highland Heights, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 25, 1997, Ser. No. 845,183

Int. Cl.^{6} B60C *13/00*

U.S. Cl. 152—524 **20 Claims**

1. A process for marking at least one sector on the surface of a tire to identify a location of a measurable variation in said tire that can be detected when the tire is rotated about its axis of rotation said process, comprising:

a) measuring a variation in at least one sector of the tire,

b) subsequently applying a water-based fluorescent marking composition to said sector of said tire to form a fluorescent coating thereon to mark the location of said variation, said fluorescent marking composition either including poly(vinyl alcohol) or being applied over a poly(vinyl alcohol) coating, and

c) subsequently drying said fluorescent marking composition.

13. A pneumatic tire having at least one sector marked with a fluorescent coating to facilitate assembly with other wheel components to minimize total variations in the wheel, said tire comprising

a) a tire casing

b) a tire sidewall

c) a tire tread

d) a fluorescent coating adhering directly to said tire, or adhered to a poly(vinyl alcohol) based coating which is adhered directly to said tire, said fluorescent coating identifying a sector that varies from the remainder of the tire, said fluorescent coating being derived from drying a water-based fluorescent coating composition and either including poly(vinyl alcohol) or being applied over a poly(vinyl alcohol) based coating.

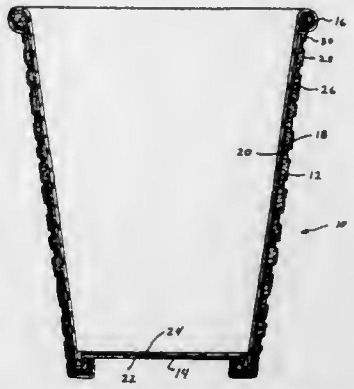
5,840,139
INSULATED STOCK MATERIAL AND CONTAINERS AND METHODS OF MAKING THE SAME

Daniel James Geddes, Appleton; Michael Andrew Breining, Neenah, and Michael Schmelzer, Appleton, all of Wis., assignors to Fort James Corporation, Deerfield, Ill.

Division of Ser. No. 604,783, Feb. 23, 1996, Pat. No. 5,766,709. This application Apr. 11, 1997, Ser. No. 843,065

Int. Cl.^{6} B32B *5/18*

U.S. Cl. 156—79 **18 Claims**



1. A method of forming an insulating composite container comprising:

providing a container body having a thermoplastic synthetic resin film on at least a portion of an outer surface of said container body and a printed pattern on at least an outer surface of said thermoplastic synthetic resin film; and

heat-treating said container body at a predetermined temperature for a predetermined time period sufficient to form a heat insulating layer on at least said portion of said outer surface by expanding said thermoplastic synthetic resin;

wherein at least a portion of said printed pattern controls the expansion of said thermoplastic synthetic resin during the heat treating of said container body.

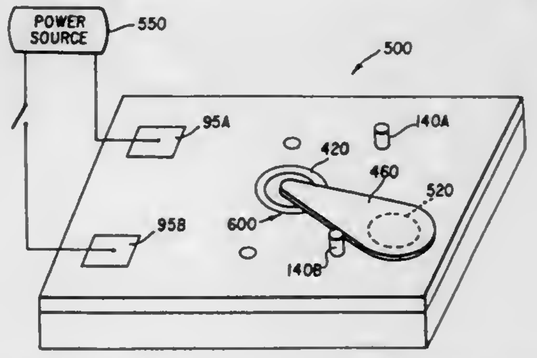
5,840,140
METHOD FOR MAKING A MICROCERAMIC OPTICAL SHUTTER

Syamal K. Ghosh; Dilip K. Chatterjee, both of Rochester, and Edward P. Furlani, Lancaster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 12, 1997, Ser. No. 798,694

Int. Cl.^{6} B32B *31/26;* G02B *26/02*

U.S. Cl. 156—89.28 **4 Claims**



1. A method of making a microceramic optical shutter comprising:

(a) forming a sacrificial stator member comprising a sacrificial stator core with a tape cast ceramic material wrapped around its central portion, and a sacrificial fiber wound in a helical fashion on the tape cast ceramic material;

(b) forming a micromolded bottom ceramic portion in the green state having a cavity for receiving the sacrificial stator member, and inserting the sacrificial stator member in such cavity and providing an opening in the bottom ceramic portion for a light aperture;

(c) forming a micromolded top ceramic portion in the green state having a first pair of through holes for receiving the ends of the sacrificial fiber and providing an opening in the top ceramic portion for a light aperture, and a second pair of through holes disposed in relationship to the sacrificial stator member;

(d) assembling the top and bottom micromolded ceramic portions and sintering such assembled structure to form a unitary ceramic body with a light aperture and to burn out the sacrificial stator core through the second pair of through holes to provide a second cavity for receiving a ferromagnetic stator member;

(e) etching through the first pair of through holes the sacrificial fiber to thereby provide an embedded helical coil receiving cavity;

(f) filling the helical coil receiving cavity with an electrically conductive metal and filling the second cavity with soft molten ferromagnetic material to form the ferromagnetic stator member;

(g) providing a recess in the unitary ceramic body; and

(h) mounting a shutter drive mechanism in the recess and in operative relationship to the stator and having a shutter blade which is movable between light blocking and light passing positions relative to the light aperture so that when a drive voltage is applied to the coil structure, in a first direction a field is created through the stator which provides a driving force to the shutter drive mechanism to move it to the light passing position and when the drive voltage is applied in the opposite direction to the coil structure the shutter drive mechanism moves the shutter from the light passing position to the light blocking position.

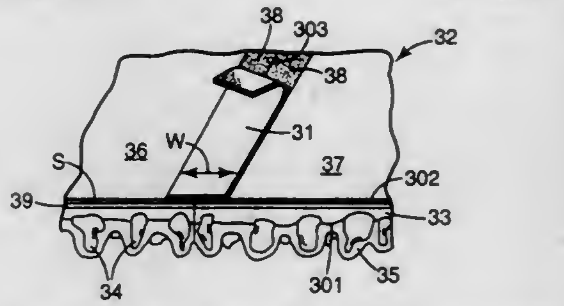
5,840,141
SPLICE MEANS, A METHOD OF SPLICING AN ABRASIVE ARTICLE WITH SAME AND THE SPLICED ABRASIVE ARTICLE FORMED THEREBY

Gerald E. Korbel, North St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 293,655, Aug. 22, 1994, Pat. No. 5,595,804. This application Jul. 12, 1996, Ser. No. 678,923

Int. Cl.^{6} B32B *31/12*

U.S. Cl. 156—153 **6 Claims**



1. A method for splicing a flexible abrasive belt comprising the steps of:

(a) positioning two free sheet ends of abrasive sheet material to be juxtaposely abutted together to form a juncture line, wherein said abrasive sheet material has opposed major surfaces with a coating of abrasive grains bonded to one of said major surfaces and a backing side constituting the other major surface; and wherein said two free ends on said backing side of said abrasive sheet material are roughened adjacent to said juncture line to form roughened areas having increased surface area;

(b) coating said roughened surfaces of said two free sheet ends with a splice adhesive;

(c) positioning a splice in contact with said splice adhesive to overlap said juncture line and contact the surfaces of each of

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said two free sheet ends wherein said splice comprises a polymeric film having a major surface and a plurality of monofilaments bonded to said major surface of said polymeric film by a hot melt fiber adhesive curable by exposure to water in the absence of nonaqueous liquid solvent, said plurality of monofilaments being arranged on said major surface of said polymeric film so as to span said juncture line, wherein said major surface of said polymeric film is sputter etched to provide a plurality of micropedestals therein of a height of from about 0.01 to 1.0 micrometer and of a spacing apart of from about 0.05 to 0.5 micrometer; and

(d) curing said splice adhesive.

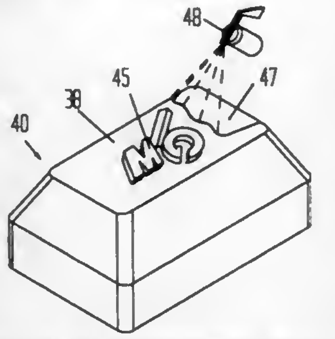
5,840,142
DECORATION AND PRINTING ON POLYOLEFIN SURFACES

Michael J. Stevenson, 1200 Soldier Pass Rd., Sedona, Ariz. 86336; Robert A. Reeves, 845 Oasis Dr., Cottonwood, Ariz. 86326, and Matthew P. Stevenson, 385 Ross Rd., Sedona, Ariz. 86336

Filed Nov. 22, 1996, Ser. No. 754,159

Int. Cl.^{6} B32B ***31/00;*** **B44C** ***1/17;*** **B05D** ***3/06;3/08***

U.S. Cl. 156—237 **11 Claims**



1. The method for the permanent application of indicia to a surface of a polyolefin object which comprises:

a. applying indicia formed of a mixture of finely divided polyolefin, pigment and wax to said surface to provide an indicia-bearing area thereof;

b. providing a coating over said indicia-bearing area of a coating mixture consisting essentially of from 1 to 99 weight percent polyolefin and the remaining weight percent being a binder selected from the group consisting of rosins, aromatic and aliphatic hydrocarbon resins and waxes, and terpene base resins to obtain a coated, indicia-bearing area;

c. heating the coated, indicia-bearing area by exposing the surface of said polyolefin object to atmospheric pressure heating at a temperature sufficient to fuse said coating and incorporate said coating and said indicia permanently into said surface.

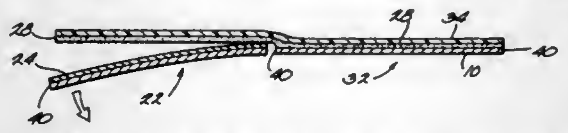
5,840,143
METHOD OF MAKING AN IDENTIFICATION CARD

Roger W. Swanson, Barrington, Ill., assignor to Champion Business Forms, Inc., Glendale Hts., Ill.

Filed May 3, 1996, Ser. No. 646,700

Int. Cl.^{6} B32B ***31/00;*** **B42D** ***15/10***

U.S. Cl. 156—256 **14 Claims**



1. A method of making an identification card comprising the steps of,

a) Advancing a continuous web having a first portion and a second portion with each said portion having a first side and a second side, the sum of the areas of the first portion and the second portion being less than the area of the web, and the combined first and second portions having an outer periphery,

b) Coating only said first portion of said first side with a release agent,

c) Coating said first side of said first portion and said first side of said second portion with a pressure sensitive adhesive, said second portion being adjacent said first portion and about the same size as said first portion,

d) Adhering a sheet of clear plastic to said adhesive so that said plastic overlays said first and second portions,

e) Perforating or die cutting said plastic sheet and said web with a single cut near the periphery of said first and second portions around the entire perimeter thereof,

f) Perforating or die cutting said web between said first and second portions,

g) Removing said first and second portions of said web and said overlying clear plastic sheet along said single cut from the remainder of said web,

h) Removing only said first portion of said web from said plastic sheet and from said second portion of said web along said cut or said perforations between said first and second portions while maintaining the entire said second portion with said plastic sheet to expose one half of said plastic sheet and said adhesive thereon, and

l) Folding said exposed half of said plastic sheet over said second portion and adhering said exposed half of said plastic sheet to said second side of said second portion to form an identification card.

5,840,144
PROCESS FOR APPLYING A COVERING MADE OF A NATURAL PRODUCT

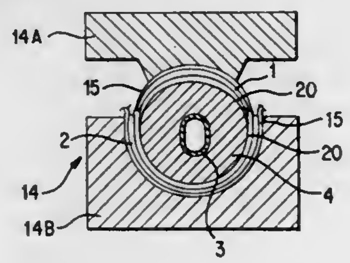
Rolf Schumacher, Sindelfingen, and Andreas Kellermann, Weil der stadt, both of Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany

Filed Aug. 5, 1996, Ser. No. 692,406

Claims priority, application Germany, Aug. 4, 1995, 195 28 788.6

Int. Cl.^{6} B62D ***1/06***

U.S. Cl. 156—267 **21 Claims**



1. A process for making a steering wheel for vehicles with a covering made of a natural product on a plastic casing supported by a skeleton tube, wherein the steering wheel has a steering wheel rim partially covered on the top and the bottom segment of the steering wheel, when the steering wheel is facing straight forward, with a covering made of wood or cork veneer with a varnish coating, wherein in between the top and bottom segments, on either side of the steering wheel when the steering wheel is facing straight forward, are segments covered with a soft covering, wherein a circumferential groove, which extends along the cross-sectional plane of the steering wheel rim, is arranged in the transition area between the wood- or cork-veneered segments and the soft covering segments, for receiving the end of the soft covering, and wherein the process for veneering the wood- or cork-veneered segments with veneer comprises the steps of:

cutting curved strips corresponding to the wood- or cork-veneered segments out of a flat sheet of fine wood or cork veneer, the width of each of the curved strips being larger than 180 degrees of the cross-sectional circumference of the steering wheel rim, wherein upon a application to the steering wheel the curved strips mate together in an overlapping manner;

watering the veneer strips for at least one hour to soften them and make them pliable;

press-drying the softened veneer blanks in a heatable molding tool having an upper and a lower die, which, except for the veneer thickness, correspond in a negative or mating manner, and molding the blanks into a dimensionally stable shaped veneer part in the form of a curved and groove-shaped half shell, wherein the edge of the groove-shaped half shell, which projects out of the shape-determining engraving of the molding tool, forms a projection which is curled in an undefined manner, wherein the veneering of the wood- or cork-veneered segments takes place in two stages, each stage having two steps, wherein the first stage comprises finish-veneering one axial side of the steering wheel rim and the second stage comprises finish-veneering the axially opposite side, wherein the first step of each stage comprises gluing a shaped veneer part with a bonding agent on the respective side and pressing the shaped veneer part with a veneering tool axially against the steering wheel rim during setting time, and the second step of each stage comprises trimming the projections of the shaped veneer parts, which are curled in an undefined manner, by milling or grinding along an intersecting line extending tangentially with respect to the cross-section of the steering wheel rim and aligned approximately axially with respect to the steering wheel rim;

subsequently after the two-sided veneering of the segments, grinding the segments to fit, polishing, varnishing and finishing the surface; and

trimming the circumferential ends of the shaped veneer parts with a fine end-milling cutter guided in space by a numerically controlled machine.

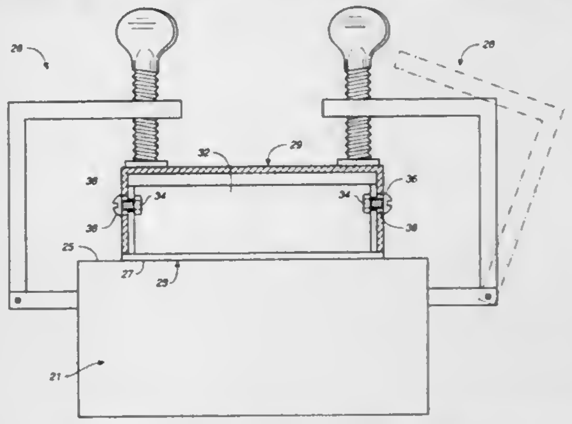
5,840,145
METHOD FOR REINFORCING A FLEXIBLE SHEET

Noel Schmidt, Palo Alto; Cliff Gyotoku, and David Albertalli, both of San Jose, all of Calif., assignors to Raster Graphics, Inc., San Jose, Calif.

Filed Mar. 12, 1997, Ser. No. 815,129

Int. Cl.^{6} B25B ***11/00***

U.S. Cl. 156—272.4 **16 Claims**



1. A method for reinforcing a flexible sheet, comprising the steps of:

positioning a flexible sheet on a surface of a magnetic chuck, the surface of the magnetic chuck having a topography, such that a magnetic force of the magnetic chuck causes a first surface of the flexible sheet to be formed into a reverse topography of the topography of the magnetic chuck;

securing a frame having greater rigidity than the flexible sheet relative to the flexible sheet as the first surface of the flexible sheet is formed into the reverse topography of the topography of the magnetic chuck by the magnetic force of the magnetic chuck; and

removing the flexible sheet together with the frame secured thereto from the magnetic chuck,

wherein the first surface of the flexible sheet retains the reverse topography of the topography of the magnetic chuck when the flexible sheet is removed from the magnetic chuck together with the frame secured thereto.

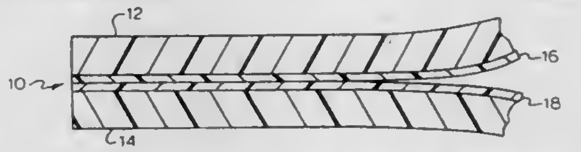
5,840,146
METHOD AND COMPOSITIONS THAT RENDER MATERIALS RF RESPONSIVE

Lecon Woo, Libertyville; Ying Lo, Mundelein; Michael T. K. Ling, Vernon Hills; Dean Laurin, Hawthorn Woods; Byron Gleason, Algonquin; Lillian A. Buan, Crystal Lake, and William D. Johnston, Kildeer, all of Ill., assignors to Baxter International Inc., Deerfield, Ill.

Division of Ser. No. 805,218, Dec. 11, 1991, Pat. No. 5,645,904. This application Jun. 6, 1995, Ser. No. 466,289

Int. Cl.^{6} B32B ***31/00***

U.S. Cl. 156—272.4 **25 Claims**



1. A method of bonding a material structure having a first non-radio frequency active substrate material and a second non-radio frequency active substrate material, the method comprising:

depositing of at least one coating of at least one radio frequency active material on at least a portion of a surface of at least the first substrate material;

depositing a non-radio frequency active material proximate the radio frequency active material to define a cap layer;

positioning the first and second substrate materials so that the radio frequency active material is positioned between the first and second substrate materials; and

applying pressure and radio frequency energy to the first and second substrate materials to effect a strong heat seal bond between the first and second substrate materials.

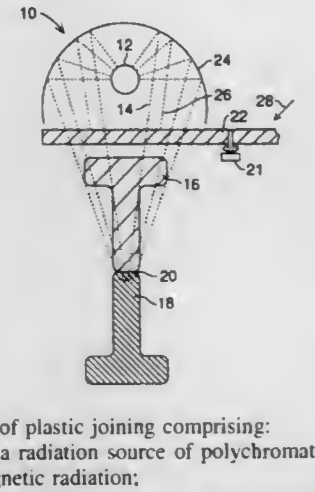
5,840,147
PLASTIC JOINING METHOD

Robert A. Grimm, Columbus, Ohio, assignor to Edison Welding Institute, Columbus, Ohio

Filed Jun. 7, 1995, Ser. No. 478,505

Int. Cl.^{6} B32B ***31/00***

U.S. Cl. 156—272.2 **20 Claims**



1. A method of plastic joining comprising:

a) providing a radiation source of polychromatic, non-coherent electromagnetic radiation;

b) providing an absorbing material that absorbs said polychromatic, non-coherent electromagnetic radiation with the generation of heat;

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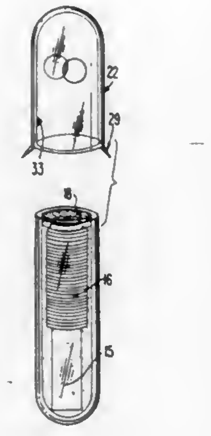
- c) providing a substantially rigid transmitting plastic that transmits said polychromatic, non-coherent electromagnetic radiation;
- d) providing a substrate;
- e) forming a bond line by placing said absorbing material in said bond line in proximity with said transmitting plastic and said substrate;
- f) filtering polychromatic, non-coherent electromagnetic radiation from said radiation source;
- g) directing said polychromatic, non-coherent electromagnetic radiation from said filtering step initially through said transmitting plastic and then to said absorbing material;
- h) absorbing said polychromatic non-coherent electromagnetic radiation with said absorbing material to produce sufficient heat in said bond line to afford intermixing of molten transmitting plastic and molten substrate; and
- i) cooling said bond line containing said absorbing material to bond said transmitting plastic and said substrate.

5,840,148
METHOD OF ASSEMBLY OF IMPLANTABLE TRANSPONDER

Neil E. Campbell, Hasbrouck Heights, N.J., and Donald J. Urbas, Evergreen, Colo., assignors to Bio Medic Data Systems, Inc., Seaford, Del.

Filed Jun. 30, 1995, Ser. No. 497,480
Int. Cl.^{6} B29C *69/02;* B32B *31/06;7/00*
U.S. Cl. 156—275.5 10 Claims



1. A method of producing an identification marker formed from a vial, the method comprising the steps of:

providing a vial having an open end and having an outer wall and an inner wall;

partially filling the vial with a predetermined volume of curable material in a liquid state;

inserting an electronic transponder into the vial containing the curable material, wherein the insertion of the electronic transponder results in the curable material completely enveloping the transponder;

affixing a cap over the open end of the vial;

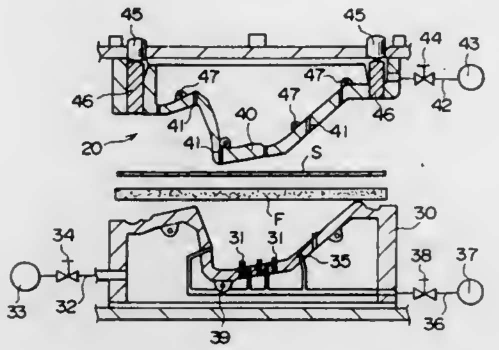
curing the curable material; and

assuring that the curable liquid material sufficiently fills the vial so that when the electronic transponder is inserted into the vial, the curable liquid material overflows the open end and covers, at least in part, the outer wall of the vial at the open end so that curing causes the curable liquid material disposed between the cap and the outer wall of the vial to bond the cap to the vial.

5,840,149
MOLDING METHOD FOR LAMINATED BODY USING COOLING AIR

Kazuhiro Tokunaga; Takashi Tsubosaki; Shoichi Itoh, and Hisashi Yamada, all of Kanagawa-ken, Japan, assignors to Kasai Kogyo Co., Ltd., Kanagawa-ken, Japan

Continuation of Ser. No. 245,114, May 17, 1994, abandoned. This application Aug. 20, 1996, Ser. No. 699,853
Claims priority, application Japan, May 21, 1993, 5-120022; Jul. 5, 1993, 5-165767
Int. Cl.^{6} B29C *51/10*
U.S. Cl. 156—285 9 Claims



1. A method of forming a laminated molded body comprising a laminated body of a sound insulation material made of a thermoplastic resin sheet and a sound absorbing material made of a thermal-molding felt, the method comprising the steps of:

softening the thermal-molding felt and the thermoplastic resin sheet by heating;

positioning the softened thermal-molding felt and the thermoplastic resin sheet on a cold-pressing-molding lower mold, wherein the thermal-molding felt and the thermoplastic resin sheet extend at least to about an outer periphery of the lower mold;

lowering a cold-pressing-molding upper mold onto said lower mold;

pressing and integrally molding the softened thermoplastic resin sheet and the thermal-molding felt while maintaining a predetermined clearance between the upper mold and the lower mold;

sealing the thermal-molding felt and the thermoplastic resin sheet at about the outer periphery of the lower mold during the molding step; and

supplying cooling air into the thermal-molding felt through pressure air holes provided on a first mold face in one of the lower and upper molds during molding step, the first mold face contacting the thermal-molding felt during the molding step, and penetrating the cooling air into and through the thermal-molding felt to the thermoplastic resin sheet to force the thermoplastic resin sheet against a second mold face of the other of the lower and upper molds to more precisely mold the thermoplastic resin sheet against the second mold face.

5,840,150
GLUE APPLICATOR FOR USE IN PAPER CORE MANUFACTURE

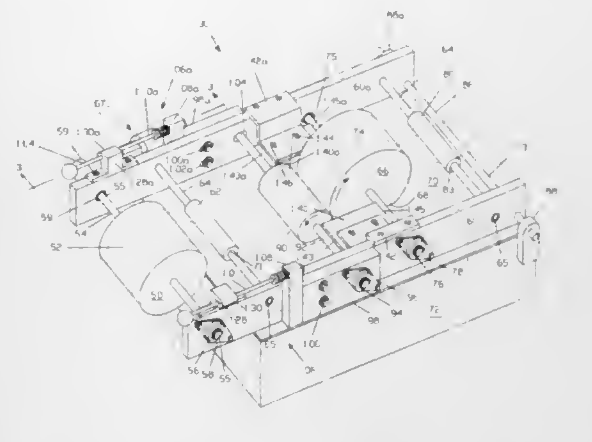
Billy E. Brown, P.O. Box 879, Hwy. 280 By-Pass West, Alexander City, Ala. 35010

Filed Jan. 11, 1996, Ser. No. 585,043
Int. Cl.^{6} B32B *31/00*
U.S. Cl. 156—324 18 Claims

1. A glue applicator for applying a continuous layer of glue to a paper web pulled through the glue applicator by a paper core manufacturing facility comprising:

a horizontally extending, elongated frame having opposed sides,

a liquid glue reservoir positioned below said frame for containing liquid glue,



a rotatable glue applicator roller supported by said frame, with a lower periphery of said glue applicator roller immersed in said liquid glue and an upper periphery of said glue applicator roller being in contact with said paper web so as to apply said continuous layer of glue directly to said paper web as said paper web moves over said glue applicator roller,

a rotatable doctor roller adjustably mounted to said frame adjacent said glue applicator roller so that a gap between said doctor roller and said glue applicator roller is adjustable for metering thickness of said continuous layer of glue,

a rotatable drive roller supported by said frame, and coupled to rotate said glue applicator roller and said doctor roller as said paper web moves thereover,

a wiper positioned at each end of said glue applicator roller and said doctor roller, each said wiper further positioned between said glue applicator roller and said doctor roller and having a single wiping edge common to ends of said glue applicator roller and said doctor roller so that each said single wiping edge removes excess glue from a respective end of said doctor roll and said glue applicator roll,

whereby said paper web moving across said drive roller powers rotation of said glue applicator roller and said doctor roller so that said periphery of said glue applicator roller moves at approximately the same speed as said paper web, with said doctor roller being rotatable powered by said drive roller to meter thickness of said continuous layer of glue applied to said paper web.

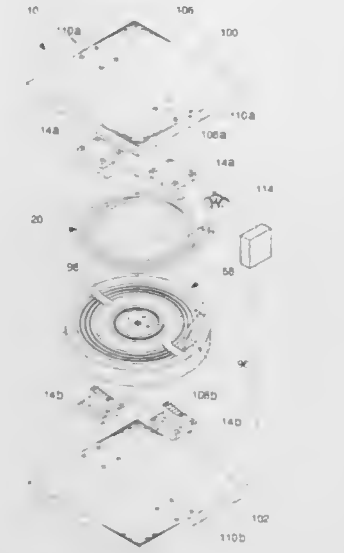
5,840,151
APPARATUS AND DIES FOR FORMING PEELABLE TUBE ASSEMBLIES

John M. Munsch, Libertyville, Ill., assignor to Baxter International Inc., Deerfield, Ill.

Continuation-in-part of Ser. No. 694,799, Aug. 9, 1996, abandoned, which is a continuation of Ser. No. 299,534, Sep. 1, 1994, abandoned, which is a division of Ser. No. 299,800, Sep. 1, 1994, Pat. No. 5,466,322, which is a continuation of Ser. No. 13,447, Feb. 4, 1993, abandoned. This application Nov. 13, 1996, Ser. No. 747,776
Int. Cl.^{6} B29C *65/00;65/04*
U.S. Cl. 156—380.2 7 Claims

1. In an apparatus for forming tube assemblies of plastic tubular members which can be peeled to separate the tubular members from one another, a set of radio frequency dies placed about the tubular members to connect spaced portions of adjacent tubular members together, the die set comprising:

a pair of dies having respective leading surfaces which can be moved between a tube-receiving first position and an operative second position wherein in the first position the die surfaces are spaced at a first predetermined distance from each other and in the second position they are spaced at a second predetermined distance less than the first distance for forming the tube assembly, the dies being formed from an RF energy conducting material;



a plurality of cooperating grooves formed in the leading surfaces of the dies with grooves of the dies aligned with each other to cooperate to define die bores in the operative position, the die bores being sized to engage and radially compress the tubular members without occluding the flow passages of the tubes; and

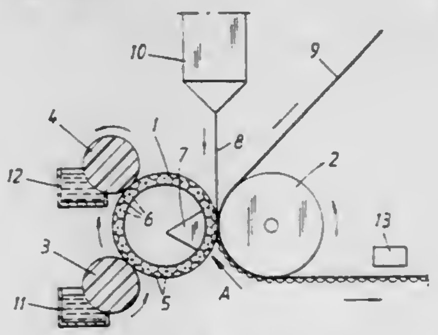
a land between pairs of adjacent grooves of the leading surfaces of the dies with corresponding lands on the die surfaces facing each other to define flow chambers for portions of the tubular members near the flow chambers which are plasticized upon application of RF energy to the dies for forming connecting webs of plastic between adjacent tubular members in the flow chambers when the dies are in their operative position.

5,840,152
APPARATUS FOR JOINING TOGETHER TWO WEBS OF MATERIAL

Thomas Billgren, Kullavik, Sweden; Maurice Leclercq, Drucat, and Francis Robert, Neufmoulin, both of France, assignors to Molnlycke AB, Gothenburg, Sweden

PCT No. PCT/SE95/01456, § 371 Date Jun. 11, 1997, § 102(e) Date Jun. 11, 1997, PCT Pub. No. WO96/18502, PCT Pub. Date Jun. 20, 1996

PCT Filed Dec. 5, 1995, Ser. No. 849,669
Claims priority, application Sweden, Dec. 13, 1994, 9404351
Int. Cl.^{6} B32B *31/30*
U.S. Cl. 156—498 8 Claims



1. Apparatus for joining a first web (8) consisting of plastic material to a second web (9) consisting of absorbent material, wherein the apparatus includes a cooling-roll (1), a counter-roll (2), and means for feeding the first and the second webs through a nip defined between the cooling-roll and the counter-roll, said webs being pressed together in said nip, and wherein the plastic material in the first web (8) is in a plastic state when entering the nip, wherein a pattern of molds (5) having air-permeable bottoms is arranged over at least a part of a mantle surface of the cooling-roll

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(1); a vacuum box (7) is disposed inwardly of the mantle in the region of abutment of the first web (8) with the cooling-roll; and the apparatus also includes cooling devices for cooling the mantle from outside said cooling roll.

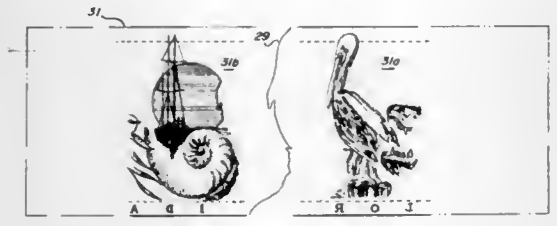
5,840,153
TRANSFER SHEET ASSEMBLY FOR WRAP AROUND DESIGN AND METHOD FOR MAKING AND USING

Robert Sieber, 11 Gray Road Box 2249, Braubridge, Ontario, Canada

Division of Ser. No. 019,461, Feb. 18, 1993, Pat. No. 5,324,378. This application Jun. 27, 1994, Ser. No. 266,938

Int. Cl.⁶ B32B *31/00*

U.S. Cl. 156—542 5 Claims



1. A transfer sheet means for transferring a wrap-around pictorial design representation to the surface of fabric materials comprising:

(a) a first transfer sheet having a first portion of a pictorial design pattern arranged upon its surface for transfer to a fabric surface,

(b) a second transfer sheet having a second matching portion of said pictorial design pattern arranged upon its surface for transfer to the same fabric surface,

(c) the matching edges of the first and second pictorial design patterns being arranged to abut along a design intersection having a minimum of straight sections and designed to pass along a plurality of peripheral paths closely corresponding to elements of the pictorial design representation, and,

(d) at least one partially transparent flap extending from the edge of the pictorial design representation, said flap having sufficient thickness to serve as a heat shield when extending over an already applied pictorial representation on fabric and prevent heat damage to said representation while applying heat to the matching pictorial pattern.

5,840,154
METHOD AND DEVICE FOR JOINING A SEALING FOIL WITH A WEB OF MATERIAL

Klaus Wittmaier, Valhingen/Enz, Germany, assignor to Schober GmbH Werkzeug- und Maschinenbau, Eberdingen/Hochdorf, Germany

Filed Mar. 28, 1996, Ser. No. 623,554

Claims priority, application Germany, Mar. 30, 1995, 195 11 698.4

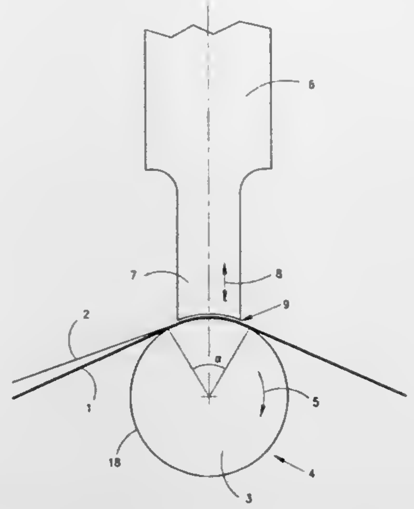
Int. Cl.⁶ B29C *65/08*

U.S. Cl. 156—580.2 16 Claims

1. A device for joining a sealing foil to a web of material, comprising:

a rotating cylindrical support body defining a cylindrical smooth surface; and

an ultrasonic unit having a sonotrode tip, the shape of which is concave and matches the shape of said cylindrical surface such that the tip surface is smooth and defines an axis coaxial with the axis of said support body, wherein said support body and said ultrasonic unit define a sealing gap for passage of the sealing foil and web of material, and wherein the sealing foil and web of material are brought together in said sealing gap during their passage therethrough and rest against said surface, wherein the height defined by said sealing gap along the width and circumference of said sealing gap is constant.



5,840,155
BLOWER ARRANGEMENT FOR DETACHING A METALLIZED BELT FROM A SHEET AND FOR PROVIDING A BRAKING FORCE ON A SHEET IN A PLATEN PRESS

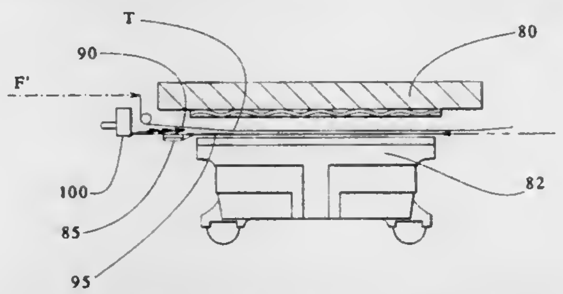
Jean-Claude Rebeaud, Le Mont-Sur-Lausanne, Switzerland, assignor to Bobst SA, Lausanne, Switzerland

Filed Apr. 26, 1996, Ser. No. 638,179

Claims priority, application Switzerland, Apr. 28, 1995, 01226/95

Int. Cl.⁶ B32B *31/00*

U.S. Cl. 156—584 5 Claims



1. A blower arrangement for detaching a metallized belt from a sheet and for creating a braking force on the sheet in a platen press, which comprises an upper fixed supporting platen and a lower mobile supporting platen, between which platens the sheet is transported in order to receive a printing according to a given pattern from a metallized film coming from the metallized belt conducted between the sheet and one of the platens of the platen press, said arrangement comprising a bar arranged next to the exit of the press, said bar being provided with a series of nozzles with each nozzle being sealed by control means, each nozzle having the shape of a flattened parallelepiped to create a plane of jets coming from said nozzles being directed approximately horizontally between the metallized belt and the sheet, said control means for each nozzle being a valve member that is translationally mobile in an axial direction between an open position and a closed position to a duct for supplying pressurized air to the nozzle, said valve member having a communication passage aligned with the duct when in the open position, each valve member having a periphery with two spaced indexing recesses, and flexible biasing means for retaining the valve in one of the open and closed positions by moving into one of the two spaced indexing recesses.

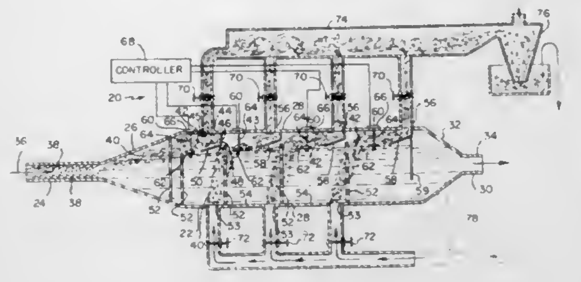
5,840,156
FROTH FLOTATION PROCESS FOR DEINKING WASTEPAPER USING MULTIFLOW PRESSURIZED DEINKING MODULE

Richard P. Hebert, Cherry Valley, and David B. Grimes, Greenfield, both of Mass., assignors to Beloit Technologies, Inc., Wilmington, Del.

Filed Apr. 14, 1997, Ser. No. 834,606

Int. Cl.⁶ D21C *5/02*

U.S. Cl. 162—4 20 Claims



1. In a froth floatation process for separating ink particles from a fibrous pulp stock, wherein gas is dispersed in the stock to generate bubbles which rise through the stock and form a surface foam containing a higher concentration of said ink particles, the improvement comprising:

providing an enclosed vessel having a bottom, a top, a stock inlet, a stock outlet and said vessel having a plurality of foam outlets communicating with the top of the vessel;

feeding a stock of paper pulp containing ink particles through the enclosed vessel from the stock inlet to the stock outlet;

mixing air with the stock and injecting the air at a plurality of air injection locations within the vessel to generate a foam;

allowing the foam to float to the top of the vessel to form a surface foam;

removing the surface foam at the plurality of foam outlets, each outlet being spaced along the top of the vessel, and spaced downstream towards the stock outlet from at least one of said plurality of air injection locations;

measuring the location of an interface between the stock and the surface foam at a plurality of locations between the stock inlet and the stock outlet;

and controlling the flow of stock through the vessel and the injection of air and removal of surface foam so that each measured interface between the surface foam and the stock is maintained spaced from the top of the vessel.

5,840,157
DEINKING AGENT AND METHOD OF DEINKING THROUGH FLOTATION USING THE DEINKING AGENT

Masaaki Hagiwara, and Yoshie Hirakouchi, both of Tokyo, Japan, assignors to Lion Corporation, Tokyo, Japan

PCT No. PCT/JP94/00200, § 371 Date Jul. 22, 1994, § 102(e) Date Jul. 22, 1994, PCT Pub. No. WO94/19532, PCT Pub. Date Sep. 1, 1994

PCT Filed Feb. 10, 1994, Ser. No. 256,773

Claims priority, application Japan, Feb. 26, 1993, 5-038430

Int. Cl.⁶ D21C *5/02*

U.S. Cl. 162—5 15 Claims

1. A deinking agent comprising a compound represented by the following general formula I:

$$R^1O-(PO)m-(EO)m-(XO)k-R^2 \quad (I)$$

wherein R^1 represents an alkyl or alkenyl group having 12 to 22 carbon atoms; R^2 represents a hydrogen atom; PO, EO and XO represent a propylene oxide unit, an ethylene oxide unit and an alkylene oxide unit having not less than 3 cabon atoms, respectively; m=1~8; n=10~40; and k is such a number that the number of total carbon atoms present in the polymerized XO unit ranges from 3 to 120; the PO and EO in Formula I being added through block-addition.

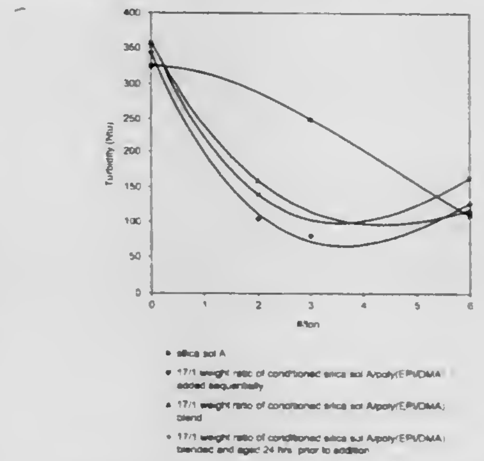
5,840,158
COLLOIDAL SILICA/POLYELECTROLYTE BLENDS FOR PULP AND PAPER APPLICATIONS

Pek Lee Choo; Bruce A. Keiser, both of Naperville; Michio Kobayashi, Aurora; Maureen B. Nunn, Naperville; David A. Picco, Shorewood, and Kristine S. Salmen, Naperville, all of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Continuation-in-part of Ser. No. 535,430, Sep. 28, 1995, Ser. No. 613,791, Nov. 26, 1995, Pat. No. 5,620,629, and Ser. No. 701,224, Aug. 21, 1996, Pat. No. 5,667,697. This application Apr. 7, 1997, Ser. No. 834,915

Int. Cl.⁶ D21H *21/10*

U.S. Cl. 162—164.3 5 Claims



1. A method for the manufacture of paper comprising the steps of:

a) forming an aqueous cellulosic papermaking slurry;

b) adding an effective coagulating amount of a coagulant and a flocculant to said cellulosic papermaking slurry, wherein said coagulant is prepared by blending

i) an effective coagulating amount of an aqueous conditioned colloidal silica sol with an average particle size within the range of from 1 to 150 nm and wherein the aqueous colloidal silica sol is conditioned by contacting said sol with a strong acid cation exchange resin, and

ii) an effective coagulating amount of a cationically-charged water-soluble polymeric coagulant selected from the group consisting of poly(diallyldimethylammonium chloride), poly(diallyldimethylammonium chloride/acrylic acid), poly(diallydimethylammonium chloride/acrylamide), poly(epichlorohydrin/dimethylamine), poly(epichlorohydrin/dimethylamine/ammonium), poly-(ethyleneimine) and cationized starch;

c) draining said cellulosic suspension to form a sheet; and,

d) drying said sheet.

5,840,159
MARINE EVAPORATOR FOR FRESH WATER PRODUCTION

Axel E. Rosenblad, 77 Bayside Dr., Atlantic Highlands, N.J. 07716

Filed Sep. 30, 1996, Ser. No. 724,603

Int. Cl.⁶ B01D *3/00*

U.S. Cl. 203—10 19 Claims

1. A dissolved-solids-bearing water evaporator for producing fresh water by evaporation of dissolved solids-bearing water and condensation of vapor generated by such evaporation to produce a stream of fresh water, comprising, in combination: a housing

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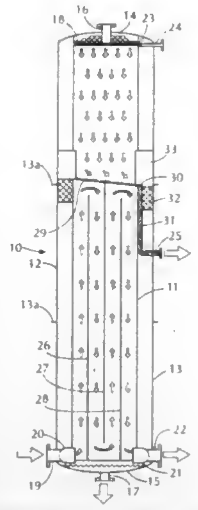


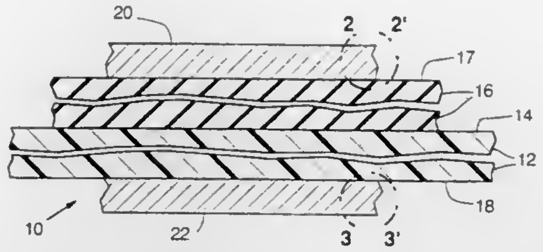
having a dissolved-solids-bearing water inlet and a dissolved-solids-bearing water outlet; a plurality of plate heat exchange elements within the housing, each plate element having a lower internal space, means for introducing a heating medium into the lower internal space and means for discharging the heating medium from the lower internal space, means for introducing vapor derived from the evaporation of dissolved-solids-bearing water within the housing into an upper internal space and means for discharging fresh water from within the upper internal space, said upper and lower internal spaces being separated by a transverse partition; and entrainment separator means for preventing water entrained by vapor derived from the evaporation of dissolved-solids-bearing water from entering the upper internal space.

5,840,160
SEPARATION OF 3-CARENE FROM LIMONENE BY EXTRACTIVE DISTILLATION
Lloyd Berg, 1314 South Third Ave., Bozeman, Mont. 59715
Filed Dec. 6, 1996, Ser. No. 761,291
Int. Cl.^{6} B01D *3/40;* C07C *7/08*
U.S. Cl. 203—57 **1 Claim**

1. A method for recovering 3-carene from a mixture of 3-carene and limonene which consists essentially of distilling a mixture of 3-carene and limonene in the presence of an extractive distillation agent, recovering the 3-carene as overhead product and obtaining the limonene and the extractive distillation agent as bottoms product, wherein said extractive distillation agent consists of one material selected from the group consisting of phenol, o-cresol, m-cresol, p-cresol, 3-ethyl phenol, 2,6-dimethyl phenol, tetra ethyl ortho silicate, 1-octanol, sec. phenyl alcohol, acetophenone, 2,6-dimethyl-4-heptanone, propiophenone, diethylene glycol methyl ether, diethylene glycol butyl ether, triethylene glycol, polyethylene glycol 300, polyethylene glycol 400, benzyl ether, 1,2-Methylene dioxybenzene, phenyl ether, 1,2-diamino cyclohexane, methyl n-amyl ketoxime, adiponitrile, 1,1,3,3-tetramethyl urea, nitrobenzene, 2-nitrotoluene, 3-nitrotoluene and triacetin.

5,840,161
DOUBLE-SIDED REFLECTOR FILMS
F. Eugene Woodard, Los Altos; Thomas Pass, Sunnyvale, and Ted L. Larsen, Palo Alto, all of Calif., assignors to Southwall Technologies Inc., Palo Alto, Calif.
Continuation of Ser. No. 303,342, Sep. 9, 1994, abandoned. This application Nov. 1, 1996, Ser. No. 743,418
Int. Cl.^{6} C23C *14/34*
U.S. Cl. 204—192.14 **28 Claims**

1. A method for producing a reflector composite film made up of plastic film having a slip side and a nonslip side each side carrying a metal-containing reflector layer, comprising

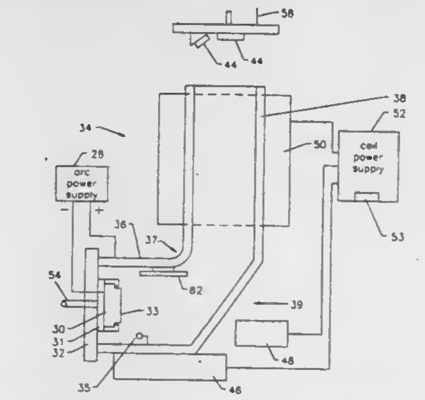


a. preglowing the nonslip side of the plastic film thereby forming a preglowed plastic film having a preglowed nonslip side and a nonpreglowed slip side
b. sputter-depositing a nonslip side reflector layer on the preglowed nonslip side of the preglowed plastic film thereby forming a reflector-layer carrying plastic film having a nonpreglowed slip side and
c. sputter-depositing a slip side reflector layer on the nonpreglowed slip side of the reflector-layer carrying plastic film.

5,840,162

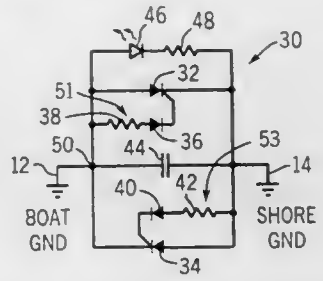
Patent Not Issued For This Number

5,840,163
RECTANGULAR VACUUM-ARC PLASMA SOURCE
Richard P. Welty, Boulder, Colo., assignor to Vapor Technologies, Inc., Boulder, Colo.
Continuation of Ser. No. 233,006, Apr. 25, 1994, Pat. No. 5,480,527. This application Dec. 22, 1995, Ser. No. 577,810
Int. Cl.^{6} C23C *14/32*
U.S. Cl. 204—192.38 **30 Claims**



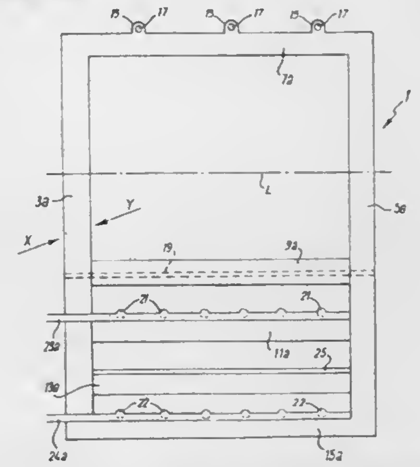
1. An apparatus for a vacuum arc discharge, said apparatus comprising:
(a) a cathode composed at least in part of a material to be evaporated, said cathode having an evaporable surface of substantially rectangular shape,
(b) sensing means operatively connected at or near each of a pair of opposite ends along a length of said evaporable surface for sensing when an arc spot approaches either of said opposite ends, said sensing means capable of generating a signal when the arc spot approaches either of said opposite ends,
(c) magnetic field establishing means for establishing over said evaporable surface a magnetic field, said magnetic field being represented by magnetic flux lines, said magnetic field establishing means being independent of an electrical current flowing through said cathode, and said flux lines having a predominant component which is substantially parallel to said evaporable surface and substantially perpendicular to the length thereof, and
(d) magnetic field reversing means for reversing the direction of said magnetic flux lines responsive to said signal from said sensing means without substantially changing the shape of said predominant component thereof or its orientation with respect to said evaporable surface.

5,840,164
GALVANIC ISOLATOR
Richard E. Staerzl, Fond du Lac, Wis., assignor to Brunswick Corporation, Lake Forest, Ill.
Filed Nov. 12, 1996, Ser. No. 747,259
Int. Cl.^{6} C23F *13/00*
U.S. Cl. 204—196 **21 Claims**



1. A galvanic isolator for protecting a submersible metal marine propulsion unit from corrosion, the galvanic isolator comprising:
a first element comprising a blocking element electrically connected between a boat ground and a shore ground, the blocking element being operable between an open state and a closed state and preventing the flow of current between shore ground and boat ground in the open state and allowing the flow of current between shore ground and boat ground in the closed state; and
a second element comprising a trigger element electrically connected to the blocking element to selectively close the blocking element when the voltage difference between the shore ground and the boat ground exceeds a threshold value, said trigger element responding to said voltage difference between the shore ground and the boat ground without an active circuit powered by an external power supply.

5,840,165
ELECTROLYTIC TREATMENT OF MATERIAL
Bernard Turner, Preston, United Kingdom, assignor to British Nuclear Fuels plc, United Kingdom
Division of Ser. No. 586,767, Apr. 25, 1996. This application Nov. 12, 1997, Ser. No. 968,212
Claims priority, application United Kingdom, Jun. 2, 1994, 9411063
Int. Cl.^{6} C25D *17/00*
U.S. Cl. 204—198 **8 Claims**



1. An apparatus for electrolytically treating electrically conducting material by placing material to be treated in an aqueous oxidizing electrolyte, passing an electric current through said electrolyte and said material to be treated and sparging said electrolyte with gas, the apparatus comprising:
a) an electrically conducting frame in which is received an insulating liner for insertion in the electrolyte, said liner including a perforated base for permitting entry of the electrolyte:
b) a plurality of pipes extending beneath said perforated base of said insulating liner, said pipes each having a plurality of gas outlet holes directed towards said perforated base;
c) whereby in use of said apparatus, said material to be treated is placed within said liner in contact with said electrolyte, said conducting frame and said electrically conducting material coupled to opposite poles of a source of electric current; and
d) whereby gas is passed through said pipes to sparge said electrolyte in a region where said electrolyte is in contact with said material to be treated.

5,840,166
RARE EARTH METAL-NICKEL HYDROGEN STORAGE ALLOY, PROCESS FOR PRODUCING THE SAME, AND ANODE FOR NICKEL-HYDROGEN RECHARGEABLE BATTERY
Akihito Kaneko, Kobe, Japan, assignor to Santoku Metal Industry Co. Ltd., Hyogo-Ken, Japan
PCT No. PCT/JP96/01900, § 371 Date Mar. 7, 1997, § 102(e) Date Mar. 7, 1997, PCT Pub. No. WO97/03213, PCT Pub. Date Jan. 30, 1997
PCT Filed Jul. 9, 1996, Ser. No. 809,531
Claims priority, application Japan, Jul. 10, 1995, 7-195722; Jul. 10, 1995, 7-195723; Jul. 10, 1995, 7-195724
Int. Cl.^{6} H01M *4/02*
U.S. Cl. 204—293 **9 Claims**

1. A rare earth metal-nickel hydrogen storage alloy consisting essentially of the formula (1) $(R_{1-x}L_x)(Ni_{1-y}M_y)_z$ . . . (1) wherein R stands for La, Ce, Pr, Nd, or mixtures thereof, L stands for Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Y, Sc, Mg, Ca, or mixtures thereof, M stands for Co, Al, Mn, Fe, Cu, Zr, Ti, Mo, Si, V, Cr, Nb, Hf, Ta, W, B, C, or mixtures thereof, x, y and z satisfy the formulae of $0.05 \leqq x \leqq 0.4$, $0 \leqq y \leqq 0.5$, and $3.0 < z \leqq 4.5$, respectively, said alloy including in an amount of not less than 30 volume % and less than 95 volume % thereof crystals each containing not less than 5 and less than 25 antiphase boundaries extending perpendicular to C-axis of a crystal grain of the alloy per 20 nm along the C-axis, not less than 60% and less than 95% of added amount of said element represented by L in the formula (1) being arranged in antiphase areas.

5,840,167
SPUTTERING DEPOSITION APPARATUS AND METHOD UTILIZING CHARGED PARTICLES
Byeong-Chan Kim, Kyungki-do, Rep. of Korea, assignor to LG Semicon Co., Ltd, Chungcheongbuk-Do, Rep. of Korea
Filed Aug. 14, 1995, Ser. No. 514,832
Int. Cl.^{6} C23C *14/34*
U.S. Cl. 204—298.05 **13 Claims**

1. A sputtering deposition apparatus comprising:

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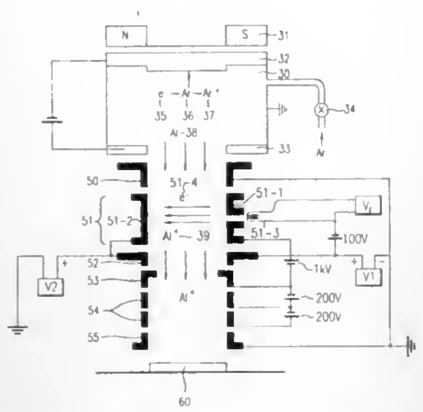
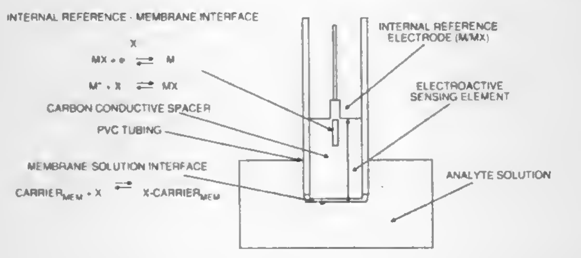


- sputtering means for sputtering a deposition material from a target, the sputtered deposition material being directed in a uniform direction substantially perpendicular to a substrate;
- ionizing means for ionizing the sputtered deposition material directed in the uniform direction by colliding the sputtered deposition material with electrons;
- electromagnetic field intercepting means for intercepting an electromagnetic field between the sputtering means and the ionizing means and for providing neutral deposition material from the sputtering means to the ionizing means, the electromagnetic field intercepting means being electrically grounded;
- accelerating means for accelerating the deposition material ionized by the ionizing means;
- extracting means for extracting a positively ionized deposition material from the accelerated deposition material, the extracting means having a potential difference from the accelerating means; and
- decelerating means for decelerating the ionized deposition material extracted by the extracting means and for depositing the deposition material thus decelerated onto a wafer.

5,840,168
SOLID CONTACT ION-SELECTIVE ELECTRODE

Nikolas A. Chaniotakis, Iraklion, Greece, and Steven J. West, Hull, Mass., assignors to Orion Research, Inc., Beverly, Mass.

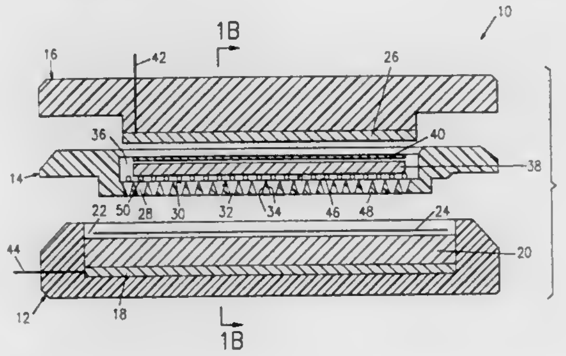
Filed Jun. 16, 1995, Ser. No. 490,935
Int. Cl.^{6} G01N *27/20*
U.S. Cl. 204—416 7 Claims


INTERNAL REFERENCE - MEMBRANE INTERFACE
X
MX + e ⇌ M
M+ + X ⇌ MX
CARBON CONDUCTIVE SPACER
PVC TUBING
MEMBRANE SOLUTION INTERFACE
CARRIER_MEM + X ⇌ X-CARRIER_MEM
INTERNAL REFERENCE ELECTRODE (M/MX)
ELECTROACTIVE SENSING ELEMENT
ANALYTE SOLUTION

1. A solid contact ion-selective electrode comprising a substrate comprising a conductive and porous carbon matrix, wherein the interfacial potential of said electrode is fixed by the presence of a metal M and metal salt MX in said substrate, and wherein the presence of an aqueous layer is substantially eliminated, so that the electrode contains essentially no aqueous solution or air bubbles.

5,840,169
APPARATUS AND PROCESS FOR ELECTROELUTION OF A GEL CONTAINING CHARGED MACROMOLECULES

Peter Andersen, Lystrupvej 7, DK-2700 Bronshoj, Denmark
PCT No. PCT/DK92/00058, § 371 Date Mar. 13, 1995, § 102(e) Date Mar. 13, 1995, PCT Pub. No. WO93/16788, PCT Pub. Date Sep. 2, 1993
PCT Filed Feb. 25, 1992, Ser. No. 290,993
The portion of the term of this patent subsequent to Aug. 13, 2011, has been disclaimed.
Int. Cl.^{6} G01N *27/26*
U.S. Cl. 204—462 53 Claims



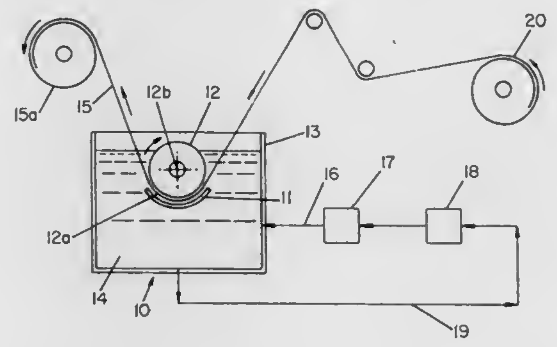
32. An electroelution apparatus for eluting charged macromolecules in a gel comprising:

(a) a base including a sponge covered by a semipermeable membrane;
(b) a frame containing multiple parallel chambers, wherein each chamber has a bottom; and
(c) side vents in the frame to harvest the isolated compounds without disassembling the apparatus.

5,840,170
METHOD FOR INHIBITING THE ELECTRODEPOSITION OF ORGANIC PARTICULATE MATTER ON COPPER FOIL

Albert E. Nagy, Mentor-on-the-Lake, Ohio, assignor to Gould Electronics Inc., Eastlake, Ohio

Filed Nov. 30, 1992, Ser. No. 982,999
Int. Cl.^{6} C25D *5/34;3/38*
U.S. Cl. 205—101 9 Claims

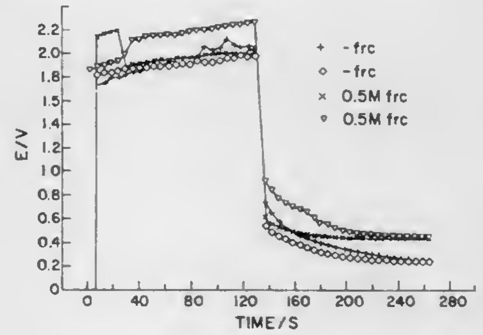


1. A process for electrolytic treatment of copper foil, comprising the steps of;

(A) applying a voltage across an anode and cathode, wherein the anode and cathode are in contact with an electroplating composition containing a gelatin component;
(B) removing organic particulate matter by contacting the electroplating composition containing the organic particulate matter with a macroreticular resin; and
(C) electrolytically treating said copper foil.

5,840,171
ELECTROCHEMICAL REACTIONS

Brian Jeffrey Birch, Northants, and Nicholas Andrew Morris, Bedford, both of Great Britain, assignors to Unilever Patent Holdings BV, Vlaardingen, Netherlands
PCT No. PCT/GB93/02615, § 371 Date Nov. 3, 1995, § 102(e) Date Nov. 3, 1995, PCT Pub. No. WO94/15207, PCT Pub. Date Jul. 7, 1994
PCT Filed Dec. 21, 1993, Ser. No. 464,715
Claims priority, application United Kingdom, Dec. 23, 1992, 9226840
Int. Cl.^{6} C25B *15/02;1/24;1/16;* C25C *1/00*
U.S. Cl. 205—335 25 Claims

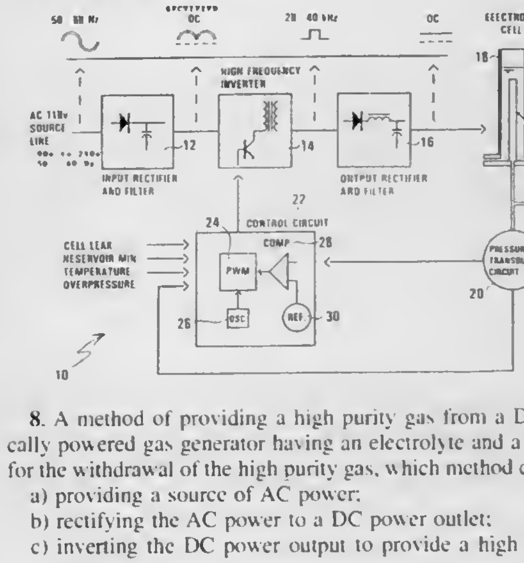


1. An electrochemical process for generating a controlled amount of a reagent electrochemically which comprises providing an electrode in electrical contact with a solution of an electrochemically inert salt, wherein the solution comprises a thin layer thereof of thickness less than 1 mm, creating an electric potential at the electrode for a sufficient time to generate by electrochemical process between the electrode and a component of the solution a controlled amount of the reagent in a localized region of the thin layer adjacent the electrode, and monitoring the presence and amount of the reagent in the localized region, said reagent being generated at known time in a flowing solution and being monitored on arrival at a downstream detector to provide a measure of the rate of flow of the solution.

5,840,172
DIRECT CURRENT HYDROGEN GENERATOR, SYSTEM AND METHOD

George Zugravu, Methuen, Mass., assignor to Whatman Inc., Haverhill, Mass.

Filed Mar. 25, 1997, Ser. No. 823,987
Int. Cl.^{6} C25B *15/00;1/02*
U.S. Cl. 205—639 10 Claims



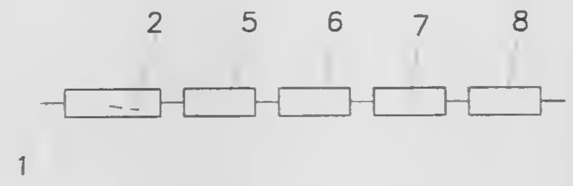
8. A method of providing a high purity gas from a DC electrically powered gas generator having an electrolyte and a gas outlet for the withdrawal of the high purity gas, which method comprises:

a) providing a source of AC power;
b) rectifying the AC power to a DC power outlet;
c) inverting the DC power output to provide a high frequency DC power output;
d) monitoring the gas outlet for gas pressure or gas flow and producing a voltage signal responsive to such gas pressure or gas flow;
e) comparing the voltage signal to a reference signal to produce a voltage control signal;
f) generating a pulse width modulation signal from a pulse width modulator and modifying the pulse width solely in response to the voltage control signal to provide a PWM output signal;
g) modifying the high frequency DC power output by the PWM output signal to provide a high frequency PWM power output;
h) rectifying the PWM power output to provide a flat, continuous DC power output; and
i) providing the flat, continuous DC power output to the gas generator.

5,840,173
PROCESS FOR TREATING THE SURFACE OF MATERIAL OF HIGH-GRADE STEEL

Ralf Waldmann, Rüscheid, Germany, assignor to Keramchemie GmbH, Siershahn, Germany

Filed Jun. 12, 1997, Ser. No. 873,482
Claims priority, application Germany, Jun. 19, 1996, 196 24 436.6; May 21, 1997, 197 21 135.6
Int. Cl.^{6} C23G *1/08;* C25F *1/06*
U.S. Cl. 205—705 15 Claims



1. A process for surface treatment of material consisting of high-grade steel, the process comprising the steps of subjecting the material to at least one spraying treatment with a pickling solution in at least one treatment vessel, wherein the pickling solution contains hydrochloric acid as a sole acid, and subsequently rinsing the material.

5,840,174
PROCESS FOR THE PURIFICATION OF GASES

Thomas Lehmann, Langenselbold; Dieter Engel, Rheinfelden, and Rainer Sanzenbacher, Gelnhausen, all of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Germany

Filed Aug. 30, 1996, Ser. No. 705,627
Claims priority, application Germany, Aug. 30, 1995, 195 31 707.6
Int. Cl.^{6} B01D *53/00*
U.S. Cl. 205—763 19 Claims

1. A process of electrolytically removing a contaminant from gas, which comprises:

- passing contaminated gas over a fixed bed electrode of an electrolysis cell having at least one fixed bed electrode;
- trickling a liquid electrolyte co- or counter-currently to said contaminated gas downward through said fixed bed electrode;
- said contaminant in said contaminated gas being at least partially soluble in said liquid electrolyte;
- said electrolysis cell having a counter-electrode and counter-electrode compartment separated from the fixed bed electrode and a corresponding electrode compartment by a separator;
- said fixed bed electrode operating as a trickle bed reactor operating in an unflooded state;
- providing electrical contact means with said fixed bed electrode;

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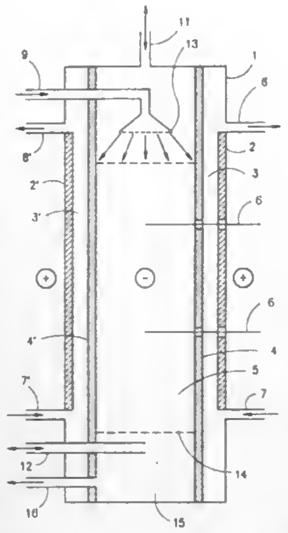


electrochemically converting contaminant in said contaminated gas which is absorbed by said electrolyte at an effective cell voltage to an oxidized or reduced compound.

5,840,175
PROCESS OILS AND MANUFACTURING PROCESS FOR SUCH USING AROMATIC ENRICHMENT WITH EXTRACTION FOLLOWED BY SINGLE STAGE HYDROFINISHING

Keith K. Aldous, Legue City; Jacob Ben Angelo, Spring, both of Tex., and Joseph Philip Boyle, Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Aug. 29, 1997, Ser. No. 920,554
Int. Cl.^{6} C10G *23/00*

U.S. Cl. 208—87 **9 Claims**

1. A method for producing a process oil comprising:

adding an aromatic extract oil to a naphthenic rich feed to provide a blended feed;

extracting the blended feed with an aromatic extraction solvent at a temperature of from about 20° C. to about 100° C. and a solvent to feed ratio of 0.5:1 to 3:1 to obtain a raffinate for hydrotreating;

hydrotreating the raffinate at a temperature of about 275° C. to about 375° C. and a hydrogen partial pressure of 300 to 2500 psia at a space velocity of about 0.1 to 1 v/v/hr.

5,840,176
REPLACEMENT OF PARTICLES IN A MOVING BED PROCESS

Roger R. Lawrence, Elmhurst; Frank T. Micklich, Joliet; Charles T. Ressl, Mount Prospect, and Paul A. Sechrist, Des Plaines, all of Ill., assignors to UOP LLC, Des Plaines, Ill.

Continuation-in-part of Ser. No. 239,002, May 6, 1994, Pat. No. 5,545,312. This application Aug. 12, 1996, Ser. No. 695,473
Int. Cl.^{6} C10G *35/10*

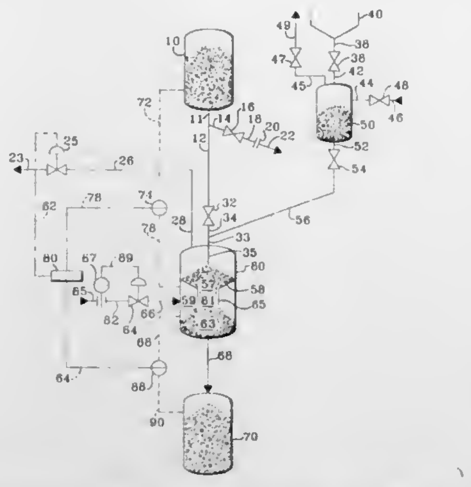
U.S. Cl. 208—152 **18 Claims**

1. A method for the replacement of particles in a process, said method comprising:

(a) withdrawing a first stream comprising particles from a first zone and rejecting said first stream from said process;

(b) introducing a second stream comprising particles and a first component to a second zone, and passing particles through said second zone;

(c) passing a third stream comprising a second component to said second zone at a rate that is sufficient to purge said first component from the total void volume in said second zone;



(d) withdrawing a fourth stream comprising at least a portion of said first component and a first portion of said second component from said second zone; and

(e) withdrawing a fifth stream comprising particles and a second portion of said second component from said second zone, and passing said fifth stream to a third zone containing a third component, said third zone being in uninterrupted communication with said second zone, and said fifth stream comprising sufficient second component to inhibit passing said third component from said third zone to said second zone.

5,840,177
QUATERNARY AMMONIUM HYDROXIDES AS MERCAPTAN SCAVENGERS

Jerry J. Weers, Ballwin, and David R. Gentry, St. Louis, both of Mo., assignors to Baker Hughes Incorporated, Houston, Tex.

Continuation of Ser. No. 206,137, Mar. 3, 1994, abandoned. This application Sep. 16, 1997, Ser. No. 931,675
Int. Cl.^{6} C10G *19/02*

U.S. Cl. 208—208 R **28 Claims**

1. A method for scavenging mercaptans in a hydrocarbon fluid, comprising adding to the fluid an effective mercaptan-scavenging amount of an aqueous scavenging composition comprising a quaternary ammonium hydroxide thereby to react the quaternary ammonium hydroxide with mercaptans in the fluid, the quaternary ammonium hydroxide being of the formula $R^1R^2R^3R^4NOH$, wherein

R^1 and R^2 are independently selected from the group consisting of alkyl groups of from one to about eighteen carbon atoms, aryl groups of from six to about eighteen carbon atoms and alkylaryl groups of from seven to about eighteen carbon atoms, and R^3 is selected from the group consisting of alkyl groups of from two to about eighteen carbon atoms, aryl groups of from six to about eighteen carbon atoms and alkylaryl groups of from seven to about eighteen carbon atoms, provided, however, that R^2 and R^3 may be joined to form a heterocyclic ring including the N and optionally an oxygen atom, and

R^4 is selected from the group consisting of $—(CH_2CH_2O)_nH$, wherein n is an integer from one to about eighteen,

$$—(CH_2\underset{\displaystyle CH_3}{\underset{|}{C}}HO)_m(CH_2CH_2O)_pH,$$

wherein m and p are independently selected from integers from zero to about eighteen, except that the sum m+p is at most about eighteen, and $—CHR^5CHR^6Y$, wherein R^5 and R^6 are independently selected from the group consisting of hydrogen, alkyl groups of from one to about eighteen carbon atoms, aryl groups of from six to about eighteen carbon atoms and alkylaryl groups of from seven to about eighteen carbon atoms, and Y is a non-acidic group selected from the group consisting of —OH, —SR^7 and —NR^7R^8, wherein R^7 and R^8 are independently selected from the group consisting of hydrogen, alkyl groups of from one to about eighteen carbon atoms, aryl groups of from six to about eighteen carbon atoms and alkylaryl groups of-from seven to about eighteen carbon atoms.

5,840,178
HEAVY FEED UPGRADING AND USE THEREOF IN CAT CRACKING

Jean C. Huang; Belinda G. Lambeth, both of Baton Rouge, La.; Patrick H. Terry, Middletown, and Daniel P. Leta, Flemington, both of N.Y., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Jun. 19, 1996, Ser. No. 666,168
Int. Cl.^{6} C10G *17/00;29/04*

U.S. Cl. 208—251 R **9 Claims**

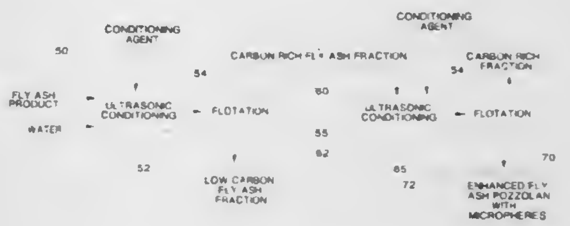
1. A process for upgrading a feed containing metal and coke precursors which consists essentially of contacting said feed in the absence of added hydrogen with an effective amount of feed soluble metal alkoxide containing at least one metal selected from the group consisting essentially of Al, Si, Ti, Zr and rare earth metal at a temperature and for a time sufficient to decompose said alkoxide and precipitate at least a portion of said metal and coke precursors from said feed, thereby effectively removing said metal and precursors from said feed and forming an upgraded feed.

5,840,179
ULTRASONIC CONDITIONING AND WET SCUBBING OF FLY ASH

Rafic Y. Minkara, Kennesaw, and Jerry L. Heavilon, Marietta, both of Ga., assignors to JTM Industries, Inc., Kennesaw, Ga.

Filed Mar. 17, 1998, Ser. No. 40,515
Int. Cl.^{6} B03D *1/02;* B03B *1/00;* B02C *19/18*

U.S. Cl. 209—166 **7 Claims**



1. The process of conditioning a fly ash product, which product contains agglomerations of fly ash particles, and contains matrices of carbon having entrapped fly ash microspheres therein, to form an enhanced pozzolan fraction of fly ash particles with microspheres and with reduced carbon content, and to form a carbon rich fraction, comprising the steps of:

forming a slurry of such fly ash product and water;

treating said slurry by adding conditioning agents and applying ultrasonic energy to said slurry containing said conditioning agents to break up the agglomerations and fracture the carbon matrices and thereby release from said matrices into said slurry entrapped microspheres and reduce the mean size of the fly ash particles; and

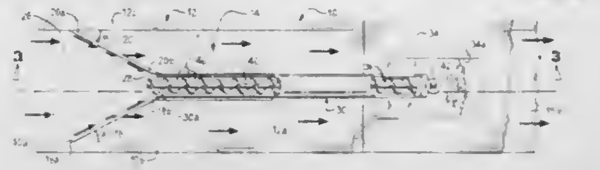
separating by flotation a carbon fraction from said ultrasonically treated slurry to form said carbon rich fraction and said enhanced pozzolan fraction.

5,840,180
WATER FLOW SEGREGATING UNIT WITH ENDLESS SCREW

Gilles Filion, Kirkland, Canada, assignor to John Meunier Inc., Montreal, Canada

Filed Jun. 2, 1997, Ser. No. 869,284
Int. Cl.^{6} E02B *5/08;* B01D *29/46;29/94;35/22*

U.S. Cl. 210—162 **3 Claims**



1. A combination of a sewer pipe waste segregating unit and sewer pipe comprising:

(a) a generally planar and vertical bar screen located within and diagonally across said sewer pipe for segregating macroparticulate contaminants in waste water flowing through the bar screen in said sewer pipe, and said bar screen comprising a plurality of parallel spaced bars each having upstream and downstream ends, and an upstream edge face, a waste outlet aperture defined at said downstream ends of the bars and at the bottom of said sewer pipe; and

(b) an elongated conveyor member, extending upwardly through the sewer pipe and therebeyond and defining a bottom end operatively connected to said bar screen waste outlet aperture and a top discharge end spaced above said sewer pipe;

wherein said conveyor member carries macroparticulate contaminants intercepted by said bar screen from said bar screen waste outlet aperture to said conveyor member top discharge end; each bar of said bar screen being formed with a longitudinal channel in said upstream edge face, each said channel having a cross-sectional area which decreases from said upstream end to said downstream end of said bar.

5,840,181
CHROMATOGRAPHIC SEPARATION OF FATTY ACIDS USING ULTRAHYDROPHOBIC SILICALITE

Robert Lyle Patton, Rolling Meadows; Beth McCulloch, Clarendon Hills, and Peter K. Nickl, Des Plaines, all of Ill., assignors to UOP LLC, Des Plaines, Ill.

Filed Oct. 14, 1997, Ser. No. 949,604
Int. Cl.^{6} B01D *15/08*

U.S. Cl. 210—198.2 **5 Claims**

1. As an article of manufacture, ultrahydrophobic monodisperse silicalite spheres of diameter between about 1 and about 20 microns having an adsorption capacity for water of no more than 1.0 weight percent at 20° C. and 4.6 mm water vapor pressure.

5,840,182
APPARATUS AND METHOD FOR BIOLOGICAL PURIFICATION OF WASTE

John A. Lucido, Mt. Sinai; Daniel Keenan, Rockville Centre; Eugene T. Premuzic, East Moriches; Mow S. Lin, Rocky Point, and Ludmila Shelenkova, Yaphank, all of N.Y., assignors to Brookhaven Science Associates LLC, Upton, N.Y.

Continuation of Ser. No. 613,125, Mar. 8, 1996, abandoned. This application Jun. 3, 1997, Ser. No. 867,946
Int. Cl.^{6} C02F *3/00*

U.S. Cl. 210—202 **7 Claims**

1. An apparatus for delivering a pre-conditioned bacterial culture to an environment containing wastes including wastes which are substrates for metabolism of the bacterial culture, the apparatus comprising:

a) a first container having a bioreactor chamber containing a bacterial culture;

b) a second container having a second chamber containing an aqueous solution containing inorganic nutrients;

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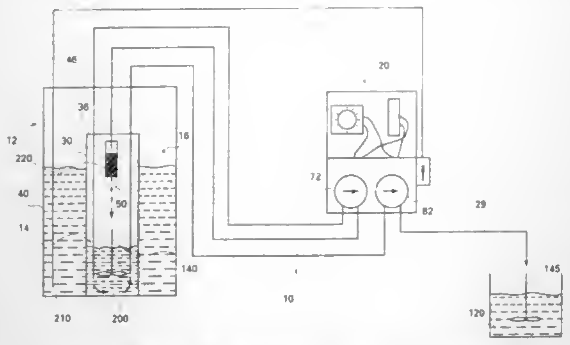


- c) a third container having a third chamber containing a supply of organic nutrients which are soluble in an aqueous solution, the third chamber being operably connected in one-way fluid communication between the bioreactor chamber and the second chamber;
- d) a controller comprising:
  - i) means for introducing a predetermined supply of aqueous solution from the second chamber to the third chamber and from the third chamber to the bioreactor chamber;
  - ii) means for removing a predetermined volume of bacterial culture from the bioreactor chamber thereby enabling maintenance of the bacterial culture in substantially exponential growth in the bioreactor chamber; and
  - iii) means for delivering the predetermined supply of bacterial culture from the bioreactor chamber to the environment containing wastes including wastes which are substrates for metabolism of the bacterial culture.

5,840,183
APPARATUS FOR THE SEPARATION OF MATERIALS, ESPECIALLY FOR THE SEPARATION OF OIL AND OTHER SUBSTANCES FROM WATER

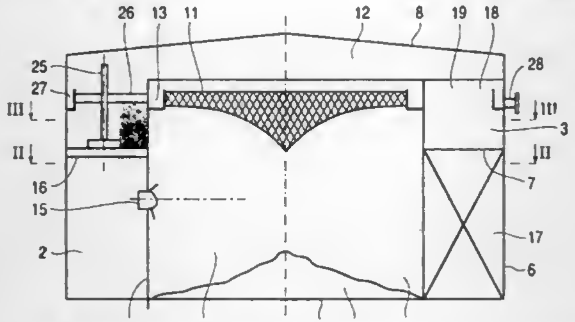
Johannes Hermannes Bakker, Alemere, Netherlands, assignor to International Business Development Inc., Tulsa, Okla.

Filed Jan. 22, 1997, Ser. No. 787,097

Claims priority, application Netherlands, Jan. 23, 1996, 1002158

Int. Cl.^{6} C02F *9/00*

U.S. Cl. 210—221.2 **4 Claims**



1. An apparatus for the separation of at least one phase from a liquid, the apparatus comprising:

- a substantially cylindrical first reservoir for primary separation of the phase from the liquid by means of gravity;
- a second reservoir surrounding a part of the first reservoir and having at least one common wall with the first reservoir, the second reservoir providing additional separation of the phase from the liquid by at least one plate separator located therein;
- a third reservoir surrounding a part of the first reservoir at a location above the second reservoir, and having at least one common wall with the first reservoir and at least one common wall with the second reservoir, the third reservoir providing additional separation of the phase from the liquid by introducing air into the liquid, and an entrance feeding a liquid containing said at least one phase to said first reservoir, a first passage feeding liquid still containing at least some of said at least one phase from said first reservoir to said second reservoir, and a second passage feeding liquid still containing at least some of said at least one phase from said second reservoir to said third reservoir.

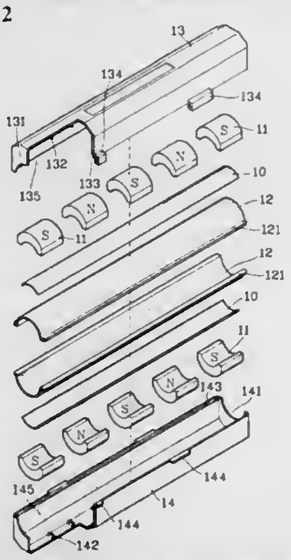
5,840,184
MAGNETIC REGULATOR FOR PREVENTING SCALE IN A NON-DRINKING WATER SYSTEM

Jan Te-Chin, 24F-1, No. 161, Sung-Teh Rd., Taipei, Taiwan

Filed Sep. 26, 1997, Ser. No. 938,873

Int. Cl.^{6} B01D *35/06*

U.S. Cl. 210—222 **9 Claims**



1. A magnetic regulator for preventing water scale formation in a non-drinking water system, comprising:

- a pair of metal plates forming a sheath;
- a pair of semicircular lining plates located between the metal plates to form a substantially circular cross-section when assembled, each lining plate having two lateral flanges;
- a plural number of magnets located axially outside the lining plates, including a pair of magnets having the same polarity and being located radially across from the lining plates, and a pair of magnets having opposite polarities and being located axially adjacent each other; and
- a pair of covers to house the metal plates, magnets and lining plates therein; each cover having a grove in each of two lateral edges for engaging with one of the two lateral flanges of each of the lining plates, pairs of snap ears on two lateral sides thereof for engaging with each other to form a complete enclosure, and a semicircular opening to form an opening when assembled for engaging with a water pipe.

5,840,185
SPORTS BOTTLE FILTER CARTRIDGE

Douglass Hughes, Reno, Nev., and Roger P. Reid, Caldwell, Id., assignors to Douglass E. Hughes, Boulder, Colo.

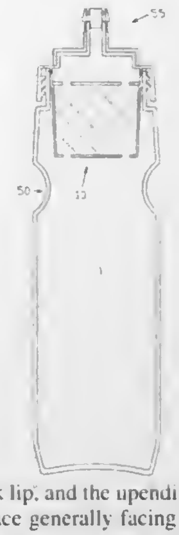
Filed Jul. 23, 1996, Ser. No. 685,334

Int. Cl.^{6} B01D *27/08*

U.S. Cl. 210—232 **20 Claims**

1. A filter cartridge for a sports bottle having a mouth with a longitudinal centerline, a neck defining the mouth, a neck lip and a cap having a downwardly-protruding sealing ring, the cartridge comprising:

- a media container with an axial centerline for placement generally coaxially within a sports bottle neck; and
- an extension connected to said media container for extending between a sports bottle neck and cap for securing the cartridge into the sports bottle, the extension having a generally-axial upending wall with a top end and a generally radial member extending outward from the top end of the upending wall for resting on the neck lip, and the upending wall having a slanted inner sealing surface generally facing the axial centerline and slanting from bottom to top away from said axial centerline, said slanted inner sealing surface being for sealing with the downwardly-protruding sealing ring of the cap.



5,840,186
LIQUID FILTRATION APPARATUS

Peter Bruce MacAlpine, and Graeme Michael Wigg, both of Preston, United Kingdom, assignors to British Nuclear Fuels plc, United Kingdom

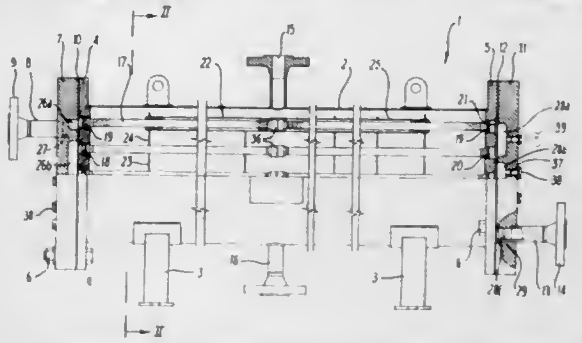
PCT No. PCT/GB95/02146, § 371 Date May 9, 1996, § 102(e) Date May 9, 1996, PCT Pub. No. WO96/08307, PCT Pub. Date Mar. 21, 1996

PCT Filed Sep. 12, 1995, Ser. No. 640,908

Claims priority, application United Kingdom, Sep. 15, 1994, 9418578

Int. Cl.^{6} B01D *63/00*

U.S. Cl. 210—321.79 **23 Claims**



1. An apparatus for the filtration of a liquid comprising an elongate housing having an inlet port for liquid to be treated, an outlet port for concentrated liquid and a discharge port for permeate liquid, a plurality of tubes extending through said housing, each tube having a wall permeable to at least one component of the liquid to be treated such that the permeate passes through said wall into a common chamber defined by the housing for discharge through said discharge port, and channel means provided at each end of the tubes, the channel means being in communication with the tubes and disposed so as to direct the liquid to be treated along at least three successive passes through the tubes, each pass comprising more than one of said plurality of tubes, the arrangement being such that the volumetric rate of liquid flowing in a first of said passes is greater than the volumetric rate of liquid flowing in a final one of said passes, wherein a manifold member is provided at each end of the housing, each manifold member having a surface adjacent to the ends of the tubes, the channel means being formed in said surface and communicating with a plurality of said tubes, wherein the housing comprises a cylindrical shell having an end plate at each end thereof, a plurality of throughbores being provided in each of said end plates for receiving a respective end of a tube, wherein each manifold member is mounted on a respective end plate at a side thereof remote from said shell, and wherein each manifold member is removably mounted to enable replacement thereof by a manifold member having channel means of a different profile whereby the number of tubes in each group can be altered.

5,840,187
DEVICE FOR FILTERING, WASHING AND DRYING A SOLID MATERIAL-LIQUID MIXTURE

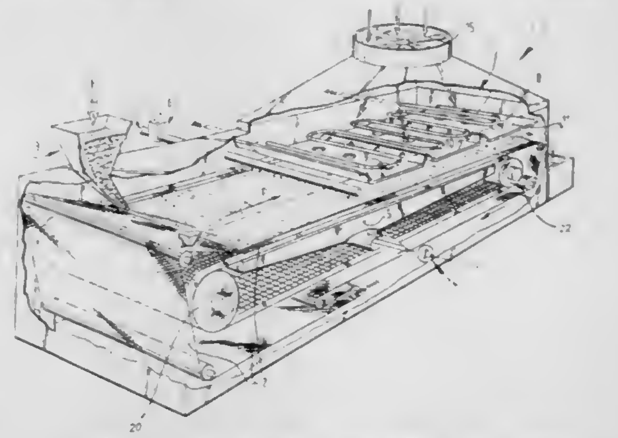
Ulrich Derenthal, Roxheim, Germany, and Karel Antoon Thissen, Utrecht, Netherlands, assignors to Pannevis B. V., Utrecht, Netherlands

Filed Dec. 18, 1996, Ser. No. 768,953

Claims priority, application Netherlands, Dec. 21, 1995, 1001970

Int. Cl.^{6} C02F *11/12;* **B01D** *33/04;* **F26B** *17/04;19/00*

U.S. Cl. 210—400 **20 Claims**



1. A device for filtering, washing and drying a solid material-liquid mixture, comprising:

- a liquid permeable filter cloth;
- means for circulating the filter cloth in a process direction;
- means for feeding the mixture to the filter cloth;
- means for generating a pressure difference such that the pressure above the filter cloth is greater than the pressure below the filter cloth;
- means for supplying liquid to the mixture on the filter cloth;
- means for collecting filtrate; and
- means placed above the filter cloth for drying the mixture,
- wherein the means for drying includes at least one radiation source and at least one plate placed between the at least one radiation source and the mixture on the filter cloth, with the at least one plate configured to absorb radiation from the at least one radiation source and emit radiation of a wavelength which is a function of the degree of blackening.

5,840,188
SNAP FIT FILTER BAG ASSEMBLY

Richard Kirsgalvis, Michigan City, Ind., assignor to Le Sac Corporation, Michigan City, Ind.

Filed Oct. 21, 1997, Ser. No. 955,033

Int. Cl.^{6} B01D *29/27*

U.S. Cl. 210—448 **18 Claims**

1. A liquid filter comprising: a housing having an annular sidewall and an interconnecting bottom wall which define an internal chamber therein, said housing having an upper opening into said internal chamber, said opening delimited by an annular shoulder and an annular support located spacedly above said shoulder, said annular shoulder comprised of a horizontal and vertical surface and said annular support comprised of a horizontal and vertical face, said shoulder and support located at an upper region of said sidewall proximate to said opening:

- a top lid spanning said housing opening:

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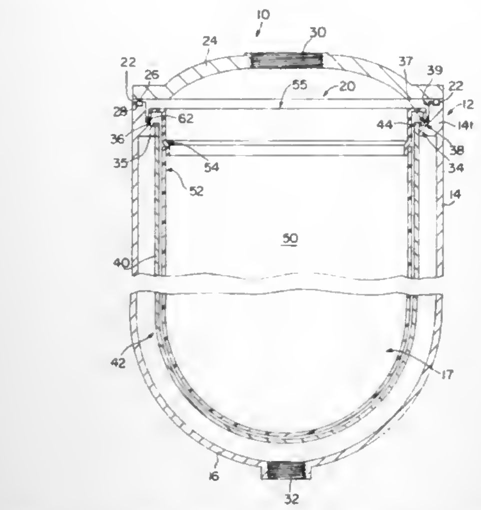


inlet and outlet ports located in liquid flow communication through said internal chamber of said housing, said inlet port located within said top lid and said outlet port located within said bottom wall;

a filter bag for filtering liquid passed through said filter, said filter bag having an opening defined by a flexible shape-retaining ring portion and a liquid impervious wall part attached to said ring portion, said ring portion being liquid impervious and having an annular flange terminating in a downturned bulbous lip;

a reticulated basket having an annular flange delimiting an opening therein, said basket inserted within said internal chamber with said annular flange in resting contact on said annular shoulder;

a removable annular insert ring in abutting contact with said annular support, said annular insert ring having a front wall, a rear wall, and interconnecting top and bottom walls, said rear wall contacting said vertical face of said annular support, said bottom wall in resting contact against on said horizontal face of said annular support, and said front wall in sealing contact with said bulbous lip of said edge portion on said filter bag, said front wall having an undercut,

wherein said annular supported includes an undercut face and said annular flange of said ring portion is adapted to flex downwardly and inwardly towards said internal chamber so as to wedge said bulbous lip within said undercut face of said annular support, thereby forming a liquid impervious seal between said housing and said filter bag without the need for a dedicated groove within said housing for receiving said bulbous lip.

5,840,189
BEVERAGE FILTER CARTRIDGE

John E. Sylvan, Brookline, and Peter B. Dragone, Concord, both of Mass., assignors to Keurig, Inc., Waltham, Mass.

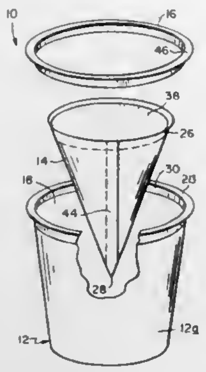
Continuation of Ser. No. 527,770, Sep. 13, 1995, abandoned, which is a continuation-in-part of Ser. No. 192,409, Feb. 4, 1994, abandoned, which is a division of Ser. No. 945,746, Sep. 16, 1992, Pat. No. 5,325,765. This application Aug. 20, 1997, Ser. No. 914,955

Int. Cl.^{6} B01D *27/00;29/085;* **B65B** *29/02*

U.S. Cl. 210—474 **6 Claims**

1. A beverage filter cartridge comprising:

an impermeable hollow base, said base having a closed substantially flat circular bottom with a continuous truncated conical side wall extending upwardly therefrom to a radially outwardly protruding lip surrounding a circular access opening;



a self-supporting filter element received in said base, said filter element being permanently joined to an interior surface of said side wall at a location adjacent to said access opening and being configured and positioned to subdivide the interior of said base into first and second chambers, said first chamber being arranged to store a beverage extract received through said access opening; and

an impermeable circular cover closing said access opening and being permanently joined in a sealed relationship to said lip to cooperate with said base in forming an imperforate cartridge, said cover being yieldably pierceable to accommodate an injection of liquid into said first chamber for combination with said extract to produce a beverage, said filter being adapted to accommodate a flow therethrough of said beverage into said second chamber, and said base being yieldably pierceable to accommodate an outflow of said beverage from said second chamber to the exterior of said cartridge.

5,840,190
SURFACE MODIFIED BIOCOMPATIBLE MEMBRANES

Elisabeth Scholander, Upsala, Sweden; Andrzej Werynski; Andrzej Jozwiak, both of Warsaw, Poland, and Olle Larm, Bromma, Sweden, assignors to Norsk Hydro A.S., Oslo, Norway

PCT No. PCT/NO94/00088, § 371 Date Feb. 1, 1996, § 102(e) Date Feb. 1, 1996, PCT Pub. No. WO94/26399, PCT Pub. Date Nov. 24, 1994

PCT Filed May 9, 1994, Ser. No. 557,066

Claims priority, application Norway, May 19, 1993, 931809

Int. Cl.^{6} B01D *39/00*

U.S. Cl. 210—500.24 **14 Claims**

1. A surface-modified non-thrombogenic membrane for use in contact with body fluids or tissue, which comprises

(a) at least one surface modifying polymer incorporated into the membrane material to give functional groups on the membrane surface; and

(b) a antithrombotic compound immobilized on the membrane surface by being covalently coupled to said functional groups on the membrane surface.

5,840,191
PROCESS FOR THE TREATMENT OF CONTAMINATED MATERIAL

Harry Eccles, Preston, United Kingdom, assignor to British Nuclear Fuels plc, Warrington, England

PCT No. PCT/GB95/00287, § 371 Date Oct. 3, 1996, § 102(e) Date Oct. 3, 1996, PCT Pub. No. WO95/22375, PCT Pub. Date Aug. 24, 1995

PCT Filed Feb. 13, 1995, Ser. No. 693,266

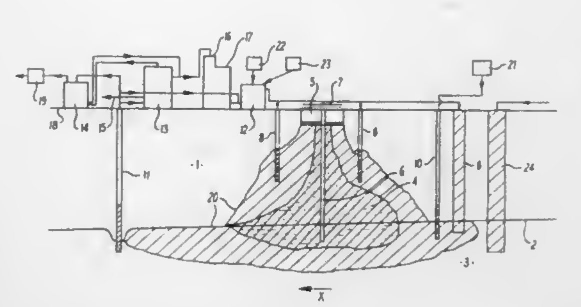
Claims priority, application United Kingdom, Feb. 16, 1994, 9402975; Jul. 16, 1994, 9414425

Int. Cl.^{6} C02F *3/30*

U.S. Cl. 210—601 **14 Claims**

1. A process for the decontamination of a medium comprising a material contaminated with one or more organic species and one or more metal species, said process comprising the steps of:

treating a body of said medium by one or more microbial agents which breaks down the organic contaminant(s) by or through the action of said one or more microbial agents, said microbial agents being provided under aerobic conditions and substantially neutral pH,



followed by treating said body with microbially produced sulfuric acid, under aerobic conditions and substantially acidic pH, so as to solubilize and leach the metal species as a metal sulfate; and,

treating the leached metal sulfate by a bioprecipitation process, under anaerobic conditions, which converts said sulfate to one or more insoluble metal sulfides.

5,840,192
SINGLE-FILM MEMBRANE, PROCESS FOR OBTAINING IT AND USE THEREOF

Rachid El Moussaoui, Brussels, and Henri Hurwitz, Rhode-Saint-Genese, both of Belgium, assignors to Universite Libre de Bruxelles, Brussels, Belgium

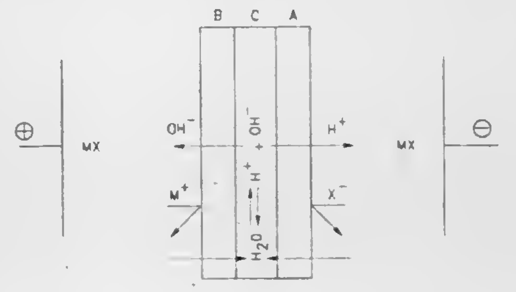
PCT No. PCT/BE94/00014, § 371 Date May 13, 1996, § 102(e) Date May 13, 1996, PCT Pub. No. WO94/19399, PCT Pub. Date Sep. 1, 1995

PCT Filed Feb. 21, 1994, Ser. No. 505,348

Claims priority, application Belgium, Feb. 24, 1993, 9300174

Int. Cl.^{6} B01D *15/04*

U.S. Cl. 210—638 **24 Claims**



1. A single-film membrane made of a single polymeric matrix comprising a hydrophilic interface formed therein, said hydrophilic interface being capable of dissociating into H and OH, wherein said membrane comprises one or more inorganic compounds selected from the group consisting of a salt of an element of column 2a, a salt of a transition element, a salt of an element belonging to the lanthanide groups, a salt of an element belonging to the actinide groups of Mendeleev's Table, a hydroxide of an element of column 2a, a hydroxide of an element belonging to the actinide groups of Mendeleev's Table, and a mixture of any of the foregoing, in an amount effective to reduce the electrical resistance and the water dissociation potential ad to increase the, Faraday efficiency of said membrane.

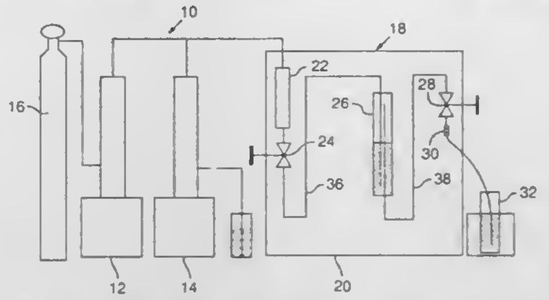
5,840,193
FLUID EXTRACTION USING CARBON DIOXIDE AND ORGANOPHOSPHORUS CHELATING AGENTS

Neil G. Smart; Chien M. Wai; Yuehe Lin, and Yak Hwa Kwang, all of Moscow, Id., assignors to Idaho Research Foundation, Moscow, Id.

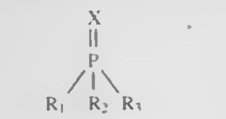
Filed Jul. 26, 1996, Ser. No. 686,422

Int. Cl.^{6} B01D *11/00;11/02*

U.S. Cl. 210—638 **40 Claims**



1. A method for extracting metal and/or metalloid species from a solid or liquid media comprising exposing the media to carbon dioxide and a chelating agent represented by the formula



wherein X is sulfur and R_1–R_3 are independently selected from the group consisting of hydroxyls, sulfhydryls, lower alkyls, lower alkoxys, halogenated lower alkyls, halogenated lower alkoxys, and mixtures thereof, the chelating agent forming chelates with the species, the chelates being soluble in the carbon dioxide the chelating agent not comprising a phosphine sulfide.

5,840,194
PROCESS FOR TREATING ARSENIC-CONTAINING WASTE WATER

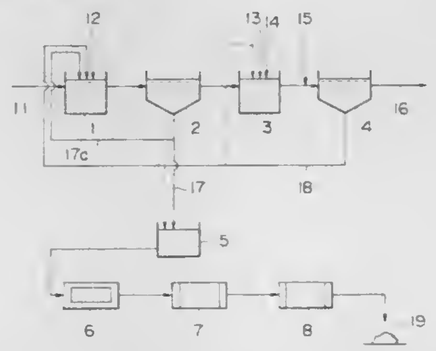
Mamoru Yokose, Tokyo; Hiroshi Fujita; Koosoo Tao, both of Hiroshima; Hiroshi Baba, Hyogo-ken; Hideki Kamiyoshi, Hyogo-ken, and Ranko Shikai, Hyogo-ken, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 9, 1996, Ser. No. 761,858

Claims priority, application Japan, Jan. 16, 1996, 8-004788

Int. Cl.^{6} C02F *1/58*

U.S. Cl. 210—710 **11 Claims**



1. A process for treating arsenic-containing waste water, comprising adding a calcium compound to said arsenic-containing waste water to adjust the pH to 12 or higher; separating the waste water into a first sludge and a first liquid phase, drying the first sludge to reduce the water content to 20% or less calcining the dried sludge at a calcination temperature of about 550° to about 600° C., adding a ferric salt to the first liquid phase to adjust the

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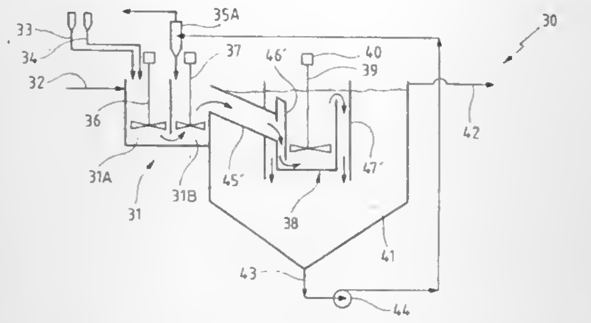
pH to from about 6 to about 9; and separating the salted liquid phase into a second sludge and a second liquid phase.

5,840,195
METHOD AND INSTALLATION FOR TREATING AN UNTREATED FLOW BY SIMPLE SEDIMENTATION AFTER BALLASTING WITH FINE SAND

Francoise Delsalle, Courbevoie; Nicholas Lepoder, Conflans-St.-Honorine, and Patrick Binot, Busy St. George, all of France, assignors to Omnium de Traitement et de Valorisation, Saint-Maurice Cedex, France

Division of Ser. No. 431,833, May 1, 1995, Pat. No. 5,730,864. This application Mar. 4, 1997, Ser. No. 810,834
Claims priority, application France, Feb. 5, 1994, 9405308
Int. Cl.^{6} C08F *1/52;* B01D *21/08*
U.S. Cl. 210—713 **22 Claims**



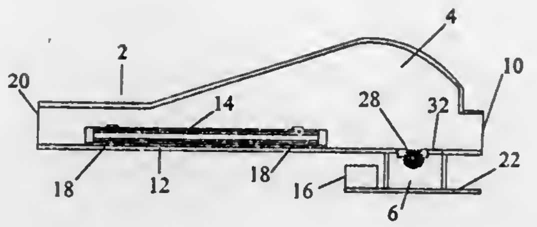
1. A method for removing solids from an influent liquid comprising the steps of:
- a) directing the influent liquid to a coagulation zone and mixing therein a coagulant with the influent liquid to form a mixed liquid;
- b) adding an insoluble granular material having a density greater than the influent liquid;
- c) directing the mixed liquid to an intermediate zone and mixing the liquid so as to maintain the granular material in suspension within the intermediate zone;
- d) directing the mixed liquid to a sedimentation tank having no separator plates disposed therein and separating the granular material and solids from the mixed liquid through a settling process resulting in settled sludge being formed in a lower portion of the sedimentation tank;
- e) maintaining within the sedimentation tank an average mirror rate greater than 15 m/h while producing a clarified effluent having at least a 60% reduction in suspended solids relative to the influent liquid; and
- f) directing the settled sludge from the sedimentation tank to a separation zone and separating the granular material from the sludge and recycling the granular material through the sedimentation process.

5,840,196
WASTEWATER MANAGEMENT PRODUCT AND PROCESS

Craig Thomas Laurent, 17 W. Coolidge St., Battle Creek, Mich. 49017

Filed Jun. 10, 1997, Ser. No. 872,260
Int. Cl.^{6} C02F *1/32;3/28*
U.S. Cl. 210—748 **9 Claims**

1. A waste water treatment assembly comprising
- (a) an enclosure having an inlet end, an outlet end, a lower chamber, an upper chamber and a panel which acts as a splash retainer separating the two chambers,
- (b) a rotatable wheel having a hub located inside the lower chamber and near the inlet end of the enclosure and a portion of said wheel protruding through an opening in the panel separating the two chambers,

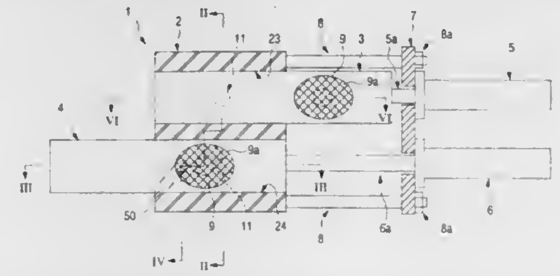


- (c) power source located outside of the enclosure connected by a shaft to the hub of the wheel,
- (d) a conduit capable of accessing a source of waste water and delivering the waste water horizontally to the hub of the wheel within the lower chamber,
- (e) a conduit capable of delivering air to a position above the wheel and the panel separating the two chambers, and
- (f) a conduit capable of delivering the treated waste water out of the outlet end of the enclosure for further processing or disposal wherein said power source is capable of rotating the wheel vertically at speed sufficient to draw the waste water and air into the enclosure breaking the wastewater into droplets and mixing the droplets with air to aerosolize the wastewater in the upper chamber.

5,840,197
METHOD FOR FILTERING A SCREEN CHANGER AND A SCREEN CHANGER

Yasuhiko Ishida, and Hideki Mizuguchi, both of Hiroshima, Japan, assignors to The Japan Steel Works, Ltd., Tokyo, Japan

Filed Apr. 19, 1996, Ser. No. 634,843
Claims priority, application Japan, Apr. 19, 1995, 7-093784
Int. Cl.^{6} B01D *37/00;* D01D *1/10;* B29C *47/68*
U.S. Cl. 210—780 **2 Claims**



1. A screen changer comprising:

a housing including a through passage and a plurality of through holes, said through holes respectively intersecting hranch passages of the through passage branching off from a middle portion of the through passage;

a plurality of slide bars respectively including filtering portions respectively adjoining the through passage, the slide bars being respectively inserted into the through holes of the housing in such a manner that they are liquid tight and can be reciprocated,

wherein said screen changer allows molten materials to pass from in-flow passages of the through passage of the housing through said filtering portions of the slide bars to out-flow passages of the through passage of the housing, and

a material discharge passage extending from proximal to a point of intersection of at least one of the through holes of the housing and the through passage of the housing, said material discharge passage communicating with the outside,

wherein when said material discharge passage and said in-flow passages are brought into communication with each other by the in-flow portions of the through passage portions of the slide bars, said in-flow passages of the other of said through holes are prevented from communicating with the respective one of the filtering portions of the respective one of the slide bars.

2. A screen changer filtering method comprising the steps of:

passing molten materials from an extruding machine from an in-flow passage of a through passage of a housing to through passage portions and filtering portions of a plurality of slide bars to an out-flow passage of said through passage of said housing;

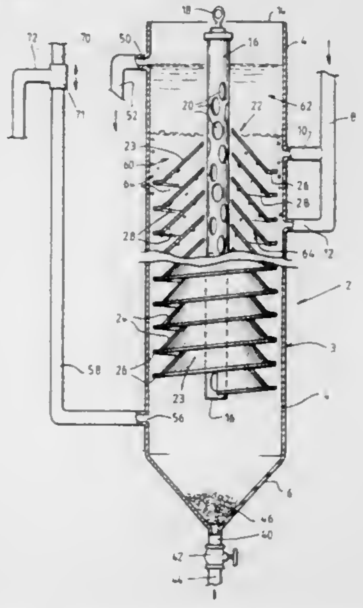
moving said slide bars to bring in-flow passages of said through passage of said housing into a first position which is in adjoinment with a material discharge passage formed to communicate through holes of said housing with the outside, through in-flow portions of said through passage portions, such that the molten materials flow through said material discharge passage and are prevented from flowing through said filtering portions to said out-flow passage of said through passage of said housing; and

moving said slide bars to bring in-flow passages of said through passage of said housing into a second position which is in adjoinment with out-flow portions of said through passage portions, whereby said material discharge passage is closed and molten materials are allowed to pass through said filtering portions and through said out-flow passage of said through passage of said housing.

5,840,198
SEPARATION APPARATUS AND METHOD

Neville Clarke, Berwick, Australia, assignor to International Fluid Separation Pty Ltd, Australia

PCT No. PCT/AU95/00460, § 371 Date Jan. 29, 1997, § 102(e) Date Jan. 29, 1997, PCT Pub. No. WO96/04058, PCT Pub. Date Feb. 15, 1996
PCT Filed Jul. 28, 1995, Ser. No. 776,368
Claims priority, application Australia, Jul. 29, 1994, PM7147
Int. Cl.^{6} C02F *1/40*
U.S. Cl. 210—802 **29 Claims**

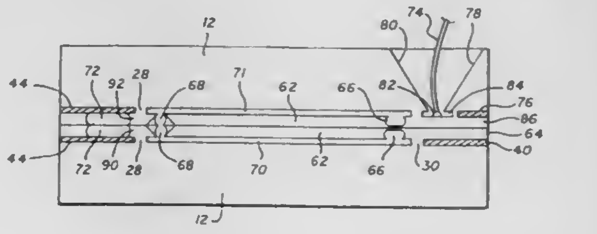


22. A method of substantially separating a mixture of at least two at least partially immiscible liquids into at least a first liquid component and a second liquid component using a tortuous flow path including convection current flow within a separation apparatus having a wall, comprising the steps of admitting the mixture to the separation apparatus through an inlet means, allowing the mixture to flow along a tortuous flow path in convection current flow for a time sufficient to at least partially separate the mixture into the first and second liquid components, and discharging the first liquid component when separated from the mixture through a first outlet means and discharging the second liquid component when separated from the mixture through a second outlet means, wherein the separating means includes a baffle arrangement having at least two baffles which are spaced apart from each other over at least a part of the respective surfaces of the baffles so that the mixture to be separated can flow intermediate the surfaces in use, each of the baffles being provided with an aperture located at or towards the center of the baffle and with a peripheral edge portion, wherein the peripheral edge portion of at least one baffle is provided with a discontinuity, the baffle arrangement being arranged so that the peripheral edge portions are spaced apart from an internal surface of the wall of the separation apparatus, wherein the baffle arrangement defines a tortuous flow path from the inlet to the outlets along which the mixture to be separated is caused to flow for a time sufficient to allow the mixture to at least partially separate into the at least two liquid components, wherein the flow includes convection current flow within and around the baffle arrangement in order to separate the mixture into the two liquid components, thereby separating the first liquid component from the second liquid component.

5,840,199
METHOD FOR PURGING A MULTI-LAYER SACRIFICIAL ETCHED SILICON SUBSTRATE

Keith O. Warren, Newbury Park, Calif., assignor to Litton Systems, Inc., Woodland Hills, Calif.

Continuation of Ser. No. 564,789, Nov. 29, 1995, which is a continuation-in-part of Ser. No. 251,902, Jun. 1, 1994, Pat. No. 5,476,819. This application Apr. 8, 1997, Ser. No. 841,938
Int. Cl.^{6} H01L *21/00*
U.S. Cl. 216—2 **12 Claims**



1. A method of forming a multi-layer sacrificial etch silicon substrate comprising the steps of:

providing a silicon substrate having multiple buried oxide layers;

etching away the buried oxide layers;

suspending said silicon substrate on a rotating fixture at a given distance from a focus thereof;

rotating the fixture about said focus at a rotational velocity to achieve a centrifugal force.

5,840,200
METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES

Satoshi Nakagawa, Toyama; Toyoji Ito, Shiga; Yoji Bito, Toyama, and Yoshihisa Nagano, Osaka, all of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed Jan. 24, 1997, Ser. No. 788,310
Claims priority, application Japan, Jan. 26, 1996, 8-011481
Int. Cl.^{6} H01L *21/302*
U.S. Cl. 216—6 **9 Claims**

1. A method of manufacturing semiconductor devices, comprising the steps of:

forming a film to be etched on a semiconductor substrate, said film to be etched being made of at least one of a ferroelectric material, a high dielectric constant material, and platinum;

forming a patterned mask made of a metal to be oxidized on said film to be etched; and

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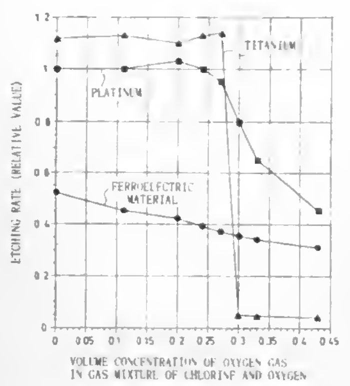


selectively etching said film to be etched by using said patterned mask as an etching mask and a plasma of a gas mixture of chlorine and oxygen.

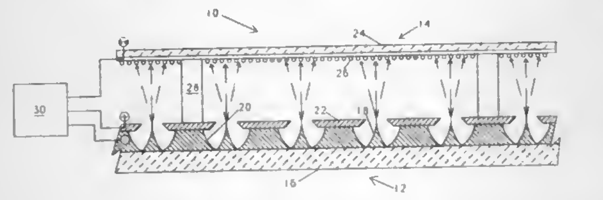
5,840,201
METHOD FOR FORMING SPACERS IN FLAT PANEL DISPLAYS USING PHOTO-ETCHING

Jason B. Elledge, Meridian, Id., assignor to Micron Display Technology, Inc., Boise, Id.

Division of Ser. No. 587,732, Jan. 19, 1996, Pat. No. 5,705,079. This application Apr. 25, 1997, Ser. No. 846,018

Int. Cl.^{6} B44C *1/22*

U.S. Cl. 216—24 **16 Claims**



1. A plurality of spacer elements for large area field emission displays formed by the process of:

forming a number of adhesive areas on a substrate:

providing a sheet of photo etchable material on the substrate;

exposing the sheet to light through a mask such that the exposure defines areas which will form spacers and areas to be later removed;

adhering the areas of the sheet which will form spacers to the adhesive areas on the substrate; and

removing the areas to be removed, thereby leaving spacers adhered to the substrate at the adhesive areas.

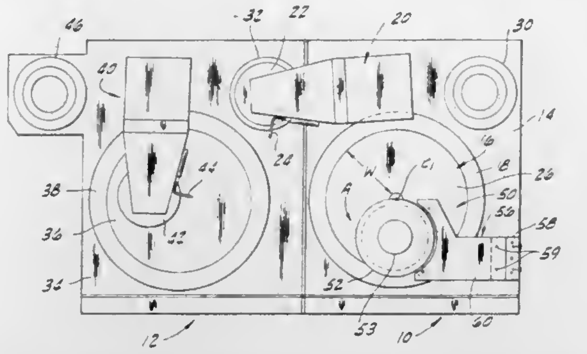
5,840,202
APPARATUS AND METHOD FOR SHAPING POLISHING PADS

Robert J. Walsh, Ballwin, Mo., assignor to MEMC Electronic Materials, Inc., St. Peters, Mo.

Filed Apr. 26, 1996, Ser. No. 639,185

Int. Cl.^{6} H01L *21/00*

U.S. Cl. 216—52 **20 Claims**



16. A method for polishing semiconductor wafers using a wafer polishing machine having a rotating polishing pad including a polishing surface defined by a radially inner and a radially outer boundary and having a radial width, the polishing surface having a cross sectional profile between its radially inner and outer boundaries, the method comprising the steps of:

polishing at least one face of each of a first plurality of semiconductor wafers;

monitoring the cross sectional profile to determine whether the profile of the polishing surface becomes more curved in shape than permitted by a process tolerance amount;

if the determined shape of the profile of the polishing surface is more curved than the process tolerance amount, shaping the polishing pad, said step of shaping the polishing pad comprising the steps of placing a pad shaping tool in a fixture such that a pad shaping surface of the tool engages the polishing surface of the polishing pad across the entire radial width of the polishing surface, rotating the polishing pad and constraining with the fixture the pad shaping tool from rotation about the center of rotation of the polishing pad whereby the pad shaping tool shapes the polishing surface;

polishing at least one face of each of a second plurality of semiconductor wafers.

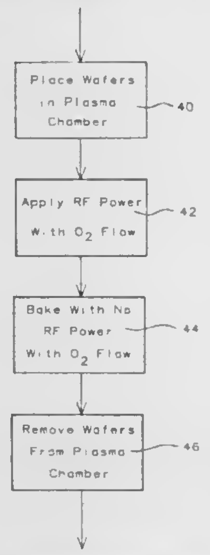
5,840,203
IN-SITU BAKE STEP IN PLASMA ASH PROCESS TO PREVENT CORROSION

Chiang Jen Peng, Hsin-Chu, Taiwan, assignor to Taiwan Semiconductor Manufacturing Company Ltd., Hsin-Chu, Taiwan

Filed Dec. 2, 1996, Ser. No. 755,873

Int. Cl.^{6} H01L *21/00*

U.S. Cl. 216—66 **19 Claims**


Place Wafers in Plasma Chamber
40
Apply RF Power With O2 Flow
42
Bake With No RF Power With O2 Flow
44
Remove Wafers From Plasma Chamber
46

1. A method of fabricating integrated circuit wafers, comprising:

providing an integrated circuit wafer having devices formed therein;

forming a layer of metal over said integrated circuit wafer;

forming a layer of photoresist over said layer of metal:

selectively exposing said layer of photoresist;

developing said selectively exposed layer of photoresist thereby forming a photoresist mask;

etching away that part of said layer of metal not covered by said photoresist mask;

removing said photoresist mask using a wet photoresist stripper;

placing said wafer in a batch type plasma chamber after removing said photoresist mask;

establishing a radio frequency plasma discharge, having a first radio frequency power, in said batch type plasma chamber for a first time while flowing oxygen gas through said batch type plasma chamber at a first flow rate;

terminating said radio frequency plasma discharge;

heating said wafer in said batch type plasma chamber to a first temperature for a second time while flowing oxygen gas through said batch type plasma chamber at a second flow rate, after terminating said radio frequency plasma discharge, wherein said second flow rate is 100 sccm or less; and

removing said wafer from said batch type plasma chamber.

5,840,204
METHOD FOR PATTERNING A LAYER ON OXIDE SUPERCONDUCTOR THIN FILM AND SUPERCONDUCTING DEVICE MANUFACTURED THEREBY

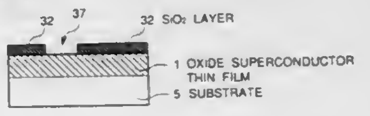
Hiroshi Inada; So Tanaka, and Michitomo Iiyama, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

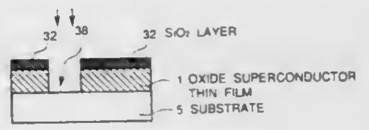
Division of Ser. No. 990,836, Dec. 14, 1992, Pat. No. 5,413,982. This application Apr. 5, 1995, Ser. No. 417,395

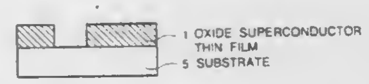
Claims priority, application Japan, Dec. 13, 1991, 3-352196; Dec. 13, 1991, 3-352198; Dec. 10, 1992, 4-352660

Int. Cl.^{6} H01L *21/00*

U.S. Cl. 216—95 **6 Claims**







1. A method for patterning a layer overlying an oxide superconductor thin film, wherein said layer is etched by wet etching using a weak HF solution, a buffer solution that contains HF or a mixture that contains HF.

5,840,205
METHOD OF FABRICATING SPECIMEN FOR ANALYZING DEFECTS OF SEMICONDUCTOR DEVICE

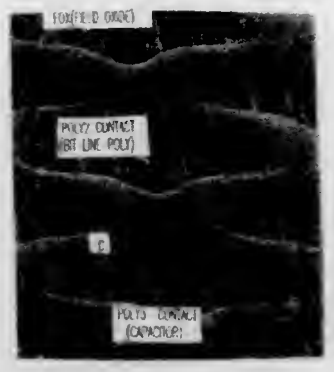
Jeong-Hoi Koo, Seoul, and Doo-Jin Park, Onyang, both of Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., Kyoungki-do, Rep. of Korea

Filed Jul. 19, 1996, Ser. No. 684,451

Claims priority, application Rep. of Korea, Jul. 19, 1995, 1995-21184

Int. Cl.^{6} C25F *3/00*

U.S. Cl. 216—109 **5 Claims**



1. A method of fabricating a specimen for analyzing defects of a semiconductor device comprising the steps of:

searching for a defective portion that exists in a patterned layer of a wafer, through a bit map test, wherein the wafer includes a semiconductor substrate and patterned layers formed on the semiconductor substrate, wherein the patterned layers comprise memory devices,

making a first specimen of selected size by cutting the wafer, the first specimen comprising the defective portion to be adjacent to a cutting line:

molding the first specimen with a resin;

grinding the substrate of the first specimen at a selected slope to form a ground face; and

etching the ground face to expose the defective portion.

5,840,206
NOZZLE FOR INTRODUCING A LIQUID METAL INTO A MOLD, FOR THE CONTINUOUS CASTING OF METAL PRODUCTS, THE BOTTOM OF WHICH HAS HOLES

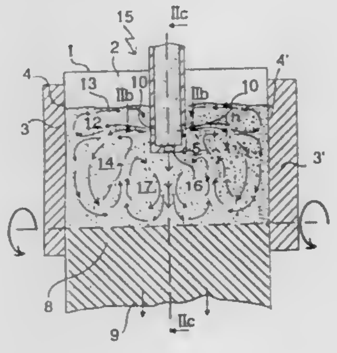
Laurent Gacher, Sarreguemines; Jean-Michel Damasse, Isbergues, and Gérard Raisson, Nevers, all of France, assignors to Thyssen Stahl Aktiengesellschaft, Duisberg, Germany, and Usinor Sacilor, Puteaux, France

Filed Oct. 4, 1996, Ser. No. 725,902

Claims priority, application France, Oct. 30, 1995, 95 12764

Int. Cl.^{6} B22D *11/10*

U.S. Cl. 222—594 **7 Claims**



1. A nozzle for introducing liquid metal into a mold for the continuous casting of flat metal products having two large walls and two side walls, comprising a vertically oriented tube having a lateral wall and a bottom wall, said tube including at its lower end two outlet ports which are made in its lateral wall opposite each other for directing liquid metal each toward a side wall of said mold, and at least two holes made in the bottom wall, wherein a first group of said holes is arranged in said bottom wall on one side of a longitudinal plane of symmetry of the nozzle, which plane includes the axes of the outlet ports, and a second group of said holes is arranged in said bottom wall on the other side of said plane of symmetry, each of said groups of holes being arranged to uniformly distribute liquid metal across the area of its respective side of said bottom wall in a downward direction into said mold, and each hole of said first group being aligned with a hole of said second group in a direction approximately perpendicular to the general orientation of said outlet ports.

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5,840,207
CORROSION INHIBITED CALCIUM CHLORIDE SOLIDS AND BRINE SOLUTIONS

John Scott Beazley, Calgary; William Edward Sadar, Abbotsford; Douglas Robert Maynes, Okotoks, all of Canada, and Mark G. Jantzen, Randolph, N.J., assignors to General Chemical Corporation, Parsippany, N.J.

Filed Aug. 22, 1996, Ser. No. 702,754

Int. Cl.^{6} C09K *3/18;* **C23F** *11/04*

U.S. Cl. 252—70 **13 Claims**

1. A method for inhibiting the corrosion of metals in roads and roadway structures that are contacted with calcium chloride deicer composition, comprising adding to a calcium chloride composition a corrosion inhibiting effective amount of a liquid modified diethanolamide, and applying said composition to the surfaces of said roads and roadway structures containing metal.

5,840,208
LIQUID CRYSTAL COMPOSITION AND LIQUID CRYSTAL DISPLAY ELEMENT

Takashi Yamaguchi; Katsuyuki Murashiro; Fusayuki Takeshita; Tetsuya Matsushita, and Etsuo Nakagawa, all of Chiba, Japan, assignors to Chisso Corporation, Osaka-fu, Japan

Filed Mar. 5, 1997, Ser. No. 812,956

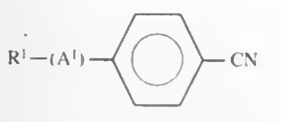
Claims priority, application Japan, May 8, 1996, 8-139442

Int. Cl.^{6} C09K *19/30:19/32;19/34;19/12*

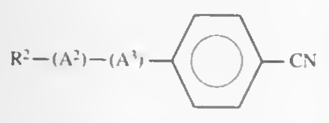
U.S. Cl. 252—299.63 **8 Claims**

1. A liquid crystal composition which comprises as a first component,

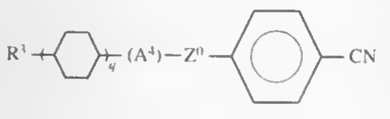
at least one member of compounds expressed by the formulas (I-a) to (I-d):



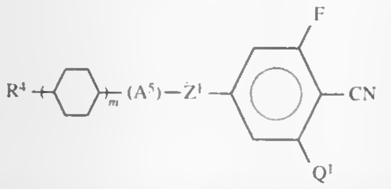
(I-a)



(I-b)



(I-c)



(I-d)

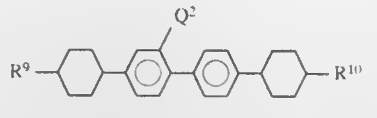
wherein R^1, R^2, R^3 and R^4 each independently represent an alkyl group of 1 to 10 carbon atoms, and optionally one or two or more not-adjacent methylene groups (—CH_2—) in the group may be replaced by oxygen atom or —CH═CH—; Z^0 represents —COO— or —CH_2CH_2—; Z^1 represents —CH_2CH_2—, —COO— or single bond; Q^1 represents H or F; A^1 represents 1,4-cyclohexylene, 1,4-phenylene, 1,3-dioxane-2,5-diyl or 1,3-pyrimidine-2,5-diyl; A^2 and A^4 each independently represent 1,4-cyclohexylene or 1,4-phenylene; A^3 represents 1,4-cyclohexylene, 1,4-phenylene or 1,3-pyrimidine-2,5-diyl; A^5 represents 1,4-cyclohexylene or 1,4-phenylene whose H on the lateral position may be replaced by F; and q and m each independently represent 0 or 1,

as a second component, at least one member of compounds expressed by the formulas (II) to (V):

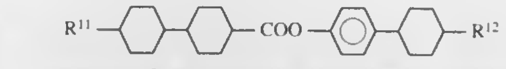
$$R^5-(B)-Z^2-(C)-R^6 \qquad \text{(II)}$$

-continued

$$R^7-(D)-Z^3-(E)-Z^4-(G)-R^8 \qquad \text{(III)}$$



(IV)



(V)

wherein R^5 and R^6 each independently represent an alkyl group of 1 to 10 carbon atoms and optionally one or two or more not-adjacent methylene groups (—CH_2—) in the group may be replaced by oxygen atom or —CH═CH—;

B represents 1,4-cyclohexylene, 1,4-phenylene or 1,3-pyrimidine-2,5-diyl; C represents 1,4-cyclohexylene or 1,4-phenylene; and Z^2 represents —C≡C—, —COO—, —CH_2CH_2—, —CH═CH— or single bond,

R^7 and R^8 each independently represent an alkyl group of 1 to 10 carbon atoms and optionally one or two or more not-adjacent methylene groups (—CH_2—) in the group may be replaced by oxygen atom (—O—) or —CH═CH—, D represents 1,4-cyclohexylene or 1,3-pyrimidine-2,5-diyl;

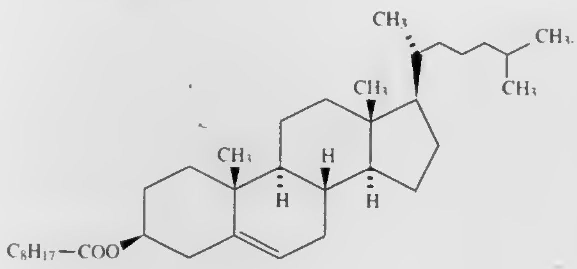
E represents 1,4-cyclohexylene or 1,4-phenylene whose one H on the lateral position may be replaced by F;

G represents 1,4-cyclohexylene or 1,4-phenylene;

Z^3 represents —CH_2CH_2— or single bond; and Z^4 represents —C≡C—, —COO—, —CH═CH— or single bond, and

R^9 to R^{12} each independently represent an alkyl group of 1 to 10 carbon atoms or an alkenyl group of 2 to 10 carbon atoms; and Q^2 represents H or F,

and as a third component, cholesteryl nonanoate expressed by the formula (X)



(X)

5,840,209
OPTICALLY ACTIVE COMPOUND, LIQUID CRYSTAL COMPOSITIONS CONTAINING THE OPTICALLY ACTIVE COMPOUND, AND LIQUID CRYSTAL DISPLAY DEVICE

Hiroshi Mineta; Tomoyuki Yui; Masahiro Johno; Seiji Adachi, and Yuki Motoyama, all of Tsukuba, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

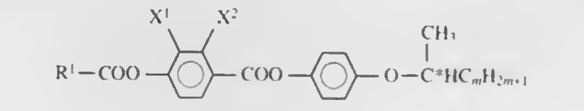
Filed May 14, 1997, Ser. No. 856,285

Claims priority, application Japan, May 14, 1996, 8-118757; Jul. 9, 1996, 8-179378

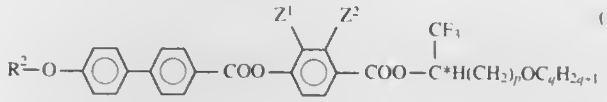
Int. Cl.^{6} C09K *19/20:* **C07C** *69/76;41/00:* **G02F** *1/1343*

U.S. Cl. 252—299.67 **22 Claims**

3. An anti-ferroelectric liquid crystal composition consisting essentially of an optically active compound of the formula (1) and an anti-ferroelectric liquid crystal compound of the formula (2),



(1)



(2)

wherein, in the formula (1), R^1 is a linear alkyl group, one of X^1 and X^2 is a hydrogen atom and the other is a fluorine atom, m is an integer of 3 to 10, and C* is an asymmetric carbon atom, and in the formula (2), R^2 is a linear alkyl group, each of Z^1 and Z^2 is a hydrogen atom or one of Z^1 and Z^2 is a hydrogen atom and the other is a fluorine atom, p is an integer of 5 to 8, q is an integer of 2 or 4, and C* is an asymmetric carbon atom.

5,840,210
DRY FOAMABLE COMPOSITION AND USES THEREOF

Sadanand Memula, Missouri City, Tex., assignor to Witco Corporation, Greenwich, Conn.

Filed Feb. 8, 1996, Ser. No. 598,275

Int. Cl.^{6} B01F *17/00;* **C09D** *105/00*

U.S. Cl. 252—307 **18 Claims**

1. A dry composition which upon admixture with water forms a product that can form a stable voluminous foam, the dry composition consisting essentially of

(a) 20 to 60 wt. % of at least one anionic surfactant;

(b) 1 to 10 wt. % of at least one compound selected from the group consisting of fatty acid monoethanolamides and fatty acid diethanolamides;

(c) 0.5 to 5 wt. % of at least one alcohol containing 8 to 18 carbon atoms; and

(d) and (e) 20 to 55 wt. % of at least two sugars one of which is (e) maltodextrin which is 10 to 30 wt % of said dry composition.

5,840,211
OIL SLICK DISPERSANTS

Ramesh Varadaraj, Flemington; Max Leo Robbins, South Orange; Jan Bock, Warren, and Salvatore James Pace, Milford, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

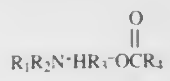
Filed Jul. 12, 1996, Ser. No. 678,840

Int. Cl.^{6} B01J *13/00*

U.S. Cl. 252—312 **3 Claims**

1. A method for dispersing heavy waxy crude oil slicks on water comprising:

applying to the heavy waxy crude oil slick; wherein the viscosity of the heavy or waxy, crude oil ranges from about 2000 to about 15,000 centipoise at 25° C., a composition consisting of a hydrocarbon solvent and a surfactant or mixture of surfactants having the formula:



$$R_1R_2N^{+}HR_3{}^{-}O\overset{\displaystyle O}{\overset{\|}{C}}R_4$$

where R_1 and R_2 are the same or different oxyethylene or polyoxyethylene groups represented by the formula:

$H(OCH_2CH_2)_x$,

where x is an integer of from 1 to about 25; and

R_3 and R_4 are the same or different alkyl or alkenyl groups having from about 8 to about 20 carbon atoms.

5,840,212
RIGID FOAMS WITH IMPROVED INSULATION PROPERTIES AND A PROCESS FOR THE PRODUCTION OF SUCH FOAMS

Herman P. Doerge, Pittsburgh, Pa., assignor to Bayer Corporation, Pittsburgh, Pa.

Filed Oct. 23, 1996, Ser. No. 736,167

Int. Cl.^{6} C08J *9/14;* **C08K** *3/00;* **C08G** *18/00*

U.S. Cl. 252—350 **12 Claims**

1. A blowing agent consisting of

a) from about 1 to about 30% by weight of at least one C_1–C_5 polyfluoroalkane represented by the formula

CX_3-CY_2-R

in which

X represents hydrogen or fluorine,

Y represents hydrogen, fluorine or CF_3 and

R represents H, F, CH_2F, CHF_2, CH_3, CF_3, CF_2—CH_3, CF_2CH_2F, CH_2—CH_3, CH_2—CH_2—CH_3 or —$CH(CH_3)$—CH_3.

b) from about 70 to about 99% by weight of an HCFC and

c) optionally, up to 10% by weight (based on total foam-forming composition) of water

in which the sum of a) plus b) is approximately 100% by weight.

5,840,213
USES OF HEPTAFLUOROPROPANE

Charles J. Mazac, and John S. Rubacha, both of West Lafayette, Ind., assignors to Great Lakes Chemical Corporation, West Lafayette, Ind.

Continuation-in-part of Ser. No. 433,258, Apr. 28, 1995, Pat. No. 5,679,287. This application Mar. 14, 1997, Ser. No. 818,508

Int. Cl.^{6} A23L *3/3445;* **F17C** *1/00*

U.S. Cl. 252—399 **47 Claims**

1. A method of storing goods comprising:

storing the goods in a closed container containing the goods and a surrounding gaseous space, the gaseous space including a gas at about atmospheric pressure and comprising heptafluoropropane.

5,840,214
METHOD OF INCREASING POLYANILINE CONDUCTIVITY WITH IONIC SURFACTANTS

Patrick J. Kinlen, Fenton, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jul. 26, 1996, Ser. No. 690,213

Int. Cl.^{6} H01B *1/12;* **B05D** *3/10*

U.S. Cl. 252—500 **19 Claims**

1. A method for increasing the conductivity of a polyaniline salt composition, the method comprising:

(a) selecting a composition comprising a polyaniline salt of an organic acid, said polyaniline salt having a conductivity and having a solubility in xylene of at least about 25% w/w; and

(b) contacting said polyaniline salt with an ionic surfactant thereby to at least about double the conductivity of the polyaniline salt.

19. A method for increasing the conductivity of a film, coating or fiber comprised of a polyaniline salt of an organic acid, the

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method comprising contacting said film, coating or fiber with an ionic surfactant whereupon the conductivity of said polyaniline salt is increased by a factor of at least about 2.

5,840,215
ANISOTROPIC CONDUCTIVE ADHESIVE COMPOSITIONS

Shridhar R. Iyer, Sugar Land, and Pui Kwan Wong, Houston, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 16, 1996, Ser. No. 768,055

Int. Cl.^{6} H01B *1/22;* **B32B** *35/00;31/00*

U.S. Cl. 252—500 **31 Claims**

1. A thermally reworkable anisotropic conductive adhesive composition comprising:

(a) a thermally reworkable crosslinked resin produced by reacting at least one dienophile having a functionality greater than one and at least one 2,5-dialkyl substituted furan-containing polymer, and

(b) at least one electrically conductive material present in an effective amount to provide a conducting medium in only one direction.

5,840,216
ELECTROCONDUCTIVE PASTE AND LAMINATED CERAMIC ELECTRIC PART

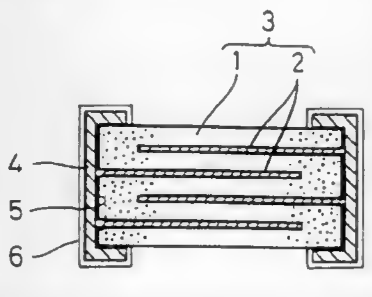
Akira Ohtani, Shiga-ken, and Kunihiko Hamada, Takefu, both of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Aug. 5, 1996, Ser. No. 691,937

Claims priority, application Japan, Aug. 7, 1995, 7-200793

Int. Cl.^{6} H01B *1/02;1/16*

U.S. Cl. 252—514 **6 Claims**



1. An electroconductive paste comprising a metal and glass frit dispersed in an organic vehicle, wherein the glass frit comprises a zinc borosilicate containing about 5 to 12 wt % calcium oxide and SiO_2, B_2O_3, ZnO, Na_2O and Al_2O_3 wherein the proportion of zinc oxide to the total weight of the glass frit is from about 27 to 32% by weight.

5,840,217
SPIRO COMPOUNDS AND THEIR USE AS ELECTROLUMINESCENCE MATERIALS

Donald Lupo, Frankfurt; Josef Salbeck, Kelkheim; Hermann Schenk, Hofheim; Thomas Stehlin, Kriftel; Roland Stern, Wieshaden, and Arno Wolf, Mainz, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

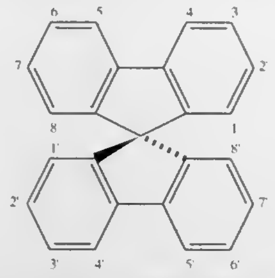
Filed Apr. 5, 1995, Ser. No. 417,390

Claims priority, application Germany, Apr. 7, 1994, 44 11 969.0; Nov. 25, 1994, 44 42 063.3; Dec. 27, 1994, 44 46 818.0

Int. Cl.^{6} G02F *1/00;* **H01B** *1/00;* **H01J** *1/62*

U.S. Cl. 252—583 **12 Claims**

1. An electroluminescence device including an active layer comprising a spirobifluorene compound of formula (II)



(II)

where the benzo groups can be substituted and/or fused independently of one another.

5,840,218
RESISTANCE MATERIAL COMPOSITION

Hiroji Tani, Nagaokakyo, and Keisuke Nagata, Oumihachiman, both of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Oct. 25, 1996, Ser. No. 738,320

Claims priority, application Japan, Oct. 25, 1995, 7-302053

Int. Cl.^{6} H01B *1/06;* **B32B** *9/00;* **A01C** *7/00*

U.S. Cl. 252—521.5 **14 Claims**

1. A ceramic substrate having a sintering temperature of not more than about 1000° C. and having therein a resistance material composition forming a resistor and consisting essentially of at least one nitride of an element of Group VA and Group VIA.

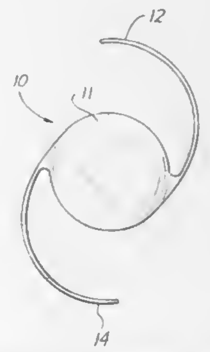
5,840,219
INTRAOCULAR LENSES AND METHODS FOR MAKING SAME

Tuan A. Nguyen, Fountain Valley, Calif., assignor to Allergan, Waco, Tex.

Division of Ser. No. 603,510, Feb. 20, 1996, Pat. No. 5,725,574, which is a continuation of Ser. No. 315,736, Sep. 30, 1994, abandoned, which is a continuation of Ser. No. 126,728, Sep. 24, 1993, abandoned, which is a continuation of Ser. No. 933,410, Aug. 21, 1992, abandoned. This application May 19, 1997, Ser. No. 858,549

Int. Cl.^{6} B29D *11/00*

U.S. Cl. 264—2.7 **18 Claims**



1. A method of making an intraocular lens comprising:

compressing a core having a thickness to reduce said thickness in a range of 3% to 25% and form a compressed lens blank having a compressed thickness and a size so that only a single intraocular lens is formed therefrom, said core comprising a polymer selected from the group consisting of methyl methacrylate homopolymers, methyl methacrylate-containing copolymers and mixtures thereof, provided that said compressed lens blank has increased tensile strength relative to said core; and

forming a single intraocular lens including an optic and at least one fixation member secured to said optic and extending from said optic from said compressed lens blank.

5,840,220
ORGANOSILOXANE COMPOSITION AND METHOD FOR PREPARING SAME

Shoji Akamatsu, and Yasue Kanzaki, both of Chiba Prefecture, Japan, assignors to Dow Corning Toray Silicone Co., Ltd., Tokyo, Japan

Division of Ser. No. 633,633, Apr. 17, 1996, Pat. No. 5,661,203. This application Apr. 21, 1997, Ser. No. 845,248

Int. Cl.^{6} B29C *35/04*

U.S. Cl. 264—15 **3 Claims**

1. A method for preparing an organosiloxane composition containing finely divided, hollow resin particles, said method comprising heating a mixture comprising

(A) 70 to 99.9 weight percent of a polyorganosiloxane oil,

(B') 0.1 to 10 weight percent of a finely divided thermoplastic organic resin containing a heat-activated blowing agent and

(C) 0 to 20 weight % thickener

wherein said mixture is heated sufficiently to activate said blowing agent, resulting in an irreversible expansion of said resin particles.

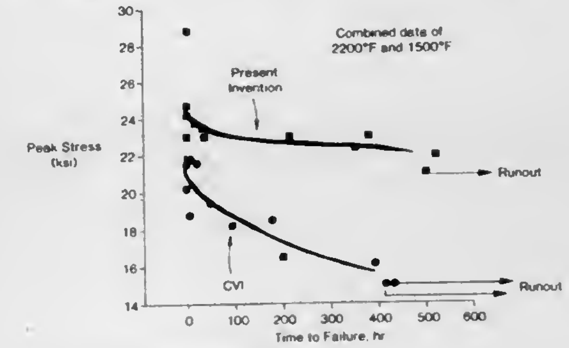
5,840,221
PROCESS FOR MAKING SILICON CARBIDE REINFORCED SILICON CARBIDE COMPOSITE

Sai-Kwing Lau, East Amherst; Salavatore J. Calandra, North Tonawanda, and Roger W. Ohnsorg, Grand Island, all of N.Y., assignors to Saint-Gobain/Norton Industrial Ceramics Corporation, Worcester, Mass.

Filed Dec. 2, 1996, Ser. No. 758,715

Int. Cl.^{6} C01B *31/36*

U.S. Cl. 264—29.7 **36 Claims**



1. A process comprising the steps of:

a) providing a fiber preform comprising a non-oxide ceramic fiber having at least one coating, comprising carbon,

b) melting a matrix alloy comprising silicon and between 0.003 wt % and 10 wt % carbon dissolved therein to form a molten alloy, and

c) infiltrating the fiber preform with the molten alloy.

5,840,222
METHOD FOR INJECTION-MOLDING WORKPIECES

Richard Herbst, Freisinger Strasse 3b, D-85386 Eching, Germany

Filed Jan. 16, 1997, Ser. No. 786,381

Claims priority, application Germany, Jan. 16, 1996, 196 01 280.5

Int. Cl.^{6} B29C *45/64*

U.S. Cl. 264—39 **12 Claims**

1. A method for injection-molding workpieces in a mold of an injection-molding machine, the machine being adapted to be operated either at a nominal speed for the production of said workpieces or at a reduced speed during at least one test cycle for the initial setup of the machine, the method comprising the steps of:

(a) during said test cycle of said machine closing said mold and injecting molten plastic material into cavities of said mold;

(b) opening said mold at said reduced speed;

(c) demolding said workpieces from said mold by means of a handling system, said handling system having a workpiece carrier system for supporting said workpieces;

(d) holding said handling system stationary for a predetermined period of time;

(e) inspecting said workpieces on said handling system during said period of time for determining whether said workpieces are of a predetermined quality,

(f) if the inspection shows that said workpieces are not of said predetermined quality, repeating steps (a) through (e);

(g) generating a signal when said workpieces are of said predetermined quality; and

(h) continuously operating said machine at said nominal speed.

5,840,223
METHOD OF BLOW MOLDING HOLLOW ARTICLES FROM THERMOPLASTIC SYNTHETIC RESIN

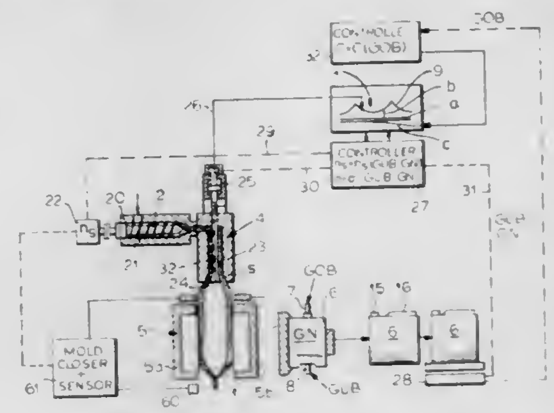
Harald Feuerherm; Horst Deckwerth, and Rolf Kappen-Feuerherm, all of Troisdorf, Germany, assignors to Harald Feuerherm, Troisdorf, Germany

Filed Nov. 29, 1996, Ser. No. 758,490

Claims priority, application Germany, Nov. 30, 1995, 195 44 634.8

Int. Cl.^{6} B29C *49/78*

U.S. Cl. 264—40.1 **12 Claims**



1. A method of blow molding hollow articles of a thermoplastic synthetic resin, comprising the steps of:

(a) extruding a tubular preform from a thermoplastic synthetic resin melt by forcing said thermoplastic synthetic resin melt through a nozzle gap having a variable gap width;

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(b) providing, as a predetermined wall-thickness program for controlling said gap width as a function of a length of said preform, a program curve which, plotted over n successive volume segments over the length of the preform, comprises a resultant obtained by superimposition of a base gap, a profile curve and a correction strip, said profile curve representing a preform thickness characteristic and said correction strip having the configuration of a ramp constituting a nonlinear function;

(c) varying said gap width in accordance with said predetermined wall-thickness program thereby extruding successive volumes of extruded thermoplastic synthetic resin melt for said n successive segments over said length of the preform;

(d) measuring at least one parameter of distribution of said extruded thermoplastic synthetic resin melt in said preform or distribution of thermoplastic synthetic resin in a blow-molded product fabricated from the preform to obtain a measured value and comparing said measured value with a control value;

(e) applying to gap width set points, determined by said program curve of said wall thickness program, corrective values influencing sag of said preform so as to eliminate deviations of said measured value from said control value, thereby compensating for visco-elastic changes in the preform during formation thereof, said correction values being obtained by multiplication of the values of the correction strip with a profile factor, said profile factor being a function of the at least one parameter of distribution;

(f) blowing said tubular preform in a blow mold to expand the tubular preform and produce a blow-molded article therefrom having waste portions; and

(g) removing said blow-molded article having waste portions from said blow mold and detaching said waste portions from said blow-molded article.

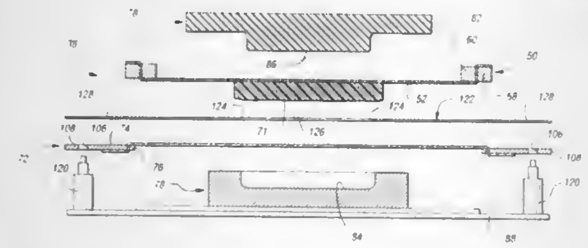
5,840,224
APPARATUS FOR MAKING FORMED LAMINATE

Christian Thary, Farmington Hills, Mich., assignor to Namba Corporation, Walled Lake, Mich.

Filed Sep. 12, 1997, Ser. No. 928,604

Int. Cl.⁶ B29C *44/06*

U.S. Cl. 264—46.4 **7 Claims**



1. A method for making a three-dimensionally formed laminate having a periphery of a predetermined shape, comprising:

positioning a mask having an opening approximately of the predetermined shape above a flexible film to expose the film upwardly through the opening;

rotating the mask and the film about a generally vertical axis;

spraying a foamable liquid mixture downwardly through the opening of the rotating mask onto the rotating film to distribute the foamable liquid mixture onto the film in the predetermined shape of the laminate to be formed;

separating the mask and the film with the foamable liquid mixture remaining on the film and reacting to provide a foam that, after substantial completion of the expansion but before substantial curing, has a transitory state when the liquid mixture is still viscous and encloses gas bubbles generated by the reaction; and

positioning a flexible sheet and the film with the foam therebetween between first and second three-dimensionally contoured mold surfaces and providing relative movement of the contoured mold surfaces toward each other when the foam is in said transitory state to form the flexible sheet and provide a collapsed foam layer that is bonded to the flexible sheet with the predetermined shape as the three-dimensionally formed laminate.

5,840,225
METHOD AND APPARATUS FOR INTEGRALLY ATTACHING A COVER MATERIAL TO A FOAMED ARTICLE

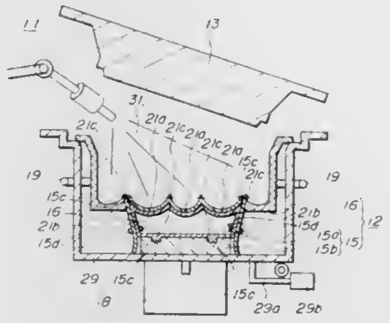
Masanobu Kikuchi; Norio Yanagishita, and Koji Yamada, all of Ayase, Japan, assignors to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed Oct. 26, 1994, Ser. No. 330,083

Claims priority, application Japan, Oct. 27, 1993, 5-289771

Int. Cl.⁶ B29C *67/00;67/20*

U.S. Cl. 264—46.6 **10 Claims**



1. A method for joining a cover material to a foamed article during formation of said foamed article comprising:

positionally aligning a cover material to be joined to said foamed article at a predetermined portion of a first lower mold such that said cover material is held in a positionally aligned condition;

vertically lowering said first lower mold to a predetermined position;

horizontally moving a second lower mold comprising a plurality of side mold portions into a predetermined positional engagement with said first lower mold so as to define a molding space therebetween, said molding space receiving foam therein, said first and second lower molds cooperatively retaining side portions of said cover material;

sealingly attaching an upper mold over said molding space for creating a sealed environment;

introducing foam resin into said molding space;

pressurizing said sealed environment above atmospheric pressure so as to adjust the pressure therewithin.

7. A molding apparatus for forming a foamed article comprising:

a casing;

a lower mold disposed in said casing, said lower mold including a set stand capable of receiving a cover material thereon and said lower mold further including a plurality of side mold portions, said article having an outer peripheral portion and each of said set stand and said side mold portions being contoured and adapted to form the outer peripheral portion of the article, said lower mold cooperating with said casing to define within said casing a circumferential space surrounding said lower mold;

an upper mold cooperating with said lower mold to define therebetween a molding space;

means for introducing foamed resin into said molding space;

means for vertically lowering said set stand relative to said side mold portions;

means for horizontally moving said side mold portions into engagement with said set stand; and

means for introducing pressurized air into said circumferential space.

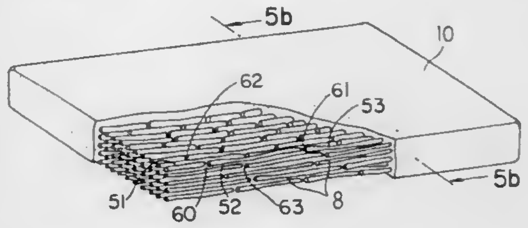
5,840,226
MANUFACTURING METHOD FOR A CONSTRUCTION MATERIAL MADE OF WOODY MATERIAL AND MORTAR

Tsuyoshi Fujii, and Atsushi Miyatake, both of Ibaragi-ken, Japan, assignors to The Forestry and Forest Products Research Institute, Ibaragi-ken, Japan

Division of Ser. No. 623,213, Mar. 28, 1996, Pat. No. 5,741,589. This application Apr. 9, 1997, Ser. No. 831,785

Int. Cl.⁶ B28B *1/08*

U.S. Cl. 264—71 **4 Claims**



1. A method of manufacturing woody strand cement board, comprising the steps of:

(a) cutting woody material selected from the group consisting of wood, bamboo and reed to a predetermined length to obtain cut woody material;

(b) splitting the cut woody material along a fiber direction;

(c) finely splitting the woody material from step (b) to obtain finely split pieces;

(d) spreading in a molding frame the finely split pieces of step (c) as a single layer with gaps between the finely split pieces, and pouring mortar over the single layer;

(e) repeating step (d) thereby extending the single layer in multiple stages within the molding frame in a piling direction, and covering each finely split piece with mortar, thereby obtaining finely split pieces with mortar filled in the gaps, with the finely split pieces formed in an aggregated state;

(f) de-airing by vibrating an upper lid plate located on the top surface of the finely split pieces in the aggregated state while closely contacting the finely split pieces and the mortar;

(g) applying pressure to the upper lid plate and pressing and tightening until the mortar becomes semi-hardened; and

(h) after pressing and tightening, preserving the mortar until a predetermined state of hardness is achieved.

5,840,227
METHOD OF MAKING INTERNAL THERMAL PROTECTION FOR A THRUSTER

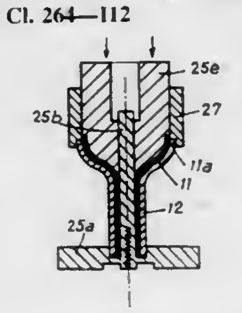
Jacques Bourdoncle, Saint Aubin de Medoc, and Loïc Le Magourou, Saint Medard en Jalles, both of France, assignors to Societe Europeenne de Propulsion, Suresnes, France

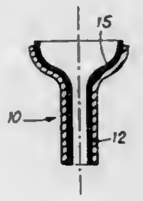
Filed Feb. 19, 1997, Ser. No. 801,015

Claims priority, application France, Feb. 20, 1996, 96 02051

Int. Cl.⁶ B29C *70/00*

U.S. Cl. 264—112 **4 Claims**





1. A method of making internal thermal protection for a thruster structure, comprising the following steps:

preparing an elastomer base having a viscosity of less than 1500 Pa.s at 50° C., and consisting essentially of a substance that vulcanizes at a temperature above 120° C. and is selected from the group consisting of polychloroprenes and silicone gums;

mixing the elastomer base with fibers by means of a mechanical mixer without putting the base into solution, so as to obtain a solid composition in divided form that is suitable for storage; and

molding the solid composition in situ directly on the thruster structure to be protected, including vulcanizing the molded solid composition at a temperature above 120° C., in order to form the a fiber-reinforced elastomer layer directly on the thruster structure to be protected, said layer providing said internal thermal protection for said thruster structure.

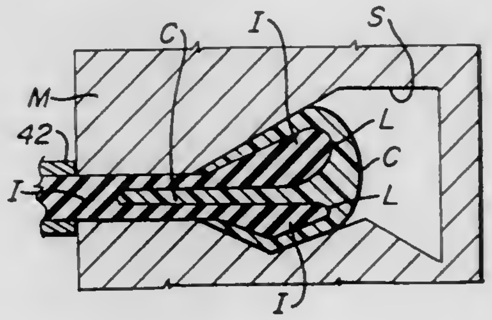
5,840,228
METHOD OF CREATING INDICIA ON A MOLDED ARTICLE

Eugene B. Ritchey, 13821 Sable Blvd., Brighton, Colo. 80601

Continuation-in-part of Ser. No. 727,361, Oct. 8, 1996. This application May 7, 1997, Ser. No. 852,724

Int. Cl.⁶ B29C *45/16*

U.S. Cl. 264—132 **5 Claims**



1. A method of creating indicia on a multi-layered molded article, said method comprising the steps of:

providing a mold of a desired shape including a recessed portion;

arranging at least two resins in a concentric arrangement;

simultaneously injecting the at least two resins in the concentric arrangement into the mold;

maintaining the concentric arrangement of the two resins as they are simultaneously injected and flow into the mold;

advancing the flow of an innermost resin in the concentric arrangement of the at least two resins by an outer resin in the concentric arrangement of the at least two resins which places an even and controllable force on the innermost resin;

creating a substantially uniform cap layer from the innermost resin as the at least two resins are injected into the mold;

creating at least one core layer from the outer resin as the at least two resins are injected into the mold;

forming the molded article from the at least two resins injected into the mold, the molded article including a protruding portion corresponding to the recessed portion of the mold; and

creating indicia on the protruding portion.

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5,840,229
METHOD FOR PRODUCING MOLDED ARTICLE BY POWDER SLUSH MOLDING A THERMOPLASTIC ELASTOMER POWDER

Hiroyuki Sugimoto, Yasu-gun; Yoshihiro Nakatsuji, Toyonaka; Toshio Igarashi, Kyoto, and Shigeo Tanaka, Ichihara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Nov. 15, 1995, Ser. No. 558,098
Claims priority, application Japan, Nov. 16, 1994, 6-282040
Int. Cl.^{6} B29C *41/18;41/04;* **C08L** *23/16;23/08*
U.S. Cl. 264—142 **5 Claims**

1. A method for producing a molded article comprising powder slush molding a thermoplastic elastomer powder having a sphere-reduced average diameter of 0.7 mm or less, a bulk specific gravity of at least 0.38 and a falling property of 20 seconds/100 ml or less and comprising a thermoplastic elastomer which contains an amorphous elastomeric ethylene-α-olefin copolymer and a crystallizable polyolefin resin and has a complex dynamic viscosity η*(1) of 1.5×10^5 poise or less when measured at 250° C. at a frequency of 1 radian/sec., and a Newtonian viscosity index n of 0.67 or less, where said Newtonian viscosity index n is calculated according to the following formula:

$$n=(\log \eta^*(1)-\log \eta^*(100))/2$$

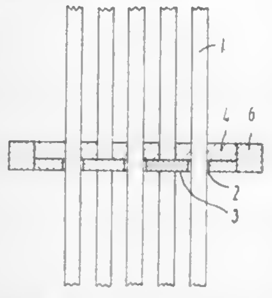
wherein η*(100) is a complex dyname viscosity measured at 250° C. at a frequency of 100 radian/sec. wherein said crystallizable polyolefin resin has a melt flow rate measured at 230° C. under a load of 2.16 kg according to JIS K-7210 of at least 20 g/10 min.

5,840,230
PROCESS FOR PREPARING HOLLOW FIBRE SECTIONS FOR HOLLOW FIBRE MODULES AND SAID HOLLOW FIBRE SECTION FOR A HOLLOW FIBRE MODULE

Svend Andreas Geleff, 13 Gejlager, Skodborg, DK-6630 Rødding, and Knud Søndertoft Pedersen, 414 Ribe Landevej, DK-7100 Vejle, both of Denmark

PCT No. PCT/DK94/00214, § 371 Date Nov. 20, 1996, § 102(e) Date Nov. 20, 1996, PCT Pub. No. WO95/33548, PCT Pub. Date Dec. 14, 1995

PCT Filed Jun. 2, 1994, Ser. No. 737,407
Int. Cl.^{6} B01D *11/16*
U.S. Cl. 264—145 **7 Claims**



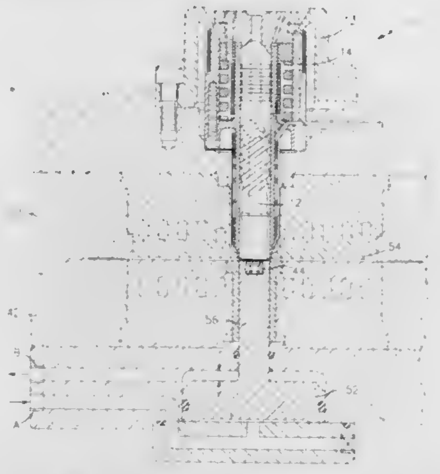
1. A process for the manufacture of hollow fibre sections for hollow fibre modules, said process comprising the steps of:

a) providing a casting matrix comprising a shoulder and a horizontal perforated plate in which a number of perforations are arranged in a predetermined pattern,
b) conveying a plurality of continuous hollow fibres through the perforations,
c) casting a hardenable casting material in the casting matrix for the formation of a solid tube plate,
d) raising the tube plate with the embedded continuous hollow fibres in a vertical direction to a desired distance from the perforated plate,
e) cutting the tube plate in the horizontal plane to expose the hollow fibre ends and form a first tube plate and a second tube plate,
f) repeating steps c, d, and e to form a third tube plate and a fourth tube plate, the second tube plate and the third tube plate defining an upper tube plate and a lower tube plate for the formation of a hollow fibre section.

5,840,231
VALVE GATE ASSEMBLY

Alex Teng, Etobicoke, Canada, assignor to Husky Injection Molding Systems Ltd., Canada

Filed Aug. 14, 1997, Ser. No. 912,950
Int. Cl.^{6} B29C *45/38*
U.S. Cl. 264—154 **22 Claims**



1. The process which comprises: guiding molten resin to a molding area via a movable valve stem; enclosing said valve stem with a nozzle body; enclosing a channel means for said molten plastic flow by said nozzle body, wherein said molten plastic flow is in a flow direction; providing a mold cavity for receiving said molten plastic to form a molded part, said cavity formed between cooperating first and second mold halves, wherein the valve stem is situated in the first mold half; transferring molten plastic from said channel means to said mold cavity by an injection orifice downstream of the valve stem communicating with said mold cavity and channel means; and moving a movable core pin forming a portion of the molded part situated in the second mold half downstream of said valve stem and contacting said valve stem between a forward position in a direction opposed to said flow direction opening said injection orifice and a rearward position in a direction in said flow direction closing said injection orifice.

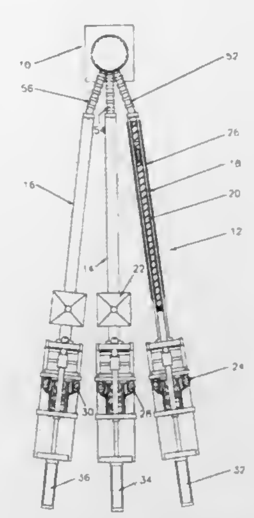
5,840,232
MULTI-LAYER PARISON EXTRUSION SYSTEM

Russell J. La Belle, Wilmington, N.C., assignor to Wilmington Machinery, Inc., Wilmington, N.C.

Filed Jun. 13, 1997, Ser. No. 876,083
Int. Cl.^{6} B29C *47/06;47/26*
U.S. Cl. 264—171.26 **18 Claims**

1. An apparatus for intermittently forming large, multi-layer parisons for use in extrusion blow molding comprising:

a) a die head having an extrusion orifice, a plurality of annular conduits in communication with said orifice, and a plurality of resin inlets in communication with said conduits; and
b) a plurality of reciprocating screw extruders, each of said extruders being in communication with at least one of said inlets, each extruder including a cylinder having a discharge end and a receiving end, an accumulation chamber in said cylinder adjacent said discharge end, a resin inlet adjacent said receiving end, and a resin discharge outlet in communication with said accumulation chamber and one of said resin inlets; and a screw within said cylinder axially aligned with said accumulation chamber and having a forward end toward said accumulation chamber, said screw being rotatable within said cylinder to convey said resin from said resin inlet into said accumulation chamber while moving axially away from said accumulation chamber, and drive means for moving the forward end of said screw rapidly into said accumulation chamber to discharge resin through said discharge outlet and said die head on a first in, first out basis.



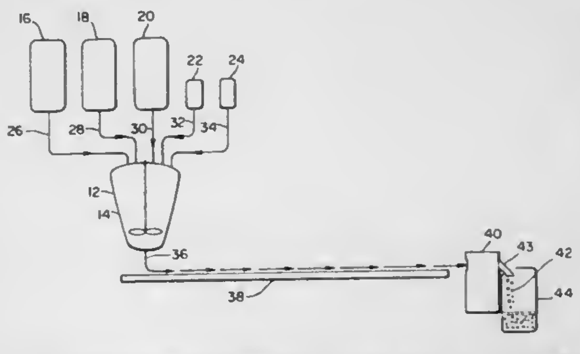
16. A method for intermittently forming large, multi-layer parisons for use in extrusion blow molding comprising:

a) providing a die head having an extrusion orifice, a plurality of annular conduits in communication with said orifice, and a plurality of resin inlets in communication with said conduits;
b) providing a plurality of reciprocating screw extruders, each extruder including a cylinder having a discharge end and a receiving end, an accumulation chamber in said cylinder adjacent said discharge end, a resin inlet adjacent said receiving end, and a resin discharge outlet in communication with said accumulation chamber and one of said resin inlets; and a screw within said cylinder axially aligned with said accumulation chamber and having a forward end toward said accumulation chamber;
c) extruding resins into said accumulation chambers while axially moving said screws away from said accumulation chambers; and
d) simultaneously moving the forward ends of said screws into said accumulation chambers to discharge resin under pressure through said discharge outlets and said die head on a first in, first out basis, and through said conduits and extrusion orifice to form said multi-layer parison.

5,840,233
PROCESS OF MAKING MELT-SPUN ELASTOMERIC FIBERS

Robert P. Foss, Hockessin, Del., assignor to Optimer, Inc., Wilmington, Del.

Filed Sep. 16, 1997, Ser. No. 931,056
Int. Cl.^{6} C08G *18/30;* **D01F** *6/70*
U.S. Cl. 264—176.1 **33 Claims**



1. A method for the preparation of a melt-spun fiber comprising providing a melt-spinnable elastomeric polymer having the formula:

$$[\mathrm{Pr}-\mathrm{Ar}]_n \qquad (I).$$

wherein:
- n is from about 30 to about 65;
- Ar is a residue of an aromatic dihydroxy compound; and
- Pr is a prepolymer which comprises:
  - from about 85 to about 95 mole % of a prepolymer component of formula T-G-T;
  - from about 3 to about 15 mole % of a prepolymer component of formula T-G-T-G-T; and
  - from 0 to about 2 mole % of a prepolymer component of formula T-G-T-G-T-G-T, wherein:
    - G is a residue of a polyol; and
    - T is a residue of a diisocyanate compound; and
- melt spinning said melt-spinnable elastomeric polymer to provide the fiber;

wherein said melt-spinnable elastomeric polymer is prepared by a method which comprises combining together said polyol, said diisocyanate compound and said aromatic dihydroxy compound, wherein said polyol and said diisocyanate compound are combined together in a mole ratio of about 1:2 to provide the melt-spinnable elastomeric polymer with substantially no higher melting polymeric component.

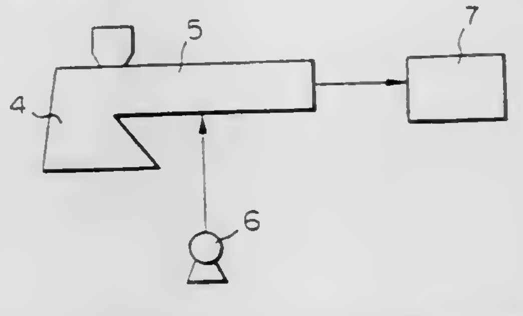
5,840,234
HIGH-DENSITY POLYETHYLENE PLEXIFILAMENTARY FIBER NONWOVEN FABRIC COMPOSED OF FIBER THEREOF, AND MANUFACTURING METHODS THEREOF

Kohzoh Ito; Ikuo Ueno; Yoshiaki Nakayama, and Katsuzi Hikasa, all of Moriyama, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 233,947, Apr. 28, 1994, which is a division of Ser. No. 968,463, Oct. 29, 1992, abandoned, which is a continuation of Ser. No. 814,046, Dec. 26, 1991, abandoned, which is a continuation of Ser. No. 211,234, Jun. 9, 1988, abandoned. This application Mar. 12, 1996, Ser. No. 614,067

Claims priority, application Japan, Oct. 13, 1986, 61-241450; Apr. 20, 1987, 62-95231; Jul. 9, 1987, 62-169682; Jul. 11, 1987, 62-172073; Jul. 13, 1987, 62-172960; Jul. 22, 1987, 62-181189; Aug. 27, 1987, 62-211422

Int. Cl.^{6} D01F *6/00*
U.S. Cl. 264—205 **6 Claims**



1. A method of manufacturing a uniform nonwoven fabric of plexifilamentary fibers, which comprises striking a skirt of a spreading and swinging rotating dispersion plate with an unspread three-dimensional plexifilamentary fiber, said spreading and swinging rotating dispersion plate comprising a rotatable disk, a cylindrical portion extending in a perpendicular direction from a center of the disk and having a cylindrical outer surface a diameter of which is smaller than that of the disk, and the skirt portion being arranged in an inclined state in a space between one surface of the disk and the cylindrical outer surface of the cylindrical portion, the skirt portion being comprised of a plurality of swinging faces swinging the unspread three-dimensional plexifilamentary fiber flown in a direction substantially parallel to an axis of the cylindrical portion and a cushioning face arranged alternately with the swinging face and capable of cushioning a sudden change of the swinging direction of the three-dimensional plexifilamentary fiber swung by the swinging face, where an inclined angle α between a

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center of the swinging face of the skirt portion and an upper surface of the disk is substantially the same as an inclined angle β between a center of the cushioning face and the upper surface of the disk, and the cushioning face has a fan-like shape a width of a portion near to the disk of which is wider than a width of a portion near to the cylindrical portion.

5,840,235
BIAXIALLY ORIENTED FILM OF HIGH MOLECULAR WEIGHT POLYETHYLENE, PROCESS FOR PREPARING THE SAME, SURFACE-MODIFIED BIAXIALLY ORIENTED FILM OF HIGH MOLECULAR WEIGHT POLYETHYLENE AND PROCESS FOR PREPARING THE SAME

Kazuo Yagi; Hitoshi Mantoku; Akinao Hashimoto; Isaburo Higashi, and Yoshinori Akana, all of Kuga-gun, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Division of Ser. No. 463,369, Jun. 5, 1995, Pat. No. 5,674,919, which is a division of Ser. No. 108,617, Aug. 26, 1993, abandoned. This application Aug. 29, 1997, Ser. No. 920,882

Claims priority, application Japan, Dec. 27, 1991, 3-346523; Jun. 17, 1992, 4-158335

Int. Cl.⁶ C08J *9/00;* **D02J** *1/06;* **B29C** *55/00*

U.S. Cl. 264—288.8 **3 Claims**

1. A process for preparing a biaxially oriented film of high molecular weight polyethylene, which comprises

(1) melt kneading together 20–75 parts by weight of a high molecular weight polyethylene [A] having an intrinsic viscosity [η] of at least 5.0 dl/g or more and 80–25 parts by weight of a hydrocarbon plasticizer [B] which is a solid at ordinary temperature and capable of making a uniform mixture with the high molecular weight polyethylene [A], followed by forming a raw fabric sheet from the resulting molten mixture,

(2) removing by extraction the hydrocarbon plasticizer [B] from the raw fabric sheet at a temperature below 90° C. with a solvent [C] capable of dissolving said hydrocarbon plasticizer [B] to obtain an unstretched sheet containing substantially no residual hydrocarbon plasticizer [B],

(3) stretching at a temperature of less than 135° C. the unstretched sheet so that the stretch ratio in the lengthwise direction becomes 3 times or more and that in the crosswise direction becomes 3 times or more, thereby obtaining a stretched film having a specific surface area of 70 m^2/g or more and a fibril structure, and

(4) heating the stretched film under the standard length constraint at a temperature of 132°–145° C. for 1 second to 10 minutes, thereby reducing said stretched film in specific surface area by 20 m^2/g or more.

5,840,236
SLUSH MOLDING PROCESS

Hung Dang Ngoc, Limeil Brevannes, France, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 746,949, Nov. 18, 1996, Pat. No. 5,686,147. This application Apr. 7, 1997, Ser. No. 834,581

Int. Cl.⁶ B29C *41/18*

U.S. Cl. 264—302 **14 Claims**

1. A process for producing a hollow rubber article which comprises: (1) injecting a slush molding plastisol composition which is comprised of (a) polyvinyl chloride, (b) from about 40 to about 65 parts of a plasticizer per 100 parts of the polyvinylchloride, (c) from about 1 to about 3 parts of a stabilizer and (d) from about 10 to about 15 parts of a highly crosslinked nitrile rubber composition per 100 parts of the polyvinyl chloride, wherein the highly crosslinked nitrile rubber has repeat units which are derived from (i) 1,3-butadiene, (ii) acrylonitrile and (iii) a crosslinking agent, and wherein said highly crosslinked nitrile rubber has a Mooney viscosity of about 50 to about 120, a swelling index of less than about 10 percent, a mill shrinkage of less than 10 percent and a gel content of greater than 90 percent, into a mold; (2) maintaining the mold at an elevated temperature for a period of time which is sufficient for the slush molding compound to be fused into the shape of the desired hollow article; and (3) removing the hollow rubber article from the mold.

5,840,237
PALLET FOR RAW COVER TIRE AND MANUFACTURING METHOD OF TIRE USING THE SAME

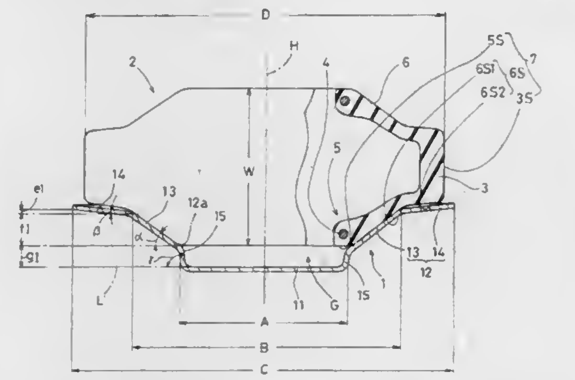
Yukihide Ohya, Kobe, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo-ken, Japan

Filed Oct. 2, 1996, Ser. No. 724,958

Claims priority, application Japan, Oct. 2, 1995, 7-255096; Aug. 30, 1996, 8-230326

Int. Cl.⁶ B29C *35/00*

U.S. Cl. 264—326 **5 Claims**



1. A pallet for a raw cover tire, the raw cover tire having a tire outer surface consisting of an outer circumferential surface of a tread, outer side surfaces of beads each with a bead core therein, and outer side surfaces of side walls extending from the outer circumferential surface of the tread to the outer side surfaces of the beads and varying in the inclination angle to a surface at substantially a right angle to the tire axial center,

said pallet comprising

a circular bottom plate disposed at a substantially right angle to the tire axial center,

a supporting portion provided radially outside of an outer periphery of the circular bottom plate and supporting at least one of the outer side surfaces of the side walls of the raw cover tire, said supporting portion having a first receiving surface of a cone form inclining downwardly toward the bottom plate at an angle α to the bottom plate, and a second receiving surface of a cone form extending upwardly from an upper edge of the first receiving surface at an angle β smaller than the angle α, and

a riser wall rising upwardly from the periphery of the bottom plate to a lower edge of the supporting portion at an angle γ larger than the angle α of the first receiving surface.

5,840,238
PROCESS FOR THE MANUFACTURE OF FIBRE-REINFORCED COMPOSITES

Frans Setiabudi, Eschbach, and Thomas Kainmüller, Weil am Rhein, both of Germany, assignors to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

Filed May 13, 1997, Ser. No. 856,620

Claims priority, application Switzerland, May 14, 1996, 1227/96

Int. Cl.⁶ B28B *7/38*

U.S. Cl. 264—331.17 **5 Claims**

1. A process for the production of a fibre-reinforced composite, which comprises introducing a fabric into the lower part of an open two-part mould, closing the mould and injecting into the mould under pressure and curing a reactive resin mixture comprising

(a) a Diels-Alder adduct of cyclopentadiene and

(b) a compound of the formula I

$$(R_1R_2R_3P)_xL_yRu^{2+}Z_1^{-}Z_2^{-} \qquad (I),$$

in which R_1, R_2 and R_3 independently of one another are phenyl, tolyl or cyclohexyl,

L is benzene which is unsubstituted or substituted by 1 to 3 C_1–C_4alkyl, thiophene, benzonitrile, acetonitrile, nitrogen (N_2), an unsubstituted or partly or completely fluorinated C_1–C_4alcohol, CO, H_2O or NH_3,

Z_1^- and Z_2^- independently of one another are H^-, Cl^-, Br^-, BF_4^-, PF_6^-, SbF_6^-, AsF_6^-, $CF_3SO_3^-$, $C_6H_5—SO_3^-$, p-toluenesulfonate (tosylate), 3,5-dimethylphenylsulfonate, 2,4,6-trimethylphenylsulfonate, 4-trifluoromethylphenylsulfonate or cyclopentadienyl,

x is a number from 1 to 3 and y is a number from 0 to 3, where $2 \leqq x+y \leqq 4$.

5,840,239
APPARATUS AND METHOD FOR FORMING THREE-DIMENSIONAL OBJECTS IN STEREOLITHOGRAPHY UTILIZING A LASER EXPOSURE SYSTEM HAVING A DIODE PUMPED FREQUENCY QUADRUPLED SOLID STATE LASER

Jouni P. Partanen, Los Angeles, and William F. Hug, Pasadena, both of Calif., assignors to 3D Systems, Inc., Valencia, Calif.

Filed Jan. 31, 1997, Ser. No. 792,347

Int. Cl.⁶ B29C *35/08;41/02*

U.S. Cl. 264—401 **16 Claims**

1. A method of forming a 3D object from a solidifiable medium, comprising the steps of:

forming a coating of solidifiable medium adjacent to a previously formed lamina in preparation for forming a subsequent lamina of said object;

selectively exposing a target surface of said solidifiable medium to a beam of pulses of electromagnetic radiation, having a desired pulse repetition rate, to form a subsequent lamina of the object and to adhere said subsequent lamina to said previously formed lamina; and

repeating the forming and exposing steps to form the three-dimensional object from a plurality of adhered laminae;

wherein the pulse repetition rate is selected to be equal to or greater than that given in

$$F=\frac{V_s}{W_0}=\sqrt{\frac{2}{\pi}}\;\frac{P_l}{E_c W_0^2}\exp(-C_d/D_p)$$

wherein V_s is a scanning speed of the beam, W_o is a half width of the beam at $1/e^2$ of a peak irradiance distribution of the beam, P_l is a power of the beam, E_c is a critical exposure of the medium, C_d is a desired cure depth, and D_p is a penetration depth (1/e absorption depth) of the beam in the medium.

5,840,240
METHOD OF MAKING A SILICONE COMPOSITE VASCULAR GRAFT

Mark D. Stenoien, Columbia Heights; William J. Drasler, Minnetonka; Robert J. Scott, Oak Grove, and Mark L. Jenson, Greenfield, all of Minn., assignors to Possis Medical, Inc., Minneapolis, Minn.

Continuation of Ser. No. 787,227, Nov. 4, 1991, abandoned. This application Nov. 3, 1995, Ser. No. 552,930

Int. Cl.⁶ A61F *2/06*

U.S. Cl. 264—425 **19 Claims**

1. A method of fabricating a fibrous porous tubular means for use a vascular graft comprising the steps of:

a. electrostatically spinning a silicone polymeric material, forming fibers of said polymeric material;

b. depositing said fibers onto a spinning mandrel and thereby forming a fibrous porous structure on said mandrel; and,

c. providing controlled heating to cure said fibers using infra-red energy means.

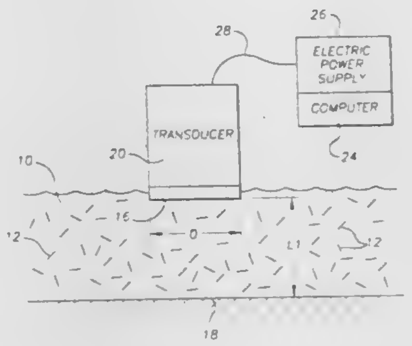
5,840,241
METHOD OF ALIGNING FIBROUS COMPONENTS OF COMPOSITE MATERIALS USING STANDING PLANAR COMPRESSION WAVES

Richard Patten Bishop, P.O. Box 10495, Burke, Va. 22009, and Bradbury Robinson Face, 334 S. Church St., Smithfield, Va. 23430

Filed Mar. 6, 1997, Ser. No. 812,178

Int. Cl.⁶ B29B *13/08;* **B06B** *3/00*

U.S. Cl. 264—437 **6 Claims**



1. A process for aligning fibrous elements which are loosely immersed in a fluid matrix, comprising the steps of:

positioning an actuator member adjacent a base material, said base material comprising a plurality of fibrous elements immersed within a fluid matrix;

positioning a planar reflective surface adjacent said base material;

aligning said actuator member with said planar reflective surface along a longitudinal axis;

positioning said planar reflective surface perpendicular to said longitudinal axis;

introducing vibrational energy into said base material to establish a standing compression wave in said base material between said actuator member and said planar reflective surface;

wherein said step of introducing vibrational energy into said base material to establish a standing compression wave comprises

oscillating said actuator member parallel to said longitudinal axis at a first freouency;

reflecting said standing wave off of said planar reflective surface;

oscillating said planar reflective surface parallel to said longitudinal axis;

controlling a phase angle of oscillation of said actuator member;

controlling a phase angle of oscillation of said planar reflective surface to correspond to said phase angle of oscillation of said actuator member;

and controlling the magnitude of said first frequency;

said standing compression wave having at least one node intermediately disposed in said base material between said actuator member and said planar reflective surface;

and wherein said vibrational energy causes said fibrous elements to accumulate at said node.

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5,840,242

AMORPHOUS SILICON OXYCARBIDE AND CRYSTALLINE SILICON CARBIDE FIBERS FROM CURABLE ALKENYL OR ALKYNYL FUNCTIONAL SILOXANE RESINS

William Henry Atwell, Midland; Duane Ray Bujalski, Auburn; Jonathan Lipowitz; Kai Su, both of Midland, all of Mich., and Gregg Alan Zank, Tokyo, Japan, assignors to Dow Corning Corporation, Midland, Mich.

Filed Apr. 22, 1997, Ser. No. 837,664

Int. Cl.^{6} C04B *35/571*

U.S. Cl. 264—470 **17 Claims**

1. A method for preparing a ceramic fiber comprising

(A) forming a fiber from a siloxane resin having the formula $(R^1SiO_{3/2})_q(R^2SiO_{3/2})_r(R^1{}_aR^2{}_bRSiO_{3-a-b/2})_s$ wherein R is an unsaturated carbon group; each R^1 is selected from the group consisting of an aryl group having from 6 to 10 carbon atoms and functional derivatives thereof; each R^2 is selected from the group consisting of an alkyl group having from 1 to 4 carbon atoms and functional derivatives thereof; a has a value of 0, 1 or 2; b has a value of 0, 1, or 2 with the proviso that a+b=0 or 2; q has a value of 0.3 to 0.5; r has a value of 0.3 to 0.5 and s has a value us 0.15 to 0.3;

(B) curing the fiber of (A) by exposing the fiber to high energy radiation; and

(C) heating the fiber of (B) in an inert environment to a temperature above about 800° C. to convert the fiber of (B) to a ceramic fiber.

5,840,243

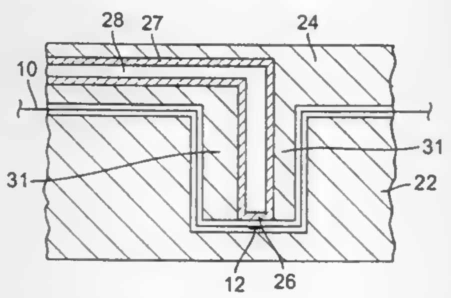
METHOD OF FORMING BLISTER PACK PACKAGING

Robert L. Hicks; Lawrence H. Luebbert, and Gary L. Konop, all of Iowa City, Iowa, assignors to Gillette Canada Inc., Kirkland, Canada

Filed Jun. 17, 1996, Ser. No. 664,353

Int. Cl.^{6} B29C *51/42*

U.S. Cl. 264—509 **10 Claims**



1. A method of forming blister pack packaging, the method comprising

placing a substantially planar thermoplastic material, the material having an area with a preprinted graphic, between a pair of opposed male and female thermoforming dies, the male die having a cooled portion arranged to contact the preprinted area of the thermoplastic material to prevent undesirable distortion of the graphic; and

contacting the preprinted area with the cooled portion of the male die while

thermoforming the thermoplastic material against the female die to form a blister the preprinted area cooled by the cooled portion of the male die to a level preventing distortion of the graphic during thermoforming.

5,840,244

HIGH IMPACT LLDPE FILMS WITH HIGH STALK EXTRUSION

Vaseem Firdaus, and Pradeep P. Shirodkar, both of Somerset, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Jan. 14, 1992, Ser. No. 820,461

Int. Cl.^{6} B29C *47/20;47/88*

U.S. Cl. 264—565 **24 Claims**

1. A process for producing a film, which comprises

providing a resin which is a linear low density polyethylene comprising at least about 80 percent by weight of ethylene units wherein the molecular weight distribution, measured by a ratio of z average molecular weight to weight average molecular weight (M_z/M_w) which is greater than 3.5,

extruding said resin through an annular die to form an extruded tube of molten material to provide the tube with a tube diameter which is substantially the annular die diameter;

while continuously extruding the tube, expanding the tube, downstream of said annular die, to attenuate the walls thereof to form the tube of molten material into a bubble of a bubble diameter which exceeds (1) the annular die diameter and (2) the tube diameter;

wherein said bubble has a frost line which comprises a demarcation line between said molten material and solid biaxially oriented film; and

producing said film of a thickness ranging from 0.25 to 2.0 :nils, exhibiting an impact strength, determined by ASTM D-1709 of 150 to 800, and a MD tear resistance as determined by ASTM D-1922 of 200 to 500, comprising a copolymer of linear low density polyethylene comprising at least about 80 percent by weight of ethylene units and the remainder being an alpha olefin of 3 to 10 carbon atoms.

5,840,245

AIR FILTER AMD METHOD FOR REDUCING THE AMOUNT OF MICROORGANISMS IN CONTAMINATED AIR

Garth Coombs, Evergreen, and Isidro Vasquez Bastidas, Jr., Littleton, both of Colo., assignors to Johns Manville International, Inc., Denver, Colo.

Continuation of Ser. No. 869,560, Apr. 15, 1992, abandoned. This application Dec. 5, 1995, Ser. No. 567,609

Int. Cl.^{6} A61L *9/00*

U.S. Cl. 422—4 **12 Claims**

1. A method of making an air filter media which reduces the amount of microorganisms in contaminated air, comprising the steps of:

providing an air porous fiberglass mat;

placing on the fiberglass an antimicrobially effective amount of an inorganic antimicrobial agent so as to be positioned in the path of contaminated air passed through the fiberglass mat to thereby reduce the amount of microorganisms in the contaminated air;

wherein the step of placing the inorganic antimicrobial agent on the fiberglass further comprises the steps of:

mixing an aqueous solution of a water-soluble inorganic antimicrobial agent with a fiberglass binder resin solution to form an aqueous antimicrobial agent-containing binder solution; and

spraying said aqueous antimicrobial agent-containing binder solution onto the fiberglass.

5,840,246

OIL LAMP WITH FRAGRANCE EMANATOR

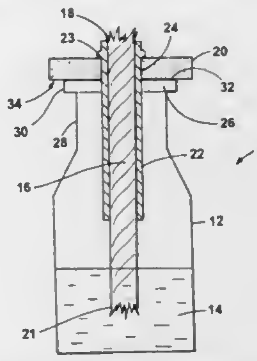
Randall Lee Hammons, Sussex; Stephen Vito Dente, Tenafly, and Thomas Shiaw-tong Lin, Whippany, all of N.J., assignors to Reckitt & Colman Inc., Montvale, N.J.

Filed Aug. 6, 1996, Ser. No. 689,337

Claims priority, application United Kingdom, Jun. 21, 1996, 9613015

Int. Cl.^{6} A61L *9/00;* **A62B** *7/08*

U.S. Cl. 422—4 **25 Claims**



1. A delivery device for the controlled release of a volatile substance which comprises:

a fluid vessel having a neck end, wherein said fluid vessel contains a quantity of fuel, said fuel comprising at least one organic liquid;

a porous emanator element having a flat face contacting the neck end of the fluid vessel, and a central passage, said emanator having entrained within a quantity of a volatile liquid;

a wick having a first end adapted to be ignited, and a second end in contact with the fuel, said first end passing completely through the emanator element passage; and

a wick holding tube passing through the emanator element passage and encasing at least part of the wick, wherein the outer diameter of at least a portion of the wick is substantially the same as the inner diameter of at least a portion of the wick holder, and the outer diameter of at least a portion of the wick holder is substantially the same as the inner diameter of at least a portion of the emanator element passage.

5,840,247

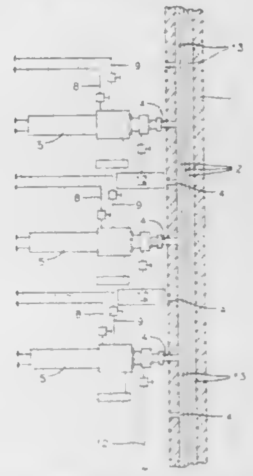
PROCESS FOR THE PROTECTION OF ACTIVE REINFORCEMENTS EMBEDDED IN A CONCRETE MASS

Pierre-Marie Dubois, Rue les Culots, 37, Ophain-Bois-Seigneur-Isaac, Belgium, B-1421, and Daniel Michaux, 15 Allee Courbet, Livry Gargan, France, F-93190

Filed Sep. 9, 1996, Ser. No. 709,678

Int. Cl.^{6} C23F *11/00*

U.S. Cl. 422—7 **7 Claims**



1. A process for the protection of active reinforcements embedded in a concrete mass against the effects of oxidation, capable of detecting imperfections resulting from injection grout, comprising: drilling at least one channel in the concrete mass to provide an opening in front of the active reinforcements; and thereafter injecting a corrosion inhibiting solution into said channel while applying a high power pulsating wave to said solution to make it penetrate such that at least each channel is occluded;

said high power pulsating wave being generated by a high power ultrasonic power transmitter with a high enough frequency to produce a pulsating effect on said solution, and to place said solution under pressure.

5,840,248

MOIST-HEAT STERILIZATION APPARATUS AND PROCESS, IN PARTICULAR TO SET UP AUTOCLAVES FOR DENTAL SURGERY USE

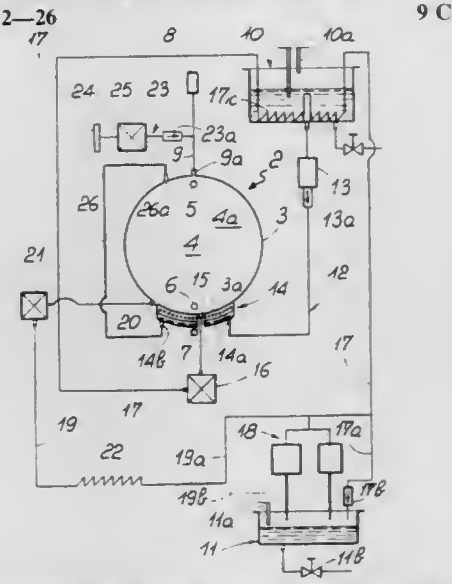
Daniele Ongaro, Milan, Italy, assignor to M.O.COM. S.r.L., Buccinasco, Italy

Filed Apr. 19, 1996, Ser. No. 634,882

Claims priority, application Italy, Apr. 28, 1995, MI95A0852

Int. Cl.^{6} A61L *2/00;9/00;* **B60H** *1/22*

U.S. Cl. 422—26 **9 Claims**



1. A moist-heat sterilization apparatus comprising a boiler shell, a chamber defined within said boiler shell for holding object to be sterilized, a heating block located externally of said chamber and in contact with said boiler shell for transmitting heat by thermal conduction to said boiler shell, heating members in said heating block, a water feeding circuit for feeding water to said heating block, a steam conveying circuit between said heating block and said chamber for conveying steam to said chamber, said steam conveying circuit ending in said chamber at a position spaced from said heating block, and means defining a steam generating canalization within said heating block, said canalization providing communication between said water feeding circuit and said steam conveying circuit, whereby said heating means causes a first steam flow to be generated through said canalization and to be conveyed by said steam conveying circuit to said chamber and a second steam flow to be generated internally of said chamber adjacent said heating block.

5,840,249

PRESERVATIVE FOR ORGANIC MATERIALS

Bernard Bendiner, 326 Woodsedge, Suite B, Michigan City, Ind. 46360

Filed Feb. 28, 1997, Ser. No. 807,426

Int. Cl.^{6} A61K *7/00;* **D21C** *5/02;9/00;* **B01J** *19/00*

U.S. Cl. 422—28 **37 Claims**

1. A process for producing a preservative for applying to organic matter that will prevent the decomposition of the organic matter and enable it to be used for industrial purposes, comprising the steps of:

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producing a decomposition resistant hydrous cellulose pulp, the individual fibers of which are coated with a thin wax film;
- (a) filtering the decomposition resistant hydrous cellulose pulp through a very fine filter;
- (b) adding potassium sorbate to the filtrate at a ratio of one part of filtrate to potassium sorbate that is in the range of 0.1% to 5% by weight;
- (c) adding citric acid to the mixture in amounts to reduce the pH to 6.5 or lower.

5,840,250
COMPOSITIONS AND METHODS FOR DISINFECTING A CONTACT LENS AND DETECTING THE PRESENCE OF AN OXIDATIVE DISINFECTANT

John Y. Park, Santa Ana; Lin Peng, Tustin, and Anthony J. Dziabo, Lake Forest, all of Calif., assignors to Allergan, Waco, Tex.

Division of Ser. No. 496,867, Jun. 30, 1995, Pat. No. 5,703,024. This application Sep. 30, 1997, Ser. No. 938,493

Int. Cl.^{6} A61L *2/18*

U.S. Cl. 422—28 **12 Claims**

1. A method for disinfecting a contact lens comprising:

contacting a contact lens with an aqueous liquid medium containing an effective amount of an oxidative disinfectant component at conditions to effectively disinfect and contact lens, said contacting occurring in the presence of a color indicator component which is soluble in said liquid medium and is adapted to provide a color indication of the presence of said oxidative disinfectant component in said liquid medium, said color indicator component comprising an effective amount of a transition metal component which is redox active, has an oxidized state of a first color and a reduced state of a different second color and a polymeric polyanionic component in an amount effective to inhibit the staining of said contact lens by said transition metal component.

5,840,251
DEVICE AND METHOD FOR CLEANING, DISINFECTING AND DRYING AN ENDOSCOPE

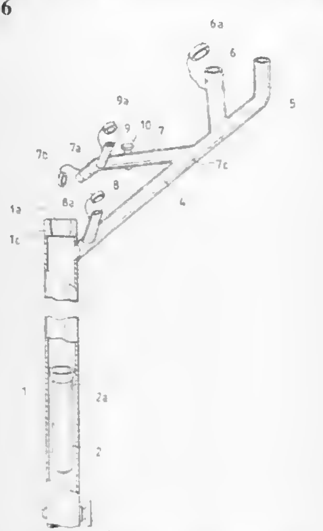
Yasuo Iwaki, Moriyama, Japan, assignor to Nitto Medical Corporation, Osaka, Japan

Filed Oct. 31, 1996, Ser. No. 742,061

Claims priority, application Japan, Oct. 31, 1995, 7-308378; Aug. 8, 1996, 8-227659

Int. Cl.^{6} A01N *1/00;* **G05B** *1/00;* **A61L** *2/00;* **E04H** *15/26*

U.S. Cl. 422—36 **19 Claims**



1. A device for cleaning, disinfecting and drying an endoscope, said endoscope having an insertion portion for being inserted into a patient and a forceps socket, said device comprising:

a tubular body having a top, a bottom opposite said top, an upper part adjacent said top, a lower part adjacent said bottom, an outlet at said bottom and an opening at said top, said opening receiving said insertion portion of said endoscope;

a water inlet pipe extending from said upper part of said tubular body;

a branch pipe branching from said inlet pipe and connecting to said forceps socket of said endoscope;

at least one injection pipe extending from at least one of said inlet pipe and said branch pipe, said at least one injecting pipe injecting at least one of air, a detergent and a disinfectant; and

a fluid reservoir positioned within said tubular body at said lower part, said fluid reservoir receiving said insertion portion of said endoscope.

5,840,252
METHOD OF MANUFACTURING AND STORING MEDICAL SOLUTIONS

Joseph A. Giertych, Lake Forest, Ill., assignor to Baxter International Inc., Deerfield, Ill.

Division of Ser. No. 409,110, Mar. 23, 1995, Pat. No. 5,605,934. This application Oct. 18, 1996, Ser. No. 732,762

Int. Cl.^{6} B65B *31/00*

U.S. Cl. 422—40 **10 Claims**

1. A method for preparing liquid products comprising the steps of:

providing a liquid product having a pH that is less than a desired final pH;

adding a base to the liquid product to increase the pH of the liquid product to at least the desired final pH;

lowering the pH of the product below the desired final pH by adding carbon dioxide to the product;

storing the product in a gas permeable container; and

allowing the pH of the product to increase over time toward the desired final pH level due to the release of carbon dioxide from the gas permeable container.

5,840,253
CELL WASH APPARATUS

Eric Chase, Walnut Creek; Harvey Schulte, Los Altos, and Howard L. North, Los Gatos, all of Calif., assignors to Cytek Development Inc, Fremont, Calif.

Filed Jun. 20, 1996, Ser. No. 667,449

Int. Cl.^{6} G01N *21/00;* **B01L** *3/02;11/00;9/00*

U.S. Cl. 422—63 **10 Claims**

1. Apparatus for washing cell suspensions within a test tube having an inside surface and an axis of symmetry, comprising:
- a) a frame;
- b) stopper means rotatably disposed on said frame for frictionally engaging said test tube's inside surface sufficient to rotate said test tube;
- c) rotating means for rotating said stopper means and said test tube about said axis of symmetry;
- d) washing means positioned within said stopper means for both adding a wash solution to said cell suspension in said test tube and removing excess wash solution and waste from said cell suspension in said test tube during rotation of said test tube about said axis.

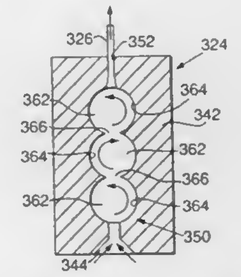
5,840,254
APPARATUS FOR MIXING FLUIDS FOR ANALYSIS

Edward Lawrence Carver, Jr.; David Charles DeCava, both of Oxford, and Steven Skiptunas, Naugatuck, all of Conn., assignors to CDC Technologies, Inc., Oxford, Conn.

Filed Jun. 2, 1995, Ser. No. 458,701

Int. Cl.^{6} G01N *15/06*

U.S. Cl. 422—68.1 **28 Claims**



1. An apparatus for at least one of particle and chemical analysis of reagent mixtures having a plurality of reagent-mixture components, comprising:

means for pumping each of a plurality of reagent-mixture components in a respective stream at a respective flow rate;

means for introducing at least one reagent-mixture component into a stream of at least one other reagent-mixture component to mix the plurality of reagent-mixture components into a combined reagent-mixture stream, said means including an elongated mixing chamber defining an upstream end and a downstream end, at least one inlet port located at the upstream end of the mixing chamber and coupled in fluid communication with the pumping means for introducing a plurality of reagent-mixture component streams into the mixing chamber, an outlet port located downstream of the at least one inlet port for receiving the combined reagent-mixture stream, and a plurality of raised surface portions spaced relative to each other and projecting inwardly into the mixing chamber and transverse relative to its elongated direction for creating turbulence within the mixing chamber to facilitate mixing of the reagent-mixture components into the combined reagent-mixture stream; and

means coupled in fluid communication with the outlet port for at least one of (i) chemically analyzing and (ii) analyzing a particle distribution of the combined reagent-mixture stream.

5,840,255
GAS SENSOR

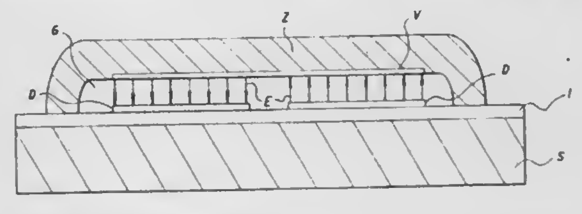
Andreas Kappel; Randolf Mock, both of München, and Hans Meixner, Haar, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 30, 1996, Ser. No. 777,021

Claims priority, application Germany, Dec. 29, 1995, 195 49 146.7

Int. Cl.^{6} G01N *27/04*

U.S. Cl. 422—90 **19 Claims**



1. A gas sensor, comprising:

a gas sensitive layer having two sides;

a measuring electrode structure on one of said sides of said gas sensitive layer; and

an electrically conductive layer on the other of said sides of said gas sensitive layer said electrically conductive layer being constructed and positioned so as to electrically shield an electrical field above the measuring electrode structure.

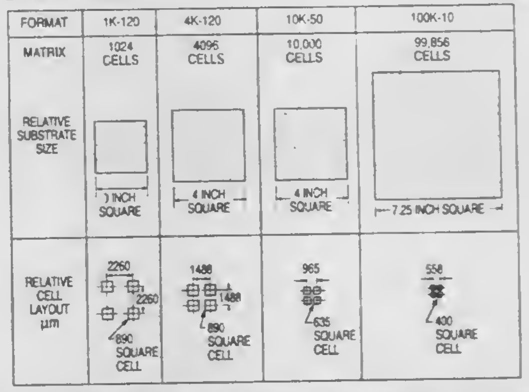
5,840,256
PLATE FOR REACTION SYSTEM

Robert Richard Demers; Satyam Choudary Cherukuri, both of Cranbury; Aaron Wiliam Levine, Mercer, and Kerry Dennis O'Mara, Burlington, all of N.J., assignors to David Sarnoff Research Center Inc., Princeton, N.J.

Filed Apr. 9, 1996, Ser. No. 630,018

Int. Cl.^{6} B01L *11/00*

U.S. Cl. 422—102 **21 Claims**



1. A processing system for conducting a plurality of processes in parallel, the processing system comprising

a liquid distribution system for directing liquids to a plurality of uniformly sized reaction cells, and

a plate comprising said cells, the plate is reversibly and sealably attached to the liquid distribution system, having a plurality of the reaction cells formed in its upper surface and having seal-forming surfaces surrounding the reaction cells for sealing with the liquid distribution system and thereby isolating reaction cells from adjacent reaction cells, wherein the density of the reaction cells is at least about 10 cells per cm^2, wherein reaction cells are separated from each adjacent reaction cell by at least about 0.15 mm,

wherein the plate can engage the liquid distribution system such that a plurality of said cells can receive liquid from the liquid distribution system without having to adjust the engagement between the plate and the liquid distribution system and wherein the area of each of the openings of the reaction cells of the plate is no more than about 50% of the area defined by the multiplication product of (1) the pitch between reaction cells in separate rows and (2) the pitch between reaction cells in separate columns.

5,840,257
DEVICE FOR USE WITH AN OIL LAMP TO ALLOW DIFFUSION OF THE SCENT OF A PERFUME

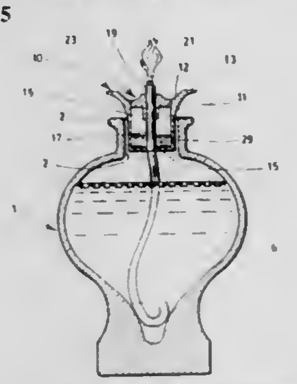
Jean-Louis Bureau, Charlesbourg, and Jacques Bureau, Ste-Anne de Beaupré, both of Canada, assignors to Rayflam Inc., Sainte-Foy, Canada

Filed May 12, 1997, Ser. No. 854,389

Claims priority, application Canada, Apr. 8, 1997, 2202179

Int. Cl.^{6} A62B *7/08*

U.S. Cl. 422—125 **28 Claims**



1. A device for use with an oil lamp to allow the diffusion of the scent of a perfume, said oil lamp having a lip and an opening of a predetermined diameter, said device comprising:

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- a circular vessel having a top, a bottom, a center, a circumference and being closed at the bottom and open at the top thereof, thereby defining a perfume-holding area;
- a central tubular element having a top and a bottom extending longitudinally through the center of said vessel, said central tubular element including a wick,
- means to hold in position said device on said lip of said oil lamp and over said opening;
- said means to hold in position include an outwardly projecting flange at the top of said vessel, and
- said vessel extends into said opening a predetermined distance; a ring-like element having a central opening adapted to be inserted around said central tubular element at the top thereof such that said central tubular element projects upwardly from said ring-like element, said ring-like element having a diameter adapted to rest on said outwardly projecting lip of said device, said ring-like element being provided with openings to permit air flow between said perfume-holding area and ambient air.

5,840,258

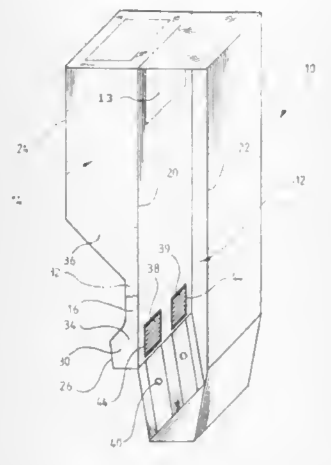
METHOD AND APPARATUS FOR TRANSPORTING SOLID PARTICLES FROM ONE CHAMBER TO ANOTHER CHAMBER

Timo Hyppanen, Karhula, Finland, assignor to Foster Wheeler Energia Oy, Helsinki, Finland

Continuation-in-part of Ser. No. 41,571, Apr. 5, 1993, Pat. No. 5,332,553, Ser. No. 41,580, Apr. 5, 1993, Pat. No. 5,345,896, Ser. No. 66,277, May 26, 1993, Pat. No. 5,540,894, and Ser. No. 973,396, Nov. 10, 1992. This application Jul. 12, 1993, Ser. No. 89,810

Int. Cl.^{6} F27B *15/08;* **B01J** *8/18*

U.S. Cl. 422—142 **24 Claims**



10. Apparatus for transporting solid particles comprising:
- a first chamber having solid particles therein;
- an adjacent second chamber;
- a partition wall separating said first and second chambers;
- gas inlet means, for introducing transporting gas into said first chamber; and
- two or more horizontal or inclined passages disposed one on top of the other in said partition wall interconnecting said chambers, for providing a solid flow gas seal, a controllable solid flow valve, or both a solid flow gas seal and a controllable solid flow valve.

5,840,259

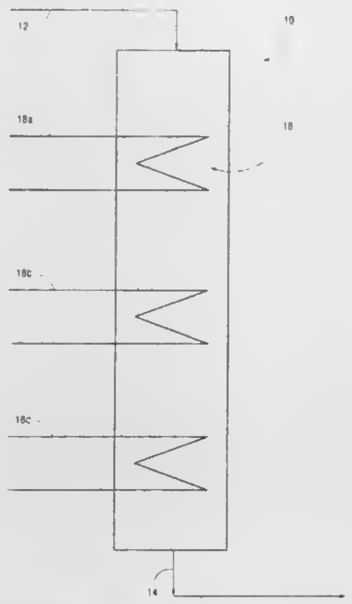
BOILING POINT REACTOR WITH HEAT REMOVAL

John R. Adams, Houston, Tex., assignor to Catalytic Distillation Technologies, Pasadena, Tex.

Filed Apr. 5, 1993, Ser. No. 42,524

Int. Cl.^{6} B01J *8/04*

U.S. Cl. 422—191 **1 Claim**



1. In a boiling point reactor wherein reactants react exothermically to vaporize a portion of the reaction mixture in a vertically disposed fixed bed, wherein the improvement comprises providing as said vertically disposed fixed bed a plurality of alternating particulate catalyst beds and inert packing beds having a cooling coil within each of said inert packing beds for removing heat by condensing a portion of the vaporized reaction mixture.

5,840,260

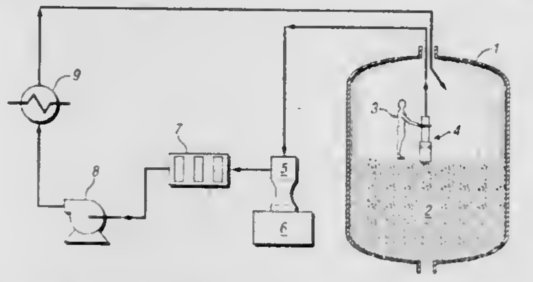
CATALYST REMOVAL SYSTEM

Thomas Peyton Easterly, Friendswood, and William Ogle Jones, Houston, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 31, 1996, Ser. No. 741,502

Int. Cl.^{6} B01J *8/08;20/34;* **A47L** *9/02;* **B08B** *5/04*

U.S. Cl. 422—219 **7 Claims**



1. An apparatus for removing catalyst particles from a bed of catalyst particles in a vessel comprising:
- a means for creating a vacuum;
- a nozzle connected to said means for creating a vacuum, said nozzle comprising an inside pipe connected at a first end thereof to which a pressure differential created by said vacuum means is applied, said inside pipe having an open second end opposite to said first end, a concentric outside pipe attached to the inside pipe at an end thereof opposite to the second end, the outside pipe being open at an end thereof proximate to the second end of the inside pipe, and circumferentially spaced orifices in the outside pipe, said orifices being sized in relation to the cross sections of the inside and outside pipes such that approximately equal mixtures of a gas and the catalyst particles are drawn into and through the nozzle for a given pressure differential created by the vacuum means; and
- a means for separating the catalyst particles from the gas connected to said nozzle.

5,840,261

CONTAINER FOR MEDICAL INSTRUMENTS

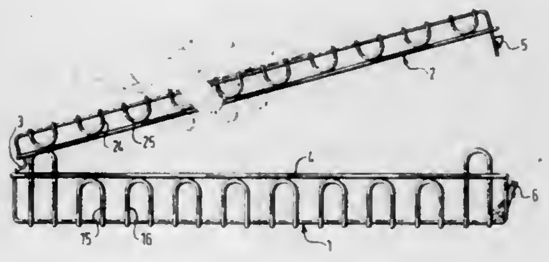
Harry Mönch, Knittlingen, Germany, assignor to Richard Wolf GmbH, Knittlingen, Germany

Filed Nov. 3, 1995, Ser. No. 552,607

Claims priority, application Germany, Nov. 12, 1994, 44 40 514.6

Int. Cl.^{6} A61L *2/06*

U.S. Cl. 422—300 **13 Claims**



1. A container for receiving and supporting medical instruments, comprising:
- a lower wire-formed part including first and second sides;
- a lid removably connected to said lower part and including a first end, a second end, a top side, means on said lid first end for positively locking said first end of said lid to said first side of said lower part to removably and pivotally connect said lid first end and said lower part first side for pivotal movement of said lid and lower part about said pivotal connection and configured to define a biasing means for normally urging said lid second end away from and into spaced relation with said lower part second side, and a handle positioned on said top side;
- latching means on one of said lid second end and said lower part second side for latching engagement and retention of said lid second end and said lower part second side when said lid second end is selectively displaced against said biasing means urgency into engagement with said lower part second side, said latching means being selectively operable for releasing said latched engagement of said lid second end and said lower part second side whereby said lid second side is urgently displaced by said biasing means into spaced relation with said lower part second side to thereby automatically open said container and provide access to medical instruments supported in and to be received in said container;
- means for supporting medical instruments, said supporting means being removably positioned in said lower part and defining at least one receptacle for receiving a medical instrument; and
- means for bracing a medical instrument within the at least one receptacle, said lid being pivotally movable between a first closed position in which said lid second end is engaged with said lower part second side and said brace means acts to restrict access to the at least one receptacle, and a second open position in which said lid second end is separated and spaced from said lower part second side and the at least one receptacle is open and accessible to permit selective movement of a medical instrument into and out from the at least one receptacle.

5,840,262

PROCESS FOR THE MANUFACTURE OF PURE LEAD OXIDE FROM EXHAUSTED BATTERIES

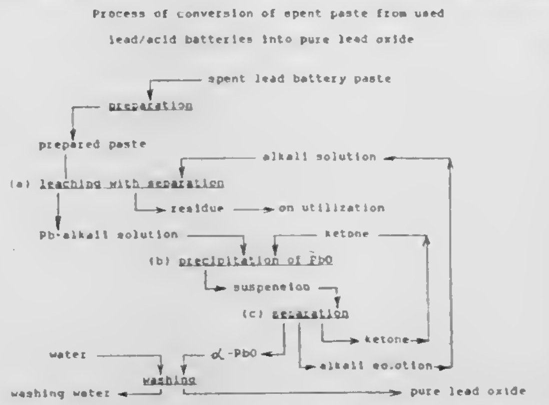
Efim Margulis, Haifa, Israel, assignor to Margulead Ltd., Haifa-Bay, Israel

Filed Feb. 7, 1996, Ser. No. 597,821

Claims priority, application Israel, Jan. 14, 1996, 116753

Int. Cl.^{6} C01G *21/00*

U.S. Cl. 423—92 **6 Claims**



1. A process for producing lead oxide in a pure state from a spent paste obtained from exhausted lead-acid batteries, which comprises the steps of:
- (a) leaching calcined and desulfurized spent paste with an aqueous concentrated solution comprising an alkali hydroxide at a temperature of above 100° C., and separating the solution from the residue;
- (b) precipitating lead oxide from the solution obtained in step (a), by adding a volatile ketone, and
- (c) separating from the resulting suspension the lead oxide, thus producing after washing a pure α-lead oxide, the alkali solution and ketone being recycled to the process.

5,840,263

FLUE GAS TREATING PROCESS AND SYSTEM

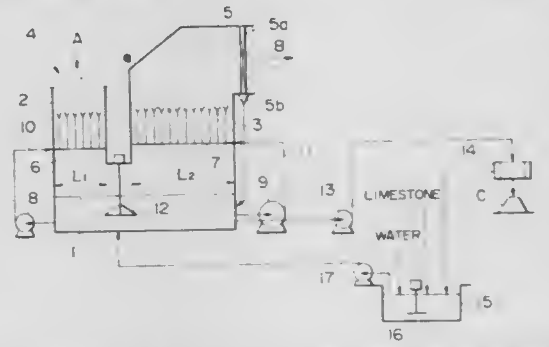
Takeo Shinoda; Tamotsu Higuchi; Shinichiro Kotake; Kiyoshi Okazoe; Tatsuto Nagayasu; Koichiro Iwashita; Kenichiro Kawamichi, all of Tokyo; Susumu Okino, and Toru Takashina, both of Hiroshima-ken, all of Japan, assignors to Mitsubishi Heavy Industries, Ltd., Tokyo, Japan

Filed May 5, 1997, Ser. No. 848,838

Claims priority, application Japan, May 30, 1996, 8-136455; Jun. 20, 1996, 8-159704

Int. Cl.^{6} B01D *53/34*

U.S. Cl. 423—243.01 **14 Claims**



1. A flue gas treating process for removing at least sulfur dioxide and dust present in flue gas by gas-liquid contact with an absorbing fluid, which comprises:
- feeding an absorbing fluid into a tank of a gas-liquid contact apparatus wherein said gas-liquid contact apparatus comprises an inlet side liquid column absorption tower extending upwardly from a lateral part of the tank and having a uniform cross section which encompasses a first area of gas liquid

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contact and having a plurality of spray pipes, and further comprises an outlet side liquid column absorption tower extending upwardly from another lateral part of the tank and having a uniform cross section which encompasses a second area of gas-liquid contact and having a plurality of spray pipes, wherein the cross-section of said inlet side liquid column absorption tower is smaller than the cross section of said outlet side liquid column absorption tower;

flowing untreated flue gas in a downward direction into said inlet side absorption tower, at a flow velocity value favorable for the collection of dust and the absorption of sulfur dioxide, while spraying the absorbing fluid in an upward direction from said tank via the plurality of spray pipes of the inlet side absorption tower, at a feed rate value wherein dust concentration in the flue gas is reduced, thereby contacting the untreated flue gas with the absorbing fluid to reduce the dust concentration and sulfur dioxide concentration; and

flowing the flue gas in an upward direction toward said outlet side absorption tower, at a flow velocity value favorable for the absorption of sulfur dioxide, while spraying the absorbing fluid in an upward direction from said tank via the plurality of spray pipes of the outlet side absorption tower, at a feed rate value wherein at least the sulfur dioxide concentration is reduced, thereby contacting the flue gas with the absorbing fluid to further reduce the dust concentration and sulfur dioxide concentration.

5,840,264

CRYSTALLINE INORGANIC OXIDE COMPOSITIONS PREPARED BY NEUTRAL TEMPLATING ROUTE

Thomas J. Pinnavaia, and Peter T. Tanev, both of East Lansing, Mich., assignors to Board of Trustees operating Michigan State University, East Lansing, Mich.

Continuation-in-part of Ser. No. 293,806, Aug. 22, 1994, abandoned. This application Dec. 14, 1994, Ser. No. 355,979

Int. Cl.^{6} C01B *33/20*

U.S. Cl. 423—277 **4 Claims**

1. A calcined crystalline inorganic oxide composition having a framework wall defining uniform framework-confined mesopores and textural mesopores external to the framework-confined mesopores prepared by a method which comprises mixing a neutral amine template and a neutral inorganic oxide precursor, hydrolysis of the precursor with an aqueous solution optionally in the presence of co-solvent to form a gel, aging of the gel to form the crystalline composition, which is then calcined wherein the composition has a particle size of less than about 400 Å, wherein the composition has a N_2 adsorption-desorption isotherm with at least one hysteresis loop, wherein the ratio of the textural mesopores to the framework-confined mesopores is above about 0.2, wherein the composition has a specific surface area from about 300 to 1500 m^2/g, wherein the composition has a wall thickness of at least 15 Å, wherein crystalline inorganic oxide composition has the formula:

$$A_xL_yM_zE_pO_q$$

A is optional and is at least one element selected from the group consisting of Ca, Mg, Zn and Cu; L is optional and is at least one element selected from the group consisting of B, Al, Ga, Cr and Fe; M is at least one element selected from the group consisting of Si, Ge, Ti, V, and Zr; E is optional and is at least one element selected from the group consisting of V, W and Mo; O is oxygen and x, y, z, p and q are the molar parts of A, L, M, E and O, respectively, wherein x when present is between 0.001 and 1; y when present is between 0.001 and 2; z when present is between 0.001 and 1; p when present is between 0.001 and 2 and is between 1 and 6 and wherein the composition contains at least one of A, L, and E; and wherein the composition has at least one diffraction pattern selected from the group consisting of FIGS. 2, 3, 7, 8 and 9.

5,840,265

CARBON FIBERS AND PROCESS FOR THEIR PRODUCTION

Iwao Yamamoto, and Akihiko Yoshiya, both of Kagawa, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Filed Aug. 14, 1996, Ser. No. 689,777

Claims priority, applicatinn Japan, Aug. 18, 1995, 7-233447

Int. Cl.^{6} D01F *9/12*

U.S. Cl. 423—447.2 **12 Claims**

1. Pitch based carbon fibers characterized in that their thermal conductivity is at least 1,000 W/m·K as measured at room temperature, their electrical resistivity is at most 1.2 μΩm, their tensile modulus is at least 95 ton/mm^2, their compression strength is at least 30 kg/mM^2, and the ratio of crack-free fibers to cracked fibers is from 5/95 to 30/70, where the crack-free fibers are fibers having no cracks in their cross section, and the cracked fibers are fibers having cracks in their cross section.

5,840,266

DEHYDRATION OF FLUORIDE MIXTURES

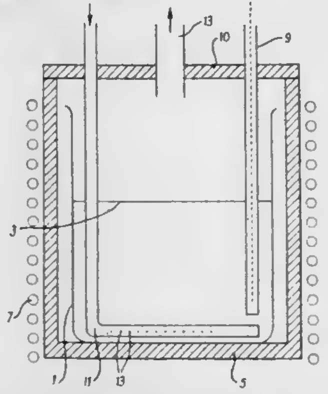
Robert Glyn Lewin, Bury, and Graham Hodgson, Lancashire, both of United Kingdom, assignors to British Nuclear Fuels plc - Springfield Works, United Kingdom

Continuation of Ser. No. 629,331, Apr. 8, 1996, abandoned, which is a continuation of Ser. No. 395,657, Feb. 28, 1995, abandoned, which is a continuation of Ser. No. 182,945, Jan. 18, 1994, abandoned. This application Sep. 12, 1997, Ser. No. 928,133

Claims priority, application United Kingdom, Jan. 19, 1993, 9300956

Int. Cl.^{6} C01B *7/19;* **C25D** *21/18*

U.S. Cl. 423—483 **13 Claims**



1. A process for the treatment of a mixture comprising an inorganic fluoride salt and hydrofluoric acid, wherein the mixture has an excess of hydrofluoric acid as compared with a stoichiometric composition according to the formula $MF_n.HF$ where M is a cation same as the cation of the inorganic fluoride salt and having a valency n, said mixture also comprising at least 0.2 weight percent water, the process comprising the steps of:

(a) forming a liquid phase of the mixture by melting the salt therein at an elevated temperature of at least 70° C.; and

(b) feeding an inert gas through the liquid phase of the mixture to remove the water by physical forced evaporation at the elevated temperature.

5,840,267

METHOD FOR PRODUCING METAL OXIDE POWDERS

Kunio Saegusa, Ibaraki, Japan, assignor to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Jun. 27, 1996, Ser. No. 670,536

Claims priority, application Japan, Jul. 6, 1995, 7-196193

Int. Cl.^{6} C01B *13/32;7/01;7/09;7/13*

U.S. Cl. 423—592 **6 Claims**

1. A method for producing a metal oxide powder which comprises heating a metal or metals in an atmosphere gas comprising

(a) a halogen gas, a hydrogen halide gas or a mixture of these gases in a concentration of from 0.5% by volume or to 99.5% by volume; and (b) oxygen, water vapor or a mixture of these gases in a concentration of from 0.5% by volume to 99.5% by volume.

5,840,268

METHOD FOR PREPARING AN ULTRAFINE POWDER

Takayasu Ikegami, and Noriko Saito, both of Tsukuba, Japan, assignors to National Institute for Research in Inorganic Materials, Tsukuba, Japan

Filed Oct. 23, 1996, Ser. No. 731,995

Int. Cl.^{6} C01G *1/02*

U.S. Cl. 423—592 **12 Claims**

1. A method for preparing an ultrafine powder, which comprises forming a precipitate by reacting a hydroxide precipitate-forming agent to an aqueous solution containing at least one metal ion capable of forming a hydroxide precipitate which forms a stable floc in the presence of sulfate ions, adding sulfate ions before or after forming the precipitate, to let the formed precipitate form a stable floc, and then dispersing the precipitate in an organic solvent without drying it, followed by drying to obtain independently separated amorphous or crystalline primary particles having an average particle size of at most 0.2 μm.

8. A method for preparing an ultrafine powder, which comprises forming a precipitate by reacting a hydroxide precipitate-forming agent to an aqueous solution containing at least one metal ion capable of forming a hydroxide precipitate of which the average particle size of primary particles is at most 0.2 μm, followed by filtration, dispersing the precipitate, before the precipitate dries up, in an organic solvent capable of dissolving water, followed by filtration, and then dispersing the precipitate in an organic solvent in which the solubility of water is negligible, followed by drying.

5,840,269

METHOD OF PREPARING A DOUBLE LAYERED NICKEL HYDROXIDE ACTIVE MATERIAL

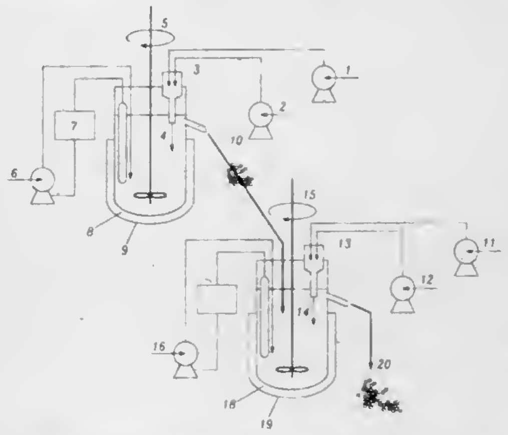
Dong Yup Shin, Kyungki-do; Jin-kyung Kim, and Yeong-chan Eun, both of Chungcheongnam-do, all of Rep. of Korea, assignors to Samsung Display Devices Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 19, 1997, Ser. No. 994,259

Claims priority, application Rep. of Korea, Aug. 4, 1997, 1997-37201

Int. Cl.^{6} C01B *13/36;* **C01G** *53/00*

U.S. Cl. 423—592 **12 Claims**



1. A method of preparing a double layered active material of nickel hydroxide comprising the steps of:

(1) spraying a first solution comprising nickel sulfate solution and aqueous ammonia into a first reaction bath into which sodium hydroxide solution is injected;

(2) reacting said first solution with sodium hydroxide for a time sufficient to form a core of nickel hydroxide;

(3) injecting said core of nickel hydroxide into a second reaction bath into which sodium hydroxide is injected;

(4) spraying a second solution comprising nickel sulfate solution and aqueous ammonia into said second reaction bath; and

(5) reacting said second solution and sodium hydroxide with said core of nickel hydroxide and growing an outer layer on said core of nickel hydroxide, said outer layer having a different physical property from said core of nickel hydroxide.

5,840,270

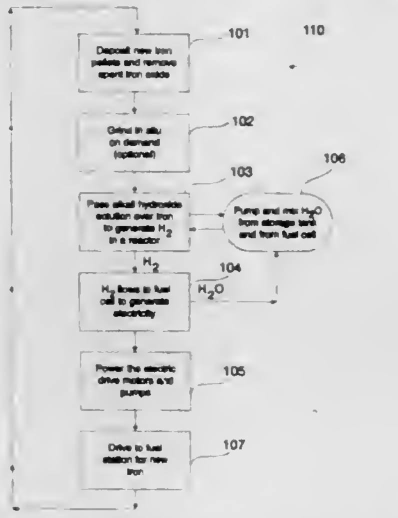
CATALYTIC METHOD OF GENERATING HYDROGEN

John Werth, Princeton, N.J., assignor to H Power Corporation, Belleville, N.J.

Continuation-in-part of Ser. No. 52,561, Apr. 23, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 477,521

Int. Cl.^{6} C01B *3/08*

U.S. Cl. 423—658 **30 Claims**


101
110
Deposit new iron pellets and remove spent iron oxide
102
Grind in situ on demand (optional)
103
106
Pass alkali hydroxide solution over iron to generate H2 in a reactor
Pump and mix H2O from storage tank and from fuel cell
H2
104
H2O
H2 flows to fuel cell to generate electricity
105
Power the electric drive motors and pumps
107
Drive to fuel station for new iron

1. An improved H_2O—iron reaction method, comprising reacting H_2O and iron material to form hydrogen in situ, aboard an electrical vehicle, in the presence of a catalyst comprising a dissolved alkali metal hydroxide, said alkali metal hydroxide enhancing said H_2O—iron reaction.

16. An improved H_2O—iron reaction method, comprising the steps of:

reacting H_2O and iron material to form hydrogen in the presence of a catalyst comprising a dissolved alkali metal hydroxide, said alkali metal hydroxide enhancing said H_2O—iron reaction; and

allowing said reaction to proceed at temperatures below approximately 250° C., at a conversion rate of iron to iron oxide exceeding 2%/minute.

5,840,271

SYNTHETIC MATERIAL WITH HIGH VOID VOLUME ASSOCIATED WITH MESOPOROUS TORTUOUS CHANNELS HAVING A NARROW SIZE DISTRIBUTION

Jose Carrazza, San Antonio; Jose Rafael Cordova, El Paraiso; Juan Lujano, Los Chaguaramos, and Jose Manuel Cruz, Los Pequs, all of Venezuela, assignors to Intevep, S.A., Caracas, Venezuela

Continuation-in-part of Ser. No. 605,286, Feb. 9, 1996, abandoned. This application Jan. 31, 1997, Ser. No. 794,204

Int. Cl.^{6} C01B *33/36;* **C04B** *38/00*

U.S. Cl. 423—700 **19 Claims**

1. A composition of matter, comprising an inorganic porous metal oxide material, said material being a non-crystalline material having a short range order structure and having wall portions defining mesopore-sized channels having a mean diameter of between about 15 Å to about 100 Å and a narrow diameter

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distribution of less than or equal to about 30 Å, said material having a void volume from said mesopore-sized channels of at least about 0.1 cc/g.

5,840,272
IMAGING INFECTIOUS FOCI WITH HUMAN IGM 16.88

Ramaswamy Subramanian, Frederick, Md., assignor to PerImmune Holdings, Inc., Rockville, Md.

Continuation-in-part of Ser. No. 346,988, Nov. 30, 1994, Pat. No. 5,549,882, which is a continuation of Ser. No. 899,661, Jun. 9, 1992, abandoned. This application Aug. 22, 1996, Ser. No. 701,420

Int. Cl.^{6} A61K *51/00;36/14*

U.S. Cl. 424—1.49 **6 Claims**

1. A method for imaging infectious foci in an animal comprising administering radiolabeled human IgM 16.88, ATCC accession number HB 8495, to the animal in an amount effective for detection by scanning, scanning said animal to detect the radiolabeled 16.88 and identifying the location of the radiolabeled 16.88, identifying the location of infectious foci thereby.

5,840,273
TECHNETIUM-99M COMPLEXES FOR USE AS RADIOPHARMACEUTICALS

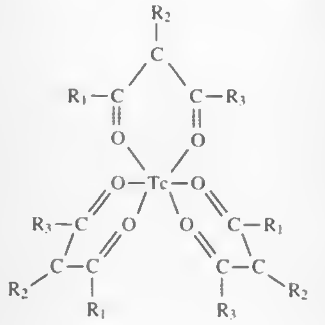
Dennis L. Nosco, 1026 Driftwood Trails Dr., Florissant, Mo. 63031

Division of Ser. No. 855,256, Mar. 23, 1992, Pat. No. 5,419,905, which is a division of Ser. No. 605,207, Oct. 29, 1990, Pat. No. 5,116,598. This application May 26, 1995, Ser. No. 451,637

Int. Cl.^{6} A61K *51/04*

U.S. Cl. 424—1.65 **13 Claims**

1. A technetium-99m radiopharmaceutical complex for examining the renal function, said complex having the formula:



wherein

each of the symbols R_1–R_3 is individually selected from the group consisting of hydrogen, straight or branched, unsubstituted or hydroxy or carboxy substituted alkyl group having 1–4 carbon atoms, and ACOOH, wherein A is a straight or branched, unsubstituted or hydroxy or carboxy substituted alkyl group having 0–4 carbon atoms; and

Tc represents technetium-99m;

with the provisos that

(a) at least one of the symbols R_1–R_3 is ACOOH; and

(b) at most three of the symbols R_1–R_3 are ACOOH:

or a pharmaceutically acceptable salt of this complex.

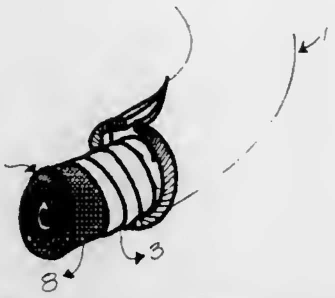
5,840,274
DEFLATION RESISTANT TIRE AND INSERT APPARATUS

Thomas R. Bishop, 1423-B N. Broadway, Escondido, Calif. 92026, assignor to Thomas R. Bishop, Diamond Bar, Calif.

Filed Nov. 13, 1995, Ser. No. 556,320

Int. Cl.^{6} B60C *7/12*

U.S. Cl. 152—157 **7 Claims**



1. A tire comprising a casing containing a ring made from flexible laminated plastic sheets, having a plurality of gas filled spaces therebetween, rolled into a generally cylindrical shape an disposed in a ring configuration, with opposite ends of said cylinder disposed in juxtaposition to each other.

5,840,275
ULTRASONIC CONTRAST AGENT WITH POLYMERIC GAS OR AIR FILLED MICROBALLOONS

Daniel Bichon, Montpellier; Philippe Bussat, Collonges S/Saleve, both of France, and Michel Schneider, Troinex, Switzerland, assignors to Bracco International B.V., Netherlands

Continuation of Ser. No. 33,435, Mar. 18, 1993, abandoned, which is a continuation of Ser. No. 695,343, May 3, 1991, abandoned. This application Aug. 16, 1994, Ser. No. 291,542

Claims priority, application European Pat. Off., May 18, 1990, 90810367

Int. Cl.^{6} A61B *8/13*

U.S. Cl. 424—9.52 **13 Claims**

1. An ultrasonic contrast agent comprising a suspension of air or gas microballoons in a physiologically acceptable aqueous carrier liquid in a concentration of 10^5 to 10^{10} microballoons/ml, the microballoons having a mean size in the range of 0.5 to 1,000 microns, are bounded by a soft, elastic, 50–500 nm thick polymer membrane filled with air or a physiologically acceptable gas, the membrane being temporarily deformable under pressure variations and made from a biodegradable, synthetic, resilient, interfacially depositable polymer selected from the group consisting of polysaccharides, polylactides, polyglycolides, copolymers of polylactides and polyglycolides, copolymers of lactides and lactones, poly-(ortho)esters, polydioxanone, poly-β-aminoketones, polyphosphazenes, polyanhydrides and polyalkyl-(cyano)acrylates.

5,840,276
ACTIVATABLE INFUSABLE DISPERSIONS CONTAINING DROPS OF A SUPERHEATED LIQUID FOR METHODS OF THERAPY AND DIAGNOSIS

Robert E. Apfel, New Haven, Conn., assignor to Apfel Enterprises, Inc., New Haven, Conn.

Filed Jan. 8, 1997, Ser. No. 780,337

Int. Cl.^{6} A61K *49/04;* **C09K** *3/00*

U.S. Cl. 424—9.52 **31 Claims**

1. A dispersion for therapeutic or diagnostic use comprising an aqueous continuous phase suitable for infusion into a human or other animal and dispersed drops comprising a practically immiscible superheated liquid, said drops having an average diameter of 0.05–20 μm, being physically stable in said composition and in said body and having an amount of superheat of at least 17 Celsius degrees, said amount of superheat being sufficient to permit their in-body nucleation by a level of ionizing radiation or ultrasound tolerable to said body.

5,840,277
TREATMENT OF CHRONIC PULMONARY INFLAMMATION

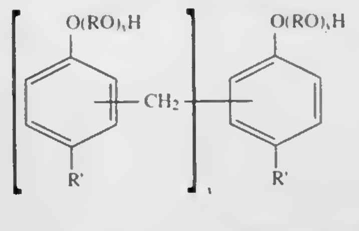
Andrew J. Ghio, Durham, N.C., and Thomas P. Kennedy, Richmond, Va., assignors to Charlotte Hospital Authority, Charlotte, N.C.

Continuation-in-part of Ser. No. 413,699, Mar. 30, 1995, which is a continuation-in-part of Ser. No. 219,770, Mar. 29, 1994, Pat. No. 5,474,760, which is a continuation-in-part of Ser. No. 299,316, Aug. 31, 1994, Pat. No. 5,512,270, which is a continuation-in-part of Ser. No. 39,732, Mar. 30, 1993, abandoned. This application Apr. 15, 1996, Ser. No. 632,275

Int. Cl.^{6} A61K *9/12;31/765*

U.S. Cl. 424—45 **17 Claims**

1. A method of inhibiting activation of nuclear transcription factor NF-κB in a mammal comprising administering to a mammal an effective amount of a compound of the formula:



where R=ethylene, R'=C_4 to C_{14} straight chain or branched alkyl, x is greater than 1, and y=8 to 18, whereby activation of nuclear transcription factor NF-κB is inhibited.

5,840,278
NASAL SPRAY HAVING A MINERAL VITAMIN COMPONENT, A MINERAL COMPONENT AND ALOE VERA

Thomas Coleman, 9536 Wilshire Blvd. #410, Beverly Hills, Calif. 90212

Filed Feb. 20, 1997, Ser. No. 803,535

Int. Cl.^{6} A61K *9/12*

U.S. Cl. 424—45 **6 Claims**

1. An aqueous nasal spray formulation consisting essentially of: 25–40% by volume of a vitamin component blend consisting of vitamin C, rose hips, acerola and lemon bioflavenoids; 8–12% by volume of a mineral component blend consisting of zinc, potassium, calcium and magnesium; 8–12% by volume aloe vera and 45–60% by volume of a water-based solvent.

5,840,279
PHARMACEUTICAL POWDER CARTRIDGE WITH INTEGRATED METERING DEVICE AND INHALER FOR POWDERED MEDICAMENTS

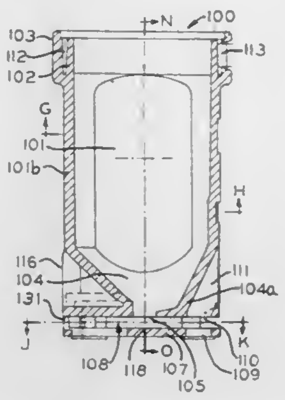
Andre Narodylo, Linsengericht; Wolfgang Gottenauer, Bruchkobel; Joachim Goede, Hanau, all of Germany; Coenraad Lerk, Peize, and Anne H. De Boer, Drachten, both of Netherlands, assignors to ASTA Medica Aktiengesellschaft, Dresden, Germany

Filed Jun. 21, 1996, Ser. No. 667,414

Claims priority, application Germany, Jun. 21, 1995, 195 22 415.9; Jun. 21, 1995, 195 22 416.7

Int. Cl.^{6} A61K *9/14*

U.S. Cl. 424—46 **45 Claims**



1. A replaceable pharmaceutical powder cartridge for powder inhalers for holding a supply of medicament for a large number of doses of pharmaceutical powder, said replaceable cartridge including an integrated metering device which comprises at least one metering cavity for holding a predetermined quantity of a pharmaceutical powder, said integrated metering device comprising a metering slide which is movable from a filling position wherein medicament is transferred from said supply into said metering cavity into an emptying position wherein said medicament in said metering cavity is available to a user of the inhaler by substantially transverse movement of said metering slide with respect to the flow direction of pharmaceutical powder into said metering cavity.

5,840,280
SILICONE COPOLYOL FORMULATED HAIRSPRAY COMPOSITIONS

Joseph Raymond Faryniarz, Oxford, Conn., and Susan Kay Hentrich, Alton, Ill., assignors to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.

Filed May 30, 1996, Ser. No. 655,171

Int. Cl.^{6} A61K *7/11*

U.S. Cl. 424—47 **12 Claims**

1. A non-foaming hairspray composition comprising:

(i) from 0.5 to 10% by weight of a film-forming resin having a number average molecular weight of from 5,000 to 100,000;

(ii) from 0.02 to 0.5% by weight of a propoxylated non-ethoxylated silicone copolyol having molecular weight 500 to 30,000; and

(iii) from 70 to 99% by weight of a cosmetically acceptable carrier selected from the group consisting of C_1–C_4 alkanol, water and mixtures thereof, the carrier being up to 30% water, to deliver the resin and silicone copolyol onto the hair.

5,840,281
ORAL COMPOSITION

Abdul Gaffar, Princeton; John Afflitto, Brookside, and Malathy Subramanian, Somerset, all of N.J., assignors to Colgate Palmolive Company, New York, N.Y.

Division of Ser. No. 1,480, Jan. 7, 1993, Pat. No. 5,368,845. This application Aug. 11, 1994, Ser. No. 288,846

Int. Cl.^{6} A61K *7/16;7/22*

U.S. Cl. 424—49 **20 Claims**

1. An oral composition comprising an antiplaque amount of a lanthionine-containing bacteriocin and an antiplaque-increasing amount of a polyphosphonate which is an inhibitor of the crystallization of hydroxyapatite comprising ions of a geminal C_{1-2} alkyl diphosphonate or a polymer or copolymer of vinyl phosphonic acid.

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5,840,282

LIGHT SCREENING COMPOSITIONS

Hans Ulrich Gonzenbach, Geneva; Peter Gygax, Fällanden; Bernhard Hostettler, and Ulrich Huber, both of Zürich, all of Switzerland, assignors to Givaudan-Roure (International) SA, Vernier-Geneva, Switzerland

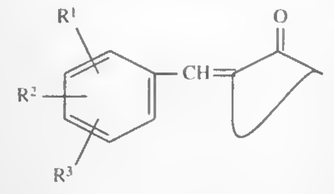
Filed Jun. 13, 1996, Ser. No. 662,386

Claims priority, application European Pat. Off., Jun. 21, 1995, 95810416

Int. Cl.^{6} A61K *7/42;7/44;7/00:31/135*

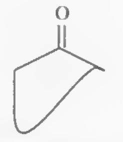
U.S. Cl. 424—59 **13 Claims**

1. A photostable, cosmetic light-screening composition, comprising, in a cosmetically acceptable vehicle containing at least one fatty phase, about 0.75 to about 5% by weight, of a dibenzoylmethane derivative UV-A screening agent and at least about 0.5% to about 2% by weight, of a stabilizer of the general formula



I

wherein



II

represents a bridged cyclic compound which is selected from the group consisting of camphor, norcamphor, nopinone, pinocamphone, verbanone, thujone, and 4,7-methano-octahydro-inden-5-one, and wherein R^1, R^2, R^3 independently signify hydrogen, lower alkyl, lower alkoxy, or 2 adjacent radicals represent methylenedioxy, and where, in case of the camphor derivatives, the ratio of the UV-A filter to the stabilizer is greater than about 1.5:1 and where 4-methylbenzylidene camphor is excluded from the scope of formula I.

5,840,283

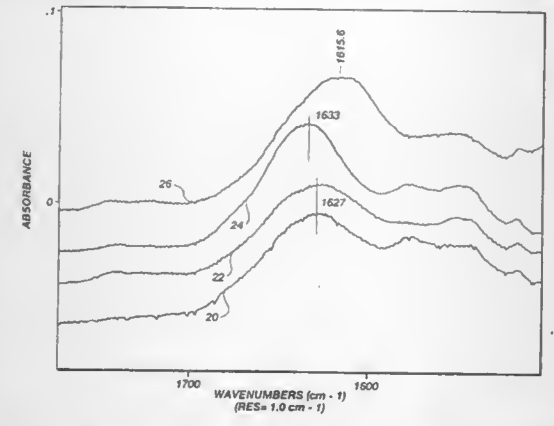
COMPOSITION AND METHOD FOR TREATING DISEASED NAILS

James L. Sorenson, Salt Lake City, and Robert V. Petersen, Murray, both of Utah, assignors to Sorenson Pharmaceutical, Inc., Salt Lake City, Utah

Continuation of Ser. No. 528,302, Sep. 14, 1995, abandoned. This application Aug. 15, 1997, Ser. No. 921,771

Int. Cl.^{6} A61K *7/04;38/43*

U.S. Cl. 424—61 **12 Claims**



1. A nail-permeable composition for treatment of disease conditions in animal nails comprising a proteolytic enzyme component having an effective amount of proteolytic enzyme in a concentration of from about 0.1% to about 15% by weight of the applied composition to facilitate permeation through animal nails without causing debridement and a medicament component having an effective amount of disease-affecting medicament in admixture with said proteolytic enzyme component to form a topically spreadable composition.

5,840,284

Patent Not Issued For This Number

5,840,285

DERMATOLOGICAL COMPOSITIONS USING A SERIES OF UNUSUALLY SAFE ESTERS AS COSMETIC EMOLLIENTS WITH UNIQUE AND IDEAL PHYSICAL PROPERTIES

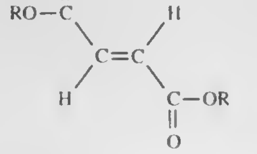
Arnold W. Fogel, Upper Saddle River, N.J., assignor to Bernel Chemical Co., Inc, Englewood, N.J.

Continuation-in-part of Ser. No. 806,927, Dec. 11, 1991, abandoned. This application Nov. 19, 1993, Ser. No. 154,562

Int. Cl.^{6} A61K *7/025*

U.S. Cl. 424—64 **10 Claims**

1. An emollient composition consisting essentially of compounds of the structure:



where R is a blend of C_{12}–C_{15} straight chain alkyl groups and wherein said composition is a solid at room temperature and melts at body temperature.

5,840,286

METHODS OF MAKING LOW RESIDUE ANTIPERSPIRANT GEL-SOLID STICK COMPOSITIONS

John Michael Gardlik, Cincinnati; Gerald John Guskey, Montgomery, and Curtis Bobby Motley, West Chester, all of Ohio, assignors to Procter & Gamble Company, Cincinnati, Ohin

Filed Dec. 20, 1996, Ser. No. 771,088

Int. Cl.^{6} A61K *7/37;7/00*

U.S. Cl. 424—65 **29 Claims**

1. A method for making an anhydrous antiperspirant gel-solid stick composition, which method comprises the steps of:

(A) combining the following components:
  (i) from about 0.5% to about 60% by weight of particulate antiperspirant active;
  (ii) from about 1% to about 15% by weight of a solid non-polymeric gellant selected from the group consisting of fatty acid gellants, esters and amides of fatty acid gellants, hydroxy fatty acids, cholesterolic materials, alkyl amides other than n-acyl amino acid derivatives, lanolinolic materials, and combinations thereof, wherein the solid non-polymeric gellant is substantially free of organic polymeric gellants, inorganic thickening agents, dibenzylidene alditol, n-acyl amino acid derivatives or combinations thereof, and
  (iii) from about 10% to about 80% by weight of an anhydrous liquid carrier having an average solubility parameter of from about 3 to about 13 $(cal/cm^3)^{0.5}$ and
(B) liquefying the solid non-polymeric gellant; and then
(C) solidifying the liquefied gellant in the presence of the anhydrous liquid carrier and particulate antiperspirant active

to form an antiperspirant gel-solid composition having a visible residue index of from about 11 to about 30 L-value, a product hardness of from about 500 gram-force to about 5,000 gram-force, and a ratio of an elastic modulus to a viscous modulus of from about 0.1 to about 100,

wherein the refractive indices of the particulate antiperspirant active, the solid non-polymeric gellant, and the anhydrous liquid carrier are not matched.

5,840,287

ANTIPERSPIRANT COMPOSITIONS CONTAINING GELLANTS IN THE FORM OF ALKYL AMIDES OF DI- AND TRI-CARBOXYLIC ACIDS

Gerald John Guskey, Montgomery; Raymond Joseph Lo, and David Frederick Swaile, both of Cincinnati, all of Ohio, assignors to Procter & Gamble Company, Cincinnati, Ohin

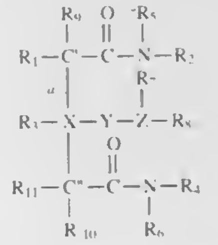
Filed Dec. 20, 1996, Ser. Nn. 771,183

Int. Cl.^{6} A61K *7/32;7/38;7/34;7/00*

U.S. Cl. 424—65 **17 Claims**

1. An antiperspirant composition comprising:

(A) an antiperspirant active;
(B) from about 0.1% to about 25% by weight of a gellant of the formula:



  (a) R_1 is nil, hydroxy, hydrogen, aryl, siloxane or saturated or unsaturated, substituted or unsubstituted, straight, branched or cyclic chain C_1–C_{22} alkyl, C_1–C_{22} alkenyl, C_1–C_{22} alkoxy, C_1–C_{22} alkyl esters, C_1–C_{22} alkyl ethers, or C_1-C_{22} alkyl substituted aryl;
  (b) R_2, R_4, R_5 and R_6 are independently or together, hydrogen, hydroxy, aryl, siloxane or saturated or unsaturated, substituted or unsubstituted, straight, branched or cyclic chain C_1–C_{22} alkyl, C_1–C_{22} alkenyl, C_1–C_{22} alkoxy, C_1–C_{22} alkyl esters, C_1–C_{22} alkyl ethers, or C_1–C_{22} alkyl substituted aryl;
  (c) R_3 is nil, hydroxy, hydrogen, saturated or unsaturated, substituted or unsubstituted, straight, branched or cyclic chain C_1–C_4 alkyl, C_1–C_4 alkenyl, C_1–C_4 alkoxy, C_1 C_4 alkyl esters or C_1–C_4 alkyl ethers;
  (d) R_7 and R_8 are independently or together, nil, hydrogen, hydroxy, aryl, siloxane or saturated or unsaturated, substituted or unsubstituted, straight, branched or cyclic chain C_1–C_{22} alkyl, C_1–C_{22} alkenyl, C_1- C_{22} alkoxy, C_1–C_{22} alkyl esters, C_1–C_{22} alkyl ethers, or C_1–C_{22} alkyl substituted aryl;
  (e) R_9 is nil or hydrogen;
  (f) R_{10} and R_{11} are independently or together, nil, hydrogen, hydroxy, aryl, siloxane or saturated or unsaturated, substituted or unsubstituted, straight, branched or cyclic chain C_1–C_6 alkyl, C_1- C_6 alkenyl, C_1–C_6 alkoxy, C_1–C_6 alkyl esters, C_1–C_6 alkyl ethers, or C_1–C_6 alkyl substituted aryl;
  (g) X is nil, nitrogen, aryl or $\left(CH_2\right)_n$ where n is an integer from 1 to 6;
  (h) Y is nil, acyl or carbonyl;
  (i) Z is nil, hydrogen, hydroxy, aryl, siloxane, nitrogen or saturated or unsaturated, substituted or unsubstituted, straight, branched or cyclic chain C_1–C_{22} alkyl, C_1–C_{22} alkenyl, C_1–C_{22} alkoxy, C_1–C_{22} alkyl esters, C_1–C_{22} alkyl ethers, or C_1–C_{22} alkyl substituted aryl; and
  (j) "a" is a double or single bond provided:
    (i) when X is nil, Y, Z, R_3, R_7 and R_8 are nil, C' is bonded directly to C" and R_1 is not a hydrogen;
    (ii) when X and Z are not nil and Y is nil, X is directly bonded to Z;
    (iii) when Z is nil, a hydrogen or a hydroxy, R_7 and R_8 are nil; and
    (iv) when "a" is a double bond, R_3 and R_9 are nil; and
(C) an anhydrous liquid carrier.

5,840,288

ANTIPERSPIRANT GEL-SOLID STICK COMPOSITION CONTAINING A MODIFIED SILICONE CARRIER

Gerald John Guskey, Montgomery; Thomas Vincent Orr, Cincinnati; James Robert Schwartz, West Chester, all of Ohio, and James Merle Heinrich, Fairfield, Conn., assignors to Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 20, 1996, Ser. No. 771,614

Int. Cl.^{6} A61K *7/32;7/34;7/38;7/00*

U.S. Cl. 424—65 **25 Claims**

1. An anhydrous antiperspirant gel-solid stick composition comprising:

  (a) from about 0.5% to about 60% by weight of particulate antiperspirant active;
  (b) from about 1% to about 15% by weight of a solid non-polymeric gellant that is substantially free of organic polymeric gellants, dibenzylidene alditol, inorganic thickening agents, derivatives of n-acyl amino acid, or combinations thereof;
  (c) from about 10% to about 80% by weight of an anhydrous liquid carrier containing a silicone liquid carrier selected from the group consisting of polyalkylsiloxanes, polyalkyarylsiloxanes, polyestersiloxanes, polyethersiloxane copolymers, polyfluorosiloxanes, polyaminosiloxanes, and combinations thereof; and

wherein the composition has a visible residue index of from about 11 to about 30 L-value, a product hardness of from about 500 gram-force to about 5,000 gram-force, and a ratio of an elastic to viscous moduli of from about 0.1 to about 100.

5,840,289

ANTIPERSPIRANT AEROSOL COMPOSITION AND METHOD OF MAKING SAME

Peter John Hall, Bromborough, United Kingdom, assignor to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.

Filed Feb. 24, 1997, Ser. No. 804,872

Claims priority, application United Kingdom, Feb. 29, 1996, 9604340

Int. Cl.^{6} A61K *7/38;7/32;7/00*

U.S. Cl. 424—68 **6 Claims**

1. A suspension antiperspirant aerosol composition for topical application to the human skin comprising 1–30% by weight of solid milled activated aluminium chlorohydrate, 1–30% by weight of a liquid masking agent 30-90% of a propellant for expelling the composition from a container and a carrier.

5,840,290

INJECTABLE BIO-ACTIVE GLASS IN A DEXTRAN SUSPENSION

Larry L. Hench, London, England; Jon K. West; Guy LaTorre, both of Gainesville, Fla.; June Wilson, London, England; William Toreki, III, Gainesville, Fla., and Christopher Batich, Gainesville, Fla., assignors to University of Florida Research Foundation, Gainesville, Fla.

Filed May 30, 1996, Ser. No. 657,713

Int. Cl.^{6} A61F *2/02;* **A61K** *9/50;* **B32B** *5/16*

U.S. Cl. 424—423 **3 Claims**

1. A pharmaceutically acceptable fluid composition particularly adapted for the repair, replacement, reconfiguration, reconstruction

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or augmentation of selected soft tussue and/or hard tissue (bone) anatomic structures capable of injection via a surgical needle into an animal comprising a homogenous suspension of bio-active and bio-compatible glass particulate composition having particle size from about 250 μm to about 90 μm in an aqueous solution of dextrans or of dextran derivatives having an average molecular weight of about 10,000 to about 2×10^6 Daltons and optionally one or more preservative, coloring, flow enhancing, or suspension enhancing agents.

5,840,291

BASE MATERIAL FOR HAIR COSMETICS

Misao Tsubakihara; Nana Wakita, both of Osaka; Kazuhiro Kato, and Tadanori Nakatsuse, both of Saitama, all of Japan, assignors to Mandom Corporation, and Wako Pure Chemical Industries, Ltd., both of Osaka, Japan

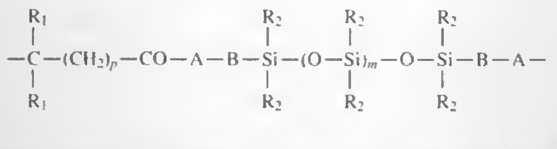
Continuation of Ser. No. 722,601, Sep. 27, 1996, abandoned. This application Oct. 14, 1997, Ser. No. 949,616

Claims priority, application Japan, Oct. 5, 1995, 7-286685

Int. Cl.^{6} C08G *77/06*

U.S. Cl. 424—70.12 **5 Claims**

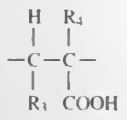
1. A base material for hair cosmetics, which comprises a linear block copolymer comprising 5 to 70% by weight of a polysiloxane segment having a repeating unit of the formula



$$-\underset{R_1}{\overset{R_1}{C}}-(CH_2)_p-CO-A-B-\underset{R_2}{\overset{R_2}{Si}}-(O-\underset{R_2}{\overset{R_2}{Si}})_m-O-\underset{R_2}{\overset{R_2}{Si}}-B-A-$$

wherein each R_1 is hydrogen, lower alkyl or cyano; each R_2 is hydrogen, alkyl, haloalkyl or aryl; A is NH or O; B is lower alkylene, oxygen interupted lower alkylene or lower alkenyloxy; p is 0 or an integer of 1 to 6; and m is 0 or an integer of 1 to 200;

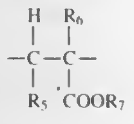
10 to 90% by weight of a monomer moiety of an ethylenically unsaturated carboxylic acid having a repeating unit of the formula



$$-\underset{R_3}{\overset{H}{C}}-\underset{COOH}{\overset{R_4}{C}}-$$

wherein R_3 is hydrogen, lower alkyl or carboxyl; and R_4 is hydrogen, lower alkyl or lower carboxyalkyl; and

80% or less by weight of a monomer moiety of an ethylenically unsaturated carboxylic acid ester having a repeating unit of the formula



$$-\underset{R_5}{\overset{H}{C}}-\underset{COOR_7}{\overset{R_6}{C}}-$$

wherein R_5 is a hydrogen, lower alkyl or alkoxycarbonyl; and R_6 is hydrogen, lower alkyl, lower carboxyalkyl or alkyloxycarbonylalkyl; and R_7 is alkyl.

5,840,292

HAIR TREATMENT COMPOSITION

G. Jae Lee, Trumbull, and Paul Vinski, Ridgefield, both of Conn., assignors to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.

Continuation of Ser. No. 812,529, Dec. 20, 1991, abandoned. This application Aug. 29, 1996, Ser. No. 705,070

Int. Cl.^{6} A61K *7/11*

U.S. Cl. 424—70.16 **6 Claims**

1. A hair treatment composition comprising:

(i) a water-insoluble, dispersible polymeric resin having a viscosity of less than about 2 centipoise at 25° C. when 10% is dispersed in water, present in an effective amount for setting hair, said resin being a diglycol/cyclohexanedimethanol/isophthalates/sulfoisophthalates polyester; and

(ii) a water-soluble amphoteric polymer present in an effective amount for setting hair, said amphoteric polymer being an acrylamide/acrylate/butylaminoethyl methacrylate copolymer, wherein said water-insoluble resin and amphoteric polymer have a relative wt. % ratio of 3:2 to 1:4.

5,840,293

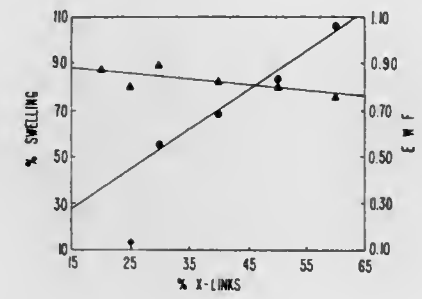
IONIC BEADS FOR CONTROLLED RELEASE AND ADSORPTION

Sergio Nacht, Los Altos; Richard Won, Palo Alto; Martin A. Katz, Menlo Park; Tai Cheng; Christine J. Y. Liau, both of Mountain View; Robert P. Eury, Half Moon Bay, and Michael Froix, Mountain View, all of Calif., assignors to Advanced Polymer Systems, Inc., Redwood City, Calif.

Continuation of Ser. No. 8,852, Jan. 25, 1993, abandoned, which is a continuation of Ser. No. 779,681, Oct. 21, 1991, abandoned, which is a continuation-in-part of Ser. No. 272,600, Nov. 16, 1988, abandoned. This application May 17, 1994, Ser. No. 245,307

Int. Cl.^{6} A61K *9/14;7/00*

U.S. Cl. 424—78.02 **18 Claims**



1. A topical composition comprising:

(a) a carrier suitable for topical application having a pH below about 6;

(b) substantially non-collapsible polymeric beads, each bead having an exterior surface and defining a network of internal pores open to the exterior surface, the exterior surface of each bead having a positive charge sufficient to promote adhesion of the bead to keratinic materials, dispersed within the carrier, the beads being formed from a crosslinked polymer bearing protonatable functionalities that are capable of retaining a cationic charge, the crosslinked polymer comprising a vinylpyridine selected from 2-vinylpyridine, 4-vinylpyridine, 3-methyl-2-vinylpyridine, 4-methyl-2-vinylpyridine, 6-methyl-2-vinylpyridine, 3-ethyl-2-vinylpyridine, 5-ethyl-2-vinylpyridine, 2-methyl-3-vinylpyridine, 2-methyl-4-vinylpyridine, 2-methyl-5-vinylpyridine, and 2-ethyl-5-vinylpyridine; and

(c) a substantially neutral impregnant that is a therapeutically or topically active substance retained inside the pore network of each bead.

5,840,294

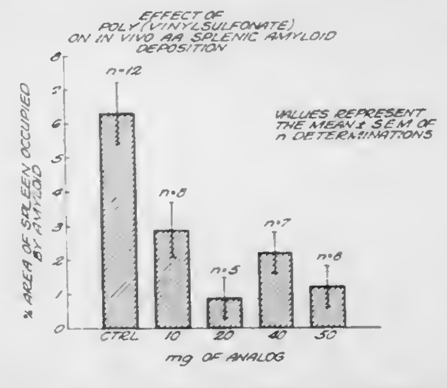
METHOD FOR TREATING AMYLOIDOSIS

Robert Kisilevsky; Walter Szarek, and Donald Weaver, all of Kingston, Canada, assignors to Queen's University at Kingston, Kingston, Canada

Continuation-in-part of Ser. No. 463,548, Jun. 5, 1995, which is a continuation-in-part of Ser. No. 403,230, Mar. 15, 1995, Pat. No. 5,643,562, which is a continuation-in-part of Ser. No. 315,391, Sep. 29, 1994, abandoned, which is a continuation-in-part of Ser. No. 219,798, Mar. 29, 1994, abandoned, which is a continuation-in-part of Ser. No. 37,844, Mar. 29, 1993, abandoned. This application Oct. 13, 1995, Ser. No. 542,997

Int. Cl.^{6} A61K *31/74;31/785;31/795;* A61F *2/02*

U.S. Cl. 424—78.31 **66 Claims**



1. A method for inhibiting amyloid deposition in a subject comprising administering to the subject an effective amount of a therapeutic compound, the therapeutic compound comprising at least one sulfonate group covalently attached to a carrier molecule, or a pharmaceutically acceptable salt thereof.

5,840,295

NERVE-DERIVED TRANSGLUTAMINASE ENZYME

Michal Schwartz, Rehovot, and Shoshana Eitan, Tel-Aviv, both of Israel, assignors to Yeda Research and Development Co., Ltd., Rehovot, Israel

Division of Ser. No. 99,759, Jul. 30, 1993, Pat. No. 5,514,565, which is a continuation-in-part of Ser. No. 840,783, Feb. 24, 1992, abandoned, which is a continuation-in-part of Ser. No. 573,580, Aug. 27, 1990, abandoned. This application Jun. 7, 1995, Ser. No. 467,202

Claims priority, application Israel, Jul. 30, 1992, 102686; Oct. 20, 1992, 103469; May 19, 1993, 105752

Int. Cl.^{6} A61K *38/45*

U.S. Cl. 424—94.5 **13 Claims**

1. A purified nerve-derived transglutaminase enzyme obtainable from injured fish optic nerve which converts IL-2 to a dimeric IL-2 having oligodendrocyte cytotoxic activity.

5,840,296

ENGINEERED CYTOTOXIC RIBONUCLEASE A

Ronald T. Raines, 2320 Lakeland Ave., Madison, Wis. 53704; Peter A. Leland, 4849 Sheboygan Ave. #321, Madison, Wis. 53705, and L. Lane Schultz, 2152 Allen Blvd., Apartment No. 1, Middleton, Wis. 53562

Filed Oct. 15, 1997, Ser. No. 950,866

Int. Cl.^{6} A61K *38/46;* C12N *9/16;9/22*

U.S. Cl. 424—94.6 **9 Claims**

9. A method for creating novel engineered ribonuclease A molecules having cytotoxic properties comprising the steps of creating an altered gene encoding a ribonuclease A, the gene having an alteration in the coding region corresponding to amino acids 85 to 94 of bovine pancreatic ribonuclease A, expressing the altered gene in a suitable host cell, and testing the affinity of the expressed ribonuclease A for ribonuclease inhibitor.

5,840,297

VACCINE COMPRISING ANTI-IDIOTYPIC ANTIBODY TO CHLAMYDIA GLXA AND PROCESS

Alex Bruce MacDonald, Amherst, Mass.; Ling-Ling An, La Jolla, Calif.; Elizabeth Sutton-Stuart, Amherst, Mass., and Judith A. Whittum-Hudson, Elkton, Md., assignors to Johns Hopkins University, and University of Massachusetts

Filed Mar. 19, 1993, Ser. No. 34,572

Int. Cl.^{6} A61K *39/395;* C12N *5/06;* C07K *16/00*

U.S. Cl. 424—131.1 **17 Claims**

5. A vaccine administered to an animal comprising an amount sufficient to effectively immunize said animal against chlamydia infection in the animal which comprises a biologically active composition selected from the group consisting of a monoclonal anti-idiotypic antibody which induces in the animal an anti-anti-idiotypic antibody which recognizes an antigen comprising a genus-specific chlamydia glycolipid exoantigen (GLXA), a Fab fragment of said anti-idiotypic antibody and mixtures thereof and a pharmaceutically acceptable adjuvant.

5,840,298

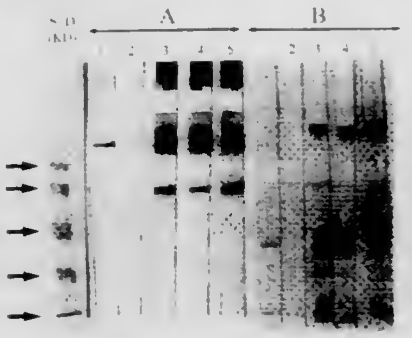
NEUTRALIZING HIGH AFFINITY HUMAN MONOCLONAL ANTIBODIES SPECIFIC TO RSV F-PROTEIN AND METHODS FOR THEIR MANUFACTURE AND THERAPEUTIC USE THEREOF

Peter Brams; Soulaima Salim Chamat; Li-Zhen Pan, all of San Diego, Calif.; Edward E. Walsh, Pittsford, N.Y.; Cheryl Janne Heard, Encinitas, and Roland Anthony Newman, San Diego, both of Calif., assignors to IDEC Pharmaceuticals Corporation, San Diego, Calif.

Division of Ser. No. 488,376, Jun. 7, 1995. This application Apr. 18, 1996, Ser. No. 634,223

Int. Cl.^{6} A61K *39/395;39/42;* C12N *15/00;* C07H *21/04*

U.S. Cl. 424—133.1 **11 Claims**



1. A method for preventing or treating RSV (Respiratory Syncytial Virus) infection in susceptible or RSV infected persons which comprises administering a prophylactically or therapeutically effective amount of one or more human monoclonal antibodies which possess an affinity (kd) to the RSV F-protein of about 2×10^{-9} to 10^{-10} molar and which also neutrlie RSV in vitro.

5,840,299

HUMANIZED ANTIBODIES AGAINST LEUKOCYTE ADHESION MOLECULE VLA-4

Mary M. Bendig, London; Olivier J. Léger, Hertfordshire; José Saldanha, Enfield Middlesex; S. Tarran Jones, Radlett, all of United Kingdom, and Ted A. Yednock, Fairfax, Calif., assignors to Athena Neurosciences, Inc., South San Francisco, Calif.

Continuation-in-part of Ser. No. 186,269, Jan. 25, 1994, abandoned. This application Nov. 21, 1995, Ser. No. 561,521

Int. Cl.^{6} A61K *39/395;* C07K *16/28;* C12P *21/08;* C12N *15/13*

U.S. Cl. 424—133.1 **29 Claims**

1. A humanized immunoglobulin comprising a humanized heavy chain and a humanized light chain:

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(1) the humanized light chain comprising three complementarity determining regions (CDR1, CDR2 and CDR3) having amino acid sequences from the corresponding complementarity determining regions of the mouse 21-6 immunoglobulin light chain variable domain designated SEQ. ID. No. 2, and a variable region framework from a human kappa light chain variable region framework sequence provided that at least one position selected from a first group consisting of L45, L49, L58 and L69 (Kabat numbering convention) is occupied by the same amino acid residue present in the equivalent position of the mouse 21-6 immunoglobulin light chain variable region framework; and

(2) the humanized heavy chain comprising three complementarity determining regions (CDR1, CDR2 and CDR3) having amino acid sequences from the corresponding complementarity determining regions of the mouse 21-6 immunoglobulin heavy chain variable domain designated SEQ. ID. No. 4, and a variable region framework from a human heavy chain variable region framework sequence provided that at least one position selected from a second group consisting of H27, H28, H29, H30, H44, H71 (Kabat numbering convention) is occupied by the same amino acid residue present in the equivalent position of the mouse 21-6 immunoglobulin heavy chain variable region framework;

wherein the humanized immunoglobulin specifically binds to alpha-4 integrin with a binding affinity having a lower limit of about $10^7 M^{-1}$ and an upper limit of about five-times the binding affinity of the mouse 21-6 immunoglobulin wherein the 21-6 immunoglobulin has the light chain with a variable domain designated SEQ ID NO: 2 and IgG1 heavy chain with a variable domain designated SEQ ID NO: 4.

5,840,300

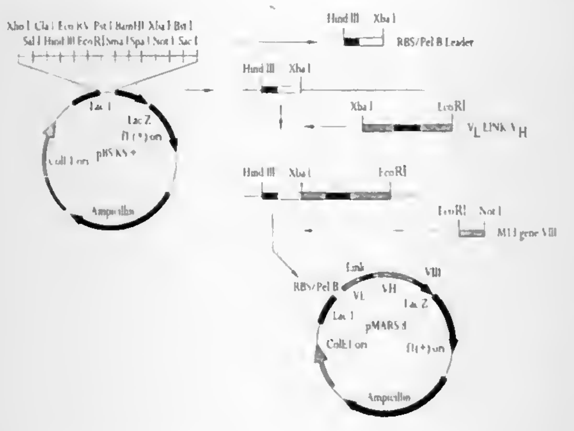
METHODS AND COMPOSITIONS COMPRISING SINGLE CHAIN RECOMBINANT ANTIBODIES

William V. Williams, Havertown, and David B. Weiner, Merion Station, both of Pa., assignors to Trustees of the University of Pennsylvania, Philadelphia, Pa.

Filed Sep. 11, 1995, Ser. No. 526,583

Int. Cl.⁶ A61K *39/395;39/42;38/00;* **C07H** *21/02*

U.S. Cl. 424—135.1 **5 Claims**



1. A recombinant single chain antibody molecule selected from the group consisting of SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12, SEQ ID NO:13, SEQ ID NO:14, SEQ ID NO:15, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:18, SEQ ID NO:19 and SEQ ID NO:20.

5,840,301

METHODS OF USE OF CHIMERIZED, HUMANIZED, AND SINGLE CHAIN ANTIBODIES SPECIFIC TO VEGF RECEPTORS

Patricia Rockwell, West Redding, Conn., and Neil I. Goldstein, Maplewood, N.J., assignors to ImClone Systems Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 196,041, Feb. 10, 1994, abandoned. This application Oct. 20, 1994, Ser. No. 326,552

Int. Cl.⁶ A61K *39/395;* **C07K** *16/00;* **C12P** *21/08*

U.S. Cl. 424—143.1 **40 Claims**

1. A method for reducing tumor growth in a mammal in need thereof comprising treating the mammal with an effective amount of a monoclonal antibody which specifically binds to an extracellular domain of a VEGF receptor and reduces tumor growth.

5,840,302

TREATMENT OF BACTERIALLY-INDUCED INFLAMMATORY DISEASES

Richard P. Darveau, Kirkland, Wash., assignor to Bristol-Myers Squibb Company, New York, N.Y.

Continuation-in-part of Ser. No. 150,635, Nov. 10, 1993, abandoned. This application Nov. 10, 1994, Ser. No. 337,614

Int. Cl.⁶ A61K *39/40;39/395;38/46;* **C07K** *16/00*

U.S. Cl. 424—150.1 **13 Claims**

1. A method for modulating the progression of periodontal disease in a mammal, which comprises:

administering to the mammal a compound which inhibits the ability of *Porphyromonas gingivalis* to inhibit the extravasation of leukocytes from the vascular endothelium to gingival tissues.

5,840,303

PEPTIDES FOR INDUCING CYTOTOXIC T LYMPHOCYTE RESPONSES TO HEPATITIS B VIRUS

Francis V. Chisari, Del Mar, Calif.; Carlo Ferrari, Parma, Italy; Amalia Penna, Parma, Italy, and Gabriele Missale, Parma, Italy, assignors to The Scripps Research Foundation, La Jolla, Calif.

Division of Ser. No. 935,898, Aug. 26, 1992, abandoned, which is a continuation-in-part of Ser. No. 749,540, Aug. 26, 1991, abandoned. This application Jun. 6, 1995, Ser. No. 468,279

Int. Cl.⁶ A61K *39/29;39/12;39/385;* **C07K** *7/06*

U.S. Cl. 424—189.1 **12 Claims**

1. A peptide containing at least one cytotoxic T lymphocyte (CTL) epitope, the peptide comprising from eight to seventeen amino acids and including at least seven contiguous amino acids of a corresponding portion of $HBpol_{803-811}$ having the following sequence:

VIII ($HBpol_{803-811}$) (Seq. ID No. 10) Ser-Leu-Tyr-Ala-Asp-Ser-Pro-Ser-Val.

5,840,304

T-CELL RECEPTOR β SUBUNIT POLYPEPTIDES

Mark M. Davis, Mountain View, and Stephen M. Hedrick, Solana Beach, both of Calif., assignors to Bd. of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Division of Ser. No. 924,395, Aug. 3, 1992, Pat. No. 5,316,925, which is a continuation of Ser. No. 663,809, Oct. 22, 1984, abandoned, which is a continuation-in-part of Ser. No. 585,333, Mar. 1, 1984, abandoned. This application Apr. 29, 1994, Ser. No. 235,601

Int. Cl.⁶ C07K *14/725;* **C12N** *15/12;15/62*

U.S. Cl. 424—192.1 **51 Claims**

1. A chemically synthesized peptide or polypeptide comprising at least 8 consecutive amino acids of a T cell antigen receptor β subunit.

11. A peptide or polypeptide comprising at least 8 consecutive amino acids of a T cell antigen receptor β subunit, produced by the process of expressing said peptide or polypeptide in a host cell from a heterologous nucleic acid construct, wherein said construct comprises a first polynucleotide coding for at least 8 consecutive amino acids of a T cell antigen receptor β subunit, said first polynucleotide being operatively linked to and controlled by a second polynucleotide, which second polynucleotide regulates gene expression in said host cell.

28. An isolated peptide or polypeptide comprising a hybrid sequence combining at least 8 consecutive amino acids of a T cell antigen receptor β subunit with a heterologous amino acid sequence.

5,840,305

TREATMENT OF HIV-INFECTION BY INTERFERING WITH HOST CELL CYCLOPHILIN RECEPTOR ACTIVITY

Michael Bukrinsky, Glenwood Landing; Barbara A. Sherry, New York, both of N.Y.; Peter C. Ulrich, Old Tappan, N.J., and Anthony Cerami, Shelter Island, N.Y., assignors to The Picower Institute for Medical Research, Manhasset, N.Y.

Filed Mar. 14, 1996, Ser. No. 615,933

Int. Cl.⁶ A61K *39/395;* **C07K** *16/28*

U.S. Cl. 424—152.1 **4 Claims**

1. A method for reducing HIV titer comprising administering an effective amount of an anti-cyclophilin antibody to a subject.

5,840,306

DNA ENCODING HUMAN PAPILLOMAVIRUS TYPE 18

Kathryn J. Hofmann, Collegeville; Kathrin U. Jansen, Ft. Washington, and Michael P. Neeper, Collegeville, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 22, 1995, Ser. No. 408,669

Int. Cl.⁶ A61K *39/12;* **C07H** *21/04;* **C12N** *5/10;15/86*

U.S. Cl. 424—186.1 **13 Claims**

12. A composition which induces an immune response in a subject treated with die composition, the composition comprising a nucleic acid encoding the amino acid sequence of SEQ ID NO:2 or SEQ ID NO:4 in a pharmaceutically acceptable carrier.

5,840,307

HAPTEN-CARRIER CONJUGATES FOR USE IN DRUG-ABUSE THERAPY AND METHODS FOR PREPARATION

Philip A. Swain, Brighton; Victoria Carol Schad, Cambridge; Julia Lea Greenstein, West Newton; Mark Adrian Exley, Brookline; Barbara Saxton Fox, Wayland; Stephen P. Powers, Waltham, and Malcolm L. Gefter, Lincoln, all of Mass., assignors to ImmuLogic Pharmacuetical Corp., Waltham, Mass.

Division of Ser. No. 414,971, Mar. 31, 1995. This application Jun. 1, 1995, Ser. No. 457,206

Int. Cl.⁶ A61K *39/385;39/00;39/395;* **C07P** *451/02*

U.S. Cl. 424—193.1 **3 Claims**

1. A method of treating drug addiction to cocaine in mammals comprising

(a) providing a therapeutic composition comprising at least one conjugate of a hapten-carrier conjugate selected from the group consisting of PS-2, PS-4, PS-5 and PS-6 all as shown in FIG. 3*a* wherein Q in FIG. 3*a* is a carrier comprising at least one T-cell epitope, and a pharmaceutically acceptable carrier, said conjugate being capable of stimulating the production of anti-drug antibodies,

(b) administering said therapeutic composition to a subject mammal,

(c) measuring titer of anti-drug antibodies,

(d) monitoring said subject mammal for a desired therapeutic effect wherein a sustainable increase of sufficiently high titer of anti-drug antibodies indicates a desired measurable outcome.

5,840,308

ANTIVIRAL OR ANTIFUNGAL COMPOSITION COMPRISING AN EXTRACT OF POMEGRANATE RIND OR OTHER PLANTS AND METHOD OF USE

Sabah Abdel Amir Jassim, Nottingham; Stephen Paul Denyer, Lewes, and Gordon Sydney Anderson Birnie Stewart, Loughborough, all of United Kingdom, assignors to Merck Patent GmbH, Darmstadt, Germany

PCT No. PCT/GB95/00324, § 371 Date Sep. 17, 1996, § 102(e) Date Sep. 17, 1996, PCT Pub. No. WO95/22254, PCT Pub. Date Aug. 24, 1995

PCT Filed Feb. 16, 1995, Ser. No. 632,455

Claims priority, application European Pat. Off., Feb. 17, 1994, 94301148

Int. Cl.⁶ A01N *65/00;59/16;* **A61K** *35/78;33/26*

U.S. Cl. 424—195.1 **13 Claims**

1. An antiviral or antifungal composition for treating surfaces, comprising an effective concentration of a mixture of a ferrous salt and an extract of pomegranate rind, wherein said composition does not substantially affect bacterial viability as measured by colony forming ability.

5,840,309

STIMULATING FIBROBLASTS AND/OR KERATINOCYTES

Morris Herstein, Scarsdale, N.Y., and Marion Froschle, Volketswil, Switzerland, assignors to La Prairie SA, Volketswil, Switzerland

Continuation of Ser. No. 317,144, Oct. 3, 1994, abandoned. This application Jan. 6, 1997, Ser. No. 779,171

Int. Cl.⁶ A61K *35/78;35/72;35/74*

U.S. Cl. 424—195.1 **6 Claims**

1. A composition for stimulating at least one of fibroblasts and keratinocytes comprising a synergistically effective amount therefor of a combination of the following ingredients:

a) glycoprotein 1, which is a purified cytoplasmic fraction obtained from yeast and Saccharomyces;

b) glycoprotein 2, which is a purified cytoplasmic fraction obtained from Lactobacillus,

c) ginseng extract; and

d) horsetail extract.

5,840,310

PHYTODRUG FOR TREATING SKIN FUNGAL INFECTIONS AND METHODS OF PREPARING AND USING SAME

Charles O. N. Wambebe; Nkechi M. Enwerem, both of Abuja; Ibrahim Kolo, Suleja, and Shingu K. Gamaniel, Abuja, all of Nigeria, assignors to National Institute For Pharmaceutical Research and Development, Abuja, Nigeria

Filed Aug. 6, 1997, Ser. No. 906,832

Int. Cl.⁶ P01N *65/00*

U.S. Cl. 424—195.1 **29 Claims**

1. A composition for treating skin fungal infections comprising an organic solvent extract of *Mitra villosus* plant leaves.

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5,840,311
AGENT ACCELERATING COLLAGEN DECOMPOSITION

Toshikazu Nakamura, 10-27, Takamidai, Takatsuki-shi, Osaka 569; Akira Shiota; Nobuaki Fujise, both of Tochigi, and Mitsuo Namiki, Takarazuka, all of Japan, assignors to Toshikazu Nakamura; Snow Brand Milk Products Co., Ltd., and Sumitomo Pharmaceuticals Co., Ltd., all of Japan

PCT No. PCT/JP95/00822, § 371 Date Dec. 11, 1996, § 102(e) Date Dec. 11, 1996, PCT Pub. No. WO95/29694, PCT Pub. Date Nov. 9, 1995

PCT Filed Apr. 25, 1995, Ser. No. 732,332

Claims priority, application Japan, Apr. 28, 1994, 6-114372

Int. Cl.^{6} A61K *38/18*

U.S. Cl. 424—198.1 **1 Claim**

1. A method for accelerating collagen decomposition in a subject having excessive collagen deposition comprising administering a hepatocyte growth factor in an amount effective to accelerate collagen decomposition.

5,840,312
RECOMBINANT *BACILLUS ANTHRACIS* STRAINS UNABLE TO PRODUCE THE LETHAL FACTOR PROTEIN OR EDEMA FACTOR PROTEIN

Michele Mock, Paris, France; Angel Cataldi, Buenos Aires, Argentina, and Corinne Pezard, Paris, France, assignors to Institut Pasteur, Paris Cedex, France

Continuation of Ser. No. 961,914, Mar. 2, 1993, abandoned. This application Oct. 19, 1994, Ser. No. 325,647

Claims priority, application France, May 2, 1991, 91 05417

Int. Cl.^{6} A61K *39/07;* **C12N** *15/31;15/75;15/70*

U.S. Cl. 424—200.1 **36 Claims**

1. A recombinant strain of *Bacillus anthracis* which induces in a human or animal host the production of protective antibodies against a virulent strain of *Bacillus anthracis*, wherein said recombinant strain contains a plasmid having a mutation of a least one given gene coding for a protein responsible for a toxic effect of *Bacillus anthracis*, wherein said gene is the lef gene or the cya gene of *Bacillus anthracis*, said mutation having a deletion of at least 0.1 kb of said gene, and the gene thus mutated having the inability to produce the protein responsible for said toxic effect.

5,840,313
PEPTIDES FOR USE IN VACCINATION AND INDUCTION OF NEUTRALIZING ANTIBODIES AGAINST HUMAN IMMUNODEFICIENCY VIRUS

Anders Vahlne, Hovás; Bo Syennerholm, Göteborg; Lars Rymo, Hovás; Stig Jeansson, and Peter Horal, both of Göborg, all of Sweden, assignors to Syntello Vaccine Development KB, Gothenburg, Sweden

Continuation of Ser. No. 48,976, Apr. 16, 1993, abandoned, which is a continuation-in-part of Ser. No. 8,092, Jan. 22, 1993, abandoned, which is a continuation of Ser. No. 589,422, Sep. 27, 1990, abandoned. This application Jun. 20, 1995, Ser. No. 493,235

Int. Cl.^{6} A61K *39/21;38/00;39/00;* **C07K** *5/00*

U.S. Cl. 424—208.1 **11 Claims**

1. A peptide consisting of an epitopic amino acid sequence from human immunodeficiency virus gp120 protein, selected from the group consisting of SEQ ID NO:1, SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:12, SEQ ID NO:14, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:36 and SEQ ID NO:41 and wherein antisera raised in monkeys against said epitopic sequence has a specific antibody-dependent cellular cytotoxicity index value greater than 0.5 at a dilution greater than 1:30.

5,840,314
PRODUCTION OF STREPTOCOCCAL M PROTEIN

June Rothman Scott, Atlanta, Ga., and Vincent Angelo Fischetti, West Hempstead, N.Y., assignors to The Rockefeller University, New York, N.Y., and Emery University, Atlanta, Ga.

Continuation of Ser. No. 61,812, May 13, 1993, abandoned, which is a continuation of Ser. No. 800,890, Nov. 27, 1991, abandoned, which is a continuation of Ser. No. 604,353, Oct. 26, 1990, abandoned, which is a continuation of Ser. No. 456,189, Dec. 15, 1989, abandoned, which is a continuation of Ser. No. 141,586, Jan. 7, 1988, abandoned, which is a division of Ser. No. 621,716, Jun. 18, 1984, Pat. No. 4,784,948, which is a continuation-in-part of Ser. No. 521,962, Aug. 10, 1983, abandoned. This application Feb. 22, 1994, Ser. No. 200,914

Int. Cl.^{6} A61K *39/09;* **C12P** *21/06;* **C07K** *1/00*

U.S. Cl. 424—244.1 **8 Claims**

1. An isolated polypeptide comprising a streptococcal M6 protein.

5,840,315
VACCINES BASED ON STREPTOKINASE

James Andrew Leigh, Newbury, England, assignor to Pfizer Inc., New York, N.Y.

PCT No. PCT/GB93/00110, § 371 Date Jul. 15, 1994, § 102(e) Date Jul. 15, 1994, PCT Pub. No. WO93/14209, PCT Pub. Date Jul. 22, 1993

PCT Filed Jan. 18, 1993, Ser. No. 256,632

Claims priority, application United Kingdom, Jan. 17, 1992, 9201013

Int. Cl.^{6} A61K *39/09*

U.S. Cl. 424—244.1 **4 Claims**

1. A vaccine for use to treat or prevent mastitis in a bovine species, comprising an immunologically effective amount of a plasminogen-activating streptokinase protein produced by *Streptococcus uberis*, and a pharmaceutically acceptable carrier.

5,840,316
RYEGRASS POLLEN ALLERGEN

Mohan Bir Singh, Templestowe; Robert Bruce Knox, North Balwyn; Penelope Smith, North Fitzroy; Asil Avjioglu, Doncaster; Piyada Theerakulpisut, Carlton; Terryn Hough, Mordialloc; Cenk Suphioglu, Greensborough, and Eng Kok Ong, South Yarra, all of Australia, assignors to University of Melbourne, Melbourne, Australia

Continuation of Ser. No. 930,060, Aug. 14, 1992, abandoned, which is a continuation-in-part of Ser. No. 746,702, Aug. 16, 1991, abandoned, which is a continuation-in-part of Ser. No. 585,086, Oct. 26, 1990, abandoned. This application Feb. 14, 1994, Ser. No. 195,947

Int. Cl.^{6} A67K *39/36;* **C07K** *14/415*

U.S. Cl. 424—257.1 **6 Claims**

1. Purified ryegrass pollen allergen *Lol p* Ib.2 produced in a host cell transformed with a nucleic acid sequence encoding amino acids 25–314 of SEQ ID NO:4.

5,840,317
COMPOSITION COMPRISING TUMOR CELL LINES CONTAINING GD2 GANGLIOSIDE GM2 GANGLIOSIDE, M-TAA, AND EITHER M-URINARY ANTIGEN OR M-FETAL ANTIGEN

Donald L. Morton, 24752 Malibu Rd., Malibu, Calif. 90265

Division of Ser. No. 961,786, Oct. 14, 1992, which is a continuation-in-part of Ser. No. 908,638, Jul. 2, 1992, abandoned, which is a continuation of Ser. No. 510,602, Apr. 18, 1990, abandoned, said Ser. No. 961,786 is a continuation-in-part of Ser. No. 431,533, Nov. 3, 1989. This application Jun. 6, 1995, Ser. No. 468,029

Int. Cl.^{6} A61K *39/00*

U.S. Cl. 424—277.1 **8 Claims**

1. A composition comprising viable cells of one or more tumor cell lines, which cell line or lines provide to a composition an antigenically effective amount of each of GD2 ganglioside, GM2 ganglioside, M-TAA, and either M-fetal antigen or M-urinary antigen, the antigens being included in the composition in amounts effective to elicit an antibody response against said antigens, the composition being suitable for injection to an animal and said one or more tumor cell lines rendered incapable of proliferation in vivo.

5,840,318
METHODS AND COMPOSITIONS FOR MODULATING IMMUNE SYSTEMS OF ANIMALS

William E. Marshall, Bedford Hills, and Michael K. Hoffmann, New York, both of N.Y., assignors to Immunom Technologies, Inc., Bedford Hills, N.Y.

Continuation-in-part of Ser. No. 517,016, Aug. 18, 1995, abandoned, which is a continuation-in-part of Ser. No. 376,175, Jan. 20, 1995, abandoned, which is a continuation-in-part of Ser. No. 59,745, May 11, 1993, abandoned. This application Oct. 29, 1996, Ser. No. 739,264

Int. Cl.^{6} A61K *25/66;39/02;35/74*

U.S. Cl. 424—282.1 **14 Claims**

1. A method for activating and modulating the immune system of an animal comprising:

(a) growing bacteria in a medium, wherein the bacteria is of a class selected from the group consisting of Lactobacillus, Staphylococcus, Streptococcus, Pseudomonas, Bacillus, Escherichia, Enterococcus, and Klebsiella;

(b) exposing said bacteria to biological, chemical or physical stress so that the bacteria release a stress release product into the medium;

(c) removing said bacteria from said medium and said stress release product to form a separated product;

(d) filtering said separated product through a filter having a 10,000 dalton molecular weight cutoff to obtain said stress release product; and

(e) administering an effective amount of said stress release product to said animal.

5,840,319
BIOLOGICAL AGENT COMPOSITIONS

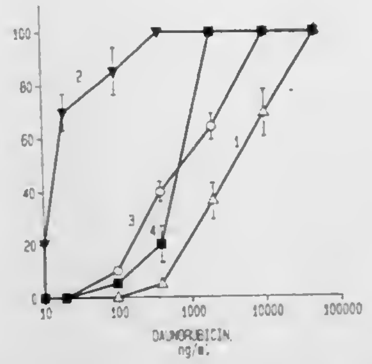
Valery Yu Alakhov, 20726, Gay Cedars, Baie d'Urfe, Quebec, Canada, H9X 2T4; Alexander V. Kabonov, #257, 8 Build. 2, Profsoyuzhaya str., Moscow, Russian Federation; Peter G. Sveshnikov, # 2, 6, Tepley Stan str., Moscow 117133, Russian Federation, and Eugenii S. Severin, # 65, 57/65, Novoslobodskaya str., Moscow 103055, Russian Federation

Continuation-in-part of Ser. No. 374,406, Jan. 17, 1995, abandoned, which is a continuation of Ser. No. 957,998, Oct. 8, 1992, abandoned. This application Oct. 15, 1997, Ser. No. 951,079

Int. Cl.^{6} A61K *9/00*

U.S. Cl. 424—400 **18 Claims**

1. A method of treating a subject, wherein the subject has resistance to a biological agent, the method comprising administering a composition comprising the biological agent and a micelle forming copolymer composition having a CMC of no more than about 0.5% wt/vol at 37° C. in an isotonic aqueous solution.



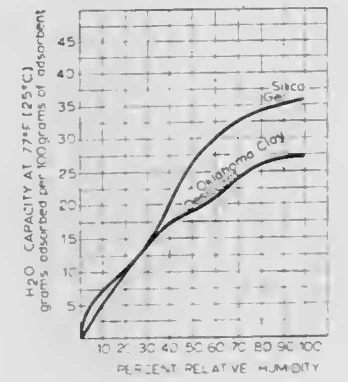
5,840,320
METHOD OF APPLYING MAGNESIUM-RICH CALCIUM MONTMORILLONITE TO SKIN FOR OIL AND ORGANIC COMPOUND SORPTION

Ira Edgar Odom, Bartlett, Ill., assignor to AMCOL International Corporation, Arlingon Heights, Ill.

Filed Oct. 25, 1995, Ser. No. 548,101

Int. Cl.^{6} A61K *7/48;7/50*

U.S. Cl. 424—401 **13 Claims**



9. A method of reducing itching associated with an insect bite comprising covering the insect bite with a composition comprising a mixture of a calcium montmorillonite clay and a liquid, said calcium montmorillonite clay having at least about 4% by weight magnesium, measured as MgO, said composition comprising liquid in an amount of about 5% to about 80% by weight, and about 20% to about 95% of said calcium montmorillonite clay; and washing the composition from the skin.

5,840,321
HYDROPHILIC, HIGHLY SWELLABLE HYDROGELS

Fritz Engelhardt, Frankfurt am Main; Uwe Stüven, Bad Soden, both of Germany; Thomas Daniel, Chesapeake, Va., and Norbert Herfert, Altenstadt, Germany, assignors to Clariant GmbH, Frankfurt, Germany

Filed Jul. 8, 1996, Ser. No. 676,590

Claims priority, application Germany, Jul. 7, 1995, 195 24 724.8

Int. Cl.^{6} A61K *31/78;31/765*

U.S. Cl. 424—402 **16 Claims**

1. A hydrophilic, highly swellable hydrogel, comprising a cross-linked hydrogel coated with about 0.05 to about 2% by weight of a non-reactive, water insoluble wax, the quantity of the wax is based on the quantity of the uncoated cross-linked hydrogel.

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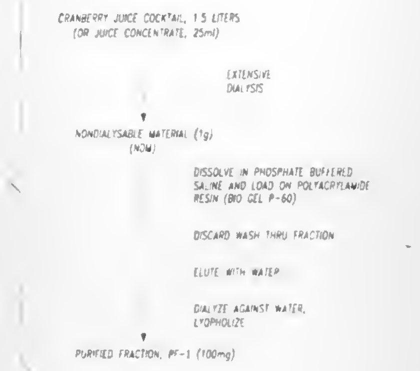
5,840,322
ANTI-ORAL-MICROBIAL ADHESION FRACTION DERIVED FROM VACCINIUM

Ervin Weiss, Herzeliya; Itzhak Ofek, Givataun; Yoel Kashman, Tel Aviv; Janina Goldhar, Tel Aviv, and Nathan Sharon, Tel Aviv, all of Israel, assignors to Ramot-University Authority For Applied Research & Industrial Devel. Ltd., Israel

Filed Dec. 19, 1996, Ser. No. 772,021

Int. Cl.^{6} A01N *25/02*

U.S. Cl. 424—405 **10 Claims**


CRANBERRY JUICE COCKTAIL, 1.5 LITERS
(OR JUICE CONCENTRATE, 25ml)
EXTENSIVE DIALYSIS
NONDIALYSABLE MATERIAL (1g)
(NDM)
DISSOLVE IN PHOSPHATE BUFFERED SALINE AND LOAD ON POLYACRYLAMIDE RESIN (BIO GEL P-60)
DISCARD WASH THRU FRACTION
ELUTE WITH WATER
DIALYZE AGAINST WATER, LYOPHOLIZE
PURIFIED FRACTION, PF-1 (100mg)

1. A non-food oral hygiene composition comprising a suitable carrier and an effective amount of an isolated adhesion inhibitory water extract fraction from Vaccinium juice, said isolated fraction having

(a) a molecular weight of ≧14,000; and

(b) coaggregation reversal and coaggregation inhibition activity against oral bacteria;

(c) an elemental analysis of carbon 43–51%, hydrogen 4–5%, no nitrogen, no sulfur and no chlorine;

(d) an nuclear magnetic resonance (NMR) line spectrum as set forth in FIGS. 2A and 2B;

(e) an ultraviolet spectrum with an absorption peak at 280 nm in neutral or acidic pH solution which is absent in alkali solutions; and

(f) an adhesion inhibitory activity against P fimbriated bacteria; and

wherein the concentration of the isolated adhesion inhibitory fraction is between 1 μg and 10 mg per milliliter (ml).

5,840,323
AGGLOMERATED CARRIER CONTAINING A SOIL RELEASE POLYMER AND AN ANTIBACTERIAL AGENT FOR LAUNDRY APPLICATIONS

Riad Ahmed Taha, Spotswood, and Patrick J. Getty, Metuchen, both of N.J., assignors to Colgate-Palmolive Co., New York, N.Y.

Filed Aug. 25, 1997, Ser. No. 918,933

Int. Cl.^{6} A01N *25/10*

U.S. Cl. 424—405 **16 Claims**

1. A particulate agglomerated carrier which is an agglomerate of (i) a soil release copolymer of polyethylene terephthalate (PET) and polyoxyethylene terephthalate (POET); and (ii) an antibacterial agent, which carrier is suitable for use in admixture with a laundry detergent composition or as an additive to a wash solution separate from any detergent composition, and which carrier is capable of depositing an effective amount of said antibacterial agent on laundered fabrics, said carrier being comprised of:

(a) particles of said soil release copolymer; and

(b) an antibacterial agent which is normally solid at ambient temperature, wherein said particles of soil release copolymer are agglomerated at a temperature above ambient with a melt of said antibacterial agent to form an agglomerated mixture which is reduced in size to the range of particle size desired for said particulate carrier.

5,840,324
ANTIPARASITIC COMPOSITIONS

Desmond Ronald Hennessy, North Epping; John Richard Ashes, Wahroonga; Trevor William Scott, Kellyville; Suresh Kumar Gulati, Eastwood, and John Winston Steel, Castlecrag, all of Australia, assignors to Commonwealth Scientific and Industrial Organisation, Parkville, Australia

PCT No. PCT/AU94/00272, § 371 Date Mar. 13, 1996, § 102(e) Date Mar. 13, 1996, PCT Pub. No. WO94/27598, PCT Pub. Date Dec. 8, 1994

PCT Filed May 24, 1994, Ser. No. 549,755

Claims priority, application Australia, May 26, 1993, PL9030

Int. Cl.^{6} A61K *9/14;9/52*

U.S. Cl. 424—418 **24 Claims**

1. A particulate composition for combating and preventing parasite infestation of ruminants, which composition comprises an anti-parasitic agent selected from the group consisting of benzimidazoles, macrocyclic lactones, organophosphates, salicylanilides, substituted phenols, tetramisoles and pyrimidines dispersed in a dispersant comprising protein that is sufficiently cross-linked to cause said dispersant to have solubility characteristics offering sufficient degrees of resistance to the various environments encountered in a ruminant gastrointestinal tract, such that said agent is made available to said parasite in a non-zero amount from all of the rumen, the abomasum and the intestine, either directly or by absorption into the ruminant blood plasma, wherein, following oral administration, staged degradation of said dispersant causes effective, non-zero, amounts of the anti-parasitic agent to become available to the parasite by release during passage of the composition through each of the rumen, the abomasum and the intestine.

5,840,325
OSTEOGENIC DEVICES

Thangavel Kuberasampath, Medway, and David C. Rueger, West Roxbury, both of Mass., assignors to Stryker Corporation, Kalamazoo, Mich.

Continuation of Ser. No. 268,252, Jun. 29, 1994, Pat. No. 5,496,552, which is a continuation of Ser. No. 103,604, Aug. 6, 1993, abandoned, which is a continuation of Ser. No. 827,052, Jan. 28, 1992, Pat. No. 5,250,302, which is a division of Ser. No. 579,865, Sep. 7, 1990, Pat. No. 5,108,753, which is a division of Ser. No. 179,406, Apr. 8, 1988, Pat. No. 4,968,590. This application Feb. 26, 1996, Ser. No. 606,839

Int. Cl.^{6} A61F *13/00;2/00*

U.S. Cl. 424—420 **31 Claims**

1. A method for inducing heterotopic bone formation in a mammal comprising:

the step of implanting a biocompatible matrix and a substantially pure osteogenic protein at a heterotopic locus in said mammal,

said osteogenic protein comprising a pair of polypeptide chains disulfide bonded to produce a dimeric species having a conformation such that said pair of polypeptide chains is capable of inducing endochondral bone formation in a mammal when implanted with said matrix in a mammal.

5,840,326

Patent Not Issued For This Number

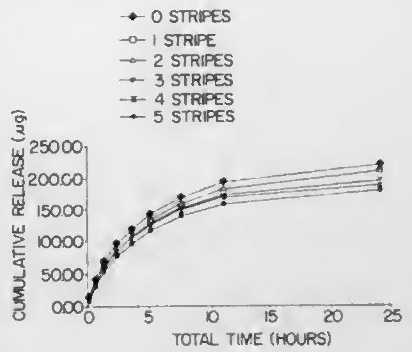
5,840,327
TRANSDERMAL DRUG DELIVERY DEVICE HAVING ENHANCED ADHESION

Robert M. Gale, Los Altos, and Patricia S. Campbell, Palo Alto, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed Aug. 15, 1996, Ser. No. 704,426

Int. Cl.^{6} A61F *13/02*

U.S. Cl. 424—448 **12 Claims**



1. A flexible and compliant device for the transdermal administration of a drug at a therapeutically effective rate through intact skin at sensitive body areas comprising:

a) a reservoir comprising a drug selected from the group consisting of testosterone, estradiol, and progesterone dispersed throughout a non-adhesive, polymeric carrier permeable to said drug, said reservoir having a skin-facing drug transfer surface and a skin-distal surface;

b) a discontinuous pattern of adhesive on the skin-facing surface of the reservoir, said adhesive covering about 8–16% of the surface area of said reservoir skin-facing surface, said pattern of adhesive having a skin-adhesion surface that lies in a different plane from that of said reservoir skin-facing drug transfer surface; and

c) a backing on the skin distal surface of the reservoir.

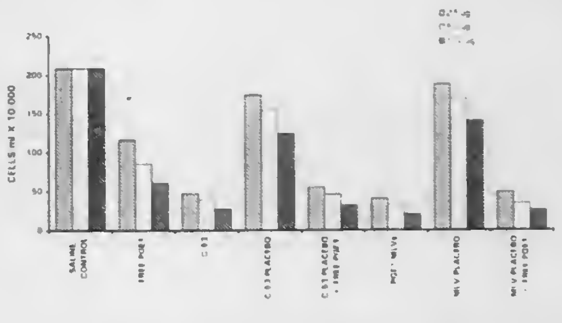
5,840,328
TREATMENT USING ARACHIDONIC ACID METABOLITE AND PARTICULATE FORMULATIONS

Andrew S. Janoff, Yardley, Pa., and David F. Eierman, Kingston, N.J., assignors to The Liposome Company, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 179,739, Jan. 11, 1994, abandoned. This application Jan. 11, 1995, Ser. No. 371,541

Int. Cl.^{6} A61K *9/127;9/16;31/557*

U.S. Cl. 424—450 **6 Claims**



1. A composition consisting essentially of a pharmaceutically acceptable carrier, a free prostaglandin and a particle which is selected from the group consisting of liposomes and latex microspheres, wherein the particle is an endocytosable particle, an opsonizable particle, a phagocytosable particle, a particle capable of binding to phagocytic receptors, or a particle capable of binding to serum proteins, wherein the prostaglandin is not entrapped in the particle and wherein less than about half of the prostaglandin is associated with the surface of the particle.

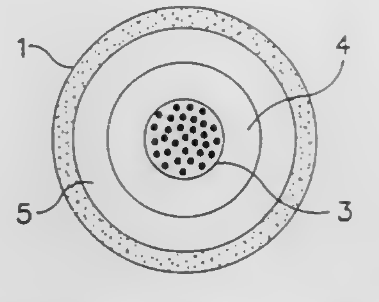
5,840,329
PULSATILE DRUG DELIVERY SYSTEM

Jane Pei-Fan Bai, Chadds Ford, Pa., assignor to BioAdvances LLC, Philadelphia, Pa.

Filed May 15, 1997, Ser. No. 857,105

Int. Cl.^{6} A61K *9/26;9/58;9/60;9/62*

U.S. Cl. 424—458 **17 Claims**



1. A pulsatile drug delivery system for the release of an active medicament in pulsed dosages when exposed to an aqueous environment which comprises one or more groups of particles which contain the active medicament, enclosed in a solid dosage form, with each of said groups having a distinct pattern of drug release based upon its combination of controlled release layers, swelling layers, and coating layers, wherein the controlled release layer of the particles comprises a matrix comprising a slightly cross-linked poly(acrylic acid) polymer of an approximate molecular weight of 250,000 to above 4 billion and a water-soluble polymer or monomer in a weight ratio ranging from 40:1 to 1:40.

5,840,330
PROCESS FOR THE PREPARATION OF SHAPED, COMPRESSED CONTROLLED-RELEASE UNIT-DOSAGE FORMS, AND THE COMPRESSED UNIT-DOSAGE FORMS THUS OBTAINED

Berthold Stemmle, Burgdorf; Klaus Budde, Burgwedel; Alexander Wirl, Heuchelheim, and Fritz Demmer, Hirschberg-Leutershausen, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

Continuation of Ser. No. 955,705, Dec. 18, 1992, abandoned. This application Dec. 15, 1994, Ser. No. 357,143

Int. Cl.^{6} A61K *9/20*

U.S. Cl. 424—464 **29 Claims**

1. Process for the preparation of shaped, compressed, controlled-release unit-dosage forms from a therapeutic active substance exhibiting self-retardation properties of release such that unit-dosage forms compressed from such active substance without release retarding agent provide controlled release behavior, comprising:

(1) converting the active substance and a additive charge that inhibits or compensates for the self-retardation properties of said active substance by granulation into granulate particles wherein said additive charge is such that compressed objects made from said granulate particles with the same pressure which is used for the production of the unit-dosage forms without any further additives exhibit a release which is more rapid than the release of said controlled-release unit dosage forms, and then

(2) compressing said granulate particles with a release-retarding agent such that said granulate particles form an inner phase and said release-retarding agent is contained in an outer phase distinct from said inner phase, thereby forming the unit-dosage forms.

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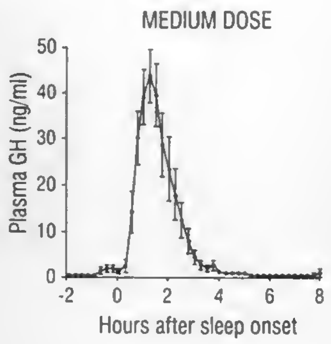
5,840,331

USE OF γ-HYDROXYBUTYRATE FOR THE STIMULATION OF SLEEP-RELATED GROWTH HORMONE AND PROLACTIN

Eve Van Cauter, Chicago, Ill., and Martin B. Scharf, Cincinnati, Ohio, assignors to Arch Development Corporation, Chicago, Ill.

Filed Jun. 7, 1995, Ser. No. 485,059
Int. Cl.^{6} A61K *9/20*

U.S. Cl. 424—464 **21 Claims**



1. A method for stimulating the release of growth hormone or prolactin in a human subject comprising the steps of:
(a) identifying a human subject having age-related suppression of growth hormone or prolactin release; and then
(b) orally administering to said human subject, within one hour prior to retiring, a unit dose of γ-hydroxybutyrate of about 2 to 5 g, said unit dose effective to increase the release of growth hormone or prolactin.

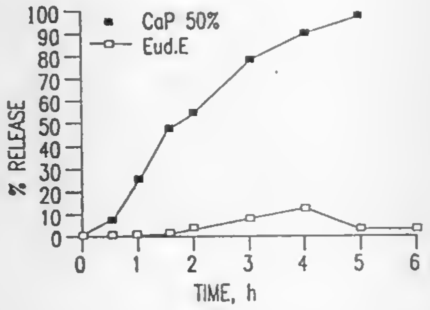
5,840,332

GASTROINTESTINAL DRUG DELIVERY SYSTEM

E. Itzhak Lerner; Moshe Flashner, both of Petah Tikva, and Adel Penhasi, Bat-Yam, all of Israel, assignors to Perio Products Ltd., Jerusalem, Israel

Filed Jan. 18, 1996, Ser. No. 588,247
Int. Cl.^{6} A61K *9/20*

U.S. Cl. 424—464 **21 Claims**



1. A drug delivery formulation for localized drug release in the gastrointestinal tract of an animal comprising:
a. a core comprising a drug and core material; and
b. a coating surrounding said core, said coating having an outer surface,
wherein said coating comprises water-insoluble hydrophilic particulate matter embedded in a water-insoluble carrier, such that when said formulation enters the gastrointestinal tract, said particulate matter absorbs liquid, thus forming channels that interconnect said core with said outer surface of said coating, and through which channels, said drug from said core is released into the gastrointestinal tract.

5,840,333

PROCESS FOR THE PREPARATION OF ORAL COMPOSITIONS CONTAINING QUINOLONES

Gabriel Gousset, Les Plessis Robinson, and Philippe Riviere, Chatenay-Malabry, both of France, assignors to Rhone-Poulenc Rorer S.A., Antony, France

PCT No. PCT/FR94/01211, § 371 Date Apr. 19, 1996, § 102(e) Date Apr. 19, 1996, PCT Pub. No. WO95/11022, PCT Pub. Date Apr. 27, 1995

PCT Filed Oct. 19, 1994, Ser. No. 632,394
Claims priority, application France, Oct. 21, 1993, 93 12550
Int. Cl.^{6} A61K *31/44;31/47;31/495;9/20*

U.S. Cl. 424—464 **5 Claims**

1. A process for preparing an oral antibacterial formulation of quinolone active principles, which comprises the steps of:
compacting at least one quinolone active principle and at least one excipient suitable for oral formulation into a mixture;
grinding the compacted mixture into granules wherein said granules have a particle size ranging from 50 μm to 1 mm; and
compressing the granules.

5,840,334

SELF-BINDING SHEARFORM COMPOSITIONS

Michael G. Raiden, Fairfax; Pradeepkumar P. Sanghvi, Herndon; Tushar K. Misra, Leesburg; Jeffery W. Currington, Winchester; Satish V. Kamath, Centreville, all of Va., and Mahendra Govind Pankhania, Nottingham, England, assignors to Fuisz Technologies Ltd., Chantilly, Va.

Filed Aug. 20, 1997, Ser. No. 915,068
Int. Cl.^{6} A61K *9/20*

U.S. Cl. 424—464 **30 Claims**

1. A glycerine-free shearform matrix having enhanced self-binding characteristics consisting essentially of at least one saccharide-based carrier and the sugar alcohols sorbitol and xylitol.

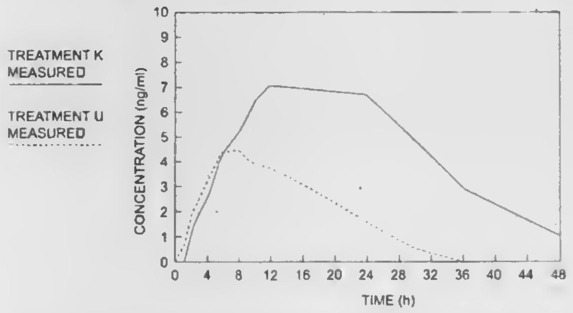
5,840,335

SYSTEM FOR THE CONTROLLED RELEASE OF ACTIVE AGENTS AND A PROCESS FOR ITS PREPARATION

Udo Wenzel, Halle/Saale; Jurgen Metzner, Halle/Salle; Thomas Rosin, Halle/Neustadt, all of German Dem. Rep.; Halvor Jaeger, Neu-Ulm/Gerlenhofen, and Zoser B. Salama, Senden/Wullenstetten, both of Germany, assignors to Prof. Dr. Udo Wenzel, Halle/Saale, Germany

Continuation of Ser. No. 892,727, May 28, 1992, abandoned, which is a continuation of Ser. No. 472,927, Jan. 31, 1990, abandoned. This application Mar. 23, 1995, Ser. No. 409,941
Claims priority, application German Dem. Rep., Jan. 31, 1989, WP A 61 K/325 354-3
Int. Cl.^{6} A61K *9/24*

U.S. Cl. 424—473 **20 Claims**



1. A system for the controlled release of an active agent to an environment of use, said system having a predetermined zero-order release rate of the active agent to the environment of use, comprising:

a) a shell formed of a water-insoluble material which is permeable to the passage of an external fluid,
b) a core which is surrounded by said shell, and comprised of
i) a water-soluble active agent, and
ii) a water-soluble polyvinyl alcohol polymeric adjuvant having a lesser ability to become solved in water than the active agent, said active agent and said polymeric adjuvant being hydrated when the external fluid permeates through the shell, said active agent being present in an amount which provides a saturated solution of active agent in the core at said predetermined zero-order release rate to thereby provide a predetermined solved amount of said active agent at said predetermined zero-order release rate, said polymeric adjuvant being a polymer which precipitates in a saturated aqueous solution of the active agent and being present in an amount which provides a saturated solution of said polymeric adjuvant at said predetermined zero-order release rate to thereby provide a predetermined solved amount of polymeric adjuvant at said predetermined zero-order release rate, and said predetermined solved amounts of active agent and polymeric adjuvant creating a predetermined hydrostatic pressure,
iii) wherein the active agent and polymeric adjuvant are present in a ratio such that
iv) if the release rate of the active agent deviates from the predetermined zero-order release rate by being higher than the predetermined zero-order release rate, an additional amount of polymeric adjuvant becomes solved and is delivered to the shell where it acts to decrease the permeability of the shell and thereby decrease the deviation and
v) if the release rate of the active agent deviates from the predetermined zero-order release rate by being lower than the predetermined zero-order release rate, an additional amount of active agent becomes solved to increase the hydrostatic pressure above said predetermined hydrostatic pressure, said increased hydrostatic pressure acting on said shell to increase the permeability of the shell and thereby decrease the deviation.

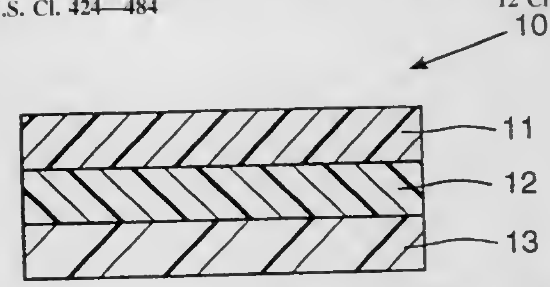
5,840,336

TWO-PHASE MATRIX FOR SUSTAINED RELEASE DRUG DELIVERY DEVICE

Tsung-Min Hsu, Union City, and Tung Fen Chen, Sunnyvale, both of Calif., assignors to Cygnus, Inc., Redwood City, Calif.

Division of Ser. No. 56,076, Apr. 30, 1993, which is a continuation-in-part of Ser. No. 956,635, Oct. 5, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 474,693
Int. Cl.^{6} A61K *9/14;31/38;47/02;* **A61M** *37/00*

U.S. Cl. 424—484 **12 Claims**



1. A sustained release drug formulation comprising a matrix of:
(a) a continuous hydrophobic adhesive polymer phase;
(b) a particulate phase dispersed in the continuous polymer phase comprised of:
(i) a hydrated calcium silicate comprising calcium silicate and an absorbed aqueous phase;
(ii) a water-soluble drug at least partly dissolved in the aqueous phase of (i); and
(c) a dispersing agent for dispersing (b) in (a), wherein the particulate phase defines at least a portion of the surface area of the matrix and provides a diffusion pathway for the drug in the matrix.

5,840,337

GELLING AGENT FOR POLYETHYLENE GYLCOL

Sharon L. Cody, Philadelphia; Michael R. Hoy, Sellersville, and Eric J. Walter, Philadelphia, all of Pa., assignors to McNeil-PPC, Inc., Skillman, N.J.

Division of Ser. No. 366,271, Dec. 29, 1994, Pat. No. 5,660,859. This application Jun. 13, 1997, Ser. No. 874,257
Int. Cl.^{6} A61L *9/00;9/01;* **A61K** *9/64*

U.S. Cl. 424—486 **10 Claims**

1. A gel composition, comprising:
polyethylene glycol having an average molecular weight of about 600 or less;
water;
calcium acetate in an amount effective to gel said polyethylene glycol; and
a therapeutically effective amount of a pharmaceutical dissolved or suspended in said gel.

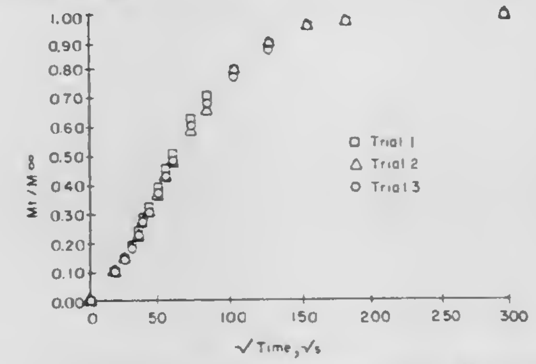
5,840,338

LOADING OF BIOLOGICALLY ACTIVE SOLUTES INTO POLYMER GELS

Eric J. Roos, 1 Barbara Jean St., Grafton, Mass. 01519, and Matthew E. Schiller, 23C Sagamore Way, Waltham, Mass. 02154

Continuation-in-part of Ser. No. 276,462, Jul. 18, 1994, Pat. No. 5,603,955, and a continuation-in-part of Ser. No. 276,193, Jul. 18, 1994. This application Nov. 6, 1995, Ser. No. 556,130
Int. Cl.^{6} A61K *9/10;47/36;47/34*

U.S. Cl. 424—488 **29 Claims**



1. A method of loading a biologically active solute into a crosslinked polymer gel network, comprising:
selecting the crosslinked polymer gel network;
forming a loading polymer solution, the loading polymer solution comprising a loading polymer, a salt and the biologically active solute, the lading polymer solution having a pH above the isoelectric point of the biologically active solute; and
contacting the crosslinked polymer gel network with the loading polymer solution under conditions sufficient for at least a portion of the loading polymer solution to partition into the gel network and for at the biologically active solute to retain activity while in the gel network.

5,840,339

BLOOD CHOLESTEROL REDUCING PHARMACEUTICAL COMPOSITION

Robert Kunin, 860 Lower Ferry Rd. - Apt. 2J, Trenton, N.J. 08628

Continuation-in-part of Ser. No. 737,705, Jul. 30, 1991, abandoned. This application Sep. 3, 1992, Ser. No. 939,990
Int. Cl.^{6} A61K *9/14*

U.S. Cl. 424—489 **6 Claims**

1. A salt comprising the reaction product of nicotinic acid and a basic anion exchange resin having a degree of crosslinking with divinylbenzene of less than about 4%, a maximum degree of crosslinking corresponding to a minimum moisture content of

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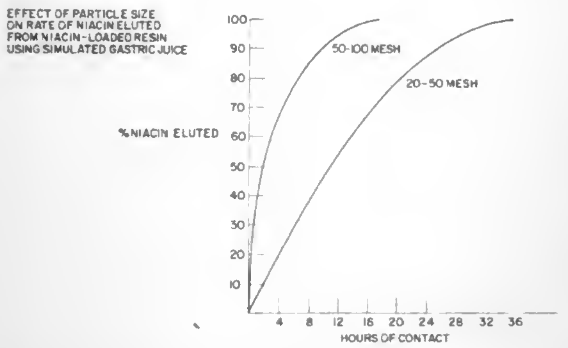


50%, and a particle size in water in a swollen, chloride form ranging from about 0.03 to about 0.84 mm.

5,840,340

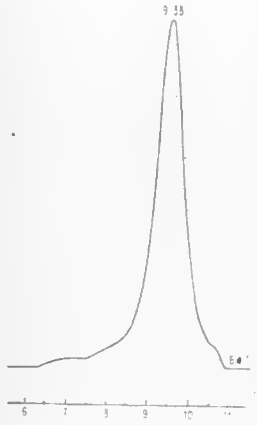
PROTEINOID CARRIERS AND METHODS FOR PREPARATION AND USE THEREOF

Sam J. Milstein, Larchmont, and Martin L. Kantor, Mamaroneck, both of N.Y., assignors to Emisphere Technologies, Inc., Hawthorne, N.Y.

Division of Ser. No. 76,803, Jun. 14, 1993, Pat. No. 5,578,323, which is a continuation-in-part of Ser. No. 920,346, Jul. 27, 1992, Pat. No. 5,443,841, which is a continuation-in-part of Ser. No. 898,909, Jun. 15, 1992, abandoned. This application Aug. 30, 1996, Ser. No. 705,808

Int. Cl.^{6} A61K *7/46;9/16;47/42*

U.S. Cl. 424—499 **3 Claims**



1. A composition comprising:

(A) a cargo selected from the group consisting of a fragrance, a cosmetic agent and a dye encapsulated within,

(B) a microsphere or microcapsule carrier, said carrier comprising a proteinoid comprising

(i) at least one monomer selected from the group consisting of tyrosine and phenylalanine;

(ii) at least one monomer selected from the group consisting of glutamic acid, pyroglutamic acid, glutamine, and aspartic acid; and

(iii) optionally at least one monomer selected from the group consisting of lysine, arginine, and ornithine,

said proteinoid being soluble within a selected pH range.

5,840,341

DRUG DELIVERY COMPOSITION CONTAINING CHITOSAN OR DERIVATIVE THEREOF HAVING A DEFINED ζ POTENTIAL

Peter James Watts, and Lisbeth Illum, both of Nottingham, United Kingdom, assignors to Danbiosyst UK Limited, Nottingham, United Kingdom

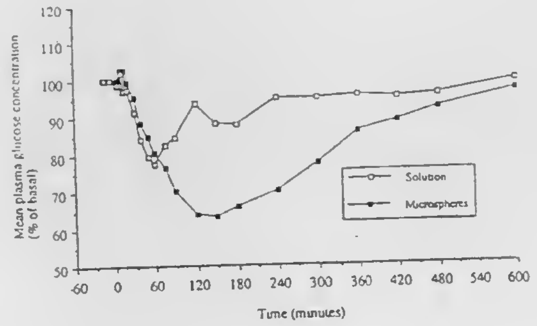
PCT No. PCT/GB95/01980, § 371 Date Apr. 21, 1997, § 102(e) Date Apr. 21, 1997, PCT Pub. No. WO96/05810, PCT Pub. Date Feb. 29, 1996

PCT Filed Aug. 21, 1995, Ser. No. 809,158

Claims priority, application United Kingdom, Aug. 20, 1994, 9416884

Int. Cl.^{6} A61K *9/50;* **B01J** *13/02;* **B32B** *5/16;* **A01N** *25/12*

U.S. Cl. 424—499 **13 Claims**



1. A drug delivery composition for administration to mucosa comprising a pharmacologically active compound and particles of chitosan or a chitosan derivative or salt, wherein the particles are either solidified or partially cross-linked such that they have a zeta potential of +0.5 to +50 mV, measured by microelectrophoresis for microspheres having a diameter of 5 μm or more and by laser Doppler anemometry for microspheres having a diameter of less than 5 μm at pH 7.4 and 0.1M ionic strength.

5,840,342

SHARK LIVER EXTRACT FOR STIMULATING THE IMMUNE SYSTEM

Lawrence R. Raithaus, P.O. Box 652, Lawai, Kauai, Hi. 96765

Filed Sep. 17, 1997, Ser. No. 932,196

Int. Cl.^{6} A61K *35/407;35/12*

U.S. Cl. 424—553 **6 Claims**

1. A process for preparing a purified biological material capable of stimulating the immune system of mammals and reducing the deleterious effect on non-cancerous cells resulting from the administration of radiation treatment comprising the steps of:

a) cooling shark liver to about 0° C.,

b) pulverizing said cooled shark liver to produce a finely ground material,

c) mixing the finely ground material with an equal amount, by weight, of water while maintaining the mixture at about 0° C. and stirring said mixture for about 20 minutes,

d) centrifuging the mixture at 0° C. to 4° C. for 4 to 6 hours until said mixture separates into three distinct layers, said layers comprising a cellular layer, an aqueous layer and an oil layer,

e) separating the aqueous layer from the other layers,

f) filtering the aqueous layer to generate a filtered solution; and

g) spraying the filtered solution into a vacuum chamber held at 0° C. to 4° C. to produce a dry powdered substance for pharmaceutical administration.

5,840,343

ROOM TEMPERATURE STERILANT FOR MEDICAL DEVICES

Robert T. Hall, II, Welch; Bradley K. Onstad, Deephaven, and Daniel B. Carlsen, St. Louis Park, all of Minn., assignors to Minntech Corporation, Minneapolis, Minn.

Continuation of Ser. No. 565,995, Dec. 1, 1995, abandoned. This application Apr. 8, 1997, Ser. No. 838,339

Int. Cl.^{6} A01N *59/00;37/02;37/16*

U.S. Cl. 424—616 **15 Claims**

1. A method of sterilizing a filter module with an anti-microbial composition comprising contacting the filter module with the anti-microbial composition comprising from about 0.01 to about 10.0 wt. % of an ester of formic acid: from about 0.01 to about 10.0 wt. % of an oxidizer; from about 0.001 to about 5.0 wt. % performic acid and up to about 99.98 wt. % water.

5,840,344

MONOCLONAL ANTIBODIES HAVING PROPERTY OF CAUSING APOPTOSIS

Naoshi Fukushima, Shizuoka, Japan, assignor to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP94/01453, § 371 Date Apr. 15, 1996, § 102(e) Date Apr. 15, 1996, PCT Pub. No. WO95/06748, PCT Pub. Date Mar. 9, 1995

PCT Filed Sep. 2, 1994, Ser. No. 605,059

Claims priority, application Japan, Sep. 3, 1993, 5-242110

Int. Cl.^{6} A61K *39/395;* **C07K** *16/28;* **C12N** *5/06;5/12*

U.S. Cl. 424—153.1 **8 Claims**

1. A monoclonal antibody that recognizes an antigen expressed by the splenic stromal cells of an animal administered rG-CSF, said monoclonal antibody having the property of causing apoptosis on bone marrow cells.

7. The monoclonal antibody of claim 1, which is BMAP-1 produced by hybridoma FERM BP-4382.

5,840,345

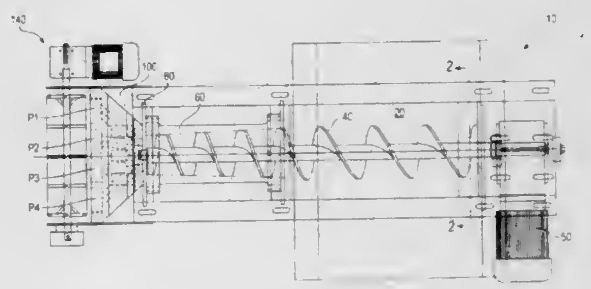
DOUGH TRANSPORT DEVICE

Ajwad Ayash, 4504 John Tyler Ct., Annandale, Va. 22003

Filed Apr. 17, 1995, Ser. No. 422,952

Int. Cl.^{6} A23P *1/12*

U.S. Cl. 425—311 **42 Claims**



1. A cutting mechanism for cutting dough extruded from an outlet nozzle of a dough transport device comprising:

a shaft having a center rotational axis;

a plurality of spokes connected to said shaft and extending perpendicular to said shaft:

at least one cutting edge attached across said spokes so that said cutting edge is substantially parallel to said center rotational axis and provides an empty space between said cutting edge and said shaft; and

a motor for rotating said shaft in a single direction about said center rotational axis and thereby rotating said cutting edge to allow said cutting edge to repeatedly cut said dough extruded from said outlet nozzle and located in said empty space when being cut.

5,840,346

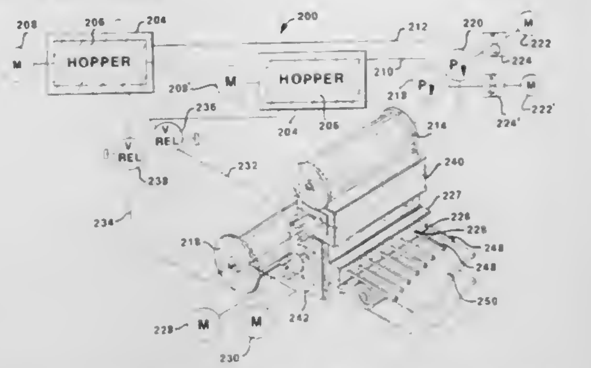
VISCOUS MATERIAL DISPENSING APPARATUS

Christopher S. Hannaford, 2110 Toledo Ave. North, Golden Valley, Minn. 55422

Continuation-in-part of Ser. No. 680,359, Jul. 15, 1996, Pat. No. 5,688,540, which is a continuation of Ser. No. 452,114, May 26, 1995, Pat. No. 5,536,517. This application Jul. 30, 1997, Ser. No. 903,539

Int. Cl.^{6} A23P *1/00;* **B29C** *47/00;* **B67D** *5/00*

U.S. Cl. 425—382 R **24 Claims**



1. Apparatus for metering viscous material which comprises:

means, including pump means, for delivering material to be metered; and

flow divider means in fluid communication with said pump means, said flow divider means having multiple positive displacement metering means each having input means for receiving material to be metered and output means for discharging said metered material at a selected rate, operating energy for said metering means being obtained from the material being metered, at least one of said metering means input means receiving material to be metered from said pump means and said pump means having a feed rate greater than the rate of the discharging of the metering means.

5,840,347

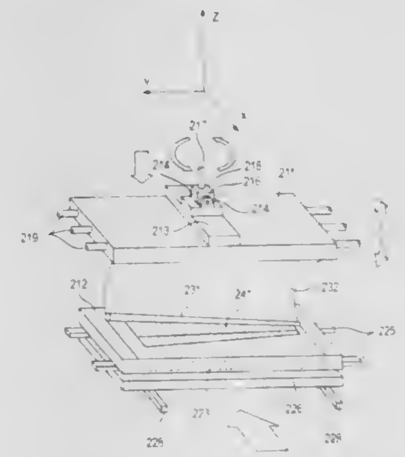
APPARATUS FOR MAKING A CYLINDRICAL PRODUCT OF FIBER REINFORCEMENT-THERMOPLASTIC RESIN COMPOSITE

Teruaki Muramatsu, Tokushima, and Yoshihiro Endo, Shizuoka, both of Japan, assignors to Toho Rayon Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 689,125, Jul. 30, 1996, abandoned, which is a division of Ser. No. 366,323, Dec. 29, 1994, Pat. No. 5,585,062. This application Oct. 24, 1997, Ser. No. 959,537

Int. Cl.^{6} B28B *21/42*

U.S. Cl. 425—393 **7 Claims**



1. An apparatus for producing a cylindrical product of a fiber reinforcement-thermoplastic resin composite, which comprises:

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- a tapered mandrel having a surface for winding a fiber reinforcement-thermoplastic resin composite sheet thereon to impart a cylindrical shape to the composite sheet,
- two plates, which face each other and are disposed at opposite sides of and in the vicinity of the surface of the mandrel, such that there is a variable gap between each of the plates and the surface of the mandrel.
- a two-ended flexible guide sheet, wherein each guide sheet end is fixed to one of the respective two plates, so that the guide sheet can wind along the mandrel forming the U-shape between the plates when the plates move relatively,
- a means for moving at least one of the plates relative to the other to form a concave part of the U-shape along the surface of the mandrel when rolling the mandrel, and
- a means for heating a contacting portion of the mandrel and the guide sheet at which contacting portion the guide sheet starts to wind on the mandrel when at least one of the plates is moved relative to the other plate;
- wherein at least one of the plates has a means for supporting said plate to swingably control the gap between the plates and the mandrel while being revolvable in the direction of the movement of the mandrel rolling on the surface of the other plate.

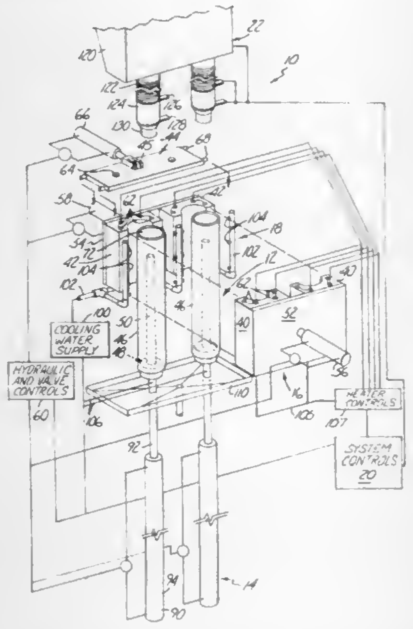
5,840,348
AUTOMATED CARBON BLOCK MOLDING MACHINE AND METHOD

Randy B. Heiligman, Minnetonka, Minn., assignor to Ultrapure Systems, Inc., Minneapolis, Minn.

Filed Sep. 15, 1995, Ser. No. 529,290

Int. Cl.^{6} B28B *7/42*

U.S. Cl. 425—407 **30 Claims**



1. An automated carbon block molding machine for making cylindrical carbon blocks from granular carbon particles and a binder, the machine comprising:

- a mold unit having
  - a sleeve defining a chamber having an open end for receiving the granular carbon particles and the binder,
  - a piston supporting a bottom wall having a surface closing an end of the chamber opposite the open end,
  - an actuator for moving the piston along a longitudinal axis within the chamber,
- a top wall movable between a first position exposing the open end of the chamber so that the chamber can be filled with the granular carbon particles and binder and a second position where the open end of the chamber is closed to provide a mold for the carbon block, and
- a center member extending along the axis within the chamber between the bottom wall and the top wall when the top wall is in its second position;
- a heating unit having first and second heater parts, each heater part being movable between a first position where the heater part is in contact with the sleeve and a second position where the heater part is not in contact with the sleeve, the heating unit being operable to heat the sleeve to melt the binder in the chamber to bond the compressed carbon particles to form the carbon block within the chamber;
- cooling means for cooling the carbon block in the chamber; and
- a programmed control unit for selectively operating the actuator to move the piston to compress the granular carbon particles and binder in the chamber and for subsequently operating the heating unit to heat the sleeve and the compressed granular carbon particles and binder.

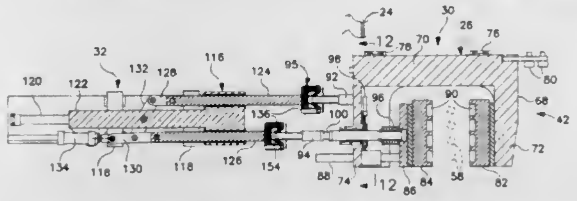
5,840,349
ROTARY BLOW MOLDING MACHINE

John M. Brown, Jr., Westminster, Md.; David N. Fiorani, Jacobus, Pa.; John M. Mathy, Jr., Stewartstown, Pa., and Rolf E. Weingardt, York, Pa., assignors to Graham Engineering Corporation, York, Pa.

Filed Feb. 12, 1997, Ser. No. 797,936

Int. Cl.^{6} B29C *49/36;49/56*

U.S. Cl. 425—532 **64 Claims**



1. A horizontal rotary blow molding machine including a pair of spaced apart main shaft supports; a horizontal rotary main shaft journaled in bearings in said supports; a plurality of mold assemblies spaced around the main shaft between the supports, each assembly including a frame having a base adjacent to the main shaft and a pair of spaced apart arms extending outwardly from the main shaft, a blow mold comprising a pair of mold halves mounted in the frame between said arms for relative movement in a direction parallel to the axis of the main shaft between an open mold position and a closed mold position, a shift rod joined to one mold half and extending parallel to the axis of the main shaft past an adjacent arm, and a mold clamp engageable with the shift rod; a plurality of linear bearings, each bearing joining a mold assembly to the main shaft whereby the mold assemblies are moveable along the main shaft; a mounting member on the main shaft; a plurality of blow pin assemblies on the mounting member, each assembly associated with one of said molds and including a blow pin engageable with such mold and a blow pin drive operable to move the blow pin toward and away from the mold; a rotary drive engageable with said main shaft and operable to rotate the main shaft, mold assemblies, mounting member and blow pin assemblies around the horizontal axis of the main shaft in steps and to dwell the main shaft, mold assemblies, mounting member and blow pin assemblies in circumferential positions between rotary steps, said positions including a container eject position and an adjacent parison capture position located above the container eject position; a first mold assembly drive mounted on one ,of said supports adjacent the container eject position and a second mold assembly drive mounted on one of said supports adjacent the parison capture position; engageable and disengageable members forming drive connections between said respective mold assembly drives and mold assemblies located in the container eject position and the parison capture position, said first mold assembly drive operable to shift a mold assembly along the main shaft from a retracted position to an extended position and to open the mold in such assembly, said second mold assembly drive operable to shift a mold assembly along the main shaft from an extended position to a retracted position and to close the mold in such assembly; and a parison extruder located above a mold assembly located in the circumferential parison capture position and in the extended position on the main shaft.

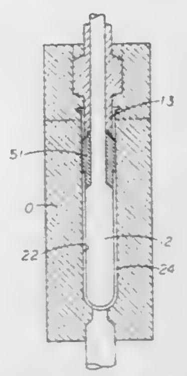
5,840,350
MODIFIED PLASTIC BOTTLE INJECTION BLOW-MOLDING APPARATUS AND METHOD

Tony Salemi, Ann Arbor, Mich., assignor to Brit Corporation, Ypsilanti, Mich.

Continuation of Ser. No. 313,368, Sep. 27, 1994, abandoned. This application Oct. 3, 1996, Ser. No. 725,415

Int. Cl.^{6} B29C *49/48*

U.S. Cl. 425—533 **2 Claims**



1. In an injection blow-molding machine for the manufacture of plastic bottles comprising an injection mold and core to form a preform of plastic and a split bottle blow-mold to form a bottle by blowing a gas into a preform placed therein,

- the improvement to the machine comprising in combination a smooth walled generally tubular shape lacking any means to form cap fastening means and having at least one closed end, said shape formed by the injection mold and core,
- the bottle blow-mold comprising a bottle volume-forming portion, a dome-forming portion, and a cap attachment means-forming portion therebetween, and
- a sleeve on the core, the sleeve being positioned to foreshorten the tubular shape in the injection mold.

5,840,351
GOLF BALL-FORMING MOLD

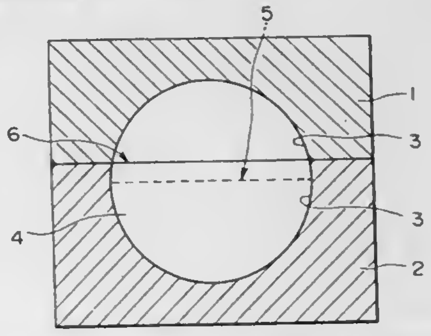
Michio Inoue; Keisuke Ihara; Hirotaka Shimosaka, and Atuki Kasasima, all of Chichibu, Japan, assignors to Bridgestone Sports Co., Ltd., Tokyo, Japan

Filed Jun. 20, 1996, Ser. No. 666,222

Claims priority, application Japan, Jun. 21, 1995, 7-178130

Int. Cl.^{6} B29C *33/44;45/40*

U.S. Cl. 425—556 **5 Claims**



1. A mold for molding a golf ball having a multiplicity of dimples in its surface, some of the dimples being provided on a horizontal great circle projected on the surface and formed by feeding a molding material into a mold cavity, the mold comprising, two split mold segments which are mated in a separable manner to define a spherical mold cavity therein in the shape of a golf ball having a multiplicity of dimples, some of said dimples being provided on the horizontal great circle of the golf ball, the two mold segments being split at a horizontal plane spaced vertically from the horizontal great circle of the golf ball, said horizontal plane being spaced in the range of 1 to 2 mm from the horizontal great circle.

5,840,352
FRESNEL LENS MANUFACTURING APPARATUS

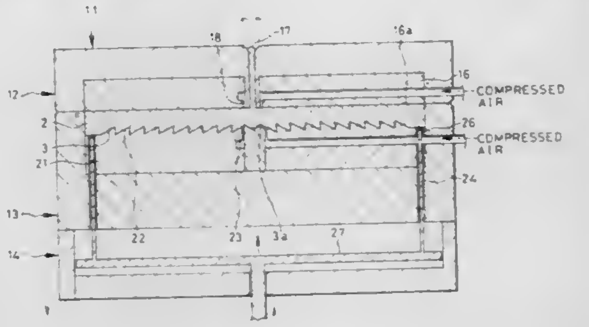
Mitsuru Shimizu, and Yoshihiro Fujita, both of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 297,962, Aug. 30, 1994, abandoned. This application Aug. 19, 1996, Ser. No. 699,639

Claims priority, application Japan, Sep. 6, 1993, 5-221395; Mar. 1, 1994, 6-31485; Aug. 18, 1995, 7-210357

Int. Cl.^{6} B29C *45/43*

U.S. Cl. 425—556 **9 Claims**



1. A Fresnel plate producing apparatus, having a mold assembly comprising first and second molds coupled with each other, and including a Fresnel forming face formed on an inside of at least one of said first and second molds, melted resin injected into said mold assembly forming said Fresnel plate by injection molding, said producing apparatus comprising:

- at least one first annular slit formed through said mold assembly and arranged inside said mold assembly along a circle concentric with and closely surrounding the center of said Fresnel plate for blowing compressed air toward said Fresnel plate has been inserted;
- a plurality of ejector pins, disposed through said mold assembly and regularly peripherally distributed only about and only outside said Fresnel forming face, said Fresnel forming face being free from ejector pins; and
- means for moving said pins toward said Fresnel plate formed by said injection molding.

5,840,353
PROCESS FOR THE PREPARATION OF A FOOD PRODUCT

Peter Wilding, Wellingborough, and Elizabeth Mary Woolner, Bedford, both of United Kingdom, assignors to Lipton, Division of Conopco, Inc., Englewood Cliffs, N.J.

Filed Apr. 7, 1997, Ser. No. 835,247

Claims priority, application European Pat. Off., Apr. 12, 1996, 96302608

Int. Cl.^{6} A23L *1/28;* **A01H** *5/08*

U.S. Cl. 426—15 **3 Claims**

1. A process for providing a tomato-based product comprising the following steps:

- a) applying ultra high pressure to a tomato piece, such that polygalacturonase is inactivated and pectinmethylesterase is not inactivated;
- b) incubating the tomato piece with endogenous pectinmethylesterase to achieve a desired consistency; and
- c) inactivating the pectinmethylesterase.

5,840,354
DRIED FRUIT PRODUCTS FORTIFIED WITH CALCIUM AND METHOD OF PREPARATION

Lanny P. Baumann, Arden Hills; Richard O. Benham, New Hope, both of Minn.; Laurie C. Burgess, Merrimac, N.H., and Daniel L. Gordon, Plymouth, Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Jun. 3, 1997, Ser. No. 867,785

Int. Cl.^{6} A23L *1/06;1/304*

U.S. Cl. 426—74 **32 Claims**

1. A food composition fortified with calcium, comprising:

A. about 5 to 65% by weight of the composition of comminuted edible plant solids;

B. about 0.1 to 85% by weight of the composition of added carbohydrates;

C. sufficient amounts of calcium phosphate to provide a total calcium content of about 180 to 1500 mg per one ounce of the composition, said calcium phosphate having a particle size distribution such that at least 90% have a particle size of less than 150 microns; and

D. about 9 to 20% by weight of the composition of moisture.

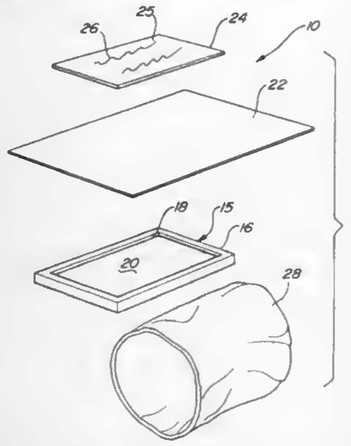
5,840,355
FLOWER ARRANGEMENT INCLUDING A CONFECTIONERY PRODUCT AND A GREETING CARD

Thomas B. Prescott, Saline, and Marc S. Margolis, Ann Arbor, both of Mich., assignors to The King Group, Inc., Ann Arbor, Mich.

Filed Oct. 31, 1996, Ser. No. 741,523

Int. Cl.^{6} A23L *1/00;* B65D *65/00*

U.S. Cl. 426—104 **4 Claims**



1. A confectionery product that also functions to transmit a message to a person receiving the product, said product comprising a shaped bar of candy having a top surface provided with a cavity having a bottom surface, a wrapper member enclosing said candy bar and extending into said cavity, a tubular heat shrink member encircling said bar and said wrapper member, said shrink member being in firm engagement with said wrapper member and covering said cavity, and a greeting card supported in said cavity on said bottom surface in a position between said wrapper and said shrink member.

5,840,356
SHELF-STABLE FRUIT PUREE AND METHOD OF PREPARATION

Bert F. Swensen, Columbus, Miss., assignor to The Network Group, Inc., Jackson, Miss.

Filed Aug. 14, 1997, Ser. No. 914,572

Int. Cl.^{6} A23B *1/22;* A23L *1/27;* A23C *9/14*

U.S. Cl. 426—262 **18 Claims**

1. A method for producing a shelf-stable fruit puree, comprising the steps of: slowly thawing at least one variety of frozen fruit at a defined temperature over a period of time of at least one day to form a fruit base; preparing a premix of preservatives dissolved in water; adding the fruit base to said premix of preservatives to form a fruit-preservative mixture; and adjusting the pH of said fruit-preservative mixture with edible acid to maintain a pH in the range of 2.3 to 3.8.

5,840,357

Patent Not Issued For This Number

5,840,358
PROCESS FOR THE PREPARATION OF AN ANIMAL FEED SUPPLEMENT BASED ON FERMENTATION BROTH

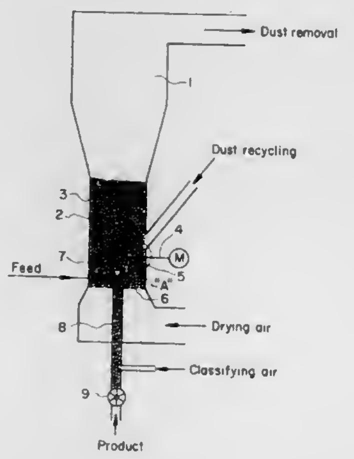
Andreas Höfler, Alzenau; Hans-Christian Alt, Gelnhausen; Claas-Jürgen Klasen, Freigericht; Heinz Friedrich, Hanau; Ulrich Hertz, Bruchkobel; Lothar Mörl, Hohenwarthe, and Rüdiger Schütte, Alzenau, all of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Germany

Filed May 30, 1997, Ser. No. 866,161

Claims priority, application Germany, May 31, 1996, 196 21 930.2

Int. Cl.^{6} A23K *1/00*

U.S. Cl. 426—467 **35 Claims**



1. A process for the preparation of an animal feed supplement which contains a fermentation product based on a fermentation broth, said process comprising:

granulating, compacting and drying the fermentation broth in a fluidised bed in one step, whilst introducing into the fluidised bed by mechanical means a sufficient amount of additional energy to obtain a granular product having a predetermined particle diameter and a predetermined bulk density in addition to energy required to produce the fluidised bed.

5,840,359
PROCESS AND APPARATUS FOR MANUFACTURING NOODLES

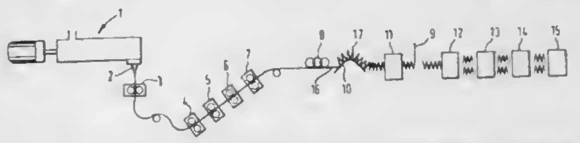
Jurg Lechthaler, Wallisellen, Switzerland; Shiok Guat Teh, Singapore, Singapore; Luca Rusconi, Pasay, Philippines; Philipp Paul Meyer, Benglen, and Othman Mohamad Yusoff, La Tour-de-Peilz, both of Switzerland, assignors to Nestec S.A., Vevey, Switzerland

PCT No. PCT/CH95/00251, § 371 Date Sep. 17, 1997, § 102(e) Date Sep. 17, 1997, PCT Pub. No. WO97/16070, PCT Pub. Date May 9, 1997

PCT Filed Oct. 27, 1995, Ser. No. 849,813

Int. Cl.^{6} A21C *11/00;* A23P *1/00*

U.S. Cl. 426—516 **20 Claims**



1. In a process for the manufacture of noodles, which comprises preparing a mixture of cereal semolina or flour and water, the mixture having a water content of 25–40%, converting the mixture into a band of pasta, and cutting the band into noodles, the improvement which comprises preparing the mixture in a twin-screw kneader at a relatively low pressure of no greater than 1000 kPa and converting the mixture into a band of pasta by passing the mixture through a die having an oblong outlet orifice.

5,840,360
PROCESS FOR EXTRACTING ROASTED AND GROUND COFFEE

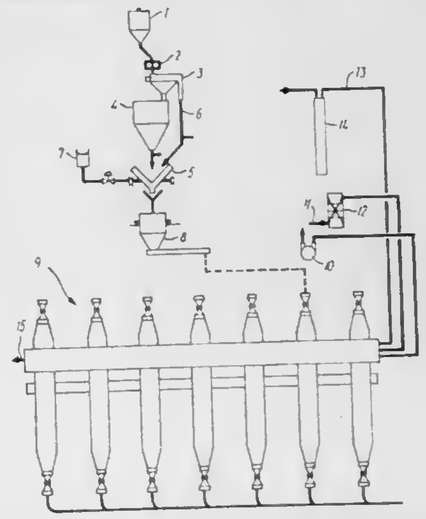
Torben Brinch Larsen, Hørsholm, Denmark, assignor to Niro Holding A/S, Soborg, Denmark

Continuation of Ser. No. 78,251, Jun. 21, 1993, abandoned. This application Jun. 5, 1996, Ser. No. 658,301

Claims priority, application Denmark, Jan. 28, 1991, 0147/91

Int. Cl.^{6} A23F *5/24*

U.S. Cl. 426—594 **11 Claims**



1. A process for extracting an amount of roasted and ground coffee in an extractor, wherein the coffee is pre-wetted before being transferred to the extractor, the process comprising the steps of:

a) wetting the coffee with water having a first temperature between 20° C. and 100° C. to obtain a wetted coffee mixture having a water content of 20–50% by weight, said wetted coffee mixture having a second temperature;

b) transferring said wetted coffee mixture created in said step a) to the extractor to essentially fill the extractor therewith;

c) after the extractor is essentially filled with said wetted coffee mixture, evacuating gases and water vapor from the extractor to obtain a pressure of between 600 millibar and a value corresponding to the vapor pressure of water at said second temperature obtained by said wetted coffee mixture as a result of said wetting step a);

d) without any further evacuation of gases and water vapor from said evacuated extractor and prior to the introduction of gases or air into said evacuated extractor, introducing a hot, aqueous extraction liquid at a first end of said evacuated extractor to substantially fill said extractor, said introduction of said aqueous extraction liquid causing substantially no foam to be created;

e) supplying further hot, aqueous extraction liquid to said first end of the extractor and removing an aqueous extract containing both volatile coffee flavor components as well as non-volatile coffee flavor components from a second end of the extractor opposite said first;

f) controlling the amount of said further extraction liquid to obtain a liquid flow rate through the extractor of 20–50 m/h, calculated on basis of the amount of liquid passing through the extractor and the area of a section perpendicular to the flow path through the extractor, disregarding the presence of the coffee; and

g) removing the coffee from the extractor after extraction of 45–60% by weight of its solid matter at an extraction time of from 1 to 2.5 hours.

5,840,361
FRUCTAN-CONTAINING BABY FOOD COMPOSITIONS AND METHODS THEREFOR

Richard C. Theuer, Chesterfield, Mo., and Mary Beth Cool, Canajoharie, N.Y., assignors to Beech-Nut Nutrition Corporation, St. Louis, Mo.

Filed Apr. 9, 1997, Ser. No. 838,673

Int. Cl.^{6} A23L *1/29*

U.S. Cl. 426—615 **30 Claims**

1. A baby food composition comprising at least one fructan-containing vegetable in an amount suitable for providing at least 1% fructan (w/w) to said composition to selectively stimulate colonic bifidobacteria in a human infant upon ingestion of the composition, in an acceptable baby-food formulation.

5,840,362
METHOD OF REMOVING HYDROCARBONS FROM LIQUID SMOKE COMPOSITIONS

Gary L. Underwood, Manitowoc, and Jeffrey J. Rozum, Madison, both of Wis., assignors to Red Arrow Products, Inc., Manitowoc, Wis.

Continuation of Ser. No. 536,948, Sep. 29, 1995, abandoned. This application Jul. 23, 1997, Ser. No. 899,226

Int. Cl.^{6} A23L *1/015;1/232*

U.S. Cl. 426—650 **19 Claims**

1. A method of removing hydrocarbons from a liquid smoke composition containing phenolics, said method comprising the step of contacting the liquid smoke composition with a nonionic, divinylbenzene-ethylvinlybenzene copolymer resin for a sufficient time and in an amount of about 35 to about 50 milliliters of the liquid smoke composition per gram of the resin to provide a treated liquid smoke composition, wherein at least about 80% of the hydrocarbons are removed from the liquid smoke composition, and the treated liquid smoke composition contains at least 92% of the phenolics present in the liquid smoke composition.

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5,840,363

PROCESS FOR THROUGHPLATING PRINTED CIRCUIT BOARDS USING CONDUCTIVE PLASTICS

Gerhard Rösch, Nürnberg, and Walter Stuckmann, Altdorf, both of Germany, assignors to Grundig AG, Fuerth, Germany

Continuation of Ser. No. 535,122, Oct. 27, 1995, abandoned. This application Mar. 28, 1997, Ser. No. 827,594

Claims priority, application Germany, Apr. 30, 1993, 43 14 259.1

Int. Cl.^{6} B05D *5/12*

U.S. Cl. 427—97 **13 Claims**

1. A method for the throughplating of printed circuit boards using conductive plastics, wherein a polymer layer having intrinsic electrical conductivity is bonded to non-conducting locations of printed circuit boards, whereupon a metallic layer is deposited, said method comprising the steps of:

selecting a printed circuit board having a substrate material and metal-clad locations on both sides;

directly depositing the polymer layer on said substrate material without prior oxidative pre-treatment thereof by wetting an entire surface of the selected printed circuit board, the surface defining throughplating holes, with a monomer solution comprising a monomer for forming a polymer, the monomer being adsorbed into the surface defining the throughplating holes;

polymerizing the monomer using an acidic solution comprising water and an acidic oxidizing substance, the acidic solution having a flow velocity relative to the surface to inhibit bonding of the polymer layer to said metal-clad locations; and

removing polymer bonded during the polymerizing step to the metal-clad locations of the selected circuit board.

5,840,364

COATING SOLUTION FOR A HEAT-RAY SHIELDING FILM AND A PROCESS FOR FORMING A HEAT-RAY SHIELDING FILM BY EMPLOYING THE SAME

Hiromitsu Takeda; Yoshihiro Ohtsuka, both of Ichikawa; Kenji Adachi, Inzai, and Hiroko Kuno, Matsudo, all of Japan, assignors to Sumitomo Metal Mining Company, Limited

Filed Dec. 12, 1996, Ser. No. 764,006

Claims priority, application Japan, Dec. 12, 1995, 7-322622; Apr. 22, 1996, 8-100075; May 14, 1996, 8-119280

Int. Cl.^{6} B05B *5/00*

U.S. Cl. 427—160 **4 Claims**

1. A process for forming a multilayer heat-ray shielding film which comprises applying onto a transparent base a coating solution for a heat-ray shielding film comprising a dispersion obtained by dispersing in a dispersion medium as its main component fine particles of at least one oxide selected from the group consisting of ruthenium-, iridium- and rhodium-containing oxides, said particles having an average particle diameter of up to 100 nm, heating said coating solution to form a first film forming layer having a thickness of 0.05 to 5 microns, applying onto said first film-forming a layer solution containing at least one selected from the group consisting of a resin binder, a metal alkoxide of silicon, zirconium, titanium or aluminum, and a partially hydrolyzed polymer of said metal alkoxide, and heating it to form a second film-forming layer.

5,840,365

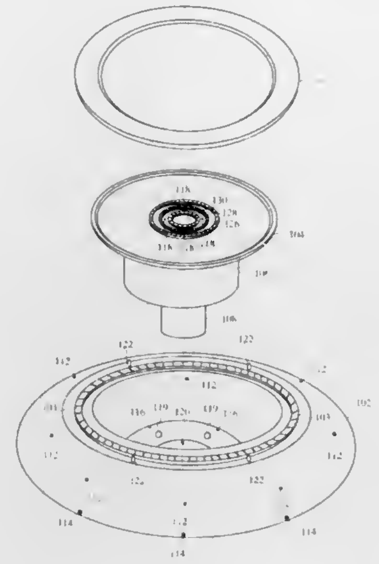
METHOD AND APPARATUS FOR SPIN-COATING COMPACT DISCS

Andreas Ebert, La Grangeville, N.Y., and Abdul Ghafar, Fremont, Calif., assignors to The Fairchild Corporation, Dulles, Va.

Filed Feb. 7, 1997, Ser. No. 797,819

Int. Cl.^{6} B05D *5/12*

U.S. Cl. 427—240 **30 Claims**



1. A spinning chemical applicator for spin coating a work piece, comprising:

a bowl having a base region and substantially curved walls;

a chuck base having a chuck plate for holding the work piece, the chuck base and the chuck plate contained within an inner region of the bowl;

a bowl covering lid being mounted on a top surface of the substantially curved walls;

a plurality of upper venting holes being defined in the substantially curved walls, the plurality of upper venting holes defining a venting path to the inner region of the bowl; and

a plurality of venting drain holes defined in the substantially curved walls at an edge location that is substantially below each of the plurality of upper venting holes, the plurality of venting drain holes providing a venting and drain path for the inner region of the bowl.

20. A method for uniformly spin-coating a chemical over a work piece, comprising:

(a) providing a bowl having a base region and substantially curved walls, the substantially curved walls defining an opening for receiving the work piece, the work piece being placed on a chuck attached to the base region of the bowl;
  (i) wherein the bowl contains a plurality of upper venting holes defined in the substantially curved walls, the plurality of upper venting holes defining a venting path to the inner region of the bowl;
  (ii) wherein the bowl contains a plurality of venting drain holes defined in the substantially curved walls at an edge location that is substantially below each of the plurality of upper venting holes, and the plurality of venting drain holes provide a venting and drain path for the inner region of the bowl;

(b) placing a lid over the bowl once the chemical is applied on the surface of the work piece, the work piece being secured to the chuck that is attached to the base region of the bowl, and

(c) spinning the bowl to a chemical spin-coating speed.

5,840,366

METHOD OF FORMING THIN FILM

Shigeru Mizuno, and Akihiko Koura, both of Fuchu, Japan, assignors to Anelva Corporation, Tokyo, Japan

Filed Aug. 28, 1995, Ser. No. 520,298

Claims priority, application Japan, Sep. 9, 1994, 6-242201

Int. Cl.^{6} C23C *16/14*

U.S. Cl. 427—250 **14 Claims**

1. A method of forming a tungsten film onto a heated substrate by means of chemical vapor deposition, comprising:

a first step of generating tungsten nuclei by a reaction between WF_6 and SiH_4 as an initial stage; and

a second step of growing said tungsten nuclei to make a tungsten layer so that a crystal grain size thereof is maintained to be a predetermined size, by a reaction between WF_6 and H_2, as a subsequent stage;

wherein said first and second steps are alternately repeated to deposit said tungsten film onto the heated substrate.

5,840,367

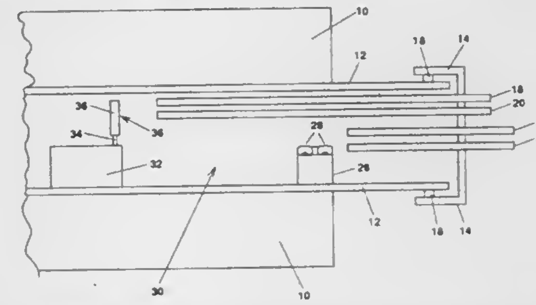
PROCESS FOR PREPARING A TWO PHASE HFB_2-SIB_4 MATERIAL

Eric J. Wuchina, Wheaton, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 669,673, Jun. 24, 1996, Pat. No. 5,691,258. This application Mar. 26, 1997, Ser. No. 825,151

Int. Cl.^{6} C23C *16/38*

U.S. Cl. 427—255.1 **8 Claims**



1. A steady state flow chemical vapor deposition process comprising:

directing the following gas streams at a surface being coated
  (a) a stream of a mixture of $HfCl_4$ and $SiCl_4$,
  (b) a stream of BCl_3, and
  (c) a stream of H_2,

wherein the streams (a), (b), and (c) are kept separate until they reach the surface where they mix and the $HfCl_4$ reacts with the BCl_3 and the $SiCl_4$ reacts with the BCl_3 on the surface to produce a two phase HfB_2-SiB_4 ceramic coating on the surface, and

wherein the surface being coated is kept at a temperature of from 1100° C. to 1300° C. and the total system pressure is kept at from 20 to 40 Torr.

5,840,368

APPARATUS FOR FORMING LOW-TEMPERATURE OXIDE FILMS AND METHOD OF FORMING LOW-TEMPERATURE OXIDE FILMS

Tadahiro Ohmi, 1-17-301, Komegabukuro 2-chome, Aoba-ku, Miyagi-ken 980, Japan

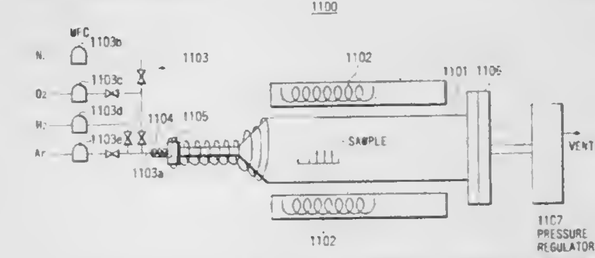
PCT No. PCT/JP93/01682, § 371 Date Jul. 24, 1995, § 102(e) Date Jul. 24, 1995, PCT Pub. No. WO94/11901, PCT Pub. Date May 26, 1994

PCT Filed Nov. 17, 1993, Ser. No. 428,154

Claims priority, application Japan, Nov. 17, 1992, 4-306905

Int. Cl.^{6} C23C *16/00;* **H01L** *21/00*

U.S. Cl. 427—255.4 **7 Claims**



1. A method of forming silicon oxide films, comprising the steps of supplying a gas containing water and oxygen to the interior of an oxidation furnace of an apparatus for forming low-temperature oxide films; said oxidation furnace having a gas supply port and a gas exhaust port, and a heater for heating said oxidation furnace to an arbitrary temperature, said apparatus further comprising a gas supply system disposed upstream of said oxidation furnace and provided with a mechanism for providing an arbitrary amount of water or a mechanism for generating an arbitrary quantity of water, said oxidation furnace, said gas supply system and junction portions thereof being constructed of metallic materials; and

heating and oxidizing a sample within said oxidation furnace at low temperatures of 600° C. or less and under pressures of 1 kg/cm^2 or more.

5,840,369

POLYIMIDE PRECURSOR COMPOSITION, POLYIMIDE COMPOSITION, PROCESS FOR THE PRODUCTION OF SAID POLYIMIDE PRECURSOR COMPOSITION, AND PROCESS FOR THE PRODUCTION OF SAID POLYMIDE COMPOSITION

Masamichi Maruta; Hidehisa Nanai, both of Kawagoe; Yoshihiro Moroi, Tokyo; Hiroshi Takahashi, and Seiji Hasegawa, both of Higashimatsuyama, all of Japan, assignors to Central Glass Co., Ltd., Yamaguchi-ken, Japan

Division of Ser. No. 615,991, Mar. 14, 1996, Pat. No. 5,686,525, which is a division of Ser. No. 346,227, Nov. 22, 1994, abandoned. This application Mar. 18, 1997, Ser. No. 819,941

Claims priority, application Japan, Nov. 26, 1993, 5-296992

Int. Cl.^{6} B41M *1/12;* **B05D** *1/32*

U.S. Cl. 427—282 **5 Claims**

1. A method for forming a polyimide relief pattern film, comprising the steps of:

(a) providing a screen printing ink consisting essentially of a polyimide precursor composition having a thixotropic factor of 3 or more converted from a polyamide acid solution by subjecting said polyamide acid solution to heat treatment, said polyamide acid solution being obtained by reacting an aromatic tetracarboxylic acid component and a diamine component in the presence of an oxygen-containing solvent having a boiling point of 180° C. to 300° C., said screen printing ink having no addition of fine particles for imparting thixotropic properties,

(b) screen printing said screen printing ink on a substrate,

(c) removing solvent contained in said screen printing ink on said substrate, and

(d) thermally curing said screen printing ink on said substrate.

5,840,370

IN-LINE PROCESSING OF CONTINOUS GLASS FIBERS WITH THERMOSET SOLUTION EPOXY

Andrew B. Woodside, Pickerington; Joan T. Muellerleile, Bexley, and David R. Hartman, Granville, all of Ohio, assignors to Owens Corning Fiberglas Technology, Inc., Summit, Ill.

Filed May 2, 1996, Ser. No. 643,050

Int. Cl.^{6} B32B *9/00;* **B05D** *3/05*

U.S. Cl. 427—372.2 **2 Claims**

1. A method of forming preimpregnated fibers suitable for making a composite article comprising the stems of:

(a) providing a plurality of fibers;

(b) applying an aqueous-based chemical treatment to said fibers to form coated fibers, said chemical treatment containing a curable resin; and

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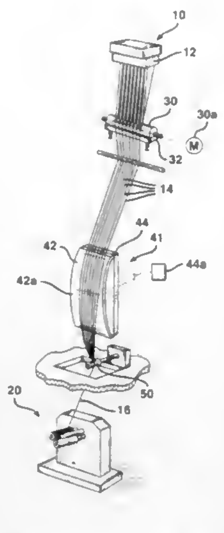


(c) drying said chemical treatment on said coated fibers with a contact plate which transfers energy in the form of heat to said fibers to dry said chemical treatment without fully curing said resin; wherein said coated fibers have a solids content of from about 10% to about 30% by weight.

5,840,371

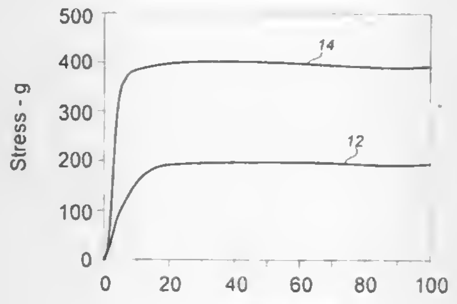
TREATMENT FOR IMPROVED CONDUCTIVITY OF COLLECTOR-ELECTRODE INTERFACE IN LAMINATED LITHIUM-ION RECHARGEABLE BATTERIES

Paul C. Warren, Far Hills, N.J., assignor to Bell Communications Research, Inc., Morristown, N.J.

Filed Jul. 2, 1997, Ser. No. 887,507

Int. Cl.^{6} B05D *3/02*

U.S. Cl. 427—377 **6 Claims**



5

1. A method for improving the laminate adhesion under heat and pressure between a polymeric rechargeable battery electrode composition and a metallic current collector which comprises pretreating the surface of said collector by forming thereon a polymeric film compatible with said electrode composition and heating said film to effect adhesion thereof to said collector surface characterized in that said heating step is carried out in a non-oxidizing atmosphere.

5,840,372

PROCESS FOR THE PRODUCTION OF A MULTILAYER PROTECTIVE AND/OR DECORATIVE COATING ON A SUBSTRATE SURFACE, AND AQUEOUS PAINTS SUITABLE FOR CARRYING OUT THE PROCESS

Heinz Peter Rink; Bernhard Lettmann, both of Münster, Germany, and Achim Gast, Yuigahama, Japan, assignors to BASF Lacke+Farben, AG, Muenster-Hiltrup, Germany

PCT No. PCT/EP93/00967, § 371 Date Dec. 9, 1994, § 102(e) Date Dec. 9, 1994, PCT Pub. No. WO93/23443, PCT Pub. Date Nov. 25, 1993

PCT Filed Apr. 21, 1993, Ser. No. 325,470

Claims priority, application Germany, May 12, 1992, 42 15 499.5

Int. Cl.^{6} B05D *1/36*

U.S. Cl. 427—407.1 **7 Claims**

1. Process for the preparation of a multilayer coating on a substrate surface, comprising

- (1) applying a pigmented aqueous basecoat which comprises a polyacrylate resin and a crosslinking agent selected from the group consisting of aminoplasts and blocked polyisocyanates, as binder to the substrate surface, wherein the polyacrylate resin is obtained by polymerization of
  - (a) a mixture of esters comprising
    - i) esters selected from the group consisting of furfuryl acrylate, furfuryl methacrylate, and mixtures thereof and
    - ii) esters selected from the group consisting of esters of methacrylic acid, esters of acrylic acid, and mixtures thereof, and
  - (b) monomers different from a) and mixtures thereof, such that the proportion of furfuryl acrylate and/or furfuryl methacrylate, based on the total weight of (a)+(b)=100% by weight, is 0.25 to 10% by weight,
- (2) forming a polymer film from the basecoat applied in stage (1),
- (3) applying a transparent topcoat to the resulting basecoat and subsequently
- (4) baking together the basecoat and topcoat.

6. Process according to claim 1, characterized in that the pigmented aqueous basecoat contains an aluminum pigment.

5,840,373

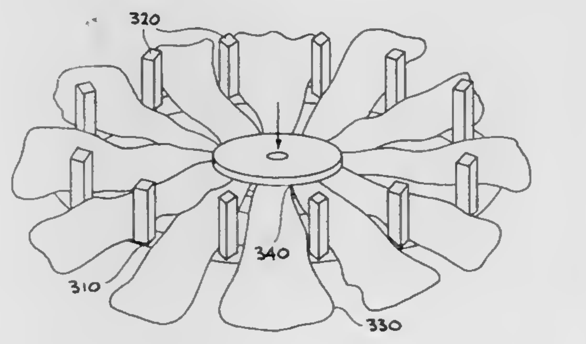
METHOD OF GROWING FILMS BY FLAME SYNTHESIS USING A STAGNATION-FLOW REACTOR

David W. Hahn, Dublin, and Christopher F. Edwards, Sunnyvale, both of Calif., assignors to Sandia Corporation, Livermore, Calif.

Filed Aug. 19, 1996, Ser. No. 699,817

Int. Cl.^{6} B05D *1/08*

U.S. Cl. 427—446 **8 Claims**



1. A method of growing films by flame synthesis, comprising the steps of:

- a) positioning a flame stabilizer on a top surface of a substrate in a stagnation flow reactor, wherein the flame stabilizer comprises:
  - i) an annular ring having a top surface, wherein said annular ring is positioned coaxially and coplanar with the substrate, and
  - ii) spaced apart, vertical pillars mounted on the top surface of said annular ring, wherein said vertical pillars are spaced equidistant from one another thereby dividing a flame into equal segments;
- b) injecting a gas through a nozzle in the stagnation flow reactor, wherein the nozzle is spaced apart from and parallel to the substrate and wherein the gas is suitable for forming a film;
- c) igniting the gas to form a flame;
- d) impinging the flame onto the substrate surface; and
- d) decreasing the separation distance between the nozzle and the top surface of the substrate to form a strained flame.

5,840,374

METHOD OF FORMING A SiO_2 PASSIVATION FILM ON A PLASTIC SUBSTRATE

Kazuyuki Ito; Kyuzo Nakamura; Michio Ishikawa; Jun Togawa; Noriaki Tani; Masanori Hashimoto, all of Chiba-ken, and Yumiko Ohashi, Nagoya, all of Japan, assignors to Nihon Shinku Gijutsu Kabushiki Kaisha, Kanagawa-ken, and Brother Kogyo Kabushiki Kaisha, Aichi-ken, both of Japan

Continuation-in-part of Ser. No. 310,760, Sep. 27, 1994, Pat. No. 5,554,418. This application Jun. 11, 1996, Ser. No. 661,500

Claims priority, application Japan, Dec. 28, 1993, 5-335714

Int. Cl.^{6} B05D *3/06;* C23C *16/22*

U.S. Cl. 427—579 **6 Claims**

1. A method of forming an SiO_2 passivation film on a surface of a plastic substrate by a plasma chemical vapor deposition process wherein an organic oxysilane is used as a raw gas, which comprises using tetraethoxysilane or tetramethoxysilane as the organic oxysilane and using a gas selected from the group consisting of Ar, He and NH_3 as a reactive gas which serves as an auxiliary for decomposing the raw gas at a temperature not greater than the thermal deformation temperature of the substrate in the absence of a gas having an ashing effect, whereby ashing of the substrate by oxygen or hydrogen radicals is prevented.

5,840,375

METHOD FOR THE PREPARATION OF A HIGHLY CORROSION RESISTANT RARE EARTH BASED PERMANENT MAGNET

Kenichi Katsumi; Takehisa Minowa, and Masao Yoshikawa, all of Takefu, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jun. 12, 1996, Ser. No. 661,877

Claims priority, application Japan, Jun. 22, 1995, 7-156197; Jun. 22, 1995, 7-156221; Aug. 29, 1995, 7-220123

Int. Cl.^{6} B60B *1/00*

U.S. Cl. 427—600 **9 Claims**

1. A method for the preparation of a highly corrosion-resistant rare earth-iron-boron permanent magnet which comprises the steps of:

- (a) providing a sintered base body of a rare earth-iron-boron permanent magnet with an outer surface by alloying the rare earth-iron-boron elements and forming a block of permanent magnetic material;
- (b) coating the surface of the base body of the rare earth-iron-boron permanent magnet with an aqueous coating liquid containing an alkali metal silicate having a chemical composition expressed by the formula $M_2O.nSiO_2$, in which M is an alkali metal element and n is a positive number in the range from 1.5 to 20, to form a coating layer;
- (c) drying the coating layer to give a dried surface film; and
- (d) subjecting the dried surface film of alkali metal silicate to a heat treatment at a temperature in the range from 50° to 450° C. to form a vitrified alkali metal silicate-based coating film, the coating amount of the aqueous coating liquid containing an alkali metal silicate in step being such that the vitrified alkali metal silicate-based coating film formed has a thickness in the range from 100 nm to 3 μm.

5,840,376

HIGH MAGNETIC FIELD PROCESSING OF LIQUID CRYSTALLINE POLYMERS

Mark E. Smith; Brian C. Benicewicz, and Elliot P. Douglas, all of Los Alamos, N. Mex., assignors to The Regents of the University of California, Los Alamos, N. Mex.

Filed Feb. 28, 1996, Ser. No. 608,343

Int. Cl.^{6} C09K *19/00*

U.S. Cl. 428—1 **2 Claims**

1. A bulk article of a liquid crystalline thermoset material including diglycidyl ether of dihydroxy-alpha-methyl stilbene and sulfanilamide, said material processed in a high strength magnetic field whereby said material is characterized as having a tensile modulus parallel to orientation of said field of at least 25 percent greater than said material processed in the absence of such a high strength magnetic field.

5,840,377

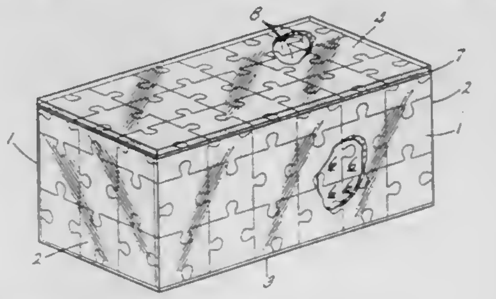
CONTAINER WITH JIGSAW PUZZLE COMPONENTS

John L. Donnell, 4881 Donald St., Eugene, Oreg. 97405

Continuation-in-part of Ser. No. 49,953, Feb. 5, 1996. This application Mar. 5, 1997, Ser. No. 811,222

Int. Cl.^{6} A63F *9/12*

U.S. Cl. 428—33 **16 Claims**



1. A walled receptacle including,

a translucent wall member of rigid construction,

a liner component including Jigsaw puzzle pieces providing a display when assembled, and

retentive means for maintaining said liner component when assembled in place in surfacial abutment with said wall member.

5,840,378

ENDLESS FABRIC FOR CONDENSING PAPER MATERIAL AND METHOD OF MAKING THEREOF

Hiroyuki Nagura, and Takehito Kuji, both of Tokyo, Japan, assignors to Nippon Filcon Co., Ltd., Tokyo, Japan

Filed Dec. 12, 1996, Ser. No. 766,593

Claims priority, application Japan, Dec. 13, 1995, 7-349924; Nov. 15, 1996, 8-338831

Int. Cl.^{6} B32B *23/02*

U.S. Cl. 428—57 **23 Claims**

1. An endless fabric for condensing paper material comprising: an endless fabric having an outer surface, a running surface opposite to the outer surface and two selvages formed by weaving plastic monofilaments: an antiflexing part being formed on the outer surface by filling said endless fabric with first thermoplastic resin at at least one of the selvages; a guide ridge formed of second thermoplastic resin and integrally welded on the running surface with said second thermoplastic resin which fills the running surface

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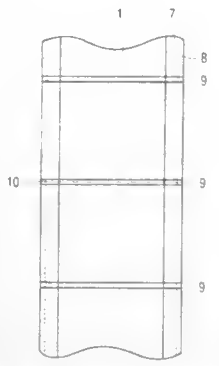


of said antiflexing part: and a reinforcing strip formed by filling not less than 85% of the empty space in said endless fabric with third thermoplastic resin in a length nearly equal to the width of said endless fabric as extended between the selvages,

wherein said endless fabric is a multi-ply woven fabric formed by plastic monofilament wefts in at least three layers, the layers comprise at least an uppermost layer, a intermediate layer and a lowermost layer, said wefts being interlaced with plastic monofilament warps, and

wherein said reinforcing strip is platelike and has two opposite end parts in the width direction and a central part and wherein said opposite end parts are weaker in rigidity than the central part.

5,840,379

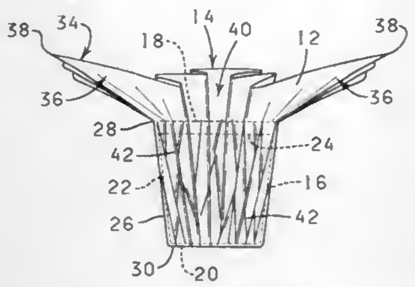
ARTICLE FORMING SYSTEM

Donald E. Weder; Earl H. Weder, both of Highland, Ill.; Raymond E. Jack Dunn, St. Louis, and Franklin J. Craig, Valley Park, both of Mo., assignors to Southpac Trust International, Inc.

Continuation of Ser. No. 452,801, May 30, 1995, Pat. No. 5,616,380, which is a continuation of Ser. No. 108,093, Aug. 17, 1993, Pat. No. 5,472,752, which is a continuation of Ser. No. 24,573, Mar. 1, 1993, abandoned, which is a continuation of Ser. No. 464,694, Jan. 16, 1990, Pat. No. 5,208,027, which is a continuation of Ser. No. 219,083, Jul. 13, 1988, Pat. No. 4,897,031, which is a continuation of Ser. No. 4,275, Jan. 5, 1987, Pat. No. 4,773,182, which is a continuation of Ser. No. 613,080, May 22, 1984, abandoned. This application Feb. 6, 1997, Ser. No. 795,614

Int. Cl.^{6} A01G *9/02*

U.S. Cl. 428—34.1 **51 Claims**



1. A flower pot cover made by forming at least one sheet of material into a predetermined shape for receiving an object, wherein the flower pot cover comprises a base having a closed lower end and an open upper end with an object opening extending therethrough, wherein the sheet of material is a polymer film which normally is flexible and substantially non-shape-sustaining, wherein the formed flower pot cover is flexible and may be substantially flattened and unflattened to assume the original shape of the formed flower pot cover without substantial loss of the preformed shape thereby providing the flexible yet shape-sustaining nature of the formed flower pot cover, wherein the forming of the sheet of material is accomplished by substantially permanently fixing a portion of the sheet of material into a plurality of folds to form the base of the flower pot cover and for cooperating to retain the flower pot cover in the formed shape.

5,840,380

BASICITY-RESISTANT REFRACTORY

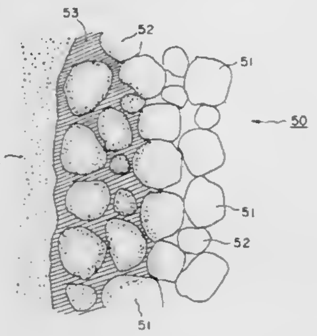
Etsuji Kimura; Kenichi Yamaguchi, and Fumihiko Ogino, all of Omiya, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Continuation of Ser. No. 189,246, Jan. 31, 1994, abandoned. This application Apr. 15, 1996, Ser. No. 631,959

Claims priority, application Japan, Aug. 30, 1993, 5-237436; Aug. 30, 1993, 5-237437

Int. Cl.^{6} B32B *17/00*

U.S. Cl. 428—34.4 **15 Claims**



1. A basicity-resistant refractory comprising a substratum which is a sintered refractory and, as a surface layer thereon, a sintered oxide mixture comprising particles of magnesium oxide which is a main component, and particles of an oxide which is a second component and which is one or more oxides selected from the group consisting of titanium oxide, niobium oxide, neodymium oxide, lanthanum oxide, manganese oxide, nickel oxide and cobalt oxide and forms a composite oxide with magnesium oxide and iron oxides through reaction with iron oxides in a melt or a calcined mass.

5,840,381

CORROSION INHIBITING LAMINATE SHEETS AND CONTAINERS

Ryochi Ohtsuka, Toyohashi, Japan, assignor to Aicello Chemical Co., Ltd., Aichi-ken, Japan

Filed Apr. 25, 1996, Ser. No. 638,087

Int. Cl.^{6} A47G *19/22*

U.S. Cl. 428—34.4 **26 Claims**

1. A corrosion-inhibiting laminate sheet for wrapping metal products, wherein a space is formed between the laminated sheet and the metal products, comprising:

a first thermoplastic resin layer comprising water-soluble glass powder having a solubility of 0.1 % by weight or higher in water; and

a second thermoplastic resin layer comprising at least one inorganic acid metal salt, each of said first thermoplastic resin layer and said second thermoplastic resin layer being formed into a sheet using heat and laminated together, said laminate sheet having a strength sufficient to wrap metal products.

5,840,382

ELECTRONIC PART WITH LAMINATED SUBSTRATES HAVING DIFFERENT DIELECTRIC CONSTANTS

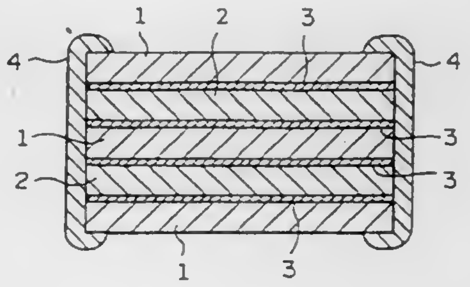
Mitsuyoshi Nishide, and Hiroji Tani, both of Kyoto, Japan, assignors to Murata Mfg. Co., Ltd., Japan

Continuation of Ser. No. 68,123, May 27, 1993, abandoned. This application Jul. 17, 1997, Ser. No. 895,519

Claims priority, application Japan, May 28, 1992, 4-135475

Int. Cl.^{6} B32B *3/00*

U.S. Cl. 428—209 **20 Claims**



1. An electronic part comprising (1) a laminate comprising at least first and second previously fired ceramic substrates each containing in the inside thereof a passive element, and an adhesive layer comprising glass which is interposed between said first and second substrates, and (2) an outer electrode which is formed on the surface of said laminate of the substrates and electrically connected to said passive elements;

wherein said adhesive layer comprises a glass selected from the group consisting of PbO—ZnO—B_2O_3 amorphous glass, ZnO—Sio_2—B_2O_3 amorphous glass, SiO_2—Al_2O_3—PbO crystalline glass, SiO_2—B_2O_3—CaO crystalline glass, SiO_2—Al_2O_3—B_2O_3 crystalline glass, and their amorphous glasses,

wherein said first substrate has a first dielectric constant, said adhesive layer has a dielectric constant of up to 10, and the second substrate has a dielectric constant of 4–20, the respective dielectric constants of the adhesive layer and the second substrate being lower than said first dielectric constant.

5,840,383

ELECTROMAGNETIC WAVE REFLECTIVE FABRIC

Paul A. Kotz, Greensboro, N.C., and Gary T. Starr, Lynchburg, Va., assignors to BGF Industries, Inc., Greensboro, N.C.

Filed Feb. 12, 1996, Ser. No. 600,085

Int. Cl.^{6} H01Q *15/14*

U.S. Cl. 428—35.8 **30 Claims**

1. An electromagnetic wave reflecting fabric compound comprising:

a plurality of metallic fibers for reflecting electromagnetic waves,

a plurality of sheath-core binder fibers dispersed throughout said metallic fibers, said binder fibers having a sheath melted sufficiently to bond said metallic fibers and said sheath-core fibers together,

a molding resin, and

said metallic fibers and said binder fibers form a mat of material capable of reflecting electromagnetic waves, said mat impregnated with said molding resin to form an electromagnetic wave reflective antenna dish.

5,840,384

AQUEOUS COATING COMPOSITION FOR EXTERIOR SURFACE OF CAN

Sumio Noda; Seiji Takami; Keiichi Shimizu, and Kaoru Morita, all of Hiratsuka, Japan, assignors to Kansai Paint Company, Ltd, Japan

Continuation of Ser. No. 501,460, Jul. 12, 1995, abandoned. This application Oct. 9, 1997, Ser. No. 947,868

Claims priority, application Japan, Jul. 13, 1994, 6-186766

Int. Cl.^{6} C08L *63/00*

U.S. Cl. 428—35.8 **8 Claims**

1. An aqueous composition, for coating the exterior surface of a can, comprising a water-soluble or water-dispersible reaction product prepared from:

(a) about from 50 to 90 parts by weight of at least one resin having carboxyl functionality having an acid value of about from 30 to 300 selected from the group consisting of acrylic resin having a number-average molecular weight of 4,000 to 20,000 and polyester resin having a number-average molecular weight of 800 to 3,000;

(b) 10 to 50 parts by weight of epoxy resin having an epoxy equivalent of about from 380 to 2,300 and a number-average molecular weight of about from 700 to 3,000; and

(c) a tertiary amine,

resulting in at least 50 mole % of the epoxy groups of the epoxy resin (b) being quaternary ammonium salt, the composition comprising at least about 30% water and wherein the aqueous composition contains substantially no epoxy groups.

5,840,385

COVER FOR PRODUCT PACKAGE AND METHOD FOR PRODUCING SAME

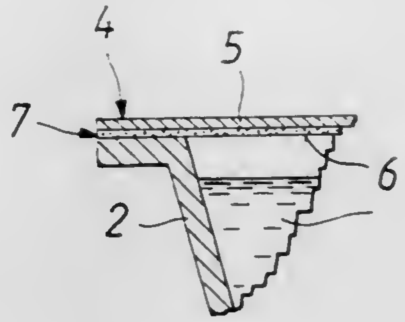
Tapani Penttinen, Huutjärvi; Riitta Koskiniemi, Kyminlinna, and Matti Salste, Imatra, all of Finland, assignors to Enso-Gutzeit Oy, Imatra, Finland

Continuation of Ser. No. 471,067, Jun. 6, 1995, abandoned. This application Aug. 18, 1997, Ser. No. 912,753

Claims priority, application Finland, Jun. 16, 1994, 942877

Int. Cl.^{6} B32B *27/10;* B65D *65/40*

U.S. Cl. 428—36.7 **15 Claims**



1. A cover (**4**) to be heat-sealed an the mouth of a product package (**1**) and extracted therefrom when opening the package, comprising a paper layer (**5**), a polymer heat-sealing layer (**11**), and a non-curling polymer support layer (**9**) forming a barrier against oxygen disposed therebetween, said polymer heat-sealing layer (**11**) permitting extraction of the cover after said heat sealing on the mouth of said product package, and said polymer support layer (**9**) including a crystalline polymer component of high degree of crystallization and an amorphous polymer component to render said cover non-curling.

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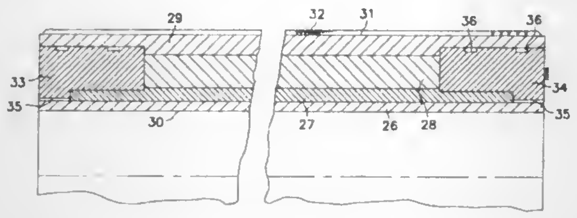
5,840,386
SLEEVE FOR A LIQUID TRANSFER ROLL AND METHOD FOR PRODUCING IT

Russell Bruce Hatch, Swindon, United Kingdom, and Jacques Luthi, Viry, France, assignors to Praxair S.T. Technology, Inc., Danbury, Conn.

Filed Feb. 22, 1996, Ser. No. 605,529

Int. Cl.^{6} B41F *13/08;* **B29C** *44/34*

U.S. Cl. 428—36.9 **15 Claims**



1. A sleeve adapted to be mounted and dismounted on a mandrel to form a liquid transfer roll, said sleeve having radially inner and outer surfaces and a pair of opposite axial ends, said sleeve comprising:

a radially expandable inner skin defining said radially inner surface of said sleeve and adapted to withstand wear and abrasion during mounting of the sleeve on said mandrel and demounting of the sleeve from said mandrel;

at least one radially compressible intermediate layer of resilient plastic material;

a rigid, self-supporting metal outer tube;

a reinforced intermediate tube disposed between said compressible layer and said rigid metal outer tube; and

a metal ring disposed at each of said axial ends of the sleeve, said metal rings being designed and arranged to permit radial expansion of said inner skin as well as radial compression of said intermediate layer, wherein said metal rings are positioned radially between said inner and outer tubes, with radial gaps permitting radial expansion of said inner tube and radial compression of said intermediate layer being provided between said metal rings and said inner tube.

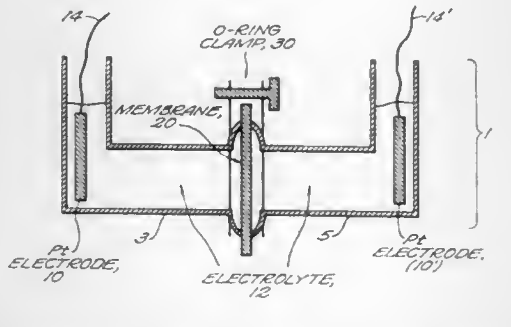
5,840,387
SULFONATED MULTIBLOCK COPOLYMER AND USES THEREFOR

Laurence Berlowitz-Tarrant, Harvard, Mass.; Timothy N. Tangredi, Palm Harbor, Fla.; Gary E. Wnek, Latham, N.Y., and Robert J. Nicolosi, Tyngsboro, Mass., assignors to Aegis Biosciences L.L.C., Palm Harbor, Fla.

Filed Jun. 10, 1996, Ser. No. 661,111

Int. Cl.^{6} B29D *22/00*

U.S. Cl. 428—36.91 **19 Claims**



1. A nonthrombogenic article for use in contact with blood or blood products, the ariicle comprising a substrate hanving at least one surface, said surface having disposed thereon an anionic sulfonated multiblock copolymer, wherein said multiblock copolymer is at least 20% sulfonated.

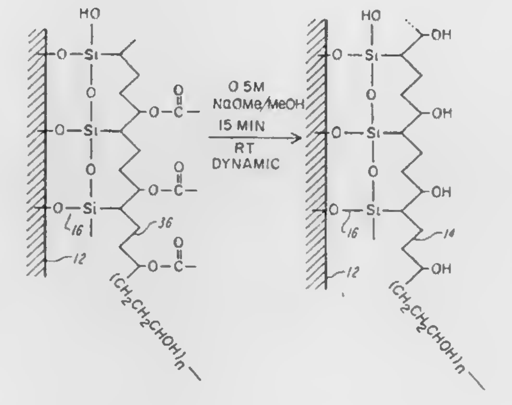
5,840,388
POLYVINYL ALCOHOL (PVA) BASED COVALENTLY BONDED STABLE HYDROPHILIC COATING FOR CAPILLARY ELECTROPHORESIS

Barry L. Karger, Newton, and Wolfgang Goetzinger, Boston, both of Mass., assignors to Northeastern University, Boston, Mass.

Contiouation of Ser. No. 379,834, Jan. 27, 1995, abandoned. This application May 22, 1997, Ser. No. 861,906

Int. Cl.^{6} C25B *9/00*

U.S. Cl. 428—36.91 **9 Claims**



1. A coated microcapillary column for high precision and high performance electrophoresis, comprising:

a microcapillary column having an interior cavity and a wall with an inner surface, said inner surface of said wall having an interconnected, polymeric, surface-modifying coating comprising a polyvinyl alcohol based polymer covalently attached to said inner surface of said wall, said coating remaining stable and covalently attached to said wall at pH values comprising pH 4.4 to pH 10.0.

5,840,389
TRANSPARENT IMPACT-RESISTANT MOLDED ARTICLES

Tadashi Asanuma, Takaishi; Tateyo Sasaki, Kishiwada, and Shosuke Nakanishi, Takaishi, all of Japan, assignors to Mitsui Chemicals, Inc., Tokyo, Japan

Division of Ser. No. 124,531, Sep. 22, 1993, Pat. No. 5,637,367, which is a continuation of Ser. No. 831,519, Feb. 5, 1992, abandoned. This application Feb. 18, 1997, Ser. No. 802,825

Claims priority, application Japan, Feb. 15, 1991, 3-021991; Mar. 18, 1991, 3-051880

Int. Cl.^{6} B29D *23/00*

U.S. Cl. 428—36.91 **11 Claims**

1. A transparent and impact-resistant multi-layer blow-molded article which comprises:

(i) at least one layer comprising a syndiotactic propylene homopolymer which has a syndiotactic pentad fraction of 0.7 or more and an intrinsic viscosity of from 0.5 to 10 measured in a tetrahydronapthalene solution at 135° C. or a syndiotactic propylene copolymer which contains 10% by weight or less of ethylene or α-olefin units having 4 to 20 carbon atoms, and wherein a peak intensity observed at about 20.2 ppm in the absorption spectrum of ^{13}C-NMR measured in a 1,2,4-trichlorobenzene solution of the polypropylene is 0.5 or more of a peak intensity attributed to all the methyl groups of the propylene unit and a copolymer of ethylene and propylene; and

(ii) at least one surface layer comprising a syndiotactic propylene homopolymer which has a syndiotactic pentad fraction of 0.7 or more and an intrinsic viscosity of from 0.5 to 10 measured in a tetrahydronaphthalene solution at 135° C.

5,840,390
FRM DISC PREFORM AND MANUFACTURING METHOD THEREOF

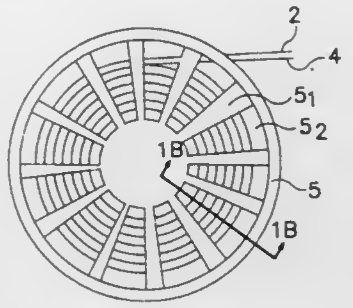
Chikara Fujiwara, Komaki, Japan, assignor to Research Institute of Advanced Material Gas-Generator Co., Ltd. (AMG), Tokyo, Japan

Filed Oct. 4, 1995, Ser. No. 539,040

Claims priority, application Japan, Nov. 2, 1994, 6-269432

Int. Cl.^{6} D04H *3/02*

U.S. Cl. 428—37 **11 Claims**



1. An FRM disc preform comprising:

a reinforcing fiber wound in a spiral shape and having opposing flat faces, said wound reinforcing fiber forming a plurality of windings;

a spray coating, made of a matrix metal, formed on one or both of said flat faces of said reinforcing fiber to hold said spiral shape thereof;

a spacing element comprising a matrix metal wire interposed between each of said windings of said reinforcing fiber in order to maintain a space between each of said windings, wherein said spacing element can be removed from said preform or can remain as a part of said preform, and said spacing element is formed of the same material as that of said matrix metal; and

a metal foil provided on one of said flat faces of said reinforcing fiber, said metal foil being formed of the same material as that of said matrix metal, wherein said spray coating is formed on the other of said flat faces of said reinforcing fiber on which said metal foil is not provided.

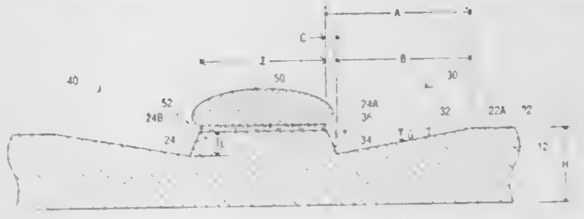
5,840,391
DECORATIVE GLASS SHEET WITH SIMULATED BEVELED PANE AND METHOD FOR FORMING THE SAME

Keith L. Eichhorn, High Point, and Lars Richter, Trinity, both of N.C., assignors to Glass Unlimited of High Point, Inc., High Point, N.C.

Filed Oct. 15, 1997, Ser. No. 951,096

Int. Cl.^{6} B44C *5/08;* **C03C** *27/02*

U.S. Cl. 428—38 **40 Claims**



1. A decorative glass sheet simulating a multi-pane, camed window or door, said decorative glass sheet comprising:

a) a glass panel having an outer surface;

b) a plurality of grooves formed through said outer surface and into said glass panel, said grooves intersecting one another, each said groove including a first wall extending from a first peripheral edge to a groove bottom apex and a second wall extending from said apex to a second peripheral edge, said second wall having a width greater than a width of said first wall; and

c) a central portion forming a part of said outer surface and defined by said second peripheral edges of said grooves and surrounded thereby;

d) a decorative region defined by said first peripheral edges of said grooves, said decorative region having substantially the same shape as said central portion; and

e) decorative caming strips adhered to said outer surface of said glass panel and disposed adjacent and along said first peripheral edges of said grooves.

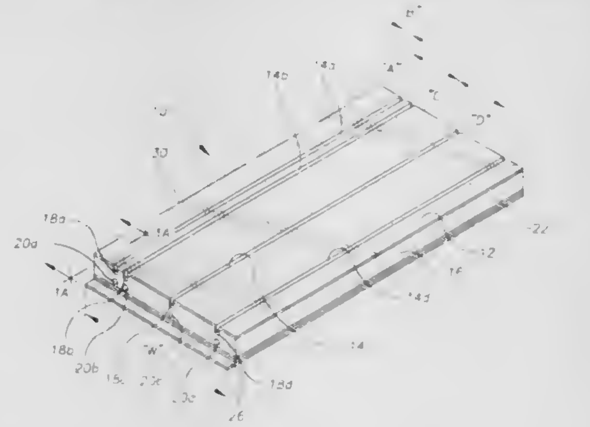
5,840,392
SELF-ADHERING DUCT INSULATION BOARD

Kevin H. Clark, and Deborah W. Clark, both of 1810 Edwardsville Dr., Edwardsville, Kans. 66111

Filed Sep. 4, 1997, Ser. No. 923,479

Int. Cl.^{6} B32B *3/30*

U.S. Cl. 428—40.1 **19 Claims**



1. A self-adhering duct insulation board comprising:

a central foam insulation board with first, second, third, and fourth parallel outer board bend channels formed into an outer surface thereof and first, second, third, and fourth parallel inner board bend channels formed into an inner surface thereof, said first, second, third, and fourth outer board bend channels being oriented in parallel with said first, second, third, and fourth inner board bend channels, each of said first, second, third, and fourth outer board bend channels being arranged in relation to one of said first, second, third, and fourth inner board bend channels in a manner to form a flexible board bending hinge;

an outer foil layer permanently attached onto said outer surface of said central foam insulation board, said outer foil layer forming four foil bend channels, one into each of said first, second, third, and fourth outer board bend channels of said central foam insulation board;

an inner foil layer permanently secured to said inner surface of said central foam insulation board;

an adhesive layer deposited onto said inner foil layer in a manner such that said inner foil layer is positioned between said adhesive layer and said central foam insulation board; and

a peel off cover sheet positioned onto said adhesive layer;

said first outer board bend channel being spaced from a first side edge of said central foam insulation board a distance ot between seven and nine inches;

said second outer board bend channel being spaced from said first side edge of said central foam insulation board a distance of between nine and eleven inches;

said third outer board bend channel being spaced from said first side edge of said central foam insulation board a distance of between twenty-three and twenty-five inches;

said fourth outer board bend channel being spaced from said first side edge of said central foam insulation board a distance of between thirty-nine and forty-one inches.

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5,840,393
PRINTABLE FLEXIBLE SHEET

Raymond Peter Gannon, St. Lucia, Australia, assignor to The University of Queensland, Queensland, Australia

PCT No. PCT/AU95/00579, § 371 Date Mar. 4, 1997, § 102(e) Date Mar. 4, 1997, PCT Pub. No. WO96/07551, PCT Pub. Date Mar. 14, 1996

PCT Filed Sep. 6, 1995, Ser. No. 793,945

Claims priority, application Australia, Sep. 6, 1994, PM7879

Int. Cl.^{6} B32B *3/14*

U.S. Cl. 428—49 **14 Claims**

1. A printed flexible sheet which includes at least one printed layer including print, said at least one layer comprising heat fusible particles and a carrier phase for said particles, wherein said said print is at least partially absorbed or adsorbed into said carrier phase, and said carrier phase is able to substantially volatilize upon heating of said printed sheet to about the temperature at which said particles fuse.

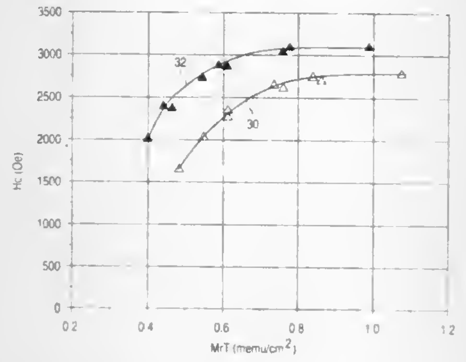
5,840,394
METHOD OF MANUFACTURING A THIN FILM MAGNETIC RECORDING MEDIUM HAVING LOW MRT VALUE AND HIGH COERCIVITY

Rajiv Yadav Ranjan, San Jose, and Miaogen Lu, Fremont, both of Calif., assignors to Komag, Incorporated, Milpitas, Calif.

Filed Apr. 2, 1997, Ser. No. 829,995

Int. Cl.^{6} G11B *5/66*

U.S. Cl. 428—65.3 **17 Claims**



6. A magnetic disk comprising:

a substrate;

a first magnetic layer formed on said substrate, said first magnetic layer comprising Co, and wherein the total atomic percentage of Cr, Ta, Ti, W, Zr or Hf, if any, is less than 7.5 at. %; and

a second magnetic layer formed on said first magnetic layer in an epitaxial relation with said first magnetic layer, said second magnetic layer comprising Co and one or more materials selected from the group consisting of Cr, Ta, Ti, W, Zr and Hf, and wherein said one or more materials constitute more than 7.5 at. % of said magnetic layer, said first and second magnetic layers being formed such that data can be recorded longitudinally therein.

5,840,395
OPTICAL INFORMATION RECORDING MEDIUM AND METHOD FOR PRODUCING SAME

Kazumi Sawada, Shizuoka, and Yoshihiro Shigemori, Saitama, both of Japan, assignors to Sony Disc Technology, Inc., Kanagawa, Japan

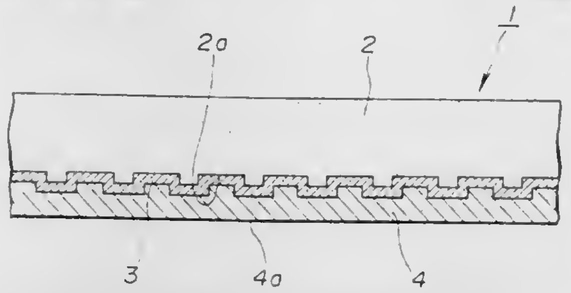
PCT No. PCT/JP95/02190, § 371 Date Sep. 12, 1996, § 102(e) Date Sep. 12, 1996, PCT Pub. No. WO96/13834, PCT Pub. Date May 9, 1996

PCT Filed Oct. 25, 1995, Ser. No. 666,481

Claims priority, application Japan, Oct. 27, 1994, 6-264282

Int. Cl.^{6} B32B *3/00*

U.S. Cl. 428—64.1 **5 Claims**



1. An optical information recording medium comprising:

a plastic substrate colored by admixture of coloring matter; and

a signal recording portion from which information signals are optically read out,

wherein particles of the coloring matter admixed into said plastic substrate are not more than 50 μm in diameter.

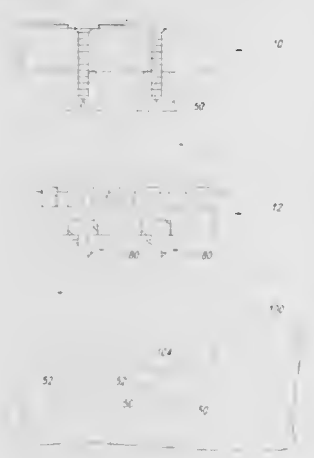
5,840,396
APPARATUS AND METHOD FOR FIXEDLY ATTACHING PROTECTIVE SURFACE COVERS TO STRUCTURAL SUBSTRATES

Richard T. Betz, 2141 NW. Pacific Yew Pl., Issaquah, Wash. 98027

Continuation-in-part of Ser. No. 245,445, May 18, 1994, Pat. No. 5,587,218. This application Jan. 16, 1996, Ser. No. 586,548

Int. Cl.^{6} B44C *1/26*

U.S. Cl. 428—67 **13 Claims**



1. A protective cover in combination with a substrate, comprising:

an anchor having a recess, the anchor being embedded into the substrate having a contoured region; and

a permanent cover affixed to the substrate, the permanent cover having a finished element composed of a metal and a fastener, the element having an upper surface, a lower surface, a channel extending along at least a portion of the lower surface, and a profile mated with the contoured region, the fastener having a non-exposed head positioned in the channel and a stud extending beyond the lower surface, the fastener being selectively positioned in place in the channel to align the stud with the recess of the anchor when the anchor is embedded in the substrate, the stud being positioned in the recess and the element being bonded to the substrate to permanently attach the permanent cover to the substrate.

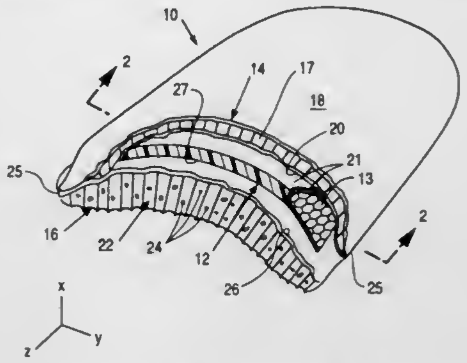
5,840,397
SPORTS PAD

Curtis L. Landi, and Susan L. Wilson, both of Sunnyvale, Calif., assignors to Supracor Systems, Inc., San Jose, Calif.

Filed Nov. 8, 1996, Ser. No. 747,061

Int. Cl.^{6} B32B *3/12*

U.S. Cl. 428—73 **12 Claims**



1. A sports pad for protecting particular areas of a user's body from blunt trauma or similar injury, comprising:

a substantially rigid plate having a lower face and an upper side surface, said plate being formed to fit the curvature of a body surface to be protected;

an outer panel including a first flexible cellular honeycomb core affixed to said upper side surface; and

an inner panel including a second flexible cellular honeycomb core secured to said lower face and adapted to engage a user's body, the cell walls of said second core being apertured to allow fluid flow through said cells.

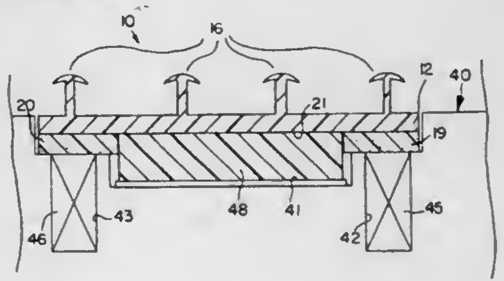
5,840,398
FASTENER ASSEMBLY WITH MECHANICAL END SEALS, METHOD AND FASTENER ASSEMBLY MOLD

Patrick J. Billarant, Charlotte, N.C., assignor to Aplix, Inc., Charlotte, N.C.

Continuation of Ser. No. 633,627, Apr. 17, 1996, Pat. No. 5,665,449, which is a continuation-in-part of Ser. No. 566,870, Dec. 4, 1995, Pat. No. 5,654,070, which is a continuation of Ser. No. 381,507, Jan. 31, 1995, Pat. No. 5,500,268. This application Apr. 30, 1997, Ser. No. 846,279

Int. Cl.^{6} A44B *21/00*

U.S. Cl. 428—100 **2 Claims**



1. An elongate fastener assembly for being molded into a foamed cushion, and comprising:

(a) a base having first and second major surfaces defining first and second opposed ends having a relatively narrow width and first and second relatively long opposed side edges, said base including opposed, longitudinally-extending flanges devoid of attachment members for being positioned in overlapping foam-tight sealing relation to corresponding longitudinally-extending marginal areas of a mold;

(b) a multiplicity of attachment members carried by the base and extending outwardly from the first major surface of said base;

(c) first and second laterally-extending end sealing gaps respectively formed a spaced-apart distance inwardly from the first and second opposed ends of the base intermediate opposed rows of attachment members and extending across the entire, relatively narrow, width of the base between and to the first and second opposed side edges, each of said laterally-extending sealing gaps being defined by a widthwise area devoid of said attachment members for permitting a sealing dam carried by the mold in which the foamed cushion is molded to fit into said sealing gap and sealingly engage the first major surface of said base to form a foam-tight seal between the end of the base and the sealing dam of the mold to prevent intrusion of liquid foam past the end of the base onto those attachment members located between the sealing gaps during molding of the cushion; and

(d) a multiplicity of permanent anchors carried by the base and extending outwardly from the second major surface of said base, the anchors being spaced apart sufficiently to allow foam intrusion between said anchors to permanently attach said fastener assembly to the foamed cushion.

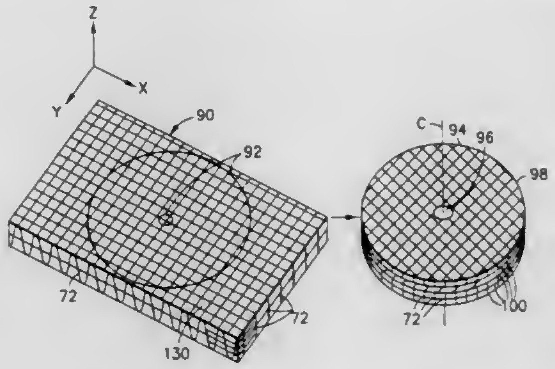
5,840,399
CONSTRUCTION OF ARTICLES OF MANUFACTURE OF FIBER REINFORCED STRUCTURAL COMPOSITES

John A. Kozel, 34 Walnut Cir., Basking Ridge, N.J. 07920

Filed Nov. 5, 1996, Ser. No. 746,015

Int. Cl.^{6} B32B *3/06;17/12;27/04*

U.S. Cl. 428—102 **56 Claims**



1. An improvement in an impeller having a rotor extending in radial directions from a central axis to an outer periphery and a plurality of vanes unitary with the rotor and extending from the rotor in axial directions essentially parallel to the central axis, each vane having a length along an axial direction, the improvement comprising:

a structural composite including a plurality of layers of reinforcing fibers in a matrix of synthetic polymeric material, each layer extending essentially parallel to the radial directions, the layers being juxtaposed with one another along the axial direction;

the reinforcing fibers of each layer being woven in a pattern essentially perpendicular to the central axis, and further reinforcing fibers extending in the axial directions through the juxtaposed layers, the further reinforcing fibers extending within each vane, along the length of each vane, essentially parallel to the length of the vanes, and into the rotor.

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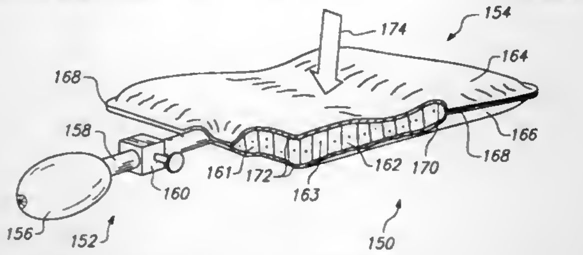
5,840,400
PERFORATED CORE HONEYCOMB PANEL SYSTEM

Curtis L. Landi, and Susan L. Wilson, both of Sunnyvale, Calif., assignors to Supracor Systems, Inc., Calif.

Continuation-in-part of Ser. No. 717,523, Jun. 19, 1991, Pat. No. 5,180,619, which is a continuation-in-part of Ser. No. 446,320, Dec. 4, 1989, Pat. No. 5,039,567. This application Nov. 12, 1992, Ser. No. 974,474

Int. Cl.^{6} B32B *3/12*

U.S. Cl. 428—116 **22 Claims**



1. A honeycomb panel system comprising:

a first panel including

a first honeycomb core formed of undulated strips of resilient thermoplastic material, thermal compression bonded together to form cell walls defining a plurality of contiguous regularly shaped cells, the walls of at least some of said cells having perforations therein;

a first facing sheet bonded to an upper surface of said core formed by the upper extremities of said cell walls; and

a second facing sheet bonded to a lower surface of said core formed by the lower extremities of said cell walls, said first and second facing sheets being sealingly joined together about the perimeter of said core to provide a hermetically sealed chamber; and

means fluid-communicatively coupled to said sealed chamber for selectively adding gas to or subtracting gas from said sealed chamber, said gas flowing through the perforations in the walls of said cells to change certain characteristics of said first panel.

5,840,401
SEALING PROFILE FOR MOTOR VEHICLES

Karl Baesecke, Bad Salzdetfurth, Germany, assignor to Meteor Gummiwerke K. H. Badje GmbH & Co., Bockenem, Germany

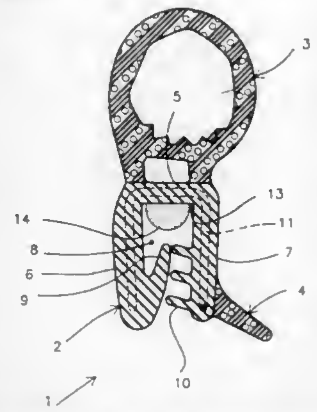
PCT No. PCT/EP96/03323, § 371 Date Apr. 23, 1997, § 102(e) Date Apr. 23, 1997, PCT Pub. No. WO97/08003, PCT Pub. Date Mar. 6, 1997

PCT Filed Jul. 27, 1996, Ser. No. 817,724

Claims priority, application Germany, Aug. 24, 1995, 195 31 167.1

Int. Cl.^{6} E06B *7/23*

U.S. Cl. 428—122 **26 Claims**



1. A sealing profile for sealing an opening of a motor vehicle which has a closure element movable relative to the opening, said sealing profile comprising:

a retaining part having a substantially U-shaped cross-section capable of being fitted onto a flange extending around the opening of the motor vehicle;

said retaining part including a bridge and two limbs formed at the ends of said bridge, said bridge having an inner surface extending between the limbs;

at least one sealing part fixed sealingly to the retaining part and which is to seal against the closure element of the motor vehicle; and

a continuous foamed open-cell sealing strand connected to and projecting from the inner surface of said bridge between said two limbs, said sealing strand being positioned for engagement with a flange inserted between said limbs, said sealing strand having a permanent elasticity and permanent self-adhesive property, said sealing strand being an adhesive sealing compound comprising an at least partially vulcanized elastomeric mixture, said strand being connected to said bridge by its own adhesiveness.

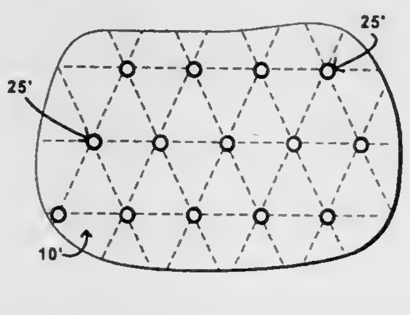
5,840,402
METALLIZED LAMINATE MATERIAL HAVING ORDERED DISTRIBUTION OF CONDUCTIVE THROUGH HOLES

Sidney J. Roberts, Dennison; Eugene T. Selbitschka, South St. Paul, both of Minn.; Glenn W. Gengel, Longmont, Colo., and Brent N. Sweitzer, Nerstrand, Minn., assignors to Sheldahl, Inc., Northfield, Minn.

Filed Jun. 24, 1994, Ser. No. 265,649

Int. Cl.^{6} B32B *3/00*

U.S. Cl. 428—131 **27 Claims**



1. A metallized laminate material for use in the manufacture of a printed wiring board having a pitch defining a minimum spacing between centers of adjacent circuit traces on the manufactured board, the metallized laminate material comprising:

(a) a dielectric polymeric film substrate, the substrate having a working area on opposing first and second sides and including a plurality of vias arranged in an ordered distribution throughout the working area on the first and second sides and having a pitch defining a minimum spacing between centers of adjacent vias, and wherein each via has a diameter which is between 10 and 50 percent of the pitch of the manufactured board, and each via includes a wall defining a through hole extending between the opposing first and second sides of the substrate; and

(b) an electrically conductive material adhesivelessly deposited on the opposing first and second sides of the substrate and on the via walls.

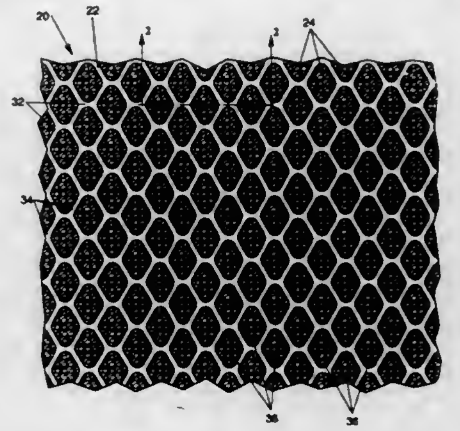
5,840,403
MULTI-ELEVATIONAL TISSUE PAPER CONTAINING SELECTIVELY DISPOSED CHEMICAL PAPERMAKING ADDITIVE

Paul Dennis Trokhan, Hamilton; Dean Van Phan, West Chester, and Joe Brian Melvin, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 14, 1996, Ser. No. 664,468

Int. Cl.^{6} D21H *21/22;* B32B *3/00*

U.S. Cl. 428—154 **29 Claims**



1. A chemically enhanced paper structure comprising:

a macroscopically monoplanar cellulosic substrate having two elevations, a first elevation defining a first pattern and a second elevation defining a second pattern, said second pattern comprising a plurality of discrete domes extending outwardly from said first elevation, wherein each said elevation comprises one or more regions; and

an immobilized chemical papermaking additive disposed on one of said regions corresponding to one of said elevations of said cellulosic substrate, said regions of said other elevation being free of said additive.

5,840,404
ABSORBENT MULTILAYER SHEET AND METHOD FOR MAKING SAME

Pierre Graff, Wolfgantzen, France, assignor to Fort James France, Kunheim, France

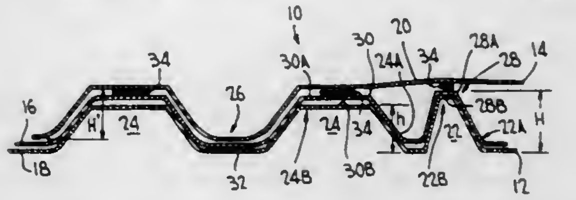
PCT No. PCT/FR96/01281, § 371 Date Apr. 23, 1997, § 102(e) Date Apr. 23, 1997, PCT Pub. No. WO97/08386, PCT Pub. Date Mar. 6, 1997

PCT Filed Aug. 13, 1986, Ser. No. 817,594

Claims priority, application France, Aug. 25, 1995, 95 10096

Int. Cl.^{6} B32B *3/00;31/00;* D21H *11/00*

U.S. Cl. 428—154 **13 Claims**



1. An absorbing multi-layer web comprising at least two layers with each layer being constituted of at least one ply of absorbent paper having a specific surface weight of between 10 and 40 g/m^2 per ply, an outer side of one layer forming an outer side of the multi-layer web and an inner side, an inner side of a first layer of said at least two layers including first and second protrusions and an inner side of a second layer of said at least two layers including third protrusions structured to nest between said first and second protrusions of the first layer, the first layer and the second layer being bonded to each other at least a portion of tops of the first and second protrusions of the first layer and joined to the second layer between two of the third protrusions, wherein the first layer is a double ply and includes an inner ply having an inner side containing first and second protrusions, and an outer ply having an inner side containing first protrusions coinciding with the first protrusions of the inner ply and said outer ply further containing second protrusions coinciding with the second protrusions of the inner ply;

and wherein bonding between said first layer and said second layer is by adhesive present between at least a portion of tops of the first protrusions of the inner ply of the first layer and the second protrusions of the inner ply of the first layer, and wherein the tops of the first protrusions of the inner ply and the first protrusions of the outer ply are bonded adhesively.

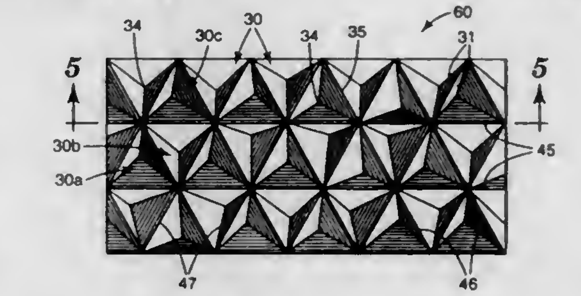
5,840,405
GLITTERING CUBE-CORNER RETROREFLECTIVE SHEETING

Jeanine M. Shusta, Mahtomedi; Paul E. Marecki, May Township; Matthew R. Atkinson, Cottage Grove; Cheryl M. Frey, White Bear Lake, and Olester Benson, Jr., Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 30, 1996, Ser. No. 640,326

Int. Cl.^{6} G02B *5/124*

U.S. Cl. 428—156 **34 Claims**



1. A glittering retroreflective sheeting that comprises an array of cube-corner elements that have faces of adjacent cube-corner elements arranged such that a dihedral angle α located between adjacent faces varies to such an extent that the sheeting glitters when exposed to light, the glitter being noticeable from a front side of the sheeting regardless of whether a seal film is secured to the array of cube-corner elements.

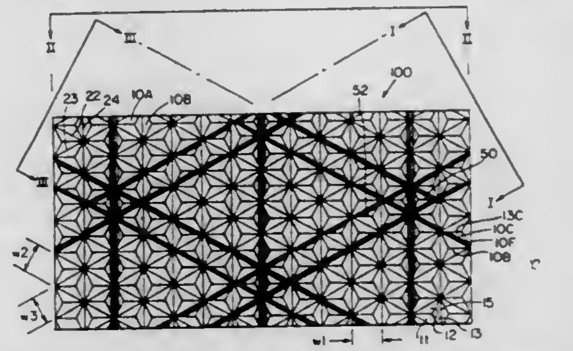
5,840,406
RETROREFLECTIVE PRISM STRUCTURE WITH WINDOWS FORMED THEREON

Robert B. Nilsen, Weatogue, Conn., assignor to Reflexite Corporation, Avon, Conn.

Division of Ser. No. 314,487, Sep. 28, 1994, Pat. No. 5,565,151. This application Aug. 28, 1996, Ser. No. 702,245

Int. Cl.^{6} B32B *3/00;* G02B *5/122*

U.S. Cl. 428—156 **20 Claims**



1. Retroreflective sheeting comprising an array of reflective prisms formed into pairs of prisms each prism comprised of a base and three intersecting lateral faces which meet at an apex and

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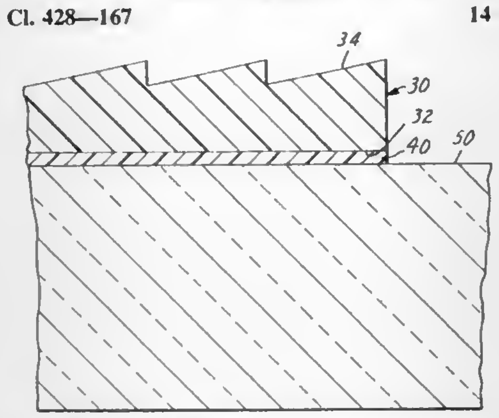
wherein at least one of said prisms in some pairs is smaller in both height and width than the other.

5,840,407

OPTICAL FILM TO SIMULATE BEVELED GLASS

John A. Futhey, Port Townsend, Wash., and Douglas C. Sundet, Hudson, Wis., assignors to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Filed Apr. 25, 1995, Ser. No. 428,564
Int. Cl.^{6} B32B *3/28*
U.S. Cl. 428—167 **14 Claims**



1. A window with a simulated beveled portion, said window comprising:
  a pane of glass;
  a polymeric film having a first smooth surface and a second structured surface said second structured surface being formed of a plurality of spaced parallel grooves, each said groove being formed by a first facet which is substantially perpendicular to said first smooth surface and a second facet which makes an angle between 1 to 60 degrees with said first smooth surface said film being affixed to said pane of glass and simulating a beveled appearance.

5,840,408

DECORATIVE APPLIQUES FOR GARMENTS

Elene M. Giansetto, 29 Washington Pl., Ridgewood, N.J. 07450
Filed Jun. 14, 1996, Ser. No. 663,945
Int. Cl.^{6} A41D *19/00*
U.S. Cl. 428—190 **12 Claims**

1. A sheer garment having a decorative applique removably adhered to an interior surface of the sheer garment to create a silhouette on the exterior surface of the sheer garment, comprising:
  a) a decorative applique having an adhering surface;
  b) a sheer garment having an interior surface; and
  c) glue on said adhering surface for removably adhering said adhering surface and said decorative applique to engage the interior surface of said sheer garment by pressing said adhering surface and said decorative applique against the interior surface of said sheer garment to create a silhouette of said decorative applique on the exterior surface of said sheer garment.

5,840,409

Patent Not Issued For This Number

5,840,410

MAGNETIC RECORDING MEDIUM HAVING A MAGNETIC LAYER AND A PARTIALLY-FILLED LIQUID LUBRICANT-CONTAINING COATING THEREUNDER

Shigeto Oiri, Sagamihara; Yoji Tsukamoto, Yokohama, and Hideaki Yasul, Sagamihara, all of Japan, assignors to Imation Corp., Oakdale, Minn.

Filed Feb. 7, 1996, Ser. No. 597,826
Claims priority, application Japan, Feb. 23, 1995, 7-34980
Int. Cl.^{6} G11B *5/71*
U.S. Cl. 428—212 **11 Claims**

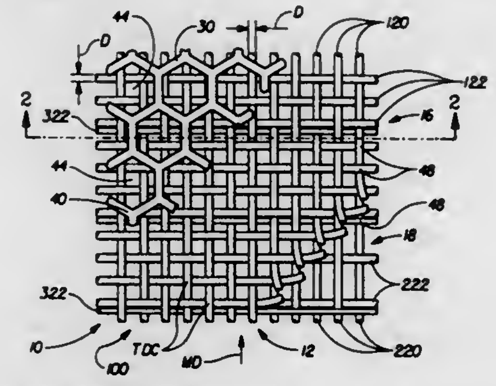
1. A magnetic recording medium comprising a nonmagnetic substrate, a liquid lubricant-containing coating layer formed on the substrate, and a magnetic layer formed directly on the coating layer, wherein the maximum amount of liquid lubricant which can be absorbed by a layer per unit volume of the layer is defined by U for the lubricant-containing coating layer and M for the magnetic layer, wherein the amount of liquid lubricant actually present within the lubricant-containing coating layer is in the range from 50% to 80% of U. $0.9 \leqq M/U \leqq 1.2$, and the magnetic layer has a thickness of 0.5 μm or less.

5,840,411

MULTIPLE LAYER PAPERMAKING BELT PROVIDING IMPROVED FIBER SUPPORT FOR CELLULOSIC FIBROUS STRUCTURES, AND CELLULOSIC FIBROUS STRUCTURES PRODUCED THEREBY

Michael Gomer Stelljes, Jr., West Chester; Glenn David Boutilier, Cincinnati, and Paul Dennis Trokhan, Hamilton, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 254,387, Jun. 2, 1994, Pat. No. 5,496,624. This application Dec. 20, 1995, Ser. No. 575,308
Int. Cl.^{6} D03D *3/00*
U.S. Cl. 428—229 **19 Claims**



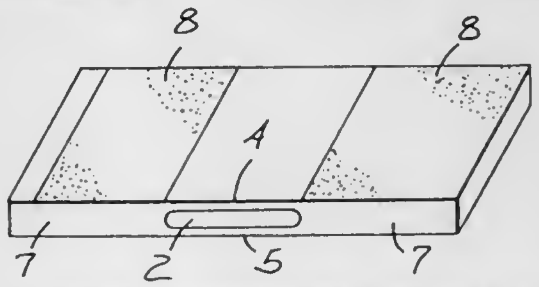
1. A papermaking belt comprising:
  a web facing first layer of interwoven machine direction yarns and cross-machine direction yarns, said machine direction and cross-machine direction yarns of said first layer having a yarn diameter and being interwoven in a weave comprising knuckles, said knuckles defining a web facing top plane, each yarn of said first layer having a top dead center longitude, said top dead center longitude remaining within 1.5 yarn diameters of said top plane; and
  a machine facing second layer of interwoven machine direction yarns and cross-machine direction yarns, said machine direction and cross-machine direction yarns of said second layer being interwoven in a weave, said first layer and said second layer being tied together by a plurality of tie yarns which do not remain within 1.5 yarn diameters of said top plane, wherein said reinforcing structure has a thickness at least 2.5 times as great as said yarn diameter.

5,840,412

COMPOSITE MATERIALS AND PROCESS

Leigh E. Wood, Woodbury, Minn.; Dennis L. Krueger, Hudson, Wis.; Michael R. Gorman, Lake Elmo, and Randall L. Alberg, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 427,424, Apr. 24, 1995, which is a continuation-in-part of Ser. No. 225,095, Apr. 8, 1994, Pat. No. 5,429,856, which is a continuation of Ser. No. 971,277, Nov. 4, 1992, abandoned, which is a continuation-in-part of Ser. No. 501,331, Mar. 26, 1990, abandoned. This application May 21, 1996, Ser. No. 651,807
Int. Cl.^{6} D06N *7/04;* **C09J** *7/02*
U.S. Cl. 428—284 **9 Claims**



1. A continuous nonwoven film laminate comprising at least one fibrous nonwoven layer laminated to a coextruded film comprising at least one discrete elastomeric core containing region capable of elastic elongation and a matrix of thermoplastic polymeric material, which polymeric matrix material is less elastic than the elastomeric core material, said matrix material completely circumscribing said at least one discrete elastomeric core so that there is at least two nonelastic film regions comprising nonelastic matrix material, wherein the thickness and the presence of the elastomeric core material varies across the film length and/or width and wherein said coextruded film has been stretched in the transverse direction past the inelastic deformation limit of the matrix material around said at least one elastomeric core to form a microtextured skin layer, formed of the matrix material over the at least one elastomeric core, only in the elastomeric core containing region of said film, said laminate is extensible in the transverse direction and nonextensible in the longitudinal direction.

5,840,413

FIRE RETARDANT NONWOVEN MAT AND METHOD OF MAKING

Richard Emil Kajander, Toledo, Ohio, assignor to Johns Manville International, Inc., Denver, Colo.

Continuation of Ser. No. 310,958, Sep. 23, 1994, abandoned, which is a continuation-in-part of Ser. No. 91,096, Jul. 13, 1993, abandoned. This application Jul. 9, 1997, Ser. No. 890,725
Int. Cl.^{6} B32B *27/42*
U.S. Cl. 428—292.1 **7 Claims**

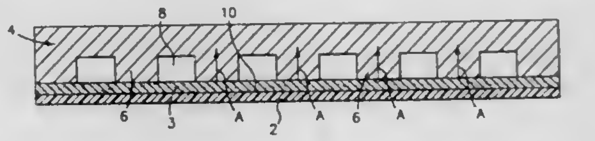
1. A fire resistant nonwoven fiber glass mat containing no additional flame retardants such as phosphates, other than catalytic amounts of phosphorous compounds, ammonium compounds, aluminum compounds or chlorinated organic or inorganic compounds, and comprising 60–90 weight percent of glass fibers bonded together with 10–30 weight percent of an aqueous melamine formaldehyde resin based binder, based on the weight of said mat, wherein said melamine formaldehyde resin has in a dry, but uncured, state a nitrogen content of at least 35 weight percent, wherein the percentage of resin in the final mat does not exceed 0.6 of said nitrogen content, and wherein the phosphorous content of said resin does not exceed an amount remaining from an initial maximum of 0–1.5 percent of a buffered phosphate catalyst in an aqueous melamine formaldehyde resin based binder.

5,840,414

POROUS CARBON BODY WITH INCREASED WETTABILITY BY WATER

John A. S. Bett, Hamden; Douglas J. Wheeler, Tolland, and Calvin Bushnell, Glastonbury, all of Conn., assignors to International Fuel Cells, Inc., So. Windsor, Conn.

Filed Nov. 15, 1996, Ser. No. 751,543
Int. Cl.^{6} B32B *3/26;* **H01M** *2/16*
U.S. Cl. 428—307.7 **7 Claims**



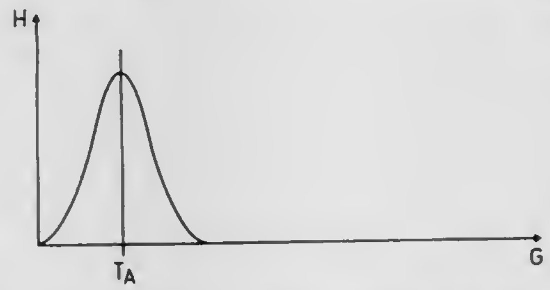
1. A fuel cell power plant plate component, said plate component being formed from electrically conductive carbon particles which are sized to provide fine pores in the component, said plate component being rendered hydrophilic by incorporation of a metal oxide selected from the group consisting of tin oxide (SnO_2), aluminum oxide (Al_2O_3), niobium oxide (Nb_2O_5), ruthenium oxide (RuO_2), tantalum oxide (Ta_2O_5), titanium oxide (TiO_2), and mixtures thereof, into said pores, said metal oxide having a solubility in water of less than about 10^{-6} moles per liter.

5,840,415

METALLIC MATERIAL

Theodor Hirzel, Widen, Switzerland, assignor to Unipor AG, Winterthur, Congo

Division of Ser. No. 783,968, Oct. 29, 1991, Pat. No. 5,322,657. This application Mar. 9, 1994, Ser. No. 207,678
Int. Cl.^{6} B32B *5/16*
U.S. Cl. 428—323 **12 Claims**



1. Material, produced by forming clusters having a fine structure, each cluster comprising a plurality of particles of comparable size held together by a first binding agent and shaping said clusters into a cohesive structure with the aid of a second binding agent to fasten together a plurality of said clusters, thereby forming a coarser structured material, said material containing a first system of coarser structured channels and cavities extending between the clusters or being formed by the outer envelope of the clusters and a plurality of second systems of fine structured channels and cavities extending between the particles and within the clusters, said first coarse structured channel system and said second fine structured systems of channels being interconnected.

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5,840,416

LINING MATERIAL, METHOD FOR COATING A MATERIAL FOR PRODUCING A LINING, AND APPARATUS

Harri Repo, Herrala, Finland, assignor to Clariant Finance (BVI), Ltd., Tortola, Virgin Islands (Br.)

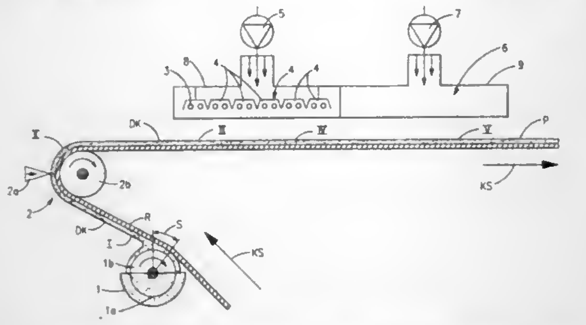
PCT No. PCT/FI92/00342, § 371 Date Jul. 14, 1994, § 102(e) Date Jul. 14, 1994, PCT Pub. No. WO93/13264, PCT Pub. Date Jul. 8, 1993

PCT Filed Dec. 15, 1992, Ser. No. 256,011

Claims priority, application Finland, Dec. 18, 1991, 915948

Int. Cl.^{6} D32B *5/16;* **B05D** *3/02;* **B05C** *11/00*

U.S. Cl. 428—323 24 Claims



1. A lining material for forming a tight barrier coating on a base material, said lining comprising:

a thermoplastic polymer that does not cross-link in an aqueous dispersion, said thermoplastic polymer being 65%–85% of said lining by dry matter weight;

an additive including at least one particulate material having barrier-forming properties and in an aqueous dispersion, said additive being 15%–35% of said lining by dry matter weight; and

at least 95% of the particles of said at least one particulate material fulfilling the condition that the ratio between the largest and the smallest dimension of a particle of said particulate material is greater than 5:1.

5,840,417

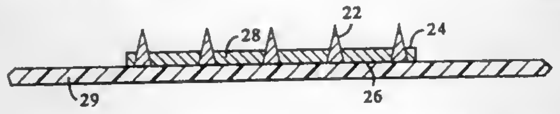
MULTILAYER ELECTRICAL DEVICES COMPRISING AREA BONDING CONDUCTIVE ADHESIVE PREFORMS

Justin C. Bolger, 27 Rolling Ln., Dover, Mass. 02030

Division of Ser. No. 226,715, Apr. 12, 1994, which is a continuation-in-part of Ser. No. 047,141, Apr. 12, 1993, abandoned. This application Jun. 1, 1995, Ser. No. 457,859

Int. Cl.^{6} B32B *5/16*

U.S. Cl. 428—323 12 Claims



1. An electronic device comprising at least two sheet materials positioned on top of each other along a Z-axis, with a top sheet material and a bottom sheet material, wherein each sheet material has a multiplicity of electrically conductive adhesive members having top surfaces, each of said members comprising an electrically conductive metal filler and being separated from each other by means of a non-conductive adhesive region having a top surface disposed between said conductive adhesive members, said conductive adhesive members and said nonconductive adhesive region being formed together to form an integral sheet material having planar top and bottom surfaces, each extending in two directions to form X-Y planes, said bottom planar surface being substantially flat and said top planar surface being formed in a manner so that the top surfaces of the conductive adhesive members extend beyond the top surface of the non-conductive adhesive region, wherein at least two conductive adhesive members in one sheet material are electrically connected in the X-Y plane by means of an electrically conductive material, and at least one conductive adhesive member from one sheet material is electrically connected to the at least one adhesive member in another sheet material along the Z-axis.

5,840,418

CLAD MEMBER AND METHOD OF MANUFACTURING SAME

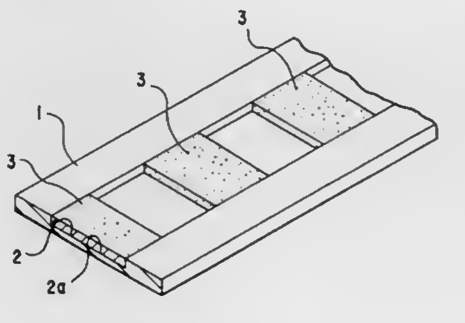
Harumitsu Makita, Hamamatsu, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan

Filed Sep. 5, 1996, Ser. No. 708,584

Claims priority, application Japan, Sep. 7, 1995, 7-230451

Int. Cl.^{6} B32B *3/02*

U.S. Cl. 428—67 2 Claims



1. A clad member comprising:

a strip clad base material comprising an elongated metallic material having on its surface an elongated recessed portion; and

solidified portions of a metallic material which is different in kind from said clad base material, said solidified portions being disposed in said recessed portion at a distance from each other and being directly bonded with said clad base material through melting.

5,840,419

POLYMERIC FILMS

Paul Thomas Alder, Swindon, England, assignor to Hoechst Trespaphan GmbH, Germany

PCT No. PCT/GB96/00024, § 371 Date Aug. 28, 1996, § 102(e) Date Aug. 28, 1996, PCT Pub. No. WO96/21567, PCT Pub. Date Jul. 18, 1996

PCT Filed Jan. 9, 1996, Ser. No. 696,843

Claims priority, application United Kingdom, Jan. 11, 1995, 9500466; Nov. 27, 1995, 9524199

Int. Cl.^{6} B32B *5/16*

U.S. Cl. 428—327 10 Claims

1. Multilayer polyolefin film comprising a core layer of a propylene polymer and an outer polyolefin layer on the core layer, the outer polyolefin layer including a coefficient of friction reducing amount of elastomeric particles of partially cross-linked, polysiloxane containing non-crosslinked polysiloxane in the form of silicone oil in an amount up to 70% by weight, such that the siliconeoil is free to be released from the particles when the particles are subjected to mechanical stress to affect the slip properties of the film.

5,840,420

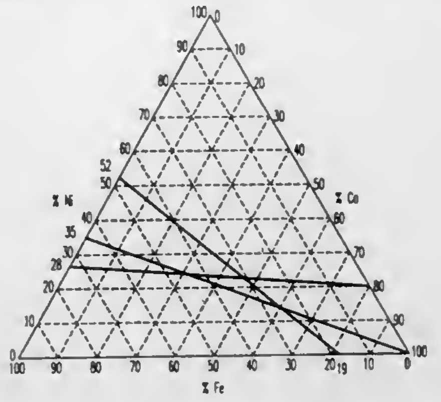
MAGNETORESISTANCE ELEMENTS EXHIBITING THERMALLY STABLE GIANT MAGNETORESISTANCE EFFECT

Martin R. Parker, Tuscaloosa, Ala., and Syed A. Hossain, Fremont, Calif., assignors to The University of Alabama, Tuscaloosa, Ala.

Filed Mar. 21, 1996, Ser. No. 619,350

Int. Cl.^{6} G11B *5/66;* **B32B** *5/16*

U.S. Cl. 428—332 6 Claims



1. A magnetoresistive element exhibiting giant magnetoresistive characteristics (GMR), comprising alternating layers of (1) a magnetic alloy selected from the group consisting of NiFeCo, NiCo, FeCo and mixtures thereof, and (2) Cu, wherein said element comprises at least two layers of said magnetic alloy which are anti-ferromagnetically coupled, and wherein said GMR characteristics are stable at a temperature of up to 300° C. wherein said magnetic alloy layers have a thickness of 23–40 angstroms.

5,840,421

IMAGE RECORDING MEDIUM CAPABLE OF REUSE

Tomoo Kobayashi; Kaoru Torikoshi, both of Minami-ashigara, and Tadakazu Ezure, Ashigarakami-gun, all of Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1996, Ser. No. 749,962

Claims priority, application Japan, Nov. 22, 1995, 7-304308; May 24, 1996, 8-129710

Int. Cl.^{6} B41M *5/00;* **G03G** *7/00*

U.S. Cl. 428—332 12 Claims

1. A reusable image recording medium capable of formation and removal of images comprising a substrate and a coating formed on a surface of said substrate and having a recording surface with image forming material-peelability, wherein said recording surface has a surface smoothness of 200 seconds or lower as measured by a Bekk smoothness tester, wherein at least the surface of said substrate comprises a material reactive with a curable silicone compound and said coating comprises a reaction product of the curable silicone compound, and wherein a part of the reaction product has reacted with and is bonded to the substrate.

5,840,422

PH CONTROL POLYMER

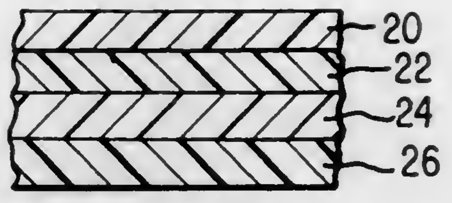
Walter B. Mueller, Inman, S.C.; Cynthia L. Ebner, New Market, Md., and William P. Roberts, Spartanburg, S.C., assignors to W. R. Grace & Co.-Conn., Duncan, S.C.

Continuation-in-part of Ser. No. 432,337, May 1, 1995, abandoned, which is a division of Ser. No. 44,850, Apr. 8, 1993, Pat. No. 5,445,893, which is a continuation-in-part of Ser. No. 823,319, Jan. 21, 1992, Pat. No. 5,323,763. This application Feb. 7, 1997, Ser. No. 796,326

Int. Cl.^{6} B32B *7/10;27/08;27/30;27/32*

U.S. Cl. 428—355 EN 9 Claims

1. In a multilayer, autoclavable, flexible film comprising a sealant layer and a layer containing a vinyl carboxylate copolymer, the improvement comprising the inclusion, in a layer disposed between the sealant layer and the layer containing a vinyl carboxylate copolymer, of an ionomer in an amount effective to neutralize acidic compounds which migrate from said vinyl carboxylate copolymer layer to a product having an initial pH greater than 5 which is enclosed by a container made from said film such that the pH of said product remains at or above about 5 after autoclave sterilization of said product in said container.



5,840,423

POLYVINYL ALCOHOL-BASED FIBER HAVING EXCELLENT HOT WATER RESISTANCE AND PRODUCTION PROCESS THEREOF

Hirofumi Sano, Kurashiki; Tomoyuki Sano, Okayama; Mitsuro Mayahara, Okayama; Yoshinori Hitomi, Okayama; Akira Shimizu, Kurashiki; Yusuke Ando, Kurashiki, and Hiroshi Sumura, Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

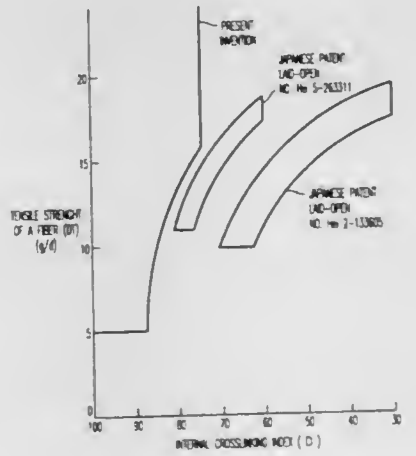
PCT No. PCT/JP96/02293, § 371 Date May 5, 1997, § 102(e) Date May 5, 1997, PCT Pub. No. WO97/09472, PCT Pub. Date Mar. 3, 1997

PCT Filed Aug. 14, 1996, Ser. No. 817,822

Claims priority, application Japan, Sep. 5, 1995, 7-227921

Int. Cl.^{6} D02G *3/00*

U.S. Cl. 438—364 3 Claims



1. A polyvinyl alcohol-based fiber which has been crosslinked by an acetalization product of an aliphatic polyaldchyde having at least 6 carbon atoms and having an internal crosslinking index (CI) and tensile strength (DT) which satisfy the following equations (1)–(3):

$$CI \geqq 86.5 - 2\times10^{-6}\times(DT)^{5.8} \quad (1)$$

$$CI \geqq 75 \quad (2)$$

$$DT \geqq 5 \text{ g/d.} \quad (3)$$

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5,840,424
CURABLE COMPOSITE MATERIALS

Patrick Terence McGrail, Saltburn, and Stephen Derek Jenkins, Middlesbrough, both of England, assignors to Fiberite, Inc., Tempe, Ariz.

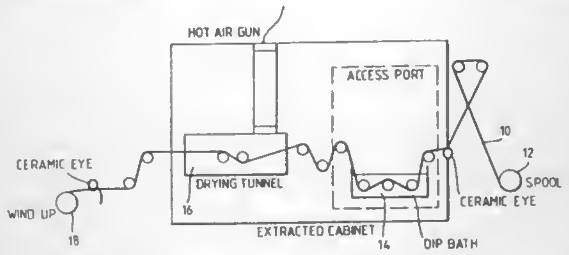
PCT No. PCT/GB94/00333, § 371 Date Oct. 17, 1995, § 102(e) Date Oct. 17, 1995, PCT Pub. No. WO94/19398, PCT Pub. Date Sep. 1, 1994

PCT Filed Feb. 18, 1994, Ser. No. 495,552

Claims priority, application United Kingdom, Feb. 19, 1993, 9303314; May 20, 1993, 9310436

Int. Cl.^{6} B32B *9/00*

U.S. Cl. 428—367 **22 Claims**



1. A curable composite material comprising a thermosettable resin matrix and a continuous-fibre reinforcement impregnated by said matrix, the individual fibres of said reinforcement being sized with an amorphous aromatic thermoplastic resin selected to have a number average molecular weight in the range 1500 to 30000, comprising a polysulphone having end groups and/or pendent groups of formula —R—Z where R is a divalent hydrocarbon group and a Z is a group reactive with the thermosettable resin matrix or with a curing agent or with like groups of formula —R—Z on other polymer molecules, said polysulphone consisting essentially of ether- and/or thioether-linked repeating units selected from the group consisting of:

$(PhSO_2Ph)_{n1}$

and

$(Ph)_a$

where Ph is phenylene, a and n1 are independently 1 to 2 and may on average be fractional and, when a exceeds 1, the phenylenes in $(Ph)_a$ are linked by a single chemical bond or a divalent group other than $—SO_2—$, provided that at least repeating units $(PhSO_2Ph)_{n1}$ are present in said polysulphone, wherein the amorphous, aromatic thermoplastic resin size on the fibres of said reinforcement substantially uniformly coats the fibres without significantly tacking the fibres together.

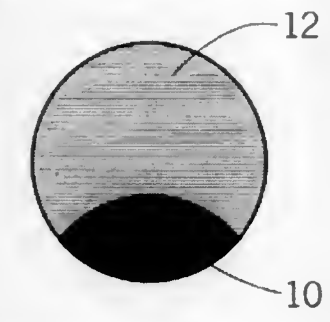
5,840,425
MULTICOMPONENT SUFFUSED ANTISTATIC FIBERS AND PROCESSES FOR MAKING THEM

John A. Hodan, 4 Glenwood Cir., Arden, N.C. 28704

Filed Dec. 6, 1996, Ser. No. 761,696

Int. Cl.^{6} D02G *3/00*

U.S. Cl. 428—372 **7 Claims**



1. A multicomponent fiber comprising:

a suffusible component present at some or all of the periphery of said fiber;

an impervious component differing from said suffusible component in susceptibility to suffusion coating and longitudinally coextensive with said suffusible component and substantially impervious to solutions which suffuse conductive particles into said suffusible component; and

finely-divided, electrically conductive particles suffused into said suffusible component in an amount sufficient to render an electrical resistance of not more than 10^9 ohms/cm.

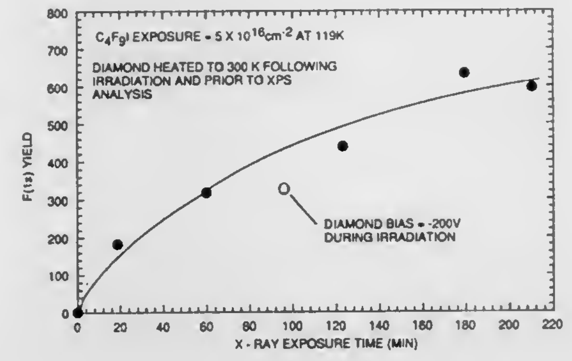
5,840,426
METHOD FOR FLUORINATION OF DIAMOND SURFACES AND ASSOCIATED PRODUCT

Vincent S. Smentkowski, Pittsburgh, and John T. Yates, Jr., Allison Park, both of Pa., assignors to University of Pittsburgh of the Commonwealth System of Higher Education, Pittsburgh, Pa.

Division of Ser. No. 521,894, Aug. 31, 1995, Pat. No. 5,665,435. This application Feb. 7, 1997, Ser. No. 798,311

Int. Cl.^{6} B32B *9/00*

U.S. Cl. 428—408 **12 Claims**



1. A fluorinated diamond made by the method comprising:

depositing a layer of perfluorinated alkyl iodides having the formula $C_nF_{2n+1}I$ on a diamond surface;

producing perfluorinated alkyl free radicals by photodecomposing C—I bonds of said perfluorinated alkyl iodides on said diamond surface;

forming a perfluorinated alkyl layer by anchoring said photochemically induced perfluorinated alkyl free radicals to said diamond surface; and

decomposing said perfluorinated alkyl layer on said diamond surface to produce chemisorbed fluorine on said diamond surface, wherein said perfluorinated alkyl iodide is selected from the group consisting of n=1 to 13.

5,840,427
METHOD FOR MAKING CORROSION RESISTANT ELECTRICAL COMPONENTS

Suryadevara V. Babu, and Cancheepuram V. Srividya, both of Potsdam, N.Y., assignors to Teledyne Industries Incorporated, Los Angeles, Calif.

Filed May 21, 1996, Ser. No. 650,987

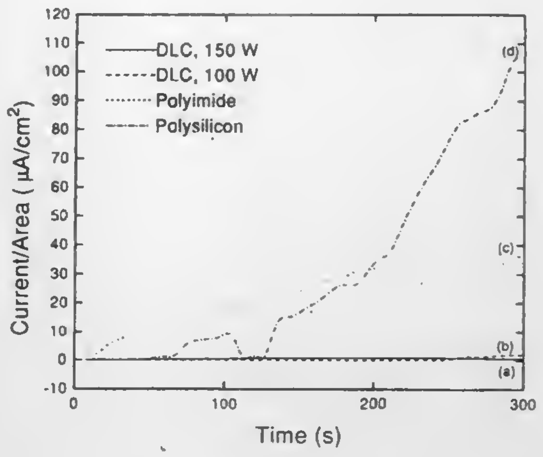
Int. Cl.^{6} H01L *31/0312*

U.S. Cl. 428—408 **20 Claims**

1. A corrosion resistant electrical component comprising:

an electrical component;

a polysilicon coating encapsulating the electrical component; and



a diamond-like carbon coating formed from a carbon source gas having a carbon to hydrogen ratio of between about 1:1 and 1:2 encapsulating the polysilicon coated electrical component.

5,840,428
ORGANICALLY-MODIFIED, RADIATION-CURABLE SILOXANE RESIN AND METHOD OF MAKING THE SAME

John Donald Blizzard, Bay City, and James Steven Tonge, Sanford, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 395,250, Feb. 28, 1995, abandoned. This application Aug. 19, 1996, Ser. No. 699,257

Int. Cl.^{6} C08F *2/50;283/12;* **C08L** *83/06;83/07*

U.S. Cl. 428—412 **22 Claims**

1. A radiation-curable siloxane resin composition comprising:

(A) at least one multifunctional acrylate; and

(B) a reaction product formed from the co-hydrolysis and co-condensation of:

  (a) at least one alkoxy-functional organometallic compound of the general formula $M(OR)_4$ wherein

  M is selected from the group consisting of Si and Ti, and

  each OR is the same or a different alkoxy group; and

  (b) at least one alkoxy silane of the general formula

$X_aSi(OR)_b(R')_c$

wherein

each OR is as defined above,

each X is a monovalent organic radical that renders the alkoxy silane capable of copolymerization with the multifunctional acrylate (A) and is selected from the group consisting of organic radicals including at least one ethylenically unsaturated group

each R' is independently a monovalent hydrocarbon radical; and

a is 1, 2 or 3,

b is 1, 2 or 3,

c is 0, 1 or 2, and

a+b+c=4; with

(c) a predetermined quantity of water sufficient to cause said co-hydrolysis and permit said co-condensation without gelling said reaction product (B) or causing a precipitate to form therefrom,

said co-hydrolysis and co-condensation being carried out by first blending (a) said at least one alkoxy-functional organometallic compound and (b) said at least one alkoxysilane and thereafter adding (c) said predetermined quantity of water to the blend so-formed.

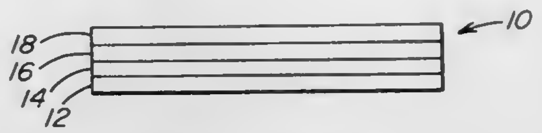
5,840,429
AIRCRAFT TRANSPARENCY

Thomas G. Rukavina, Verona, and Robert M. Hunia, Kittanning, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 5, 1996, Ser. No. 743,867

Int. Cl.^{6} B32B *27/30*

U.S. Cl. 428—412 **51 Claims**



1. An aircraft transparency comprising:

a. a substrate having a pair of opposed major surfaces;

b. an electroconductive metal oxide coating disposed over at least one of the major surfaces of said substrate; and

c. a primer comprising a carbonate diol-based crosslinked polyurethane for adhering said metal oxide coating to the at least one of the major surfaces of said substrate.

5,840,430
STRETCH CLING FILM AND FABRICATION METHOD

David B. Ramsey, Angleton, and Kenneth B. Stewart, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 163,805, Dec. 8, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 483,784

Int. Cl.^{6} B32B *27/08*

U.S. Cl. 428—516 **17 Claims**

1. In a process for making a multilayer one-sided cling-wrap film having at least two layers, comprising the steps of:

(i) feeding an ethylene polymer composition into a reverse layer coextrusion extruder,

(ii) feeding an ethylene polymer composition into an obverse layer coextrusion extruder,

(iii) additionally feeding an ethylene polymer composition into a core or structural layer coextrusion extruder,

(iv) melting and mixing the polymer compositions at a melt temperatures greater than about 177° C. to form at least two molten polymer streams,

(v) adjusting the extrusion output such that at least 5 percent by weight of the total extrusion output constitutes the reverse layer molten polymer stream,

(vi) extruding the molten polymer streams through a coextrusion feedblock into a slot die to form a web or into an annular die to form a tube having a reverse layer and an obverse layer,

(vii) blowing up and cooling said tube or drawing down and cooling said web to make said multilayer film, and

(viii) collecting said multilayer film for subsequent use,

the improvement comprising feeding to the reverse layer coextrusion extruder at least one film-forming, inherent cling substantially linear ethylene polymer without tackifier therein and characterized as having:

a) a melt flow ratio, I_{10}/I_2, $\geqq 5.63$,

b) a molecular weight distribution, M_w/M_n, defined by the equation: $M_w/M_n \leqq (I_{10}/I_2) - 4.63$,

c) a critical shear rate at onset of surface melt fracture of at least 50 percent greater than the critical shear rate at the onset of surface melt fracture of a linear ethylene polymer having about the same I_2 and M_w/M_n, and

d) a density of about 0.90 g/cc or less,

e) a composition distribution branching index (CDBI), as determined using temperature rising elution fractionation, greater than 50 percent,

f) about 0.01 long chain branch/1000 carbons to about 3 long chain branches/1000 carbons, and

g) a n-hexane solubility of at least 90 percent, based on the weight of the polymer composition, under extraction conditions defined in 21 CFR § 177.1520(*c*).

feeding to the obverse layer coextrusion extruder a film-forming olefin polymer composition having a density greater than 0.90 g/cc.

5,840,431

METHOD FOR PREFERABLY REGION-BY-REGION COATING OF A TRANSPARENT CARRIER PLATE

Klaus Kall, Offenburg, Germany, assignor to Fritz Borsi KG, Schutterwald, Germany

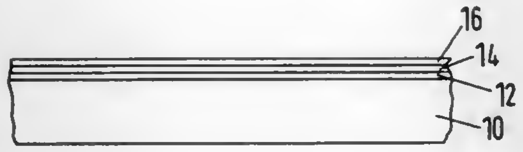
PCT No. PCT/DE95/00290, § 371 Date Oct. 15, 1996, § 102(e) Date Oct. 15, 1996, PCT Pub. No. WO95/28290, PCT Pub. Date Oct. 26, 1995

PCT Filed Feb. 28, 1995, Ser. No. 727,636

Claims priority, application Germany, Apr. 14, 1994, 44 12 876.2

Int. Cl.^{6} B05D *5/06;1/36;* **B32B** *3/00*

U.S. Cl. 428—542.2 **18 Claims**



1. A method of manufacturing a colorized plastic carrier plate comprising the following steps:

providing a transparent acrylic plastic carrier plate having a back side;

applying a first chromatic layer to the back side of the transparent carrier plate;

embossing a non-opaque metallic foil layer on top of the first chromatic layer with a roller-type embossing process;

applying a second chromatic layer on top of the metallic foil layer.

5,840,432

ELECTROCONDUCTIVE PASTE

Keizo Hirai, Hitachiota; Hiroshi Wada, Hitachinaka; Akihiro Sasaki, Hitachi; Hisashi Kaga, Hakodate; Junichi Kikuchi; Shozo Yamana, both of Hitachi, and Hideji Kuwajima, Hitachinaka, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, and Technopolis Hakodate Industrial Technology, Hokkaido, both of Japan

Filed Feb. 8, 1996, Ser. No. 598,701

Claims priority, application Japan, Feb. 13, 1995, 7-023259; Feb. 13, 1995, 7-023260; Feb. 13, 1995, 7-023261; Jun. 23, 1995, 7-157255

Int. Cl.^{6} B22F *3/00*

U.S. Cl. 428—570 **37 Claims**

1. An electroconductive composite metal powder comprising non-noble metal powder particles of a non-noble metal, which have a flat shape, the particles each having a surface area and a weight, 50% or more of the surface area of said particles being covered with a noble metal in an amount of 2 to 30% by weight based on the weight of the non-noble metal powder particles, thereby providing a noble metal covering layer, and with a layer of a mixture of the non-noble metal and the noble metal being interposed between the non-noble metal powder particles and the noble metal covering layer wherein the layer of a mixture of the non-noble metal has a thickness of ½ to 1/50 of a thickness of the noble metal covering.

5,840,433

COATING COMPOSITIONS FOR ARTICLES OF GRAPHITE-ALUMINA REFRACTORY MATERIAL

Kassum Juma, Stafford, England, assignor to Foseco International Limited, Birmingham, England

PCT No. PCT/GB94/02127, § 371 Date Mar. 13, 1996, § 102(e) Date Mar. 13, 1996, PCT Pub. No. WO95/11870, PCT Pub. Date Mar. 4, 1995

PCT Filed Sep. 30, 1994, Ser. No. 617,842

Claims priority, application United Kingdom, Oct. 27, 1993, 9322154

Int. Cl.^{6} B32B *9/00*

U.S. Cl. 428—689 **20 Claims**

1. A refractory article of manufacture comprising:

an article of graphite-alumina refractory material coated with at least one mineral having a sheet structure and a refractory oxide bond.

5,840,434

THERMAL STRESS RELAXATION TYPE CERAMIC COATED HEAT-RESISTANT ELEMENT AND METHOD FOR PRODUCING THE SAME

Yoshitaka Kojima; Hideyuki Arikawa, both of Hitachi; Mitsuo Haginoya, Ibaraki-ken; Akira Mebata, Kitaibaraki; Tetsuo Sasada, and Hajime Toriya, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 320,780, Oct. 11, 1994, which is a continuation-in-part of Ser. No. 118,641, Sep. 10, 1993, abandoned. This application May 2, 1996, Ser. No. 641,813

Claims priority, application Japan, Sep. 10, 1992, 4-266889

Int. Cl.^{6} C03C *27/04*

U.S. Cl. 428—632 **20 Claims**

1. A ceramic coated heat-resistant element comprising a heat resisting alloy base mainly composed of a material selected from the group consisting of Ni, Co and a mixture of Ni and Co, and a heat-resistant coating layer provided on the surface of the base, wherein said heat-resistant coating layer comprises a metal layer of an alloy superior to the base in high-temperature corrosion and oxidation resistance overlying the base, an Al_2O_3 ceramic thin film layer overlying the metal layer, a first ZrO_2 ceramic coating layer having a dense texture overlying the Al_2O_3 ceramic thin film layer and a second ZrO_2 ceramic coating layer having a tertiary columnar texture overlying said first ZrO_2 ceramic coating layer, said tertiary columnar texture comprising a secondary columnar texture composed of at least one column, each of which comprises a primary columnar texture composed of primary columns, cracks being present only in said second ZrO_2 ceramic coating layer in a direction of thickness along a boundary of the columns, and said tertiary columnar texture being finely divided by micro-cracks.

5,840,435

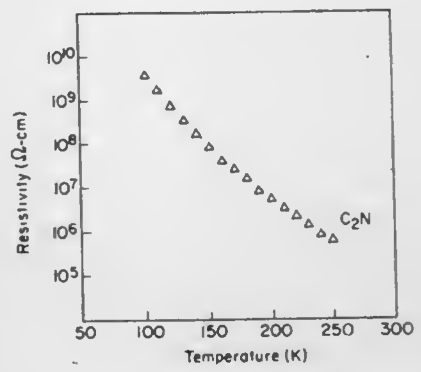
COVALENT CARBON NITRIDE MATERIAL COMPRISING C_2N AND FORMATION METHOD

Charles M. Lieber, Lexington; Z. John Zhang, and Chunming Niu, both of Somerville, all of Mass., assignors to President and Fellows of Harvard College, Cambridge, Mass.

Continuation-in-part of Ser. No. 145,967, Oct. 29, 1993, abandoned, which is a continuation-in-part of Ser. No. 92,020, Jul. 15, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 477,194

Int. Cl.^{6} B32B *9/00*

U.S. Cl. 428—698 **39 Claims**



1. A composition comprising C_2N.

5,840,436

SPALLING-RESISTANT, CREEP-RESISTANT AND OXIDATION-RESISTANT SETTERS

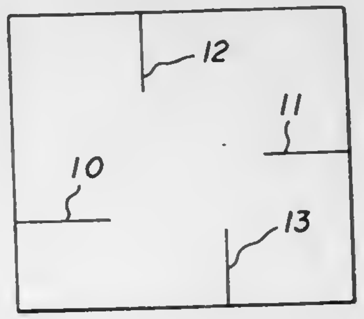
Shigeru Hanzawa, Kagamihara, and Tsuneo Komiyama, Toki, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Continuation of Ser. No. 193,108, Feb. 8, 1994, abandoned. This application Oct. 21, 1996, Ser. No. 734,126

Claims priority, application Japan, Jun. 5, 1992, 4-147435; Jun. 25, 1992, 4-167526; Sep. 7, 1992, 4-238457

Int. Cl.^{6} B32B *17/00*

U.S. Cl. 428—698 **8 Claims**



1. A rectangular spalling-resistant refractory setter for use in a heating furnace, comprising an Si—SiC sintered material containing, as a main phase, 2–25% by weight of Si and 75–98% by weight of SiC, and an Al impurity in a controlled amount of 0.1 to 0.2 part by weight per 100 parts by weight of said main phase, said material having a bending strength of 1,000 kgf/cm^2 or higher at 1,000°–1,300° C. and having at least one slit extending from each of at least one pair of the two pairs of parallel sides of the setter toward the opposite side, the length of each slit being 15–35% of the length of each setter side which is parallel to the slit.

5,840,437

APPARATUS WITH FUEL CELLS

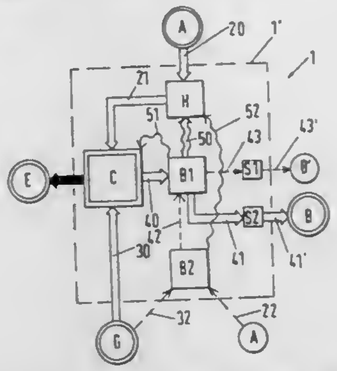
Roland Diethelm, Bauma, Switzerland, assignor to Sulzer Innotec AG, Winterthur, Switzerland

Filed Nov. 26, 1996, Ser. No. 756,618

Claims priority, application European Pat. Off., Dec. 19, 1995, 95810806

Int. Cl.^{6} H01M *8/04;8/06;8/18*

U.S. Cl. 429—14 **11 Claims**



1. Apparatus comprising a cell block having fuel cells, a heat insulating sleeve substantially surrounding the cell block, an afterburner chamber between the sleeve and the cell block, and an auxiliary burner having a combustion chamber,

the afterburner chamber having opposite ends respectively connected via first and second channels to at least one exhaust duct, the first and second channels each being closeable by a first blocking member and a second blocking member respectively, the combustion chamber of the auxiliary burner communicating with the second channel at a location between the afterburner chamber and the second blocking member, the second blocking member being closed and the first blocking member being open during a starting-up phase.

5,840,438

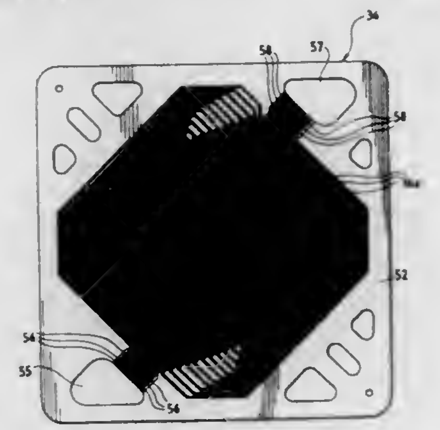
ELECTROCHEMICAL FUEL CELL WITH AN ELECTRODE SUBSTRATE HAVING AN IN-PLANE NONUNIFORM STRUCTURE FOR CONTROL OF REACTANT AND PRODUCT TRANSPORT

Mark C. Johnson, Phoenix, Ariz.; David P. Wilkinson, North Vancouver, Canada; Charles P. Asman, Surrey, Canada; Myles L. Bos, Burnaby, Canada, and Robert J. Potter, Chalkhouse Green, England, assignors to Ballard Power Systems Inc., Burnaby, Canada

Filed Aug. 25, 1995, Ser. No. 520,133

Int. Cl.^{6} H01M *8/10;2/14;* **C25B** *11/00;11/12*

U.S. Cl. 429—30 **35 Claims**



1. In an electrochemical fuel cell comprising:

(a) an anode separator plate having a pair of oppositely facing major planar surfaces, a fuel stream inlet and a fuel stream outlet;

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- (b) a cathode separator plate having a pair of oppositely facing major planar surfaces, an oxidant stream inlet and an oxidant stream outlet;
- (c) a membrane electrolyte interposed between said anode separator plate and said cathode separator plate;
- (d) an anode substrate interposed between said anode separator plate and said membrane electrolyte, said anode substrate having a pair of oppositely facing major planar surfaces and a quantity of anode catalyst disposed on one of the major planar surfaces thereof, said anode catalyst promoting oxidation of a fuel stream and defining an anode electrochemically active area, said anode substrate having an anode inlet region adjacent said fuel stream inlet and an anode outlet region adjacent said fuel stream outlet;
- (e) a cathode substrate interposed between said cathode separator plate and said membrane electrolyte, said cathode substrate having a pair of oppositely facing major planar surfaces and a quantity of cathode catalyst disposed on one of the major planar surfaces thereof, said cathode catalyst promoting reduction of an oxidant stream to form a reaction product and defining a cathode electrochemically active area, said cathode substrate having a cathode inlet region adjacent said oxidant stream inlet and a cathode outlet region adjacent said oxidant stream outlet;

the improvement comprising:

at least one of said anode substrate and said cathode substrate having localized in-plane nonuniform structure in its electrochemically active area for imparting uneven fluid transport properties between its inlet region and its outlet region.

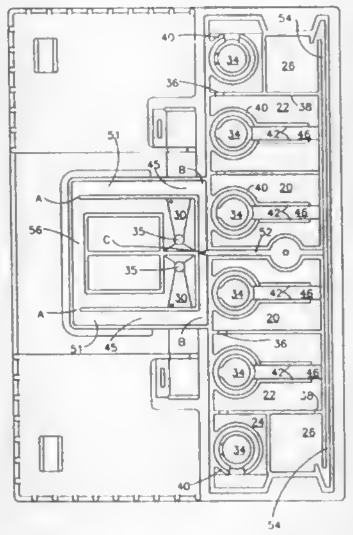
5,840,439
BATTERY COVER

Robert W. Fritts, Thomasville, and David M. Revak, High Point, both of N.C., assignors to Douglas Battery Manufacturing Company, Winston-Salem, N.C.

Continuation of Ser. No. 796,425, Feb. 6, 1997, Pat. No. 5,731,100. This application Oct. 11, 1997, Ser. No. 961,994

Int. Cl.^{6} H01M *2/12*

U.S. Cl. 429—84 **25 Claims**



1. A leak resistant battery cover for a battery of the type having a housing with a plurality of cells comprising:

- a) a cover member having an upper wall, a lower wall and an interior area disposed between and formed by said upper and lower walls, said interior area lying over at least a portion of at least a first and second cell;
- b) first and second apertures in said lower wall communicating with a first cell in the housing;
- c) a third aperture in said lower wall communicating with a second cell in the housing;
- d) a first path in said interior area providing communication between said second aperture and said third aperture for the flow of electrolyte gases therebetween;
- e) at least one atmospheric vent spaced from said first aperture and communicating with atmosphere; and
- f) a second path in said interior area providing communication between said first aperture and said atmospheric vent for the flow of electrolyte gases therebetween;

wherein gases emitted upwardly through said third aperture from the second cell must travel along said first path, through said second aperture down into the first cell, upwardly through said first aperture into said second path, along said second path to said atmospheric vent and through said atmospheric vent to reach atmosphere.

5,840,440
HYDROGEN STORAGE MATERIALS HAVING A HIGH DENSITY OF NON-CONVENTIONAL USEABLE HYDROGEN STORING SITES

Stanford R. Ovshinsky, Bloomfield Hills; Michael A. Fetcenko, Rochester Hills; Jun Su Im, Sterling Heights; Kwo Young; Benjamin S. Chao, both of Troy, and Benjamin Reichman, West Bloomfield, all of Mich., assignors to Ovonic Battery Company, Inc., Troy, Mich.

Filed Nov. 20, 1995, Ser. No. 560,612

Int. Cl.^{6} H01M *10/34*

U.S. Cl. 429—60 **57 Claims**

1. A high capacity hydrogen storage material characterized by a density of hydrogen storage sites of greater than 1.2×10^{23}/cc.

5,840,441
BATTERY CAN, SHEET FOR FORMING BATTERY CAN, AND METHOD FOR MANUFACTURING SHEET

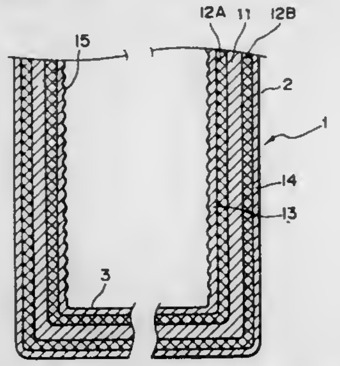
Sugikawa Hirofumi; Michibata Sachio, and Hayashi Keiichi, all of Osaka, Japan, assignors to Katayama Special Industries, Ltd., Osaka-fu, Japan

Division of Ser. No. 187,000, Jan. 27, 1994. This application Jan. 17, 1995, Ser. No. 373,438

Claims priority, application Japan, Jun. 4, 1993, 5-134987; Jun. 4, 1993, 5-134988; Jun. 4, 1993, 5-134989; Jun. 4, 1993, 5-134990

Int. Cl.^{6} H01M *2/04*

U.S. Cl. 429—176 **8 Claims**



1. A battery can, which is cylindrical and open in one end thereof and formed by drawing and ironing, comprising a cylindrical wall and a bottom surface disposed at the other end thereof, in which the cylindrical wall and the bottom surface are composed of a steel plate which comprises a cold-rolled steel plate having a plated layer formed on each major surface thereof, in which the plated steel sheet has in-plane anisotropy Δr of less than ±0.15, representing the difference among Lankford values (r), where

$$\Delta r=(r_x+r_y)/2-r_z$$

in which r_x is a width deformation degree in a lengthwise direction thereof/a thickness deformation degree in the lengthwise direction thereof, r_y is a width deformation degree in a widthwise direction thereof/a thickness deformation degree in the widthwise direction thereof, and r_z is a width deformation degree in an oblique direction thereof/a thickness deformation degree in the oblique direction thereof.

5,840,442
METHOD FOR ACTIVATING AN ALKALINE RECHARGEABLE BATTERY

Hidetoshi Abe, Iwaki, Japan, assignor to Furukawa Denchi Kabushiki Kaisha, Yokohama, Japan

Filed Dec. 12, 1996, Ser. No. 764,319

Claims priority, application Japan, Dec. 19, 1995, 7-330858

Int. Cl.^{6} H01M *4/24;4/26*

U.S. Cl. 429—206 **14 Claims**

1. A method for activating an alkaline rechargeable battery comprising:

providing an assembled alkaline rechargeable battery comprising a positive electrode and a negative electrode, the positive electrode being prepared by mixing a divalent cobalt compound and a nickel-containing powder to form an active substance mixture, and

setting the temperature of the assembled alkaline rechargeable battery at the start of charging to 30° to 80° C., when activating is being carried out, wherein the charging is performed so that a quantity of electricity of 30 to 200% of the theoretical quantity of electricity necessary for oxidizing said divalent cobalt compound into a trivalent cobalt compound is provided, and then continuing the charging such that the battery temperature is at room temperature.

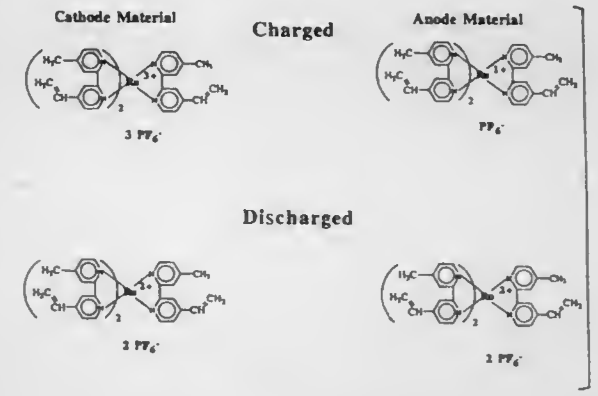
5,840,443
REDOX POLYMER ELECTRODES FOR ADVANCED BATTERIES

Brian A. Gregg, and A. Michael Taylor, both of Golden, Colo., assignors to Midwest Research Institute, Kansas City, Mo.

Filed Jul. 31, 1995, Ser. No. 509,560

Int. Cl.^{6} H01M *4/02*

U.S. Cl. 429—212 **12 Claims**



1. A secondary cell comprising two electrode means, and an electrolyte, wherein at least one of said electrode means comprises a redox polymer material, wherein the redox polymer material changes oxidation state to transfer charge and is selected from the group consisting of: pyridyl or polypyridyl complexes of iron, ruthenium, osmium, chromium, tungsten, or nickel; tetra (4-aminophenyl) porphyrin and poly(ethyleneglycol)diglycidylether; iron tetra (4-aminophenyl)porphyrin and poly(ethyleneglycol)diglycidylether; and epoxy polymer of iron tetra (4-aminophenyl)porphorin; tetra (4-aminophenyl)porphyrin; metal complexes of cyclams, metal complexes of crown ethers and metallocenes.

5,840,444
ELECTRODE FOR STORAGE BATTERY AND PROCESS FOR PRODUCING THE SAME

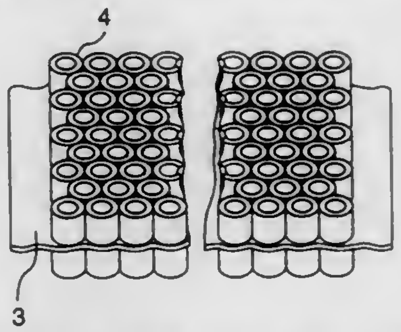
Hiroki Takeshima, Fujisawa; Yohei Hattori, Moriguchi; Katsuhiro Okamoto, Toyohashi; Masato Tsuji, Kyoto, and Takeo Takayanagi, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 587,354, Jan. 16, 1996, abandoned. This application Oct. 30, 1996, Ser. No. 742,186

Claims priority, application Japan, Jan. 18, 1995, 7-005687; Mar. 2, 1995, 7-042903; Dec. 28, 1995, 7-342786

Int. Cl.^{6} H01M *4/24;4/26*

U.S. Cl. 429—223 **44 Claims**



1. An electrode for alkaline storage batteries comprising an electroconductive core material selected from the group consisting of a perforated or non-perforated metal sheet or foil having at least two surfaces pasted with a paste containing an active material in combination with unitary sintered fibrous hollow nickel members on both said surfaces of the electroconductive core material pasted with said paste containing said active material, said unitary sintered fibrous nickel members being of about 2 to 4 mm in length and a majority of said nickel members being unitary sintered on said electroconductive core material in a perpendicular form.

5,840,445
METHOD OF MANUFACTURING A SELF-ALIGNED PHASE-SHIFTING MASK

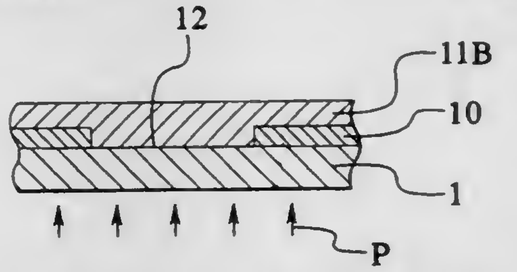
Rikio Ikeda, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 24, 1992, Ser. No. 873,150

Claims priority, application Japan, Apr. 26, 1991, 3-125363

Int. Cl.^{6} G03F *9/00*

U.S. Cl. 430—5 **11 Claims**



1. A method of manufacturing a phase-shifting mask having a light shielding portion, a light permeation portion and a phase-shifting portion on a transparent substrate, wherein the method comprises:

forming a negative resist layer over the entire surface of the transparent substrate formed with a light shielding material pattern,

applying exposure through the rearface of the transparent substrate and development to leave the negative resist layer on the light permeation portion,

etching back said negative resist layer to form a sub-space between the negative resist layer and the light shielding portion and using said negative resist layer as a phase-shifting portion.

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5,840,446
MASK FOR MONITORING DEFECT

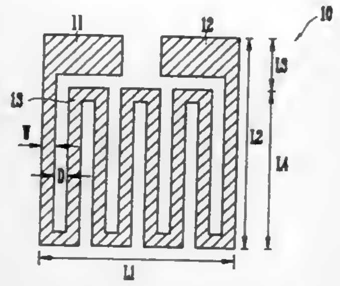
Geun Ho Lee, Seoul, and Jeong Hwy Kim, Ichon-Shi, both of Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., Kyungki-Do, Rep. of Korea

Filed Jun. 19, 1996, Ser. No. 666,885

Claims priority, application Rep. of Korea, Jun. 24, 1995, 1995 17293

Int. Cl.^{6} G03F *9/00*

U.S. Cl. 430—5 **8 Claims**



1. A mask for monitoring a defect, comprising:

first, second, and third field regions which are formed on a quartz substrate and divided by a scribe line;

a plurality of unit patterns, each of which has the same pattern structure, formed within each internal portion of said first, second, and third field regions,

wherein said unit patterns comprising:

a first pad formed on said internal portion;

a second pad formed at the side of said first pad at a specific distance therefrom; and

a zigzag-shaped third pad formed to interconnect said first and second pads.

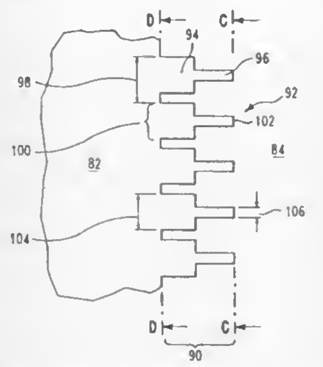
5,840,447
MULTI-PHASE PHOTO MASK USING SUB-WAVELENGTH STRUCTURES

Song Peng, So. Burlington, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 29, 1997, Ser. No. 920,688

Int. Cl.^{6} G03F *9/00*

U.S. Cl. 430—5 **16 Claims**



1. A phase shift mask for lithography in which light passes through, thereby imparting a pattern onto an integrated circuit, the light having a wavelength and an intensity, the phase shift mask defining a phase change transition between a first and second region of respectively two different first and second phases, the phase shift mask comprising:

a layer of a first transmissive material comprising the first region and of the first phase, the first transmissive material having a first refractive index;

a layer of a second transmissive material comprising the second region and of the second phase, the second transmissive material having a second refractive index;

a plurality of periodic structures of the first transmissive material disposed in the transition between the first and second regions, the pitch between structures being less than the wavelength of the light used in the lithography process, the structures having a first side proximate to the first region and a second side proximate to the second region, the structures being shaped such that the effective refractive index along the first sides approximates the refractive index of the first transmissive material and the effective refractive index along the second sides approximates that of the second transmissive material, the transition having a gradual change in effective refractive index from that of the first transmissive material along the first sides to that of the second transmissive material along the second sides, resulting in a gradual phase change from the first phase at the first sides to the second phase at the second sides, thereby substantially eliminating intensity nulls associated with phase change transitions.

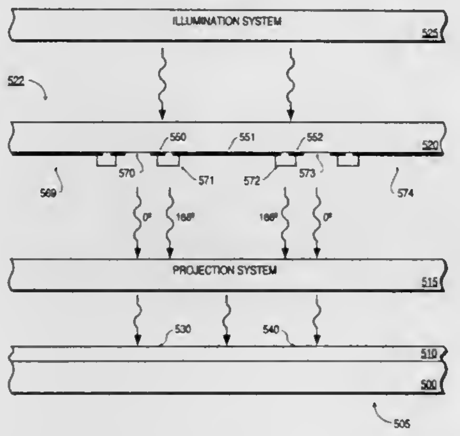
5,840,448
PHASE SHIFTING MASK HAVING A PHASE SHIFT THAT MINIMIZES CRITICAL DIMENSION SENSITIVITY TO MANUFACTURING AND PROCESS VARIANCE

Yan Borodovsky, Portland, and Vivek Singh, Beaverton, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Dec. 31, 1996, Ser. No. 777,599

Int. Cl.^{6} G03F *9/00*

U.S. Cl. 430—5 **17 Claims**



1. A reticle having only one phase delay for transmitting incident radiation, said reticle comprising:

a first region being transparent to said incident radiation;

a second region being transparent to said incident radiation, said second region being adjacent to said first region, said incident radiation transmitted by said second region having said phase delay of other than an integer multiple of 90 degrees relative to said incident radiation transmitted by said first region.

5,840,449
STRUCTURED PIGMENT COATING AND ITS PREPARATION AND USE

John Zambounis, Basel, and Manfred Hofmann, Marly, both of Switzerland, assignors to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

Filed May 6, 1996, Ser. No. 643,723

Claims priority, application Switzerland, May 12, 1995, 1394/95

Int. Cl.^{6} G02B *5/20;* G11B *7/00;7/26;* B05D *3/00*

U.S. Cl. 430—7 **24 Claims**

1. A process for the preparation of a material comprising a substrate on the surface of which there is at least one pigment coating consisting of one or more pigments of the formula (I)

$$A(D_1)(D_2)_x \qquad (I)$$

in which A is the radical of an unsubstituted or mono- or polysubstituted chromophore of the quinacridone, anthraquinone, perylene, indigo, azo, quinophthalone, isoindolinone, isoindoline, dioxazine, phthalocyanine or diketopyrrolopyrrole series which contains nitrogen atoms attached to D_1 and to x D_2, each nitrogen atom present in A being able independently of the others to be attached to 0, 1 or 2 groups D_1 or D_2,

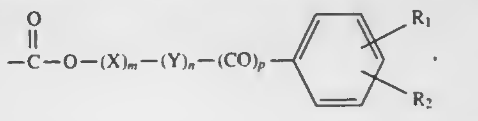
D_1 and D_2 are hydrogen, and x is an integer from 0 to 4,

which pigment coating is applied by

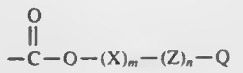
(a) coating at least a portion of the substrate surface with a melt of at least one unsubstituted or mono- or polysubstituted latent pigment of the formula (III), or a solution consisting essentially of at least one latent pigment of formula (III) and one or more solvents,

$$A(D_3)(D_4)_x \qquad (III)$$

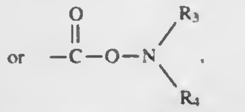
A and x in formula (III) having the same meaning as in formula (I), A containing nitrogen atoms attached to D_3 and to x D_4, and each nitrogen atom present in A being able independently of the others to be attached to 0,1 or 2 groups D_3 or D_4, and D_3 and D_4 independently of one another being groups of the formula



(Va)



$$-\overset{\overset{\displaystyle O}{\|}}{C}-O-(X)_m-(Z)_n-Q \qquad (Vb)$$



$$\text{or} \quad -\overset{\overset{\displaystyle O}{\|}}{C}-O-N\begin{matrix}\diagup R_3\\ \diagdown R_4\end{matrix} \qquad (Vc)$$

(b) converting at least a portion of the latent pigment into its insoluble pigment form by eliminating groups D_3 and D_4 and replacing the eliminated groups with hydrogen, and

(c) removing any remaining latent pigment from the surface of said material, where, in the formulae (Va), (Vb) and (Vc),

m, n and p independently of one another are 0 or 1,

X is C_1–C_{14}alkylene, C_2–C_{14}alkenylene, C_2–C_4alkynylene, C4–Cl_2cycloalkylene or C_4–C_{12}cycloalkenylene,

Y is a group —V—$(CH_2)_q$—,

Z is a group —V—$(CH_2)_r$—,

V is C_3–C_6cycloalkylene,

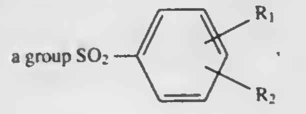
q is a number from 1 to 6,

r is a number from 0 to 6,

R_1 and R_2 independently of one another are hydrogen, C_1–C_6alkyl, C_1–C_4alkoxy, halogen, CN, NO_2, phenyl which is unsubstituted or substituted by C_1–C_4alkyl, C_1–C_4alkoxy or halogen, or are phenoxy,

Q is hydrogen, CN, $Si(R_1)_3$, a group $C(R_5)(R_6)(R_7)$,

in which R_5, R_6 and R_7 independently of one another are hydrogen or halogen and at least one of the radicals R_5, R_6 and R_7 is halogen,

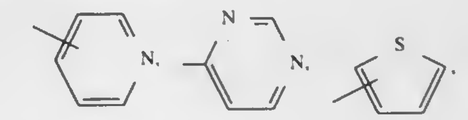


in which R_1 and R_2 are as defined above,

a group SO_2R_8 or SR_8, in which R_8 is C_1–C_4alkyl,

a group $CH(R_9)_2$, in which R_9 is phenyl which is unsubstituted or substituted by C_1–C_4alkyl, C_1–C_4alkoxy or halogen,

or a group of the formula



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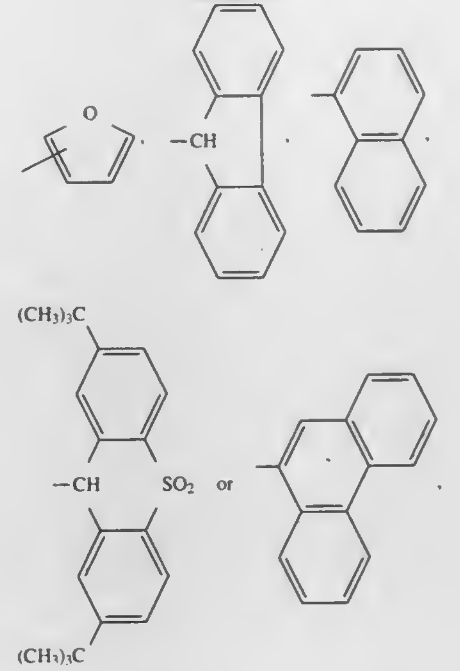
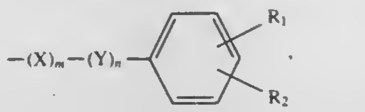


and

R_3 and R_4 independently of one another are hydrogen, C_1–C_{18}alkyl, or a group



in which X, Y, R_1, R_2, m and n are as defined above, or R_3 and R_4 together with the nitrogen atom to which they are attached form a pyrrolidinyl, piperidyl or morpholinyl radical.

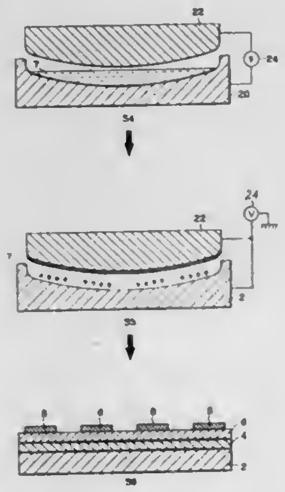
5,840,450
METHOD FOR FORMING A BLACK MATRIX ON A FACEPLATE PANEL FOR A COLOR CRT

Jong-ho Cho, Kwacheon, Rep. of Korea, assignor to Samsung Display Devices Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 24, 1996, Ser. No. 774,094

Int. Cl.^{6} G03C *5/00;* G03G *13/22;13/10*

U.S. Cl. 430—25 **2 Claims**



1. A method for forming a black matrix on a curved inner surface of a faceplate panel for a color cathode ray tube, said

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faceplate having an organic conductive layer and an organic photoconductive layer, the method comprising the steps of:

charging the photoconductive layer to a potential;

exposing a portion of the charged photoconductive layer to light in a predetermined pattern, whereby the charge on an unexposed portion remains;

charging a wet conductive black matrix material to an opposite potential to that on the unexposed portion of the photoconductive layer;

depositing the charged black matrix material on an outer surface of a developer, the outer surface having a complimentary configuration to the inner surface of the panel, by dipping the outer surface of the developer into a container of the charged black matrix material; and

contacting the outer surface of the developer, on which the charged black matrix material is deposited, with the oppositely charged photoconductive layer on the curved inner surface of the faceplate panel while a same potential is applied to the developer and the conductive layer, whereby the black matrix material is deposited on the unexposed portion of the photoconductive layer.

5,840,451

INDIVIDUALLY CONTROLLABLE RADIATION SOURCES FOR PROVIDING AN IMAGE PATTERN IN A PHOTOLITHOGRAPHIC SYSTEM

Bradley T. Moore; Robert Dawson; H. Jim Fulford, Jr., all of Austin; Mark I. Gardner, Cedar Creek; Frederick N. Hause, Austin; Mark W. Michael, Cedar Park, and Derick J. Wristers, Austin, all of Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Dec. 4, 1996, Ser. No. 760,029

Int. Cl.^{6} G03F *9/00*

U.S. Cl. 430—30 **48 Claims**

1. A method of using a photolithographic system, comprising:

providing individually controllable radiation sources; and

scanning the radiation sources relative to an image plane to form the image pattern on the image plane during fabrication of an integrated circuit device.

5,840,452

PROCESS AND APPARATUS FOR ELECTROPHOTOGRAPHIC STATIC ELIMINATION

Seizo Kitagawa, Kawasaki, Japan, assignor to Fuji Electric Company, Ltd., Kanagawa, Japan

Filed Nov. 29, 1996, Ser. No. 758,444

Claims priority, application Japan, Dec. 5, 1995, 7-316205

Int. Cl.^{6} G03G *21/08*

U.S. Cl. 430—31 **8 Claims**

1. An electrophotographic process, comprising:

a. providing an organic photoconductor comprised of a charge generation layer and a charge transport layer containing a poly(alkanedioic acid 2,6-dimethoxyanthracene-9,10-diol ester) resin formed on a conductive substrate, and having a half decay exposure; and

b. eliminating static from the organic photoconductor by illuminating the organic photoconductor with a static elimination light having a wavelength ranging from 520 to 680 nm and with a dose of the static elimination light which ranges from 3 to 10 times the half decay exposure of the organic photoconductor.

5,840,453

SOLVATION-BASED CHARGE DIRECTION OF ELECTROPHOTOGRAPHIC DEVELOPER COMPOSITIONS

Ronald Swidler, Palo Alto, Calif., assignor to Colorep, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 764,113, Sep. 23, 1991, abandoned, which is a continuation of Ser. No. 582,431, Sep. 13, 1990, abandoned, which is a continuation-in-part of Ser. No. 356,264, May 23, 1989, Pat. No. 5,069,995, which is a continuation-in-part of Ser. No. 464,896, Jan. 16, 1990, Pat. No. 5,411,833, which is a continuation-in-part of Ser. No. 546,044, Jun. 28, 1990, Pat. No. 5,153,090. This application Dec. 3, 1993, Ser. No. 162,381

Int. Cl.^{6} G03G *13/01;9/13;9/135*

U.S. Cl. 430—42 **32 Claims**

15. A positively charged electrophotographic liquid developer composition comprising, dispersed in an oleophilic, electrically insulating carrier liquid, (a) toner particles of a resinous phase containing colorant, the particles being formed by admixing the resinous phase and the colorant at a temperature in the range of about 70° C. to 200° C. followed by comminuting the admixture, and (b) a charge director comprising a metal ion selected from aluminum, chromium and ferric and including, as a counterion, the anion of an ortho-hydroxy aromatic acid, wherein the resinous phase is comprised of a polymeric or a monomeric material having specific polar group solvation sites that complex with metal ions of the metal salt and comprise solvation sites consisting of hydroxyl groups, and wherein the charge director and the specific solvation sites are selected such that solvation of the charge director by the material is an exothermic reaction with a ΔH that is more negative than about −50 kJ/mole and the charge director metal ions form complexes with the hydroxyl group solvation sites of the material.

5,840,454

AROMATIC POLYCARBONATE AND ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEDIUM USING SAME

Kazukiyo Nagai, Numazu; Masaomi Sasaki; Hiroshi Tamura, both of Susono; Tetsuro Suzuki, Fuji; Tomoyuki Shimada, Sunto-gun; Chihaya Adachi, Numazu; Chiaki Tanaka, Tagata-gun; Nozomu Tamoto, Numazu; Kouji Kishida, Sunto-gun; Akira Katayama, Tagata-gun; Mitsutoshi Anzai, Ushiku, and Akihiro Imai, Sagamihara, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, and Hodogaya Chemical Co., Ltd., Kawasaki, both of Japan

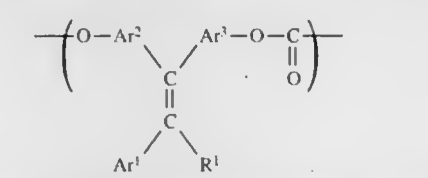
Filed Jun. 20, 1996, Ser. No. 666,947

Claims priority, application Japan, Jun. 21, 1995, 7-178194; Jun. 23, 1995, 7-180794; Jun. 30, 1995, 7-165962; Sep. 21, 1995, 7-267786; Feb. 7, 1996, 8-045555; Feb. 7, 1996, 8-045556; Mar. 4, 1996, 8-045995

Int. Cl.^{6} G03G *5/047*

U.S. Cl. 430—59 **15 Claims**

1. An electrophotographic photosensitive medium comprising a conductive substrate, and a photosensitive layer formed on said conductive substrate, said photosensitive layer comprising an aromatic polycarbonate having a charge transport property comprising the following structural unit (I):



(I)

wherein R^1 is selected from the group consisting of a hydrogen atom, substituted and unsubstituted alkyl groups and substituted and unsubstituted aryl groups; Ar^1 is selected from the group consisting of substituted and unsubstituted nitrogen-containing aryl group or a monovalent heterocyclic group having an amine structure and Ar^2 and Ar^3 are independently selected from the group consisting of substituted and unsubstituted arylene groups.

5,840,455

ELECTROPHOTOGRAPHIC PHOTOCONDUCTOR

Hiroshi Ikuno; Narihito Kojima, and Hiroshi Nagame, all of Numazu, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 24, 1996, Ser. No. 653,387

Claims priority, application Japan, May 24, 1995, 7-149502

Int. Cl.^{6} G03G *15/04*

U.S. Cl. 430—67 **18 Claims**

1. An electrophotographic photoconductor, comprising an electrically conductive supporting substrate, a photoconductive layer disposed thereon, and a surface protective layer disposed on said photoconductive layer, wherein said surface protective layer comprises a hydrogenated diamond-like carbon or a hydrogenated amorphous carbon, and further comprises at least one additional element selected from the group consisting of nitrogen, fluorine, boron, phosphorus, chlorine, bromine and iodine, wherein said at least one additional element is present from a first concentration in a portion of a layer of said surface protective layer adjacent to said photoconductive layer to a second concentration in a remainder of a layer of said surface protection layer, wherein said first concentration is lower than said second concentration, and wherein said surface protective layer has a Knoop hardness of more than or equal to 1000 kg/mm^2 in an outermost layer of the surface protective layer.

5,840,456

COLOR TONER COMPRISING TWO BINDER RESINS OF DIFFERING SOFTENING POINT

Masami Tomita; Hiroshi Yaguchi; Yasuo Asahina; Yasuaki Iwamoto, all of Numazu; Satoru Miyamoto, Mishima, and Tomomi Suzuki, Gotenba, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 8, 1996, Ser. No. 689,368

Claims priority, application Japan, Aug. 8, 1995, 7-222708; Aug. 2, 1996, 8-220324

Int. Cl.^{6} G03G *9/087*

U.S. Cl. 430—106 **15 Claims**

1. A color toner comprising:

a binder resin composition comprising a binder resin A with a softening point in the range of 85° to 110° C., and a binder resin B with a softening point in the range of 115° to 135° C., said binder resin A and said binder resin B being compatible with each other;

a coloring agent; and

a wax with a melting point in the range of 65° to 90° C., which is not compatible with said binder resin composition and dispersed in said binder resin composition.

5,840,457

MAGNETIC BLACK TONER AND MULTI-COLOR OR FULL-COLOR IMAGE FORMING METHOD

Motoo Urawa, Funabashi; Keita Nozawa, Shizuoka-ken; Hiroshi Yusa, Machida; Takashige Kasuya; Yuki Karaki, both of Shizuoka-ken; Kazuo Maruyama, Mishima, and Masao Takano, Susono, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 30, 1997, Ser. No. 902,945

Claims priority, application Japan, Jul. 31, 1996, 8-216845; Jul. 24, 1997, 9-198025

Int. Cl.^{6} G03G *13/01;9/083*

U.S. Cl. 430—45 **59 Claims**

26. A multi-color or full-color image forming method, comprising:

(1) developing an electrostatic latent image with a developer comprising a non-magnetic yellow toner to form a yellow toner image on an image bearing member, and then transferring the yellow toner image onto a transfer-receiving material via or without via an intermediate transfer member,

(2) developing an electrostatic latent image with a developer comprising a non-magnetic magenta toner to form a magenta toner image on an image bearing member, and then transferring the magenta toner image onto a transfer-receiving material via or without via an intermediate transfer member,

(3) developing an electrostatic latent image with a developer comprising a non-magnetic cyan toner to form a cyan toner image on an image bearing member, and then transferring the cyan toner image onto a transfer-receiving material via or without via an intermediate transfer member,

(4) developing an electrostatic latent image with a magnetic black toner to form a magnetic black toner image on an image bearing member, and then transferring the magnetic black toner image onto a transfer-receiving material via or without via an intermediate transfer member, and

(5) fixing under application of heat and pressure the yellow toner image, the magenta toner image, the cyan toner image and the magnetic black toner image on the transfer-receiving material by means of a heat-pressure fixation device not equipped with an oil applicator to form a multi-color or full-color image on the transfer-receiving material,

wherein the magnetic black toner comprises (a) magnetic black toner particles containing a binder resin, a magnetic material and a first solid wax, and (b) first inorganic fine powder, wherein

(i) the magnetic material is contained in 30–200 wt. parts per 100 wt. parts of the binder resin,

(ii) the first solid wax provides a DSC heat-absorption main peak in a range of 60°–120° C.,

(iii) the first solid wax shows a ratio Mw/Mn between weight-average molecular weight (Mw) and number-average molecular weight (Mn) of 1.0–2.0,

(iv) the binder resin has a THF (tetrahydrofuran)-insoluble content of at most 5 wt. %,

(v) the binder resin contains a THF-soluble content providing a GPC chromatogram showing a molecular weight distribution including a content (M1) at 40–70% of components having molecular weights of below 5×10^4, a content (M2) at 20–45% of components having molecular weights of 5×10^4–5×10^4, and a content (M3) at 2–25% of components having molecular weights exceeding 5×10^5, satisfying $M1 \geqq M2 > M3$, and

(vi) the magnetic black toner exhibits viscoelasticity characteristics including a value C of tan δ at 100° C. and a value D of tan δ at 150° C. giving a ratio D/C of at least 1.0, and a minimum (Emin) and a maximum (Emax) of tan δ within a temperature range of 150°–190° C. both falling in a range of 0.5–3.0.

5,840,458

DEVELOPER FOR DEVELOPING AN ELECTROSTATIC LATENT IMAGE TO WHICH LAMINATED TITANIUM OXIDE IS EXTERNALLY ADDED

Kenichi Kido; Katsunori Kurose; Takeshi Arai, all of Amagasaki, and Masayuki Hagi, Takatsuki, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Feb. 13, 1996, Ser. No. 600,375

Claims priority, application Japan, Feb. 14, 1995, 7-025247; Feb. 14, 1995, 7-025248; Feb. 14, 1995, 7-025251; Feb. 14, 1995, 7-025439; Dec. 11, 1995, 7-321591

Int. Cl.^{6} G03G *9/087;9/08*

U.S. Cl. 430—110 **34 Claims**

1. A developer for developing an electrostatic latent image comprising:

toner particles comprising a colorant and a binder resin; and

laminated titanium oxide particles adhered to surface of the toner, said titanium oxide particles having an average particle size of 5 to 40 nm.

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5,840,459
TONER FOR DEVELOPING ELECTROSTATIC IMAGES AND PROCESS FOR PRODUCTION THEREOF

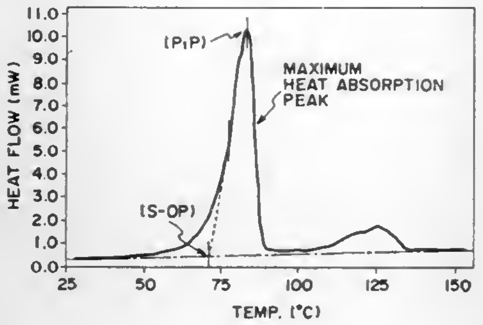
Manabu Ohno, Funabashi; Satoshi Mitsumura, Yokohama; Nobuyuki Okubo, Yokohama, and Yoshinori Tsuji, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 12, 1996, Ser. No. 662,081

Claims priority, application Japan, Jun. 15, 1995, 7-171614

Int. Cl.^{6} G03G *9/08*

U.S. Cl. 430—110 **39 Claims**



1. A toner for developing electrostatic images comprising: 100 parts by weight of a binder resin, a colorant and 1 to 20 parts by weight of a low molecular weight wax having a weight average molecular weight (Mw) of at most 30,000, said binder resin, said colorant and a portion of said low molecular weight wax present as toner particles and the balance of the low-molecular weight wax present as wax particles;

wherein the toner has a melt index as measured at 125° C. under a load of 98 N of at least 10 g/10 min,

the wax particles are present at a ratio of 10–500 wax particles per 10,000 toner particles,

the low-molecular weight wax comprises a compound represented by the formula of: R—Y, wherein R denotes a hydrocarbon group, and Y denotes a hydroxyl group, carboxyl group, alkyl ether group or alkyl ester group; and

the low-molecular weight wax has a thermal property providing a DSC curve as measured by a differential scanning calorimeter exhibiting:

- (i) a maximum heat-absorption peak on temperature increase having a peak temperature in a temperature range of 70°–130° C.;
- (ii) a heat-absorption peak including the maximum heat-absorption peak showing an onset temperature of at least 50° C., and
- (iii) a maximum heat-evolution peak on temperature decrease in a range of ±15° C. from the peak temperature of the maximum heat absorption peak.

5,840,460
TONER FOR DEVELOPING ELECTROSTATIC LATENT IMAGES

Junji Machida, Toyonaka, and Chikara Tsutsui, Nishinomiya, both of Japan, assignors to Minolta Co., Ltd, Osaka, Japan

Filed Jan. 31, 1997, Ser. No. 792,125

Claims priority, application Japan, Feb. 2, 1996, 8-017504; Feb. 21, 1996, 8-033564

Int. Cl.^{6} G03G *9/087;9/097*

U.S. Cl. 430—110 **20 Claims**

1. A toner fixed by heat, comprising a binder resin having a melt index value of 3 to 12 (g/10 minutes) at 150° C., a colorant and an offset-preventing agents, the toner having a melt index value of 15 to 40 (g/10 minutes) at 125° C.

14. A one-component developing toner fixed by heat, comprising a binder resin, a colorant and an offset-preventing agent, the toner having a melt index value of 10 to 40 (g/10 minutes) at 125° C., a grindability index of 1 to 3 and a volume mean particle size of 5 to 9 μm.

5,840,461
PROCESS FOR PRODUCING CYLINDRICAL SUBSTRATE FOR IMAGE FORMATION

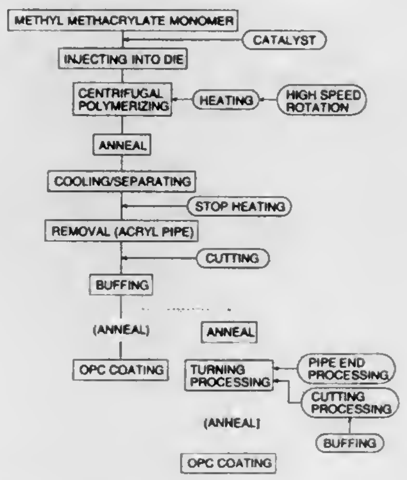
Satoshi Haneda; Hisayoshi Nagase; Hiroyuki Tokimatsu; Masahiro Onodera; Shuta Hamada, all of Hachioji; Toshihide Miura, Koganei, and Fumitaka Mochizuki, Hachioji, all of Japan, assignors to Konica Corporation, Japan

Filed Mar. 28, 1997, Ser. No. 827,259

Claims priority, application Japan, Apr. 3, 1996, 8-081373; Jun. 7, 1996, 8-145901; Jun. 12, 1996, 8-151032; Oct. 1, 1996, 8-260730

Int. Cl.^{6} G03G *5/00*

U.S. Cl. 430—133 **22 Claims**



1. A method of producing a cylindrical photoreceptor for use in an electrophotographic apparatus wherein said photoreceptor is exposed by an exposing device within said photoreceptor, said method comprising

- (a) injecting polymerizable liquid material into a die whose inner surface is cylindrical;
- (b) polymerizing said polymerizable liquid material while rotating said die to form a cylindrical substrate inside said die;
- (c) thereafter removing said substrate from said die;
- (d) coating said substrate with a transparent electroconductive layer; and
- (e) coating said electroconductive layer with an organic photoconductive layer;

wherein said cylindrical substrate is a light transmitting resin material which transmits light generated by said exposing device; and

a thickness of the substrate is controlled according to an injecting amount of the polymerizable liquid material.

5,840,462
TONER PROCESSES

Daniel A. Foucher, Toronto; Raj D. Patel; Guerino G. Sacripante, both of Oakville, all of Canada, and Grazyna E. Kmiecik-Lawrynowicz, Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 13, 1998, Ser. No. 6,622

Int. Cl.^{6} G03G *9/09;9/087*

U.S. Cl. 430—137 **21 Claims**

1. A process for the preparation of toner which comprises

- i) flushing a pigment into a sulfonated polyester resin;
- ii) mixing an organic soluble dye with the colorant polyester resin of i);

- iii) dispersing the resulting mixture into warm water thereby enabling the formation of submicron particles;
- iv) allowing the resulting solution to cool below about, or about equal to the glass transition temperature of said sulfonated polyester resin;
- v) adding an alkali halide solution and heating; and optionally
- vi) recovering said toner, followed by washing and drying.

5,840,463
PHOTOSENSITIVE DONOR ELEMENT ASSEMBLAGES AND ASSOCIATED PROCESS FOR LASER-INDUCED THERMAL TRANSFER

Graciela Beatriz Blanchet-Fincher, Greenville, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 14, 1997, Ser. No. 891,776

Int. Cl.^{6} G03C *5/00;8/02*

U.S. Cl. 430—201 **5 Claims**

1. An assemblage for use in a laser-induced thermal transfer process, the assemblage comprising:

- (A) a photosensitive donor element comprising in order:
  - (A1) a support;
  - (A2) a photohardenable layer comprising a binder, at least one photohardenable component, and an initiator;
  - (A3) optionally a barrier layer;
  - (A4) optionally a coversheet;
  - (A5) at least one ejection layer comprising a first polymer having a decomposition temperature T_1; and
  - (A6) at least one top layer having an outer surface and comprising (i) a second polymer having a decomposition temperature T_2 and (ii) an imageable component;

and

- (B) a receiver element comprising in order:
  - (B1) a receiver support; and
  - (B2) optionally an image-receiving layer;

wherein the outer surface of the top layer (A6) is adjacent to and in contact with the receiver support (B1) or the image-receiving layer (B2) of the receiver element and wherein a photomask for use in preparing a relief image is fabricated on the photosensitive donor element according to the laser-induced thermal transfer process.

5,840,464
SINGLE COATING TRANSFER COLOR PROOFING SYSTEM

John J. Gigantino, 124 W. Sixth Ave., Roselle, N.J. 07203; David L. Siegfried, 139 Mill Pond Pl., Langhorne, Pa. 19047, and Rhonda L. Stark, P.O. Box 103, Oxford, N.J. 07863

Continuation-in-part of Ser. No. 246,018, May 19, 1994, abandoned. This application Jun. 14, 1995, Ser. No. 490,218

Int. Cl.^{6} G03C *11/12;* **C03F** *7/30*

U.S. Cl. 430—257 **12 Claims**

1. A method for forming a colored image which comprises:

- A) providing a photosensitive element which comprises, in order:
  - i) a substrate having a release surface; and
  - ii) a photosensitive layer coated, at a coating weight of from about 0.1 to 5.0 g/M^2, directly on said release surface, which photosensitive layer comprises: 1) a light sensitive, negative working, photopolymerizable composition, which composition contains a photoinitiator and a polymerizable monomer; and 2) a film forming resinous binder composition, which composition contains a styrene maleic anhydride copolymer; 3) an adhesive resin; and 4) at least one colorant, and
- B) either
  - i) laminating said element with heat and pressure with said photosensitive layer being laminated directly to a an adhesion promoted surface of a developer resistant receiver sheet; and removing said substrate by the application of peeling forces; and imagewise exposing said photosensitive layer to actinic radiation; and removing nonexposed areas of a negative working photosensitive layer with a liquid developer; or
  - ii) imagewise exposing said photosensitive layer to actinic radiation; and laminating said element with heat and pressure with said photosensitive layer being laminated directly to an adhesion promoted surface of a developer resistant receiver sheet; and removing said substrate by the application of peeling forces; and removing nonexposed areas of a negative working photosensitive layer with a liquid developer; or
  - iii) laminating said element with heat and pressure with said photosensitive layer being laminated directly to an adhesion promoted surface of a developer resistant receiver sheet; and imagewise exposing said photosensitive layer to actinic radiation; and removing said substrate by the application of peeling forces; and removing nonexposed areas of a negative working photosensitive layer with a liquid developer;

whereby a colored image is formed on the adhesion promoted surface of the receiver sheet, and wherein steps A and B are repeated at least once wherein another photosensitive element having at least one different colorant is laminated onto said adhesion promoted surface of the receiver sheet with its photosensitive layer laminated directly to the nonremoved portions of the previous image.

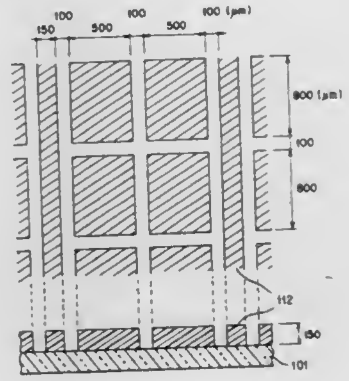
5,840,465
COMPOSITIONS AND METHOD FOR FORMATION OF BARRIER RIBS OF PLASMA DISPLAY PANEL

Masahisa Kakinuma, Menuma-machi; Osamu Kawana, and Katsuto Murata, both of Sakado, all of Japan, assignors to Taiyo Ink Manufacturing Co., Ltd., Japan

Filed Oct. 13, 1995, Ser. No. 543,217

Int. Cl.^{6} H01J *9/02;11/00;* **C03B** *19/06*

U.S. Cl. 430—270.1 **33 Claims**



17. A composition for the formation of barrier ribs of a plasma display panel, which comprises (A) a low-melting glass having a working point of not more than 560° C., (B) a hydroxyl group-containing polymer having at least two hydroxyl groups per molecule, (C) an inorganic filler, (D) a diluent, (E) an organosilicic compound possessing in one terminal part thereof an alkoxysilane group having at least two alkoxy groups bonded thereto and in the other terminal part thereof an amine terminal group, and (F) a blocked isocyanate compound having isocyanate groups blocked with an amine.

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5,840,466

OPITAL RECORDING MEDIA AND THEIR PRODUCTION METHODS

Toshihisa Nonaka, Otsu; Gentaro Ohbayashi, Kusatsu, and Kusato Hirota, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

PCT No. PCT/JP95/00564, § 371 Date Nov. 22, 1995, § 102(e) Date Nov. 22, 1995, PCT Pub. No. WO95/26549, PCT Pub. Date Oct. 5, 1995

PCT Filed Mar. 27, 1995, Ser. No. 553,640

Claims priority, application Japan, Mar. 25, 1994, 6-055990; Apr. 28, 1994, 6-091972

Int. Cl.^{6} G11B *7/24*

U.S. Cl. 430—270.13 **7 Claims**

1. An optical recording medium, comprising a recording layer formed on a substrate to which a light beam is applied to record, erase and read data, said recording and erasing of data being carried out by means of phase change between amorphous and crystalline states of the recording layer,

said recording medium having a laminated structure comprising a transparent substrate on which a first dielectric layer comprising a mixture of ZnS and SiO_2, a recording layer, a second non-transparent dielectric layer comprising ZnS, SiO_2 and C, and a reflective layer are formed in order,

wherein the second dielectric layer has an extinction coefficient k which meets the equation $0.01 \leqq k \leqq 1.0$,

wherein the molar ratio of ZnS and SiO_2 in the second dielectric layer meets the equation $ZnS/SiO_2=85/15–65/35$ and the molar ratio of $(ZnS+SiO_2)$ and C meets the equation $(ZnS+SiO_2)/C=95/5–80/20$.

5,840,467

IMAGE RECORDING MATERIALS

Katsuji Kitatani; Keitaro Aoshima; Yuichi Shiraishi; Kazuto Kunita, and Hiroaki Yokoya, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 410,756, Mar. 27, 1995, abandoned. This application Oct. 28, 1996, Ser. No. 739,064

Claims priority, application Japan, Apr. 18, 1994, 6-078888

Int. Cl.^{6} G03F *7/30;7/021;7/023*

U.S. Cl. 430—302 **11 Claims**

2. A method of forming a positive working printing plate which consists essentially of imagewise exposing and alkali development-processing an image recording material comprising a support having thereon a layer comprising a water-insoluble, alkaline water-soluble resin as a binder, a substance capable of generating heat by the absorption of infrared rays or near infrared rays which is carbon black, and a heat decomposable substance capable of substantially lowering the solubility of the binder when the substance is in an undecomposed state, wherein the printing plate is formed by direct-platemaking the image recording material from digital data of a computer using a light source having emission wavelengths in the region of from near infrared to infrared rays.

5,840,468

Patent Not Issued For This Number

5,840,469

GALLIC ACID AS A LASER DIRECT THERMAL DEVELOPER

Jon Alfred Bjork, Cottage Grove, and James Bernard Philip, Mahtomedi, both of Minn., assignors to Imation Corp., Oakdale, Minn.

Filed May 13, 1997, Ser. No. 855,350

Int. Cl.^{6} G03C *1/498*

U.S. Cl. 430—350 **16 Claims**

1. A thermographic element comprising a support having coated thereon a thermographic emulsion layer comprising:

(a) a light insensitive silver salt;

(b) a gallic acid reducing agent; and

(c) an infrared radiation absorbing compound, wherein said element provides an image having a D_{min} of less than about 0.2 and a D_{max} of greater than about 3.0 in the ultraviolet spectral range when exposed to infrared radiation for a time and at an intensity sufficient to provide total energy of about 400 to 500 mJ/cm^2.

5,840,470

RAPID IMAGE PRESENTATION METHOD EMPLOYING SILVER BROMIDE TABULAR GRAIN PHOTOGRAPHIC ELEMENTS

Anne E. Bohan; John M. Buchanan, and Richard P. Szajewski, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 730,557, Oct. 15, 1996, Pat. No. 5,698,379. This application Jul. 7, 1997, Ser. No. 888,403

Int. Cl.^{6} G03C *7/407*

U.S. Cl. 430—359 **14 Claims**

1. A method of providing a color display image comprising the steps of:

A) color developing an imagewise exposed silver halide film having a support that is substantially transparent after photographic processing, and having thereon a coated layer thickness of up to about 30 μm, and at least three color records, each color record having at least one silver halide emulsion, said film further comprising up to about 0.2 mmol/m^2 of color masking coupler, each said developed color record exhibiting a gamma of between about 0.1 and 1.0 and an exposure latitude of from 2.5 log E to 6.0 log E, and said film exhibiting a photographic sensitivity of at least ISO 100,

B) scanning said developed film to form density representative digital signals for said at least three color records, and

C) digitally manipulating said density representative digital signals formed in step B to correct either or both interimage interactions and gamma mismatches among said at least three color records so as to produce a digital record of said corrected color image.

5,840,471

METHOD FOR PROCESSING SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Naoko Fukuwatari; Eiichi Ueda, and Yasuo Kurachi, all of Hino, Japan, assignors to Konica Corporation, Japan

Filed Sep. 26, 1997, Ser. No. 938,233

Claims priority, application Japan, Oct. 2, 1996, 8-261754; Oct. 23, 1996, 8-280753; Apr. 18, 1997, 9-101496; Jun. 17, 1997, 9-159870

Int. Cl.^{6} G03C *5/31*

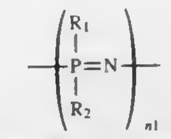
U.S. Cl. 430—399 **11 Claims**

1. A method for processing a silver halide photographic light-sensitive material comprising the steps of

developing the silver halide photographic light-sensitive material with a developing solution and

contacting said developing solution with a member comprising particles of a compound having a structural unit represented by Formula 1 and/or particles of a compound represented by

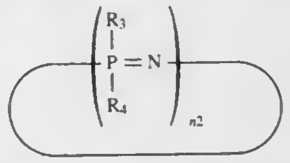
Formula 2, the compound having a structural unit represented by Formula 1 and the compound represented by Formula 2 have each a solubility of not more than 1 g per 100 g of water at 40° C.;



$$\left(-\overset{R_1}{\underset{R_2}{P}}=N-\right)_{n1}$$

Formula 1

wherein R_1 and R_2 are each independently an alkyl group, an alkoxy group, an aryl group, an aryloxy group, an alkenyl group, an alkynyl group, an amino group, an alkylthio group, an arylthio group, an acyl group, a cyano group, a cyanato group, an isocyanato group, an isothiocyanato group or an azide group, n_1 is an integer of 1 to 50,000, when n_1 is 2 or more, R_1 and R_2 may be the same or different between the structural units;



$$\left(\overset{R_3}{\underset{R_4}{P}}=N\right)_{n2}$$

Formula 2

wherein R_3 and R_4 are synonymous for R_1 and R_3 in Formula 1, n_2 is an integer of 3 to 20, and R_3 and R_4 may be the same or different between the structural units.

5,840,472

DEVELOPER FOR SILVER HALIDE PHOTOGRAPHIC PHOTOSENSITIVE MATERIAL

Hirotomo Sasaki; Harumi Watanabe, and Kohzaburoh Yamada, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

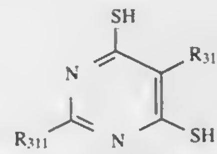
Filed Feb. 7, 1997, Ser. No. 797,633

Claims priority, application Japan, Feb. 7, 1996, 8-044023; Feb. 7, 1996, 8-044040; Feb. 7, 1996, 8-044060; Sep. 26, 1996, 8-254572

Int. Cl.^{6} G03C *5/30*

U.S. Cl. 430—488 **8 Claims**

1. A developer for a black and white silver halide photographic photosensitive material comprising at least one black-and-white developing agent selected from the group consisting of a dihydroxybenzene, an ascorbic acid derivative and a hydroquinone monosulfonate and at least one compound represented by the following fonnula (3-1):



(3-1)

wherein R_{311} and R_{312} each represents a mercapto group or a group capable of substituting to the pyrimidine ring.

5,840,473

MIXED EMULSIONS OF DIFFERENT SPEED PROPERTIES USING SULFINATE AND SULFONATE COMPOUNDS

Jerzy Z. Mydlarz, Fairport; Roger L. Klaus, and Frederick C. Derks, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 23, 1997, Ser. No. 841,546

Int. Cl.^{6} G03C *1/36;1/09*

U.S. Cl. 430—509 **11 Claims**

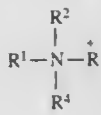
1. A photographic negative film comprising at least two photographic emulsions wherein said at least two emulsions are the same emulsion and wherein at least one of said at least two same emulsions is treated with a speed decreasing compound of Formula I:

$$Z^1—X^1O_2S—M^1 \tag{I}$$

and a compound of Formula II:

$$Z^2—X^2O_2—M^2 \tag{II}$$

wherein X^1 is sulfur and X^2 is selected from the group consisting of sulfur and selenium, M^1 and M^2 are independently selected from group consisting of a metal ion and



$$R^1—\overset{R^2}{\underset{R^4}{N}}—\overset{+}{R^3}$$

wherein R^1, R^2, R^3 and R^4 are independently selected from the group consisting of hydrogen and an alkyl of 1–3 carbon atoms, and Z^1 and Z^2 are independently selected from the group consisting of an unsubstituted or substituted alkyl of 1 to 18 carbon atoms, an unsubstituted or substituted aryl group having 6 to 10 carbon atoms, an unsubstituted or substituted 5-membered or 6-membered heterocyclic group having one or two heteroatoms, and L, wherein L is a divalent linking group, provided that, if Z^1 is L, the compound of Formula I is a polymer and, if Z^2 is L, the compound of Formula II is a polymer, such that after said treating at least one of said same emulsions has a different sensitivity.

5,840,474

PREPARATION METHOD FOR (100) TABULAR SILVER HALIDE GRAINS RICH IN CHLORIDE IN SILICA SOL AS BINDER

Hieronymus Andriessen, and Peter Verrept, both of Mortsel, Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Seo. 18, 1996, Ser. No. 715,499

Claims priority, application European Pat. Off., Oct. 2, 1995, 95202639

Int. Cl.^{6} G03C *1/035;1/015;1/07*

U.S. Cl. 430—569 **4 Claims**

1. Process for the preparation of a radiation sensitive silver halide emulsion comprising silver halide grains comprising a binder consisting essentially of colloidal silica sol and containing at least 50 mole % of chloride in said silver halide grains, based on the total amount of silver halide, in which more than 50% of the total projected area of the grain population is accounted for by tabular grains bounded by parallel major faces lying in (100) crystallographic planes and having an adjacent edge ratio of less than 10, and wherein the average aspect ratio of the (100) tabular grain population is at least 2, said process comprising:

(a) a nucleation step performed by introducing into a vessel silver and halide salt solutions, wherein chloride ion accounts for at least 50 mole % and iodide ion accounts for at most 10 mole % of the totality of halide, while the pCl is maintained between 0.5 and 3.0,

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(b) a physical ripening step,

(c) at least one growth step performed by introducing silver and halide salt solutions as defined in step (a) at increasing flow rates into said vessel, thereby maintaining the pCl at a value between 0.5 and 3.0 and wherein a colloidal silica sol and an onium compound are added both before or during said nucleation step (a) and during said physical ripening step (b) such that the amount of silica sol added during said step (b) ranges from 40 to 60% of the total amount of silica sol added and wherein the ratio of the total amount of onium compound added to the total amount of silica sol added ranges from 0.07 to 0.15.

5,840,475

PHOTOTHERMOGRAPHIC ELEMENT FOR PROVIDING A VIEWABLE RETAINED IMAGE

David H. Levy, Rochester; Lyn M. Eshelman, Penfield; Mark E. Irving, Rochester, and Debra L. Hartsell, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 28, 1996, Ser. No. 740,110

Int. Cl.^{6} G03C *1/498*

U.S. Cl. 430—619 **9 Claims**

1. An element comprised of

a support and, coated on the support,

a photothermographic layer capable of providing a retained viewable image when imagewise exposed and heated, said layer being comprised of

(1) photosensitive silver halide grains including tabular grains having {100} major faces,

containing greater than 70 mole percent chloride, based on silver,

accounting for greater than 50 percent of total silver halide grain projected area, and

exhibiting an average thickness of less than 0.3 μm,

(2) a light insensitive source of silver, and

(3) a reducing agent for said light-insensitive source of silver.

5,840,476

Patent Not Issued For This Number

5,840,477

METHODS FOR DETECTING MUTATIONS ASSOCIATED WITH HYPERTROPHIC CARDIOMYOPATHY

Christine Seidman; Jonathan Seidman, both of Milton; Ludwig Thierfelder, Brookline; Hugh Watkins, Brookline, and Calum McRae, Brookline, all of Mass., assignors to Brigham & Women's Hospital, Boston, and President & Fellows of Harvard College, Cambridge, both of Mass.

Division of Ser. No. 354,326, Dec. 12, 1994, which is a continuation of Ser. No. 252,627, Jun. 2, 1994, abandoned, which is a continuation-in-part of Ser. No. 989,160, Dec. 11, 1992, Pat. No. 5,429,923. This application Jun. 7, 1995, Ser. No. 481,793

Int. Cl.^{6} C12Q *1/68;1/00;* **C12P** *19/34;* **C07H** *21/02*

U.S. Cl. 435—4 **7 Claims**

1. A method for diagnosing hypertrophic cardiomyopathy comprising:

obtaining a sample of at least two sarcomeric proteins from a subject being tested for hypertrophic cardiomyopathy; and

diagnosing the subject for hypertrophic cardiomyopathy by detecting an abnormality in the at least two sarcomeric proteins as an indication of the disease.

5,840,478

METHOD OF DETECTING AMPLIFIED NUCLEIC SEQUENCES IN CELLS BY FLOW CYTOMETRY

Bruce Patterson; Michelle Till, both of Chicago, and Steven Wolinsky, Glencoe, all of Ill., assignors to Northwestern University, Evanston, Ill.

Continuation of Ser. No. 901,702, Jun. 19, 1992, abandoned. This application May 18, 1994, Ser. No. 245,530

Int. Cl.^{6} C12Q *1/70;1/68;* **C12P** *19/34*

U.S. Cl. 435—5 **16 Claims**

1. A method to detect specific nucleic acid target sequences in a cell lacking a cell wall by fluorescence-activated cytometry comprising:

(a) isolating cells lacking a cell wall;

(b) incubating said cells with a water-soluble fixative to form a suspension;

(c) washing the cells;

(d) amplifying specific target nucleic acid sequences in said washed cells in the presence of deoxyribonucleoside triphosphate analogs wherein said analogs are deoxyribonucleoside triphosphates coupled to a substituent group that inhibits cellular effusion of amplified target nucleic acid products containing said analogs;

(e) contacting said suspension of cells containing amplified target nucleic acids with labeled nucleic acid probes sufficiently complementary to said target nucleic acid sequences so as to specifically bind to them; and

(f) detecting said labeled nucleic acid probes by fluorescence-activated flow cytometry so as to identify cells containing said nucleic acid target sequences.

5,840,479

PREPARATION AND USE OF GENE BANKS OF SYNTHETIC HUMAN ANTIBODIES ("SYNTHETIC HUMAN-ANTIBODY LIBRARIES")

Melvyn Little, Neckargemünd; Frank Berthold Breitling, Wiesloch; Thomas Seehaus, Heppenheim; Stefan Dübel, Heidelberg, and Iris Klewinghaus, Mannheim, all of Germany, assignors to Behring Diagnostics GmbH, Marburg, Germany

Continuation of Ser. No. 247,393, May 23, 1994, abandoned, which is a continuation of Ser. No. 654,207, Jan. 30, 1991, abandoned. This application Dec. 2, 1994, Ser. No. 353,372

Claims priority, application Germany, Feb. 1, 1990, 40 02 897.6; Feb. 9, 1990, 40 03 880.7

Int. Cl.^{6} C12N *15/13;* **C07H** *21/04;* **C07K** *19/00*

U.S. Cl. 435—5 **54 Claims**

1. A synthetic human antibody -DNA library obtained by:

1) synthesizing almost random sequences for the antibody hypervariable regions, wherein (a) relatively conserved amino acids in the hypervariable regions have been taken into account in the choice of appropriate nucleotides during the oligonucleotide synthesis and (b) the ratio of the nucleotides used in chosen such that a nonsense codon is to be expected at most in every 89th position;

2) inserting said almost random sequences for the hypervariable regions into a human antibody framework; and

3) incorporating said almost random sequences combined with said human antibody framework into an expression vector.

5,840,480

RETROVIRUS FROM THE HIV GROUP AND ITS USE

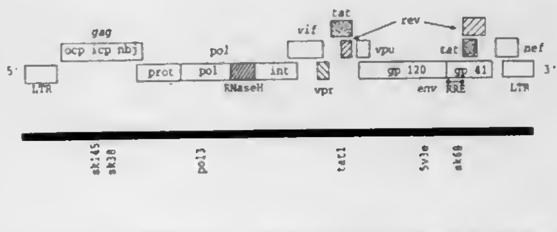
Lutz G. Guertler, Munich; Josef Eberle, Freising; Albrecht v. Brunn, Augsburg; Stefan Knapp, Marburg-Wehrshausen, and Hans-Peter Hauser, Marburg, all of Germany, assignors to Behring Diagnostics GmbH, Marburg, Germany

Division of Ser. No. 132,653, Oct. 5, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 468,059

Claims priority, application Germany, Oct. 6, 1992, 42 33 646.5; Oct. 22, 1992, 42 35 718.7; Dec. 30, 1992, 42 44 541.8; Jun. 1, 1993, 43 18 186.4

Int. Cl.^{6} C12Q *1/70;* **C12N** *7/00;7/04;* **A61K** *39/21*

U.S. Cl. 435—5 **11 Claims**



1. An immunodeficiency virus of the HIV group, or variants of said virus, which exhibits all the essential morphological and immunological properties of the retrovirus which has the designation MVP-5180/91 (SEQ ID NO:56) and which has been deposited with the European Collection of Animal Cell Cultures (ECACC) under No. V 920 92 318.

5,840,481

PARASITE-DERIVED RESISTANCE

Stephen A. Johnston, 309 N. Gregson, Durham, N.C. 27701, and John C. Sanford, Geneva, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y., and Stephen A. Johnston, Dallas, Tex.

Continuation of Ser. No. 344,616, Nov. 17, 1994, Pat. No. 5,580,716, which is a continuation of Ser. No. 68,168, May 28, 1993, abandoned, which is a continuation of Ser. No. 856,889, Mar. 25, 1992, Pat. No. 5,240,841, which is a continuation of Ser. No. 449,049, Dec. 14, 1989, abandoned, which is a continuation of Ser. No. 842,484, Mar. 21, 1986, abandoned, which is a continuation-in-part of Ser. No. 714,263, Mar. 21, 1985, abandoned. This application Nov. 29, 1996, Ser. No. 758,561

Int. Cl.^{6} C12Q *1/70;1/68;* **C12N** *1/21:15/82*

U.S. Cl. 435—5 **21 Claims**

1. A method of making a host cells resistant to a virus for the host, comprising:

a) isolating DNA coding for a gene, or fragment thereof of said virus;

b) operably linking said DNA, or a fragment thereof, within an expression vector;

c) transforming said host cells with said expression vector;

d) growing said transformed cells in the presence of said virus, wherein said DNA, or fragment thereof, is expressed as a gene product, and wherein said gene product disrupts an essential activity of said virus; and

e) identifying said transformed host cells which are resistant to infection by said virus by selecting transformed host cells which survive or resist infection by said virus.

5,840,482

Y CHROMOSOME SPECIFIC NUCLEIC ACID PROBE AND METHOD FOR DETERMINING THE Y CHROMOSOME IN SITU

Joe W. Gray, Livermore, and Heinz-Ulrich Weier, Tracy, both of Calif., assignors to The Regents of the University of California, Alameda, Calif.

Filed Oct. 10, 1990, Ser. No. 594,921

Int. Cl.^{6} C12Q *1/68*

U.S. Cl. 435—6 **21 Claims**

1. A nucleic acid probe for use in in situ hybridization consisting of:

a. a human Y chromosome identifying nucleic acid sequence that specifically hybridizes under standard in situ hybridization conditions to a region of the Y chromosome represented by the nucleotide sequence of FIG. 1 from nucleotide 2965 to nucleotide 3212 (SEQ. ID. NO.: 10) or to the nucleotide sequence complementary to that nucleotide sequence from nucleotide 2965 to nucleotide 3212 (SEQ. ID. NO.: 10); and optionally,

b. a regulatory or structural nucleic acid segment which does not completely compromise the binding capability of said Y chromosome identifying nucleic acid sequence, and/or,

c. a labeling means which provides a signal indicating the presence of the probe hybridized to a nucleic acid sequence contained in a test sample;

wherein said nucleic acid probe has a size of from 124 base pairs (bp) to 248 bp.

5,840,483

METHOD OF MAINTAINING A DESIRED RECOMBINANT GENE IN A GENETIC POPULATION OF CELLS

Roy Curtiss, III, St. Louis, Mo., assignor to Washington University, St. Louis, Mo.

Continuation of Ser. No. 402,308, Mar. 10, 1995, Pat. No. 5,672,345, which is a continuation of Ser. No. 990,361, Dec. 15, 1992, which is a continuation of Ser. No. 251,304, Oct. 3, 1988, which is a continuation-in-part of Ser. No. 106,072, Oct. 7, 1987, abandoned. This application Jun. 7, 1995, Ser. No. 473,926

Int. Cl.^{6} C12Q *1/68*

U.S. Cl. 435—6 **12 Claims**

1. A method of selecting for the presence of a recombinant gene in a population of bacterial cells comprising growing genetically engineered cells characterized by:

a) a lack of functioning native chromosomal gene encoding an enzyme 1, which catalyzes a step in the biosynthesis of diaminopimelic acid (DAP);

b) a presence of a first recombinant gene encoding an enzyme 2, which is a functional replacement for enzyme 1 and wherein the first recombinant gene cannot recombine to replace the defective chromosomal gene;

c) a presence of a second recombinant gene encoding a desired gene product; and

d) physical linkage between the first recombinant gene and the second recombinant gene, wherein loss of the first recombinant gene causes the bacterial cells to lyse when in an environment which requires expression of said first recombinant gene for survival.

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5,840,484
COMPARATIVE GENE TRANSCRIPT ANALYSIS

Jeffrey J. Seilhamer, Los Altos, and Randal W. Scott, Mountain View, both of Calif., assignors to Incyte Pharmaceuticals, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 179,873, Jan. 11, 1994, and a continuation-in-part of Ser. No. 137,951, Oct. 14, 1993, and a continuation-in-part of Ser. No. 100,523, Aug. 3, 1993, which is a continuation-in-part of Ser. No. 977,780, Nov. 19, 1992, abandoned, which is a continuation-in-part of Ser. No. 916,491, Jul. 17, 1992, abandoned. This application Jan. 27, 1994, Ser. No. 187,530

Int. Cl.^{6} C12Q *1/68*

U.S. Cl. 435—6 **11 Claims**

1. A method of analyzing a specimen containing gene transcripts, comprising the steps of:
   - obtaining a first mixture of mRNA;
   - making cDNA copies of the mRNA;
   - isolating a representative population of the cDNA copies and producing therefrom a first cDNA library, wherein a selected set of random primers is used in the generation of the first cDNA library;
   - identifying a first set of gene transcripts from the first library and determining cDNA sequences corresponding to the gene transcripts;
   - processing the cDNA sequences corresponding to the first gene transcripts in a programmed computer in which a database of reference transcript sequences indicative of reference cDNA sequences is stored, to generate a first identified sequence value for each of the first gene transcripts, where each said identified sequence value is indicative of a sequence annotation and a degree of match between one of the first gene transcripts and at least one of the reference cDNA sequences; and
   - processing each said identified sequence value to generate first final data values indicative of a number of times each first identified sequence value is present in the first cDNA library.

5,840,485
TOPOLOGICALLY SEGREGATED, ENCODED SOLID PHASE LIBRARIES

Michal Lebl, Oro Valley; Kit S. Lam; Sydney E. Salmon, both of Tucson; Victor Krchnak, Oro Valley; Nikolai Sepetov, Oro Valley, and Peter Kocis, Oro Valley, all of Ariz., assignors to Selectide Corporation, Del.

Continuation-in-part of Ser. No. 68,327, May 27, 1993, abandoned. This application May 26, 1994, Ser. No. 249,830

Int. Cl.^{6} C12Q *1/68;* G01N *33/53;* C07K *17/02;* C07H *21/04*

U.S. Cl. 435—6 **47 Claims**

1. A library for identifying and analyzing a ligand of an acceptor of interest comprising: a multiplicity of separate solid phase supports having a plurality of reactive functional groups; to each of which said supports are attached via said functional groups:
   - a) a species of test compound, said test compound comprised of a sequence of subunits; and
   - b) one or more species of coding molecule, wherein the coding molecules that are attached to each support:
     - i) are comprised of α-amino acids, and
     - ii) are topologically segregated from the test compound that is attached to each said support, such that the coding molecule is in the interior of each said support, and the test compound is attached to greater than 90% of the reactive functional groups on the exterior of each said support;

wherein, on each said support:
   - each species of coding molecule is different from the species of test compound; and
   - the sequence of the subunits of the test compound is encoded by the species of coding molecules.

5,840,486
MUTANT DNA ENCODING PROTEIN PHOSPHATASE 1 G-SUBUNIT

Oluf Pedersen, Holte, Denmark; Christian Bjørbæk, Boston, Mass.; Lars Hansen, Frederiksberg, Denmark, and Patricia Townsend Cohen, Dundee, United Kingdom, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

Filed Oct. 2, 1995, Ser. No. 537,342

Int. Cl.^{6} C12P *19/34;* C07H *21/04;* C12N *15/09;* C12Q *1/68*

U.S. Cl. 435—6 **22 Claims**

1. A DNA isolate comprising a DNA sequence encoding the protein phosphatase type 1 (PP1) G-subunit, wherein said coding sequence of PP1 G-subunit is mutated in the first position of codon 905 such that aspartic acid^{905} in the expressed PP1 G-subunit is substituted by tyrosine; or a fragment of said DNA isolate spanning codon 905 that specifically hybridizes to the complement of said DNA isolate.

5,840,487
INTERNAL CONTROLS FOR ISOTHERMAL NUCLEIC ACID AMPLIFICATION REACTIONS

James G. Nadeau, Chapel Hill, and Michael C. Little, Raleigh, both of N.C., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Continuation of Ser. No. 508,006, Jul. 2, 1995, abandoned, which is a continuation of Ser. No. 58,648, May 5, 1993, Pat. No. 5,457,027. This application Feb. 18, 1997, Ser. No. 801,542

Int. Cl.^{6} C12Q *1/68;* C12P *19/34*

U.S. Cl. 435—6 **10 Claims**

1. A method for detecting inhibition of a nucleic acid amplification reaction comprising:
   - a) coamplifying in the isothermal nucleic acid amplification reaction a known amount of an internal control nucleotide sequence and a target nucleotide sequence, if present, the internal control sequence exhibiting minimal secondary structure at a selected temperature for isothermal amplification and having substantially the same length and substantially the same G+C content as the target sequence, and;
   - b) detecting inhibition of the isothermal nucleic acid amplification reaction by detecting inhibition of amplification of the internal control nucleotide sequence.

5,840,488
NUCLEIC ACID PROBES FOR DETECTION AND/OR QUANTITATION OF NON-VIRAL ORGANISMS

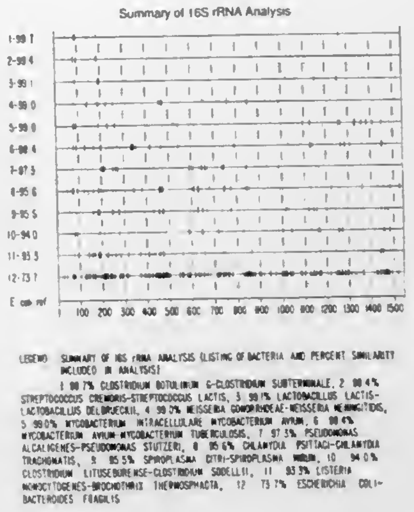
James John Hogan, San Diego, Calif., assignor to Gen-Probe Incorporated, San Diego, Calif.

Continuation of Ser. No. 200,866, Feb. 22, 1994, which is a continuation of Ser. No. 806,929, Dec. 11, 1991, abandoned, which is a continuation of Ser. No. 295,208, Dec. 9, 1988, abandoned, which is a continuation-in-part of Ser. No. 83,542, Aug. 7, 1987, abandoned, which is a continuation-in-part of Ser. No. 934,244, Nov. 24, 1986, abandoned. This application Jun. 6, 1995, Ser. No. 471,394

Int. Cl.^{6} C12Q *1/68*

U.S. Cl. 435—6 **11 Claims**

1. A method of making an oligonucleotide probe able to distinguish between a non-viral target species and a non-viral non-target species comprising the following steps:
   - a) identifying one or more potential variable regions present in rRNA, or encoding rDNA, by comparing the rRNA or encoding rDNA of at least two different species belonging to the same non-viral genus, wherein each of said one or more potential variable regions is identified based on at least a one base difference between the rRNA or encoding rDNA of said at least two different species in each of said one or more potential variable regions, wherein said at least two different species are not made up of both said target species and said non-target species;



   - b) selecting a variable region from said potential variable regions identified in said step (a) by comparing the rRNA, or encoding rDNA, of said target species and said non-target species in one or more locations corresponding to said potential variable regions and identifying said variable region from said potential variable regions based on at least a one base difference in the rRNA, or encoding rDNA, of said target species and said non-target species;
   - c) producing said oligonucleotide probe to comprise a target-complementary sequence, wherein said target-complementary sequence is obtained by substantially maximizing complementarity to said variable region present in said target species, while substantially minimizing complementarity to said variable region present in said non-target species, such that a duplex formed between said oligonucleotide probe and nucleic acid of said target species has a higher T_m than a duplex formed between said oligonucleotide probe and nucleic acid of said non-target species.

5,840,489
DIAGNOSIS AND TREATMENT OF SUPRAVALVULAR AORTIC STENOSIS AND WILLIAMS SYNDROME

Mark T. Keating; Mark F. Leppert, both of Salt Lake City, Utah, and Colleen A. Morris, Las Vegas, Nev., assignors to University of Utah Research Foundation, Salt Lake City, Utah

Continuation of Ser. No. 41,576, Apr. 5, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 474,020

Int. Cl.^{6} C12Q *1/68;* C12P *19/34;* C07H *21/02;* C12N *15/00*

U.S. Cl. 435—6 **8 Claims**

1. A method for determining whether supravalvular aortic stenosis (SVAS) is present in a human, comprising:
   - (i) determining a sequence of an exon of an elastin gene or a sequence of an elastin cDNA of said human by a method of nucleic acid sequencing; and
   - (ii) comparing said sequence of an exon of an elastin gene or said sequence of an elastin cDNA of said human with a DNA sequence encoding native, non-variant elastin, whereby a difference in said sequence of an exon of an elastin gene or said sequence of an elastin cDNA of said human from said DNA sequence encoding native, non-variant elastin is indicative of a variant elastin gene and the presence of SVAS in said human, said difference being selected from the group consisting of: a translocation resulting in a breakpoint within an elastin gene, a deletion, an insertion, a frameshift mutation, a nonsense mutation and an inversion.

5,840,490
TELOMERASE ACTIVITY ASSOCIATED WITH HEMATOLOGICAL AND COLORECTAL MALIGNANCIES

Silvia Bacchetti; Christopher M. Counter; Brian Leber, all of Hamilton, Canada, and Calvin Bruce Harley, Palo Alto, Calif., assignors to McMaster University, Hamilton, Canada

Filed Jun. 7, 1995, Ser. No. 485,454

Int. Cl.^{6} C12Q *1/68;1/70;* C12P *19/34;* C07H *21/02*

U.S. Cl. 435—6 **19 Claims**

1. A method for detecting myelodysplastic syndrome, said method comprising:
   - (a) collecting a bone marrow sample;
   - (b) analyzing said sample for telomerase activity;
   - (c) correlating said activity with a first standard level and a second standard level of telomerase activity, wherein said first standard level of telomerase activity is at least 4-fold less than said second standard level of telomerase activity; and
   - (d) correlating a telomerase activity falling within said first and said second standard levels of telomerase levels of telomerase activity with myelodysplastic syndrome.

5,840,491
DNA SEQUENCE ENCODING THE MACHADO-JOSEPH DISEASE GENE AND USES THEREOF

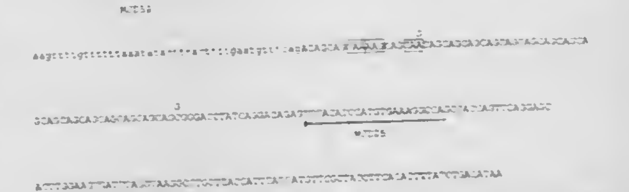
Akira Kakizuka, Kyoto University Faculty Housing, #224, Gokasho, Kan'yuchi, Uji-shi, Kyoto, Japan

Filed Sep. 21, 1995, Ser. No. 531,927

Claims priority, application Japan, Sep. 21, 1994, 6-251600

Int. Cl.^{6} C12Q *1/68;* C12P *19/34;* C07H *21/04*

U.S. Cl. 435—6 **30 Claims**



1. A method of determining whether an expanded nucleotide CAG triplet repeat, or its fully complementary sequence, is present in DNA in an individual, said expanded triplet being characteristic of Machado-Joseph Disease, comprising the steps of:
   - a) obtaining DNA from an individual; and
   - b) determining the presence of an expanded CAG triplet repeat, or its fully complementary sequence, in the DNA,

   wherein the presence of an expanded CAG triplet repeat in the DNA is indicative of the presence of Machado-Joseph Disease in the individual.

5,840,492
METHOD AND COMPOSITIONS FOR DETECTING HEMATOPOIETIC TUMORS

Richard J. Baer, Dallas, Tex., assignor to University of Texas System Board of Regents, Austin, Tex.

Continuation of Ser. No. 371,676, Jan. 12, 1995, abandoned, which is a continuation of Ser. No. 152,973, Nov. 15, 1993, abandoned, which is a continuation of Ser. No. 33,060, Mar. 10, 1993, abandoned, which is a continuation of Ser. No. 763,377, Sep. 20, 1991, abandoned, which is a continuation-in-part of Ser. No. 621,140, Nov. 28, 1990, abandoned, which is a continuation-in-part of Ser. No. 613,197, Nov. 14, 1990, abandoned, which is a continuation-in-part of Ser. No. 590,408, Sep. 28, 1990, abandoned. This application Nov. 15, 1995, Ser. No. 558,340

Int. Cl.^{6} C12Q *1/68*

U.S. Cl. 435—6 **9 Claims**

1. A method for detecting presence of hematopoietic tumors in a patient, said method comprising:

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combining for hybridization (1) a deletion probe, having a first fluorochrome, said deletion probe substantially matching an altered human chromosome 1 having a tal-1 deletion indicative of presence of said hematopoietic tumors and said deletion probe being a nucleic acid sequence capable of hybridizing with the altered human chromosome 1 having said deletion; (2) a control probe, having a second fluorochrome, said control probe substantially matching both a normal and the tal-1 altered human chromosome 1 and said control probe being a nucleic acid sequence capable of hybridizing with the normal human chromosome 1; and (3) cells suspected of containing a deletion at the tal-1 locus on chromosome 1 from said patient;

hybridizing in situ the cells and said deletion probe and said control probe; and

analyzing the hybridization patterns of the cells and said deletion probe and/or said control probe for an indication of the presence of a tal-1 deletion, indicating the presence of said hematopoietic tumors in said patient.

5,840,493

MITOCHONDRIAL DNA MUTATIONS THAT SEGREGATE WITH LATE ONSET DIABETES MELLITUS

Robert E. Davis, and Corinna Herrnstadt, both of San Diego, Calif., assignors to Mitokor, San Diego, Calif.

Continuation-in-part of Ser. No. 414,969, Mar. 31, 1995, abandoned, which is a continuation-in-part of Ser. No. 219,842, Mar. 30, 1994, Pat. No. 5,565,323, and Ser. No. 397,808, Mar. 3, 1995. This application Oct. 21, 1996, Ser. No. 734,564

Int. Cl.^{6} C12Q *1/68;* **C12P** *19/34;* **C07H** *21/04*

U.S. Cl. 435—6 **5 Claims**

1. A method for detecting the presence or risk of developing non-insulin dependent diabetes mellitus in a human patient said method comprising:

a) obtaining a biological sample containing mitochondria from said patient and isolating mitochondrial DNA therefrom;

b) determining the presence in said mitochondrial DNA of at least one mutation in a mitochondrial ATP synthase gene or $tRNA^{Lys}$ gene, said mutation selected from the group consisting of mutation at ATP synthase nucleotide 8371, 8374, 8383, 8386, 8392, 8395, 9396, 8398,8401, 8404, 8410, 8419, 8422, 8423, 8428, 8450, 8459, 8463, 8467, 8470, 8473, 8474, 8485, 9486, 8487, 8488, 8491, 8503, 8506, 8508, 8509, 8512, 8539, 8541, 8557, 8662, 9566, 8568; mutation at $tRNA^{Lys}$ nucleotide 8336 8345, 8348, 8349, 8351; and combinations thereof; and

c) correlating the presence or absence of said at least one mutation with the presence or risk of developing non-insulin dependent diabetes mellitus.

5,840,494

METHOD FOR MOLECULAR STAGING OF PROSTATE CANCER

Aaron E. Katz, Armonk; Ralph Buttyan; Anthony Raffo, both of New York, and Carl A. Olsson, Larchmont, all of N.Y., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Continuation of Ser. No. 229,391, Apr. 15, 1994, abandoned. This application Apr. 18, 1997, Ser. No. 844,024

Int. Cl.^{6} C12Q *1/68;* **C07H** *21/04;* **C12P** *19/34*

U.S. Cl. 435—6 **5 Claims**

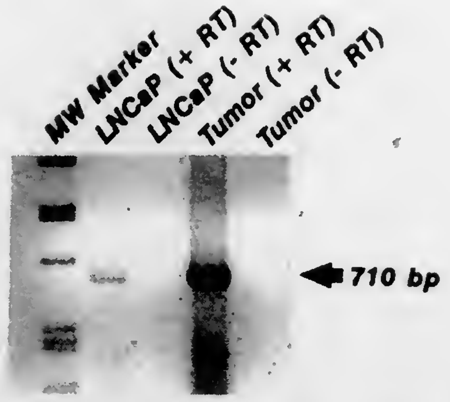
1. A method of determining the presence of mRNA encoding the PSA protein in a sample from a human subject which comprises:

(a) collecting a sample of peripheral blood from the subject;

(b) extracting mRNA molecules from the peripheral blood;

(c) amplifying a cDNA molecule encoding the PSA protein which comprises:

(i) contacting the mRNA molecule extract with a nucleic acid molecule primer capable of specifically hybridizing to a nucleic acid sequence site included within the mRNA encoding the PSA protein under conditions allowing the primer to specifically hybridize to the mRNA encoding the PSA protein;



(ii) contacting the composition produced by (I) with reverse transcriptase under conditions allowing the reverse transcriptase to transcribe a single stranded cDNA molecule copy of the mRNA molecule encoding the PSA protein;

(iii) heat denaturing the cDNA and mRNA molecule of composition produced by step (ii);

(iv) contacting the composition produced by step (iii) with a first primer capable of specifically hybridizing to a first unique nucleic acid molecule sequence site located on the cDNA molecule complementary to the mRNA encoding the PSA protein under conditions allowing the first primer to specifically hybridize with the first unique nucleic acid molecule sequence site;

(v) contacting the composition produced by step (iv) with DNA polymerase under conditions allowing the DNA polymerase to synthesize a double stranded cDNA molecule encoding the PSA protein using the first primer to initiate synthesis and the single-stranded cDNA molecule as a template;

(vi) heat denaturing the double-stranded cDNA molecule of the composition produced by step (v);

(vii) contacting the composition produced by step (vi) with the first primer and a second nucleic acid molecule primer capable of specifically hybridizing with a second unique nucleic acid sequence site is located on the other cDNA strand 3' of the first unique site under conditions allowing the first and second primers to specifically hybridize with the first and second unique sequences, respectively, of the cDNA molecule, encoding the PSA protein;

(viii) contacting the composition produced by step (vii) with DNA polymerase under conditions allowing the DNA polymerase to synthesis cDNA molecules encoding the PSA protein using the first or second primers to initiate synthesis and the heat denatured cDNA molecule encoding the PSA protein as a template; and

(ix) repeating steps (vi) through (viii) for at least twenty five times; and

(d) detecting the presence of the cDNA molecule encoding the PSA protein and by:

(a') adding digoxigenin-labeled nucleotides in step (iv);

(b') loading the composition of step (ix) which contains digoxigenin-labeled nucleotides onto a gel;

(c') electrophoresing the cDNA into the gel with a digoxigenin-labeled DNA ladder;

(d') transferring and fixing the DNA in the gel onto a membrane;

(e') contacting the DNA on the membrane with an antibody which specifically binds digoxigenin, wherein the antibody is linked to an enzyme capable of directly or indirectly activating a chemiluminescent substrate;

(f') contacting the antibody bound DNA with the activatable chemiluminescent substrate;

(g') visualizing the presence of labeled DNA by exposing the membrane to a light sensitive device; and

(h') detecting the presence of the cDNA molecule encoding the PSA protein and thereby determining the stage of prostate cancer.

5,840,495

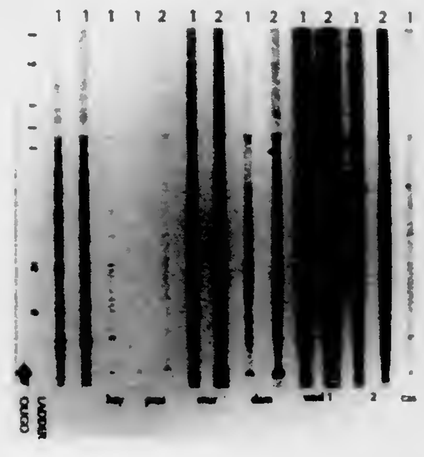
METHODS FOR DIAGNOSIS OF CONDITIONS ASSOCIATED WITH ELEVATED LEVELS OF TELOMERASE ACTIVITY

Michael D. West, Belmont, Calif.; Jerry Shay, Dallas, and Woodring Wright, Arlington, both of Tex., assignors to University of Texas System Board of Regents, Austin, Tex.

Division of Ser. No. 38,766, Mar. 24, 1993, Pat. No. 5,489,508, which is a continuation-in-part of Ser. No. 882,438, May 13, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 480,037

Int. Cl.^{6} C12Q *1/68;* **G01N** *33/53*

U.S. Cl. 435—7.1 **27 Claims**



7. A method for diagnosis of cancer in a patient, the method comprising the steps of:

determining the presence or amount of telomerase within said cells; and

correlating said presence or amount of telomerase with cancer.

5,840,496

METHOD FOR DIAGNOSING ENDOMETRIAL CANCER

John Stephen Haskill, Chapel Hill, N.C., assignor to Chiron Corporation, Emeryville, Calif.

Division of Ser. No. 425,232, Apr. 18, 1995, which is a continuation of Ser. No. 791,474, Nov. 8, 1991, abandoned, which is a continuation-in-part of Ser. No. 594,827, Oct. 9, 1990, abandoned. This application Jun. 2, 1995, Ser. No. 459,814

Int. Cl.^{6} G01N *33/53*

U.S. Cl. 435—7.1 **6 Claims**

1. A method for diagnosing endometrial cancer in a patient comprising measuring the amount of intracellular IL-1 receptor antagonist present in endometrial cells from a patient suspected of having said cancer, and comparing the amount to that present in normal endometrial cells.

5,840,497

METHOD FOR SPECIFIC SILENCING OF GENES BY DNA METHYLATION

Robin Holliday, West Pennant Hills, Australia, assignor to The Commonwealth of Australia Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

PCT No. PCT/AU94/00314, § 371 Date Feb. 5, 1996, § 102(e) Date Feb. 5, 1996, PCT Pub. No. WO94/29461, PCT Pub. Date Dec. 22, 1994

Continuation of Ser. No. 553,587, Feb. 5, 1996, abandoned. This PCT application Jun. 10, 1994, Ser. No. 937,583

Claims priority, application Australia, Jun. 11, 1993, PL 9338

Int. Cl.^{6} C12Q *1/68;* **C07H** *21/00;* **C12N** *5/10*

U.S. Cl. 435—6 **8 Claims**

1. A method of silencing a specific gene in a cell in vitro comprising introducing into the cell a single stranded oligonucleotide containing 5-methyl deoxycytosine, the single stranded oligonucleotide having a sequence complementary to a sequence within the promoter region of the gene to be silenced, wherein the sequence within the promoter region contains at least one CpG doublet.

5,840,498

ANTIBIOTIC CRYPTDIN PEPTIDES AND METHODS OF THEIR USE

Michael E. Selsted, Irvine, Calif., and Andre J. Ouellette, Lynn, Mass., assignors to The Regents of the University of California, Alameda, Calif.

Continuation of Ser. No. 342,268, Nov. 18, 1994, which is a continuation-in-part of Ser. No. 930,649, Aug. 14, 1992, Pat. No. 5,422,424, which is a continuation-in-part of Ser. No. 889,020, May 26, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 482,279

Int. Cl.^{6} G01N *33/53;33/542;33/537;33/543*

U.S. Cl. 435—7.1 **6 Claims**

1. A method for detecting an inflammatory pathology in a subject's intestine, comprising the steps of:

a) determining an amount of cryptdin in a sample obtained from the subject's intestine; and

b) comparing said amount of cryptdin to an amount of cryptdin in a normal subject, wherein a deviation of at least one standard deviation from said amount of cryptdin in a normal subject is indicative of an inflammatory pathology in said subject's intestine,

said cryptdin having an amino acid sequence as follows:

$$X_1\text{-C-}X_2\text{-C-R-}X_3\text{-C-}X_4\text{-E-}X_5\text{-C-}X_6\text{-C-C-}X_7$$

wherein

X_1 is 3 to 9 amino acids;
X_2 is 1 amino acid;
X_3 is 2 or 3 amino acids;
X_4 is 3 amino acids;
X_5 is 5 amino acids;
X_6 is 6 to 10 amino acids; and
X_7 is 0 to 9 amino acids.

5,840,499

METHOD AND KIT FOR DETECTION OF THROMBIN RECEPTOR ACTIVATION OF PLATELETS AND OTHER CELLS

Lawrence Brass, Bala Cynwyd, and James A. Hoxie, Berwyn, both of Pa., assignors to Trustees of the University of Pennsylvania, Philadelphia, Pa.

Continuation-in-part of Ser. No. 220,375, Mar. 31, 1994, abandoned. This application Jun. 6, 1996, Ser. No. 659,486

Int. Cl.^{6} G01N *33/53;33/543;* **C07K** *7/00;16/28*

U.S. Cl. 435—7.1 **3 Claims**

1. A method of diagnosing a pre-thrombotic state in a patient comprising:

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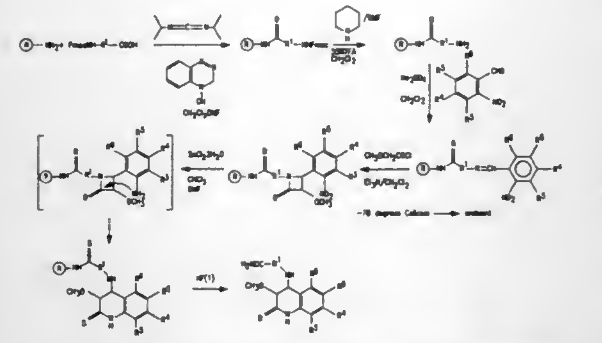
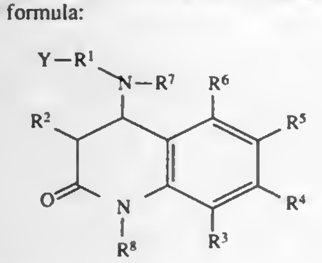
(a) obtaining a sample comprising whole blood, serum, plasma or urine from a patient;
(b) contacting a solid phase support coated with a peptide consisting of SEQ ID NO: 2 with the sample and a known amount of an antibody which specifically binds to the peptide consisting of SEQ ID NO: 2 so that the peptide consisting of SEQ ID NO: 2 and any peptide fragment comprising the N-terminal fragment of the thrombin receptor cleaved by thrombin between residues Ser^{42} and Arg^{41} in the sample can specifically bind to the antibody;
(c) detecting any antibody bound specifically to the peptide consisting of SEQ ID NO: 2 on the solid phase support; and
(d) quantifying the amount of peptide comprising the N-terminal fragment of the thrombin receptor cleaved by thrombin between residues Ser^{42} and Arg^{41} in the sample based on an amount of specifically bound antibody detected so that a pre-thrombotic state in the patient can be diagnosed.

5,840,500
QUINOLINE DERIVATIVES AND QUINOLINE COMBINATORIAL LIBRARIES

Yazhong Pei, Aliso Viejo, and John S. Kiely, San Diego, both of Calif., assignors to Trega Biosciences, Inc., San Diego, Calif.
Filed Jul. 11, 1996, Ser. No. 678,136
Int. Cl.⁶ G01N *33/53;33/566;33/536;33/531*
U.S. Cl. 435—7.1 **6 Claims**



1. A library of two or more tetrahydro-quinoline compounds of the formula:



FORMULA I

wherein:
R^1 is selected from the group consisting of C_1 to C_6 alkyl, C_1 to C_6 substituted alkyl, C_2 to C_7 alkenyl, C_2 to C_7 substituted alkenyl, C_2 to C_7 alkynyl, C_2 to C_7 substituted alkynyl, C_3 to C_7 cycloalkyl, C_3 to C_7 substituted cycloalkyl, C_5 to C_7 cycloalkenyl, C_5 to C_7 substituted cycloalkenyl, phenyl, substituted phenyl, naphthyl, substituted naphthyl, C_7 to C_{12} phenylalkyl, C_7 to C_{12} substituted phenylalkyl or a group of the formula:

$$—(CH_2)_n—Ar—(CH_2)_m—$$

wherein n and m are independently selected from a number 0 to 6; and Ar is an aryl group selected from the group consisting of phenyl, substituted phenyl, heteroaryl and substituted heteroaryl;
R^1 is selected from the group consisting of hydroxy, C_1 to C_7 alkoxy, C_1 to C_7 substituted alkoxy, C_1 to C_7 acyloxy, C_7 to C_{12} phenylalkoxy, C_7 to C_{12} substituted phenylalkoxy, phenoxy, substituted phenoxy, phthalimide, substituted phthalimide, amino, protected amino (monosubstituted)amino, (disubstituted)amino, C_1 to C_4 alkylthio, C_1 to C_4 substituted alkylthio, C_1 to C_4 alkylsulfonyl, C_1 to C_4 substituted alkylsulfonyl, C_1 to C_4 alkylsulfoxide, C_1 to C_4 substituted alkylsulfoxide, phenylthio, substituted phenylthio, phenylsulfoxide, substituted phenylsulfoxide, phenylsulfonyl and substituted phenylsulfonyl;
R^3, R^4, R^5 and R^6 are, independently, selected from the group consisting of a hydrogen atom, halo, hydroxy, protected hydroxy, cyano, nitro, C_1 to C_6 alkyl, C_2 to C_7 alkenyl, C_2 to C_7 alkynyl, C_1 to C_6 substituted alkyl, C_2 to C_7 substituted alkenyl, C_2 to C_7 substituted alkynyl, C_1 to C_7 alkoxy, C_1 to C_7 substituted alkoxy, C_1 to C_7 acyloxy, C_1 to C_7 acyl, C_3 to C_7 cycloalkyl, C_3 to C_7 substituted cycloalkyl, C_5 to C_7 cycloalkenyl, C_5 to C_7 substituted cycloalkenyl, a heterocyclic ring, C_7 to C_{12} phenylalkyl, C_7 to C_{12} substituted phenylalkyl, phenyl, substituted phenyl, naphthyl, substituted naphthyl, cyclic C_2 to C_7 alkylene, substituted cyclic C_2 to C_7 alkylene, cyclic C_2 to C_7 heteroalkylene, substituted cyclic C_2 to C_7 heteroalkylene, carboxy, protected carboxy, hydroxymethyl, protected hydroxymethyl, amino, protected amino, (monosubstituted)amino, protected (monosubstituted)amino, (disubstituted)amino, carboxamide, protected carboxamide, C_1 to C_4 alkylthio, C_1 to C_4 substituted alkylthio, C_1 to C_4 alkylsulfonyl, C_1 to C_4 substituted alkylsulfonyl, C_1 to C_4 alkylsulfoxide, C_1 to C_4 substituted alkylsulfoxide, phenylthio, substituted phenylthio, phenylsulfoxide, substituted phenylsulfoxide, phenylsulfonyl and substituted phenylsulfonyl;
R^7 and R^8 are, independently, selected from the group consisting of a hydrogen atom, C_1 to C_6 alkyl, C_1 to C_6 substituted alkyl, C_1 to C_7 acyl, C_1 to C_7 substituted acyl, phenylsulfonyl, substituted phenylsulfonyl, C_1 to C_4 alkylsulfonyl, C_1 to C_4 substituted alkylsulfonyl, C_1 to C_6 alkylaminocarbonyl, C_1 to C_6 substituted alkylaminocarbonyl, phenylaminocarbonyl, and substituted phenylaminocarbonyl; and
Y is $C(O)NHR^9$, wherein R^9 is a hydrogen atom, C_1 to C_6 alkyl and C_1 to C_6 substituted alkyl; or
a salt of the tetrahydro-quinoline compounds.

5,840,501
DETERMINATION OF CPSA

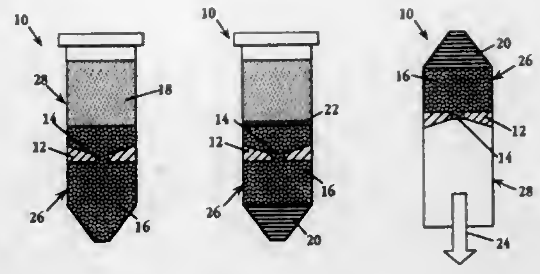
William Jeffrey Allard, Poughquag, N.Y.; Kwok K. Yeung, Ridgefield, Conn., and Zeqi Zhou, New City, N.Y., assignors to Bayer Corporation, Tarrytown, N.Y.
Continuation-in-part of Ser. No. 834,969, Apr. 7, 1997, which is a continuation-in-part of Ser. No. 738,383, Oct. 25, 1996, abandoned. This application Jul. 31, 1997, Ser. No. 903,750
Int. Cl.⁶ G01N *33/573;33/574;33/577;* **C07K** *16/40*
U.S. Cl. 435—74 **12 Claims**

1. A method for determining complexed prostate specific antigen (CPSA) in a blood sample, comprising the steps of:
(a) treating the total amount of immunologically determinable PSA (tPSA) in the blood sample to render free PSA (fPSA) substantially nondetectable by immunoassay, and
(b) determining PSA in the treated blood sample by immunoassay, whereby substantially only cPSA is detectable in said assay.

5,840,502
METHODS FOR ENRICHING SPECIFIC CELL-TYPES BY DENSITY GRADIENT CENTRIFUGATION

Peter Van Vlasselaer, Sunnyvale, Calif., assignor to Activated Cell Therapy, Inc., Mountain View, Calif.
Filed Aug. 31, 1994, Ser. No. 299,467
Int. Cl.⁶ G01N *33/567;* **B01L** *11/00*
U.S. Cl. 435—7.21 **13 Claims**

7. A method of enriching for a population of desired cells from a cell mixture containing multiple cell populations, comprising:
layering a cell mixture containing the desired cells onto a gradient density solution contained in a centrifuge tube;



said tube having a first closed end defining an inner bottom wall and an opposite open end; an annular member disposed in said tube and defining an opening therethrough, wherein said opening has an area less than the area of a cross section of said tube, said annular member defining a lower portion of the tube extending between said member and said tube bottom wall and upper portion above said annular member; said tube containing a density gradient solution which fills said lower portion and a part of said top portion to a level above said annular member;
said density gradient solution having an osmolality of 280±10 mOsm/kg H_2O and a specific density within 0.0005 gr/ml of the specific density of the desired cell;
centrifuging said tube at a gravitational force sufficient to pellet cells having specific densities greater than the specific density of the density gradient material in said tube; and
collecting from upper portion of said tube an enriched fraction of said population of cells.

5,840,503
NUCLEAR MATRIX PROTEIN FLUID ASSAY

Lee Anne Beausang, Norfolk; Graham P. Lidgard, Wellesley, and Thomas E. Miller, Franklin, all of Mass., assignors to Matritech, Inc., Newton, Mass.
Division of Ser. No. 112,646, Aug. 26, 1993, abandoned, which is a continuation of Ser. No. 785,804, Oct. 31, 1991, abandoned. This application May 18, 1995, Ser. No. 444,821
Int. Cl.⁶ G01N *33/567;33/574;33/53;* **C12Q** *1/00*
U.S. Cl. 435—7.21 **25 Claims**

1. A method for evaluating the efficacy of a therapy associated with cell death in a tissue, said method comprising the steps of:
(a) providing first and second fluid samples drawn from a patient after initiation of a said therapy, wherein said first fluid sample is drawn from said patient before said second fluid sample, and wherein at least one of said samples contains soluble debris released from cells of said tissue;
(b) contacting said first and second fluid samples, separately, with a binding partner that binds specifically to a body fluid-soluble interior nuclear matrix protein having a specific binding site for said binding partner;
(c) measuring, in each of said first and second fluid samples, a quantity per unit volume of said body fluid-soluble interior nuclear matrix protein recognized specifically by said binding partner, said quantity being indicative of the magnitude of cell death in said tissue; and
(d) comparing said quantities per unit volume of said body fluid-soluble interior nuclear matrix protein in said first and second fluid samples, wherein an increase in said quantity of body fluid-soluble interior nuclear matrix protein in said second fluid sample relative to said first fluid sample is indicative of an increase in cell death and a decrease in said quantity of body fluid-soluble interior nuclear matrix protein in said second fluid sample relative to said first fluid sample is indicative of a decrease in cell death.

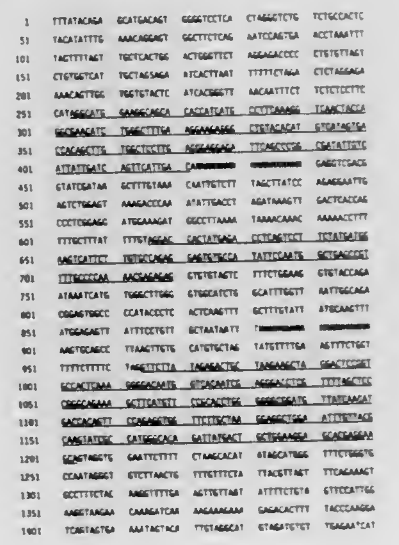
5,840,504
METHOD FOR SEPARATING SEX SPECIFIC MOLECULES AND NON-SEX SPECIFIC MOLECULES

Stan R. Blecher, Guelph, Canada, assignor to University of Guelph, Guelph, Ontario, Canada
Filed Aug. 9, 1996, Ser. No. 694,784
Int. Cl.⁶ G01N *33/536;* **C07K** *16/28*
U.S. Cl. 435—7.21 **7 Claims**

1. A method for separating sex specific molecules and non-sex specific molecules associated with animal plasma membranes, comprising:
(a) treating a plasma membrane fraction from adult, fetal, or embryonic animal cells or tissues, with one or more antibodies which bind to non-sex specific molecules in the cell membrane fraction to form conjugates between the non-sex specific molecules and the antibodies; and
(b) separating the material in the cell membrane fraction which does not bind to the antibodies to obtain a subfraction containing sex specific molecules.

5,840,505
METHOD FOR INHIBITING ADENYLOSUCCINATE SYNTHETASE ACTIVITY IN METHYLTHIOADENOSINE PHOSPHORYLASE DEFICIENT CELLS

Carlos J. Carrera, San Diego; Dennis A. Carson, Del Mar; Howard B. Cottam, Fallbrook, and Tsutomu Nobori, San Diego, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.
Continuation-in-part of Ser. No. 176,855, Dec. 29, 1993, abandoned. This application Mar. 8, 1996, Ser. No. 612,542
Int. Cl.⁶ C12Q *1/34;1/46;1/48;1/37*
U.S. Cl. 435—18 **13 Claims**



1. A method for inhibiting the activity of adenyl succinate synthetase (ASS) in methythioadenosine phosphorylase (MTAse) deficient cells comprising:
(a) determining that a population of cells obtained from a mammalian host is MTAse deficient; and,
(b) administering a therapeutically effective amount of an ASS inhibitory agent to the host, wherein said contact has the effect of depleting MTAse deficient host cells of adenosine 5'-monophosphate.

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5,840,506
METHODS FOR THE DIAGNOSIS AND PROGNOSIS OF CANCER

Antonio Giordano, Philadelphia, Pa., assignor to Thomas Jefferson University, Philadelphia, Pa.

Filed Apr. 4, 1997, Ser. No. 832,877
Int. Cl.^{6} G01N *33/574*

U.S. Cl. 435—7.23 **34 Claims**

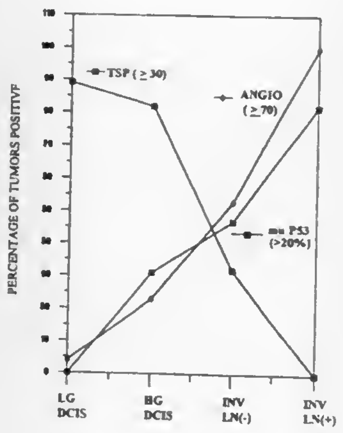
1. A method for determining a prognosis in a patient afflicted with cancer comprising determining the expression level of the pRb2/p130 gene in a sample from the patient, a decreased level of pRb2/p130 expression being indicative of an unfavorable prognosis.

5,840,507
METHODS FOR CANCER PROGNOSIS AND DIAGNOSIS

John Fruehauf, Tustin, Calif., assignor to Oncotech, Inc., Irvine, Calif.

Filed Apr. 11, 1997, Ser. No. 843,008
Int. Cl.^{6} G01N *33/53*

U.S. Cl. 435—7.23 **4 Claims**



1. A method for determining the prognosis of cancer patients for metastasis, recurrence and relapse of neoplastic disease comprising the steps of

- (a) obtaining a tumor sample from a human cancer patient;
- (b) determining the level of p53 nuclear localization, the level of thrombospondin 1 expression and the extent of microvascularization in the tumor sample by immunohistochemical staining;
- (c) preparing an index comprising index values of
  - (i) the percentage of cells in the tumor sample that are positive for p53 nuclear localization multiplied by the sum of (one plus the intensity of immunohistochemical staining);
  - (ii) the greatest number of microvessels per 200× magnification field, after a minimum scan of ten fields; and
  - (iii) the percentage of cells in the tumor sample that are positive for thrombospondin 1 expression;

  wherein the intensity of p53 staining is assigned
  a value of 0 for staining equal to a negative control,
  a value of 1 for staining greater than the negative control,
  a value of 2 for moderate staining intensity which is more than the negative control, but less than the positive control,
  a value of 3 for staining intensity equal to a positive control, and
  a value of 4 for staining intensity greater than the positive control;
  wherein positive p53 nuclear localization is determined by more than 5% of the cells stained at an intensity of 2 or greater; and
  wherein positive thrombospondin 1 expression is determined by greater than 30 optical density units;
- (d) weighing the index values of steps (c)(i), (c)(ii) and (c)(iii) on a scale of +1 to −4, to yield weighed values, with low p53 nuclear localization, high thrombospondin 1 expression and low level of microvascularization, each, being scored as +1; and
- (e) summing the weighed values for p53 nuclear localization, thrombospondin 1 expression and microvascularization;

wherein the prognosis for metastasis, recurrence and relapse of neoplastic disease is made when the sum of the weighed values is less than −5 but greater than or equal to −12.

5,840,508
COMPOSITIONS AND METHODS FOR REMOVAL OF DETERGENTS

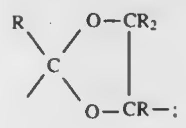
Arthur C. Switchenko, Mountain View; Nurith Kurn, Palo Alto; Christian Neukom, mountain View; Marcel Pirio; Donald E. Berger, Jr., both of San Jose, and Edwin F. Ullman, Atherton, all of Calif., assignors to Behring Diagnostics GmbH, Marburg, Germany

Division of Ser. No. 154,340, Nov. 18, 1993, Pat. No. 5,563,038, which is a continuation of Ser. No. 879,655, May 6, 1992, abandoned, which is a division of Ser. No. 223,501, Jul. 25, 1988, Pat. No. 5,116,726. This application May 31, 1995, Ser. No. 455,424
Int. Cl.^{6} G01N *33/531*

U.S. Cl. 435—7.32 **29 Claims**

1. A kit for conducting an assay for determining a biological antigen selected from the group consisting of poly(amino acids), polysaccharides, liposaccharides, glycoqroteins, lipoproteins and ribonuclear proteins in a sample suspected of containing said analyte, said kit comprising in packaged form:

- (i) a compound having detergent properties and having the structural formula Y—A—Z—P wherein:
  Y is alkyl, alkenyl, or alkynyl, having from 2 to 12 carbon atoms; or aralkyl, aralkenyl or aralkynyl, having from 7 to 12 carbon atoms;
  A is —S—; —Se—; —CHX—or —CH(X)CH=CH—, wherein X is Cl, Br, or I; —O—CH=CH—; —S—CH=CH—; —S—S—; —$SO_2CH_2CH_2$—O—;



or -$Si(R)_2O$—; or
—$OSi(R)_2O$— wherein R is lower alkyl
  Z is saturated or unsaturated alkylene having from 1 to 10 carbon atoms or saturated or unsaturated aralkylene having from 7 to 10 carbon atoms; and
  P is a hydrophilic moiety;
- (ii) a modifying reagent capable of modifying said detergent properties of said compound Y—A—Z—P and
- (iii) said biological antigen or an antibody for said biological antigen.

5,840,509
PROTEASE AND RELATED NUCLEIC ACID COMPOUNDS

Binhui Ni; Marc Paul, and Xin Wu, all of Carmel, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jul. 9, 1997, Ser. No. 890,542
Int. Cl.^{6} C12N *9/48;9/64;9/14;* C12Q *1/37*

U.S. Cl. 435—23 **2 Claims**

1. An isolated polypeptide which comprises the amino acid sequence

```
Met  Asp  Asn  Asn  Glu  Thr  Ser  Val
1                   5

                    Asp  Ser  Lys  Ser  Ile  Asn  Asn  Phe
                         10                       15

Glu  Thr  Lys  Thr  Ile  His  Gly  Ser
               20

                    Lys  Ser  Met  Asp  Ser  Gly  Ile  Tyr
                    25                       30

Leu  Asp  Ser  Ser  Tyr  Lys  Met  Asp
          35                       40

                    Tyr  Pro  Glu  Met  Gly  Leu  Cys  Ile
                                        45

Ile  Ile  Asn  Asn  Lys  Asn  Phe  His
     50                       55

                    Lys  Ser  Thr  Gly  Met  Ser  Ala  Arg
                                   60

Asn  Gly  Thr  Asp  Val  Asp  Ala  Ala
65                       70

                    Asn  Leu  Arg  Glu  Thr  Phe  Met  Ala
                              75                       80

Leu  Lys  Tyr  Glu  Val  Arg  Asn  Lys
                    85

                    Asn  Asp  Leu  Thr  Arg  Glu  Glu  Ile
                         90                       95

Met  Glu  Leu  Met  Asp  Ser  Val  Ser
               100

                    Lys  Glu  Asp  His  Ser  Lys  Arg  Ser
                    105                      110

Ser  Phe  Val  Cys  Val  Ile  Leu  Ser
          115                      120

                    His  Gly  Asp  Glu  Gly  Val  Ile  Phe
                                        125

Gly  Thr  Asn  Gly  Pro  Val  Asp  Leu
     130                      135

                    Lys  Lys  Leu  Thr  Ser  Phe  Phe  Arg
                                   140

Gly  Asp  Tyr  Cys  Arg  Ser  Leu  Thr
145                      150

                    Gly  Lys  Pro  Lys  Leu  Phe  Ile  Ile
                              155                      160

Gln  Ala  Cys  Arg  Gly  Thr  Glu  Leu
                    165

                    Asp  Cys  Gly  Ile  Glu  Thr  Asp  Ser
                         170                      175

Gly  Thr  Asp  Asp  Asp  Met  Ala  Cys
               180

                    Gln  Lys  Ile  Pro  Val  Gly  Ala  Asp
                    185                      190

Phe  Leu  Tyr  Ala  Tyr  Ser  Thr  Ala
          195                      200
```

-continued

```
                    Pro  Gly  Tyr  Tyr  Ser  Trp  Arg  Asn
                                        205

Ser  Arg  Asp  Gly  Ser  Trp  Phe  Ile
     210                      215

                    Gln  Ser  Leu  Cys  Ala  Met  Leu  Lys
                                   220

Leu  Tyr  Ala  His  Lys  Leu  Glu  Phe
225                      230

                    Met  His  Ile  Leu  Thr  Arg  Val  Asn
                              235                      240

Arg  Lys  Val  Ala  Met  Glu  Phe  Glu
                    245

                    Ser  Phe  Ser  Leu  Asp  Ala  Thr  Phe
                         250                      255

His  Ala  Lys  Lys  Gln  Ile  Pro  Cys
               260

                    Ile  Val  Ser  Met  Leu  Thr  Lys  Glu
                    265                      270

Leu  Tyr  Phe  Tyr  His
          275
```

which is designated as SEQ ID NO:2.

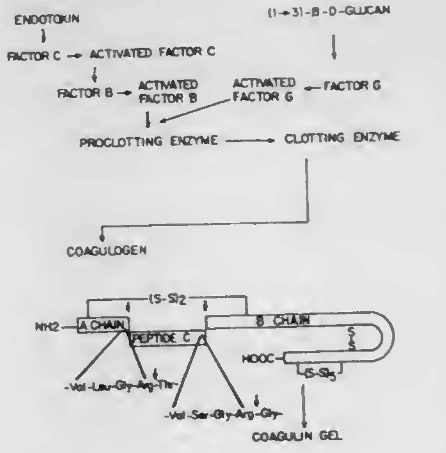
5,840,510
REAGENT FOR ENDOTOXIN ASSAY AND METHOD FOR ENDOTOXIN ASSAY USING THE SAME

Shigenori Tanaka; Hiroshi Tamura, both of Tokyo, and Kazuhiro Aita, Fukuoka, all of Japan, assignors to Seikagaku Kogyo Kabushiki Kaisha (Seikagaku Corporation), Tokyo, Japan

Division of Ser. No. 661,705, Jun. 11, 1996, Pat. No. 5,695,948, which is a continuation of Ser. No. 202,177, Feb. 25, 1994, abandoned. This application Jun. 30, 1997, Ser. No. 885,176
Claims priority, application Japan, Apr. 26, 1994, HEI-5-61464

Int. Cl.^{6} C12Q *1/37;1/56;1/00;1/34*

U.S. Cl. 435—23 **6 Claims**



1. A reagent composition for specifically assaying for endotoxin in a sample comprising:

- (A) aprotinin; and
- (B) a horseshoe crab amebocyte lysate reagent, wherein said aprotinin is present in the reagent composition in an amount sufficient to completely inhibit activation of factor G present in the horseshoe crab amebocyte lysate reagent.

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5,840,511
METHODS COMPRISING CALCIUM INDEPENDENT CYTOSOLIC PHOSPHOLIPASE A/B ENZYMES

Simon Jones, Somerville, and Jin Tang, Canton, both of Mass., assignors to Genetics Institute, Inc., Cambridge, Mass.

Continuation of Ser. No. 422,106, Apr. 14, 1995, Pat. No. 5,589,170, which is a division of Ser. No. 281,193, Jul. 27, 1994, Pat. No. 5,466,595. This application Oct. 23, 1996, Ser. No. 735,716

Int. Cl.^{6} C12Q *1/44;* A61K *38/46*

U.S. Cl. 435—19 **4 Claims**

1. A method for identifying an inhibitor of phospholipase activity, said method comprising:

(a) combining a phospholipid, a candidate inhibitor compound, and a composition comprising a phospholipase enzyme peptide; and

(b) observing whether said phospholipase enzyme peptide cleaves said phospholipid and releases fatty acid thereby,

wherein said composition comprises a peptide selected from the group consisting of a peptide comprising the amino acid sequence of SEQ ID NO:2 and a peptide encoded by a polynucleotide comprising a nucleotide sequence selected from the group consisting of:

(1) the nucleotide sequence of SEQ ID NO:1;

(2) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:2; and

(3) allelic variants of the sequence of (1).

5,840,512
METHOD FOR MEASUREMENT OF IONIZED CALCIUM

Toshio Tadano; Akira Miike, both of Shizuoka; Norihiko Kayahara, Kanagawa, and Jun Umemoto, Hyogo, all of Japan, assignors to Kyowa Medex Co., Ltd., Tokyo, Japan

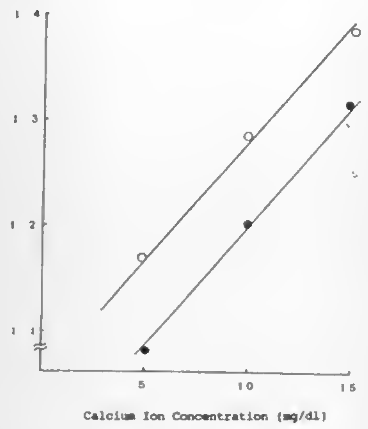
PCT No. PCT/JP94/00851, § 371 Date Apr. 3, 1996, § 102(e) Date Apr. 3, 1996, PCT Pub. No. WO94/28167, PCT Pub. Date Dec. 8, 1994

PCT Filed May 30, 1994, Ser. No. 553,512

Claims priority, application Japan, May 31, 1993, 5-129379

Int. Cl.^{6} C12Q *1/34;1/00;* H01L *21/302*

U.S. Cl. 435—18 **2 Claims**



1. A method for quantitatively determining ionized calcium, which comprises the steps of:

selecting a sample;

carrying out an enzyme reaction with a phospholipase in a buffer comprising a nitrogen heterocycle-binding sulfonic acid selected from the group consisting of N-2-hydroxyethylpiperazine-N'-2-ethanesulfonic acid, 3-(N-morpholino) propanesulfonic acid, 1,2-N, N'-bis(N",N"'-di(2-sulfoethyl)piperazino)ethane, and a salt thereof;

quantitatively determining a reaction product of said enzyme reaction; and

correlating an amount of said reaction product with an amount of ionized calcium in said sample.

5,840,513
ANTIBODIES DIRECTED TO PAGC PEPTIDES FOR THE DETECTION OF SALMONELLAE

Peter Schubert, Darmstadt; Siegfried Neumann, Seeheim-Jugenheim; Christa Burger, Darmstadt; Winfried Linxweller, GroB-Umstadt; Andreas Bubert, Gerbrunn; Werner Goebel, Veitschochheim, and Hans-Joachim Mollenkopf, Randersacker, all of Germany, assignors to Merck Patent Gesellschaft mit Beschrankter Haftung, Germany

Filed Jan. 13, 1995, Ser. No. 372,197

Claims priority, application Germany, Jan. 14, 1994, 44 00 990.9

Int. Cl.^{6} G01N *33/569;* C07K *16/12*

U.S. Cl. 435—7.35 **9 Claims**

1. An isolated antibody which is specifically directed to an epitope of a peptide from protein PagC, said peptide having an amino acid sequence selected from the group consisting of:

Glu Pro Glu Gly Ile His Tyr His Asp Lys Phe Glu Val (SEQ ID NO:1) Ia;

Ala Thr Phe Lys Glu His Ser Thr Gln Asp Gly Asp Ser (SEQ ID NO: 2) Ib;

Gly Asp Arg Ala Ser Gly Ser Val Glu Pro Glu Gly (SEQ ID NO: 3) Ic;

Gin Ser Lys Val Gln Asp Phe Lys Asn Ile Arg (SEQ ID NO: 4) Id;

and

Glu His Ser Thr Gln Asp Gly Asp Ser Phe Ser Asn Lys (SEQ ID NO: 5) Ie,

wherein said antibody specifically detects Salmonella bacteria, but not *Escherichia coli, Citrobacter diversus, Yersinia enterolytica*, and *Enterobacter cloacae*.

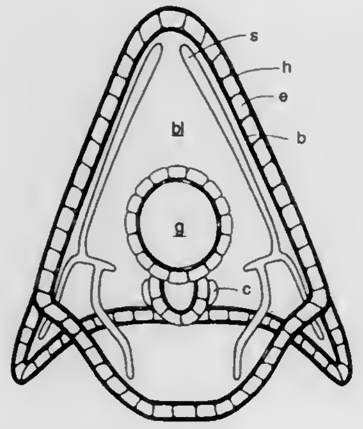
5,840,514
METHODS OF TESTING CANCER AND ANTICANCER DRUGS

Donna L. Livant, Ann Arbor, Mich., assignor to The Regents of the University of Michigan, Ann Arbor, Mich.

Filed Nov. 21, 1996, Ser. No. 754,322

Int. Cl.^{6} C12Q *1/02;1/00*

U.S. Cl. 435—29 **11 Claims**



1. A method of testing human cancer comprising:

a) providing:

i) a human cancer patient,

ii) a fibroncctin-depleted substrate, and

iii) an invasion-inducing agent consisting of a peptide having the sequence PHSRN;

b) obtaining cancer cells from said patient;

c) contacting said cells ex vivo with said fibronectin-free substrate and said invasion-inducing agent; and

d) measuring the extent of cancer cell invasion of said substrate.

5,840,515
ERYTHROCYTE LYSIS REAGENT, AND ITS USE IN METHODS FOR ISOLATING AND DIFFERENTIATING LEUCOCYTES

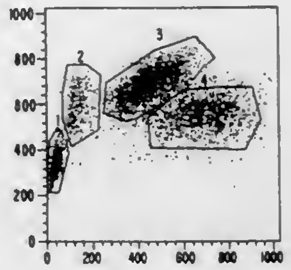
René Provost, Chateaugiron, France, assignor to Hycel Diagnostics, Pouilly en Auxois, France

Filed Jun. 13, 1996, Ser. No. 662,628

Claims priority, application France, Jun. 13, 1995, 95 07005

Int. Cl.^{6} C12Q *1/04;1/02;* G01N *1/30;33/483*

U.S. Cl. 435—29 **7 Claims**



1. A method for isolating and differentiating leucocytes in a blood sample comprising the following steps:

lysis of the erythrocytes with a solution whose osmolality and pH have been adjusted to maintain leucocyte integrity, and containing saponin,

determination of the point of lysis at that point, and

inhibition of the lysis by diluting the sample with a solution having a substantially similar composition but not containing saponin.

5,840,516
AMINO ACID TRANSPORTERS AND USES

Susan G. Amara, and Jeffrey L. Arriza, both of Portland, Oreg., assignors to State of Oregon, Portland, Oreg.

Division of Ser. No. 140,729, Oct. 20, 1993, Pat. No. 5,658,782. This application Aug. 19, 1997, Ser. No. 916,745

Int. Cl.^{6} C12Q *1/02;* G01N *33/53;33/566;* C07K *1/00*

U.S. Cl. 435—29 **2 Claims**

1. A method of screening a compound as an inhibitor of excitatory amino acid transport in cells expressing an excitatory amino acid transporter, the method comprising the following steps:

(a) transforming a cell culture with a recombinant expression construct which expresses the human excitatory amino acid transporter EAAT2 wherein the cells of the transformed cell culture express the excitatory amino acid transporter; and

(b) assaying the transformed cell culture with the compound to determine whether the compound is capable of inhibiting excitatory amino acid transport by the excitatory amino acid transporter.

5,840,517
PROCESS FOR PREPARING OBESITY PROTEIN ANALOGS

Paul Robert Atkinson, Indianapolis; Lisa Kay Foster, Greenwood; Thomas Charles Furman, Indianapolis, and Warren Cameron MacKellar, Plainfield, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 429,362, Apr. 26, 1995, Pat. No. 5,614,379. This application Mar. 24, 1997, Ser. No. 823,104

Int. Cl.^{6} C12P *21/02*

U.S. Cl. 435—68.1 **15 Claims**

1. A process for preparing an obesity protein analog, which comprises contacting an obesity protein analog precursor with dDAP.

5,840,518
DNA FRAGMENT, VECTOR CONTAINING THE DNA FRAGMENT, TRANSFORMANT TRANSFORMED WITH THE VECTOR AND PROCESS FOR PRODUCING PROTEIN USING THE VECTOR

Hideaki Morishita; Toshinori Kanamori, and Masahiro Nobuhara, all of Tokyo, Japan, assignors to Mochida Pharmaceutical Co. Ltd., Tokyo, Japan

Filed Apr. 29, 1994, Ser. No. 235,515

Claims priority, application Japan, May 1, 1993, 5-128528

Int. Cl.^{6} C12N *15/00;15/11;15/70;* C12P *21/02*

U.S. Cl. 435—69.1 **21 Claims**

1. An isolated DNA molecule comprising a nucleotide sequence encoding a polypeptide that does not occur in nature which comprises an amino acid sequence selected from the group of amino acid sequences consisting of SEQ. I.D. NO. 2, SEQ. I.D. NO. 4, SEQ. I.D. NO. 6, SEQ. I.D. NO. 8, SEQ. I.D. NO. 10, SEQ. I.D. NO. 12, SEQ. I.D. NO. 14 and SEQ. I.D. NO. 16.

5,840,519

Patent Not Issued For This Number

5,840,520
RECOMBINANT NEGATIVE STRAND RNA VIRUS EXPRESSION SYSTEMS

David Kirkwood Clarke, Pacifica, Calif., and Peter M. Palese, Leonia, N.J., assignors to Aviron, Mountain View, Calif.

Continuation-in-part of Ser. No. 190,698, Feb. 1, 1994, abandoned, which is a continuation of Ser. No. 925,061, Aug. 4, 1992, abandoned, which is a division of Ser. No. 527,237, May 22, 1990, Pat. No. 5,166,057, which is a continuation-in-part of Ser. No. 440,053, Nov. 21, 1989, abandoned, and Ser. No. 399,728, Aug. 28, 1989, abandoned. This application Sep. 30, 1994, Ser. No. 316,439

Int. Cl.^{6} C12P *21/06;19/34;* A61K *39/12*

U.S. Cl. 435—69.1 **9 Claims**

1. A recombinant RNA molecule comprising a binding site specific for an RNA-directed RNA polymerase derived from a respiratory syncytial virus, operatively linked to a heterologous RNA sequence comprising the reverse complement of an mRNA coding sequence.

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5,840,521
EXPRESSION VECTOR CONTAINING AN INDUCIBLE SELECTION GENE SYSTEM

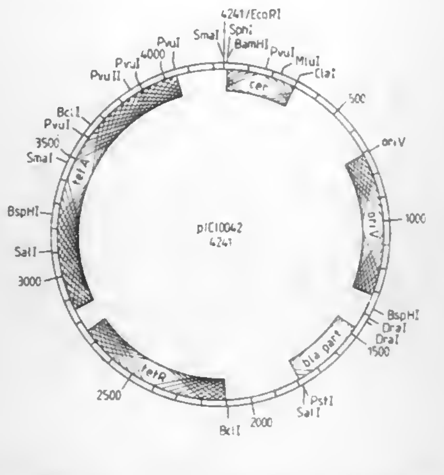
Peter Thomas Barth, Helsby, England, assignor to Imperial Chemical Industriles PLC, London, England

Continuation of Ser. No. 842,081, Feb. 26, 1992, abandoned. This application Nov. 8, 1994, Ser. No. 338,793

Claims priority, application United Kingdom, Feb. 26, 1991, 9104017; Apr. 29, 1991, 9109188

Int. Cl.^{6} C12P *21/00;* **C12N** *1/21;15/63*

U.S. Cl. 435—69.1 **19 Claims**



1. A vector which comprises an inducible selection gene system comprising the tetA and tetR genes and an expression cassette containing a gene encoding a heterologous polypeptide in its reading frame.

5,840,522
RECOMBINANT LECTINS

Michael Piatak, Jr., Walnut Creek, Calif., assignor to Chiron Corporation, Emeryville, Calif.

Continuation of Ser. No. 837,583, Mar. 7, 1986, abandoned, which is a continuation-in-part of Ser. No. 715,934, Mar. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 653,515, Sep. 20, 1984, abandoned. This application May 9, 1995, Ser. No. 437,048

Int. Cl.^{6} C12P *21/02;* **C07H** *21/04;* **C12N** *1/21;15/70*

U.S. Cl. 435—69.1 **27 Claims**

1. A recombinant DNA sequence comprising a first DNA sequence encoding the amino acid sequence comprising the B chain portion of the ricin E protein encoded in pRT38 as shown in FIG. 14.

5,840,523
METHODS AND COMPOSITIONS FOR SECRETION OF HETEROLOGOUS POLYPEPTIDES

Laura C. Simmons, Burlingame, and Daniel G. Yansura, Pacifica, both of Calif., assignors to Genetech, Inc., S. San Francisco, Calif.

Filed Mar. 1, 1995, Ser. No. 398,615

Int. Cl.^{6} C12P *21/02;* **C12N** *15/67;* **C07H** *21/04;* **C12Q** *1/68*

U.S. Cl. 435—69.1 **21 Claims**

1. A method of secreting a heterologous polypeptide of interest in a cell comprising using a translational initiation region variant operably linked to nucleic acid encoding said heterologous polypeptide to express said heterologous polypeptide, wherein the translational strength of said variant translational initiation region is less than the translational strength of the wild-type translational initiation region and wherein the amino acid sequence of said translational initiation region variant is not altered.

5,840,524
GRANULOCYTE CHEMOTACTIC PROTEIN

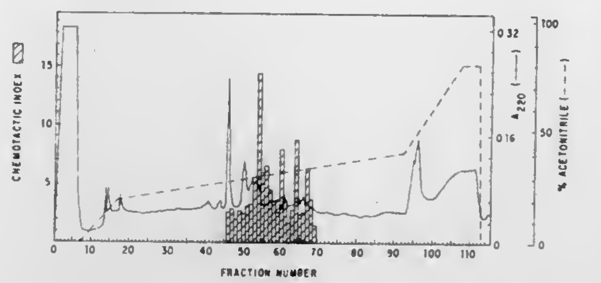
Jo Van Damme, Brussels, and Paul Proost, Heverlee, both of Belgium, assignors to Stichting Rega vzw, Leuven, Belgium

PCT No. PCT/EP93/03330, § 371 Date May 24, 1995, § 102(e) Date May 24, 1995, PCT Pub. No. WO94/12537, PCT Pub. Date Jun. 9, 1994

PCT Filed Nov. 26, 1993, Ser. No. 436,420

Int. Cl.^{6} C12P *21/06;* **A61K** *38/00;* **C07H** *21/04*

U.S. Cl. 435—69.1 **20 Claims**



1. A substantially pure mammalian granulocyte chemotactic protein-2 (GCP-2).

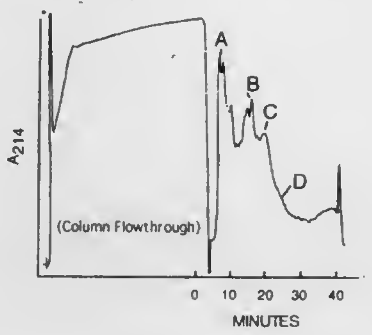
5,840,525
NUCLEIC ACIDS, VECTORS AND HOST CELLS ENCODING HEREGULIN

Richard L. Vandlen, Hillsborough, and William E. Holmes, Pacifica, both of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Division of Ser. No. 126,145, Sep. 23, 1993, abandoned, which is a continuation of Ser. No. 880,917, May 11, 1992, abandoned, which is a continuation-in-part of Ser. No. 847,743, Mar. 6, 1992, Pat. No. 5,367,060, which is a continuation-in-part of Ser. No. 790,801, Nov. 8, 1991, abandoned, which is a continuation-in-part of Ser. No. 765,212, Sep. 25, 1991, abandoned, which is a continuation-in-part of Ser. No. 705,256, May 24, 1991, abandoned. This application May 31, 1995, Ser. No. 456,241

Int. Cl.^{6} C12N *15/00;15/63;15/85;1/21;* **C07H** *21/04*

U.S. Cl. 435—69.1 **29 Claims**



1. An isolated polynucleotide which encodes a polypeptide comprising the growth factor domain of heregulin-β2 within SEQ ID NO: 28.

5. A recombinant expression vector comprising the polynucleotide of claim 1.

6. A host cell comprising the vector of claim 5.

7. A method of producing a polypeptide comprising culturing the host cell of claim 6 to express the polypeptide and recovering the polypeptide from the host cell.

11. An isolated polynucleotide which encodes a polypeptide comprising the growth factor domain of heregulin-β3 within SEQ ID NO: 30.

5,840,526
IMMUNOGLOBULINS DEVOID OF LIGHT CHAINS

Cecile Casterman, and Raymond Hamers, both of Sint-Genesius-Rode, Belgium, assignors to Vrije Universiteit Brussel, Brussels, Belgium

Division of Ser. No. 106,944, Aug. 17, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 471,282

Claims priority, application European Pat. Off., Aug. 21, 1992, 92402326; May 21, 1993, 93401310

Int. Cl.^{6} C12P *21/06;* **C12N** *15/63;5/04;* **C07K** *16/12*

U.S. Cl. 435—69.1 **10 Claims**

1. An immunoglobulin comprising two heavy polypeptide chains, each heavy chain consisting of a complete antigen binding site, said immunoglobulin containing a variable (V_{HH}) region and a constant region, said constant region being devoid of first constant domain C_H1, wherein the immunoglobulin is devoid of polypeptide light chains, and wherein the variable region contains in position 45 an amino acid which is not a leucine, proline or glutamine residue.

5,840,527
RECOMBINANT ALVEOLAR SURFACTANT PROTEIN

James W. Schilling, Jr., Palo Alto; Robert T. White, Fremont; Barbara Cordell, and Bradley J. Benson, both of San Francisco, all of Calif., assignors to Byk Gulden Lomberg Chemische Fabrik GmbH, Constance, Germany

Continuation of Ser. No. 384,609, Feb. 3, 1995, abandoned, which is a continuation of Ser. No. 116,225, Sep. 2, 1993, abandoned, which is a continuation of Ser. No. 430,497, Nov. 1, 1989, abandoned, which is a division of Ser. No. 310,035, Feb. 10, 1989, abandoned, which is a continuation of Ser. No. 8,453, Jan. 29, 1987, abandoned, which is a continuation-in-part of Ser. No. 857,715, Apr. 30, 1986, Pat. No. 4,933,280, which is a continuation-in-part of Ser. No. 808,843, Dec. 13, 1985, Pat. No. 4,912,038, which is a continuation-in-part of Ser. No. 680,358, Dec. 11, 1984, Pat. No. 4,659,805. This application Jun. 7, 1995, Ser. No. 483,939

Int. Cl.^{6} C12N *1/00;5/10;15/12;15/63*

U.S. Cl. 435—69.1 **10 Claims**

1. An isolated polynucleotide encoding a lung-specific hydrophobic protein, which protein enhances surfactant-like activity of phospholipids in the lungs of an animal,

wherein said protein comprises the amino acid sequence -Ile-Pro-Cys-Phe-Pro-Ser-Ser-Leu-Lys-Arg-Leu-Leu-Ile-Ile-Val-, and has an apparent molecular weight of about 5 kd as determined by polyacrylamide gel electrophoresis under reducing conditions; and

wherein said polynucleotide is sufficiently complementary in structure to the polynucleotide sequence shown in FIG. 15 that, if allowed to hybridize to the complement of that polynucleotide sequence, it remains hybridized under stringency conditions corresponding to two washes at 50° C. for 30 minutes in 2× SSC, 0.1% SDS.

5,840,528
TRANSFORMATION OF *PHAFFIA RHODOZYMA*

Albert Johannes Joseph Van Ooyen, Vorrburg, Netherlands, assignor to Gist-Brocades, N.V., Netherlands

Continuation of Ser. No. 119,609, Sep. 10, 1993, abandoned. This application Jun. 23, 1995, Ser. No. 494,151

Claims priority, application European Pat. Off., Sep. 11, 1992, 92202789; Oct. 28, 1992, 92203313; Jun. 25, 1993, 93201848

Int. Cl.^{6} C12P *21/06;* **C12N** *1/19;15/64;15/11*

U.S. Cl. 435—69.1 **20 Claims**

17. A recombinant DNA molecule which is effective in producing a desired protein in a Phaffia cell, comprising:

(a) a first DNA sequence encoding the desired protein;

(b) in operable linkage with said first DNA sequence, a Phaffia promoter heterologous to said DNA sequence; and

(c) a second DNA sequence which is homologous to a Phaffia chromosomal DNA sequence.

5,840,529
MAMMALIAN PRO-HORMONE CONVERTASE

Nabil G. Seidah, Iles-des-Soeurs; Robert Day, Ste-Dorothée, and Michel Chrétien, Montreal, all of Canada, assignors to Clinical Research Institute of Montreal, Montreal, Canada

Continuation-in-part of Ser. No. 517,015, Aug. 18, 1995, abandoned, and Ser. No. 510,347, Aug. 2, 1995, abandoned. This application Oct. 19, 1995, Ser. No. 545,562

Int. Cl.^{6} C12P *21/00;* **C12N** *15/63;* **C07H** *21/04;* **C07K** *14/00*

U.S. Cl. 435—69.1 **22 Claims**

1. A pro-hormone convertase named PC7 isolated from rat tissue, having the amino acid sequence defined in SEQ ID NO: 5.

5,840,530
DNA ENCODING RECEPTORS FOR THE BETA-2 CHAIN OF HUMAN IL-12

Ulrich Andreas Gubler, and David Howard Presky, both of Glen Ridge, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jul. 23, 1996, Ser. No. 685,118

Int. Cl.^{6} C12N *15/09;15/03;15/11*

U.S. Cl. 435—69.1 **12 Claims**

1. An isolated DNA which encodes human interleukin-12 (IL-12) beta2 receptor protein and comprises a DNA sequence encoding the amino acid sequence SEQ ID NO:2 or a DNA sequence that hybridizes under stringent conditions to the nucleic acid that encodes for the amino acids of SEQ ID NO:2 which

(a) has low binding affinity for human IL-12, and

(b) when complexed with a human IL-12 beta1 receptor protein forms a complex having high binding affinity to human IL-12.

5,840,531
INGAP PROTEIN INVOLVED IN PANCREATIC ISLET NEOGENESIS

Aaron I. Vinik, Norfolk; Gary L. Pittenger, Virgina Beach; Ronit Rafaeloff, Chesapeake, all of Va.; Lawrence Rosenberg, and William P. Duguid, both of Montreal, Canada, assignors to McGill University, Canada, and Eastern Virginia Medical School of the Medicine College of Hampton Roads, Norfolk, Va.

Continuation-in-part of Ser. No. 401,530, Feb. 22, 1995. This application Sep. 9, 1996, Ser. No. 709,662

Int. Cl.^{6} C12N *15/00*

U.S. Cl. 435—69.1 **19 Claims**

1. An isolated DNA molecule encoding a mammalian islet cell neogenesis associated protein (INGAP) protein, wherein the INGAP protein has the amino acid sequence shown in SEQ ID NO: 2.

5,840,532
NEURONAL BHLH-PAS DOMAIN PROTEINS

Steven L. McKnight, and David W. Russell, both of Dallas, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed Jan. 21, 1997, Ser. No. 785,310

Int. Cl.^{6} C12N *1/20;15/00;15/11*

U.S. Cl. 435—69.1 **4 Claims**

1. A recombinant nucleic acid encoding a neuronal PAS domain protein (NPAS) comprising SEQ ID NO:5, 6, 7 or 8.

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5,840,533
TISSUE PLASMINOGEN ACTIVATOR

Mineo Niwa, Muko; Yoshimasa Saito, Osaka; Hitoshi Sasaki, Amagasaki; Masako Hayashi; Jouji Notani, both of Takatsuki, and Masakazu Kobayashi, Ikeda, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 412,859, Mar. 29, 1995, Pat. No. 5,648,250, which is a continuation of Ser. No. 238,796, May 6, 1994, abandoned, which is a continuation of Ser. No. 131,672, Oct. 5, 1993, abandoned, which is a continuation of Ser. No. 991,714, Dec. 16, 1992, abandoned, which is a continuation of Ser. No. 879,736, May 6, 1992, abandoned, which is a continuation of Ser. No. 711,410, Jun. 5, 1991, abandoned, which is a continuation of Ser. No. 227,149, Aug. 2, 1988, abandoned. This application Mar. 5, 1997, Ser. No. 811,949

Claims priority, application United Kingdom, Aug. 3, 1987, 8718298; Oct. 26, 1987, 8725052; Nov. 13, 1987, 8726683

Int. Cl.^{6} C12P *21/02;* **C07H** *21/04;* **C12N** *15/58;15/70*

U.S. Cl. 435—69.1 **4 Claims**

1. An isolated DNA encoding a non-glycosylated tissue plasminogen activator (tPA) represented by the following amino acid sequence (I) as its primary structure (SEQ ID NO: 1):

180
R— Glu Gly Asn Ser Asp Cys Tyr Phe Gly Asn

190
Gly Ser Ala Tyr Arg Gly Thr His Ser

200
Leu Thr Glu Ser Gly Ala Ser Cys Leu Pro Trp

210
Asn Ser Met Ile Leu Ile Gly Lys Val

220
Tyr Thr Ala Gln Asn Pro Ser Ala Gln Ala Leu

230
Gly Leu Gly Lys His Asn Tyr Cys Arg

240
Asn Pro Asp Gly Asp Ala Lys Pro Trp Cys His

250
Val Leu Lys Asn Arg Arg Leu Thr Trp

260
Glu Tyr Cys Asp Val Pro Ser Cys Ser Thr Cys

270
Gly Leu Arg Gln—Y—

277 280
—X— Gly Gly Leu Phe Ala Asp Ile Ala Ser His

290
Pro Trp Gln Ala Ala Ile

300
Phe Ala Lys His Arg Arg Ser Pro Gly Glu Arg

310
Phe Leu Cys Gly Gly Ile Leu Ile Ser

320
Ser Cys Trp Ile Leu Ser Ala Ala His Cys Phe

330
Gln Glu Arg Phe Pro Pro His His Leu

340
Thr Val Ile Leu Gly Arg Thr Tyr Arg Val Val

350
Pro Glu Glu Glu Glu Gln Lys Phe Glu

360
Val Glu Lys Tyr Ile Val His Lys Glu Phe Asp

370
Asp Asp Thr Tyr Asp Asn Asp Ile Ala

-continued

380
Leu Leu Gln Leu Lys Ser Asp Ser Ser Arg Cys

390
Ala Gln Glu Ser Ser Val Val Arg Thr

400
Val Cys Leu Pro Pro Ala Asp Leu Gln Leu Pro

410
Asp Trp Thr Glu Cys Glu Leu Ser Gly

420
Tyr Gly Lys His Glu Ala Leu Ser Pro Phe Tyr

430
Ser Glu Arg Leu Lys Glu Ala His Val

440
Arg Leu Tyr Pro Ser Ser Arg Cys Thr Ser Gln

450
His Leu Leu Asn Arg Thr Val Thr Asp

460
Asn Met Leu Cys Ala Gly Asp Thr Arg Ser Gly

470
Gly Pro Gln Ala Asn Leu His Asp Ala

480
Cys Gln Gly Asp Ser Gly Gly Pro Leu Val Cys

490
Leu Asn Asp Gly Arg Met Thr Leu Val

500
Gly Ile Ile Ser Trp Gly Leu Gly Cys Gly Gln

510
Lys Asp Val Pro Gly Val Tyr Thr Lys

520
Val Thr Asn Tyr Leu Asp Trp Ile Arg Asp Asn

527
Met Arg Pro

wherein R is Ser.
X is -lys-, and
Y is -TyrSerGlnProGlnPheArgIle-(SEQ ID NO: 3)
or -TyrSerGlnProGlnPheAspIle-(SEQ ID NO: 4).

5,840,534
HUMAN SMT3-LIKE PROTEIN

Jennifer L. Hillman, San Jose, and Purvi Shah, Sunnyvale, both of Calif., assignors to Incyte Pharmaceuticals, Inc., Palo Alto, Calif.

Filed May 9, 1997, Ser. No. 853,974

Int. Cl.^{6} C12P *21/02;* **C12N** *15/63;1/21;* **C07H** *21/04*

U.S. Cl. 435—69.1 **8 Claims**

1. An isolated and purified polynucleotide comprising a nucleic acid sequence encoding a polypeptide comprising the amino acid sequence of SEQ ID NO:1.

5,840,535
DNA ENCODING A ZINC RING PROTEIN

Jennifer L. Hillman, Mountain View; Preeti Lal, and Purvi Shah, both of Sunnyvale, all of Calif., assignors to Incyte Pharmaceuticals, Inc., Palo Alto, Calif.

Filed Jun. 2, 1997, Ser. No. 867,057

Int. Cl.^{6} C12N *15/12;15/64;* **C07K** *14/435*

U.S. Cl. 435—69.1 **7 Claims**

1. An isolated and purified polynucleotide sequence encoding a human zinc RING protein comprising the amino acids sequence of SEQ ID NO:1.

5,840,536
GROWTH FACTOR RECEPTOR-BINDING INSULIN RECEPTOR

Damien J. Dunnington; James D. Frantz, and Steven E. Shoelson, all of SmithKline Beecham Corporation, Corporate Intellectual Property—UW2220, P.O. Box 1539, King of Prussia, Pa. 19406-0939

Filed Jul. 9, 1997, Ser. No. 890,094

Int. Cl.^{6} C12N *15/00*

U.S. Cl. 435—69.1 **12 Claims**

1. An isolated polynucleotide selected from the group consisting of:

(a) a polynucleotide encoding human GrbIR-1 having the nucleotide sequence as set forth in SEQ ID NO:1 from nucleotide 289 to 1897; and

(b) a polynucleotide capable of hybridizing to the complement of a polynucleotide according to (a) under moderately stringent hybridization conditions and which encodes a functional human GrbIR-1 which binds to the insulin receptor and contains a pleckstrin homology domain as set forth in SEQ ID NO:2.

5,840,537
CDNA ENCODING A VESICLE TRANSPORT PROTEIN

Olga Bandman; Neil C. Corley, both of Mountain View, and Preeti Lal, Santa Clara, all of Calif., assignors to Incyte Pharmaceuticals, Inc., Palo Alto, Calif.

Filed Jul. 25, 1997, Ser. No. 900,927

Int. Cl.^{6} C12N *15/00;15/63;15/85;* **C07H** *21/04*

U.S. Cl. 435—69.1 **8 Claims**

1. An isolated and purified polynucleotide sequence encoding the vesicle transport protein of SEQ ID NO. 1.

5,840,538
LGT

Chantal Myriam Petit, Wayne, Pa., assignor to SmithKline Beecham Corporation, Philadelphia, Pa.

Filed Aug. 6, 1997, Ser. No. 906,753

Int. Cl.^{6} C12P *21/06;* **C12N** *7/00;* **C07H** *17/00;* **C07K** *14/00*

U.S. Cl. 435—69.1 **12 Claims**

1. An isolated polynucleotide comprising a polynucleotide sequence selected from the group consisting of:

(a) a polynucleotide having at least a 70% identity to a polynucleotide encoding a polypeptide comprising the amino acid sequence of SEQ ID NO:2;

(b) a polynucleotide having at least a 70% identity to a polynucleotide encoding the same mature polypeptide expressed by the Lgt gene contained in the *Streptococcus pneumoniae* of the deposited strain (NCIMB 40794);

(c) a polynucleotide encoding a polypeptide comprising an amino acid sequence which is at least 72% identical to the amino acid sequence of SEQ ID NO:2;

(d) a polynucleotide which is complementary to the polynucleotide of (a), (b) or (c); and

(e) a polynucleotide comprising at least 15 sequential bases of the polynucleotide of (a), (b) or (c).

5,840,539
POLYNUCLEOTIDES ENCODING A VESICLE TRANSPORT ASSOCIATED PROTEINS

Jennifer L. Hillman, Mountain View; Preeti Lal, Santa Clara; Purvi Shah, Sunnyvale, and Neil C. Corley, Mountain View, all of Calif., assignors to Incyte Pharmaceuticals, Inc., Palo Alto, Calif.

Filed Oct. 10, 1997, Ser. No. 948,616

Int. Cl.^{6} C12N *1/21:15/63;21/00*

U.S. Cl. 435—69.2 **8 Claims**

1. An isolated and purified polynucleotide sequence encoding the amino acid sequence of SEQ ID No:1.

5,840,540
NUCLEIC ACIDS ENCODING PRESENILIN II

Peter H. St. George-Hyslop; Johanna M. Rommens, and Paul E. Fraser, all of Toronto, Canada, assignors to The Hospital for Sick Children, and HSC Research and Development Limited Partnership, both of Canada

Division of Ser. No. 592,541, Jan. 26, 1996, which is a continuation-in-part of Ser. No. 509,359, Jul. 31, 1995, Ser. No. 496,841, Jun. 28, 1995, and Ser. No. 431,048, Apr. 28, 1995. This application Nov. 10, 1997, Ser. No. 967,101

Int. Cl.^{6} C12P *21/06;* **C07H** *17/00;* **C07K** *14/00*

U.S. Cl. 435—69.1 **31 Claims**

1. An isolated polynucleotide which encodes a human presenilin II (PS2) protein comprising the amino acid sequence shown in SEQ ID NO:137, or a splice variant thereof.

5,840,541
SYNTHESIS AND IMMUNOGENICITY OF ROTAVIRUS GENES USING A BACULOVIRUS EXPRESSION SYSTEM

Mary K. Estes, Friendswood, Tex., assignor to Baylor College of Medicine, Houston, Tex.

Division of Ser. No. 385,993, Feb. 9, 1995, abandoned, which is a continuation of Ser. No. 830,587, Feb. 6, 1992, abandoned, which is a division of Ser. No. 947,773, Dec. 30, 1986, Pat. No. 5,186,933. This application Jun. 7, 1995, Ser. No. 485,577

Int. Cl.^{6} C12N *7/01;15/46;15/80;* **C12P** *21/02*

U.S. Cl. 435—69.3 **7 Claims**

1. A recombinant molecule, comprising:

(a) a baculovirus gene promoter;

(b) a rotavirus gene which codes for rotavirus protein NS28, said promoter spatially positioned in relation to said gene effective to regulate the expression of said gene.

5,840,542
METHOD FOR MANUFACTURE OF PROINSULIN WITH HIGH EXPORT YIELD

Yup Kang, Soowon, Rep. of Korea, and Ji-Won Yoon, Calgary, Canada, assignors to Mogam Biotechnology Research Institute, Kyonggi-do, Rep. of Korea

Filed Jul. 28, 1995, Ser. No. 508,664

Int. Cl.^{6} C12N *15/17*

U.S. Cl. 435—69.4 **4 Claims**

1. A method for increasing the export yield of proinsulin from bacterial cells expressing proinsulin, which comprises modifying a proinsulin secretion vector such that the connecting peptide region of the proinsulin has the amino acid sequence RRE-AEDQGSLQKR, which are residues 8–10 of SEQ. ID. NO. 10 and producing the proinsulin in bacterial cells.

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5,840,543

FERMENTATION PROCESS

Robert Craig Hockney, and Bhuphendra Vallabh Kara, both of Cheshire, England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 215,676, Mar. 22, 1994, abandoned, which is a continuation of Ser. No. 661,306, Feb. 27, 1991, abandoned. This application May 1, 1995, Ser. No. 431,459

Claims priority, application United Kingdom, Feb. 27, 1990, 9004390

Int. Cl.^{6} C12P *21/02;21/06*

U.S. Cl. 435—69.5 **18 Claims**

2. A process for expressing a polypeptide, said process comprising cultivating a bacterial host cell transformed with a vector or plasmid carrying genetic material coding for said polypeptide in the presence of a growth medium and adding to the growth medium a supplement comprising at least one amino acid so that the amino acid is present in the growth medium in an amount sufficient to inhibit growth of the host cell and thereby accumulate the polypeptide.

5,840,544

DNA ENCODING RANTES HOMOLOG FROM PROSTATE

Phillip R. Hawkins; Olga Bandman, both of Mountain View, and Lynn E. Murry, Portalo Valley, all of Calif., assignors to Incyte Pharmaceuticals, Inc., Palo Alto, Calif.

Filed Apr. 17, 1996, Ser. No. 633,682

Int. Cl.^{6} C12P *21/02;* **C12N** *15/19*

U.S. Cl. 435—69.5 **5 Claims**

1. A purified polynucleotide encoding a polypeptide with an amino acid sequence shown in SEQ ID NO:2.

5,840,545

HYBRID DNA PREPARED BINDING COMPOSITION

Kevin W. Moore, San Bruno, and Alejandro Zaffaroni, Atherton, both of Calif., assignors to Schering Corporation

Division of Ser. No. 394,923, Feb. 23, 1995, abandoned, which is a continuation of Ser. No. 210,540, Mar. 17, 1994, abandoned, which is a continuation of Ser. No. 61,760, May 13, 1993, abandoned, which is a continuation of Ser. No. 928,526, Aug. 11, 1992, abandoned, which is a continuation of Ser. No. 740,862, Jul. 31, 1991, abandoned, which is a continuation of Ser. No. 235,835, Aug. 18, 1988, abandoned, which is a continuation of Ser. No. 558,551, Dec. 5, 1983, Pat. No. 4,642,334, which is a continuation of Ser. No. 358,414, Mar. 15, 1982, abandoned. This application Jun. 5, 1995, Ser. No. 461,071

Int. Cl.^{6} C12P *21/02;21/08;* **C12N** *1/21;15/13*

U.S. Cl. 435—696 **2 Claims**

2. A method of synthesizing an rFv fragment comprising:

(1) cloning first and second DNA molecules respectively encoding heavy and light chains from a hybridoma producing an antibody to a predetermined ligand;

(2) tailoring the cloned DNA molecules to express fragments comprising 95–125 amino acids of the heavy and light chain variable regions, without constant regions, in a host cell;

(3) inserting the tailored DNA molecules into an expression vector in proper relationship with transcriptional and translational regulatory signals in the vector;

(4) transforming the host cell with the expression vector and growing the host cell, whereby the light and heavy variable region polypeptides are expressed and associate to form an rFv having substantially the same binding specificity for the predetermined ligand as the antibody from the hybridoma.

5,840,546

KERATIN SULFATE HYDROLASE OBTAINABLE BY USING *BACILLUS CIRCULANS* AND METHOD FOR PRODUCING SAME

Kiyoshi Morikawa, Tokyo; Hiroshi Maruyama, Akiruno; Takako Isomura, Koganei; Kiyoshi Suzuki, Tachikawa, and Sadao Tatebayashi, Akiruno, all of Japan, assignors to Seikagaku Corporation, Tokyo, Japan

PCT No. PCT/JP95/02385, § 371 Date May 22, 1997, § 102(e) Date May 22, 1997, PCT Pub. No. WO96/16166, PCT Pub. Date May 30, 1996

PCT Filed Nov. 22, 1995, Ser. No. 849,637

Claims priority, application Japan, Nov. 22, 1994, 6-288031

Int. Cl.^{6} C12P *21/04;* **C12N** *9/24;9/26*

U.S. Cl. 435—71.1 **8 Claims**

1. An isolated keratan sulfate hydrolase which has the following physicochemical properties:

(a) catalyzing the hydrolysis of the N-acetylglucosaminidic linkage of keratan sulfate;

(b) acting on keratan sulfate I, keratan sulfate II, and keratan polysulfate and producing sulfated keratan sulfate disaccharide and sulfated keratan sulfate tetrasaccharide as main hydrolyzates;

(c) an optimum reaction pH from 4.5 to 6 in a 0.1M acetate buffer or 10 mM tris-acetate buffer at 37° C.;

(d) stable in the pH range of from 6 to 7 when the hydrolase is maintained in a 0.1M acetate buffer or 10 mM tris-acetate buffer at 37° C. for one hour;

(e) an optimum reaction temperature from 50° to 60° C. when the hydrolase reacts in a 0.1M acetate buffer, pH 6.0, for 10 minutes;

(f) stable in the temperature range of 45 ° C. or below when the hydrolase is maintained in a 0.1M acetate buffer, pH 6.0, for one hour; and

(g) obtainable from *Bacillus circulans.*

5,840,547

BIOEMULSIFIERS

Eugene Rosenberg, Givat Shmuel, and Eliora Z. Ron, Tel-Aviv, both of Israel, assignors to RAMOT University Authority for Applied Research & Indfustrial Development Ltd., Tel-Aviv, Israel

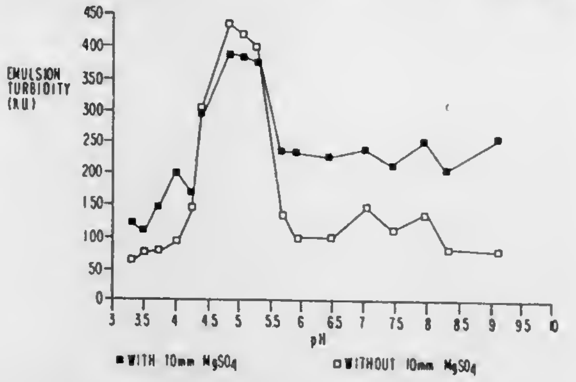
PCT No. PCT/US96/00168, § 371 Date Sep. 30, 1996, § 102(e) Date Sep. 30, 1996, PCT Pub. No. WO96/20611, PCT Pub. Date Jul. 11, 1996

PCT Filed Jan. 5, 1996, Ser. No. 702,711

Claims priority, application Israel, Jan. 5, 1995, 112254

Int. Cl.^{6} A23L *1/05;* **A61K** *9/107;* **B01F** *17/30;* **C07K** *14/22*

U.S. Cl. 435—71.2 **30 Claims**



1. An isolated bioemulsifier designated Alasan or E-KA53 produced from *Acinetobacter radioresistens* strain KA53 and which in its essentially pure form has the following characteristics:

(a) Molecular weight from 100,000 to 2,000,000 Daltons;

(b) Emulsifying activity which increases with preheating at increasing temperatures—60°– 90° C.;

(c) Resistance to strong alkali while retaining emulsifying activity;

(d) Reduced viscosity that varies as a function of temperature treatment;

(e) Emulsifying activity that varies as a function of pH and magnesium ions; and

(f) Specific constituent building blocks defined in Table 4 and Table 5.

5,840,548

PROCESS FOR PRODUCING MICROBIAL LIPIDS FROM HYDROCARBONS

Kimihiko Ogihara; Masamichi Sato; Kazunori Ishigami; Kouki Sakashita, and Yoshihiro Takayama, all of Tokyo, Japan, assignors to Kashima Oil Co., Ltd., Tokyo, Japan

Filed Sep. 12, 1995, Ser. No. 527,335

Claims priority, application Japan, Sep. 13, 1994, 6-219205; Dec. 12, 1994, 6-307998

Int. Cl.^{6} C12P *7/64;7/62*

U.S. Cl. 435—134 **14 Claims**

1. A process for producing lipids comprising glycerides as the main component, which comprises culturing a bacterium selected from the group consisting of Mycobacterium sp. KO-201 (FERM BP-5157), Agrobacterium sp. KO-202 (FERM BP- 5158), and Rhizobium sp. KO-203 (FERM BP-5159) in medium containing aliphatic hydrocarbons until lipids are accumulated in the bacterium and then recovering the lipids therefrom.

5,840,549

MALE INFERTILITY Y-DELETION DETECTION BATTERY

Marijo Kent First, and Ariege Muallem, both of Madison, Wis., assignors to Promega Corporation, Madison, Wis.

Continuation-in-part of Ser. No. 531,556, Sep. 18, 1995, which is a continuation-in-part of Ser. No. 472,416, Jun. 7, 1995. This application Dec. 4, 1996, Ser. No. 753,979

Int. Cl.^{6} C12P *19/34;* **C07H** *21/04;* **C12N** *15/00*

U.S. Cl. 435—91.2 **21 Claims**

1. A method for detecting deletions in a Y chromosome which are indicative of male infertility comprising:

(a) combining a plurality of distinct oligonucleotide primer pairs capable of priming a corresponding plurality of human X and Y chromosome loci selected from the group consisting of:

DYS240, DYS271, DYS221, KAL182, and MIC2;

DYF53S1, DYS229, DYZ1, DYS230, DAZ(3), DAZ(4), and MIC2; and

SMCY, DYS217, DYS223, DYS7, DYS237, DYS236, DYS215, MIC2;

with isolated genomic DNA of a test subject; then

(b) amplifying the plurality of distinct oligonucleotide primer pairs by a corresponding multiplex polymerase chain reaction to yield locus-specific amplified chromosomal DNA fragments; then

(c) separating the amplified chromosomal DNA fragments; and then

(d) comparing the amplified chromosomal DNA fragments to corresponding amplified chromosomal DNA fragments from normal male subjects, whereby deletions in the Y chromosome of the test subject are detected.

5,840,550

ENDO-XYLOGLUCAN TRANSFERASE

Kazuhiko Nishitani, Kagoshima; Kazuhide Okazawa, Otsu; Kiyozo Asada, Shiga-ken, and Ikunoshin Kato, Uji, all of Japan, assignors to Takara Shuzo Co., Ltd., Kyoto-fu, Japan

Division of Ser. No. 381,280, Jan. 31, 1995, Pat. No. 5,516,694, which is a continuation of Ser. No. 37,281, Mar. 26, 1993, abandoned, which is a continuation-in-part of Ser. No. 929,513, Aug. 14, 1992, abandoned. This application May 22, 1995, Ser. No. 445,533

Claims priority, application Japan, Mar. 26, 1992, 4-098506; Jul. 24, 1992, 4-217489; Jan. 28, 1993, 5-031163

Int. Cl.^{6} C12P *19/18;* **C12N** *9/10*

U.S. Cl. 435—97 **6 Claims**

1. An isolated and purified endo-xyloglucan transferase, which is encoded by a DNA comprising the DNA sequence shown in SEQ ID NO. 15.

5,840,551

METHOD OF PRODUCING L-AMINO ACIDS BY FERMENTATION

Holger Werning, Duisburg, Germany; Harald Voss, Gratkorn, Austria; Walter Pfefferle, Halle, and Wolfgang Leuchtenberger, Bielefeld, both of Germany, assignors to Degussa Aktiengesellschaft, Germany

Filed Dec. 19, 1996, Ser. No. 769,437

Claims priority, application Germany, Dec. 19, 1995, 195 47 361.2

Int. Cl.^{6} C12P *13/04;13/08;13/06*

U.S. Cl. 435—106 **12 Claims**

1. A method of producing a target L-amino acid by fermenting a microorganism which excretes said target amino acid, said microorganism having an auxotrophy with respect to at least one limiting amino acid, wherein said method comprises

charging a culture medium with a first inflow current containing said limiting amino acid and a second inflow current containing a carbon source necessary for the growth and formation of the target amino acid,

wherein said inflow currents are initiated simultaneously but have chronological infeed profiles of differing forms.

5,840,552

PREPARATION OF PHARMACEUTICALLY ACTIVE COMPOUNDS BY BIOOXIDATION

Robert Holt, Fleetham, United Kingdom; Per Lindberg, Mölndal, Sweden; Christopher Reeve, Middlesborough, and Stephen Taylor, Darlington, both of United Kingdom, assignors to Astra Aktiebolag, Sodertalje, Sweden

PCT No. PCT/SE95/01415, § 371 Date Nov. 21, 1996, § 102(e) Date Nov. 21, 1996, PCT Pub. No. WO96/17076, PCT Pub. Date Jun. 6, 1996

PCT Filed Nov. 27, 1995, Ser. No. 569,114

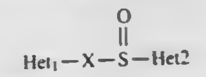
Claims priority, application United Kingdom, Nov. 28, 1994, 9423970

Int. Cl.^{6} C12P *17/16*

U.S. Cl. 435—118 **9 Claims**

1. A method of preparing a pharmaceutically active compound as a single sulfoxide enantiomer or an enantiomerically enriched form having the formula (II)

(II)



$$\mathrm{Het}_1-X-\overset{O}{\overset{\|}{S}}-\mathrm{Het}2$$

wherein

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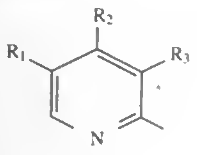
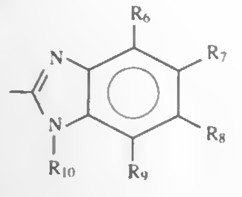
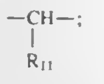
Het$_1$ is



and
Het$_2$ is



and
X is



$$-\underset{\substack{| \\ R_{11}}}{CH}-;$$

R_1, R_2 and R_3 are the same or different and selected from the group consisting of hydrogen, alkyl, alkoxy which is unsubstituted or substituted by fluorine, alkylthio, alkoxyalkoxy, dialkylamino, piperidino, morpholino, halogen, phenylalkyl, and phenylalkoxy;

R_6–R_9 are the same or different and selected from the group consisting of hydrogen, alkyl, alkoxy, halogen, haloalkoxy, alkylcarbonyl, alkoxycarbonyl, oxazolyl, and trifluoroalkyl;

or adjacent groups R_6–R_9 together with the carbon atoms to which they are attached form an unsubstituted or substituted ring;

R_{10} is hydrogen or alkoxycarbonyloxymethyl;

R_{11} is hydrogen or forms an alkylene chain together with R_3;

which method comprises the steps of: enantioselectively biooxidizing a pro-chiral sulfide compound of the formula (I):

$$\text{Het1—X—S—Het2} \qquad (I)$$

by means of a microbial organism or a microbial enzyme system; and

isolating the pharmaceutically active single enantiomeric or enantiomerically enriched sulfoxide compound.

5,840,553
PROCESS FOR PREPARING 1,2-PROPANEDIOL DERIVATIVE COMPOUNDS

Yoshihiko Yasohara, Himeji; Kenji Miyamoto, Kobe; Noriyuki Kizaki, Akashi; Shigeru Kawano, Kobe, and Junzo Hasegawa, Akashi, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

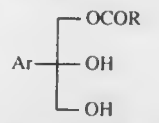
Division of Ser. No. 553,558, Dec. 18, 1995, Pat. No. 5,654,472. This application Mar. 11, 1997, Ser. No. 815,440

Claims priority, application Japan, Apr. 19, 1994, 6-80741; Apr. 19, 1994, 6-80742

Int. Cl.^{6} C07C *27/00;* **C12P** *7/04;7/22;7/24*

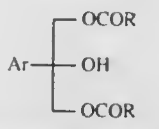
U.S. Cl. 435—147 **9 Claims**

1. A process for preparing an optically active 2-aryl-3-acyloxy-1,2-propanediol, which comprises allowing a microorganism or an enzyme selected from the group of a microorganism belonging to Chromobacterium genus, Rhizopus genus, Mucor genus, Candide genus, Aspergillus genus, Geotrichum genus, Pseudomonas genus, Bacillus genus or Humicola genus, the enzyme derived from that microorganism and the enzyme derived from porcine pancreas, to act on a 2-aryl-1,3-diacyloxy-2-propanol represented by the formula (I) thereby forming an optically active 2-aryl-3-acyloxy-1,2-propanediol represented by the formula (VIII), wherein said microorganism or enzyme has enzyme activity which enables formation of the optically active 2-aryl-3-acyloxy-1,2-propanediol represented by the formula (VIII):



(VIII)

wherein Ar is an aryl group which may be substituted, R is a normal chain or branched chain alkyl group, a normal or branched chain alkenyl group which may be substituted or an aryl group which may be substituted, by stereospecific hydrolysis of an 2-aryl-1,3-diacyloxy-2-propanol represented by the formula (I):



(I)

wherein each of Ar and R is the same as defined above.

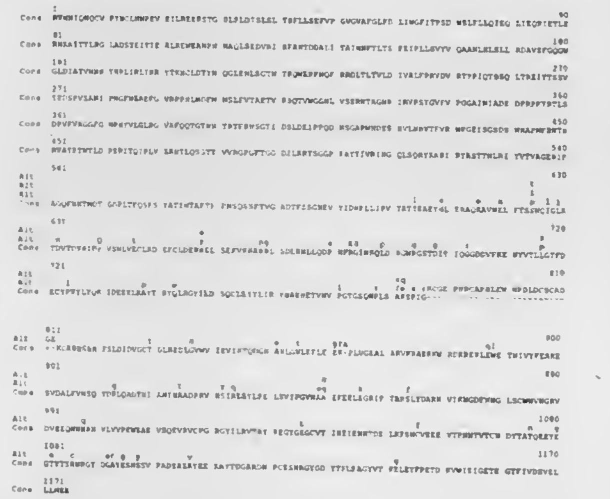
5,840,554
β-ENDOTOXIN EXPRESSION IN *PSEUDOMONAS FLUORESCENS*

Mark Thompson, Del Mar, and George E. Schwab, La Jolla, both of Calif., assignors to Mycogen Corporation, San Diego, Calif.

Division of Ser. No. 239,476, May 6, 1994, Pat. No. 5,527,883. This application Apr. 24, 1996, Ser. No. 639,923

Int. Cl.^{6} C12N *15/11;15/32;15/78;* **A01N** *63/00*

U.S. Cl. 435—172.3 **21 Claims**



1. A method for improving *Bacillus thuringiensis* δ-endotoxin expression in a Pseudomonad comprising transforming said Pseudomonad with a gene encoding a *Bacillus thuringiensis* toxin wherein said *Bacillus thuringiensis* toxin is a chimeric toxin comprising a cryIF core N-terminal toxin portion and a C-terminal protoxin portion from a cryIA(b) toxin or a cryIA(c)/cryIA(b) chimeric toxin.

5,840,555
TRANSCRIPTIONAL REGULATORY REGIONS DERIVED FROM THE K18 GENE

Robert G. Oshima, Encinitas; Nickolay S. Neznanov, and Grace Cecena, both of San Diego, all of Calif., assignors to La Jolla Cancer Research Foundation, La Jolla, Calif.

Continuation of Ser. No. 146,486, Oct. 29, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 486,148

Int. Cl.^{6} C12N *5/00;15/00;* **C07H** *21/04*

U.S. Cl. 435—172.3 **12 Claims**

6. A DNA molecule comprising a transgene operably linked to a 825 bp DNA molecule and a 3.5 kb DNA molecule, said 825 bp DNA molecule derived by restriction endonuclease cleavage of plasmid pGC1853 (ATCC accession no. 97981) using NsiI and XhoI, or an equivalent DNA molecule thereof, and said 3.5 kb DNA molecule derived by restriction endonuclease cleavage of plasmid pGC1853 (ATCC accession no. 97981) using XmnI and HindIII, or an equivalent DNA molecule thereof, wherein said 825 bp and 3.5 kb DNA molecules confer both integration site-independent and copy number-dependent expression, provided that said DNA molecule is not the K18 gene.

5,840,556
MOLECULAR GENETIC CONSTRUCTION OF VACCINE STRAINS OF PASTEURELLACEAE

Robert E. Briggs, Boone, and Fred M. Tatum, Ames, both of Iowa, assignors to The United States of America as represented by the Department of Agriculture and Biotechnology Research and Development Corporation, Peoria, Ill.

Filed Dec. 19, 1996, Ser. No. 770,234

Int. Cl.^{6} C12N *1/00;1/21;15/00;* **C12Q** *1/68*

U.S. Cl. 435—172.3 **5 Claims**

1. A method of introducing a DNA segment to a Pasteurellaceae genome comprising:

administering to a Pasteurellaceae cell selected from the group consisting of *P. Multocida, P. Haemolytica,* and *H. somnus,* a recombinant construct comprising the DNA segment and plasmid PBB192 which is temperature-conditional for replication in the Pasteurellaceae cell to form transformants;

subjecting the transformants to a non-permissive temperature;

screening the transformants for the presence of the DNA segment; and

screening the transformants for the absence of the plasmid.

5,840,557
METHOD FOR PRODUCING SEEDS AND PLANTS THEREOF INVOLVING AN IN VITRO STEP

Erwin Heberle-Bors, Vienna, Austria; Rosa Maria Benito Moreno, Valenzia, Spain; Anna Alwen, Cairo, Egypt; Alisher Tourajew, Vienna, and Eva Maria Stöger, Salzburg, both of Austria, assignors to Mogen International nv, Leiden, Netherlands

Continuation of Ser. No. 491,720, Jun. 19, 1995, abandoned, which is a continuation-in-part of Ser. No. 228,357, Apr. 15, 1994, abandoned, which is a continuation-in-part of Ser. No. 458,685, Jan. 12, 1990, abandoned. This application Mar. 27, 1997, Ser. No. 826,331

Claims priority, application Germany, Jul. 21, 1987, 37 24 154.0

Int. Cl.^{6} C12N *15/00;15/29;15/82;* **A01H** *14/00*

U.S. Cl. 435—172.3 **19 Claims**

1. A method for producing transgenic seeds, which comprises the steps of:

a) isolating uninucleated microspores from anthers and removing tissue embedding the uninucleated microspores,
b) culturing the isolated microspores in a nutrient solution,
c) transferring foreign genetic material into the isolated microspores to obtain transformed microspores,
d) maturing completely the transformed microspores to obtain transformed pollen grains in vitro,
e) pollinating receiver plants with the transformed pollen grains and obtaining the transgenic seeds from the pollinated receiver plants.

5,840,558
SOYBEAN PEROXIDASE GENE FAMILY AND AN ASSAY FOR DETECTING SOYBEAN PEROXIDASE ACTIVITY

Richard A. Vierling, Jr., Lafayette, Ind., assignor to Indiana Crop Improvement Association, Layfayette, Ind.

Filed Oct. 27, 1995, Ser. No. 671,320

Int. Cl.^{6} C12N *9/08;1/20;15/09;* **C07H** *21/04*

U.S. Cl. 435—192 **10 Claims**

1. An isolated soybean DNA comprising cDNA coding for an SEPa1 polypeptide wherein said SEPa1 polypeptide comprises the amino acid sequence set forth in Seq ID NO:11.

5,840,559
HUMAN SPERMIDINE/SPERMINE N1-ACETYLTRANSFERASE

Jennifer L. Hillman, San Jose, Calif., assignor to Incyte Pharmaceuticals, Inc., Palo Alto, Calif.

Filed Oct. 30, 1996, Ser. No. 742,009

Int. Cl.^{6} C12N *9/10;1/20;15/00;* **C07H** *21/04*

U.S. Cl. 435—193 **8 Claims**

1. An isolated and purified polynucleotide sequence encoding a polypeptide comprising the amino acid sequence of SEQ ID NO:1.

5,840,560
GLUCOSE KINASE FROM *STREPTOCOCCUS PNEUMONIAE*

Michael Terence Black, Chester Springs; John Edward Hodgson, Malvern, both of Pa.; David Justin Charles Knowles, Surrey RH1 6LY, United Kingdom; Michael Arthur Lonetto; Richard O. Nicholas, both of Collegeville, Pa.; Robert King Stodola, Flourtown, Pa., and Martin Karl Russel Burnham, Norristown, Pa., assignors to SmithKline Beecham Corporation, Philadelphia, Pa.

Filed Jul. 17, 1997, Ser. No. 896,083

Int. Cl.^{6} C12N *9/12;15/00;1/20;* **C07H** *21/04*

U.S. Cl. 435—194 **27 Claims**

1. An isolated polynucleotide comprising a polynucleotide encoding a polypeptide having at least a 95% identity to a polypeptide comprising amino acids 1 to 333 of SEQ ID NO:2.

5,840,561
PHYTASE

Daisuke Mochizuki; Junko Tokudo; Tadashi Suzuki, all of Mobara; Masao Shimada, Yamato, and Shin-ichirou Tawaki, Kawasaki, all of Japan, assignors to Mitsui Chemicals, Inc., Tokyo, Japan

Division of Ser. No. 498,263, Jul. 3, 1995. This application Nov. 24, 1997, Ser. No. 977,060

Claims priority, application Japan, Jul. 5, 1994, 6-174906; Feb. 24, 1995, 7-60111

Int. Cl.^{6} C12N *9/20;1/20;15/00;* **C07H** *21/04*

U.S. Cl. 435—195 **13 Claims**

1. A cloned gene originated from *Schwanniomyces occidentalis,* which encodes a phytase subunit having a molecular size after removing sugar chains of 50 kD ±5 kD determined by SDS-polyacrylamide gel electrophoresis.

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5,840,562

DNA ENCODING HUMAN CYSTEINE PROTEASE

Dinh Diep, San Francisco; Scott Michael Braxton, San Mateo, and Angelo M. Delegeane, Hayward, all of Calif., assignors to Incyte Pharmaceuticals, Inc., Palo Alto, Calif.

Continuation of Ser. No. 567,506, Dec. 5, 1995, abandoned. This application Sep. 12, 1997, Ser. No. 928,613

Int. Cl.⁶ C12N *9/48;* **C07H** *21/04*

U.S. Cl. 435—212 **5 Claims**

1. A purified polynucleotide comprising a nucleic acid sequence encoding the polypeptide of SEQ ID NO:2, or the complement of said polynucleotide.

5,840,563

METHOD FOR GROWING SWINE INFERTILITY AND RESPIRATORY SYNDROME VIRUS

Danny W. Chladek; Louis L. Harris, and David E. Gorcyca, all of St. Joseph, Mo., assignors to Boehringer Ingelheim Animal Health, Inc., Ridgefield, Conn.

Continuation of Ser. No. 316,529, Sep. 30, 1994, Pat. No. 5,846,805, which is a division of Ser. No. 301,738, Sep. 6, 1994, abandoned, which is a continuation of Ser. No. 860,444, Mar. 30, 1992, abandoned, which is a continuation-in-part of Ser. No. 760,713, Sep. 16, 1991, abandoned, and a continuation-in-part of Ser. No. 749,839, Aug. 26, 1991, abandoned. This application Jul. 9, 1996, Ser. No. 677,585

Int. Cl.⁶ C12N *7/00;7/02;7/04;7/08*

U.S. Cl. 435—235.1 **9 Claims**

1. A method of growing swine infertility and respiratory syndrome virus comprising:

(a) inoculating swine infertility and respiratory syndrome virus on simian cells; and

(b) incubating the inoculated simian cells.

5,840,564

TUSSUE PLASMINOGEN ACTIVATOR HAVING ZYMOGENIC OR FIBRIN SPECIFIC PROPERTIES

Stephen Anderson, Princeton, N.J.; William F. Bennett, San Mateo, Calif.; David Botstein, Belmont, Calif.; Deborah L. Higgins, San Mateo, Calif.; Nicholas F. Paoni, Moraga, Calif., and Mark J. Zoller, San Francisco, Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Division of Ser. No. 733,124, Oct. 17, 1996, which is a continuation of Ser. No. 662,891, Aug. 1, 1996, Pat. No. 5,728,567, which is a continuation of Ser. No. 422,736, Apr. 14, 1995, Pat. No. 5,616,486, which is a division of Ser. No. 179,059, Jan. 7, 1994, Pat. No. 5,411,871, which is a continuation of Ser. No. 88,451, Jul. 6, 1993, Pat. No. 5,520,913, which is a division of Ser. No. 770,510, Oct. 3, 1991, Pat. No. 5,262,170, which is a continuation of Ser. No. 384,608, Jul. 24, 1989, Pat. No. 5,108,901, which is a continuation-in-part of Ser. No. 240,856, Sep. 2, 1988, abandoned. This application Sep. 9, 1997, Ser. No. 926,362

Int. Cl.⁶ C07H *21/04;* **C12N** *9/64*

U.S. Cl. 435—226 **14 Claims**

1. An isolated nucleic acid molecule encoding a tissue plasminogen activator (t-PA) variant having at least two functional regions consisting of a protease domain and an N-terminal region associated with fibrin binding, said variant having a substitution of a naturally-occurring amino acid at each of amino acid positions 296, 297, 298 and 299 of native human t-PA.

5,840,565

METHODS FOR ENHANCING THE PRODUCTION OF VIRAL VACCINES IN PKR-DEFICIENT CELL CULTURE

Allan S. Lau, San Francisco, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Filed Aug. 21, 1996, Ser. No. 700,198

Int. Cl.⁶ C12N *7/00;* **A61K** *39/12;* **C07H** *21/00;* **C12Q** *1/70*

U.S. Cl. 435—235.1 **19 Claims**

1. A method for production of a viral vaccine for an animal virus comprising:

(a) infecting a cell culture with a donor virus, wherein said cell culture is deficient in PKR activity, wherein said PKR-deficient cells are obtained by a process selected from the group consisting of:

- i. transfection of a parent cell line with a PKR antisense polynucleotide,
- ii. unaided uptake into a cell line by culturing said cell line in the presence of a PKR antisense polynucleotide,
- iii. transfection of a parent cell line with a PKR dominant negative mutant gene, said mutant gene selected from the group consisting of [Arg^{296}]PKR, mutants with deletions between amino acid residues 39–59, mutants with deletions between amino acid residues 58–69, mutants having a mutation at glycine 57, and mutants having a mutation at lysine 60; and
- iv. culturing a cell line in the presence of 2-aminopurine;

(b) culturing said infected cell culture under conditions sufficient to provide efficient virus growth; and

(c) harvesting the virus produced.

5,840,566

ISOLATION OF A GENE ENCODING HUMAN THYROTROPIN BETA SUBUNIT

Ione A. Kourides, Forest Hills, and Graham Kerr Whitfield, New York, both of N.Y., assignors to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Continuation of Ser. No. 671,134, Mar. 18, 1991, abandoned, which is a continuation of Ser. No. 808,004, Dec. 11, 1985, abandoned. This application Jan. 19, 1993, Ser. No. 6,208

Int. Cl.⁶ C07H *21/04;* **C12N** *5/10;1/20;15/79*

U.S. Cl. 435—240.2 **11 Claims**

1. Substantially pure DNA expressing the beta-subunit of human thyroid stimulating hormone which comprises the nucleotide sequence:

ATG ACT GCT CTC TTT CTG ATG TCC ATG CTT TTT GGC CTT GCA TGT GGG CAA GCG ATG TCT TTT TGT ATT CCA ACT GAG TAT ACA ATG CAC ATC GAA AGG AGA GAG TGT GCT TAT TGC CTA ACC ATC AAC ACC ACC ATC TGT GCT GGA TAT TGT ATG ACA CGG

followed by a sequence of about 400–450 nucleotides, and ending with the sequence:

GAT ATC AAT GGC AAA CTG TTT CTT CCC AAA TAT GCT CTG TCC CAG GAT GTT TGC ACA TAT AGA GAC TTC ATC TAC AGG ACT GTA GAA ATA CCA GGA TGC CCA CTC CAT GTT GCT CCC TAT TTT TCC TAT CCT GTT GCT TTA AGC TGT AAG TGT GGC AAG TGC AAT ACT GAC TAT AGT GAC TGC ATA CAT GAA GCC ATC AAG ACA AAC TAC TGT ACC AAA CCT CAG AAG TCT TAT CTG GTA GGA TTT TCT GTC TAA.

5,840,567

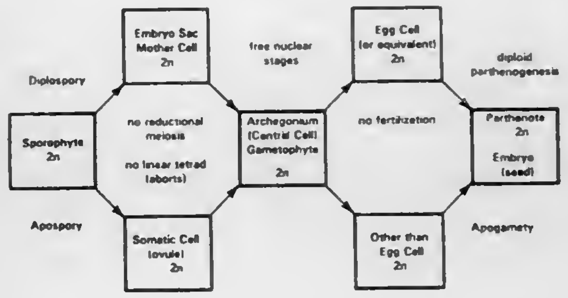
SIMPLIFIED HYBRID SEED PRODUCTION BY LATENT DIPLOID PARTHENOGENESIS AND PARTHENOTE CLEAVAGE

Don J. Durzan, Davis, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Filed Dec. 21, 1994, Ser. No. 362,188

Int. Cl.⁶ A01H *4/00;* **C12H** *5/04*

U.S. Cl. 435—240.49 **37 Claims**



1. A method for inducing asexual reproduction of hybrid seeds and plants having identical genetic characteristics by providing environmental conditions leading to diploid parthenogenesis and somatic polyembryogenesis, said method comprising the steps:

(a) selecting a genotype for asexual reproduction from a group consisting of Norway spruce, Sugar pine, Cupressus sempervirens, Douglas fir, Loblolly pine, and Araucaria angustifolia;

(b) obtaining a seed from the selected genotype;

(c) rescuing a tissue containing a proembryo, embryo and suspensor from the seed in time period from immediately after the seed fertilization to about three months after the fertilization and incubating rescued tissues on a half strength modified Murashige-Skoog or DCR basal medium supplemented with organic nitrogen sources, cyclitols, sucrose, and plant growth regulators present in amount from about $2\text{–}15\times10^{-5}$ M, in darkness at from about 20° C. to about 30° C. for about 3 to 6 weeks until a white embryonal suspensor mass develops;

(d) determining a presence of an egg-equivalent binucleate stage in cells of the white embryonal suspensor mass;

(e) incubating the embryonal suspensor mass cells having said egg-equivalent binucleate stage on the medium, in darkness at 23° C. to about 26° C. for about three to about four weeks until they develop into parthenotes;

(f) subculturing a parthenot of step (e) on the same medium every ten-twelve days three or more times under the same conditions as in step (e);

(g) incubating said culture in darkness at 23° C. to about 26° C. for about three to about four weeks to develop into an early embryo;

(h) subculturing the early embryo on medium every ten to twelve days three or more times under the same conditions as in step (g);

(i) incubating the early embryo on basal medium MS-1 or DCR-1 containing reduced amount of inositol to about 100 mg/L, in a continuous light for about seven to eight weeks at about 23° C. to about 26° C. to convert the early embryos to somatic embryos developing multiple cotyledons;

(j) culturing the developed somatic embryo on the basal MS-1 or DCR-1 medium lacking an organic nitrogen source, for about five to six weeks until a plantlet develops;

(k) growing the plantlet into a plant; and

(l) recovering hybrid seeds having the identical genetic characteristics from the plant.

5,840,568

HODGKIN'S DISEASE ASSOCIATED MOLECULES AND USES THEREOF

Michael Pfreundschuh, Homburg/Saar, Germany, assignor to Ludwig Institute for Cancer Research, New York, N.Y.

Continuation-in-part of Ser. No. 644,116, May 10, 1996, which is a continuation-in-part of Ser. No. 580,980, Jan. 3, 1996, which is a continuation-in-part of Ser. No. 479,328, Jun. 7, 1995. This application Jun. 21, 1996, Ser. No. 668,128

Int. Cl.⁶ C12N *1/20;15/00;* **G01N** *33/00;* **C07H** *21/04*

U.S. Cl. 435—252.3 **19 Claims**

1. Isolated nucleic acid molecule consisting of the nucleotide sequence of SEQ ID NO: 7.

5,840,569

HUMAN GTP-BINDING PROTEINS

Jennifer L. Hillman, San Jose; Olga Bandman; Phillip R. Hawkins, both of Mountain View, and Surya K. Goli, Sunnyvale, all of Calif., assignors to Incyte Pharmaceuticals, Inc., Palo Alto, Calif.

Filed Dec. 12, 1996, Ser. No. 766,551

Int. Cl.⁶ C12N *1/21*

U.S. Cl. 435—252.3 **7 Claims**

1. An isolated and purified polynucleotide sequence encoding a polypeptide comprising the amino acid sequence of SEQ ID NO:1.

5,840,570

ASPARTIC PROTEINASE DEFICIENT FILAMENTOUS FUNGI

Randy M. Berka, 331 W. 27th Ave., San Mateo, Calif. 94403; Kirk J. Hayenga, 1910 Garden Dr. No. 108, Berlingame, Calif. 94010; Virgil B. Lawlis, 1105 Bailwood Way, San Mateo, Calif. 94403, and Michael Ward, 381 Myrtle St., Half Moon Bay, Calif. 94019

Continuation of Ser. No. 931,123, Aug. 17, 1992, abandoned, which is a continuation of Ser. No. 214,237, Jul. 1, 1988, abandoned. This application Nov. 23, 1994, Ser. No. 345,018

Int. Cl.⁶ C12N *1/15;15/09;15/12*

U.S. Cl. 435—254.3 **10 Claims**

1. A viable mutant Aspergillus selected from the group consisting of *A. niger, A. awamori,* and *A. oryzae* suitable for the production of heterologous polypeptides, wherein the mutant comprises a site-selected deletion of part or all of nucleic acid coding for an aspergillopepsin such that said mutant does not excrete said aspergillopepsin and does not revert to wild type, wherein said nucleic acid coding for said aspergillopepsin hybridizes to an oligonucleotide probe coding for six or more contiguous amino acids of the amino acid sequence of aspergillopepsin A from *A. awamori.*

5,840,571

BIOLOGICAL DEGRADATION OF HALOGENATED COMPONENTS IN THE UNSATURATED SOIL ZONE

Ralph Emerson Beeman, Victoria, and Stephen Hoover Shoemaker, Spring, both of Tex., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 12, 1995, Ser. No. 571,059

Int. Cl.⁶ C02F *3/00;* **C12N** *1/00;1/20;* **B09B** *3/00*

U.S. Cl. 435—262.5 **16 Claims**

1. A process for biodegrading halogenated aliphatic hydrocarbons or halogenated fuel components, said halogenated fuel components selected from the group consisting of halogenated benzene, halogenated toluene, halogenated xylene, and halogenated ethylbenzene, in a soil zone between the ground surface and underlying water table, comprising

A) contacting in situ in said soil zone in a gas phase or vapor phase 1) an electron donor compound contained in or added to

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said soil zone with 2) dehalogenating bacteria indigenous in or added to said soil zone and 3) said halogenated aliphatic hydrocarbons or said halogenated fuel components present in said soil zone, by inducing and controlling gas flow through said soil zone; and

B) stimulating by said contacting anaerobic biodegradation of said halogenated aliphatic hydrocarbons or said halogenated fuel components.

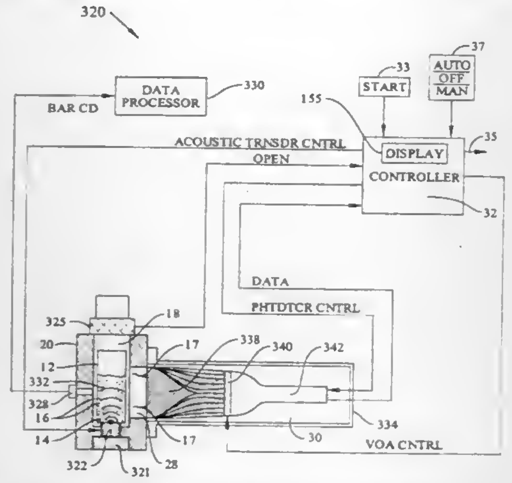
5,840,572
BIOLUMINESCENT BIOASSAY SYSTEM

Hugh D. Copeland, Chula Vista; David Lapota, San Diego; Dena E. Rosenberger, El Cajon, and Gary F. Mastny, San Diego, all of Calif., assignors to United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 321,066, Oct. 11, 1994, Pat. No. 5,565,360. This application Jul. 29, 1996, Ser. No. 688,133

Int. Cl.⁶ C12M *3/00*

U.S. Cl. 435—286.7 **33 Claims**



1. A system for measuring the toxicity of an aqueous solution, comprising:

a light tight chamber having a cavity for holding a sample container containing an aqueous test solution of bioluminescent organisms;

a vibration generating system mounted to said light tight chamber for generating pressure pulses in said test solution;

a light detector system for detecting light emitted by said bioluminescent organisms and for generating electric pulses in response to detecting said detected light emissions; and

a controller for controlling said vibration generating system and said light detector system, and for counting said electric pulses within a predetermined period of time.

5,840,573
MOLECULAR ANALYZER AND METHOD OF USE

Robert E. Fields, 1618 Sand Hill Rd., Palo Alto, Calif. 94304

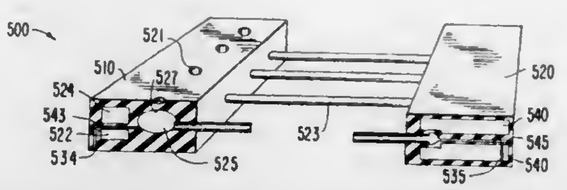
PCT No. PCT/US95/01591, § 371 Date Oct. 3, 1996, § 102(e) Date Oct. 3, 1996, PCT Pub. No. WO95/21382, PCT Pub. Date Aug. 10, 1995

PCT Filed Feb. 1, 1995, Ser. No. 687,589

Claims priority, application United Kingdom, Feb. 1, 1994, 9401849; Feb. 8, 1994, 9402357; Mar. 11, 1994, 9404758; Mar. 21, 1994, 9405565; Jul. 6, 1994, 9413641; Oct. 24, 1994, 9421378

Int. Cl.⁶ C12M *1/00;3/02;* **B01L** *3/00;* **G05D** *23/00*

U.S. Cl. 435—287.2 **29 Claims**



1. A molecular analyzer comprising a sample tube holder having a rigid frame with oppositely disposed sides, at least one internal chamber contained inside one of said sides of said frame, at least one sample tube, at least one internal conduit for providing communication between said at least one internal chamber and said at least one sample tube, characterized by;

said sample tube holder being further comprised of elastomeric members fitted to and held in close connection to said rigid frame;

said at least one sample tube being sealingly held between said elastomeric members;

said at least one internal chamber being filled with a detection reagent;

at least one port provided in one of said elastomeric members, said at least one port providing sealable access for a test sample to be loaded into said at least one sample tube;

an evacuated chamber contained within another of said sides of said frame and being in communication with said at least one sample tube;

means for blocking and unblocking said at least one internal conduit such that when said at least one internal conduit is blocked no communication between said at least one internal chamber and said at least one sample tube occurs, and when said at least one internal conduit is unblocked communication between said at least one internal chamber and said at least one sample tube occurs, whereby said detection reagent can flow through said at least one internal conduit, said at least one sample tube and into said evacuated chamber; and

means for controlling a temperature of said test sample.

5,840,574
VIRAL VACCINES

Louis Joseph Norman Ross, Newbury, England; Simon David Scott, Amsterdam, Netherlands, and Matthew McKinley Binns, Ely, United Kingdom, assignors to Rhône Mérieux, Lyons, France

Division of Ser. No. 81,932, Jun. 23, 1993, Pat. No. 5,558,860, which is a continuation-in-part of Ser. No. 669,392, Apr. 29, 1991, abandoned. This application Jun. 5, 1995, Ser. No. 462,591

Claims priority, application United Kingdom, Sep. 13, 1988, 8821441; WIPO, Sep. 13, 1989, PCT/GB89/01076

Int. Cl.⁶ C12N *15/85;15/38*

U.S. Cl. 435—320.1 **4 Claims**

1. A nucleotide sequence having the sequence of the coding portion of the MDV gB gene, as set forth in FIGS. 2A to 2R.

5,840,575
DNA LADDERS

Edward David Hyman, Bayou Biolabs 1500 Edwards Ave. suite Q, Harahan, La. 70123

Filed Jan. 10, 1997, Ser. No. 781,866

Int. Cl.⁶ C12N *15/63;* **C12Q** *1/68;* **C07H** *21/04*

U.S. Cl. 435—320.1 **7 Claims**

1. A plasmid for generating DNA ladders, whereby:

(a) the plasmid contains five or more R sites of a restriction endonuclease R;

(b) the length between all adjacent R sites is an integer multiple of a minimal length, said minimal length is the length between the closest adjacent R sites;

(c) partial R restriction endonuclease digestion of the plasmid generates a DNA ladder with at least five differently sized DNA fragments; and

(d) said DNA ladder has the properties that (i) all DNA fragments of the ladder have lengths which are integer multiples of the minimal length; (ii) the smallest DNA fragment length is the minimal length, (iii) the largest DNA fragment is the length of the entire plasmid; and (iv) the ladder has a DNA fragment at every integer multiple of the minimal length ranging from the minimal length to the plasmid length.

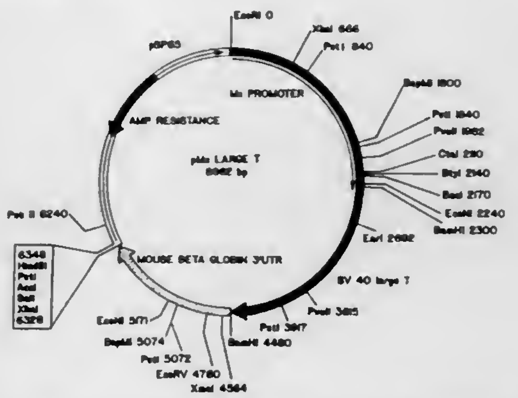
5,840,576
METHODS AND COMPOSITIONS OF GROWTH CONTROL FOR CELLS ENCAPSULATED WITHIN BIOARTIFICIAL ORGANS

Malcolm Schinstine, Ben Salem, Pa.; Molly S. Shoichet, Toronto, Canada; Frank T. Gentile, Warwick; Joseph P. Hammang, Barrington, both of R.I.; Laura M. Holland, Horsham, Pa.; Brian M. Cain, Everett; Edward J. Doherty, Mansfield, both of Mass.; Shelley R. Winn, Smithfield, R.I., and Patrick Aebischer, Lutry, Switzerland, assignors to CytoTherapeutics, Inc.

Division of Ser. No. 432,698, May 9, 1995, which is a continuation-in-part of Ser. No. 279,773, Jul. 20, 1994. This application May 23, 1995, Ser. No. 445,193

Int. Cl.⁶ C12N *5/00*

U.S. Cl. 435—325 **4 Claims**



1. A method for controlling distribution of cells within a bioartificial organ comprising suspending the cells in a hydrogel matrix within the bioartificial organ, the matrix being derivatized with a cell proliferation-inhibiting or cell differentiation-inducing peptide or peptide sequence wherein the hydrogel matrix is composed of agarose derivatized with a peptide sequence selected from the group consisting of an RGD-containing sequence, (ArgGlyAsp; AA_2–AA_4 of SEQ ID NO:2), a YIGSR-containing sequence (TyrIleGlySerArg; AA_5–AA_9 of SEQ ID NO:1) and an IKVAV-containing sequence (IleLysVaLAlaVal; AA_{11}–AA_{15} of SEQ ID NO:3).

5,840,577
ANIMAL 2-5A-DEPENDENT RNASES AND ENCODING SEQUENCES THEREFOR

Robert H. Silverman, Shaker Heights; Bret A. Hassel, Chagrin Falls, and Almin Zhou, Solon, all of Ohio, assignors to The Cleveland Clinic Foundation, Cleveland, Ohio

Division of Ser. No. 28,086, Mar. 8, 1993, abandoned. This application Jun. 5, 1995, Ser. No. 462,481

Int. Cl.⁶ C12N *5/00*

U.S. Cl. 435—325 **30 Claims**

1. An isolated nucleotide sequence encoding 5'-phosphorylated, 2,5-linked oligoadenylate (2-5A)-dependent RNase, said isolated nucleotide sequence selected from the group consisting of:

a) a nucleotide sequence having a sequence comprising nucleotides designated as 1–2928 of SEQ ID NO: 1;

b) a nucleotide sequence having a sequence consisting of nucleotides designated as 100–2928 of SEQ ID NO: 1;

c) a nucleotide sequence having a sequence consisting of nucleotides designated as 100–2326 of SEQ ID NO: 1;

d) a nucleotide sequence having a sequence consisting of nucleotides designated as 104–2326 of SEQ ID NO: 1;

e) a nucleotide sequence having a sequence consisting of nucleotides designated as 788–928 of SEQ ID NO: 1;

f) a nucleotide sequence having a sequence consisting of nucleotides designated as 788–826 of SEQ ID NO: 1 and nucleotides designated 860–928 of SEQ ID NO: 1.

5,840,578
METHODS FOR DETERMINING SUSCEPTIBILITY TO LEAD POISONING

Robert J. Desnick, New York, and James G. Wetmur, Scarsdale, both of N.Y., assignors to Mount Sinai School of Medicine of the City University of New York, New York, N.Y.

Division of Ser. No. 195,744, Feb. 14, 1994, Pat. No. 5,639,607, which is a continuation of Ser. No. 742,130, Aug. 7, 1991, abandoned. This application Jan. 24, 1997, Ser. No. 788,279

Int. Cl.⁶ C12N *5/00;15/00*

U.S. Cl. 435—325 **9 Claims**

1. A recombinant DNA vector into which some or all of a DNA sequence encoding ALA-D^2 has been cloned.

5,840,579
NUCLEIC ACIDS ENCODING P53 MUTATIONS WHICH SUPPRESS P53 CANCER MUTATIONS

Jef D. Boeke, and Rainer K. Brachmann, both of Baltimore, Md., assignors to The Johns Hopkins University, Baltimore, Md.

Continuation-in-part of Ser. No. 650,125, May 1, 1996. This application Feb. 5, 1997, Ser. No. 795,006

Int. Cl.⁶ C12W *5/00;1/14;* **C07H** *17/00*

U.S. Cl. 435—325 **32 Claims**

1. An isolated nucleic acid encoding human p53 which comprises:

at least one intragenic suppressor mutation, wherein said intragenic suppressor mutation suppresses in cis a dominant-negative mutation of human p53; and

at least one dominant negative mutation of human p53.

5,840,580
PHENOTYPIC CHARACTERIZATION OF THE HEMATOPOIETIC STEM CELL

Leon W. Terstappen, Huntingdon Valley, Pa.; Michael R. Loken, Mercer Island, Wash.; Shiang Huang, San Ramon, Calif.; Johanna Olweus, and Fridtjof Lund-Johansen, both of Fremont, Calif., assignors to Becton Dickinson and Company, Franklin Lakes, N.J.

Continuation of Ser. No. 358,038, Dec. 15, 1994, abandoned, which is a contiouation of Ser. No. 169,912, Dec. 20, 1993, abandoned, which is a continuation-in-part of Ser. No. 895,491, Jun. 8, 1992, abandoned, which is a continuation-in-part of Ser. No. 759,092, Sep. 6, 1991, abandoned, which is a continuation of Ser. No. 517,101, May 1, 1990, abandoned. This application May 14, 1997, Ser. No. 856,406

Int. Cl.⁶ A01N *63/00;* **C12N** *5/06;5/08*

U.S. Cl. 435—372 **9 Claims**

1. A population of human cells that lacks mature progenitor cells of the erythroid, lymphoid, and myeloid lineages and is enriched for hematopoietic stem cells wherein said stem cells are capable of limited self-renewal and differentiation into erythroid myeloid and lymphoid progenitors and mature cells, which population is comprised of cells having a $CD34^+/CD38^-/HLA\text{-}DR^+$ phenotype, wherein cells having said phenotype comprise at least 95% of said population.

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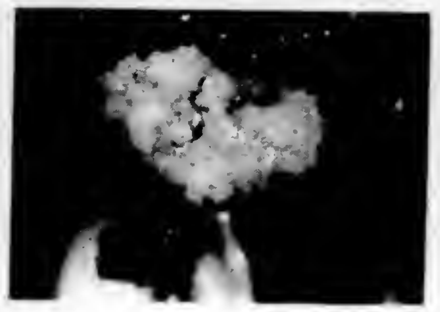
5,840,581
PROCESS FOR SOMATIC EMBRYOGENESIS OF SWEETGUM

Daniel T. Carraway, Bainbridge, and Scott A. Merkle, Athens, both of Ga., assignors to International Paper Company, Purchase, N.Y.

Filed Mar. 29, 1996, Ser. No. 626,235

Int. Cl.^{6} C12N *5/00;5/02*

U.S. Cl. 435—430.1 **30 Claims**



1. A method for producing embryos for propagation of sweetgum which comprises:
- collecting male inflorescence tissue from a mature sweetgum tree;
- disinfesting the inflorescence tissue;
- culturing the disinfested tissue on a plant cell growth medium comprising a basal medium containing from about 0.01 to about 5 milligrams per liter of N-phenyl-N-1,2,3-thiadaizol-5-ylurea (TDZ) and from about 0.01 to about 3 milligrams per liter 2,4-dichlorophenoxyacetic acid (2,4-D) to produce somatic embryos; and
- maturing the somatic embryos in a maturation medium containing a precocious germination inhibitor and, optionally, one or more sugars.

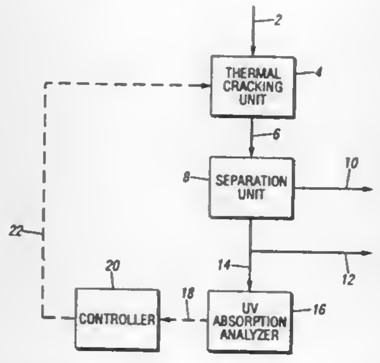
5,840,582
METHOD FOR DETERMINING THE HYDROGEN-TO-CARBON RATIO IN A LIQUID HYDROCARBON FRACTION AND USE THEREOF

Danny Yuk-Kwan Ngan, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 7, 1995, Ser. No. 479,746

Int. Cl.^{6} G01N *35/08;33/22*

U.S. Cl. 436—55 **16 Claims**



1. A method for determining the hydrogen-to-carbon ratio of a liquid hydrocarbon fraction, which method comprises subjecting a sample of a liquid hydrocarbon fraction to an ultra-violet absorption analysis and, using a predetermined correlation between the ultra-violet absorbance and the hydrogen-to-carbon ratio of like hydrocarbon fractions, determining the hydrogen-to-carbon ratio of the said liquid hydrocarbon fraction.

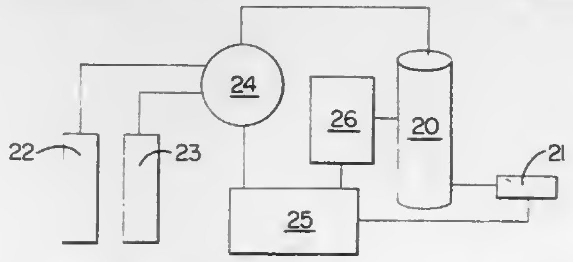
5,840,583
MICROWAVE ASSISTED CHEMICAL PROCESSES

David A. Barclay, Charlotte; William Edward Jennings, Wingate, and Edward E. King, Charlotte, all of N.C., assignors to CEM Corporation, Matthews, N.C.

Continuation of Ser. No. 538,603, Oct. 3, 1995, abandoned. This application Sep. 5, 1997, Ser. No. 924,628

Int. Cl.^{6} G01N *33/00;35/08;33/20;1/00*

U.S. Cl. 436—55 **30 Claims**



1. A method of increasing the rate of chemical reactions by avoiding thermal dilution while controlling an elevated temperature for the reactions, the method comprising:
- adding an unheated portion of a second reagent to a heated portion of a first reagent, with at least one of said reagents being thermally responsive to electromagnetic radiation in the microwave range;
- monitoring the temperature of the added first and second reagents as the second reagent is added; and
- applying sufficient microwave radiation from a microwave source to the added first and second reagents based on the monitored temperature by moderating passage of the microwave radiation from the microwave source to maintain the added reagents substantially at the elevated temperature while substantially avoiding thermal dilution that would otherwise be caused by the addition of the unheated reagent to the heated reagent, and without moderating production of microwave radiation from the microwave source.

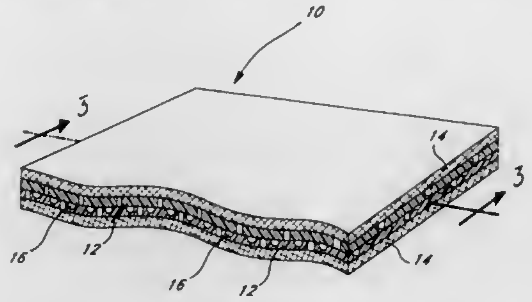
5,840,584
BLOOD IN FECES TEST DEVICE

Ottfried Waldenburg, P. O. Box 548, Sells, Ariz. 85634

Filed Jun. 7, 1995, Ser. No. 481,651

Int. Cl.^{6} G01N *33/72*

U.S. Cl. 436—66 **17 Claims**



1. A device for detecting the presence of occult blood in feces, comprising
- a sheet of brittle material in which are formed a plurality of chambers holding a liquid reagent solution,
- said sheet of brittle material being sandwiched between sheets of absorbant material, at least one of said sheets of absorbant material being impregnated with a guaiac material,
- said plurality of chambers providing individual liquid tight enclosures having thin walls that rupture to release the reagent solution when the device is used to wipe feces from an anus,
- said released liquid reagent solution reacting with the guaiac material in the presence of occult blood in feces to produce a color that so indicates the presence of occult blood in the feces collected by wiping the anus.

5,840,585
RH BLOOD GROUP ANTIGEN COMPOSITIONS AND METHODS OF USE

L. Scott Rodkey; Marwan A. Yared, and Kenneth J. Moise, Jr., all of Houston, Tex., assignors to Baylor College of Medicine, Houston, and Board of Regents, The University of Texas System, Austin, both of Tex.

Filed Sep. 17, 1996, Ser. No. 715,173

Int. Cl.^{6} G01N *30/90*

U.S. Cl. 436—161 **36 Claims**

1. A method of purifying an antibody that specifically binds to a native Rh antigen comprising:
- a) contacting a sample suspected of containing said antibody with an immobilized antigenically-active Rh antigen under conditions effective to specifically bind said antibody to said antigen; and
- (b) subsequently eluting said antibody from said immobilized antigen.

5,840,586
METHOD AND APPARATUS FOR ANTENATAL RISK ASSESSMENT FOR CHROMOSOMAL ABNORMALITIES FACTORING IN MATERNAL AGE INFLUENCE

Christopher John Davies, Energlyn Park, United Kingdom, assignor to Clinical Diagnostic Systems, Inc., Rochester, N.Y.

Continuation of Ser. No. 275,180, Jul. 14, 1994, abandoned. This application Nov. 30, 1995, Ser. No. 565,498

Claims priority, application United Kingdom, Jul. 22, 1993, 9315230

Int. Cl.^{6} G01N *33/53;33/92*

U.S. Cl. 436—510 **3 Claims**

2. A method for antenatal risk assessment for a chromosomal abnormality in a fetus, comprising:
- A) calculating a pregnant patient's prior risk of carrying a fetus having said chromosomal abnormality,
- B) measuring said pregnant patient's blood for a concentration of unconjugated estriol, its precursors, its metabolites, or a mixture thereof,
- C) calculating a normalized value of said concentration by dividing by a median value found in a population of women with unaffected pregnancies with the same gestational age as said pregnant patient,
- D) correcting said normalized value for influence of maternal age by dividing said normalized value by a corrected normal median value for a population of women of that maternal age,
- E) calculating a first probability that the corrected normalized value is part of a Gaussian distribution of values found in pregnancies with said chromosomal abnormality,
- F) calculating a second probability that the corrected normalized value is a part of a Gaussian distribution of values found in unaffected pregnancies,
- G) calculating a likelihood ratio, said likelihood ratio being the ratio of said first probability and said second probability, and
- H) modifying said prior risk by the likelihood ratio.

5,840,587
METHODS FOR DETERMINING ANTIPHOSPHOLIPID ANTIBODIES

Michael W. Stewart, Albert; Phillip A. Gordon, and Wai Sum Etches, both of Edmonton, all of Canada, assignors to University Hospitals Board, Edmonton, Canada

Division of Ser. No. 129,593, Sep. 30, 1993, Pat. No. 5,561,070, which is a division of Ser. No. 905,562, Jun. 29, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 477,334

Claims priority, application Canada, Jun. 26, 1992, 2072548

Int. Cl.^{6} C01N *33/563*

U.S. Cl. 436—513 **25 Claims**

1. A method for determining the presence, in a fluid, of anti-target-phospholipid antibodies, comprising:
- contacting microspheres with a solution of a target phospholipid, which is selectively bound by antibodies to be determined, under conditions effective to allow coating of the phospholipid on the microspheres thereby forming a solution/phospholipid-coated microsphere mixture;
- washing the phospholipid-coated microspheres by mixing the solution/phospholipid-coated microsphere mixture with an equal volume of aqueous buffer and collecting the washed phospholipid-coated microspheres;
- contacting a fluid suspected of containing anti-target-phospholipid antibodies with the phospholipid-coated microspheres to permit binding of any anti-target-phospholipid antibodies present in the fluid to the phospholipid-coated microspheres; and
- determining the presence of any anti-target phospholipid antibodies bound to the phospholipid-coated microspheres.

5,840,588
AGGLUTINATION INHIBITION ASSAY METHODS AND REAGENTS FOR PSYCHOACTIVE SUBSTANCES

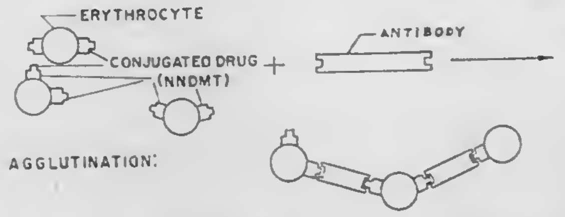
Meir Strahilevitz, 10440 Willowdale, Creve Coeur, Mo. 63141

Division of Ser. No. 699,159, May 13, 1991, which is a division of Ser. No. 345,964, May 1, 1989, Pat. No. 5,037,645, which is a division of Ser. No. 925,821, Oct. 30, 1986, Pat. No. 4,834,973, which is a division of Ser. No. 319,238, Nov. 9, 1981, Pat. No. 4,620,977, which is a continuation of Ser. No. 761,290, Jan. 21, 1977, Pat. No. 4,375,414, which is a continuation of Ser. No. 255,154, May 19, 1972, abandoned. This application Jun. 5, 1995, Ser. No. 469,084

Claims priority, application United Kingdom, May 20, 1971, 16001

Int. Cl.^{6} G01N *33/531;33/543;33/546;33/555*

U.S. Cl. 436—518 **21 Claims**



1. A method of determining a psychoactive hapten, comprising a step for binding said hapten to an agglutinable particle selected from the group consisting of erythrocytes and latex particles; and thereafter an agglutination inhibition immunoassay step, utilizing said hapten bound to said particle, for the determination of said hapten in a sample.

5,840,589
METHOD FOR FABRICATING MONOLITHIC AND MONOCRYSTALLINE ALL-SEMICONDUCTOR THREE-DIMENSIONAL INTEGRATED CIRCUITS

Raymond M. Warner, Jr., 6136 Sherman Cir., Edina, Minn. 55436, and Ronald D. Schrimpf, 9855 N. Canyon Brook Pl., Tucson, Ariz. 85741

Continuation-in-part of Ser. No. 705,726, May 24, 1991, which is a division of Ser. No. 443,175, Nov. 30, 1989, Pat. No. 5,089,862, which is a continuation-in-part of Ser. No. 861,708, May 12, 1986, Pat. No. 4,885,615, which is a continuation-in-part of Ser. No. 799,652, Nov. 19, 1985, Pat. No. 4,794,442. This application Jun. 6, 1995, Ser. No. 468,968

Int. Cl.^{6} H01L *21/203*

U.S. Cl. 437—128 **26 Claims**

1. A method for fabricating a monolithic silicon IC that is 3-D in the sense that it comprises two or more layers of circuitry, using sputter epitaxy to grow a large number of uniform, thin layers of silicon on a lightly doped, type-1, plane-surfaced silicon substrate, each layer embodying an opposite-type (type-2) doping pattern that

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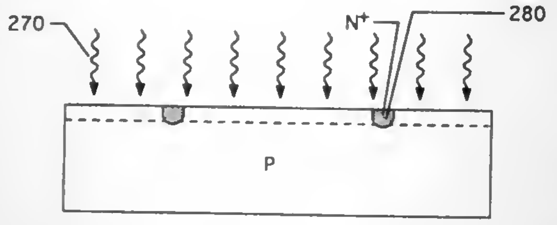


is essentially two-dimensional (2-D), and through the merging, where desired, of these 2-D doping patterns, creates a 3-D doping pattern, with each of said 2-D-patterned silicon layers being created by a repetition of this five-step cycle:
- a. sputter-epitaxial deposition of a lightly doped type-1 primary layer by using a lightly doped type-1 silicon target;
- b. sputter-epitaxial deposition of an appreciably thinner and heavily doped type-2 silicon secondary layer by using a heavily doped type-2 semiconductor target;
- c. diffusion in selected areas of the type-2 impurity by subjecting the silicon surface to an incident, focused, patterned light flash, with the resulting 2-D pattern of diffused impurity extending through the primary layer grown in step a;
- d. removal by using ion milling of a surface layer from the silicon, said layer being thicker than the secondary layer grown in step b, thus eliminating type-2 impurity from the primary layer grown in step a except from the regions of localized diffusion;
- e. rapid flash annealing of the primary (step a) layer by using general (unpatterned) light incident upon the silicon surface.

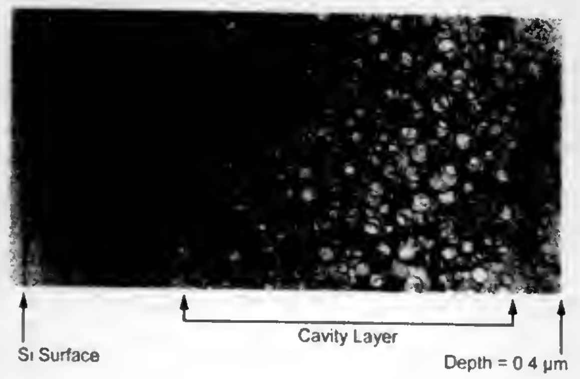
5,840,590
IMPURITY GETTERING IN SILICON USING CAVITIES FORMED BY HELIUM IMPLANTATION AND ANNEALING

Samuel M. Myers, Jr.; Dawn M. Bishop, and David M. Follstaedt, all of Albuquerque, N. Mex., assignors to Sandia Corporation, Albuquerque, N. Mex.

Filed Dec. 1, 1993, Ser. No. 160,704

Int. Cl.^{6} H01L *21/306*

U.S. Cl. 437—11 **19 Claims**



1. A process for gettering a substrate containing metal impurities for the manufacture of semiconductor devices comprising:
- ion-implanting an inert gas into a surface of the substrate to form gettering cavities therein with wall surfaces and with dangling chemical bonds located at the wall surfaces; and
- annealing the ion-implanted substrate to promote migration of the metal impurities within the bulk of said substrate to said gettering cavities;
- said metal impurities being trapped at the wall surfaces of the gettering cavities by means of attachment to said dangling chemical bonds, said dangling chemical bonds being highly reactive with said metal impurities resulting in the immobilization of said metal impurities.

5,840,591
METHOD OF MANUFACTURING BURIED BIT LINE DRAM CELL

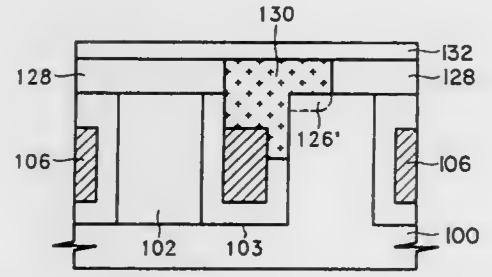
Jae-Kwan Park, Kyungki-do, and Jong-Woo Park, Seoul, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Nov. 30, 1995, Ser. No. 565,029

Claims priority, application Rep. of Korea, Nov. 30, 1994, 1994 32137

Int. Cl.^{6} H01L *21/70*

U.S. Cl. 437—52 **6 Claims**



1. A method for manufacturing a Buried Bit Line DRAM cell comprising the steps of:
- forming a trench into a semiconductor substrate for isolating devices and burying a bit line;
- forming a first insulating material layer on a surface of said trench;
- forming said bit line to a first depth into said trench having said first insulating material layer formed thereon;
- forming a second insulating material layer on said bit line while filling a remaining portion of said trench, and planarizing said substrate;
- forming a transistor having a gate insulating layer, a source/drain, and a gate on said planarized substrate;
- forming a first insulating layer to insulate said gate;
- forming a second insulating layer on the resultant structure having said first insulating layer formed therein;
- exposing said drain of said transistor and said bit line by partially etching said second insulating layer;
- forming a bit line contact plug for making contact between said drain and said bit line by depositing a conductive material on the resultant structure after exposing said drain;
- forming a third insulating layer on the resultant structure having said bit line contact plug formed therein and etching said third and second insulating layers to expose said source of said transistor; and
- forming a buried contact plug by depositing a conductive material on the resultant structure after exposing said source and etching back said conductive material.

5,840,592
METHOD OF IMPROVING THE SPECTRAL RESPONSE AND DARK CURRENT CHARACTERISTICS OF AN IMAGE GATHERING DETECTOR

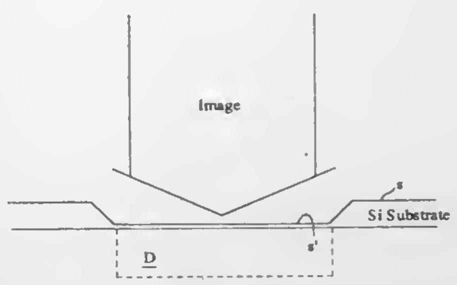
Stephen D. Russell, San Diego, Calif.; Douglas A. Sexton, Adair Village, Oreg.; Eugene P. Kelley, Spring Valley, and Ronald E. Reedy, San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 171,326, Dec. 21, 1993, abandoned. This application Jul. 5, 1994, Ser. No. 273,445

Int. Cl.^{6} H01L *21/265*

U.S. Cl. 437—173 **15 Claims**

1. A method for improving the spectral response and dark current characteristics of an image gathering detector, comprising the steps of:
- ion implanting dopants through an image detecting surface of a semiconducting structure to form an ion implanted region;
- generating a spatially homogenized laser beam;



- irradiating said ion implanted region with said homogenized laser beam to melt said ion implanted region; and
- solidifying said ion implanted region whereupon said ion implanted region has a peak dopant concentration substantially at said image detecting surface.

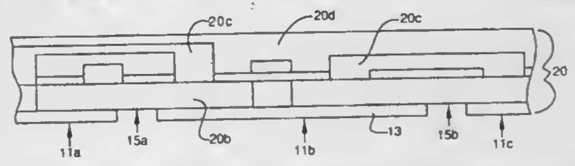
5,840,593
MEMBRANE DIELECTRIC ISOLATION IC FABRICATION

Glenn Joseph Leedy, Montecito, Calif., assignor to Elm Technology Corporation, Jackson, Wyo.

Continuation of Ser. No. 475,770, Jun. 7, 1995, Pat. No. 5,654,220, which is a continuation of Ser. No. 315,905, Sep. 30, 1994, which is a division of Ser. No. 865,412, Apr. 8, 1992, Pat. No. 5,354,695. This application Mar. 10, 1997, Ser. No. 813,439

Int. Cl.^{6} H04L *21/00*

U.S. Cl. 438—6 **2 Clalms**



1. A method of fabricating an integrated circuit comprising the steps of:
- providing a free standing membrane formed of a layer of low stress dielectric and a substrate layer;
- forming a plurality of transistors in the substrate layer; and
- forming interconnections on the dielectric layer between the transistors.

5,840,594
METHOD OF AND APPARATUS FOR MOUNTING ELECTRONIC PARTS ON A BOARD

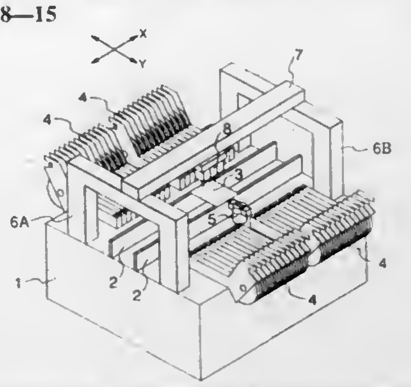
Yuzo Tsubouchi, Onojo; Nobutaka Abe, Dazaifu, and Yuji Nakamura, Kurume, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 15, 1997, Ser. No. 929,420

Claims priority, application Japan, Sep. 27, 1996, 8-256115

Int. Cl.^{6} H01L *21/66*

U.S. Cl. 438—15 **5 Claims**



1. An electronic parts mounting method for horizontally moving a head with a plurality of nozzles arranged at a first interval therebetween, and for picking-up electronic parts from plural ones of numbers of parts feeders arranged at a second interval therebetween by means of said nozzles, the first interval set to be an integral multiple of the second interval, and for mounting said electronic parts onto a board, said method comprising the steps of:
- detecting a positional relationship among said nozzles by a first camera, and storing data of the positional relationship in a storage portion;
- detecting pick-up points of said electronic parts in said plural parts feeders by a second camera, and storing data of the pick-up points in a storage portion;
- judging, in accordance with said positional relationship data and said pick- up point data, whether or not all of said electronic parts can be simultaneously picked up by said nozzles;
- picking up said electronic parts by said nozzles simultaneously when it is judged that all of said electronic parts can be simultaneously picked up, or separately when it is judged that all of said electronic parts can not be simultaneously picked up; and
- transferring and mounting said electronic parts on said board.

5,840,595
CALIBRATION OF SEMICONDUCTOR PATTERN INSPECTION DEVICE AND A FABRICATION PROCESS OF A SEMICONDUCTOR DEVICE USING SUCH AN INSPECTION DEVICE

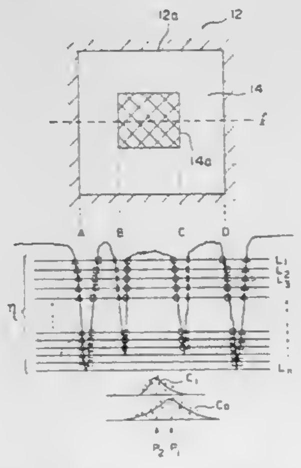
Katsuyoshi Kobayashi, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 385,685, Feb. 8, 1995, Pat. No. 5,692,070. This application Apr. 11, 1997, Ser. No. 834,045

Claims priority, application Japan, Mar. 15, 1994, 6-044469

Int. Cl.^{6} H01L *21/00*

U.S. Cl. 438—16 **5 Claims**



1. A method for fabricating a semiconductor device that includes a pattern inspection step for inspecting a pattern by means of a pattern alignment inspection device, said pattern alignment inspection device comprising: an optical source designed to emit an optical beam along a predetermined, designed optical axis; a stage for holding a substrate that carries at least first and second patterns thereon; an optical system provided on said optical axis for illuminating said substrate on said stage by said optical beam produced by said optical source; an imaging device for imaging said substrate illuminated on said stage, said imaging device acquiring an image of said first pattern and an image of said second pattern; and an analyzing system supplied with said images of said first and second patterns for detecting a deviation in position between said first pattern and said second pattern; said method comprising the steps of:
- (a) disposing said substrate upon said stage in a first orientation;
- (b) acquiring an image of said substrate disposed on said stage in said step (a), by said imaging device;
- (c) detecting a first positional offset between said first and second patterns on said substrate by processing said image of said substrate acquired in said step (b);

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- (d) disposing said substrate upon said stage with a second, different orientation;
- (e) acquiring an image of said substrate disposed on said stage in said step (d), by said imaging device;
- (f) detecting a second positional offset between said first and second patterns on said substrate by processing said image of said substrate acquired in said step (e);

detecting a deviation of an optical axis of said optical system with respect to said designed optical axis by comparing said first offset and said second offset; and

detecting a mutual offset of said first pattern and said second pattern by applying a correction for correcting said deviation of said designed optical axis, upon one of said first and second offsets;

wherein said first orientation and said second orientation are mutually offset by 180 degrees.

5,840,596

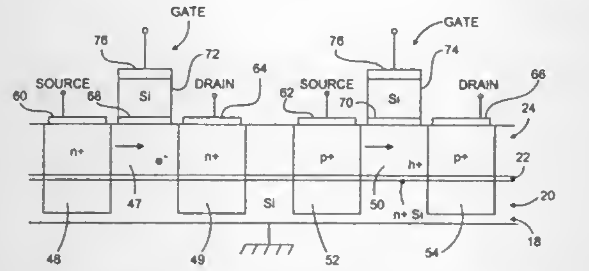
METHOD OF MANUFACTURING COMPLEMENTARY MODULATION-DOPED FIELD EFFECT TRANSISTORS

Stephen Joseph Kovacic, Kanata, Canada, assignor to Nothern Telecom Limited, Montreal, Canada

Division of Ser. No. 665,735, Jun. 17, 1996, Pat. No. 5,686,744. This application Jun. 13, 1997, Ser. No. 874,253

Int. Cl.^{6} H01L *21/00*

U.S. Cl. 438—47 **12 Claims**



1. A method of making a CMODFET(complementary modulation doped field-effect transistor) circuit comprising the steps of:

- a) forming on a substrate a heterostructure by performing the steps of:
  - i) forming on the substrate a first undoped or lightly p-doped layer of silicon or silicon alloy;
  - ii) forming a second heavily n-doped layer of silicon or silicon alloy;
  - iii) forming a third silicon alloy layer;
  - iv) forming a fourth heavily n-doped layer of silicon or silicon alloy;
  - v) forming a fifth undoped or lightly p-doped layer of silicon or silicon alloy;

  wherein a conduction band well exists in the third layer and a valence band hetero-offset exists between the third layer and each of the second and fourth layers;
- b) forming at least one n-channel MODFET on the heterostructure, comprising the steps of:
  - i) implanting a heavily n-doped source region and a heavily n-doped drain region extending from spaced apart locations on the fifth layer of the heterostructure down through at least a portion of the third layer; and
  - ii) placing a source electrode on a surface of the source region, a drain electrode on a surface of the drain region, and a gate electrode on the fifth layer between the source electrode and the drain electrode;
- c) forming at least one p-channel MODFET on the heterostructure, comprising the steps of:
  - i) implanting a heavily p-doped source region and a heavily p-doped drain region extending from spaced apart locations on the fifth layer of the heterostructure down through at least a portion of the third layer; and
  - ii) placing a source electrode on a surface of the source region, a drain electrode on a surface of the drain region, and a gate electrode on the fifth layer between the source electrode and the drain electrode.

5,840,597

METHOD OF MAKING A SEMICONDUCTOR DEVICE FORCE AND/OR ACCELERATION SENSOR

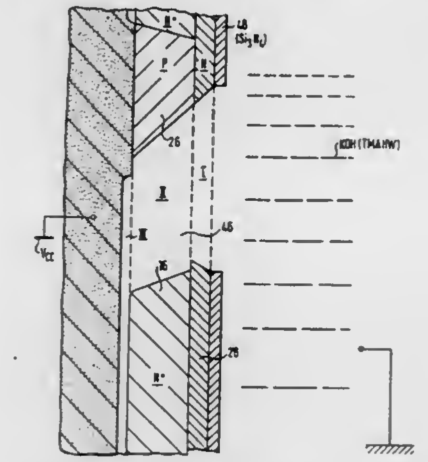
Siegbert Hartauer, Landshut, Germany, assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 448,717, May 24, 1995, abandoned, which is a division of Ser. No. 215,987, Mar. 22, 1994, abandoned. This application Jan. 27, 1997, Ser. No. 789,515

Claims priority, application Germany, Mar. 22, 1993, 43 09 206.3

Int. Cl.^{6} H01L *21/00*

U.S. Cl. 438—52 **8 Claims**



1. A method of making a semiconductor device for sensing force and/or acceleration, comprising the steps of:

providing a substrate of semiconductor material of a first conductivity type;

depositing a first epitaxial layer of a second conductivity type on the semiconductor substrate of the first conductivity type;

forming an area of said first conductivity type in a portion of said first epitaxial layer to define a mass;

depositing a second epitaxial layer of said first conductivity type on said first epitaxial layer, said second epitaxial layer being integrally connected to said mass;

etching a portion of said first epitaxial layer surrounding said mass to form a gap between said mass and said substrate and to form a space on sides of said mass, whereby said mass is coupled to a remaining portion of said first epitaxial layer by an integrally formed support element;

forming a transducer on the second epitaxial layer, in a region of the resilient support element, responsive to flexure of the resilient support element induced by movement of the mass relative to the semiconductor substrate to provide an output data signal; and

wherein the mass, the first and second epitaxial layers, and the semiconductor substrate are formed as an integral body of monocrystalline semiconductor material.

5,840,598

LOC SEMICONDUCTOR ASSEMBLED WITH ROOM TEMPERATURE ADHESIVE

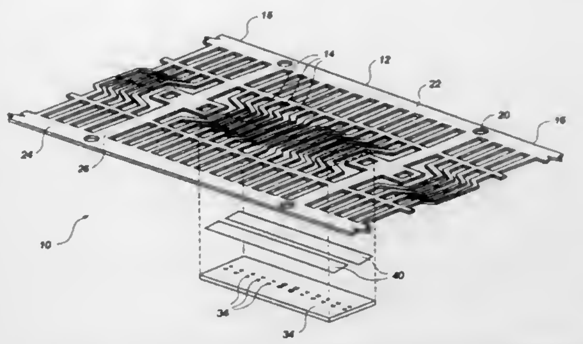
Ford B. Grigg, Meridian, and Warren M. Farnworth, Nampa, both of Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Aug. 14, 1997, Ser. No. 916,977

Int. Cl.^{6} H01L *21/44;21/48;21/50*

U.S. Cl. 438—118 **9 Claims**

1. A method of assembling a semiconductor device assembly, said method comprising:



providing a lead frame having a plurality of lead fingers thereon, at least one lead finger of said plurality of lead fingers having an attaching surface;

providing a semiconductor device having an active surface having at least one bond pad thereon configured for electrical connection to said at least one lead finger of said plurality of lead fingers of said lead frame;

selecting a non-conductive polymer adhesive from a group of copolymers that includes isobutyl compounds;

applying said non-conductive polymer adhesive to one of said active surface of said semiconductor device and said attaching surface of said at least one lead finger of said plurality of lead fingers of said lead frame;

retaining said semiconductor device, said lead frame, and said non-conductive polymer adhesive at room temperature;

urging said active surface of said semiconductor device and said attaching surface of said at least one lead finger of said plurality of lead fingers of said lead frame together at room temperature to attach said semiconductor device and said at least one lead finger of said plurality of lead fingers of said lead frame together, thereby effecting connection between said attaching surface of said at least one lead finger of said plurality of lead fingers of said lead frame and said active surface of said semiconductor device.

5,840,599

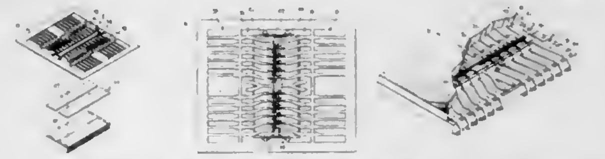
PROCESS OF PACKAGING AN INTEGRATED CIRCUIT WITH A CONDUCTIVE MATERIAL BETWEEN A LEAD FRAME AND THE FACE OF THE CIRCUIT

Michael Anthony Lamson, Westminster, and Katherine Gail Heinen, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 161,993, Dec. 2, 1993, Pat. No. 5,432,127, which is a division of Ser. No. 64,291, May 18, 1993, abandoned, which is a division of Ser. No. 840,563, Feb. 24, 1992, Pat. No. 5,233,220, which is a continuation of Ser. No. 628,948, Dec. 14, 1990, abandoned, which is a continuation of Ser. No. 373,742, Jun. 30, 1989, abandoned. This application Oct. 27, 1994, Ser. No. 330,171

Int. Cl.^{6} H01L *21/56;21/58;21/60*

U.S. Cl. 438—123 **10 Claims**



1. A process of packaging a semiconductor device having a major surface carrying bond pads arranged linearly and centrally of the major surface, the process comprising:

- A. adhesively securing a conductive layer of material over the major face of the semiconductor device to leave exposed the plural bond pads;
- B. forming a lead frame by forming a plurality of leads for carrying power and signals to and from the semiconductor device, including:
  - i. forming the leads to have a first portion adapted to be contained within encapsulation material and connected to a bond wire and a second portion adapted to extend beyond the encapsulation material.
  - ii. forming the leads in groups,
  - iii. forming the first portions of all the leads in each group to have substantially the same geometrical configuration.
  - iv. forming the first portions of all the leads in each group to be mirror images of the first portions of the leads in the other groups, and
  - v. forming the leads so that the leads are substantially equally spaced from one another in each group that the capacitance of each of the leads is substantially:
- C. arranging the first portion of the leads over the major face of the semiconductor device and the conductive layer to sandwich the conductive layer between the device and the first portions of the leads, the arranging including arranging the first portions of the leads to be spaced from the plural bonds pads;
- D. connecting the bond pads to the first portions of the leads of the lead frame with bond wires; and
- E. encapsulating the device, conductive layer and first portions of the leads with encapsulating material to the second portions of the leads exposed outside of the encapsulating material.

5,840,600

METHOD FOR PRODUCING SEMICONDUCTOR DEVICE AND APPARATUS FOR TREATING SEMICONDUCTOR DEVICE

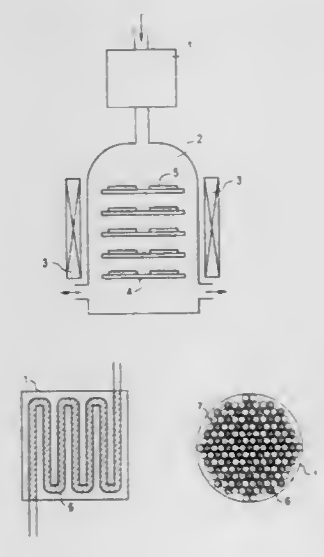
Shunpei Yamazaki, Tokyo; Mitsunori Sakama, Kanagawa, and Yasuhiko Takemura, Kangawa, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Filed Aug. 30, 1995, Ser. No. 521,534

Claims priority, application Japan, Aug. 31, 1994, 6-232410; Aug. 31, 1994, 6-232411; Aug. 31, 1994, 6-232412

Int. Cl.^{6} H01L *21/02;21/302;21/324;21/329*

U.S. Cl. 438—151 **25 Claims**



1. A method for forming semiconductor device comprising the steps of:

forming an island silicon region including crystallinity on a substrate having an insulating surface;

forming a thermal oxidation film as a gate insulating film by thermally oxidizing the silicon film, the thermal oxidation film covering the silicon film; and

annealing the thermal oxidation film at 400° to 700° C. in an atmosphere iocluding nitrogen oxide which is excited or decomposed by ultraviolet light.

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5,840,601

THIN FILM TRANSISTOR AND METHOD FOR MAKING SAME

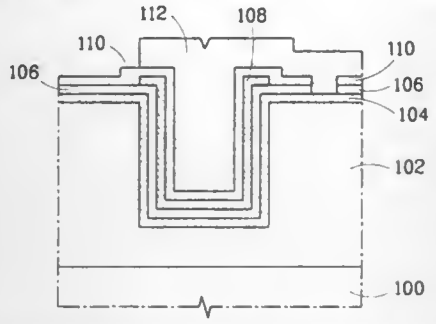
Won-Ju Cho, Choongcheongbuk-Do, Rep. of Korea, assignor to LG Semicon Co., Ltd., Choongcheongbuk-Do, Rep. of Korea

Filed Dec. 27, 1996, Ser. No. 773,593

Claims priority, application Rep. of Korea, Dec. 28, 1995, 1995 62056

Int. Cl.⁶ H01L *21/84*

U.S. Cl. 438—151 **19 Claims**



1. A method for making a thin film transistor having a substrate, the method comprising the steps of:

forming a first insulating layer on the substrate, the first insulating layer having a trench portion;
forming a first gate on the first insulating layer;
forming a second insulating layer on the first gate;
forming an active layer on the second insulating layer;
forming a third insulating layer over the second insulating layer and the active layer;
etching the second and third insulating layers to form a contact hole and exposing the first gate; and
forming a second gate over the third insulating layer and the contact hole, wherein the second gate is thicker than the first gate.

5,840,602

METHODS OF FORMING NONMONOCRYSTALLINE SILICON-ON-INSULATOR THIN-FILM TRANSISTORS

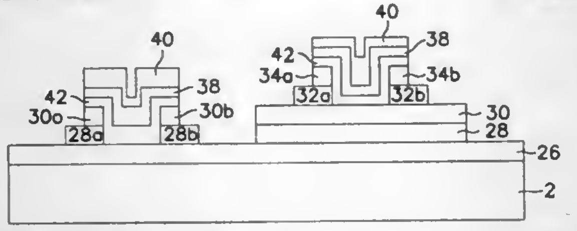
Min-Koo Han; Byung-Hyuk Mln, both of Seoul; Cheol-Min Park, Kyungki-do, and Byung-Seong Bae, Seoul, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jul. 25, 1996, Ser. No. 686,242

Claims priority, application Rep. of Korea, Feb. 21, 1996, 1696-4044

Int. Cl.⁶ H01L *21/8238;21/84*

U.S. Cl. 438—153 **15 Claims**



1. A method of forming nonmonocrystalline complimentary metal oxide semiconductor thin-film transistors, comprising the steps of:

forming a first silicon layer of first conductivity type on an electrically insulating substrate;
forming a first insulating layer on the first silicon layer, opposite the substrate;
forming a second silicon layer of second conductivity type on the first insulating layer, opposite the first silicon layer;
patterning the second silicon layer to define spaced source and drain regions of second conductivity type having exposed sidewalls;
patterning the first silicon layer to define spaced source and drain regions of first conductivity type having exposed sidewalls;
forming a first amorphous silicon channel region in contact with the exposed sidewalls of the spaced amorphous source and drain regions of first conductivity type;
forming a second amorphous silicon channel region in contact with the exposed sidewalls of the spaced amorphous source and drain regions of second conductivity type;
converting the first and second amorphous silicon channel regions to polycrystalline silicon;
forming a first insulated gate electrode on the first channel region; and
forming a second insulated gate electrode on the second channel region.

5,840,603

METHOD FOR FABRICATION BICMOS INTEGRATED CIRCUIT

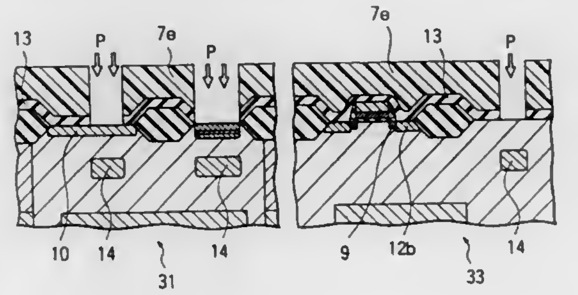
Kayoko Sakamoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 20, 1997, Ser. No. 915,405

Claims priority, application Japan, Aug. 22, 1996, 8-220893

Int. Cl.⁶ H01L *21/8238*

U.S. Cl. 438—202 **12 Claims**



1. A fabrication process of a BiCMOS integrated circuit comprising the steps of:

forming a first photoresist layer on a semiconductor substrate, said first photoresist layer having first opening portions in a region where an n-channel MOS transistor is formed in said semiconductor substrate, and in a region where a collector leading region of an npn-type bipolar transistor is formed in said semiconductor substrate;
implanting a first n-type impurity with said first photoresist layer as a mask;
removing said first photoresist layer;
forming a second photoresist layer on said semiconductor substrate, said second photoresist layer having second opening portions in a region where an emitter region of said npn-type bipolar transistor is formed, and in the region where said collector leading region is forming; and
implanting a second n-type impurity with said second photoresist layer as a mask for forming an n-type selective diffusion region in a region below a region where said emitter region is formed and in the region where said collector leading region is formed.

5,840,604

METHODS OF FORMING MOS TRANSISTORS HAVING HOT-CARRIER SUPPRESSION ELECTRODES

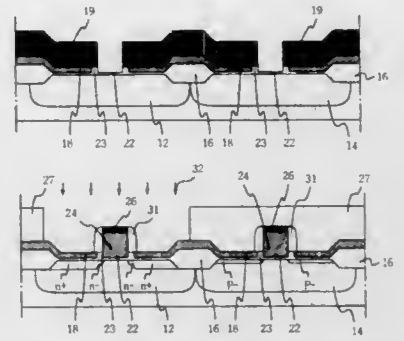
Ji-Hyoung Yoo, Kyungki-do, and Gwang-Hyeon Lim, Inch'eon, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 12, 1996, Ser. No. 764,314

Claims priority, application Rep. of Korea, Dec. 28, 1995, 1995-61309

Int. Cl.⁶ H01L *21/8238;21/336*

U.S. Cl. 438—230 **20 Claims**



12. A method of forming a field effect transistor, comprising the steps of:

forming a first electrically insulating layer on a face of a semiconductor substrate containing a region of first conductivity type therein extending to the face;
forming first and second hot-carrier suppression electrodes having opposing sidewalls on the first electrically insulating layer;
oxidizing the opposing sidewalls of the first and second hot-carrier suppression electrodes;
forming a gate electrode between the oxidized sidewalls of the first and second hot-carrier suppression electrodes;
forming source and drain regions of second conductivity type in the region of first conductivity type; and
forming a source electrode electrically connected to the first hot-carrier suppression electrode and the source region, and a drain electrode electrically connected to the second hot-carrier suppression electrode and the drain region.

5,840,605

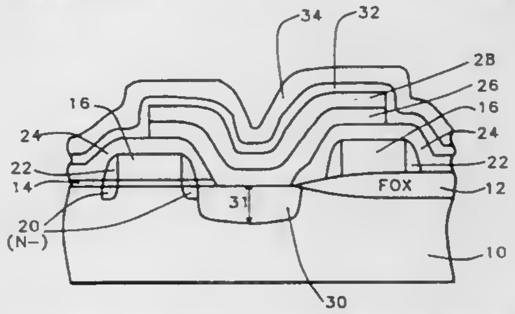
DUAL LAYER POLYSILICON CAPACITOR NODE DRAM PROCESS

Hsiao-Chin Tuan, Hsin-chu, Taiwan, assignor to Industrial Technology Research Institute, Hsin-chu, Taiwan

Filed Apr. 19, 1993, Ser. No. 47,397

Int. Cl.⁶ H01L *21/8242*

U.S. Cl. 438—253 **14 Claims**



1. The method of forming a DRAM capacitor structure with buried junction comprising:

forming a gate silicon oxide layer on a silicon substrate;
depositing a first doped layer of polysilicon over said gate silicon oxide layer;
patterning said first doped polysilicon layer to form gate electrodes;
implanting ions into said silicon substrate to form source/drain regions within said silicon substrate;
depositing a dielectric layer over said gate electrodes and an isolation layer;
anisotropically etching said dielectric layer to form dielectric spacers on the sidewalls of said gate electrodes;
depositing a node contact oxide layer over said gate electrodes and said isolation layer;
forming an opening in said node contact oxide layer to said silicon substrate;
depositing a dual layer of polysilicon over said node contact oxide layer and within said opening wherein said dual layer of polysilicon consists of a bottom layer of undoped polysilicon and a top layer of in-situ doped polysilicon and wherein the relative thicknesses of the said bottom layer and the said top layer of the said dual layer of polysilicon are calculated so as to optimize both the concentration of dopant at the surface of said capacitor node and the junction depth of said buried junction wherein said concentration of dopant at the surface must be greater than about 5 E 19 atoms/cm3 and wherein said junction depth must be less than about 0.45 micrometers and greater than 0;
annealing said substrate to drive in said dopant through said dual layer of polysilicon to form said buried junction within said substrate underlying said opening;
patterning said dual polysilicon layer to form the capacitor node;
depositing a capacitor dielectric layer over said capacitor node; and
depositing a second in-situ doped polysilicon layer over said capacitor dielectric to form the top capacitor plate to complete formation of said capacitor node structure with buried junction.

5,840,606

METHOD FOR MANUFACTURING A COMB-SHAPED LOWER ELECTRODE FOR A DRAM CAPACITOR

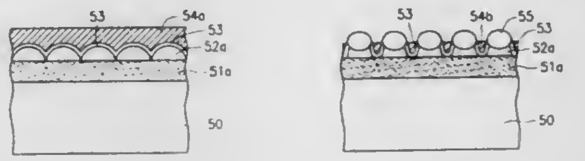
Claymens Lee, Fengshan, Taiwan, assignor to United Semiconductor Corp., Hsinchu, Taiwan

Filed Nov. 25, 1997, Ser. No. 977,539

Claims priority, application Taiwan, Jul. 28, 1997, 86110698

Int. Cl.⁶ H01L *21/8242*

U.S. Cl. 438—255 **8 Claims**



1. A method for manufacturing a DRAM capacitor comprising the steps of:

providing a substrate having a transistor and an insulating layer formed thereon, wherein the insulating layer contains a contact window opening exposing a source/drain region of the transistor;
forming a polysilicon layer over the insulating layer, the contact window opening and the exposed source/drain region;
forming a hemispherical grain silicon over the polysilicon layer;
forming an oxide layer over the hemispherical grain silicon;
forming a silicon nitride layer over gaps between the hemispherical grain silicon exposing portions of the oxide layer;
forming a plurality of hard mask layers over the oxide layer not covered by the silicon nitride layer; and
removing the silicon nitride layer, the oxide layer and portions of the polysilicon layer below the oxide layer using the hard mask layers to form a plurality of trenches.

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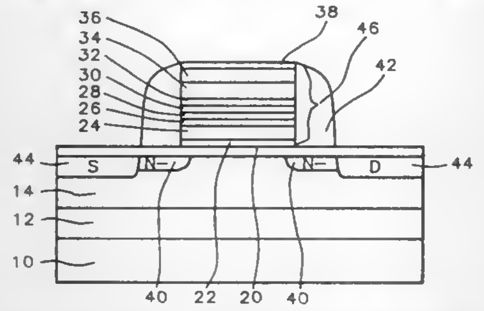
5,840,607
METHOD OF FORMING UNDOPED/IN-SITU DOPED/UNDOPED POLYSILICON SANDWICH FOR FLOATING GATE APPLICATION

Jun-Ker Yeh; Long-Sheng Yeou; Kuo-Sheng Chuang, and Slu-Han Liao, all of Hsin Chu, Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Ltd., Hsin-Chu, Taiwan

Filed Oct. 11, 1996, Ser. No. 729,996
Int. Cl.⁶ H01L *21/336*
U.S. Cl. 438—257 **19 Claims**

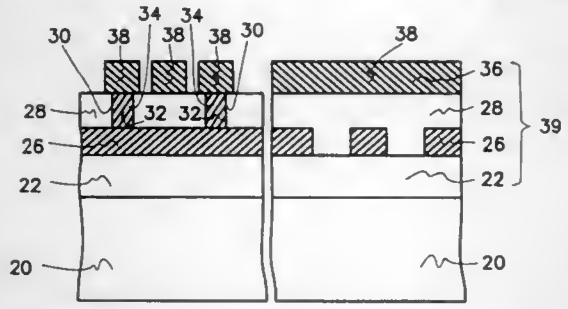


1. A method for forming a transistor having a floating gate comprised of an undoped/in-situ doped/undoped polysilicon sandwich on a substrate, the method comprising:
a) forming a tunnel oxide layer on said substrate;
b) forming a floating gate layer over said tunnel oxide layer by sequentially forming a first undoped polysilicon layer, a first doped polysilicon layer and a second undoped polysilicon layer;
c) forming an intergate dielectric layer over said floating gate layer;
d) forming a control gate over said intergate dielectric layer;
e) forming a cap oxide layer over said control gate;
f) patterning said cap oxide layer, said control gate said intergate dielectric layer said second undoped polysilicon layer said first doped polysilicon layer said first undoped polysilicon layer and said tunnel oxide layer thereby forming a stacked gate structure.

5,840,608
HIGH DENSITY ROM AND A METHOD OF MAKING THE SAME

Kuang-Yeh Chang, Taipei, Taiwan, assignor to United Microelectronics Corporation, Taipei, Taiwan

Filed Feb. 28, 1997, Ser. No. 808,260
Claims priority, application Taiwan, Nov. 22, 1996, 85114439
Int. Cl.⁶ H01L *21/8246*
U.S. Cl. 438—275 **10 Claims**

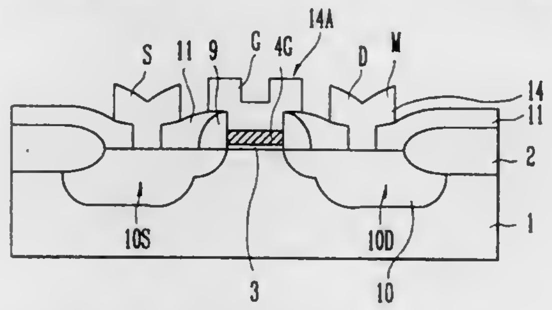


1. A method of making a high density ROM, comprising:
(a) forming a first insulating layer over a substrate;
(b) forming a first metal layer over the first insulating layer;
(c) patterning the first metal layer to form a plurality of parallel bit lines which are spaced from one another at substantially equal intervals, and which all extend in a first direction;
(d) forming a second insulating layer over the bit lines and first insulating layer;
(e) forming at least one via in the second insulating layer;
(f) blanketing tungsten over the second insulating layer and filling the via with the tungsten;
(g) removing a portion of the tungsten and leaving a remainder of the tungsten in the via to form a tungsten plug;
(h) forming a second metal layer over the second insulating layer; and
(i) patterning the second metal layer to form a plurality of parallel word lines which are spaced from one another at substantially equal intervals and which all extend in a second direction, wherein the first direction forms an angle with the second direction.

5,840,609
METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE HAVING STACKED GATE ELECTRODE STRUCTURE

Yeong Cheol Hyeon, and Hyun Kyu Yu, both of Daejon-Shi, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejon-shi, Rep. of Korea

Filed Oct. 16, 1997, Ser. No. 951,564
Claims priority, application Rep. of Korea, Nov. 4, 1996, 1996 51779
Int. Cl.⁶ H01L *21/26*
U.S. Cl. 438—299 **5 Claims**



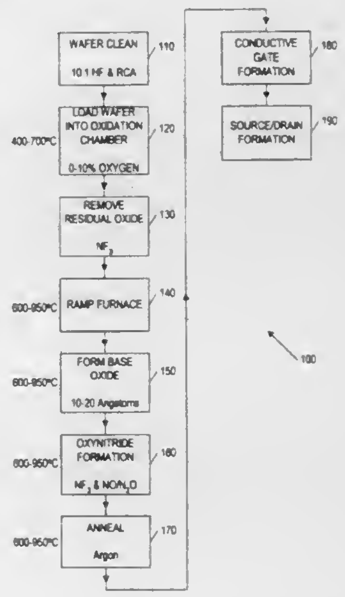
1. A method for manufacturing a semiconductor device having a stacked gate electrode structure comprising:
preparing a silicon substrate;
forming a field oxide layer on a portion of the silicon substrate;
growing a gate oxide layer on the silicon substrate;
sequentially depositing a first polysilicon layer, first oxide layer and second polysilicon layer on the entire surface of the resulting structure;
coating a first photoresist layer on the second polysilicon layer and for gate electrode at a predetermined portion on the second polysilicon layer;
sequentially removing the second polysilicon layer, the first oxide layer, the first polysilicon layer and the gate oxide layer using the mask pattern for gate electrode to thereby define a gate electrode structure;
removing the mask pattern for gate electrode;
introducing an impurity having a low density into the entire surface of the resulting structure to form a lightly doped diffusion region at the both side of the gate electrode structure into the silicon substrate;
depositing a second oxide layer on the entire surface of the resulting structure;
forming an oxide spacer at the both side of the gate electrode structure by a dry etching process of the second oxide layer;
introducing an impurity having a high density into the entire surface of the resulting structure to define a source region and a drain region into the lightly doped diffusion region of the silicon substrate;
depositing an doped oxide layer used as an interdielectric layer on the entire surface of the resulting structure including the oxide spacer and the field oxide layer;
heating the doped oxide layer and locally planarizing the top surface of the doped oxide layer;
coating a spin-on glass (SOG) layer on the doped oxide layer to secondary planarize the surface of the resulting structure;

removing the resulting structure planarized by the doped oxide layer and the spin-on glass (SOG) layer by performing a SOG etch-back process, until the top surface of the second polysilicon layer in the gate structure is exposed;
sequentially removing the exposed second polysilicon layer and the underlying first oxide layer to expose the top surface of the first polysilicon layer in the gate structure;
coating a second photoresist layer on the entire surface of the resulting structure and removing predetermined portions of the second photoresist layer to form a mask pattern for contact hole, thereby exposing portions of the oxide layer above the source region and the drain region;
removing the exposed portions of the doped oxide layer using the mask pattern for contact hole to define the contact holes for the source region and the drain region, to thereby expose a portion of the source region and the drain region;
removing the mask pattern for contact hole;
depositing a metal layer on the entire surface of the resulting structure; and
forming a metal on the source region, drain region and gate electrode structure by removing portions of the metal layer, thereby forming a source electrode, a drain electrode and a gate electrode which are respectively electrically connected to the source region, drain region and gate electrode structure.

5,840,610
ENHANCED OXYNITRIDE GATE DIELECTRICS USING NF_3 GAS

Mark C. Gilmer, Austin, and Mark I. Gardner, Cedar Creek, both of Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jan. 16, 1997, Ser. No. 784,741
Int. Cl.⁶ H01L *21/336;21/31:21/469*
U.S. Cl. 438—301 **21 Claims**

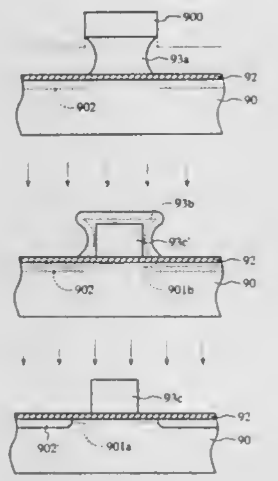


17. A method of forming a dielectric upon a semiconductor surface comprising:
removing a residual oxide from an upper surface of said semiconductor substrate in a fluorine bearing ambient such that a fluorine terminated upper surface is formed, wherein said removing is performed in a chamber at 400° to 700° C.;
ramping up the chamber temperature to 600° to 950° C.;
forming a base oxide layer substantially free of nitrogen by exposing the upper surface to a nitrogen-free, fluorine-free ambient; and
reoxidizing said base oxide layer in a reoxidizing ambient comprising nitrogen, oxygen, and fluorine to form an oxynitride layer.

5,840,611
PROCESS FOR MAKING A SEMICONDUCTOR MOS TRANSISTOR

Chang-Jae Lee, and Jae-Jeong Kim, both of Cheongju-si, Rep. of Korea, assignors to Goldstar Electron Company, Ltd., Chungcheongbuk-Do, Rep. of Korea

Continuation of Ser. No. 357,952, Dec. 15, 1994, abandoned. This application Jul. 23, 1997, Ser. No. 899,396
Claims priority, application Rep. of Korea, Dec. 16, 1993, 1993 28014
Int. Cl.⁶ H01L *21/336*
U.S. Cl. 438—307 **19 Claims**



1. A process for forming a MOS transistor having an LDD structure with at least a first impurity region and a second impurity region formed in a semiconductor substrate and a gate electrode of a first width, wherein the first impurity region has a higher inpurity concentration than the second impurity region and is spaced apart from a side of the gate electrode, the process comprising the steps of:
(a) forming an insulating layer on the semiconductor substrate;
(b) forming a conductive layer having a thickness on the insulating layer;
(c) forming an etch inhibition pattern on the conductive layer, wherein the etch inhibition pattern has a width greater than the first width;
(d) carrying out an anisotropic etching on the conductive layer using the etch inhibition pattern as a mask to remove a portion of the thickness of the conductive layer;
(e) carrying out an isotropic etching on the anisotropically etched conductive layer to form a gate electrode pattern, wherein the gate electrode pattern has concave sides and an upper portion of a second width greater than the first width;
(f) carrying out a first ion implantation for forming the first inpurity region in the semiconductor substrate, wherein the etch inhibition pattern and the gate electrode pattern having the upper portion of the second width are used as a first mask;
(g) removing the etch inhibition pattern after the first ion implantation;
(h) oxidizing e gate electrode pattern to form an oxide layer on the gate electrode pattern;
(i) removing the oxide layer for forming the gate electrode of the first width;
(j) carrying out a second ion implantation for forming the second impurity region in the semiconductor substrate, wherein the gate electrode is used as a second mask; and
(k) carrying out a heat treatment, wherein the LDD structure is formed.

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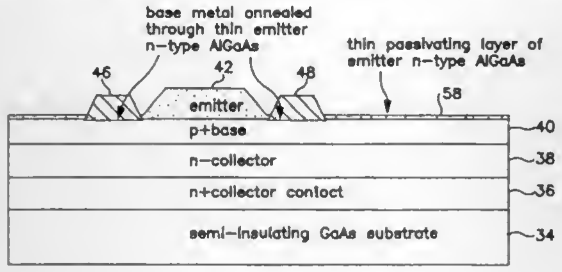
5,840,612
METHOD OF FABRICATING VERY HIGH GAIN HETEROJUNCTION BIPOLAR TRANSISTORS

Aaron K. Oki, Torrance; Dwight C. Strelt, Seal Beach; Donald K. Umemoto, Manhattan Beach, and Liem T. Tran, Torrance, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.
Continuation of Ser. No. 648,526, May 13, 1996, abandoned.
This application Aug. 14, 1997, Ser. No. 911,388
Int. Cl.^{6} H01L *21/331*
U.S. Cl. 438—312 14 Claims

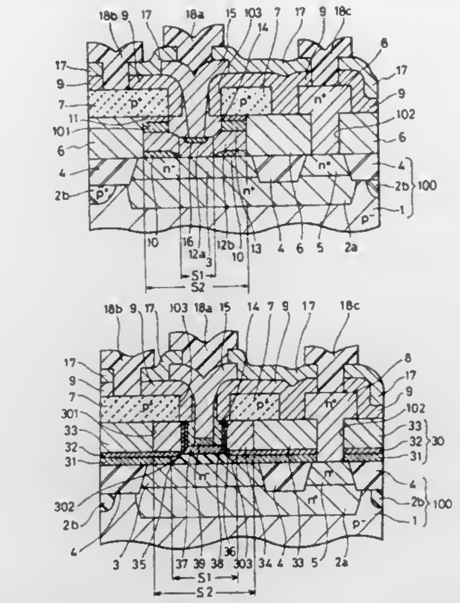

base metal annealed through thin emitter n−type AlGaAs
thin passivating layer of emitter n−type AlGaAs
46
42
48
58
emitter
p+base
n−collector
n+collector contact
semi−insulating GaAs substrate
40
38
36
34

1. A method for fabricating a heterojunction bipolar transistor (HBT) comprising the steps of:
- a) providing a vertically integrated device having a substrate layer, a subcollector layer, a collector layer, a base layer and an emitter layer formed one on top of the other;
- b) forming a first photoresist over the emitter layer;
- c) creating a photomask patterned to define the location of an emitter mesa and access to said base layer;
- d) exposing and developing said photoresist to remove all but a portion of the first photoresist on the emitter layer;
- e) etching said emitter layer to form an emitter mesa and a thin passivating layer, said etching controlled to leave said thin passivating layer of said emitter on top of said base layer in addition to said emitter mesa;
- f) applying a second photoresist to define the location of a pair of base metal contacts;
- g) exposing and developing said second photoresist to expose portions of the passivating layer, as well as creating an overhang on the emitter mesa to define locations for the base metal contacts;
- h) depositing a metal layer on said exposed areas of said passivating layer, as well as on top of said photoresist, forming base metal contacts, that are self aligned with respect to said emitter mesa;
- i) removing said second photoresist, as well as said metal layer on top of said photoresist, leaving a pair of base metal contacts that are self aligned with respect said emitter mesa on said passivating layer; and
- j) annealing said remaining base metal contacts to cause diffusion of said base metal contacts through said passivating layer to enable reaction of said base metal contacts with said base layer resulting in base ohmic contacts.

5,840,613
FABRICATION METHOD FOR SEMICONDUCTOR DEVICE

Fumihlko Sato, Tokyo, Japan, assignor to NEC Corporation, Japan
Division of Ser. No. 730,083, Oct. 15, 1996, Pat. No. 5,798,561.
This application Jun. 12, 1997, Ser. No. 873,357
Claims priority, application Japan, Oct. 16, 1995, 7-267173
Int. Cl.^{6} H01L *21/331*
U.S. Cl. 438—320 8 Claims

1. A fabrication method of a semiconductor device comprising:
- (a) providing a semiconductor base region having a first semiconductor active region of a first conductivity type in its inside;
  - said first active region being exposed from a main surface of said base region;



- (b) forming a first insulating region on said main surface of said base region to cover said first active region;
  - said first insulating region having a first window which exposes said first active region;
- (c) forming a semiconductor contact region of a second conductivity type opposite in polarity to said first conductivity type on said first insulating region;
  - said contact region having a second window whose size is smaller than that of said first window;
  - said contact region having an overhanging part which overhangs said first window;
  - said second window being defined by an inner end of said overhanging part which is entirely overlapped with said first window;
  - said contact region being made of a polycrystalline semiconductor;
- (d) forming a second semiconductor active region of said second conductivity type on said first active region contacting therewith in said first window;
- (e) forming a semiconductor connection region of said second conductivity type in said first window to surround said second active region; and
  - said connection region being contacted with said overhanging part of said contact region and said second active region, thereby electrically interconnecting said second active region with said contact region;
  - said connection region being made of a polycrystalline semiconductor.

5,840,614
METHOD OF PRODUCING A SEMICONDUCTOR WAFER USING ULTRAVIOLET SENSITIVE TAPE

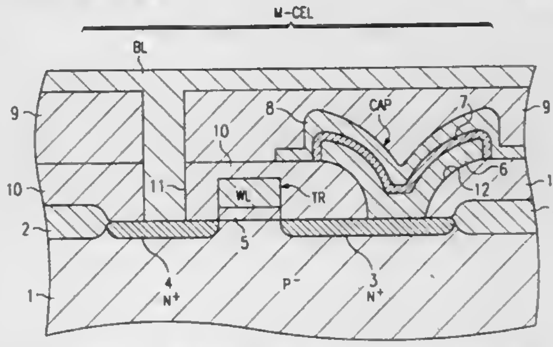
Sung Min Sim, Suwon-city, and Do Yun Hwang, Kwangjin-gu, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea
Filed Nov. 7, 1996, Ser. No. 744,376
Claims priority, application Rep. of Korea, Nov. 8, 1995, 9540239
Int. Cl.^{6} H01L *21/302*
U.S. Cl. 438—464 6 Claims

1. A process for producing semiconductor devices, the process comprising the steps of:
- forming a plurality of chips having predetermined circuit patterns on a first surface of a semiconductor wafer;
- adhering an ultraviolet sensitive tape to said first surface having predetermined circuit patterns formed thereon;
- lapping a second surface of the wafer, opposite to said first surface; and

- irradiating said ultraviolet sensitive tape with ultraviolet rays to release said ultraviolet sensitive tape from said first surface.

5,840,615
METHOD FOR FORMING A FERROELECTRIC MATERIAL FILM BY THE SOL-GEL METHOD, ALONG WITH A PROCESS FOR A PRODUCTION OF A CAPACITOR AND ITS RAW MATERIAL SOLUTION

Katsuhiro Aoki, Tsukuba; Yukio Fukuda, Toukai-mura; Akitoshi Nishimura, Tsukuba; Tomomi Nagao, Aikawa-machi, and Shinichi Hachiya, Sagamihara, all of Japan, assignors to Texas Instruments Incorporated, Dallas, Tex.
Continuation of Ser. No. 227,930, Apr. 15, 1994, abandoned.
This application Mar. 3, 1997, Ser. No. 810,201
Claims priority, application Japan, Apr. 16, 1993, 5-113973
Int. Cl.^{6} H01L *21/8242*
U.S. Cl. 438—396 9 Claims

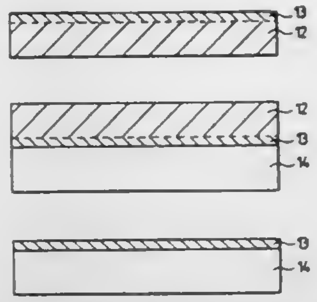


1. A method of forming a film of ferroelectric material with a perovskite crystalline structure by the sol-gel technique, said method comprising:
- preparing a raw material solution containing an organometallic compound of a metallic element from which the film of ferroelectric material is to be formed, and a stabilizer taken from one or a combination of substances of the group including an alkanolamine and a β-diketone, wherein the concentration of the stabilizer has a mole ratio to the total metal atoms of (stabilizer/total metal atoms)>3;
- providing a coating of the raw material solution on a substrate;
- drying the coating of the raw material solution to form a dried gel film; and
- oxidative sintering the dried gel film at a temperature in the range of substantially 450° up to 550° C. to form a film of ferroelectric material having a perovskite crystalline structure.

5,840,616
METHOD FOR PREPARING SEMICONDUCTOR MEMBER

Kiyofumi Sakaguchi, and Takao Yonehara, both of Atsugi, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 133,784, Oct. 8, 1993, abandoned, which is a continuation of Ser. No. 886,609, May 21, 1992, abandoned. This application Sep. 8, 1995, Ser. No. 525,246
Claims priority, application Japan, May 22, 1991, 3-145286; May 24, 1991, 3-148162; May 27, 1991, 3-149303; May 27, 1991, 3-149304; May 27, 1991, 3-149305; May 28, 1991, 3-150986; May 28, 1991, 3-150987; May 28, 1991, 3-150988; May 29, 1991, 3-152252
Int. Cl.^{6} H01L *21/76*
U.S. Cl. 438—459 24 Claims

1. A method for producing a semiconductor member comprising the steps of:
- forming a first substrate having a porous monocrystalline semiconductor layer and a non-porous monocrystalline semiconductor thin film layer;
- bonding, at a first temperature, said first substrate to an insulating second substrate having a thermal expansion coefficient different from that of said first substrate, to provide a first multi-layer structure wherein said non-porous monocrystalline semiconductor thin film layer is arranged at an inner side thereof;
- removing said porous monocrystalline semiconductor layer from said first multi-layer structure to form a second multi-layer structure; and
- thermally processing by heating said second multi-layer structure at a second temperature, higher than the first temperature, to strengthen the bonding between said second substrate and said non-porous monocrystalline semiconductor thin film layer.

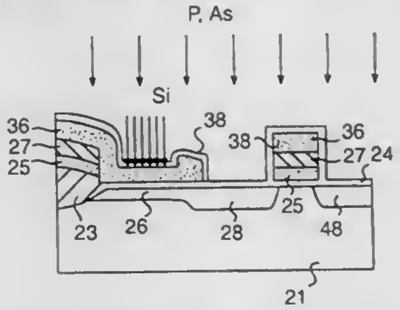


5,840,617

Patent Not Issued For This Number

5,840,618
METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE USING AN AMORPHOUS MATERIAL

Toshiyuki Kondo, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation of Ser. No. 515,377, Aug. 15, 1995, abandoned.
This application Sep. 23, 1996, Ser. No. 717,747
Claims priority, application Japan, Aug. 15, 1994, 6-211710
Int. Cl.^{6} H01L *21/425*
U.S. Cl. 438—533 20 Claims



1. A method of manufacturing a semiconductor device on a semiconductor substrate to form an interconnection layer in contact with an impurity region in the substrate, the method comprising the following steps:
- forming an oxide film on the substrate;
- forming an interconnection layer of amorphous material on the oxide film;
- forming a gate electrode on the oxide film;
- patterning the interconnection layer while the oxide film is on the substrate to prevent etching of the substrate;
- patterning the gate electrode while the oxide film is on the substrate to prevent etching of the substrate, wherein the gate electrode is separated from the interconnection layer;
- electrically connecting the interconnection layer to the substrate by introducing ions into the amorphous material to reduce the oxide film underneath the interconnection layer;
- forming an impurity region in a first portion of the substrate underneath the interconnection layer and in a second portion

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of the substrate extending from the interconnection layer to the gate electrode, wherein the impurity region is continuous from the first portion to the second portion of the substrate; and

crystallizing the amorphous material, after the introduction of ions into the amorphous layer, to increase the conductivity of the interconnection layer.

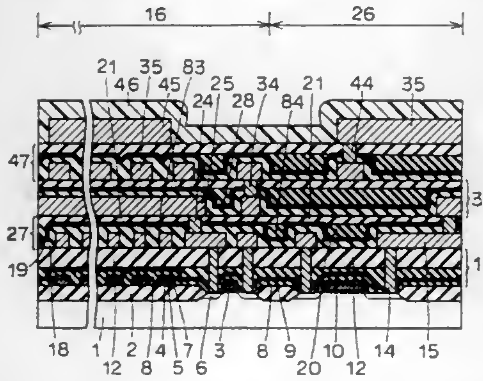
5,840,619
METHOD OF MAKING A SEMICONDUCTOR DEVICE HAVING A PLANARIZED SURFACE

Yoshio Hayashide, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 298,296, Aug. 31, 1994, Pat. No. 5,500,558. This application Jan. 16, 1996, Ser. No. 586,528

Int. Cl.⁶ H01L *21/44*

U.S. Cl. 428—598 **6 Claims**



1. A method for manufacturing a semiconductor device having a planarized surface, comprising:

- a first step of preparing a semiconductor substrate having a high density interconnection region including a convex pattern having a planarized portion and a low density interconnection region, at the periphery of the high density region, comprising a concave portion;
- a second step of forming an insulating film on said semiconductor substrate to cover said convex pattern and to fill in said concave portion;
- a third step of selectively etching away a portion of said insulating film located on said planarized portion of said convex pattern so as to leave a remaining frame-shaped insulating film, having a width of 1–500 μm, at least on said outer periphery of said convex pattern; and
- a fourth step of polishing said remaining insulating film by chemical/mechanical polishing method, thereby planarizing the surface of the semiconductor device.

5,840,620
METHOD FOR RESTORING THE RESISTANCE OF INDIUM OXIDE SEMICONDUCTORS AFTER HEATING WHILE IN SEALED STRUCTURES

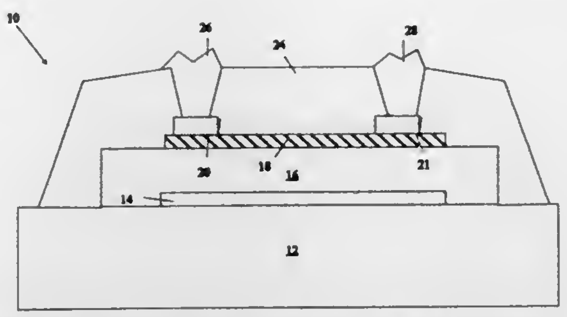
Carleton H. Seager, 1304 Onava Ct., NE., and Joseph Tate Evans, Jr., 13609 Verbena Pl., NE., both of Albuquerque, N. Mex. 87112

Continuation-in-part of Ser. No. 260,028, Jun. 15, 1994, abandoned. This application Dec. 22, 1995, Ser. No. 577,851

Int. Cl.⁶ H01L *21/477;31/18*

U.S. Cl. 438—609 **1 Claim**

1. In a method for the fabrication of a circuit element comprising the deposition of a semiconductor layer comprising Indium Oxide deposited on an oxygen containing ferroelectric sealed under a dielectric layer, followed by the heating of said semiconductor layer to a temperature in excess of 400° C., the improvement comprising the step of heating said semiconductor layer to a temperature between 100° C. and 300° C. and then cooling said circuit element to ambient temperature.



5,840,621
METHOD FOR MANUFACTURING CONTACT STRUCTURE CAPABLE OF AVOIDING SHORT-CIRCUIT

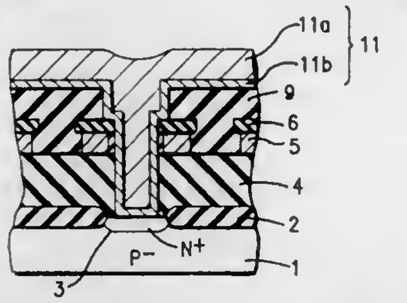
Naoki Kasai, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Division of Ser. No. 558,090, Nov. 13, 1995, Pat. No. 5,654,236. This application May 22, 1997, Ser. No. 861,769

Claims priority, application Japan, Nov. 15, 1994, 6-280399

Int. Cl.⁶ H01L *21/4763*

U.S. Cl. 438—618 **6 Claims**



1. A method for manufacturing a contact structure, comprising the steps of:

- forming a first insulating layer on a semiconductor substrate;
- forming a first conductive layer on said first insulating layer;
- forming a silicon nitride layer on said first conductive layer;
- forming a first pattern layer on said silicon nitride layer;
- anisotropically etching said silicon nitride layer and said first conductive layer with a mask of said first pattern layer;
- removing said first pattern layer;
- isotropically etching said first conductive layer with a mask of said silicon nitride layer and said first insulating layer;
- forming a second insulating layer on the entire surface after said first conductive layer is isotropically etched;
- forming a second pattern layer on said second insulating layer;
- perforating a contact hole in said second insulating layer and said first insulating layer;
- removing said second pattern layer; and
- burying a second conductive layer in said contact hole.

5,840,622
PHASE MASK LASER FABRICATION OF FINE PATTERN ELECTRONIC INTERCONNECT STRUCTURES

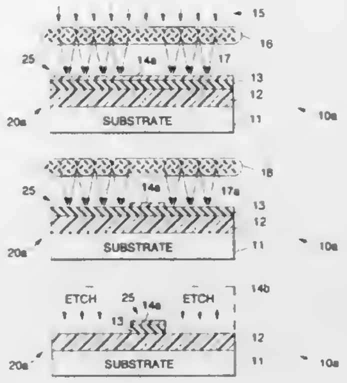
Robert S. Miles, Monrovia; Philip A. Trask, Laguna Hills, and Vincent A. Pillai, Irvine, all of Calif., assignors to Raytheon Company, Lexington, Mass.

Division of Ser. No. 436,045, May 5, 1995, abandoned, which is a continuation of Ser. No. 119,925, Sep. 10, 1993, abandoned. This application Aug. 27, 1996, Ser. No. 703,854

Int. Cl.⁶ H01L *21/28*

U.S. Cl. 438—622 **7 Claims**

1. A process for fabricating an interconnect structure comprising the steps of:



- providing a substrate;
- forming a first layer of dielectric material on the substrate wherein the first layer of dielectric material has a first thickness;
- forming a metal layer on the first layer of dielectric material;
- forming a second layer of dielectric material on the metal layer wherein the second layer of dielectric material has a second thickness that is less than about one-fifth of the first thickness of the first layer of dielectric material;
- disposing a phase mask above the second layer of dielectric material that has a phase pattern therein defining a metal conductor pattern that corresponds to an interconnect structure;
- providing a laser beam;
- processing the second layer of dielectric material using the phase mask and the laser beam to form the interconnect structure wherein a portion of the second layer of dielectric material remains on top of the interconnect structure.

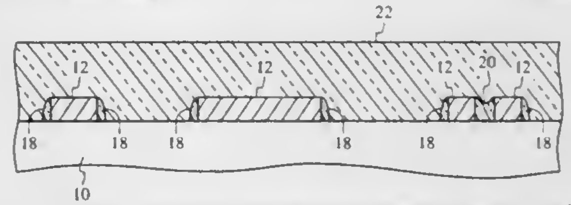
5,840,623
EFFICIENT AND ECONOMICAL METHOD OF PLANARIZATION OF MULTILEVEL METALLIZATION STRUCTURES IN INTEGRATED CIRCUITS USING CMP

Kashmir S. Sahota, Fremont, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 4, 1995, Ser. No. 539,140

Int. Cl.⁶ H01L *21/4763*

U.S. Cl. 438—624 **12 Claims**



1. A method for increasing the oxide removal rate of oxide chemical-mechanical polishing employed to planarize dielectric layers in an integrated circuit structure by forming said planarized dielectric layers from doped oxide films, said method comprising:

- (a) depositing at least one conducting film on said integrated circuit structure;
- (b) patterning and etching said conducting film to form conducting lines, some of which are separated by comparatively wide spaces and others of which are separated by comparatively narrow space therebetween;
- (c) filling said narrow spaces by forming spacers therein, and forming spacers in said comparatively wide spaces to form partially filled comparatively wide spaces;
- (d) depositing only one doped oxide film over said spacers in said narrow spaces and said spacers in said comparatively wide spaces and over said integrated circuit structure to completely fill said partially filled comparatively wide spaces; and
- (e) polishing said doped oxide film using chemical-mechanical polishing to planarize said dope oxide film, wherein the doped oxide film substantially increases the rate of planarization.

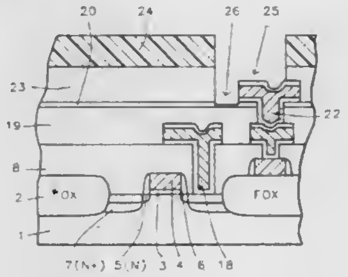
5,840,624
REDUCTION OF VIA OVER ETCHING FOR BORDERLESS CONTACTS

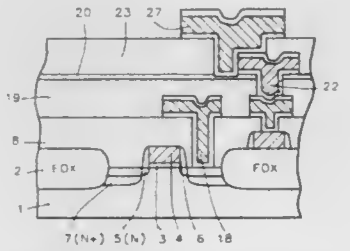
Syun-Ming Jang, and Yu Chen-Hua Douglas, both of Hsin-chu, Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Ltd, Hsin-chu, Taiwan

Filed Mar. 15, 1996, Ser. No. 616,411

Int. Cl.⁶ H01L *21/4763;21/44*

U.S. Cl. 438—624 **9 Claims**





1. A method for fabricating a MOSFET device structure, on a semiconductor substrate, using an etch stop layer, as part of an underlying interlevel dielectric composite layer, to prevent the etching of said underlying said interlevel dielectric composite layer, during the creation of a via hole, in an overlying interlevel dielectric layer, comprising the steps of:

- providing a MOSFET device structure, with source and drain regions on said semiconductor substrate;
- providing metal filled contact holes, in a silicon oxide layer, contacting a source and drain region of said MOSFET device structure;
- deposition of a first interlevel dielectric composite layer, consisting of a thick underlying first insulator layer, and of a thin overlying second insulator layer, on said metal filled contact hole, and on a top surface of said silicon oxide layer;
- opening a first via hole in said first interlevel dielectric composite layer, to said metal filled contact hole;
- depositing a first metallization layer on said first interlevel dielectric composite layer, completely filling said first via hole;
- patterning of a top portion of said first metallization layer to form a first level metal structure;
- deposition of a second interlevel dielectric layer on said first level metal structure, and on a top surface of said thin overlying insulator layer, of said first interlevel dielectric composite layer;
- opening a second via hole in said second interlevel dielectric layer, to said first level metal structure, and to the top surface of said thin overlying insulator layer, of said first interlevel dielectric composite layer, in regions where said second via hole did not overlie said first level metal structure, exposing a portion of the top surface of said first level metal structure, and exposing a side of said first level metal structure;
- deposition of a second metallization layer on said second interlevel dielectric layer, completely filling said second via hole, including deposition on top surface of said thin overlying insulator layer, of said first interlevel dielectric composite layer, in said second via hole, in regions where said second via hole did not overlie said first metal structure, deposition on a portion of the top surface of said first level metal structure, and deposition on the exposed side of said first level metal structure; and

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patterning of said second metallization layer to form second level metal structure.

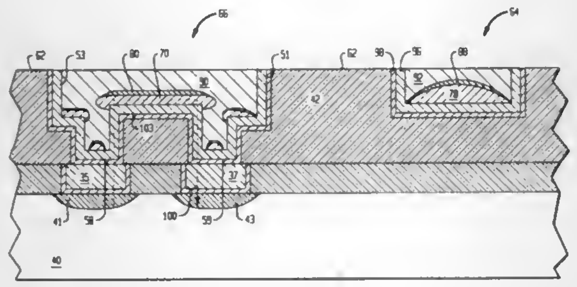
5,840,625
METHOD OF FABRICATING INTEGRATED CIRCUIT INTERCONNECTION EMPLOYING TUNGSTEN/ ALUMINUM LAYERS

Klaus Feldner, Fishkill, N.Y., assignor to Siemens Aktiengesellschaft, Munich, Germany

Division of Ser. No. 413,557, Mar. 30, 1995, abandoned. This application Oct. 4, 1996, Ser. No. 726,443

Int. Cl.⁶ H01L *21/28*

U.S. Cl. 438—626 7 Claims



1. A method of fabricating an integrated circuit interconnection for interconnecting at least first and second conductive regions within an integrated circuit, comprising the steps of: forming at least first and second via holes in a dielectric body of said integrated circuit, said first via hole extending to said first conductive region, said second via hole extending to said second conductive region;

- forming a first runner opening within said dielectric body between said via holes;
- depositing a first conductive barrier layer on said first and second conductive regions within said via holes and in a third region within said first runner opening;
- depositing a first tungsten layer on said first conductive barrier layer;
- forming an aluminum layer on said first tungsten layer;
- depositing a second conductive barrier layer on said aluminum layer; and
- depositing a second tungsten layer on said second barrier layer.

5,840,626
SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THE SAME

Tatsuya Ohguro, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 27, 1996, Ser. No. 722,324

Claims priority, application Japan, Sep. 28, 1995, 7-250420; Sep. 18, 1996, 8-266614

Int. Cl.⁶ H01L *21/4763*

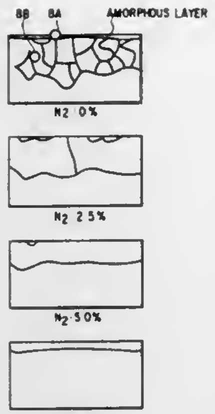
U.S. Cl. 438—649 21 Claims

1. A method of manufacturing a semiconductor device comprising the steps of:

- forming a first metal film including a first metal on a surface of a silicon layer by sputtering using a gas mixture comprising nitrogen gas, said first metal being nickel; and
- causing thermal reaction of said silicon layer with said metal film to form a monosilicide film of said first metal.

6. A method of manufacturing a semiconductor device comprising the steps of:

- forming a first metal film including a first metal on a surface of a silicon layer, said first metal being nickel;



- adding nitrogen to said first metal film by ion implantation; and
- causing thermal reaction of said silicon layer with said first metal film to form a monosilicide film of said first metal.

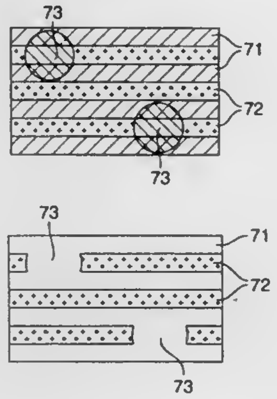
5,840,627
METHOD OF CUSTOMIZING INTEGRATED CIRCUITS USING STANDARD MASKS AND TARGETING ENERGY BEAMS FOR SINGLE RESIST DEVELOPMENT

Alan H. Huggins, Gilroy, Calif., assignor to Clear Logic, Inc., Santa Clara, Calif.

Filed Mar. 24, 1997, Ser. No. 823,777

Int. Cl.⁶ H01L *21/44*

U.S. Cl. 438—669 20 Claims



1. A method for customizing integrated circuits comprising the steps of:

- providing a substrate in which circuit elements have been formed, said circuit elements having connection points provided at an upper surface of the substrate;
- forming a conductive layer over said upper surface of the substrate;
- depositing a photoresist layer over said conductive layer;
- exposing said photoresist layer to define a pattern of interconnect lines and spaces on said photoresist layer;
- exposing said photoresist layer to define desired areas on said pattern of interconnect lines and spaces; and
- developing and removing exposed portions of said photoresist layer to create a pattern of said photoresist.

5,840,628
PLASMA CVD METHOD FOR DEPOSITING TIN LAYER

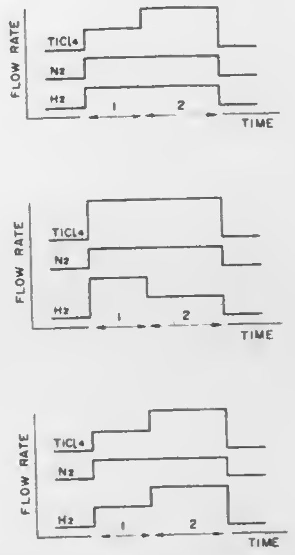
Takaaki Miyamoto, Kanagawa, Japan, assignor to Sony Corporation, Japan

Filed Jun. 13, 1995, Ser. No. 489,765

Claims priority, application Japan, Jun. 22, 1994, 6-139765

Int. Cl.⁶ H01L *21/44*

U.S. Cl. 438—680 21 Claims



1. A plasma CVD method for depositing TiN layers on a processed substrate by using mixture gas comprising Ti-based gas, H_2 gas and nitrogen-based gas, said plasma CVD method wherein a first plasma CVD process with a low mixture ratio of said Ti-based gas in said mixture gas is carried out prior to a second plasma CVD process with an increased mixture ratio of said Ti-based gas in said mixture gas.

5,840,629
COPPER CHEMICAL MECHANICAL POLISHING SLURRY UTILIZING A CHROMATE OXIDANT

Ronald A. Carpio, Austin, Tex., assignor to Sematech, Inc., Austin, Tex.

Filed Dec. 14, 1995, Ser. No. 572,082

Int. Cl.⁶ H01L *21/302;* **C09K** *13/00*

U.S. Cl. 438—692 21 Claims

1. A copper polishing slurry for use in chemical mechanical polishing of a copper layer formed atop a semiconductor wafer, said copper polishing slurry comprising a chromate salt, wherein said slurry is for use in chemical mechanical polishing of a copper layer, wherein said slurry allows rapid formation of a passive oxide film on said copper layer which reduces or prevents dissolution or etching of said copper, and wherein said slurry allows said passive oxide film to be removed when said passive oxide film is subjected to abrasive action.

5,840,630
FBI ETCHING ENHANCED WITH 1,2 DI-IODO-ETHANE

Michael A. Cecere, San Jose, and Theodore Ralph Lundquist, Dublin, both of Calif., assignors to Schlumberger Technologies Inc., San Jose, Calif.

Filed Dec. 20, 1996, Ser. No. 771,804

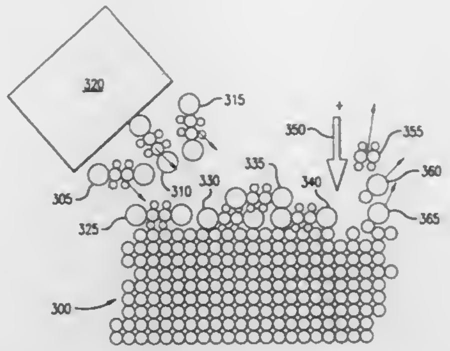
Int. Cl.⁶ H01L *21/302*

U.S. Cl. 438—712 16 Claims

1. A method of etching material from a specimen, comprising:

a. placing a specimen in a vacuum chamber;

b. directing a vapor containing molecules of 1,2 di-iodo-ethane at a localized surface region of the specimen from which material is to be etched;



c. generating a focused ion beam; and

d. directing the focused ion beam at the localized surface region to etch material from the specimen.

5,840,631
METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE

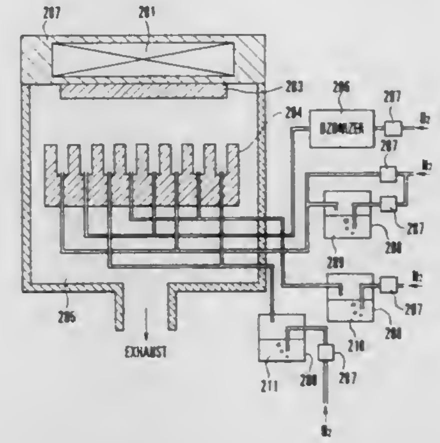
Akira Kubo; Tetsuya Homma, and Koji Kishimoto, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Nov. 27, 1995, Ser. No. 562,991

Claims priority, application Japan, Nov. 28, 1994, 6-293069

Int. Cl.⁶ H01L *21/443*

U.S. Cl. 438—789 15 Claims



1. A method of manufacturing a semiconductor device, comprising the steps of:

- forming a lower wiring layer on a semiconductor substrate through an insulating film;
- adding a stall quantity of compound gas having a catalytic effect for promoting formation of silicon oxide using a main component gas comprising a large quantity of ozone, water vapor, and one of alkoxysilane and organosiloxane as a source gas to form a silicon oxide insulating film by a chemical vapor deposition (CVD) method on a surface of said semiconductor substrate on which said lower wiring layer is formed, said small quantity of the compound gas being small relative to the quantity of said main component gas and said large quantity of ozone being large relative to quantities of the water vapor and said one of alkoxysilane-and organosiloxane; and
- forming an upper wiring layer on said silicon oxide film.

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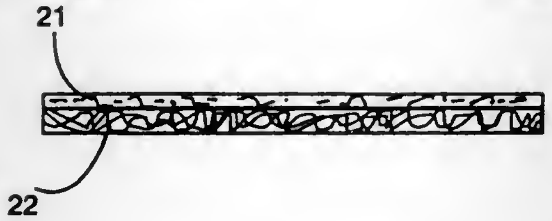
5,840,632
REMOVAL OF ORGANIC CONTAMINANTS USING POLYMERIC SHEETS, FILMS, STRANDS AND FILAMENTS

Gerald W. Miller, Cincinnati, Ohio, assignor to Hitech Polymers Inc., Cincinnati, Ohio

Filed Sep. 30, 1996, Ser. No. 723,388

Int. Cl.^{6} C08L *63/00*

U.S. Cl. 442—62 **19 Claims**



19. A foamed film capable of absorbing organic contaminants and provided as an extrusion coat on a plastic fiber mat, comprising:

- a foamed film formed from a composition comprising: 10–45% by weight of one or more of polystyrene, polyethylene, polypropylene, and their copolymers; about 0.1–1% by weight blowing agent; and at least about 50% by weight elastomeric material; and
- wherein the plastic fiber mat is a polypropylene fiber mat, and wherein said film has a thickness of between about 5–200 mils.

5,840,633
NONWOVEN FABRIC AND METHOD OF MAKING THE SAME

Kazuhiko Kurihara, Itabashi-ku; Hiroshi Yazawa, Kunitachi; Toshikazu Ohishi, Kawaguchi; Yoichi Mazawa, Yono; Yuki Kuroiwa, Shiki; Shuichi Murakami, Itabashi-ku; Sadayuki Ishiyama, Setagaya-ku, and Jun Yamada, Yokosuka, all of Japan, assignors to Polymer Processing Research Inst., Ltd., and Nippon Petrochemicals Company, Ltd., both of Tokyo, Japan

PCT No. PCT/JP95/02376, § 371 Date Sep. 17, 1996, § 102(e) Date Sep. 17, 1996, PCT Pub. No. WO96/17121, PCT Pub. Date Jun. 6, 1996

PCT Filed Nov. 22, 1995, Ser. No. 682,535

Claims priority, application Japan, Nov. 25, 1994, 6-315470

Int. Cl.^{6} D04H *3/04;3/00*

U.S. Cl. 442—361 **18 Claims**

1. A nonwoven fabric comprising a first fiber web prepared by stretching a mass of long fiber filaments, said long fiber filaments formed from at least two different thermoplastic polymers wherein said filaments are aligned in one direction, and a second fiber web laminated to said first fiber web wherein said first and said second fiber webs each have a strength of at least 0.5 g/d.

8. A method of making a nonwoven fabric comprising preparing a first fiber web formed of long fiber filaments, said filaments formed of at least two thermoplastic polymers having different properties and having substantially no molecular orientation; [and] stretching said first fiber web in one direction whereby a stretched first fiber web is obtained; and laminating a second fiber web to said first fiber web, wherein said first and said second fiber webs each have a strength of at least 0.5 g/d.

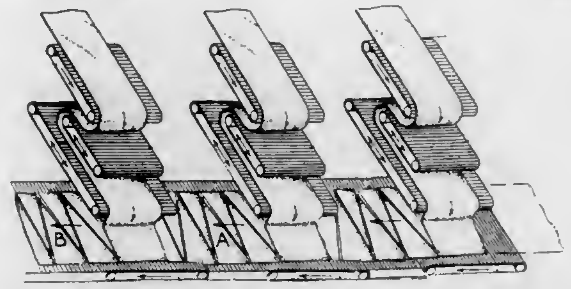
5,840,634
SEALING OF BONDED BATTS

Susan Carol Chamberlin, Wilmington; Wo Kong Kwok, Hockessin, and Robert Wallace Slavin, Newark, all of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 22, 1996, Ser. No. 589,661

Int. Cl.^{6} B32B *31/00*

U.S. Cl. 442—361 **1 Claim**



1. A bonded batt having opposed faces and consisting essentially of polyester fiberfill that is of dtex 0.2–50 and that is through-bonded with bonded bicomponent fiber of dtex 1–10, one component of which softens at a higher temperature than does the other component which is a binder material that softens at a temperature that is at least 100° C. and that is also lower than the temperature at which the fiberfill begins to soften, said bonded bicomponent fiber being in amount about 5 to about 25% by weight calculated on the sum of its own weight and that of the polyester fiberfill, and of a barrier layer that (1) comprises about 5 to about 25% by weight of the batt, (2) is located at one or both of said faces and (3) consists essentially of bonded bicomponent fibers of dtex 1–10, one component of which softens at a higher temperature than does the other component which is a binder material that softens at a temperature that is at least 100° C. and that is also lower than the temperature at which said fiberfill begins to soften.

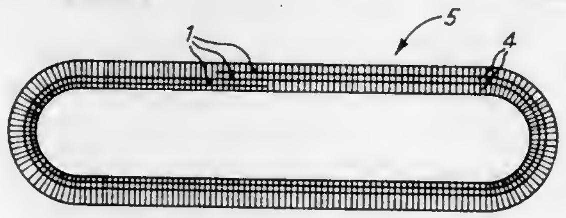
5,840,635
TRANSPORT AND SUPPORT MEANS FOR HEAVY, HIGH TEMPERATURE ARTICLES AND ITS MANUFACTURING PROCESS

Serafino Bertotto, Como, Italy, assignor to Industrie Tessili Bresciane S.P.A., Merone, Italy

Filed Oct. 18, 1996, Ser. No. 733,797

Int. Cl.^{6} B32B *5/02*

U.S. Cl. 442—270 **15 Claims**



1. A transport and support means for heavy high temperature articles which includes:

- (a) a flexible support base made of a woven fabric (**1**) with a heat resistance of at least 150° C., and
- (b) a veil or layer (**4'**) of synthetic staple heat resistant fibres needled to at least one surface of the flexible support base,

where the flexible support base is made of at least one weft woven fabric (**1**), one or more ply (**1***a*, **1***b*, **1***c*), using rigid, synthetic monofilaments with a diameter between 0.1 and 1.0 mm and warp woven using parallel, twisted or braided synthetic multifilaments (**1***d*) and where the aforementioned support base has been treated with a silicon rubber or with a heat-resistant resin and then vulcanised.

5,840,636
CONVEYOR BELT HAVING A WOVEN FABRIC BACKING

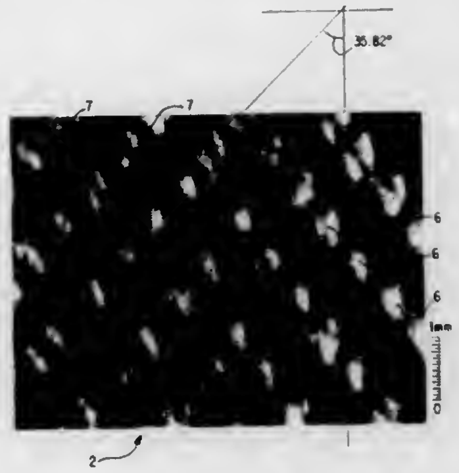
Yoshinori Mitsutsuka, Hamamatsu; Hans-Georg Tope, Langenhagen, and Burkhard Koenig, Neustadt, all of Germany, assignors to Forbo International S.A., Eglisau/Zurich, Switzerland

Filed Nov. 25, 1996, Ser. No. 756,016

Claims priority, application Germany, Nov. 25, 1995, 195 43 975.9

Int. Cl.^{6} D03D *3/00;* F16G *1/00*

U.S. Cl. 442—203 **6 Claims**



1. A conveyor belt for movement in a moving direction, said conveyor belt having a woven fabric backing, the woven fabric of said backing comprising staple fiber yarns and being woven in a twill weave with an inclination angle of from 10° to 70° relative to the moving direction of the conveyor belt, wherein said staple fiber yarns are warp yarns of said woven fabric, adjacent warp yarns having the same direction of lay in a longitudinal direction and being alternately S and Z twisted, and said conveyor belt further comprising elements for supporting tensile forces, said tensile force supporting elements being arranged in a woven fabric or being sheathed as threads by staple fibers.

5,840,637
YARNS OF COVERED HIGH MODULUS MATERIAL AND FABRICS FORMED THEREFROM

Jeffrey Scott Denton, Mendon; Dana Burton Eagles, Sherborn; Joseph Gerald O'Connor, Hopedale, and Robert Bernard Davis, Framingham, all of Mass., assignors to Albany International Corporation, Albany, N.Y.

Continuation-in-part of Ser. No. 714,856, Sep. 17, 1996. This application Sep. 18, 1996, Ser. No. 710,488

Int. Cl.^{6} D03D *3/00*

U.S. Cl. 442—200 **13 Claims**

1. A fabric for use in the forming, pressing, or drying sections of a paper making machine, the fabric having at least one layer comprised of a composite yarn comprised of:

- a first yarn of high modulus filamentary material within a second yarn;
- wherein the second yarn is a bicomponent filamentary material, the bicomponent filamentary material having a sheath component and a core component, wherein the bicomponent filamentary material covers the first, high modulus filamentary material and encases the first, high modulus filamentary material along the length of the composite yarn.

5,840,638
PHOSPHATE GLASSES FOR RADIOACTIVE, HAZARDOUS AND MIXED WASTE IMMOBILIZATION

Hui Cao, Middle Island; Jay W. Adams, Stony Brook, and Paul D. Kalb, Wading River, all of N.Y., assignors to Brookhaven Science Associates, Upton, N.Y.

Filed Dec. 23, 1996, Ser. No. 772,982

Int. Cl.^{6} C03C *3/17*

U.S. Cl. 501—48 **3 Claims**

1. A lead-free glass composition which consists essentially of from about 1 mole % to about 6 mole % iron (III) oxide, from about 1 mole % to about 6 mole % aluminum oxide, from about 15 mole % to about 20 mole % sodium oxide or potassium oxide, from about 30 mole % to about 60 mole % phosphorous pentoxide, wherein said lead-free glass composition has a melting temperature from about 850° C. to about 950° C., whereby a glass composition of sufficient chemical durability is obtained for encapsulation of radioactive, hazardous and mixed wastes.

5,840,639
PROCESS FOR MAKING CRACK-FREE SILICON CARBIDE DIFFUSION COMPONENTS

Jack Shindle, Rutland; Stephen Dynan, Sterling, and John Vayda, West Brookfield, all of Mass., assignors to Saint-Gobain/Norton Industrial Ceramics Corporation, Worcester, Mass.

Division of Ser. No. 725,717, Oct. 4, 1996, Pat. No. 5,702,997. This application Sep. 10, 1997, Ser. No. 926,708

Int. Cl.^{6} C04B *35/52*

U.S. Cl. 501—88 **17 Claims**

1. A method for producing a crack-free recrystallized silicon carbide body, comprising the steps of:

- a) providing a raw powder batch comprising:
  - i) at least 40 w/o fine grain fraction having a particle size of less than 10 microns, the fine grain fraction comprising silicon carbide and fine free carbon, wherein the fine free carbon is present in an amount of at least 0.10 w/o of the raw batch, the fine free carbon having a surface area of at least 10 m^2/g,
  - ii) at least 40 w/o coarse grain fraction having a particle size of at least 30 microns, the coarse grain fraction comprising silicon carbide and coarse free carbon, wherein the coarse free carbon is present in an amount of at least 0.10 w/o of the coarse grain fraction,

  the raw batch having a total silica content of at least 0.5 w/o, the raw batch having a total silicon carbide content of at least 96 w/o,
- b) forming the raw batch into a green body, and
- c) recrystallizing the green body to provide a recrystallized silicon carbide body having a density of between 2.0 g/cc and 2.8 g/cc.

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5,840,640

Patent Not Issued For This Number

5,840,641
PREPARATION OF PULVERULENT ZIRCONIUM DIOXIDE

Hans-Josef Sterzel, Dannstadt-Schauernheim, and Werner Hesse, Obrigheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed May 6, 1997, Ser. No. 851,346

Claims priority, application Germany, May 15, 1996, 196 19 638.8

Int. Cl.^{6} C04B *35/48;* **C01G** *25/02*

U.S. Cl. 501—103 **11 Claims**

1. A process for the preparation of pulverulent zirconium dioxide which comprises

a) dissolving a chlorine free zirconium compound in a mixture of formic acid and water in a molar ratio of from 1:1 to 1:3 as a solvent to form a solution,

b) removing the volatile components from said solution to form a residue, and

c) calcinating said residue.

5,840,642
DIELECTRIC MATERIAL FOR MICROWAVE OF $CATIO_3$-$LA(MG_{1/2}TI_{1/2})$ O_3-$LAALO_3$ GROUP

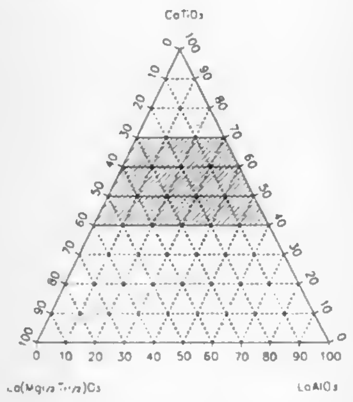
Kyung Yong Kim, Seoul, and Whan Choi, Choongcheongbuk-Do, both of Rep. of Korea, assignors to Korea Institute of Science and Technology, Rep. of Korea

Filed Aug. 15, 1997, Ser. No. 912,181

Claims priority, application Rep. of Korea, Aug. 17, 1996, 1996 34072

Int. Cl.^{6} L04B *35/465*

U.S. Cl. 501—136 **2 Claims**



1. A dielectric material for a microwave of a $CaTiO_3$-$La(Mg_{1/2}Ti_{1/2})O_3$-$LaAlO_3$ group, comprising a composition condition of $0.3 \leqq x \leqq 0.6$ and $0.2 \leqq y \leqq 0.8$ wherein (1-x) $CaTiO_3$-x [(1-y) La $(Mg_{1/2}Ti_{1/2})O_3$-y$LaAlO_3$].

5,840,643
RECOVERY OF OXIDATION CATALYSTS USED FOR THE PRODUCTION OF TRIMELLITIC ACID

Sang-hoon Park; Jae-Young Bae; Young-sam Kim, and Jae-eun Kim, all of Kyungsangnam-do, Rep. of Korea, assignors to Yukong Limited, Seoul, Rep. of Korea

Filed Jan. 3, 1996, Ser. No. 577,310

Claims priority, application Rep. of Korea, Jan. 7, 1995, 1995-226

Int. Cl.^{6} B01J *70/34*

U.S. Cl. 502—25 **14 Claims**

1. A method for separating oxidation catalysts used for production of trimellitic acid, consisting essentially of:

adding water to a reactor effluent in a volume ratio of water to the reactor effluent of 0:1 to 11:1, said reactor effluent being in a slurry state and resulting from oxidizing pseudocumene with air in acetic acid and in the presence of cobalt, manganese and bromine catalysts;

heating the mixture of water and the reactor effluent to a temperature of 25° to 140° C. to convert the slurry to a diluted reactor effluent in a liquid phase;

passing the diluted reactor effluent through ion exchange resins to adsorb cobalt, manganese and bromine ions on the resins;

regenerating the resins with a regenerating agent; and

simultaneously isolating the cobalt, manganese and bromine catalysts from said regenerating agent.

5,840,644
METALLOCENES CONTAINING ARYL-SUBSTITUTED INDENYL DERIVATIVES AS LIGANDS, PROCESS FOR THEIR PREPARATION, AND THEIR USE AS CATALYSTS

Frank Küber, Oberursel; Bernd Bachmann, Eppstein; Walter Spaleck, Liederbach; Andreas Winter, Glashütten, and Jürgen Rohrmann, Kelkheim, all of Germany, assignors to Targor GmbH, Germany

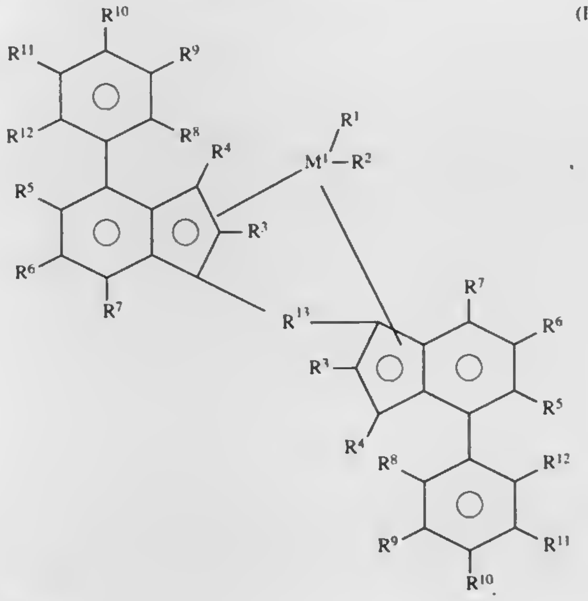
Continuation of Ser. No. 475,155, Jun. 7, 1995, which is a division of Ser. No. 83,816, Jun. 28, 1993, abandoned. This application Dec. 28, 1995, Ser. No. 580,416

Claims priority, application Germany, Jun. 27, 1992, P 42 21 244.8

Int. Cl.^{6} C08F *4/642*

U.S. Cl. 502—117 **5 Claims**

1. A catalyst system which comprises the combination of components comprising a metallocene and a cocatalyst, wherein the metallocene is a compound of the formula I



(I)

in which

M^1 is a metal from group IVb, Vb or VIb of the Periodic Table,

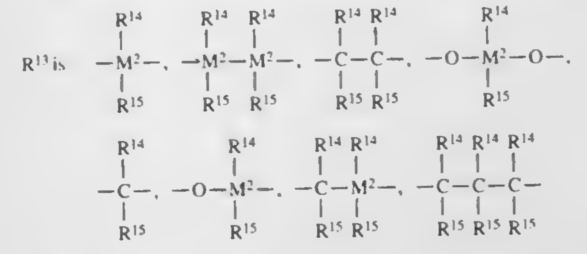
R^1 and R^2 are identical or different and are a hydrogen atom, a C_1–C_{10}-alkyl group, a C_1–C_{10}-alkoxy group a C_6–C_{10}-aryl group, a C_6–C_{10}-aryloxy group, a C_2–C_{10}-alkenyl group, a C_7–C_{40}-arylalkyl group, a C_7–C_{40}-alkylaryl group, a C_8–C_{40}-arylalkenyl group, an OH group or a halogen atom,

the radicals R^3 are identical or different and are a hydrogen atom, a halogen atom, a C_1–C_{10}-alkyl group, which may be halogenated, a C_8–C_{10}-aryl group,

an —NR^{16}_2, —SR^{16},—$OSiR^{16}_3$, —SiR^{16}_3 or —PR^{16}_2 radical, in which R^{16} is a halogen atom, a C_1–C_{10}-alkyl group or a C_6–C_{10}-aryl group,

the radicals R^8 are identical or different and are a C_1–C_{10}-alkyl group, which may be halogenated, a C_6C_{10}-aryl group, an —NR^{16}_2, —SR^{16}, —$OSiR^{16}_3$, —SiR^{16}_3 or —PR^{16}_2 radical, in which R^{16} is a halogen atom, a C_1–C_{10}-alkyl group or a C_6–C_{10}-aryl group,

R^4 to R^7 and R^9 to R^{12} are identical or different and are as defined for R^3, or adjacent radicals R^4 to R^{12}, together with the atoms connecting them, form one or more aromatic or aliphatic rings, or the radicals R^5 and R^8 or R^{12}, together with the atoms connecting them, form an aromatic or aliphatic ring,



$$R^{13}\text{ is }\ -\overset{R^{14}}{\underset{R^{15}}{M^2}}-,\ -\overset{R^{14}}{\underset{R^{15}}{M^2}}-\overset{R^{14}}{\underset{R^{15}}{M^2}}-,\ -\overset{R^{14}}{\underset{R^{15}}{C}}-\overset{R^{14}}{\underset{R^{15}}{C}}-,\ -O-\overset{R^{14}}{\underset{R^{15}}{M^2}}-O-,$$

$$-\overset{R^{14}}{\underset{R^{15}}{C}}-,\ -O-\overset{R^{14}}{\underset{R^{15}}{M^2}}-,\ -\overset{R^{14}}{\underset{R^{15}}{C}}-\overset{R^{14}}{\underset{R^{15}}{M^2}}-,\ -\overset{R^{14}}{\underset{R^{15}}{C}}-\overset{R^{14}}{\underset{R^{15}}{C}}-\overset{R^{14}}{\underset{R^{15}}{C}}-$$

$=BR^{14}$, $=AlR^{14}$, —Ge—, —O—, —S—, =SO, $=SO_2$, $=NR^{14}$, =CO, $=PR^{14}$ or $=P(O)\,R^{14}$, where R^{14} and R^{15} are identical or different and are a hydrogen atom, a halogen atom, a C_1–C_{10}-alkyl group, a C_1–C_{10}- fluoroalkyl group, a C_1–C_{10}-alkoxy group, a C_6–C_{10}aryl group, a C_8–C_{10}-fluoroaryl group, a C_6–C_{10}-aryloxy group, a C_2–C_{10}-alkenyl group, a C_7–C_{40}-arylalkyl group, a C_7–C_{40}-alkylaryl group or a C_8–C_{40}-arylalkenyl group, or R^{14} and R^{15}, in each case together with atoms connecting them, form one or more rings, and

M^2 is silicon, germanium or tin.

5,840,645
OLEFIN POLYMERIZATION CATALYST AND METHOD FOR THE POLYMERIZATION OF OLEFIN USING SAID OLEFIN POLYMERIZATION CATALYST

Ryosuke Ohno, Ichihara, and Toshiyuki Tsutsui, Kuga-gun, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 416,536, Apr. 3, 1995, abandoned, which is a continuation of Ser. No. 101,707, Aug. 4, 1993, abandoned. This application Feb. 20, 1996, Ser. No. 603,096

Claims priority, application Japan, Aug. 6, 1992, 4-210408; Jun. 17, 1993, 5-171256

Int. Cl.^{6} C08F *4/656;4/655;10/00*

U.S. Cl. 502—117 **26 Claims**

1. An olefin polymerization catalyst comprising

(I) a prepolymerized olefin polymerization catalyst obtained by bringing (D) a silica particulate carrier into contact with (A) an aluminoxane compound,

bringing the resulting product into contact with (B) a transition metal compound represented by the formula (ii'): $R^3R^4R^5R^6M$ wherein M represents zirconium or hafnium, R^3 and R^4 each represent a group having a cyclopentadienyl skeleton and can be linked together through an alkylene group, a substituted alkylene group, a silylene group or a substituted silylene group, and R^5 and R^6 each represent alkyl group, cycloalkyl group, aryl group, aralkyl group, alkoxy group, aryloxy group, trialkylsilyl group, SO_3R group, halogen atom or hydrogen atom, wherein said substituted alkylene group is substituted with 1 or 2 hydrocarbon groups each having 1 to 6 carbon atoms, and wherein said substituted silylene group is substituted with 1 or 2 hydrocarbon groups each having 1 to 6 carbon atoms, and (C) an organoaluminum hydride compound represented by the formula $H_nAlR^7_{3-n}$, wherein R^7 represents an alkyl group, a cycloalkyl or aryl group, and n is 1 or 2, wherein said aluminoxane compound (A) is in an amount of 10 to 500 in terms of the atomic ratio (Al/transition metal) of aluminum of said compound (A) to the transition metal of the transition metal compound (B), said transition metal compound (B) is in an amount of 5×10^{-6} to 5×10^{-4} mol, as transition metal based on 1 g of the silica particulate carrier (D), and said organoaluminum hydride compound (C) is in an amount of 0.01 to 3 in terms of the atomic ratio (Al-C/Al-A) of aluminum atom (Al-C) of the compound (C) to aluminum atom (Al-A) of the aluminoxane (A) and

prepolymerizing ethylene in the presence of the resultant catalyst to obtain said prepolymerized olefin polymerization catalyst containing polyolefin in an amount of 1 to 100 gram based on 1 gram of the particulate carrier; and

(II) (E) an organoaluminum compound, wherein the organoaluminum compound (E) is contained in an amount of from 3 to 150 mols based on 1 g atom of transition metal in the transition metal compound (B) in said solid catalyst component and

said organoaluminum compound (E) is selected from the group consisting of:

the compounds represented by the formula of $R^7_nAlX_{3-n}$ wherein R^7 represents a hydrocarbon group of 1–12 carbon atoms, X represents halogen and n is 1–3; and

from the group consisting of the compounds represented by the formula of $R^7_nAlY_{3-n}$ wherein R^7 represents a hydrocarbon group of 1–12 carbon atoms, Y represents —OR^8, —$OSiR^9_3$, —$OAlR^{10}_2$, —NR^{11}_2, —SiR^{12}_3 or —$N(R^{13})AlR^{14}_2$, wherein R^8, R^9 and R^{14} each represents methyl, ethyl, isopropyl, isobutyl, cyclohexyl, phenyl or trimethylsilyl, R^{11} represents hydrogen atom, methyl, ethyl, isopropyl, phenyl or trimethylsilyl and R^{12} and R^{13} each represents methyl or ethyl, and n is 1–2.

5,840,646
OLEFIN POLYMERIZATION CATALYST COMPONENT

Hiroaki Katayama; Masaaki Nabika; Akio Iami, all of Ichihara; Norio Kawamura, Chiba, and Hidenori Hanaoka, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

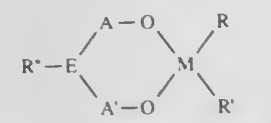
Filed Aug. 9, 1996, Ser. No. 695,382

Claims priority, application Japan, Aug. 11, 1995, 7-205953

Int. Cl.^{6} B01J *31/00;* **C07F** *7/00;7/28*

U.S. Cl. 502—152 **14 Claims**

1. An olefin polymerization catalyst component represented by the general formula (1):



(1)

wherein M is titanium, zirconium or hafnium; each of A and A' is the same or different and is a hydrocarbon or halogenated hydrocarbon having 1 to 50 carbon atoms, or a hydrocarbon or halogenated hydrocarbon group having 1 to 50 carbon atoms and a substituent containing an oxygen atom; E is a residual group of an element of the 13th to 15th Groups capable of forming three bonds; each of R and R' is the same or different and is a halogen atom or a hydrocarbon group having 1 to 20 carbon atoms; and R" represents a hydrocarbon or halogenated hydrocarbon group containing at least one hetero atom and having 1 to 20 carbon atoms.

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HYDROFORMYLATION PROCESS USING NOVEL PHOSPHITE-METAL CATALYST SYSTEM

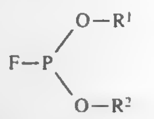
Thomas Allen Puckette, and Ginette Elizabeth Struck, both of Longview, Tex., assignors to Eastman Chemical Company, Kingsport, Tenn.

Filed Sep. 15, 1997, Ser. No. 929,687

Int. Cl.^{6} B01J *27/188;27/13;* **A01N** *43/30;* **C07D** *209/82*

U.S. Cl. 502—213 **21 Claims**

1. A catalyst composition comprising one or more transition metals selected from the Group VIII metals and rhenium and one or more fluorophosphite compounds having the general formula



(I)

wherein R^1 and R^2 are hydrocarbyl radicals which contain a total of up to about 40 carbon atoms and wherein the ratio of gram moles fluorophosphite ligand to gram atoms transition metal is at least 1:1.

5,840,648

CATALYST FOR THE MANUFACTURE OF ACRYLONITRILE AND HYDROGEN CYANIDE

Dev Dhanaraj Suresh, Hudson; Christos Paparizos, Willowick; Michael J. Seely, Twinsburg; Maria Strada Friedrich, Lyndhurst, and Tama Lee Drenski, Twinsburg, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Sep. 2, 1997, Ser. No. 923,878

Int. Cl.^{6} B01J *23/00;23/18;23/04*

U.S. Cl. 502—306 **18 Claims**

1. A catalyst composition comprising a complex of catalytic oxides of iron, bismuth, molybdenum and calcium and characterized by the following empirical formula:

$$A_aB_bC_cD_dFe_eBi_fMo_{12}O_x$$

where

A=one or more of Li, Na, K, Rb and Cs or mixtures thereof

B=one or more of Mg, Mn, Ni, Co, Ag, Pb, Re, Cd and Zn or mixtures thereof

C=one or more of Ce, Cr, Al, Sb, P, Ge, La, Sn, V and W or mixtures thereof

D=one or more of Ca, Sr, Ba or mixtures thereof

and a=0.01 to 1.0; b and e=1.0–10; c, d, and f=0.1 to 5.0 and x is a number determined by the valence requirements of the other elements present.

5,840,649

NOX ADSORBENTS

Masayoshi Ichiki, Osaka; Yuki Sairyo, Suita; Kazuhiro Kondo, Amagasaki, and Atsushi Fukuju, Toyonaka, all of Japan, assignors to Hitachi Zosen Corporation, Osaka, Japan

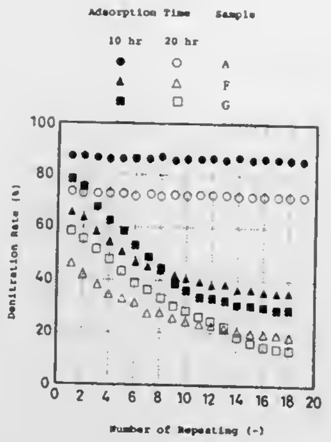
Filed Jan. 19, 1996, Ser. No. 588,882

Claims priority, application Japan, Jan. 20, 1995, 7-007180; Jan. 20, 1995, 7-007181; Jan. 20, 1995, 7-007182

Int. Cl.^{6} B01J *23/32;23/40;8/00*

U.S. Cl. 502—324 **33 Claims**

1. An NOx adsorbent comprising adsorbing components supported on a titania carrier wherein said carrier is a Mn—Ti system surface-reformed titania carrier obtained by adding a Mn compound to amorphous titania and baking the titania and said adsorbing components are oxides of Ru and/or Ce.



5,840,650

PROCESS OF MAKING A CATALYST FOR PRODUCING OXIRANE COMPOUNDS

Mitsuhisa Tamura; Kazuhiro Yamauchi, and Kenshi Uchida, all of Ichihara, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 27, 1996, Ser. No. 622,171

Claims priority, application Japan, Mar. 30, 1995, 7-073319

Int. Cl.^{6} B01J *21/00*

U.S. Cl. 502—350 **6 Claims**

1. A process for producing a heterogeneous catalyst used for producing an oxirane compound by reacting an olefinic compound with an organic hydroperoxide which catalyst is substantially insoluble in the reaction mixture and comprises at least one silicon compound, selected from the group consisting of silica and inorganic silicates, in chemical combination with an oxide or hydroxide of titanium, comprising:

(a) impregnating the silicon compound with a titanium compound in a solvent for impregnation,
(b) removing the solvent for impregnation,
(c) then washing the remaining composition with a washing solvent and removing the washing solvent, and
(d) then calcining the residual composition.

5,840,651

PROCESS FOR THE PRODUCTION OF ACTIVATED COKE FOR SIMULTANEOUS DESULFURIZATION AND DENITRIFICATION

Kazuhiko Hanashita; Masahiro Matsuoka; Hiroyasu Suenaga; Katsuhiko Umeno, and Toshihisa Yuda, all of Kitakyushu, Japan, assignors to Mitsui Mining Co., Ltd., Tokyo, Japan

PCT No. PCT/JP94/01943, § 371 Date Jul. 6, 1995, § 102(e) Date Jul. 6, 1995, PCT Pub. No. WO95/13868, PCT Pub. Date May 26, 1995

Continuation of Ser. No. 481,350, Jul. 6, 1995. This PCT application Nov. 18, 1994, Ser. No. 907,913

Claims priority, application Japan, Nov. 19, 1993, 5-312757

Int. Cl.^{6} B01J *20/02*

U.S. Cl. 502—434 **3 Claims**

1. A process for production of a high-strength activated coke for desulfurization and denitrification from coal as a principal raw material, which comprises the steps of:

blending at least one caking coal and at least one non-caking coal or at least two caking coals of different caking properties to provides a coal blend 10–50 wt. % of said caking coal or caking coal of greater caking property and a diameter of 5–20 mm;

adding a binder to said coal blend to provide a mixture;

kneading said mixture to provide a kneaded mixture;

forming the resultant mixture in a briquetting machine, pelletizer, or extruder to provide a formed material having a diameter of 5–20 mm;

oxidizing said formed material in an atmosphere having an oxygen concentration of 1–18 vol. % and a temperature of 50°–250° C. for a period of 10–180 minutes, with a supply gas being 0.1–20 Nm^3/kg based on said formed material to provide a oxidized mixture;

carbonizing said oxidized mixture at an oxygen concentration not higher than 8 vol. % and a heating efficiency of 20°–40° C./min to a final temperature 600°–900° C. to provide a carbonized mixture; and

oxidizing said carbonized mixture in an atmosphere having an oxygen concentration of 12–16 vol. % and a temperature of 350°–500° C. for a period of 40–200 minutes, with a supply gas being 1–20 Nm^3/kg based on said carbonized mixture.

5,840,652

SULFONYL COMPOUND AND THERMALSENSITIVE RECORDING MEDIUM USING THE SAME

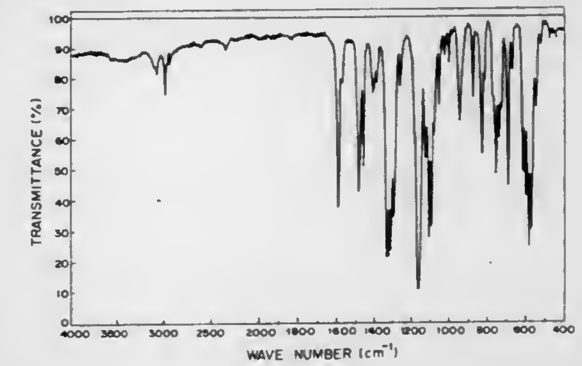
Shigeru Oda, and Eiji Kawabata, both of Osaka, Japan, assignors to Sanko Kaihatsu Kagaku Kenkyusho, Ibaraki, Japan

Filed Feb. 19, 1997, Ser. No. 801,255

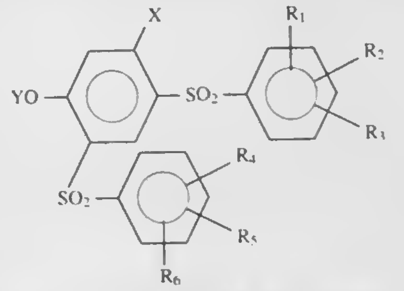
Claims priority, application Japan, Feb. 21, 1996, 8-033508

Int. Cl.^{6} B41M *5/30*

U.S. Cl. 503—216 **2 Claims**

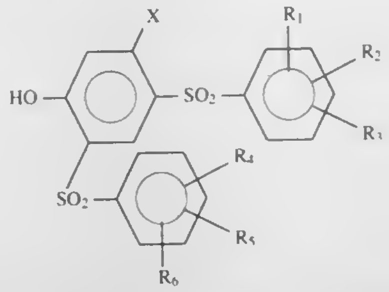


1. A thermalsensitive recording medium having a thermalsensitive recording layer mainly comprising a basic dye precursor, a developer and a sensitizing agent on the surface of a supporting base material, wherein a developer composition comprising at least one of sulfonyl compounds of the general formula (1). ,



(1)

wherein X represents hydrogen atom or an alkyl group of 1–4 carbon atoms; R_1, R_2, R_3, R_4, R_5 and R_6 which may be the same or different, represent a hydrogen atom, a halogen atom or an alkyl group of 1–4 carbon atoms; and Y represents an alkyl group, an aralkyl group, an allyl group, a cyclohexyl group, an alkyl group-substituted or non-substituted aryl group, an alkylsulfonyl group, a benzenesulfonyl group, an alkylbenzenesulfonyl group, an alkyloyl group, a benzoyl group, an alkylbenzoyl group, an acryloyl group, a methacryloyl group or a glycidyl group; and at least one of sulfonyl compounds of general formula (2).



(2)

wherein X, R_1, R_2, R_3, R_4, R_5 and R_6 are as defined in the above formula (1) is included in the above thermalsensitive recording layer.

5,840,653

SUBSTITUTED PYRAZOLYLPYRAZOLE DERIVATIVES

Michael Ganzer; Helga Franke, both of Berlin; Uwe Hartfiel, Frankfurt, and Jürgen Bohner, Berlin, all of Germany, assignors to Hoechst Schering AgrEvo GmbH, Berlin, Germany

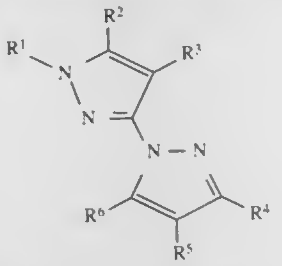
Filed Jun. 4, 1997, Ser. No. 868,569

Claims priority, application Germany, Jun. 6, 1996, 196 23 892.7

Int. Cl.^{6} A01N *43/56;* **C07D** *403/04*

U.S. Cl. 504—280 **5 Claims**

1. Substituted pyrazolylpyrazoles of the formula 1



(I)

in which

R^1 is C_1–C_4-alkyl,

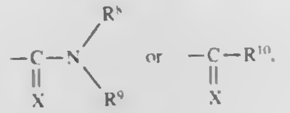
R^1 is C_1–C_4-alkyl, C_1–C_4-alkylthio, C_1–C_4-alkylsulfinyl, C_1–C_4-alkylsulfonyl, C_1–C_4-alkoxy, or is C_1–C_4-alkyl, C_1–C_4-alkylthio, C_1–C_4-alkylsulfonyl or C_1–C_4-alkoxy, each of which is mono- or polysubstituted by halogen,

R^1 and R^2 together form the group $—(CH_2)_m—$,

R^3 is hydrogen or halogen,

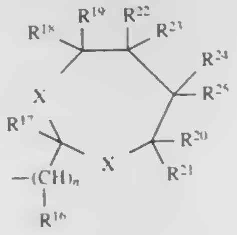
R^4 is hydrogen or C_1–C_4-alkyl,

R^5 is hydrogen, nitro, cyano, $—COOR^7$, the group



$$-\underset{\underset{X}{\|}}{C}-N\begin{matrix}R^8\\ R^9\end{matrix} \quad \text{or} \quad -\underset{\underset{X}{\|}}{C}-R^{10},$$

R^6 is one of the groups



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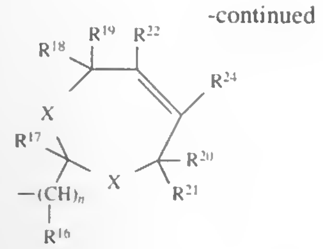
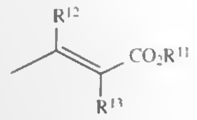
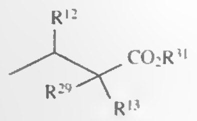
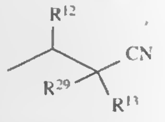
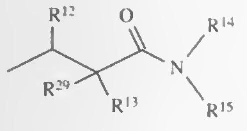




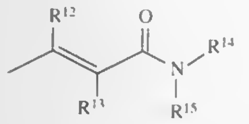




$-(CH_2)_o-A$,



or



R^7, R^8 and R^9 independently of each other are hydrogen or C_1–C_4-alkyl,

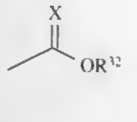
R^8 and R^9 together with the adjacent nitrogen atom form a 5- or 6-membered saturated heterocyclic ring,

R^{10} is hydrogen, C_1–C_4-alkyl, or C_1–C_4-alkyl which is mono- or polysubstituted by halogen,

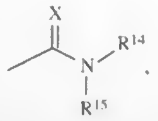
R^{11} C_5–C_8-alkyl, C_3–C_6-cycloalkyl, C_2–C_6-alkenyl, C_3–C_6-alkynyl, or is a C_1–C_6-alkyl, C_3–C_6-cycloalkyl, C_2–C_6-alkenyl or C_3–C_6-alkynyl which is mono- or polysubstituted by identical or different substituents from the group consisting of halogen, cyano, hydroxyl and C_1–C_4-alkoxy, or is a C_2–C_8-alkyl, C_3–C_8-cycloalkyl, C_3–C_8-cycloalkyl-C_1–C_4-alkyl, C_3–C_8-alkenyl or C_3–C_8-alkynyl which is interrupted once or more than once by oxygen, or is C_1–C_4-alkoxycarbonyl-C_1–C_4-alkyl which may optionally be substituted by halogen atoms, or is C_1–C_4-alkoxycarbonyl-C_2–C_4-alkenyl which is optionally substituted by halogen, or is the group $—(CH_2)_p—NR^8R^9$,

R^{12} and R^{13} independently of each other are hydrogen, halogen, C_1–C_4-alkyl, C_2–C_4-alkenyl, C_3–C_4-alkynyl or C_1–C_4-alkoxy, or a C_1–C_4-alkyl, C_2–C_4-alkenyl or C_3–C_4-alkynyl which is mono- or polysubstituted by identical or different substituents from the group consisting of halogen, cyano, carboxyl, hydroxyl, C_1–C_4-alkoxy and C_1–C_4-alkoxycarbonyl,

A is cyano,



or



R^{14} and R^{15} independently of each other are hydrogen, C_1–C_6-alkyl, C_3–C_6-cycloalkyl, C_2–C_6-alkenyl or C_3–C_6-alkynyl, or a C_1–C_6-alkyl, C_3–C_6-cycloalkyl, C_2–C_6-alkenyl or C_3–C_6-alkynyl which is mono- or polysubstituted by identical or different substituents from the group consisting of halogen, cyano, hydroxyl and C_1–C_4-alkoxy, or a C_2–C_8-alkyl, C_3–C_8-cycloalkyl, C_2–C_8-alkenyl or C_3–C_8-alkynyl which is interrupted once or more than once by oxygen, or C_1–C_4-alkoxycarbonyl-C_1–C_4-alkyl which may optionally be substituted by halogen or C_1–C_4-alkoxycarbonyl-C_2–C_4-alkenyl which may optionally be substituted by halogen, or C_1–C_4-alkoxycarbonyl,

R^{14} and R^{15} together with the nitrogen atom form a saturated heterocyclic C_3–C_6-ring which may be interrupted once or more than once by oxygen or sulfur,

R^{16} is hydrogen or C_1–C_4-alkyl,

R^{17} is hydrogen, C_1–C_4-alkyl or halo-C_1–C_4-alkyl,

R^{18}, R^{19}, R^{20}, R^{21}, R^{22} and R^{24} independently of each other are hydrogen, halogen, C_1–C_4-alkyl, C_2–C_4-alkenyl or C_3–C_4-alkynyl, carboxyl or C_1–C_4-alkoxycarbonyl, or a C_1–C_4-alkyl, C_2–C_4-alkenyl or C_3–C_4-alkynyl which is mono- or polysubstituted by identical or different substituents from the group consisting of halogen, cyano, nitro, hydroxyl and C_1–C_4-alkoxy,

R^{23} and R^{25} are hydrogen, halogen, C_1–C_4-alkyl, C_2–C_4-alkenyl or C_3–C_4-alkynyl, or

R^{23} and R^{25} together form a saturated or unsaturated carbocyclic or heterocyclic three to eight membered ring optionally containing one or more than one sulfur or oxygen atoms,

R^{29} is hydrogen or halogen,

R^{31} is hydrogen, C_1–C_4-alkyl, C_5–C_8-alkyl, C_3–C_6-cycloalkyl, C_2–C_6-alkenyl, C_3–C_6-alkynyl, or is a C_1–C_6-alkyl, C_3–C_6-cycloalkyl, C_2–C_6-alkenyl or C_3–C_6-alkynyl which is mono- or polysubstituted by identical or different substituents from the group consisting of halogen, cyano, hydroxyl and C_1–C_4-alkoxy, or is a C_2–C_8-alkyl, C_3–C_8-cycloalkyl, C_3–C_8-cycloalkyl-C_1–C_4-alkyl, C_2–C_8-alkenyl or C_3–C_8-alkynyl which is interrupted once or more than once by oxygen, or is C_1–C_4-alkoxycarbonyl-C_1–C_4-alkyl which may optionally be substituted by halogen, or is C_1–C_4-alkoxycarbonyl-C_2–C_4-alkenyl which may optionally be substituted by halogen, or is the group $(CH_2)_p—NR^8R^9$, with the proviso that, if R^{12} and R^{31} are hydrogen or R^{12} is hydrogen and R^{31} is C_1–C_4-alkyl, R^{13} may not be hydrogen or halogen,

R^{32} is hydrogen, C_1–C_6-alkyl, C_3–C_6-cycloalkyl, C_2–C_6-alkenyl, C_3–C_6-alkynyl, or is a C_1–C_6-alkyl, C_3–C_6-cycloalkyl, C_2–C_6-alkenyl or C_3–C_6-alkynyl which is mono- or polysubstituted by identical or different substituents from the group consisting of halogen, cyano, hydroxyl and C_1–C_4-alkoxy, or is a C_2–C_8-alkyl, C_3–C_8-cycloalkyl, C_2–C_8-alkenyl or C_3–C_8-alkynyl which is interrupted once or more than once by oxygen, or is C_1–C_4-alkoxycarbonyl-C_1–C_4-alkyl which may optionally be substituted by halogen,

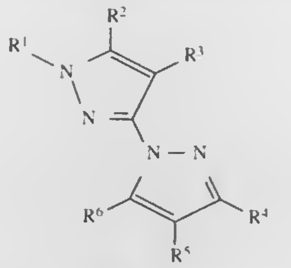
m is 3 or 4,

n is 0, 1, 2 or 3,

o is 1, 2 or 3,

p is 2, 3 or 4 and

X is oxygen or sulfur, with the proviso that when R^6 is



(I)

o is not 2 when R^{32} is hydrogen or C_1–C_6 alkyl.

5,840,654
HERBICIDAL HETEROCYCLIC-SUBSTITUTED PYRIDINES

Alex Kleemann, Hanau, Germany, assignor to American Cyanamid Company, Madison, N.J.

PCT No. PCT/EP94/00969, § 371 Date Feb. 2, 1996, § 102(e) Date Feb. 2, 1996, PCT Pub. No. WO94/22833, PCT Pub. Date Oct. 13, 1994

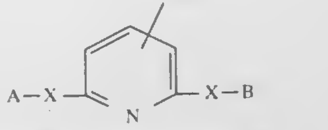
PCT Filed Mar. 25, 1994, Ser. No. 525,690

Claims priority, application European Pat. Off., Mar. 26, 1993, 93105006

Int. Cl.⁶ A01N ***43/40;*** **C07D** ***401/12***

U.S. Cl. 504—251 **16 Claims**

1. A method of combating undesired plant growth at a locus which comprises treating the locus with a 2,6-substituted pyridine of the formula 1:



1

wherein X represents an oxygen or sulphur atom, A represents an optionally substituted 5 or 6 membered nitrogen-containing heteroaromatic group; B represents an optionally substituted 5 or 6 membered cyclic hydrocarbon, alkyl, alkenyl, alkynyl, aryl or aralkyl group, or one of the meanings for A; R represents a halogen atom or an alkyl, haloalkyl, alkoxy, alkylthio or dialkylamino group; and m represents 0, 1 or 2.

5,840,655

Patent Not Issued For This Number

5,840,656
METHOD FOR INCREASING FERTILIZER EFFICIENCY

Alan M. Kinnersley, E. Lansing; Robert D. Coleman, Okemos; Cheng-Yuh Kinnersley, E. Lansing, and John L. McIntyre, Alto, all of Mich., assignors to Auxein Corporation, Lansing, Mich.

Continuation-in-part of Ser. No. 511,498, Aug. 4, 1995, abandoned, which is a continuation of Ser. No. 200,218, Feb. 23, 1994, Pat. No. 5,439,873. This application Nov. 6, 1996, Ser. No. 744,593

Int. Cl.⁶ A01N ***3/02;33/00;*** **C05F** ***11/00***

U.S. Cl. 504—115 **19 Claims**

1. An improved fertilizer composition comprising:

a fertilizer and an amino acid component selected from gamma-aminobutyric acid and a mixture of gamma-aminobutyric acid and glutamic acid, whereby the fertilizer and the amino acid are combined in an amount effective to increase plant growth.

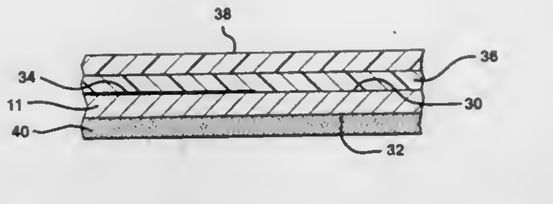
5,840,657
IMAGABLE LINERLESS PRESSURE SENSITIVE ADHESIVE

Rajendra Mehta, Centerville; David F. Laurash, Bellbrook; Mark Dotson; A. Dale Lakes, both of Dayton, and Lawrence W. Arway, Kettering, all of Ohio, assignors to The Standard Register Company, Dayton, Ohio

Continuation of Ser. No. 462,576, Jun. 5, 1995, abandoned, which is a continuation-in-part of Ser. No. 198,353, Feb. 18, 1994. This application Jan. 31, 1997, Ser. No. 791,537

Int. Cl.⁶ B41M ***5/40***

U.S. Cl. 503—204 **20 Claims**



1. A linerless continuous series of labels comprising:

a web having first and second major surfaces, said first surface of said web including on two or more selected portions thereof imagable coatings of color formers and color developers which may be activated to form different colored images or areas in said selected portions of said web, wherein said coatings which produce said different colored images or areas are applied to separate portions of said web.

a coating of a release material on said first surface of said web which overlies said coatings of color formers and color developers; and

a coating of a pressure sensitive adhesive on the second surface of said web.

5,840,658
PROCESS FOR THE CONTROLLED FIXING OF SCALE INHIBITOR IN A SUBTERRANEAN FORMATION

Francisca Ferreirado Rosário; Carlos Nagib Khalil; Maria Carmen Moreira Bezerra, and Sandra Botelho Rondinini, all of Rio De Janeiro, Brazil, assignors to Petroleo Brasilerio S.A.- Petrobras, Rio De Janeiro, Brazil

Filed Dec. 27, 1996, Ser. No. 777,375

Int. Cl.⁶ E21B ***43/22;*** **C09K** ***7/02***

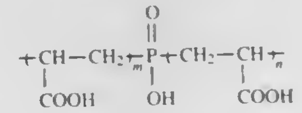
U.S. Cl. 507—236 **18 Claims**

1. A process for fixing of a scale inhibitor in a subterranean formation, which comprises:

a) injecting into the formation a solution consisting essentially of a polymeric scale inhibitor, a metal cation, a precursor and a weak organic acid, wherein the polymeric scale inhibitor and metal cation are slightly soluble in water in the formation and wherein the precursor reacts in the formation to produce an alkaline compound which causes the polymeric scale inhibitor to precipitate in the formation; and

b) allowing the polymeric scale inhibitor to precipitate in situ in the formation in an amount which is effective in inhibiting scale formation for a given period of time;

wherein the polymeric scale inhibitor is a phosphine polycarboxylate having the formula



$$\left[\underset{\displaystyle COOH}{CH}-CH_2\right]_m\overset{\displaystyle O}{\underset{\displaystyle OH}{P}}\left[CH_2-\underset{\displaystyle COOH}{CH}\right]_n$$

and the precursor is an amide or urea.

5,840,659
METHOD OF PREPARING OXIDE SUPERCONDUCTIVE MATERIAL

Tetsuyuki Kaneko; Kazuyuki Hamada; Hisao Yamauchi; Seiji Adachi, and Shoji Tanaka, all of Tokyo, Japan, assignors to Sumitomo Electric Industries, Ltd.; Ube Industries Ltd.; Matsushita Electrical Industrial Co., Ltd., and International Superconductivity Technology Center, all of Japan

Continuation of Ser. No. 487,126, Jun. 7, 1995, abandoned, which is a division of Ser. No. 186,831, Jan. 25, 1994, abandoned, which is a continuation of Ser. No. 891,356, May 29, 1992. This application Mar. 14, 1997, Ser. No. 818,368

Claims priority, application Japan, May 30, 1991, 3-127939

Int. Cl.⁶ A23G ***1/00;3/30;*** **A23L** ***1/10;1/522***

U.S. Cl. 505—501 **4 Claims**

1. A method of preparing an oxide superconductive material being expressed in the following formula:

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$Tl_xBa_2Ca_yCu_3O_z$

where x, y and z are in relations satisfying $1.5 \leqq x \leqq 2.0$, $2.0 \leqq y \leqq 2.5$, $x+y=4.0$ and $9.0 \leqq z \leqq 11.0$, said method comprising the steps of:

mixing powder raw materials of Tl, Ba, Ca and Cu compounds in blending ratios to form a mixed powder satisfying said composition formula;

sintering the as-formed mixed powder in flowing oxygen gas in the atmosphere to obtain a sintered body; and

annealing said sintered body in a closed atmosphere at 700° to 800° C. for at least 10 hours.

5,840,660

METHOD OF PREPARING BISMUTH OXIDE SUPERCONDUCTOR

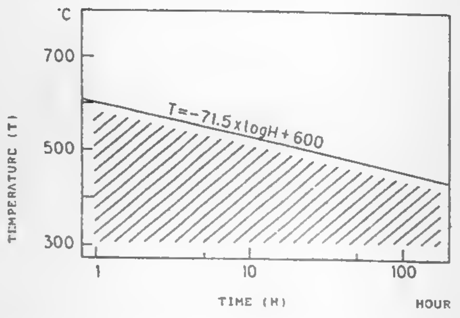
Munestugu Ueyama; Kenichi Sato, both of Osaka, Japan, and George E. Zahr, Glen Mills, Pa., assignors to E.I. Du Pont De Nemours And Company, Wilmington, Del., and Sumitomo Electric Industries, Ltd., Japan

Continuation of Ser. No. 966,025, Dec. 21, 1992, abandoned. This application Apr. 28, 1995, Ser. No. 430,552

Claims priority, application Japan, Mar. 20, 1991, 3-56691

Int. Cl.⁶ C04B *33/32*

U.S. Cl. 505—470 **5 Claims**



1. A method of preparing a bismuth oxide superconductor comprising the steps of:

preparing raw material powder for a bismuth oxide superconductor, said raw material having a composition for preparing a 2212 phase of Bi—Sr—Ca—Cu—O or (Bi, Pb)—Sr—Ca—Cu—O and a 2223 phase of Bi—Sr—Ca—Cu—O or (Bi, Pb)—Sr—Ca—Cu—O;

heating said raw material powder to prepare a bismuth oxide superconductor powder containing 2212 and 2223 phases, wherein the amount of said 2212 phase is larger than that of said 2223 phase;

adding an organic vehicle to said bismuth oxide superconductor powder;

molding said bismuth oxide superconductor powder; and

removing said organic vehicle by heat treating said molded bismuth superconductor powder under conditions not more than those expressed as T=−71.5×log H+ 600, wherein T denotes temperature of the heat treatment (°C.) and H denotes time of heat treatment.

5,840,661

2-ARYL CYCLOPENTANE-1,3-DIONE DERIVATIVES

Reiner Fischer, Monheim; Jacques Dumas, Köln; Thomas Bretschneider, Lohmar; Christoph Erdelen, Leichlingen; Ulrike Wachendorff-Neumann, Neuwied; Hans-Joachim Santel; Markus Dollinger, both of Leverkusen; Andreas Turberg, Erkrath, and Norbert Mencke, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

PCT No. PCT/EP95/02482, § 371 Date Dec. 31, 1996, § 102(e) Date Dec. 31, 1996, PCT Pub. No. WO96/01798, PCT Pub. Date Jan. 25, 1996

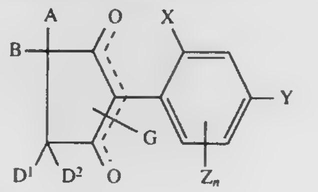
PCT Filed Jun. 26, 1995, Ser. No. 765,429

Claims priority, application Germany, Jul. 7, 1994, 44 23 943.2; Jan. 30, 1995, 195 02 815.5; May 23, 1995, 195 18 962.0

Int. Cl.⁶ A01N *35/06;* C07C *49/395;49/297*

U.S. Cl. 504—348 **10 Claims**

1. Compounds of the formula (I)



(I)

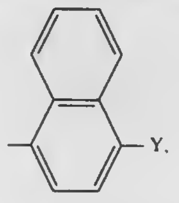
in which

X represents halogen, nitro, cyano, alkyl, alkoxy, alkenyloxy, alkylthio, alkylsulphinyl, alkylsulphonyl, halogenoalkyl or halogenoalkoxy,

Y represents hydrogen, halogen, nitro, cyano, alkyl, alkoxy, alkenyloxy, alkylthio, alkylsulphinyl, alkylsulphonyl, halogenoalkyl or halogenoalkoxy,

Z represents halogen, nitro, cyano, alkyl, alkoxy or halogenoalkoxy,

n represents an integer from 0 to 3, or wherein the radicals X and Z, together with the phenyl radical to which they are bonded, form the naphthalene radical of the formula



in which

Y has the abovementioned meaning,

A and B independently of one another represent alkyl, alkenyl, alkinyl, alkoxyalkyl, polyalkoxyalkyl or alkylthioalkyl, in each case optionally substituted once or several times in an identical or different manner by halogen, or saturated or unsaturated, unsubstituted or substituted cycloalkyl

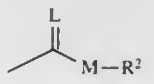
or

A and B, together with the carbon atom to which they are bonded, form a saturated or unsaturated ring and is optionally substituted,

D^1 and D^2 independently of one another represent hydrogen, halogen or alkyl which is optionally substituted by halogen of optionally substituted phenyl,

G represents hydrogen (a), or represents one of the groups

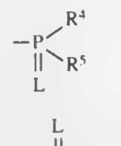
$$-CO-R^1 \quad (b)$$



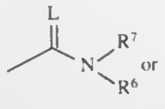
(c)

$$-SO_2R^3 \quad (d)$$

-continued



(e)



(f)

E (g)

E represents a metal ion equivalent or an ammonium ion,

L represents oxygen or sulphur,

M represents oxygen or sulphur,

R^1 represents alkyl, alkenyl, alkoxyalkyl, alkylthioalkyl or polyalkoxyalkyl, in each case optionally substituted once or several times in an identical or different manner by halogen, or optionally substituted, saturated or unsaturated cycloalkyl, or represents in each case optionally substituted phenyl, phenylalkyl, phenoxyalkyl

R^2 represents alkyl, alkenyl, alkoxyalkyl or polyalkoxyalkyl, in each case optionally substituted once or several times in an identical or different manner by halogen, or in each case optionally substituted cycloalkyl, phenyl or benzyl,

R^3 represents alkyl which is in each case optionally substituted once or several times in an identical or different manner by halogen, or represents in each case optionally substituted phenyl or phenylalkyl,

R^4 and R^5 independently of one another represent alkyl, alkoxy, alkylamino, alkenylamino, dialkylamino, dialkenylamino, alkylthio, alkenylthio, alkinylthio or cycloalkylthio, in each case optionally substituted once or several times in an identical or different manner by halogen, or represent in each case optionally substituted phenyl, phenoxy or phenylthio,

R^6 and R^7 independently of one another represent hydrogen or alkyl, alkenyl, alkoxy or alkoxyalkyl, in each case optionally substituted once or several times in an identical or different manner by halogen, or represent optionally substituted phenyl or represent optionally substituted benzyl,

or

R^6 and R^7 together represent an alkylene radical

and the enantiomerically pure forms of compounds or the formula (I).

5,840,662

LUBRICATING OILS OF IMPROVED FRICTION DURABILITY

Roger Keith Nibert, Hampton; Raymond Frederick Watts, Long Valley, and Ricardo Alfredo Bloch, Scotch Plains, all of N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Continuation of Ser. No. 544,953, Oct. 18, 1995, abandoned. This application Aug. 28, 1997, Ser. No. 919,961

Int. Cl.⁶ C10M *133/16*

U.S. Cl. 508—291 **10 Claims**

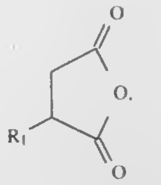
1. A power transmission in combination with a fluid composition comprising:

(1) a major amount of lubricating oil, and

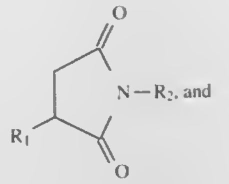
(2) a friction durability improving effective amount of an additive combination, the additive combination comprising a mixture of:

(a) an antioxidant;

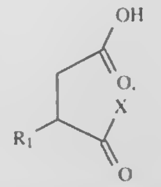
(b) a low potency friction modifier selected from the group consisting of structures (I), (II), and (III), and their mixtures, where structures (I), (II), and (III) are represented by:



(I)

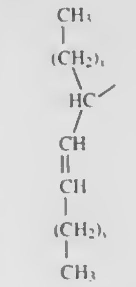


(II)



(III)

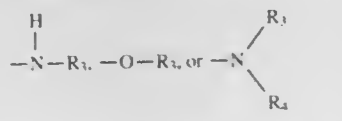
where: R_1 is a C_6 to C_{30} isomerized alkenyl group represented by:



where x and y are integers whose sum is from 1 to 25.

or its fully saturated analog, R_2 contains no less than 2 and no more than 100 carbon atoms and is an alkyl group, aryl group, or their heteroatom-containing derivatives.

X is represented by



$$-\underset{}{\overset{H}{\underset{|}{N}}}-R_3,\ -O-R_3,\text{ or } -N\begin{matrix}\diagup R_3\\ \diagdown R_4\end{matrix}$$

R_3 and R_4 are independently alkyl, aryl, or their heteroatom-containing derivatives; and

(c) an oil-soluble phosphorus-containing compound.

5,840,663

POWER TRANSMITTING FLUIDS IMPROVED ANTI-SHUDDER DURABILITY

Roger K. Nibert, Hampton; Manoj Tandon, Princeton, and Raymond F. Watts, Long Valley, all of N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Dec. 18, 1996, Ser. No. 768,843

Int. Cl.⁶ C10M *141/10*

U.S. Cl. 508—291 **16 Claims**

1. A power transmitting fluid composition comprising:

(1) a major amount of a lubricating oil, and

(2) an anti-shudder improving effective amount of an additive combination comprising:

(a) a reaction product of an isomerized alkenyl substituted succinic anhydride and a polyamine characterized by structure (I), where structure (I) is:

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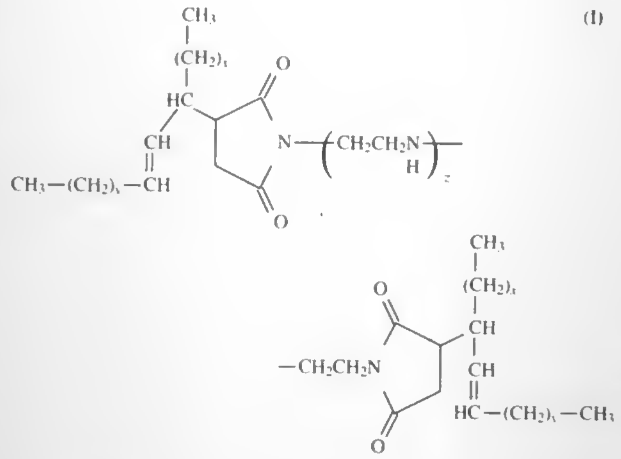


(I)

where:

x and y are independent integers whose sum is from 1 to 30, and

z is an integer from 1–10;

or the alkyl analog thereof,

(b) an oil-soluble alkyl phosphite;

(c) an ashless dispersant with alkyl sidechains of greater than about 1800 molecular weight; and

(d) a nitrogen containing corrosion inhibitor.

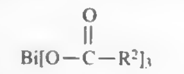
5,840,664
PREPARATION OF BISMUTH DITHIOCARBAMATES
Thomas J. Karol, Norwalk, and Steven G. Donnelly, New Fairfield, both of Conn., assignors to R. T. Vanderbilt Company, Inc., Norwalk, Conn.

Division of Ser. No. 509,277, Jul. 31, 1995, Pat. No. 5,631,214. This application Jan. 23, 1997, Ser. No. 787,613

Int. Cl.^{6} C10M *141/12;141/06*

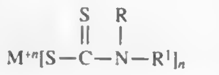
U.S. Cl. 508—283 **1 Claim**

1. A lubricating composition comprises a major portion of natural or synthetic oil of lubricating viscosity and a minor antiwear inhibiting amount of a reaction mixture prepared by exchange reaction between bismuth carboxylate of the formula



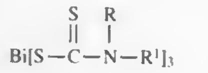
$$Bi[O-\overset{O}{\overset{\|}{C}}-R^2]_3$$

and metal dithiocarbamate of the formula



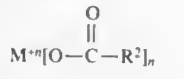
$$M^{+n}[S-\overset{S}{\overset{\|}{C}}-\overset{R}{\overset{|}{N}}-R^1]_n$$

to form a reaction mixture comprising bismuth dithiocarbamates of the formula



$$Bi[S-\overset{S}{\overset{\|}{C}}-\overset{R}{\overset{|}{N}}-R^1]_3$$

and metal carboxylates of the formula



$$M^{+n}[O-\overset{O}{\overset{\|}{C}}-R^2]_n$$

wherein R and R_1 are hydrocarbyl groups selected independently from alkyl, alkenyl, cycloalykl, aryl, alkaryl and arylakyl groups, R^2 is an alkyl or alkenyl group, fatty acid or napthenic acid residue or mixtures thereof, M represents a metal selected from alkali metals, group IIA and group IIB metals, n is 1 or 2, and wherein the reaction mixture is diluted with 2-hydroxyethyloctadecylimidazole.

5,840,665

Patent Not Issued For This Number

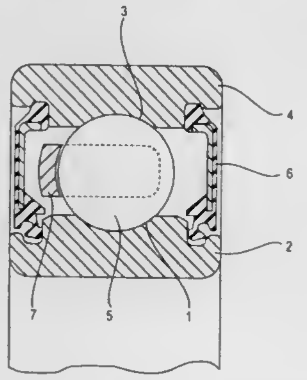
5,840,666
GREASE COMPOSITION
Atsushi Yokouchi; Hideki Koizumi; Kenichi Iso, and Michiharu Naka, all of Kanagawa, Japan, assignors to NSK Ltd., Tokyo, Japan

Filed Dec. 20, 1996, Ser. No. 770,852

Claims priority, application Japan, Dec. 20, 1995, 7-348520; Feb. 9, 1996, 8-046917

Int. Cl.^{6} C10M *103/00*

U.S. Cl. 508—107 **9 Claims**



1. A rolling bearing having sealed therein a grease composition comprising a base oil, a thickener selected from the group consisting of a metallic soap and a urea compound, and an inorganic filler having an average particle size of not greater than 2 μm.

5,840,667
BLEACH ACTIVATORS
Neal James Milne, Chester, and Jonathan Mercer Watkins, Deeside, both of Great Britain, assignors to Warwick International Group, Ltd., Holywell, Great Britain

PCT No. PCT/GB95/01847, § 371 Date Feb. 5, 1997, § 102(e) Date Feb. 5, 1997, PCT Pub. No. WO96/04244, PCT Pub. Date Feb. 15, 1996

PCT Filed Aug. 3, 1995, Ser. No. 776,965

Claims priority, application United Kingdom, Aug. 5, 1994, 9415871; Jan. 6, 1995, 9500223

Int. Cl.^{6} C07C *400/40;271/22;* **C11D** *3/39*

U.S. Cl. 510—376 **26 Claims**

1. A composition comprising a peroxygen bleach precursor and a compound of formula I:

$$R^3—E—C(X)—G—R^1—C(O)—L \qquad (I)$$

in which

X is O or S;

one of E and G is —A— and the other is —N(R^2)—;

A is —O— or —S—;

R^1 is selected from the group consisting of arylene, aliphatic hydrocarbon-arylene and C_{1-50} divalent aliphatic or cycloaliphatic hydrocarbon which is optionally interrupted by at least one group selected from the group consisting of arylene, ether, ester, anhydride, thioether, secondary or tertiary amine, amide and imide linkage;

R^2 is selected from the group consisting of H, aliphatic hydrocarbon, aliphatic hydrocarbon-aryl, aryl-aliphatic hydrocarbon and aryl;

R^3 is selected from the group consisting of aliphatic hydrocarbon, aliphatic hydrocarbon-, aryl-aliphatic hydrocarbon or aryl, or, when E is —N(R^2)—, H; and

L is a leaving group the coniugate acid of which has a pK_a of 4 to 13, optionally connected to at least one of R^1, R^2 and R^3.

5,840,668
PERFUMED LAUNDRY DETERGENT POWDERS
John Martin Behan, Kennington; Richard Arthur Birch, Hythe; John Leake, Chester; Jeremy Nicholas Ness, Canterbury; Anthony Nock, Warrington, and Keith Douglas Perring, Ashford, all of Great Britain, assignors to Quest International B.V., Naarden, Netherlands

PCT No. PCT/EP93/03695, § 371 Date Nov. 14, 1995, § 102(e) Date Nov. 14, 1995, PCT Pub. No. WO94/16046, PCT Pub. Date Jul. 21, 1994

PCT Filed Dec. 23, 1993, Ser. No. 481,483

Claims priority, application European Pat. Off., Jan. 11, 1993, 93300147; Jan. 13, 1993, 93300180

Int. Cl.^{6} A61K *7/00;* **C11D** *3/08;3/50*

U.S. Cl. 510—349 **10 Claims**

1. A perfumed, free flowing concentrated laundry detergent power comprising:

at least 15% w/w of detergent surfactants,

less than 10% w/w of fillers,

having a ratio of total solid constituents to total liquid constituents of less than 30:1 and containing at least 0.1% w/w of perfume, wherein the perfume is added as a perfume-on-carrier system consisting of amorphous silica having a mean diameter in the range of 20–50 microns which further have a surface area in the range of 100–450 m^2/gram which carry at least 25% w/w of perfume, which release at least 60% w/w of the perfume in a Perfume Release Test and which are inert as defined by a Perfume Stability Test.

5,840,669
HERBAL DRY CLEANING POWDER COMPOSITION
Kameswaran Neelakantan, Chennai, India, assignor to Gem Energy Industry Limited, Chennai, India

Filed Dec. 3, 1997, Ser. No. 984,252

Claims priority, application India, Jun. 20, 1997, 1350/97

Int. Cl.^{6} C11D *3/382;3/48*

U.S. Cl. 510—344 **8 Claims**

1. A herbal dry cleansing powder composition comprising constituents in the amount of

about 6–12% by weight of *COCOA NUCIFERA*,

about 6–12% by weight of *HIBISCUS ROSA SINESIS*,

about 6–12% by weight of *SAPINDUS TRIFOLIATUS*,

about 6–12% by weight of *TRIGONELLA FOENUM GRAECEUM*,

about 4–9% by weight of *MELIA AZADIRACHTA* and

about 43–72% by weight of a preservative.

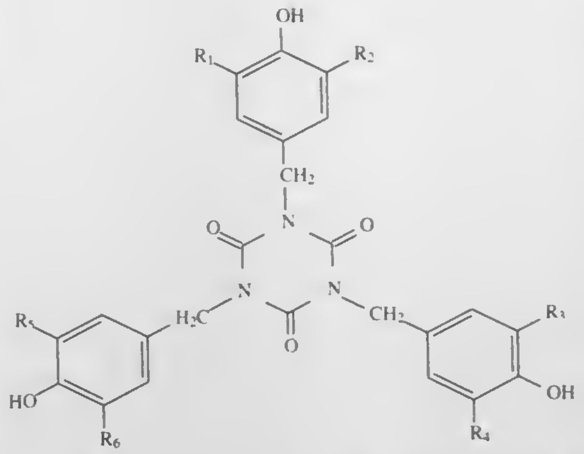
5,840,670
COMPOSITION
Richard Payne, Manasquan; AnBen Hwang, Verona, and Ravi Subramanyam, Belle Mead, all of N.J., assignors to Colgate-Palmolive Co., New York, N.Y.

Filed Jan. 29, 1997, Ser. No. 790,498

Int. Cl.^{6} C11D *9/30;3/28*

U.S. Cl. 510—152 **15 Claims**

1. A solid or aqueous liquid cleansing composition which comprises at least 30 weight percent of soap and, optionally, one or more additional surfactants and a color stabilizing effective amount of a compound of the formula:



wherein R_1, R_2, R_3, R_4, R_5, and R_6 are the same or different and are isopropyl or tertiary butyl, with the proviso that when the composition is solid, the amount of the compound is from about 25 to about 500 ppm of the composition and when the composition is aqueous liquid, the amount of the compound is about 10 to about 300 ppm of the composition.

5,840,671
CLEANING SOLUTION FOR CONTACT LENS EXHIBITING EXCELLENT DETERGENCY
Atumi Fujimura, Kakamigahara; Kaoru Kamiya, Nishikasugai-gun, and Shinji Tanaka, Ichinomiya, all of Japan, assignors to Tomey Technology Corporation, Japan

Filed Dec. 8, 1995, Ser. No. 569,450

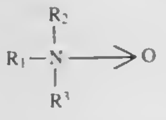
Claims priority, application Japan, Dec. 15, 1994, 6-312009

Int. Cl.^{6} C11D *1/75;1/12;1/62;1/94*

U.S. Cl. 510—112 **17 Claims**

1. A cleaning solution for cleaning a contact lens, said solution comprising

a tertiary amine oxide represented by the following formula,



$$R_1-\overset{R_2}{\overset{|}{\underset{R^3}{\underset{|}{N}}}}\longrightarrow O$$

wherein R_1 represents an alkyl group having 12–18 carbon atoms while each of R_2 and R_3 represents an alkyl or hydroxyalkyl group having 1–2 carbon atoms, wherein R_2 and R_3 can be the same or different, and

an anionic surface active agent in the form of a triethanolamine salt, the total content of said tertiary amine oxide and said anionic surface active agent being within a range of 1.0–10% by weight of the cleaning solution, wherein the ratio of said tertiary amine oxide to said anionic surface active agent ranges from 3:2 to 20:1.

5,840,672
ANTIOXIDANT SYSTEM FOR LUBRICATION BASE OILS
Vincent James Gatto, Midlothian, Va., assignor to Ethyl Corporation, Richmond, Va.

Filed Jul. 17, 1997, Ser. No. 896,045

Int. Cl.^{6} C10M *141/02;141/06;141/08*

U.S. Cl. 508—334 **24 Claims**

1. An antioxidant system comprising:

(A) a secondary diarylamine,

(B) at least one member selected from the group consisting of sulfurized olefins and sulfurized hindered phenols, and

(C) an oil soluble, sulfur-containing molybdenum compound.

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5,840,673
INSULIN-LIKE GROWTH FACTOR BINDING PROTEIN 3 (IGF-BP3) IN TREATMENT OF P53-RELATED TUMORS

Leonard R. Buckbinder, Doylestown, Pa.; Nikolai Kley, Princeton Junction, and Bernd R. Seizinger, Stockton, both of N.J., assignors to Bristol-Myers Squibb Company, Princeton, N.J.

Filed Sep. 12, 1996, Ser. No. 713,052
Int. Cl.^{6} A61K *38/17;* **C12Q** *1/02*

U.S. Cl. 514—2 **4 Claims**

1. A method of inhibiting growth of p53-related tumors, which comprises administering an effective amount of a modulator of IGF-BP3, wherein the modulator upregulates IGF-BP3 expression or activity.

5,840,674
COVALENT MICROPARTICLE-DRUG CONJUGATES FOR BIOLOGICAL TARGETING

Milton B. Yatvin, Portland, Oreg.; Michael H. B. Stowell, Padadena, Calif.; Vincent S. Gallicchio, Lexington, Ky., and Michael J. Meredith, Lake Oswego, Oreg., assignors to Oregon Health Sciences University, Portland, Oreg.

Continuation of Ser. No. 441,770, May 16, 1995, Pat. No. 5,543,391, and Ser. No. 246,941, May 19, 1994, Pat. No. 5,543,390, which is a continuation-in-part of Ser. No. 142,771, Oct. 26, 1993, Pat. No. 5,543,389, which is a continuation-in-part of Ser. No. 911,209, Jul. 9, 1992, Pat. No. 5,256,641, which is a continuation-in-part of Ser. No. 607,982, Nov. 1, 1990, Pat. No. 5,149,794. This application Aug. 1, 1996, Ser. No. 691,891
Int. Cl.^{6} A01N *37/18;57/26*

U.S. Cl. 514—2 **25 Claims**

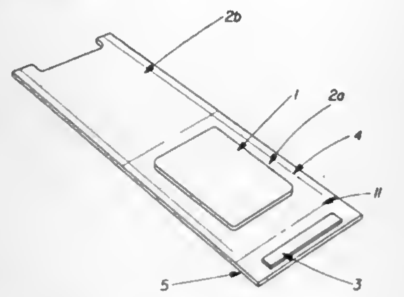
1. A composition of matter comprising a biologically-active compound, a nonporous microparticle, and an organic coating material, wherein the nonporous microparticle is coated with the biologically-active compound and said coated microparticle is further coated with the organic coating moiety, and wherein the organic coating material is specifically degraded inside a phagocytic mammalian cell infected with a microorganism to allow release of the biologically-active compound within the infected cell.

5,840,675
CONTROLLED RELEASED FABRIC CARE ARTICLE

Bruce Albert Yeazell, Cincinnati, Ohio, assignor to The Procter and Gamble Company, Cincinnati, Ohio

Filed Jan. 17, 1997, Ser. No. 785,444
Int. Cl.^{6} D06L *1/00*

U.S. Cl. 510—439 **28 Claims**



1. An article for treating fabrics, comprising:
a) an absorbent substrate; and
b) a liquid cleaning/refreshment composition releasably absorbed in said substrate; said substrate being wholly or partly covered by
c) a coversheet which is permeable to said cleaning/refreshment composition in the liquid or vapor state.

5,840,676
MICROEMULSION LIGHT DUTY LIQUID CLEANING COMPOSITIONS

Julien Drapier, Seraing, Belgium, assignor to Colgate-Palmolive Company, Piscataway, N.J.

Continuation-in-part of Ser. No. 714,435, Sep. 16, 1996, abandoned, which is a continuation-in-part of Ser. No. 526,785, Sep. 11, 1995, Pat. No. 5,580,848, which is a continuation-in-part of Ser. No. 356,615, Dec. 15, 1994, Pat. No. 5,529,723. This application Jul. 17, 1997, Ser. No. 896,243
Int. Cl.^{6} C11D *1/04;1/29;1/94;3/28*

U.S. Cl. 510—417 **11 Claims**

1. A clear microemulsion light duty liquid cleaning composition which comprises approximately by weight:
(a) 14% to 24% of an alkali metal salt of an anionic sulfonate surfactant;
(b) 2% to 6% of an alkali metal salt of a C8–18 ethoxylated alkyl ether sulfate;
(c) 2% to 8% of a betaine surfactant;
(d) 4% to 12% of a nonionic surfactant;
(e) 1% to 10% of at least one solubilizing agent;
(f) 1% to 14% of a cosurfactant;
(g) 0 to 10% of a supplemental solubilizing agent;
(h) 1% to 8% of water insoluble heterocyclic compounds selected from the group consisting of 2,5-dimethylhydrofuran, 2-methyl-1,3-dioxolane, 2-ethyl- 2-methyl 1,3 dioxolane, 3-ethyl · 4-propyl tetrahydropyran, 3-morpholino-1,2-propanediol and N-isopropyl morpholine; selected from the group consisting of water insoluble hetrocyclic compounds, water insoluble
(i) the balance being water.

5,840,677
BORONIC ACID OR BORINIC ACID DERIVATIVES AS ENZYME STABILIZERS

Lone Kierstein Nielsen, Lyngby, Denmark, and Allison Deane-Wray, Liss, Great Britain, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark, and Borax Consolidated Ltd., London, United Kingdom

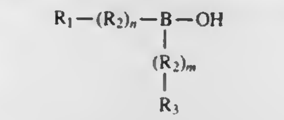
PCT No. PCT/DK94/00249, § 371 Date Jan. 25, 1996, § 102(e) Date Jan. 25, 1996, PCT Pub. No. WO95/02046, PCT Pub. Date Jan. 19, 1995

PCT Filed Jun. 22, 1994, Ser. No. 571,954

Claims priority, application Denmark, Jul. 9, 1993, 0833/93; Apr. 26, 1994, 0477/94
Int. Cl.^{6} C11D *3/386*

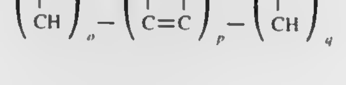
U.S. Cl. 510—392 **10 Claims**

1. A liquid composition comprising an enzyme and a boronic acid derivative enzyme stabilizer or borinic acid derivative enzyme stabilizer of the following formula:



$$\begin{array}{l} R_1-(R_2)_n-\underset{\displaystyle\underset{\displaystyle R_3}{|}}{\underset{\displaystyle (R_2)_m}{\underset{|}{B}}}-OH \end{array}$$

where R_1 is
(a) a substituted fused aromatic ring structure containing 14 or 18 carbon atoms in the ring;
(b) a substituted monocyclic heterocyclic ring structure containing up to 17 carbon atoms in the ring;
(c) a substituted fused aromatic heterocyclic ring structure containing up to 17 carbon atoms in the ring;
(d) a substituted monocyclic quinonone ring structure containing up to 18 carbon atoms in the ring;
(e) a substituted fused quinonone ring structure containing up to 18 carbon atoms in the ring; wherein
R_2 has the formula:



$$\left(\begin{matrix} X \\ | \\ CH \end{matrix}\right)_o-\left(\begin{matrix} X & X \\ | & | \\ C= & C \end{matrix}\right)_p-\left(\begin{matrix} X \\ | \\ CH \end{matrix}\right)_q$$

where X is the same or different and selected from hydrogen, C_1–C_6 alkyl, substituted C_1–C_6 alkyl, aryl, substituted aryl, hydroxy, hydroxyl derivative, halogen, amine, alkylated amine, amine derivative, nitro, thiol, thiol derivative, aldehyde, acid, acid salt, ester, sulfonate or phosphonate, and o, p and q may each be 0, 1, or 2; n and m may each be 0 or 1; R_1 and R_3 are independently one of a hydroxyl group, a substituted monocyclic ring structure, or a substituted dicyclic aromatic ring structure.

5,840,678
LIQUID DETERGENTS CONTAINING A PEPTIDE TRIFLUOROMETHYL KETONE

Regine Labeque, Neder-over-Heembeek, Belgium; John McMillan McIver, Cincinnati, Ohio, and Christiaan Arthur J.K. Thoen, Haasdonk, Belgium, assignors to Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 381,894, Feb. 8, 1995, Pat. No. 5,582,762. This application Sep. 25, 1996, Ser. No. 719,665

Claims priority, application European Pat. Off., Aug. 14, 1992, 92870122
Int. Cl.^{6} C11D *3/386*

U.S. Cl. 510—392 **14 Claims**

1. A liquid aqueous detergent composition comprising:
(a) from 1% to 80% of a detersive surfactant;
(b) from 0.0001% to 1.0% of active proteolytic enzyme or mixtures thereof; and
(c) from 0.00001% to 5% of a peptide trifluoromethyl ketone wherein the peptide trifluoromethyl ketone is selected from the group consisting of trifluoromethyl ketones having 4 amino acids wherein the C terminal end is selected from the group consisting of Gly-Ala-Leu(trifluoromethyl) and Gly-Ala-Phe(trifluoromethyl).

5,840,679
METHOD OF INHIBITING P-SELECTIN LIGAND ACTIVITY

Glenn R. Larsen, Sudbury; Dianne S. Sako, Boston; Xiao-Jia Chang, Newton Centre; Geertruida M. Veldman, Sudbury; Dale Cumming, Acton; Ravindra Kumar, Belmont; Gray Shaw, Concord, and Ray Camphausen, Arlington, all of Mass., assignors to Genetics Institute, Inc., Cambridge, Mass.

Division of Ser. No. 428,734, Apr. 25, 1995, which is a continuation-in-part of Ser. No. 316,305, Sep. 30, 1994, abandoned, which is a continuation-in-part of Ser. No. 235,398, Apr. 28, 1994, abandoned, which is a continuation-in-part of Ser. No. 112,608, Aug. 26, 1993, abandoned, which is a continuation-in-part of Ser. No. 965,662, Oct. 23, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 472,576
Int. Cl.^{6} A61K *38/16;39/395;* **G01N** *33/53;* **C07K** *16/00*

U.S. Cl. 514—8 **26 Claims**

1. A method of inhibiting P-selectin-mediated binding comprising administering a composition comprising a pharmaceutically acceptable carrier and an isolated glycoprotein having P-selectin ligand activity comprising a carbohydrate and a protein comprising the sequence from amino acid 42 to amino acid 60 of SEQ ID NO:2, wherein said carbohydrate comprises sLe^x or sLe^a, and wherein said isolated glycoprotein does not comprise the transmembrane domain or intracellular domain of mature P-selectin ligand protein.

5,840,680
ASP^{B28} INSULIN CRYSTALS

Per Balschmidt, Esperærde, Denmark, assignor to Novo Nordisk A/S, Bagsvaerd, Denmark

Continuation of Ser. No. 644,781, May 10, 1996, abandoned, which is a division of Ser. No. 127,672, Sep. 28, 1993, Pat. No. 5,547,930. This application Dec. 11, 1996, Ser. No. 763,853

Claims priority, application Denmark, Jun. 21, 1993, 727/93
Int. Cl.^{6} A61K *38/28;* **C07K** *5/00;7/00;16/00*

U.S. Cl. 514—3 **14 Claims**

1. Crystals comprising Asp^{B28} human insulin, protamine, and a member selected from the group consisting of phenol, a m-cresol, or a combination thereof.

5,840,681
X-RAY INDUCED SKIN DAMAGE PROTECTIVE COMPOSITION

Theodore Hersh, Atlanta, and Michael A. Warshaw, Savannah, both of Ga., assignors to Thione International, Inc., Atlanta, Ga.

Division of Ser. No. 658,105, May 31, 1996, Pat. No. 5,667,791. This application Sep. 15, 1997, Ser. No. 929,397
Int. Cl.^{6} C07K *14/475;* **A61K** *38/18;7/48*

U.S. Cl. 514—2 **2 Claims**

1. A composition for repair of skin damaged from the skin's exposure to x-ray radiation comprising an amount of a selenoamino acid, glutathione and at least one member selected from the group consisting of an epithelial growth factor and fibroblast growth factor to repair x-ray induced skin damage in a suitable carrier for topical application.

5,840,682
PEPTIDE ANTAGONISTS OF NEUROTENSIN

Francois-Frédéric Clerc, Antony; Marie-Christine Dubroeucq, Enghein Les Bains; Gérard Helynck, Choisy Le Roi; Jean Leboul, Gometz La Ville, and Jean-Paul Martin, Colombes, all of France, assignors to Rhone-Poulenc Rorer S.A., Antony Cedex, France

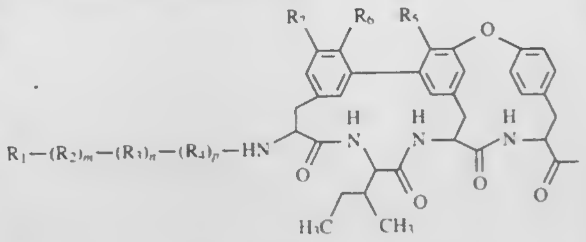
PCT No. PCT/FR95/00643, § 371 Date Nov. 19, 1996, § 102(e) Date Nov. 19, 1996, PCT Pub. No. WO95/32218, PCT Pub. Date Nov. 30, 1995

PCT Filed May 17, 1995, Ser. No. 737,695

Claims priority, application France, May 20, 1994, 94 06167
Int. Cl.^{6} A61K *38/12*

U.S. Cl. 514—9 **29 Claims**

1. A compound of formula (I)



(I)

wherein
R represents a hydroxyl radical, a carboxyl protective group, or a —NH—CH_2—COOH radical;
R_1 represents a hydrogen atom, adamantylacetyl, adamantylcarbonyl, norbornylacetyl, norbornylphenoxycarbonyl, benzoyl, nicotinoyl, 4-phenylbenzoyl, 4-tert-butylbenzoyl or 2-pyrrolidinecarbonyl radical, or an amine protective group;
R_2 represents an Arg or Lys residue;
R_3 represents an Arg or Lys residue;
R_4 represents a Pro residue;
m, n and p, are independently 0 or 1, provided that when R_1 is a hydrogen atom, the sum of m+n+p is at least equal to 1;
R_5 and R_6 are identical and represent a hydroxyl or methoxy radical; and

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R_7 represents a hydrogen, chlorine, bromine or iodine atom or a nitro radical, and wherein one or more of the —CO—NH— groups are optionally replaced by —CH_2—NH— groups or the —CO—NH— group between the R_2 and R_3 residues is optionally replaced by a CH═CH group; or

a pharmaceutically acceptable salt thereof.

5,840,683
PEPTIDES INHIBITING THE ONCOGENIC ACTION OF P21 RAS

Joseph J. Hlavka, Tuxedo Park; Matthew R. Pincus, Brooklyn; John Fowler Noble, Pomona, all of N.Y.; Henry Baxter Abajian, Hillsdale, N.J., and Andrew S. Kende, Pittsford, N.Y., assignors to Innapharma, Inc., Upper Saddle River, N.J.

Filed Sep. 21, 1995, Ser. No. 531,525

Int. Cl.^{6} A61K *38/12;* C07K *5/08*

U.S. Cl. 514—9 **10 Claims**

1. A peptide having an amino acid sequence Val-Val-Ile or a physiologically acceptable salt thereof.

5,840,684
GLYCOPEPTIDE ANTIBIOTIC DERIVATIVES

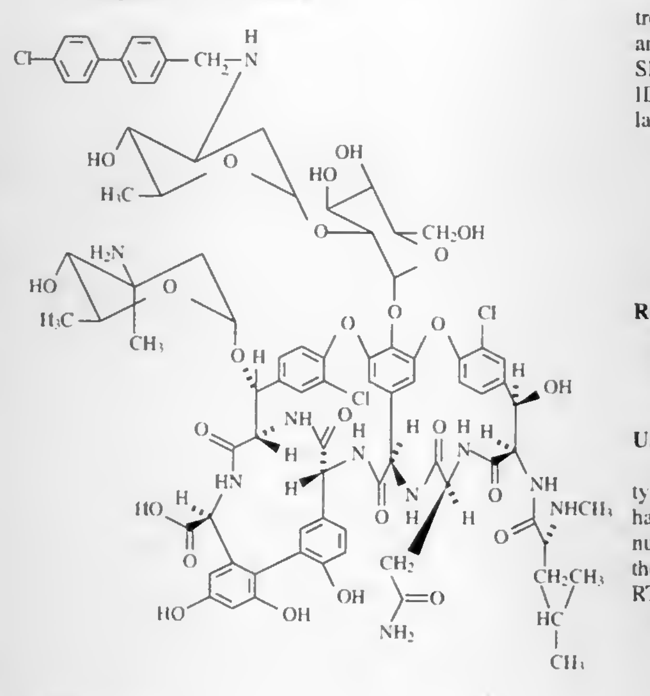
Robin D. G. Cooper, Indianapolis; Bret E. Huff, Mooresville; Thalia I. Nicas, Indianapolis; John T. Quatroche, Indianapolis; Michael J. Rodriguez, Indianapolis; Nancy J. Snyder, Charlottesville; Michael A. Staszak, Indianapolis; Richard C. Thompson, Frankfort; Stephen C. Wilkie, Indianapolis, and Mark J. Zweifel, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 356,413, Dec. 15, 1994, abandoned, which is a continuation-in-part of Ser. No. 189,393, Jan. 28, 1994, abandoned. This application Mar. 24, 1995, Ser. No. 410,155

Int. Cl.^{6} A61K *38/12;38/14;* C07K *7/54;9/00*

U.S. Cl. 514—11 **7 Claims**

1. A compound of the formula:



or a salt thereof.

5,840,685
INTRAVAGINAL DELIVERY OF BIOLOGICALLY ACTIVE POLYPEPTIDES

Takeru Fujii, Naruto; Seiichi Sako, Anan; Shigeyuki Takama, Itano-gun; Toru Hibi, and Akiya Yamada, both of Takamatsu, all of Japan, assignors to Teikoku Seiyaku Co., Ltd., Kagawa, Japan

Continuation of Ser. No. 315,502, Mar. 1, 1989, abandoned, which is a continuation-in-part of Ser. No. 167,163, Mar. 11, 1988, abandoned. This application Jun. 15, 1992, Ser. No. 899,165

Int. Cl.^{6} A61K *38/00;* C07K *7/60;7/36;14/00*

U.S. Cl. 514—12 **8 Claims**

1. A pharmaceutical composition of matter adapted for intravaginal administration comprising: a stable biologically active polypeptide selected from the group consisting of calcitonin or an analog or derivative thereof, in an amount sufficient to elicit a pharmacological effect when administered intravaginally; an absorption promoter consisting essentially of an effective absorption promoting amount of polyoxyethylene (9) octylphenylether and a medium chain aliphatic carboxylic acid selected from the group consisting of caproic acid, caprylic acid, lauric acid or a salt thereof, the total concentration of said absorption promoter in the composition being between about 0.01 and about 5 w/v %, said concentration being sufficient to enhance absorption of the polypeptide through the vaginal mucosa; and a nontoxic pharmaceutically acceptable carrier or diluent therefor, in a formulation suitable for intravaginal administration.

5,840,686
PIGMENT EPITHELIUM-DERIVED FACTOR: CHARACTERIZATION OF ITS NOVEL BIOLOGICAL ACTIVITY AND SEQUENCES ENCODING AND EXPRESSING THE PROTEIN AND METHODS OF USE

Gerald J. Chader; Sofia Patricia Becerra; Joan P. Schwartz, all of Bethesda, Md.; Takayuki Taniwaki, Koga-Machi, Japan, and Yukihiro Sugita, Rockville, Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 952,796, Sep. 24, 1992, abandoned. This application Jun. 7, 1994, Ser. No. 257,963

Int. Cl.^{6} A61K *38/17*

U.S. Cl. 514—12 **6 Claims**

1. A method of prolonging neuron cell survival comprising: treating a cell population comprising neurons with an effective amount of pigment epithelium-derived factor (PEDF), as shown in SEQ ID NO: 2 or a biologically active truncated fragment of SEQ ID NO: 2, thereby prolonging neuronal cell survival in said population.

5,840,687
MODIFIED LIGANDS FOR RECEPTOR TYROSINE KINASES

Richard N. Harkins, Alameda; Marian Seto, South San Francisco, and Bradley A. Katz, San Francisco, all of Calif., assignors to Schering Aktiengesellschaft, Berlin, Germany

Filed Feb. 2, 1995, Ser. No. 384,714

Int. Cl.^{6} C12P *21/02*

U.S. Cl. 514—12 **25 Claims**

1. A modified ligand having specificity for a Class I receptor tyrosine kinase (RTK) and corresponding to a native RTK ligand having amino acids forming three cysteine linkages, said linkages numbered in ascending order with regard to the relative position of their first cysteine with respect to the amino terminus of the native RTK ligand:

wherein the first, second, and third cysteine linkages of the native RTK ligand define a domain A, a domain B and a domain C, and the three linkages comprise a first, a second, a third, a fourth, a fifth and a sixth cysteine, with the first linkage being between the first and third cysteines, the second linkage being between the second and fourth cysteines and the third linkage being between the fifth and sixth cysteines; where domain A is defined as the first cysteine, those amino acids situated between the first and the second cysteines, and the second cysteine; domain B is defined as those amino acids situated between the second and fourth cysteines; and domain C is defined as the fourth cysteine and those amino acids attached to the carboxy terminus of the fourth cysteine; and,

wherein the modified RTK ligand has four cysteine amino acids forming two linkages between cysteines two and four, and five and six, respectively, and having two domains, A_1 and C_1 corresponding to domains A and C of the native RTK ligand,

wherein domain A_1 consists essentially of the biologically active amino acid sequences of the domain A of a native RTK ligand; and,

wherein domain C_1 consists essentially of the biologically active amino acid sequences of the domain C of a native RTK ligand,

wherein cysteine two, which is the carboxy terminus of domain A_1, and cysteine four, which is the amino terminus of domain C_1, are connected by a peptide bridge comprising a prebridge subdomain and a bridge subdomain, and where, within the peptide bridge, there is a β-turn corresponding to the β-turn present within domain B of the native RTK ligand,

wherein the modified RTK ligand consists of the formula:

$$X1\text{-}X2_A\text{-}X2_B\text{-}X3$$

wherein X1 is domain A_1 and consists of amino acid residues AA_1-1 through AA_1-6, and where
AA_1-1 is Ser;
AA_1-2 is His;
AA_1-3 is Thr;
AA_1-4 is Gln;
AA_1-5 is Phe;
AA_1-6 is Cys; and

wherein $X2_A$ and $X2_B$ taken together comprise the peptide bridge domain and

wherein $X2_A$ is the prebridge subdomain and consists of amino acid residues AA_{2A}-1 through AA_{2A}-5, and where
AA_{2A}-1 is Phe;
AA_{2A}-2 is His;
AA_{2A}-3 is Gly;
AA_{2A}-4 is Thr; and
AA_{2A}.5 is a peptide bond; and

wherein $X2_B$ is the bridge subdomain and consists of 1 to 3 amino acid residues (AA_{2B}-1, AA_{2B}-2, AA_{2B}-3) and

wherein, if $X2_B$ is one amino acid residue,
AA_{2B}-1 is Gly or Ser;

wherein, if $X2_B$ is two amino acid residues,
AA_{2B}-1 is Asp, Ser, Thr, or Pro and AA_{2B}-2 is Asp, Ser, Asn, or Arg; or
AA_{2B}-1 is Pro and AA_{2B}-2 is Gly or Asn; or
AA_{2B}-1 is Gly, Asn or Asp and AA_{2B}-2 is Gly; or
AA_{2B}-1 is Gly and AA_{2B}-2 is Ser, Glu, Thr, Asn, Ala, Gly, Asp, or Lys; and

wherein, if $X2_B$ is three amino acid residues,
AA_{2B}-1 is any amino acid and
AA_{2B}-2 is Asp, Ser, Thr, or Pro and AA_{2B}-3 is Asp, Ser, Asn, or Arg; or,
AA_{2B}-2 is Pro and AA_{2B}-3 is Gly or Asn; or,
AA_{2B}-2 is Gly, Asn, or Asp and AA_{2B}-3 is Gly; or
AA_{2B}-2 is Gly and AA_{2B}-3 is Ser, Glu, Thr, Asn, Ala, Gly, Asp, or Lys; and

wherein X3 is domain C_1 and consists of amino acid residues AA_3-1 through AA_3-19, and where
AA_3-1 is Cys;
AA_3-2 is Val;
AA_3-3 is Cys;
AA_3-4 is His;
AA_3-5 is Ser;
AA_3-6 is Gly;
AA_3-7 is Tyr;
AA_3-8 is Val;
AA_3-9 is Gly;
AA_3-10 is Ala;
AA_3-11 is Arg;
AA_3-12 is Cys;
AA_3-13 is Glu;
AA_3-14 is His;
AA_3-15 is Ala;
AA_3-16 is Asp;
AA_3-17 is Leu;
AA_3-18 is Leu; and
AA_3-19 is Ala; and

wherein said RTK is the EGF receptor.

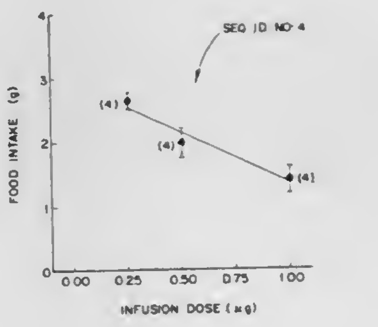
5,840,688
EATING SUPPRESSANT PEPTIDES

Patrick Tso, Shreveport, La., assignor to Research Corporation Technologies, Inc., Tucson, Ariz.

Continuation-in-part of Ser. No. 216,537, Mar. 22, 1994, abandoned. This application Mar. 22, 1995, Ser. No. 408,858

Int. Cl.^{6} A61K *38/06;38/07;38/08;38/10*

U.S. Cl. 514—12 **18 Claims**



1. A peptide consisting of 9 to 30 amino acids comprising 7 contiguous amino acids of SEQ ID NO:4 and analogs and homologs thereof, wherein said analogs and homologs consist of 9 to 30 amino acids and wherein said peptide, analogs and homologs suppress appetite or inhibit food intake when administered to a mammal.

5,840,689
METHOD FOR STIMULATING THE REGROWTH OF NEURONS

Joanne K. Daniloff, Baton Rouge, La., assignor to Board of Supervisors of Louisiana State University and Agricultural and Mechanical College, Baton Rouge, La.

Continuation of Ser. No. 146,734, Oct. 29, 1993, abandoned. This application Jun. 2, 1995, Ser. No. 458,555

Int. Cl.^{6} A61K *38/17;38/39*

U.S. Cl. 514—12 **18 Claims**

1. A process for repairing one or more injured mammalian neurons, wherein the site of neural injury is within the spinal cord, comprising applying to the site of neural injury an agent comprising a compound selected from the group consisting of:

(a) exogenous neural cell adhesion molecule;
(b) the 170–200 kD domain of the neural cell adhesion molecule;
(c) the 140 kD domain of the neural cell adhesion molecule;
(d) the immunoglobulin-like domains I–V of the 140 kD domain of the neural cell adhesion molecule, said immunoglobulin-like domains I–V having a molecular weight of 52 kD; and
(e) the immunoglobulin-like domain I of the 140 kD domain of the neural cell adhesion molecule, said immunoglobulin-like domain I having a molecular weight of 13 kD.

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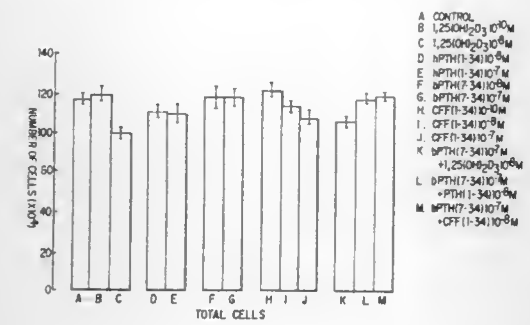
5,840,690
REGULATION OF CELL PROLIFERATION AND DIFFERENTATION USING PEPTIDES

Michael F. Holick, 31 Bishop La., Sudbury, Mass. 01776
Continuation of Ser. No. 281,648, Jul. 28, 1994, Pat. No. 5,527,772, which is a division of Ser. No. 118,692, Sep. 10, 1993, abandoned, which is a continuation of Ser. No. 575,219, Aug. 30, 1990, abandoned, which is a continuation-in-part of Ser. No. 110,973, Oct. 20, 1987, abandoned. This application Jun. 6, 1995, Ser. No. 471,576
Int. Cl.^{6} A61K *38/03;38/16;38/29*
U.S. Cl. 514—12 **52 Claims**



1. A method of inhibiting proliferation or enhancing differentiation of a mammalian skin cell, said method comprising contacting a mammalian skin cell in need of inhibited proliferation or enhanced differentiation with a proliferation-inhibiting or differentiation-enhancing amount of a peptide selected from the group consisting of human parathyroid hormone (hPTH), human hypercalcemic factor (hCFF), a hPTH agonist and a hCFF factor agonist,

wherein said agonist peptides are at least 8 amino acids long, said peptides contain a fragment of 8 amino acids which has at least 4 amino acids in common with the 34 amino acid N-terminal region of hPTH or hCFF, and said peptides are capable of inhibiting proliferation or enhancing the differentiation in vitro of cultured human keratinocytes.

5,840,691
METHOD FOR TREATING ISCHEMIA USING POLYPEPTIDES WITH FIBRONECTIN ACTIVITY

Leo T. Furcht, 2100 W. 21st St., Minneapolis, Minn. 55405; James B. McCarthy, 2555 37th Ave. S., Minneapolis, Minn. 55406; Sharon M. Wahl, 17121 Longdraft, Galthersburg, Md. 20878; Janice B. Allen, 215 S. Main St., Wendell, N.C. 27591; Kevin L. Billups, 5505 Dufferin Dr., Savage, Minn. 55378, and Jeffrey E. Everett, 1180 Benton Way, Arden Hills, Minn. 55112
Continuation-in-part of Ser. No. 139,903, Oct. 21, 1993, abandoned, which is a continuation-in-part of Ser. No. 990,296, Dec. 10, 1992, Pat. No. 5,591,719. This application Jun. 7, 1995, Ser. No. 480,133
Int. Cl.^{6} A61K *38/04;38/08;38/10;38/16*
U.S. Cl. 814—12 **16 Claims**

1. A method for treating ischemia in a mammal comprising: administering to said mammal an effective amount of a composition which comprises a polypeptide comprising an amino acid sequence selected from the group of tyr-glu-lys-pro-gly-ser-pro-pro-arg-glu-val-val-pro-arg-pro-arg-pro-gly-val (SEQ ID NO: 1), lys-asn-asn-gln-lys-ser-glu-pro-leu-ile-gly-arg-lys-lys-thr (SEQ ID NO: 2), trp-gln-pro-pro-arg-ala-arg-ile (SEQ ID NO: 3), asp-glu-leu-pro-gln-leu-val-thr-leu-pro-his-pro-asn-leu-his-gly-pro-glu-ile-leu-asp-val-pro-ser-thr (SEQ ID NO: 4), ser-pro-pro-arg-arg-ala-arg-val-thr (SEQ ID NO: 5), and ile-thr-val-tyr-ala-val-thr-gly-arg-gly-asp-ser-pro-ala-ser-ser-lys-pro-ile-ser (SEQ ID NO: 6), wherein the polypeptide has no more than about 100 amino acid residues.

5,840,692
PEPTIDE FRAGMENTS AND ANALOGS OF THROMBOSPONDIN

Alan Howard Deutch, Columbia, Md., and George Paul Tuszynski, Williamstown, N.J., assignors to Allegheny University of the Health Sciences, Philadelphia, Pa., and W. R. Grace, Co. - Conn., Columbia, Md.
Continuation-in-part of Ser. No. 359,263, Dec. 19, 1994, abandoned, which is a division of Ser. No. 110,146, Aug. 20, 1993, Pat. No. 5,426,100, which is a continuation of Ser. No. 896,527, Jun. 9, 1992, abandoned, which is a division of Ser. No. 483,527, Feb. 22, 1990, Pat. No. 5,190,918. This application Jun. 7, 1995, Ser. No. 488,273
Int. Cl.^{6} A61K *38/00;38/04;* **C07K** *5/00;7/00*
U.S. Cl. 514—12 **17 Claims**

1. A method for mimicking a biological activity of thrombospondin, the method comprising administering an effective amount of a polypeptide compound having the formula:

(SEQ ID NO:15)

$$Z_1\text{-}AA_1\text{-}AA_2\text{-}AA_3\text{-}AA_4\text{-}AA_5\text{-}AA_6\text{-}AA_7\text{-}AA_8\text{-}AA_9\text{-}Z_2$$

wherein:

Z_1 is selected from the group consisting of hydrogen, amino, acetyl, at least one amino acid residue, and at least one desamino form of an amino acid residue;

AA_1 is a neutral/nonpolar/large/cyclic amino acid residue;

AA_2 is selected from the group consisting of a neutral/polar/small amino acid residue, a neutral/polar/large/non-cyclic amino acid residue, and an acidic amino acid residue;

AA_3 is selected from the group consisting of a neutral/non-polar/large/cyclic amino acid residue, a neutral/nonpolar/large/non-cyclic amino acid residue, a neutral/polar/large/non-cyclic amino acid residue, and a neutral/polar/small amino acid residue;

AA_4 is a neutral/polar/small amino acid residue;

AA_5 is selected from the group consisting of a neutral/polar/small amino acid residue and a neutral/polar/large/non-cyclic amino acid residue;

AA_6 is selected from the group consisting of a neutral/nonpolar/large/non-cyclic amino acid residue and a neutral/polar/large/non-cyclic amino acid residue;

AA_7 is selected from the group consisting of a neutral/polar/large/non-cyclic amino acid residue and a neutral/polar/small amino acid residue;

AA_8 is a neutral/polar/small amino acid residue;

AA_9 is a neutral/polar/small amino acid residue; and

Z_2 is selected from the group consisting of hydroxyl, carboxyl, a non-amino acid, agmatine, at least one amino acid residue, at least one carboxyamide form of an amino acid residue, and at least one alkylamide form of an amino acid residue.

5,840,693
VASCULAR ENDOTHELIAL GROWTH FACTOR-B

Ulf Eriksson, Bålsta; Birgitta Olofsson, Stockholm, both of Sweden; Kari Alitalo, Espoo, and Katri Pajusola, Helsinki, both of Finland, assignors to Ludwig Institute for Cancer Research, New York, N.Y., and Helsinki University Licensing Ltd. OY, Helsinki, Finland
Continuation-in-part of Ser. No. 569,063, Dec. 6, 1995, which is a continuation-in-part of Ser. No. 469,427, Jun. 6, 1995, Pat. No. 5,607,918, which is a continuation-in-part of Ser. No. 397,651, Mar. 1, 1995, abandoned. This application Mar. 1, 1996, Ser. No. 609,443
Int. Cl.^{6} A61K *38/18;* **C07K** *14/515*
U.S. Cl. 514—12 **22 Claims**

1. An isolated protein which comprises a characteristic sequence Pro-Xaa-Cys-Val-Xaa-Xaa-Xaa-Arg-Cys-Xaa-Gly-Cys-Cys (SEQ ID NO:16) and has the property of promoting proliferation of endothelial cells or mesodermal cells, said protein comprising an amino acid sequence selected from the group consisting of the amino acid sequence of FIG. 1 (SEQ ID NO:2), the amino acid sequence of FIG. 2 (SEQ ID NO:3), the amino acid sequence of FIG. 4 (SEQ ID NO:5), the amino acid sequence of FIG. 6 (SEQ ID NO:7), the amino acid sequence of FIG. 8 (SEQ ID NO:9), the amino acid sequence of FIG. 11 (SEQ ID NO:11), the amino acid sequence of FIG. 13 (SEQ ID NO:13) , and the amino acid sequence of FIG. 15 (SEQ ID NO:15).

5,840,694

Patent Not Issued For This Number

5,840,695
ECTOPARASITE SALIVA PROTEINS AND APPARATUS TO COLLECT SUCH PROTEINS

Glenn R. Frank, Wellington; Shirley Wu Hunter, Ft. Collins, both of Colo., and Lynda Wallenfels, St. George, Utah, assignors to Heska Corporation, Ft. Collins, Colo.
Continuation-in-part of Ser. No. 487,001, Jun. 7, 1995, which is a continuation-in-part of Ser. No. 487,608, Jun. 7, 1995, which is a continuation-in-part of Ser. No. 319,590, Oct. 7, 1994, Pat. No. 5,646,115. This application Apr. 10, 1996, Ser. No. 630,822
Int. Cl.^{6} A61K *38/00;* **A01N** *37/18;* **C07H** *21/02*
U.S. Cl. 514—12 **41 Claims**

1. A formulation comprising at least one isolated ectoparasite saliva protein, wherein said ectoparasite saliva protein comprises at least a portion of an amino acid sequence, wherein said portion is encoded by a nucleic acid molecule that hybridizes under stringent hybridization conditions with a nucleic acid molecule that encodes a flea saliva protein present in a flea saliva extract selected from the group consisting of FS-1, FS-2 and FS-3 flea saliva extracts, wherein said formulation is substantially free of non-saliva ectoparasite proteins.

5,840,696
DIURETIC AND ANTINATRIURETIC RESPONSES PRODUCED BY THE ENDOGENOUS OPIOID-LIKE PEPTIDE, NOCICEPTIN (ORPHANIN FQ)

Howard Lippton, 144 Elks Pl., Suite 1602, New Orleans, La. 70112
Filed Sep. 11, 1997, Ser. No. 927,328
Int. Cl.^{6} A61K *38/00;38/10;* **C07K** *7/00*
U.S. Cl. 514—13 **10 Claims**

1. A method for producing free-water diuresis in a patient in need of free-water diuresis, which comprises administering to a patient a therapeutically effective amount of nociceptin.

5,840,697
PEPTIDE INHIBITORS OF CALMODULIN

Sylvie E. Blondelle, San Diego; Richard A. Houghten, Del Mar, both of Calif., and Enrique Perez-Paya, Valencia, Spain, assignors to Torrey Pines Institute for Molecular Studies, San Diego, Calif.
Filed Jun. 6, 1996, Ser. No. 660,747
Int. Cl.^{6} A61K *38/08;* **C07K** *7/06*
U.S. Cl. 514—17 **12 Claims**

1. A peptide having the structure:

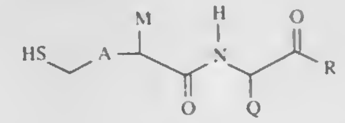
Ac-A1-B2-C3-D4-E5-F6-NH_2, (SEQ ID No. 1)

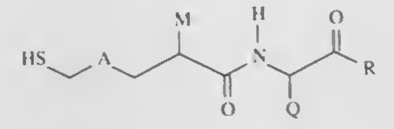
wherein A1 is (D)Leu or Leu;
wherein B2 is (D)Gln, Gln, (D)Trp, or Trp;
wherein C3 is (D)Arg, Arg, (D)Ile, or Ile;
wherein D4 is (D)Ile, Ile, (D)His, or His;
wherein E5 is (D)Leu, Leu, (D)His, or His; and
wherein F6 is (D)Trp, Trp, (D)Arg, or Arg.

5,840,698
INHIBITORS OF COLLAGENASE-1 AND STORMELYSIN-1 METALLOPROTEASES, PHARMACEUTICAL COMPOSITIONS COMPRISING SAME AND METHODS OF THEIR USE

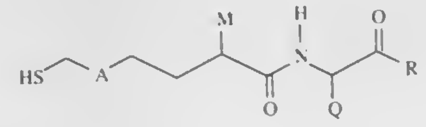
David A. Campbell, San Mateo; Dinesh V. Patel, Fremont, and Xiao-Yi Xiao, San Diego, all of Calif., assignors to Affymax Technologies N.V., Greenford, United Kingdom
Continuation-in-part of Ser. No. 482,211, Jun. 7, 1995, abandoned, which is a continuation-in-part of Ser. No. 329,420, Oct. 27, 1994, abandoned. This application Oct. 27, 1995, Ser. No. 549,346
Int. Cl.^{6} A61K *38/00;38/06*
U.S. Cl. 514—18 **14 Claims**

1. A compound comprising a formula:





or



wherein

A is selected from the group consisting of >C=O and >CHOH;

M and Q are each independently selected from the group consisting of hydrogen, alkyl, substituted alkyl, aryl, and heteroaryl;

R is selected from the group consisting of $—NR^1R^2$ and $—NHCH(Q')C(O)NR^1R^2$;

R^1 is selected from the group consisting of hydrogen, alkyl, substituted alkyl, aryl, heteroaryl, arylalkyl, heteroarylalkyl, heterocyclic and heterocyclicalkyl;

R^2 is hydrogen, or R^1 and R^2 together with the nitrogen atom to which they are attached form a heterocyclic or heteroaryl ring;

Q' is selected from the group consisting of hydrogen, alkyl, substituted alkyl, aryl, and heteroaryl;

or pharmaceutically acceptable salts thereof.

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5,840,699

PEPTIDE DERIVATIVES

Kyoichi Sakakibara, Tokyo; Masaaki Gondo, Yokohama; Koichi Miyazaki, Ebina; Takeshi Ito, Kawasaki; Akihiro Sugimura, Kawasaki, and Motohiro Kobayashi, Kawasaki, all of Japan, assignors to Teikoku Hormone Mfg. Co. Ltd., Tokyo, Japan

PCT No. PCT/JP96/00949, § 371 Date Oct. 21, 1997, § 102(e) Date Oct. 21, 1997, PCT Pub. No. WO96/33212, PCT Pub. Date Oct. 24, 1996

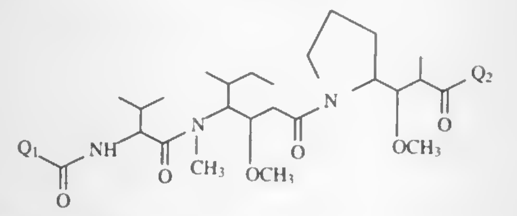
PCT Filed Apr. 8, 1996, Ser. No. 945,211

Claims priority, application Japan, Apr. 21, 1995, 7-119090; Apr. 21, 1995, 7-119092

Int. Cl.^{6} C07K *5/00;7/00;* **A61K** *38/00*

U.S. Cl. 514—18 **7 Claims**

1. A peptide compound of the formula

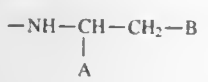


(I)

or a salt thereof, wherein:

(a) Q_1 represents a 1-dimethylamino-2-methylpropyl group and Q_2 represents an (R)- or (S)-2-hydroxy- 2-phenylethylamino group, a ^{2}-phenylcyclopropylamino group or a 1,2,3,4-tetrahydroisoquinolin-2-yl group, or

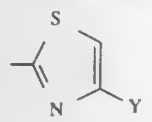
(b) Q_1 represents a 1-methyl-2-pyrrolidinyl group and Q_2 represents



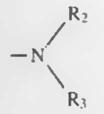
$$-NH-\underset{\displaystyle A}{\underset{|}{CH}}-CH_2-B$$

where

A is a hydrogen atom or



in which Y is a hydrogen atom or —COR_1, and R_1 is a hydroxyl group, a lower alkoxy group, an aralkyloxy group or



in which R_2 and R_3 are the same or different and are each a hydrogen atom, a lower alkyl group, a phenyl group, or a four- to seven-membered heterocyclic group having one or two heteroatoms selected from S, O and N, or R_2 and R_3, together with the nitrogen atom to which they are attached, may form a four- to seven-membered heterocyclic group which may further have one heteroatom selected from S, O and N, and

B is a phenyl group which may optionally be substituted by a halogen atom, hydroxyl group, lower alkyl group or lower alkoxy group.

5,840,700

METHODS OF PRODUCING TRANSFER FACTOR

Charles H. Kirkpatrick, Denver, and Stephen J. Rozzo, Aurora, both of Colo., assignors to National Jewish Center for Immunology and Respiratory Medicine, Denver, Colo.

Division of Ser. No. 279,278, Jul. 22, 1994, Pat. No. 5,470,835, which is a continuation of Ser. No. 20,244, Feb. 19, 1993, abandoned, which is a continuation of Ser. No. 718,571, Jun. 26, 1991, abandoned, which is a continuation-in-part of Ser. No. 547,500, Jul. 2, 1990, abandoned. This application May 16, 1995, Ser. No. 441,973

Int. Cl.^{6} C07K *17/00*

U.S. Cl. 514—21 **24 Claims**

1. A method of producing substantially pure transfer factor comprising the steps of:

a. contacting a transfer factor-containing sample with an immobilized antigen to which the transfer factor binds specifically under conditions favoring binding of antigen-specific transfer factor to the antigen to form a transfer factor:antigen complex;

b. separating the antigen-specific transfer factor from the complex;

c. applying the separated antigen-specific transfer factor onto a reversed phase, high performance liquid chromatography column; and

d. eluting a substantially pure transfer factor containing fraction;

e. selecting the transfer factor containing fraction by monitoring increased absorption at about 214 nm, the substantially pure transfer factor having a specific activity of at least 5,000 units per absorbance unit at 214 nm.

5,840,701

COMPOSITIONS AND METHODS UTILIZING NITROXIDES IN COMBINATION WITH BIOCOMPATIBLE MACROMOLECULES

Jen-Chang Hsia, 135 Starcrest, Irvine, Calif. 92715

Continuation-in-part of Ser. No. 482,952, Jun. 7, 1995, which is a continuation-in-part of Ser. No. 417,132, Mar. 31, 1995, which is a continuation-in-part of Ser. No. 291,590, Aug. 15, 1994, Pat. No. 5,591,710, which is a continuation-in-part of Ser. No. 107,543, Aug. 16, 1993, abandoned. This application Feb. 22, 1996, Ser. No. 605,531

Int. Cl.^{6} A61K *31/04*

U.S. Cl. 514—21 **5 Claims**

1. A method to alleviate tissue damage from cerebral ischemia comprising intravenously administering a physiologically compatible dose of polynitroxylated albumin wherein the average molar ratio of nitroxide to albumin is between approximately 17 to 95.

5,840,702

CYSTIC FIBROSIS TREATMENT

David M. Bedwell, Birmingham, Ala., assignor to UAB Research Foundation, Birmingham, Ala.

Filed Mar. 22, 1996, Ser. No. 620,866

Int. Cl.^{6} A61K *31/70*

U.S. Cl. 514—23 **12 Claims**

1. A method of stimulating expression of a functional full-length cystic fibrosis transmembrane conductance regulator protein in an individual in need of such treatment, comprising the step of administering to said individual a pharmacologically effective dose of an aminoglycoside.

5,840,703

PHASE TRANSFER CATALYST FOR USE IN THE SYNTHESIS OF POLYOL FATTY ACID POLYESTERS

Patrick J. Corrigan, 33 Dexter Park Blvd., Cincinnati, Ohio 45241, and John K. Howie, 5958 Olive Branch Rd., Oregonia, Ohio 45054

Filed Nov. 15, 1996, Ser. No. 749,568

Int. Cl.^{6} A61K *31/70;* **C07H** *1/00*

U.S. Cl. 514—23 **36 Claims**

1. An essentially solvent free mixture of a phase transfer catalyst, a polyol, a fatty acid lower alkyl ester and a base initiator, wherein said phase transfer catalyst comprises:

a compound of the formula $(R\text{-}A^+\text{-}(R')_3)X^-$, a crown ether compound, a compound of the formula $R''\text{-}(—O—CH_2—CH_2—)_n\text{-}R'''$, or mixtures of said compounds;

wherein

A is nitrogen or phosphorous,

R is a straight chain C_1–C_{16} hydrocarbon,

each R' is individually a straight chain C_1–C_8 hydrocarbon.

X is Cl, Br, I, or C_2–C_{22} fatty acid ion,

R" and R"' individually are hydrogen, an alkyl group of from about 1 to about 20 carbon atoms, or an esterified carboxylic acid, and

n is from about 2 to about 100.

5,840,704

ANTIPARASITIC AGENTS AND PROCESS FOR THEIR PREPARATION

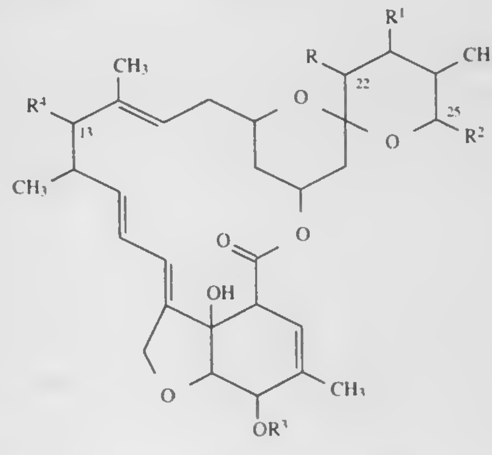
Stephen P. Gibson; Alexander C. Goudie; Kelvin S. Holdom, and John D. Bu'Lock, all of New York, N.Y., assignors to Pfizer Inc., New York, N.Y.

Continuation of Ser. No. 786,691, Nov. 1, 1991, abandoned, which is a continuation of Ser. No. 142,888, Jan. 11, 1988, Pat. No. 5,089,480, which is a continuation-in-part of Ser. No. 886,867, Jul. 16, 1986, abandoned. This application Mar. 23, 1993, Ser. No. 35,546

Int. Cl.^{6} A61K *31/70;31/335;* **C07H** *17/08;* **C07D** *305/00*

U.S. Cl. 514—30 **9 Claims**

1. A compound having the formula



(I)

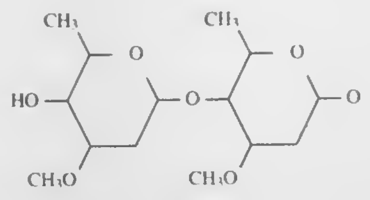
wherein

R when taken individually is H; R^1 when taken individually is H or OH; R and R^1 when taken together represent a double bond;

R^2 is an alpha-branched C_5–C_8 alkyl or C_3–C_8 alkenyl group;

R^3 is hydrogen or methyl;

R^4 is H or a 4'-(alpha-L-oleandrosyl)-alpha-L-oleandrosyloxy group of the formula:



with the proviso that when R^2 is alkenyl it is not 2-buten-2-yl, 2-penten-2-yl or 4-methyl-2-penten- 2-yl.

9. A method of combatting parasite infections or infestations which comprises contacting the organism responsible for said infection or infestation or the location of said organism with an antiparasitic amount of a compound according to claim 1.

5,840,705

α-GLUCOSIDASE INHIBITOR, COMPOSITION PRINCIPALLY COMPRISING SUGAR AND CONTAINING THE SAME, SWEETENER, FOOD AND FEED

Masayuki Tsukada; Hiroyuki Takeda; Norio Maeda; Yasunori Fukumori; Norio Shiomi; Shuichi Onodera, all of Hokkaido, and Takuji Fujisawa, Fukuoka, all of Japan, assignors to The Hokuren Federation of Agricultural Cooperatives, Japan

Filed Feb. 21, 1996, Ser. No. 604,563

Claims priority, application Japan, Apr. 20, 1995, 7-119163

Int. Cl.^{6} A01N *43/04;* **A61K** *31/70*

U.S. Cl. 514—43 **16 Claims**

1. An α-glucosidase inhibitor composition containing, as an effective ingredient, at least one substance selected from the group consisting of nucleotides, nucleosides and nucleic acid-derived bases, and having a mild action inhibiting α-glucosidase.

5,840,706

Patent Not Issued For This Number

5,840,707

STABILIZING AND DELIVERY MEANS OF BIOLOGICAL MOLECULES

Raphael James Mannino, and Susan Gould-Fogerite, both of Annandale, N.J., assignors to Albany Medical College, Albany, N.Y., and University of Medicine and Dentistry of New Jersey, Newark, N.J.

Continuation-in-part of Ser. No. 130,986, Oct. 4, 1993. This application Feb. 22, 1995, Ser. No. 394,170

Int. Cl.^{6} A61K *9/127*

U.S. Cl. 514—44 **27 Claims**

1. A protein- or peptide-cocheleate formulation comprising

a) a polynucleotide component;

b) a negatively charged lipid component, and

c) a divalent cation component.

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5,840,708

ADMINISTRATION OF OLIGONUCLEOTIDES ANTISENSE TO DOPAMINE RECEPTOR MRNA FOR DIAGNOSIS AND TREATMENT OF NEUROLOGICAL PATHOLOGIES

Benjamin Weiss, Wynnewood, Pa., assignor to Allegheny University of the Health Sciences, Philadelphia, Pa.

PCT No. PCT/US93/12161, § 371 Date Jun. 7, 1995, § 102(e) Date Jun. 7, 1995, PCT Pub. No. WO94/13303, PCT Pub. Date Jun. 23, 1994

Continuation-in-part of Ser. No. 991,582, Dec. 14, 1992, abandoned. This PCT application Dec. 14, 1993, Ser. No. 448,386

Int. Cl.^{6} A01N *43/04;* **C07H** *21/04*

U.S. Cl. 514—44 **27 Claims**

1. A method of inhibiting production of a pre-determined dopamine receptor in a human cell, said method comprising:

a) providing an antisense oligonucleotide which hybridizes to the expression-controlling sequence comprising the translational start site of a nucleic acid that encodes said predetermined dopamine receptor, said oligonucleotide consisting of a sequence selected from the group consisting of SEQ ID NO: 3, SEQ ID NO: 4, SEQ ID NO: 5, SEQ ID NO: 7 and SEQ ID NO: 8; and

b) contacting said human cell with said antisense oligonucleotide under conditions whereby said antisense oligonucleotide enters cells producing said dopamine receptor and hybridizes with said expression-controlling sequence of said nucleic acid encoding said predetermined dopamine receptor to inhibit production of said dopamine receptor in said human cell.

5,840,709

Patent Not Issued For This Number

5,840,710

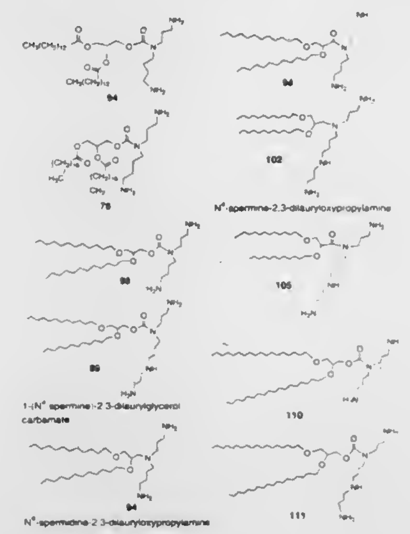
CATIONIC AMPHIPHILES CONTAINING ESTER OR ETHER-LINKED LIPOPHILIC GROUPS FOR INTRACELLULAR DELIVERY OF THERAPEUTIC MOLECULES

Edward R. Lee, Quincy; David J. Harris, Lexington; Craig S. Siegel, Woburn; Mathieu B. Lane, Cambridge; Shirley C. Hubbard, Belmont; Seng H. Cheng, Wellesley; Simon J. Eastman, Marlboro; John Marshall, Milford, and Ronald K. Scheule, Hopkinton, all of Mass., assignors to Genzyme Corporation, Framingham, Mass.

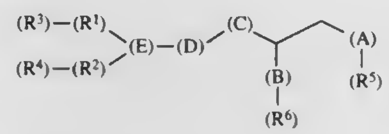
Continuation-in-part of Ser. No. 540,867, Oct. 11, 1995, which is a continuation-in-part of Ser. No. 352,479, Dec. 9, 1994, Pat. No. 5,650,096. This application Oct. 20, 1995, Ser. No. 546,087

Int. Cl.^{6} A61K *38/00;48/00;* **C07C** *53/00;69/74*

U.S. Cl. 514—44 **36 Claims**


94
102
76
N⁴-spermine-2,3-dilauryloxypropylamine
98
105
89
1-(N⁴-spermine)-2,3-dilaurylglycerol carbamate
110
94
N⁴-spermidine-2,3-dilauryloxypropylamine
111

1. A cationic amphiphile capable of facilitating transport of biologically active molecules into cells, said amphiphile having the structure



$$\left.\begin{matrix}(R^3)-(R^1)\\(R^4)-(R^2)\end{matrix}\right\rangle(E)-(D)-(C)-\underset{\substack{|\\(B)\\|\\(R^6)}}{\diagdown}-\underset{\substack{|\\(R^5)}}{(A)}$$

wherein:

(A) and (B) are independently O, N or S;

R^5 is an alkyl or acyl group that includes, optionally, one or more points of unsaturation;

R^6 is an alkyl or acyl group that includes, optionally, one or more points of unsaturation;

(C) is selected from the group —CH_2—, >C═O, and >C═S;

(E) is a carbon atom or a nitrogen atom;

(D) is a linking group or is absent;

R^3 is H, or a saturated or unsaturated aliphatic group;

R^1 is —NH—, an alkylamine, or a polyalkylamine;

R^4 is H, or a saturated or unsaturated aliphatic group;

R^2 —NH—, an alkylamine, or a polyalkylamine; and wherein R^1 is the same or is different from R^2, except that both R^1 and R^2 cannot be —NH—.

5,840,711

COMPOSITIONS CONTAINING LITHIUM INORGANIC SALTS AND ANTI-VIRAL DRUGS AND METHOD OF TREATING VIRAL INFECTIONS SUCH AS ACQUIRED IMMUNODEFICIENCY SYNDROME

Vincent S. Gallicchio, Lexington, Ky., assignor to University of Kentucky Research Foundation, Lexington, Ky.

Continuation-in-part of Ser. No. 493,479, Jun. 21, 1995, abandoned. This application Jan. 9, 1997, Ser. No. 780,913

Int. Cl.^{6} A61K *31/70*

U.S. Cl. 514—45 **6 Claims**

1. A composition comprising a lithium gamma linolenate salt of an anti-viral selected from the group consisting of AZT, dideoxyinosine (ddI), dideoxycytosine (ddC), and d4T, and an excipient.

5,840,712

WATER SOLUBLE VITAMIN B_{12} RECEPTOR MODULATING AGENTS AND METHODS RELATED THERETO

A. Charles Morgan, Jr., Mill Creek; D. Scott Wilbur, Edmonds, and Pradip M. Pathare, Seattle, all of Wash., assignors to Receptagen Corporation, and University of WA, both of Edmonds, Wash.

Continuation-in-part of Ser. No. 406,191, Mar. 16, 1995, Ser. No. 406,192, Mar. 16, 1995, Pat. No. 5,739,287, and Ser. No. 406,194, Mar. 16, 1995, each which is a continuation-in-part of Ser. No. 224,831, Apr. 8, 1994, abandoned. This application Oct. 19, 1995, Ser. No. 545,151

Int. Cl.^{6} A01N *43/04;* **A61K** *31/70*

U.S. Cl. 514—52 **10 Claims**

1. A vitamin B_{12} dimer comprising a first and a second vitamin B_{12} molecule covalently coupled through at least one water-soluble linker through a coupling site independently selected from the group consisting of coupling sites a–g, coupling site h, and coupling site i.

5,840,713

THERAPY FOR TISSUE MEMBRANE INSUFFICIENCY

Paul B. Weisz, Foxdale Village, Apt. 1-A, 500 E. Marylyn Ave., State College, Pa. 16801-6236

Continuation-in-part of Ser. No. 416,107, Apr. 3, 1995, Pat. No. 5,760,015. This application Sep. 19, 1995, Ser. No. 530,777

Int. Cl.^{6} A61K *31/715;* **C08B** *31/16*

U.S. Cl. 514—58 **17 Claims**

1. A therapeutic method for reducing pathologically excessive permeability of tissue membranes of a mammal to leakage of proteinic substances therethrough, which method comprises administering, to a mammal exhibiting effects of tissue membrane leakage, an oligosaccharide selected from the group consisting of α-, β-, and γ- cyclodextrins which is substituted with at least about 1.4 anionic groups selected from the group consisting of sulfate, phosphate or sulfonate per sugar unit, in an amount which is effective to reduce leakage of proteinic substances through said membrane.

5,840,714

INCLUSION COMPLEXES OF RACEMIC IBUPROXAM AND OF OPTICALLY ACTIVE IBUPROXAM WITH CYCLODEXTRIN DERIVATIVES, PHARMACEUTICAL PREPARATIONS CONTAINING SAID INCLUSION COMPLEXES AND METHODS FOR USING SAME

Janko Žmitek; Katarina Verhnjak; Darja Ferčej-Temeljotov; Mateja Kovačič ; Anton Lavrič , and Breda Bole-Vunduk, all of Ljubljana, Slovenia, assignors to LEK, tovarna farmacevtskih in kemicnih izdelkov, d.d., Ljubljana, Slovenia

PCT No. PCT/SI94/00015, § 371 Date Feb. 20, 1996, § 102(e) Date Feb. 20, 1996, PCT Pub. No. WO95/07076, PCT Pub. Date Mar. 16, 1995

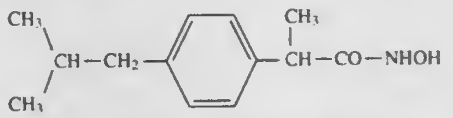
PCT Filed Sep. 6, 1994, Ser. No. 602,729

Claims priority, application Slovenia, Sep. 10, 1993, P-9300470

Int. Cl.^{6} A61K *47/40;* **C07H** *21/00*

U.S. Cl. 514—58 **29 Claims**

1. Inclusion complex selected from the group consisting of including complexes of recemic 2-(4-isobutylphenyl)-propiohydroxamic acid with a cyclodextrin derivative wherein said derivative is selected from the group consisting of dimethyl-β-cyclodextrin, methyl-β-cyclodextrin, trimethyl-β-cyclodextrin, hydroxyethyl-β-cyclodextrin, hydroxypropyl-β-cyclodextrin, glucosyl-β-cyclodextrin, dimaltosyl-β-cyclodextrin, diglucosyl-β-cyclodextrin, succinyl-β-cyclodextrin, triacetyl-β-cyclodextrin, diethyl-β-cyclodextrin, carboxymethylethyl-β-cyclodextrin, dipentyl-β-cyclodextrin, tripentyl-β-cyclodextrin, or acetyldipentyl-β-cyclodextrin: inclusion complexes of optically active S-(+)- 2-(4-isobutylphenyl)-propiohydroxamic acid (ibuproxam) of the formula



with a cyclodextrin derivative wherein said derivative is selected from the group consisting of dimethyl-β-cyclodextrin, methyl-β-cyclodextrin, trimethyl-β-cyclodextrin, hydroxyethyl-β-cyclodextrin, hydroxypropyl-β-cyclodextrin, glucosyl-β-cyclodextrin, dimaltosyl-β-cyclodextrin, diglucosyl-β-cyclodextrin, succinyl-β-cyclodextrin, triacetyl-β-cyclodextrin, diethyl-β-cyclodextrin, carboxymethylethyl-β-cyclodextrin, dipentyl-β-cyclodextrin, tripentyl-β-cyclodextrin, or acetyldipentyl-β-cyclodextrin; and inclusion complex of said optically active S(+)-2-(4-isobutylphenyl)propiohydroxamic acid with β-cyclodextrin.

20. A method for treating at least one condition selected from the group consisting of inflammation, febrile condition or pain which comprises administering to a patient suffering from said condition a therapeutically active amount of an inclusion complex according to claim 1 with a lower ulcerogenic activity.

5,840,715

DIETARY REGIMEN OF NUTRITIONAL SUPPLEMENTS FOR RELIEF OF SYMPTOMS OF ARTHRITIS

Vito V. Florio, Tamaroc, Fla., assignor to Inholtra Investment Holdings & Trading, N.V., Aruba, Netherlands Antilles

PCT No. PCT/US95/16722, § 371 Date Jan. 6, 1998, § 102(e) Date Jan. 6, 1998, PCT Pub. No. WO97/21434, PCT Pub. Date Jun. 19, 1997

PCT Filed Dec. 11, 1995, Ser. No. 952,272

Int. Cl.^{6} A61K *31/70;65/60;35/78*

U.S. Cl. 514—62 **5 Claims**

1. A method of providing symptomatic relief from debilitating effects of arthritis in a patient, comprising:

(A) providing for daily consumption by said patient of (a) from about 250 to about 1,500 mg of a natural source of gamma linolenic acid, (b) from about 250 to about 1,500 mg of a mixture of eicosapentaenoic acid and docosahexaenoic acid wherein the weight ratio of eicosapentaenoic acid to docosa-

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hexaenoic acid is 4:3, and (c) from about 500 to about 3,000 mg of a mixture of chondroitin sulfate, N-acetyl glucosamine sulfate, and glucosamine sulfate wherein the weight ratio of N-acetyl glucosamine sulfate to glucosamine sulfate to chondroitin sulfate is 5:5:2, and

(B) maintaining said daily consumption so as to relieve the debilitating effects of arthritis,

with the proviso that the mixture of subparagraph (c) and the mixture of subparagraph (b) be taken together at least once in the morning; and that the mixture of subparagraph (c) and the natural source of gamma linolenic acid of subparagraph (a) be taken together at least once in the evening.

5,840,716
PHOSPHONATE NUCLEOTIDE COMPOUNDS

Masaru Ubasawa; Kouichi Sekiya; Hideaki Takashima; Naoko Ueda; Satoshi Yuasa, and Naohiro Kamiya, all of Kanagawa, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

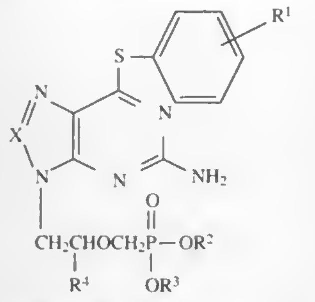
Filed Jan. 17, 1997, Ser. No. 785,606

Claims priority, application Japan, Jan. 18, 1996, 8-006480

Int. Cl.^{6} A01N *57/00;* C07F *9/02*

U.S. Cl. 514—75 **18 Claims**

1. A phosphonate nucleotide compound represented by the following formula (I) or its salt, or a hydrate or a solvate thereof:



(I)

wherein R^1 represents hydrogen atom or a C_1–C_6 alkoxy group, R^2 and R^3 independently represent hydrogen atom, a C_1–C_{22} alkyl group, an acyloxymethyl group, an acylthioethyl group, or an ethyl group substituted with one or more halogen atoms; R^4 represents hydrogen atom, a C_1–C_4 alkyl group, a C_1–C_4 hydroxyalkyl group, or a C_1–C_4 alkyl group substituted with one or more halogen atoms; and X represents a carbon atom or a nitrogen atom.

5,840,717
USE OF SALICYLIC ACID FOR REGULATING SKIN WRINKLES AND/OR SKIN ATROPHY

Roy Lonnie Blank, Spring Valley, N.Y., assignor to Richardson-Vicks Inc., Shelton, Conn.

Division of Ser. No. 775,488, Dec. 31, 1996, abandnned, which is a continuation of Ser. No. 641,296, Apr. 30, 1996, Pat. No. 5,616,572, which is a continuation of Ser. No. 434,250, May 3, 1995, abandoned, which is a continuation of Ser. No. 28,756, Mar. 9, 1993, abandoned, which is a continuation of Ser. No. 796,750, Nov. 25, 1991, abandoned. This application Apr. 10, 1997, Ser. No. 827,892

Int. Cl.^{6} A61K *31/60;7/42;7/44;7/00*

U.S. Cl. 514—159 **19 Claims**

1. A method for regulating wrinkles or atrophy in mammalian skin comprising treating the skin with a safe and effective amount of a composition comprising:

(a) a safe and effective amount of salicylic acid,

(b) a humectant, and

(c) a pharmaceutically-acceptable carrier.

5,840,718
22-EPIMERIC-1,25-DIHYDROXY-16,22,23-TRIENE-CHOLECALCIFEROL

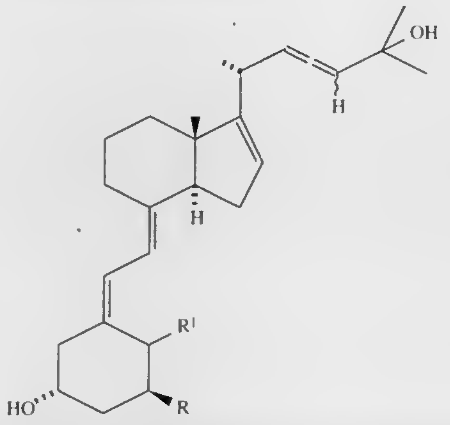
Bernard Michael Hennessy, Nutley; Jerome Anthony Iacobelli, Paramus, and Milan Radoje Uskokovic, Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Mar. 6, 1997, Ser. No. 811,809

Int. Cl.^{6} A61K *31/59*

U.S. Cl. 514—167 **16 Claims**

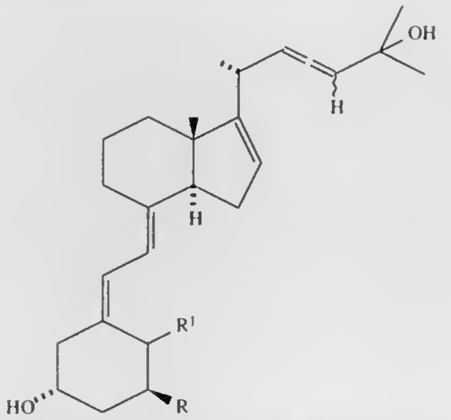
1. A compound of the formula



I

wherein R is hydroxy and R^1 is H_2 or $=CH_2$ or R is hydrogen or fluoro and R^1 is $=CH_2$.

6. A pharmaceutical composition comprising (a) an effective amount of a compound of the formula



I

wherein R is hydroxy and R^1 is H_2 or $=CH_2$ or R is hydrogen or fluoro and R^1 is $=CH_2$ and (b) an inert carrier.

5,840,719
APOPTOSIS INHIBITORS FOR TREATING NEURODEGENERATIVE DISEASES

Lee Laurence Rubin, London, Great Britain, and Susan Frances Brooks, deceased, late of St. Albans, Great Britain, by Gavin Brooks, executor, assignors to Eisai Company, Ltd., Tokyo, Japan

PCT No. PCT/GB94/01169, § 371 Date May 8, 1996, § 102(e) Date May 8, 1996, PCT Pub. No. WO94/27583, PCT Pub. Date Dec. 8, 1994

PCT Filed May 31, 1994, Ser. No. 556,974

Claims priority, application United Kingdom, May 28, 1993, 9311132

Int. Cl.^{6} A61K *31/56;31/505;31/52;31/47, 31/44;31/405;31/34;31/135*

U.S. Cl. 514—180 **6 Claims**

1. A method of treating or preventing a disease involving apoptotic cell death, the method comprising administering to a subject in need thereof, or to cells of a subject, an effective amount of an agent that prevents cell entry into, or passage through, the mitotic cycle wherein the agent is selected from the group consisting of serotonin, dopamine, ascorbic acid, gluquidone, caffeine, hydrocortisone and dexamethasone.

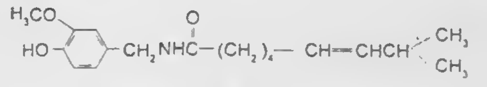
5,840,720
4-O AND 5-AMINOMETHYLATION OF SYNTHETIC CAPSAICIN DERIVATIVES, A NEW DISCOVERY OF CAPSAICIN ANTAGONIST

Ing-Jun Chen, Kaohsiung, Taiwan, assignor to Tong-Ho Lin, Taipei, Taiwan

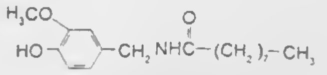
Filed Oct. 23, 1995, Ser. No. 547,040

Int. Cl.^{6} C07D *273/01*

U.S. Cl. 544—230.5 **10 Claims**

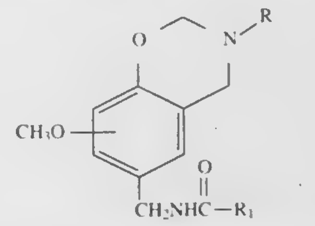


Capsaicin (cap ; A)
8-methyl-N-vanillyl-nonenamide

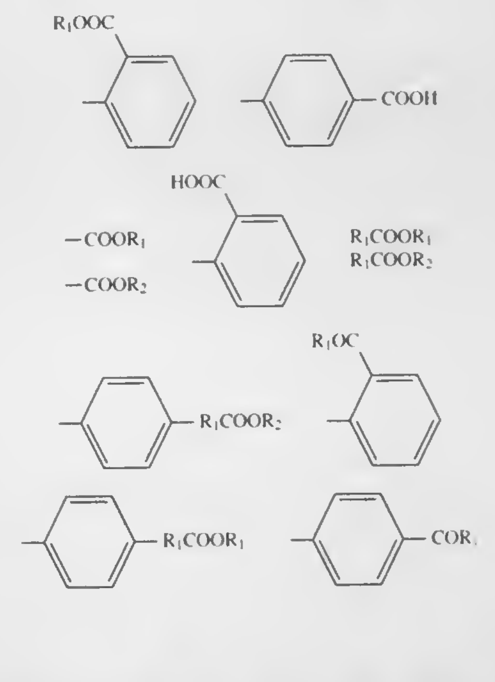


Nonivamide (NVA ; B)
nonanoyl vanillylamide

1. A capsaicin derivative having the formula



wherein R is a member selected from the group consting of $—R_1$



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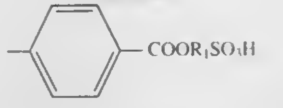


wherein R_1 is a member selected from the group consisting of C_{1-12} alkyl, C_{1-12} alkenyl, C_{1-12} alkylene, and C_{1-12} alkenylene, and

wherein R_2 is a member selected from the group consisting of H, C_{1-3} alkylene-NR_1R_1, and C_{1-6} alkenylene-NR_1R_1.

5,840,721
IMIDAZOLE DERIVATIVES AS MDR MODULATORS

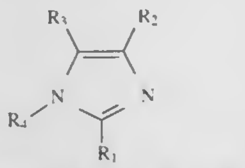
Adnan M. M. Mjalli, Louisville, Ky., and Chengzhi Zhang, San Diego, Calif., assignors to Ontngen Corporation, Carlsbad, Calif.

Continuation-in-part of Ser. No. 890,911, Jul. 9, 1997, abandoned. This application Oct. 16, 1997, Ser. No. 951,695

Int. Cl.^{6} A61K *31/415;* C07D *233/56;233/04;233/02;233/61*

U.S. Cl. 514—232.2 **74 Claims**

1. A compound of the formula 1



Formula 1

wherein the substituents R_1, R_2, R_3, and R_4 are defined as described in A and B below:

A. when R_1 is selected from the group consisting of:

(i) substituted C_{1-11} alkyl or substituted C_{2-11} alkenyl, wherein the substituents are selected from the group consisting of hydroxy, C_{1-6} alkyloxy; or

(ii) mono-, di-,and tri-substituted aryl-C_{0-11} alkyl wherein aryl is selected from the group consisting of phenyl, furyl, thienyl wherein the substituents are selected from the group consisting of:

(a) phenyl, trans -2-phenylethenyl, 2-phenylethynyl, 2-phenylethyl, or in which the said phenyl group is mono- or disubstituted with a member selected from the group consisting of hydroxy, halo, C_{0-4} alkyl and C_{1-4} alkyloxy,

(b) substituted C_{1-6} alkyl, substituted C_{2-6} alkyloxy, substituted C_{2-6} alkylthio, substituted C_{2-6} alkoxycarbonyl, wherein the substituents are selected from the group consisting of C_{1-6} alkoxy, C_{1-6} alkylthio, or

(c) C_{1-11} CO_2R_5, C_{1-11} $CONHR_5$, trans- $CH═CHCO_2R_5$, or trans-$CH═CHCONH_5$ wherein R_5 is C_{1-11} alkyl, or phenyl C_{1-11} alkyl, C_{1-6} alkoxycarbonylmethyleneoxy;

then R_2 and R_3 are each independently selected from the group consisting of mono-, di, and tri-substituted phenyl wherein the substituents are independently selected from:

(i) substituted C_{1-6} alkyl,

(ii) substituted C_{1-6} alkyloxy, C_{3-6} alkenyloxy, substituted C_{3-6} alkenyloxy,

(iii) substituted C_{1-6} alkyl-amino, di(substituted C_{1-6} alkyl)amino,

(iv) C_{3-6} alkenyl-amino, di(C_{3-6} alkenyl)amino, substituted C_{3-6} alkenyl-amino, di(substituted C_{3-6} alkenyl)amino,

(v) pyrrolidino, piperidino, morpholino, imidazolyl, substituted imidazolyl, piperazino, N—C_{1-6} alkenylpiperazino, N—C_{3-6} alkenylpiperazino, N—(C_{1-6} alkoxy C_{1-6} alkyl)piperazino, N—(C_{1-6} alkoxy C_{3-6} alkenyl)piperazino, N—(C_{1-6} alkylamino C_{1-6} alkyl)piperazino, N—(C_{1-6} alkylamino C_{3-6} alkenyl)piperazino,

wherein the substituents are selected from the group consisting of

(a) hydroxy, C_{1-6} alkylalkoxy, C_{1-6} alkylamino,

(b) C_{3-6} alkenyloxy, C_{3-6} alkenylamino, or

(c) pyrrolidino, piperidino, morpholino, imidazolyl, substituted imidazolyl, piperazino, N—C_{1-6} alkenylpiperazino, N—C_{3-6} alkenylpiperazino, N—(C_{1-6} alkoxy C_{1-6} alky-

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l)piperazino, N—(C_{1-6} alkoxy C_{3-6} alkenyl)piperazino, N—(C_{1-6} alkylamino C_{1-6} alkyl)piperazino, N—(C_{1-6} alkylamino C_{3-6} alkenyl)piperazino,

or R_2 and R_3 taken together forming an aryl group or substituted aryl wherein the substituents are defined as above in (i)–(v);

and R_4 is selected from the group consisting of:

- (i) hydrogen:
- (ii) substituted C_{1-11} alkyl or C_{2-11} alkenyl wherein the substituents are independently selected from the group consisting of hydrogen, hydroxy, C_{1-6} alkyloxy, C_{1-6}alkylthio, C_{1-6} alamino, phenyl-C_{1-6} alkylamino, C_{1-6} alkoxycarbonyl; or
- (iii) substituted aryl C_{0-11}, alkyl wherein the aryl group is selected from phenyl, imidazolyl, furyl, thienyl in which the substituents are selected from A. (a–c); or

B. when R_1 is selected from the group consisting of:

Mono-,di-, and tri-substituted aryl-C_{0-6} alkyl wherein aryl is selected from the group consisting of phenyl, thienyl, and the substituents are selected from the group consisting of:

- (a) trans-2-substituted benzimidazolylethenyl, trans-2-substituted benzoxazolylethenyl, trans-2-substituted benzthiazolylethenyl, in which the substituents are selected from the group consisting of hydrogen, hydroxy, halo, trihalomethyl, C_{1-4} alkyl and C_{1-4} alkyloxy, C_{1-4} alkyloxycarbonyl, C_{1-4} alkylamino, di(C_{1-4} alkyl)amino, C_{3-6} alkenylamino, di(C_{3-6} alkenyl)amino, C_{1-4} alkyloxy-C_{1-4} alkylamino, substituted C_{1-4} alkyl and C_{1-4} alkyloxy, substituted C_{1-4} alkyloxycarbonyl, substituted C_{1-4} alkylamino, di(substituted C_{1-4} alkyl)amino, substituted C_{3-6} alkenylamino, di(substituted C_{3-6} alkenyl)amino, wherein the substituents are as defined above,
- (b) trans-2-cyano ethenyl, trans-2-alkylsulfonyl ethenyl, trans-2alkenylsulfonyl ethenyl, trans-2- substituted alkylsulfonyl ethenyl, trans-2- substituted alkenylsulfonyl ethenyl, in which the substituents are defined above,
- (c) C_{1-6} CO_2R_5, trans- CH═$CHCO_2R_5$, $C_{1-6}CONHR_5$, or trans-CH═$CHCONHR_5$, wherein R_5 is C_{1-6} alkoxy C_{2-6} alkyl, amino C_{2-6} alkyl, C_{1-6} alkylamino C_{2-6} alkyl, di(C_{1-6} alkyl)amino C_{2-6} alkyl, C_{1-6} alkylthio C_{2-6} alkyl, substituted C_{1-6} alkoxy C_{2-6} alkyl, substituted C_{1-6} alkylamino C_{2-6} alkyl, di(substituted C_{1-6} alkyl)amino C_{2-6} alkyl, substituted C_{1-6} alkylthio C_{2-6} alkyl, in which the substituents are selected from the group consisting of pyrrolidino, piperidino, morpholino, piperazino, N—C_{1-6} alkenylpiperazino, N—C_{3-6} alkenylpiperazino, N—(C_{1-6} alkoxy C_{1-6} alkyl)piperazino, N—(C_{1-6} alkoxy C_{3-6} alkenyl)piperazino, N—(C_{1-6} alkylamino C_{1-6} alkyl)piperazino, N—(C_{1-6} alkylamino C_{3-6} alkenyl)piperazino, imidazolyl, oxazolyl, thiazolyl,
- (d) $C_{1-6}CONR_6R_7$, or trans- CH═$CHCONR_6R_7$, wherein R_6 and R_7 are independently selected from the group consisting of C_{1-6} alkyl, phenyl C_{1-6} alkyl, C_{1-6} alkoxycarbonylmethyleneoxy, hydroxy C_{2-6} alkyl, C_{1-6} alkyloxy C_{2-6} alkyl, amino C_{2-6} alkyl, C_{1-6} alkylamino C_{2-6} alkyl, di(C_{1-6} alkyl)amino C_{2-6} alkyl, C_{1-6} alkylthio C_{2-6} alkyl, substituted C_{1-6} alkoxy C_{2-6} alkyl, substituted C_{1-6} alkylamino C_{2-6} alkyl, di(substituted C_{1-6} alkyl)amino C_{2-6} alkyl, substituted C_{1-6} alkylthio C_{2-6} alkyl, wherein the substituents are selected from the group consisting of pyrrolidino, piperidino, morpholino, piperazino, N—C_{1-6} alkenylpiperazino, N—C_{3-6} alkenylpiperazino, N—(C_{1-6} alkoxy C_{1-6} alkyl)piperazino, N—(C_{1-6} alkoxy C_{3-6} alkenyl)piperazino, N—(C_{1-6} alkylamino C_{1-6} alkyl)piperazino, N—(C_{1-6} alkylamino C_{3-6} alkenyl)piperazino, imidazolyl, oxazolyl, thiazolyl,
- (e) R_7 C(O) C_{1-6} alkyl, R_7 C(O) carbonyl C_{2-6} alkenyl, in which R_7 is defined as above [2(d)],
- (f) HO—C_{1-6} alkyl-C_{2-6} alkenyl, R_7—O—C_{1-6} alkyl-C_{2-6} alkenyl, R_7NH—C_{1-6} alkyl-C_{2-6} alkenyl, R_6R_7N—C_{1-6} alkyl-C_{2-6} alkenyl, R_7NH—C(O)—O—C_{1-6} alkyl-C_{2-6} alkenyl, R_6R_7N—C(O)—O—C_{1-6} alkyl-C_{2-6} alkenyl, R_7O—C(O)—OC_{1-6} alkyl-C_{2-6} alkenyl, R_7—C(O)—O—C_{1-6} alkyl-C_{2-6} alkenyl, wherein R_6 and R_7 is defined as above [2(d)].
- (g) R_7—O—CO_{0-3} alkyl-C_{3-6} cycloalkan-1-yl, R_7NH— C_{0-3} alkyl- C_{3-6} cycloalkan-1-yl, R_6R_7N— C_{0-3} alkyl- C_{3-6} cycloalkan-1-yl, R_7NH—C(O)—O— C_{0-3} C_{3-6} cycloalkan-1-yl, R_6R_7N—C(O)—O— C_{0-3} alkyl- C_{3-6} cycloalkan-1-yl, R_7O—C(O)—O— C_{0-3} alkyl- C_{3-6} cycloalkan-1-yl, R_7—C(O)—O— C_{0-3} alkyl- C_{3-6} cycloalkan-1-yl, R_7O—C(O)—C_{0-3} alkyl—C_{3-6} cycloalkan-1-yl, wherein R_7 and is defined as above [2(d)];

then R_2 and R_3 are each independently selected from the group consisting of

- (1) hydrogen, halo, trihalomethyl, C_{1-6} alkyl, substituted C_{1-6} alkyl, C_{1-6} alkenyl, substituted C_{0-6} alkenyl, C_{1-6} alkyloxy, substituted C_{1-6} alkyloxy, C_{3-6} alkenyloxy, substituted C_{3-6} alkenyloxy, C_{1-6} alkylamino, substituted C_{1-6} alkylamino, C_{3-6} alkenylamino, substituted C_{3-6} alkenylamino,
- (2) mono-, di-, and tri-substituted phenyl wherein the substituents are independently selected from:
  - (i) halo, trifluoromethyl, substituted C_{1-6} alkyl,
  - (ii) C_{1-6} alkyloxy, substituted C_{1-6} alkyloxy, C_{3-6} alkenyloxy, substituted C_{3-6} alkenyloxy,
  - (iii) C_{1-6} alkyl-amino, di(C_{1-6} alkyl)amino, substituted C_{1-6} alkyl-amino, di(substituted C_{1-6} alkyl)amino, C_{3-6} alkenylamino, di(C_{3-6} alkenyl)amino, substituted C_{3-6} alkenylamino, di(substituted C_{3-6} alkenyl)amino,or
  - (iv) pyrrolidino, piperidino, morpholino, imidazolyl, substituted imidazolyl, piperazino, N—C_{1-6} alkenylpiperazino, N—C_{3-6} alkenylpiperazino, N—(C_{1-6} alkoxy C_{1-6} alkyl)piperazino, N—(C_{1-6} alkoxy C_{3-6} alkenyl)piperazino, N—(C_{1-6} alkylamino C_{1-6} alkyl)piperazino, N—(C_{1-6} alkylamino C_{3-6} alkenyl)piperazino,

wherein the substituents are selected from the group consisting of

- (a) hydrogen, hydroxy, halo, trifluoromethyl,
- (b) C_{1-6} alkylalkoxy, C_{1-6} alkylamino, C_{1-6} alkylthio,
- (c) C_{3-6} alkenyloxy, C_{3-6} alkenylamino, C_{3-6} alkenylthio, or
- (d) pyrrolidino, piperidino, morpholino, imidazolyl, substituted imidazolyl, piperazino, N—C_{1-6} alkenylpiperazino, N—C_{3-6} alkenylpiperazino, N—(C_{1-6} alkoxy C_{1-6} alkyl)piperazino, N—(C_{1-6} alkoxy C_{3-6} alkenyl)piperazino, N—(C1-6 alkylamino C_{1-6} alkyl)piperazino, N—(C_{1-6} alkylamino C_{3-6} alkenyl)piperazino;

with the proviso that at least one of R_2 and R_3 group be selected from [B (2)] and the phenyl and the substituents be selected from (ii)–(v) above; or R_2 and R_3 taken together forming an aryl group such as phenyl, pyridyl, in which the aryl may be optionally substituted, wherein the substituents are defined as above in (i)–(iv);

and R_4 is selected from the group consisting of:

- (a) hydrogen;
- (b) substituted C_{1-11} alkyl or C_{2-11} alkenyl wherein the substituents are independently selected from the group consisting of hydrogen, hydroxy, C_{1-6} alkyloxy, C_{1-6}alkylthio, C_{1-6} alklylamino, phenyl-C_{1-6} alkylamino, C_{1-6} alkoxycarbonyl and the substituents are selected from (ii)–(iv); or
- (c) aryl C_{0-11} alkyl wherein the aryl group is selected from phenyl, imidazolyl, furyl, thienyl.

or its pharmaceutically acceptable salts.

70. A method of treatment for increasing the sensitivity of tumor cells to anti-cancer chemotherapeutic agents, said tumor cells being susceptible to anticancer chemotherapeutic agents, and said tumor cells having become resistant to chemotherapy comprising administration to a mammalian species in need of such treatment a therapeutically effective amount of a compound of claim 1 and a pharmaceutically acceptable carrier.

5,840,722
USE OF CARBOXYLIC ACID DERIVATIVES AS DRUGS

Ernst Baumann, Dudenhofen; Uwe Josef Vogelbacher; Joachim Rheinheimer, both of Ludwigshafen; Dagmar Klinge, Heidelberg; Hartmut Riechers, Ludwigshafen; Burkhard Kröger, Limburgerhof; Siegfried Bialojan, Oftersheim; Claus Bollschweiler, Heidelberg; Wolfgang Wernet, Hassloch; Liliane Unger, Ludwigshafen, and Manfred Raschack, Weisenheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP95/01099, § 371 Date Sep. 30, 1996, § 102(e) Date Sep. 30, 1996, PCT Pub. No. WO95/26716, PCT Pub. Date Oct. 12, 1995

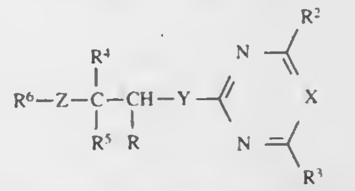
PCT Filed Mar. 23, 1995, Ser. No. 718,377

Claims priority, application Germany, Mar. 31, 1994, 44 11 225.4

Int. Cl.^{6} A01N *43/66*

U.S. Cl. 514—241 **1 Claim**

1. A method of inhibiting endothelin receptors by administering to a patient a compound of the formula I



I

where R is formyl, CO_2H or a radical which can be hydrolyzed to COOH, and the remaining substituents have the following meanings:

R^2 is halogen, C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy or C_1–C_4-alkylthio;

X is nitrogen or CR^{14} where R^{14} is hydrogen or, together with R^3, forms a 3- or 4-membered alkylene or alkenylene chain in which, in each case, one methylene group is replaced by oxygen;

R^3 is halogen, C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, C_1–C_4-alkylthio or R^3 is linked to R^{14} as indicated above to form a 5- or ^{6}-membered ring;

R^4 is C_1–C_{10}-alkyl which can carry from one to five halogen atoms and/or one of the following radicals: C_1–C_4-alkoxy, C_1–C_4-alkylthio, cyano, C_1–C_8-alkylcarbonyl, C_1-C_8-alkoxycarbonyl, phenyl, phenoxy or phenylcarbonyl, where the phenyl radicals in turn can carry from one to five halogen atoms and/or from one to three of the following radicals: C_1–C_4-alkyl, C1–C_4-haloalkyl, C_1–C_4-alkoxy, C1–C_4-haloalkoxy and/or C_1–C_4-alkylthio; C_1–C_4-alkyl which can carry from one to five halogen atoms and carries one of the following radicals: a five-membered heteroaromatic ring which contains from one to three nitrogen atoms and/or one sulfur or oxygen atom and which can carry from one to four halogen atoms and/or one or two of the following radicals: C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy,

C_1–C_4-haloalkoxy, C_1–C_4-alkylthio and/or phenyl; C_3–C_{12}-Cycloalkyl or C_3–C_{12}-cycloalkenyl, each of which can contain one oxygen or sulfur atom and can carry from one to five halogen atoms and/or one of the following radicals: C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, cyano, C_1–C_8-alkylcarbonyl, carbonyl, C_1–C_8-alkoxycarbonyl, phenyl, phenoxy or phenyl-carbonyl, where the phenyl radicals in turn can carry from one to five halogen atoms and/or from one to three of the following radicals: C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy,

C_1–C_4-haloalkoxy and/or C_1–C_4-alkylthio; C_3–C_8-alkenyl or C_3C_6-alkynyl, each of which can carry from one to five halogen atoms and/or one of the following radicals: C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, cyano, C_1–C_8-alkylcarbonyl, C_1–C_8-alkoxycarbonyl, phenyl, phenoxy or phenylcarbonyl, where the phenyl radicals in turn can carry from one to five halogen atoms and/or from one to three of the following radicals: C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy and/or C_1–C_3-alkylthio;

a five- or six-membered heteroaromatic ring which contains from one to three nitrogen atoms and/or one sulfur or oxygen atom and which can carry from one to four halogen atoms and/or one or two of the following radicals: C_1–C_4-alkyl, C_{14}-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, CL-c_4-alkylthio, phenyl, phenoxy or phenylcarbonyl, where the phenyl radicals in turn can carry from one to five halogen atoms and/or from one to three of the following radicals: C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C1-C_4-haloalkoxy and/or C_1–C_4-alkylthio; phenyl or naphthyl, each of which can be substituted by one or more of the following radicals: halogen, nitro, cyano, hydroxyl, C_1–C_4-alkyl, C_1—C_4-haloalkyl, C_1–$_4$-alkoxy,

C_1-C_4-haloalkoxy, phenoxy, C_1–C_4-alkylthio, amino C_1–C_4-alkylamino or C_1–C_4-dialkylamino; R^4 and R_5 form, together with the adjacent carbon atom, a 3-membered membered ring which can contain one oxygen or sulfur atom and can carry from one to three of the following radicals: C_1–C_4-alkyl, halogen, C_1–$_4$-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy and/or C_1–C_4-akylthio;

is hydrogen, C_1–C_4-alkyl, C_3—alkenyl, C_3-alkynyl, C_3–C_8-Cycloalkyl, C_4–C_4-haloalkyl, C_4–C_4-alkoxyalkyl,

C_1–C_4-alkylthioalkyl, phenyl or R_5 is linked to R^4 as indicated above to form a 3- to 8-membered ring; R^6 is C_1sufyl-alkyl, C_3—alkenyl, C_3—alkynyl or C_3–C_8-cycloalkyl, it being possible for each of these radicals to be substituted one or more times by: halogen, nitro, cyano, C_1–C_4-alkoxy, C_3–C_6-alkenyloxy, C_3—alkynyloxy, C_1–C_4-alkyl-thio, C_1–C_4-haloalkoxy, C_1–C_4-alkylcarbonyl, C_4-alkoxy carbonyl, C_1–C_4-alkylamino , di-C_1–C_4-alkylamino, phenyl, phenoxy or phenyl which is substituted one or more times, e.g. from one to three times, by halogen, nitro, cyano, C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_4-haloalkoxy or C_1–C_4-alkylthio;

phenyl or naphthyl, each of which can be substituted by one or more of the following radicals: halogen, nitro, cyano, hydroxyl, amino, C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, phenoxy, C_1–C_4-alkylthio, C_1–C_4-alkylamino or C_1–C_4-dialkylamino;

a five- or six-membered heteroaromatic ring which contains from one to three nitrogen atoms and/or one sulfur or oxygen atom and which can carry from one to four halogen atoms and/or one or two of the following radicals: C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, C_1–C_4-alkyl thio, phenyl, phenoxy or phenylcarbonyl, where the phenyl radicals in turn can carry from one to five halogen atoms and/or from one to three of the following radicals: C_1–C_4-alkyl, C_1–C_4–haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy and/or C_1–C_4-alkylthio; Y is sulfur or oxygen or a single bond; Z is sulfur or oxygen.

5,840,723
QUINOXALINE DERIVATIVES FOR TREATING TINNITUS

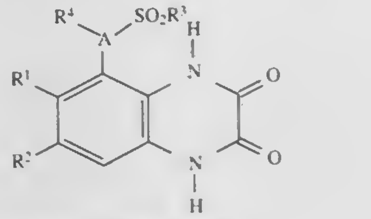
Steven B. Sands, Stonington, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Oct. 9, 1996, Ser. No. 728,111

Int. Cl.^{6} A61K *31/495*

U.S. Cl. 514—249 **11 Claims**

1. A method of treating tinnitus in a mammal comprising administering to a mammal in need of such treatment a therapeutically effective amount of a compound of the formula



I

or a pharmaceutically acceptable salt thereof.
wherein:

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1998
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A represents N or CH;

R^1 and R^2 are each independently C$_1$–C$_4$ alkyl, halo or CF$_3$;

R^3 is C$_3$–C$_7$ cycloalkyl, CF$_3$, C$_6$–C$_{10}$ aryl, or C$_1$ –C$_4$ alkyl, wherein said C$_1$–C$_4$ alkyl is optionally substituted by C$_3$–C$_7$ cycloalkyl or C$_6$–C$_{10}$ aryl;

R^4 is H, C$_3$–C$_7$ cycloalkyl or C$_1$–C$_6$ alkyl, wherein said C$_1$–C$_6$ alkyl is optionally substituted by hydroxy, C$_1$–C$_4$ alkoxy, C$_6$–C$_{10}$ aryl, C$_3$–C$_6$ heterocyclyl, C$_2$–C$_6$ alkenyl, C$_2$–C$_6$ alkynyl, C$_2$–C$_6$ alkanoyl, CO$_2$H, C$_1$–C$_4$ alkoxycarbonyl, amino, C$_1$–C$_4$ alkylamino, di(C$_1$–C$_4$) alkyl)amino, —NHS0$_2$CF$_3$, -CONR^{5}R^6, —NHCONR5R^6 or —O(CH$_2$)$_n$NR^{5}NR^6; and said C$_6$–C$_{10}$ aryl and said C$_3$–C$_9$ heterocyclyl are optionally substituted by up to 3 substituents independently selected from the group consisting of C$_1$–C$_4$ alkyl, C$_1$–C$_4$ alkoxy, halo and CF$_3$;

R^5 and R^6 are each independently H or C$_1$–C$_4$ alkyl, or R^5 and R^6 are taken together to form a pyrrolidino, piperidino or morpholino group; and,

n is 2, 3 or 4.

5,840,724

COMPOUNDS CONTAINING PHENYL LINKED TO ARYL OR HETEROARYL BY AN ALIPHATIC- OR HETEROATOM-CONTAINING LINKING GROUP

Garry Fenton; Andrew David Morley; Malcolm Norman Palfreyman; Andrew James Ratcliffe; Brian William Sharp; Keith Alfred James Stuttle; Sukanthini Thurairatnam, and Bernard Yvon Jack Vacher, all of Dagenham, United Kingdom, assignors to Rhone-Poulenc Rorer Limited, West Malling, United Kingdom

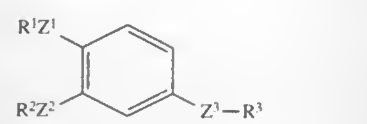
Division of Ser. No. 484,805, Jun. 7, 1995, Pat. No. 5,679,696, which is a division of Ser. No. 98,178, Jul. 28, 1993. This application Jun. 24, 1997, Ser. No. 881,888

Claims priority, application United Kingdom, Jun. 1, 1993, 9311281

Int. Cl.^{6} C07D *213/02;* A61K *31/44*

U.S. Cl. 514—252 20 Claims

1. A compound of formula I



I

wherein

R^1 is optionally substituted lower alkyl;

R^2 is C$_3$–C$_{15}$ alkyl, cycloalkyl substituted or halo substituted alkyl optionally substituted alkenyl, optionally substituted cycloalkyl, optionally substituted cycloalkenyl, optionally substituted or oxidized cyclothioalklyl, or optionally substituted or oxidized cyclothioalkenyl;

R^3 is optionally substituted aryl or optionally substituted heteroaryl;

Z, Z^1 and Z^2 are independently oxygen or sulfur,

Z^3 is —CX$_2$—O—, SOCH$_2$—, SO$_2$CH$_2$—, —O—CX$_2$—, —O—CZ—, —N=N—, —NH—SO$_2$—, —CZ—CZ—NH—, —NH— CO—O—, —O—CO—NH— or —NH—CO—NH—; and

X is halo, or

an N-oxide thereof or a pharmaceutically acceptable salt thereof, provided that when Z^3 is —N=N—: R^3 is optionally substituted aryl and Z^1 and Z^2 are oxygen: then R^2 is other than C$_3$–C$_{15}$ alkyl.

5,840,725

SUBSTITUTED OXIMES, HYDRAZONES AND OLEFINS AS NEUROKININ ANTAGONISTS

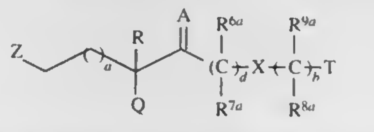
Gregory A. Reichard, Morris Plains; Robert G. Aslanian, Rockaway; Cheryl A. Alaimo, Somerset; Michael P. Kirkup, Lawrenceville; Andrew Lupo, Jr., Emerson, all of N.J.; Pietro Mangiaracina, Monsey, N.Y.; Kevin D. McCormick, Edison, N.J.; John J. Piwinski, Clinton Township, N.J.; Bandarpalle B. Shankar, Branchburg, N.J.; Neng-Yang Shih, North Caldwell, N.J.; James M. Spitler, Westfield, N.J.; Pauline C. Ting, New Providence, N.J.; Ashit Ganguly, Upper Montclair, N.J., and Nicholas I. Carruthers, North Plainfield, N.J., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 641,384, Apr. 30, 1996, Pat. No. 5,696,267, Continuation-in-part of Ser. No. 460,819, Jun. 1, 1995, abandoned, which is a continuation-in-part of Ser. No. 432,740, May 2, 1995, abandoned. This application Jul. 25, 1997, Ser. No. 901,028

Int. Cl.^{6} A61K *31/495;* C07D *403/06*

U.S. Cl. 514—252 20 Claims

1. A compound represented by the structural formula



I

or a pharmaceutically acceptable salt thereof, wherein:

a is 0, 1, 2 or3;

b and d are independently 0, 1 or 2;

R is H, C$_{1\text{-}6}$ alkyl, —OR^6 or C$_2$–C$_6$ hydroxyalkyl;

A is =N—OR^1, =N—N(R^2)(R^3), =C(R^{11})(R^{12}) or=NR^{25};

X is a bond, —C(O)—, —O—, —NR^6—, —S(O)$_e$—, —N(R^6)C(O)—, —C(O)N(R^6)— —OC(O)NR^6—, —OC(=S)NR^6—, —N(R^6)C(=S)O—, —C(=NOR^1)—, —S(O)$_2$N(R^6)—, —N(R^6)S(O)$_2$—, —N(R^6)C(O)O— or —OC(O)—, provided that when d is 0, X is a bond, —C(O)—, —NR^6—, —C(O)N(R^6)—, —N(R^6)C(O)—, —OC(O)NR^6—, —C(=NOR^1)—, —N(R^6)C(=S)O—, —OC(=S)NR^6—, —N(R^6)S(O)$_2$— or —N(R^6)C(O)O—; provided that when A is =C(R^{11})(R^{12}) and d is 0, X is not —NR^6— or —N(R^6)C(O)—; and provided that when A is =NR^{25}, d is 0 and X is —NR^6— or —N(R^6)C(O)—;

T is H, R^4-aryl, R^4-heterocycloalkyl, R^4-heteroaryl, phthalimidyl, R^4-cycloalkyl or R^{10}-bridged cycloalkyl;

Q is R^5-phenyl, R^5-naphthyl, —SR^6, —N(R^6)(R^7), or —OR^6 [or R^5-heteroaryl], provided that when Q is —SR^6, —N(R^6)(R^7) or —OR^6, R is not —OR^6;

R^1 is H, C$_{1\text{-}6}$ alkyl, —(C(R^6)(R^7))$_n$—G, —G^2, —(C(R^6)(R^7))$_p$—M— (C(R^{13})(R^{14}))$_n$—(C(R^8)(R^9))$_u$—G, —C(O)N(R^6)—(C(R^{13})(R^{14}))$_n$—(C(R^8)(R^9))$_u$—G or —(C(R^6)(R^7))$_p$—M—(R^4-heteroaryl);

R^2 and R^3 are independently selected from the group consisting of H, C$_{1\text{-}6}$ alkyl, —CN, —(C(R^6)(R^7))$_n$—G, —G^2, —C(O)—(C(R^8)(R^9))$_n$—G and —S(O)$_e$R^{13}; or R^2 and R^3, together with the nitrogen to which they are attached, form a ring of 5 to 6 members, wherein 0, 1 or 2 ring members are selected from the group consisting of —O—, —S— and —N(R^{19})—;

R^4 and R^5 are independently 1–3 substituents independently selected from the group consisting of H, halogeno, —OR^6, —OC(O)R^6, —OC(O)N(R^6)(R^7), —N(R^6)(R^7), C$_{1\text{-}6}$ alkyl, —CF$_3$, —C$_2$F$_5$, —COR^6, —CO$_2$R^6, —CON(R^6)(R^7), —S(O)$_e$R^{13}, —CN, —OCF$_3$, —NR^{6}CO$_2$R^{16}, —NR^{6}COR^7, —NR^{8}CON(R^6)(R^7), R^{15}-phenyl, R^{15}-benzyl, NO$_2$, —N(R^6)S(O)$_2$R^{13} or —S(O)$_2$N(R^6)(R^7); or adjacent R^4 substituents or adjacent R^5 substituents can form a —O—CH$_2$—O— group; and R^4 can also be R^{15}-heteroaryl;

R^6, R^7, R^8, R^{6a}, R^{7a}, R^{8a}, R^{13} and R^{14} are independently selected from the group consisting of H, C$_{1\text{-}6}$ alkyl, C$_2$–C$_6$ hydroxyalkyl, C$_1$–C$_6$ alkoxy-C$_1$–C$_6$ alkyl, R^{15}-phenyl, and R^{15}-benzyl; or R^6 and R^7, together with the nitrogen to which they are attached, form a ring of 5 to 6 members, wherein 0, 1 or 2 ring members are selected from the group consisting of —O—, —S— and —N(R^{19})—;

R^9 and R^{9a} are independently selected from the group consisting of R^6 and —OR^6

R^{10} and R^{10a} are independently selected from the group consisting of H and C$_{1\text{-}6}$ alkyl;

R^{11} and R^{12} are independently selected from the group consisting of H, C$_1$–C$_6$ alkyl, —CO$_2$R^6, —OR^6, —C(O)N(R^6)(R^7), C$_1$–C$_6$ hydroxyalkyl, —(CH$_2$)$_r$—OC(O)R^6, —(CH$_2$)$_r$—OC(O)CH=CH$_2$, —(CH$_2$)$_r$—O(CH$_2$)$_s$–CO$_2$R^6, —(CH$_2$)$_r$—O—(CH$_2$)$_s$—C(O)N(R^6)(R^7) and —(CH$_2$)$_r$—N(R^6)(R^7);

R^{15} is 1 to 3 substituents independently selected from the group consisting of H, C$_1$–C$_6$ alkyl, C$_1$–C$_6$ alkoxy, C$_1$–C$_6$ alkylthio, halogeno, —CF$_3$, —C$_2$F$_5$, —COR^{10}, —CO$_2$R^{10}, —C(O)N(R^{10})$_2$, —S(O)$_e$R^{10a}, —CN, —N(R^{10})COR^{10}, —N(R^{10};CON(R^{10})$_2$ and —NO$_2$;

R^{16} is C$_{1\text{-}6}$ alkyl, R^{15}-phenyl or R^{15}-benzyl;

R^{19} is H, C$_1$–C$_6$ alkyl, —C(O)N(R^{10})$_2$, —CO$_2$R^{10}, —(C(R^8)(R^9))$_f$—CO$_2$R^{10} or —(C(R^8)(R^9))$_u$—C(O)N(R^{10})$_2$;

f, n, p, r and s are independently 1–6;

u is 0–6;

G is selected from the group consisting of H, R^4-aryl, R^4-heterocycloalkyl, R^4-heteroaryl, R^4-cycloalkyl, —OR^6, —N(R^6)(R^7), —COR^6, —CO$_2$R^6, —CON(R^7)(R^9), —S(O)$_e$R^{13}, —NR^{6}CO$_2$R^{16}, —NR^{6}COR^7, —NR^{8}CON(R^6)(R^7), —N(R^6)S(O)$_2$R^{13}, —S(O)$_2$N(R^6)(R^7), —OC(O)R^6, —OC(O)N(R^6)(R^7), —C(=NOR^8)N(R^6)(R^7), —C(=NR^{25})N(R^6)(R^7), —N(R^8)C(=NR^{25})N(R^6)(R^7), —CN, —C(O)N(R^6)OR^7, and —C(O)N(R^9)—(R^4-heteroaryl), provided that when n is 1 and u is 0, or when R^9 is —OR^6, G is not —OH or —N(R^6)(R^7);

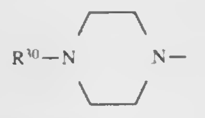
M is selected from the group consisting of a double bond, —O—, —N(R^6)—, —C(O)—, —C(R^6)(OR^7)—, —C(R^8)(N(R^6)(R^7))—, —C(=NOR^6)N(R^7)—, —C(N(R^6)(R^7))=NO—, —C(=NR^{25})N(R^6)—, —C(O)N(R^9)—, —N(R^9)C(O)—, —C(=S)N(R^9)—, —N(R^9)C(=S)— and —N(R^6)C(O)N(R^7)—, provided that when n is 1, G is not OH or —NH(R^6); and when p is 2–6, M can also be —N(R^6)C(=NR^{25})N(R^7)— or —OC(O)N(R^6)—;

G^2 is R^4-aryl, R^4-heterocycloalkyl, R^4-heteroaryl, R^4-cycloalkyl, —COR^6, —CO$_2$R^{16}, —S(O)$_2$N(R^6)(R^7) or —CON(R^6)(R^7);

e is 0, 1 or 2, provided that when e is 1 or 2, R^{13} and R^{10a} are not H;

R^{25} is H, C$_1$–C$_6$ alkyl, —CN, R^{15}-phenyl or R^{15}-benzyl;

Z is



or morpholinyl;

g and j are independently 0–3;

h and k are independently 1–4, provided the sum of h and g is 1–7;

J is two hydrogen atoms, =O, =S, =NR^9 or =NOR^1;

L and L^1 are independently selected from the group consisting of H, C$_1$–C$_6$ alkyl, C$_1$–C$_6$ alkenyl, —CH$_2$-cycloalkyl, R^{15}-benzyl, R^{15}-heteroaryl, —C(O) R^6, —(CH$_2$)m—OR^6, —(CH$_2$)$_m$—N(R^6)(R^7), —(CH$_2$)$_m$—C(O)—OR^6 and —(CH$_2$)$_m$—C(O)N(R^6)(R^7):

m is 0 to 4, provided that when j is 0, m is 1–4;

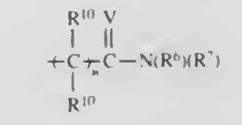
R^{26} and R^{27} are independently selected from the group consisting of H, C$_1$–C$_6$ alkyl, R^4-aryl and R^4-heteroaryl; or R^{26} is H, C$_1$–C$_6$ alkyl, R^4-aryl or R^4-heteroaryl, and R^{27} is —C(O)R^6, —C(O)—N(R^6)(R^7), —C(O)(R^4-aryl), —C(O)(R^4-heteroaryl), —SO$_2$R^{13} or —SO$_2$—(R^4-aryl);

R^{28} is H, —(C(R^6)(R^{19}))$_t$—G, —(C(R^6)(R^7))$_v$—G^2 or—NO$_2$;

t and v are 0, 1, 2 or 3, provided that when j is 0, t is 1, 2 or 3;

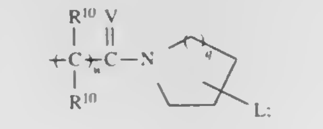
R^{29} is H, C$_1$–C$_6$ alkyl, —C(R^{10})$_2$S(O)$_e$R^6, R^4-phenyl or R^4-heteroaryl;

R^{30} is H, C$_1$–C$_6$ alkyl, R^4-cycloalkyl, —(C(R^{10})$_2$)$_w$—(R^4-phenyl), —(C(R^{10})$_2$)$_w$-(R^4-heteroaryl), —C(O)R^6, —C(O)OR^6, —C(O)N(R^6)(R^7),



$$-\!\left(\underset{R^{10}}{\overset{R^{10}}{C}}\right)_{w}\!\!-\overset{V}{\overset{\|}{C}}-N(R^6)(R^7)$$

or



w is 0, 1, 2, or 3;

V is =O, =S or =NR^6; and

q is 0–4.

5,840,726

HETEROCYCLIC SUBSTITUTED PIPERAZINONE DERIVATIVES

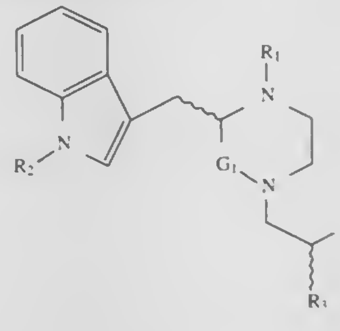
Timothy P. Burkholder, Fairfield; Elizabeth M. Kudlacz, and Tieu-Binh Le, both of Cincinanti, all of Ohio, assignors to Hoechst Marion Roussel Inc., Cincinnati, Ohio

Continuation of Ser. No. 404,788, Mar. 15, 1995, abandoned. This application Jun. 19, 1997, Ser. No. 878,695

Int. Cl.^{6} A61K *31/495;* C07D *403/06;209/20;209/24*

U.S. Cl. 514—253 18 Claims

1. A compound of the formula



wherein

G$_1$ is —CH$_2$— or —C(O)—;

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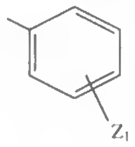
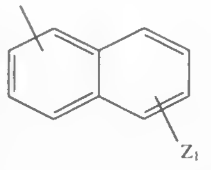
Ar_1 is a radical chosen from the group:

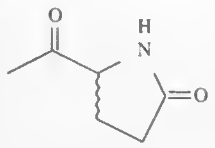




wherein

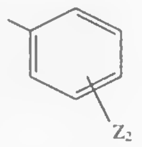
Z_1 is from 1 to 3 substituents each independently chosen from the group consisting of hydrogen, halogen, benzyloxy, hydroxy, CF_3, C_1–C_4 alkyl, and C_1–C_4 alkoxy;

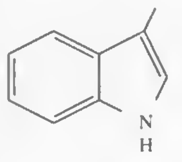
R_1 is hydrogen, a radical of the formula,



or —$(CH_2)_q$$Ar_2$, or —$CH_2C(O)Ar_2$

wherein q is an integer from 1 to 4 and Ar_2 is a radical of the formula



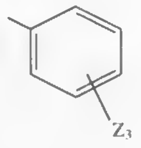


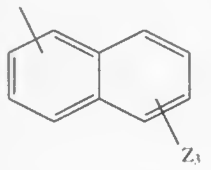
wherein

Z_2 is from 1 to 3 substituents each independently chosen from the group consisting of hydrogen, halogen, benzyloxy, hydroxy, CF_3, C_1–C_4 alkyl, and C_1–C_4 alkoxy;

R_2 is hydrogen, C_1–C_4 alkyl, or —CHO;

R_3 is hydrogen or a radical chosen from the group





wherein

Z_3 is from 1 to 3 substituents each independently chosen from the group consisting of hydrogen, halogen, benzyloxy, hydroxy, CF_3, C_1–C_4 alkyl, and C_1–C_4 alkoxy;

or stereoisomers, or pharmaceutically acceptable salt thereof.

5,840,727

(4-HETEROARYL)-1-[(2,3-DIHYDRO-1H-ISOINDOL-2-YL) ALKYL] PIPERAZINES AND RELATED COMPOUNDS AND THEIR THERAPEUTIC UTILITY

Joseph T. Strupczewski, 4 Stewart La., Flemington, N.J. 08822; Kenneth J. Bordeau, 211 Durham-Nox Rd., Kintnersville, Pa. 18930; Edward J. Glamkowski, 7 Owens Dr., Warren, N.J. 07060; Yulin Chiang, 24 Vom Eigen Dr., Covent Station, N.J. 07961; Peter A. Nemoto, 23 First Ave., Raritan, N.J. 08869, and John J. Tegeler, 816 Star View Way, Bridgewater, N.J. 08807

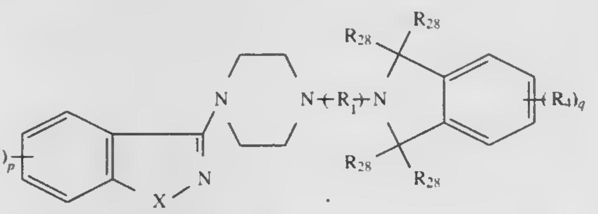
Division of Ser. No. 329,000, Oct. 25, 1994, Pat. No. 5,776,963, which is a continuation-in-part of Ser. No. 144,265, Oct. 28, 1993, abandoned, which is a continuation-in-part of Ser. No. 969,383, Oct. 30, 1992, Pat. No. 5,364,866, which is a continuation-in-part of Ser. No. 788,269, Nov. 5, 1991, abandoned, which is a continuation-in-part of Ser. No. 944,705, Sep. 5, 1991, abandoned, which is a continuation of Ser. No. 619,825, Nov. 29, 1990, abandoned, which is a continuation of Ser. No. 456,790, Dec. 29, 1989, abandoned, which is a continuation-in-part of Ser. No. 354,411, May 19, 1989, abandoned. This application Jun. 6, 1995, Ser. No. 468,960

Int. Cl.^{6} A61K *31/695;31/495;* **C07D** *403/04;413/04*

U.S. Cl. 514—254 **25 Claims**

1. A compound of the formula:

wherein



X is —O—, —S—, —NH—, or —N(R_2)—;

R_2 is selected from the group consisting of lower alkyl, aryl lower alkyl, aryl, cycloalkyl, aroyl, alkanoyl, alkoxycarbonyl, and phenylsulfonyl groups;

aryl is as defined hereinafter;

p is 1 or 2;

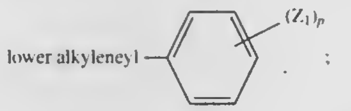
Y is hydrogen, lower alkyl, hydroxy, chlorine, fluorine, bromine, iodine, lower alkoxy, trifluoromethyl, nitro, or amino;

R_1 is —$CR_{24}R_{27}$—$(CR_{23}R_{24})_n$—$CR_{24}R_{27}$—, where n is 0, 1, 2 or 3; or

—$CHR_{24}CH{=}CH$—CHR_{24}—,
—CHR_{24}—$C{\equiv}C$—CHR_{24}—,
—CHR_{24}—$CH{=}CH$—$CR_{23}R_{24}$—CHR_{24}—,
—CHR_{24}—$CR_{23}R_{24}$—$CH{=}CH$—CHR_{24} —,
—CHR_{24}—$C{\equiv}C$—$CR_{23}R_{24}$—CHR_{24}—, or
—CHR_{24}—$CR_{23}R_{24}$—$C{\equiv}C$—CHR_{24},

the —CH=CH— bond being cis or trans;

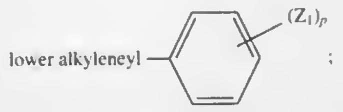
R_{23} is hydrogen, (C_1–C_{18}) linear alkyl, phenyl, hydroxy, (C_1–C_{18})alkoxy, aryloxy; aryl(C_1–C_{18})alkyloxy, (C_1–C_{18})alkanoyloxy, hydroxy(C_1–C_6)alkyl, (C_1–C_{18})alkoxy(C_1–C_6)alkyl, aryl(C_1–C_{18})alkyloxy(C_1–C_6)alkyl, (C_1–C_{18}) alkanoyloxy(C_1–C_6)alkyl or



;

where Z_1 is lower alkyl, —OH, lower alkoxy, —CF_3, —NO2, —NH_2, or halogen, and p is as previously defined;

R_{24} is hydrogen, (C_1–C_{18}) linear alkyl, phenyl, hydroxy(C_1–C_6)alkyl, (C_1–C_{18},)alkoxy(C_1–C_6)alkyl, phenyl(C_1–C_6)alkyloxy, aryl(C_1–C_{18})alkyoxy(C_1–C_6)alkyl, (C_1–C_{18})alkanoyloxy(C_1–C_6)alkyl or



;

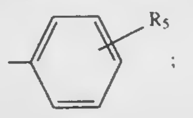
where $Z_1$and p are as previously defined;

R_{27} is hydrogen or R_{24} and R_{27} taken together with the carbon to which they are attached form C=O or C=S;

R_4 is hydrogen, lower alkyl, lower alkoxy, hydroxy, tri(C_1–C_6)alkylsilyloxy, hydroxy lower alkyl, alkanoyloxy lower alkyl, amino, mono- or dialkylamino, (C_1–C_{18})acyl amino, (C_1–Cl_8)alkanoyl, trifluoromethyl, chlorine, fluorine, bromine, nitro, —O—C(=O)—C_1–C_{18}straight or branched chain)alkyl or —C(=O)-aryl;

R_2 is hydrogen, (C_1–C_6)alkyl, aryl(C_1–C_6)alkyl or aryl,

in which aryl is phenyl or



;

where R_5 is hydrogen, lower alkyl, lower alkoxy, hydroxy, chlorine, fluorine, bromine, iodine, lower monoalkylamino, lower dialkylamino, nitro, cyano, trifluoromethyl, or trifluoromethoxy;

q is 1, 2, 3, or 4;

and, any hydroxyl group attached to an aliphatic or aromatic carbon atom, or any primary or secondary nitrogen atom may be acylated with a (C_4–C_{18})alkanoyl group, in addition, any nitrogen atom may alternatively be acylated with a (C_4–C_{18})alkoxycarbonyl group;

all geometric, optical, and stereoisomers thereof, or a pharmaceutically acceptable acid addition salt thereof.

5,840,728

CONFORMATIONALLY LOCKED NUCLEOSIDE ANALOGS AS ANTIHERPETIC AGENTS

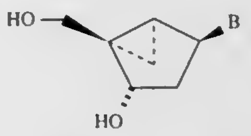
Victor E. Marquez, Gaithersburg; Marc C. Nicklaus, Elkridge; Joseph J. Barchi, Jr., Bethesda, all of Md.; Juan B. Rodriguez, Buenos Aires, Argentina, and Maqbool Siddiqui, Rockville, Md., assignors to United States of America as represented by the Department of Health and Human services, Washington, D.C.

Filed Aug. 7, 1997, Ser. No. 908,724

Int. Cl.^{6} A61K *31/44;31/505;31/32;* **C07D** *239/24*

U.S. Cl. 514—261 **4 Claims**

1. A method of treating a herpes virus infection in an individual in need thereof, comprising the step of administering to said individual an effective herpes antiviral amount of a compound having the formula



in a pharmaceutically acceptable carrier, wherein B is selected from the group consisting of adenine, thymine, cytosine and guanine.

5,840,729

XANTHINE DERIVATIVES AS ADENOSINE A1 RECEPTOR ANTAGONISTS

Janice M. Hitchcock, Mundolsheim; Stephen M. Sorensen, Illkirch, both of France; Mark W. Dudley, and Norton P. Peet, both of Cincinnati, Ohio, assignors to Merrell Pharmaceuticals Inc., Cincinnati, Ohio

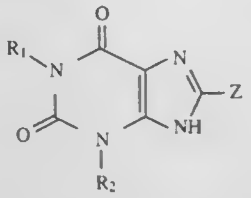
PCT No. PCT/US94/01009, § 371 Date Dec. 18, 1995, § 102(e) Date Dec. 18, 1995, PCT Pub. No. WO94/19349, PCT Pub. Date Sep. 1, 1994

Continuation of Ser. No. 23,501, Feb. 26, 1993, abandoned. This PCT application Jan. 27, 1994, Ser. No. 500,991

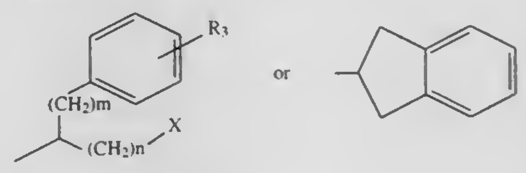
Int. Cl.^{6} A61K *31/52;* **C07D** *473/01*

U.S. Cl. 514—263 **6 Claims**

1. The method of attenuating a cognitive deficit in a patient in need thereof comprising administering to the patient a compound according to the structure:



including the (R) and (S) enantiomers and racemic mixtures thereof, and the pharmaceutically acceptable salts thereof, wherein R_1 and R_2 are each independently (C_1–C_4) lower alkyl or (C_2–C_4) lower alkenyl, Z is:



R_3 is (C_1–C_3) lower alkyl, nitro, amino, hydroxy, fluoro, bromo or chloro, m is zero or an integer from 1 to 4, n is an integer from 1 to 4, and X is H or OH.

5,840,730

FUNGICIDAL COMPOSITIONS AND METHOD OF CONTROLLING PLANT FUNGI

Adolf Hubele, Magden, Switzerland, and Ronald Zeun, Neuenburg, Germany, assignors to Novartis Corporation, Summit, N.J.

Division of Ser. No. 642,232, May 2, 1996, Pat. No. 5,663,176, which is a division of Ser. No. 437,730, May 9, 1995, Pat. No. 5,538,979, which is a division of Ser. No. 300,499, Sep. 2, 1994, Pat. No. 5,447,935, which is a division of Ser. No. 166,780, Dec. 14, 1993, Pat. No. 5,373,013, which is a division of Ser. No. 16,365, Feb. 11, 1993, abandoned. This application Apr. 30, 1997, Ser. No. 846,985

Claims priority, application Switzerland, Feb. 13, 1992, 427/92

Int. Cl.^{6} A01N *43/54;43/64*

U.S. Cl. 514—275 **7 Claims**

1. A fungicidal composition containing a synergistically effective amount of a mixture of 4-(4-chlorophenyl)-2-phenyl-2-(1,2,4-triazol-1-ylmethyl)butyronitrile or a salt or metal complex thereof as component 1 and 4,6-dimethyl-N-phenyl-2-pyrimidinamine of the formula

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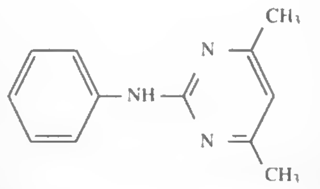


or a salt or metal complex thereof as component II, and an inert carrier therefor, wherein the ratio by weight of component I to component II is in the range of about 7:1 to 1:10.

5,840,731
PAIN-ALLEVIATING DRUG COMPOSITION AND METHOD FOR ALLEVIATING PAIN

David J. Mayer; Donald D. Price; Jianren Mao, all of Richmond, Va., and John W. Lyle, Belmar, N.J., assignors to Virginia Commonwealth University, Richmond, Va.

Filed Aug. 2, 1995, Ser. No. 510,546

Int. Cl.⁶ A61K *31/16;31/44*

U.S. Cl. 514—289 **3 Claims**

1. A drug composition comprising:

a) a pharmacologically effective amount of an opioid analgesic selected from the group consisting of morphine, heroin, hydromorphone, oxymorphone, levorpbanol, levallorphan, codeine, hydrocodone, oxycodone, nalmefene, nalorphine, naloxone, naltrexone, buprenorphine, butorphanol, nalbuphine, their mixtures and their pharmaceutically acceptable salts;

b) a pharmacologically effective amount of a second component which is the nonopioid analgesic acetaminophen; and,

c) an analgesia-enhancing amount of a third component which is a nontoxic N-methyl-D-aspartate receptor antagonist selected from the group consisting of dextrorphan, dextromethorphan, their mixtures and their pharmaceutically acceptable salts.

5,840,732
IMIDAZOPYRIDINE OR IMIDAZOPYRIMIDINE COMPOUNDS, THEIR PRODUCTION AND USE

Muneo Takatani, Kyoto; Hitoshi Ikeda, Higashiosaka; Kyoko Iida, and Hidenori Abe, both of Osaka, all of Japan, assignors to Takeda Chemical Industries Ltd., Osaka, Japan

PCT No. PCT/JP95/01192, § 371 Date Dec. 6, 1996, § 102(e) Date Dec. 6, 1996, PCT Pub. No. WO95/35296, PCT Pub. Date Dec. 28, 1995

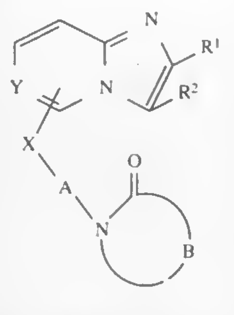
PCT Filed Jun. 15, 1995, Ser. No. 481,391

Claims priority, application Japan, Jun. 20, 1994, 6-137600; Mar. 23, 1995, 7-064128

Int. Cl.⁶ A61K *31/44;31/505;* **C07D** *405/00;409/00;239/72*

U.S. Cl. 514—300 **51 Claims**

1. A compound represented by the formula:



wherein X represents a bond, —S(O)m—, —O—, —NR^{3a}—, —Alk—, —Alk—W— or —S—Alk—W—; wherein

Alk represents a divalent hydrocarbon group unsubstituted or substituted with 1 or 2 substituents selected from the group consisting of halogens, lower alkoxy groups, acyl groups, carboxyl groups, hydroxyl group, pyridylthio group, nitro group, cyano group and oxo group, (i) wherein said acyl groups are selected from the group consisting of lower alkanoyl groups unsubstituted or substituted with 1–3 halogens, lower alkylsulfonyl groups, lower alkylsulfinyl groups, C_{6-10} arylcarbonyl groups, carbamoyl groups, lower alkylcarbamoyl groups, lower alkenylcarbamoyl groups, and cyclic aminocarbonyl groups wherein the dialkyl moiety has formed a 5- or 6-membered ring structure in combination with the nitrogen of a carbamoyl group, and (ii) wherein said carboxyl group unesterified or esterified resulting in a lower alkoxycarbonyl group;

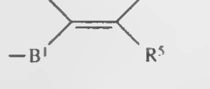
W represents —O—, —NR^{3a}—,—CO—O— or —O—CO—NR^{3a}—, wherein R^{3a} represents a hydrogen or a hydrocarbon group wherein said hydrocarbon group is unsubstituted or substituted at any position with 1 to 5 substituents selected from the group consisting of nitro group, hydroxyl group, oxo group, thioxo group, cyano group, sulfone group, halogens, lower alkoxy groups, phenoxy group, halogenophenoxy groups, lower alkylthio groups, phenylthio group, amino groups, carboxyl groups, acyl groups, and heterocyclic groups, wherein (i) said amino groups are unsubstituted or substituted with substituents selected from the group consisting of lower alkyl groups and acyl groups, (ii) said acyl group as a substituent of said hydrocarbon group or as a substituent of said amino group are selected from the group consisting of the same acyl groups which are recited as substituents for Alk above, and (iii) said carboxyl group is unesterified or esterified resulting in a lower alkoxycarbonyl group;

m represents an integer from 0 to 2); Y represents CH or N;

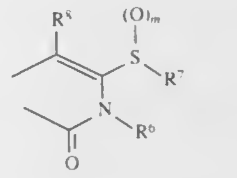
R^1 and R^2, independently represent (i) a hydrogen, (ii) a hydrocarbon group, wherein said hydrocarbon group is unsubstituted or substituted at any position with 1 to 5 substituents selected from the group consisting of the same group of substituents recited as substituents for said hydrocarbon of R^{3a} above, (iii) a halogen, (iv) a nitro group, (v) a nitroso group, (vi) an amino group unprotected or protected with a protecting group selected from the group consisting of amide-forming protective groups, carbamate-forming protecting groups, and trityl and phthaloyl, (vi) a carboxyl group, wherein said carboxyl group is unesterified or esterified resulting in a lower alkoxycarbonyl group, and (vii) an acyl group, wherein said acyl group is selected from the group consisting of the same acyl groups recited as substituents for Alk above;

A represents a divalent hydrocarbon group that is unsubstituted or substituted with 1 or 2 substituents selected from the group consisting of said group of substituents recited for Alk above;

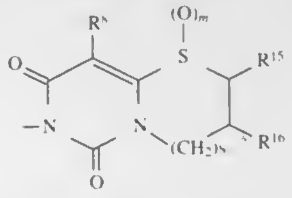
B represents the following formula:



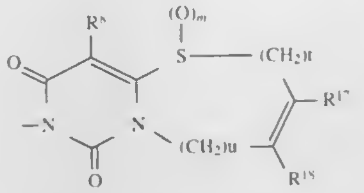
wherein B^1 represents —$(CH_2)_f$— or —CZ^1—Z^2— (f represents an integer from 1 to 6; Z^1 represents O or S; Z^2 represents O, S, —Alk^1—, —Alk^1—S— or NR^{3b}; Alk^1 represents a divalent hydrocarbon group that is unsubstituted or substituted with 1 or 2 substituents selected from the group consisting of said group of substituents recited for Alk above: R^{3b} represents a hydrogen or a hydrocarbon group unsubstituted or substituted by the same groups recited as substituents for the hydrocarbon groups of R^1 or R^2 above); R^4 and R^5 independently represent (i) a hydrogen or a carboxyl group unesterified or esterified, resulting in a lower alkoxycarbonyl group, (ii) an amino group unsubstituted or substituted, wherein said substituents are selected from the group consisting of lower alkyl groups and acyl groups, wherein said acyl groups are selected from the group consisting of the same group of acyl groups recited as substituents of A above; (iii) a heterocyclic group that is unsubstituted or substituted with 1 to 4 substituents selected from the group consisting of halogens, lower alkyl groups, lower alkenyl groups, lower alkoxy groups, nitro group, cyano group, hydroxy group, lower alkoxycarbonyl groups, carboxy groups, carbamoyl groups, lower alkylcarbamoyl groups, and lower alkenylcarbamoyl groups, (iv) —W^1, (v) —S—W^1, (vi) —O—W^1, wherein W^1 represents a hydrogen or a hydrocarbon group that is unsubstituted or substituted at any position 1 to 5 with substituents selected from the group consisting of nitro group, hydroxyl group, oxo group, thioxo group, cyano group, sulfone group, halogens, lower alkoxy groups, phenoxy group, halogenophenoxy groups, lower alkylthio groups, phenylthio group, amino groups, carboxyl groups, acyl groups, and heterocyclic groups, wherein (i) said amino groups are unsubstituted or are substituted with substituents selected from the group consisting of lower alkyl groups and acyl groups, (ii) said acyl group as a substituent of said hydrocarbon group or as a substituent of said amino group are selected from the group consisting of the same acyl groups which are recited as substituents for Alk above, and (iii) said carboxyl group is unesterified or esterified resulting in a lower alkoxycarbonyl group; or R^4 and R^5 are uncombined or combined to form a ring selected from the group consisting of cyclopropyl, cyclobutyl, cyclopentyl and cyclohexyl; or B represents the following formula:



wherein R^6 and R^7 independently represent (i) a hydrocarbon group that is unsubstituted or substituted by the same groups of substituents for the hydrocarbon group of R^1 or R^2 above, (ii) a heterocyclic group that is unsubstituted or substituted with 1 to 4 substituents selected from the group consisting of halogens, lower alkyl groups, lower alkenyl groups, lower alkoxy groups, nitro group, cyano group, hydroxy group, lower alkoxycarbonyl groups, carboxy groups, carbamoyl groups, lower alkylcarbamoyl groups, and lower alkenylcarbamoyl groups; or (iii) R^6 and R^7 are uncombined or combined to form a ring wherein the ring formed by combining R^6 and R^7 is represented by the formula:



wherein R^{15} represents a (i) hydrogen, (ii) a lower alkyl group that is unsubstituted or substituted with 1 or 2 substituents selected from the group consisting of halogens, lower alkoxy groups, hydroxy group, lower alkoxycarbonyl groups, carboxyl group, carbamoyl groups, lower alkylcarbamoyl groups, and pyridylthio groups, (iii) an aralkyl group being a phenyl-lower alkyl group or a naphthyl-lower alkyl group, wherein the phenyl moiety of the phenyl-lower alkyl group and the naphthyl moiety of the naphthyl-lower alkyl group that is unsubstituted or substituted with 1 to 4 substituents selected from the group consisting of halogens, lower alkyl groups, lower alkenyl groups, lower alkoxy groups, nitro group, cyano group, hydroxy group, lower alkoxycarbonyl groups, carbamoyl groups, lower alkylcarbamoyl groups and lower alkenylcarbamoyl groups, and (iv) an aryl group that is unsubstituted or substituted with 1 to 4 substituents selected from the group consisting of halogens, lower alkyl groups, lower alkenyl groups, lower alkoxy groups, nitro group, cyano group, oxo group, hydroxy group, amino groups, lower acylamino groups, lower alkoxycarbonyl groups, carbamoyl groups, lower alkylcarbamoyl groups, and lower alkenylcarbamoyl groups, (v) a lower alkoxy group, (vi) a lower alkylthio group, (vii) an aryloxy group, (viii) an arylthio group, (ix) —$COOR^{15a}$ or (x) —CH_2COOR^{15a} (R^{15a} represents a lower alkyl group): R^{16} represents a hydrogen or a lower alkyl group; s represents an integer from 0 to 4, or the formula:



wherein R^{17} and R^{18} independently represent a hydrogen or a lower alkyl group: t and u independently represent an integer from 0 to 2; R^8 represents a hydrogen, a hydrocarbon group unsubstituted or substituted, a heterocyclic group unsubstituted or substituted, a nitro group, a cyano group, an amino group unprotected or protected, a halogen, or an acyl group, wherein said unsubstituted or substituted hydrocarbon group, unprotected or protected amino group, or acyl group for R^8 are selected from the group consisting of the same groups recited as said unsubstituted or substituted hydrocarbon groups, unprotected or protected amino groups or acyl groups for R^1 and R^2, and wherein said unsubstituted or substituted heterocyclic group for R^8 is selected from the group consisting of the same group recited as heterocyclic group substituents for R^4 and R^5 above; m represents an integer from 0 to 2 or a salt thereof.

5,840,733
METHODS AND COMPOSITIONS FOR PRODUCING NOVEL CONJUGATES OF THROMBIN INHIBITORS AND ENDOGENOUS CARRIERS RESULTING IN ANTI-THROMBINS WITH EXTENDED LIFETIMES

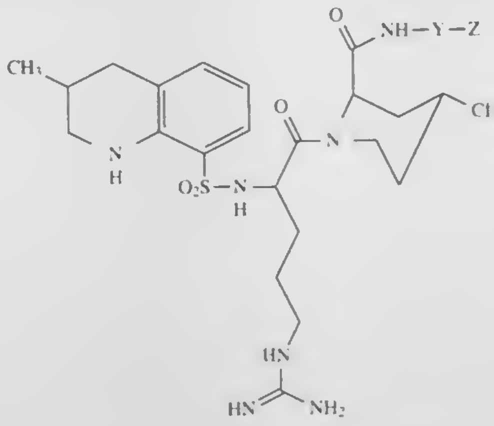
Alexander Krantz, Menlo Park; Alan M. Ezrin, Moraga, and Yonghong Song, Foster City, all of Calif., assignors to Red-Cell, Canada, Inc., Montreal, Canada

Filed Jul. 1, 1996, Ser. No. 674,315

Int. Cl.⁶ A61K *31/415;* **C07D** *401/06*

U.S. Cl. 514—311 **18 Claims**

1. A compound of the formula:



wherein:

Y is a linking group of from 2–30 atoms: and

Z is a chemically reactive group capable of reaction with a reactive functionality of a target molecule in an aqueous system to form covalent bonds therewith or an activatable precursor to said chemically reactive group; and wherein said compound possesses thrombin inhibitory activity in vivo when bonded to a long lived blood component.

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5,840,734
USE OF TEMPOL IN THE PREVENTION OF PHOTOAGING

Eric Bernstein, Wynnewood, Pa., assignor to Thomas Jefferson University, Philadelphia, Pa.

Filed May 6, 1997, Ser. No. 851,739

Int. Cl.^{6} A61K *31/445*

U.S. Cl. 514—315 **5 Claims**

1. A method of protecting humans exposed to sunlight against photoaging, sunburn and skin cancer comprising topically applying to skin of a human tempol in an amount effective to protect the skin against photoaging, sunburn and skin cancer.

5,840,735
SEX STEROID ACTIVITY INHIBITORS

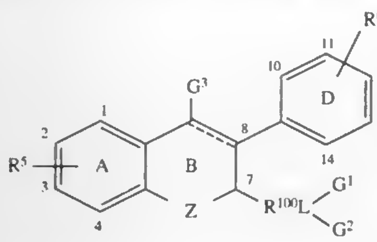
Fernand Labrie, and Yves Merand, both of Quebec, Canada, assignors to Endorecherche Inc., Canada

Division of Ser. No. 801,704, Dec. 2, 1991, Pat. No. 5,395,842, which is a continuation-in-part of Ser. No. 265,150, Oct. 31, 1988, abandoned, and Ser. No. 377,010, Jul. 7, 1989, abandoned. This application Aug. 3, 1994, Ser. No. 285,354

Int. Cl.^{6} A61K *31/445;31/44;31/545;* **C07D** *401/00*

U.S. Cl. 514—320 **13 Claims**

1. A pharmaceutical composition comprising a pharmaceutically acceptable carrier or diluent and a therapeutically effective amount of an estrogen activity inhibitor of the following formula:



wherein the dotted line is optional double bond;

wherein R_5 and R_6 are independently hydrogen, hydroxyl or a moiety which is converted to hydroxyl in vivo, but are not simultaneously hydrogen and are not simultaneously at positions 3 and 12;

wherein Z is a bivalent ring closing moiety;

wherein R^{100} is a bivalent moiety which distances L from the B-ring by 4–10 intervening atoms;

wherein L is a bivalent or trivalent polar moiety selected from the group consisting of —CO—, —SO—, —CON<, —N< and —SON<;

wherein G^1 is either absent or selected from the group consisting of hydrogen, a C_1 to C_5 hydrocarbon, a saturated or unsaturated C_5 to C_7 cycloalkyl, a bivalent moiety which joins G^2 and L to form a 5- to 7-membered heterocyclic ring, and halo-substituted derivatives of the foregoing;

wherein G^2 is either absent or selected from the group consisting ft hydrogen, a C_1 to C_5 hydrocarbon, a substituted or unsubstituted C_5 to C_7 cycloalkyl, a bivalent moiety which joins G^1 and L to form a 5- to 7-membered heterocyclic ring and halo-substituted derivatives of the foregoing; and

wherein G^3 is a lower hydrocarbon.

5,840,736
METHODS AND COMPOSITIONS FOR STIMULATING NEURITE GROWTH

Robert E. Zelle, Stow, and Michael Su, Newton, both of Mass., assignors to Vertex Pharmaceuticals Incorporated, Cambridge, Mass.

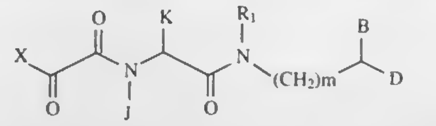
Filed Nov. 13, 1996, Ser. No. 748,447

Int. Cl.^{6} A61K *31/44;38/18*

U.S. Cl. 514—332 **26 Claims**

1. A pharmaceutically acceptable composition comprising:

a) a neurotrophic amount of a compound having the formula (I):



(I)

and pharmaceutically acceptable derivatives thereof, wherein:

R_1, B and D are independently: hydrogen, Ar, (C1–C6) straight or branched alkyl, (C2–C6) straight or branched alkenyl or alkynyl, (C5–C7) cycloalkyl substituted (C1–C6) straight or branched alkyl, (C5–C7) cycloalkyl substituted (C3–C6) straight or branched alkenyl or alkynyl, (C5–C7) cycloalkenyl substituted (C1–C6) straight or branched alkyl, (C5–C7) cycloalkenyl substituted (C3–C6) straight or branched alkenyl of alkynyl, Ar-substituted (C1–C6) straight or branched alkyl, Ar-substituted (C3–C6) straight or branched alkenyl or alkynyl;

provided that R_1 is not hydrogen;

wherein any one of the CH_2 groups of said alkyl chains in R_1, B and D is optionally replaced by O, S, SO, SO_2 or NR;

wherein R is hydrogen, (C1–C6) straight or branched alkyl, (C3–C4) straight or branched alkenyl or alkynyl, or (C1–C4) bridging-alkyl wherein a bridge is formed between the nitrogen and a carbon atom of said alkyl chain to form a ring, and wherein said ring is optionally fused to Ar;

wherein each Ar is independently selected from phenyl, 1-naphthyl, 2-naphthyl, indenyl, azulenyl, fluorenyl, anthracenyl, 2-furyl, 3-furyl, 2-thienyl, 3-thienyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, pyrrolyl, oxazolyl, thiazolyl, imidazolyl, pyraxolyl, 2-pyrazolinyl, pyrazolidinyl, isoxazolyl, isotriazolyl, 1,2,3-oxadiazolyl, 1,2,3-triazolyl, 1,3,4-thiadiazolyl, pyridazinyl, pyrimidinyl, pyrazinyl, 1,3,5-triazinyl, 1,3,5-trithianyl, indolizinyl, indolyl, isoindolyl, 3H-indolyl, indolinyl, benzo[b]furanyl, benzo[b]thiophenyl, 1H-indazolyl, benzimidazolyl, benzthiazolyl, purinyl, 4H-quinolizinyl, quinolinyl, 1,2,3,4-tetrahydroisoquinolinyl, isoquinolinyl, 1,2,3,4-tetrahydroisoquinolinyl, cinnolinyl, phthalazinyl, quinazolinyl, quinoxalinyl, 1,8-naphthyridinyl, pteridinyl, carbazolyl, acridinyl, phenazinyl, phenothiazinyl and phenoxazinyl; and

wherein each Ar is optionally and independently substituted with one to three substituents independently selected from hydrogen, halogen, hydroxyl, nitro, —SO_3H, trifluoromethyl, trifluoromethoxy, (C1–C6) straight or branched alkyl, O—((C1–C6) straight or branched alkyl), O-benzyl, O-phenyl, 1,2-methylenedioxy, —NR_5R_6, carboxyl, N—(C1–C6 straight or branched alkyl or C3–C5 straight or branched alkenyl) carboxamides, N,N-di-((C1–C6) straight or branched alkyl or (C3–C5) straight or branched alkenyl), carboxamides, morpholinyl, piperidinyl, O—M, CH_2—$(CH_2)_q$—M, O— $(CH_2)_q$—M, $(CH_2)_q$—O—M, and CH═CH—M;

wherein R_5 and R_6 are independently selected from the group consisting of hydrogen, (C1–C6) straight or branched alkyl, (C2–C6) straight or branched alkenyl or alkynyl, and benzyl or R_5 and R_6 are taken together to form a 5–7 membered heterocyclic ring;

M is selected from the group consisting of 4-methoxyphenyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, pyrazyl, quinolyl, 3,5-dimethylisoxazoyl, 2-methylthioazoyl, thiazoyl, 2-thienyl, 3-thienyl, 4-thienyl and pyrimidyl; and

q is 0–2;

J is selected from the group consisting of (C1–C6) straight or branched alkyl, (C3–C6) straight or branched alkenyl or alkynyl, Ar-substituted (C1–C6) straight or branched alkyl, and Ar-substituted (C3–C6) straight or branched alkenyl of alkynyl, and cyclohexylmethyl;

K is selected from the group consisting of (C1–C6) straight or branched alkyl, Ar-substituted (C1–C6) straight or branched alkyl, (C2–C6) straight or branched alkenyl or alkynyl, and Ar-substituted (C3–C6) straight or branched alkenyl or alkynyl:

X is selected from the group consisting of Ar, —OR_2, and —$N(R_3)R_4$;

wherein R_2 has the same definition as R_1:

R_3 and R_4 independently have the same definitions as B and D; or R_3 and R_4 are taken together to form a 5–7 membered heterocyclic aliphatic or aromatic ring; and

m is 0 or 1;

b) a neurotrophic factor; and

c) a pharmaceutically suitable carrier.

5,840,737
OMEPRAZOLE SOLUTION AND METHOD FOR USING SAME

Jeffrey Owen Phillips, Columbia, Mo., assignor to The Curators of the University of Misouri, Columbia, Mo.

Filed Jul. 15, 1996, Ser. No. 680,376

Int. Cl.^{6} A61K *31/44*

U.S. Cl. 514—338 **12 Claims**

1. A method for treating gastric acid disorders by administering to a patient a single dose of a pharmaceutical composition of omeprazole or lansoprazole in a pharmaceutically acceptable carrier consisting essentially of a bicarbonate salt of a Group IA metal wherein said administering step consists of providing to the patient orally a single dose of an aqueous solution or, suspension of the pharmaceutical composition without requiring further administration of the bicarbonate salt of the Group IA metal.

5,840,738
SELECTIVE β-3 ADRENERGIC AGONISTS

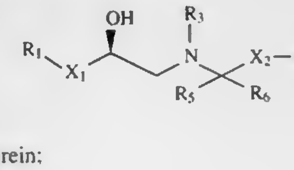
Michael Gregory Bell; Thomas Alan Crowell; Christine Ann Droste; Cynthia Darshini Jesudason; Donald Paul Matthews, all of Indianapolis; John Hampton McDonald, III, Carmel; David Andrew Neel, Zionsville; Christopher John Rito, Mooresville; Anthony John Shuker, and Mark Alan Winter, both of Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 708,621, Sep. 5, 1996, abandoned. This application Jun. 25, 1997, Ser. No. 882,623

Int. Cl.^{6} A61K *31/415;* **C07D** *209/08*

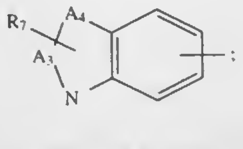
U.S. Cl. 514—359 **17 Claims**

1. A method of treating a non-human animal to promote growth, efficiency of feed utilization, or lean body mass by administering a compound of the formula:



wherein:

R_1 is



the bond between A_3 and A_4 is either a single or double bond;

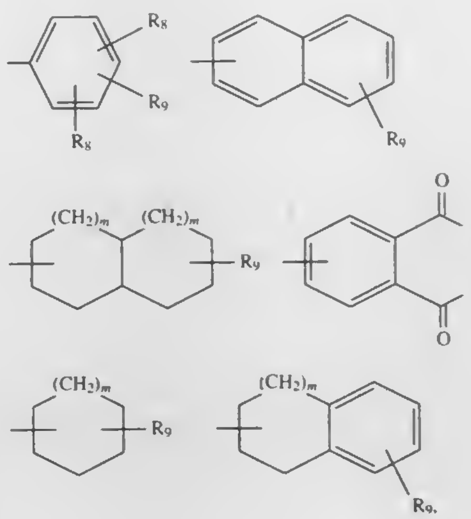
A_3 and A_4 are independently carbon or nitrogen;

R_7 is hydrogen, halo, hydroxy, C_1–C_4 alkyl, C_1–C_4 haloalkyl, aryl, CN, $COOR_2$, $CONHR_3$, $NHCOR_2$, OR_2, NHR_2, SR_2, SO_2R_2, SO_2NHR_2, or SOR_2:

R_2 and R_3 are independently hydrogen, C_1–C_4 alkyl, or aryl:

X_1 is —OCH_2—, —SCH_2—, or a bond:

R_4 is an optionally substituted heterocycle or a moiety selected from the group consisting of:



X_2 is a bond, or a 1 to 5 carbon straight or branched alkylene;

R_5 is hydrogen or C_1–C_4 alkyl;

R_6 is hydrogen or C_1–C_4 alkyl;

or R_5 and R_6 combine with the carbon to which each is attached to form a C_3–C_6 cycloalkyl;

or R_6 combines with X_2 and the carbon to which each is attached to form a C_3–C_8 cycloalkyl;

R_8 is independently halo, or C_1–C_4 alkyl;

R_9 is halo, CN, OR_{10}, C_1–C_4 alkyl, C_1–C_4 haloalkyl, CO_2R_2, $CONR_{11}R_{12}$, CONH(C_1–C_4 alkyl or C_1–C_4 alkoxy), SR_2, $CSNHR_2$, $CSNR_{11}R_{12}$, SO_2R_2, $SO_2NR_{11}R_{12}$, SOR_2, $NR_{11}R_{12}$, optionally substituted aryl, optionally substituted heterocycle, or C_2–C_4 alkenyl substituted with CN, CO_2R_2 or $CONR_{11}R_{12}$;

R_{10} is C_1–C_4 alkyl, C_1–C_4 haloalkyl, $(CH_2)_nC_3$–C_8 cycloalkyl, $(CH_2)_n$aryl, $(CH_2)_n$heterocycle, $(CH_2)_nC_3$–C_8 optionally substituted cycloalkyl, $(CH_2)_n$ optionally substituted aryl, or $(CH_2)_n$ optionally substituted heterocycle;

R_{11} and R_{12} are independently hydrogen, C_1–C_4 alkyl, aryl, $(CH_2)_n$aryl, or R_{11} and R_{12} combine with the nitrogen to which each is bound to form morpholinyl, piperidinyl, pyrrolidinyl, or piperazinyl;

n is 0, 1, 2, or 3; and

m is 0 or 1;

or pharmaceutically acceptable salts thereof.

5,840,739
THIAZOLINE ACID DERIVATIVES

Raymond J. Bergeron, Jr., Gainesville, Fla., assignor to University of Florida Research Foundation, Inc., Gainesville, Fla.

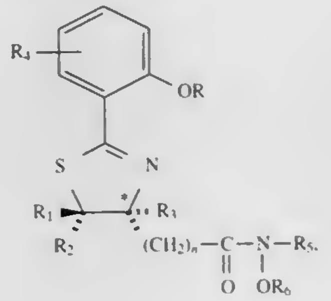
Continuation-in-part of Ser. No. 532,805, Nov. 9, 1995, which is a continuation of Ser. No. 976,635, Nov. 16, 1992, abandoned. This application Mar. 29, 1996, Ser. No. 624,289

Int. Cl.^{6} A61K *31/425;* **C07D** *277/56*

U.S. Cl. 514—365 **10 Claims**

1. A compound of the formula:

(I)



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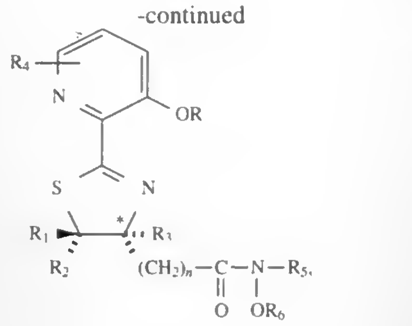
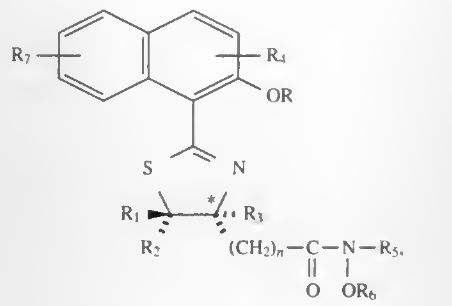
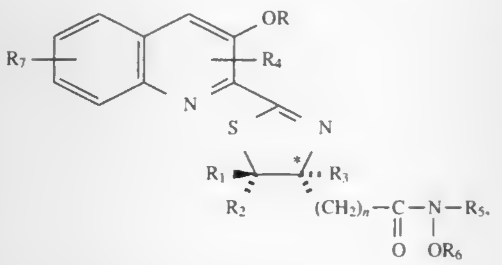


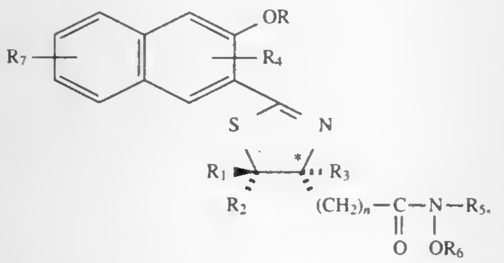
(II)



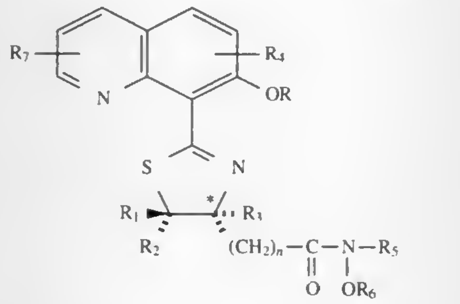
(III)



(IV)



(V)



(VI)

wherein:

R may be H or acyl;

R_1, R_2, R_3, R_4 and R_7 may be the same or different and represent H, alkyl or hydrocarbyl arylalkyl having up to 14 carbon atoms, or

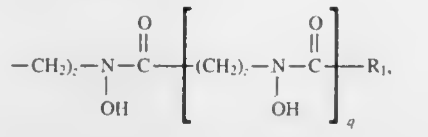
$$-CH_2\!-\!\left[O\!-\!(CH_2)_x\right]_y\!-\!OCH_3,$$

wherein x is 1–10 and y is 0–10;

R_5 is H, alkyl having up to 15 carbon atoms,

$$-(CH_2)_{1-2}\!-\!\left[O\!-\!(CH_2)_x\right]_y\!-\!OCH_3,$$

wherein x is 1–10 and y is 0–10, or



$$-(CH_2)_z-\underset{\displaystyle OH}{\underset{|}{N}}-\overset{\displaystyle O}{\overset{\|}{C}}-\left[(CH_2)_z-\underset{\displaystyle OH}{\underset{|}{N}}-\overset{\displaystyle O}{\overset{\|}{C}}\right]_q-R_1,$$

wherein R_1 is as defined above, z is 1–10 and q is 0–5;

R_6 is H or acyl;

n is 0–10;

a salt thereof with a pharmaceutically acceptable acid, or a pharmaceutically acceptable complex thereof.

5,840,740

AMINOSTEROL COMPOUNDS AND A METHOD OF TREATING INFECTION USING THE AMINOSTEROL COMPOUNDS

Michael Zasloff, Merion Station, Pa.; Ann Shinnar, Teaneck, N.J.; William Kinney, Churchville, and Meena Rao, Horsham, both of Pa., assignors to Magainin Pharmaceuticals Inc., Plymouth Meeting, Pa.

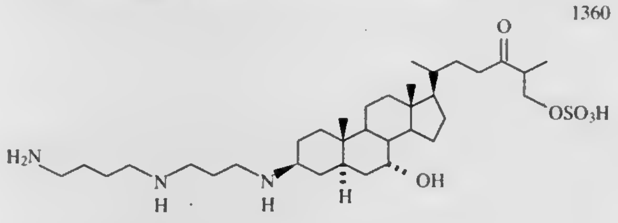
Filed Jun. 7, 1995, Ser. No. 483,059

Int. Cl.⁶ A01K *31/575;* **A07J** *41/00*

U.S. Cl. 514—182 **16 Claims**

1. A compound having the following structure:

1360



or a pharmaceutically acceptable salt thereof.

5,840,741

ARTERIOSCLEROSIS DEPRESSANT

Hisao Tomioka, Ichikawa; Hidefumi Ohsawa, Narasino; Masao Moroi, and Toshio Kawashima, both of Tokyo, all of Japan, assignors to Tokyo Tanabe Company Limited, Tokyo, Japan

PCT No. PCT/JP95/00277, § 371 Date Nov. 22, 1996, § 102(e) Date Nov. 22, 1996, PCT Pub. No. WO95/32714, PCT Pub. Date Dec. 7, 1995

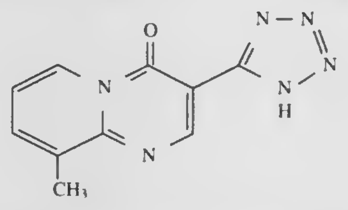
PCT Filed Feb. 24, 1995, Ser. No. 737,680

Claims priority, application Japan, May 31, 1994, 6-119146

Int. Cl.⁶ A61K *31/41*

U.S. Cl. 514—381 **9 Claims**

1. A pharmaceutical preparation containing 9-methyl-3-(1H-tetrazol-5-yl)-4H-pyrido[1, 2-a]pyrimidin-4-one represented by the following chemical formula:



Or the physiologically-acceptable salt thereof in an effective amount to treat arteriosclerosis, and a physiologically acceptable carrier.

5,840,742

PHARMACEUTICAL COMPOSITION FOR INHIBITING THE GROWTH OF CANCERS

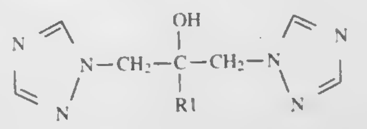
James Berger Camden, West Chester, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 473,818, Jun. 7, 1995, Pat. No. 5,665,751. This application Aug. 14, 1997, Ser. No. 911,171

Int. Cl.⁶ A61K *31/41*

U.S. Cl. 514—383 **14 Claims**

1. A unit dosage composition for treating cancer in animals or humans comprising from about 150 mg/kg to about 400 mg/kg of a 1,3-bis-triazolyl-2-propanol of the formula:



wherein R^1 is an optionally substituted alkyl, cycloalkyl, aryl or haloaryl or aralkyl (e.g., benzyl); and salts and metal complexes and ethers or esters thereof and the non-toxic, pharmaceutically acceptable acid addition salts with both organic and inorganic acids.

5,840,743

MODIFIED BENZIMIDAZOLE NUCLEOSIDES AS ANTIVIRAL AGENTS

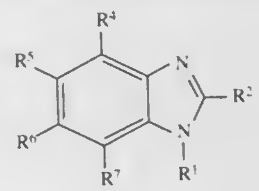
Leroy B. Townsend; John C. Drach, both of Ann Arbor, Mich., and George A. Freeman, Raleigh, N.C., assignors to The Regents of the University of Michigan, Ann Arbor, Mich., and Glaxo Wellcome Inc., Research Triangle Park, N.C.

Filed Jan. 22, 1997, Ser. No. 786,696

Int. Cl.⁶ A61K *31/415;* **C07D** *405/04*

U.S. Cl. 514—395 **13 Claims**

1. A modified benzimidazole nucleoside of the formula:



wherein

R^1 is selected from the group consisting of:

2'-fluoro-threo-furanosyl; 3'-fluoro-threo-furanosyl;

2'-fluoro-erythro-furanosyl; 3'-fluoro-erythro-furanosyl;

2'-fluoro-ribo-furanosyl; 3'-fluoro-ribo-furanosyl;

2'-fluoro-ara-furanosyl; 3'-fluoro-ara-furanosyl;

2'-fluoro-xylo-furanosyl; and 3'-fluoro-xylo-furanosyl;

R^2 is —H, —F, —Cl, —Br, —I, or $—NR_2$,

wherein R is independently —H or an alkyl group having 1–6 carbon atoms;

R^4 is —H, —F, —Cl, —Br, or —I;

R^5 is —H, —F, —Cl, —Br, or —I;

R^6 is —H, —F, —Cl, —Br, or —I;

R^7 is —H, —F, —Cl, —Br, or —I;

or a pharmaceutically acceptable salt thereof.

5,840,744

INTRAVAGINAL TREATMENT OF VAGINAL INFECTIONS WITH BUFFERED METRONIDAZOLE COMPOSITIONS

Robert J. Borgman, Mundelein, Ill., assignor to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Continuation of Ser. No. 295,242, Aug. 24, 1994, Pat. No. 5,536,743, which is a continuation-in-part of Ser. No. 950,827, Sep. 24, 1992, abandoned, which is a continuation-in-part of Ser. No. 362,273, Jun. 6, 1989, abandoned, which is a continuation-in-part of Ser. No. 144,252, Jan. 15, 1988, Pat. No. 1,837,378. This application Jul. 15, 1996, Ser. No. 680,750

Int. Cl.⁶ A61K *31/415*

U.S. Cl. 514—398 **49 Claims**

1. A buffered non-flowing composition suitable for the treatment of bacterial vaginosis which contains metronidazole in a treatment amount of about 375 mg or less wherein the metronidazole is present in a concentration of at least about 0.1 weight percent, based on the weight of the composition, and the metronidazole is present together with a buffer system in a physiologically tolerable medium; said buffer system providing an acidic buffered pH value for the composition in the range of about 3.75 to about 4.25.

5,840,745

HYDROSOLUBLE 3-ARYLIDENE-2-OXINDOLE DERIVATIVES AS TYROSINE KINASE INHIBITORS

Franco Buzzetti, Monza; Maria Gabriella Brasca, Cusago; Antonio Longo, Milan, and Dario Ballinari, San Donato Milanese, all of Italy, assignors to Pharmacia S.p. A., Milan, Italy

PCT No. PCT/EP95/05176, § 371 Date Sep. 25, 1996, § 102(e) Date Sep. 25, 1996, PCT Pub. No. WO96/22976, PCT Pub. Date Aug. 1, 1996

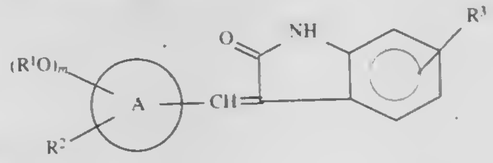
PCT Filed Dec. 22, 1995, Ser. No. 704,760

Claims priority, application United Kingdom, Jan. 26, 1995, 9501567.3

Int. Cl.⁶ A61K *31/40;* **C07D** *209/14;209/34;211/06*

U.S. Cl. 514—414 **13 Claims**

1. A compound of formula (I)



(I)

wherein

m is zero, 1 or 2;

A is a bicyclic ring selected from the group consisting of tetralin, naphthalene, quinoline and indole;

R^1 is hydrogen, C_1–C_6 alkyl or C_2–C_6 alkanoyl; one of R^2 and R^3 independently is hydrogen and the other is a substituent selected from the group consisting of:

a C_1–C_6 alkyl group substituted by 1, 2 or 3 hydroxy groups;

$—SO_3R^4$ in which R^4 is hydrogen or C_1–C_6 alkyl unsubstituted or substituted by 1, 2 or 3 hydroxy groups;

$—SO_2NHR^5$ in which R^5 is as R^4 defined above or a $—(CH_2)_n$–$N(C_1$–C_6 alkyl$)_2$ group in which n is 2 or 3;

$—COOR^6$ in which R^6 is C_1–C_6 alkyl unsubstituted or substituted by phenyl or by 1, 2 or 3 hydroxy groups or phenyl;

$—CONHR^7$ in which R^7 is hydrogen, phenyl or C_1–C_6 alkyl substituted by 1, 2 or 3 hydroxy groups or by phenyl;

$—NHSO_2R^8$ in which R^8 is C_1–C_6 alkyl or phenyl unsubstituted or substituted by halogen or by C_1–C_4 alkyl;

$—N(R^9)_2$, $—NHR^9$ or OR^9 wherein R^9 is C_2–C_6 alkyl substituted by 1, 2 or 3 hydroxy groups;

$—NHCOR^{10}$, $—OOCR^{10}$ or $—CH_2OOCR^{10}$ in which R^{10} is C_1–C_6 alkyl substituted by 1, 2 or 3 hydroxy groups;

$—NHCONH_2$; $—NH—C(NH_2)═NH$; $—C(NH_2)═NH$; $—CH_2NHC(NH_2)═NH$; $—CH_2NH_2$; $—OPO(OH)_2$; $—CH_2OPO(OH)_2$; $—PO(OH)_2$; or a

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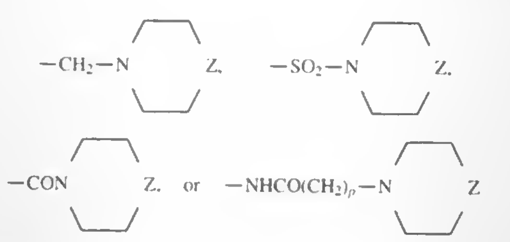


group,

wherein p is 1, 2 or 3 and Z is —CH_2—, —O— or N—R^{11} in which R^{11} is hydrogen or is as R^9 defined above;

and the pharmaceutically acceptable salts thereof.

5,840,746
USE OF INHIBITORS OF CYCLOOXYGENASE IN THE TREATMENT OF NEURODEGENERATIVE DISEASES

Yves Ducharme, Montreal; Jacques Yves Gauthier, Laval; Petpiboon Prasit; Yves Leblanc, both of Kirkland; Zhaoyin Wang, Pierrefonds; Serge Leger, and Michel Therien, both of Dollard Des Ormeaux, all of Canada, assignors to Merck Frosst Canada, Inc., Kirkland, Canada

Continuation-in-part of Ser. No. 152,620, Nov. 12, 1993, Pat. No. 5,436,265, and a continuation-in-part of Ser. No. 147,804, Nov. 4, 1993, Pat. No. 5,604,260, and a continuation-in-part of Ser. No. 539,930, Oct. 6, 1995, abandoned, which is a continuation-in-part of Ser. No. 461,783, Jun. 5, 1995, abandoned, which is a continuation-in-part of Ser. No. 179,467, Jan. 10, 1994, Pat. No. 5,474,995, which is a continuation-in-part of Ser. No. 82,196, Jun. 24, 1993, abandoned. This application Sep. 5, 1997, Ser. No. 926,291

Claims priority, application United Kingdom, Oct. 12, 1994, 9420616

Int. Cl.^{6} A61K *31/38;31/425;31/34;31/27*

U.S. Cl. 514—438 **9 Claims**

1. A method of treating Alzheimer's disease in a human which comprises administering to said human an effective amount of a non-steroidal COX-2 inhibitor, wherein said non-steroidal COX-2 inhibitor will bind at least 100 times as well to COX-2 as to COX-1.

5,840,747
CALCIUM CHANNEL ANTAGONISTS

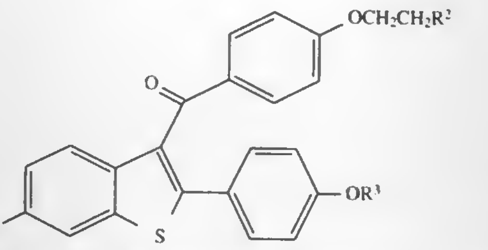
Marlene L. Cohen, Carmel, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Jun. 7, 1995, Ser. No. 485,406

Int. Cl.^{6} A61K *31/445*

U.S. Cl. 514—443 **14 Claims**

1. A method for treating cardiac disorders by antagonizing or blocking calcium channels in vascular tissue which comprises administering to a warm-blooded animal in need thereof a pharmaceutically-effective amount of a compound having the formula



I

wherein R^1 and R^3 are independently hydrogen, C_1–C_4 alkyl, —CO—(C_1–C_6 alkyl), or —CH_2Ar, —CO—Ar, wherein Ar is phenyl or substituted phenyl;

R^2 is selected from the group consisting of pyrrolidine, hexamethylenemino, and piperidino; or a pharmaceutically-acceptable salt thereof.

5,840,748
DIHALOCEPHALOMANNINE AND METHODS OF USE THEREFOR

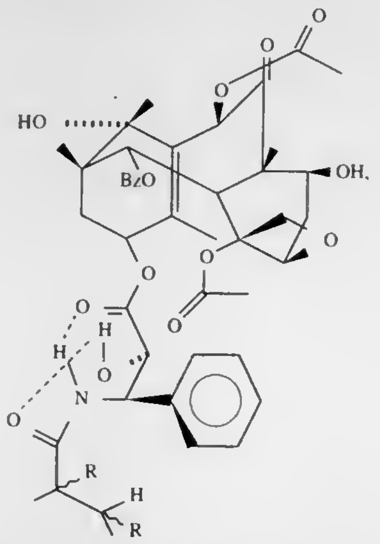
Luben K. Yankov, Edison, and Ramesh C. Pandey, Highland Park, both of N.J., assignors to Xechem International, Inc., New Brunswick, N.J.

Continuation-in-part of Ser. No. 530,846, Oct. 2, 1995, abandoned. This application Dec. 13, 1995, Ser. No. 571,427

Int. Cl.^{6} A61K *31/335;* **C07D** *305/14*

U.S. Cl. 514—449 **4 Claims**

1. 2",3"-dihalocephalomannine of the formula 1:



wherein R is halogen.

4. A method of treating a patient's tumor in need of treatment which comprises administering to said patient a tumor sensitive amount of the compounds of claims 1 or 2.

5,840,749
N-HYDROXY-DIBENZ [B,E]OXEPINALKYLAMINES, N-HYDROXY-DIBENZ [B,E]OXEPINALKANOIC ACID AMIDES AND RELATED HETEROCYCLIC ANALOGUES

Richard C. Allen, Flemington; Grover C. Helsley, Stockton; R. Richard L. Hamer, Lebanon; Brian S. Freed, Somerset, all of N.J.; John I. White, Chapel Hill, N.C., and Lawrence L. Martin, Lebanon, N.J., assignors to Hoechst Marion Roussel, Inc., Cincinnati, Ohio

Continuation of Ser. No. 936,494, Aug. 28, 1992, abandoned, which is a continuation-in-part of Ser. No. 651,850, Feb. 7, 1991, abandoned, which is a continuation-in-part of Ser. No. 398,607, Aug. 25, 1989, abandoned. This application Mar. 8, 1994, Ser. No. 207,464

Int. Cl.^{6} A61K *31/335;* **C07D** *313/12*

U.S. Cl. 514—450 **28 Claims**

1. A compound of the formula

wherein X together with the carbon atoms to which it is attached forms a benzene ring; W and Z are independently hydrogen, halogen, loweralkyl or trifluoromethyl; R^1 is hydrogen, arylloweralkyl, loweralkoxycarbonyl, loweralkylcarbonyl, arylcarbonyl or arylloweralklcarbonyl; R^2 is loweralkyl, cycloalkyl, arylloweralkyl, loweralkoxycarbonyl, loweralkylcarbonyl, arylcarbonyl or arylloweralkylcarbonyl; m is 0 or 1 and n is an integer from 0 to 4; or a pharmaceutically acceptable salt thereof, with the proviso that when m is 0 and R^1 is hydrogen, then R^2 is loweralkyl, cycloalkyl or arylloweralkyl.

5,840,750
DISCODERMOLIDE COMPOUNDS

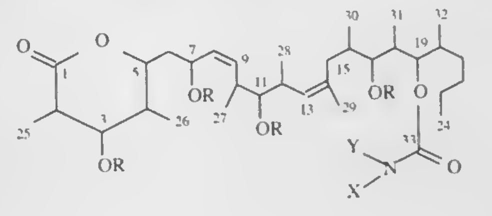
Ross E. Longley; Sarath P. Gunasekera, both of Vero Beach, and Shirley A. Pomponi, Fort Pierce, all of Fla., assignors to Harbor Branch Oceanographic Institution, Inc., Fort Pierce, Fla.

Continuation-in-part of Ser. No. 567,442, Dec. 5, 1995. This application Dec. 5, 1996, Ser. No. 761,106

Int. Cl.^{6} A61K *31/35;* **C07D** *309/30*

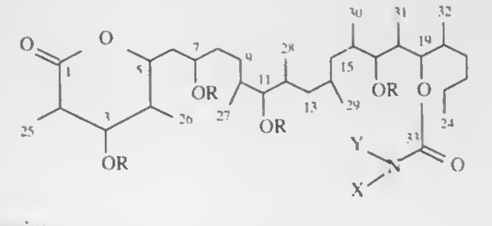
U.S. Cl. 514—459 **7 Claims**

1. A compound having the formula:



(II)

or



(III)

wherein:

R=—H, —A, —CH_2—Q, —COA, or —COZ,

A=lower alkyl,

Z=monocyclicaryl,

Q=phenyl, tolyl, or xylyl,

X=—H, —A, —Z, or —CH_2—Z, and

Y=—H, —A, —Z, —CH_2—Z, —COA, —COZ, and acid addition salts thereof.

5,840,751
5,6-DIHYDROPYRONE DERIVATIVES AS PROTEASE INHIBITORS AND ANTIVIRAL AGENTS

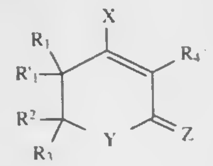
Edmund Lee Ellsworth, Brighton; Elizabeth Lunney, Ann Arbor, and Bradley Dean Tait, Canton, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 155,443, Nov. 19, 1993, abandoned. This application Oct. 12, 1994, Ser. No. 319,820

Int. Cl.^{6} A61K *31/35;31/415;31/44;31/505*

U.S. Cl. 514—460 **23 Claims**

1. A compound or a pharmaceutically acceptable salt thereof of formula



I

wherein

X is OR_5, NHR_5, CH_2OR_5, CO_2R_6, or SR_5, wherein R_5 is R_6 or COR_6 wherein R_6 is independently H, a straight chain alkyl group containing 1 to 6 carbon atoms, a branched or cyclic alkyl group containing 3 to 7 carbon atoms, an alkylcycloalkyl group of 5–9 carbon atoms, benzyl, phenyl, or a heterocycle;

Z is O or S;

Y is O, or S

R_1 and R_1' are each independently $[CH_2]_{n1}$-$[W_1]_{n2}$-$[Ar]_{n2}$-$[CH_2]_{n3}$-$[W_2]_{n4}$-R_7;

R_2 is independently selected from the group of structures from which R_1 is selected with the proviso that if W_1 is a heteroatom n1 is an integer of from 1 to 4;

R_3 is independently selected from the group of structures from which R_1 is selected with the proviso that if W_1 is a heteroatom n1 is an integer of from 1 to 4;

R_2 and R_3 may be taken together to form an unsubstituted or substituted 3-, 4-, 5-, 6-, or 7-membered ring, wherein the substituents are one or more of the R_7 groups listed below:

R_4 is $[CH_2]_{n1}$-$[W_3]_{n2}$-$[W_4]_{n4}$-$[Ar]_{n2}$-$[CH_2]_{n3}$-$[W_2]_{n4}$-R_7;

n1, n2, n3, n4, and n5 are independently integers of from 0 to 4, 0 to 1, 0 to 4, 0 to 1, and 0 to 2, respectively;

W_1, W_2 and W_4 are independently O, $OCONR_7$ $S(O)_{n5}$, CO, $C(=NR_7)NR_7$, $CR_7=CR_7$, C=C, NR_7, CS, C=N—R_7, C=NOR_7, NR_7SO_2, SO_2NR_7, $C=C(R_7)_2$.$CR_7N(R_7)_2$, CR_7OR_7, $C(R_7)_2$, NCO_2R_7, NR_7CO_2, CO_2, $NCON(R_7)_2$, NR_7CONR_7, $NCOR_7$, NR_7CO, or $CONR_7$;

W_3 is independently selected from the group of structures from which W_1 is selected, with the further limitation that if n1 in R_4 is zero, that W_3 is selected from the group of structures consisting of —CO, —$CR_7=CR_7$, —C≡C, —CS, —C=N—R_7, —C=NOR_7, —$CR_7N(R_7)_2$, —$C=C(R_7)_2$, —CR_7OR_7, —$C(R_7)_2$, —CO_2, and —$CONR_7$,

R_7 is independently H, Ar, a straight or branched alkyl or alkenyl group containing from 1 to 6 carbon atoms, or two R_7 groups can be taken together to form a ring of 3–7 atoms, or a substituted derivative thereof wherein the substituents are one or more of CO_2R_6, COR_6, $CON(R_6)_2$, $NR_6CON(R_6)_2$, NR_6COR_6, OR_6, $S(O)_{n5}R_6$, $N(R_6)_2$, Cl, Br, F, CF_3, Ar, OAr, or $S(O)_{n5}Ar$;

Ar is independently phenyl, naphthyl, a 5- or 6-membered heterocycle containing 1 to 4 heteroatoms, a cycloalkyl containing 3 to 6 atoms, a fused ring system containing 8–10 atoms, or a substituted derivative thereof wherein the substituents are of F, Cl, Br, CN, NO_2, $(CH2)_{n6}R_6$, $(CH2)_{n6}C(Me)=CH_2$, $(CH_2)_{n6}N(R_6)_2$, $(CH_2)_{n6}NR_6CON(R_6)_2$, $(CH_2)_{n6}NR_6COR_6$, $(CH_2)_{n6}OR_6$, $(CH_2)_{n6}OCOR_6$, $(CH_2)_{n6}OCON(R_6)_2$, $(CH_2)_{n6}CO_2R_6$, $(CH_2)_{n6}CON(R_6)_2$, $(CH_2)_{n6}COR_6$, CF_3, $(CH_2)_{n6}S(O)_{n5}R_6$, OCH_2O, or $O(CH_2)_2O$; and

n6 is independently an integer of from 0 to 3.

5,840,752
REDUCTION OF HAIR GROWTH

James P. Henry, 10257 Meadow Fence Ct., Myersville, Md. 21773; Gurpreet S. Ahluwalia, 8632 Stableview Ct., Gaithersburg, Md. 20882, and Douglas Shander, 16112 Howard Landing Dr., Gaithersburg, Md. 20878

Filed Nov. 21, 1996, Ser. No. 754,556

Int. Cl.^{6} A61K *31/35*

U.S. Cl. 514—460 **32 Claims**

1. A method of reducing mammalian hair growth which comprises

selecting an area of skin from which reduced hair growth is desired; and

applying to said area of skin a dermatologically acceptable composition comprising an inhibitor of a cholesterol pathway enzyme in an amount effective to reduce hair growth.

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5,840,753

1,2 DIARYLMETHYLENE DERIVATIVES, THEIR METHODS OF PREPARATION AND THEIR USES IN THERAPEUTICS

Eric Nicolaï, Rueil Malmaison, and Jean-Marie Teulon, La Celle Saint Cloud, both of France, assignors to Laboratories UPSA, Agen, France

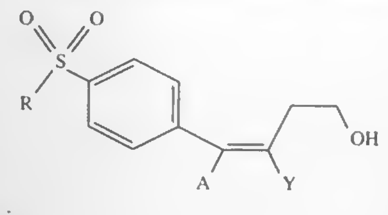
Filed Mar. 24, 1997, Ser. No. 822,842

Claims priority, application France, Oct. 8, 1996, 96 12234

Int. Cl.^{6} A61K *31/36;* **C07D** *317/48;* **C07C** *69/593;63/64*

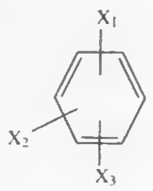
U.S. Cl. 514—464 **12 Claims**

1. A 1,2 diarylmethylene compound of formula (1):



Formula (1)

wherein:
  R is:
    a lower alkyl radical having 1 to 6 carbon atoms,
    a lower haloalkyl radical having 1 to 6 carbon atoms, or
    an $—NH_2$ group,
  A is:
    an aromatic ring:



wherein X_1, X_2 and X_3 independently are:
  the hydrogen atom,
  a halogen atom,
  a lower alkyl radical having 1 to 6 carbon atoms, or
  a trifluoromethyl radical,
  or even two of these together form a methylene dioxy group,
Y is:
  a CO_2R_1 group wherein R_1 is selected from the group consisting of the hydrogen atom and a lower alkyl radical having 1 to 6 carbon atoms,
  a $—CH_2OH$ group,
  or a pharmaceutically acceptable salt thereof.

5,840,754

DOSAGE FORM COMPRISING OXYBUTYNIN

George V. Guittard, Cupertino; Francisco Jao; Susan M. Marks, both of San Jose; David J. Kidney, Palo Alto, and Fernando Gumucio, Santa Clara, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 445,849, May 22, 1995, Pat. No. 5,674,895. This application Sep. 5, 1996, Ser. No. 706,576

Int. Cl.^{6} A01N *37/44*

U.S. Cl. 514—534 **6 Claims**

1. A method for lessening the incidence of side-effects in a patient associated with the oral administration of a controlled-release dosage form tablet comprising oxybutynin, where'n the method comprises administering said oxybutynin from the controlled-release dosage form tablet to the patient over twenty-four hours and thereby lessening the incidence of side effects.

5,840,755

METHOD AND COMPOSITION FOR TOPICAL THERAPY OF HEADACHES

Rainer K. Liedtke, Munich, Germany, assignor to American Pharmed Labs, Inc., New York, N.Y.

Filed Jul. 17, 1996, Ser. No. 682,351

Claims priority, application Germany, Jul. 17, 1995, 195 26 019.8

Int. Cl.^{6} A01N *37/12*

U.S. Cl. 514—535 **14 Claims**

1. A topical carrier system for topical therapy of headaches for application to intact mammalian forehead or temple skin or both, which comprises a therapeutically effective amount or dose of a local anaesthetic for delivery from said topical carrier system to said mammalian forehead or temple skin or both,
  wherein said topical carrier system comprises at least one component having around, oral, rectangular or semicircular shape.

5,840,756

PHARMACEUTICAL COMPOSITION OF L-DOPA ESTER

Sasson Cohen, Tel Aviv; Sela Yoram, Raanana; Ruth Levy, Tel Aviv; Nava Shterman, Petach Tikva; Eldad Melamed, Mevasserett Zion, and Dafna Atlas, Neve Granot, all of Israel, assignors to Teva Pharmaceutical Industries Ltd., and Yissum Research Development Company of the Hebrew University of Jerusalem, both of Jerusalem, Israel

Filed Jul. 11, 1996, Ser. No. 678,716

Int. Cl.^{6} A61K *31/24;31/195;31/16;31/135*

U.S. Cl. 514—538 **16 Claims**

1. A pharmaceutical composition comprising a therapeutically effective amount of L-DOPA ethyl ester and a carrier, wherein the therapeutically effective amount is an amount effective to provide an early burst of levodopa followed by the maintenance of a sustained level of levodopa and wherein the carrier comprises from 5.5 to 98.5 percent hydroxypropylmethyl cellulose; from 0.25 to 4.5 percent hydroxypropyl cellulose; and from 1 to 90 percent of a carboxyvinyl polymer by weight of the carrier.

5,840,757

LIPID EMULSION INTENDED FOR PARENTERAL OR ENTERAL FEEDING

Guy Dutot, Noisy le Roi, France, assignor to Clintec Nutrition Company, Deerfield, Ill.

Continuation of Ser. No. 453,359, Dec. 19, 1989, abandoned, which is a continuation of Ser. No. 223,120, Jul. 22, 1988, abandoned. This application Sep. 5, 1991, Ser. No. 755,610

Claims priority, application France, Jul. 23, 1987, 87 10407

Int. Cl.^{6} A61K *31/20*

U.S. Cl. 514—560 **16 Claims**

1. A lipid emulsion suitable for use as a parenteral or enteral foodstuff, comprising from 5 to 50% by weight, relative to the total weight of the emulsion, of a lipid phase in water, said lipid phase consisting essentially of a mixture of long-chain fatty acids in which 15 to 45% by weight of the total fatty acids are essential fatty acids, the essential fatty acids being linoleic acid and α-linolenic acid.

5,840,758

OXIME DERIVATIVES OF FENAMATES AS INHIBITORS OF PROSTAGLANDIN BIOSYNTHESIS

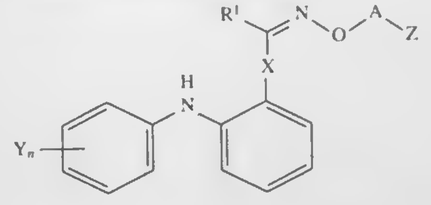
Clint D. W. Brooks, Libertyville; Teodozyj Kolasa, Lake Villa, both of Ill.; Wendy Lee, Hamden, Conn., and Andrew O. Stewart, Libertyville, Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Jun. 6, 1996, Ser. No. 659,474

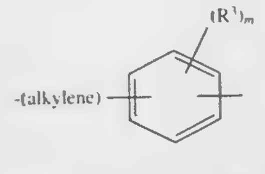
Int. Cl.^{6} A61K *31/41;31/275;31/19;31/165*

U.S. Cl. 514—564 **13 Claims**

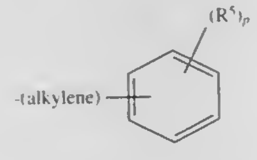
1. A compound having the formula:



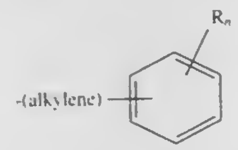
or a pharmaceutically acceptable salt thereof wherein
  Y is selected from the group consisting of
    halogen,
    alkyl of one to six carbon atoms, and
    haloalkyl of one to six carbon atoms, and
  n is 0, 1, 2,or3;
  A is selected from the group consisting of
    (a) alkylene of one to six carbon atoms,
    (b) alkylene of one to six carbon atoms substituted with one or two substituents selected from the group consisting of
      $—OR^2$,
      —CN,
      $—NO_2$, and
      $—COOR^2$,
    (c) cycloalkylene of three to eight carbon atoms,
    (d) cycloalkylene of three to eight carbon atoms substituted with one or two substituents independently selected from
      alkyl of one to six carbon atoms,
      $—OR^2$,
      —CN,
      $—NO_2$, and
      $—COOR^2$,
    (e) cycloalkylene of three to eight carbon atoms wherein one or two of the carbon atoms is replaced with one or two heteroatomsindependently selected from O, S, and N,
    (f) cycloalkylene of three to eight carbon atoms wherein one or two of the carbon atoms is replaced with one or two heteroatoms independently selected from O, S, and N, and the ring contains one or two substituents independently selected from
      alkyl of one to six carbon atoms,
      $—OR^2$,
      —CN,
      $—NO_2$, and
      $—COOR^2$,
    (g) alkenylene of two to six carbon atoms,
    (h) alkenylene of two to six carbon atoms substituted with one or two substituents selected from the group consisting of
      $—OR^2$,
      —CN,
      $—NO_2$, and
      $—COOR^2$,
    (i)



wherein m is 0, 1, 2, or 3, and R^3, which may be the same or different at each occurrence, is selected from the group consisting of
      $—OR^2$
      —CN,
      $—NO_2$,
      $—COOR^2$,
      halogen,
      alkyl of one to six carbon atoms,
      haloalkyl of one to six carbon atoms, and
      alkoxy of one to six carbon atoms;
  X is absent or is alkylene of one to six carbon atoms;
  Z is selected from the group consisting of
    (a) hydrogen,
    (b) COM wherein M is selected from the group consisting of
      $—OR^4$ wherein R^4 is selected from the group consisting of
        a pharmaceutically acceptable cation,
        hydrogen,
        alkyl of one to six carbon atoms,
        phenyl,
        phenyl substituted one, two or three substituents selected from
        halogen,
        alkyl of one to six carbon atoms,
        haloalkyl of one to six carbon atoms,
        alkoxy of one to six carbon atoms, and



wherein p is 0, 1, 2, or 3, and R^5, which may be the same or different at each occurrence, is selected from
halogen,
alkyl of one to six carbon atoms,
haloalkyl of one to six carbon atoms, and
alkoxy of one to six carbon atoms, and
      $—NR^6R^7$ wherein R^6 and R^7 are independently selected from
        hydrogen,
        alkyl of one to six carbon atoms,
        hydroxyalkyl of one to six carbon atoms, and
        hydroxy; and
      a pharmaceutically acceptable metabolically cleavable group,
    (c) $—OR^2$,
    (d) tetrazolyl
    (e) $—CH(OR^2)—CH_2OR^8$,
    (f) $—CH(OR^2)—CH_2—CH_2OR^8$, and
    (g) $—CH(OR^2)—CH(OR^8)—CH_2OR^9$, and
    (h) $=N—OR^2$; and
  R^1, R^2, R^8, and R^9 are independently selected at each occurrence from the group consisting of
    (a) hydrogen,
    (b) alkyl of one to six carbon atoms,
    (c) phenyl,
    (d) phenyl substituted one, two or three substituents selected from
      halogen,
      alkyl of one to six carbon atoms,
      haloalkyl of one to six carbon atoms,
      alkoxy of one to six carbon atoms, and



wherein m is 0, 1, 2, or 3, and R, which may be the same or different at each occurrence, is selected from halogen,
alkyl of one to six carbon atoms,
haloalkyl of one to six carbon atoms, and
alkoxy of one to six carbon atoms.

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5,840,759

USE OF NITRIC OXIDE RELEASING COMPOUNDS TO PROTECT NONCANCEROUS CELLS FROM CHEMOTHERAPEUTIC AGENTS

James B. Mitchell, Damascus; Angelo Russo, Bethesda; Murali C. Krishna, Derwood; David A. Wink, Jr., Hagerstown, all of Md., and James E. Liebmann, Albuquerque, N. Mex., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 319,888, Oct. 7, 1994, Pat. No. 5,650,442, which is a continuation-in-part of Ser. No. 133,574, Oct. 8, 1993, abandoned. This application Mar. 11, 1997, Ser. No. 814,857

Int. Cl.^{6} A61K *31/13;31/44;31/495;31/445*

U.S. Cl. 514—610 **13 Claims**

1. A method of protecting noncancerous cells in a mammal from a chemotherapeutic agent, which method comprises administering to a mammal in need of chemotherapy a chemotherapy-protecting effective amount of a nitric oxide-containing compound, which spontaneously releases nitric oxide under physiological conditions without requiring the presence of oxygen, in conjunction with chemotherapy.

5,840,760

MATERIALS AND METHODS FOR CONTROLLING METHICILLIN-RESISTANT *STAPHYLOCOCCUS AUREUS* MICROBES

Charles E. Carraher, Jr., Parkland, and Cynthia Butler, Boca Raton, both of Fla., assignors to Florida Atlantic University, Boca Raton, Fla.

Filed Nov. 19, 1996, Ser. No. 752,706

Int. Cl.^{6} A61K *31/32*

U.S. Cl. 514—493 **18 Claims**

1. A process for controlling methicillin-resistant *Staphyloccus aureus* (MRSA) microbes which comprises contacting said MRSA with an effective anti-MRSA amount of a modified tin-containing material.

5,840,761

ALKYLBENZOYLGUANIDINE DERIVATIVES

Rolf Gericke, Seeheim-Jugenheim; Dieter Dorsch, Ober-Ramstadt; Manfred Baumgarth, Ober-Ramstadt; Klaus-Otto Minck, Ober-Ramstadt, and Norbert Beier, Reinheim, all of Germany, assignors to Merck Patent Gesellschaft mit Beschrankter Haftung, Germany

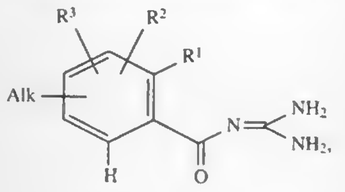
Filed Aug. 30, 1995, Ser. No. 520,767

Claims priority, application Germany, Aug. 31, 1994, 4430916.3

Int. Cl.^{6} A61K *31/165;* **C07C** *231/02;233/64*

U.S. Cl. 514—617 **17 Claims**

1. An alkylbenzoylguanidine of the formula I



I

in which

R^1 is A, CF_3, CH_2F, CHF_2, C_2F_5, CN, NO_2, Hal, $C\equiv CH$ or $-X-R^4$,

R^2 and R^3 are in each case, independently of each other, H, Hal, A, $-X-R^4$, CN, NO_2, CF_3, CH_2F, CHF_2, C_2F_5, CH_2CF_3, $-SO^{n}-R^{hu\ 6}$, $-SO_2NR^4R^5$, Ph or OPh,

R^4 is H, A, cycloalkyl having from 5 to 7 C atoms, cycloalkylmethyl having from 6 to 8 C atoms, CF_3, CH_2F, CHF_2, CH_2CF_3, Ph or $-CH_2-Ph$,

R^5 is H or A,

R^6 is A or Ph,

Alk is located in the para-position on the ring with respect to the guanidine group and is a straight-chain or branched C_1–C_8-alkyl radical, C_3–C_8-cycloalkyl which can be unsubstituted or substituted once, twice or three times by A, or is $-CR^7{=}CHR^{7'}$ or $-C\equiv CR^7$,

R^7 and $R^{7'}$ are in each case, independently of each other, H, A or Ph,

A is alkyl having from 1 to 6 C atoms,

Hal is F, Cl, Br or I,

X is O, S or NR^5,

Ph is phenyl which is unsubstituted or substituted once, twice or three times by A, OA, NR^4R^5, F, Cl, Br, I or CF_3, and

n is 1 or 2,

and the physiologically tolerable salts thereof.

5,840,762

METHOD FOR THE TREATMENT OF CARDIAC ARRHYTHMIAS AND SHORTENING OF ACTION POTENTIAL DURATION

Joel E. Bernstein, Deerfield, and Kenneth M. Verburg, Wheaton, both of Ill., assignors to GenDerm Corporation

Filed Jan. 12, 1996, Ser. No. 585,872

Int. Cl.^{6} A61K *31/16*

U.S. Cl. 514—627 **1 Claim**

1. A method of preventing, suppressing or reversing an abnormal cardiac rhythm in a patient having a myocardial disorder, comprising:

administering to a patient having a disorder of the myocardium a composition comprising an admixture of cis-8-methly-N-vanillly-6-nonenamide in a pharmaceutically acceptable vehicle, said cis-8-methly-N-vanillly-6-nonenamide being administered to the patient in an amount sufficient to alter an electrophysiologic property of the myocardium, to prevent, suppress or reverse an abnormal cardiac rhythm, and to shorten the action potential duration.

5,840,763

TREATMENT OF A LATENT INFECTION OF HERPES VIRUSES

Hugh John Field; Alana Maureen Thackray, both of Cambridge; Teresa Helen Bacon, Weybridge, all of England; David Sutton, Wayne, Pa., and Richard Anthony Vere Hodge, Reigate, England, assignors to SmithKline Beecham plc, Brentford, United Kingdom

Filed Sep. 1, 1995, Ser. No. 522,790

Int. Cl.^{6} A61K *31/52*

U.S. Cl. 514—262 **12 Claims**

1. A method for reducing reactivation of a latent infection of herpes viruses in a human in need thereof which method comprises administering to said human an effective amount of famciclovir, or penciclovir, or a pharmaceutically acceptable salt thereof, at greater than 18 hours post-infection.

5,840,764

SUBSTITUTED HYDROXY-ANILINO DERIVATIVES OF CYCLOBUTENE-3,4-DIONES

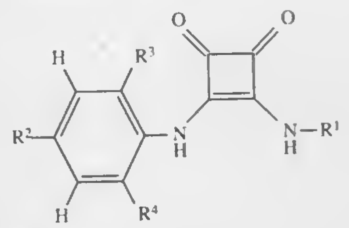
Dominick A. Quagliato, Bridgewater, N.J.; Edward M. Matelan, Yardley, Pa., and Madelene M. Antane, Lawrenceville, N.J., assignors to American Home Products Corporation, Madison, N.J.

Filed Jan. 14, 1998, Ser. No. 7,335

Int. Cl.^{6} A01N *33/02;33/06;* **C07C** *51/16;211/00*

U.S. Cl. 514—646 **13 Claims**

1. A compound of the formula



(I)

wherein:

R^1 is straight chain alkyl of 1 to 10 carbon atoms, branched chain alkyl of 3 to 10 carbon atoms, cycloalkyl of 3 to 10 carbon atoms, hydroxyalkyl of 2 to 10 carbon atoms, fluoroalkyl of 1 to 10 carbon atoms or polyfluoroalkyl of 1 to 10 carbon atoms;

and one of R^2, R^3 and R^4 is hydroxyl and the other two are, independently, H, CN, halogen, alkyl of 1 to 3 carbon atoms or hydroxyl;

or a pharmaceutically acceptable salt thereof.

5,840,765

DEPILATING METHOD

Ethel Miller, 1408 Swan Ave., Yakima, Wash. 98902

Filed Aug. 4, 1997, Ser. No. 905,460

Int. Cl.^{6} A61K *31/05*

U.S. Cl. 514—731 **17 Claims**

1. A method of removing hair from the human body which comprises applying to the skin of said human body an effective amount of a composition consisting essentially of phenol, o-phenylphenol, or chlorophenol or mixtures thereof in an effective concentration.

5,840,766

PROCESS FOR REMOVING BILE SALTS FROM A PATIENT AND COMPOSITIONS THEREFOR

W. Harry Mandeville, III, Lynnfield, and Stephen Randall Holmes-Farley, Arlington, both of Mass., assignors to GelTex Pharmaceuticals, Inc., Waltham, Mass.

Division of Ser. No. 482,969, Jun. 7, 1995, Pat. No. 5,703,188, which is a continuation-in-part of Ser. No. 258,477, Jun. 10, 1994, Pat. No. 5,624,963, which is a continuation-in-part of Ser. No. 71,564, Jun. 2, 1993, abandoned, said Ser. No. 482,969 is a continuation-in-part of Ser. No. 258,431, Jun. 10, 1994, abandoned. This application Oct. 28, 1997, Ser. No. 959,471

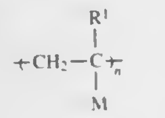
Int. Cl.^{6} A01N *33/18*

U.S. Cl. 514—742 **28 Claims**

1. The therapeutic composition effective for removing bile salts comprising a therapeutic amount of a crosslinked polymer comprising

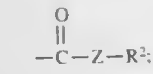
(1) a monoreactive hydrophobic co-monomer and

(2) a repeat unit having the formula



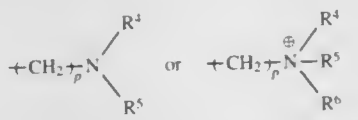
$$+\!\!\left(CH_2-\underset{M}{\overset{R^1}{\underset{|}{\overset{|}{C}}}}\right)\!\!\!+_n$$

or copolymer thereof, where n-is an integer; R^1 is H or a C_1–C_8 alkyl group; M is



$$-\overset{\overset{O}{\|}}{C}-Z-R^2;$$

Z is O, NR^3, S, or $(CH_2)_m$; m=0–10; R^3 is H or a C_1–C_8 alkyl group; and R^2 is



where p=0–10, and each R^4, R^5, and R^6, independently, is H, a C_1–C_8 alkyl group, or an aryl group.

5,840,767

PERFLUOROCARBONS FOR BIOLOGICAL GAS EXCHANGE AND METHOD

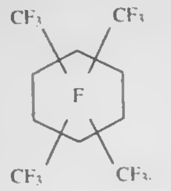
Leland C. Clark, Jr., Cincinnatti, Ohio, assignor to Synthetic Blood International, Inc., Calif.

Filed Dec. 1, 1995, Ser. No. 565,782

Int. Cl.^{6} A61K *31/02*

U.S. Cl. 514—759 **22 Claims**

1. A method of facilitating transport of gases in a biological system, the improvement comprising using as the gas transport agent a perfluorinated compound having the following structure wherein ring carbons are fully fluorinated:



5,840,768

MCC: ALGINATE PHARMACEUTICAL SUSPENSIONS

Edward Selinger, Langhorne; Sheila M. Dell, New Hope, both of Pa.; John A. Colliopoulos, Princeton Junction, N.J., and William J. Reilly, Jr., New Hope, Pa., assignors to FMC Corporation, Philadelphia, Pa.

Filed Jun. 4, 1997, Ser. No. 869,039

Int. Cl.^{6} A61K *47/00;31/19;31/16;33/08*

U.S. Cl. 514—779 **8 Claims**

1. An improved pharmaceutical suspension consisting essentially of water, a pharmaceutically effective amount of a substantially water insoluble or slightly water soluble active ingredient,

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from 0.5% to 10% by weight of the suspension of suspending agent comprising 80% to 90% by weight attrited microcrystalline cellulose at least partially surface coated with 10% to 20% by weight of a calcium/sodium alginate salt complex barrier dispersant, said suspension having a pH of at least 3.5, and optionally sweetening, flavoring and taste masking agents.

5,840,769
DIRECT TABLETTING AIDS

Karl Kolter, Limburgerhof; Siegfried Lang, Ludwigshafen; Peter Schmidt, Tuebingen, and Anja Hühne, Tübingen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Jul. 7, 1997, Ser. No. 888,542

Claims priority, application Germany, Jul. 16, 1996, 196 28 617.4

Int. Cl.^{6} A61K *47/00;47/32*

U.S. Cl. 514—781 **11 Claims**

1. A direct tabletting aid comprising

A) 75–98% by weight of a powdered cellulose suitable for tabletting

B) 1–15% by weight of soluble polyvinylpyrrolidone

C) 0.5–10% by weight of crosslinked insoluble polyvinylpyrrolidone.

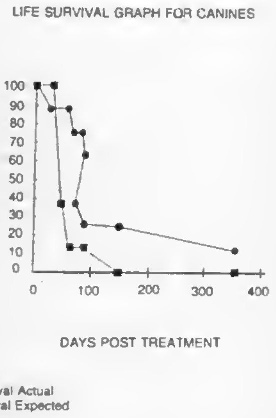
5,840,770
METHOD OF KILLING TUMOR CELLS

Albert Fay Hill, Denver, Colo., assignor to Hill Medical Corporation, La Jolla, Calif.

Continuation of Ser. No. 426,088, Apr. 21, 1995, abandoned, which is a continuation-in-part of Ser. No. 111,288, Aug. 24, 1993, Pat. No. 5,449,522. This application Jan. 28, 1997, Ser. No. 790,683

Int. Cl.^{6} A61K *38/28;33/14;45/05*

U.S. Cl. 514—885 **8 Claims**



1. A method for killing tumor cells in a mammal comprising administering to said mammal insulin or an insulin precursor in a dosage sufficient to maintain blood levels of insulin between about 16 μU/mL and about 50 μU/mL, glucose or a glucose precursor in a dosage sufficient to maintain blood levels of glucose between about 58 mg/dL and about 140 mg/dL, and potassium or a potassium precursor in a dosage sufficient to maintain blood levels of potassium between about 3.5 mEq/L and about 6.0 mEq/L.

5,840,771
PROPHYLAXIS AGAINST DISEASES TRAMSMITTABLE BY SEXUAL CONTACT, AND THERAPY OF SUCH DISEASES

Michael J. Oldham, Oxnard, and Bruce F. Rose, Ventura, both of Calif., assignors to Legere Pharmaceuticals, Ltd., Carson City, Nev.

Continuation of Ser. No. 759,517, Dec. 4, 1996, abandoned, which is a continuation of Ser. No. 609,104, Feb. 29, 1996, abandoned, which is a continuation of Ser. No. 462,666, Jun. 5, 1995, abandoned, which is a division of Ser. No. 317,599, Oct. 3, 1994, abandoned, which is a continuation-in-part of Ser. No. 130,190, Oct. 1, 1993, abandoned. This application Sep. 26, 1997, Ser. No. 938,831

Int. Cl.^{6} A01N *65/00;* **A61K** *35/78;39/385*

U.S. Cl. 514—931 **8 Claims**

1. A method of treating sexually transmitted vaginal infections comprising administering to the vagina an amount of a composition containing at least one lectin capable of binding to a pathogenic microorganism or to carbohydrate moieties expressed on the vaginal epithelial cell surface, said lectin being effective to diminish the infective capability of said microorganism, said lectin being dispersed in a biocompatible non-toxic vehicle.

5,840,772
METHODS OF RECYCLING AND COMPOSITIONS USED THEREIN

Donald S. Peters, Mentor, and Randall J. Brent, Solon, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 18, 1996, Ser. No. 715,603

Int. Cl.^{6} C08J *11/04*

U.S. Cl. 521—41 **16 Claims**

1. A method of physically separating a gas barrier polymer coating from a base thermoplastic polymer in a multilayered structure, comprising the steps of:

(A) providing the multilayered structure comprising at least one gas barrier polymer coating and at least one base thermoplastic polymer;

(B) contacting the multilayered structure with a mixture comprising (i) a major amount of water, (ii) at least one compound selected from the group consisting of a basic compound and an acid compound, (iii) at least one lifting agent, and (iv) at least one accelerator; wherein the pH of the mixture in step (B) is less than about 6.5; and

(C) physically separating the gas barrier polymer coating from the base thermoplastic polymer.

5,840,773
PROCESS FOR RECOVERING AND RECYCLING POLYAMIDE FROM CARPET WASTE

Martin Booij, Munstergeleen; Jan A.J. Hendrix, Obbicht; Yvonne H. Frentzen, Venlo, and Nicolaas M.H. Beckers, Cadier en Keer, all of Netherlands, assignors to DSM N.V., Heerlen, Netherlands

Filed Aug. 22, 1996, Ser. No. 701,612

Claims priority, application Belgium, Aug. 23, 1995, 09500704

Int. Cl.^{6} C08J *11/04*

U.S. Cl. 521—49 **17 Claims**

1. A process for recovering at least one polyamide from a polyamide-containing carpet waste, said process comprising the steps of:

providing carpet waste containing at least one polyamide;

providing an extraction agent comprising at least one aliphatic alcohol and being substantially free of an alkaline earth halide;

combining the carpet waste and the extraction agent to form an extraction solution; and

extracting the at least one polyamide from the extraction solution, wherein the at least one aliphatic alcohol is selected from the group consisting of methanol, ethanol, and propanol.

5,840,774
LOW DENSITY MICROPOROUS POLYMERS AND PROCESS

Paul Ehrlich, Buffalo, and Robert Bruce Stewart, Cheektowaga, both of N.Y., assignors to Research Foundation of State University of New York, Albany, N.Y.

Filed Feb. 28, 1991, Ser. No. 662,263

Int. Cl.^{6} C08J *9/26*

U.S. Cl. 521—61 **20 Claims**

1. A process for preparing a low density microporous polymer comprising, providing a mixture comprising a crystalline polymer and a polymer solvent, said mixture capable of achieving a supercritical condition; forming a supercritical solution from said mixture by applying pressure at a temperature sufficient for said mixture to attain a supercritical condition; cooling the supercritical solution at a rate sufficient to precipitate a porous crystalline polymer product.

5,840,775
POROUS POLYTETRAFLOUROETHYLENE AND PREPARATION

Edward George Howard, Jr., Hockessin, and Arthur Zenker Moss, Wilmington, both of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 406,624, Mar. 20, 1995, Pat. No. 5,721,283, which is a continuation-in-part of Ser. No. 169,461, Dec. 17, 1993, abandoned, which is a continuation-in-part of Ser. No. 065,735, May 21, 1993, abandoned, which is a continuation-in-part of Ser. No. 936,447, Aug. 28, 1992, abandoned, which is a continuation-in-part of Ser. No. 904,244, Jun. 25, 1992, abandoned. This application Mar. 4, 1997, Ser. No. 812,987

Int. Cl.^{6} C08J *9/14*

U.S. Cl. 521—64 **46 Claims**

1. Process for preparing porous polytetrafluoroethylene (PTFE) polymer comprising:

(a) contacting PTFE with a fluid which penetrates and swells but does not significantly dissolve the polymer or eliminate viscoelastic memory therefrom, at a temperature in the range of about 250°–400° C.;

(b) cooling and separating the penetrated polymer from unabsorbed fluid, said polymer containing up to about 80% by weight of absorbed fluid; and

(c) removing the absorbed fluid, to form a porous product having a single DSC melting endotherm, said endotherm being in the range of about 315° to 333° C. with an associated heat of fusion of at least 35 J/g.

5,840,776

Patent Not Issued For This Number

5,840,777
METHOD OF PRODUCING POLYSACCHARIDE FOAMS

Dana Burton Eagles, Sherborn; George Bakis, West Roxbury; Andrew Bruce Jeffery, North Quincy; Constantinos Mermingis, Boston, all of Mass., and Thomas Henry Hagoort, Montclair, N.J., assignors to Albany International Corp., Albany, N.Y.

PCT No. PCT/US93/05993, § 371 Date Feb. 15, 1994, § 102(e) Date Feb. 15, 1994, PCT Pub. No. WO94/00512, PCT Pub. Date Jan. 6, 1994

PCT Filed Jun. 18, 1993, Ser. No. 196,079

Claims priority, application United Kingdom, Nov. 19, 1992, 9224255; Jun. 19, 1993, 9212976

Int. Cl.^{6} C08J *9/00;9/02;9/06*

U.S. Cl. 521—82 **24 Claims**

1. A method of forming a dry polysaccharide foam from an aqueous polysaccharide solution comprised of the steps of:

a) forming an aqueous solution of a polysaccharide selected from the group consisting of alginic acid, a soluble alginate salt, and other soluble polysaccharides containing exchangeable counter-cations;

b) introducing a gas into the aqueous solution to form a wet foam by agitating the solution;

c) homogeneously dispersing an insoluble carbonate or hydrogen carbonate salt having one or more di- or tri-valent cations in the wet foam and subsequently treating the wet foam with an acid having a concentration not in excess of 1N thereby liberating carbon dioxide as a gas and the cations to produce a cross-linked polysaccharide foam; and

d) drying the wet foam to form a dry polysaccharide foam;

wherein the dry foam is predominantly comprised of polysaccharide.

5,840,778
PROCESS AND DEVICE FOR PRODUCING FOAM USING CARBON DIOXIDE DISSOLVED UNDER PRESSURE

Ferdinand Althausen, Neunkirchen; Reiner Raffel, Siegburg; Wilfried Ebeling, and Robert Eihen, both of Köln, all of Germany, assignors to Bayer Aktiengesellschaft, and Hennecke GmbH, both of Leverkusen, Germany

PCT No. PCT/EP95/04492, § 371 Date May 21, 1997, § 102(e) Date May 21, 1997, PCT Pub. No. WO96/16782, PCT Pub. Date Jun. 6, 1996

PCT Filed Nov. 15, 1995, Ser. No. 836,859

Claims priority, application Germany, Nov. 28, 1994, 44 42 254.7; Dec. 23, 1994, 44 46 336.7; Jan. 5, 1995, 195 00 198.2; Jul. 5, 1995, 195 24 434.6

Int. Cl.^{6} C08J *9/00;* **C08G** *18/00*

U.S. Cl. 521—99 **7 Claims**

1. A process for producing polyurethane foam materials from two reactive components using carbon dioxide as a blowing agent by mixing at least one of the reactive components with carbon dioxide under pressure, mixing the reactive components, at least one of which contains carbon dioxide under pressure, suddenly expanding the reactive mixture containing carbon dioxide by passing the reactive mixture through at least one opening extending to less than 1 mm in at least one dimension with the production of high rates of shear, reducing the flow velocity of the expanded mixture and stabilizing the flow of the mixture by passing it through a sieve having a free cross sectional area which is 5 to 100 times larger than the total free cross sectional area of the at least one opening through which the mixture is expanded.

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5,840,779

CATALYSTS WHICH STABILIZE HYDROHALOCARBON BLOWING AGENT IN POLYURETHANE FOAM FORMULATIONS

Robert Christian Parker, Hamburg, and Timothy Rech Demmin, Grand Island, both of N.Y., assignors to AlliedSignal Inc., Morristown, N.J.

Division of Ser. No. 777,876, Oct. 15, 1991, Pat. No. 5,688,834, which is a continuation-in-part of Ser. No. 752,396, Aug. 30, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 475,912

Int. Cl.^{6} C08J *9/14;* **C08G** *18/18;* **C08K** *5/05;5/17*

U.S. Cl. 521—118 **8 Claims**

1. A composition comprising polyisocyanate, polyol, hydrofluorocarbon blowing agent consisting essentially of 1,1,2,3,3,-pentafluoropropane, surfactant, and at least one polyamine catalyst of the formula $R^{16}R^{17}N—R^{18}—N(R^{19})—R^{18}—NR^{16}R^{17}$ wherein R^{16}, R^{17}, and R^{19} are the same or different and selected from hydrogen or straight chain and branched alkyl having 1 to 18 carbon atoms; cycloalkyl having 5 to 18 carbon atoms; straight chain or branched substituted alkyl and hydroxyalkyl having 2 to 18 carbon atoms containing $—CH_2—CR^4R^5Cl$ where R^4 and R^5 are the same or different and selected from hydrogen, bromine, chlorine, aryl, or alkyl having 1 to 8 carbon atoms or straight chain or branched alkoxyalkyl having 4 to 23 carbon atoms containing $—CH_2—(CH_2)_n—(CO)_a—O—CH_2—CR^4R^5Cl$ where R^4 and R^5 are the same or different and selected from hydrogen, bromine, chlorine, aryl, or alkyl having 1 to 8 carbon atoms, n is 1 to 3, a is 0 or 1, R^{18} is selected from alkyl having 1 to 18 carbon atoms for polymerization of said polyisocyanate and said polyol wherein said polyamine catalyst is less volatile than N,N-dimethylcyclohexylamine or said polyamine catalyst is a tertiary amine having at least one isocyanate-reactive functionality selected from the group consisting of —OH and —NH— wherein said polyamine catalyst results in a decreased amount of decomposition of said hydrofluorocarbon blowing agent to haloalkenes.

5,840,780

FOAMED POLYMER AND PROCESS FOR PRODUCTION THEREOF

Robert N. Wilson, Hixson, Tenn., assignor to Woodbridge Foam Corporation, Mississauga, Canada

Division of Ser. No. 674,242, Jul. 1, 1996, Pat. No. 5,624,971. This application Apr. 25, 1997, Ser. No. 845,438

Int. Cl.^{6} C08J *9/24;9/35*

U.S. Cl. 521—137 **16 Claims**

1. A foamed isocyanate-based polymer having a cellular structure and comprising a non-surface cross-linked superabsorbent polymer, the foamed isocyanate-based polymer being capable of: (i) absorbing at least about 10 times its weight of a 0.9 wt./wt. % aqueous NaCl solution maintained at a temperature of from about 20° to about 25° C., and (ii) retaining at least about 10 times its weight of absorbed aqueous NaCl solution which is bound to the superabsorbent polymer.

5,840,781

POLYETHER POLYOLS, POLYOL FORMULATION CONTAINING THEM AND THEIR USE IN THE PRODUCTION OF HARD POLYURETHANE FOAMS

Karl-Werner Dietrich, Odenthal; Manfred Dietrich, Leverkusen, both of Germany; Wilhelm Lamberts, Sao Paulo-SP, Brazil, and Walter Klän, Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

PCT No. PCT/EP96/00140, § 371 Date Jul. 15, 1997, § 102(e) Date Jul. 15, 1997, PCT Pub. No. WO96/23017, PCT Pub. Date Aug. 1, 1996

PCT Filed Jan. 15, 1996, Ser. No. 875,805

Claims priority, application Germany, Jan. 27, 1995, 195 02 578.4

Int. Cl.^{6} C08G *18/50*

U.S. Cl. 521—167 **19 Claims**

1. A polyether polyol containing tertiary amino groups and having an OH number of from about 300 to about 500 produced by adding only propylene oxide to o-toluene diamine produced by

a) reacting 3 mol of propylene oxide with o-toluene diamine,
b) adding an alkali catalyst to the reaction mixture of a), and
c) adding propylene oxide to the reaction mixture of b) until a product having an OH number of from about 300 to about 500 is obtained.

5,840,782

REACTION SYSTEM FOR PREPARING MICROCELLULAR ELASTOMERS

Dominicus Limerkens, Meeuwen-Gruitrode; Christopher Phanopoulos, Tervuren, and Johan Mietje Jozef Indesteege, Mol, all of Belgium, assignors to Imperial Chemical Industries PLC, London, United Kingdom

Continuation of Ser. No. 93,245, Jul. 16, 1993, abandoned. This application Sep. 8, 1995, Ser. No. 526,123

Claims priority, application United Kingdom, Aug. 5, 1992, 9216631

Int. Cl.^{6} C08G *18/00*

U.S. Cl. 521—174 **27 Claims**

1. A reaction system comprising:

(1) a polyisocyanate composition having a free NCO-value of 15–25% by weight comprising an isocyanate-terminated prepolymer which is the reaction product of an excess of an organic polyisocyanate and a polyether polyol having an average nominal hydroxyl functionality of 2–4, a number average molecular weight of 3000–5000 and an ethylene oxide content of 20–35% by weight, wherein at least 50% of the ethylene oxide groups are present at the end of the polyether polyol;
(2) a polyol selected from the group consisting of a polyether polyol having an average nominal hydroxyl functionality of 2.2–4 and a polyester polyol; and
(3) water.

5,840,783

PRESSURE-SENSITIVE ADHESIVES FOR POLYOLEFIN SURFACES

Bradley S. Momchilovich; Michael A. Johnson, both of Stillwater; Paul Hattam, Woodbury; Mark D. Purgett; Albert I. Everaerts, both of Oakdale, and Kevin Kaczorek, Mahtomedi, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 427,214, Apr. 24, 1995, abandoned. This application Nov. 14, 1996, Ser. No. 749,048

Int. Cl.^{6} C08J *3/28;* **C09J** *3/14*

U.S. Cl. 522—412 **30 Claims**

1. A pressure sensitive adhesive composition comprising:

(a) 50 to 100 parts by weight of at least one acrylic or methacrylic ester of a non-tertiary allyl alcohol in which the allyl group contains 4 to 20 carbon atoms;

(b) 0 to 50 parts by weight of at least one reinforcing monomer, copolymerizable with component (a), the sum of (a) and (b) amounting to 100 parts by weight;
(c) 0.1 to 15 parts by weight, per 100 parts by weight of the sum of components (a) and (b), of a chlorinated polyolefin selected from the group consisting of chlorinated polypropylene and chlorinated ethylene vinyl acetate, said chlorinated polyolefin characterized as being substantially soluble in the (a) and (b) components; and
(d) a photoinitiator of a type and in an amount effective to polymerize said components (a) and (b),

said adhesive composition being substantially solvent free.

5,840,784

POLYMERIC COMPOSITIONS AND METHODS FOR USE IN LOW TEMPERATURE WELL APPLICATIONS

Gary P. Funkhouser, and Keith A. Frost, both of Duncan, Okla., assignors to Halliburton Energy Services, Inc., Duncan, Okla.

Filed May 7, 1997, Ser. No. 851,991

Int. Cl.^{6} C09K *7/00*

U.S. Cl. 523—130 **22 Claims**

1. An improved method of sealing or plugging a subterranean zone having a temperature below about 70° F. comprising the steps of:

introducing into said zone an aqueous solution of a polymerizable monomer, an azo polymerization initiator and an oxygen scavenger comprised of stannous chloride; and
allowing said polymerizable monomer to polymerize in said zone thereby forming a sealing or plugging gel therein.

5,840,785

MOLDING PROCESS FEEDSTOCK USING A COPPER TRIFLATE CATALYST

Jeanne K. Allen, St. Peters, and Gregory M. Brasel, Ballwin, both of Mo., assignors to Megamet Industries, St. Charles, Mo.

Filed Apr. 5, 1996, Ser. No. 626,131

Int. Cl.^{6} B22C *1/22;* **C08K** *5/53:5/42:5/17*

U.S. Cl. 523—145 **37 Claims**

1. A feedstock for use in a debinding reaction injection process (D-RIM) for a powder injection molding (PIM) comprising:

a powdered metal, powdered ceramic material, or a mixture of powdered metal and powdered ceramic materials coated with an organo-functional silane;
a condensation-reaction thermosetting resin; and,
a latent catalyst which is comprised of a metal salt.

5,840,786

PLASTISOL COMPOSITION

Michael Beck, Duesseldorf; Lutz Jeromin, Hilden; Christiane Hoeltgen, Duesseldorf, and Wolfgang Ritter, Haan, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

Continuation of Ser. No. 663,034, Jul. 5, 1996, abandoned. This application Jul. 29, 1997, Ser. No. 902,509

Claims priority, application Germany, Dec. 10, 1993, 43 42 089.2

Int. Cl.^{6} C08L *83/00*

U.S. Cl. 523—201 **27 Claims**

1. A plastisol composition comprising a bead polymer comprised of a copolymer comprised of one or more monomers selected from the group consisting of styrene, α-methyl styrene, and p-methyl styrene, and from 2% to 20% by weight, based on the copolymer, of an olefinically unsaturated carboxylic acid and at least one water-insoluble inorganic salt, wherein said bead polymer has a core/shell structure.

5,840,787

CELLULOSIC PRODUCTS USING HIGH-BULK CELLULOSIC FIBERS

Hugh West; Amar N. Neogi, both of Seattle; Dwight Albert Dudley, II, Federal Way, and Dwayne M. Shearer, Seattle, all of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Continuation-in-part of Ser. No. 218,106, Mar. 25, 1994, abandoned. This application Sep. 30, 1996, Ser. No. 723,325

Int. Cl.^{6} C08L *1/02;* **D21J** *1/00*

U.S. Cl. 524—35 **11 Claims**

1. A fiber-binder sheet or pad product wherein adjacent fibers are in contact and form plural fiber crossover points which comprises:

from 0.5–100.0 weight percent chemically intrafiber crosslinked high bulk cellulosic fibers in admixture with 99.5–0.0 weight percent conventional cellulose fibers; and
from about 0.1 to about 6 weight percent of a water borne binding agent, said binding agent being more heavily concentrated at the fiber—fiber crossover points of crosslinked fibers with each other and with other fibers during removal of water from the product, whereby the binder more effectively contributes strength and integrity to the structure.

5,840,788

ULTRAVIOLET LIGHT RESISTANT URETHANE TOP COAT FOR GOLF BALLS

Mitchell E. Lutz, Fairhaven, Mass.; William Ellis Hatch, Valencia, and Brian Louis Zanotti, Hyde Park, both of Pa., assignors to Acushnet Company, Fairhaven, Mass.

Filed Jun. 20, 1997, Ser. No. 879,714

Int. Cl.^{6} C08K *5/3415:5/3477:5/353;* **B05D** *1/36*

U.S. Cl. 524—95 **30 Claims**

1. A UV light resistant, visibly transparent, urethane golf ball topcoat composition, which comprises an optical brightener that absorbs at least some ultraviolet light at wavelengths greater than about 350 nm, and emits visible light, and a light stabilizer package, the light stabilizer package comprising at least one UV light absorber, wherein the UV light absorber has an absorption peak at a wavelength between about 330 nm and about 360 nm and a UV light absorbance at a wavelength of about 350 nm that is at least about 3 times greater than the UV light absorbance at a wavelength of about 370 nm, wherein the optical brightener is present in an amount sufficient to visibly increase the brighiness of the ball, and the light absorber is present in an amount sufficient to visibly reduce or eliminate discoloration of the ball on exposure to UV light used to cure the UV curable ink.

5,840,789

AQUEOUS COMPOSITIONS THICKENED WITH ACRYLATE-BASED POLYMERIC RHEOLOGY MODIFIERS

Daniel W. Verstrat, Ooltewah, and Milagros C. Barron, Hixson, both of Tenn., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Continuation-in-part of Ser. No. 698,690, Aug. 16, 1996. This application Aug. 13, 1997, Ser. No. 910,378

Int. Cl.^{6} C08K *5/41*

U.S. Cl. 524—156 **11 Claims**

1. An aqueous detergent composition having a pH of less than or equal to about 11, comprising:

a thickening amount of a stable emulsion of a polymer, said emulsion prepared by single-stage emulsion polymerization of monomers consisting of
from about 5 to about 80 weight percent of an acrylate monomer (a) selected from the group consisting of a C_2–C_6 alkyl ester of acrylic acid and a C_1–C_6 alkyl ester of methacrylic acid,
from about 5 to about 80 weight percent of a monomer (b) selected from the group consisting of a vinyl-substituted heterocyclic compound containing at least one of a nitrogen or

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sulfur atom, (meth)acrylamide, a mono- or di-(C_1–C_4)alkylamino (C_1–C_4)alkyl (meth)acrylate, and a mono or di-(C_1–C_4)alkylamino (C_1–C_4)alkyl (meth)acrylamide, and

0.1 to about 30 weight percent of an associative monomer (d) wherein the percentage of monomers is based on 100 weight percent,

wherein said emulsion polymerization is conducted in the presence of water, a first surfactant in amounts effective to emulsify the polymer in the water, a free-radical initiator and from about 0.5 to about 20 weight percent of an alcohol selected from the group consisting of a C_2–C_{12} linear or branched monohydric alcohol and a non-polymeric polyhydric alcohol, based on the total weight of said emulsion, wherein said single-stage emulsion polymerization is conducted in the absence of a polymeric colloidal stabilizer; and

a minimum effective amount of an active ingredient selected from the group consisting of an acid and a second surfactant.

5,840,790

PRESERVATION AND ENHANCED STABILIZATION OF LATEX

Chong Oon Ong, Petaling Jaya, Malaysia, assignor to RXD Corporation SDN BHD, Petaling Jaya, Malaysia

Continuation of Ser. No. 337,379, Nov. 8, 1994, abandoned. This application May 23, 1996, Ser. No. 652,139

Claims priority, application Malaysia, Nov. 9, 1993, PI 930 2344

Int. Cl.^{6} C08K *5/17*

U.S. Cl. 524—186 **22 Claims**

1. A method for preserving a natural rubber in a colloidal system comprising the steps of:

adding at least one primary aliphatic amine and at least one bactericide, as an aqueous dispersion, to a natural rubber latex, wherein said method avoids the need for adding ammonia to preserve said latex.

5,840,791

LASER-MARKABLE POLYMER MOULDING COMPOSITIONS

Herbert Magerstedt, Moers, and Frank Gerling, Düsseldorf, both of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed May 15, 1997, Ser. No. 857,752

Claims priority, application Germany, May 24, 1996, 196 20 993.5

Int. Cl.^{6} C08K *3/38*

U.S. Cl. 524—405 **5 Claims**

1. Thermoplastic moulding compositions comprising

A) 99.995 to 30 parts by weight of thermoplastic polymer,
B) 0.005 to 3 parts by weight of boric anhydride,
C) 0 to 50 parts by weight of fillers and reinforcing materials,
D) 0 to 60 parts by weight of flame retardant additives,
E) 0 to 30 parts by weight of elastomer modifiers,
F) 0 to 8 parts by weight of antimony trioxide,
G) 0.4 to 3 parts by weight of copper(II) pyrophosphate hydrate.

5,840,792

LITHIUM, ALUMINUM, MAGNESIUM/ZINC HYDROXIDE SALT

Hitoshi Machimura; Akiko Taniguchi, and Tatsuo Murakami, all of Toyama, Japan, assignors to Fuji Chemical Industry Co., Ltd., Japan

PCT No. PCT/JP96/00569, § 371 Date Nov. 8, 1996, § 102(e) Date Nov. 8, 1996, PCT Pub. No. WO96/28508, PCT Pub. Date Sep. 19, 1996

PCT Filed Mar. 8, 1996, Ser. No. 737,276

Claims priority, application Japan, Mar. 10, 1995, 7-079526; Mar. 5, 1996, 8-075357

Int. Cl.^{6} C01F *7/16;* **C08K** *3/10*

U.S. Cl. 524—417 **16 Claims**

1. A complex hydroxide salt represented by the formula

$$[Al_2(Li_{(1-x)}M_x)(OH)_6]_n(A^{-n})_{1+x}.mH_2O$$

wherein A is an inorganic or organic anion, M is Mg and/or Zn, n is a valence number of an anion A, m is 0 or positive number and x satisfies the expression $0.01 \leqq x<1$.

2. A stabilizer composition for halogen-containing resin comprising the complex hydroxide salt of claim 1.

7. A halogen-containing resin composition which comprises 0.01 to 10 parts by weight of the stabilizer for halogen-containing resin defined in claim **2** per 100 parts by weight of the halogen-containing resin.

5,840,793

MODIFIED HIGH HEAT AMORPHOUS CRYSTALLINE BLENDS

Raymond H. Glaser, Mt. Vernon; Darryl Nazareth, Evansville, both of Ind., and Jerry Jan-nan Yang, Taipei, Taiwan, assignors to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 028,061, Mar. 8, 1993, Pat. No. 5,430,102. This application Aug. 9, 1994, Ser. No. 287,997

Int. Cl.^{6} C08G *75/02;* **C08L** *81/02*

U.S. Cl. 524—423 **23 Claims**

1. A no flash thermoplastic resin composition having improved flow and good thermal and chemical resistance, comprising:

(A) at least one high heat amorphous resin selected from the group consisting of polyetherimides, polysulfones, polyarylsulfones, and polyethersulfones in an amount ranging from about 0.5 to about 43.5 weight percent of the overall composition;

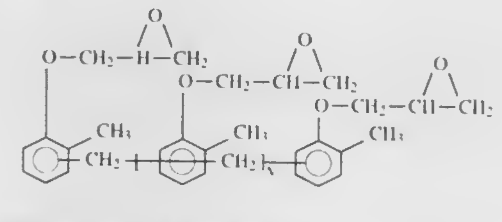
(B) at least one polysulfide in an amount ranging from about 33.5 to about 76.5 weight percent of the overall composition wherein said polysulfide has the repeating structural unit:

$$-(-R_1-S_n-)-$$

wherein R_1 is a divalent aromatic radical and n is a number from 1–5,

(C) at least one high density polyolefin consisting essentially of a high crystalline polyolefin in an amount ranging from about 0.1 to about 5 weight percent of the overall composition;

(D) at least one polyepoxy compound in an amount ranging from about 0.05 to about 10 weight percent of the overall composition wherein said polyepoxy compound has the formula



wherein N is 0 or greater: and

(E) at least one reinforcing filler in an amount ranging from about 20 to about 60 weight percent of the overall composition, wherein the sum of said weight percents is 100 percent.

5,840,794

ALKOXY FUNCTIONAL SEALANTS WITH RAPID DEVELOPMENT OF GREEN STRENGTH

Richard Alan Palmer, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 781,340, Jan. 10, 1997, abandoned. This application Aug. 21, 1997, Ser. No. 916,165

Int. Cl.^{6} C08G *77/08*

U.S. Cl. 524—425 **20 Claims**

1. A composition comprising the product obtained by mixing

(A) a polymer which contains per molecule an average of at least 1.2

$$(RO)_{(3-x)}R^1_xSi-$$

chain terminations where each R is methyl or ethyl, each R^1 is methyl, ethyl, or vinyl, and x has an average value of from 0 to 1 inclusive;

(B) a titanium catalyst of the average formula

$$Ti(OR^2)_{(4-y)}(OR^3)_y$$

where each R^2 is selected from the group consisting of a monovalent tertiary aliphatic hydrocarbon radical and a monovalent branched-secondary aliphatic hydrocarbon radical, each R^3 is a monovalent linear aliphatic hydrocarbon radical having from 1 to 6 carbon atoms per radical, y has an average value of from 0 to 1 inclusive,

(C) a filler having a hydroxyl group content derived from hydroxyl groups selected from the group consisting of covalent-bonded hydroxyl radicals, adsorbed water, or both the covalent-bonded hydroxyl radicals and the adsorbed water, and

(D) an alkoxysilane of the average formula

$$R^4_zSi(OR^5)_{(4-z)}$$

in which each R4 is methyl, ethyl, or vinyl, each R^5 is methyl or ethyl, and z has an average value of from 1 to 2 inclusive, where each of ingredients (A), (B), (C), and (D) are present in amounts such that a molar ratio (I) is 0.9 to 5 and a molar ratio (II) is 0.6 to 2, where

$$\text{molar ratio (I)} = \frac{\text{moles of titanium catalyst} + \text{moles of alkoxysilane}}{\text{moles of hydroxyl group in } (C)}$$

and

$$\text{molar ratio (II)} = \frac{\text{moles of titanium catalyst}}{\text{moles of alkoxysilane} + \text{moles of silicon-bonded alkoxy unit chain terminations in } (A)}$$

5,840,795

TREATED CLAY PRODUCT, METHODS OF MAKING AND USING AND PRODUCTS THEREFROM

Gary M. Freeman; Carl J. Marshall, Jr.; Walter O. Lackey, and Thomas J. Lynch, all of Macon, Ga., assignors to J. M. Huber Corporation, Edison, N.J.

Filed Apr. 30, 1997, Ser. No. 841,367

Int. Cl.^{6} C08K *3/00*

U.S. Cl. 524—447 **85 Claims**

1. A treated clay product comprising a hydrous kaolin clay surface treated with a multi-component system consisting of a functional silane in an amount between about 0.1 and 5.0% by weight based on dry clay, a methylene donor in an amount between about 0.1 and 5.0% by weight based on dry clay and a methylene acceptor in an amount between about 0.1 and 5.0% by weight based on dry clay.

5,840,796

POLYMER NANOCOMPOSITES

Santokh S. Badesha; Arnold W. Henry, both of Pittsford; James B. Maliborski, Rochester, and Clifford O. Eddy, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 9, 1997, Ser. No. 855,726

Int. Cl.^{6} C08K *3/34*

U.S. Cl. 524—449 **16 Claims**

1. A polymer nanocomposite comprising a mica layered silicate and a fluoroelastomer, wherein the nanocomposite has a structure selected from the group consisting of an exfoliated structure and an intercalated structure wherein the fluoroelastomer is a copolymer or terpolymer consisting of monomers selected from the group consisting of vinylidenefluoride, hexafluoropropylene, and tetrafluoroethylene.

5,840,797

LIGHT WEIGHT, HIGH PERFORMANCE VIBRATION-DAMPING SYSTEM

Raj V. Singh, Vandalin, Ohio, assignor to H. B. Fuller Licensing & Financing, Inc., St. Paul, Minn.

Filed Sep. 16, 1996, Ser. No. 714,657

Int. Cl.^{6} C08K *3/04;7/28;* **C08J** *9/32;* **C08L** *57/02*

U.S. Cl. 524—495 **12 Claims**

1. A light, uncured, elastomeric, vibration damping composition comprising:

(a) at least one butyl rubber;

(b) at least one tackifying resin present in an amount effective for improving the vibration damping effect of the composition; at least one black pigment being present in an amount effective for providing and increasing the solids content of the composition, wherein the pigment is a lightweight filler having a specific gravity of less than or equal to 1.31;

(d) substantially spherical microspheres being present in an amount effective for controlling the viscosity and increasing the cohesive strength of the composition;

wherein said composition is uncured and having a specific gravity of about 1.00 to about 1.20.

5,840,798

GLASS FILLED POLYESTER MOLDING COMPOSITION

Peter Hendrikus Theodorus Vollenberg, Evansville, and Jon Walter Thompson, Vernon, both of Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Jun. 6, 1997, Ser. No. 870,325

Int. Cl.^{6} C08K *7/14*

U.S. Cl. 524—423 **19 Claims**

1. A reinforced polyester molding composition comprising a polyester poly(alkylene terephthalate) resin and glass fibers, wherein said glass fibers have a bimodal cross sectional area wherein one smaller diameter fiber cross sectional area is selected to improve impact strength and the other larger diameter cross sectional area is selected to improve warpage wherein the ratio of diameters of the smaller diameter fibers to the larger diameter fibers is less than about 0.8 and the distribution of larger diameter fibers to smaller diameter fibers is from 55/45 to 90/20, said smaller fiber diameter distribution being from about 6 to about 15 microns.

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MIXER SYSTEM FOR THE PRODUCTION OF WATER-THINNABLE COATING COMPOSITIONS

Bernd Mayer, Münster; Uwe Meisenburg, Duisburg, and Heinz Peter Rink, Münster, all of Germany, assignors to BASF Lacke+Farben, AG, Muenster-Hiltrup, Germany

PCT No. PCT/EP93/02563, § 371 Date Apr. 18, 1995, § 102(e) Date Apr. 18, 1995, PCT Pub. No. WO94/07960, PCT Pub. Date Apr. 14, 1994

PCT Filed Sep. 22, 1993, Ser. No. 406,917

Claims priority, application Germany, Sep. 30, 1992, 42 32 721.0

Int. Cl.^{6} C08J *3/00;* **C08K** *3/20;* **C08L** *75/00;31/00*

U.S. Cl. 524—507 **13 Claims**

1. A mixer system for the production of water-thinnable coating compositions having precisely defined color shades, wherein the mixer system comprises

Component (A) which is various base colors of precise colors that permit reproducible color matching, wherein each base color contains less than 5% by weight of water, pigment selected from the group consisting of color pigments, special effect pigments, and mixtures thereof; organic solvent, and at least one water-dilutable or water-dispersible binder comprising a resin selected from the group consisting of water-dilutable or water-dispersible polyacrylate resins, and mixtures thereof, and

B) at least one pigment-free component which contains water,

wherein the polyacrylate resin is obtained by adding and polymerizing,

(I) a first mixture of

a1) up to 87.5% of an acrylate or methacrylate which is copolymerizable with (a2), (a3), (b1) and (b2) and is essentially free from carboxyl groups, or a mixture of such (meth)acrylates, and

(a2) up to 45 % by weight of an ethylenically unsaturated monomer which is copolymerizable with (a1), (a3), (b1) and (b2) and which carries at least one hydroxyl group per molecule and is essentially free from carboxyl groups, or a mixture of such monomers and

(a3) up to 25 % by weight of an ethylenically unsaturated monomer which is copolymerizable with (a1), (a2), (b1) and (b2) and is essentially free from carboxyl groups, or a mixture of such monomers,

to an organic solvent or solvent mixture, and polymerizing the mixture in the presence of at least one polymerization initiator, and after at least 80% by weight of the first mixture has been added and polymerized, adding thereto

(II) a second mixture of

(b1) from 2.5 to 15% by weight of an ethylenically unsaturated monomer which is copolymerizable with (a1), (a2) and (a3) and carries at least one carboxyl group per molecule, or a mixture of such monomers, together with

(b2) from 0 to 6% by weight of an ethylenically unsaturated monomer which is copolymerizable with (a1), (a2), (a3) and (b1) and is free from carboxyl groups, or a mixture of such monomers,

and continuing polymerization, the sum of the proportions by weight of (a1), (a2), (a3), (b1) and (b2) always being 100% by weight, wherein the polyacrylate resin has a hydroxyl number of from 0 to <40, an acid number of from 20 to 100, and a glass transition temperature (T_G) of from –40° C. to +60° C.,

wherein components A and B are stored separately.

5,840,800

CROSSLINKED EMULSIONS OF PRE-FORMED SILICON MODIFIED ORGANIC POLYMERS

Eric Jude Joffre; Arthur James Tselepis, and Andreas Thomas Franz Wolf, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Nov. 2, 1995, Ser. No. 552,162

Int. Cl.^{6} C08L *43/04*

U.S. Cl. 524—806 **37 Claims**

1. A method of forming a aqueous dispersion of a crosslinked silicon-modified organic polymer comprising:

forming a premixture comprising:

a) 100 weight parts of silicon-modified organic polymer,

b) 0.5 to 10 weight parts surfactant and

c) 0.5 to 1000 weight parts water;

agitating the premixture to form an emulsion; and

facilitating the crosslinking of the silicon-modified organic polymer in the emulsion;

wherein, the silicon-modified organic polymer is an organic polymer having a viscosity of 5 to 500 Pa.s, a glass transition temperature of less than 20° C., and 1 to 5 substitutents represented by the formula:

$$—Y—(X_bR^1{}_{2-b}SiO)_mSiX_aR^1{}_{3-a}$$

wherein R^1 is the same or different alkyl, alkenyl, aryl, or aralkyl group having 1 to 20 carbon atoms, or a triorganosiloxy group represented by the formula $R^2{}_3SiO$—, where R^2 individually is a monovalent hydrocarbon group having from 1 to 20 carbon atoms,

X is the same or different hydroxyl group, condensable group or hydrolyzable group;

Y is a divalent group which forms hydrolytically stable bonds to the organic polymer and to a silicon atom of the substituent;

a is an integer from 0 to 3,

b is an integer from 0 to 2 with the proviso that if a is 0 then b is 1 or 2 in at least one siloxane unit of the substituent and m is an integer of from 0 to 19 with the proviso that if m is 0 then a is 1, 2, or 3.

5,840,801

METHOD FOR IMPROVING DISPERSION AND COMPATIBILITY OF ZINC SALTS IN ELASTOMERIC COMPOUNDS DURING VULCANIZATION

Eric S. Gardiner, Westtown, N.Y., assignor to Arizona Chemical Company, Panama City, Fla.

Filed Jun. 24, 1996, Ser. No. 669,058

Int. Cl.^{6} C08L *29/02;93/04*

U.S. Cl. 525—54.44 **23 Claims**

1. A process for vulcanizing an elastomeric material which comprises:

premixing ZnO and an amount of amphiphilic triblock copolymer (ATC) sufficient to provide a dispersion of ZnO in the ATC, the ATC being selected from the group consisting of rosin diesters and C_{18}–C_{24} fatty acid diesters of polyethylene glycol (PEG), the PEG having a molecular weight of from about 350 to about 1000 amu;

combining the ZnO/ATC dispersion with an elastomeric component and sulfur to provide a reaction mixture; and

vulcanizing the reaction mixture.

17. A vulcanized elastomeric material comprising an elastomeric matrix containing one or more zinc salts and an amphiphilic triblock copolymer material (ATC) selected from the group consisting of rosin diesters and C_{18}–C_{24} fatty acid diesters of polyethylene glycol (PEG) 350 to PEG 1000 dispersed in the elastomeric matrix.

5,840,802

DUAL GRAFT STAGE AND THERMALLY STABILIZED POLYORGANOSILOXANE/POLYVINYL-BASED GRAFT COPOLYMERS AND THERMOPLASTIC COMPOSITIONS CONTAINING THE SAME

James Louis DeRudder, Mt. Vernon, Ind., and I-Chung Wayne Wang, Vienna, W. Va., assignors to General Electric Company, Pittsfield, Mass.

Filed Oct. 11, 1991, Ser. No. 775,789

Int. Cl.^{6} C08L *51/08*

U.S. Cl. 525—63 **15 Claims**

1. A thermally stabilized multi-stage polyorganosiloxane/polyvinyl-based graft polymer composition having improved color-imparting and impact-imparting properties comprising

(a) as a first stage, a substrate selected from:

(i) a polymeric co-homopolymerized substrate comprised of, in combination, an organo-siloxane polymer and at least one vinyl-based polymer;

(ii) a polymeric co-homopolymerized substrate comprised of, in combination, an organo-siloxane polymer, at least one vinyl-based polymer, and units which are derived from a cross-linking agent or agents;

(iii) a polymeric co-homopolymerized substrate comprised of, in combination, an organo-siloxane polymer, at least one vinyl-based polymer, and units which serve as a graft-linking agent or agents;

(iv) a polymeric co-homopolymerized substrate comprised of, in combination, an organo-siloxane polymer, at least one vinyl-based polymer, units which are derived from a cross-linking agent or agents and units from the same or different agent or agents which serve as a graft-linking agent or agents; or

(v) a polymeric co-homopolymerized substrate comprised of, in combination, an organo-siloxane polymer, at least one vinyl-based polymer, and a mixture of any of units which are derived from a cross-linking agent or agents, units which serve as a graft-linking agent or agents, or units derived from a cross-linking agent or agents and units from the same or different agent or agents which serve as a graft-linking agent or agents; and

(b) at least one subsequent stage or stages graft polymerized in the presence of any previous stage and which is comprised of a vinyl-based polymer or a cross-linked vinyl-based polymer;

said graft polymer being superdried.

5,840,803

THERMOPLASTIC COMPOSITION CONTAINING A GRAFTED COPOLYMERIC ACRYLATE RUBBER

Moh Ching Oliver Chang, and Richard M. Auclair, both of Westfield, Mass., assignors to Bayer Corporation, Pittsburgh, Pa.

Filed Feb. 26, 1997, Ser. No. 806,965

Int. Cl.^{6} C08L *51/04*

U.S. Cl. 525—85 **11 Claims**

1. A thermoplastic molding composition comprising

(i) about 5 to 95 percent by weight of a grafted copolymer rubber comprising a grafted phase of styrene-acrylonitrile (SAN) phase and a crosslinked (meth)acrylate-acrylonitrile (BA-AN) substrate, and

(ii) about 5 to 95 percent by weight of an uncrosslinked SAN having a number average molecular weight of about 20,000 to 100,000,

said composition further characterized in that (a) it contains no additional grafted copolymer rubber based on crosslinked (meth)acrylate-acrylonitrile substrate and in that said (i) is in particulate form wherein particles have a monomodal size distribution and a weight average particle size of 0.05 to 0.5 microns.

5,840,804

CROSSLINKED WATER-SOLUBLE POLYMER DISPERSIONS

Joachim Carl; Peter Quis, both of Darmstadt; Manfred Braum, Mainz, and Wolfram Desch, Weiterstadt, all of Germany, assignors to Roehm GmbH Chemische Fabrik, Darmstadt, Germany

Continuation of Ser. No. 396,798, Mar. 1, 1995, abandoned. This application Mar. 13, 1997, Ser. No. 816,900

Claims priority, application Germany, Mar. 1, 1994, 44 06 624.4

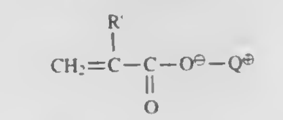
Int. Cl.^{6} C08L *33/08*

U.S. Cl. 524—555 **25 Claims**

1. A method of producing an aqueous dispersion of a water-soluble polymer, comprising the step of:

radically polymerizing the following monomers in aqueous solution at a temperature of 0°–100° C.:

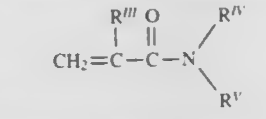
(a1) 50–99.999 wt. % of at least one water-soluble monomer selected from the group consisting of a salt of (meth)acrylic acid of formula IV:



$$CH_2=C(R')-C(=O)-O^{\ominus}-Q^{\oplus}$$

(IV)

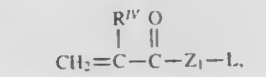
(meth)acrylic acid, (meth)acrylamide of formula V:



$$CH_2=C(R''')-C(=O)-N(R^{IV})(R^{V})$$

(V)

and a monomer of formula VI:



$$CH_2=C(R^{IV})-C(=O)-Z_1-L,$$

(VI)

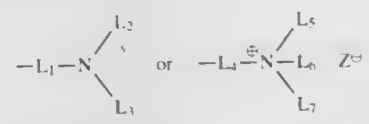
where R' is hydrogen or methyl, $O^{\oplus}$ is an alkali metal ion, or ammonium ion

or $O^{\oplus}$ is another monovalent positively charged ion;

R''' is hydrogen or methyl, R^{IV} and R^{V}, independently, are hydrogen or a C_1–C_5 alkyl group or a functionalized C_1–C_5 alkyl group;

Z_1 is O, NH, or NR_4, where R_4 is as an alkyl group with 1–4 carbon atoms; and

L is the group



where L_1 and L_4 are an alkylene group or a hydroxyalkylene group with 2–6 carbon atoms;

L_2, L_3, L_5, L_6, and L_7, independently, are hydrogen or an alkyl group with 1–6 carbon atoms; and

Z is a halogen, acetate, or SO_4CH_3

(a2) 0.01–1 wt. % of at least one crosslinking monomer containing at least 2 ethylenically unsaturated radically polymerizable groups;

(a3) 0–30 wt. % of at least one hydrophobic monomer; and

(a4) 0–20 wt. % of at least one amphiphilic monomer;

in the presence of at least one polymer dispersant, to form said water-soluble polymer in a dispersion;

wherein the sum of the amounts of monomers (a1), (a2), (a3), and (a_4) is 100% by weight of the monomers, the weight average molecular weight of said water-soluble polymer is at least 500,000 Dalton, and said water-soluble polymer is incompatible with said polymer dispersant.

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5,840,805
ROOM-TEMPERATURE-CURABLE ORGANOPOLYSILOXANE COMPOSITIONS

Hisataka Nakashima, Fukuoka Prefecture, and Shigeki Sugiyama, Chiba Prefecture, both of Japan, assignors to Dow Corning Toray Silicone Co., Ltd., Tokyo, Japan

Filed Oct. 25, 1995, Ser. No. 548,032

Claims priority, application Japan, Oct. 28, 1994, 6-288930

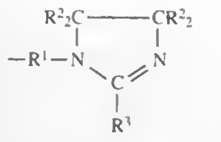
Int. Cl.^{6} C08K *5/24*

U.S. Cl. 524—731 **12 Claims**

1. A room-temperature-curable organopolysiloxane composition comprising a composition obtained by mixing

(A) 100 parts by weight of a polydiorganosiloxane having silanol or a silicon-bonded hydrolyzable group at both molecular chain terminals, with the proviso that this polydiorganosiloxane does not contain an imidazolinyl radical bonded to silicon,

(B) 1 to 100 parts by weight of an imidazolinyl-functional organopolysiloxane having per molecule at least one imidazolinyl radical of the following general formula bonded to silicon



wherein R^1 is a C_1 to C_{50} divalent hydrocarbon radical, each R^2 is selected from the group consisting of hydrogen atom and a C_1 to C_{50} monovalent hydrocarbon radical, and R^3 is a C_2 to C_{50} monovalent hydrocarbon radical with aliphatic unsaturation,

(C) 10 to 1,000 parts by weight filler, and

(D) 0.1 to 50 parts by weight Si-bonded hydrolyzable group-containing organosilane or organosiloxane oligomer.

5,840,806
CURABLE RESIN COMPOSITIONS

Shigeru Komazaki, Izumi; Shinichi Kudo, Izumiotsu, and Masataka Ooka, Nara, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

PCT No. PCT/JP96/01212, § 371 Date Jan. 7, 1997, § 102(e) Date Jan. 7, 1997, PCT Pub. No. WO96/35755, PCT Pub. Date Nov. 14, 1996

PCT Filed May 8, 1996, Ser. No. 750,980

Claims priority, application Japan, May 9, 1995, 7-110534

Int. Cl.^{6} C08L *33/02;33/14;43/04;61/20;63/00;67/02;75/04;83/06*

U.S. Cl. 525—101 **11 Claims**

1. A curable resin composition comprising (A) a resin obtained by condensation of (a-1) a polymer having both a hydrolyzable silyl group and a functional group other than said hydrolyzable silyl group, and (a-2) a polysiloxane having a hydroxyl group bonded to a silicon atom and/or a hydrolyzable group bonded to a silicon atom, and (B) a compound having a functional group capable of reacting with said other functional group contained in said resin (A),

wherein the compound (B) is blended with the resin (A) obtained by condensation of the polymer (a-1) and the polysiloxane (a-2).

5,840,807
PACKAGING BASED ON A POLYMER CONTAINING POLYAMIDE BLOCKS AND POLYETHER BLOCKS, FOR CONSERVING FRESH PRODUCE

Alain Frey, St-Leger de Rôtes; Roland Leroux, Chaville, and Laurent Fischer, Sequigny, all of France, assignors to Elf Atochem S.A., Puteaux, France, .

Division of Ser. No. 634,753, Apr. 10, 1996. This application Dec. 13, 1996, Ser. No. 766,253

Claims priority, application France, Apr. 11, 1995, 95 04324

Int. Cl.^{6} C08G *63/00*

U.S. Cl. 525—-178 **11 Claims**

1. Packaging for fresh food or fruits during development or after ripening comprising a thermoplastic film comprising a block copolymer comprising polyamide blocks and polyether blocks, wherein said thermoplastic film is permeable to water vapour, to ethylene, to CO_2, and to oxygen, wherein the permeability to CO_2 is greater than the permeability to oxygen, and wherein the thermoplastic film comprises polyolefins.

5,840,808
PROCESS FOR PREPARING OLEFIN POLYMER

Kenji Sugimura, and Mamoru Kioka, both of Kuga-gun, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

PCT No. PCT/JP96/00261, § 371 Date Oct. 7, 1996, § 102(e) Date Oct. 7, 1996, PCT Pub. No. WO96/24627, PCT Pub. Date Aug. 15, 1996

PCT Filed Feb. 7, 1996, Ser. No. 718,385

Claims priority, application Japan, Feb. 7, 1995, 7-019512; Feb. 7, 1995, 7-019514; Feb. 7, 1995, 7-019515

Int. Cl.^{6} C08F *210/16*

U.S. Cl. 525—268 **4 Claims**

1. A process for preparing an olefin polymer, comprising:

(i) homopolymerizing propylene or copolymerizing propylene and an α-olefin other than propylene in the presence of the olefin polymerization catalyst (1) to form a crystalline polypropylene component;

(ii) copolymerizing ethylene and an α-olefin of 3 to 20 carbon atoms to form a low-crystalline or non-crystalline ethylene/α-olefin copolymer component in the presence of the olefin polymerization catalyst (1),

wherein said steps (i) and (ii) are carried out in an arbitrary order so as to form a propylene block copolymer component, said catalyst (1) comprising:

(A) a solid titanium catalyst component containing magnesium, titanium, halogen and an electron donor,

(B) an organometallic compound, and optionally

(C) an electron donor;

then adding an olefin polymerization catalyst (2) to the polymerization system, said catalyst (2) comprising:

(D) a transition metal compound selected from Group IVB of the periodic table containing a ligand having cyclopentadienyl skeleton, and

(E) (E-1) an aluminoxane compound, and/or (E-2) Lewis acid or an ionic compound; and

(iii) copolymerizing ethylene and an α-olefin of 3 to 20 carbon atoms so as to form a low-crystalline or non-crystalline ethylene/α-olefin copolymer component, wherein step (iii) is carried out after steps (i) and (ii).

5,840,809
EPOXIDIZED BLOCK COPOLYMER, ITS PRODUCTION, AND ITS COMPOSITION

Yoshihiro Ohtsuka; Yasuhiro Oshino, and Masaki Tanaka, all of Hiroshima, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

PCT No. PCT/JP96/01843, § 371 Date Mar. 3, 1997, § 102(e) Date Mar. 3, 1997, PCT Pub. No. WO97/02296, PCT Pub. Date Jan. 23, 1997

PCT Filed Jul. 3, 1996, Ser. No. 793,710

Claims priority, application Japan, Jul. 3, 1995, 7-191230; Sep. 1, 1995, 7-248450; Sep. 28, 1995, 7-274673; Dec. 18, 1995, 7-348374; Dec. 18, 1995, 7-348376; Dec. 18, 1995, 7-348377; Apr. 10, 1996, 8-088500

Int. Cl.^{6} C08F *8/00;8/08;* **C08L** *53/02*

U.S. Cl. 525—316 **12 Claims**

1. A process for producing an epoxidized block copolymer, which comprises the steps of:

(1) mixing a block copolymer (C) comprising a polymer block (A) composed mainly of a vinyl aromatic hydrocarbon compound and a polymer block (B) composed mainly of a conjugated diene compound, or a hydrogenation product (D) of the block copolymer (C), with an organic solvent so as to obtain an organic solvent solution or organic solvent slurry having a polymer concentration of 5 to 50% by weight;

(2) epoxidizing unsaturated carbon bonds contained in a polymer block (B) composed mainly of a conjugated diene compound with use of an epoxidizing agent that is an acetic ester solution of peracetic acid, not containing water in the organic solvent solution or organic solvent slurry to thereby obtain a reaction mixture; and

(3) evaporating off the organic solvent from the reaction mixture to thereby obtain an epoxidized block copolymer.

5,840,810
METALATION AND FUNCTIONALIZATION OF POLYMERS AND COPOLYMERS

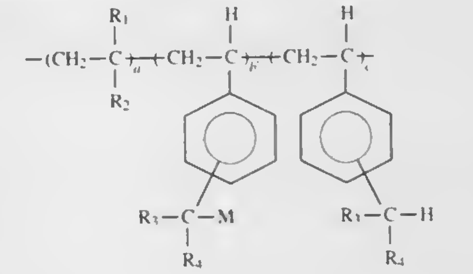
Jean M. J. Fréchet, Oakland, Calif.; Shah A. Haque, Houston, Tex.; Joachim H. G. Steinke, London, England, and Hsien-Chang Wang, Bellaire, Tex., assignors to Exxon Chemical Patents Inc, Houston, Tex., and Cornell Research Foundation Inc., Ithaca, N.Y.

Continuation-in-part of Ser. No. 476,753, Jun. 7, 1995, Pat. No. 5,670,581, which is a continuation-in-part of Ser. No. 447,131, May 22, 1995, abandoned, which is a continuation-in-part of Ser. No. 444,950, May 19, 1995, abandoned. This application Jun. 6, 1996, Ser. No. 659,457

Int. Cl.^{6} C08F *8/42*

U.S. Cl. 525—333.3 **1 Claim**

1. A metalated polymer represented by the formula



wherein "a" is in the range of 1 to 70,000, "b" in the range of 1 to 7,000 and "c" in the range of 0 to 7,000, a≧b+c, R_1 and R_2 are each independently a C_1–C_5 alkyl or and $R_1+R_2 \leqq 5$ carbon atoms; R_3 and R_4 are each independently one of hydrogen, a C_1–C_4 alkyl group, and M is an alkali metal selected from sodium, potassium, rubidium and cesium.

5,840,811
OPTICALLY ACTIVE BLOCK POLYESTER COPOLYMER AND METHOD FOR PRODUCTION THEREOF

Yoji Hori; Tohru Kobayashi; Hideyuki Hongo; Akio Yamaguchi; Yoko Takahashi; Takashi Imai, and Toshimitsu Hagiwara, all of Kanagawa, Japan, assignors to Takasago International Corporation, Tokyo, Japan

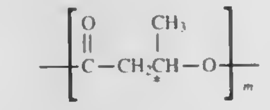
Continuation of Ser. No. 470,118, Jun. 6, 1995, abandoned. This application Jan. 22, 1997, Ser. No. 786,253

Claims priority, application Japan, Jun. 8, 1994, 6-148725; Dec. 13, 1994, 6-332198

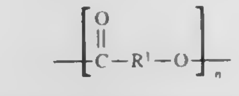
Int. Cl.^{6} C08G *63/08;63/85*

U.S. Cl. 525—411 **8 Claims**

1. An optically active diblock polyester copolymer or active triblock polyester copolymer consisting essentially of a diblock copolymer or triblock copolymer of structural formula (I)–(II), (II)–(I), (I)–(II)–(I) or (I)–(II)–(X), wherein (I) and (II) are represented by the following general formulas:



$$-\!\!\left[\overset{\overset{\displaystyle O}{\|}}{C}-CH_2\overset{\overset{\displaystyle CH_3}{|}}{\underset{*}{C}H}-O\right]_m\!\!- \qquad (I)$$



$$-\!\!\left[\overset{\overset{\displaystyle O}{\|}}{C}-R^1-O\right]_n\!\!- \qquad (II)$$

wherein $\underset{\star}{C}$ represents an asymmetric carbon atom, R^1 represents a member selected from the group consisting of $—(CH_2)_x—$, $—CH_2CH(CH_3)—$, $—CH_2CH(CH_5)—$, $—CH(CH_3)CH(CH_3)—$, $—C(CH_3)_2CH_2—$, $—CH(CH_3)CH_2CH_2—$, $—CH_2CH(CH_3)CH_2—$, $—CH_2CH_2CH(CH_3)—$, $—CH_2CH(CH_3)CH_2CH_2—$, $—CH(CH_3)OCOCH(CH_3)—$, $—CH_2OCOCH_2$, $—CH_2CH(CH_3)OCH_2CH_2—$, $—(CH_2)_7CH{=}CH(CH_2)6—$, $—(CH_2)_{10}O(CH_2)_4—$, $—(CH_2)_9O(CH_2)_5—$ and $—(CH_2)_8O(CH_2)_6—$, x represents a natural number in the range of from 2 to 15, and m and n each represents a natural number in the range of from 300 to 5,000;

and (X) is a lactone group.

5,840,812
WATERPROOF AND BREATHABLE FLAT MATERIALS MADE FROM RESIN MIXTURES OF THERMOPLASTIC POLYURETHANE

Dirk Schultze, Fallingbostel, Germany, assignor to Wolff Walsrode AG, Walsrode, Germany

Filed Nov. 22, 1995, Ser. No. 561,988

Claims priority, application Germany, Nov. 29, 1994, 44 42 380.2

Int. Cl.^{6} C08L *75/04;75/08;* **D06M** *13/425;* **C08K** *5/01*

U.S. Cl. 525—458 **11 Claims**

1. Waterproof but breathable flat materials prepared from the melt from polymer resin mixtures consisting of at least two different melt processable polyurethanes, wherein the different thermoplastic polyurethanes have soft segments with different chemical constitutions, wherein the thermoplastic polyurethane which forms the matrix is present in an amount of 70–95 wt. % with reference to the total weight of thermoplastic polyurethanes used for melt processing and is a polyurethane with a soft segment prepared from etherdiols, wherein the ether segment has a carbon/oxygen atomic ratio of at least two and at most three wherein the polymer resins are admixed while in the melt, said melt being melt processed to produce a flat material, wherein the flat materials according to the invention have a higher permeability to water vapour, determined according to DIN 53 122 than flat materials made from only one of the individual polyurethanes used for the polymer resin mixture.

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5,840,813

HOMOPOLYMERIZATION OF ACRYLATE OR METHACRYLATE ENDBLOCKED POLYDIORGANOSILOXANES

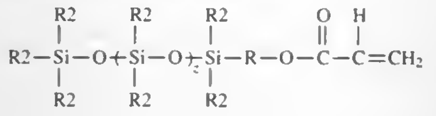
Gerald Alphonse Gornowicz; Linda Denise Kennan; Anil Kumar Saxena, and Arthur James Tselepis, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jan. 3, 1997, Ser. No. 779,852

Int. Cl.^{6} C08F *283/00;26/08;* **C08J** *5/54*

U.S. Cl. 525—479 **8 Claims**

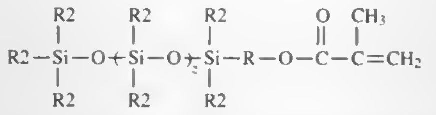
1. A method of making an emulsion containing a homopolymer of a polyorganosiloxane having acryloxy or methacryloxy groups, comprising heating and shearing a reaction mixture formed by combining (i) water; (ii) an anionic surfactant, a cationic surfactant, a nonionic surfactant, or a combination thereof; (iii) a cosurfactant which is a hydrophobic solvent, or a compound having low water solubility, selected from the group consisting of fatty alcohols, n-alkanes, and halogen substituted n-alkanes; (iv) a mono-acryloxyalkyl terminated polydiorganosiloxane macromonomer (I) or a mono-methacryloxyalkyl terminated polydiorganosiloxane macromonomer (II) having the formula



$$\mathrm{R2}-\underset{\mathrm{R2}}{\overset{\mathrm{R2}}{\mathrm{Si}}}-\mathrm{O}\left[\underset{\mathrm{R2}}{\overset{\mathrm{R2}}{\mathrm{Si}}}-\mathrm{O}\right]_z\underset{\mathrm{R2}}{\overset{\mathrm{R2}}{\mathrm{Si}}}-\mathrm{R}-\mathrm{O}-\overset{\mathrm{O}}{\overset{\|}{\mathrm{C}}}-\overset{\mathrm{H}}{\mathrm{C}}=\mathrm{CH_2}$$

(I)

or



$$\mathrm{R2}-\underset{\mathrm{R2}}{\overset{\mathrm{R2}}{\mathrm{Si}}}-\mathrm{O}\left[\underset{\mathrm{R2}}{\overset{\mathrm{R2}}{\mathrm{Si}}}-\mathrm{O}\right]_z\underset{\mathrm{R2}}{\overset{\mathrm{R2}}{\mathrm{Si}}}-\mathrm{R}-\mathrm{O}-\overset{\mathrm{O}}{\overset{\|}{\mathrm{C}}}-\overset{\mathrm{CH_3}}{\mathrm{C}}=\mathrm{CH_2}$$

(II)

where R in each formula is a divalent hydrocarbon radical with 1–6 carbon atoms; R2 in each formula is the hydrogen atom, a C_{1-8} alkyl radical, a haloalkyl radical, or an aryl radical; and z in each formula is 1–1,000; and (v) a free radical initiator.

5,840,814

MULTI-ARM STAR POLYMERS HAVING A WELL-DEFINED CORE AND METHODS FOR THE SYNTHESIS THEREOF

Istvan J. Majoros; Timea M. Marsalko, both of Stow, and Joseph P. Kennedy, Akron, all of Ohio, assignors to The University of Akron, Akron, Ohio

Filed Aug. 7, 1996, Ser. No. 693,418

Int. Cl.^{6} C08G *85/00;77/38*

U.S. Cl. 525—502 **27 Claims**

1. A star polymer comprising:

a core component selected from the group consisting of calix [n] arenes where n=4 to 16 and derivatives thereof; and

at least three polymer arms connected to said core component.

5,840,815

GAS-PHASE OR SLURRY POLYMERIZATION PROCESS FOR THE PREPARATION OF AN OLEFIN POLYMER

Toshiyuki Tsutsui; Ken Yoshitsugu, and Takashi Ueda, all of Kuga-gun, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 303,182, Sep. 8, 1994, abandoned, which is a division of Ser. No. 686,599, Apr. 17, 1991, Pat. No. 5,374,700. This application Jun. 2, 1995, Ser. No. 460,717

Claims priority, application Japan, Apr. 18, 1990, 2-102160; May 14, 1990, 2-123858; Aug. 8, 1990, 2-211334

Int. Cl.^{6} C08F *4/642;2/14;2/34*

U.S. Cl. 526—127 **2 Claims**

1. A process for the preparation of an olefin polymer, which comprises

polymerizing olefin in the presence of a solid catalyst formed from

(A) a compound of a transition metal in Group IVB of the periodic table, having ligands comprising at least two groups each having a cyclopentadienyl skeleton, said at least two groups being crosslinked through a group containing carbon and/or silicon, and

(B) an organoaluminum oxy-compound, under the condition that the produced polymer exists in a solid state in a gas phase polymerization system or a slurry polymerization system using an inactive hydrocarbon, to form an olefin polymer satisfying the following conditions:

(a) the olefin polymer has a MFR of 0.001 to 100 g/10 min at a temperature of 190° C. and a load of 2.16 kg; and

(b) the melt tension (MT) and MFR of the olefin polymer satisfy the relation

$$\log MT > -0.66 \log MFR + 0.6.$$

5,840,816

METHOD OF MANUFACTURING A POLYSILOXANE CHARGE TRANSPORTING MATERIAL

Hideki Kobayashi, Ichihara; Nobuo Kushibiki, Fujisawa; Tohru Masatomi, Ichihara, and Kikuko Takeuchi, Odawara, all of Japan, assignors to Dow Corning Toray Silicone Co., Ltd., and Dow Corning Asia, Ltd., both of Tokyo, Japan

Filed Nov. 4, 1996, Ser. No. 743,600

Claims priority, application Japan, Nov. 6, 1995, 7-287649

Int. Cl.^{6} C08G *77/26*

U.S. Cl. 528—4 **14 Claims**

1. A method of manufacturing a polysiloxane material having charge transporting properties, the method comprising:

dissolving a charge transporting material having an ionization potential within the range of 4.5 to 6.2 eV and represented by the formula:

$$A—[R^1SiR^2_{3-n}Q_n]_p$$

wherein A denotes an organic group derived from a charge transporting compound having the ionization potential of 4.5 to 6.2 eV, which is an aromatically substituted tertiary amine having a plurality of aromatic groups where at least one of the aromatic hydrocarbon groups is bonded to R^1 which is an alkylene group having 1 to 18 carbon atoms;

R^2 is a monovalent hydrocarbon group or a halogen-substituted monovalent hydrocarbon group having 1 to 15 carbon atoms; Q is a hydrolyzable group; n is an integer from 1 to 3; p is an integer from 1 to 3 and a curable polysiloxane resin having a ratio of monovalent hydrocarbon groups to silicon atoms in a range of 0.5 to 1.5 in an organic solvent which is essentially free of water;

mixing the charge transporting material and curable polysiloxane resin to form a mixture thereof;

and curing the mixture.

5,840,817

POLYMER FOR PHOTO-CONDUCTIVE LAYER AND PREPARATION METHOD THEREOF

Jae-ho Shim, Seoul; Min-ho Kim, Suwon; Bong-mo Jeong, Seoul; Wan-woo Park, Yongin, and Deuk-yong Yang, Suwon, all of Rep. of Korea, assignors to Samsung Display Devices Co., Ltd., Kyungki-Do, Rep. of Korea

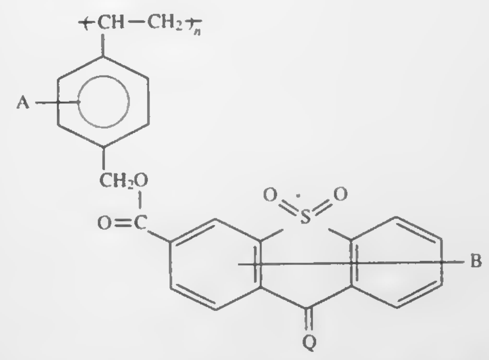
Filed Nov. 18, 1996, Ser. No. 746,843

Claims priority, application Rep. of Korea, Dec. 29, 1995, 95-66820

Int. Cl.^{6} C08F *32/08*

U.S. Cl. 526—284 **13 Claims**

1. A polymer for a photo-conductive layer having a weight average molecular weight of 160,000 to 240,000 and represented by formula (I):



(I)

wherein A represents a hydrogen atom, a halogen atom, an alkyl group or an alkoxy group; B represents a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group, a cyano group, a nitro group, an ester group or a trifluoromethyl group; Q represents an oxygen atom, $C(CN)_2$, $C(CO_2R)_2$, $C(CN)CO_2R$, C(CN)COR, C(CN)COAr, NCN or NAr, where R represents an alkyl group or an aryl group and Ar represents an aryl group; and n is 400 to 600.

5,840,818

Patent Not Issued For This Number

5,840,819

PROCESS FOR THE PREPARATION OF POLYMER POWDERS BY SUSPENSION POLYMERIZATION

Michel Biensan, allcc des Sylvains, France, assignor to Elf Atochem S.A., France

Filed Apr. 17, 1997, Ser. No. 837,419

Claims priority, application France, Apr. 17, 1996, 96 04790

Int. Cl.^{6} C08F *2/38;20/18;12/06*

U.S. Cl. 526—210 **18 Claims**

1. In a process for the manufacture of co(polymer) powders by aqueous suspension polymerization of at least one monomer which is polymerizable in suspension, the said aqueous suspension polymerization being conducted in the presence of at least one free-radical generator as catalyst and in the presence of at least one dispersing agent the improvement wherein the polymerization is also conducted in the presence of additives of:

(a) at least one inhibitor scavenging free radicals and;

(b) at least one complexing agent.

5,840,820

OLEFIN METATHESIS REACTIONS IN CARBON DIOXIDE MEDIUM

Joseph M. DeSimone, Chapel Hill, and Chad D. Mistele, Carrboro, both of N.C., assignors to The University of North Carolina at Chapel Hill, Chapel Hill, N.C.

Continuation-in-part of Ser. No. 423,501, Apr. 13, 1995, abandoned. This application Jun. 6, 1995, Ser. No. 469,480

Int. Cl.^{6} C07C *6/04;6/00*

U.S. Cl. 526—169 **20 Claims**

1. A process for carrying out an olefin metathesis reaction to produce a metathesis modified olefin, comprising:

(a) providing a reaction mixture comprising an olefin and a metathesis initiator in a carbon dioxide reaction medium wherein said olefin is solubilized in said carbon dioxide reaction medium, and

(b) reacting said olefin with said initiator in said reaction medium to produce said metathesis modified olefin.

5,840,821

COATING SOLUTION AND METHOD FOR PREPARING THE COATING SOLUTION, METHOD FOR FORMING INSULATING FILMS FOR SEMICONDUCTOR DEVICES, AND METHOD FOR EVALUATING THE COATING SOLUTION

Tadashi Nakano, Chiba; Makoto Shimura, Chiab, and Tomohiro Ohta, Chiba, all of Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

PCT No. PCT/JP94/01910, § 371 Date Nov. 21, 1995, § 102(e) Date Nov. 21, 1995, PCT Pub. No. WO95/24639, PCT Pub. Date Sep. 14, 1995

PCT Filed Nov. 11, 1994, Ser. No. 545,736

Claims priority, application Japan, Mar. 11, 1994, 6/41314

Int. Cl.^{6} C08G *77/00*

U.S. Cl. 528—10 **32 Claims**

1. A method for evaluating an organicity of siloxanes in coating solutions for forming an insulating film used in production of semiconductor devices, the method comprising the steps of:

providing a sample of siloxanes to be analyzed;

introducing the sample into an NMR spectrometer;

integrating ^{29}Si-NMR spectral signals to determine numbers of silicon atoms in the siloxanes bonded to three, two, one and zero organic group; and

evaluating the organicity, wherein the step of evaluating comprises calculating ratios of the numbers of silicon atoms in the siloxanes bonded to three, two, one and zero organic group.

5,840,822

MONO(HYDROXYALKYL)UREA AND OXAZOLIDONE CROSSLINKING AGENTS

Sharon P. Lee, Edison, and Steven P. Pauls, Sr., Old Bridge, both of N.J., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Filed Sep. 2, 1997, Ser. No. 922,244

Int. Cl.^{6} C08G *18/00;18/08;18/22*

U.S. Cl. 528—44 **8 Claims**

1. A composition, comprising:

(1) a poly-functional molecule comprising at least two functional groups selected from the group consisting of carboxyl and anhydride; and

(2) a crosslinking agent selected from the group consisting of a mono(hydroxyalkyl)urea comprising a single urea group, a single hydroxyl group, and at least two carbon atoms are disposed between the urea group and the hydroxyl group, and 2-oxazolidone, wherein the crosslinking agent is present in an amount effective to crosslink the poly-functional molecule.

5,840,823

AQUEOUS POLYURETHANE DISPERSIONS HAVING LATENT CROSSLINKING PROPERTIES

Ulrike Licht, Mannheim; Nicolas Kokel, Ludwigshafen; Karl Häberle, Speyer, and Renate Wüstefeld, Schifferstadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Feb. 25, 1997, Ser. No. 804,690

Claims priority, application Germany, Mar. 6, 1996, 196 08 610.8

Int. Cl.^{6} C08G *18/67*

U.S. Cl. 528—73 **10 Claims**

1. An aqueous polyurethane dispersion having latent crosslinking properties and containing

I) a disperse phase (P.I), containing

Ia) a polyurethane (PUR.Ia) which, in addition to groups which impart water dispersibility to the polyurethane, carries groups which have a C—C double bond and in which the double bond is activated by a carbonyl group bonded directly therewith, or

Ib) a mixture of

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- a polyurethane (PUR.Ib) which carries groups which impart water dispersibility to the polyurethane but not groups which have a C—C double bond and in which the double bond is activated by a carbonyl group bonded directly therewith and
- a compound (V.I) which differs from the polyurethanes PUR.Ia and PUR.Ib, and which carries groups which have a C—C double bond and in which the double bond is activated by a carbonyl group bonded directly therewith and

II) a disperse phase (P.II) containing a compound which differs from the compounds (PUR.Ia), (PUR.Ib) and (V.I) and which carries a plurality of groups selected from the group consisting of the thiol groups, primary amino groups and secondary amino groups.

5,840,824

EPOXY RESIN, EPOXY RESIN COMPOSITION AND HARDENED PRODUCT THEREOF

Yasumasa Akatsuka, Saitama-ken; Kenichi Kuboki, Chiba-ken; Yoshio Shimamura, Tokyo, and Ryoichi Hasegawa, Saitama-ken, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

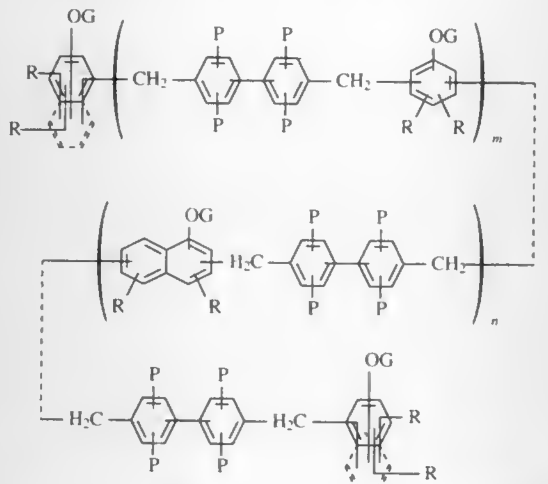
Filed Dec. 26, 1996, Ser. No. 773,967

Claims priority, application Japan, Dec. 28, 1995, 7-352295

Int. Cl.^{6} C08G *59/00;65/08;65/14*

U.S. Cl. 528—97 **5 Claims**

1. An epoxy resin represented by the formula (1)



(1)

wherein in the formula (1), each of m and n is an average value and exceeds 0 but is not more than 10, each of P and R represents a hydrogen atom, a halogen atom, a saturated or unsaturated alkyl group having 1 to 8 carbon atoms, an allyl group or an aryl group, wherein P and R may be the same or different from each other, and G represents a glycidyl group.

5,840,825

GAS BARRIER COATING COMPOSITIONS CONTAINING PLATELET-TYPE FILLERS

Leland H. Carlblom, Richland Township, Allegheny County, and Jerome A. Seiner, Pittsburgh, both of Pa., assignors to PPG Incustries, Inc., Pittsburgh, Pa.

Filed Dec. 4, 1996, Ser. No. 760,239

Int. Cl.^{6} C08L *63/02;* **C08G** *59/24;* **C08K** *5/06;3/20*

U.S. Cl. 528—183 **48 Claims**

1. A gas barrier coating composition comprising:

(a) polyamine (A) comprising at least one of the following:
  (i) a first polyamine, and
  (ii) an ungelled amine-epoxide adduct which is the reaction product of the first polyamine and at least one of the following:
    a. epichlorohydrin, and
    b. a polyepoxide having at least two glycidyl groups linked to an aromatic member;

polyepoxide (B) comprising a polyepoxide having at least two glycidyl groups linked to an aromatic member; and

(c) filler (C) comprising a platelet shaped inorganic filler with the following particle size distribution:
  (i) a number mean particle diameter in the range from about 5.5 to about 1.5 microns, and
  (ii) a volume mean particle diameter in the range from about 8 to about 25 microns.

5,840,826

PROCESS FOR PREPARING AROMATIC POLYCARBONATE

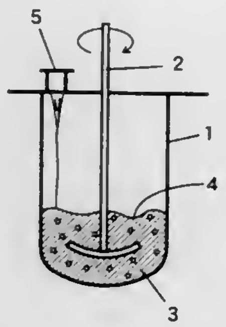
Kyosuke Komiya; Shinsuke Fukuoka, both of Kurashiki, and Mamoru Kawamura, Oomiya, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sep. 19, 1997, Ser. No. 913,781

Claims priority, application Japan, Dec. 15, 1995, 7-327369

Int. Cl.^{6} C08G *64/00*

U.S. Cl. 528—196 **5 Claims**



1. In a method for producing an aromatic polycarbonate which comprises subjecting to a transesterification reaction in a polymerizer at least one polymerizable material selected from the group consisting of:

a molten monomer mixture of an aromatic dihydroxy compound and a diaryl carbonate, and

a molten prepolymer obtained by a process comprising reacting an aromatic dihydroxy compound with a diaryl carbonate,

wherein said polymerizable material is present in the form of a liquid mass in the polymerizer and wherein said liquid mass of polymerizable material being transesterified in said polymerizer has an exposed surface,

the improvement in which said transesterification reaction of said liquid mass of polymerizable material is performed under reaction conditions such that the following formula (1) is satisfied:

$$\log (S/V) \geqq 2\times10^{-5}\times\bar{M}n+0.8 \qquad (1)$$

wherein:

S represents an evaporation surface area (m^2) which is defined as the area (m^2) of said exposed surface of the liquid mass of polymerizable material;

V represents the volume (m^3) of said liquid mass of polymerizable material in said polymerizer; and

$\bar{M}n$ represents the number average molecular weight of the aromatic polycarbonate to be produced.

5,840,827

LOW MOLECULAR WEIGHT HYDROXY FUNCTIONAL POLYESTERS FOR COATINGS

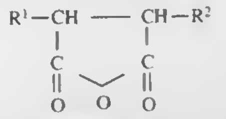
Joseph J. Zupancic, Glen Ellyn; Doanld J. Algrim, Palatine; Ronald J. Lewarchik, Sleepy Hollow, all of Ill., and Marc L. Smith, Highland, Calif., assignors to Morton International, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 38,520, Mar. 11, 1998. This application Apr. 20, 1998, Ser. No. 63,020

Int. Cl.^{6} C08G *63/02*

U.S. Cl. 528—272 **21 Claims**

1. A polyester composition comprising a polyester oligomer having a number average molecular weight (M_n) of from about 650 to about 950, a weight average molecular weight (M_w) of from about 950 to about 1900, a polydispersity of from about 1.45 to about 2, a hydroxyl functionality between 2 and 3, a hydroxyl value of from about 150 to about 275, and an acid number less than about 7, substantially all of the hydroxyl functionality being primary, from 0 to about 5% of the hydroxyl functionality being pendant from the polyester backbone as hydroxy-alkyl groups, the polyester being formed by the reaction of monomers consisting of aromatic and non-aromatic carboxylic anhydrides having from 4 to 34 carbon atoms and polyols having from 2 to 20 carbon atoms; from about 10 to about 50% by weight of the monomers being anhydrides having the formula:



Formula 1

wherein R^1 is a non-aromatic, saturated or unsaturated hydrocarbon radical having from 6 to 30 carbon atoms, R^2 is hydrogen or a non-aromatic saturated or unsaturated hydrocarbon radical having from 1 to 8 carbon atoms, and R^1 and R^2 have, in total, from 8 to 30 carbon atoms.

5,840,828

POLYIMIDE FIBERS

Terry L. St. Clair, Poquoson; Catharine C. Fay, Yorktown, and Dennis C. Working, Norfolk, all of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 689,760, Aug. 13, 1996, Pat. No. 5,670,256. This application May 7, 1997, Ser. No. 858,201

Int. Cl.^{6} C08G *73/10;* **D02G** *3/00;* **D01F** *6/04;6/00*

U.S. Cl. 528—353 **11 Claims**

1. A method of making a polyimide fiber comprising the steps of:

(a) reacting 3,4'-oxydianiline and 4,4'-oxydiphthalic anhydride to produce a polyimide powder;
(b) drying the polyimide powder in an air oven at approximately 200° C. for twenty-four hours;
(c) placing the dried polyimide powder in a single screw extruder and heating the extruder contained polyimide powder to a melt processing temperature from about 340° C. to about 360° C.;
(d) equipping the single screw extruder with a eight-filament, 0.0135 inch vertical die;
(e) selecting the height of the extruder from about 100.5 inches to about 364.5 inches;
(f) employing a rate of ten revolutions per minute for the single screw extruder; and
(g) recovering a polyimide fiber from the extruder having an average fiber diameter from about 0.0094 inch to about 0.0147 inch.

5,840,829

PLATEABLE STRUCTURAL ADHESIVE FOR CYANATE ESTER COMPOSITES

Ralph D. Hermansen, Northridge; Brian M. Punsly, Torrance, and Wai-Cheng Seetoo, Monterey Park, all of Calif., assignors to Hughes Electronics Corporation, Los Angeles, Calif.

Division of Ser. No. 549,139, Oct. 27, 1995, Pat. No. 5,780,581. This application Nov. 25, 1997, Ser. No. 977,031

Int. Cl.^{6} C08G *63/00;* **C08L** *67/00;* **B32B** *31/00;* **B31B** *1/60*

U.S. Cl. 528—363 **8 Claims**

1. A method for bonding cyanate ester composite articles to one another, said cyanate ester composite articles each having a surface, said method comprising:

(a) preparing an adhesive according to steps comprising:
  (i) providing a cured cyanate ester polymer in powder form; and
  (ii) mixing said cured cyanate ester polymer with a polymer mixture to form a thoroughly wetted mass, said polymer mixture comprising at least one polyepoxide resin and a substantially stoichiometric amount of curing agent.
(b) applying said adhesive to said surface of at least one of said cyanate ester composite articles to be bonded;
(c) positioning said cyanate ester composite articles to form a mated assembly, said adhesive therebetween and in contact with each of said cyanate ester composite articles; and
(d) allowing said adhesive to cure, thereby bonding said cyanate ester composite articles to one another.

5,840,830

PROCESS FOR PRODUCING POLY(ARYLENE SULFIDE)

Michihisa Miyahara, Wilmington, N.C.; Hiroyuki Sato, and Yoshikatsu Satake, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo K.K., Tokyo, Japan

Filed Feb. 11, 1997, Ser. No. 802,343

Claims priority, application Japan, Feb. 21, 1996, 8-058316

Int. Cl.^{6} C08G *75/14*

U.S. Cl. 528—388 **19 Claims**

1. A process for producing a poly(arylene sulfide), comprising a dehydration step of heating and dehydrating a mixture containing an organic amide solvent (a), an alkali metal sulfide and water to control a water content in the mixture and a subsequent polymerization step of subjecting the alkali metal sulfide and a dihalo-aromatic compound to a polymerization reaction in the organic amide solvent (a), wherein hydrogen sulfide vaporized off during the dehydration step is absorbed in another organic amide solvent (b) outside a system in which the dehydration step is carried out, thereby recovering it, and the hydrogen sulfide thus recovered is reused in the polymerization reaction as a raw material for the alkali metal sulfide.

5,840,831

CURED SILICONE POWDER AND METHOD OF PREPARATION

Tadashi Hamachi; Kazuo Kobayashi; Yoshitsugu Morita; Kiyotaka Sawa, and Ryuji Tachibana, all of Chiba Prefecture, Japan, assignors to Dow Corning Toray Silicone Co., Ltd., Tokyo, Japan

Filed Aug. 13, 1997, Ser. No. 910,344

Claims priority, application Japan, Aug. 28, 1996, 8-245596

Int. Cl.^{6} C08F *6/00*

U.S. Cl. 528—488 **8 Claims**

1. A method of preparing a cured silicone powder inhibited from evolving unpleasant odors with the passage of time, comprising treating the surface of a silicone powder by dipping the cured silicone powder in an aqueous alkaline solution, the aqueous alkaline solution containing an alkali selected from the group consisting of alkali metal and alkaline-earth metal hydroxides; alkali metal and alkaline-earth metal salts of inorganic acids; ammonia; alkali metal and alkaline-earth metal salts of carboxylic

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acids; amine compounds; nitrogenous heterocyclic compounds; and mixtures of two or more alkali.

5,840,832
TRANSCRIPTION FACTOR REGULATING MHC EXPERESSION, CDNA AND GENOMIC CLONES ENCODING SAME AND RETROVIRAL EXPRESSION CONSTRUCTS THEREOF

Santa Jeremy Ono, Baltimore, Md., and Jack L. Strominger, Lexington, Mass., assignors to The Johns Hopkins University, Baltimore, Md., and The President and Fellows of Harvard College, Cambridge, Mass.

Filed Oct. 21, 1994, Ser. No. 327,832
Int. Cl.^{6} C07K *14/00;14/435;* **C12N** *15/63*

U.S. Cl. 530—300 **5 Claims**

1. A substantially pure polypeptide which contains at least about five copies of a cysteine rich sequence according to SEQ ID NO:1 coupled to a cysteine rich sequence according to SEQ ID NO:2 by a bridge peptide of from one to five amino acids, said polypeptide specifically binding to double stranded DNA having a sequence according to SEQ ID NO:3.

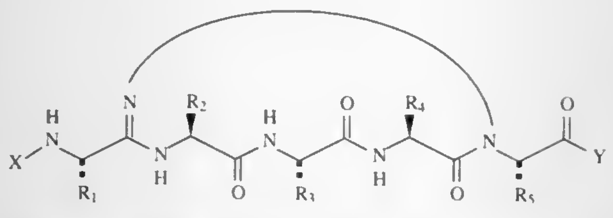
5,840,833
ALPHA-HELIX MIMETICS AND METHODS RELATING THERETO

Michael Kahn, Kirkland, Wash., assignor to Molecumetics, Ltd, Bellevue, Wash.

Filed Oct. 27, 1995, Ser. No. 548,997
Int. Cl.^{6} C07K *1/04;1/08;1/113;2/00*

U.S. Cl. 530—300 **6 Claims**

1. An alpha-helix mimetic having the structure:



wherein R_1 through R_5 are independently selected from an amino acid side chain moiety and derivative thereof; and X and Y represent the remainder of the mimetic.

5,840,834
TECHNIQUE FOR JOINING AMINO ACID SEQUENCES AND NOVEL COMPOSITION USEFUL IN IMMUNOASSAYS

Darrell Peterson, Chesterfield, Va., assignor to Virginia Commonwealth University, Richmond, Va.

Filed Dec. 21, 1994, Ser. No. 360,360
Int. Cl.^{6} C07K *5/02*

U.S. Cl. 530—323 **19 Claims**

1. A composition, comprising:
a chelating agent;
a metal electron acceptor:
a first amino acid sequence covalently bonded to said chelating agent; and
a second amino acid sequence having a histidine tag, said first amino acid and said second amino acid being linked together by said metal electron acceptor which bonds with both said chelating agent and said histidine tag.

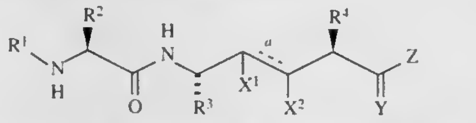
5,840,835
INHIBITORS OF PEPTIDE BINDING TO MHC CLASS II PROTEINS

Alan D. Adams, Cranford, and A. Brian Jones, Scotch Plains, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 28, 1996, Ser. No. 738,520
Int. Cl.^{6} A61K *38/00;38/04;* **C07K** *5/00*

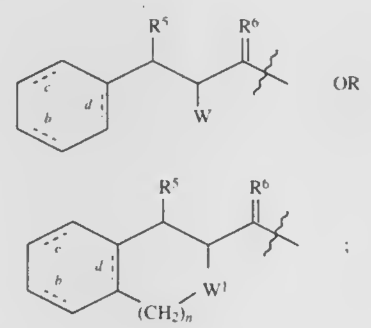
U.S. Cl. 530—323 **14 Claims**

1. A compound of structural formula I:



(I)

or a pharmaceutically acceptable salt or ester thereof wherein:
the bond represented by the dotted line "a" is selected from a single bond and a double bond;
when "a" represents a double bond X^1 and X^2 are each hydrogen;
when "a" represents a single bond, X^1 and X^2 are each H_2, or X^1 and X^2 together are CH_2, forming a cyclopropane ring with the "a" bond;
Z is selected from:
(a) NH_2,
(b) NHR^7,
(c) OH, and
(d) OR^7;
Y is selected from:
(a) O, and
(b) H,H;
R^1 is



;

R^2 is:
(a) C_{1-8} alkyl, unsubstituted or substituted with one substituent selected from:
(1) —$CONHR^8$,
(2) —$COOR^8$,
(3) —COOH,
(4) OH,

(5) alkoxy,
(6) —$NHC(O)R^8$,
(7) pyridyl,
(8) NH_2, and
(9) NHR^8;
R^3 is C_{2-6} alkyl, unsubstituted or substituted with one substituent selected from:
(a) C_{3-8}cycloalkyl,
(b) aryl,
(c) CF_3, and
(d) halogen;
R^4 is C_{2-6} alkyl, unsubstituted or substituted with one substituent selected from:
(a) C_{3-8}cycloalkyl,
(b) aryl,
(c) CF_3, and
(d) halogen;
R^5 is selected from:
(a) hydrogen, and
(b) C_{1-5} alkyl;
R^6 is selected from:
(a) two hydrogens,
(b) hydrogen and C_{1-5} alkyl, and
(c) =O (carbonyl);
R^7 is selected from:
(a) hydrogen, and
(b) C_{1-5} alkyl, unsubstituted or substituted with one substituent selected from:
(1) C_{3-8}cycloalkyl,
(2) aryl,
(3) OH,
(4) NH_2, and
(5) halogen;
at each occurrence, R^8 is independently selected from: C_{1-3} alkyl and aryl;
the bonds represented by the dotted lines "b", "c", and "d" are all double bonds or are all single bonds;
n is selected from zero, 1 and 2;
W is selected from:
(a) hydrogen,
(b) NH_2,
(c) NHR^5, and
(d) $NHCOR^5$;
W^1 is selected from:
(a) O,
(b) NH,
(c) NR^5, and
(d) $NCOR^5$;
aryl is selected from:
(a) phenyl,
(b) naphthyl,
(c) indenyl,
(d) thiophenyl,
(e) benzothiophenyl,
(f) furanyl,
(g) benzofuranyl,
(h) pyrollyl,
(i) indolyl, and
(j) pyridyl;
wherein the aryl group may be unsubstituted or substituted with one to three substituents selected from:
(1) C_{1-4} alkyl,
(2) C_{1-4} alkoxy,
(3) halogen, and
(4) hydroxy.

5,840,836
PANCREATIC ISLET CELL ANTIGENS OBTAINED BY MOLECULAR CLONING

Daniel U. Rabin, Branford, Conn., assignor to Bayer Corporation, Tarrytown, N.Y.

Continuation of Ser. No. 872,646, Jun. 8, 1992, abandoned, which is a continuation of Ser. No. 715,181, Jun. 14, 1991, abandoned, which is a continuation-in-part of Ser. No. 441,703, Dec. 4, 1989, abandoned, which is a continuation-in-part of Ser. No. 312,543, Feb. 17, 1989, abandoned. This application May 5, 1994, Ser. No. 239,276
Int. Cl.^{6} C07K *14/705*

U.S. Cl. 530—324 **26 Claims**

1. A non-glycosylated polypeptide comprising the sequence of amino acids encoded by the DNA insert of a recombinant cloning vehicle selected from the group consisting of ATCC 40550, 40551, 40552, 40553, 40554, 40703, 40704, 40705, 40706 and 75030.

5,840,837
ANALOGS OF PARATHYROID HORMONE AND PARATHYROID HORMONE RELATE PEPTIDE SYNTHESIS AND USE FOR THE TREATMENT OF OSTEOPOROSIS

John L. Krstenansky, Palo Alto; John J. Nestor, Cupertino, and Teresa H. Ho, Los Altos, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 184,328, Jan. 18, 1994, which is a continuation-in-part of Ser. No. 915,247, Jul. 14, 1992, Pat. No. 5,589,452. This application May 24, 1995, Ser. No. 449,447
Int. Cl.^{6} A61K *38/29;* **C07K** *14/00*

U.S. Cl. 530—324 **8 Claims**

1. A process for the synthesis of a modified PTH or PTHrP having bone mass restoring activity which differs from naturally occurring PTHrP or PTHrP by changes comprising substitutions at one or more of positions (22–31), wherein the substitutions are selected from the group consisting of SEQ ID Nos. (26, 27, 28, 29, 30, 85 and 86), said process comprising sequentially coupling protected amino acids, optionally on a resin, deprotecting, and purifying the polypeptide product.

5,840,838
PROCESS FOR ENHANCING THE ACTIVITY OF AMYLOID β PEPTIDES

Kenneth Hensley; D. Allan Butterfield; John M. Carney, and Michael Aksenov, all of Lexington, Ky., assignors to University of Kentucky Research Foundation, Lexington, Ky.

Filed Feb. 29, 1996, Ser. No. 609,090
Int. Cl.^{6} C07K *7/00;14/00*

U.S. Cl. 530—324 **11 Claims**

1. A process for treating a synthetic amyloid beta peptide, which process comprising the steps of:
a) providing a synthetic amyloid beta peptide;
b) dissolving the synthetic amyloid beta peptide in a deoxygenated solvent selected from the group consisting of trifluoroethanol, dimethyl sulfoxide, hexafluorocyclohexane, morpholino-propanesulfonic acid, dimethylformamide, and acetonitrile to a concentration ranging from about 0.01 to about 10 mg/ml;
c) incubating the dissolved synthetic amyloid beta peptide for about 30 minutes to about 4 hours at a temperature between about 20° C. to about 65° C.;
d) removing the solvent by evaporative deposition in about 5 to about 10 minutes; and
e) recovering the synthetic amyloid beta peptide obtained in step d.

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5,840,839
ALTERNATIVE OPEN READING FRAME DNA OF A NORMAL GENE AND A NOVEL HUMAN CANCER ANTIGEN ENCODED THEREIN

Rong-Fu Wang, Bethesda, and Steven A. Rosenberg, Potomac, both of Md., assignors to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Filed Feb. 9, 1996, Ser. No. 599,602
Int. Cl.^{6} C07K *7/06;14/47*

U.S. Cl. 530—325 **20 Claims**

1. A cancer antigen peptide or antigenic epitope thereof encoded by an alternative open reading frame nucleic acid sequence of the TRP-1 gene other than the open reading frame sequence that encodes the normal TRP-1 protein wherein the nucleic acid sequence consists of ORF3 depicted in FIG. 2 as SEQ ID No: 5 or a portion thereof.

5,840,840
SELECTIVE RNASE CYTOTOXIC REAGENTS

Susanna M. Rybak, Frederick; Richard J. Youle, Garrett Park; Dianne L. Newton, Rockville, all of Md., and Peter J. Nicholls, Berkshire, United Kingdom, assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 14,082, Feb. 4, 1993, abandoned, which is a continuation of Ser. No. 779,195, Oct. 22, 1991, abandoned, which is a continuation-in-part of Ser. No. 510,696, Apr. 20, 1990, abandoned. This application Sep. 22, 1993, Ser. No. 125,462
Int. Cl.^{6} C12N *9/12;* **C12P** *21/04*

U.S. Cl. 530—350 **7 Claims**

1. A selective cytotoxic reagent that specifically binds target cells comprising a pancreatic RNase A protein fused recombinantly to a protein which binds a specific cell surface marker on the target cells.

5,840,841
METHOD AND APPARATUS FOR BIOPOLYMER SYNTHESIS

Ronald N. Zuckermann, Berkeley; Verena D. Heubner, Benicia; Daniel V. Santi, San Francisco, and Michael A. Siani, Oakland, all of Calif., assignors to Chiron Corporation, Emeryville, Calif.

Continuation of Ser. No. 131,057, Oct. 1, 1993, Pat. No. 5,705,610, which is a division of Ser. No. 652,194, Feb. 6, 1991, Pat. No. 5,252,296, which is a continuation-in-part of Ser. No. 523,791, May 15, 1990, Pat. No. 5,182,366. This application May 8, 1997, Ser. No. 853,066
Int. Cl.^{6} C07K *1/02;1/04;1/06;* **C07H** *21/04*

U.S. Cl. 530—338 **10 Claims**

1. A method of synthesis of a mixture of different-sequence biopolymers, comprising the steps of

distributing to each of a plurality of reaction vessels a particle suspension composed of a suspension of solid-phase particles, derivatized with particle-bound biopolymer terminal subunits, in a suspension solution,

coupling a selected subunit to the particle-bound terminal subunits in each reaction vessel by successively adding to and removing from the particles in each vessel:

(a) a reaction solution containing a selected subunit in a form effective to couple the subunit to said biopolymer terminal subunits, and

(b) a volume of said suspension solution in which the particles are suspended, thereby forming a further particle suspension,

withdrawing from each vessel a selected volume of said suspension,

mixing the withdrawn suspensions to form a new particle suspension mixture, and

repeating said distributing, coupling, withdrawing, and mixing steps,

wherein said suspension solution is substantially isopycnic with said particles, and said particle suspensions thereby have a stable, substantially uniform particle density.

5,840,842
RECEPTOR-TYPE PHOSPHOTYROSINE PHOSPHATASE-SIGMA

Joseph Schlessinger, and Hai Yan, both of New York, N.Y., assignors to New York University, New York, N.Y.

Division of Ser. No. 130,570, Oct. 1, 1993, abandoned. This application May 24, 1995, Ser. No. 447,464
Int. Cl.^{6} C07K *14/705*

U.S. Cl. 530—350 **3 Claims**

1. An isolated polypeptide that is a naturally occurring receptor-type protein tyrosine phosphatase-a protein having (i) the amino acid sequence SEQ ID NO: 3; or (ii) an amino acid sequence encoded by a nucleic acid molecule that hybridizes under stringent conditions to a nucleic acid molecule comprising the nucleotide sequence of the complement of SEO ID NO: 2.

5,840,843
SYNTHETIC POLYPEPTIDES AS INHIBITORS OF HIV-1

Shibo Jiang; Kang Lin, and A. Robert Neurath, all of New York, N.Y., assignors to The New York Blood Center, New York, N.Y.

Continuation of Ser. No. 859,923, Mar. 26, 1992, Pat. No. 5,444,044. This application Jun. 7, 1995, Ser. No. 484,107
Int. Cl.^{6} C07K *1/00;14/00;17/00*

U.S. Cl. 530—350 **37 Claims**

1. A HIV-1-based polypeptide having an amino acid sequence of the envelope glycoprotein of HIV-1_{IIIB} virus or a natural variant thereof from amino acid residue 600 to amino acid residue 862, or a portion thereof comprising at least the sequence from amino acid residue 637 to amino acid residue 666.

5,840,844
SOLUBLE LYMPHOCYTE HOMING RECEPTORS

Laurence A. Lasky, Sausalito; Steven D. Rosen, San Francisco; Scott E. Stachel, and Mark S. Singer, both of Berkeley, all of Calif., assignors to Genentech, Inc. University of California, Oakland, Calif.

Continuation of Ser. No. 59,029, May 6, 1993, abandoned, which is a continuation of Ser. No. 786,149, Oct. 31, 1991, Pat. No. 5,216,131, which is a division of Ser. No. 315,015, Feb. 23, 1989, Pat. No. 5,098,833. This application Aug. 10, 1995, Ser. No. 513,278
Int. Cl.^{6} C07K *14/705*

U.S. Cl. 530—350 **13 Claims**

1. A lymphocyte homing receptor (LHR) comprising residues 39-317 of the amino acid sequence shown in FIG. 1 (SEQ ID NO:2) or FIG. 2 (SEQ ID NO:4), capable of binding to a native endothelial ligand of mature LHR, and incapable.

5,840,845
SENESCENT CELL DERIVED INHIBITORS OF DNA SYNTHESIS

James R. Smith, Houston, Tex., and Asao Noda, Odawara, Japan, assignors to Baylor College of Medicine, Houston, Tex.

Continuation of Ser. No. 268,439, Jun. 30, 1994, abandoned, which is a continuation of Ser. No. 160,814, Jan. 3, 1994, Pat. No. 5,424,400, which is a division of Ser. No. 970,462, Nov. 2, 1992, Pat. No. 5,302,706, which is a continuation-in-part of Ser. No. 808,523, Dec. 16, 1991, abandoned. This application Sep. 6, 1995, Ser. No. 524,218
Int. Cl.^{6} C07K *14/00;14/475*

U.S. Cl. 530—350 **1 Claim**

1. A purified protein being substantially free of natural contaminants and capable of inhibiting DNA synthesis in a recipient cell, said protein being senescent cell derived inhibitor-1, SDI-1, and consisting of the amino acid sequence of SEQ ID. NO:2.

5,840,846
FIBRONECTIN BINDING PROTEIN AS WELL AS ITS PREPARATION

Magnus Höök, Birmingham, Ala.; Klas Jönsson; Kjell Martin Lindberg, both of Upsala, Sweden, and Christer Signäs, Upsala, Sweden, assignors to Alfa-Laval Agri International Aktiebolag, Tumba, Sweden

Division of Ser. No. 340,458, Nov. 14, 1994, Pat. No. 5,320,951, which is a continuation of Ser. No. 974,181, Nov. 10, 1992, abandoned, which is a division of Ser. No. 520,808, May 9, 1990, Pat. No. 5,175,096. This application Oct. 4, 1996, Ser. No. 725,492

Claims priority, application Sweden, May 11, 1989, 8901687
Int. Cl.^{6} C07K *14/00;14/31*

U.S. Cl. 530—350 **8 Claims**

1. A protein having fibronectin binding activity, wherein said protein is encoded by a hybrid DNA molecule from *Staphylococcus aureus* wherein the hybrid DNA molecule consists of the following nucleotide sequence:

GTTAACAACA ATCTTAACTT TTTATTAACT

CGCTTTTTTT CATTGCTTTT TAAGGCGGGA GATTATTTTG ATTTCACATT

AAAAACCGAA CAATATAGAA TTGCATTTAT

TGAGTTTTTA AAATAAATGA ATGGTATCTC AACACTGCGT AAAGTTCCGG

ATTTTGCATT TAAGGGAGAA TATTATAGTG

AAAAGCAATC TTAGATACGG CAAGTTATGG CGACAGGAGA AATAATTGGA

CATAAGAAAA CACAAATTGG GAGCGGCCTC

AGTATTCTTA GGAACAATGA GTTTAAAGAA TATGTACAAG AAAAGAAAGA

TCGTTGTTGG AATGGGACAA GAAAAAGAAG

CTGCAGCATC GGAACAAAAC TAAATCTATT TATTGATCCT ACAACAGTGA

AATACTACAG TAGAGGAAAG TGGGAGTTCA

GCTACTGAAA GTAAAGCAAG GTTGAAGTTA AATTGGGTGA GACTACGGTT

CGAAACACAA ACAACTACAA ATAACGTTAA

-continued

TACAATAGAT GAAACACAAT

CATACAGCGC GACATCAACT GAGCAACCAT

CACAATCAAC ACAAGTAACA

ACAGAAGAAG CACCGAAAAC TGTGCAAGCA

CCAAAAGTAG AAACTTCGCG

AGTTGATTTG CCATCGGAAA AAGTTGCTGA

TAAGGAAACT ACAGGAACTC

AAGTTGACAT AGCTCAACAA AGTAAAGTCT

CAGAAATTAA ACCAAGAATG

AAAAGATCAA CTGACGTTAC AGCAGTTGCA

GAGAAAGAAG TAGTGGAAGA

AACTAAAGCG ACAGGTACAG ATGTAACAAA

TAAAGTGGAA GTAGAAGAAG

GTAGTGAAAT TGTAGGACAT AAACAAGATA

CGAATGTTGT AAATCCTCAT

AACGCAGAAA GAGTAACCTT GAAATATAAA

TGGAAATTTG GAGAAGGAAT

AAGCGATAAT GTTGAAACTC

AGATAAAAAG TACAGATGGT

GAAAGAAAAG TTAGATATAC

TTTAACTGCT GAATTATCTT

CGCAAAAAGG TAACCAAAAT

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                                      AGTAACAGCT  AATGGTCGAA
TTGATACTTT  AAATAAAGTA  GATGGGAAAT
                                      TTAGTCATTT  TGCGTACATG
AAACCTAACA  ACCAGTCGTT  AAGCTCTGTG
                                      ACAGTAACTG  GTCAAGTAAC
TAAAGGAAAT  AAACCAGGGG  TTAATAATCC
                                      AACAGTTAAG  GTATATAAAC
ACATTGGTTC  AGACGATTTA  GCTGAAAGCG
                                      TATATGCAAA  GCTTGATGAT
GTCAGCAAAT  TTGAAGATGT  GACTGATAAT
                                      ATGAGTTTAG  ATTTTGATAC
TAATGGTGGT  TATTCTTTAA  ACTTTAATAA
                                      TTTAGACCAA  AGTAAAAATT
ATGTAATAAA  ATATGAAGGG  TATTATGATT
                                      CAAATGCTAG  CAACTTAGAA
TTTCAAACAC  ACCTTTTTGG  ATATTATAAC
                                      TATTATTATA  CAAGTAATTT
AACTTGGAAA  AATGGCGTTG  CATTTTACTC
                                      TAATAACGCT  CAAGGCGACG
GCAAAGATAA  ACTAAAGGAA  CCTATTATAG
                                      AACATAGTAC  TCCTATCGAA
CTTGAATTTA  AATCAGAGCC  GCCAGTGGAG
                                      AAGCATGAAT  TGACTGGTAC
AATCGAAGAA  AGTAATGATT  CTAAGCCAAT
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CTGTTGAAGG  TGCAGAAGGT  CATGCAGAAG
                                      GTACCATTGA  AACTGAAGAA
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                                      ACACATGAAA  ATTCAAAACA
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                                      TACAAACCCA  GGTGGTGGTC
AGGTTACTAC  TGAGTCTAAC  CTAGTTGAAT
                                      TTGACGAAGA  TTCTACAAAA
GGTATTGTAA  CTGGTGCTGT  TAGCGATCAT
                                      ACAACAATTG  AAGATACGAA
AGAATATACG  ACTGAAAGTA  ACTTGATTGA
                                      ACTAGTAGAT  GAACTACCTG
AAGAACATGG  TCAAGCGCAA  GGACCAATCG
                                      AGGAAATTAC  TGAAAACAAT
CATCATATTT  CTCATTCTGG  TTTAGGAACT
                                      GAAAATGGTC  ACGGTAATTA
TGGCGTGATT  GAAGAAATCG  AAGAAAATAG
                                      CCACGTGGAT  ATTAAGAGTG
AATTAGGTTA  CGAAGGTGGC  CAAAATAGCG
                                      GTAATCAGTC  ATTTGAGGAA
GACACAGAAG  AAGATAAACC  GAAATATGAA
                                      CAAGGTGGCA  ATATCGTAGA
TATCGATTTC  GATAGTGTAC  CTCAAATTCA
                                      TGGTCAAAAT  AATGGTAACC
AATCATTCGA  AGAAGATACA  GAGAAAGACA
                                      AACCTAAGTA  TGAACAAGGT
GGTAATATCA  TTGATATCGA  CTTCGACAGT
                                      GTGCCACATA  TTCACGGATT
CAATAAGCAC  ACTGAAATTA  TTGAAGAAGA
                                      TACAAATAAA  GATAAACCAA
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ATTATCAATT  CGGTGGACAC  AATAGTGTTG
                                      ACTTTGAAGA  AGATACACTT
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                                      CAAACGATTG  AAGAAGATAC
AACACCTCCA  ATCGTGCCAC  CAACGCCACC
                                      GACACCAGAA  GTACCAAGCG
AGCCGGAAAC  ACCAACACCA  CCGACACCAG
                                      AAGTACCAAG  CGAGCCGGAA
ACACCAACAC  CGCCAACGCC  AGAGGTACCA
                                      ACTGAACCTG  GTAAACCAAT
ACCACCTGCT  AAAGAAGAAC  CTAAAAAACC
                                      TTCTAAACCA  GTGGAACAAG
GTAAAGTAGT  AACACCTGTT  ATTGAAATCA
                                      ATGAAAAGGT  TAAAGCAGTG
GTACCAACTA  AAAAAGCACA  ATCTAAGAAA
                                      TCTGAACTAC  CTGAAACAGG
TGGAGAAGAA  TCAACAAACA  ACGGCATGTT
                                      GTTCGGCGGA  TTATTTAGCA
TTTTAGGTTT  AGCGTTATTA  CGCAGAAATA
                                      AAAAGAATCA  CAAAGCATAA
TCAATCCAAA  ATTGACAGGT  TTATTTCATA
                                      AATTATATGA  AGTAAGCCTG
TTTTTTAAAA  TTAAAACAAA  TTTCCCAAGA
                                      AATAATTACA  TACTCAATGA
CACTATGAAG  GCGTTCTAAT  TAGTGTTAAA
                                      ATGACGTTGA  TACATAGATT
TAATACTTAG  GAAAAGGAGC  ACATTAACTT
                                      TGAAAAAAAT  AAAAAAGGCA
ATCATTCCCG  CTGCTGGTTT  AGGGACTAGA
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                                      TTTTTACCAG  CAACTAAAGC
GATGCCAAAG  GAAATGCTTC  CTATCTTAGA
                                      TAAACCCACA  ATACAATATA
TCGTTGAAGA  AGCTGCAAGA  GCTGGAATTG
                                      AAGATATTAT  TATAGTGACA
GGTCGCCACA  AACGCGCGAT  TGAAGATCAT
                                      TTTGATAGTC  AAAAAGAATT
AGAAATGGTG  TTAAAAGAAA  AAGGTAAATC
                                      TGAATTACTA  GAGAAAGTTC
AGTATTCAAC  GGAACTTGCG  AATATTTTTT
                                      ATGTAAGGCA  GAAAGAACAA
AAAGGTTTAG  GGCATGC
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wherein said protein is produced by a process comprising the steps of

a) cloning said hybrid DNA molecule into a microorganism such that said DNA is expressed by said microorganism;

b) cultivating the microorganism in a growth promoting medium; and

c) lysing the cloned microorganism.

5,840,847

PURIFIED PROSTAGLANDIN RECEPTOR FP

Mark Abramovitz; Richard Grygorczyk, both of Quebec; Kathleen Metters, Montreal; Truyen Nguyen, Quebec; Thomas H. Rushmore, Quebec, and Deborah Slipetz, Quebec, all of Canada, assignors to Merck Frosst Canada, Inc., Quebec, Canada

Division of Ser. No. 083,741, Jun. 25, 1993. This application Nov. 21, 1997, Ser. No. 976,074

Int. Cl.^{6} C07K *14/705;* **C12N** *15/12*

U.S. Cl. 530—350 **6 Claims**

1. A human prostaglandin receptor FP protein free from other human proteins, which comprises the amino acid sequence set forth in SEQ ID NO:5.

5,840,848

METHOD FOR PREPARATION OF TYPE II COLLAGEN

Anna Gunilla Oberg Sturrock, Acton, and Dale P. Devore, Chelmsford, both of Mass., assignors to AutoImmune, Inc., Lexington, Mass.

Filed Jan. 3, 1997, Ser. No. 778,467

Int. Cl.^{6} A61K *37/17;* **C07K** *1/00;14/00;16/00*

U.S. Cl. 530—356 **20 Claims**

1. A method of facilitating the removal of perichondrial membrane from vertebrate cartilage tissue containing unseparated perichondrial membrane comprising contacting said cartilage with an acidic solution containing an acid protease under agitation for a period of time sufficient to digest or loosen said perichondrial membrane from said cartilage.

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5,840,849

BLENDS OF COLLAGEN TYPE I AND COLLAGEN TYPE III FOR FOOD CASINGS

A J Bailey, Bristol, Great Britain; Michaël de Mari; Bettina Schmidl, both of Wormerveer, Netherlands, and Fransiscus Aloysius Timmermans, Oss, Netherlands, assignors to Loders Croklaan B.V., Wormerveer, Netherlands

Filed Jul. 29, 1997, Ser. No. 902,162

Claims priority, application European Pat. Off., Jul. 29, 1996, 96305547

Int. Cl.^{6} A61K *38/17;* **A23L** *1/31;* **A23J** *3/00*

U.S. Cl. 530—356 **11 Claims**

1. A blend of collagen type I and collagen type III having different types of cross-linkings,

wherein the blend comprises cross-linkings of the hydroxylsinopyridinoline (Pyrid), dihyroxylsinonorleucine (DHLNL) and histdinohydrdoxylysinonorleucine (HHL) types, in amounts satisfying the weight ratio:

Pyrid+DHLNL/HHL=0.04–6;

wherein the collagen type I is derived from bovine hides, and the collagen type III is derived from animal intestines; and

wherein the blend comprises collagen type I and collagen type III in a weight ratio of 90:10 to 75:25.

5,840,850

DEWATERING GLUTEN WITH ANIONIC SURFACTANTS

William J. Palardy, Chalfont, Pa., assignor to BetzDearborn Inc., Trevose, Pa.

Filed Aug. 22, 1997, Ser. No. 916,826

Int. Cl.^{6} A61K *35/78*

U.S. Cl. 530—374 **9 Claims**

1. A method of enhancing the dewatering of gluten which comprises adding to an aqueous gluten solution prior to dewatering, an effective dewatering amount of an anionic surfactant.

5,840,851

PURIFICATION OF HEMOGLOBIN

J. Jeffrey Plomer, 12636 Grove St., Broomfield, Colo. 80020; James R. Ryland, 946 St. Andrews La., Louisville, Colo. 80027; Maura-Ann H. Matthews, 3100 N. Broadway, Apt. 205, Boulder, Colo. 80304; David W. Traylor, 4045 Field Dr., Wheat Ridge, Colo. 80033; Erin E. Milne, 2206 Sunridge Cir., Broomfield, Colo. 80020; Steven L. Durfee, 6739 Montview Blvd., Denver, Colo. 80207; Antony J. Mathews, 673 W. Locust Ct., Louisville, Colo. 80027, and Justinian O. Neway, 3197 Nelson Rd., Longmont, Colo. 80503

Continuation-in-part of Ser. No. 339,304, Nov. 14, 1994, abandoned, which is a continuation-in-part of Ser. No. 97,273, Jul. 23, 1993, abandoned. This application May 10, 1995, Ser. No. 438,511

Int. Cl.^{6} C07K *1/22;1/18*

U.S. Cl. 530—385 **51 Claims**

1. A method for producing a partially purified hemoglobin solution comprising:

(a) contacting a hemoglobin-containing lysate with an immobilized metal affinity chromatography (IMAC) resin charged with a divalent metal ion;

(b) washing the IMAC resin with at least one IMAC wash solution; and

(c) eluting the IMAC resin with an eluting solution to obtain the partially purified hemoglobin solution.

5,840,852

METHOD FOR PRODUCING ULTRAPURE STABLE POLMERIZED HEMOGLOBIN BLOOD-SUBSTITUTE

Carl W. Rausch, Medford; Maria S. Gawryl, Charlestown; Robert A. Houtchens, Milford; Anthony J. Laccetti, North Andover, and William R. Light, Natick, all of Mass., assignors to Biopure Corporation, Cambridge, Mass.

Continuation of Ser. No. 409,337, Mar. 23, 1995. This application Jun. 2, 1995, Ser. No. 458,916

Int. Cl.^{6} C07K *14/805;* **A61K** *38/42*

U.S. Cl. 530—385 **1 Claim**

1. A stable polymerized hemoglobin human blood-substitute, comprising mammalian hemoglobin, with a concentration between 120 to 140 grams per liter of solution, wherein:

a) methemoglobin content is less than 15% by weight;

b) oxyhemoglobin content is less than or equal to 10 percent by weight;

c) endotoxin concentration is less than 0.5 Endotoxin units per milliliter;

d) 15% by weight, or less, of the polymerized hemoglobin has a molecular weight of over 500,000 Daltons; and

e) 10% by weight, or less, of the polymerized hemoglobin has a molecular weight equal to or less than 65,000 Daltons.

5,840,853

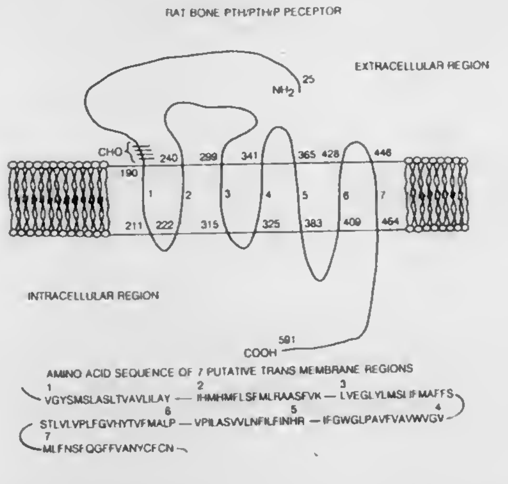
PARATHYROID HORMONE RECEPTOR AND DNA ENCODING SAME

Gino V. Segre, Wayland; Henry M. Kronenberg, Belmont; Abdul-Badi Abou-Samra, Plainville; Harald Juppner, Boston; John T. Potts, Jr., West Newton, and Ernestina Schipani, Boston, all of Mass., assignors to The General Hospital Corporation, Boston, Mass.

Division of Ser. No. 864,475, Apr. 6, 1992, Pat. No. 5,494,806, which is a continuation-in-part of Ser. No. 681,702, Apr. 5, 1991, abandoned. This application Jun. 6, 1995, Ser. No. 471,494

Int. Cl.^{6} C07K *16/28;* **A61K** *39/395*

U.S. Cl. 530—387.1 **15 Claims**



1. An antibody which is immunoreactive with a naturally occurring, mammalian parathyroid hormone receptor wherein the mammalian species is human, rat or opossum.

5,840,854

MONOCLONAL ANTIBODY BR110 AND USES THEREOF

Karl Erik Hellstrom; Ingegerd Hellstrom, both of Seattle; Ursula Garrigues, Bainbridge Island, all of Wash.; Stephen McAndrew, Newtown, Pa., and Hans Marquardt, Mercer Island, Wash., assignors to Bristol-Myers Squibb Company, Princeton, N.J.

Filed Oct. 7, 1996, Ser. No. 726,528

Int. Cl.^{6} A61K *31/395*

U.S. Cl. 530—387.7 **22 Claims**

1. A monoclonal antibody that binds to GA733-1 antigen, said antibody having an antigen binding site which competitively inhibits the binding of monoclonal antibody BR110 produced by a hybridoma designated ATCC No. HB11698 to the GA733-1 antigen.

5,840,855

MYCOBACTERIAL RECOMBINANTS AND PEPTIDES

Thomas Shinnick, Atlanta, Ga., and Richard Houghten, Solana Beach, Calif., assignors to Scripps Clinic and Research Foundation, LaJolla, Calif.

Division of Ser. No. 993,815, Dec. 18, 1992, Pat. No. 5,478,726, which is a continuation of Ser. No. 574,439, Aug. 28, 1990, which is a division of Ser. No. 159,667, Feb. 24, 1988, Pat. No. 4,976,958, which is a continuation-in-part of Ser. No. 19,529, Feb. 26, 1987, Pat. No. 4,952,395. This application Dec. 22, 1995, Ser. No. 577,980

Int. Cl.^{6} C07K *16/12;7/08;* **A61K** *39/04*

U.S. Cl. 530—388.4 **1 Claim**

1. Paratopic molecules that immunoreact with a peptide having the amino acid residue sequence, written from left to right and in the direction from amino-terminus to carboxy-terminus, represented by the formula

MAKTIAYDEEARRGL.

5,840,856

ANTIBODIES TO A HUMAN PF4 SUPERFAMILY RECEPTOR

Anan Chuntharapai, Colma; James Lee, San Bruno; Caroline Hebert, San Francisco, and K. Jin Kim, Los Altos, all of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

PCT No. PCT/US94/06380, § 371 Date Aug. 10, 1994, § 102(e) Date Aug. 10, 1994, PCT Pub. No. WO94/28931, PCT Pub. Date Dec. 22, 1994

Continuation-in-part of Ser. No. 76,093, Jun. 11, 1993, Pat. No. 5,543,503, which is a continuation-in-part of Ser. No. 810,782, Dec. 19, 1991, abandoned, which is a continuation-in-part of Ser. No. 677,211, Mar. 29, 1991, abandoned. This PCT application Jun. 7, 1994, Ser. No. 284,586

Int. Cl.^{6} C07K *16/00;* **C12P** *21/08;* **C12N** *5/12*

U.S. Cl. 530—388.22 **2 Claims**

1. An antibody with an antigen binding site which is capable of binding to a PF4AR polypeptide having the amino acid sequence of SEQ ID NO:4, wherein the antigen binding site does not cross-react with other PF4AR polypeptides.

5,840,857

URINARY FOLLICLE STIMULATING HORMONE

Guiseppe Arpaia; Serenella Serani; Antonino Sirna, and Stefano Villa, all of Rome, Italy, assignors to Istituto di Ricerca Cesare Serono S.p.A., Rome, Italy

Division of Ser. No. 413,936, Mar. 30, 1995, which is a continuation of Ser. No. 767,297, Sep. 27, 1991, abandoned, which is a division of Ser. No. 337,766, Feb. 7, 1989, Pat. No. 5,128,453. This application Dec. 29, 1995, Ser. No. 580,858

Claims priority, application Italy, Jun. 26, 1987, 48110/87

Int. Cl.^{6} C07K *14/59;1/34;1/22*

U.S. Cl. 530—413 **5 Claims**

1. A process for preparing a substantially pure biologically active follicle stimulating hormone (FSH) preparation, free from traces of luteinizing hormone detectable at 1.5 mIU/ml, based on the 2nd IRP-HMG reference standard for luteinizing hormone, and substantially free from all other urinary proteins, comprising subjecting a post-menopausal urinary concentrate to immunopurification using FSH-specific immobilized monoclonal antibodies to form an immunocomplex of FSH and the antibodies thereto, eluting to recover the FSH, and removing any residual traces of contaminants by reverse phase HPLC.

5,840,858

PROTEIN PURIFICATION USING IMMOBILIZED METAL AFFINITY CHROMATOGRAPHY FOR COMPLEMENT RECEPTOR PROTEINS

Thomas Michael Smith, Drexel Hill, and Gail Folena-Wasserman, Richboro, both of Pa., assignors to T Cell Sciences, Inc., Needham, Mass.

PCT No. PCT/US94/07555, § 371 Date Apr. 3, 1996, § 102(e) Date Apr. 3, 1996, PCT Pub. No. WO95/01797, PCT Pub. Date Jan. 19, 1995

Continuation of Ser. No. 90,351, Jul. 9, 1993, abandoned. This PCT application Jul. 6, 1994, Ser. No. 581,604

Int. Cl.^{6} C07K *1/22;1/36*

U.S. Cl. 530—413 **46 Claims**

1. A method for purifying a complement receptor protein from a mixture containing same comprising sequentially contacting said mixture with a cationic chromatographic support, metal affinity chromatographic support, a size exclusion chromatographic support and selectively eluting the protein from each support.

5,840,859

(AMINOSTYRYL)PYRIDINIUM COMPOUNDS FOR RADIOLABELLING CELL MEMBRANES

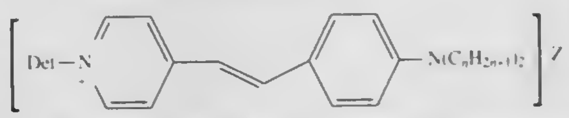
Carol Lambert; Ronnie C. Mease, both of Fairfax, Va., and John G. McAfee, Chevy Chase, Md., assignors to Research Corporation Technologies, Inc., Tucson, Ariz.

Filed Jun. 27, 1996, Ser. No. 673,798

Int. Cl.^{6} C09F *13/00;* **C07D** *211/70;* **A61K** *51/04*

U.S. Cl. 534—10 **9 Claims**

1. A compound of the formula (I):



(I)

wherein Det is an organic group comprising a detectable radioisotope, n is 4–16, and Z is a biologically acceptable anion.

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5,840,860

FATTY ACID DELIVERY SYSTEM COMPRISING A HYDROLYZABLE BOND

Geoffrey Annison, The Concourse, Singapore; David L. Topping, and Richard J. Illman, both of O'Halloran Hill, Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Australia

PCT No. PCT/AU94/00713, § 371 Date Sep. 5, 1996, § 102(e) Date Sep. 5, 1996, PCT Pub. No. WO95/13801, PCT Pub. Date May 26, 1995

PCT Filed Nov. 17, 1994, Ser. No. 646,294

Claims priority, application Australia, Nov. 17, 1993, PM2454

Int. Cl.^{6} C07H *1/00*

U.S. Cl. 536—1.11 **118 Claims**

1. A method of delivering a fatty acid to the colon of a human or animal, including the step of ingesting a physiologically acceptable level of an agent, said agent comprising a carrier covalently bonded to the fatty acid by a bond hydrolysable in the colon to give free fatty acid.

5,840,861

A83543 COMPOUNDS AND PROCESS FOR PRODUCTION THEREOF

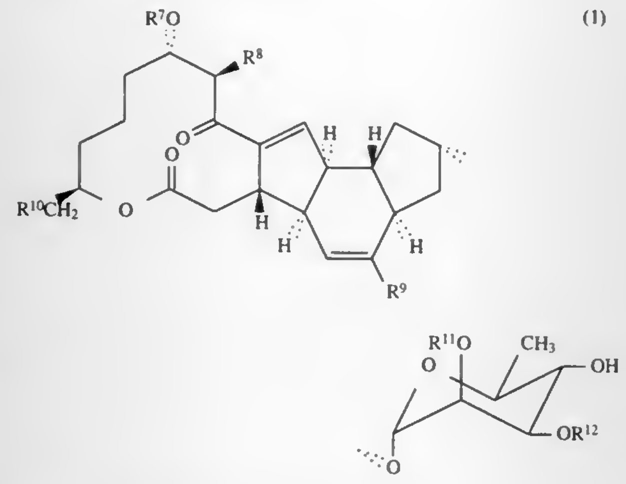
Jon S. Mynderse; Mary C. Broughton, both of Indianapolis, Ind.; Walter M. Nakatsukasa, Seattle, Wash.; James A. Mabe, Hendersonville, N.C.; Jan R. Turner, Carmel, Ind.; Lawrence Creemer, Indianapolis, Ind.; Mary L. B. Huber, Danville, Ind.; Herbert A. Kirst, Indianapolis, Ind., and James W. Martin, Coatesville, Ind., assignors to DowElanco, Indianapolis, Ind.

Division of Ser. No. 30,522, Mar. 12, 1993, abandoned. This application Feb. 8, 1995, Ser. No. 385,497

Int. Cl.^{6} C07H *17/04;* **A61K** *31/70;* **C12P** *19/62*

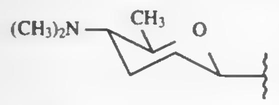
U.S. Cl. 536—16.8 **9 Claims**

1. A compound of the formula 1

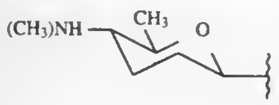


(1)

wherein R^7 is hydrogen or a group of formula



(a)



(b)

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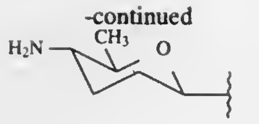
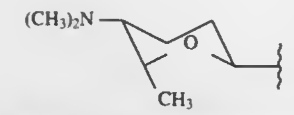


(c)

or)



(d)

R^8, R^9, R^{10}, R^{11}, and R^{12} are independently hydrogen or methyl, provided that R^{11} and R^{12} are not concurrently hydrogen; or an acid addition salt thereof when R^7 is other than hydrogen.

5,840,862

PROCESS FOR ALIGNING, ADHERING AND STRETCHING NUCLEIC ACID STRANDS ON A SUPPORT SURFACE BY PASSAGE THROUGH A MENISCUS

David Bensimon, Paris; Aaron Bensimon, Antony, and François Heslot, Viroflay, all of France, assignors to Institut Pasteur, and Centre National de la Recherche Scientifique, both of, Paris, France

Continuation of Ser. No. 386,485, Feb. 10, 1995, abandoned. This application Jun. 6, 1995, Ser. No. 467,535

Claims priority, application France, Feb. 11, 1994, 94 01574; Jun. 17, 1994, 94 07444

Int. Cl.^{6} C07H *21/00;* **C12N** *15/00;* **C12Q** *1/68*

U.S. Cl. 536—22.1 **9 Claims**

1. A process for aligning a nucleic acid strand on a surface, wherein the process comprises:

(a) providing a solvent for the nucleic acid strand between two surfaces where one surface is an anchoring surface to which one end of the nucleic acid strand is anchored by a bond and another end of the nucleic acid strand is free, and where the solvent forms a meniscus between and perpendicular to the surfaces at an interface of the solvent with air between the surfaces; and

(b) moving the meniscus and solvent between the surfaces so that the nucleic acid strand passes through the meniscus into air at the interface whereby the nucleic acid strand is aligned on the anchoring surface perpendicular to the meniscus without breaking the bond that anchors the end of the nucleic acid strand to the surface.

5,840,863

Patent Not Issued For This Number

5,840,864

Patent Not Issued For This Number

5,840,865

EUKARYOTIC TRANSPOSABLE ELEMENT

Charalambos Savakis, Heraklion, Greece; Gerald H. Franz, Baden, Austria, and Athanasios Loukeris, Athens, Greece, assignors to Institute of Molecular Biology and Biotechnology/ Forth, Crete, Greece

Continuation-in-part of Ser. No. 239,765, May 9, 1994, which is a division of Ser. No. 946,237, Sep. 14, 1992, Pat. No. 5,348,874. This application Sep. 20, 1995, Ser. No. 530,566

Int. Cl.^{6} C07H *21/04*

U.S. Cl. 536—23.2 **5 Claims**

1. An isolated transposable element having a DNA sequence which hybridizes to the DNA sequence of SEQ ID NO:1 or SEQ ID NO:4 in a buffered solution of 0.9M NaCl, at a temperature of 55° C.

5,840,866

HUMAN UBIQUITIN-CONJUGATING ENZYME

Janice Au-Young, Berkeley; Surya K. Goli, Sunnyvale, and Jennifer L. Hillman, San Jose, all of Calif., assignors to Incyte Pharmaceuticals, Inc., Palo Alto, Calif.

Filed Jul. 10, 1996, Ser. No. 679,765

Int. Cl.^{6} C07H *21/04;* **C12N** *9/10;1/20;15/00*

U.S. Cl. 536—23.2 **4 Claims**

1. An isolated and purified polynucleotide encoding a polypeptide consisting of the amino acid sequence of SEQ ID NO:1.

5,840,867

APTAMER ANALOGS SPECIFIC FOR BIOMOLECULES

John J. Toole, Burlingame; Linda C. Griffin, Atherton; Louis C. Bock, Foster City, and John A. Latham, Palo Alto, all of Calif., assignors to Gilead Sciences, Inc., Foster City, Calif.

Continuation-in-part of Ser. No. 658,849, Feb. 21, 1991, abandoned, and a continuation of Ser. No. 787,921, Nov. 6, 1991, abandoned, which is a continuation-in-part of Ser. No. 745,215, Aug. 14, 1991, abandoned, which is a continuation-in-part of Ser. No. 659,981, Feb. 21, 1991, abandoned. This application May 3, 1994, Ser. No. 237,973

Int. Cl.^{6} C07H *21/04;21/02;* **C12Q** *1/68*

U.S. Cl. 536—23.1 **4 Claims**

1. A composition consisting essentially of the aptamer having the formula:

GGTTGGTGTGGTTGG (SEQ ID NO:19).
GGTTGGTGTGGTTGG$^{\#}$G$^{\#}$T (SEQ ID NO:20),
GGTTGGTGTGGTT*G*G (SEQ ID NO:21).
G*G*T*T*G*G*T*G*T* G*G*T*T*G*G (SEQ ID NO:22).
GGTTGG(dU)G(dU)GGTTGG (SEQ ID NO:23).
GG(dU)TGGTGTGG(dU)TGG (SEQ ID NO:24). or
GGTTGGTGTGGTU' GG (SEQ ID NO:25):

wherein:

* indicates a P(O)S linkage,

# indicates a P(O)NH(CH$_2$CH$_2$OCH$_3$) linkage, and

U' indicates 5-(1-pentynyl)uracil.

5,840,868

PESTICIDAL PROTEINS AND STRAINS

Gregory W. Warren; Michael G. Koziel, both of Cary; Martha A. Mullins, Raleigh; Brian Carr; Nalini M. Desai, both of Cary, and Kristy Kostichka, Durham, all of N.C., assignors to Novartis Finance Corporation, New York, N.Y.

Division of Ser. No. 463,483, Jun. 5, 1995, which is a continuation-in-part of Ser. No. 314,594, Sep. 28, 1994, abandoned, which is a continuation-in-part of Ser. No. 218,018, Mar. 23, 1994, abandoned, which is a continuation-in-part of Ser. No. 37,057, Mar. 25, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 471,044

Int. Cl.^{6} C07H *21/02;21/04;* **C12Q** *1/68;* **C07K** *1/00*

U.S. Cl. 536—23.1 **10 Claims**

1. A substantially pure nucleotide sequence which encodes an auxiliary protein having SEQ ID NO:2 or 20, or the complement thereof, wherein said auxiliary protein activates the insecticidal activity of an insect-specific protein.

5,840,869

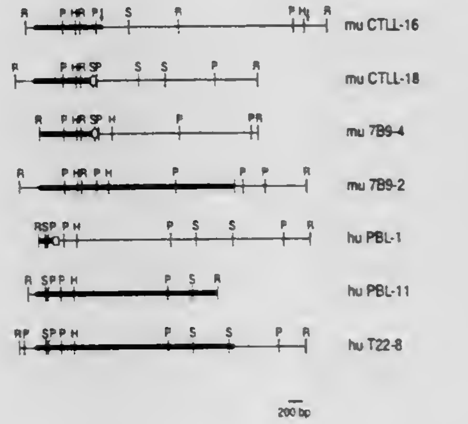
DNA ENCODING INTERLEUKIN-4 RECEPTORS

Bruce Mosley; David J. Cosman; Linda Park, all of Seattle; M. Patricia Beckmann, Poulsbo; Carl J. March, and Rejean Idzerda, both of Seattle, all of Wash., assignors to Immunex Corporation, Seattle, Wash.

Continuation-in-part of Ser. No. 370,924, Jun. 23, 1989, abandoned, which is a continuation-in-part of Ser. No. 326,156, Mar. 20, 1989, abandoned, which is a continuation-in-part of Ser. No. 319,438, Mar. 2, 1989, abandoned, which is a continuation-in-part of Ser. No. 265,047, Oct. 31, 1988, abandoned. This application Feb. 14, 1990, Ser. No. 480,694

Int. Cl.^{6} C07H *21/04;* **C12P** *21/02;* **C12N** *15/00*

U.S. Cl. 536—23.5 **12 Claims**



1. An isolated DNA sequence which encodes a biologically active human IL-4 receptor comprising the amino acid sequence of amino acids −25–800 or 1–800 of FIGS. 4A–4C.

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5,840,870

POLYNUCLEOTIDES PANCIA AND PANCIB ASSOCIATED WITH PANCREATIC CANCER

Richard D. Goold, San Francisco; Ingrid E. Akerblom, Redwood City, and Jeffrey J. Seilhamer, Los Altos Hills, all of Calif., assignors to Incyte Pharmaceuticals, Inc., Palo Alto, Calif.

Filed Dec. 29, 1995, Ser. No. 581,240

Int. Cl.^{6} C12N *15/11;15/66;15/85;* **C07H** *21/04*

U.S. Cl. 536—23.5 **10 Claims**

```
GTACGGAGGT GAGGTTTGTN ACCGCGATTC TAAGAGGTGG GCTTTTAGTC CCTCCAGACC   60
TCGGCTTTAG TGCTGTCTCC GCTTTTYTTT CACCTTCACA GAGGTTCGTG TCTTCCTAAA  120
AGAAGGTTTT ATTGGGAGGT AAAGGTCAAT GCGTAGGGGT AGAGTAAGAT GTCTTATGGT  180
GAAATTRAAG GTAAATTCTT GGGACCTAGA GAAGAAGTAA CGAGTGAGCC ACGCTGTAAA  240
AAATTGAAGT CAACCACAGA GTCGTATGTT TTTCACAATC ATAGTAATGC TGATTTTCAC  300
AGNATCCAAG AGAAAACTGG AAATGATTGG GTCCCTGTGN NCATCATTGA TGTCAGAGGA  360
CATAGTTATT TGC                                                     373
```

1. A purified polynucleotide consisting of SEQ ID NO:1.

5,840,871

PROSTATE-ASSOCIATED KALLIKREIN

Jennifer L. Hillman, San Jose, and Surya K. Goli, Sunnyvale, both of Calif., assignors to Incyte Pharmaceuticals, Inc., Palo Alto, Calif.

Filed Jan. 29, 1997, Ser. No. 790,137

Int. Cl.^{6} C07H *21/04;* **C12P** *21/06;* **C12N** *15/00;15/09*

U.S. Cl. 536—23.5 **5 Claims**

1. An isolated and purified polynucleotide sequence comprising SEQ ID NO:2.

5,840,872

Patent Not Issued For This Number

5,840,873

LABELED HYBRIDIZATION ASSAY PROBES USEFUL FOR THE DETECTION AND QUANTIFICATION OF MULTIPLE NUCLEIC ACID SEQUENCES

Norman Charles Nelson, San Diego, Calif.; James Stuart Woodhead, Raglan; Ian Weeks, Cardiff, both of United Kingdom, and Azzouz Ben Cheikh, Del Mar, Calif., assignors to Gen-Probe Incorporated, San Diego, Calif.

Continuation of Ser. No. 683,122, Jul. 16, 1996, which is a continuation of Ser. No. 331,107, Oct. 28, 1994, abandnned. This application May 19, 1997, Ser. No. 858,803

Int. Cl.^{6} C07H *21/02;* **G01N** *33/00;* **C12N** *15/00;* **C09K** *3/00*

U.S. Cl. 536—24.3 **9 Claims**

1. A composition which can be used to assay for the presence of a plurality of nucleic acid analytes which may be present in a sample comprising:

a) a plurality of different oligonucleotide probes, each of said probes having a nucleotide sequence which binds to a target nucleotide sequence of at least one nucleic acid analyte under selective conditions,

wherein each of said probes binds to a different target nucleotide sequence under said conditions, and

wherein said probes do not bind to non-targeted nucleic acids present in said sample under said conditions; and

b) a plurality of different chemiluminescent labels, each of said labels being capable of emitting light at one or more different wavelengths when a light-emitting reaction is initiated, and each of said labels being coupled to at least one of said probes, said probes collectively targeting at least two nucleic acid analytes which may be present in said sample,

wherein the chemiluminescent potential of said labels is susceptible to selective alteration when said labels are not associated with a probe:analyte hybrid,

wherein the rate at which each of said labels associated with a probe:analyte hybrid is altered is less than about 50-fold different than the rate at which any other of said labels associated with a probe:analyte hybrid is altered, and

wherein the rate at which each of said labels not associated with a probe:analyte hybrid is altered is less than about 50-fold different than the rate at which any other of said labels not associated with a probe:analyte hybrid is altered, and

wherein said light emitting reaction causes each of said labels associated with a probe:analyte hybrid to emit light at one or more wavelengths sufficiently distinct from the one or more wavelengths of light emitted by any other of said labels associated with a probe:analyte hybrid, such that each of said labels associated with a probe:analyte hybrid is independently and selectively detectable when the emitted light is simultaneously detected at said one or more wavelengths, thereby indicating presence of one or more of said nucleic acid analytes which may be present in said sample.

5,840,874

HAMMERHAND RIBOZYMES

James Phillip Haseloff, O'Connor; Wayne Lyle Gerlach, Hughes; Philip Anthony Jennings, West Chatswood, and Fiona Helen Cameron, Forestville, all of Australia, assignors to Gene Shears Pty. Limited, North Ryde, Australia

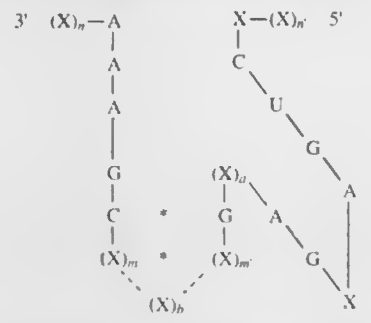
Division of Ser. No. 967,693, Oct. 27, 1992, Pat. No. 5,494,814, which is a continuation of Ser. No. 926,148, Aug. 5. 1992, Pat. No. 5,254,678, which is a continuation of Ser. No. 536,625, Aug. 14, 1990, abandoned. This application May 17, 1995, Ser. No. 443,153

Claims priority, application Australia, Dec. 15, 1987, PI5911/87; Aug. 19, 1988, PI9950/88; Sep. 9, 1988, PJ0353/88; Nov. 4, 1988, PJ1304/88; Nov. 7, 1988, PJ1333/88

Int. Cl.^{6} C07H *21/04;* **C12Q** *1/68*

U.S. Cl. 536—24.5 **7 Claims**

1. A composition which comprises a compound in association with a pharmaceutically, veterinarially, or agriculturally acceptable carrier or excipient, the compound having the structure:



wherein each X represents a nucleotide which may be the same or different;

wherein each of $(X)_n$ and $(X)_n$ represents an oligonucleotide having a predetermined sequence which is (a) capable of hybridizing with an RNA target sequence to be cleaved and (b) does not naturally occur covalently bound to the sequences A-A-A-G-C- and X-C-U-G-A-, respectively, such RNA target sequence not being present within the compound;

wherein each of n and n' represents an integer which defines the number of nucleotides in the oligonucleotide with the proviso that the sum of n+n' is greater than or equal to 14;

wherein each * represents base pairing between the nucleotides located on either side thereof;

wherein each solid line represents a chemical linkage providing covalent bonds between the nucleotides located on either side thereof;

wherein a represents an integer which defines a number of nucleotides with the proviso that a may be 0 or 1 and if 0, the A located 5' of $(X)_a$ is bonded to the G located 3' of $(X)_a$;

wherein each of m and m' represents an integer which is greater than or equal to 1;

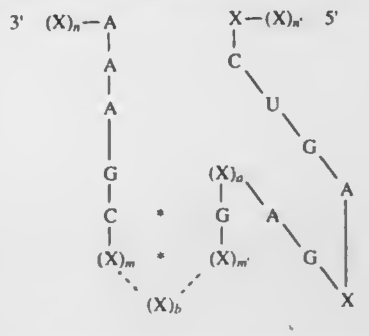
wherein each of the dashed lines independently represents either a chemical linkage providing covalent bonds between the nucleotides located on either side thereof or the absence of any such chemical linkage; and

wherein $(X)_b$ represents an oligonucleotide which may be present or absent with the proviso that b represents an integer which is greater than or equal to 4 if $(X)_b$ is present.

5. A composition having the formula:

$$3'—[—(Y)_r—Q—(Y)_s—]_z—5'$$

wherein each Q represents a compound of the formula



wherein each X represents a nucleotide which may be the same or different;

wherein each of $(X)_n$ and $(X)_{n'}$ represents an oligonucleotide having a predetermined sequence which is (a) capable of hybridizing with an RNA target sequence to be cleaved and (b) does not naturally occur covalently bound to the sequences A-A-A-G-C- and X-C-U-G-A-, respectively, such RNA target sequence not being present within the compound;

wherein each of n and n' represents an integer which defines the number of nucleotides in the oligonucleotide with the proviso that the sum of n+n' is greater than or equal to 14;

wherein each * represents base pairing between the nucleotides located on either side thereof;

wherein each solid line represents a chemical linkage providing covalent bonds between the nucleotides located on either side thereof;

wherein a represents an integer which defines a number of nucleotides with the proviso that a may be 0 or 1 and if 0, the A located 5' of $(X)_a$ is bonded to the G located 3' of $(X)_a$;

wherein each of m and m' represents an integer which is greater than or equal to 1;

wherein each of the dashed lines independently represents either a chemical linkage providing covalent bonds between the nucleotides located on either side thereof or the absence of any such chemical linkage; and

wherein $(X)_b$ represents an oligonucleotide which may be present or absent with the proviso that b represents an integer which is greater than or equal to 4 if $(X)_b$ is present

which may independently be the same or different;

wherein each Y represents a ribonucleotide which may be the same or different;

wherein each of r and s represents an integer which may be greater than or equal to 0; and

wherein z represents an integer greater than or equal to 1.

5,840,875

KIDNEY NA/PO$_4$ COTRANSPORTER ANTISENSE OLIGONUCLEOTIDE

George F. Schreiner, Los Altos; Timothy W. Meyer, Palo Alto, both of Calif., and Rainer Oberbauer, Vienna, Austria, assignors to C.V. Therapeutics, Palo Alto, Calif.

Filed Jun. 6, 1995, Ser. No. 467,007

Int. Cl.^{6} C07H *21/04;* **C12Q** *1/68;* **C12N** *5/06;* **A61K** *31/70*

U.S. Cl. 536—24.5 **1 Claim**

1. A phosphrothioate oligonucleotide consisting of the nucleotide sequence set forth in SEQ. ID. NO: 1.

5,840,876

2'-O-ALKYLTHIOALKYL AND 2'-C-ALKYLTHIOALKYL-CONTAINING NUCLEIC ACIDS

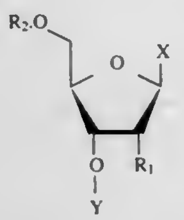
Leonid Beigelman, Longmont, and Alex Karpeisky, Boulder, both of Colo., assignors to Ribozyme Pharmaceuticals, Inc., Boulder, Colo.

Continuation of Ser. No. 426,124, Apr. 20, 1995, Pat. No. 5,716,824. This application Jun. 12, 1997, Ser. No. 873,793

Int. Cl.^{6} C07H *21/04;21/00;* **C12Q** *1/68;* **A61K** *48/00*

U.S. Cl. 536—25.3 **6 Claims**

1. A method for producing an enzymatic nucleic acid molecule having activity to cleave an RNA or a single-stranded DNA molecule, wherein said enzymatic nucleic acid molecule comprises a modified nucleotide, wherein said modified nucleotide has the formula:



wherein, R1 is independently 2'-O-R$_3$-thio-R$_3$ or 2'-C-R$_3$-thio-R$_3$, wherein said R$_3$ is independently a compound selected from a group consisting of alkyl, allyl, alkenyl, alkynyl, aryl, alkylaryl, carbocyclic aryl, heterocyclic aryl, amide and ester; X is independently a base or H; Y is independently a phosphorus-containing group; and R$_2$ is independently a phosphorus-containing group;

comprising the step of incorporating said modified nucleotide into said enzymatic nucleic acid molecule.

5,840,877

ELECTROPHORESIS GELS OF ENHANCED SELECTIVITY

Branko Kozulic, Zurich, Switzerland, assignor to Guest Elchrom Scientific, Cham, Switzerland

Filed Sep. 5, 1996, Ser. No. 708,492

Int. Cl.^{6} C12N *15/10;* **C25B** *7/00;* **C08F** *20/56*

U.S. Cl. 536—25.4 **90 Claims**

1. A gel suited for use in electrophoretic separation of high molecular weight molecules comprising the free radical polymerization reaction product of a mixture of:

at least one monomer; and

at least one vinyl cross linker reactive with said monomer and a polymer of said monomer sufficient to cross link said polymer; and

at least one preformed polymer;

wherein the concentration of a combination of said monomer and said cross linker is at least about 4% (w/v), and the concentration of said preformed polymer is about 0.005 to 2% (w/v);

wherein said gel selectively retards the electrophoretic migration rate of larger macro molecules, as compared to the

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migration rate of smaller macro molecules, from among DNA fragments of about 100 bp to 3,000 bp, by at least 5 fold as compared to the migration rates of the same molecules under the same conditions in a gel of substantially the same concentration and comprising the free radical polymer reaction product of a solution containing identical concentrations of said monomer and said cross linker but in the absence of said preformed polymer,

provided that when the monomer is acrylamide, and the cross linker is N,N'-methylene-bis-acrylamide, the preformed polymer is not agarose.

5,840,878

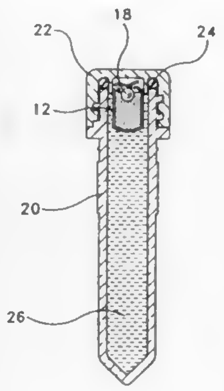
VEHICLE FOR DELIVERY OF PARTICLES TO A SAMPLE

Matthew P. Collis, Valleys, Pa., and Stephen H. Szczepanik, Catonsville, Md., assignors to Becton Dickinson and Company, Franklin Lakes, N.J.

Continuation-in-part of Ser. No. 614,230, Mar. 12, 1996, Pat. No. 5,707,860. This application Aug. 15, 1997, Ser. No. 911,697

Int. Cl.^{6} C12M *3/00;* C07H *21/00*

U.S. Cl. 536—25.4 **9 Claims**



1. A vehicle for delivery of particles to a sample containing cells comprising a dissolvable material which retains the particles until said particles are released into the sample, said particles being sufficiently non-dissolvable to remain undissolved in the sample for a time sufficient to disrupt the cells and render accessible nucleic acids therefrom when the sample is agitated or sonicated.

5,840,879

REAGENTS AND SOLID SUPPORTS FOR IMPROVED SYNTHESIS AND LABELING OF POLYNUCLEOTIDES

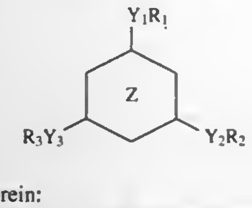
Edge R. Wang, 18886 Sydney Clr., Castro Valley, Calif. 94546

Filed Dec. 6, 1996, Ser. No. 761,711

Int. Cl.^{6} C07H *21/00;21/02;21/04*

U.S. Cl. 536—25.32 **9 Claims**

1. A compound having the structure:



wherein:

Z is 1,3,5 tri-substituted phenyl 1,3,5 tri-substituted heterophenyl, 1,3,5 tri-substituted cyclohexyl or 1,3,5 tri-substituted heterocyclohexyl, wherein said heterophenyl and heterocyclohexyl contain a O, N or S heteroatom at at least one of positions 2, 4 and 6;

R_1 and R_2 are detectable labels or protecting groups independently selected from the group consisting of amine protecting groups and hydroxyl protecting groups; wherein the amine protecting groups are selected from the group consisting of 9-fluorenylmethyloxycarbonyl (Fmoc) and butyloxycarbonyl (BOC) and wherein the hydroxyl protecting groups are selected from the group consisting of dimethoxytrityl (DMT), monomethoxytrityl (MMT) and levulinyl (Lev);

Y_1, Y_2, and Y_3 are linker arms covalently linking R_1, R_2 and R_3, respectively, to Z, and are independently selected from the group consisting of —$NH(CH_2)_nNHCO$—, —$O(CH_2)_nNHCO$, —$NHCOCH_2OCH_2COO(CH_2)_2NHCO$—, —$OOCCH_2OCH_2CONHO(CH_2)_2O$—, —$OOCCH_2OCH_2CONH$—, —N—, —O—, —CONH— and —CH_2O—, wherein n is an integer from 0 to 8; and

R_3 is a coupling group selected from the group consisting of phosphoramidite group, an amine group, a hydroxyl group, and a solid support.

5,840,880

RECEPTOR MODULATING AGENTS

A. Charles Morgan, Jr., and D. Scott Wilbur, both of Edmonds, Wash., assignors to Receptagen Corporation, Edmonds, and University of Washington, Seattle, both of Wash.

Continuation-in-part of Ser. No. 224,831, Apr. 8, 1994, abandoned. This application Mar. 16, 1995, Ser. No. 406,191

Int. Cl.^{6} C12P *19/42;* A61K *31/68*

U.S. Cl. 536—26.4 **13 Claims**

1. A vitamin B_{12} dimer comprising a first and a second vitamin B12 molecule covalently coupled through a coupling site independently selected from the group consisting of coupling sites a–g, coupling site h, and coupling site i.

5,840,881

COMPOSITION CONTAINING A WATER-INSOLUBLE OR SLIGHTLY WATER-SOLUBLE COMPOUND WITH ENHANCED WATER-SOLUBILITY

Yoshiaki Uda, Yonago; Takako Yamauchi, Takarazuka; Yasushi Nakagawa, Kawanishi; Toshihiro Ishiguro, Toyono-gun; Masahide Oka, Kawanishi; Takamasa Yamaguchi, Kobe, and Ikuo Nogami, Nagaokakyo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 353,326, Dec. 5, 1994, abandoned, and Ser. No. 152,122, Nov. 15, 1993, Pat. No. 5,434,061. This application May 8, 1995, Ser. No. 437,227

Claims priority, application Japan, Nov. 27, 1992, 6-318807; Mar. 11, 1993, 5-050652; Jul. 13, 1993, 5-173121; Dec. 6, 1993, 5-305597

Int. Cl.^{6} C08B *37/16*

U.S. Cl. 536—46 **6 Claims**

1. A composition comprising a water-insoluble or slightly water-soluble compound and a branched cyclodextrin-carboxylic acid, said branched cyclodextrin-carboxylic acid being selected from the group consisting of 6-O-cyclomaltoheptaosyl-(6→1)-α-D-glucosyl-(4→1)-O-α-D-glucuronic acid, 6-O-cyclomaltoheptaosyl-(6→1)-α-D-glucuronic acid and 2-hydroxy-3-O-(6-cyclomaltoheptaosyl)propionic acid.

5,840,882

PROCESS FOR PREPARING CELLULOSE ETHERS WITH RECOVERY OF ALKALI

Reinhard Doenges, Bad Soden, and Rudolf Ehrler, Floersheim, both of Germany, assignors to Clariant GmbH, Frankfurt, Germany

Filed Aug. 20, 1997, Ser. No. 911,946

Claims priority, application Germany, Aug. 22, 1996, 196 33 826.3

Int. Cl.^{6} C07H *1/00;15/08*

U.S. Cl. 536—91 **15 Claims**

1. A process for the preparation of hydroxyalkyl cellulose ethers, comprising:

(a) etherifying cellulose with an alkylene oxide in a water-containing organic suspension medium in the presence of an effective quantity of inorganic alkali which is approximately at least one equivalent of inorganic alkali per mole of anhydroglucose units in the cellulose, to obtain a crude hydroxyalkylcellulose ether;

(b) separating the water-containing organic suspension medium from the crude hydroxyalkyl cellulose ether, said crude hydroxylalkyl cellulose ether containing a major amount of said effective quantity of inorganic alkali, the thus-separated water-containing organic suspension medium containing a minor amount of said effective quantity of inorganic alkali;

(c) extracting essentially said major amount from said crude hydroxyalkyl cellulose ether, with a liquid organic extracting medium capable of extracting inorganic alkali, to obtain an eluate containing essentially said major amount and separating out, from said eluate, hydroxyalkylcellulose contaminated with essentially only a residual amount of inorganic alkali;

(d) treating with acid said hydroxyalkylcellulose contaminated with only a residual amount of inorganic alkali to neutralize essentially only said residual amount of inorganic alkali;

(e) separating essentially all of said inorganic alkali in said eluate from said eluate;

(f) recovering the thus-separated inorganic alkali in sufficient purity for use in the etherification of cellulose with an alkylene oxide or for use in partial hydrolysis of cellulose.

5,840,883

DEXTRIN ESTER OF FATTY ACIDS AND USE THEREOF

Takanao Suzuki, Hiratsuka; Isaburo Amano; Koji Chiba, both of Chiba, and Ruka Tofukuji, Tokyo, all of Japan, assignors to Chiba Flour Milling Co., Ltd., Chiba, and Kose Corporation, Tokyo, both of Japan

Filed Apr. 2, 1996, Ser. No. 626,469

Claims priority, application Japan, Apr. 5, 1995, 7-080050

Int. Cl.^{6} C08B *30/18;31/02;31/04*

U.S. Cl. 536—103 **12 Claims**

1. A dextrin ester of fatty acids in which dextrin has an average glucose polymerization degree of 3 to 150, the fatty acids comprise a straight chain fatty acid having 8 to 22 carbon atoms and at least one fatty acid selected from the group consisting of branched fatty acids each having 4 to 26 carbon atoms, unsaturated fatty acids each having 6 to 30 carbon atoms and straight chain saturated fatty acids each having 6 or less carbon atoms, and the degree of substitution of fatty acids per glucose unit is 1.0 to 3.0.

5,840,884

METHOD FOR CONTROLLING CRYSTAL MORPHOLOGY OF INULIN

Daniel G. Lis, Wheeling, and Lisa Anne Preston, Chicago, both of Ill., assignors to Kraft Foods, Inc., Northfield, Ill.

Filed Feb. 27, 1997, Ser. No. 805,206

Int. Cl.^{6} C07H *1/06;* C08B *37/18*

U.S. Cl. 536—127 **26 Claims**

1. A method for controlling the crystal morphology of inulin, said method comprising;

(1) forming an aqueous mixture containing about 10 to 50 weight percent inulin, wherein the inulin has the general formula GF_n where G represents a glucose ring, F represents a fructose ring, and the average value of n is about 2 to about 15;

(2) heating the aqueous mixture either to a temperature below or to a temperature above a crystal transitional temperature for the mixture and maintaining that temperature for at least about five minutes; and

(3) cooling the heated aqueous mixture to ambient temperature to obtain at least 70 weight percent inulin needle-like crystals if the temperature in step (2) is below the crystal transitional temperature or to obtain obloid inulin crystals with essentially no needle-like crystals if the temperature in step (2) is above the crystal transition temperature.

5,840,885

PROCESSES FOR THE PRODUCTION OF 6-α-AMINOACYL-PENICILLIN AND 7-α-AMINOACYL-DESACETOXYCEPHALOSPORIN DERIVATIVES

Jose Diago, Granollers, Spain, and Johannes Ludescher, Breitenbach, Austria, assignors to Biochemie Gesellschaft m.b.H., Kundl, Austria

Continuation of Ser. No. 278,772, Jul. 21, 1994, abandoned, which is a continuation of Ser. No. 922,277, Jul. 29, 1992, abandoned, which is a continuation of Ser. No. 643,876, Jan. 18, 1991, abandoned. This application Jun. 6, 1995, Ser. No. 468,148

Claims priority, application Austria, Jan. 22, 1990, 127/90

Int. Cl.^{6} C07D *487/00;499/04;501/20*

U.S. Cl. 540—222 **18 Claims**

1. In a process for the preparation of a 6-α-aminoacyl-penicillin derivative or a 7-α-aminoacyl-desacetoxy-cephalosporin derivative comprising the steps of

i) preparing a mixed carboxylic acid anhydride by reacting an N-substituted-vinyl-α-amino acid or a salt thereof with an acylating agent,

ii) reacting the obtained mixed carboxylic acid anhydride with 6-APA, 7-ADCA or a derivative of 6-APA or 7-ADCA, in free acid or salt form, and

iii) isolating the product,

the improvement which comprises carrying out

step i) in a solvent which does not contain any halogen atoms and which is water-immiscible or sparingly soluble in water or a mixture of such solvents,

step ii) in a solvent which does not contain any halogen atoms or a mixture of such solvents and with 6-APA, 7-ADCA or a non-silylated derivative of 6-APA or 7-ADCA, in free acid or salt form and

step iii) by adjusting the pH to obtain the product in a yield greater than 80% and a purity of at least 97.0%, the product being free from halogen-containing solvent.

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5,840,886

SILVER HALIDE PHOTOGRAPHIC MATERIAL AND HYDROXAMIC ACID BASED COMPOUND USED THEREFORE

Hisashi Mikoshiba; Hiroo Takizawa; Junichiro Hosokawa; Yoshio Ishii; Keiji Mihayashi, and Masakazu Morigaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

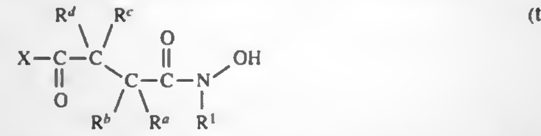
Division of Ser. No. 519,019, Aug. 24, 1995, Pat. No. 5,667,959. This application Jun. 2, 1997, Ser. No. 867,526

Claims priority, application Japan, Aug. 25, 1994, 6-222731; Mar. 10, 1995, 7-78443; Jun. 14, 1995, 7-170457

Int. Cl.^{6} C07D *265/30;* **C07C** *205/00;61/08*

U.S. Cl. 544—162 10 Claims

1. A compound represented by the following formula (II):


(II)

wherein R^1 represents a substituted or unsubstituted alkyl group having from 1 to 6 carbon atoms; R^a, R^b, R^c and R^d each independently represents a hydrogen atom, a substituted or unsubstituted alkyl group having from 1 to 18 carbon atoms, or a substituted or unsubstituted alkenyl group having from 2 to 18 carbon atoms; X represents —OR^6; and R^6 represents a hydrogen atom, a substituted or unsubstituted alkyl group having from 1 to 22 carbon atoms, a substituted or unsubstituted alkenyl group having from 2 to 22 carbon atoms, or an aryl group having from 6 to 22 carbon atoms, provided that when all of R^a, R^b, R^c and R^d represent hydrogen atoms, R^6 and R^7 represent a substituted or unsubstituted alkyl group having 14 or more carbon atoms or an aryl group having from 6 to 22 carbon atoms.

5,840,887

Patent Not Issued For This Number

5,840,888

CERTAIN ARYL AND CYCLOALKYL FUSED IMIDAZOPYRAZINEDIONES; A NEW CLASS OF GABA BRAIN RECEPTOR LIGANDS

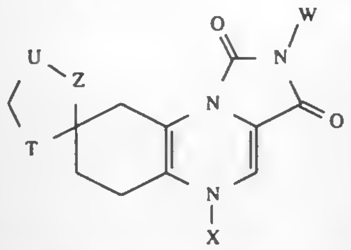
Kenneth Shaw, Weston, and Alan Hutchison, Madison, both of Conn., assignors to Neurogen Corporation, Branford, Conn.

Continuation of Ser. No. 331,561, Oct. 28, 1994, Pat. No. 5,693,801, which is a continuation-in-part of Ser. No. 876,502, Apr. 30, 1992, Pat. No. 5,266,698. This application Jun. 6, 1995, Ser. No. 465,693

Int. Cl.^{6} C07D *491/20;471/14;487/04;* **A61K** *31/495*

U.S. Cl. 544—230 1 Claim

1. A compound of the formula:



or the pharmaceutically acceptable salts thereof wherein

W is phenyl, thienyl, or pyridinyl, each of which is optionally substituted with halogen, hydroxy, straight or branched chain lower alkyl having 1–6 carbon atoms, amino, mono or dialkylamino where each alkyl is straight or branched chain lower alkyl having 1–6 carbon atoms, or straight or branched chain lower alkoxy having 1–6 carbon atoms;

Z is methylene, oxygen, or NR_{25} where

R_{25} is hydrogen, straight or branched chain lower alkyl having 1–6 carbon atoms, phenyl, pyridinyl, or phenylalkyl or pyridinylalkyl where each alkyl is straight or branched chain lower alkyl having 1–6 carbon atoms;

T is methylene or oxygen;

U is methylene or carbonyl; and

X represents hydrogen or straight or branched chain lower alkyl having 1–6 carbon atoms.

5,840,889

SYNTHESIS OF ESTROGEN-PURINE BASE AND ESTROGEN-MERCAPTURATE ADDUCTS AND DEVELOPMENT OF FLUORESCENT PROBES AND MONOCLONAL ANTIBODIES TO ASSAY THOSE ADDUCTS

Ercole L. Cavalieri; George P. Casale; Eleanor G. Rogan, and Douglas E. Stack, all of Omaha, Nebr., assignors to The Board of Regents of the University of Nebraska, Lincoln, Nebr.

Filed Apr. 19, 1996, Ser. No. 634,941

Int. Cl.^{6} C07D *473/00;* **C07J** *1/00*

U.S. Cl. 544—264 3 Claims

1. A substantially pure adduct of an estrogen and a purine wherein the adduct is selected from the group consisting of 7[4-hydroxyestron-1(α,β)-yl]guanine, 7[4-hydroxyestradiol-1(α,β)-yl]guanine, N^2[2-hydroxyestron-6-yl]deoxyguanosine, N^2[2-hydroxyestradiol-6-yl]deoxyguanosine, N^6[2-hydroxyestron-6-yl]deoxyadenosine, and N^6[2-hydroxyestradiol-6-yl]deoxyadenosine.

5,840,890

PROCESS FOR PREPARING A 2-(2-AMINO-1,6-DIHYDRO-6-OXO-PURIN-9-YL)METHODY-1,3-PROPANEDIOL DERIVATIVE

Humberto B. Arzeno, Cupertino; Eric R. Humphreys, San Bruno, both of Calif.; Jim-Wah Wong, Boulder, and Christopher R. Roberts, Berthoud, both of Colo., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

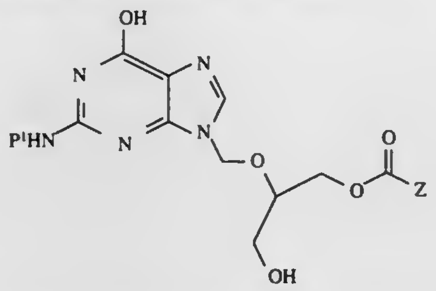
Continuation-in-part of Ser. No. 592,282, Jan. 26, 1996, abandoned. This application Jan. 9, 1997, Ser. No. 775,424

Int. Cl.^{6} C07D *473/18;* **C07B** *51/00*

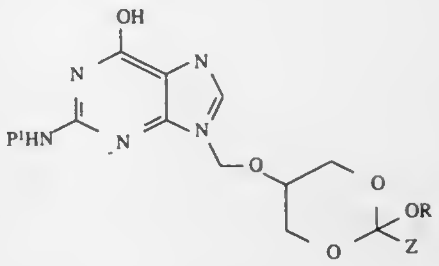
U.S. Cl. 544—276 33 Claims

1. A process for preparing the compound 2-(2-amino-1,6-dihydro-6-oxo-purin-9-yl)methoxy-3-hydroxy-1-propyl-L-valinate or a pharmaceutically acceptable salt or diastereomer thereof, comprising:

(a) transesterifying an orthoester of Formula (II), Z—C(OR)$_3$, wherein R is lower alkyl, allyl or aralkyl, and Z is hydrogen, lower alkyl, aryl or aralkyl, with optionally protected 2-(2-amino-1,6-dihydro-6-oxo-purin-9-yl)methoxy-1,3-propanediol (ganciclovir) of the Formula

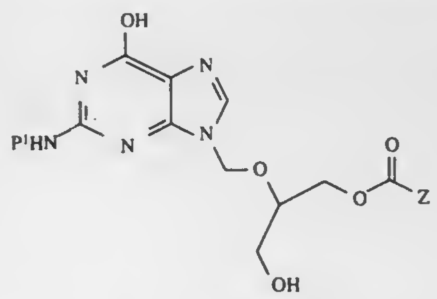


wherein P^1 is hydrogen or an amino-protecting group, in the presence of an organic acid catalyst, to produce a cyclic orthoester of Formula (III)



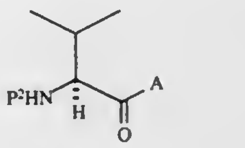
wherein P^1, R and Z are as defined above;

(b) cleaving the compound of Formula (III) by acidic hydrolysis or by hydrogenolysis to a monocarboxylate of Formula (IV)

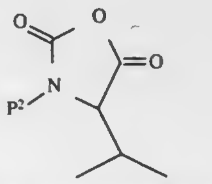


wherein p^1 and Z are as defined above;

(c) esterifying the monocarboxylate of Formula (IV) with an activated protected derivative of L-valine of Formulae (V) or (Va)

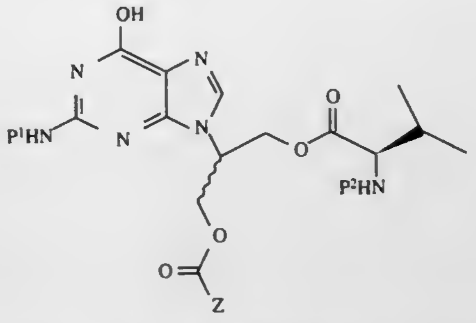


(V)



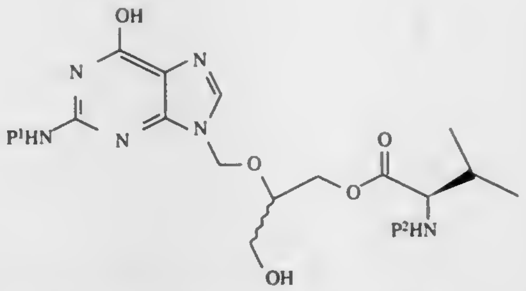
(Va)

wherein A is a carboxy-activating group, and P^2 is an amino-protecting group, to produce a monocarboxylate-monovalinate of Formula (VI)



wherein P^1, P^2 and Z are as defined above;

(d) selectively hydrolyzing the monocarboxylate-monovalinate of Formula (VI) to a monovalinate of Formula (VII)



wherein P^1 and P^2 are as defined above; and

(e) deprotecting the compound of Formula (VII) to 2-(2-amino-1,6-dihydro-6-oxo-purin-9-yl)methoxy-3-hydroxy-1-propyl-L-valinate or a pharmaceutically acceptable salt thereof; optionally followed by

(f) converting 2-(2-amino-1,6-dihydro-6-oxo-purin-9-yl)methoxy-3-hydroxy-1-propyl-L-valinate into a pharmaceutically acceptable salt thereof; or

(g) separating the 2-(2-amino-1,6-dihydro-6-oxo-purin-9-yl)methoxy-3-hydroxypropyl-L-valinate into its (R) and (S) diastereomers.

5,840,891

2-(2-AMINO-1,6-DIHYDRO-6-OXO-PURIN-9-YL) METHOXY-1,3-PROPANEDIOL DERIVATIVE

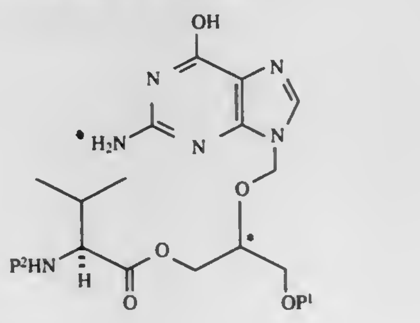
John J. Nestor, Jr., Louisville, Ky., and Hans Maag, Menlo Park, Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation of Ser. No. 453,223, May 30, 1995, which is a continuation-in-part of Ser. No. 287,893, Jul. 28, 1994, abandoned. This application Mar. 4, 1997, Ser. No. 812,990

Int. Cl.^{6} C07D *473/18;* **A61K** *31/52*

U.S. Cl. 544—276 6 Claims

1. A compound of the formula



where

P^1 is a hydroxy-protecting group;

P^2 is an amino-protecting group; and

the asterisk denotes an asymmetric carbon atom.

5,840,892

PROCESS FOR THE PREPARATION OF SUBSTITUTED PYRIMIDINES

Yves Bessard, Sierre, and Gerhard Stucky, Brig-Glis, both of Switzerland, assignors to Lonza AG, Gampel/Valais, Switzerland

Filed Apr. 8, 1997, Ser. No. 838,321

Claims priority, application Switzerland, Apr. 9, 1996, 0893/96

Int. Cl.^{6} C07D *401/06;239/34;239/52*

U.S. Cl. 544—302 24 Claims

1. A process for the preparation of a substituted pyrimidine derivative of formula:

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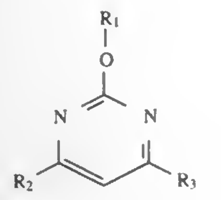
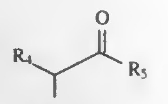


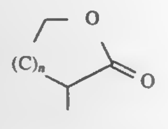
I

wherein R_1 is:



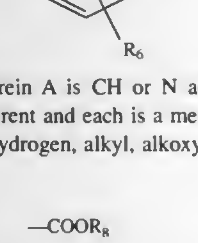
(i)

wherein R_4 is a member of the group consisting of H, alkyl, aryl, arylalkyl, carboxyl, alkylcarbonyl and alkoxycarbonyl, and wherein R_5 is a member selected from the group consisting of hydroxyl, alkoxy, aryloxy and alkyl,



(ii)

wherein n is 1 or 2,

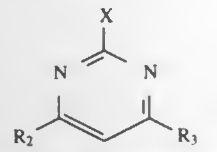


(iii)

wherein A is CH or N and wherein R_6 and R_7 are identical or different and each is a member selected from the group consisting of hydrogen, alkyl, alkoxy, aryl, aryloxy and group

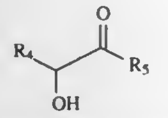
—$COOR_8$

wherein R_8 is hydrogen, alkyl or aryl, and R_2 and R_3 are identical or different and each is a member selected from the group consisting of H, alkyl, alkoxy, alkylthio, halogen, haloalkoxy, amino, alkylamino and dialkylamino, comprising reacting a halopyrimidine of formula:



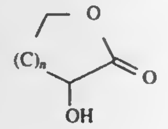
II

wherein X is a halogen atom, and R_2 and R_3 have the stated meanings, is reacted with a hydroxyl compound selected from the series:



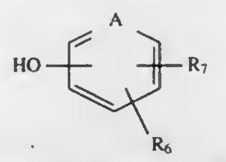
IIIa

wherein R_4 and R_5 have the stated meanings,



IIIb

wherein n has the stated meaning,



IIIc

wherein A, R_6 and R_7 have the stated meanings, in the presence of a catalytic amount of a sulfinate of formula:

$R_9SO_2^-M^+$ IV

wherein R_9 is a member selected from the group consisting of H, alkyl, aryl, arylalkyl and alkoxyaryl, and M is an alkali metal or alkaline earth metal atom, and in the presence of an inorganic or organic base to give the final product.

5,840,893

COMPOUNDS FOR TREATING INFECTIOUS DISEASES

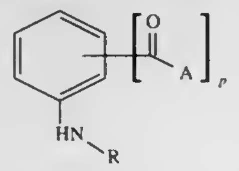
Michael I. Bukrinsky, Glenwood Landing; Anthony Cerami, Shelter Island; Peter Ulrich, Old Tappan, and Bradley J. Berger, Greenlawn, all of N.Y., assignors to The Picower Institute for Medical Research, Manhasset, N.Y.

Continuation-in-part of Ser. No. 463,405, Jun. 5, 1995, which is a continuation-in-part of Ser. No. 369,830, Jan. 6, 1995, Pat. No. 5,574,040. This application Jan. 5, 1996, Ser. No. 584,857

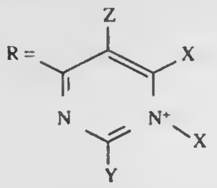
Int. Cl.^{6} C07D *239/48;251/42*

U.S. Cl. 544—329 **1 Claim**

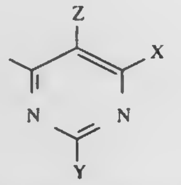
1. A compound according to the formula:



wherein A, independently,=CH_3 or CH_2CH_3, P=[0,} 1 or 2; and

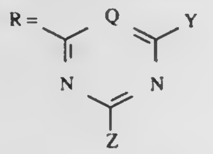


(1)



(2)

wherein X=NH_2, CH_3 or CH_2CH_3; X'=CH_3 or CH_2CH_3; Y=NH_2, $NHCH_3$, $N(CH_3)_2$; and Z=H, CH_3 or CH_2CH_3; or



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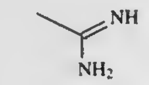

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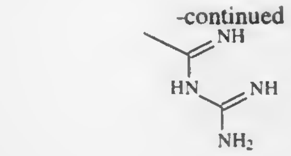

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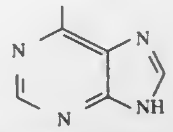


(6)

wherein Y' and Z', independently,=H, NH_2, $NHCH_3$, $N(CH_3)_2$ or $N^+(CH_3)_3$; Q is N or CH; and salts thereof.

5,840,894

PREPARATION OF 1,2,4-TRIAZOLIUM SALTS AND 1,2,4-TRIAZOLINES

Regina Schneider, Fussgönheim; Johann-Peter Melder, Neuhofen; Joaquim Henrique Teles, Ludwigshafen; Carsten Gröning, Mannheim, and Klaus Ebel, Lampertheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

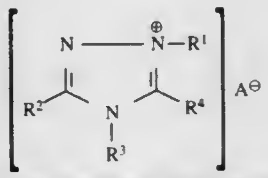
Filed Jun. 21, 1996, Ser. No. 668,140

Claims priority, application Germany, May 22, 1995, 195 22 715.8

Int. Cl.^{6} C07D *249/08;249/16*

U.S. Cl. 544—350 **2 Claims**

1. A process for preparing 1,2,4-triazolium salts of the formula Ia



Ia

wherein the substituents have the following meanings:

R^1, R^2 and R^3 are organic radicals,

R^1 being selected from the group consisting of phenyl, 2,6-dimethylphenyl, and 3,5-dichlorophenyl;

R^2 being phenyl; and

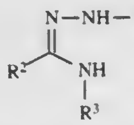
R^3 being selected from the group consisting of phenyl, 4-nitrophenyl, 2,6-dimethylphenyl, and 3,5-dichlorophenyl;

R^2 and R^3 being capable of forming together a unit selected from the group consisting of —CH=N—CH=CH—, —CH=CH—CH=CH—, and —$CH_2CH_2CH_2$—;

R^4 is selected from the group consisting of hydrogen, hydroxymethyl and 1,2-dihydroxyethyl; and

A is an anion as hereinafter set forth;

which process comprises reacting an amidrazone of the formula II



II

with a carboxylic acid of the formula III

R^4—COOH III

or a functional derivative (IIIa) of this carboxylic acid III, which functional derivative is selected from the group consisting of carbonyl chlorides, carboxylic acid esters, amides, and anhydrides;

an anion A being formed from and being the base of III or IIIa and being selected from the group consisting of HCO_2^-, $HOCH_2CO_2^-$, $R^1CO_2^-$, $R^2CO_2^-$, $R^3CO_2^-$, $CH_3CO_2^-$, Cl^-, and ClO_4^-, which anion A, optionally, can be exchanged with another anion A' by treating with an acid HA, the anion A' being selected from the group consisting of $CH_3CO_2^-$, and Cl^-, and Br^-.

5,840,895

TRIAZOLE INTERMEDIATES FOR TRICYCLIC BENZAZEPINE AND BENZOTHIAZEPINE DERIVATIVES

Yasuo Ohtsuka; Takashi Shishikura; Hiroko Ogino; Kenichi Fushihara; Mami Kawaguchi; Seiji Tsutsumi; Megumi Imai; Keiko Shito; Koji Tsuchiya; Junko Tanaka; Takako Iwasaki; Shigeru Hoshiko, and Takashi Tsuruoka, all of Kanagawa-ken, Japan, assignors to Meiji Seika Kabushiki Kaisha, Tokyo-To, Japan

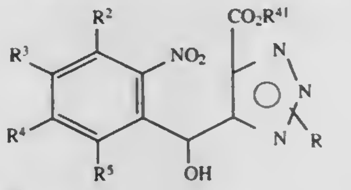
Division of Ser. No. 522,263, Oct. 26, 1995, Pat. No. 5,686,442. This application Jun. 26, 1997, Ser. No. 883,313

Claims priority, application Japan, Dec. 28, 1993, 5-337189; Aug. 26, 1994, 6-202349

Int. Cl.^{6} C07D *249/04*

U.S. Cl. 544—366 **4 Claims**

1. A compound represented by the formula (II), or a salt thereof,



(II)

wherein

—R represents
  hydrogen;
  C_{1-6} alkyl optionally substituted by halogen, hydroxyl, C_{3-7} cycloalkyl or C_{1-4} alkoxy;
  phenyl C_{1-4} alkyl, of which the hydrogen atoms on the benzene ring may be optionally substituted by halogen, hydroxyl, nitro, C_{1-4} alkyl or C_{1-4} alkoxy; or
  a protective group of the triazole group;

—R^2, R^3, R^4 and R^5, which may be the same or different, represent any one of the following (a)–(v):

- (a) hydrogen;
- (b) halogen;
- (c) hydroxyl which may be protected;
- (d) cyano;
- (e) nitro;
- (f) thiol;
- (g) formyl;
- (h) C_{1-12} alkyl optionally substituted by halogen, hydroxyl or C_{3-7} cycloalkyl;
- (i) phenyl optionally substituted by C_{1-4} alkyl;
- (j) phenyl C_{1-4} alkyl, of which the hydrogen atoms on the benzene ring may be optionally substituted by halogen, hydroxyl, nitro, amino, sulfonyl, C_{1-4} alkyl or C_{1-4} alkoxy;
- (k) C_{2-12} alkenyl, which includes one or more carbon-carbon double bonds and may be optionally substituted by
  - (1) halogen,
  - (2) cyano,
  - (3) C_{3-7} cycloalkyl.
  - (4) phenyl,
  - (5) a group—COR^9. wherein R^9 represents
    hydrogen,
    C_{1-6} alkyl, or
    phenyl optionally substituted by halogen. hydroxyl. C_{1-4} alkyl or C_{1-4} alkoxy,
  - (6) a group—$COOR^{10}$, wherein R^{10} represents hydrogen or C_{1-6} alkyl,
  - (7) a group—$CONR^{11}R^{12}$, wherein R^{11} and R^{12}, which may be the same or different, represent
    - (i) hydrogen,
    - (ii) C_{1-6} alkyl optionally substituted by hydroxyl;
      C_{1-4} alkoxy; amino which may be optionally substituted by C_{1-4} alkyl, C_{1-6} alkylcarbonyl, benzoyl, α-naphthoyl. β-naphthoyl or sulfonyl;
      phenyl which may be optionally substituted by halogen, hydroxyl, C_{1-4} alkyl (which may be optionally substituted by a saturated 5–7 membered heterocyclic ring containing one or two nitrogen atoms, which heterocy-

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clic ring is selected from the group consisting of piperidino, 4-piperidinyl, 1-pyrrolidinyl, piperadinyl and morpholino and which may be optionally substituted by C_{1-4} alkyl), C_{1-4} alkoxy or carboxyl; or

a saturated or unsaturated 5–7 membered heterocyclic ring containing one or more of oxygen atoms, nitrogen atoms or sulfur atoms, which heterocyclic ring is selected from the group consisting of pyridine, imidazole, oxazole, thiazole, pyrimidine, furan, thiophene, pyrrole, pyrrolidine, piperidine, tetrahydrofuran, oxazoline, quinoline and isoquinoline and which heterocyclic ring may be optionally substituted by C_{1-4} alkyl or phenyl C_{1-4}alkyl or may be a bicyclic ring fused with another ring, or

- (iii) phenyl, or
- (iv) a saturated or unsaturated 5–7 membered heterocyclic ring Which is formed by R^{11} and R^{12} together wish the nitrogen atom R^{11} and R^{12} attached thereto and may further contain ore or more of oxygen atoms, nitrogen atoms or sulfur atoms, which heterocyclic ring is selected from the group consisting of tetrazole, thiazole, imidazole, pyridine, pyrimidine and pyrazine and which heterocyclic ring may be optionally substituted by C_{1-4} alkyl or phenyl C_{1-4} alkyl or may be a bicyclic ring fused with another ring;

(l) C_{1-12} alkoxy optionally substituted by
- (1) halogen,
- (2) hydroxyl,
- (3) cyano,
- (4) C_{3-7} cycloalkyl,
- (5) epoxy,
- (6) phenyl optionally substituted by halogen, hydroxyl, nitro, C_{1-4} alkyl or C_{1-4} alkoxy,
- (7) C_{1-4}alkoxy,
- (8) phenoxy optionally substituted by halogen, hydroxyl, C_{1-4} alkyl, C_{1-4} alkoxy or carboxyl,
- (9) amino optionally substituted by C_{1-4} alkyl, C_{1-6} alkylcarbonyl, benzoyl, α-naphthoyl, β-naphthoyl or sulfonyl,
- (10) a group—COR^{13}, wherein R^{13} represents
  - hydrogen,
  - C_{1-6} alkyl,
  - phenyl optionally substituted by halogen, hydroxyl, C_{1-4} alkyl or C_{1-4} alkoxy, or
  - phenyl C_{1-4} alkyl, of which the hydrogen atoms on the benzene ring may be optionally substituted by halogen, hydroxyl, C_{1-4} alkyl, C_{1-4} alkoxy or carboxyl,
- (11) a group—$COOR^{14}$, wherein R^{14} represents hydrogen or C_{1-6} alkyl,
- (12) a group—$CONR^{15}R^{16}$, wherein R^{15} and R16 may be the same or different and represent
  - hydrogen,
  - C_{1-6} alkyl optionally substituted by hydroxyl, C_{1-4} alkoxy, or amino (which may be optionally substituted by C_{1-4} alkyl, C_{1-6} alkylcarbonyl, benzoyl, α-naphthoyl, β-naphthoyl or sulfonyl), or phenyl, or
- (13) a saturated or unsaturated 5–7 membered heterocyclic ring containing one or more of oxygen atoms, nitrogen atoms or sulfur atoms, which heterocyclic ring is selected from the group consisting of piperidino, 4-piperidinyl, 1-pyrrolidinyl, piperazinyl and morpholino and which heterocyclic ring may be optionally substituted by C_{1-4} alkyl or phenyl C_{1-4} alkyl, or may be a bicyclic ring fused with another ring,

(m) phenoxy optionally substituted by hydroxyl, C_{1-4} alkyl, C_{1-4} alkoxy or carboxyl;

(n) C_{2-12} alkenyloxy optionally substituted by C_{1-4} alkyl or phenyl;

(o) C_{1-12} alkylthio optionally substituted by hydroxyl, C_{3-7} cycloalkyl, C_{2-4} alkenyl, C_{1-4} alkoxy or benzyl;

(p) a group—$C{=}N—OR^{26}$, wherein R^6 represents
- hydrogen,
- C_{1-6} alkyl,
- phenyl C_{1-4} alkyl, or
- phenyl;

(q) a group—$(CH_2)_mOR^{17}$, wherein m is an integer of 1–4, and R^{17} represents
- hydrogen,
- C_{1-6} alkyl optionally substituted by halogen, hydroxyl or C_{3-7} cycloalkyl,
- phenyl C_{1-4} alkyl, of which the hydrogen atoms of the benzene ring may be optionally substituted by hydroxyl,
- C_{1-4} alkyl or C_{1-4} alkoxy,
- phenyl, or
- C_{1-4} alkylcarbonyl;

(r) a group—$(CH_2)_k—COR^{18}$, wherein k is an integer of 1– 4, and R^{18} represents
- hydrogen,
- C_{1-12} alkyl optionally substituted by hydroxyl, C_{3-7} cycloalkyl or C_{1-4} alkoxy, or
- phenyl optionally substituted by halogen, hydroxyl, nitro, C_{1-4} alkyl or C_{1-4} alkoxy;

(s) a group—$(CH_2)_j—COOR^{19}$, wherein j is an integer of 0– 4, and R^{19} represents
- hydrogen,
- C_{1-12} alkyl optionally substituted by halogen, hydroxyl or C_{1-4} alkoxy, or
- benzyl, of which the hydrogen atoms on the benzene ring may be optionally substituted by C_{3-7} cycloalkyl, C_{2-4} alkenyl, halogen, hydroxyl, nitro, C_{1-4} alkyl or C_{1-4} alkoxy, or
- a protective group of carboxyl;

(t) a group—$(CH_2)_p—NR^{20}R^{21}$, wherein p is an integer of 0– 4, and R^{20} and R^{21} may be the same or different and represent
- (1) hydrogen,
- (2) C_{1-6} alkyl optionally substituted by hydroxyl, amino (which may be optionally substituted by C_{1-4} alkyl, C_{1-6} alkylcarbonyl, benzoyl, α-naphthoyl, β-naphthoyl or sulfonyl), C_{3-7} cycloalkyl or C_{1-4} alkoxy,
- (3) phenyl C_{1-4} alkyl, of which the hydrogen atoms on the benzene ring may be optionally substituted by halogen, hydroxyl, nitro, cyano, C_{1-4} alkyl, C_{1-4} alkoxy or carboxyl,
- (4) a group—COR^{27}, wherein R^{27} represents
  - hydrogen,
  - C_{1-4} alkyl optionally substituted by hydroxyl or carboxyl, or
  - C_{3-7} cycloalkyl optionally substituted by hydroxyl or carboxyl, or
- (5) a group—SO_2R^{28}, wherein R^{28} represents
  - C_{1-4} alkyl,
  - phenyl optionally substituted by halogen, hydroxyl, nitro, cyano, C_{1-4} alkyl, C_{1-4} alkoxy or carboxyl, or
  - amino optionally substituted by C_{1-4} alkyl, C_{1-6} alkylcarbonyl, benzoyl, α-naphthoyl, β-naphthoyl or sulfonyl, or
- (6) a saturated or unsaturated 5–7 membered heterocyclic ring formed by R^{20} and R^{21} together with the nitrogen atom R^{20} and R^{21} attached thereto, which heterocyclic ring may further contain one or more of oxygen atoms, nitrogen atoms or sulfur atoms, which heterocyclic ring is selected from the group consisting of piperazino, piperidino, morpholino, succinimido, indolyl, isoindolyl, phthalimido and benzothiazolyl and may be optionally substituted by C_{1-4} alkyl or carbonyl;

(u) a group—$(CH_2)_q—CONR^{22}R^{23}$, wherein
- q is an integer of 0–4, and
- R^{22} and R^{23} may be the same or different and represent hydrogen,
- C_{1-6} alkyl (optionally substituted by C_{3-7} cycloalkyl),
- C_{3-7} cycloalkyl, phenyl (optionally substituted by hydroxyl, C_{1-4} alkyl or C_{1-4} alkoxy),
- sulfonyl, or
- a saturated or unsaturated 5–7 membered heterocyclic ring formed by R^{22} and R^{23} together with the nitrogen atom R^{22} and R^{23} attached thereto, which heterocyclic ring may further contain one or more of oxygen atoms, nitrogen atoms or sulfur atoms, which heterocyclic ring is selected from the group consisting of piperazino, piperidino, morpholino, succinimido, indolyl, isoindolyl, phthalimido and benzothiazolyl and may be optionally substituted by C_{1-4} alkyl;

(v) a group—$NR^{29}R^{30}$, wherein R^{29} and R^{30}, which may be the same or different, represent
- (1) hydrogen,
- (2) C_{1-6} alkyl optionally substituted by
  - halogen,
  - hydroxyl,
  - C_{1-4} alkoxy, or
  - amino which may be optionally substituted by C_{1-4} alkyl, C_{1-6} alkylcarbonyl, benzoyl, α-naphthoyl, β-naphthoyl or sulfonyl,
- (3) phenyl C_{1-4} alkyl, of which the hydrogen atoms on the benzene ring may be optionally substituted by halogen, hydroxyl, nitro, cyano, C_{1-4} alkyl or C_{1-4} alkoxy,
- (4) a group—COR^{31}, wherein R^{31} represents
  - hydrogen,
  - C_{1-6} alkyl optionally substituted by halogen, hydroxyl, C_{1-4} alkyl or C_{1-4} alkoxy, or phenyl optionally substituted by halogen, hydroxyl, nitro, cyano, C_{1-4} alkyl or C_{1-4} alkoxy,
- (5) a group—$COOR^{32}$, ;herein R^{32} represents
  - C_{1-6} alkyl, or
  - phenyl which may be optionally substituted by halogen, hydroxyl, nitro, cyano, C_{1-4} alkyl or C_{1-4} alkoxy,
- (6) a group—$CONR^{34}R^{35}$, wherein R^{34} and R^{35} may be the same or different and represent
  - hydrogen,
  - C_{1-6} alkyl optionally substituted by C_{1-4} alkyl or
  - amino which may be optionally substituted by C_{1-4} alkyl, C_{1-6} alkylcarbonyl, benzoyl, α-naphthoyl, β-naphthoyl or sulfonyl, or
  - phenyl, or
- (7) a group SO_2R^{36}, wherein R^{36} represents
  - C_{1-6} alkyl,
  - phenyl optionally substituted by C_{1-4} alkyl, C_{1-4} alkoxy or halogen, or
  - α- or β-naphthyl, and

—R^{41} represents hydrogen, C_{1-6} alkyl which may be optionally substituted, or a protective group of carboxyl.

5,840,896

METHOD OF PREVENTING OR LIMITING REPERFUSION DAMAGE

Herman Van Belle, and Willy Joannes Carolus Van Laerhoven, both of Beerse, Belgium, assignors to Janssen Pharmaceutica, N.V., Beerse, Belgium

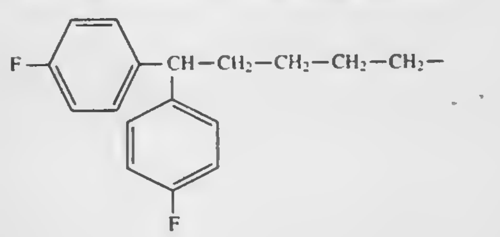
Division of Ser. No. 730,836, Jul. 12, 1991, abandoned, which is a continuation-in-part of Ser. No. 440,142, Nov. 22, 1989, abandoned. This application Apr. 18, 1995, Ser. No. 424,687

Int. Cl.⁶ C07D *241/04*

U.S. Cl. 544—390 **11 Claims**

1. A process of preparing the compound (1)-(–)-2-aminocarbonyl)-N-(4-amino-2,6-dichlorophenyl)-4-[5,5-bis(4-fluorophenyl)-pentyl]-1-piperazineacetamide (I-b)

(I-b)



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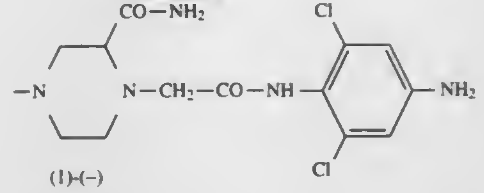
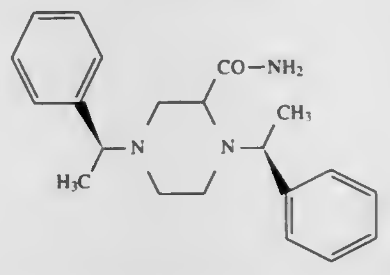


characterized by,

a) cyclizing(–)-(S,S)-N^1,N^2-bis(1-phenylethyl)-1,2-ethanediamine (II) with 2,3-dibromopropanamide (III) in a reaction-inert solvent in the presence of a base, thus yielding an intermediate of the formula:

(IV)

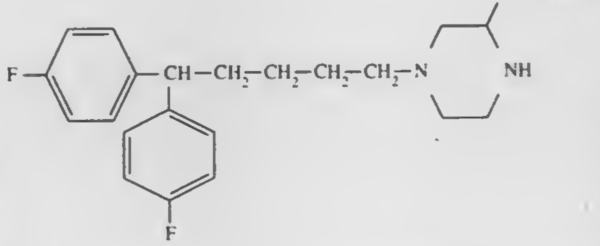


b) separating the intermediate of Formula (IV) into two stereoisomers and recovering thereby [1(S),2(S),4(S)]-1,4-bis(1-phenylethyl)-2-piperazinecarboxamide;

c) hydrogenolyzing said [1(S),2(S),4(S)]-1,4-bis(1-phenylethyl)-2-piperazinecarboxamide under a hydrogen atmosphere in an alkanol in the presence of a hydrogenation catalyst to produce (+)-2-piperazinecarboxamide (V);

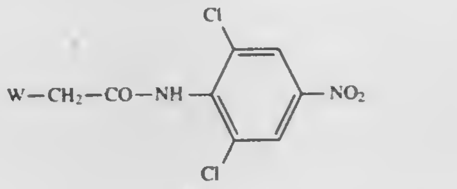
d) reductively N-alkylating said (+)2-piperazinecarboxamide (V) with 5,5-bis(4-fluorophenyl)pentaldehyde (VI) under a hydrogen atmosphere in an alkanol in the presence of a hydrogenation catalyst to produce a compound of the formula:

(VII)



e) N-alkylating the compound of Formula (VII) with an alkylating reagent of the formula:

(VIII)



wherein W represents a reactive leaving group, in a reaction-inert solvent in the presence of a base to form a compound of the formula:

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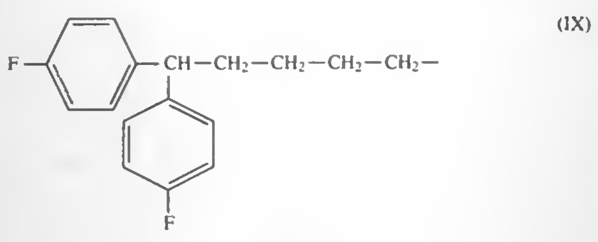
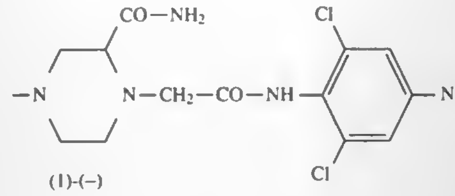

(IX)


(I)-(-)

and

f) reducing the compound of formula (IX) in the presence of a reducing agent in a reaction-inert solvent.

5,840,897

METAL COMPLEX SOURCE REAGENTS FOR CHEMICAL VAPOR DEPOSITION

Peter S. Kirlin, Bethel; Duncan W. Brown, Wilton; Thomas H. Baum, New Fairfield, all of Conn.; Brian A. Vaarstra, Nampa, Id., and Robin A. Gardiner, Bethel, Conn., assignors to Advanced Technology Materials, Inc., Danbury, Conn.

Continuation-in-part of Ser. No. 181,800, Jan. 18, 1994, Pat. No. 5,453,494, and a continuation-in-part of Ser. No. 414,504, Mar. 31, 1995, said Ser. No. 181,800 is a continuation-in-part of Ser. No. 918,141, Jul. 22, 1992, Pat. No. 5,280,012, which is a continuation of Ser. No. 615,303, Nov. 19, 1990, abandoned, which is a division of Ser. No. 581,631, Sep. 12, 1990, Pat. No. 5,225,561, which is a continuation-in-part of Ser. No. 549,389, Jul. 6, 1990, abandoned, said Ser. No. 414,504 is a continuation-in-part of Ser. No. 280,143, Jul. 25, 1994, Pat. No. 5,536,323, which is a continuation of Ser. No. 927,134, Aug. 7, 1992, abandoned, which is a continuation-in-part of Ser. No. 807,807, Dec. 13, 1991, Pat. No. 5,204,314, which is a continuation of Ser. No. 549,389, Jul. 6, 1990, abandoned.

This application Jun. 7, 1995, Ser. No. 477,797

Int. Cl.^{6} C07F *9/00;11/00;15/00;* **C07D** *213/22*

U.S. Cl. 546—2 **9 Claims**

1. A metalorganic complex of the formula:

MA_yX

wherein:

M is a y-valent metal selected from the group consisting of Pd, Pt, Rh, Ir, Ru, V, Nb, Ta, Cr, Mo, and W;

A is a monodentate or multidentate organic ligand coordinated to M which allows complexing of MA_y with X;

y is an integer having a value of 2, 3 or 4; each of the A ligands may be the same or different; and

X is a monodentate or multidentate ligand coordinated to M and containing one or more atoms independently selected from the group consisting of atoms of the elements C, N, H, S, O and F.

5,840,898

METHOD OF REMOVING HEAVY METAL CONTAMINANTS FROM ORGANIC COMPOUNDS

Francis Gerard Fang, Durham; Melissa Williams Lowery, Raleigh, and Shiping Xie, Cary, all of N.C., assignors to Glaxo Wellcome, Inc., Research Triangle Park, N.C.

PCT No. PCT/US95/05425, § 371 Date Nov. 1, 1996, § 102(e) Date Nov. 1, 1996, PCT Pub. No. WO95/29917, PCT Pub. Date Nov. 9, 1995

Continuation of Ser. No. 237,081, May 3, 1994, Pat. No. 5,491,237. This PCT application May 2, 1995, Ser. No. 732,435

Int. Cl.^{6} C07D *491/147*

U.S. Cl. 546—41 **7 Claims**

1. A method of removing Group VIII heavy metal contamination from an organic composition wherein said organic composition is a mixture of an organic compound and a Group VIII heavy metal contaminant comprising the steps of:

i) dissolving the organic composition in one or more suitable first solvents forming a solution;

ii) treating the solution with a ligand soluble in the solution; and

iii) precipitating the organic compound with one or more suitable second solvents.

5,840,899

METHOD FOR THE PREPARATION OF 9-AMINO CAMPTOTHECIN

Angelo Bedeschi, Milan; Walter Cabri, Rozzano; Ilaria Candiani, Busto Arsizio, and Franco Zarini, Settimo Milanese, all of Italy, assignors to Pharmacia S.p.A., Milan, Italy

PCT No. PCT/EP95/01692, § 371 Date Sep. 30, 1996, § 102(e) Date Sep. 30, 1996, PCT Pub. No. WO95/32207, PCT Pub. Date Nov. 30, 1995

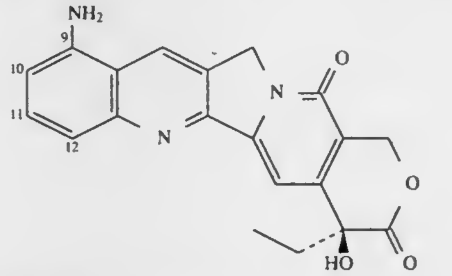
PCT Filed May 4, 1995, Ser. No. 602,792

Claims priority, application United Kingdom, May 24, 1994, 9410388

Int. Cl.^{6} C07D *491/22*

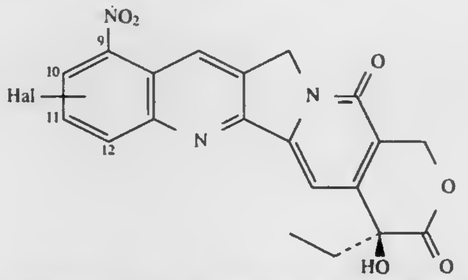
U.S. Cl. 546—48 **14 Claims**

1. A process for preparing 9-amino camptothecin of formula (I):


(I)

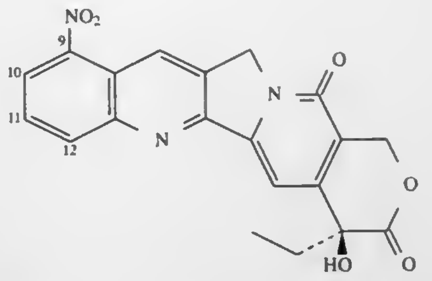
which comprises:

1) reducing a compound of formula (II):


(II)

wherein Hal is 10- or 12-halogen, in a single step to the 9-amino-camptothecin of formula (I) or, alternatively,

2a) reductively removing the Hal group from a compound of formula (II) so obtaining the compound of formula (III):


(III)

and

2b) reducing the compound of formula (III) so obtaining the 9-amino camptothecin of formula (I); the said steps 1 and 2a) and, optionally, step 2b) each being carried out in the presence of a catalytic amount of a compound of formula PdL_2 wherein L is acetate or halogen and, additionally, in the presence of an ammonium formate as a hydrogen source.

5,840,900

HIGH MOLECULAR WEIGHT POLYMER-BASED PRODRUGS

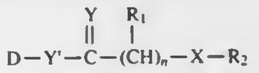
Richard B. Greenwald, Somerset, and Annapurna Pendri, Matawan, both of N.J., assignors to Enzon, Inc., Piscataway, N.J.

Continuation-in-part of Ser. No. 537,207, Sep. 29, 1995, which is a continuation-in-part of Ser. No. 380,873, Jan. 30, 1995, Pat. No. 5,614,549, which is a continuation-in-part of Ser. No. 140,346, Oct. 20, 1993, abandoned. This application Aug. 20, 1996, Ser. No. 700,269

Int. Cl.^{6} C07D *471/22*

U.S. Cl. 546—48 **31 Claims**

1. A composition comprising the formula:



$$D-Y'-\overset{\overset{\displaystyle Y}{\|}}{C}-(\overset{\overset{\displaystyle R_1}{|}}{C}H)_n-X-R_2 \qquad (I)$$

wherein:

D is a residue of a biologically active moiety having a suitable ester-forming group which has undergone an esterification reaction;

X is an electron withdrawing group;

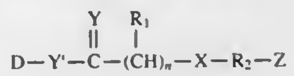
Y and Y' are independently O or S;

R_1 is selected form the group consisting of H, C_{1-6} alkyls, aryls, substituted aryls, aralkyls, heteroalkyls, substituted heteroalkyls and substituted C_{1-6} alkyls;

(n) is an integer from 1 to about 12; and

R_2 is a substantially non-antigenic polymer.

22. A composition comprising the formula:



$$D-Y'-\overset{\overset{\displaystyle Y}{\|}}{C}-(\overset{\overset{\displaystyle R_1}{|}}{C}H)_n-X-R_2-Z$$

wherein:

D is a residue of a biologically active moiety having a suitable ester-forming group which has undergone an esterification reaction;

X is an electron withdrawing group;

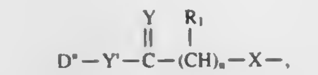
Y and Y' are independently O or S;

R_1 is independently selected form the group of H, C_{1-6} alkyls, aryls, substituted aryls, aralkyls, heteroalkyls, substituted heteroalkyls and substituted C_{1-6} alkyls;

(n) is an integer from 1 to about 12; and

R_2 is a substantially non-antigenic polymer; and

Z is a capping moiety selected from the group consisting of OH, C_{1-4} alkyl moieties and



$$D''-Y'-\overset{\overset{\displaystyle Y}{\|}}{C}-(\overset{\overset{\displaystyle R_1}{|}}{C}H)_n-X-,$$

wherein D" is selected from the group consisting of D, dialkyl ureas, C_{1-4} alkyls and capping groups.

5,840,901

OXIDATION PROCESS FOR PREPARING QUINACRIDONE PIGMENTS

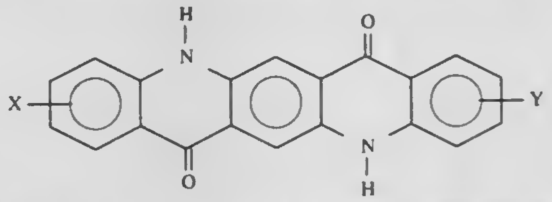
Fridolin Bäbler, Hockessin, Del., assignor to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

Filed Aug. 13, 1997, Ser. No. 910,167

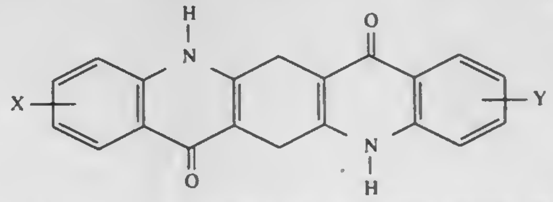
Int. Cl.^{6} C07D *471/06*

U.S. Cl. 546—49 **30 Claims**

1. A process for preparing a quinacridone of the formula I


I

wherein X and Y are independently 1 or 2 substituents selected from the group consisting of H, F, Cl, C_1–C_3alkyl and C_1–C_3alkoxy, by the oxidation of a salt of the corresponding 6,13-dihydroquinacridone of the formula II


(II)

which comprises an oxidation step in a liquid reaction medium wherein the 6,13-dihydroquinacridone salt is oxidized with hydrogen peroxide in the presence of a catalyst in the temperature range from 50° C. to the reflux temperature of the reaction medium.

5,840,902

PROCESS FOR THE PREPARATION OF BETA-HYDROXYALKYPICOLINIUM SALTS

Karlheinrich Meisel, Odenthal; Klaus Walz, Leverkusen; Gerd-Friedrich Renner, Kürten; Hans Schulze, Köln; Carsten Gerdes, Leverkusen; Karl-Rudolf Gassen, Ratingen; Reiner Ditzer, Odenthal, and Lothar Klein, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

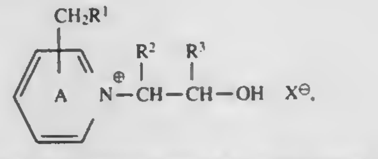
Filed Nov. 20, 1996, Ser. No. 752,885

Claims priority, application Germany, Nov. 28, 1995, 195 44 268.7

Int. Cl.^{6} C07D *221/04;213/127;213/26;215/10*

U.S. Cl. 546—79 **18 Claims**

1. Process for the preparation of a β-hydroxyalkylpicolinium salt of the formula (I)


(I)

wherein the ring A is unsubstituted or carries further substituents selected from the group consisting of nitro, halogen, cyano, C_--C_4-

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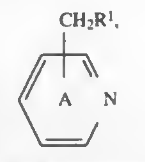
alkyl, C_1–C_4-alkoxy, acetylamino or dimethylamino and/or is fused with aromatic benzo or naphthalene rings,

R^1 represents H, cyano, C_1–C_4-alkoxycarbonyl or C_1–C_4-alkyl,

R^2 and R^3 independently of one another denote H, unsubstituted or substituted C_1–C_4-alkyl or unsubstituted or substituted phenyl wherein the substituents for C_1–C_4-alkyl are selected from the group consisting of CN, aryloxy and C_1–C_4 alkoxycarbonyls and the substituents for phenyl are selected from the group consisting of C_1–C_4-alkyl, halogen, CN, NO_2 and C_1–C_2-alkylsulphonyl, and

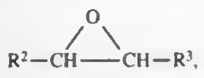
$X^{\ominus}$ represents the radical of one equivalent of a 1- to 3-basic acid,

wherein a picoline of the formula (II)



(II)

wherein A and R^1 have the abovementioned meanings, is reacted with an alkylene oxide of the formula (III)


$R^2-CH\overset{O}{—}CH-R^3,$ (III)

wherein R^2 and R^3 have the abovementioned meaning, in the presence of a 1- to 3-basic acid and in a reaction medium of water or a mixture of water and a polar solvent; at a temperature of 0°–160° C. and a pH of 2–8.

5,840,903
4-AMINOMETHYL-1-AZAADAMANTANE DERIVED BENZAMIDES

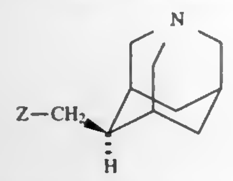
Daniel Lee Flynn, Mundelein, and Robert L. Shone, Palatine, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Jul. 27, 1992, Ser. No. 919,679

Int. Cl.⁶ A61K ***31/44;*** **C07D** ***451/00;221/02***

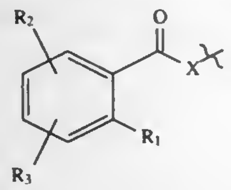
U.S. Cl. 546—99 **16 Claims**

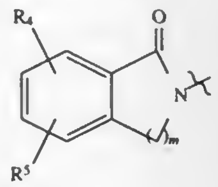
1. A compound of the formula:



or a pharmaceutically acceptable salt thereof

wherein Z is selected from the group consisting of



and


R_1 is alkoxy of one to six carbon atoms;

R_2, R_3, R_4 and R_5 are the same or different and are selected from the group consisting of hydrogen, halogen, CF_3, hydroxy, alkoxy of one to six carbon atoms, acyl of two to seven carbon atoms, amino, amino substituted by one or two alkyl groups of one to six carbon atoms, C_2–C_7 acylamino, aminocarbonyl, aminosulfone optionally substituted by one or two alkyl groups of one to six carbon atoms, C_1–C_6 alkylsulfone and nitro;

m is 1 or 2;

X is O or NR_7; and

R_7 is hydrogen or alkyl of 1 to 6 carbon atoms.

5,840,904
FLUORO-PYRIDINE-2,3-DICARBOXYLIC ANHYDRIDES WHICH ARE INTERMEDIATES FOR HERBICIDAL PYRIDINE-2,3-DICARBOXIMIDES

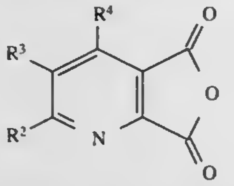
Gerhard Hamprecht, Weinheim; Eberhard Fuchs, Frankenthal; Matthias Gerber, Limburgerhof; Helmut Walter, Obrigheim, and Karl-Otto Westphalen, Speyer, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Division of Ser. No. 361,559, Dec. 22, 1994, Pat. No. 5,679,622. This application May 27, 1997, Ser. No. 863,540

Int. Cl.⁶ C07D ***491/048***

U.S. Cl. 546—116 **2 Claims**

1. A pyridine-2,3-dicarboxylic anhydride of the formula IIa'



IIa'

where one of the radicals R^2, R^3 or R^4 is fluorine and the other radicals are each hydrogen, fluorine, chlorine, C_1–C_3-alkyl, C_1–C_3-alkoxy, trifluoromethoxy, chlorodifluoromethoxy, methylthio, trifluoromethylthio, chlorodifluoromethylthio or mothylaulfonyl, with the exception of 5-fluoro- and 4,5,6-trifluoropyridine-2,3-dicarboxylic anhydride.

5,840,905
PROCESS FOR THE PREPARATION OF 4-HYDROXY-1,2,2,6,6,-PENTAMETHYLPIPERIDINE

Karl Stephan Nitsche; Walter Wolf, and Joachim Fries, all of Bensheim, Germany, assignors to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

Continuation of Ser. No. 777,492, Oct. 15, 1991, abandoned, which is a continuation of Ser. No. 451,490, Dec. 15, 1989, abandoned. This application Mar. 18, 1993, Ser. No. 33,450

Claims priority, application Switzerland, Dec. 20, 1988, 4763/88

Int. Cl.⁶ C07D ***211/44***

U.S. Cl. 546—184 **15 Claims**

1. An improved process for the preparation of 4-hydroxy-1,2,2,6,6-pentamethylpiperidine (HPMP) from 4-oxo-2,2,6,6-tetramethylpiperidine (TAA) by reducing TAA to 4-hydroxy-2,2,6,6-tetramethylpiperidine (HTMP) by means of catalytic hydrogenation, reacting the resulting crude HTMP solution, as obtained or after concentration by distillation, with formaldehyde or paraformaldehyde and formic acid at a temperature of 70°–150° C., using formaldehyde or paraformaldehyde in at least 20% molar excess, and using formic acid in about a stoichiometric amount, based in each case on HTMP, separating the aqueous phase of the reaction mixture from the crude product phase and working up the product phase by distillation, wherein the improvement comprises carrying out the entire process with water as the reaction solvent throughout and without isolating and purifying the HTMP intermediate from the catalytic hydrogenation step.

5,840,906
SYNTHESIS OF NICOTINIC ANALOGS

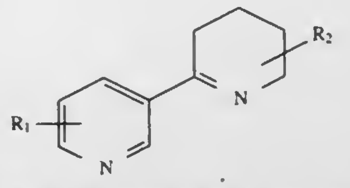
John A. Zoltewicz, Gainesville, Fla., and Michael P. Cruskie, Indianapolis, Ind., assignors to University of Florida Research Foundation, Inc., Gainesville, Fla.

Continuation of Ser. No. 304,100, Sep. 9, 1994, Pat. No. 5,602,257, which is a continuation-in-part of Ser. No. 662,867, Mar. 1, 1991, abandoned. This application Feb. 7, 1997, Ser. No. 798,420

Int. Cl.⁶ C07D ***401/04***

U.S. Cl. 546—193 **22 Claims**

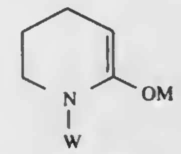
1. A process for the synthesis of an anabaseine having the formula I:



I

wherein R_1 and R_2 are independently lower alkyl having 1–6 carbon atoms, comprising the steps:

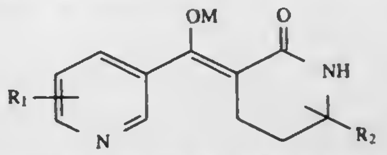
(1) reacting a 2-piperidine with an alkaline metal diisopropylamide and in the presence of a silating agent under low temperature conditions until a precipitate is observed, then raising the temperature to room temperature until the precipitate dissolves, then cooling back to the low temperature to produce a compound having the structure of formula II;



II

where M is an alkaline earth metal and W is a silated nitrogen protecting group.

(2) condensing II with a nicotinic acid derivative under low temperature conditions suitable to form III and allowing the reaction to complete at room temperature; and



III

(3) hydrolyzing III in the presence of acid to form the anabaseine I.

5,840,907
PROCESS FOR PREPARING DIKETOPYRROLOPYRROLE DERIVATIVES

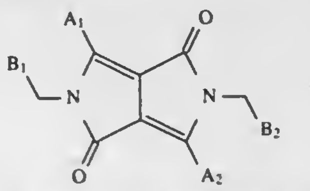
Shivakumar Basalingappa Hendi, Newark, Del., assignor to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

Filed Jun. 5, 1997, Ser. No. 870,353

Int. Cl.⁶ C07D ***487/04;519/00***

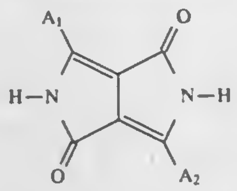
U.S. Cl. 546—256 **9 Claims**

1. A process for the preparation of a diketopyrrolopyrrole compound of the formula (I)

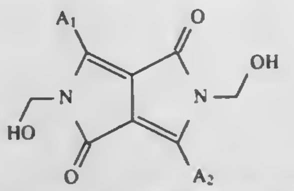


(I)

wherein A_1 and A_2 are identical or different aryl radicals and B_1 and B_2 are identical or different organic radicals; which diketopyrrolopyrrole compound has from 0 to 6 moles of $—SO_3M$ per mole of diketopyrrolopyrrole compound; wherein M is hydrogen or a metal or ammonium cation, which process comprises a reaction wherein a 1,4-diketo- 3,6-diarylpyrrolopyrrole of the formula



is reacted in a first step with formaldehyde to yield a sulfonated or non-sulfonated intermediate of the formula



(II)

which reacts in a second step with a precursor of the organic radicals, B_1 and B_2, to yield the diketopyrrolopyrrole compound of formula (I).

5,840,908
SULFENAMIDE ACCELERATORS AND RUBBER COMPOSITIONS CONTAINING THE SAME

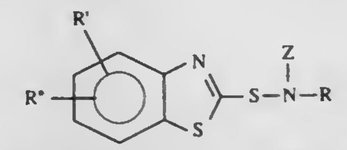
Balwant Singh; Thomas Patrick Sassi, both of Stamford, and Laurence Wu-Kwang Chang, Orange, all of Conn., assignors to Cytec Technology Corp., Wilmington, Del.

Filed May 9, 1994, Ser. No. 239,676

Int. Cl.⁶ C07D ***277/80***

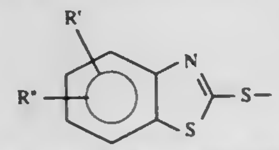
U.S. Cl. 548—164 **17 Claims**

1. A benzothiazole sulfenamide compound represented by Formula (I)



(I)

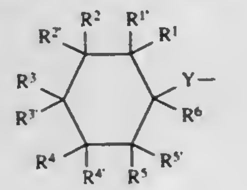
wherein Z is selected from the group consisting of hydrogen and a sulfobenzothiazole group represented by the Formula (II)



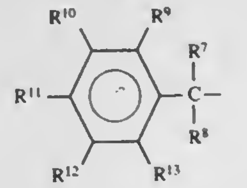
(II)

wherein each R' and R" is independently selected from the group consisting of hydrogen and C_1–C_6 alkyl; and

wherein R is Formula (i) or Formula (ii)



(i)



(ii)

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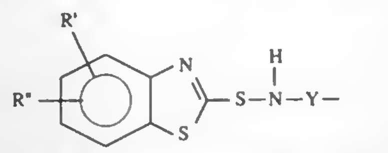
wherein in Formula (i)

Y is either a direct bond or a group of the formula —[(R^{14})(R^{15})C—]—, wherein R^{14} and R^{15} are independently hydrogen or C_1–C_6 alkyl,

R^1, $R^{1'}$, R^2, $R^{2'}$, R^3, $R^{3'}$, R^4, $R^{4'}$, R^5, $R^{5'}$ and R^6 are each independently hydrogen or C_1–C_6 alkyl, and one of R^2, $R^{2'}$, R^3, $R^{3'}$, R^4, $R^{4'}$ may optionally further be Formula (iii)



(iii)

wherein R', R" and Y are as defined above,

with the proviso that at least two of R^1 through R^6 are C_1–C_6 alkyl; and

wherein in the Formula (ii),

R^7 is a C_1–C_6 alkyl,

R^8 is hydrogen or C_1–C_6 alkyl, and

R^9, R^{10}, R^{11}, R^{12} and R^{13} are each independently hydrogen or C_1–C_6 alkyl, with the proviso that one of R^{10}, R^{11}, R^{12} may optionally further be selected from the group consisting of CH_2—CH—, CH_2═C(CH_3)—, CH_2═CH—CH_2—, CH_2═C(CH_3)CH_2—, and a group of the formula (iii), and with the proviso that when Z is a sulfobenzothiazole of Formula (II), one of R^{10}, R^{11} or R^{12} is C_2–C_6 alkyl, CH_2═CH—, CH_2═C(CH_3)—, CH_2═CH—CH_2—, CH_2═C(CH_3)CH_2—, or a group of the formula (iii).

5,840,909
PYRAZOLE DERIVATIVES

Keizo Tanikawa; Yoshimasa Kamikawaji; Keisuke Odoi; Tsutomu Higashiyama; Masayuki Sato, all of Chiba-ken, and Yukinori Masuda, Saitama-ken, all of Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

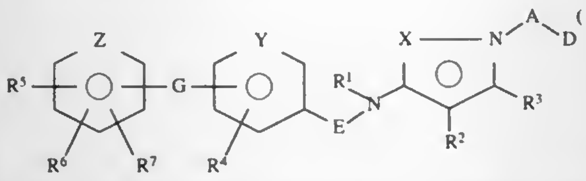
Division of Ser. No. 525,555, Sep. 29, 1995, Pat. No. 5,721,264. This application Dec. 29, 1997, Ser. No. 998,669

Claims priority, application Japan, Apr. 7, 1993, 5-80922; Jan. 10, 1994, 6-917

Int. Cl.⁶ C07D *403/12;* **A61K** *31/415*

U.S. Cl. 548—253 **11 Claims**

1. Pyrazole compounds of the following general formula (1), and their tautomers and salts:



(1)

wherein R^1 represents a hydrogen atom, a C_1–C_{10} alkyl group (said alkyl group is unsubstituted or substituted by one or more substituents selected from a halogen atom, a hydroxyl group and a C_1–C_{10} alkoxy group), a C_2–C_{10} alkenyl group (said alkenyl group is unsubstituted or substituted by one or more substituents selected from a halogen atom, a hydroxyl group and a C_1–C_{10} alkoxy group), a C_2–C_{10} alkynyl group (said alkynyl group is unsubstituted or substituted by one or more substituents selected from a halogen atom, a hydroxyl group and a C_1–C_{10} alkoxy group), a C_3–C_{10} cycloalkyl group (said cycloalkyl group is unsubstituted or substituted by one or more substituents selected from a halogen atom, a hydroxyl group and a C_1–C_{10} alkoxy group), a C_3–C_{10} cycloalkenyl group (said cycloalkenyl group is unsubstituted or substituted by one or more substituents selected from a halogen atom, a hydroxyl group and a C_1–C_{10} alkoxy group) or a C_6–C_{10} aromatic group (said aromatic group is unsubstituted or substituted by one or more substituents selected from a C_1–C_{10} alkyl group, a halogen atom, a hydroxyl group and a C_1–C_{10} alkoxy group);

R^2 represents COX^1R^{12}, wherein R^{12} represents a hydrogen atom or a C_1–C_{10} alkyl group and X^1 represents an oxygen atom or a sulfur atom;

R^3 represents a halogen atom, a C_1–C_{10} alkyl group (said alkyl group is unsubstituted or substituted by a C_6–C_{10} aromatic group), or a C_2–C_{10} alkenyl group;

R^4, R^5 and R^6 each independently represents a hydrogen atom, a halogen atom, a hydroxyl group or a C_1–C_{10} alkyl group;

R^7 represents a 5-tetrazolyl group,

X represents a nitrogen atom,

Y and Z each independently represent CR^{40}, wherein R^{40} represents a hydrogen atom, a halogen atom or a C_1–C_{10} alkyl group;

A represents $(CR^{41}R^{41})m^7$, wherein m^7 represents 0, 1, 2 or 3, and R^{41} and $R^{41'}$ each independently represents a hydrogen atom or a C_1–C_{10} alkyl group;

D represents a C_6–C_{10} aromatic group, wherein said aromatic group is unsubstituted or mono-substituted to penta-substituted by a halogen atom or a C_1–C_{10} alkyl group;

E represents $CR^{52}R^{53}$, wherein R^{52} and R^{53} each independently represents a hydrogen atom or a C_1–C_{10} alkyl group; and

G represents a covalent bond.

5,840,910
PYRIDINE DERIVATIVES HAVING ANTI-ULCERATIVE ACTIVITY

Shigeru Souda, Ushiku; Norihiro Ueda, Niihari-gun; Shuhei Miyazawa, Toride; Katsuya Tagami, Niihari-gun; Seiichiro Nomoto, Ushiku; Makoto Okita, Tsuchiura; Naoyuki Shimomura, Niihari-gun; Toshihiko Kaneko; Masatoshi Fujimoto, both of Tsukuba-gun, all of Japan; Manabu Murakami, Rockville, Md.; Kiyoshi Oketani, Tsukuba-gun, Japan; Hideaki Fujisaki, Niihari-gun, Japan; Hisashi Shibata, Tsuchiura, Japan, and Tsuneo Wakabayashi, Mito, Japan, assignors to Esai Co., Ltd., Japan

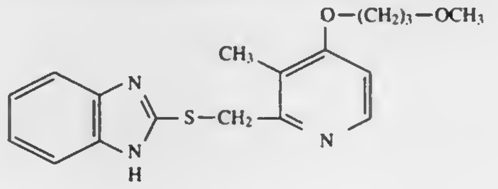
Continuation of Ser. No. 187,069, Jan. 27, 1994, abandoned, which is a division of Ser. No. 699,442, May 13, 1991, abandoned, which is a division of Ser. No. 462,328, Dec. 28, 1989, Pat. No. 5,045,552, which is a continuation of Ser. No. 119,386, Nov. 10, 1987, abandoned. This application Dec. 6, 1994, Ser. No. 354,726

Claims priority, application Japan, Nov. 13, 1986, 61-270536; Feb. 2, 1987, 62-21989; Mar. 31, 1987, 62-77784

Int. Cl.⁶ C07D *401/12*

U.S. Cl. 546—273.7 **2 Claims**

1. A compound represented by the formula;



or a pharmaceutically acceptable salt thereof.

5,840,911
IMIDAZOLE DERIVATIVES, THEIR PREPARATION AND THEIR USE AS S-ADENOSYLMETHIONINE DECARBOXYLASE (=SAMDC) INHIBITORS

Jörg Frei, Hölstein, and Jaroslav Stanek, Arlesheim, both of Switzerland, assignors to Novartis AG, Basle, Switzerland

PCT No. PCT/EP96/00143, § 371 Date Jul. 23, 1997, § 102(e) Date Jul. 23, 1997, PCT Pub. No. WO96/22979, PCT Pub. Date Aug. 1, 1996

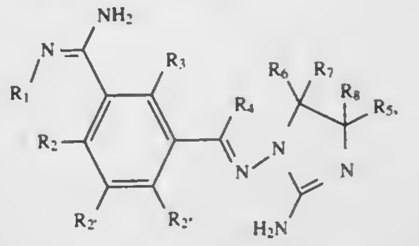
PCT Filed Jan. 15, 1996, Ser. No. 875,299

Claims priority, application Switzerland, Jan. 26, 1995, 215/95

Int. Cl.⁶ C07D *233/88;233/46;* **A61K** *31/415*

U.S. Cl. 548—326.5 **18 Claims**

1. A compound of formula I



(I)

wherein

R_1 is hydroxy or hydrogen;

the radicals R_2, R_2' and R_2" are each independently of the others hydrogen or a substituent selected from lower alkyl, halo-lower alkyl having one or more halogen atoms, C_3–C_8cycloalkyl, phenyl-lower alkyl, hydroxy, lower alkoxy, phenyl-lower alkoxy, phenyloxy, lower alkanoyloxy, benzoyloxy, halogen, amino, N-lower alkylamino, N,N-di-(lower alkyl)amino, lower alkanoylamino, benzoylamino, nitro, lower alkanoyl, benzoyl, carboxy, lower alkoxycarbonyl, 1-phenyl-lower alkoxycarbonyl, carbamoyl, N-lower alkylcarbamoyl, N,N-di(lower alkyl)carbamoyl, N-phenylcarbamoyl, cyano, mercapto, lower alkylthio, lower alkanesulfonyl, sulfamoyl, N-lower alkylsulfamoyl and N,N-di (lower alkyl)sulfamoyl;

either

R_3 is hydrogen and

R_4 is hydrogen or lower alkyl,

or

R_3 and R_4 together form a divalent radical of the formula —(CH_2)n—wherein n is 2 or 3;

R_5 and R_6 are each independently of the other hydrogen, lower alkyl; or phenyl or naphthyl each of which is unsubstituted or mono- to tri-substituted, wherein the substituents are selected independently of one another from the group consisting of lower alkyl, phenyl, naphthyl, lower alkoxy, hydroxy, lower alkanoyloxy, nitro, amino, halogen, halo-lower alkyl, caboxy, lower alkoxycarbonyl, carbamoyl, N-lower alkylcarbamoyl, N,N-di(lower alkyl)carbamoyl, cyano, lower alkanoyl, phenyl- or naphthyl-carbonyl, lower alkanesulfonyl, sulfamoyl, N-lower alkylsulfamoyl and N,N-di-lower alkylsulfamoyl; and

either R_7 and R_8 are each hydrogen, or R_7 and R_8 together form a bond; a tautomer thereof, provided that at least one tautomerisable group is present; or a salt thereof.

5,840,912
SUBSTITUTED PYRAZOLYL-PYRAZOLE DERIVATIVES, AND THEIR USE AS AGENTS WITH HERBICIDAL ACTION

Jens Geisler; Helga Franke; Uwe Hartfiel; Michael Ganzer; Jürgen Bohner, all of Berlin, Germany, and Richard Rees, Pensacola, Fla., assignors to Hoechst Schering AgrEvo GmbH, Berlin, Germany

PCT No. PCT/EP95/03732, § 371 Date Apr. 22, 1997, § 102(e) Date Apr. 22, 1997, PCT Pub. No. WO96/09303, PCT Pub. Date Mar. 28, 1996

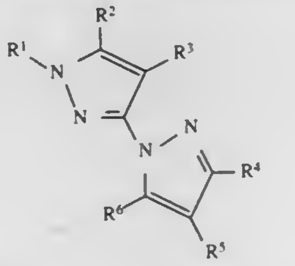
PCT Filed Sep. 21, 1995, Ser. No. 809,391

Claims priority, application Germany, Sep. 22, 1994, 44 35 373.1

Int. Cl.⁶ C07D *405/06;* **A01N** *43/56*

U.S. Cl. 548—365.4 **7 Claims**

1. Substituted pyrazol derivatives of the general formula (I)



(I)

in which

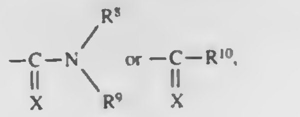
R^1=C_1–C_4 alkyl,

R^2=C_1–C_4 alkyl, C_1–C_4 alkylthio, C_1–C_4 alkoxy; or C_1–C_4 alkyl, C_1–C_4 alkylthio, C_1–C_4 alkoxy all substituted one or more times with halogen,

R^3=hydrogen or halogen,

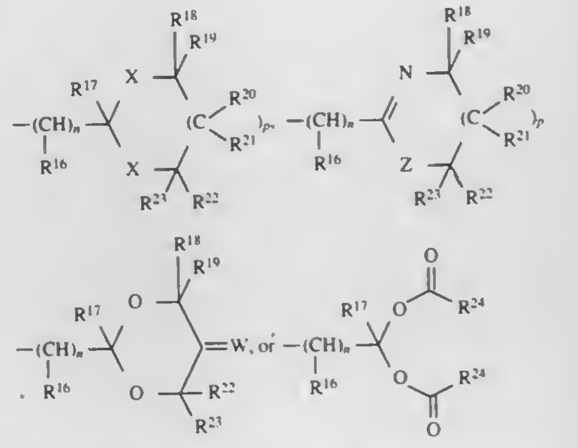
R^4=hydrogen or C_1–C_4 alkyl,

R^5=hydrogen, nitro, cyano or the groups —$COOR^7$,



$$-\underset{\underset{X}{\|}}{C}-N\begin{matrix}R^8\\ \\ R^9\end{matrix} \quad \text{or} \quad -\underset{\underset{X}{\|}}{C}-R^{10},$$

R^6=



R^7, R^8 and R^9, independent of one another, are hydrogen or C_1–C_4 alkyl,

R^8 and R^9, together with the adjacent nitrogen atom, form a 5-membered or 6-membered saturated heterocyclic ring,

R^{10}=hydrogen, C_1–C_4 alkyl, or a C_1–C_4 alkyl substituted one or more times by halogen,

R^{16}=hydrogen or C_1–C_4 alkyl,

R^{17}=hydrogen, C_1–C_4 alkyl or halogen-C_1–C_4 alkyl,

R^{18}, R^{19}, R^{20}, R^{21}, R^{22} and R^{23}, independent if one another, are hydrogen, halogen, C_1–C_4 alkyl, C_2–C_4 alkenyl or C_3–C_4 alkynyl; C_1–C_4 alkyl, C_2–C_4 alkenyl, C_3–C_4 alkynyl, carboxyl

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or C_1–C_4 alkoxycarbonyl all substituted similarly or differently one or more times by halogen, cyano, nitro, hydroxy or by C_1–C_4 alkoxy,

R^{24}=C_1–C_4 alkyl, or C_1–C_4 alkyl substituted one or more times by halogen,

n=0, 1, 2 or 3,

p=0 or 1,

X=oxygen or sulphur,

Z=oxygen, sulphur or N—R^{25},

R^{25}=hydrogen or C_1–C_4 alkyl,

W=oxygen, sulphur or carbon.

5,840,913

PROCESS FOR PREPARING N-SUBSTITUTED PYRAZOLES

Hans Rupert Merkle, Ludwigshafen; Erich Fretschner, Neckarsteinach, and Jürgen Schröder, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP96/00790, § 371 Date Aug. 20, 1997, § 102(e) Date Aug. 20, 1997, PCT Pub. No. WO96/27589, PCT Pub. Date Sep. 12, 1996

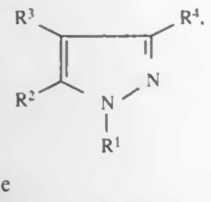
PCT Filed Feb. 27, 1996, Ser. No. 913,177

Claims priority, application Germany, Mar. 4, 1995, 195 07 600.1; Mar. 15, 1995, 195 09 361.5; Mar. 18, 1995, 195 09 958.3

Int. Cl.^{6} C07D *231/12*

U.S. Cl. 548—373.1 **13 Claims**

1. A process for the preparation of N-substituted pyrazoles of the formula I



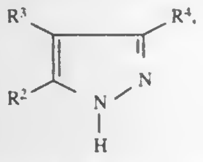
(I)

where

R^1 is C_1–C_{12}-alkyl or C_7–C_{20}-phenylalkyl and

R^2, R^3 and R^4 are, independently of one another, hydrogen, C_1–C_{12}-alkyl, C_7–C_{20}-phenylalkyl or unsubstituted or substituted aryl radicals,

which comprises catalytically reacting pyrazoles of the formula II



(II)

where R^2, R^3 and R^4 have the abovementioned meanings, with an alcohol of the formula III

$$R^1—O—H \qquad \text{(III),}$$

where R^1 has the abovementioned meanings, at from 50° to 400° C. in the molar ratio of from 0.001:1 to 1:1 in liquid phase under a subatmospheric pressure of 0.8 bar up to a superatmospheric pressure of 250 bar, selecting only acids or their alkyl esters or their anhydrides, in the molar ratio of from 0.0001:1 to 0.5:1 with respect to the pyrazole II, as catalyst.

5,840,914

3-(2-TRIALKYLSILYLOXY) ETHYL-7-1H-INDOLES AND METHOD FOR THEIR PREPARATION

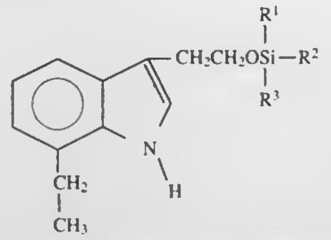
Giobbio Vincenzo, Turin, and Polastri Franco, Cusano Milanino-Mi, both of Italy, assignors to Teva Pharmaceutical Industries, Ltd., Petah Tiqva, Israel

Division of Ser. No. 453,740, May 30, 1995, Pat. No. 5,599,946. This application Oct. 24, 1996, Ser. No. 736,472

Int. Cl.^{6} C07F *7/18*

U.S. Cl. 548—406 **9 Claims**

1. A 3-(2-trialkylsilyloxy)ethyl-7-ethyl-1H-indole, having the following formula:



(I)

wherein R^1, R^2 and R^3 are the same or different, and each is an alkyl group having from 1 to 6 carbon atoms.

5,840,915

PROCESS FOR THE ENATIOSELECTIVE SYNTHESIS OF INTERMEDIATES USED

Thomas Bing Kin Lee, Whitehouse Station, and George Seung-Kit Wong, Summit, both of N.J., assignors to Hoechst Marion Roussel, Inc., Cincinnati, Ohio

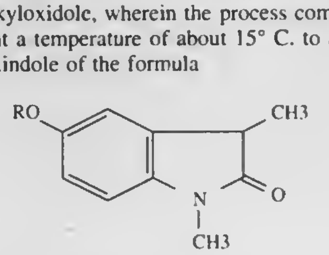
Continuation of Ser. No. 463,144, Jun. 5, 1995, abandoned, which is a division of Ser. No. 67,892, May 27, 1993, Pat. No. 5,521,320, which is a continuation-in-part of Ser. No. 833,608, Feb. 12, 1992, Pat. No. 5,274,117, which is a continuation of Ser. No. 640,514, Jan. 3, 1991, abandoned, which is a continuation of Ser. No. 469,882, Jan. 22, 1990, abandoned. This application Jun. 12, 1997, Ser. No. 873,631

Int. Cl.^{6} C07D *209/34*

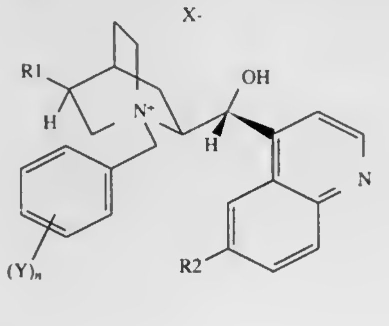
U.S. Cl. 548—486 **18 Claims**

1. A process for the synthesis of essentially enantiomerically pure 3-aminoalkyloxidole, wherein the process comprises:

(a) reacting at a temperature of about 15° C. to about 25° C. a racemic oxindole of the formula



where R is methyl, with at least one equivalent of chloroacetonitrile in a biphasic reaction mixture having an aqueous phase comprising sodium hydroxide as a deprotonation agent and a solvent phase comprising toluene and a catalytic amount of a compound of the formula



wherein

n is 1 or 2;

R_1 is vinyl, R_2 is hydrogen, Y is 4-Br and X is Br; and

R_1 is vinyl, R_2 is hydrogen, Y is 4-CF_3 and X is Br; or

R_1 is vinyl, R_2 is hydrogen, Y is 3,4-dichloro and X is Cl; or

R_1 is vinyl, R_2 is hydrogen, Y is 3,4-dichloro and X is Br; or

R_1 is ethyl, R_2 is hydrogen, Y is 4-CF_3 and X is Br; or

R_1 is vinyl, R_2 is OCH_3, Y is 3,4-dichloro and X is Br;

to thereby form two enantiomers of the resulting alkylated oxindole, wherein one of said enantiomers is in an amount of about 68% to about 90% enantiomeric excess relative to the other enantiomer;

(b) treating the mixture with a recrystallization solvent selected from alcohol, aliphatic ether and mixture thereof to selectively dissolve the excess of one of said enantiomer to form a solution containing essentially one of said enantiomer and to form a precipitate containing a racemic mixture of one of said enantiomer and the other enantiomer, then, separating said solution from said precipitate and recovering from the solution the optically pure one of said enantiomer;

(c) converting nitrile groups of the resulting alkylated oxindoles to corresponding said aminoalkyloxindole by catalytic reduction in the presence of hydrogen gas to form a mixture of enantiomers of primary amines; and

(d) contacting the mixture of enantiomers of the said aminoalkyloxindole with a chiral acid in an amount sufficient to preferentially precipitate a salt of the chiral acid and one of the enantiomers, and recovering the resulting precipitate, wherein the chiral acid is selected from the group consisting of dibenzoyl-D-tartaric acid and ditoluoyl-D-tartaric acid.

5,840,916

QUINOLINE CARBOXYLIC ACID DERIVATIVES HAVING 7-(4-AMINO-METHYL-3-OXIME) PYRROLIDINE SUBSTITUENT AND PROCESSES FOR PREPARING THEREOF

Chang Yong Hong, Daejeon; Young Kwan Kim, Kyungki-do; Jay Hyok Chang, Daejeon; Se Ho Kim, Seoul; Hoon Choi, Daejeon; Do Hyun Nam, Daejeon; Jin-Hwan Kwak, Daejeon; Yi Na Jeong, Daejeon; Jeong In Oh, Daejeon, and Mu Yong Kim, Daejeon, all of Rep. of Korea, assignors to LG Chemical Ltd., Seoul, Rep. of Korea

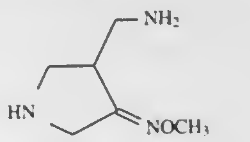
Division of Ser. No. 490,978, Jun. 15, 1995, Pat. No. 5,633,262. This application Apr. 4, 1997, Ser. No. 825,991

Claims priority, application Rep. of Korea, Jun. 16, 1994, 94-13604; Dec. 30, 1994, 94-39915; Dec. 30, 1994, 94-39930

Int. Cl.^{6} C07D *207/22*

U.S. Cl. 548—557 **1 Claim**

1. A compound of formula III



III

or a pharmaceutically acceptable salt thereof.

5,840,917

PHOSPHORYLAMIDES, THEIR PREPARATION AND USE

Satoru Oi, Nara; Hideaki Nagaya; Nobuhiro Inatomi, both of Osaka; Masafumi Nakao, Ikoma, and Hidefumi Yukimasa, Nara, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

PCT No. PCT/JP96/02769, § 371 Date Dec. 6, 1996, § 102(e) Date Dec. 6, 1996, PCT Pub. No. WO97/11705, PCT Pub. Date Apr. 3, 1997

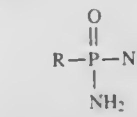
PCT Filed Sep. 25, 1996, Ser. No. 750,087

Claims priority, application Japan, Sep. 26, 1995, 7-247929; Mar. 5, 1996, 8-047454

Int. Cl.^{6} C07D *333/00;* **C07F** *9/06;* **A61K** *31/38;31/34*

U.S. Cl. 549—6 **44 Claims**

1. A method for eradicating *Helicobacter pylori* from a mammal, which comprises administering to said mammal a compound represented by the formula:



$$R—\overset{\displaystyle O}{\overset{\|}{P}}—NH_2 \quad \text{with } —NH_2 \text{ below P}$$

wherein R represents an amino group which may be substituted, or a pharmaceutically acceptable salt thereof, in combination with an antacid or an acid secretion inhibitor.

5,840,918

ISOPRENYL TRANSFERASE INHIBITORS

Michael D. Lewis; James J. Kowalczyk, both of Andover; Amy E. Christuk, Newbury; Rulin Fan, Andover; Edmund M. Harrington, Medford; Xiaoning C. Sheng, Andover; Hu Yang, North Andover; Ana Maria Garcia, Belmont, all of Mass.; Ieharu Hishinuma, Moriya-Machi, Japan; Takeshi Nagasu, Nagakuni-Machi, Japan, and Kentaro Yoshimatsu, Tsuchiura, Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

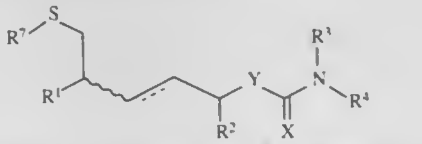
PCT No. PCT/US95/03387, § 371 Date Mar. 19, 1997, § 102(e) Date Mar. 19, 1997, PCT Pub. No. WO95/25086, PCT Pub. Date Sep. 21, 1995

Continuation-in-part of Ser. No. 214,793, Mar. 15, 1994, abandoned, which is a continuation of Ser. No. 277,201, Jul. 19, 1994, abandoned. This PCT application Mar. 15, 1995, Ser. No. 704,664

Int. Cl.^{6} C07D *333/22;307/02;* **C07C** *321/00;233/00*

U.S. Cl. 549—77 **19 Claims**

1. A compound having the formula:



(I)

wherein R^1 is H, NHR^8, or, NR^3R^9 wherein R^1 is H, $C_{1\text{-}6}$ alkyl, $C_{1\text{-}6}$ acyl, $C_{2\text{-}14}$ alkyloxycarbonyl or any other amino-protecting group, and R^9 is $C_{1\text{-}6}$ alkyl, $C_{1\text{-}6}$ acyl, or $C_{2\text{-}14}$ alkyloxycarbonyl; or, when taken together with R^7, a bifunctional thiol-protecting group;

R^2 is H, $C_{1\text{-}8}$ alkyl, ($C_{6\text{-}40}$ aryl)($C_{0\text{-}6}$ alkyl), or ($C_{3\text{-}10}$ heteroaryl)($C_{0\text{-}6}$ alkyl);

R^3 is H, $C_{1\text{-}6}$ alkyl, or ($C_{6\text{-}40}$ aryl)($C_{0\text{-}6}$ alkyl);

R^4 is $C_{3\text{-}16}$ cycloalkyl, ($C_{3\text{-}16}$ heterocyclic radical)-($C_{0\text{-}6}$ alkyl), ($C_{6\text{-}12}$ aryl)($C_{0\text{-}6}$ alkyl), ($C_{3\text{-}16}$ heteroaryl)($C_{0\text{-}6}$ alkyl), R^5(CH—)(C═O)R^6, R^5(CH—)(C═S)R^1, R^5(CH—)(CH_2)R^6, or R^5(CH_2—), wherein R^5 is $C_{1\text{-}6}$ alkyl, ($C_{3\text{-}10}$ heterocyclic radical)-($C_{0\text{-}6}$ alkyl), ($C_{3\text{-}10}$ heteroaryl)($C_{1\text{-}6}$ alkyl), hydroxymethyl, —$(CH_2)_n$—A—$(CH_2)_m$—CH_3, —$(CH_2)_n$(C═O)NH_2, or —(CH.).(C═O)NH$(CH_2)_m$$CH_3$ (wherein A is O, S, SO, or SO_2, n is 0, 1, 2 or 3, and m is 0, 1, or 2), or a side chain of a naturally occurring amino acid selected from glycine, alanine, valine, leucine, isoleucine, serine, threonine, aspartic acid, asparagine, lysine, glutamic

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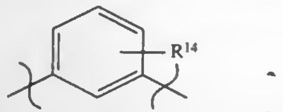
acid, glutamine, arginine, histidine, phenylalanine, cysteine, tryptophan, tyrosine, methionine, and proline; and R^6 is H, NH_2, NHOH, C_{3-16} heterocyclic radical, C_{3-16} heteroaryl, NHR^{10}, $NR^{10}R^{11}$, OR^{12}, $NR^{10}OR^{11}$, $NHOR^{13}$, or any other carboxyl-protecting group, wherein each of R^{10} and R^{11} independently, is C_{1-6}, alkyl. (C_{3-16} heterocyclic radical)(C_{0-6} alkyl), or (C_{3-16} heteroaryl)-(C_{0-6} alkyl), R^{12} is H, C_{1-6} alkyl, (C_{1-12} acyl)oxy(C_{1-12} alkyl), (C_{1-12} alkyl)oxy(C_{1-12} alkyl), or C_{2-14} alkyloxy-carbonyl, and R^{13} is H, C_{1-6} alkyl, or (C_{6-40} aryl)(C_{0-6} alkyl);

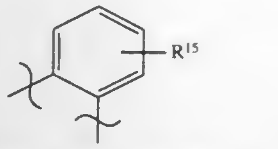
X is =O, =S, or two singly-bonded H;

Y is selected from the following five formulae:



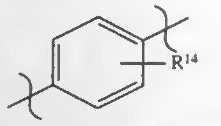
(i)

wherein R^{14} is H, halide, hydroxy, C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, C_{1-12} alkoxy, C_{1-6} acyloxy, C_{1-6} acyl, C_{6-41} aryl, C_{3-40} heterocyclic radical, C_{3-40} heteroaryl, C_{1-12} alkylsulfonyloxy, C_{1-12} haloalkylsulfonyloxy, C_{6-40} arylsulfonyloxy, or C_{6-41} aryloxy;



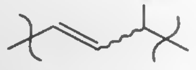
(ii)

wherein R^1 is H, halide, hydroxy, C_{1-6} alkyl, C_{2-6} alkynyl, C_{1-12} alkoxy, C_{1-6} acyloxy C_{1-6} acyl, C_{6-41} aryl, C_{3-40} heterocyclic radical, C_{3-40} heteroaryl, C_{1-12} alkylsulfonyloxy, C_{1-12} haloalkylsulfonyloxy, C_{6-40} arylsulfonyloxy, or C_{6-41} aryloxy;



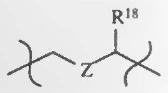
(iii)

wherein R^6 is H, halide, hydroxy, C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, C_{1-12} alkoxy, C_{1-6} acyloxy, C_{1-6} acyl, C_{6-41} aryl, C_{3-40} heterocyclic radical, C_{3-40} heteroaryl, C_{1-12} alkylsulfonyloxy, C_{1-12} haloalkylsulfonyloxy, C_{6-40} arylsulfonyloxy, or C_{6-41} aryloxy;



(iv)

wherein R^{17} is H, C_{1-8} alkyl, (C_{6-40} aryl)(C_{0-6} alkyl), (C_{3-10} heteroaryl)(C_{0-6} alkyl), or (C_{3-10} heterocyclic radical)-(C_{0-6} alkyl); and



(v)

wherein R^{18} is H, C_{1-8} alkyl, (C_{6-40} aryl)(C_{0-6} alkyl),(C_{3-10} heterocyclic radical)(C_{0-6} alkyl), or (C_{3-10} heteroaryl)(C_{1-6} alkyl), and Z is O, S, SO, SO_2, or NR^{19} wherein R^{19} is H, C_{1-6} alkyl, C_{1-6} acyl, (C_{6-40} aryl)(C_{0-6} alkyl), C_{3-10} heterocyclic radical, C_{3-10} heteroaryl, (C_{3-10} heteroaryl)(C_{0-6} alkyl), or C_{2-14} alkyloxycarbonyl; or wherein R^{18} and NR^{19} taken together form a bifunctional C_{6-40} aryl, a bifunctional C_{3-12} heterocyclic radical, or a bifunctional C_{3-12} heteroaryl; and

R^7 is H, a thiol-protecting group, or a moiety set forth in the above generic formula (1) wherein R^7 is deleted, said compound being a symmetrical disulfide dimer or an asymmetrical disulfide or, when taken together with R^1, a bifunctional thiol-protecting group;

or a pharmaceutically acceptable salt thereof.

5,840,919

CHEMILUMINESCENT 1,2-DIOXETANES

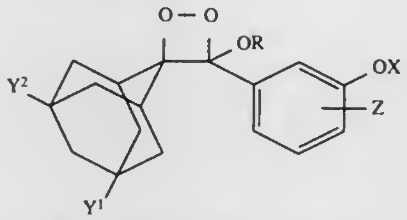
Irena Bronstein, Newton; Brooks Edwards, Cambridge, and Alison Sparks, North Andover, all of Mass., assignors to Tropix, Inc., Bedford, Mass.

Continuation-in-part of Ser. No. 231,673, Apr. 25, 1994, Pat. No. 5,582,980, which is a continuation-in-part of Ser. No. 57,903, May 7, 1993, Pat. No. 5,538,847. This application Oct. 17, 1995, Ser. No. 544,172

Int. Cl.^{6} C07F *9/06*

U.S. Cl. 549—220 **5 Claims**

1. A dioxetane of the formula (I):



(I)

wherein Y^1 and Y^2 are each independently H, a hydroxyl group, a halogen, an unsubstituted lower alkyl group, a hydroxy lower alkyl group, a halo lower alkyl group, a phenyl group, a halo phenyl group, an alkoxy phenyl group, an alkoxy phenoxy group, a hydroxy alkoxy group, a cyano group, an amide group, an alkoxy group or a carboxyl group,

wherein R is C1–20 alkyl, aryl or aralkyl,

wherein X is an enzyme-labile group selected from the group consisting of a phosphate, galactoside, acetate, 1-phospho-2,3-diacylglyceride, 1-thio-D-glucoside, adenosine tryphosphate, adenosine diphosphate, adenosine monophosphate, adenosine, α-D-glucoside, β-D-glucoside, β-D-glucuronide, α-D-mannoside, β-D-mannoside, β-D-fructofuranoside, β-glucosideuronate, P-toluenesulfonyl-L-arginine ester, and P-toluenesulfonyl-L-arginine amide, and wherein Z is an electron-active group selected from the group consisting of electron withdrawing groups and electron-donating groups and occupies the four or five position on the phenyl ring.

5,840,920

PROCESS FOR PREPARING COMPOSITIONS USEFUL AS INTERMEDIATES FOR PREPARING LUBRICATING OIL AND FUEL ADDITIVES

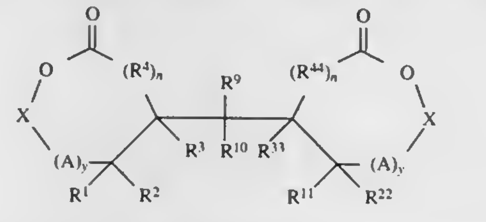
Mark R. Baker, Lyndhurst, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed Aug. 8, 1996, Ser. No. 694,046

Int. Cl.^{6} C07D *313/00;307/02*

U.S. Cl. 549—266 **21 Claims**

1. A composition comprising a compound of the formula



wherein each n=0 or 1; each y=0 or 1;

wherein each X is independently a divalent hydrocarbon based group selected from the group consisting of

$>C(R^6)(C(R^5)(R^7)(R^8))$

when y=0, and

$>C(R^7)(R^8)$

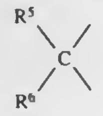
when y=1

wherein each of R^1, R^{11}, R^2, and R^{22} is independently H or a hydrocarbon based group;

each of R^3 and R^{33} is independently H or a hydrocarbon based group:

each of R^4 and R^{44} is a divalent hydrocarbylene group;

each A is a group of the formula



each R^5 is independently H or a hydrocarbon based group;

each of R^6, R^7, and R^8 is independently H or a hydrocarbon based group; and

each of R^9 and R^{10} is independently H or a hydrocarb on based group.

5,840,921

METHOD FOR THE PREPARATION OF ALDOL PRODUCT 7B

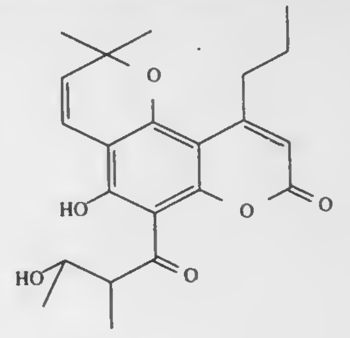
Michael T. Flavin, Darien; Ze-Qi Xu, Naperville; John D. Rizzo, Downers Grove, and Albert Khilevich, Glenview, all of Ill., assignors to Sarawak MediChem Pharmaceuticals, Inc., Lemont, Ill.

Division of Ser. No. 510,213, Aug. 2, 1995, which is a continuation-in-part of Ser. No. 285,655, Aug. 3, 1994, Pat. No. 5,489,697. This application Sep. 9, 1997, Ser. No. 925,992

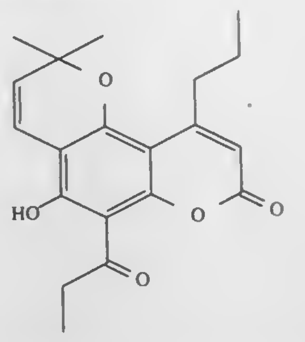
Int. Cl.^{6} C07D *493/00*

U.S. Cl. 549—282 **4 Claims**

1. A method for preparation of aldol product 7b



comprising reacting chromene 4



with acetaldehyde in the presence of a base or metal complex so as to produce said aldol product 7b.

5,840,922

COUMARIN DERIVATIVES, AND PROCESSES FOR THEIR PREPARATION

Mladen Trkovnik; Zrinka Ivezić, and Ljerka Polak, all of Zagreb, Croatia, assignors to PLIVA, farmaceutska, kemijska, prehrambena i kozmeticka industrija, dionicko drustvo, Zagrab, Croatia

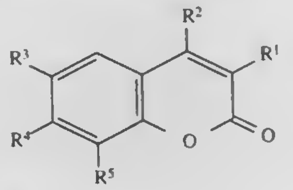
Filed Jul. 2, 1997, Ser. No. 887,217

Claims priority, application Croatia, Jul. 2, 1996, P960308A

Int. Cl.^{6} C07D *311/12:311/16*

U.S. Cl. 549—285 **9 Claims**

1. Coumarin derivative of the formula 1



1

wherein

R^1= NH_2 or —NHCH=C($CO_2C_2H_5$)$_2$, R^2= R^3= R^4= H, R^5= F,

R^1= R^3= NHCH=C($CO_2C_2H_5$)$_2$, R^2= R^4= R^5= H,

R^1= OH, R^3=NHCH=C($CO_2C_2H_5$)$_2$, R^2= R^4= R^5= H.

R^1= OH, R^2= R^3= R^4= H, R^5= —NHCH=C($CO_2C_2H_5$)$_2$, or

R^1= R^3= R^5= H, R^2= CH_3 or CF_3, R^4= —NHCH=C($CO_2C_2H_5$)$_2$.

5,840,923

CHIRAL CYCLOPENTENE DERIVATIVES AND THEIR PREPARATION

Stanley Michael Roberts, Kenton; Horacio F. Olivo, Exeter, and Raymond McCague, Miltin, all of Great Britain, assignors to Chlroscience Limited, Cambridge, Great Britain

Filed Oct. 21, 1994, Ser. No. 327,664

Claims priority, application United Kingdom, Sep. 25, 1992, 9220253; Nov. 1, 1993, 9322502

Int. Cl.^{6} C07D *307/935*

U.S. Cl. 549—311 **7 Claims**

1. An enantiomer of the lactone 4-hydroxy-2-oxa-bicyclo[3.3.0]oct-7-ene-3-one or an acylate thereof, wherein the enantiomer is present in at least 50% enantiomeric excess with respect to the other enantiomer.

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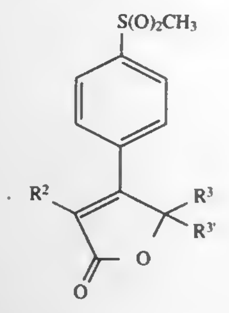
5,840,924
PROCESS OF PREPARING PHENYL HETEROCYCLES USEFUL AS COX-2 INHIBITORS

Richard Desmond, Bridgewater; Ulf H. Dolling, Westfield; Lisa F. Frey, Piscataway; Richard D. Tillyer, Westfield, and David M. Tschaen, Holmdel, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 16, 1997, Ser. No. 876,894
Int. Cl.^{6} C07D *307/58*

U.S. Cl. 549—323 **12 Claims**

1. A method of making compounds of Formula I



I

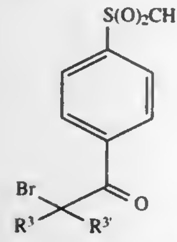
wherein

R^2 is mono- or di-substituted phenyl wherein the substituent is selected from the group consisting of
(1) hydrogen,
(2) halo,
(3) C_{1-6}alkoxy,
(4) C_{1-6}alkylthio,
(5) CN,
(6) CF_3, and
(7) C_{1-6}alkyl,

R^3 and R3' are each independently selected from hydrogen and C_{1-4}alkyl,

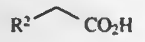
comprising:

(b4) reacting in N,N-dimethylformamide a compound of Formula 2

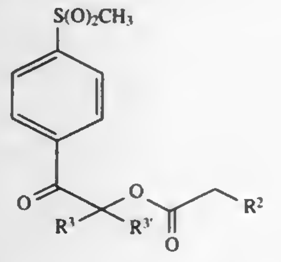


2

with a phenyl acetic acid of formula



in the presence of an inorganic base to produce a compound of Formula 5a



5a

and

(b5) treating in polar aprotic solvent the compound 5a with an organic base to yield a compound of Formula I.

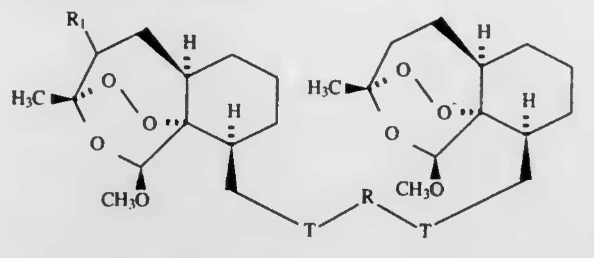
5,840,925
TRIOXANE DIMER COMPOUNDS HAVING ANTIPROLIFERATIVE AND ANTITUMOR ACTIVITIES

Qun Y. Zheng, Wayne, N.J.; Christopher Murray; Randall J. Daughenbaugh, both of Longmont, Colo.; Poonsakdi Ploypradith, and Gary H. Posner, both of Baltimore, Md., assignors to Hauser, Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 496,771, Jun. 29, 1995, Pat. No. 5,677,468. This application Dec. 2, 1996, Ser. No. 759,254
Int. Cl.^{6} C07D *321/02*

U.S. Cl. 549—349 **23 Claims**

1. A trioxane dimer compound having antiproliferative and antitumor activities of the formula:



or an enantiomers thereof, wherein:
R_1 is CH_3, $PhCH_2Cl$ or $PhCl_2$; and
R is a linker when T is CH_2O; or
R is oxygen when T is CH_2.

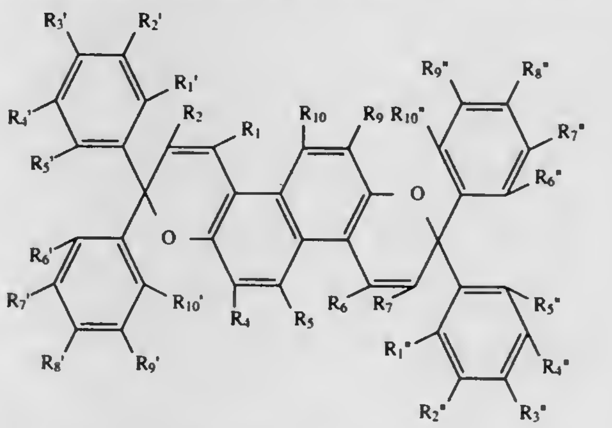
5,840,926
PHOTOCHROMIC ARTICLES

Frank J. Hughes, Edina, Minn., assignor to Vision-Ease Lens, Inc., Brooklyn Center, Minn.

Continuation of Ser. No. 477,137, Jun. 7, 1995, abandoned. This application Jul. 17, 1997, Ser. No. 895,655
Int. Cl.^{6} G02B *5/23;* **C07D** *311/78;405/10*

U.S. Cl. 549—384 **23 Claims**

1. A photochromic article comprising a host material and a photochromic amount of a naphthopyran compound, the naphthopyran compound represented by the formula:



wherein R_1, R_2, R_6, and R_7 are each hydrogen;

wherein R_4, R_5, R_9, R_{10}, R_1', R_2', R_3', R_4', R_5', R_1'', R_2'', R_3'', R_4'', and R_5'' are each selected from the group consisting of hydrogen, alkyl, alkoxy, unsubstituted phenyl, substituted phenyl, unsubstituted phenoxy, substituted phenoxy, naphthyl, naphthoxy, cycloalkyl, furyl, alkoyl, alkoyloxy, aroyl, aroyloxy, halogen, amino, dialkylamino, nitro, morpholino, piperidino, and piperazino; and

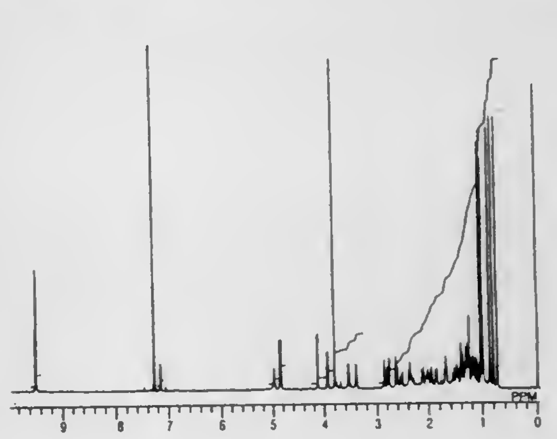
wherein R_6', R_7', R_8', R_9', and R_{10}' are each selected from the group consisting of hydrogen, alkyl, alkoxy, unsubstituted phenyl, substituted phenyl, unsubstituted phenoxy, substituted phenoxy, naphthyl, naphthoxy, cycloalkyl, furyl, alkoyl, alkoyloxy, aroyl, aroyloxy, halogen, amino, dialkylamino, nitro, morpholino, piperidino, and piperazino, provided that at least one of R_6', R_7', R_8', R_9', R_{10}', R_6'', R_7'', R_8'', R_9'', and R_{10}'' is selected from the group consisting of unsubstituted phenoxy, substituted phenoxy, naphthyl, naphthoxy, cycloalkyl, furyl, alkoyl, alkoyloxy, aroyl, aroyloxy, nitro, moripholino, piperidino, and piperazino.

5,840,927
SESQUITERPENE COMPOUNDS

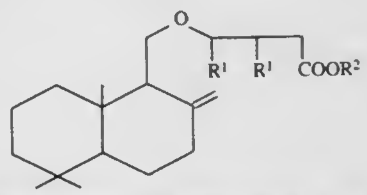
Shigeo Nozoe, Sendai; Akira Takahashi, Tsukuba; Jun-Ich Masuda, Tsukuba; Ken-ichi Tanaka, Tsukuba, and Hideo Suzuki, Tsukuba, all of Japan, assignors to Toa Gosei Co., Ltd., Japan

PCT No. PCT/JP96/00315, § 371 Date Sep. 26, 1997, § 102(e) Date Sep. 26, 1997, PCT Pub. No. WO96/25385, PCT Pub. Date Aug. 22, 1996
PCT Filed Feb. 14, 1996, Ser. No. 894,312
Claims priority, application Japan, Feb. 15, 1995, 7-050474
Int. Cl.^{6} C07D *307/92;307/91*

U.S. Cl. 549—458 **6 Claims**

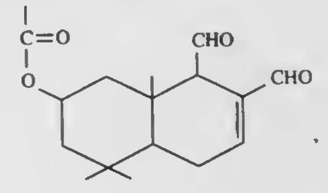


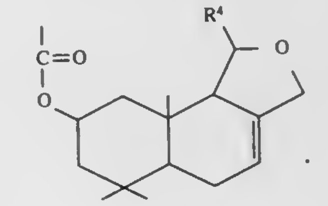
1. A sesquiterpene compound represented by the following structural formula 1:



(1)

wherein one of the two R^1 groups present in said formula is a —$COOR^3$ group, and the other one is any one of the groups represented by the following formulas,





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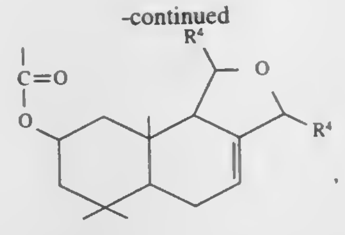

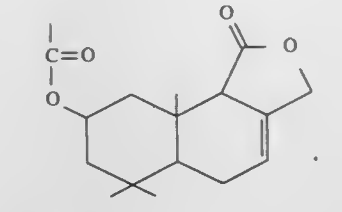

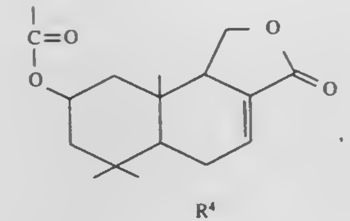

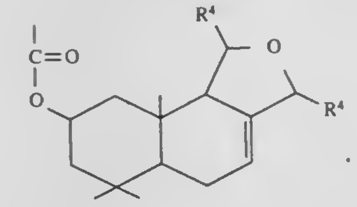

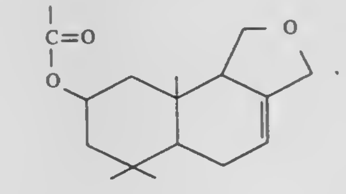

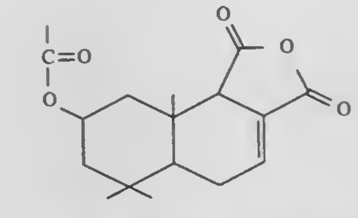

wherein each R^2 and R^3 group is independently a hydrogen atom, an alkyl group or an acyloxyalkyl group, and R^4 is a hydroxyl group or an alkoxy group.

5,840,928
METHOD FOR PRODUCTION OF 3-FORMYL-TETRAHYDROFURAN

Kenichl Satoh; Toshio Kitashima; Yutaka Chiba; Katsutoshi Kinoshita, and Kenji Kodaka, all of Chiba, Japan, assignors to Mitsui Chemicals, Inc., Tokyo, Japan

Filed Mar. 7, 1997, Ser. No. 813,348
Claims priority, application Japan, Mar. 12, 1996, 8-054878
Int. Cl.^{6} C07D *307/12*

U.S. Cl. 549—483 **2 Claims**

1. A process for the preparation of 3-formyltetrahydrofuran which consists essentially of reacting 2,5-dihydrofuran with hydro-

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gen and carbon monoxide in the range of 50° to 60° C. in the presence of a group VIII metal compound and tris(2-t-butyl-5-methylphenyl)phosphite to form 3-formyltetrahydrofuran.

5,840,929
C4 METHOXY ETHER DERIVATIVES OF PACLITAXEL

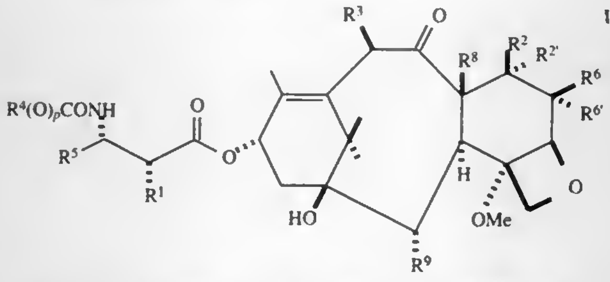
Shu-Hui Chen, Hamden, Conn., assignor to Bristol-Myers Squibb Company, Princeton, N.J.

Continuation of Ser. No. 422,374, Apr. 14, 1995, abandoned. This application Sep. 9, 1996, Ser. No. 709,673

Int. Cl.^{6} C07D *305/14*

U.S. Cl. 549—510 **4 Claims**

1. A compound of formula I



I

wherein R^1 is hydroxy; R^2 is hydroxy; R$^{2'}$ is hydrogen; R$^{6'}$ is hydrogen; R^3 is acetyloxy; R^8 is methyl; R^6 is hydrogen; R^9 is benzyloxy; R^4 and R^5 are independently C$_{1-6}$ alkyl, C$_{2-6}$ alkenyl, C$_{2-6}$ alkynyl, or —Z—R^{10}; Z is a direct bond, C$_{1-6}$ alkyl or C$_{2-6}$ alkenyl; R^{10} is aryl, substituted aryl, C$_{3-6}$ cycloalkyl or heteroaryl; and p is 0 or 1.

5,840,930
METHOD FOR PRODUCTION OF 2", 3" DIHALOCEPHALOMANNINE

Luben K. Yankov, Edison, and Ramesh C. Pandey, Highland Park, both of N.J., assignors to Xechem International, Inc., New Brunswick, N.J.

Division of Ser. No. 571,427, Dec. 13, 1995, which is a continuation-in-part of Ser. No. 530,846, Oct. 2, 1995, abandoned. This application Nov. 4, 1996, Ser. No. 743,512

Int. Cl.^{6} C07D *305/14*

U.S. Cl. 549—510 **9 Claims**

1. A method for the production of dibromocephalomannine comprising brominating cephalomannine under conditions effective to selectively brominate the unsaturated side chain portion of cephalomannine to produce 2", 3"-dibromocephalomannine.

5,840,931
TAXOIDS, THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Hervé Bouchard, Thiais; Jean-Dominique Bourzat, Vincennes; Alain Commerçon, Vitry-sur-Seine; Corinne Terrier, Livry-Gargan, and Martine Zucco, Thiais, all of France, assignors to Rhone-Poulenc Rorer S.A., Antony, France

PCT No. PCT/FR95/01393, § 371 Date Apr. 24, 1997, § 102(e) Date Apr. 24, 1997, PCT Pub. No. WO96/13494, PCT Pub. Date May 9, 1996

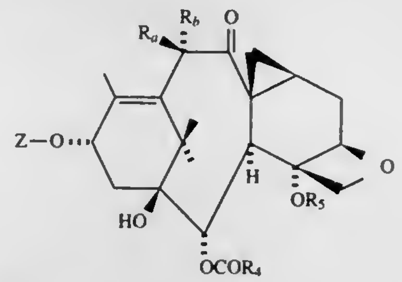
PCT Filed Oct. 23, 1995, Ser. No. 817,742

Claims priority, application France, Oct. 26, 1994, 94 12795

Int. Cl.^{6} C07D *305/14*

U.S. Cl. 549—510 **11 Claims**

1. A taxoid of formula I:

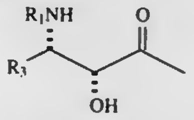


(I)

in which:

R$_a$ represents a hydrogen atom or a hydroxyl radical, an alkoxy radical containing 1 to 4 carbon atoms, an acyloxy radical containing 1 to 4 carbon atoms or an alkoxyacetoxy radical in which the alkyl portion contains 1 to 4 carbon atoms and R$_b$ represents a hydrogen atom, or alternatively R$_a$ and R$_b$, together with the carbon atom to which they are attached, form a ketone function;

Z represents a hydrogen atom or a radical of formula (II):



(II)

in which:

R$_1$ represents a benzoyl radical unsubstituted or substituted with one or more identical or different atoms or radicals selected from halogen atoms and alkyl radicals containing 1 to 4 carbon atoms, alkoxy radicals containing 1 to 4 carbon atoms or trifluoromethyl radicals, a thenoyl or furoyl radical or a radical R$_2$—O—CO— in which R$_2$ represents:

an alkyl radical containing 1 to 8 carbon atoms, an alkenyl radical containing 2 to 8 carbon atoms, an alkynyl radical containing 3 to 8 carbon atoms, a cycloalkyl radical containing 3 to 6 carbon atoms, a cycloalkenyl radical containing 4 to 6 carbon atoms or a bicycloalkyl radical containing 7 to 10 carbon atoms, these radicals unsubstituted or substituted with one or more substituents selected from halogen atoms and hydroxyl radicals, alkoxy radicals containing 1 to 4 carbon atoms, dialkylamino radicals in which each alkyl portion contains 1 to 4 carbon atoms, piperidino or morpholino radicals, 1-piperazinyl radicals unsubstituted or substituted at position 4 with an alkyl radical containing 1 to 4 carbon atoms or with a phenylalkyl radical in which the alkyl portion contains 1 to 4 carbon atoms), cycloalkyl radicals containing 3 to 6 carbon atoms, cycloalkenyl radicals containing 4 to 6 carbon atoms, phenyl radicals unsubstituted or substituted with one or more atoms or radicals chosen from halogen atoms and alkyl radicals containing 1 to 4 carbon atoms or alkoxy radicals containing 1 to 4 carbon atoms), cyano or carboxyl radicals or alkoxycarbonyl radicals in which the alkyl portion contains 1 to 4 carbon atoms;

a phenyl or α- or β-naphthyl radical unsubstituted or substituted with one or more atoms or radicals chosen from halogen atoms and alkyl radicals containing 1 to 4 carbon atoms or alkoxy radicals containing 1 to 4 carbon atoms, or a 5-membered aromatic heterocyclic radical;

or a saturated heterocyclic radical containing 4 to 6 carbon atoms, unsubstituted or substituted with one or more alkyl radicals containing 1 to 4 carbon atoms,

R$_3$ represents an unbranched or branched alkyl radical containing 1 to 8 carbon atoms, an unbranched or branched alkenyl radical containing 2 to 8 carbon atoms, an unbranched or branched alkynyl radical containing 2 to 8 carbon atoms, a cycloalkyl radical containing 3 to 6 carbon atoms, a phenyl or α- or β-naphthyl radical unsubstituted or substituted with one or more atoms or radicals selected from halogen atoms and alkyl, alkenyl, alkynyl, aryl, aralkyl, alkoxy, alkylthio, aryloxy, arylthio, hydroxyl, hydroxyalkyl, mercapto, formyl, acyl, acylamino, aroylamino, alkoxycarbonylamino, amino, alkylamino, dialkylamino, carboxyl, alkoxycarbonyl, carbamoyl, alkylcarbamoyl, dialkylcarbamoyl, cyano, nitro and trifluoromethyl radicals, or a 5-membered aromatic heterocycle containing one or more identical or different hetero atoms selected from nitrogen, oxygen and sulphur atoms and unsubstituted or substituted with one or more identical or different substituents selected from halogen atoms and alkyl, aryl, amino, alkylamino, dialkylamino, alkoxycarbonylamino, acyl, arylcarbonyl, cyano, carboxyl, carbamoyl, alkylcarbamoyl, dialkylcarbamoyl or alkoxycarbonyl radicals, wherein in the substituents of the phenyl, α- or β-naphthyl and aromatic heterocyclic radicals, the alkyl radicals and the alkyl portions of the other radicals contain 1 to 4 carbon atoms, the alkenyl and alkynyl radicals contain 2 to 8 carbon atoms, and the aryl radicals are phenyl or α- or β-naphthyl radicals;

R$_4$ represents:

an unbranched or branched alkyl radical containing 1 to 8 carbon atoms, an unbranched or branched alkenyl radical containing 2 to 8 carbon atoms, an unbranched or branched alkynyl radical containing 2 to 8 carbon atoms, a cycloalkyl radical containing 3 to 6 carbon atoms, a cycloalkenyl radical containing 4 to 6 carbon atoms or a bicycloalkyl radical containing 7 to 11 carbon atoms, these radicals being unsubstituted or substituted with one or more substituents selected from halogen atoms and hydroxyl radicals, alkyloxy radicals containing 1 to 4 carbon atoms, dialkylamino radicals in which each alkyl portion contains 1 to 4 carbon atoms, piperidino or morpholino radicals, 1-piperazinyl radicals unsubstituted or substituted at position 4 with an alkyl radical containing 1 to 4 carbon atoms or with a phenylalkyl radical in which the alkyl portion contains 1 to 4 carbon atoms), cycloalkyl radicals containing 3 to 6 carbon atoms, cycloalkenyl radicals containing 4 to 6 carbon atoms, unsubstituted or substituted phenyl radicals, cyano or carboxyl radicals or alkoxycarbonyl radicals in which the alkyl portion contains 1 to 4 carbon atoms;

or an aryl radical unsubstituted or substituted with one or more atoms or radicals selected from halogen atoms and alkyl, alkenyl, alkynyl, aryl, aralkyl, alkoxy, alkylthio, aryloxy, arylthio, hydroxyl, hydroxylalkyl, mercapto, formyl, acyl, acylamino, aroylamino, alkoxycarbonylamino, amino, alkylamino, dialkylamino, carboxyl, alkoxycarbonyl, carbamoyl, alkylcarbamoyl, dialkylcarbamoyl, cyano, nitro, azido, trifluoromethyl or trifluoromethoxy radicals;

or a saturated or unsaturated 4- to 6-membered heterocyclic radical unsubstituted or substituted with one or more alkyl radicals containing 1 to 4 carbon atoms; and

R^5 represents an unbranched or branched alkyl radical containing 1 to 8 carbon atoms, an unbranched or branched alkenyl radical containing 2 to 8 carbon atoms, an unbranched or branched alkynyl radical containing 2 to 8 carbon atoms, a cycloalkyl radical containing 3 to 6 carbon atoms, a cycloalkenyl radical containing 4 to 6 carbon atoms or a bicycloalkyl radical containing 7 to 11 carbon atoms, these radicals being unsubstituted or substituted with one or more substituents selected from halogen atoms and hydroxyl radicals, alkyloxy radicals containing 1 to 4 carbon atoms, dialkylamino radicals in which each alkyl portion contains 1 to 4 carbon atoms, piperidino or morpholino radicals, 1-piperazinyl radicals unsubstituted or substituted at position 4 with an alkyl radical containing 1 to 4 carbon atoms or with a phenylalkyl radical in which the alkyl portion contains 1 to 4 carbon atoms), cycloalkyl radicals containing 3 to 6 carbon atoms, cycloalkenyl radicals containing 4 to 6 carbon atoms, unsubstituted or substituted phenyl radicals, cyano or carboxyl radicals or alkyloxycarbonyl radicals in which the alkyl portion contains 1 to 4 carbon atoms, wherein the cycloalkyl, cycloalkenyl or bicycloalkyl radicals may be unsubstituted or substituted with one or more alkyl radicals containing 1 to 4 carbon atoms.

5,840,932
PROCESS FOR ETHYLENE OXIDE PRODUCTION

Wayne Errol Evans, Richmond, and Thomas Records Keller, III, Houston, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed May 21, 1997, Ser. No. 859,875

Int. Cl.^{6} C07D *303/00*

U.S. Cl. 549—512 **10 Claims**

1. A process for the catalytic oxidation of ethylene with molecular oxygen to an ethylene oxide product in a fixed bed reactor wherein a catalyst is disposed in multiple tubes surrounded by a fluid which removes the exothermic heat of reaction, said process comprising providing a cooling zone downstream of said tubes within said reactor, by introducing a cooled recycle slipstream into said zone.

5,840,933
CATALYTIC CONVERTER SYSTEM AND PROGRESS

John C. Jubin, Jr., West Chester, and W. Wayne Wentzheimer, Glen Mills, both of Pa., assignors to Arco Chemical Technology, L.P., Greenville, Del.

Filed Oct. 29, 1996, Ser. No. 740,461

Int. Cl.^{6} C07D *301/19*

U.S. Cl. 549—529 **3 Claims**

1. A process for the catalytic liquid phase exothermic reaction of a C$_3$–C$_5$ olefin with an aralkyl hydroperoxide with comprises passing a mixture containing the olefin and hydroperoxide at reaction conditions of elevated temperature and pressure through a series of separate reaction zones each packed with a bed of solid epoxidation catalyst, removing the liquid reaction mixture from the last of said separate reaction zones, reducing the pressure to provide partial vaporization temperature reduction of the reaction mixture removed from the last of the separate reaction zones, heating the partially vaporized mixture by indirect heat exchange with the reaction mixture from the first or an intermediate reaction zone and heating the feed mixture containing olefin and hydroperoxide by indirect heat exchange with the reaction mixture from the first or an intermediate reaction zone.

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5,840,934
PROCESS FOR PRODUCING EPOXIDIZED PRODUCT OF OLEFINS

Fumisato Goto, Tsukuba; Satoru Shibata, Naka-gun; Toshio Sasaki, and Kozo Tanaka, both of Tsukuba, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jun. 13, 1997, Ser. No. 874,246

Claims priority, application Japan, Jun. 14, 1996, 8-153823

Int. Cl.^{6} C07D *301/19*

U.S. Cl. 549—529 **7 Claims**

1. A process for producing an epoxidized product of olefins, which comprises oxidizing olefins in the presence of an oxidizing catalyst by using an alcohol medium solution of hydrogen peroxide produced by catalytically reacting hydrogen with oxygen in an alcohol single medium without requiring formaldehyde in the presence of a halogen compound of the platinum group metal.

5,840,935
UNSATURATED POLYMERIZABLE TTF, TCNQ AND DCQDI MONOMERS

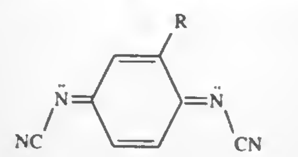
Nicholas T. Castellucci, San Pedro, Calif., assignor to Northrop Grumman Corporation, Los Angeles, Calif.

Division of Ser. No. 678,732, Jul. 17, 1996. This application Apr. 10, 1997, Ser. No. 835,689

Int. Cl.^{6} C07C *50/06*

U.S. Cl. 552—301 **3 Claims**

1. A polymerizable monomer having the formula:



in which R is selected from the group consisting of $CH_2{=}CH—$, and $CH_2{=}CH—CH_2—$.

5,840,936
AMINOSTEROL COMPOUNDS USEFUL AS INHIBITORS OF THE SODIUM/PROTON EXCHANGER (NHE)

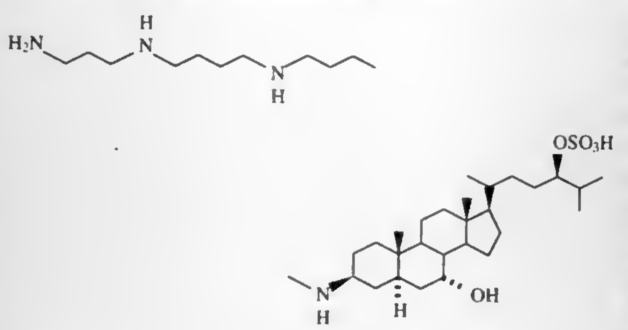
Michael Zasloff, Merion Station, Pa.; Ann Shinnar, Teaneck, N.J.; Meena Rao, Horsham, and William Kinney, Churchville, both of Pa., assignors to Magainin Pharmaceuticals Inc., Plymouth Meeting, Pa.

Filed Jun. 7, 1995, Ser. No. 475,572

Int. Cl.^{6} C07C *305/12;* **C07J** *41/00*

U.S. Cl. 552—521 **10 Claims**

1. A compound having the following structure:



or a pharmaceutically acceptable salt thereof.

5,840,937

Patent Not Issued For This Number

5,840,938
20(S)-25-HYDROXY VITAMIN D COMPOUNDS

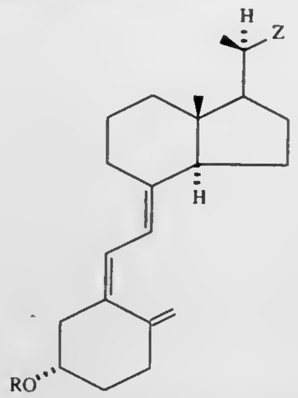
Hector F. DeLuca, Deerfield, Wis., and Jerzy Wicha, Warsaw, Poland, assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation of Ser. No. 435,230, May 5, 1995, abandoned, which is a division of Ser. No. 148,203, Nov. 3, 1993, Pat. No. 5,552,392. This application Jan. 14, 1997, Ser. No. 783,028

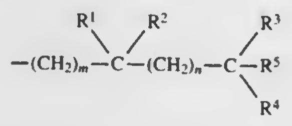
Int. Cl.^{6} C07C *401/00*

U.S. Cl. 552—653 **3 Claims**

1. A compound having the formula



where the stereochemical center at carbon 20 in the side chain has the S configuration, R is hydrogen or a hydroxy-protecting group, and Z is selected from the group consisting of Y, —OY, CH_2OY, $—C{\equiv}CY$ and $—CH{=}CHY$, where the double bond may have the cis or trans stereochemical configuration, and where Y is a radical of the structure



$$-(CH_2)_m-\overset{R^1\ \ R^2}{C}-(CH_2)_n-\underset{R^4}{\overset{R^3}{C}}-R^5$$

where m and n, independently, represent the integers from 0 to 5; where R^1 is selected from the group consisting of hydrogen, hydroxy, protected-hydroxy, fluoro, trifluoromethyl, and $C_{1\text{-}5}$ alkyl, which may be straight-chain or branched and, optionally, bear a hydroxy or protected-hydroxy substituent; where each of R^2, R^3 and R^4, independently, is selected from the group consisting of hydrogen, fluoro, trifluoromethyl and $C_{1\text{-}5}$ alkyl, which may be straight-chain or branched, and optionally bear a hydroxy or protected-hydroxy substituent; where R^1 and R^2, taken together, represent an oxo group, or an alkylidene group, $=CR_2R_3$, or the group $—(CH_2)_p—$, where p is an integer from 2 to 5; where R^3 and R^4, taken together, represent an oxo group, or the group $—(CH_2)_q—$, where q is an integer from 2 to 5; and where R^5 represents hydrogen, hydroxy, protected-hydroxy, or $C_{1\text{-}5}$ alkyl.

5,840,939
DERIVATIVES OF SUCCINAMIDE AND THEIR USE AS METALLOPROTEINASE INHIBITORS

Raymond Paul Beckett; Andrew Miller; Zoe Marie Spavold, and Mark Whittaker, all of Oxford, United Kingdom, assignors to British Biotech Pharmaceuticals, Ltd., England

PCT No. PCT/GB96/00930, § 371 Date Oct. 7, 1997, § 102(e) Date Oct. 7, 1997, PCT Pub. No. WO96/33161, PCT Pub. Date Oct. 24, 1996

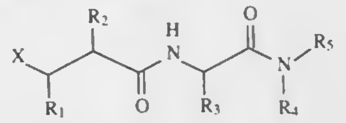
PCT Filed Apr. 18, 1996, Ser. No. 930,619

Claims priority, application United Kingdom, Apr. 18, 1995, 9507799

Int. Cl.^{6} C07C *231/00;229/00;* **A61K** *31/16*

U.S. Cl. 554—37 **16 Claims**

1. A compound of formula I



(I)

wherein

X is a $—CO_2H$ or —CONHOH group;

R_1 is hydrogen;

R_2 is a $(C_1–C_6)$alkyl, $(C_2–C_6)$alkenyl, $(C_2–C_6)$alkynyl, phenyl$(C_1–C_6)$alkyl, heteroaryl$(C_1–C_6)$alkyl, cycloalkyl$(C_1–C_6)$alkyl or cycloalkenyl$(C_1–C_6)$ alkyl group, any one of which may be optionally substituted by one or more substituents selected from $(C_1–C_6)$alkyl, $—O(C_1–C_6)$alkyl, $—S(C_1–C_6)$alkyl, $—OCH_2Ph$ wherein the phenyl group may be optionally substituted, halo and cyano (—CN);

R_3 is the characterising group of a natural or non-natural a amino acid in which any functional groups may be protected;

R_4 is a group -CHRXRY wherein R^x and R^y independently represent optionally substituted phenyl or monocyclic heteroaryl rings, which optionally may be linked covalently to each other by a bond or by a $C_1–C_4$ alkylene or $C_2–C_4$ alkenylene bridge, either of which may be optionally interrupted by an O or S atom;

R_5 is hydrogen or a $(C_1–C_6)$alkyl group; or a salt, hyoate or solvate thereof.

5,840,940
LINOLEOYLAMIDE BASED CERAMIDE DERIVATIVE AND ITS USE IN COSMETIC PREPARATIONS FOR THE TREATMENT OF DRY SKIN

Robertus Mattheus De Pater; Hein Simon Koger, both of Delft; Johannes Wilhelmus Jacobus Lambers, Pijnacker, and Jan Verweij, Leiden, all of Netherlands, assignors to Gist-Brocades B.V., Netherlands

PCT No. PCT/EP95/01069, § 371 Date Dec. 12, 1995, § 102(e) Date Dec. 12, 1995, PCT Pub. No. WO95/25716, PCT Pub. Date Sep. 28, 1995

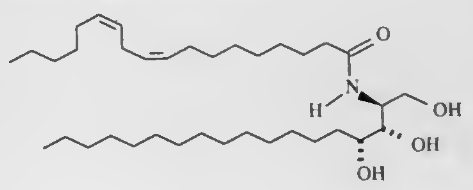
PCT Filed Mar. 20, 1995, Ser. No. 553,586

Claims priority, application Netherlands, Mar. 18, 1994, 94200712.1

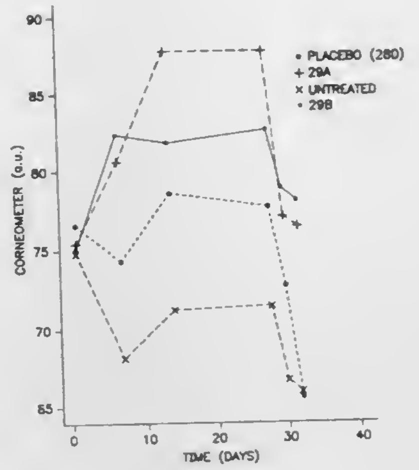
Int. Cl.^{6} C07C *233/00*

U.S. Cl. 554—61 **1 Claim**

1. A compound having the formula:



which is N-linoleoylphytosphingosine.



5,840,941
PROCESS FOR THE PREPARATION OF FLOWABLE, ANHYDROUS ACYLOXYALKANESULFONATES AND THEIR USE

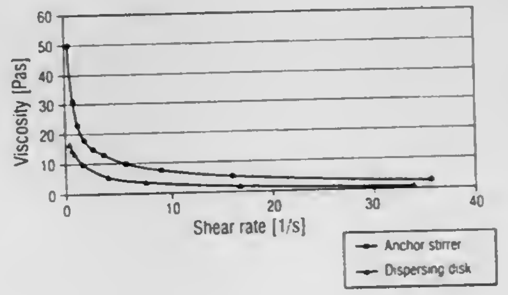
Viliam Tittel, Hofheim, and Dirk Bühring, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Filed May 8, 1996, Ser. No. 646,879

Claims priority, application Germany, May 9, 1995, 195 16 865.8

Int. Cl.^{6} C11D *1/28*

U.S. Cl. 554—92 **8 Claims**



1. A process for the preparation of flowable, anhydrous acyloxyalkanesulfonates by esterification of fatty acids with hydroxyalkanesulfonates, which comprises reacting at least one fatty acid of the formula 1 RCOOH (1), in which R is a hydrocarbon radical having 5 to 31 carbon atoms, with at least one hydroxyalkanesulfonate of the formula 2 $HO—R^1—SO_3X$ (2), in which R^1 is a C_2- to C_4-alkylene or a divalent di-C_2- to C_4-alkylether radical and X is an alkali metal or ammonium, in the presence of an esterification catalyst at a temperature of 180° to 250° C. with removal of the water present, cooling the reaction product to a temperature of 150° to 50° C. and shearing the mixture during cooling in such a manner that the mean particle size of the product is less than 100 μm.

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5,840,942

CATALYZED SYNTHESIS OF ARYL-SUBSTITUTED FATTY ACIDS AND FATTY ESTERS AND COMPOSITIONS RELATED THERETO

Bernardus A. Oude Alink, St. Louis, Mo., assignor to Baker Hughes Incorporated, Houston, Tex.

Continuation-in-part of Ser. No. 161,826, Dec. 2, 1993, Pat. No. 5,440,059. This application Jan. 19, 1995, Ser. No. 375,217

Int. Cl.^{6} C11C *3/00*

U.S. Cl. 554—162 **33 Claims**

1. A method for preparing an aryl-substituted fatty acid or fatty ester, comprising introducing at a rate and over a period of time an olefinic composition selected from the group consisting of mono-unsaturated fatty acids, mono-unsaturated fatty esters and mixtures thereof to a reaction zone comprising a liquid aromatic hydrocarbon in contact with a catalytic amount of a zeolite or clay catalyst, thereby to cause a reaction, the reaction being allowed to proceed for a time and at a temperature, and the rate and the period of time of introduction of the olefinic compsition being sufficient, to produce a reaction product comprising at least a 70% yield of aryl-substituted fatty acid or fatty ester.

5,840,943

POLYOLPOLYHYDROXYSTEARATES

Achim Ansmann, Erkrath; Rolf Kawa, Monheim; Rainer Von Kries, Illertissen, and Gabriele Strauss, Duesseldorf, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP95/02146, § 371 Date Dec. 13, 1996, § 102(e) Date Dec. 13, 1996, PCT Pub. No. WO95/34528, PCT Pub. Date Dec. 21, 1995

PCT Filed Jun. 6, 1995, Ser. No. 750,762

Claims priority, application Germany, Jun. 13, 1994, G 44 20 516.3

Int. Cl.^{6} C07C *51/00;* A01N *25/00*

U.S. Cl. 554—166 **16 Claims**

1. A process for making a water-in-oil emulsifier comprising esterifying a polyhydroxystearic acid component having a degree of self-condensation of from 2 to 20 with a polyglycerol component, the polyglycerol component consisting of:

(a) from 5 to 30% by weight of a glycerol;
(b) from 15 to 40% by weight of a diglycerol;
(c) from 10 to 30% by weight of a triglycerol;
(d) from 5 to 20% by weight of a tetraglycerol;
(e) from 2 to 10% by weight of a pentaglycerol; and
(f) remainder, up to 100%, of an oligoglycerol.

5,840,944

METHOD TO PRODUCE HIGHLY PURE EICOSAPENTAENOIC ACID OR ITS ESTER

Kiyomi Furihata, and Kazuhiko Hata, both of Tokyo, Japan, assignors to Nippon Suisan Kaisha, Ltd., Tokyo, Japan

PCT No. PCT/JP92/01393, § 371 Date Jun. 27, 1994, § 102(e) Date Jun. 27, 1994, PCT Pub. No. WO93/09210, PCT Pub. Date May 13, 1993

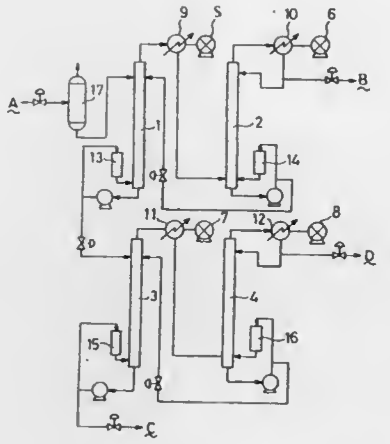
PCT Filed Oct. 28, 1992, Ser. No. 232,021

Claims priority, application Japan, Oct. 28, 1991, 3-281686

Int. Cl.^{6} C11B *3/12*

U.S. Cl. 554—175 **5 Claims**

1. A method of producing highly pure eicosapentaenoic acids or their ester wherein a mixture of fatty acids or their esters derived from natural oils and fats containing eicosapentaenoic acids or their derivatives is precision distilled in a plurality of distillation columns under a high vacuum to acquire a fraction consisting mainly of fatty acids of carbon number 20 or their esters, followed by subjecting the fraction to the column chromatography with a reversed-phase distribution system for partition refining.



5,840,945

METHOD FOR REFINING AND MANUFACTURING FATS AND OILS CONTAINING POLYUNSATURATED FATTY ACIDS

Yoshikazu Tsujiwaki; Hiroshi Yamamoto; Kazuko Hirata, all of Kobe, and Satoru Kamigasa, Kurayoshi, all of Japan, assignors to Ueda Oils and Fats Mfg. Co., Ltd., Kobe, Japan

Filed Oct. 31, 1996, Ser. No. 741,683

Claims priority, application Japan, Nov. 13, 1995, 7-294504

Int. Cl.^{6} C07C *51/43*

U.S. Cl. 554—192 **3 Claims**

1. A method of refining at least one member selected from the group consisting of a fat and an oil containing polyunsaturated fatty acids having 18 or more carbon atoms and three or more double bonds, said method comprising the step of bringing 100 parts by weight of said at least one member into contact for 10 minutes or more at 5°–80° C. with not less than 0.1 part by weight of powdered or granulated diatomaceous earth formed by calcining with a flux added.

5,840,946

VEGETABLE OIL EXTRACTED FROM RAPESEEDS HAVING A GENETICALLY CONTROLLED UNUSUALLY HIGH OLEIC ACID CONTENT

Raymond S. C. Wong; Wallace D. Beversdorf; James R. Castagno; Ian Grant, and Jayantilal D. Patel, all of Ontario, Canada, assignors to Pioneer Hi-Bred International, Inc., Johnston, Iowa

Continuation of Ser. No. 286,708, Dec. 20, 1988, Pat. No. 5,638,637, which is a continuation-in-part of Ser. No. 140,139, Dec. 31, 1987, abandoned. This application Jun. 5, 1995, Ser. No. 462,904

Int. Cl.^{6} C07C *57/02*

U.S. Cl. 554—224 **9 Claims**

1. An improved vegetable oil extracted from rapeseeds of increased stability when exposed to heat, said rapeseeds possessing genetic means for the expression of the fatty acid distribution within said vegetable oil specified hereafter and said vegetable oil having (1) an unusually high oleic acid content of 80 to 90 percent by weight based upon the total fatty acid content, (2) an erucic acid content of no more than 2.0 percent by weight based on the total fatty acid content, (3) an alpha-linolenic acid content of less than 5 percent by weight based upon the total fatty acid content, and (4) a saturated fatty acid content in the form of stearic and palmitic acids of no more than 7 percent by weight based upon the total fatty acid content.

5,840,947

ORGANOMETALLIC COMPOUND

Frank Küber, Oberursel; Michael Riedel, Frankfurt; Bernd Bachmann, Eppstein, and Andreas Winter, Glashütten, all of Germany, assignors to Targor GmbH, Germany

Filed May 16, 1996, Ser. No. 648,820

Claims priority, application Germany, May 16, 1995, 195 17 851.3

Int. Cl.^{6} C07F *17/00;* C08F *4/42*

U.S. Cl. 556—8 **13 Claims**

1. A metallocene compound of the formula I

$$R^5{}_nCp^1Cp^2M^1R^1R^2 \qquad \text{(I)}$$

where

Cp^1 and Cp^2 are, independently of one another, identical or different and are each an unsubstituted or substituted cyclopentadienyl group, n=zero or 1, R^5 is a bridge, M^1 is a metal of group IVb, Vb or VIb of the Periodic Table of the Elements, R^1 and R^2 are identical or different and are each a hydrogen atom, a C_1–C_{40}-, hydrocarbon group which optionally contains O, —OH group, halogen atom or —NR$^6{}_2$ group where R^6 are identical or different and are each a C_1–C_{10}-alkyl group or a C_6– C_{14}-aryl group wherein at least one of the two groups Cp^1 and Cp^2 is a substituted cyclopentadienyl group which bears at least one cyclic C_5–C_{20}-group containing at least one heteroatom in the ring, or which bears a fused-on C_2– C_{20}-ring system containing at least one heteroatom in the ring wherein said heteroatom is selected from the group consisting of O, N, P, Si and S.

5,840,948

PROCESS FOR THE PREPARATION OF SUBSTITUTED INDENES AND THEIR USE AS LIGAND SYSTEMS FOR METALLOCENE CATALYSTS

Jürgen Rohrmann, Kelkheim, and Frank Küber, Oberursel, both of Germany, assignors to Targor GmbH, Germany

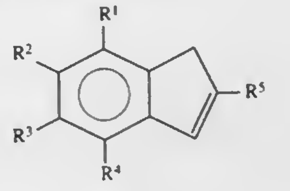
Division of Ser. No. 291,738, Aug. 17, 1994, abandoned, which is a continuation of Ser. No. 980,993, Nov. 24, 1992, abandoned. This application Jun. 5, 1995, Ser. No. 462,587

Claims priority, application Germany, Nov. 30, 1991, 41 35 594.8

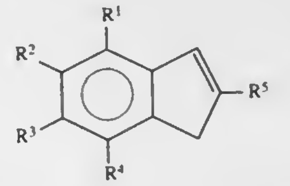
Int. Cl.^{6} C07F *17/00;7/00;* C07C *2/02*

U.S. Cl. 556—11 **20 Claims**

1. A process for the preparation of a compound of the formula IV or an isomer thereof of formula IVa



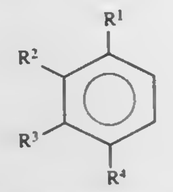
(IV)



(IVa)

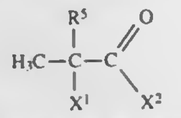
in which

R^1, R^2, R^3, R^4, and R^5 are identical or different and are hydrogen, $(C_1$–$C_{20})$ alkyl, $(C_6$–$C_{14})$aryl, $(C_1$–$C_{10})$alkoxy, $(C_2$–$C_{10})$alkenyl, $(C_7$–$C_{20})$arylalkyl, $(C_7$–$C_{20})$alkylaryl, $(C_6$–$C_{10})$aryloxy, $(C_1$–$C_{10})$-fluoroalkyl, $(C_6$–$C_{10})$-halogenoaryl, $(C_2$–$C_{10})$alkynyl, a radical —SiR$^5{}_3$, in which R^6 is $(C_1$–$C_{10})$ alkyl, a halogen atom or a hetero-aromatic radical which has 5 or 6 ring members and can contain one or more hetero atoms, or adjacent radicals R^1–R^4, with the atoms joining them, form one or more rings, and the indenyl radicals in formula IV or IVa are substituted in the 2,6-; 2,4,6-; 2,4,5-; 2,4,5,6- or 2,4,5,6,7-position which comprises reacting a compound of the formula I



(I)

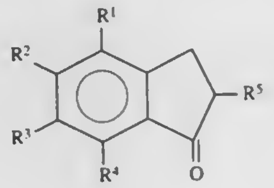
with a compound of the formula II



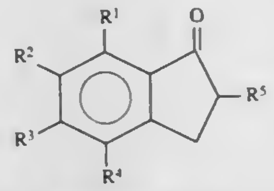
(II)

$$H_3C-\underset{X^1}{\overset{R^5}{\underset{|}{\overset{|}{C}}}}-C\overset{\displaystyle O}{\underset{\displaystyle X^2}{\lessgtr}}$$

or an anhydride thereof, in the presence of a Friedel-Crafts catalyst to give a compound of the formula III or of the formula IIIa



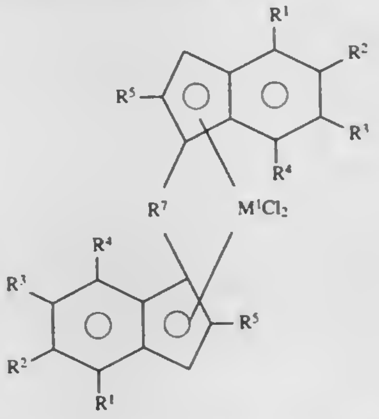
(III)



(IIIa)

in which R^1–R^5 have the meanings given and X^1 and X^2 are identical or different and are a nucleophilic leaving group, and converting this into the compound of the formula IV or IVa by reduction and dehydration by known methods.

6. A compound of the formula VI



(VI)

in which

M^1 is titanium, zirconium, hafnium, vanadium, niobium or tantalum,

R^1, R^2, R^3 and R^4 are identical or different and are hydrogen; $(C_1$–$C_{20})$alkyl; $(C_6$–$C_{14})$aryl; $(C_1$–$C_{10})$alkoxy; $(C_2$–$C_{10})$alkenyl; $(C_7$–$C_{20})$arylalkyl; $(C_7$–$C_{20})$alkylaryl; $(C_6$–$C_{10})$aryloxy; $(C_1$–$C_{10})$fluoroalkyl; $(C_6$–$C_{10})$halogenoaryl; $(C_2$–$C_{10})$alkynyl; a radical —SiR$^6{}_3$, in which R^6 is $(C_1$–$C_{10})$alkyl; a halogen atom; or a hetero-aromatic radical which has 5 or 6 ring members and can contain one or more

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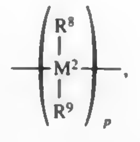
hetero atoms, or adjacent radicals R^2–R^4, with the atoms joining them, form one or more rings,

R^5 is hydrogen; $(C_{10}–C_{20})$alkyl; $(C_6–C_{14})$aryl; $(C_1–C_{10})$alkoxy; $(C_2–C_{10})$alkenyl; $(C_7–C_{20})$arylalkyl; $(C_7–C_{20})$alkylaryl; $(C_6–C_{10})$aryloxy; $(C_1–C_{10})$fluoroalkyl; $(C_6–C_{10})$halogenoaryl; $C_2–C_{10})$alkynyl; a radical —$SiR^6{}_3$, in which R^6 is $(C_1–C_{10})$alkyl; a halogen atom; or a hetero-aromatic radical which has 5 or 6ring members and can contain one or more hetero atoms,

R^7 is a radical



$$-\!\left(\begin{array}{c}R^8\\ |\\ M^2\\ |\\ R^9\end{array}\right)_{p}\!-,$$

in which

M^2 is carbon, silicon, germanium or tin

R^8 and R^9 are identical or different and are hydrogen, $(C_1–C_{20})$alkyl, $(C_6–C_{14})$aryl, $(C_1–C_{10})$alkoxy, $(C_2–C_{10})$alkenyl, $(C_7–C_{20})$arylalkyl, $(C_7–C_{20})$alkylaryl, $(C_6–C_{10})$aryloxy, $(C_1–C_{10})$fluoroalkyl, $(C_6–C_{10})$halogenoaryl, $(C_2–C_{10})$alkynyl or halogen or

R^8 and R^9, together with the atom joining them, form a ring,

p is 0, 1, 2 or 3 and

R^{10} and R^{11} are identical or different and are hydrogen, $(C_1–C_{10})$alkyl, $(C_1–C_{10})$alkoxy, $(C_6–C_{10})$aryl, $(C_6–C_{10})$aryloxy, $(C_2–C_{10})$alkenyl, $(C_7–C_{40})$arylalkyl, $(C_7–C_{40})$alkylaryl, $(C_8–C_{10})$arylalkenyl, hydroxyl or a halogen atom, and the indenyl radicals in formula VI are substituted in the 2,4,5-; 2,4,5,6- or 2,4,5,6,7-position.

5,840,949

RECOVERY OF METALLOCENE COMPLEXES

Marc Oliver Kristen, Limburgerhof; Peter Jutzi, and Thomas Redeker, both of Bielefeld, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

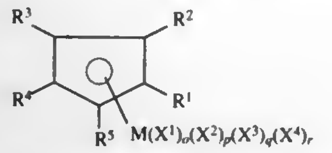
Filed Apr. 25, 1997, Ser. No. 847,487

Claims priority, application Germany, May 4, 1996, 196 180 07.4

Int. Cl.^{6} C07F *17/00;19/00;7/28*

U.S. Cl. 556—11 **6 Claims**

1. A process for recovering metallocene complexes of the formula I

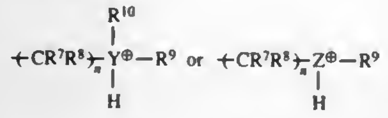


I

where

M is titanium, zirconium, hafnium, vanadium, niobium or tantalum,

R^1 to R^4 are each hydrogen, $C_1–C_{10}$-alkyl, 5–7-membered cycloalkyl which in turn may carry $C_1–C_{10}$ -alkyl as a substituent, $C_6–C_{15}$-aryl or arylalkyl, and two adjacent radicals together may furthermore form a cyclic group of 4 to 15 carbon atoms, $Si(R^6)_3$,



$$-\!\left(CR^7R^8\right)_{n}\!\overset{\displaystyle R^{10}}{\underset{\displaystyle H}{Y^{\oplus}}}-R^9 \text{ or } -\!\left(CR^7R^8\right)_{n}\!\underset{\displaystyle H}{Z^{\oplus}}-R^9$$

R^6 is $C_1–C_{10}$-alkyl, $C_6–C_{15}$-aryl or $C_3–C_{10}$-cycloalkyl,

R^7 and R^8 are each hydrogen, $C_1–C_{10}$-alkyl, $C_6–C_{15}$-aryl or $C_3–C_{10}$-cycloalkyl,

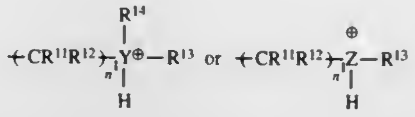
R^9 and R^{10} are each $C_1–C_{10}$-alkyl, $C_6–C_{15}$-aryl or $C_3–C_{10}$-cycloalkyl,

Y is nitrogen, phosphorus, arsenic, antimony or bismuth,

Z is oxygen, sulfur, selenium or tellurium,

n is an integer from 0 to 10,

R^5 is



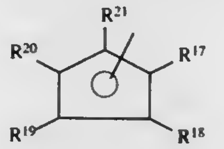
$$-\!\left(CR^{11}R^{12}\right)_{n^1}\!\overset{\displaystyle R^{14}}{\underset{\displaystyle H}{Y^{\oplus}}}-R^{13} \text{ or } -\!\left(CR^{11}R^{12}\right)_{n^1}\!\overset{\oplus}{\underset{\displaystyle H}{Z}}-R^{13}$$

R^{11} and R^{12} are each $C_1–C_{10}$-alkyl, $C_6–C_{15}$-aryl or $C_3–C_{10}$-cycloalkyl,

R^{13} and R^{14} are each hydrogen, $C_1–C_{10}$-alkyl, $C_6–C_{15}$-aryl or $C_3–C_{10}$-cycloalkyl,

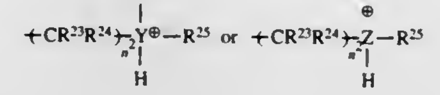
n^1 is an integer from 0 to 10,

X^1 to X^4 are each fluorine, chlorine, bromine, iodine, hydrogen, $C_1–C_{10}$-alkyl, $C_6–C_{15}$-aryl, alkylaryl having 1 to 10 carbon atoms in the alkyl radical and 6 to 20 carbon atoms in the aryl radical, —OR^{15}—, —$NR^{15}R^{16}$ or



R^{15} and R^{16} are each $C_1–C_{10}$-alkyl, $C_6–C_{15}$-aryl, alkylaryl, arylalkyl, fluoroalkyl or fluoroaryl, each having 1 to 10 carbon atoms in the alkyl radical and 6 to 20 carbon atoms in the aryl radical,

R^{17} to R^{21} are each hydrogen, $C_1–C_{10}$-alkyl, 5–7-membered cycloalkyl which in turn may carry $C_1–C_{10}$-alkyl as a substituent, $C_6–C_{15}$-aryl or arylalkyl, and two adjacent radicals together may furthermore form a cyclic group of 4 to 15 carbon atoms, $Si(R^{22})_3$,



$$-\!\left(CR^{23}R^{24}\right)_{n^2}\!\overset{\displaystyle R^{26}}{\underset{\displaystyle H}{Y^{\oplus}}}-R^{25} \text{ or } -\!\left(CR^{23}R^{24}\right)_{n^2}\!\overset{\oplus}{\underset{\displaystyle H}{Z}}-R^{25}$$

R^{22} is $C_1–C_{10}$-alkyl, $C_6–C_{15}$-aryl or $C_3–C_{10}$-cycloalkyl,

R^{23} and R^{24} are each hydrogen, $C_1–C_{10}$-alkyl, $C_6–C_{15}$-aryl or $C_3–C_{10}$-cycloalkyl,

R^{25} and R^{26} are each $C_1–C_{10}$-alkyl, $C_6–C_{15}$-aryl or $C_3–C_{10}$-cycloalkyl,

n^2 is an integer from 0 to 10 and

o, p, q, r are each an integer from 0 to 4, the sum o+p+q+r+1 corresponding to the valency of M,

which was used as an active catalyst component in the preparation of polymers of $C_2–C_{10}$-alkenes, wherein the polymerization is stopped by adding an acid and the metallocene complex of the formula I is recovered by extraction from the reaction mixture.

5,840,950

PROCESS FOR CONVERTING THE ACHIRAL MESO FORM OR THE RACEMATE OF AN ANSA-METALLOCENE COMPLEX OR MIXTURES THEREOF INTO ONE OF ITS ENANTIOMERS

David Fischer, Gönnheim; Franz Langhauser, Bad Dürkheim; Rainer Stürmer, Roedersheim; Jürgen Kerth, Carlsberg; Günther Schweier, Friedelsheim, all of Germany; Hans-Herbert Brintzinger, Taegerswilen, Switzerland, and Katrin Schmidt, Constance, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP96/02869, § 371 Date Jan. 8, 1998, § 102(e) Date Jan. 8, 1998, PCT Pub. No. WO97/03081, PCT Pub. Date Jan. 30, 1997

PCT Filed Jan. 7, 1996, Ser. No. 981,638

Claims priority, application Germany, Jul. 11, 1995, 195 25 184.9

Int. Cl.^{6} C07F *17/00;9/00;5/00*

U.S. Cl. 556—11 **9 Claims**

1. A process for converting the achiral meso form or the racemate of an ansa-metallocene complex or a mixture thereof into one of its enantiomers, which comprises carrying out the conversion photochemically in the presence of an enantiomerically pure auxiliary reagent.

5,840,951

ORGANOSILICON COMPOUNDS CONTAINING AMINO GROUPS, THEIR PREPARATION AND THEIR USE

Thomas Hierstetter, Woehlerstr.6; Jochen Dauth, Trebnitzerstr.16; Joerg Pfister, Spinnereistr.86, and Bernward Deubzer, Virchowstr.14, all of Germany, assignors to Wacker-Chemie GmbH, Germany

Filed Jul. 7, 1997, Ser. No. 888,405

Claims priority, application Germany, Sep. 18, 1996, 196 38 125.8

Int. Cl.^{6} C07F *7/10*

U.S. Cl. 556—425 **7 Claims**

1. An organosilicon compound containing amino groups and comprising

a) siloxane units of the formula

$$R_aSi(OR^1)_bO_{(4-a-b)/2} \qquad (I)$$

where

R is an identical or different hydrocarbon radical having from 1 to 18 carbon atoms, optionally substituted by halogen atoms, alkoxy groups or hydroxy groups and where the hydrocarbon radical is optionally interrupted by oxygen atoms,

R^1 is an identical or different alkyl radical which is optionally interrupted by oxygen atoms,

a is 0, 1, 2 or 3 and

b is 0, 1, 2 or 3, with the proviso that the sum a+b is not greater than 3,

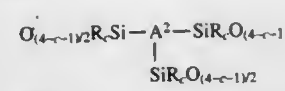
and

b) per molecule at least one unit selected from the group consisting of units of the formulae

$$AR_cSiO_{(4-c-1)/2}, \qquad (II)$$

$$O_{(4-c-1)/2}R_cSi—A^1— R_cSiO_{(4-c-1)/2} \qquad (III)$$

or



$$O_{(4-c-1)/2}R_cSi-\underset{\displaystyle SiR_cO_{(4-c-1)/2}}{\underset{|}{A^2}}-SiR_cO_{(4-c-1)/2}, \qquad (IV)$$

where

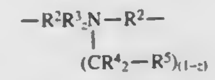
R is identical or different and has the meaning given for R above,

C is 0, 1 or 2,

A is a radical of the formula

$$—R^2R^3{}_zN(—CR^4{}_2— R^5)_{(2-z)}, \qquad (V)$$

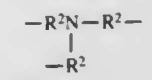
A^1 is a radical of the formula



$$-R^2R^3{}_zN\underset{\displaystyle (CR^4{}_2-R^5)_{(1-z)}}{\underset{|}{}}-R^2-$$

and

A^2 is a radical of the formula

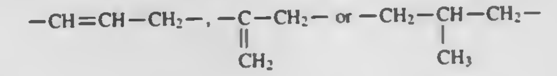


$$-R^2\underset{\displaystyle -R^2}{\underset{|}{N}}-R^2- \qquad (VII)$$

where

z is 0 or 1,

R^2 is an identical or different alkylene radical having from 2 to 8 carbon atoms, a radical of the formula



$$-CH=CH-CH_2-,\ -\underset{\displaystyle CH_2}{\underset{\|}{C}}-CH_2- \text{ or } -CH_2-\underset{\displaystyle CH_3}{\underset{|}{CH}}-CH_2-$$

where

R^3 is a hydrogen atom or an alkyl radical having from 1 to 8 carbon atoms,

R^4 is a hydrogen atom or an alkyl radical having from 1 to 8 carbon atoms,

R^5 is a radical of the formulae —CR^6=$CR^6{}_2$, —C≡CR^6, where R^6 is an identical or different hydrogen atom or alkyl radical having from 1 to 8 carbon atoms,

with the proviso that the organosilicon compound containing amino groups has at least one siloxane unit of formula (II) per molecule and at least one unit selected from the group consisting of units of formulae (III) and (IV) per molecule.

5,840,952

METHOD OF MANUFACTURING 3-MERCAPTOPROPYLALKOXY SILANE

Muneo Kudo; Hideyoshi Yanagisawa; Shoji Ichinohe; Akira Yamamoto, all of Gunma-ken; Satoru Beppu, Joetsu; Hiroyuki Iwaki, Niigata-ken, and Satoshi Sekizawa, Takaoka, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Oct. 31, 1996, Ser. No. 741,684

Claims priority, application Japan, Nov. 2, 1995, 7-309895

Int. Cl.^{6} C07F *7/08;7/18*

U.S. Cl. 556—429 **7 Claims**

1. A method of manufacturing 3-mercaptopropylalkoxy silane wherein 3-halopropylalkoxy silane represented by the general formula

$$X(CH_2)_3Si(OR)_aR_{3-a} \qquad (I)$$

is reacted in the reaction product obtained by reacting sodium sulfide anhydride and hydrogen sulfide, wherein X denotes Cl or Br; R denotes a methyl, ethyl or propyl group wherein R's can be all identical or different from each other; and "a" denotes an integer 1, 2 or 3.

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5,840,953

PURIFIED TETRAETHOXYSILANE AND METHOD OF PURIFYING

Thomas M. Potts, Joplin, Mo., assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed Nov. 16, 1995, Ser. No. 558,682

Int. Cl.^{6} C07F *07/04*

U.S. Cl. 556—483 **10 Claims**

1. A method of purifying tetraethoxysilane, comprising:

injecting impure tetraethoxysilane in the gaseous phase into a gas chromatograph column as a series of spaced pulses;

heating said gas chromatograph column to a temperature less than the boiling point of pure tetraethoxysilane;

passing said impure tetraethoxysilane through said gas chromatograph column by a flow of carrier gas;

separating impurities in said impure tetraethoxysilane from purified tetraethoxysilane which results in elution of purified tetraethoxysilane from said gas chromatograph column at a different time than said impurities; and

receiving said purified tetraethoxysilane at a location distinct from that of said impurities.

5,840,954

ENHANCING THE STORAGE STABILITY OF ORGANIC PHOSPHITES AND PHOSPHONITES

Udo Quotschalla, Heppenheim, Germany, and Helmut Linhart, Reinach, Switzerland, assignors to Cibá Specialty Chemicals Corporation, Tarrytown, N.Y.

Filed Sep. 30, 1993, Ser. No. 129,704

Claims priority, application Switzerland, Oct. 5, 1992, 3105/92

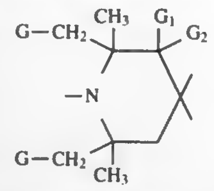
Int. Cl.^{6} C07F *9/141;9/48*

U.S. Cl. 558—71 **8 Claims**

1. A composition stabilized against hydrolysis comprising

(a) 80 to 99.9% by weight of an organic phosphite or phosphonite or a mixture thereof; and

(b) 0.1 to 20% by weight, relative to the phosphite or phosphonite or mixture thereof, of a sterically hindered amine containing at least one group of the formula II



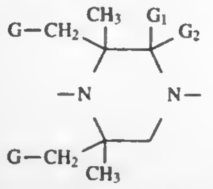
(II)

in which G is hydrogen or methyl and G_1 and G_2 are hydrogen, methyl or together are =O.

5. A composition stabilized against hydrolysis comprising

(a) 80 to 99.9% by weight of an organic phosphite or phosphonite or a mixture thereof; and

(b) 0.1 to 20% by weight, relative to the phosphite or phosphonite or mixture thereof, of a sterically hindered amine containing at least one group of the formula III



(III)

in which G is hydrogen or methyl and G_1 G_2 are hydrogen, methyl or together are =O.

5,840,955

WASTE MINIMIZATION AND PRODUCT RECOVERY PROCESS

Edward J. Sockell, 806 Westwood, Port Lavaca, Tex. 77979; Joseph C. Sarna, 206 Waterford Dr., Victoria, Tex. 77901; Ali Kerr, 301 Brocton, Victoria, Tex. 77904, and Sanjay P. Godbole, 7260 Winchester Dr., Solon, Ohio 44139

Filed Nov. 25, 1997, Ser. No. 977,762

Int. Cl.^{6} C07C *253/00;255/00*

U.S. Cl. 558—324 **9 Claims**

1. A process for the manufacture of acrylonitrile or methacrylonitrile comprising transporting the reactor effluent obtained during the ammoxidation of propylene or isobutylene to a quench column wherein the hot effluent gases are cooled by contact with an aqueous spray, passing the cooled reactor effluent overhead to an absorber column wherein the crude acrylonitrile or methacrylonitrile is absorbed in water, passing the resulting vapor stream containing the HCN to a product cooler and then to a knock-out pot, wherein the improvement comprises contacting the cooled HCN product with an aqueous stream.

5,840,956

METHOD OF MAKING (S)-3-(AMINOMETHYL)-5-METHYLHEXANOIC ACID

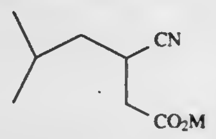
Todd Michel Grote; Brian Keith Huckabee, both of Holland; Thomas Mulhern, Hudsonville; Denis Martin Sobieray, Holland, all of Mich., and Robert Daniel Titus, Indianapolis, Ind., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 671,881, Jun. 28, 1996, abandoned, which is a division of Ser. No. 474,874, Jun. 7, 1995, Pat. No. 5,637,767. This application Feb. 6, 1997, Ser. No. 796,159

Int. Cl.^{6} C07D *255/00*

U.S. Cl. 558—441 **1 Claim**

1. The compound having the formula



wherein M is sodium or potassium.

5,840,957

TRANSESTERIFICATION PROCESS USING LANTHANUM COMPOUND CATALYST

Joseph Varapadavil Kurian, and Yuanfeng Liang, both of Newark, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 16, 1998, Ser. No. 42,525

Int. Cl.^{6} C07C *67/02*

U.S. Cl. 560—92 **7 Claims**

1. A process for making bis(3-hydroxypropyl) terephthalate monomer, comprising the step of:

contacting a C_1–C_4 dialkyl ester of terephthalic acid with 1,3-propanediol in the presence of a lanthanum compound transesterification catalyst selected from the group consisting of a lanthanum beta-diketonate, a lanthanum beta-ketoester, a lanthanum beta-diester, and mixtures thereof at a temperature from about 155° C. to about 245° C. with a mole ratio of the 1,3-propanediol to the dialkyl ester of about 1.1:1 to about 2.2:1.

5,840,958

1S TO 1R EPIMERIZATIONS OF PYRETHROID INTERMEDIATES

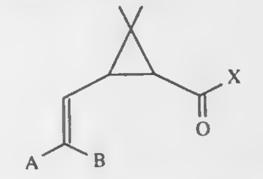
Ronald E. Montgomery, Yardley, and Leland A. Smeltz, Langhorne, both of Pa., assignors to FMC Corporation, Philadelphia, Pa.

Filed Oct. 15, 1997, Ser. No. 950,819

Int. Cl.^{6} C07C *51/353*

U.S. Cl. 560—124 **10 Claims**

1. A process for converting a first composition of a 2-(2,2-disubstitutedvinyl)-3,3-dimethylcyclopropane carboxylic acid derivative represented by the formula



where both A and B are chlorine or bromine, or one of A and B is chlorine and the other is trifluoromethyl; and X is OH or O_2C-alkyl, to a second composition of the derivative, wherein the first composition has an isomeric content of between about 0:100 to 21:79 of 1R-cis:1S-trans isomers of the derivative and the second composition has an isomeric content of about 22:78 1R-cis:1S-trans isomers of the derivative which comprises the step of heating the first composition at a temperature between 140°–170° C. in the presence of a protic acid.

5,840,959

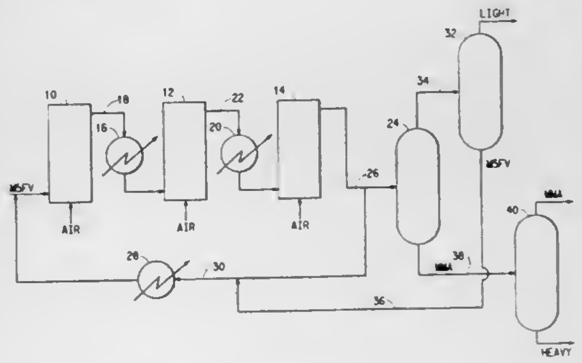
METHOD OF OXIDIZING ALKYL-5-FORMYL VALERATE TO MONOALKYL ADIPATE

Samuel Livingston Lane, Beaumont, Tex., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., and DSM N.V., Galeen, Netherlands

Filed Mar. 27, 1997, Ser. No. 828,974

Int. Cl.^{6} C07C *69/34*

U.S. Cl. 560—190 **2 Claims**



1. A method for the selective oxidation of alkyl-5-formyl valerate to monoalkyl adipate comprising the steps of:

a) contacting alkyl-5-formyl valerate with a molecular oxygen containing gas at a temperature from 20° C. to 120° C. and at a pressure in excess of 10 bars in the absence of a catalyst for a time sufficient to oxidize alkyl-5-formyl valerate to monoalkyl adipate; and

b) recovering said monoalkyl adipate.

5,840,960

POTENT INDUCERS OF TERMINAL DIFFERENTIATION AND METHOD OF USE THEREOF

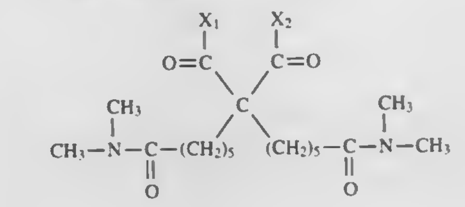
Paul A. Marks, Bridgewater, Conn.; Richard A. Rifkind, New York, N.Y.; Ronald Breslow, Englewood, N.J., and Branko Jursic, New Orleans, La., assignors to Sloan-Kettering Institute for Cancer Research, and The Trustees of Columbia University in the City of New York, both of New York, N.Y.

Continuation of Ser. No. 424,556, Apr. 17, 1995, Pat. No. 5,608,108, which is a continuation of Ser. No. 857,935, Jul. 14, 1992, abandoned, which is a continuation-in-part of Ser. No. 522,558, May 14, 1990, Pat. No. 5,175,191, which is a continuation-in-part of Ser. No. 374,343, Jun. 30, 1989, Pat. No. 5,055,608, which is a continuation-in-part of Ser. No. 270,963, Nov. 14, 1988, abandoned. This application Jun. 7, 1995, Ser. No. 476,624

Int. Cl.^{6} C07C *229/24;233/05;233/07*

U.S. Cl. 560—169 **3 Claims**

1. A compound having the structure:



wherein X_1 may be $N(CH_3)_2$, NH-phenyl, O—C_2H_5 or $HNCH_3$ and X_2 may be $n(CH_3)_2$, NH-phenyl or $HNCH_3$.

5,840,961

ASYMMETRIC SYNTHESIS OF CHIRAL BETA-AMICO ACIDS

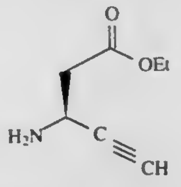
James Richard Behling, Lindenhurst; Mark Laurence Boys, Mt. Prospect; Kimberly Jo Cain-Janicki, Sleepy Hollow; Pierre-Jean Colson, Skokie, all of Ill.; Wendel William Doubleday, Encinitas, Calif.; Joseph Edward Duran, Chicago, Ill.; Payman N. Farid, Vernon Hills, Ill.; Carl Matthew Knable, Mt. Prospect, Ill.; Frank Walter Muellner, Hinsdale, Ill.; Sean Thomas Nugent, Grayslake, Ill., and Ravindra S. Topgi, Palatine, Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Jul. 10, 1997, Ser. No. 890,907

Int. Cl.^{6} C07C *229/00*

U.S. Cl. 560—172 **19 Claims**

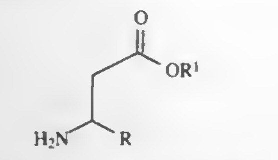
1. A process for the preparation of a chiral β-amino acid of the formula



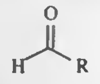
which comprises treating 3-(trimethylsilyl)-2-propynal with L-phenylglycinol to produce αS-[[3-(trimethylsilyl)-2-propynylidene]amino]benzene-ethanol; reacting αS-[[3-(trimethylsilyl)-2-propynylidene] amino]benzenethanol with

$BrZnCH_2CO_2t$-Bu to produce 1,1-dimethylethyl 3S-[(2-hydroxy-1S-phenylethyl)amino]- 5-(trimethylsilyl)-4-pentynoate; reacting 1,1-dimethylethyl 3S-[(2-hydroxy-1S-phenylethyl)amino]-5-(trimethylsilyl)-4-pentynoate with sodium periodate to form 1,1-dimethylethyl 3S-[(phenylmethylene)amino]- 5-(trimethylsilyl)-4-pentynoate; hydrolyzing 1,1-dimethylethyl 3S-[(phenylmethylene)amino]- 5-(trimethylsilyl)-4-pentynoate to produce 1,1-dimethylethyl 3S-amino-5-(trimethylsilyl)-4-pentynoate; transesterifying 1,1-dimethylethyl 3S-amino-5-(trimethylsilyl)-4-pentynoate and desilylating to produce ethyl 3S-amino- 4-pentynoate.

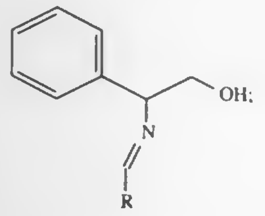
6. A process for the preparation of an (R) β-amino acid of the formula



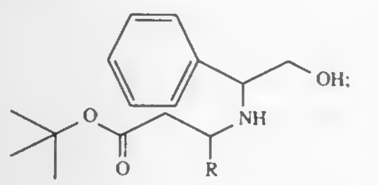
wherein R is selected from the group consisting of alkynyl, alkenyl, lower alkyl, aryl, substituted aryl, pyridyl and furanyl; and R^1 is alkyl; comprising treating an aldehyde of the formula



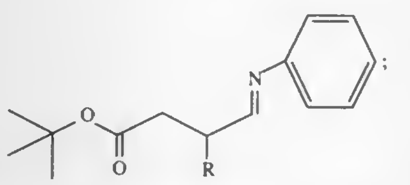
with (R) phenylglycinol in tetrahydrofuran or toluene to produce an imino alcohol of the formula



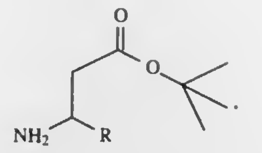
reacting said imino alcohol with $BrZnCH_2CO_2$-t-Bu in NMP, DMSO, THF or NMP/THF followed by addition of acidic ammonium chloride/HCl or basic ammonium hydroxide to give an amino alcohol of the formula



reacting said amino alcohol with $NaIO_4$ in the presence of methyl amine in ethanol/water or lead tetraacetate in methanol to form an imine of the formula



and hydrolyzing said imine in the presence of para-toluenesulfonic acid to produce an (R)-amino acid of the formula



5,840,962

PROCESS FOR PREPARING ESTERS FROM ALCOHOLS AND KETENES

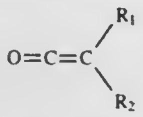
Michel Cohen, Naucalpan, and Mikhail Khramov, San Luis Potosi, both of Mexico, assignors to Industrias Monfel S.A. De C.V., Edo De Mexico, Mexico

Filed Feb. 17, 1995, Ser. No. 390,070

Int. Cl.^{6} C07C *67/00*

U.S. Cl. 560—239 **28 Claims**

1. A process for preparing an ester comprising the steps of reacting a continuous supply of a ketene having the formula



$$O{=}C{=}C\begin{matrix}R_1\\R_2\end{matrix}$$

where R_1 and R_2 are independently selected from the group consisting of hydrogen and organic radicals; with a continuous supply of an alcohol in a solvent comprising said ester in the presence of an acid catalyst in a first vessel, forming a first vessel product comprising said ester;

introducing said first vessel product continuously into a second vessel;

continuously removing a first portion of said first vessel product from said second vessel; and

continuously recirculating a second portion of said first vessel product from said second vessel to said first vessel.

5,840,963

CHEMILUMINESCENT REACTIONS USING DIHYDROXYAROMATIC COMPOUNDS AND HETEROCYCLIC ENOL PHOSPHATES

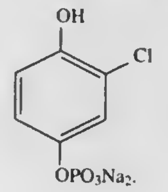
Hashem Akhavan-Tafti, Brighton, Mich., assignor to Lumigen, Inc., Southfield, Mich.

Division of Ser. No. 855,421, May 13, 1997. This application Feb. 10, 1998, Ser. No. 21,322

Int. Cl.^{6} C07F *9/06;9/02*

U.S. Cl. 562—23 **3 Claims**

1. A compound which is 3-chloro-4-hydroxyphenyl phosphate, disodium salt having the formula



5,840,964

PROCESS FOR THE PREPARATION OF THE ENANTIOMERS OF 2-(2-FLUORO-4-BIPHENYL)PROPIONIC ACID

Claudio Pozzoli, Monza, and Graziano Castaldi, Briona, both of Italy, assignors to Zambon Group S.P.A., Vicenza, Italy

Filed Dec. 22, 1995, Ser. No. 577,377

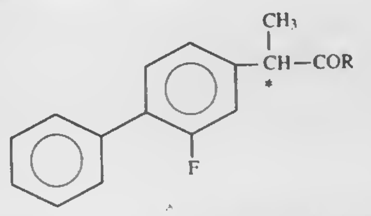
Claims priority, application Italy, Dec. 27, 1994, MI94A2647

Int. Cl.^{6} C07B *57/00;55/00*

U.S. Cl. 562—401 **14 Claims**

1. A process for the preparation of 2-(2-fluoro-4-biphenyl)propionic acid enantiomers which comprises

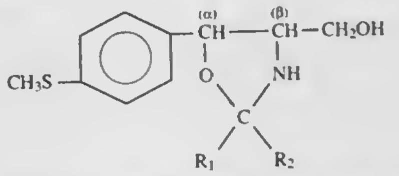
(a) the reaction of 2-(2-fluoro-4-biphenyl)propionic acid or a derivative thereof of formula



(I)

wherein R is a C_1–C_4 alkoxy group or a chlorine or bromine atom and the asterisk shows the chiral carbon atom;

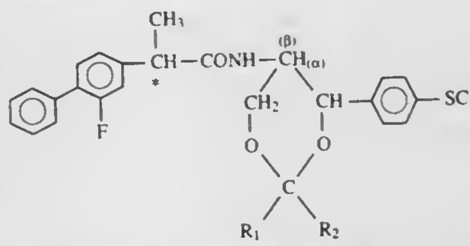
with an optically pure stereoisomer of threo 1-(4-methylthiophenyl)-2-amino-1,3-propanediol or a derivative thereof of formula



(II)

wherein R_1 and R_2 are both a hydrogen atom, a C_1–C_3 alkyl group or, together with the carbon atom to which they are bonded, form a C_5–C_6 cycloalkyl group; the asymmetric carbon atoms marked by α and β have both R or S configuration;

(b) the transfomation of the diastereoisomeric mixture of the resultant amides into the corresponding mixture of ketals of formula



(III)

wherein R_1 and R_2 have the already reported meanings; the asterisk shows the chiral carbon atom and the asymmetric carbon atoms marked by α and β have both R or S configuration;

(c) the crystallization of one of the two diastereoisomers of the ketals of formula (III) and the contemporaneous epimerization to the carbon atom marked by an asterisk by heating the mixture of the two diastereoisomers of formula (III) in the presence of equimolar amounts of an alkali metal C_1–C_4 alkoxide in a C_1–C_4 alcoholic solvent;

(d) the acid hydrolysis of the resultant diastereoisomeric pure ketal to obtain the corresponding 2-(2-fluoro-4-biphenyl)propionic acid enantiomer in optically pure form.

5,840,965

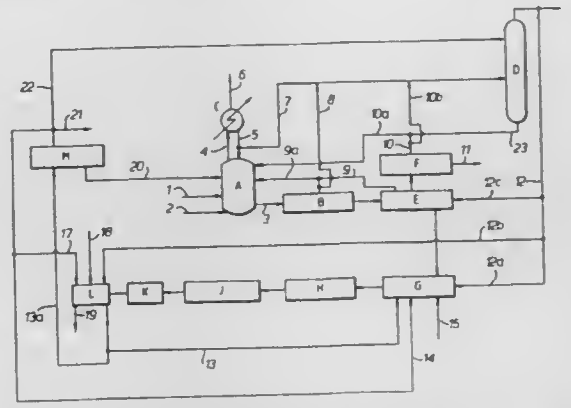
PROCESS FOR THE PRODUCTION OF PURIFIED TELEPHTALIC ACID

John Arthur Turner, Middlesbrough; Eric Hindmarsh, North Yorks; David Parker, Middlesbrough, and Ian Peter Milne, Stockton-on-Tees, all of United Kingdom, assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 668,756, Jun. 24, 1996, Pat. No. 5,698,734. This application Jul. 23, 1997, Ser. No. 899,093

Int. Cl.^{6} C07C *51/43*

U.S. Cl. 562—412 **21 Claims**



1. A process for the purification of crude terephthalic acid, comprising:

(a) dissolving the crude terephthalic acid in an aqueous medium to produce a terephthalic acid-containing solution;

(b) contacting the terephthalic acid solution with hydrogen under reducing conditions and at elevated temperature and pressure to reduce chemically at least some of the impurity present in the crude terephthalic acid;

(c) reducing pressure and temperature to obtain a slurry comprising crystallised purified terephthalic acid in aqueous medium;

(d) in a first zone effecting separation of the purified crystals from the aqueous medium by filtration of the slurry to remove aqueous medium to obtain a wet mass of purified crystals;

(e) transferring said wet mass of crystals to a second zone without reslurrying said mass and supplying aqueous wash liquor to said mass while effecting filtration whereby the wash liquor is displaced through the mass in the second zone; and

(f) recovering the aqueous medium from step (d) and/or the aqueous wash liquor from step (e) and recycling the same in the process whereby the water content thereof and valuable materials herein are retained within the process.

5,840,966

HYDROXYLATION OF SALICYLIC ACID DERIVATIVES

Premkumari Kumarathasan, Ottawa, and Renaud Vincent, Aylmer, both of Canada, assignors to Minister of Health and Welfare, Ottawa, Canada

Filed Oct. 17, 1996, Ser. No. 734,578

Int. Cl.^{6} C07C *227/16*

U.S. Cl. 562—453 **6 Claims**

1. A method for the detection of hydroxyl radical in an aqueous biological system, comprising adding to the system a non-toxic amount of 5-amino salicylic acid, and assaying the hydroxylation products so formed for the presence of 5-aminotetrahydroxy benzoic acid.

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5,840,967

PROCESS FOR THE PREPARATION OF CONTRAST AGENTS

Trygve Gulbrandsen; Odd Einar Ingvoldstad, and Lars Terje Holmaas, all of Oslo, Norway, assignors to Nycomed Imaging AS, Oslo, Norway

Filed Apr. 21, 1997, Ser. No. 845,134

Claims priority, application United Kingdom, Aug. 29, 1996, 9618055

Int. Cl.^{6} C07C *229/00;233/00*

U.S. Cl. 562—455 **12 Claims**

1. In a process for the preparation of an N-alkyl-acylamino-phenyl-carboxylic acid or carboxylic acid derivative by liquid phase acylation and subsequent N-alkylation of a corresponding amino-phenyl-carboxylic acid (or carboxylic acid derivative), the improvement comprising the addition of an alkylating agent to a solution containing the reaction products of said acylation, to effect said N-alkylation.

5,840,968

METHOD AND APPARATUS FOR PREPARING PURIFIED TEREPHTHALIC ACID

Fu-Ming Lee, and Wiston Lamshing, both of Katy, Tex., assignors to HFM International, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 760,890, Dec. 6, 1996, which is a continuation-in-part of Ser. No. 477,898, Jun. 7, 1995, Pat. No. 5,767,311. This application Oct. 31, 1997, Ser. No. 962,030

Int. Cl.^{6} C07C *51/42*

U.S. Cl. 562—486 **31 Claims**

1. A method for purifying crude terephthalic acid from a liquid dispersion thereof also containing impurities selected from unreacted starting materials, solvents, products of side reactions and/or other undesired materials comprising:

filtering said dispersion to form a crude terephthalic acid filter cake;

dissolving said filter cake in a selective crystallization solvent at a temperature between about 50° C. and about 250° C. to form a solution;

crystallizing purified terephthalic acid from said solution by reducing the temperature and/or pressure thereof;

separating said crystallized purified terephthalic acid from said solution;

redissolving said separated purified terephthalic acid in a selective crystallization solvent to form a second solution;

crystallizing second stage purified terephthalic acid from said second solution by reducing the temperature and pressure sufficient to flash evaporate solvent from said terephthalic acid of said second solution but without cooling said solution below about 50° C.;

separating said second stage purified terephthalic acid from said second solution;

washing said separated second stage purified terephthalic acid with water;

soaking said washed separated second stage purified terephthalic acid with water at a temperature between about 150° C. and about 300° C.; and

filtering and drying said water soaked second stage purified terephthalic acid.

5,840,969

PROCESS FOR THE PREPARATION OF ACETIC ACID FROM A SYNTHESIS GAS OF HYDROGEN AND CARBON MONOXIDE

Finn Joensen, Hørsholm, Denmark, assignor to Haldor Topsoe A/S, Lyngby, Denmark

Filed Nov. 26, 1997, Ser. No. 979,527

Claims priority, application Denmark, Nov. 29, 1996, 1361/96

Int. Cl.^{6} C07C *51/12*

U.S. Cl. 562—519 **6 Claims**

1. A process for the preparation of acetic acid product comprising, in a first catalytic step, conversion of a hydrogen and carbon monoxide containing synthesis gas to obtain a liquid process stream comprising methanol and, in a second catalytic step, carbonylation of the process stream with carbon monoxide to a product stream being rich in the acetic acid product in presence of catalytic effective amounts of a metal compound selected from Group VIII of the Periodic Table promoted with a halide compound, the improvement comprising the further steps of:

(i) withdrawing from the carbonylation step a vent gas stream comprising carbon monoxide and residual amounts of acetic acid and halide compound;

(ii) separating the vent gas stream into a liquid fraction containing a part of the residual amounts of acetic acid and part of the halide compound and a gaseous fraction with the carbon monoxide and remaining amounts of acetic acid and halide compound;

(iii) recycling the liquid fraction to the carbonylation step;

(iv) subjecting the gaseous fraction to liquid absorption to remove the acetic acid and halide compound in the gaseous fraction to obtain a carbon monoxide rich recycle stream; and

(v) introducing the carbon monoxide rich recycle stream into the synthesis gas conversion step.

5,840,970

PROCESS FOR THE PURIFICATION OF NAPHTHALENEDICARBOXYLIC ACID

Charles Edwan Sumner, Jr., and Arthur Thaler Spaugh, Jr., both of Kingsport, Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.

Filed Jun. 19, 1998, Ser. No. 100,367

Int. Cl.^{6} C07C *51/23*

U.S. Cl. 562—487 **4 Claims**

1. Process for the removal of impurities comprising heavy metal catalyst residues and trimellitic acid (TMA) from naphthalenedicarboxylic acid (NDA) which comprises contacting a mixture comprising a slurry of finely divided NDA containing such impurities in acetic acid with acetic anhydride, wherein the metal impurities are present as complexes with trimellitic acid and the amount of acetic anhydride employed gives an acetic anhydride:TMA mole ratio of about 1:1 to 5:1.

5,840,971

PROCESS FOR THE PRODUCTION OF ACETIC ACID BY CONTROLLED OXIDATION OF ETHANOL

Michel Gubelmann-Bonneau, Paris, France, assignor to Rhodia S.A., Sao Paulo, Brazil

Filed Feb. 21, 1995, Ser. No. 391,764

Claims priority, application France, Feb. 21, 1994, 94 01923

Int. Cl.^{6} C07C *51/235*

U.S. Cl. 562—538 **12 Claims**

1. A process for the production of acetic acid by the reaction of gaseous ethanol with a source of oxygen comprising the steps of:

contacting said gaseous ethanol with said source of oxygen in the presence of a vanadium, titanium and oxygen based catalyst in an amount of $V_{20}O_5$ between about 0.1 and 30% by weight of the total weight of the finished catalyst and at least one doping agent present in an amount of 0.01 to 20% atomic weight in relation to the vanadium,

said source of oxygen being atmospheric air present in an amount between about 0.5 and 20% molar based on the gaseous mixture,

submitting said gaseous mixture of ethanol and atmospheric air to a pressure of about 0.5 to 3.0 bar, and

recovering said acetic acid,

wherein said process has selectivity of acetic acid of about 96 to 97% and conversion of ethanol of about 87 to 92%.

5,840,972

PROCESS FOR PREPARING N^G-MONOALKYL-L-ARGININE AND RELATED COMPOUNDS

Rajnikant Patel, Dartford; Amrik Singh Mahal, Oxon, and Donald Lloyd Winston Burford, Dartford, all of United Kingdom, assignors to Glaxo Wellcome Inc., Research Triangle Park, N.C.

PCT No. PCT/GB94/00966, § 371 Date Feb. 22, 1995, § 102(e) Date Feb. 22, 1995, PCT Pub. No. WO94/26701, PCT Pub. Date Nov. 24, 1994

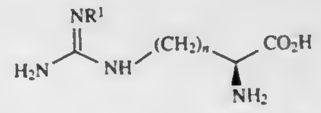
PCT Filed May 5, 1994, Ser. No. 549,795

Claims priority, application United Kingdom, May 6, 1993, 9309321

Int. Cl.^{6} C07C *249/02;277/00;279/12*

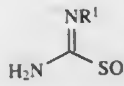
U.S. Cl. 562—560 **7 Claims**

1. A process for the preparation of a compound of formula (I)



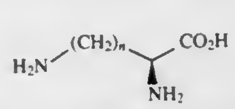
(I)

or a pharmaceutically acceptable salt or ester thereof wherein R^1 is C_{1-6} alkyl and n is 3 to 5, which comprises reacting a guanylating agent of formula (II)



(II)

wherein R^1 is as hereinbefore defined, with a compound of formula (III)



(III)

or a pharmaceutically acceptable salt or ester thereof wherein n is as hereinbefore defined, in the presence of an inorganic base.

5,840,973

PROCESS FOR PRODUCING A POLYOXYALKYLENECARBOXYLIC ACID

Tohru Yasukohchi; Kei-Ichi Maruyama, both of Kawasaki, and Tsunekatsu Maruyama, Tokyo, all of Japan, assignors to NOF Corporation, Tokyo, Japan

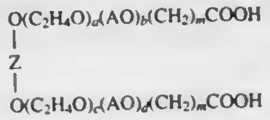
Filed Aug. 27, 1997, Ser. No. 917,824

Claims priority, application Japan, Feb. 19, 1997, 9-050984

Int. Cl.^{6} C07C *59/1245*

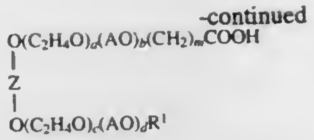
U.S. Cl. 562—583 **11 Claims**

1. A process for producing a polyoxyalkylenecarboxylic acid represented by any of general formulae [6] and [7]:



$$\begin{array}{l} O(C_2H_4O)_a(AO)_b(CH_2)_mCOOH \\ | \\ Z \\ | \\ O(C_2H_4O)_c(AO)_d(CH_2)_mCOOH \end{array} \qquad [6]$$

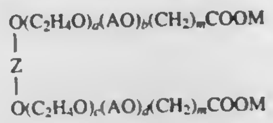
-continued



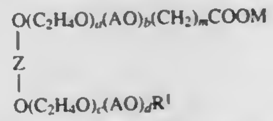
$$\begin{array}{l} O(C_2H_4O)_a(AO)_b(CH_2)_mCOOH \\ | \\ Z \\ | \\ O(C_2H_4O)_c(AO)_dR^1 \end{array} \qquad [7]$$

which comprises:

(A) a step of obtaining a salt of a polyoxyalkylenecarboxylic acid represented by any of general formulae [4] and [5]:

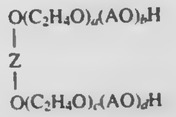


$$\begin{array}{l} O(C_2H_4O)_a(AO)_b(CH_2)_mCOOM \\ | \\ Z \\ | \\ O(C_2H_4O)_c(AO)_d(CH_2)_mCOOM \end{array} \qquad [4]$$

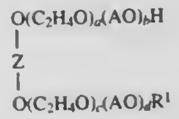


$$\begin{array}{l} O(C_2H_4O)_a(AO)_b(CH_2)_mCOOM \\ | \\ Z \\ | \\ O(C_2H_4O)_c(AO)_dR^1 \end{array} \qquad [5]$$

by reacting a polyoxyalkylene compound represented by any of general formulae [1] and [2]:



$$\begin{array}{l} O(C_2H_4O)_a(AO)_bH \\ | \\ Z \\ | \\ O(C_2H_4O)_c(AO)_dH \end{array} \qquad [1]$$



$$\begin{array}{l} O(C_2H_4O)_a(AO)_bH \\ | \\ Z \\ | \\ O(C_2H_4O)_c(AO)_dR^1 \end{array} \qquad [2]$$

with a salt of a halogenated carboxylic acid represented by general formula [3]:

$$X(CH_2)_mCOOM \qquad [3]$$

in an amount of 4 to 50 mol per 1 mol of the polyoxyalkylene compound and an alkali metal hydroxide in an amount of 8 to 70 mol per 1 mol of the polyoxyalkylene compound in the presence of an organic solvent in an amount by weight 0.5 to 4 times an amount by weight of the polyoxyalkylene compound at 80° to 150° C.;

(B) a step of converting the obtained salt of a polyoxyalkylenecarboxylic acid into the polyoxyalkylenecarboxylic acid by adjusting pH of the reaction mixture obtained in step (A) to 3 or less by adding an inorganic acid;

(C) a step of removing unreacted raw materials, byproducts, and the inorganic acid and the salt in excess amounts from the solution containing the polyoxyalkylenecarboxylic acid which is obtained in step (B) by washing with a 1 to 30% by weight aqueous solution of an inorganic salt 1 to 5 times at 60° to 120° C.; and

(D) a step of removing the organic solvent and water from the solution obtained in step (C) at a decreased pressure at 50° to 120° C. and removing precipitated salts by filtration;

wherein, in general formulae [1] to [7], R^1 represents a hydrocarbon group having 1 to 4 carbon atoms; Z represents ethylene group, propylene group, or trimethylene group; AO represents an oxyalkylene group having 3 or 4 carbon atoms; a and c each represents an average number of addition of oxyethylene group, and a+c=40 to 1,000; b and d each represents an average number of addition of an oxyalkylene group having 3 or 4 carbon atoms, and b+d=0 to 100; $(b+d)/(a+b+c+d) \leq 0.5$; when b+d is 2 or more, oxyethylene group and the oxyalkylene group having 3 or 4 carbon atoms are arranged in a random order or in blocks; X represents chlorine or bromine; m represents 1 or 2; and M represents sodium or potassium.

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5,840,974

METALLOPROTEINASE INHIBITORS

Mark Whittaker; Raymond Paul Beckett; Zoe Marie Spavold, and Fionna Mitchell Martin, all of Oxford, United Kingdom, assignors to Britisch Biotech Pharmaceuticals, Ltd., England

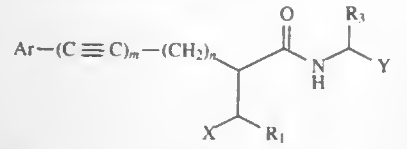
Filed Sep. 8, 1997, Ser. No. 925,592

Claims priority, application United Kingdom, Dec. 4, 1996, 9625154; Jun. 27, 1997, 9713472

Int. Cl.^{6} C07C *259/06;237/22;229/00*

U.S. Cl. 562—623 **24 Claims**

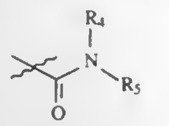
1. A compound of formula (I)



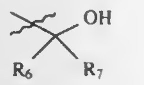
(I)

wherein

- Ar represents an optionally substituted phenyl or heteroaryl group;
- m is 1 or 2;
- n is 0, 1, 2, 3 or 4;
- x represents —COOH or —CONHOH;
- R_1 represents hydrogen, $(C_1–C_6)$alkyl; $(C_3–C_8)$cycloalkyl; $(C_2–C_6)$alkenyl; phenyl; substituted phenyl; phenyl $(C_1–C_6)$alkyl); substituted phenyl$(C_1–C_6)$alkyl; heterocyclyl; substituted heterocyclyl; heterocyclyl$(C_1–C_6)$alkyl; substituted heterocyclyl$(C_1–C_6)$alkyl; amino; protected amino; acylamino; OH; SH; $(C_1–C_6)$ alkoxy; $(C_1–C_6)$alkylamino; di-$(C_1–C_6)$alkylamino; $(C_1–C_6)$alkylthio; amino $(C_1–C_6)$alkyl; hydroxy$(C_1–C_6)$alkyl, mercapto$(C_1–C_6)$alkyl or carboxy$(C_1–C_6)$ alkyl wherein the amino-, hydroxy-, mercapto- or carboxyl-group are optionally protected or the carboxyl- group amidated; lower alkyl substituted by carbamoyl, mono(lower alkyl)carbamoyl, di(lower alkyl)carbamoyl, di(lower alkyl)amino, or carboxy-lower alkanoylamino; or a group $B'SO_pA'$— wherein p is 0, 1 or 2 and B' is hydrogen or a $(C_1–C_6)$ alkyl, phenyl, substituted phenyl, heterocyclyl, $(C_1–C_6)$acyl, phenacyl or substituted phenacyl group, and A' represents $(C_1–C_6)$alkyl;
- R_3 represents the characterising group of a natural or non-natural α amino acid in which any functional groups may be protected;
- Y Is a group of formula (ID) or (IE)



(ID)



(IE)

wherein:

- R4 represents
  - (a) an optionally substituted cycloalkyl or cycloalkenyl ring; or
  - (b) a phenyl or heteroaryl ring which may be fused to a benzene or heteroaryl ring, either or both of which rings may be substituted, and in which any ring nitrogen atom may be oxidised as an N-oxide, or
  - (c) a group $—CHR^xR^y$ wherein R^x and R^y each independently represents an optionally substituted phenyl or heteroaryl ring which may be linked covalently to each other by a bond or by a $C_1–C_4$ alkylene or $C_2–C_4$ alkenylene bridge;
  - (d) a group of formula $—(Z'—O)_w—Z$ wherein Z' is straight or branched $C_1–C_6$ alkyl optionally interrupted by one or more non-adjacent S and/or N atoms, w is an integer >1, and no continuous linear sequence of atoms in the group R_4 is >12, or
  - (e) a straight or branched $C_1–C_6$ alkyl group, optionally interrupted by one or more non-adjacent S and/or N atoms, which is substituted by at least two substituents of formula $—(Z''')_x—(OZ)_q$ wherein Z''' is straight or branched $C_1–C_6$ alkyl optionally interrupted by one or more non-adjacent S and/or N atoms, x is 0 or 1, q is 1 or 2, and no continuous linear sequence of atoms in the group R_4 is >12, or
  - (f) hydrogen, $C_1–C_6$ alkyl, $C_1–C_4$ perfluoroalkyl, or a group D-$(C_1–C_6$ alkyl)- wherein D is hydroxy, $C_1–C_6$ alkoxy, $C_1–C_6$ alkylthio, acylamino, optionally substituted phenyl or heteroaryl, NH_2, or mono- or di-$(C_1–C_6$ alkyl)amino or N-morpholino;
- or R_3 and R_4 taken together represent a divalent chain of formula -$C(R^a)(R^b)$-A"-Alk-wherein R^a and R_b are independently hydrogen or $C_1–C_6$ alkyl, A" is a bond, —O—, —S—, — S—S—, —NH— or —NRa— wherein R^a is $C_1–C_6$ alkyl, and Alk is $C_1–C_6$ alkylene; and
- R_5 is hydrogen or a $C_1–C_6$ alkyl group;
- R_6 is hydrogen, $C_1–C_6$ alkyl, phenyl$(C_1–C_6$ alkyl) or heterocyclyl$(C_1–C_6$ alkyl);
- R_7 is hydrogen or a $C_1–C_6$ alkyl group;
- or (when R_7 is hydrogen) R_3 and R_7 taken together with the carbon atoms to which they are attached form a 2-hydroxycyclohexyl or C_6 sugar (hexose) ring;
- or R_6 and R_7 taken together with the carbon atom to which they are attached form a 5 or 6-membered carbocyclic or heterocyclic ring;

and salts hydrates and solvates thereof.

5,840,975

PROCESS FOR PREPARING NUCLEUS-HALOGENATED BENZOYL CHLORIDES

Reinhold Gehring, Wuppertal; Herbert Müller, Kreuzau; Georg Hardenbicker, Wipperfürth, all of Germany, and Werner Bussmann, League City, Tex., assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

PCT No. PCT/EP96/00237, § 371 Date Jul. 24, 1997, § 102(e) Date Jul. 24, 1997, PCT Pub. No. WO96/23758, PCT Pub. Date Aug. 8, 1996

PCT Filed Jan. 22, 1996, Ser. No. 875,363

Claims priority, application Germany, Feb. 3, 1995, 195 03 471.6

Int. Cl.^{6} C07C *51/58*

U.S. Cl. 562—859 **9 Claims**

1. Process for the preparation of ring-halogenated benzoyl chlorides, characterized in that ring-halogenated benzotrichlorides are reacted with formic acid in the presence of iron salts.

5,840,976

METHOD OF STABILIZING N-VINYLAMIDES

Shin-Ichi Sato; Kiyoji Kuma; Toshimitu Inoue, and Yuuichi Nishida, all of Kitakyushu, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Continuation of Ser. No. 447,156, May 22, 1995, abandoned. This application Sep. 23, 1996, Ser. No. 724,036

Claims priority, application Japan, May 30, 1994, 6-116533

Int. Cl.^{6} C07C *209/82;209/84;209/90*

U.S. Cl. 564—4 **11 Claims**

1. A method of stabilizing N-vinylformamide comprising adding p-benzoquinone to the N-vinylformamide.

5,840,977

METHODS OF PRODUCING PANTOTHENIC ACID DERIVATIVE AND ITS STARTING MATERIALS FOR PRODUCING THE SAME

Hiroshi Ikawa, Tokyo, and Hajime Matsumoto, Hachiohji, both of Japan, assignors to Fujirebio Inc., Tokyo, Japan

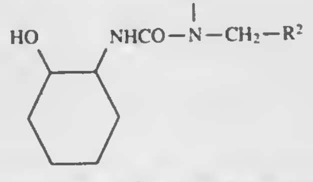
Continuation of Ser. No. 445,719, May 22, 1995, abandoned, which is a division of Ser. No. 199,939, Feb. 22, 1994, abandoned. This application Aug. 6, 1997, Ser. No. 907,008

Claims priority, application Japan, Feb. 23, 1993, 5-056324; Feb. 23, 1993, 5-056325; Feb. 23, 1993, 5-056326; Apr. 15, 1993, 5-111167

Int. Cl.^{6} C07C *273/18;275/18*

U.S. Cl. 564—57 **5 Claims**

1. An urea derivative of formula (III):



(III)

wherein R^1 and R^2 are each independently branched aliphatic hydrocarbons having 3–5 carbon atoms, phenyl or straight chain aliphatic hydro carbon having 7–10 carbon atoms.

5,840,978

PROCESS FOR PREPARING ETHYLIDENE BISFORMAMIDE

Andrew Francis Nordquist, Whitehall; Francis Peter Petrocelli, Blandon; Robert Krantz Pinschmidt, Jr., and Yin Pang Tsui, both of Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 5, 1993, Ser. No. 26,907

Int. Cl.^{6} C07C *233/03*

U.S. Cl. 564—159 **20 Claims**

1. A process for making ethylidene bisformamide comprising the steps of:

- (a) circulating a stream of formamide through a reaction zone and a separation zone wherein the reaction zone contains a solid acidic catalyst;
- (b) introducing acetaldehyde into the circulating stream of formamide to form a reaction mixture and contacting the reaction mixture with the solid acidic catalyst under reaction conditions sufficient to form a product mixture comprising ethylidene bisformamide and water;
- (c) separating water from the product mixture in the separation zone to form a water-depleted product mixture containing ethylidene bisformamide; and
- (d) recirculating the water-depleted product mixture into the reaction zone.

5,840,979

ALIPHATIC PROPARGYLAMINES AS CELLULAR RESCUE AGENTS

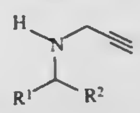
David Durden; Alick Paterson; Bruce Davis; Lillian Dyck; Peter Yu; Xinmin Li, and Alan Boulton, all of Saskatoon, Canada, assignors to University of Saskatchewan, Saskatoon, Canada

Filed Jul. 14, 1997, Ser. No. 891,904

Int. Cl.^{6} C07C *211/08*

U.S. Cl. 564—409 **9 Claims**

1. A compound having the formula I:



(I)

wherein

$R^1=H, CH_3$;

$R^2=CH_3(CH_2)_n$;

and n represents an integer in the range from 0 to 16, with the provisos that:

- (i) if R^1 is H, then n is not 4 or less;
- (ii) if R^1 is CH_3, then n is not 0; and
- (iii) if R^1 is CH_3 and n is 1 or 4, then the compound of formula (I) is in the form of a substantially pure enantiomer;

or a pharmaceutically acceptable salt thereof.

5,840,980

DIAMINE COMPOUNDS AND ELECTROPHOTOGRAPHIC PHOTORECEPTOR

Mitsutoshi Anzai; Atsushi Takesue; Takanobu Watanabe, and Chieko Inayoshi, all of Tsukuba, Japan, assignors to Hodogaya Chemical Co., Ltd., Kawasaki, Japan

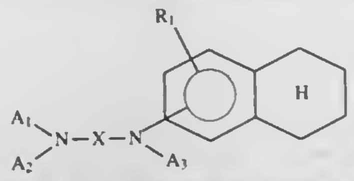
Division of Ser. No. 563,823, Nov. 28, 1995, Pat. No. 5,707,768. This application Jul. 24, 1997, Ser. No. 897,948

Claims priority, application Japan, Nov. 30, 1994, 6-319477

Int. Cl.^{6} C07C *211/55;211/54*

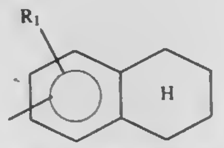
U.S. Cl. 564—308 **11 Claims**

1. A diamine compound of the following formula (1):



(1)

wherein R_1 is a hydrogen atom, a lower alkyl group or a lower alkoxy group, each of A_1, A_2 and A_3 which are independent of one another, is a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, or a group of the following formula (2):



(2)

wherein R_1 is as defined above, wherein the substituent for the substituted alkyl group for each of A_1, A_2 and A_3 is a C_{1-4} alkoxy group which may be substituted by a C_{1-4} alkoxy group or a halogen atom, a C_{5-6} cycloalkyl group, a benzyl or phenyl group which may be substituted by a C_{1-4} alkyl group a C_{1-4} alkoxy group or a halogen atom; the substituent for the substituted aryl group for each of A_1, A_2 and A_3 is a C_{1-4} alkyl or alkoxy group which may be substituted by a C_{1-4} alkoxy group or a halogen atom, a C_{5-6} cycloalkyl group, a benzyl or phenyl group which may be substituted by a C_{1-4} alkyl or alkoxy group or a halogen atom or a halogen atom; and

x is a substituted or unsubstituted arylene group or a substituted or unsubstituted heterocyclic bivalent group.

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5,840,981

PROCESS FOR PRODUCING N-METHYL-2(3,4 DIMETHOXYPHENYL)-ETHYLAMINE

Eberhard Fuchs, Frankenthal; Horst Zimmermann, Mannheim; Tom Witzel, Ludwigshafen; Boris Breitscheidel, Fulda; Rainer Becker, Bad Dürkheim, and Horst Nauhauser, Dudenhofen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP96/01861, § 371 Date Jan. 23, 1998, § 102(e) Date Jan. 23, 1998, PCT Pub. No. WO96/36589, PCT Pub. Date Nov. 21, 1996

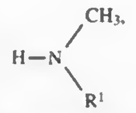
PCT Filed May 4, 1996, Ser. No. 945,530

Claims priority, application Germany, May 17, 1995, 195 18 018.6; May 17, 1995, 195 18 038.0; Feb. 23, 1996, 196 06 729.4

Int. Cl.^{6} C07C *209/22*

U.S. Cl. 564—395 **10 Claims**

1. A process for preparing N-methyl-2-(3,4-dimethoxyphenyl)ethylamine, which comprises hydrogenating 3,4-dimethoxyphenylacetonitrile with a methylamine of the general formula



$$\text{H}-\text{N}\begin{matrix}\diagup\,\text{CH}_3,\\ \diagdown\,\text{R}^1\end{matrix}$$

(I)

where R^1 is hydrogen, benzyl or tert-butyl, and hydrogen in the presence of a catalyst which comprises from 0.05 to 50% by weight of copper chromite, copper, silver, gold, iron, cobalt, nickel, ruthenium, rhodium, palladium, osmium, iridium, platinum or mixtures thereof, in the presence or absence of water at from 20° to 200° C. under from 1 to 300 bar.

5,840,982

PROCESS FOR PREPARING PARA-PHENYLENEDIAMINE DERIVATIVES

Michael Reynolds, and Russell E. Malz, both of Naugatuck, Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Filed Jun. 4, 1998, Ser. No. 90,600

Int. Cl.^{6} C07C *209/36*

U.S. Cl. 564—423 **24 Claims**

1. In a process for the preparation of a p-aminodiarylamine by reduction of the corresponding nitroso or nitro compound with hydrogen in a hydrogenator in the presence of a catalyst, the improvement that comprises equipping the hydrogenator with filtration means capable of separating the p-aminodiarylamine product from the catalyst, whereby the p-aminodiarylamine product can be removed from the hydrogenator while the catalyst is retained therein, thereby permitting the reaction to be run semicontinuously or continuously.

5,840,983

PROCESS FOR PREPARING 2-TRIFLUOROMETHOXY-ANILINE

Reinhard Lantzsch, Wuppertal, and Albrecht Marhold, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

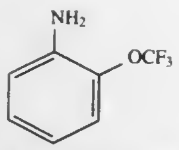
Filed Jul. 18, 1997, Ser. No. 896,353

Claims priority, application Germany, Jul. 26, 1996, 196 30 228.5

Int. Cl.^{6} C07C *211/02*

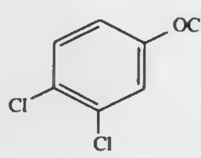
U.S. Cl. 564—423 **9 Claims**

1. Process for preparing 2-trifluoromethoxy-aniline of the formula (I)



(I)

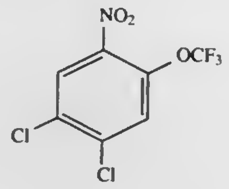
characterized in that in a first step 1,2-dichloro-4-trifluoromethoxybenzene of the formula (II)



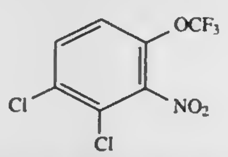
(II)

is reacted with a nitrating agent, if appropriate in the presence of a reaction auxiliary and/or a diluent, at temperatures between −20° C. and +80° C.

and the resulting nitration products of the general formulae (IIIA) and (IIIB)



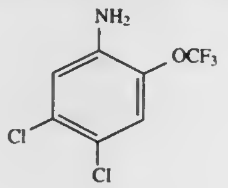
(IIIA)



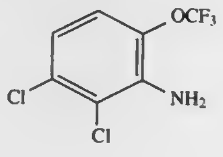
(IIIB)

are reacted in a second step with hydrogen in the presence of a catalyst, in the presence of a diluent and, if appropriate, in the presence of a reaction auxiliary, at temperatures between 0° C. and 200° C.,

it being possible to isolate the intermediate dichloro-trifluoromethoxy-anilines of the general formulae (IVA) and (IVB)



(IVA)



(IVB)

if so desired.

5,840,984

STABILIZATION OF (HYDROCARBYLTHIO) AROMATIC AMINES AGAINST ODOR FORMATION

Gregory H. Lambeth; Paul L. Wiggins, and William R. Brown, all of Baton Rouge, La., assignors to Albemarle Corporation, Richmond, Va.

Filed Jun. 23, 1997, Ser. No. 880,547

Int. Cl.^{6} C07C *373/36*

U.S. Cl. 564—440 **31 Claims**

1. A method of inhibiting a (hydrocarbylthio)aromatic amine against odor formation, which method comprises mixing with said amine a small, effective odor-inhibiting amount of at least one N,N-dihydrocarbylhydroxylamine.

5,840,985

PROCESS FOR THE CONVERSION OF FATTY AMIDES TO AMINES

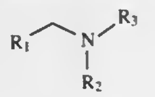
Marshall J. Nepras, Burlington, Wis.; Randal J. Bernhardt, Antioch, and Cathy J. Sporer, Lindinhurst, both of Ill., assignors to Stepan Company, Northfield, Ill.

Filed Jul. 18, 1996, Ser. No. 683,707

Int. Cl.^{6} C07C *209/50*

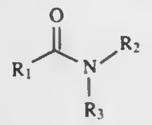
U.S. Cl. 564—488 **33 Claims**

1. A process for preparing an amine of the formula:



wherein R_1, R_2 and R_3 are independently hydrogen or saturated or unsaturated hydrocarbon groups having from about 1–28 carbon atoms; the process comprising

(a) contacting an amide of the formula:



wherein R_1, R_2 and R_3 are defined above,

with hydrogen gas at a pressure of about 50–500 psig at a temperature of about 100°–400° C. in the presence of a catalyst system comprising a hydrogenation catalyst and a nucleophilic reagent; and

(b) removing water generated by the contacting.

5,840,986

PREPARATION WITH HETEROGENEOUS CATALYSIS OF N-ALKYL-SUBSTITUTED AMINOALKYNES

Thomas Preiss, Ludwigshafen; Jochem Henkelmann, Mannheim; Joachim Wulff-Döring, Frankenthal, and Susanne Stutz, Weinheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

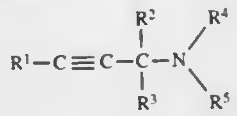
Filed Sep. 4, 1997, Ser. No. 923,557

Claims priority, application Germany, Sep. 5, 1996, 196 36 078.1

Int. Cl.^{6} C07C *209/26*

U.S. Cl. 564—471 **22 Claims**

1. A process for preparing N-alkyl-substituted aminoalkynes of the formula I



$$R^1-C\equiv C-\overset{R^2}{\underset{R^3}{C}}-N\begin{matrix}\diagup R^4\\ \diagdown R^5\end{matrix}$$

(I)

where

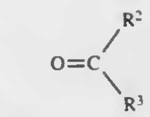
- R^1 is hydrogen, alkyl, haloalkyl, cycloalkyl, aryl, alkoxy, alkoxyalkyl or hydroxyalkyl;
- R^2 and R^3 are, independently of one another, hydrogen, alkyl, haloalkyl, aryl or alkoxy;
- R^4 and R^5 are, independently of one another, hydrogen, alkyl, haloalkyl, aryl, alkoxy or hydroxyalkyl, or R^4 and R^5 form, together with the nitrogen atom to which they are bonded, a 5- or 6-membered heterocyclic ring;

wherein a mixture of an alkyne of the formula II

$$R^1—C\equiv C—H \qquad \text{(II)}$$

where

R^1 has the abovementioned meanings, a carbonyl compound of the formula III

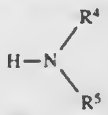


$$O=C\begin{matrix}\diagup R^2\\ \diagdown R^3\end{matrix}$$

(III)

where

R^2 and R^3 have the abovementioned meaning and an amine of the formula IV



$$H-N\begin{matrix}\diagup R^4\\ \diagdown R^5\end{matrix}$$

(IV)

where R^4 and R^5 have the abovementioned meanings, is reacted with heterogeneous catalysis, wherein an unsupported copper catalyst which is derived from malachite is used.

5,840,987

PROCESS FOR THE PREPARATION OF ETHYLAMINES

Yasuo Tsuji, Ohtake, Japan, assignor to Daicel Chemical Industries, Ltd., Sakai, Japan

Filed Nov. 6, 1997, Ser. No. 965,171

Claims priority, application Japan, Nov. 8, 1996, 8-312873

Int. Cl.^{6} C07C *209/16*

U.S. Cl. 564—479 **2 Claims**

1. In a process for the preparation of ethylamines in which respective amines are separated from a mixed reaction crude liquid containing water, ammonia, ethylalcohol, monoethylamine, diethylamine, and triethylamine obtained by a reaction of ethylalcohol with ammonia under a hydrogen atmosphere using a catalyst, the improvement which comprises the steps: distilling a mixture containing water, ethylalcohol, and triethylamine in a first distillation column after removing ammonia, monoethylamine, and diethylamine from said mixed reaction crude liquid, discharging ethylalcohol and water from a bottom of the distillation column, separating a distillate containing water, triethylamine, and partial ethylalcohol distilled out of a top of the distillation column into an upper layer liquid and a lower layer liquid in a decanter, recirculating said lower layer liquid into the first distillation column, distilling out said upper layer liquid in a second distillation column and recirculating a distillate from a top of the second distillation column into the decanter, obtaining ethylamine from a bottom of the second distillation column, and partially recirculating the upper layer liquid into a reaction system between ethylalcohol and ammonia.

5,840,988

PREPARATION OF AMINES FROM OLEFINS ON ZEOLITES OF THE MCM-49 OR MCM-56 TYPE

Karsten Eller, Ludwigshafen, and Rudolf Kummer, Frankenthal, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

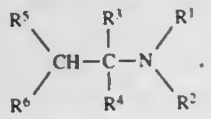
Filed Nov. 25, 1997, Ser. No. 977,893

Claims priority, application Germany, Dec. 3, 1996, 196 49 944.5

Int. Cl.^{6} C07C *209/02*

U.S. Cl. 564—485 **12 Claims**

1. A process for preparing amines of the formula I



(I)

where

- R^1,R^2,R^3,R^4,R^5,R^6 are hydrogen, C_1-to C_{20}-alkyl, C_2- to C_{20}-alkenyl, C_2- to C_{20}-alkynyl, C_3- to C_{20}-cycloalknyl, C_4- to C_{20}-alkyl-cycloalkyl, C_4- to C_{20}-cycloalkyl-alkyl, aryl, C_7- to C_{20}-alkylaryl or C_7- to C_{20}-aralkyl,
- R^1 and R^2 jointly are a saturated or unsaturated C_3- to C_9-alkylene divalent chain and

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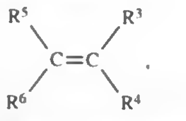
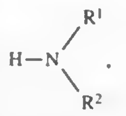
R^3 or R^5 are C_{21}- to C_{200}-alkyl, C_{21}- to C_{200}-alkenyl or jointly are a C_2- to C_{12}-alkylene divalent chain,
by reacting olefins of the formula II


(II)

where R^3, R^4, R^5 and R^6 have the abovementioned meanings, with ammonia or primary or secondary amines of the formula III


(III)

where R^1 and R^2 have the abovementioned meanings, at from 200° to 350° C. and from 100 to 300 bar in the presence of a heterogeneous catalyst, wherein the heterogeneous catalyst used comprises zeolites of the MCM-49 or MCM-56 type.

5,840,989
CATALYST FOR THE HYDROGENATION OF NITRILES TO AMINES, PREPARATION PROCESS THEREOF AND HYDROGENATION PROCESS MAKING USE THEREOF

Georges Cordier, Francheville; Pierre Fouilloux, Caluire-et-Cuire, and Nathalie Laurain, Lyons, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie Cedex, France

PCT No. PCT/FR94/01476, § 371 Date Sep. 24, 1996, § 102(e) Date Sep. 24, 1996, PCT Pub. No. WO95/17959, PCT Pub. Date Jul. 6, 1995

PCT Filed Dec. 16, 1994, Ser. No. 663,099

Int. Cl.^{6} B01J *25/02;* **C07C** *209/00*

U.S. Cl. 564—490 **44 Claims**

1. A process for the preparation of a Raney nickel type catalyst, said process comprising subjecting a metal alloy comprising nickel and aluminum which is free of a doping agent to an alkaline attack in the presence of a doping agent in complexed form, wherein said doping agent is at least one element selected from the group consisting of Group IIb and Group IVb to VIIb of the Periodic Classification of the Elements.

5,840,990
INTERMEDIATES TO CARBOCYCLIC NUCLEOSIDES

Susan Mary Daluge, Chapel Hill, N.C., and Douglas Alan Livingston, San Diego, Calif., assignors to Glaxo Wellcome Inc., Research Triangle Park, N.C.

Division of Ser. No. 295,656, Sep. 12, 1994, Pat. No. 5,641,884. This application Nov. 6, 1996, Ser. No. 743,694

Claims priority, application United Kingdom, Feb. 25, 1992, 9204015

Int. Cl.^{6} C07C *209/62*

U.S. Cl. 564—507 **2 Claims**

1. A process for the preparation of a compound of formula (VIIIb), wherein X represents an anion, its mirror

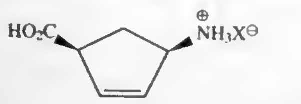
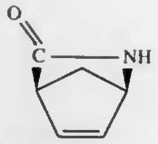

(VIIIb)

image enantiomer or a mixture of such enantiomers which comprises reacting (−)-2-azabicyclo[2.2.1]hept-5-ene-3-one of formula (IX), its mirror image enantiomer or a mixture of such enantiomers


(IX)

with one or more equivalents of an acid and one or more equivalents of water.

5,840,991
ANTIATHEROSCLEROSIS AGENTS FOR LIPID-LOWERING AND ANTIPEROXIDATIVE ACTIVITY

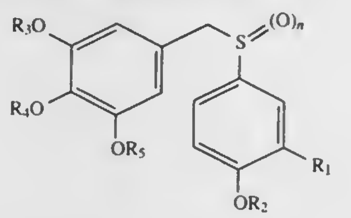
Feng-Wen Yeng; Shan-Shue Wang; Jaw-Yuh Chiu; Chin-Fen Lee, and Chia-Lin J. Wang, all of Taipei, Taiwan, assignors to Development Center for Biotechnology, Taipei, Taiwan

Continuation of Ser. No. 787,090, Jan. 22, 1997, abandoned. This application Sep. 17, 1997, Ser. No. 932,030

Int. Cl.^{6} C07L *315/00;* **A01N** *41/10*

U.S. Cl. 568—32 **13 Claims**

1. A compound having the general formula:



wherein

R_1 represents hydrogen, hydroxy or alkoxy;

R_2, R_3, R_4 and R_5 may be hydrogen or alkyl; and n is 0,1 or 2; and the pharmaceutically acceptable salts thereof, wherein when n is 0 or 2 and R_3, R_4, and R_5 are alkyl, one of R_1 or R_2 is not hydrogen.

5,840,992
PROCESS FOR PRODUCING 6-METHYLHEPTAN-2-ONE

Yoichi Kido; Masahiko Kitayama; Koichi Yoneda; Hideharu Iwasaki, and Takashi Onishi, all of Ibaraki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

PCT No. PCT/JP96/00881, § 371 Date Dec. 2, 1996, § 102(e) Date Dec. 2, 1996, PCT Pub. No. WO96/31454, PCT Pub. Date Oct. 10, 1996

PCT Filed Apr. 1, 1996, Ser. No. 737,926

Claims priority, application Japan, Apr. 4, 1995, 7-103143

Int. Cl.^{6} C07C *45/42*

U.S. Cl. 568—392 **12 Claims**

1. A process for producing 6-methylheptan-2-one, comprising subjecting isovaleral and acetone to aldol condensation in the presence of a basic substance to form a condensate which contains 4-hydroxy-6-methylheptan-2-one, and subjecting the condensate to hydrogenation reaction under a dehydration condition.

5,840,993
WATER-SOLUBLE COBALT CATALYSTS, PROCESS FOR THEIR PREPARATION AND THEIR USE AS HYDROFORMYLATION CATALYSTS IN A TWO-PHASE SYSTEM WITH POLYETHYLENE GLYCOL AS THE POLAR PHASE

Uwe Ritter; Norbert Winkhofer, and Herbert Roesky, all of Göttingen, Germany, assignors to Hoechst AG, Frankfurt am Main, Germany

PCT No. PCT/EP96/02394, § 371 Date Feb. 26, 1998, § 102(e) Date Feb. 26, 1998, PCT Pub. No. WO97/00132, PCT Pub. Date Jan. 3, 1997

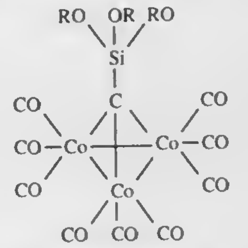
PCT Filed Jun. 3, 1996, Ser. No. 981,261

Claims priority, application Germany, Jun. 16, 1995, 195 21 936.8

Int. Cl.^{6} C07C *45/50*

U.S. Cl. 568—545 **19 Claims**

1. Cobalt carbonyl catalyst of the formula (I)


(I)

where R is —$CH(CH_2OCH_2CH_3)_2$ or —$C_2H_4(OCH_2CH_2)_nOY$, with n=1 to 12 and Y=H or CH_3.

5,840,994
PROCESS FOR PRODUCING DITRIMETHYLOLPROPANE

Teruyuki Ninomiya; Toshio Watanabe; Takaki Ikebe, and Atsushi Iwamoto, all of Okayama-ken, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Mar. 19, 1997, Ser. No. 820,080

Claims priority, application Japan, Apr. 3, 1996, 8-081363

Int. Cl.^{6} C07C *41/00*

U.S. Cl. 568—580 **20 Claims**

1. A process for producing ditrimethylolpropane which comprises reacting trimethylolpropane, 2-ethylacrolein, and formaldehyde in the presence of a basic catalyst, wherein the basic catalyst is an aliphatic amine.

5,840,995
PRECURSOR FOR ALKOXYLATION CATALYSTS

Michael Mayer, Goldbach; Joachim Hess, Hofheim, and Alfred Babiel, Villmar, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Filed Dec. 13, 1996, Ser. No. 763,715

Claims priority, application Germany, Dec. 15, 1995, 195 46 946.1

Int. Cl.^{6} C07C *41/03*

U.S. Cl. 568—618 **10 Claims**

1. An alkoxylation catalyst comprising a mixture of an active hydrogen containing compound and a reaction product of the components comprising:

(a) a compound of the formula C_8–C_{22}-alkyl—O(AO)$_x$—B where
  A is —C_2H_4— or —C_3H_6—.
  B is hydrogen or a group of the formula —CH_2COOH, —SO_3H, or —$PO(OH)_2$ and
  x is from 2 to 10;
(b) an alkaline earth metal compound; and
(c) sulfuric acid.

5,840,996
PRODUCTION OF BROMINATED METHOXYNAPHTHALENE COMPOUNDS

Mahmood Sabahi, Baton Rouge, La., assignor to Albemarle Corporation, Richmond, Va.

Filed May 8, 1997, Ser. No. 854,131

Int. Cl.^{6} C07C *41/22*

U.S. Cl. 568—634 **22 Claims**

1. A process for the preparation of 1,6-dibromo-2-methoxynaphthalene which comprises generating bromine in situ in a mixture formed by mixing together 2-methoxynaphthalene, hydrogen bromide, at least one peroxidic compound and an organic liquid solvent or diluent under reaction conditions such that bromine is generated in situ and 1,6-dibromo-2-methoxynaphthlene is formed, all of the bromine used in this reaction being in situ generated bromine.

5,840,997
METHOD FOR THE PRODUCTION OF ALKOXY- AND ARYLOXY-PHENOLS

Paul D. Pansegrau, and Brant P. Munson, both of Beulah, N. Dak., assignors to Dakota Gasification Company, Beulah, N. Dak.

Filed Mar. 31, 1997, Ser. No. 831,474

Int. Cl.^{6} C07C *43/16*

U.S. Cl. 568—648 **6 Claims**

1. A method for the production of alkoxy- and aryloxy- phenols comprising the steps of:

a. providing a two-phase mixture of the corresponding alkoxy- or aryloxy-benzaldehyde in an organic solvent phase and from 3 to 7 molar equivalents formic acid and from 2 to 6 molar equivalents hydrogen peroxide in an aqueous solvent phase, said organic solvent phase being immiscible in said aqueous solvent phase and being a solvent for said benzaldehyde and for performic acid and being non-reactive with said hydrogen peroxide and performic acid;
b. subjecting said two-phase mixture to stirring and reaction conditions whereby said formic acid and said hydrogen peroxide react in said aqueous solvent phase to form performic acid and said performic acid and said benzaldehyde react in said organic solvent phase to form the corresponding alkoxy- or aryloxy- formate ester; and
c. saponifying said formate ester to produce the corresponding alkoxy- or aryloxy- phenol.

5,840,998
SIDE CHAIN CHLORINATION OF AROMATIC AND HETEROCYCLIC ETHERS

Sanjay Mandal, Grand Island; Kevin R. Benson, West Seneca, and George Piotrowski, Cheektowaga, all of N.Y., assignors to Occidental Chemical Corporation, Niagra Falls, N.Y.

Filed Mar. 24, 1998, Ser. No. 46,525

Int. Cl.^{6} C07C *43/225*

U.S. Cl. 568—655 **21 Claims**

1. A method of chlorinating a side chain of an aromatic or heterocyclic ether comprising

(A) preparing a mixture of a fluorine-containing aliphatic solvent and an aromatic or heterocyclic ether having a chlorinatable side chain; and
(B) contacting said aromatic or heterocyclic ether in said solution with chlorine radical at an elevated temperature.

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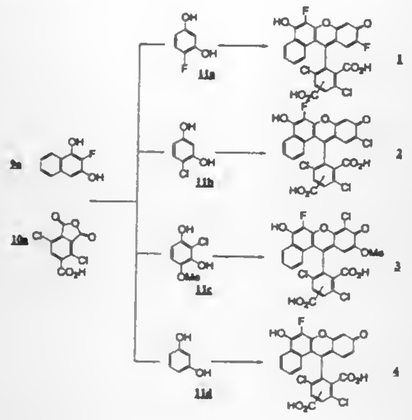
5,840,999
ASYMMETRIC BENZOXANTHENE DYES

Scott C. Benson, Oakland; Steven M. Menchen, Fremont; Peter D. Theisen, South San Francisco; Kevin M. Hennessey; Vergine C. Furniss, both of San Mateo, and Joan Hauser, Oakland, all of Calif., assignors to The Perkin-Elmer Corporation, Foster City, Calif.

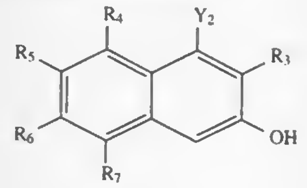
Division of Ser. No. 626,085, Apr. 1, 1996. This application Mar. 26, 1997, Ser. No. 824,102

Int. Cl.⁶ C07C ***39/14;37/68***

U.S. Cl. 568—735 **5 Claims**



1. A compound having the formula:



wherein:

R_3 is selected from the group consisting of fluorine, chlorine, sulfonate, amino, amido, nitrite, lower alkoxy, and linking group;

R_4–R_7 taken separately are selected from the group consisting of hydrogen, fluorine, chlorine, lower alkyl, lower alkene, lower alkyne, sulfonate, amino, amido, nitrile, lower alkoxy, and linking group; and

Y_2 is selected from the group consisting of hydroxyl and amine.

5,841,000
PROCESS FOR PRODUCING TRANS-2 BROMOINDAN-1-OL

Yoshio Igarashi; Shigeru Nakano; Yuzi Konno, and Fumihiro Asano, all of Fukushima-ken, Japan, assignors to Ichikawa Gosei Chemical Co., Ltd., Tokyo, Japan

PCT No. PCT/JP96/00619, § 371 Date Nov. 19, 1997, § 102(e) Date Nov. 19, 1997, PCT Pub. No. WO96/28406, PCT Pub. Date Sep. 19, 1996

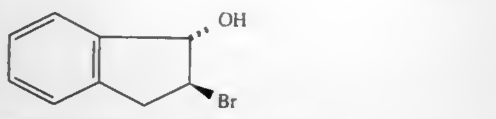
PCT Filed Mar. 13, 1996, Ser. No. 894,886

Claims priority, application Japan, Mar. 14, 1995, 7-054213

Int. Cl.⁶ C07C ***33/34;22/00***

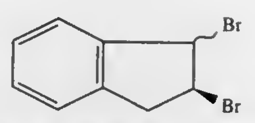
U.S. Cl. 568—808 **20 Claims**

1. Method for making trans-2-bromoindan-1-ol represented by Formula (II)



(II)

characterized in that 1,2-dibromoindane represented by General Formula (I)



(I)

(where the configuration of the bromine atoms on position 1 and position 2 are trans or cis, or a mixture of trans and cis isomers) is hydrolysed.

5,841,001
PROCESS FOR THE PREPARATION OF OPTICALLY ACTIVE 2-HALO-1-(SUBSTITUTED PHENYL) ETHANOL

Ken Tanaka; Mari Yasuda, and Makoto Ueda, all of Kanagawa, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

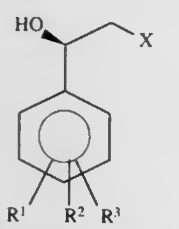
Filed Feb. 28, 1997, Ser. No. 808,853

Claims priority, application Japan, Feb. 28, 1996, 8-041441

Int. Cl.⁶ C07C ***209/02;33/20;33/34***

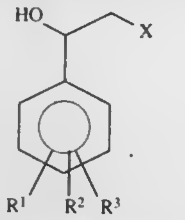
U.S. Cl. 568—812 **9 Claims**

1. A process for p roducing an optically active 2-halo-1-(substituted phenyl)ethanol repr esented by the general formula (II):



(II)

(wherein X represents a chlorine atom or a bromine atom, and R^1, R^2 and R^3 may be the same or different and each represent a hydrogen atom, a halogen atom, a C_{1-5} alkyl group, a C_{1-5} haloalkyl group, a C_{1-5} alkoxy group, a cyano group or a nitro group, with the proviso that when two of R^1, R^2 and R^3 are alkyl groups or alkoxy groups, they may be combined together to form a ring and that all of R^1, R^2 and R^3 are not hydrogen atoms at the same time), which comprises allowing a 2-halo-1-(substituted phenyl)ethanol represented by the general formula (I):



(I)

(wherein X, R^1, R^2 and R^3 are as defined above) to contact with an enzyme stereoselectively catalyzing ester interchange, in the presence of a carboxylic anhydride.

5,841,002
PROCESS FOR THE COMMERCIAL PRODUCTION OF POLYHYDROXY ALCOHOLS AND GLYCOLS

George Edwin Harrison, Billericay, and Arthur James Reason, Saltburn, both of United Kingdom, assignors to Davy Process Technology Limited, London, England

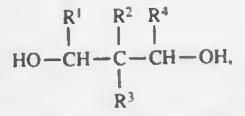
Filed Sep. 27, 1996, Ser. No. 723,186

Claims priority, application United Kingdom, Sep. 28, 1995, 9519975

Int. Cl.⁶ C07C ***31/18***

U.S. Cl. 568—853 **25 Claims**

1. A process for the production of a compound having the formula:

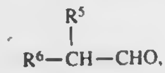


$$\begin{array}{c} R^1 \quad R^2 \quad R^4 \\ HO-\overset{|}{C}H-\overset{|}{\underset{|}{C}}-\overset{|}{C}H-OH, \\ R^3 \end{array} \qquad (I)$$

in which R^1 and R^4 each represent, independently of the other, a hydrogen atom, an alkyl group, an aralkyl group, or an aryl group; and

R^2 and R^3 each represent, independently of the other, an alkyl group, a hydroxyalkyl group, an aralkyl group, an arylhydroxyalkyl group, or an aryl group; which process comprises:

(a) reacting one mole of a first aldehyde having at least one α-hydrogen atom and having the formula:



$$R^6-\overset{\overset{R^5}{|}}{C}H-CHO, \qquad (II)$$

in which R^5 is a hydrogen atom, an alkyl group, an aralkyl group, or an aryl group; and R^6 is a hydrogen atom, an alkyl group, an aralkyl group, or an aryl group; with at least one mole of a second aldehyde having the formula:

R^7—CHO, (III)

in which R^7 is a hydrogen atom, an alkyl group or an aryl group; under aldolisation conditions in the presence of an aldolisation catalyst selected from alkali metal hydroxides, alkali metal carbonates, alkali metal bicarbonates, and mixtures thereof, and from alkaline earth metal hydroxides and mixtures thereof with alkali metal hydroxides, thereby to generate an intermediate aldolisation product;

(b) converting the intermediate aldolisation product of step (a) by one or more further steps including a step selected from hydrogenation and a cross-Cannizzaro reaction to the compound having the formula (I);

(c) recovering the compound having the formula (I);

(d) recovering an aqueous spent catalyst phase containing metal values and at least one Cannizzaro or cross-Cannizzaro reaction product or by-product;

(e) passing material of the spent catalyst phase to an electrolysis zone comprising an anode zone containing an anode, a cathode zone containing a cathode, and at least one ion selective barrier means separating the anode zone from the cathode zone;

(f) passing a direct current or rectified alternating current between the anode and the cathode thereby to liberate metal hydroxide in the cathode region, said metal hydroxide being selected from alkali metal hydroxides, alkaline earth metal hydroxides, and mixtures thereof;

(g) recovering liberated metal hydroxide of step (f);

(h) if necessary, converting at least a portion of the liberated metal hydroxide of step (g) to the catalyst of step (a); and

(i) recycling at least one of liberated metal hydroxide of step (g) and converted metal hydroxide of step (h) for use as aldolisation catalyst in step (a).

5,841,003
PROCESS FOR PREPARING ALKANEDIOLS

Lynn Henry Slaugh; Paul Richard Weider, and Joseph Broun Powell, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 23, 1996, Ser. No. 685,173

Int. Cl.⁶ C07C ***27/00***

U.S. Cl. 568—867 **18 Claims**

1. A process for preparing an alkanediol comprising the steps of:

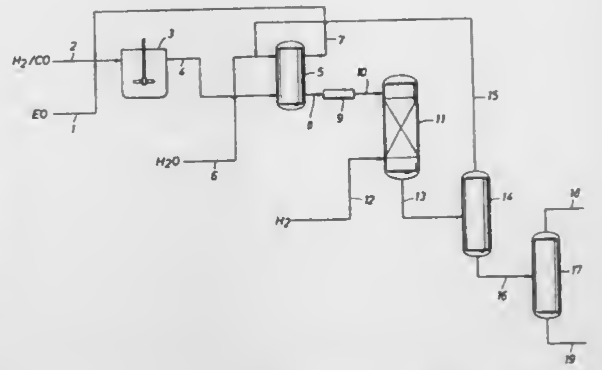
(a) contacting, at a temperature within the range of about 50° to about 100° C. and a pressure within the range of about 500 to about 5000 psig, an alkylene oxide with carbon monoxide and hydrogen in an essentially non-water miscible solvent in the presence of an effective amount of a non-phosphine-ligated cobalt catalyst and an effective amount of a lipophilic ruthenium promoter under reaction conditions effective to produce an intermediate product mixture comprising less than 15 wt % hydroxyaldehyde;

(b) adding an aqueous liquid to said intermediate product mixture and extracting into said aqueous liquid a major portion of the hydroxyaldehyde at a temperature less than about 100 so as to provide an aqueous phase comprising the hydroxyaldehyde in greater concentration than the concentration of hydroxyaldehyde in the intermediate product mixture, and an organic phase comprising at least a portion of the cobalt catalyst or a cobalt-containing derivative thereof and at least a portion of the ruthenium promoter or a ruthenium-containing derivative thereof;

(c) separating the aqueous phase from the organic phase;

(d) contacting the aqueous phase comprising the hydroxyaldehyde with hydrogen in the presence of a hydrogenation catalyst at a pressure of at least about 100 psig and a temperature during at least a portion of the hydrogenation step of at least about 40° C. to provide a hydrogenation product mixture comprising an alkanediol; and

(e) recovering the alkanediol from the hydrogenation product mixture.



5,841,004
3-SUBSTITUTED-α, β-DIBROMOETHYLBENZENE AND PROCESS FOR PREPARING THE SAME

Ken Tanaka; Manabu Katsurada, and Akemi Hosokawa, all of Kanagawa, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

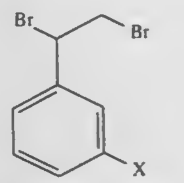
Filed Jul. 17, 1996, Ser. No. 683,772

Claims priority, application Japan, Jul. 18, 1995, 7-181729; Oct. 12, 1995, 7-264057

Int. Cl.⁶ C07C ***17/14;17/34;25/04;25/14***

U.S. Cl. 570—127 **16 Claims**

1. A 3-substituted α,β-dibromoethylbenzene represented by formula (I):



(I)

wherein X represents a chlorine, bromine, iodine or trichloromethyl.

5,841,005
PARYLENE AF4 SYNTHESIS

William R. Dolbier, Jr., 8205 S.W. 39th Pl., Alachua, Fla. 32608; Jian-Xin Duan, 1404 S.W. 10th Ter., Apartment 23, and Alex J. Roche, 716 S.W. 16th Ave, both of Alachua, Fla. 32601

Filed Mar. 14, 1997, Ser. No. 818,584

Int. Cl.⁶ C07C ***22/08***

U.S. Cl. 570—144 **42 Claims**

1. A method of making parylene AF4, the method comprising the steps of:

mixing a dihalo compound with a reducing agent comprising zinc or magnesium to form a reaction mixture, the dihalo

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compound comprising at least about 1×10^{-3} weight percent of the reaction mixture; and

reacting the reaction mixture to form product materials including the parylene AF4.

5,841,006

PROCESS FOR PREPARING PENTAFLUOROETHANE

Paolo Cuzzato, Treviso, Italy, assignor to Ausimont S.p.A., Milan, Italy

Filed Nov. 26, 1996, Ser. No. 755,823

Claims priority, application Italy, Nov. 28, 1995, MI95A2484

Int. Cl.^{6} C07C *19/08*

U.S. Cl. 570—163 **7 Claims**

1. Process for preparing pentafluoroethane containing amounts of 1-chloropentafluoroethane lower than 0.02% by weight wherein pentafluoroethane is obtained by a disputation process of tetrafluorochloroethane CF_3CHClF in gaseous phase in the presence of a chromium oxide catalyst of the formula Cr_2O_3 supported on a support comprising AlF_3, said support having a content in fluorine corresponding to at least 90% of AlF_3 determined on the total weight of the support, wherein temperatures are selected to be from 140°–180° C. for contact times comprised between 15–30 seconds, from 180° to 240° C. for contact times between 5 to 15 seconds, from 240° to 260° C. for contact times between 1 to 5 seconds, from 260° to 300° C. for contact times between 0.1 to 1 second, and subsequent separation from the obtained products.

5,841,007

PROCESS FOR MANUFACTURING 1,1,1,2-TETRAFLUOROETHANE

Byoung Sung Ahn; Young Soo Kwon; Kun You Park, and Moon Jo Chung, all of Seoul, Rep. of Korea, assignors to Korea Institute of Science and Technology, Seoul, Rep. of Korea

Filed Apr. 12, 1996, Ser. No. 630,678

Int. Cl.^{6} C07C *17/00*

U.S. Cl. 570—169 **4 Claims**

1. A process for manufacturing 1,1,1,2-tetrafluoroethane comprising:

i) introducing hydrogen fluoride and 1,1,1,2-tetrafluoroethane to a reactor comprising a catalyst; and

reacting hydrogen fluoride and trichloroethylene in said reactor, to form 1-chloro- 2,2,2-trifluoroethane,

wherein said hydrogen fluoride and said trichloroethylene are divided into at least two portions, and

wherein at least one of said portions is introduced into said reactor downstream of an inlet for said hydrogen fluoride and 1,1,1,2-tetrafluoroethane, and

ii) reacting 1-chloro-2,2,2-trifluoroethane with hydrogen fluoride to produce 1,1,1,2-tetrafluoroethane.

5,841,008

HYDROFLUOROCARBON PRODUCTION USING HEAT CARRIERS IN HIGH TEMPERATURE HYDROGENOLYSIS

Thomas R. Keane, Wilmington, Del.; Tiberiu M. Leib, Voorhees, N.J.; William H. Manogue, Newark, Del., and Peter Gideon Gelblum, Philadelphia, Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 344,434, Nov. 23, 1994, abandoned. This application May 22, 1997, Ser. No. 836,954

Int. Cl.^{6} C07C *19/08*

U.S. Cl. 570—176 **15 Claims**

1. A process for producing a saturated cyclic or acyclic hydrofluorocarbon of the formula $C_nH_aF_b$, wherein n is an integer from 1 to 6, a is an integer from 1 to 7 and b is an integer from 2 to 13, by reacting at least one saturated starting material having the same carbon structure as said saturated hydrofluorocarbon and the formula $C_nH_cX_dF_b$, wherein c is an integer from 0 to 3, d is an integer from 1 to 4, and each X is independently selected from Cl and Br, with hydrogen in a reaction vessel at a temperature of from about 350° to 700° C. and a pressure of from about 101 kPa to about 7000 kPa for a time sufficient to produce said saturated hydrofluorocarbon, characterized by:

feeding to the reaction vessel, said at least one starting material and, for each mole of total carbon-chlorine and carbon-bromine bonds in said starting material, both (a) at least 0.5 moles of hydrogen, and (b) at least about 2.5/J moles of a heat carrier compound which has a molar heat capacity greater than the molar heat capacity of hydrogen and the formula $C_mH_zF_y$, where J is the ratio of the molar heat capacity of the heat carrier compound to the molar heat capacity of hydrogen at the reaction temperature, wherein m is an integer from 1 to 4, z is an integer from 0 to 8 and y is an integer from 0 to 10; and reacting said starting material with said hydrogen in said reaction vessel in the presence of said heat carrier compound; the moles of hydrogen plus J times the moles of said heat carrier compound fed to the reaction vessel being at least about 3 times the moles of carbon-chlorine and carbon-bromine bonds in the saturated starting material fed to the reaction vessel, and less than 10% of the fluorine from the carbon-fluorine bonds fed to the reaction vessel being converted to HF.

5,841,009

OXYCHLORINATION OF ETHYLENE IN TWO STAGE FIXED-BED REACTOR

Diego Carmello, Veneto; Pierluigi Fatutto, Mestre, and Andrea Marsella, Paese, all of Italy, assignors to EVC Technology AG, Zug, Switzerland

PCT No. PCT/IB96/00159, § 371 Date Oct. 22, 1997, § 102(e) Date Oct. 22, 1997, PCT Pub. No. WO96/26171, PCT Pub. Date Aug. 29, 1996

PCT Filed Feb. 1, 1996, Ser. No. 894,288

Claims priority, application United Kingdom, Feb. 22, 1995, 9503541; Apr. 11, 1995, 9507480

Int. Cl.^{6} C07C *17/15*

U.S. Cl. 570—245 **9 Claims**

1. A method for the oxychlorination of ethylene to produce 1,2-dichloroethane (EDC), comprising reacting ethylene, a chlorine source and an oxygen source in a fixed-bed oxychlorination reactor in the presence of a catalyst, characterised in that a twin reactor system is used and the catalyst is a cupric chloride catalyst whose activity profile is arranged such that the reagent flow first comes into contact with a first layer of high activity catalyst, subsequently a second layer of low activity catalyst and finally a third layer of high activity catalyst.

5,841,010

SURFACE ACTIVE AGENTS AS GAS HYDRATE INHIBITORS

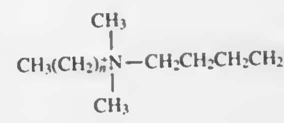
Manese Rabeony, Piscataway; Dennis George Peiffer, Annandale, both of N.J.; Christine Ann Costello; Pamela Jean Wright, both of Easton, Pa.; Karla Schall Colle, Houston, and Larry Dalton Talley, Friendswood, both of Tex., assignors to Exxon Production Research Company, Houston, Tex.

Division of Ser. No. 306,350, Sep. 15, 1994, abandoned. This application Jun. 2, 1995, Ser. No. 459,643

Int. Cl.^{6} C07C *7/20;* **F17D** *1/05*

U.S. Cl. 585—3 **2 Claims**

1. A composition comprising a mixture of hydrate forming constituents, water, and a hydrate inhibitor having a polar head group directly connected to a non polar tail group wherein the hydrate inhibitor is selected from the group consisting of sodium valerate, sodium salt of 1-butanesulfonic acid, and a zwitterion having the formula



$$CH_3(CH_2)_n^{+}\overset{\displaystyle CH_3}{\underset{\displaystyle CH_3}{N}}-CH_2CH_2CH_2CH_2SO_3^-$$

wherein n ranges from 3 to 7.

5,841,011

PROCESS FOR PRODUCING LIGHT-WEIGHT OIL FROM WASTE PLASTICS CONTAINING PHTHALIC POLYESTER AND/OR POLYVINYL CHLORIDE

Kenji Hashimoto, Tsuzuki-gun; Takao Masuda, Kyoto; Shuichi Yoshida, Handa, and Yuichi Ikeda, Nagoya, all of Japan, assignors to Kenji Hashimoto, and NGK Insulators, Ltd. both of Japan

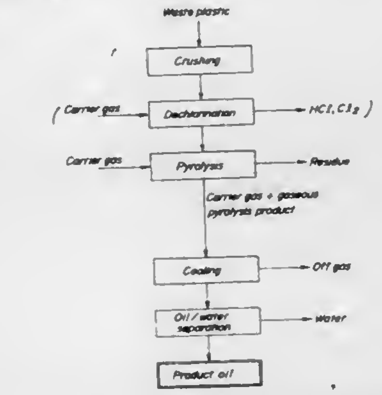
PCT No. PCT/JP96/01542, § 371 Date Feb. 6, 1997, § 102(e) Date Feb. 6, 1997, PCT Pub. No. WO96/40839, PCT Pub. Date Dec. 19, 1996

PCT Filed Jun. 6, 1996, Ser. No. 776,763

Claims priority, application Japan, Jun. 7, 1995, 7-140621

Int. Cl.^{6} C07C *1/00*

U.S. Cl. 585—241 **20 Claims**



1. A process for producing light-weight oil from waste plastics containing a phthalic polyester and/or a polyvinyl chloride comprising

pyrolyzing said waste plastics in the presence of at least one material selected from the group consisting of iron hydroxide, hydrous iron oxide, and iron oxide in an atmosphere of steam or a mixture of steam and an inert gas to produce said light-weight oil.

5,841,012

HYDROGENATION CATALYSTS FOR LOW CONCENTRATION OF CHLOROPRENE AND TRICHLOROETHYLENE IN ETHANE DICHLORIDE STREAM

Hicham Idriss, Auckland, New Zealand; Adbulrahman Saleh Al-Ubaid, Riyadh, Saudi Arabia; Saeed Mohammed Al-Wahabi, Riyadh, Saudi Arabia, and Khalid El Yahyaoui, Riyadh, Saudi Arabia, assignors to Saudi Basic Industries Corporation, Saudi Arabia

Filed Jan. 2, 1997, Ser. No. 778,307

Int. Cl.^{6} C07C *5/03;* **B01J** *21/08*

U.S. Cl. 585—260 **20 Claims**

1. A catalyst of the formula MXYZ for hydrogenation of chloroprene and trichloroethylene present in an ethane dichloride product stream, wherein

M is 0.01 to 5 wt. % of a metal selected from the group consisting of Pd, Pt and mixtures thereof;

X is 0.2 to 3 wt. % of an element selected from the group consisting of Li, Na, K, Co, Ni and mixtures thereof;

Y is 0 to 99.9 wt. % of an oxide selected from the group consisting of TiO_2, La_2O_3, V_2O_5, CeO_2, ZrO_2 and mixtures thereof; and

Z is 0 to 95 wt. % of a support selected from the group consisting of Al_2O_3, SiO_2, activated carbon and mixtures thereof.

5,841,013

AROMATICS HYDROGENATION WITH A NEW CLASS OF METAL OXIDES

Teh Chung Ho, Bridgewater; Charles Ralph Symon, Rahway; Viktor Buchholz, Branchburg, all of N.J., and Michel Daage, Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 460,318, Jun. 2, 1995, which is a division of Ser. No. 245,180, May 17, 1994, abandoned. This application May 16, 1997, Ser. No. 857,605

Int. Cl.^{6} C07C *5/10;* **B01J** *31/00*

U.S. Cl. 585—269 **3 Claims**

1. A catalyst composition of the formula $ML(Mo_yW_{1-y}O_b)_a$ wherein M is Cr and/or one or more divalent promoter metals selected from the group consisting of Mn, Fe, Co, Ni, Cu and Zn, L is one or more neutral nitrogen containing ligands at least one of which is a chelating polydentate ligand, $0\leqq y\leqq 1$, for non-chromium containing catalysts a=1, for chromium containing catalysts $0.5\leqq a\leqq 3$, and b<4.

5,841,014

ALKYLATION BY CONTROLLING OLEFIN RATIOS

David Campbell Graves; Ken Edward Kranz; James Kevin Millard, all of Kansas City, Mo., and Lyle Frederick Albright, West Lafayette, Ind., assignors to Stratco, Inc., Leawood, Kans.

Continuation of Ser. No. 755,721, Nov. 25, 1996, abandoned, which is a continuation of Ser. No. 315,926, Sep. 30, 1994, abandoned. This application Aug. 15, 1997, Ser. No. 911,219

Int. Cl.^{6} C07C *2/00;2/54;2/58;2/62*

U.S. Cl. 585—313 **8 Claims**

1. A process for alkylating comprising:

(a) contacting an olefin mixture comprising C_3 and C_5 olefins with an isoparaffin in the presence of an acid catalyst, under conditions effective to produce a spent acid catalyst and a alkylate product; wherein the mole ratio of C_3 olefins to C_5 olefins is in the range of about 30:70 to about 95:5.

5,841,015

INBRED MAIZE LINE PH05G

Joseph Kevin Gogerty, Algona, Iowa, assignor to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Filed Jan. 29, 1997, Ser. No. 790,633

Int. Cl.^{6} H01H *5/00;4/00;1/00;* **C12N** *5/04*

U.S. Cl. 800—200 **13 Claims**

1. Seed of maize inbred line designated PH05G, representative samples having been deposited under ATCC Accession No. 209728.

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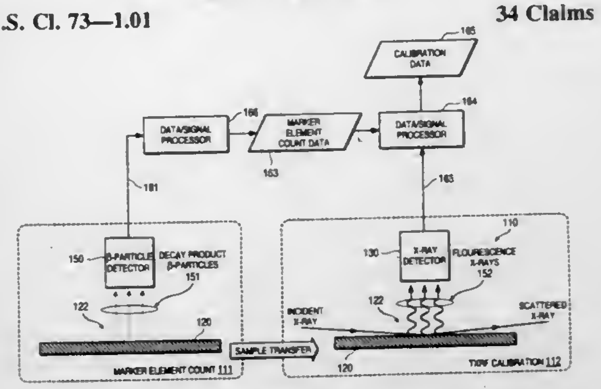
5,841,016
ULTRA-LOW LEVEL STANDARD FOR CONCENTRATION MEASUREMENTS

Tim Z. Hossain, and John Lowell, both of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Sep. 12, 1996, Ser. No. 712,715

Int. Cl.^{6} G01D *18/00*

U.S. Cl. 73—1.01 **34 Claims**



1. A reference standard material for calibrating a concentration measurement apparatus, the reference standard material comprising:

a substrate; and

a radioactive marker element detectable by the concentration measurement apparatus for calibration thereof, the radioactive marker element being on the substrate, having a known half-life, and in an amount sufficient for reliable detection of radioactive decay products thereof.

5,841,017
PHOTO-ACOUSTIC GAS SENSOR

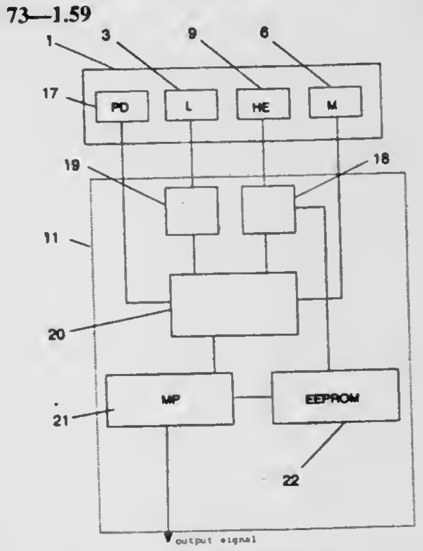
Mourad Baraket, Stäfa; Mauro Feltre, Uerikon; Martin Forster, Jona; René Lenggenhager, Horgen; Andreas Portmann, Uerikon, and Georges Tenchio, Ebmatingen, all of Switzerland, assignors to Cerberus AG, Mannedorf, Switzerland

Filed Mar. 24, 1997, Ser. No. 828,837

Claims priority, application European Pat. Off., Mar. 25, 1996, 96104689

Int. Cl.^{6} G01L *27/00*

U.S. Cl. 73—1.59 **20 Claims**



1. A photo-acoustic gas sensor comprising:

a measuring cell;

a light source disposed for irradiating the measuring cell with light having a first modulation;

a photodiode disposed for receiving radiation from the light source;

a gas-permeable diaphragm disposed for permitting an ambient gas to enter the measuring cell;

a microphone disposed for sensing pressure changes in the measuring cell;

an operation/evaluation circuit operationally coupled to the light sources the photodiode and the microphone for operating the light source and evaluating signals supplied by the microphone;

a diagnostic/calibration device comprising a pressure modulator element, configured and disposed for modulating air pressure in the measuring cell with a second modulation different from the first modulation;

a diagnostic/calibration circuit operationally coupled to the diagnostic/calibration device for operating the diagnostic/calibration device, and to the microphone for processing and evaluating monitoring signals supplied by the microphone as a function of the modulated air pressure, for generating a signal which is indicative of the functional condition of the microphone and the diaphragm, and for calibrating microphone sensitivity.

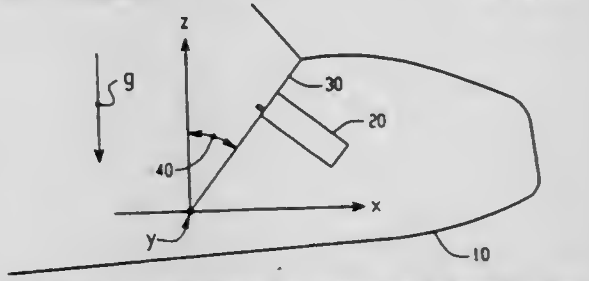
5,841,018
METHOD OF COMPENSATING FOR INSTALLATION ORIENTATION OF AN ATTITUDE DETERMINING DEVICE ONBOARD A CRAFT

Gary Stewart Watson, Ada, and Krishna Devarasetty, Kentwood, both of Mich., assignors to B. F. Goodrich Avionics Systems, Inc., Akron, Ohio

Filed Dec. 13, 1996, Ser. No. 785,553

Int. Cl.^{6} G01C *17/38;21/00*

U.S. Cl. 73—1.81 **20 Claims**



1. A method of compensating for installation orientation of an attitude determining device on-board a mobile craft with respect to a reference coordinate system of said craft to obtain attitude information of said craft from said device based on an earth frame coordinate system, said method comprising the steps of:

installing said attitude determining device on-board said mobile craft at an unknown orientation with respect to said reference coordinate system of said craft;

sensing the installation orientation of said attitude determining device with respect to said earth frame coordinate system when said craft is at rest to obtain a static orientation measurement of said device;

measuring an attitude of said mobile craft with said attitude determining device; and

compensating said craft attitude measurement of said device with said static orientation measurement to obtain attitude information of said craft's reference coordinate system with respect to said earth frame coordinate system.

5,841,019
METHOD FOR NON-DESTRUCTIVE MEASURING COMPRESSIVE AND TENSILE STRENGTHS OF CONCRETE IN THE STRUCTURE

Sergey Drabrin, P.O. Box 240229, and Yuriy Boguslavskiy, 2926 W. 25 St. #815 D, both of Brooklyn, N.Y. 11224

Filed Jul. 14, 1997, Ser. No. 892,018

Int. Cl.^{6} G01M *7/00*

U.S. Cl. 73—12.11 **11 Claims**

1. A non-destructive method for measuring the compressive strength of a body constituting the resistance of the body to finite

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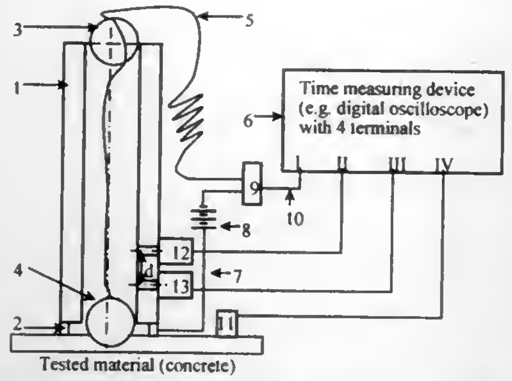

3
1
5
6
Time measuring device (e.g. digital oscilloscope) with 4 terminals
I
II
III
IV
9
10
8
12
7
13
4
2
11
Tested material (concrete)

compressive deformations exceeding an elastic recoverable compressive deformation and comprising:

(a) impacting the body with an impacter having a kinetic energy immediately prior to the impacting, the kinetic energy being sufficiently large that the body undergoes compressive damage at areas where the impacter strikes the body but not be so large that the damage prevents the body from such rebounding that the impacter loses contact with the body; wherein said impacting provides pressure to said body resulting in finite compressive deformation in the impact area exceeding elastic recoverable deformation;

(b) measuring the resistance of said body to said impacting compressive deformation constituting a compressive strength of said body by measuring the duration of the compressive phase of the impact; said duration of compressive phase being the time interval that begins when the impacter touches the surface of the body and ends when the compression of the body by the impacter stops.

5,841,020

APPARATUS AND METHOD FOR MIXING, MEASURING AND FORWARDING A MULTI-PHASE GAS MIXTURE

Johann Guelich, Winterthur, Switzerland, assignor to Total S.A., Puteaux, France, and Sulzer Pumpen AG, Winterthur, Switzerland

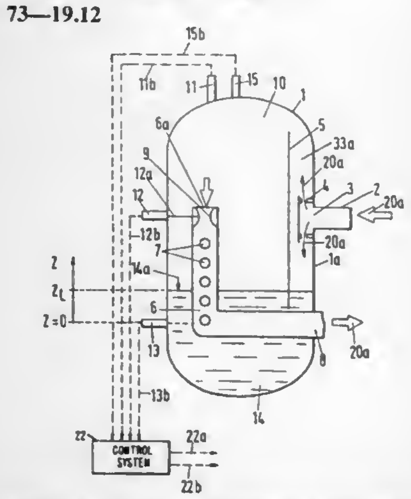
PCT No. PCT/EP95/01054, § 371 Date Sep. 11, 1996, § 102(e) Date Sep. 11, 1996, PCT Pub. No. WO95/26494, PCT Pub. Date Oct. 5, 1995

PCT Filed Mar. 21, 1995, Ser. No. 704,535

Claims priority, application Switzerland, Mar. 25, 1994, 00 905/94; Mar. 25, 1994, 00 906/94

Int. Cl.^{6} G01F *1/74*

U.S. Cl. 73—19.12 **19 Claims**



1. Apparatus for mixing and measuring a multi-phase fluid with at least one liquid and one gaseous component comprising:

a container for separating the liquid and gaseous components;

a supply tube which opens into the container;

a removal apparatus for drawing off the liquid and gaseous components, the removal apparatus comprising a drainage means with apertures that is arranged in such a manner that it penetrates a liquid surface which forms between the liquid and gaseous components during a normal operation;

a sensor for measuring a value of a pressure in the container;

a sensor for measuring a value of a pressure in the removal apparatus; and

at least one sensor for measuring a value of a height (Z_L) of the liquid surface,

where the sensors are connected to a signal reception and evaluation system via signal lines for calculating at least a flow rate (Q") of the gaseous component and a flow rate (Q') of the liquid component from the measured values.

5,841,021

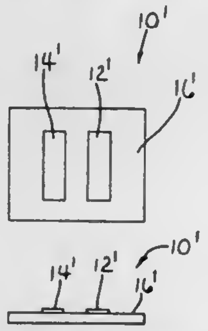
SOLID STATE GAS SENSOR AND FILTER ASSEMBLY

Emory S. De Castro, 60 Little Nahant Rd., Nahant, Mass. 01908-1028; J. David Genders, 1299 Two Rod Rd., Marilla, N.Y. 14102, and Norman L. Weinberg, 95 Chasewood La., East Amherst, N.Y. 14051

Filed Sep. 5, 1995, Ser. No. 523,687

Int. Cl.^{6} G01N *27/16;* **H01L** *7/00;* **B32B** *5/00*

U.S. Cl. 73—23.2 **121 Claims**



102. A method for detecting the presence of one or more gas contaminants in a gas sample being monitored, comprising the steps of:

directing said gas sample across a filter layer disposed in the interior of a casing to remove any interference gas from said gas sample;

exposing an ionically conductive substrate having at least one gas sensing electrode and at least one environmental variable sensing electrode mounted to one surface thereof and a reference electrode mounted to a different surface thereof to said gas sample subsequent to the removal of said interference gas;

compensating for changes in at least one environmental variable by subtracting a function of first voltage signal output by said at least one gas sensing electrode from a second voltage signal output by said at least one environmental variable sensing electrode to generate a compensated voltage signal output;

generating a third voltage signal corresponding to the difference between said compensated voltage signal output;

comparing said third voltage signal with a reference signal; and

generating a trigger signal indicating the presence of said contaminant gas whenever said third voltage signal is less than said reference signal.

5,841,022

GAS ANALYZER AND GAS ANALYSIS METHOD

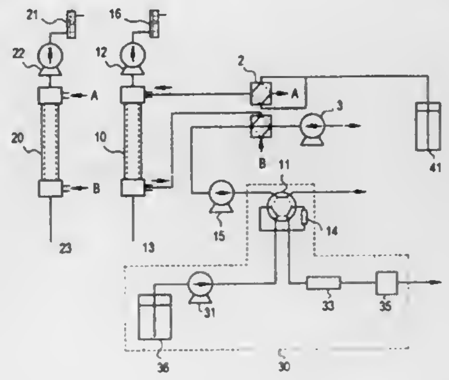
Ushio Hase, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 20, 1997, Ser. No. 915,117

Claims priority, application Japan, Sep. 12, 1996, 8-241943

Int. Cl.^{6} G01N *30/20*

U.S. Cl. 73—23.22 **7 Claims**



1. A gas parallel line analyzer used for analysis of the to-be-analyzed gas components contained in a sample gas, by absorption into an absorbing solution, which gas analyzer comprises:

two gas sampling units each comprising a tube-shaped diffusion scrubber and a sampling pump, each diffusion scrubber comprising an outer tube and an inner tube provided inside the outer tube and consisting of a gas-permeable membrane tube capable of passing therethrough only part of a sample gas, including to-be-analyzed gas components, the outer tube and the inner tube being fixed by a pair of joints at their two ends, the diffusion scrubber further comprising, at each end, a port communicating with the inner tube and a port communicating with the gap between the outer tube and the inner tube, either one of the inner tube inside and the gap between the outer tube and the inner tube being used as a passage for absorbing solution and the other being used as a passage for sample gas, and each sampling pump being connected to the passage for sample gas, of the diffusion scrubber and used for taking the sample gas into the diffusion scrubber,

a solution-feeding pump for feeding an absorbing solution into the diffusion scrubber of one gas sampling unit,

a solution-feeding pump for feeding the absorbing solution into the diffusion scrubber of the other gas sampling unit and introducing the solution leaving the diffusion scrubber, into a concentration column packed with an adsorbent capable of concentrating the to-be-analyzed gas components dissolved in the solution,

a passage-switching valve or device for switching the first gas sampling unit connecting to the former solution-feeding pump and the second gas sampling unit connecting to the latter solution-feeding pump, to each other, so that the second gas sampling unit becomes connected to the former solution feeding pump and the first gas sampling unit becomes connected to the latter solution feeding pump,

a detecting unit for detecting the to-be-analyzed gas components captured by the concentration column, and

a passage-switching valve or device for switching, to each other, a passage for introducing the solution leaving the diffusion scrubber, into the concentration column for capturing and concentration of the to-be-analyzed gas components and a passage for introducing the to-be-analyzed gas components captured and concentrated by the concentration column, into the detecting unit.

5,841,023

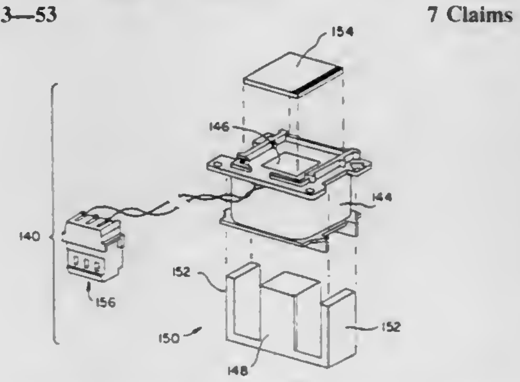
MAGNET FOR MEDICAL INSTRUMENT

James R. Parker, Indianapolis; William J. Murphy, Cicero; Charles L. Thomeczek, Jr., Fishers; Daniel L. Kennedy, Indianapolis; Gary T. Neel, Indianapolis, and David E. Storvick, Indianapolis, all of Ind., assignors to Boehringer Mannheim Corporation, Indianapolis, Ind.

Filed Aug. 31, 1993, Ser. No. 114,896

Int. Cl.^{6} G01N *1/12*

U.S. Cl. 73—53 **7 Claims**



1. An instrument comprising a detector for monitoring a change in a characteristic of a biological fluid or a control, the biological fluid or control being combined with particles which are affected by a magnetic field so that the particles become suspended relatively freely in the biological fluid or control, and an electromagnet for creating a time-varying magnetic field which causes the particles to be reoriented as the magnetic field varies, the reorientation changing as the characteristic of the biological fluid or control changes, the electromagnet including a core comprising a first leg, an electrically conductive coil provided on the core for creating a time-varying magnetic flux in the core, a flux return provided at least partly through the core for the time-varying magnetic flux, and a drive circuit coupled to the coil for providing time-varying current flow therein.

5,841,024

Patent Not Issued For This Number

5,841,025

MISFIRE DETECTION METHOD AND APPARATUS

Donald J. Remboski, Dearborn; Steven L. Plee, Brighton; Marvin L. Lynch, Detroit; Michael A. McClish, Northville, and Susan K. Sonday, Dearborn, all of Mich., assignors to Motorola Inc., Schaumburg, Ill.

Filed Mar. 31, 1995, Ser. No. 415,115

Int. Cl.^{6} G01M *15/00*

U.S. Cl. 73—117.3 **12 Claims**

1. A method of misfire detection comprising the steps of:

establishing a misfire threshold;

measuring acceleration of an internal combustion engine and providing time-ordered first, second, and third acceleration data samples dependent thereon, each data sample having a magnitude less than the misfire threshold; and

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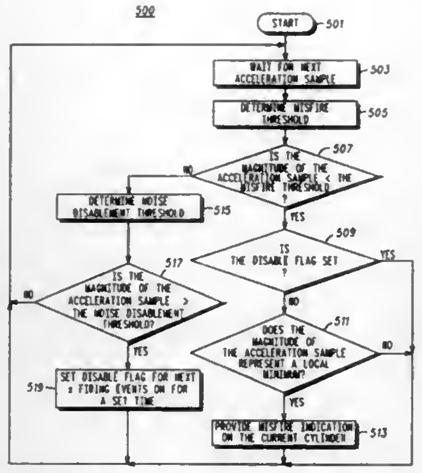

500
START
501
WAIT FOR NEXT ACCELERATION SAMPLE
503
DETERMINE MISFIRE THRESHOLD
505
IS THE MAGNITUDE OF THE ACCELERATION SAMPLE < THE MISFIRE THRESHOLD ?
507
NO
YES
DETERMINE NOISE DISABLEMENT THRESHOLD
515
IS THE DISABLE FLAG SET ?
509
YES
NO
IS THE MAGNITUDE OF THE ACCELERATION SAMPLE > THE NOISE DISABLEMENT THRESHOLD?
517
DOES THE MAGNITUDE OF THE ACCELERATION SAMPLE REPRESENT A LOCAL MINIMUM?
511
SET DISABLE FLAG FOR NEXT x FIRING EVENTS OR FOR A SET TIME
519
PROVIDE MISFIRE INDICATION ON THE CURRENT CYLINDER
513

indicating a misfire when a magnitude of the second acceleration data sample has a magnitude less than a magnitude of both the first and third acceleration data samples.

5,841,026

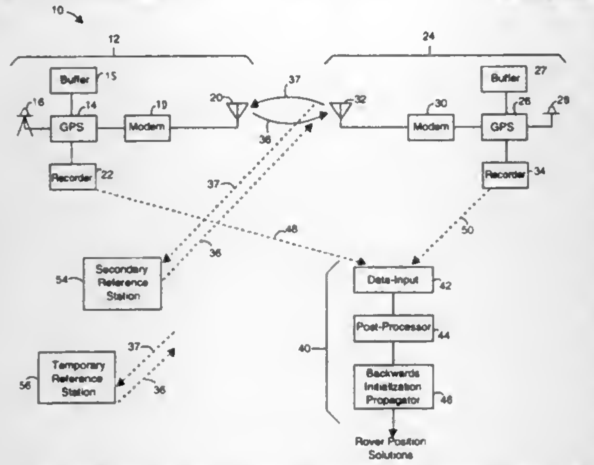
AUTOMATIC TRANSFERENCE BETWEEN REAL-TIME OPERATION AND POST-PROCESSING IN A GPS SURVEY SYSTEM

Geoffrey R. Kirk, San Francisco; Michael Timo Allison, Santa Clara, both of Calif.; Ian Viney, St. Martins, New Zealand, and Paul N. Skoog, Fremont, Calif., assignors to Trimble Navigation Limited, Sunnyvale, Calif.

Filed May 15, 1996, Ser. No. 647,701

Int. Cl.⁶ G01C *21/00*

U.S. Cl. 73—178 R **20 Claims**



1. An improved survey system, including a reference base station for receiving signals from orbiting navigation satellites, a survey rover for computing a vector to the base station, a radio data link connected to provide measurement information from the primary reference station base station to the survey rover for real time centimeter level position solutions, and recorders at each of the primary reference station base station and the survey rover for recording data, the improvement comprising:

first means for detecting a loss of real time kinematic (RTK) initialization at the survey rover;

second means for detecting a loss of communication over the radio data link; and

third means connected to each of the first and second means and for recording a file on the survey rover recorder that begins with a last valid initialization information that existed before a loss of either said RTK initialization or said communication over said radio data link, that records raw measurement information of the survey rover during either of said losses, and that ends by recording the survey rover RTK initialization information when both said RTK initialization and said communication over said radio data link are restored.

5,841,027

PIEZOELECTRIC FLOW TRANSDUCER

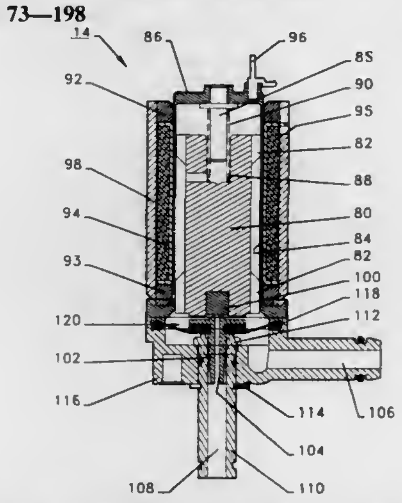
Michael F. Scarffe, Little Horwood, United Kingdom, assignor to AZTEC Development Ltd, United Kingdom

Division of Ser. No. 381,909, Feb. 13, 1995, Pat. No. 5,716,038. This application Sep. 24, 1997, Ser. No. 936,668

Claims priority, application United Kingdom, Aug. 13, 1992, 9217180

Int. Cl.⁶ G01F *15/02*

U.S. Cl. 73—198 **13 Claims**



10. A flow transducer for measuring the flow rate of a fluid, said flow transducer comprising an elongate, substantially linear measuring chamber having an upstream end and a downstream end, and along which a fluid is arranged to flow from the upstream end to the downstream end, an upstream sensor at said upstream end of said measuring chamber, and a downstream sensor at said downstream end of said measuring chamber, wherein said sensor is controllable to emit and/or receive a sound beam and is arranged such that sound beams emitted pass along said measuring chamber, wherein said measuring chamber is arranged to diverge in the direction of fluid flow, and wherein each said sensor comprises a housing defining an opening, a plastics material body within said housing, a piezoelectric element comprising a piezoelectric film supported to extend across said opening, said piezoelectric film supported to extend across said opening, said piezoelectric film having a first, inner surface, and an opposed, second, outer surface, first and second electrically conductive regions, the first electrically conductive region contacting said first surface of said piezoelectric film, the second electrically conductive region contacting said second surface of the piezoelectric film, and said first and second electrically conductive regions overlying to define one area of said piezoelectric film at which said first and second conducive regions coincide, and means for making electrical connections to said conductive regions, wherein said means for making electrical connections comprises an electrically conductive post extending through said plastics material body, said post having an end surface contacting said first, inner surface of said piezoelectric film at said one area thereof, said plastics material body having a front surface which together with said end surface of said conductive post defines a combined support surface for said piezoelectric film, and wherein said means for making electrical connections to said conductive regions further comprises a radially extending flange having an inner surface an defining the opening of said housing, said inner surface of said flange contacting a periphery of the second, outer surface of said piezoelectric film.

5,841,028

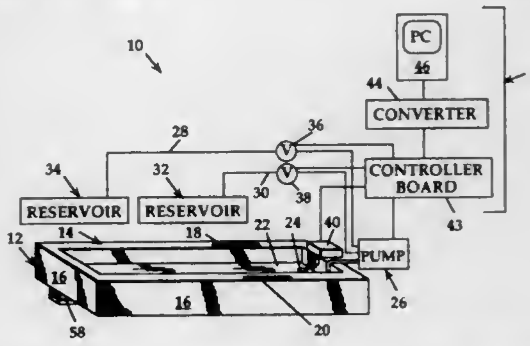
AUTOMATED LIQUID-LEVEL VESSEL APPARATUS

Andrew Malcolm Bray, Boronia, and Timothy Lloyd Belcher, Scoresby, both of Australia, assignors to Chiron Corporation, Emeryville, Calif.

Filed May 2, 1996, Ser. No. 643,030

Int. Cl.⁶ G01F *23/00*

U.S. Cl. 73—290 V **17 Claims**



1. An automated liquid-level vessel apparatus, comprising

a vessel defining a container suitable for holding a level of liquid,

means for adjusting the level of liquid in the container,

a sensing device for determining whether the level of liquid in the container is between lower and upper preselected levels, said device having

(i) a transmitter probe positioned at or below said lower preselected level, and effective to transmit an electromagnetic signal in the low frequency radio range, such that said signal has a detectably greater magnitude after transmission through liquid than after transmission through air;

(ii) a first receiver probe positioned at or below said lower preselected level, and separate from said transmitter probe,

where at least one of said probes is positioned at the preselected level,

(iii) a second receiver probe positioned at said upper preselected level, and

(iv) a detector operatively connected to said receiver probes for detecting the magnitude of electromagnetic signal transmission received at said receiver probes from the transmitter probe, and

controlling means operatively connecting said sensing device to said adjusting means to maintain the liquid level in said container between said preselected levels.

5,841,029

SWING SPEED DEVICE

David W. Luking, Louisville, Ky., assignor to Dynamis, Inc., Peewee Valley, Ky.

Filed Dec. 20, 1996, Ser. No. 771,043

Int. Cl.⁶ G01P *15/00;1/02*

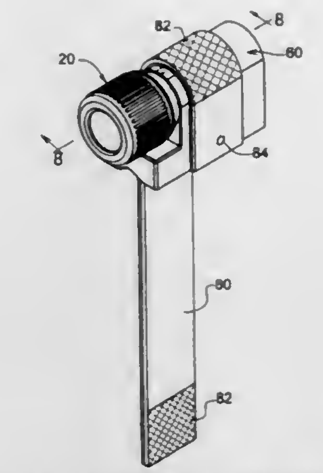
U.S. Cl. 73—514.31 **20 Claims**

1. A swing speed device for external attachment to an implement, comprising:

a. a housing, said housing having a housing bore thereinto, said housing having a magnet at a first end of said housing bore, said magnet having a magnetic field;

b. a cylinder, said cylinder having a cylinder bore thereinto, said cylinder bore having a magnet end and a second end, said cylinder bore having a movable material therein, said movable material being attractable by said magnet, said cylinder being received at least partways into said housing bore, said magnet end being toward said magnet;

c. means for adjusting said cylinder within said housing bore so said magnet end is a desired distance from said magnet; and,



d. means for attaching said housing to the implement;

e. where said movable material is at said magnet end and retained there by said magnetic field until a user using the implement creates a force which overcomes said magnetic field thereby causing said movable material to move from said magnet end to said second end of said cylinder bore.

5,841,030

PROCESS FOR THE DETERMINING THE VIBRATION CHARACTERISTICS OF A BODY

Wolfram Honsberg, Dorfen; Raymond Freymann, Munich; Franz Winter, Mainz, and Hans Steinbichler, Neubeuern, all of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Germany

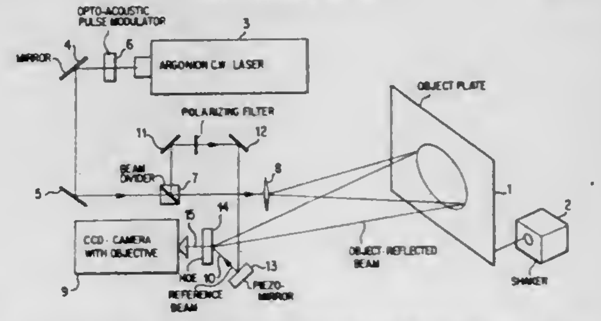
PCT No. PCT/EP95/02316, § 371 Date Apr. 14, 1997, § 102(e) Date Apr. 14, 1997, PCT Pub. No. WO96/04532, PCT Pub. Date Feb. 15, 1996

PCT Filed Jun. 14, 1995, Ser. No. 776,671

Claims priority, application Germany, Aug. 4, 1994, 44 27 692.3

Int. Cl.⁶ G01B *9/00;* **G01H** *9/00*

U.S. Cl. 73—579 **9 Claims**



1. A process for determining vibration characteristics of a body via modal analysis, the process comprising the steps of:

exciting the body at different frequencies of an excitation power so as to effect vibrations;

at one viewing angle, recording at least two optical interference images of mutually different vibration conditions of the body;

analyzing the optical interference images with a mathematical/physical model with respect to vibration characteristics existing at predetermined points on the body to compute real and imaginary parts of the vibration characteristics; and

performing modal analysis on the analyzed vibration characteristics of the predetermined points.

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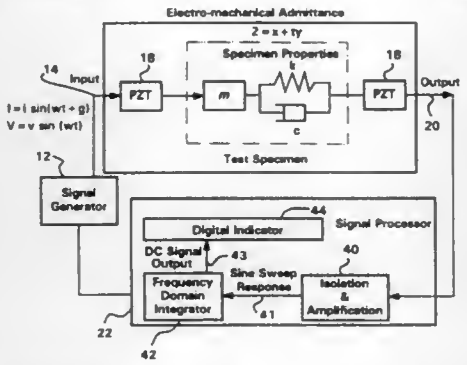
5,841,031
METHOD AND APPARATUS FOR EVALUATION AND INSPECTION OF COMPOSITE-REPAIRED STRUCTURES

J. H. Chung, Rockwall, Tex., assignor to E-Systems, Inc., Dallas, Tex.

Continuation of Ser. No. 612,421, Mar. 7, 1996, Pat. No. 5,665,913. This application May 21, 1997, Ser. No. 861,165

Int. Cl.^{6} G01N *29/16;29/18*

U.S. Cl. 73—583 **14 Claims**



1. An apparatus for testing and inspection of a composite-repaired area of a structure, comprising:

a signal generator having a test signal output;

a first transducer attached to the structure and receiving the test signal from the signal generator for converting the test signal to a mechanical signal transmitted through a portion of the composite-repaired area of the structure;

a second transducer attached to the structure for receiving the mechanical signal transmitted through the structure and converting the received mechanical signal into a response signal varying with the mechanical properties of the composite-repaired area; and

a signal processor coupled to the second transducer and receiving the response signal to output a display signal indicative of the mechanical properties of the composite-repaired area of the structure, said signal processor comparing the display signal to a baseline reference signal representing the mechanical condition of the composite-repaired area.

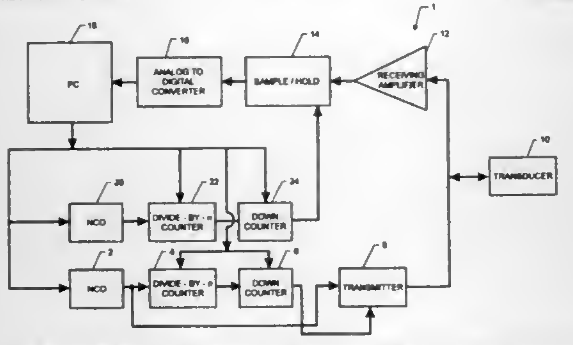
5,841,032
VARIABLE AND FIXED FREQUENCY PULSED PHASE LOCKED LOOP

Mark E. Froggatt, Yorktown, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 24, 1997, Ser. No. 792,909

Int. Cl.^{6} G01N *29/18*

U.S. Cl. 73—597 **19 Claims**



1. An apparatus for measuring phase shift in a sample comprising the following interconnected elements:

first signal means for generating a first electrical signal;

second signal means for generating a second electrical signal;

first pulse means for generating first pulses that are synchronized to said first electrical signal;

second pulse means for generating second pulses that are synchronized to said second electrical signal;

gating means for gating said first electrical signal based on said first pulses;

first conversion means for converting said gated signal into a radiated wave;

transmitting means for transmitting said radiated wave onto a sample;

receiving means for receiving said radiated wave from said sample;

second conversion means for converting said received radiated wave into a third electrical signal;

sampling means for sampling said third electrical signal at a time determined by said second pulses, wherein the sample point is determined by the accumulated phase differences between said first electrical signal and said second electrical signal;

third conversion means for converting said sampled signal into a digital signal; and

means for digitally varying the frequency and phase of said first and second electrical signals as desired such that said digital signal is zero.

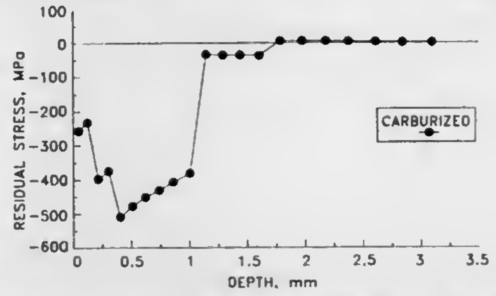
5,841,033
PROCESS FOR IMPROVING FATIGUE RESISTANCE OF A COMPONENT BY TAILORING COMPRESSIVE RESIDUAL STRESS PROFILE, AND ARTICLE

Kenneth W. Burris, and Thomas E. Clements, both of Peoria, Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Dec. 18, 1996, Ser. No. 769,283

Int. Cl.^{6} G01N *19/08*

U.S. Cl. 73—799 **15 Claims**



1. A process for improving fatigue resistance of a case hardened component having a case thickness "t", subjected to one or more of rolling, sliding, abrasion, bending and pitting, comprising the steps of:

determining the magnitude of a load acting upon said component;

determining the magnitude of fatigue strength at surface of said component and at a plurality of pre-selected points along thickness "t" of said component, in response to said load;

determining the magnitude of applied fatigue stresses acting upon said component at said surface of said component and at said plurality of pre-selected points along thickness "t" of said component;

applying a compressive residual stress profile from said surface to thickness "t" of component consisting of:

an upper compressive residual stress profile,

a lower compressive residual stress profile, and

a plurality of compressive residual stress and profiles within the area bounded between said upper and lower compressive residual stress profiles;

said compressive residual stresses at said surface and at said plurality of said pre-selected points along thickness "t" respectively having a magnitude sufficient to attain a net resultant stress being at least 25% lower than said fatigue strength at said surface and said corresponding plurality of pre-selected points,

said upper compressive residual stress profile consists of:

–400 Mpa at surface;

–50 Mpa at 40% of thickness "t";

0.0 Mpa at 50% of thickness "t"; and

0.0 Mpa at 100% of thickness "t":

and said lower compressive residual stress profile consists of:

–600 Mpa at surface;

–100 Mpa at 40% of thickness "t";

–50 Mpa at 50% of thickness "t"; and

0.0 Mpa at 100% of thickness "t".

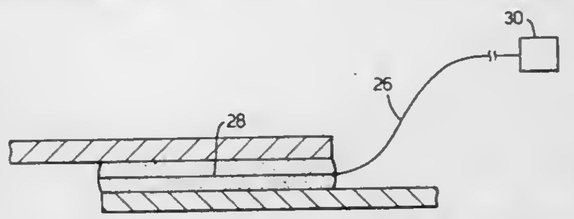
5,841,034
BONDED JOINT ANALYSIS

Andrew S Ball, Farnborough, Great Britain, assignor to British Aerospace Public Limited Company, Hampshire, Great Britain

Continuation of Ser. No. 675,835, Jul. 5, 1996, abandoned. This application Jun. 23, 1997, Ser. No. 880,725

Int. Cl.^{6} G01L *1/24*

U.S. Cl. 73—800 **1 Claim**



1. A method of analyzing the integrity of adhesively bonded structural joints under load, comprising the steps of:

locating a transducer means in proximity of said bonded joint, said transducer means being so disposed in relation to said bonded joint that parameters indicative of load transfer characteristics between a bonded material and an adhesive can be recorded in response to an applied load, wherein said transducer means comprises a fiber optical cable with an integrated optical grating means, said grating means extends parallel with the applied load for indicating strain characteristics alone a bond line of said joint, wherein said load transfer characteristics are measured by optical time domain reflectometry;

recording reference parameters indicative of the load transfer characteristics between the bonded material and the adhesive of said bonded joint under the application of a reference load after assembly of said bonded joint;

subsequently recording service parameters indicative of the load transfer characteristics between the bonded material and the adhesive of said bonded joint under the application of a service load; and

comparing said reference parameters with said subsequently obtained service parameters to determine an integrity of the bond.

5,841,035
VORTEX FLOWMETER

Tetsuo Andoh; Yoshinori Matsunaga; Takashi Kawano; Masanori Hondo; Masami Wada, and Kazuo Nagata, all of Tokyo, Japan, assignors to Yokogawa Electric Corporation, Tokyo, Japan

Filed Mar. 31, 1997, Ser. No. 828,874

Claims priority, application Japan, Apr. 2, 1996, 8-080094; Jul. 3, 1996, 8-173123

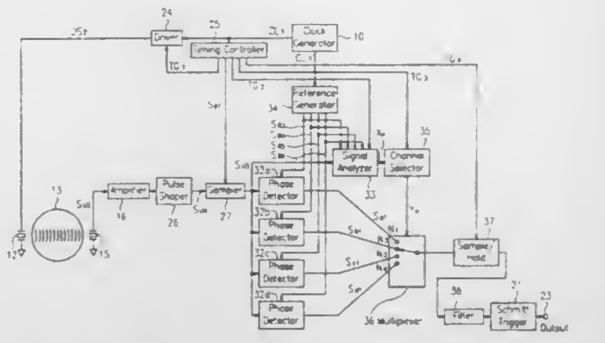
Int. Cl.^{6} G01F *1/32*

U.S. Cl. 73—861.22 **19 Claims**

1. A vortex flowmeter comprising:

a reference signal generating means for providing a plurality of reference signals of different phases;

signal analyzing means for providing an input status signal by determining relationship between phases of ultrasonic signals applied to a measuring fluid and each of said reference signals;



phase detection means for providing phase signals by detecting phase differences between said ultrasonic signals and said reference signals;

channel selection means for selecting an optimum one of said phase signals using said input status signal and for providing said optimum phase signal as a selection signal; and

means for computing and providing flow rate signals using said selection signal.

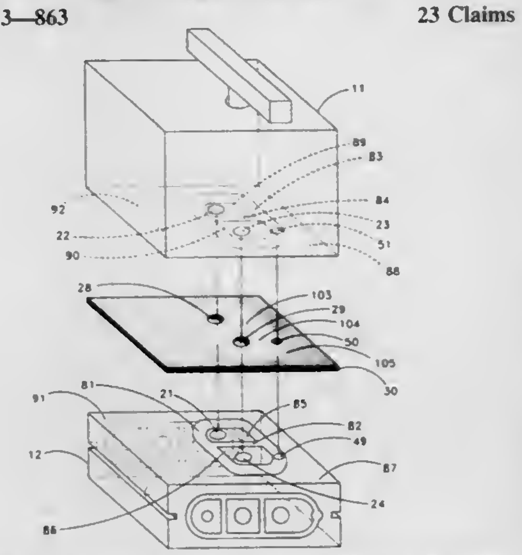
5,841,036
MODULAR SAMPLE CONDITIONING SYSTEM

Donald P. Mayeaux, 18632 Manchoc Dr., Prairieville, La. 70769

Filed Aug. 22, 1996, Ser. No. 701,406

Int. Cl.^{6} G01N *1/28;1/10*

U.S. Cl. 73—863 **23 Claims**



1. A method providing a sample fluid conditioning apparatus, comprising the steps of:

(a) providing a base module, said base module having a fluid communication means for allowing the passage of fluid therethrough, said base module further comprising a first docking face having, an external surface for receiving sample conditioning components;

(b) establishing a fluid communication order of sample conditioning components to effect conditioning of said sample fluid, comprising the steps of providing first and second sub-base modules each of said sub-base modules further having first and second docking faces each said first and second docking faces having an external surface, said first and second sub-base modules joined at said second docking face in fluid impermeable fashion so as to form said base module;

(c) providing first and second sample conditioning components, each of said sample conditioning components having a first docking face having an extra surface configured to dock with said first docking face of said base module;

(d) docking said first docking face of first and second modular conditioning components to said first face of said base module, respectively;

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(e) providing flow of said sample fluid to said first conditioning component;
(g) directing said flow of said sample fluid from said first conditioning component to said fluid communication means of said base module;
(h) directing said flow of said sample fluid from said fluid communication means of said base module to said second conditioning component.

5,841,037

PROCESS FOR SAMPLING IN PARTICLE-LADEN GAS STREAMS

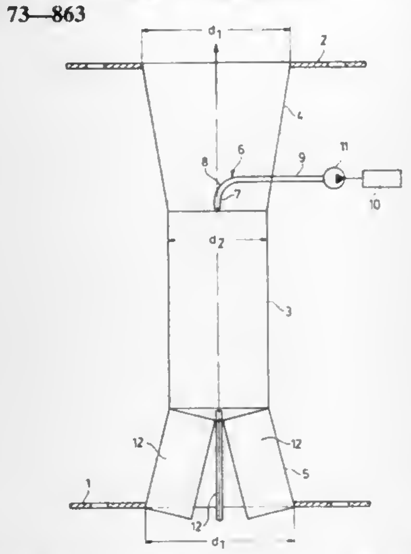
Benno Ulfik, Leverkusen; Mathias Benz, Bergisch Gladbach; Jörg Rainer Schmitz, Schwerte, and Heiko Herold, Neuss, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 27, 1997, Ser. No. 807,188

Claims priority, application Germany, Mar. 4, 1996, 196 08 242.0

Int. Cl.^{6} G01N *1/00*

U.S. Cl. 73—863 **6 Claims**



1. Process for the continuous collection of pulverulent samples from a particle-laden stream, in which a sample stream is drawn off from a particle-laden main stream in a pneumatic conveying line (**17**) and passed via a collection line (**9**) to a particle size measurement device (**10**), wherein the main stream is passed through a conveying line (**17**) having a venturi-like cross-sectional constriction (**3**, **4**, **5**) in order to reduce spin, the cross-sectional area of which is 10 to 60% of the free cross-sectional area of the conveying line (**17**) and that, downstream from the cross-sectional constriction (**3**, **4**, **5**), a partial stream is collected through one or more probe tubes (**7**) from the main stream parallel to the direction of flow thereof.

5,841,038

REMOTE POSSIBLY HAZARDOUS CONTENT CONTAINER SAMPLING DEVICE

David L. Volz, 59 La Paloma, Los Alamos, N. Mex. 87544

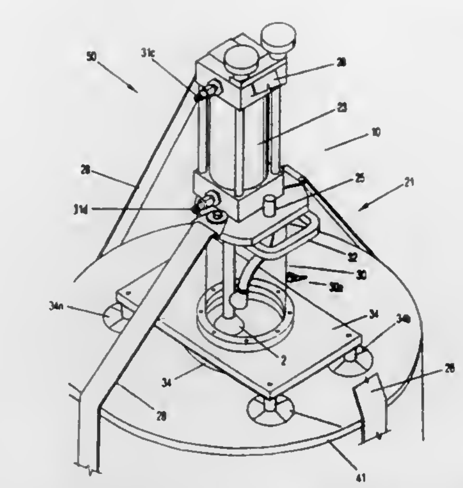
Filed Sep. 30, 1996, Ser. No. 724,117

Int. Cl.^{6} G01N *1/14*

U.S. Cl. 73—863.85 **10 Claims**

1. An apparatus for opening, sampling and venting any surface of an enclosed receptacle, where the contents of the receptacle are unknown or require verification, comprising:

a. air compression means attached to a portable vehicle;
b. a sampling device having a hollow sampling needle, the sampling device being secured to the receptacle by a securing means;



c. a means for communicating fluid flow attached between and being in fluid communication with the air compression means and the sampling device; and
d. means surrounding and encapsulating the sampling device for containing hazardous material to within the immediate environment of the sampling device which allows for introduction of an inert gas for preventing ignition of the receptacle contents.

5,841,039

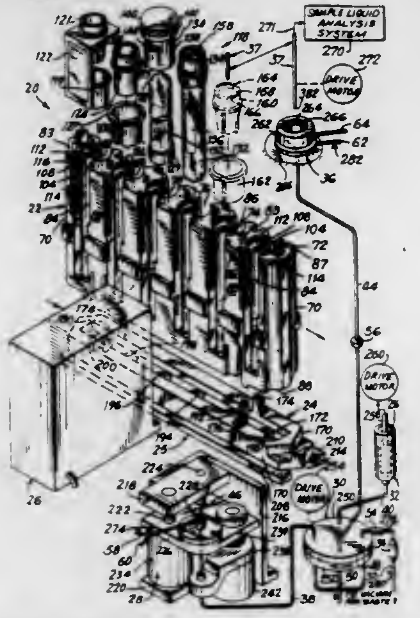
APPARATUS AND METHOD FOR INTEGRATED SAMPLING FROM CLOSED AND OPEN SAMPLE CONTAINERS

Kenneth F. Uffenheimer, Mahopac, N.Y., assignor to Technicon Instruments Corp., Tarrytown, N.Y.

Division of Ser. No. 671,713, Apr. 4, 1991, Pat. No. 5,201,232. This application Dec. 9, 1992, Ser. No. 988,074

Int. Cl.^{6} G01N *30/24*

U.S. Cl. 73—864.24 **9 Claims**



1. In sample liquid container support apparatus for use in a sampler, the improvements comprising, said support apparatus comprising, a plurality of sample liquid container mounting means each of which is operable to mount either a closed sample liquid container or an open sample liquid container, and means on said support apparatus for operatively connecting said support apparatus to a sampler for use in said sampler.

5,841,040

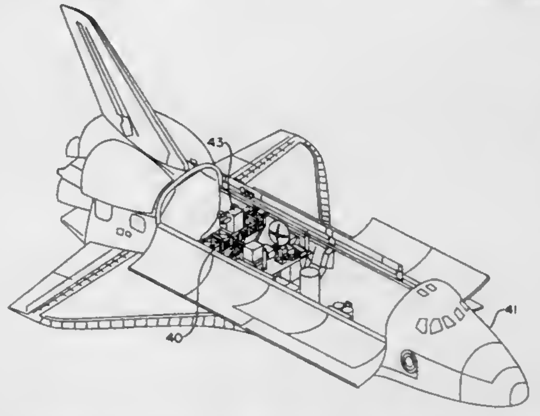
METHOD FOR ANALYZING STRUCTURE HAVING DEFORMABLE RIGID ELEMENTS

William T. Walls, Gurley, Ala., assignor to McDonnell Douglas Corporation, Huntington Beach, Calif.

Continuation of Ser. No. 723,104, Oct. 1, 1996, abandoned. This application Nov. 19, 1997, Ser. No. 974,256

Int. Cl.^{6} G01D *1/16*

U.S. Cl. 73—789 **6 Claims**



1. A system for analyzing characteristics of a structure having a rigid element, comprising:

a data input for inputting structure displacement data;
a memory for storing a plurality of structure stress defining equations adjusted to compensate for deformation of the rigid element, wherein said structure stress defining equations include:
  provision for defining a set of displacement factors to be imposed on a structure model;
  provision for calculating a load vector representing externally applied forces applied to the structure model; and
  provision for modifying the load vector to compensate for rigid element deformation before calculating stresses on the structure model through use of the load vector;
a processor for modeling the structure and processing said structure displacement data through said plurality of structure stress defining equations;
a data output for outputting said processed structure displacement data for structural analysis and modeling; and
wherein said load vector is calculated through the following equation:

$$[Pn]=\{\overline{Pn}\}+[Gm^T]\{Pm\}+[K_{nm}](\mathrm{Ym})+[\mathrm{Gm}^T][Kmm]\{Ym\} \tag{9}$$

$[P_n]$ is the load vector reduced to the independent set;
$\{\overline{P_n}\}$ is the partition of the load vector corresponding to the independent set;
$[Gm^T]$ is the transpose of $[G_m]$, where G_m is defined as:—$[R_m]^{-1}$ $[R_n]$ defined in Equation 4;
$\{P_m\}$ is the partition of the load vector corresponding to the dependent set;
$[K_{nm}]$ represents the couplings between the independent and dependent degrees of freedom;
$\{Y_m\}$ is—$[R_m]^{-1}\{\delta_G\}$; and
$[K_{mm}]$ is the partition of the global stiffness matrix pertaining to dependent degrees of freedom.

5,841,041

POROUS MOLD MATERIAL FOR CASTING AND A METHOD OF PRODUCING THE SAME

Norihiro Asano, Toyohashi, and Tatsuhiko Kato, Shinshiro, both of Japan, assignors to Sintokogio, Ltd., Nagoya, Japan

Filed Sep. 18, 1996, Ser. No. 715,562

Claims priority, application Japan, Sep. 22, 1995, 7-269149

Int. Cl.^{6} B22I *3/12;* **C22C** *1/08;1/09*

U.S. Cl. 75—229 **3 Claims**

1. A porous mold material for casting, said porous mold material being formed from the mixture of powder mainly comprising particles of ferrite stainless steel with stainless steel short fibers, by pressing, sintering, applying a nitrogen injection treatment, and cooling and reheating said mixture, characterized in that said porous mold material contains pores which range from 20 to 50 microns in size, and in that the porosity value of said porous mold material ranges from 25 to 35% by volume.

5,841,042

BRAKE LINING MATERIAL FOR HEAVY-LOAD BRAKING DEVICE

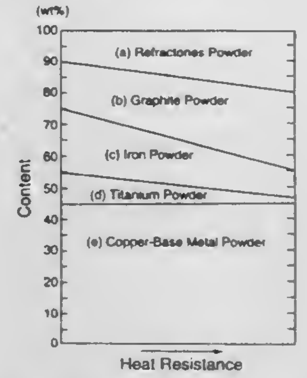
Yoshinari Kato, Mizunami, Japan, assignor to Tokyo Yogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 29, 1996, Ser. No. 639,688

Claims priority, application Japan, Oct. 20, 1995, 7-295971; Oct. 20, 1995, 7-295972; Oct. 20, 1995, 7-295973

Int. Cl.^{6} B23F *3/12;* **C22C** *1/05;9/00*

U.S. Cl. 75—231 **6 Claims**



1. A brake lining material, comprising, on a base of its total weight,

(a) 10 to 20 wt % of refractory material powder;
(b) 15 to 25 wt % a graphite powder, and
(c) as its remainder, a copper-based metal powder comprising powders of copper-based metal, iron and titanium wherein a total weight of said iron powder and said titanium powder is 0.2 to 0.4 on a base of a total weight of said metal powder and a remainder of said metal powder comprising copper-base metal which consists of copper powder, copper alloy powder or a mixture of said copper powder and said copper alloy powder and in which said refractory material powder and said graphite powder are sintered together with said metal powder in a uniformly distributed state in said metal powder.

5,841,043

SHAPED BODY OF HYDROGEN ABSORBING ALLOY AND CONTAINER PACKED WITH HYDROGEN ABSORBING ALLOY

Koichi Nishimura, Suita; Takahiro Yonesaki, Ora-gun; Shin Fujitani, Hirakata; Hiroshi Nakamura, Neyagawa; Yumiko Nakamura, Moriguchi; Ikuo Yonezu, and Hiroshi Watanabe, both of Hirakata, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Division of Ser. No. 538,371, Oct. 3, 1995, Pat. No. 5,662,729. This application May 12, 1997, Ser. No. 854,846

Claims priority, application Japan, Oct. 4, 1994, 6-239939; Oct. 7, 1994, 6-270508; Oct. 31, 1994, 6-266444

Int. Cl.^{6} C22C *19/03*

U.S. Cl. 75—231 **6 Claims**

1. A hydrogen absorbing alloy shaped body which has been prepared by filling a shaping die with a powder of hydrogen absorbing alloy and a binder comprising a fluorocarbon resin

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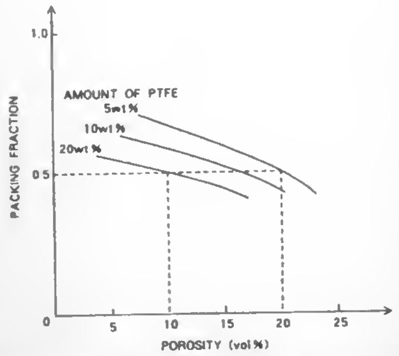


mixed together so as to form a mixture and pressing the mixture under a pressure of 40 kg/cm^2–100 kg/cm^2.

5,841,044

SILVER-IRON MATERIAL FOR ELECTRICAL SWITCHING CONTACTS (I)

Wolfgang Weise, Frankfurt; Willi Malikowski, Aschaffenburg; Roger Wolmer, Gelnhausen; Peter Braumann, Alzenau, and Andreas Koffler, Niederau, all of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 19, 1996, Ser. No. 751,935

Claims priority, application Germany, Nov. 20, 1995, 195 43 222.3

Int. Cl.^{6} C22C *5/06*

U.S. Cl. 75—232 **20 Claims**

1. Material for electrical switching contacts which is weldable onto a contact carrier substance comprising a mixture of

silver;

iron which is present in an amount of 0.5–4.5% by weight; and

at least one oxidic additive which is a member selected from the group consisting of magnesium oxide, calcium oxide, yttrium oxide, lanthanum oxide, titanium oxide, zirconium oxide, hafnium oxide, cerium oxide, niobium oxide, tantalum oxide, chromium oxide, manganese oxide, iron oxide, zinc oxide, aluminum oxide, indium oxide, silicon oxide, and tin oxide, which is present in an amount of 0.05%–2% by weight.

5,841,045

CEMENTED CARBIDE ARTICLES AND MASTER ALLOY COMPOSITION

Larry E. McCandlish, and Rajendra K. Sadangi, both of Highland Park, N.J., assignors to Nanodyne Incorporated, New Brunswick, and Rutgers University, Piscataway, both of N.J.

Filed Aug. 23, 1995, Ser. No. 518,498

Int. Cl.^{6} C22C *29/02*

U.S. Cl. 75—236 **27 Claims**

6. An article, comprising particles of a ceramic powder that have been sintered with a sintering aid comprising a low melting alloy comprising at least one binding metal selected from the group consisting of iron, cobalt and nickel and at least 3% of a grain growth inhibiting metal selected from the group vanadium, chromium, tantalum and niobium in an amount effective to provide an alloy having a liquid formation temperature of less than about 1300° C. and carbon in an amount effective to form carbides of said grain growth inhibiting metal, wherein said alloy has no more than 60% iron.

5,841,046

HIGH STRENGTH, CORROSION RESISTANT AUSTENITIC STAINLESS STEEL AND CONSOLIDATED ARTICLE

Geoffrey O. Rhodes, Saxonburg; John J. Eckenrod, Moon Township; Frank J. Rizzo, McMurray; Michael W. Perettl, Washington; Ulrike Habel, and William B. Eisen, both of Pittsburgh, all of Pa., assignors to Crucible Materials Corporation, Syracuse, N.Y.

Filed May 30, 1996, Ser. No. 652,686

Int. Cl.^{6} C22C *33/02*

U.S. Cl. 75—246 **14 Claims**

1. A consolidated, fully dense, high yield strength, austenitic stainless steel article produced from nitrogen gas atomized prealloyed particles, said article having a PRE greater than 55 and a Tσ not greater than 1232° C.

5,841,047

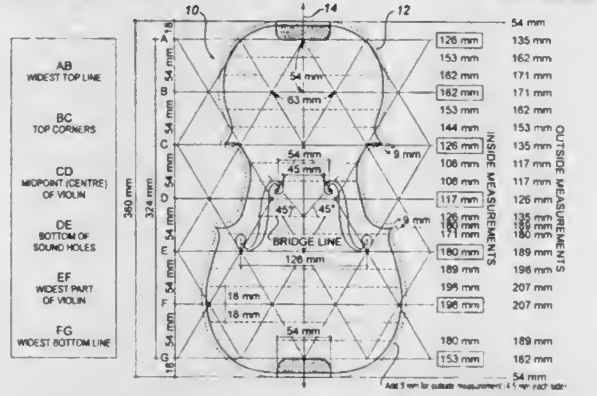
METHOD OF VIOLIN CONSTRUCTION AND A VIOLIN

Collin Mandreck, 102, 3638 - 117 Avenue, Edmonton, Alberta, Canada, T5W 0X8

Filed Aug. 19, 1996, Ser. No. 699,340

Int. Cl.^{6} G10D *1/02*

U.S. Cl. 84—274 **20 Claims**



1. In a violin having a neck, a body and a bridge all being aligned with one another along a longitudinal axis of the violin, a top surface of said violin being provided with a pair of sound holes, and an interior compartment of said body having first and second opposed blocks;

wherein an exterior length of said body, when measured along said longitudinal axis in whole number millimeters, is a factor of 9;

a spacing between facing end surfaces of said first and second opposed blocks, when measured along said longitudinal axis in whole number millimeters, is a factor of 9;

a length of said blocks, when measured along said longitudinal axis in whole number millimeters, is a factor of 9; and

a maximum transverse exterior depth of said violin, when measured from one exterior surface to the other along said longitudinal axis of said violin in whole number millimeters, is a factor of 9.

5,841,048

MUSICAL WIND INSTRUMENT HAVING STOPS WHICH ARE FULLY MACHINED BEFORE BEING ATTACHED AND A PROCESS FOR PRODUCING IT

Michael Winter, Nauheim, Germany, and Paul Baronnat, Chantemesle, France, assignors to Buffet Crampon S.A., La Ville, France

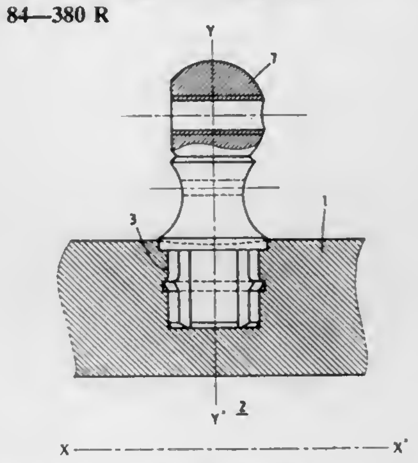
PCT No. PCT/FR96/01382, § 371 Date May 7, 1997, § 102(e) Date May 7, 1997

PCT Filed Sep. 9, 1996, Ser. No. 836,229

Claims priority, application France, Sep. 8, 1995, 95 10528

Int. Cl.^{6} G10D *7/00*

U.S. Cl. 84—380 R **6 Claims**



1. Musical wind instrument comprising a body (**1**) on the lateral outer surface of which is fixed a keying stop (**7**) engaging by means of a base in a hole in the body, characterised in that the base has a non-circular cross section and the hole is defined by an associated non-circular wall.

5,841,049

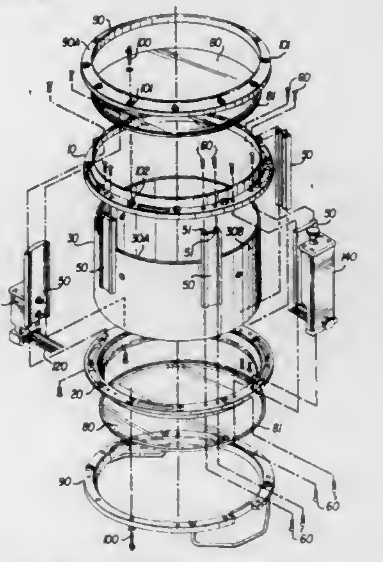
MUSICAL PERCUSSION INSTRUMENT

Carroll Glenn Strawn, Route 1 Box 23, Teachland, N.C. 28133

Filed Jan. 16, 1996, Ser. No. 587,206

Int. Cl.^{6} G10D *13/02;* G10G *5/00*

U.S. Cl. 84—411 R **25 Claims**



1. A percussion instrument comprising:

(a) a first mounting ring having a first groove therein;

(b) a second mounting ring having a second groove therein;

(c) means for mounting a batter head under tension over at least said first mounting ring;

(d) means for connecting said first and second mounting rings together and for defining an axial distance between the first and second grooves of said mounting rings; and

(e) a shell having axial ends disposed in the grooves of said first and second mounting rings and having an axial dimension between said axial ends less than the axial distance between the grooves of said mounting rings such that there is an axial spacing between at least one of said ends and the adjacent one of said grooves whereby axial loads are prevented by said axial spacing from being transmitted to said shell.

5,841,050

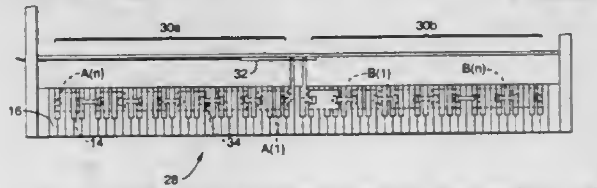
METHOD AND APPARATUS FOR OPTICALLY DETERMINING NOTE CHARACTERISTICS FROM KEY MOTION IN A KEYBOARD OPERATED MUSICAL INSTRUMENT

Pamela K. Clift, Vacaville, and Charles R. Lee, Placerville, both of Calif., assignors to Burgett, Inc., Sacramento, Calif.

Continuation-in-part of Ser. No. 395,459, Feb. 27, 1995, Pat. No. 5,524,521. This application Jun. 10, 1996, Ser. No. 658,486

Int. Cl.^{6} G10D *3/04*

U.S. Cl. 84—462 **8 Claims**



1. An apparatus for determining motion characteristics of selected string striking means in a keyboard operated musical instrument having a plurality of string striking means, comprising:

(a) a plurality of sensor banks, each said sensor bank including a plurality of sensor boards, each said sensor board including a plurality of light emitters and corresponding light sensors, said light emitters and corresponding light sensors positioned adjacent said plurality of string striking means in said keyboard operated musical instrument, each said light sensor producing an output voltage responsive to intensity of sensed light reflected from a corresponding one of said plurality of string striking means in said keyboard operated musical instrument; and

(b) control means for addressing said sensor banks, addressing said sensor boards, activating said light emitters and said light sensors in said addressed sensor boards, acquiring voltage output data from said light sensors in said addressed sensor boards, sequencing between addressing a sensor bank and a sensor board in said addressed sensor bank, and determining motion characteristics of said plurality of string striking means from said acquired output voltage data.

5,841,051

APPARATUS FOR PROVIDING MUSICAL INSTRUCTION

Marc H. Segan, New York, N.Y., assignor to M. H. Segan Limited Partnership, New York, N.Y.

Filed Aug. 17, 1995, Ser. No. 516,450

Int. Cl.^{6} G09B *15/00*

U.S. Cl. 84—477 R **17 Claims**

1. An apparatus for teaching a user to play a musical instrument, comprising:

a hand-shaped pad having a palm portion and five finger portions and being sized and shaped to receive the user's hand with one finger disposed in each of said finger portions;

an indicator associated with each of said finger portions;

an electronic circuit coupled to said indicators to selectively activate each of said indicators, activation of an indicator defining a selected finger portion and indicating to the user to move the user's finger positioned in the selected finger portion; and

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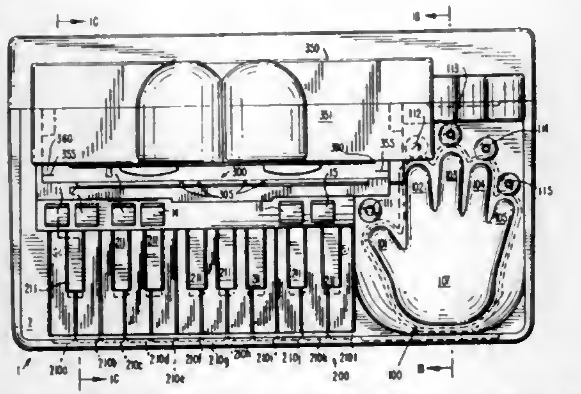


an output device coupled to said electronic circuit, wherein said electronic circuit causes said output device to produce an output to indicate the finger to be moved by the user in said selected finger portion.

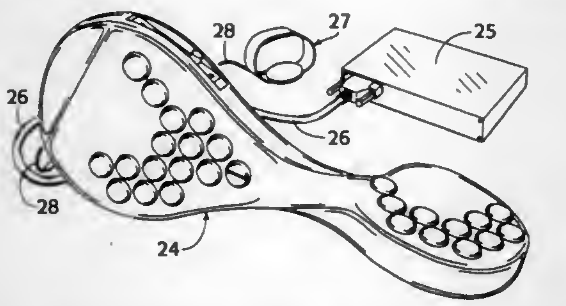
5,841,052
FINGER PLAYABLE PERCUSSION TRIGGER INSTRUMENT

Francis S. Stanton, 50 Merlham Dr., Madison, Wis. 53705, assignor to Francis S. Stanton, Madison, Wis.

Filed May 27, 1997, Ser. No. 863,817

Int. Cl.^{6} G10D *13/00;13/02*

U.S. Cl. 84—600 **14 Claims**



11. A musical instrument for triggering a percussion synthesizer, comprising:

a hand held housing having at least first and second front surfaces in which first and second front surfaces are rotated approximately 90 degrees relative to each other along the longitudinal axis of said hand held housing;

an arrangement of a plurality of trigger transducers on each of said surfaces arranged in a closest packing pattern corresponding to said player's fingers, which activates sounds on said percussion synthesizer, and which includes on each of said arrangements at least a bass drum sound, a snare drum sound, a plurality of tom-tom sounds, a plurality of cymbal sounds and a plurality of miscellaneous percussion sounds; and

a means of connecting said plurality of trigger transducers to said percussion synthesizer with a plurality of electrical connections so that each of said trigger transducers activates said sounds from said percussion synthesizer, through means to physically alter the arrangement of said plurality of electrical connections and therefore said sounds that said plurality of electrical connections represent.

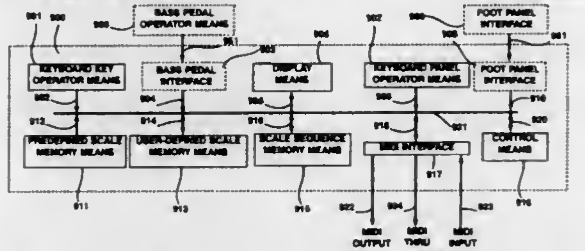
5,841,053
SIMPLIFIED KEYBOARD AND ELECTRONIC MUSICAL INSTRUMENT

Gerald L. Johnson, 6714 Pomona, Boise, Id. 83704, and Joseph T. Pawlowski, 12171 W. Musket Dr., Boise, Id. 83713

Filed Mar. 28, 1996, Ser. No. 623,485

Int. Cl.^{6} G09B *15/02;* **G10C** *3/12;* **G10H** *7/00*

U.S. Cl. 84—615 **40 Claims**


BASS PEDAL OPERATOR MEANS
FOOT PANEL INTERFACE
KEYBOARD KEY OPERATOR MEANS
BASS PEDAL INTERFACE
DISPLAY MEANS
KEYBOARD PANEL OPERATOR MEANS
FOOT PANEL INTERFACE
PREDEFINED SCALE MEMORY MEANS
USER-DEFINED SCALE MEMORY MEANS
SCALE SEQUENCE MEMORY MEANS
MIDI INTERFACE
CONTROL MEANS
MIDI OUTPUT
MIDI THRU (OPTIONAL)
MIDI INPUT

28. An electronic musical keyboard instrument or representation thereof which comprises;

a plurality of repeating recognizable patterns of seven keys of a first and a second type, which are capable of actuation, and arranged as first type-second type-first type-second type-first type-second type-first type;

a plurality of electronic signals, each assigned to a valid musical note;

a plurality of selectable stored scales of valid notes in repeating patterns of octaves for matching assignment of valid notes to the repeating patterns of seven actuatable keys;

a means for selecting a scale with valid notes, from the plurality of stored scales;

a means of electronically assigning the keys of the keyboard to the valid notes of the selected scale, such that the seven keys of any repeating pattern of seven keys on the keyboard play only the valid notes of the selected scale;

means for detecting when a selected key is actuated; and

means for generating the electronic signal assigned to a valid note, when the means for detecting when a key is actuated detects the actuation of a key.

5,841,054
MUSICAL TONE SYNTHESIZING APPARATUS HAVING COMPATIBILITY OF TONE COLOR PARAMETERS FOR DIFFERENT SYSTEMS

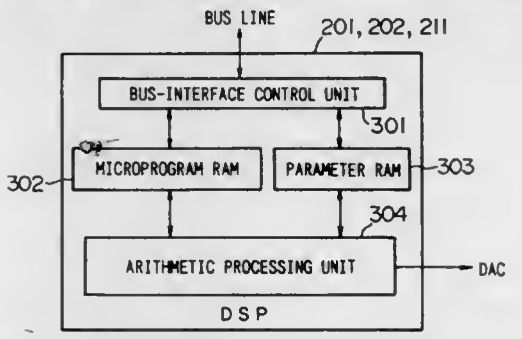
Takeshi Komano; Toshifumi Kunimoto, and Masahiro Kakishita, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed Apr. 3, 1997, Ser. No. 832,241

Claims priority, application Japan, Apr. 6, 1996, 8-110218

Int. Cl.^{6} G10H *1/06*

U.S. Cl. 84—622 **29 Claims**



1. A musical tone synthesizing apparatus comprising:

storing means for storing a prescribed set of tone-color parameters which are suited to a prescribed musical tone generation method;

tone-color-parameter providing means for providing at least a part of the tone-color parameters in response to a musical-tone-synthesis algorithm; and

processor means for executing the musical-tone-synthesis algorithm by using the at least a part of the tone-color parameters so as to synthesize musical-tone waveforms with regard to a desired tone color.

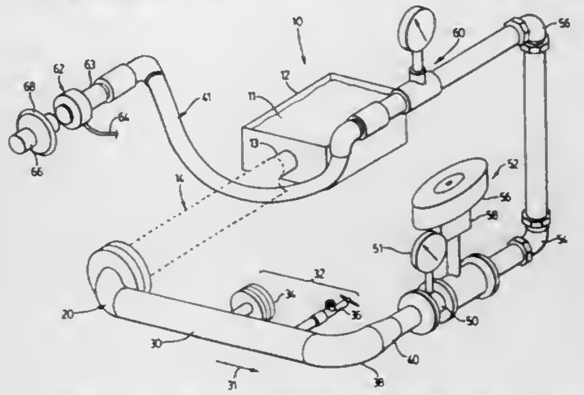
5,841,055
METHOD FOR CONTROLLED REFINING EXPLOSIVE COMPOSITIONS

Allan Hooper, North Bay; Les Collins, Corbell; Earl Reckzin; Andrew Richard, both of North Bay; Tom Palangio, Bonsfield; Mark Kelly, Callander, and Grant Simpson, North Bay, all of Canada, assignors to ETI Expolosives Technologies International (Canada) Ltd., North Bay, Canada

Division of Ser. No. 548,673, Oct. 26, 1995, Pat. No. 5,672,839. This application Jun. 11, 1997, Ser. No. 872,926

Int. Cl.^{6} F42B *3/00*

U.S. Cl. 86—20.15 **9 Claims**



1. A method for controlled pumping and thickening of a pumpable explosive, the method comprising the steps of:

a) pumping an explosive composition through a shear thickening apparatus having a refining means;

b measuring pressure at a first pressure indicator located on an upstream side of said refining means;

c) measuring pressure at a second pressure indicator located on a downstream side of said refining means;

d) providing an adjustor associated with said refining means;

e) establishing a set point pressure differential between said measured upstream and downstream pressures for attaining a predetermined amount of thickening of said explosive composition passing through said refining means;

f) monitoring the measured pressure difference between the first pressure indicator and the second pressure indicator; and

g) adjusting said shear thickening apparatus to generally maintain said set point pressure differential.

5,841,056
WATER DEFLECTOR FOR WATER-GAS PLUMES FROM UNDERWATER EXPLOSIONS

John B. Long, Sarasota, Fla.; Pius Chao, and Donald Waits, both of El Cerrito, Calif., assignors to Hydrodyne Incorporated, Sarasota, Fla.

Filed Apr. 21, 1997, Ser. No. 845,169

Int. Cl.^{6} F42B *33/00;* **E06B** *9/00*

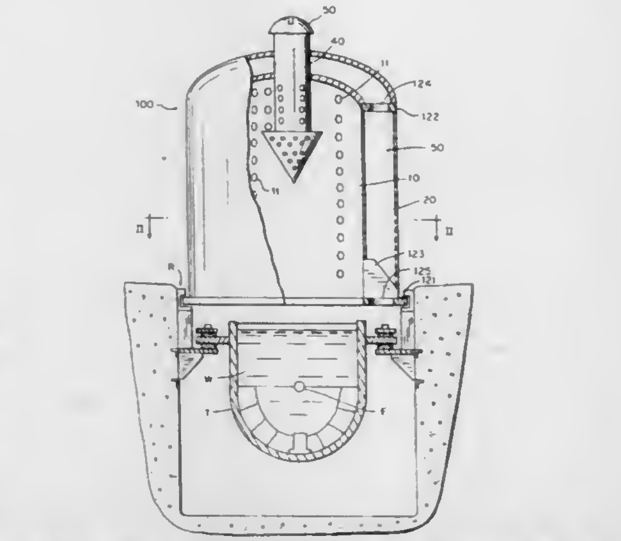
U.S. Cl. 86—50 **20 Claims**

1. An explosive blast shield for containing an upwardly moving plume of gas and liquid coming from below said blast shield, comprising:

a generally cylindrical foraminous inner shell having an open lower end and a closed upper end;

a non-foraminous outer shell surrounding and joined to the inner shell, said outer shell having an open lower end, and a vent passing therethrough; and

a space between the inner shell and the outer shell;



whereby gas of an explosive plume moving upwardly into said blast shield more readily escapes through the inner shell than liquid of the explosive plume.

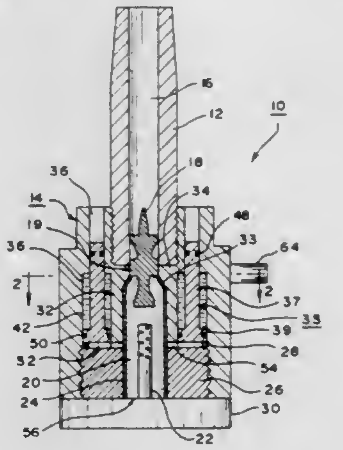
5,841,057
METHOD AND APPARATUS FOR LIQUID INJECTION TO REDUCE GUN BARREL EROSION

Aviezer Birk, Aberdeen, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 9, 1997, Ser. No. 954,887

Int. Cl.^{6} B64D *1/04*

U.S. Cl. 89—1.25 **20 Claims**



1. A gun having a bore for discharging a projectile with a gas, said gun comprising:

a housing defining a propellant chamber adapted to contain a propellant to be burned for generating the gas, said propellant chamber being connected to an entrance into the bore to provide a portion of the gas for propelling the projectile down said bore away from said entrance;

a piston arranged for movement in a piston chamber defined by said housing and cooperating with a wall of said piston chamber to provide a liquid chamber for holding a liquid when said piston is in a retracted position;

at least one liquid passage connecting said liquid chamber and said bore, and having an outlet in the vicinity of said bore entrance;

a gas chamber arranged in said housing to exert a pressure of the gas against a first face of said piston opposite to a second face of said piston for contacting the liquid in said liquid chamber; and

at least one gas passage connecting said gas chamber and said propellant chamber to provide said gas pressure in said gas

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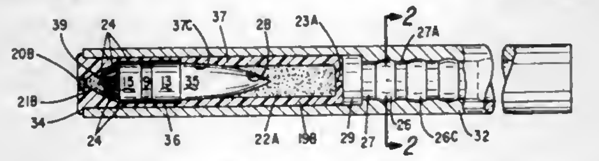
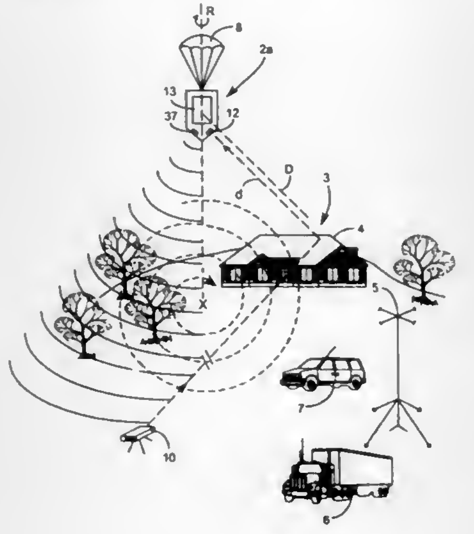
chamber, the area of said first piston face being larger than the area of said second piston face so that said gas pressure causes said piston to force the liquid out of said liquid chamber and into said gun bore through said liquid passage when the gas is generated by burning the propellant in said propellant chamber.

5,841,058
FIREARMS
John Robert Manis, P.O. Box 327, Aripeka, Fla. 34679-0327
Filed Jan. 26, 1996, Ser. No. 592,575
Int. Cl.^{6} F41F *1/00;* F41A *21/00;* F42B *10/00*
U.S. Cl. 89—8 **42 Claims**



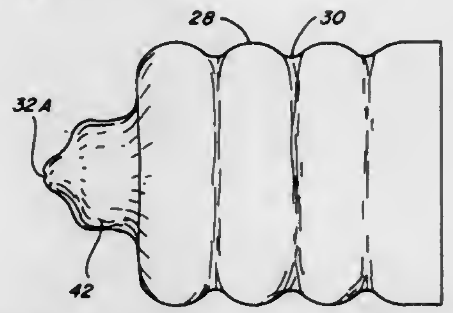
1. A system for propelling a projectile along a firearm comprising:
- a projectile, having a projectile body, that is propelled along the length of the bore of the barrel and inserted into a cartridge case;
- a series of annular chambers, recessed from a main bore wall of the firearm barrel and along the length of the bore of the barrel;
- an annular recess in said projectile body;
- a series of sealing rings in said cartridge case containing said projectile;
- a primer and rear propellant charge, contained within said cartridge case and rearward of said projectile; and
- a forward propellant charge, contained within said cartridge case, in contact with said projectile body and forward of said projectile.

5,841,059
PROJECTILE WITH AN EXPLOSIVE LOAD TRIGGERED BY A TARGET-SIGHTING DEVICE
Pascal Laurend, Ligny le Ribault, and Jean-Noël Bilbaut, Saint Doulchard, both of France, assignors to Luchaire Defense S.A., France
Filed Apr. 3, 1997, Ser. No. 826,593
Claims priority, application France, Apr. 5, 1996, 96 04365; Apr. 5, 1996, 96 04366
Int. Cl.^{6} F42C *13/02;9/14;* F42B *10/00;* F41G *7/00*
U.S. Cl. 102—213 **19 Claims**



1. A projectile detonation system for instantaneously-capable, remote detonation of conventionally launched non-guided projectiles, comprising:
- a projectile comprising a carrier projectile and a detachable sub-projectile system which includes an explosive load;
- said carrier projectile having detachment means for rotatably detaching said sub-projectile system from said projectile;
- a remote sighting device, said remote sighting device being separate from said projectile;
- said remote sighting device having means for transmitting a reflective radiation beam at a selected target; and
- said sub-projectile system having detection means for sweeping detection of a terrain as said sub-projectile system rotates in search of a reflected portion of said radiation beam that has reflected off said selected target; and
- detonation means to detonate the explosive load of said sub-projectile system when said sub-projectile is within an acceptable range of said target, the acceptable range being selected by said remote-sighting device.

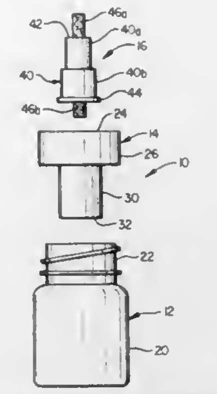
5,841,060
BLAST PLUG
Roger Dean Skaggs, 323 Church St., Bonne Terre, Mo. 63664
Filed Oct. 24, 1995, Ser. No. 547,582
Int. Cl.^{6} F42D *3/00*
U.S. Cl. 102—333 **9 Claims**



1. Plug means to absorb some of the energy of an explosion generated during a blasting operation where an explosive is positioned in a bore drilled into a rock formation, said plug means comprising a cup-shaped member formed of a relatively yieldable plastic material including an annular sidewall closed at one end by a closure wall, whereby said sidewall has at least one annular outwardly extending rib portion and at least one inwardly extending annular groove, the diameter of said cup shaped member substantially conforming to the diameter of the bore drilled into the rock formation with said cup shaped member having an unstressed diameter larger than the bore, said cup shaped member being movable into the bore such that said annular sidewall including said rib yieldably engages the wall of the bore to form a substantially sealed connection between the bore and said cup-shaped member, said cup shaped member acting as a barrier against the forces of an explosion coming through the bore.

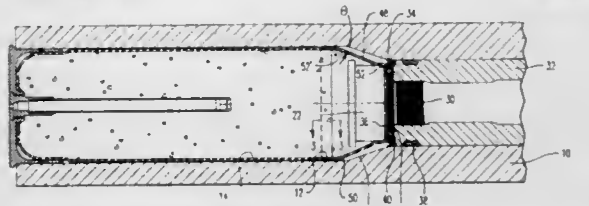
5,841,061
AIR-FUEL AERIAL FIREWORKS DISPLAY DEVICE
Robert L. Westfall, 2632 Pin Oak, Plano, Tex. 75025, and Robert D. McMurray, 1329 Bluebird La., Midlothian, Tex. 76065
Filed Aug. 4, 1997, Ser. No. 905,684
Int. Cl.^{6} F42B *4/04*
U.S. Cl. 102—361 **16 Claims**

1. An aerial fireworks display device comprising:
- a container adapted to receive a first combustible material and having an open end portion;
- a lid structure having an upper portion removably and sealingly securable to said open end portion of said container, and a hollow well portion depending from said upper portion and adapted to receive a second combustible material, said hollow well portion having a closed lower end, and an upper interior portion that opens outwardly through said upper lid structure portion;



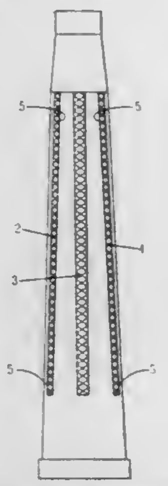
- a plug member having top and bottom ends and an interior chamber opening outwardly through said top and bottom ends, a bottom end portion of said plug member being removably insertable downwardly into said upper interior portion of said well portion of said lid structure;
- a heat-ignitable fuse having a longitudinally intermediate portion captively retained in said interior chamber of said plug member, a top end portion exposed at said top end of said plug member for ignition by a source of heat adjacent thereto, and a bottom end portion exposed at said bottom end of said plug member to ignite the received second combustible material within said hollow well portion subsequent to the heat ignition of said exposed top end portion of said heat-ignitable fuse; and
- cooperating means on said bottom end portion of said plug member and on said lid structure well portion for removably and sealingly retaining said bottom end portion of said plug member within said upper interior portion of said well portion of said lid structure.

5,841,062
TANK CARTRIDGE
Leon Manole, Great Meadows; Stewart Gilman, Wharton; James Lee, Parsippany; Manuel Munoz, Paterson; Peter Ngai, Morris Plains; Anthony Vella, Bloomfield; William Rice, Succasunna, and Nick Zuback, Carteret, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Oct. 27, 1997, Ser. No. 958,640
Int. Cl.^{6} F42B *5/18*
U.S. Cl. 102—431 **5 Claims**



1. An improved tank cartridge which comprises:
- a resin impregnated cellulose cartridge case for holding a propellant therein;
- a resin impregnated cellulose case cap operatively connected to said cartridge case wherein said case cap retains propellant within said cartridge case and supports a projectile thereon, said case cap defining a reduced free ullage space inside said tank cartridge and a space between said cap and a forcing cone wall of a tank gun, a case cap rear end operatively connected to said cartridge case, said rear end forming a skive joint therebetween, said case cap having a case cap shoulder and a case cap side wall, said case cap shoulder operatively located proximate to said skive joint, said cap side wall and said shoulder located rearward of said forcing cone wall of said tank gun and forming an angle θ between said case cap side wall and said forcing cone wall, said angle θ being about 5 degrees or less; and
- stabilizer means operatively disposed in said case for fixedly holding a projectile in axial alignment with said cartridge case and said case cap.

5,841,063
CASED AMMUNITION
Dan Hellkvist, Degerfors, and Erik Loinder, Karlskoga, both of Sweden, assignors to Bofors AB, Karlskoga, Sweden
PCT No. PCT/SE95/00239, § 371 Date Nov. 29, 1996, § 102(e) Date Nov. 29, 1996, PCT Pub. No. WO95/24607, PCT Pub. Date Sep. 14, 1995
PCT Filed Mar. 7, 1995, Ser. No. 704,742
Claims priority, application Sweden, Mar. 10, 1994, 9400808
Int. Cl.^{6} F42B *5/28;5/30*
U.S. Cl. 102—481 **16 Claims**



1. A method used in fixed service ammunition for reducing the damage effect on the environment in the event of extreme pressure increases in the propellent charges of the ammunition, upon accidental ignition and fire in the propellent powder included in the ammunition, said method comprising the steps of:
- providing each cartridge case surrounding said propellent powder with at least one longitudinal material weakening;
- designing said weakening so as to cause, upon an internal pressure increase in the case brought about by ignition of the propellent powder while the case is without external support in the cartridge chamber of a weapon, breaking of the case along the weakening thus resulting in a splitting open of the case material, said splitting being sufficiently large to prevent an explosion of the propellent powder and to impart a calm or subsiding combustion.

5,841,064
PELTIER MODULE
Nobuteru Maekawa, Katano; Katsuyoshi Shimoda, Hikone; Teruaki Komatsu, Hikone; Shinya Murase, Hikone; Hiroaki Okada, Ikoma-gun, and Hiroyuki Inoue, Hikone, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan
PCT No. PCT/JP96/01421, § 371 Date Jan. 24, 1997, § 102(e) Date Jan. 24, 1997, PCT Pub. No. WO96/37918, PCT Pub. Date Nov. 28, 1996
PCT Filed May 27, 1996, Ser. No. 776,186
Claims priority, application Japan, May 26, 1995, 7-128693
Int. Cl.^{6} H01L *35/02;35/08*
U.S. Cl. 136—203 **15 Claims**

1. A Peltier effect module comprising:
- a pair of substrates arranged opposite to each other;

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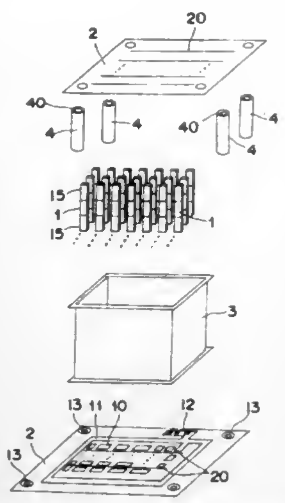


connection electrodes formed on each opposed surface of the pair of substrates;

a pair of power supply lead electrodes each formed in a closed loop and enclosing the connection electrodes on each opposed surface of the pair of substrates;

plural Peltier effect elements arranged in parallel between the pair of substrates; and

a hollow seal frame positioned between the pair of substrates to surround the plural Peltier effect elements, the seal frame having upper and lower ends for metallic bonding wherein the upper and lower ends of the seal frame are metallically bonded to respective power supply lead electrodes, thereby sealing each end of the seal frame and each substrate.

5,841,065

GAS GENERANTS CONTAINING ZEOLITES

Ivan V. Mendenhall, Providence, Utah, assignor to Autoliv ASP, Inc., Ogden, Utah

Filed Apr. 15, 1997, Ser. No. 834,182

Int. Cl.^{6} C06B *33/00;* **C06D** *5/06*

U.S. Cl. 149—37 **4 Claims**

1. In a gas generant formulation comprising 100 parts by weight of fuel plus oxidizer, said gas generant formulation containing a compound which evolves ammonia as a degradation product, the improvement wherein said gas generant formulation further comprises between about 0.5 and about 10 parts by weight of chabazite.

5,841,066

LIGHTENING STRIP

Eric Bocherens, Résidence "Les Cyclades" Bât. 1 1047, Avenue de la Résistance, 83000 Toulon, France

Filed Feb. 14, 1997, Ser. No. 800,338

Claims priority, application France, Feb. 15, 1996, 96 01845

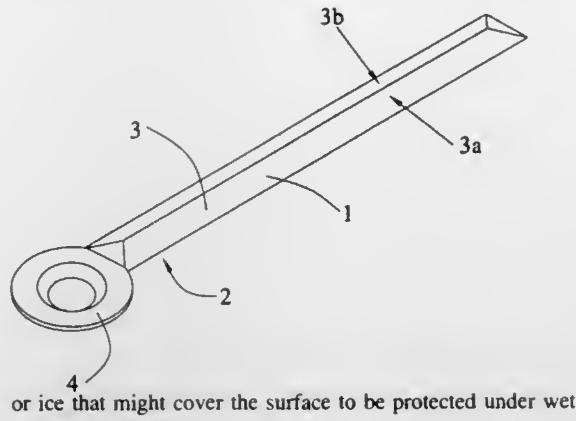
Int. Cl.^{6} H05F *3/00*

U.S. Cl. 174—2 **5 Claims**

1. A lightning strip comprising:

an attaching face adapted to be attached to a surface; and

an exposed face, wherein the lightning strip is comprised of a thermoplastic polymer mixed with conductive particles, wherein the height of the strip is greater than a layer of water or ice that might cover the surface to be protected under wet weather conditions.



5,841,067

HOUSING FOR ELECTRONIC APPARATUS AND METHOD OF DAMPING UNWANTED RADIATION OF ELECTROMAGNETIC WAVES

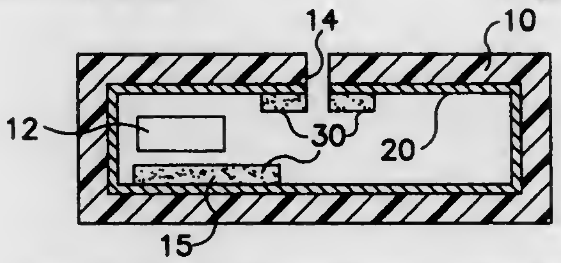
Koji Nakamura, Amagasaki; Masato Morimoto, Hirakata; Mitsuyuki Oda, Kyoto; Kazunori Kanda, Yao, and Yoshihiro Konishi, Sagamihara, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, and K. Laboratory Co., Ltd., Sagamihara, both of Japan

Filed Jun. 11, 1996, Ser. No. 661,769

Claims priority, application Japan, Jun. 21, 1995, 7-179503

Int. Cl.^{6} H05K *9/00*

U.S. Cl. 174—35 MS **6 Claims**



1. A case for electronic apparatus comprising a housing having an opening; a conductive layer disposed on an inner surface of said housing; a sheet being in the vicinity of said opening having a thickness of 70 to 400 μm, formed of a magnetic material containing resin composition comprising 7 to 60% by weight of a binder resin (a) and 40 to 93% by weight of a finely divided magnetic material (b) having a magnetic loss term; wherein the sheet is disposed only on a portion of said housing.

5,841,068

MOUNTING DEVICE FOR MOUNTING AN ELECTRICAL COMPONENT IN A WALL

George H. Umstead, 803 Park Blvd., and Steven M. Umstead, 323 8th Avenue Juniata, both of Altoona, Pa. 16601

Filed Jan. 12, 1995, Ser. No. 372,077

Int. Cl.^{6} H02G *3/08*

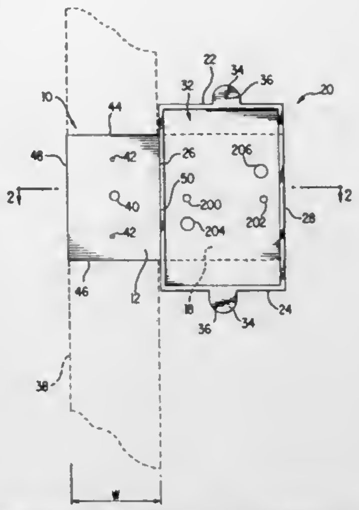
U.S. Cl. 174—58 **20 Claims**

1. A device for mounting an electrical component, comprising:

a bracket having a base, a first leg including a flange which extends form said first leg in a substantially perpendicular manner, and a second leg; and

an electrical box for receiving at least one electrical component, said electrical box being attached to said flange of said first leg of said bracket;

wherein said bracket is adapted to be attached to conventional electrical boxes of various configurations and constructions and wherein said first leg and said second leg of said bracket are biased toward each other to securingly receive a wall stud therebetween and said bracket is slidably adjustable along a length of the wall stud when the wall stud is received between said first leg and said second leg of said bracket.



5,841,069

C-SHAPED RELAY APPARATUS BETWEEN RELATIVE ROTARY MATERIALS

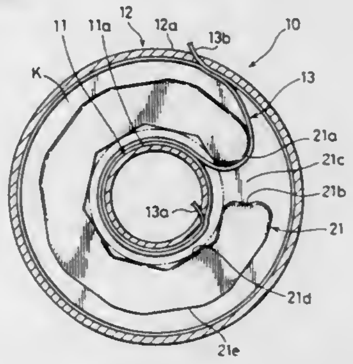
Yasutaka Nagaoka, and Nobuhiko Suzuki, both of Shizuoka-ken, Japan, assignors to Yazaki Corporation, Japan

Filed Nov. 6, 1996, Ser. No. 744,528

Claims priority, application Japan, Nov. 9, 1995, 7-291369

Int. Cl.^{6} H01B *7/06*

U.S. Cl. 174—69 **3 Claims**



1. A cable reel comprising:

an inner cylindrical member disposed, for relative rotation, within an outer cylindrical member, the respective side walls of the inner and outer members defining a circular space for accommodating a flat, flexible cable having one end portion coiled around the inner cylindrical member and a C-shaped movable member disposed for free rotational movement within the circular space adjacent the side wall of the outer cylindrical member, and having an inside polygonal circumferential surface for engaging the cable end portion coiled around the inner cylindrical member, said C-shaped movable member having a gap in its perimeter defined by first and second end portions, one of the first and second end portions having a concave surface and the other having a convex surface.

5,841,070

WIRE HARNESS DEVICE FOR INSTRUMENT PANELS

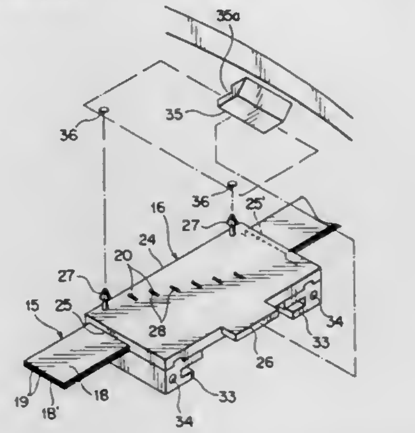
Shuji Takiguchi, and Keizo Nishitani, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed May 14, 1997, Ser. No. 856,233

Claims priority, application Japan, May 16, 1996, 8-121393

Int. Cl.^{6} H01B *7/00*

U.S. Cl. 174—72 A **5 Claims**



1. A wire harness device for instrument panels comprising:

a plurality of mounting spouts formed on an instrument panel, an electrical element unit inserted from a front surface side of each of said plurality of mounting spouts so as to be mounted to the instrument panel;

a plurality of junction units accommodated in the instrument panel, a connecting portion of the electrical element unit being connected from a front surface side of each of said plurality of junction units; and

a wire harness for the instrument panel comprising said plurality of junction units and resilient circuit bodies,

wherein each of said plurality of mounting spouts has a locking portion with an insertion guide on a front side of an inner wall of said locking portion, which opposes said connecting portion of the electrical element unit, and clip holes on a rear side thereof; and

each of said plurality of junction units is provided with a claw engaging said insertion guide, and clips engaging said clip holes.

5,841,071

ELECTRICAL CONDUCTOR FOR A SPACECRAFT SOLAR GENERATOR

Guenther La Roche, Ottobrunn, and Christiane Oxynos-Lauschke, Unterhaching, both of Germany, assignors to Daimler-Benz Aerospace AG, Germany

Filed Dec. 5, 1995, Ser. No. 567,329

Claims priority, application Germany, Dec. 5, 1994, 44 43 217.8

Int. Cl.^{6} H01R *4/00;* **C22C** *5/02*

U.S. Cl. 174—94 R **3 Claims**

1. An electrical solar cell connector for a spacecraft solar generator comprising at least one solar module, wherein the electrical solar cell connector consists of an alloy containing gold and no more than about 0.1 wt. % of at least one member selected from the group consisting of silver, palladium, and copper.

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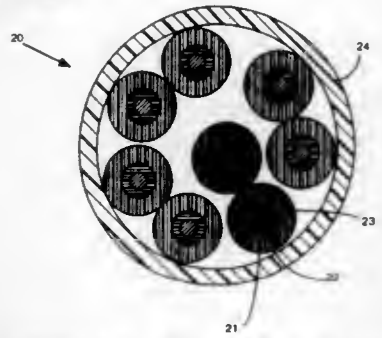
5,841,072
DUAL INSULATED DATA COMMUNICATION CABLE

Gilles Gagnon, Ville Lorraine, Canada, assignor to B.N. Custom Cables Canada Inc., St-Chrysostome, Canada

Filed Sep. 13, 1995, Ser. No. 527,531
Claims priority, application Canada, Aug. 31, 1995, 2157322
Int. Cl.^{6} H01B *7/28*

U.S. Cl. 174—110 F **9 Claims**



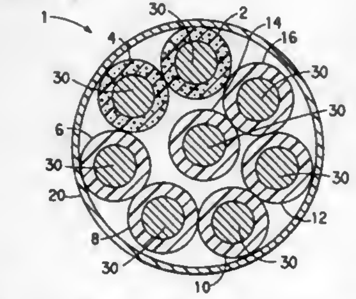
1. A data communication cable for transmitting high-frequency signals with low signal attenuation, comprising:
- at least one pair of conductors;
- a first insulation layer surrounding and enclosing each of said conductors, said first insulation layer comprising an expanded polyolefin foam containing 0% to 40% by weight of a halogenated flame-retardant;
- a second insulation layer surrounding and enclosing each said first insulation layer, said second insulation layer comprising a fluoropolymer having a signal dissipation factor less than about 3×10^{-4} and a dielectric constant less than about 2.1 at high frequencies; and
- a jacket surrounding and enclosing said conductors provided with said first and second insulation layers, said jacket comprising a material having flame-resistant and smoke-suppressive properties.

5,841,073
PLENUM CABLE

Stuart Karl Randa, Wilmington, Del., and George Martin Pruce, Glastonbury, Conn., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 5, 1996, Ser. No. 708,440
Int. Cl.^{6} H01B *11/02*

U.S. Cl. 174—113 R **4 Claims**



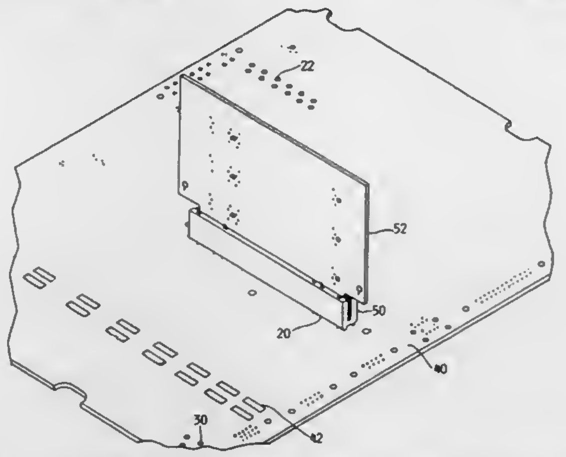
1. A category 5-rated plenum cable comprising at least four twisted pairs of insulated conductors, wherein the insulation of one of the at least four twisted pairs comprises foamed polyolefin which is free of flame retardant additive and the insulation of the remaining twisted pairs of the at least four twisted pairs is fluoropolymer, with the difference between dielectric constants of all the twisted pairs being no more than 0.25, said cable having a jacket having a thickness of no greater than 20 mils (0.508 mm), said jacket being flame retardant polyvinyl chloride.

5,841,074
BACKPLANE POWER DISTRIBUTION SYSTEM HAVING IMPEDANCE VARIATIONS IN THE FORM OF SPACED VOIDS

Patrick Kevin Egan, and Barry Lee Shepherd, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 12, 1996, Ser. No. 615,154
Int. Cl.^{6} H05K *1/00*

U.S. Cl. 174—250 **15 Claims**



8. A backplane power distribution system for distributing power from a power source, comprising:
- a laminate having
  - a plurality of interleaved dielectric layers and conductive layers wherein at least one of said conductive layers is used as a powerplane for distributing said power; and
  - a plurality of source locations and load locations, said source locations being provided to couple said powerplane to said power source and said load locations being provided to couple said powerplane to at least one load
- said powerplane having a plurality of resistances,

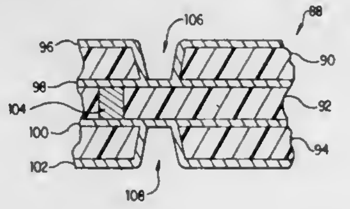
wherein said resistances comprise voids spaced apart with a spacing which decreases as said voids near said source locations.

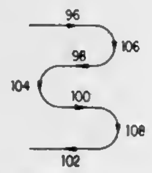
5,841,075
METHOD FOR REDUCING VIA INDUCTANCE IN AN ELECTRONIC ASSEMBLY AND ARTICLE

David A. Hanson, Altoona, Wis., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Continuation of Ser. No. 746,442, Nov. 8, 1996, abandoned. This application Jan. 28, 1998, Ser. No. 14,885
Int. Cl.^{6} H05K *1/00*

U.S. Cl. 174—250 **3 Claims**





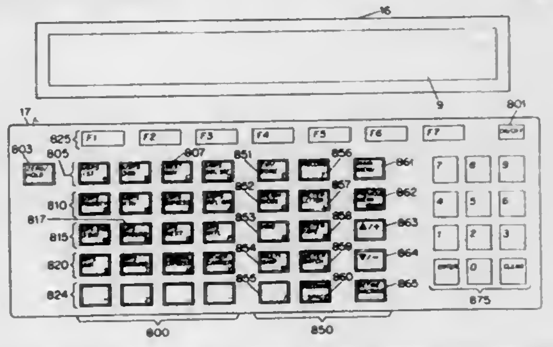
1. An electronic package assembly comprising:
- a laminated substrate having alternating conductive and dielectric layers, said laminated substrate including at least a first conductive layer, a first dielectric layer, a second conductive layer, a second dielectric layer, and a third conductive layer;
- a first conductive via formed at a location through said first conductive and said first dielectric layers, said first conductive via electrically connecting said first and second conductive layers; and
- a second conductive via formed at a location through said second dielectric layer offset from said location of said first conductive via, said second conductive via electrically connecting said second and said third conductive layers;
- said electronic package assembly defining an electrical signal path having a first portion in said first conductive layer routed in a direction toward the first conductive via, and a second portion in said second conductive layer routed in a direction toward the second conductive via;
- wherein said location of said second conductive via permits a mutual inductance formed by the first portion of the electrical signal path with the second portion of the electrical signal path to cancel a mutual inductance formed by the second portion of the electrical signal path with the first portion of the electrical signal path.

5,841,076
ELECTRONIC SCALE SYSTEM WITH PROGRAMMABLE FUNCTION KEYS

Robert G. Schwartz, Branford; Allen A. Crowe, Prospect; James S. Emmett, Derby; Fetneh Eskandari, Middletown; Martin F. Palange, Monroe; Mark E. Simcik, Bloomfield; Robert Swanbery, Fairfield; Robert J. Japenga, Simsbury; Joseph L. Lehman, Canton; William A. Weirsman, Orange, and George P. Rahgo, Milford, all of Conn., assignors to Ascom Hasler Mailing Systems, Inc., Shelton, Conn.

Division of Ser. No. 139,898, Oct. 14, 1993. This application Jun. 7, 1995, Ser. No. 479,015
Int. Cl.^{6} G01G *19/22;19/40*

U.S. Cl. 177—25.13 **3 Claims**



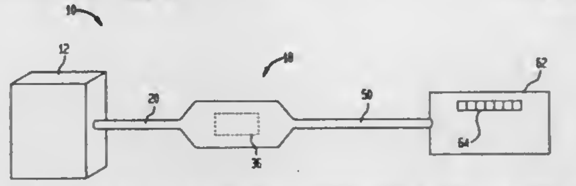
1. In an electronic scale system for determining shipping costs, said system including a keyboard and a programmed microprocessor for computing shipping costs according to the selection by the user of one or more carriers and the selection by the user of one or more service options, the improvement wherein said keyboard is provided with open keys, and said programmed microprocessor includes programming that enables a user to assign carrier or service selection functions to said open keys, whereby said open keys, when programmed and thereafter activated by a user cause said microprocessor to compute shipping costs associated with the function assigned to said programmed open keys.

5,841,077
DIGITAL LOAD CELL ASSEMBLY

Rudolph J. Kolaci, 3-09 Saddle River Rd., Fair Lawn, N.J. 07410

Filed Dec. 1, 1995, Ser. No. 565,665
Int. Cl.^{6} G01G *3/14;* **H01B** *7/06*

U.S. Cl. 177—210 R **17 Claims**



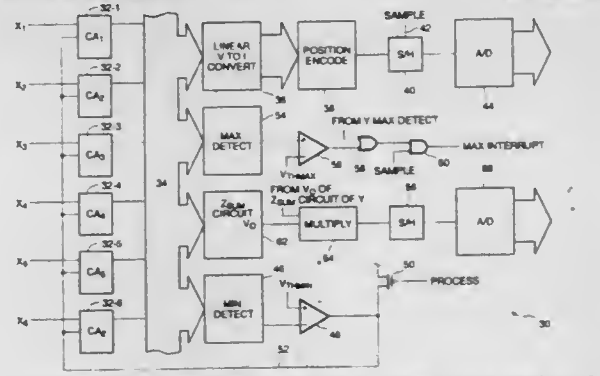
1. A digital load cell assembly comprising: a load cell unit for detecting an applied force and producing analog signals proportional to said applied force; a cable assembly electrically connected to said load cell unit, said cable assembly including analog to digital circuitry having at least one input terminal and at least one output terminal, and a first set of conductive cables connected between said load cell unit and said at least one input terminal of said analog to digital circuitry for facilitating calibration of said load cell unit and for transmitting said analog signals received from said load cell unit to said analog to digital circuitry whereby said analog signals are converted to digital signals, said cable assembly further including a second set of cables connected to said at least one output terminal of said analog to digital circuitry for transmitting said digital signals to an associated indicator which displays a value corresponding to the applied force detected by said load cell unit.

5,841,078
OBJECT POSITION DETECTOR

Robert J. Miller, San Jose, and Stephen J. Bisset, Los Altos, both of Calif., assignors to Synaptics, Inc., San Jose, Calif.

Continuation of Ser. No. 329,809, Oct. 25, 1994, Pat. No. 5,648,642, which is a continuation of Ser. No. 895,934, Jun. 8, 1992, abandoned. This application Oct. 30, 1996, Ser. No. 739,607
Int. Cl.^{6} G08C *21/00;* **G09G** *5/00*

U.S. Cl. 178—18.06 **6 Claims**



1. A method for providing an electrical signal representative of the position of an object in a two dimensional plane, including the steps of:
- providing a capacitive sensing plane including a matrix of conductive lines arranged as a plurality of spaced apart row conductive lines and column conductive lines, said capacitive sensing plane having a touch surface, said capacitive sensing plane characterized by an inherent mutual capacitance between the various ones of said row conductive lines and said column conductive lines, said row conductive lines and column conductive lines electrically insulated from said touch surface, said mutual capacitance measurably varying with the proximity of an object to said row conductive lines and said column conductive lines;
- selecting individual ones of said row conductive lines one at a time and simultaneously sensing a measurable variance in

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said mutual capacitance between the selected one of said row conductive lines and each of said plurality of column conductive lines in response to the proximity of an object; and

producing a set of object-sensed electrical signals related to the measurable variance in said mutual capacitance.

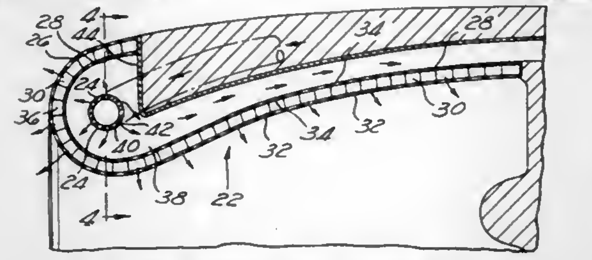
5,841,079
COMBINED ACOUSTIC AND ANTI-ICE ENGINE INLET LINER

Charles A. Parente, Oyster Bay, N.Y., assignor to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Nov. 3, 1997, Ser. No. 962,863

Int. Cl.⁶ B64D *33/02;15/04*

U.S. Cl. 181—214 **19 Claims**



1. In an air vehicle having a turbo engine including an inlet which receives intake airflow and is defined by an inner surface and a D-nose of the engine, an inlet liner for improved acoustic, anti-ice and drag performance comprising:

a permeable acoustic layer formed to attenuate sound and defining the D-nose and the inner surface, the acoustic layer comprises:

a frontface skin formed to allow fluid to pass therethrough;

a backface skin formed to allow fluid to pass therethrough; and

an acoustic core disposed between and in fluid communication with the frontface skin and the backface skin, formed to allow pressurized, heated fluid to pass therethrough and to attenuate sound; and

a pressurized fluid injecting device, in fluid communication with the acoustic layer, formed to inject fluid through the acoustic layer at the D-nose to reduce drag of the intake airflow and at a temperature sufficient to perform an anti-ice function thereat, formed to inject fluid through the acoustic layer at the inner surface to reduce drag of the intake airflow.

5,841,080
BLOWER PIPE WITH SILENCER

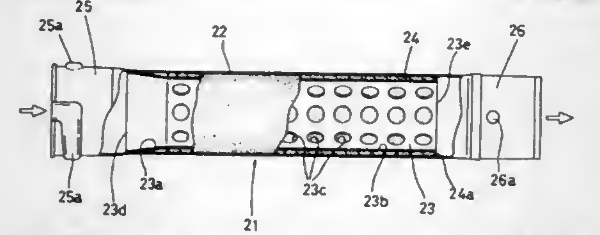
Giichi Iida; Kouji Arahata, and Tetsuya Yoshioka, all of Tokyo, Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed Apr. 18, 1997, Ser. No. 844,044

Claims priority, application Japan, Apr. 24, 1996, 8-102664

Int. Cl.⁶ F01N *7/00;* **F04D** *29/66*

U.S. Cl. 181—225 **8 Claims**



1. A blower pipe, including a silencer, for use with a power blower having an air outlet spout, said blower pipe comprising:

an outer pipe having an upstream portion adapted to be secured to the air outlet spout;

an inner pipe disposed substantially coaxially within said outer pipe, said inner pipe having an upstream end portion which widens outwardly towards said upstream portion of said outer pipe to lower flow resistance to air from the air outlet spout, said inner pipe having a main portion located downstream of said upstream end portion, said main portion having a substantially constant diameter and a plurality of lateral holes formed therein, said main portion terminating in a free downstream end portion, said outer pipe, said inner pipe upstream end portion and said inner pipe main portion defining a sound-absorption-material-receiving space therebetween; and

a sound absorption material disposed in said space, said material having an open downstream end for reduced flow resistance to the air, said open downstream end being substantially contiguous with said free downstream end portion of said main portion of said inner pipe for inhibiting transmission of vibration of said inner pipe to said outer pipe.

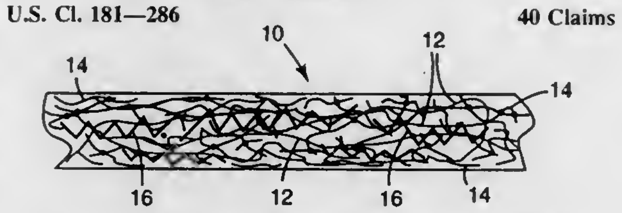
5,841,081
METHOD OF ATTENUATING SOUND, AND ACOUSTICAL INSULATION THEREFOR

Delton R. Thompson, Woodbury, and Randall L. Knoll, Stillwater, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 21, 1996, Ser. No. 669,896

Int. Cl.⁶ E04B *1/82*

U.S. Cl. 181—286 **40 Claims**



1. A method of attenuating sound, which method comprises:

(a) providing an acoustical insulation that includes a molded, three-dimensional nonwoven web that contains organic microfibers and 15 weight percent or greater heat activatable staple fibers, the heat activatable staple fibers being bonded to each other and to the microfibers at various contact points, and the nonwoven web having a thickness of 0.5 centimeters or greater and a density of less than 250 kilograms per cubic meter; and

(b) positioning the acoustical insulation between a source area and a receiving area such that a major face of the insulation intercepts and thereby significantly attenuates sound waves passing from the source area to the receiving area.

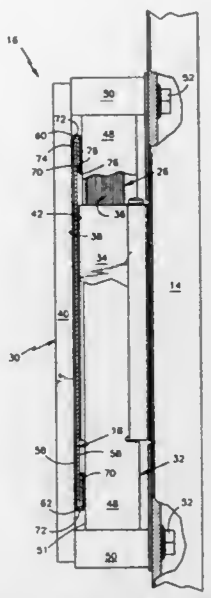
5,841,082
SECONDARY GUIDANCE SYSTEM FOR LINEAR INDUCTION MOTORS DRIVING ELEVATOR CAR DOORS

James A. Rivera, Bristol, and Michael J. Tracey, Cromwell, both of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Nov. 7, 1996, Ser. No. 746,276

Int. Cl.⁶ B66B *3/14*

U.S. Cl. 187—316 **10 Claims**



5. An elevator car door operating system for opening and closing an elevator car door including a motor primary and a motor secondary cooperatingly moving past each other to generate thrust to open and close said elevator car door, said elevator car door operating system characterized by:

a secondary guide system having a first and a second secondary guides, said first and second secondary guides establishing a running clearance between said motor primary and said motor secondary and allowing vertical movement between said motor primary and said motor secondary.

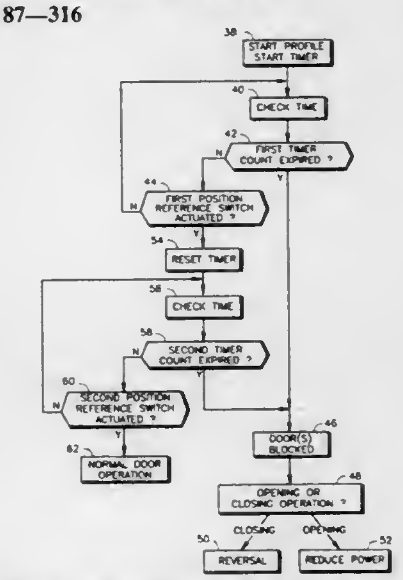
5,841,083
BLOCKED DOOR DETECTION FOR AN ELEVATOR SYSTEM

Uwe Schönauer, Berlin, Germany, and Helmut L. Schröder-Brumloop, Ville d'Avray, France, assignors to Otis Elevator Company, Farmington, Conn.

Filed Dec. 18, 1996, Ser. No. 769,015

Int. Cl.⁶ B66B *13/14*

U.S. Cl. 187—316 **8 Claims**


38
START PROFILE START TIMER
40
CHECK TIME
42
FIRST TIMER COUNT EXPIRED ?
N
Y
44
FIRST POSITION REFERENCE SWITCH ACTUATED ?
N
Y
54
RESET TIMER
56
CHECK TIME
58
SECOND TIMER COUNT EXPIRED ?
N
Y
60
SECOND POSITION REFERENCE SWITCH ACTUATED ?
N
Y
62
NORMAL DOOR OPERATION
46
DOOR(S) BLOCKED
48
OPENING OR CLOSING OPERATION ?
CLOSING
OPENING
50
REVERSAL
52
REDUCE POWER

3. A method for detecting if an elevator door is blocked comprising the steps of:

initiating a particular movement of the elevator door;

starting a first timer count upon the initiation of the movement of the door; determining if the first timer count has expired before a first door position reference switch is actuated;

determining that the elevator door is blocked if the first timer count has expired before the first door position reference switch is actuated;

determining if a second timer count has expired before a second position reference switch is actuated if the first elevator door reference position switch is actuated before the first timer count has expired; and

determining that the elevator door is obstructed if the second timer count has expired before the second reference position switch is actuated.

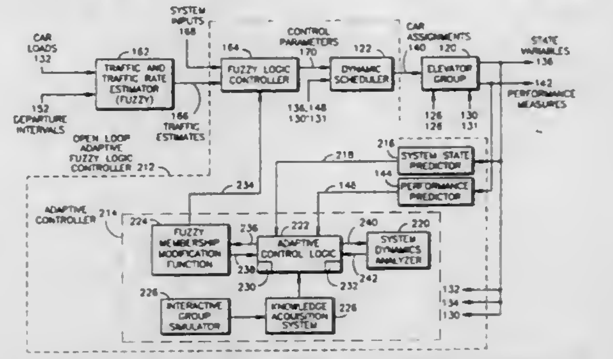
5,841,084
OPEN LOOP ADAPTIVE FUZZY LOGIC CONTROLLER FOR ELEVATOR DISPATCHING

Kandasamy Thangavelu, Avon, Conn., assignor to Otis Elevator Company, Farmington, Conn.

Filed Nov. 30, 1995, Ser. No. 564,667

Int. Cl.⁶ B66B *1/36*

U.S. Cl. 187—382 **8 Claims**



1. A group controller for controlling a plurality of elevator cars in a building having a plurality of floors, comprising:

a traffic estimator;

a fuzzy logic controller having membership functions for fuzzy sets;

an adaptive controller for modifying the membership functions of the fuzzy sets; and

an elevator dispatcher for controlling the operation of the elevator cars;

characterized by the improvement comprising:

said traffic estimator providing fuzzy estimates of the level of passenger traffic entering elevators at a lobby floor and the rate of change with respect to time of said level of passenger traffic entering elevators at said lobby floor;

said fuzzy logic controller having fuzzy sets of an elevator control parameter as a function of said fuzzy estimates of traffic and traffic rate, said fuzzy logic controller providing said control parameter in response to said fuzzy estimates of traffic and traffic rate; and

said adaptive controller modifying the membership functions of the fuzzy sets of said control parameter in response to values of pairs of elevator control system output variables and changes in said values of said pairs of variables.

5,841,085
PRESS-BUTTON SWITCHING DEVICE WITH SPRING-BIASED BRIDGE-FORMING CONTACT

Alfred Rittinghaus, Schalksmühle, and Bernhard Jaworek, Hagen, both of Germany, assignors to Bär Elektrowerke GmbH & Co. KG, Schalksmühle, Germany

Filed Apr. 16, 1997, Ser. No. 843,697

Claims priority, application Germany, Apr. 19, 1996, 296 06 984.1

Int. Cl.⁶ H01H *15/00;1/20;3/12;3/42*

U.S. Cl. 200—16 R **11 Claims**

1. A press-button switching device comprising a housing and stationary contacts and movable contacts mounted in the housing, an actuating member constructed as a press-button guided in an interior of the housing during switching movements of the press-button, the press-button being configured to move the movable contacts in and out of the housing between a switched-on position and a switched-off position, a compression spring mounted between the actuating member and the housing, wherein the actu-

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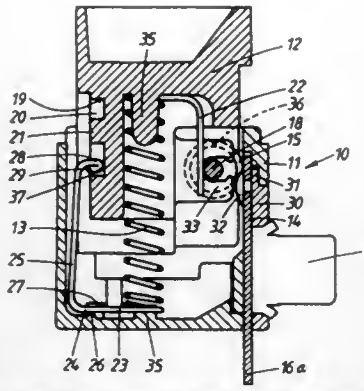


ating member is moveable out of the housing and into the housing against a force of the spring, the moveable contacts being constructed as bridge-forming contacts for bridging two strip conductors in the switched-on position, wherein the bridge contact is moved along the strip conductors during the movement of the actuating member into and out of the housing, and wherein the compression spring comprises at one end thereof a spring arm contacting the actuating member, and wherein the compression spring has a free end which resiliently presses the bridge contact against the strip conductors.

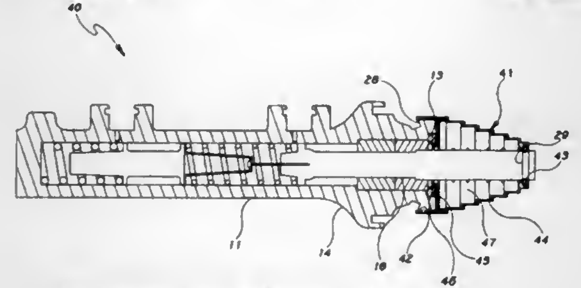
5,841,086
BRAKE MASTER CYLINDER AND BRAKELAMP SWITCH ASSEMBLY

James P. Meagher, Marion County, and John W. Smith, Hancock County, both of Ind., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Feb. 3, 1997, Ser. No. 792,032

Int. Cl.⁶ H01H *3/14*

U.S. Cl. 200—61.89 **20 Claims**



1. A brake master cylinder assembly comprising:
a brake master cylinder housing having a rear end surface separated from a front end surface by a side surface, and defining an inner cavity that opens through said front end surface;
at least one plunger movably positioned in said inner cavity;
a shaft with one end extending into said inner cavity in contact with said at least one plunger and other end extending out of said inner cavity away from said front end surface,and being moveable into said inner cavity between a retracted position and an advanced position;
an electrical brakelamp switch attached to said brake master cylinder housing adjacent one of either said front end surface or said rear end surface;
said electrical brakelamp switch having a stationary portion with at least one first electrical contact, and a moveable portion with at least one second electrical contact positioned across from said at least one first electrical contact; and
means for preventing damage so constructed and located on the master cylinder housing as to prevent damage to said electrical brakelamp switch in the event of hydraulic fluid loss within said brake master cylinder housing and advancement of said shaft to said advanced position.

5,841,087
ISOLATING SWITCH

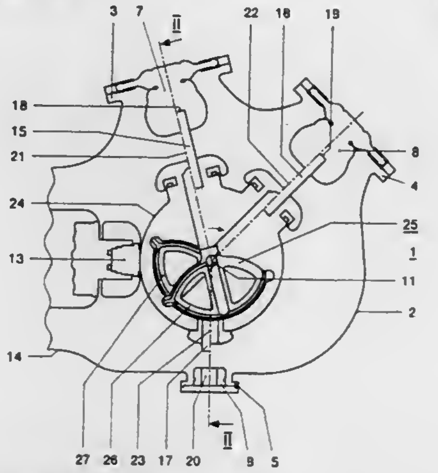
Dieter Füchsle, Lengnau, and Markus Zbinden, Dübendorf, both of Switzerland, assignors to Asea Brown Boveri AG, Baden, Switzerland

Filed Mar. 21, 1997, Ser. No. 821,928

Claims priority, application Germany, Apr. 22, 1996, 196 15 912.1

Int. Cl.⁶ H01H *33/42;33/70*

U.S. Cl. 218—45 **14 Claims**



1. An isolating switch comprising:
an isolating switch housing,
at least two switching points arranged in the isolating switch housing, said at least two switching points having an axially symmetrical design and each of said at least two switching points including one fixed switching element and one switching element which can move along a switching point axis,
a drive shaft leading into the isolating switch housing; and
a gearbox which transmits power from the drive shaft to the movable switching element,
said gearbox including, for each of the switching points, at least one control cam fixedly connected to the movable switching element and at least one lever attached to the drive shaft for interacting with said at least one control cam, said at least one control cam being aligned transversely with respect to the shaft axis and said at least one control cam being displaceable;
wherein the at least one control cam includes an elongated hole extending in a direction of the switching point axis, the drive shaft passing through said elongated hole.

5,841,088
SWITCH AND ARC EXTINGUISHING MATERIAL FOR USE THEREIN

Shoji Yamaguchi; Itsuo Nishiyama; Fumiaki Baba; Mitugu Takahasi; Takao Mitsuhashi; Kazuharu Kato; Osamu Hiroi; Tadaki Murakami; Hiroshi Adachi, all of Amagasaki; Kenichi Nishina, Fukuyama; Kazunori Fukuya, Fukuyama; Shinji Yamagata, Fukuyama, and Shunichi Katsube, Fukuyama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

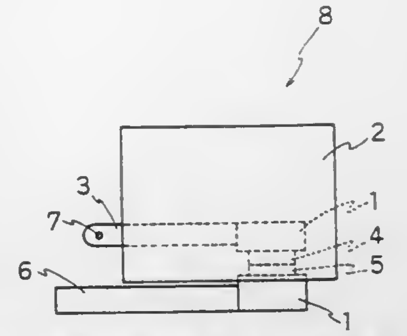
Filed Mar. 7, 1995, Ser. No. 399,578

Claims priority, application Japan, Mar. 10, 1994, 6-039884; May 23, 1994, 6-108316; Jul. 5, 1994, 6-153717; Jul. 26, 1994, 6-174465; Aug. 4, 1994, 6-183489

Int. Cl.⁶ H01H *33/02*

U.S. Cl. 218—158 **43 Claims**

1. An arc extinguishing material comprising an arc extinguishing insulator composition comprising:
at least one filler selected from the group consisting of a glass fiber containing not more than 1% by weight of compounds of group 1A metals of the periodic table in total, an inorganic mineral containing not more than 1% by weight of compounds of group 1A metals of the periodic table in total, and



a ceramic fiber containing not more than 1% by weight of compounds of group 1A metals of the periodic table in total; and
a matrix resin containing as a principal component at least one member selected from the group consisting of a polyolefin, an olefin copolymer, a polyamide, a polyamide polymer blend, a polyacetal and a polyacetal polymer blend.

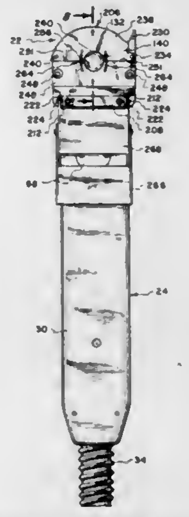
5,841,089
SMALL SIZE TUBE WELDING APPARATUS

Linas A. Martinenas, Santa Clarita, Calif., assignor to Astro ARC Polysoude, Incorporated, Pacoima, Calif.

Filed Jul. 14, 1997, Ser. No. 892,276

Int. Cl.⁶ B23K *9/12*

U.S. Cl. 219—60 A **18 Claims**



1. A small size tube welding apparatus for welding a tube of a group of tubes comprising:
a drive housing, said drive housing having a first electrical connection means;
a supply conduit connected to said drive housing, said supply conduit for supplying inert gas, cooling water and electricity to said drive housing;
a torch housing having a second electrical connection means, said second electrical connection means to electrically connect with said first electrical connection means, said second electrical connection means to engage with said first electrical connection means in a single engaging motion interlocking said drive housing and said torch housing, said second electrical connection means to disengage from said first electrical means in a single disengaging motion separating said torch housing from said drive housing, said drive housing having means to electrically connect with different said torch housings with said drive housing only being connected to one said torch housing at a time, said torch housing to fixedly mount a said tube to be welded with each said torch housing having means to connect with a different range of sizes of said tubes; and
said torch housing including a heat sink, said heat sink functioning to conduct the heat produced during the welding operation away from said apparatus.

5,841,090
METHOD AND APPARATUS FOR THE SEAM WELDING OF CONTAINERS

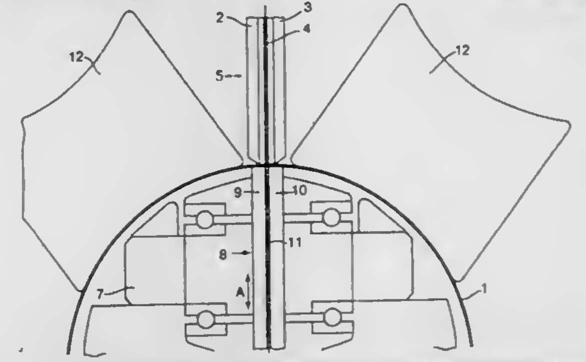
Peter Taiana, Stoffelbach, Switzerland, assignor to Elpatronic AG, Zurich, Switzerland

Filed Jul. 31, 1996, Ser. No. 688,724

Claims priority, application Switzerland, Sep. 4, 1995, 02-502/95

Int. Cl.⁶ B23K *1/16*

U.S. Cl. 219—64 **14 Claims**



5. An apparatus for the seam welding of container bodies formed from a thin sheet, the apparatus characterized by a current-carrying outer welding roller having first and second electrodes electrically separated from one another and a movably mounted non-current carrying inner roller, guide means engaging longitudinal edges of the container body to be welded together and guiding the edges between the rollers with the edges in a non-overlapping, edge-to-edge relationship for defining a seam to be welded by said outer welding roller, and force generating means coupled to the non-current carrying inner roller for urging the inner roller towards the outer roller under pressure.

5,841,091
ELECTRICAL DISCHARGE MACHINING DEVICE AND ELECTRICAL DISCHARGE MACHINING METHOD

Toshihiko Furukawa, and Tatsuo Kuroda, both of Yokohama, Japan, assignors to Sodick Co., Ltd., Japan

PCT No. PCT/JP96/02735, § 371 Date Apr. 25, 1997, § 102(e) Date Apr. 25, 1997, PCT Pub. No. WO97/10918, PCT Pub. Date Mar. 27, 1997

PCT Filed Sep. 20, 1996, Ser. No. 809,417

Claims priority, application Japan, Sep. 22, 1995, 7-269343

Int. Cl.⁶ B23H *1/00;7/02*

U.S. Cl. 219—69.12 **7 Claims**

1. An electrical discharge machining apparatus for machining in a workpiece a curved profile and a straight profile connected to the curved profile, the electrical discharge machining apparatus comprises:
a wire electrode;
means for moving at least one of the workpiece and the wire electrode relative to the other within a plane;
means for rotating at least one of the workpiece and the wire electrode relative to the other about an axis perpendicular to the plane;
a wire forming device for forming a concave channel in the axial direction of the wire electrode;
an electrically conductive guide having a curved edge shaped complementary with respect to the curved profile and a straight edge connected to the curved edge, said curved edge and straight edge being sized to fit into said concave channel;
means for transporting the wire electrode along the straight edge and the curved edge of the guide; and

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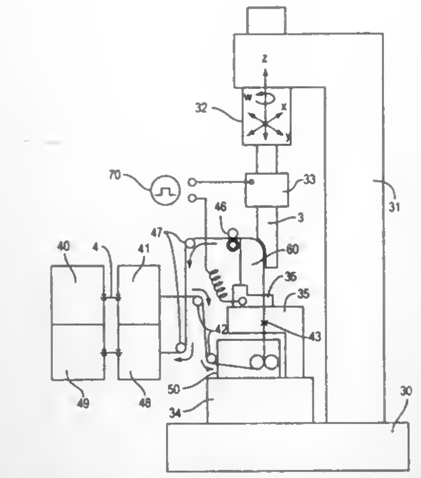


a power supply for supplying power to a machining gap formed between the workpiece and the wire electrode.

5,841,092

Patent Not Issued For This Number

5,841,093

ELECTRICAL DISCHARGE APPARATUS AND ELECTRICAL DISCHARGE MACHINING METHOD

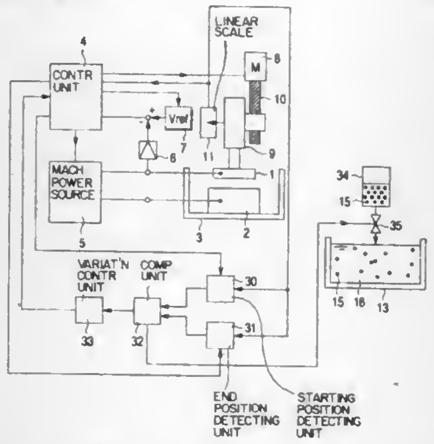
Mitsuyoshi Wada, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 25, 1996, Ser. No. 738,070

Claims priority, application Japan, Mar. 5, 1996, 8-047402

Int. Cl.^{6} B23H *1/00;1/02*

U.S. Cl. 219—69.17 18 Claims



13. An electrical discharge machining method for machining a workpiece by applying a pulse voltage within a working fluid which includes a mixture of a powdered substance and is filled into a gap between an electrode and the workpiece, when a multistage machining operation is carried out, said electrical discharge machining method comprising the steps of:

- detecting a starting position for the machining at each machining step;
- detecting an end position for the machining at each machining step;
- comparing the detected end position for the machining of a previous machining step with the detected starting position for the positioning of a next machining step; and
- changing the machining conditions depending on a comparison result output obtained in said step of comparing the positions for the machining operation.

5,841,094

METHOD AND APPARATUS FOR RESISTANCE WELDING COATED SHEET METAL

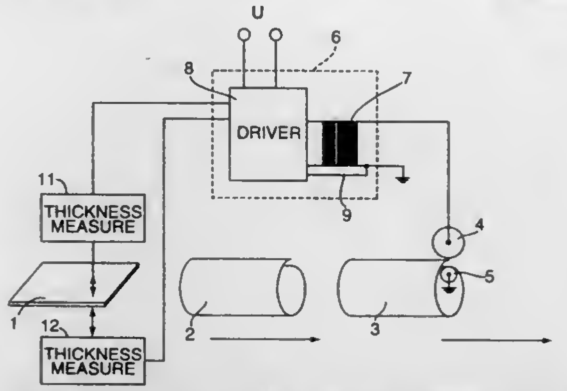
Michael Baumgartner, Rekingen, Switzerland, assignor to Elpatronic AG, Zug, Switzerland

Filed Aug. 2, 1996, Ser. No. 692,011

Claims priority, application Switzerland, Aug. 9, 1995, 02-291/95-1

Int. Cl.^{6} B23K *11/06;11/24*

U.S. Cl. 219—81 9 Claims



1. Method for electrical resistance welding, by means of a roller seam welding machine, of sheet metal provided with an electrically conductive coating, characterized in that a thickness of the coating of the sheet metal on at least one side thereof is determined upstream of a welding zone, while the welding machine is in operation, and in that a welding current source of the welding machine is controlled during a welding operation in dependence upon the coating thickness ascertained, in order to keep power input into the welding zone essentially constant.

5,841,095

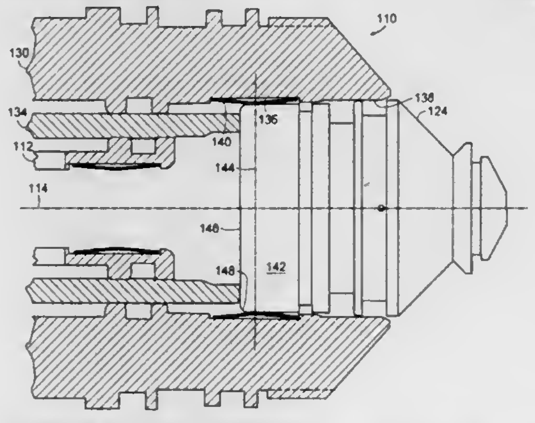
APPARATUS AND METHOD FOR IMPROVED ASSEMBLY CONCENTRICITY IN A PLASMA ARC TORCH

Zhipeng Lu; Richard W. Couch, Jr., and Jennifer L. Freeman, all of Hanover, N.H., assignors to Hypertherm, Inc., Hanover, N.H.

Filed Oct. 28, 1996, Ser. No. 736,707

Int. Cl.^{6} B23K *10/00*

U.S. Cl. 219—121.48 14 Claims



1. A plasma arc torch comprising:

- first and second consumable components forming a plasma chamber therebetween in which an arc may be formed;
- a torch body having an interior surface forming a circumferential groove and a bore in which said first component is disposed;
- a first spring element disposed between said body interior surface and said first component in said body groove for providing radially directed forces therebetween to radially center said first component in said body bore;

- a cathode block having an interior surface forming a circumferential groove and a bore in which said second component is disposed; and
- a second spring element disposed between said block interior surface and said second component in said block groove for providing radially directed forces therebetween to radially center said second component in said block bore, wherein said body bore and said block bore are substantially concentrically aligned thereby substantially concentrically aligning said first and second components.

5,841,096

LASER MACHINING APPARATUS AND METHOD OF CONTROLLING SAME

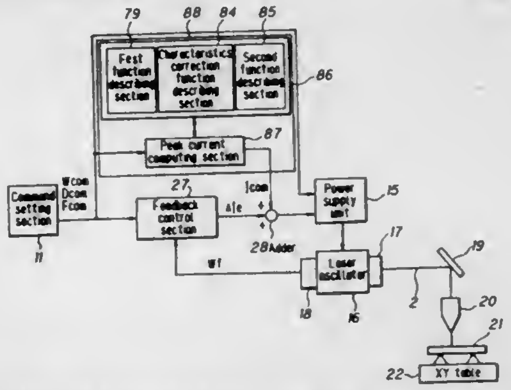
Teiji Takahashi; Yoshihito Imai; Atsushi Morita, all of Hyogo, Japan; Masato Matsubara, Nagoya, Japan; Osamu Nagano, Nagoya, Japan, and Tsukasa Fukushima, Nagoya, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 429,208, Apr. 26, 1995, abandoned. This application Sep. 12, 1997, Ser. No. 928,226

Claims priority, application Japan, Apr. 27, 1994, 6-089919; Apr. 30, 1994, 6-114558; Oct. 19, 1994, 6-253624; Apr. 18, 1995, 7-92137

Int. Cl.^{6} B23K *26/00*

U.S. Cl. 219—121.62 4 Claims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88
84
85
Fest function describing section
Characteristics correction function describing section
Second function describing section
86
Peak current computing section
87
Wcom
Dcom
Fcom
Command setting section
11
27
Feedback control section
Icom
ΔIe
28 Adder
Power supply unit
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Laser oscillator
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XY table

1. A laser machining apparatus comprising:

- a laser oscillator;
- a power supply unit for supplying excitation power to said laser oscillator, said power supply unit controlling, in response to a control input, at least one of: a frequency of said laser oscillator, a duty ratio of said laser oscillator, and a power output of said laser oscillator;
- a command value setting unit for outputting a command value including said power output of said laser oscillator and at least one of: said frequency of said laser oscillator and said duty ratio of said laser oscillator;
- a power sensor for measuring said power output of said laser oscillator to provide a power measurement value;
- a feedback control unit for computing a first operation rate from a power command value set in said command value setting unit and said power measurement value;
- a feed forward control unit comprising a laser oscillator characteristics describing unit that describes a laser oscillator characteristics function having, as a parameter, at least one of said frequency and said duty ratio, said feed forward control unit computing a second operation rate in response to said command value and said laser oscillator characteristics function; and
- a computing unit for computing said control input based on said first operation rate and said second operation rate,

wherein said feed forward control unit comprises:

- a first function describing unit for providing a description, for quantities of energy which a gas in said laser oscillator receives for electric discharge, of a quantity of energy contributing to a laser power using at least a current value at an oscillation limit of a laser output as a parameter, and
- a second function describing unit for providing a description of a relation between an approximate value for each frequency or for each duty ratio and a laser power; and

wherein said laser oscillator characteristics function is based on said description provided by said first function describing unit and by said description provided by second function describing unit.

5,841,097

PROCESS AND APPARATUS FOR WELDING WORKPIECES WITH TWO OR MORE LASER BEAMS WHOSE SPOTS ARE OSCILLATED ACROSS WELDING DIRECTION

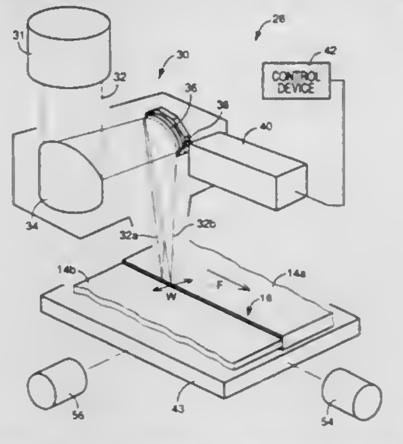
Fumikatsu Esaka; Toshiyuki Takasago, and Eiji Nishi, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Dec. 23, 1996, Ser. No. 771,655

Claims priority, application Japan, Dec. 27, 1995, 7-340457

Int. Cl.^{6} B23K *26/06*

U.S. Cl. 219—121.63 19 Claims



1. A process of welding workpieces butted together at an interface, comprising the steps of:

- focusing a plurality of laser beams on surfaces of said workpieces such that spots of said laser beams are located in the vicinity of said interface as viewed in a direction perpendicular to a direction of extension of said interface, said plurality of laser beams including two laser beams, producing spots that are spaced from each other in said direction of extension of said interface; and
- feeding said spots of said laser beams and said workpieces relative to each other in said direction of extension of said interface, while at the same time oscillating said spots of said laser beams at a predetermined frequency relative to said workpieces in a direction intersecting said direction of extension of said interface such that said spots are moved across said interface, such that respective movements of the spots of said two laser beams transcribe sinusoidal waves on the surfaces of the workpieces and the distance between the spots in said direction of extension of said interface is substantially equal to one half of the wavelength of each sinusoidal wave.

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5,841,098
METHOD AND APPARATUS FOR LASER WELDING SECTIONAL MEMBERS ONTO LARGE-FORMAT ALUMINUM STRUCTURAL COMPONENTS

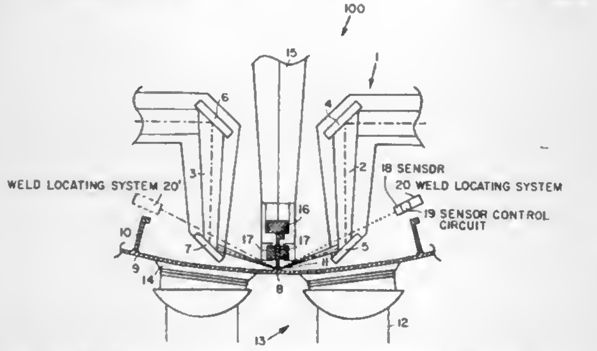
Olaf Gedrat; Guenter Kuck, both of Nordenham; Arnold Kolley, Ganderkesee, and Gerhard Neye, Stuhr II, all of Germany, assignors to Daimler-Benz Aerospace Airbus GmbH, Hamburg, Germany

Filed May 5, 1997, Ser. No. 851,724

Claims priority, application Germany, Sep. 27, 1996, 196 39 667.0

Int. Cl.⁶ B23K *26/10*

U.S. Cl. 219—121.63 **20 Claims**



18. An apparatus for laser welding a sectional member onto a large-format plate component, comprising:

a support arrangement adapted to supportingly receive said plate component thereon,

a guide and clamping roller system including at least one guide roller that is movably arranged and adapted to contact said sectional member to position said sectional member into a desired weld position on said plate component and at least one clamping roller that is movably arranged and adapted to press said sectional member against said plate component,

a seam locating sensor arranged and directed to be able to detect an actual location of a seam between said sectional member and said plate component,

a laser beam guide system that is adapted to direct at least one laser beam at a weld point along said seam, and

an electronic control system connected to an output of said seam locating sensor and connected for control signal transmission to said laser beam guide system,

wherein said laser beam guide system is not mechanically fixed to said guide and clamping roller system, and is movable independently of said guide and clamping roller system responsive to said output of said seam locating sensor through said electronic control system.

5,841,099
METHOD EMPLOYING UV LASER PULSES OF VARIED ENERGY DENSITY TO FORM DEPTHWISE SELF-LIMITING BLIND VIAS IN MULTILAYERED TARGETS

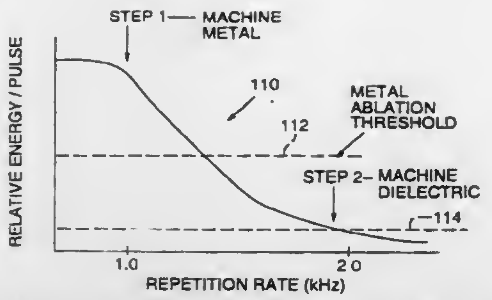
Mark D. Owen, Portland; Bonnie A. Larson, Hillsboro, both of Oreg., and Jozef Van Puymbroeck, Oostkamp, Belgium, assignors to Electro Scientific Industries, Inc., Portland, Oreg.

Continuation-in-part of Ser. No. 276,797, Jul. 18, 1994, Pat. No. 5,593,606. This application May 17, 1996, Ser. No. 651,036

Int. Cl.⁶ B23K *26/00*

U.S. Cl. 219—121.69 **43 Claims**

26. A method for laser machining a blind via in a multilayered target including at least first and second conductor layers having respective first and second conductor ablation energy thresholds and a dielectric layer having surfaces and a dielectric ablation energy threshold, the first and second conductor layers positioned above and below, respectively, the surfaces of the dielectric layer, comprising:



generating, from a nonexcimer laser at a repetition rate of greater than about 200 Hz, a first laser output having a wavelength of less than 400 nm and containing at least one first laser pulse having a first energy density over a first spatial spot size and a temporal pulse width shorter than about 100 ns, the first energy density including an average output power of greater than about 100 mW measured over the first spatial spot size and being greater than the first conductor ablation energy threshold;

applying the first laser output to the target to remove the first conductor layer within a spot area of the target;

generating from a nonexcimer laser at a repetition rate greater than about 200 Hz, a second laser output having a wavelength of less than 400 nm and containing at least one second laser pulse having a second energy density over a second spatial spot size and a temporal pulse width shorter than about 100 ns, the second energy density including an average output power of greater than 100 mW, being greater than the dielectric ablation energy threshold, and being different from the first energy density; and

applying the second laser output to the target to remove the dielectric layer within the spot area of the target to form a blind via.

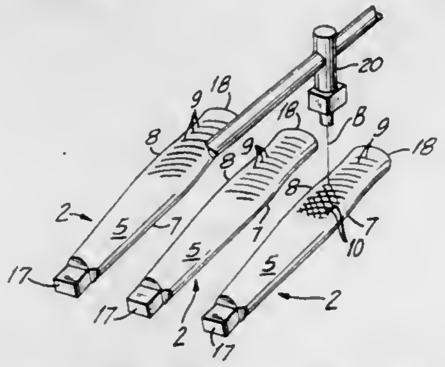
5,841,100
METHOD OF MAKING ANTI-SLIP HANDLES

Kenwar A. Minhas, Plainview, N.Y., assignor to Great Neck Saw Manufacturers, Inc., Mineola, N.Y.

Continuation-in-part of Ser. No. 692,625, Aug. 6, 1996. This application Jun. 26, 1997, Ser. No. 883,406

Int. Cl.⁶ B23K *26/00*

U.S. Cl. 219—121.69 **12 Claims**



1. The method of making an anti-slip handle having a gripping portion which comprises forming a plurality of grooves in the gripping portion of the handle; forming a first set of grooves in one direction and forming a second set of said grooves in the other direction whereby the two sets of grooves intersect each other to form a cross-hatched groove network.

5,841,101
METHOD USED IN MANUFACTURING A WORKPIECE USING A PLURALITY OF SPACED APART MASK PATTERNS

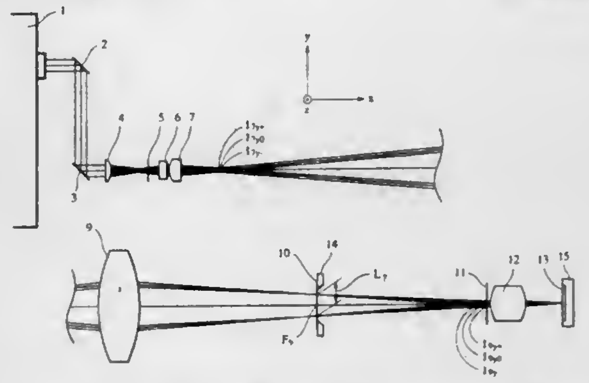
Masayuki Nishiwaki, Kawaguchi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1995, Ser. No. 575,679

Claims priority, application Japan, Dec. 27, 1994, 6-340387

Int. Cl.⁶ B23K *26/06*

U.S. Cl. 219—121.71 **12 Claims**



1. A method used in manufacturing a workpiece using a plurality of spaced apart mask patterns, comprising:

a first step of dividing a light beam emitted from a light source into a plurality of light beams on a first plane including a first direction;

a second step of dividing each of the plurality of light beams into a plurality of light beams on a second plane perpendicular to the first plane, the second plane including a second direction perpendicular to the first direction; and

a third step of focusing the plurality of light beams produced by said second step only in the first direction; and

a fourth step of focusing the plurality of light beams focused in said third step in the first direction at a position beyond the plurality of mask patterns in the second direction so that light beams focused in said third step overlap each other to form a plurality of spaced apart images each of which illuminate one of the plurality of spaced apart mask patterns.

5,841,102
MULTIPLE PULSE SPACE PROCESSING TO ENHANCE VIA ENTRANCE FORMATION AT 355 NM

David B. Noddin, Eau Claire, Wis., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Nov. 8, 1996, Ser. No. 744,413

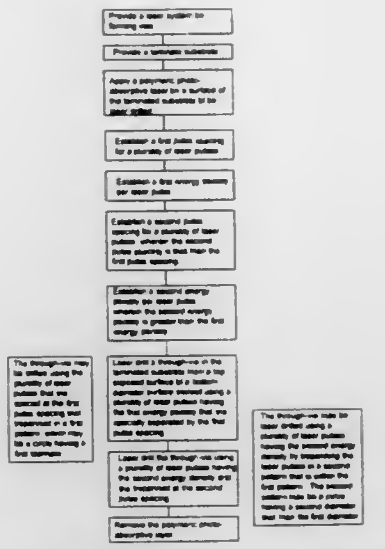
Int. Cl.⁶ B23K *26/00*

U.S. Cl. 219—121.71 **35 Claims**

1. A method for forming a through-via in a laminated substrate, comprising the steps of:

laser drilling a through-via in a laminated substrate from a top exposed surface of the substrate to a bottom exposed surface of the substrate using a plurality of laser pulses that are spatially separated by a first pulse spacing, each pulse spaced at the first pulse spacing having a first energy density per pulse; and

laser drilling the through-via using a plurality of laser pulses that are trepanned at a second pulse spacing, each pulse spatially separated by the second pulse spacing having a second energy density per pulse, the second energy density per pulse being greater than the first energy density per pulse, the second pulse spacing being less than the first pulse spacing.



5,841,103

Patent Not Issued For This Number

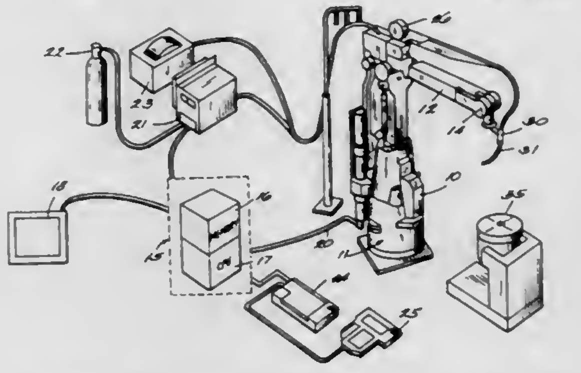
5,841,104
METHOD AND SYSTEM FOR MULTIPLE PASS WELDING

Tommy Svensson, Ft. Collins, Colo., assignor to ABB Flexible Automation, Inc., New Berlin, Wis.

Filed Sep. 3, 1996, Ser. No. 707,275

Int. Cl.⁶ B23K *9/127*

U.S. Cl. 219—125.1 **6 Claims**



1. A method of multiple pass welding using a programmable, industrial robot having a memory, a data processor, a robot arm, and a welding torch which is coupled to the robot arm, the method comprising the steps of:

inputting a first path and a positional increment to the data processor of the programmable, industrial robot and storing the positional coordinates of the first path in the memory;

making a first pass of a workpiece by moving the welding torch by means of the robot arm along the first path and storing a second path which is offset from the first path by the positional increment, the welding torch being positioned at a predetermined angle with respect to the workpiece; and

making a second pass of the workpiece by moving the welding torch by means of the robot arm along the second path.

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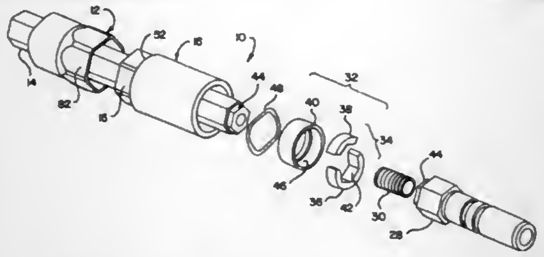
5,841,105
AUTOMATIC MIG WELDING TORCH AND METHOD OF ASSEMBLY

Christopher Haczynski, Monee, and Glen Jones, Wilmington, both of Ill., assignors to Delaware Capital Formation, Inc., Wilmington, Del.

Filed Jan. 16, 1996, Ser. No. 585,621
Int. Cl.^{6} B23K *9/173*
U.S. Cl. 219—137.31 **29 Claims**



1. An automatic MIG welding torch assembly for use in automated welding environments comprising:

an outer tube;

a conductive inner body tube positioned inside the outer tube, said inner body tube having a power connection end and a welding tip end;

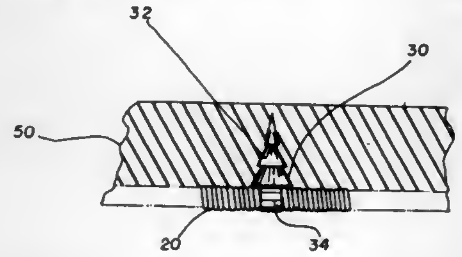
at least one insulator positioned between the outer tube and the inner body tube; and

a locking mechanism located at the power connection end of the inner body tube for securably and releasably connecting the inner body tube to a power adapter, said locking mechanism having a lock ring removably positioned around a connection formed by the power connection end and the power adapter and a lock ring bushing slidably movable in an axial direction along the conductive inner body tube and sized to frictionally fit over the lock ring.

5,841,106
HEATED WINDSHIELD WIPER BLADE ASSEMBLY

Dalton C. Kohler, 2142 Ramona Dr, Pleasant Hill, Calif. 94523

Filed Mar. 28, 1997, Ser. No. 828,045
Int. Cl.^{6} B60L *1/02*
U.S. Cl. 219—202 **11 Claims**



1. A heated windshield wiper blade assembly, for an oscillating wiper arm having at least one wiper blade carrier arm, said heated windshield wiper blade assembly comprising:

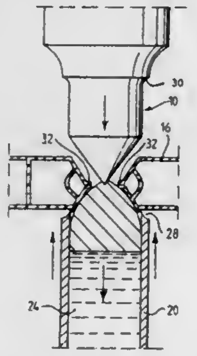
a windshield wiper blade member having a blade portion and a carrier arm flange portion, said carrier arm flange portion being mounted on said wiper blade carrier arm;

a plurality of heating coil securing pins, each of said plurality of heating coil securing pins having a blade securing portion and a heating coil attachment portion, said blade securing portion including a number of aligned generally cone-shaped portions, said generally cone-shaped portions being for insertion into said wiper blade member, said windshield wiper blade member accepting each said blade securing portion of each of said plurality of heating coil securing pins; and

an external heating coil being positioned next to said blade portion of said windshield wiper blade member, said external heating coil further being coupled to said heating coil attachment portions of said heating securing pins, said extenal heating coil providing heat to said windshield wiper blade member for melting accumulating ice or snow on said windshield wiper blade member.

5,841,107
SHEET PERFORATION APPARATUS WITH HEATED NEEDLES AND A COMPLEMENTARY MOLD

Franca Riva, Via Vecchia Del Po 19, Sale, (Alessandria), Italy
PCT No. PCT/GB93/01259, § 371 Date Feb. 23, 1995, § 102(e) Date Feb. 23, 1995, PCT Pub. No. WO94/00278, PCT Pub. Date Jan. 6, 1994
PCT Filed Jun. 17, 1993, Ser. No. 360,775
Claims priority, application United Kingdom, Jun. 23, 1992, 9213265
Int. Cl.^{6} B65D *81/26;* **B26F** *1/24*
U.S. Cl. 219—243 **18 Claims**



1. An apparatus for shaping perforations in sheet material having at least a first planar surface, which comprises a first mold structure at one side of a sheet material, the first mold structure including a projection for forming a perforation in the sheet material, and a complementary mold structure at the other side of a sheet material adapted to cooperate with the first mold structure; the complementary mold structure including a concave surface for receiving an end of the projection, wherein both of said first and complementary mold structures are each arranged to be reciprocated and are adapted to meet approximately half way through a sheet material whereby to shape the perforations between them and reduce the formation of deposits on at least the first planar surface of the sheet material wherein at least one of the first and complementary mold structures includes a cylindrical member that is adapted to move in an opposite direction to another portion of the at least one of the first and complementary mold structures.

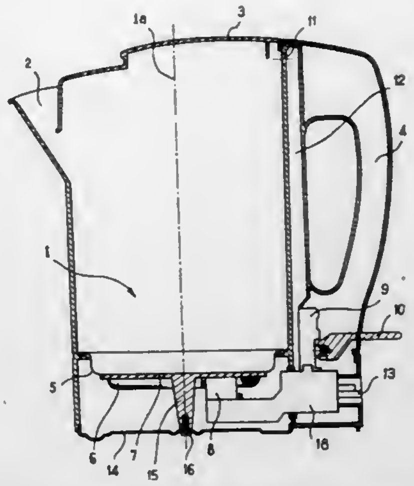
5,841,108
ELECTRICAL ELEMENT FOR HEATER PLATES, IN PARTICULAR FOR KETTLES

Jacques Lacombe, Gray, France, assignor to SEB S.A., Ecully Cedex, France

Filed Jan. 22, 1997, Ser. No. 787,098
Claims priority, application France, Jan. 25, 1996, 96 00867
Int. Cl.^{6} F27B *14/00*
U.S. Cl. 219—441 **15 Claims**

1. A substantially tubular electrical element lying substantially in a plane and adapted to be fixed under a heater plate of an electrical appliance and connected to a thermal limiter and an electrical power supply, the electrical element comprising:

a middle of a length of said element; and

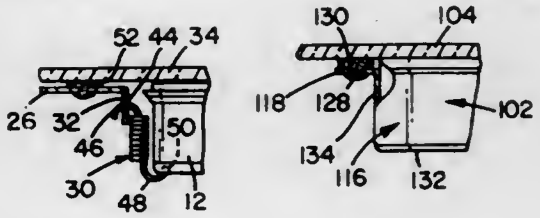


two ends of said element each extending toward the middle of the length of said element, each end configured to be connected to the thermal limiter, the thermal limiter being adjacent to the middle of the length of said element and adapted to measure at least a temperature of the middle of the length of said element and to control an amount of power from the electrical power supply to said element responsive to the temperature of the middle of the length of said element exceeding a predetermined value, wherein a portion of said element is configured to extend substantially along a peripheral contour of said heater plate.

5,841,109
GLASS SUPPORTED HEATING ELEMENTS FOR RADIANT COOKTOP RANGES

James Aaron White, Louisville; Jeffery Donald Hunt, Shelbyville, both of Ky., and Martin Edward Vink, Jr., Dalton, Ga., assignors to General Electric Company, Louisville, Ky.

Filed Apr. 7, 1997, Ser. No. 833,491
Int. Cl.^{6} H05B *3/68*
U.S. Cl. 219—464 **13 Claims**



1. A range comprising:

a cooktop comprising a frame having an opening;

a glass panel located in said opening and supported by said frame;

a plate secured to an underside surface of said glass panel, said plate having at least one radiant heating element opening and a rim extending from an underside surface of said plate surrounding said radiant heating element opening, said rim having at least one slot formed therein;

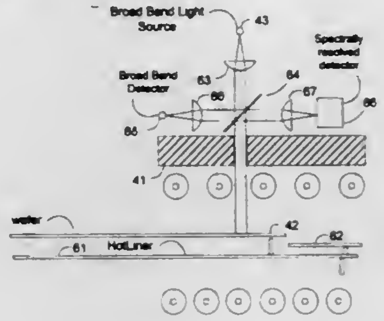
a radiant heating element; and

a mounting system comprising a spring for engaging to said rim and to said radiant heating element for positioning said radiant heating element within said radiant heating element opening, said spring comprising a spring hook portion at least partially inserted into said rim slot.

5,841,110
METHOD AND APPARATUS FOR IMPROVED TEMPERATURE CONTROL IN RAPID THERMAL PROCESSING (RTP) SYSTEMS

Zsolt Nenyei, Blaustein; Heinrich Walk, Allmendingen; Michael Maurer, Ulm, and Thomas Knarr, Langenau, all of Germany, assignors to Steag-Ast GmbH, Kirchheim, Germany

Filed Aug. 27, 1997, Ser. No. 920,614
Int. Cl.^{6} B23K *10/00*
U.S. Cl. 219—497 **11 Claims**



1. A method of rapid thermal processing (RTP) of an object using an RTP system, the object having a surface with a reflectivity, comprising;

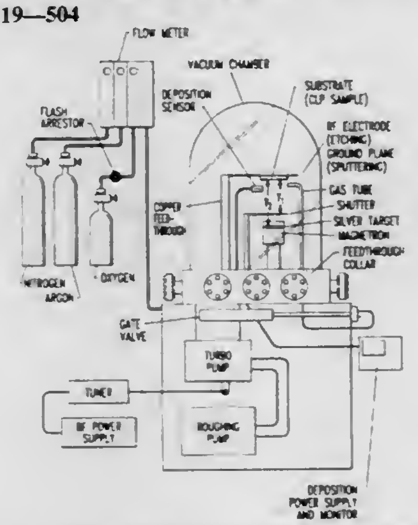
measuring the—spectrally integrated—reflectivity of the surface of the object in a broad band of wavelengths; and

adjusting a system parameter of the RTP system in response to the measured—spectrally integrated—reflectivity.

5,841,111
LOW RESISTANCE ELECTRICAL INTERFACE FOR CURRENT LIMITING POLYMERS BY PLASMA PROCESSING

John Joseph Shea, and William Kingston Hanna, both of Pittsburgh, Pa., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 19, 1996, Ser. No. 770,746
Int. Cl.^{6} B23K *10/00*
U.S. Cl. 219—504 **7 Claims**



1. A current limiting PTC polymer device comprising:

a conductive polymer composition comprising a polymer with conductive particles dispersed therein, wherein said conductive polymer composition has at least two conductive particle rich surfaces,

at least two electrodes in electrical contact with said at least two conductive particle rich surfaces; and

wherein said at least two conductive particle rich surfaces are formed by plasma etching the surface of the conductive polymer composition.

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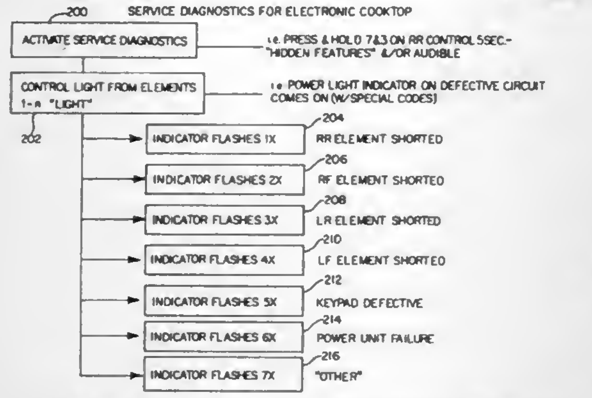
5,841,112
DIAGNOSTIC DISPLAY METHOD FOR ELECTRONIC COOKING APPLIANCE CONTROL

Timothy L. Brooks, Carlisle, and Thomas Lee Aukerman, Huber Heights, both of Ohio, assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Apr. 3, 1997, Ser. No. 832,258

Int. Cl.^{6} H05B *1/02*

U.S. Cl. 219—506 **34 Claims**



1. A cooktop service diagnostics method which is effected by a programmable controller system, wherein the programmable controller:

a) executes a routine upon receipt of a first specified pattern of input signals selectively input by the cooktop operator to the programmable controller;
b) issues an activation audible signal to indicate receipt of the specified pattern of input signals;
c) issues an activation visual signal to indicate receipt of the specified pattern of input signals;
d) tests a plurality of cooktop heating element drivers for malfunction conditions;
e) tests a plurality of cooktop controller input drivers for malfunction conditions;
f) issues a malfunction visual signal to indicate the existence and type of any malfunction condition;
g) terminates the routine upon the receipt of a second specified pattern of input signals selectively input by the cooktop operator to the programmable controller;
h) issues a deactivation visual signal to indicate termination of the routine; and
i) issues a deactivation audible signal to indicate termination of the routine.

5,841,113
UPWARD AND DOWNWARD MOVEMENT PREVENTION STRUCTURE FOR MICROWAVE OVEN

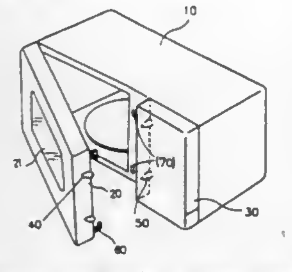
In Gwan Kim, Kyungsangnam-Do, Rep. of Korea, assignor to LG Electronics, Inc., Rep. of Korea

Filed Jun. 2, 1997, Ser. No. 867,492

Claims priority, application Rep. of Korea, Jun. 3, 1996, 1996/14748

Int. Cl.^{6} H05B *6/76*

U.S. Cl. 219—739 **5 Claims**



1. A microwave oven having a main frame, a door panel disposed on a front surface of the main frame, a control panel disposed on one side of the door panel, and a door latch assembly formed to include the door panel and the main frame, and further including,

at least one microwave oven door upward and downward movement preventing structure which comprises a first part that is immovably formed on one side surface of the door panel and a second part immovably formed on one side of the control panel corresponding to said one side surface of the door panel and cooperating with the first part to prevent upward and downward movements of the door panel,

said movement preventing structure lacking the means to latch the door panel to the control panel.

5,841,114
MICROWAVE OVEN EQUIPPED WITH A MICROWAVE OUTPUT CONTROLLING APPARATUS

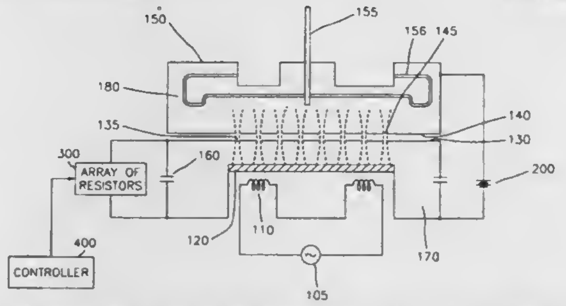
Shin-Jae Jeong, Incheon, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Rep. of Korea

Filed Jun. 25, 1998, Ser. No. 104,705

Claims priority, application Rep. of Korea, Aug. 30, 1997, 97-44079; Aug. 30, 1997, 97-44080

Int. Cl.^{6} H05B *6/64;* **H01J** *25/02*

U.S. Cl. 219—761 **8 Claims**



1. A microwave oven incorporating therein a cooking chamber, a waveguide, and an apparatus for generating a microwave, said apparatus being further characterized in that said apparatus comprises:

a heating element;
a cathode, mounted above the heating element, for emitting electrons;
a first grid, provided above the cathode, for controlling and focusing the flow of electrons emitted from the cathode, the first grid having a plurality of holes for converting electrons from the cathode to the electron beams;
a choke structure for serving as a blocking capacitor, the choke structure being positioned between the cathode and the first grid,
wherein the cathode, the first grid and the choke structure define an input cavity functioning as a resonant circuit;
means for making a variable resistance value, one end of which is connected to the first grid and the other end thereof is connected to the cathode, for inducing a bias voltage on the first grid;
a controller for controlling the means for making a variable resistance value to thereby generate a plurality of resistance values;
a second grid provided above the first grid and having a plurality of holes through which the electron beams passing through the holes of the first grid pass;
an anode for receiving the electrons passing through the holes of the second grid,
wherein the second grid and the anode define an output cavity for generating a microwave, the output cavity being electrically insulated from the input cavity;
cooling fins, provided around the anode, for cooling heat generated by the anode;
a driving voltage source for providing a driving voltage to the cathode and the anode;

an antenna arranged in the anode, for extracting the microwave from the output cavity into the cooling chamber through the waveguide; and
a feedback structure extending from the input cavity to the output cavity, for feeding a portion of the microwave in the output cavity back to the input cavity.

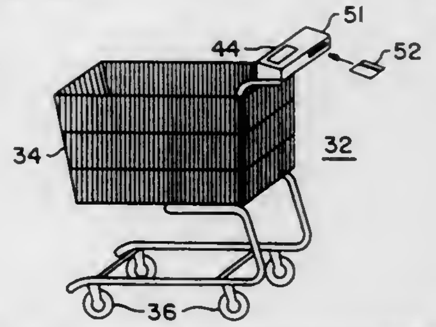
5,841,115
NUTRITIONAL INFORMATION SYSTEM FOR SHOPPERS

Kenneth James Shepley, 43 W. Albemarle Ave., Lansdowne, Pa. 19050

Continuation-in-part of Ser. No. 46,976, Apr. 13, 1993, Pat. No. 5,478,989, which is a continuation-in-part of Ser. No. 413,275, Sep. 27, 1989, abandoned, and Ser. No. 46,496, Apr. 13, 1993, Pat. No. 5,478,989. This application Jun. 7, 1995, Ser. No. 484,794

Int. Cl.^{6} G06F *17/00;15/00*

U.S. Cl. 235—375 **20 Claims**



1. Apparatus for generating personalized nutritional information for a shopper comprising:

(a) means for inputting personal data relating to an individual;
(b) barcode means for inputting data identifying at least one food product which said shopper has selected or specified, or has purchased or consumed;
(c) processor means under the control of a prestored computer program for correlating the personal data with prestored nutritional data, including a barcode address, pertinent to the at least one food product which said shopper has selected or specified, or has purchased or consumed; and
(d) means for outputting information pertinent to the at least one food product and the personal data of the individual.

5,841,116
METHOD AND SYSTEM FOR IDENTIFYING PERSONAL POSSESSIONS

Bruce Lewis, North York, Canada, assignor to The Tracker Corporation, Toronto, Canada

PCT No. PCT/CA94/00268, § 371 Date Jan. 18, 1996, § 102(e) Date Jan. 18, 1996, PCT Pub. No. WO95/03591, PCT Pub. Date Feb. 2, 1995

PCT Filed May 13, 1994, Ser. No. 581,602

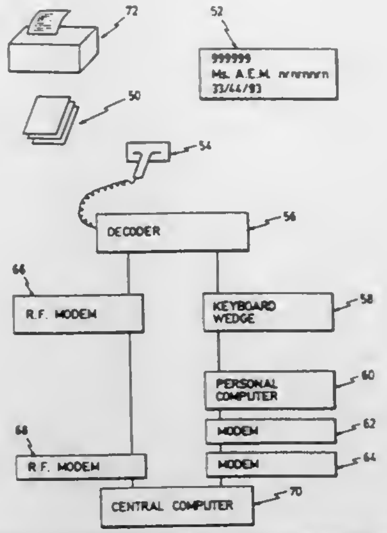
Claims priority, application United Kingdom, Jul. 19, 1993, 9314894

Int. Cl.^{6} G06K *5/10*

U.S. Cl. 235—375 **30 Claims**

1. A system for identifying personal possessions belonging to a plurality of owners, comprising

a set of labels, each label bearing a predetermined identifying insignia, each identifying insignia corresponding to a unique owner,
means for affixing selected ones of the set of labels to selected ones of the personal possessions,
means for storing, at a first location,
a set of owner identifiers, each owner identifier corresponding to a unique owner, and



for each owner identifier stored, a set of identifying data, each identifying data corresponding to the identifying insignia on one of the set of labels,
means for inputting, at a second location remote from the first, identifying data corresponding to the identifying insignia on a selected one of the set of labels affixed to a personal possession,
means for transmitting the input identifying data to the first location and for receiving at the second location an owner identifier corresponding to the input identifying data transmitted to the first location,
means for receiving at the first location the input identifying data transmitted from the second location,
means for comparing the input identifying data with at least one of the set of identifying data stored in the means for storing at the first location and where the input identifying data matches the at least one of the set of identifying data, retrieving the owner identifier corresponding to the input identifying data and
means for displaying the retrieved owner identifier.

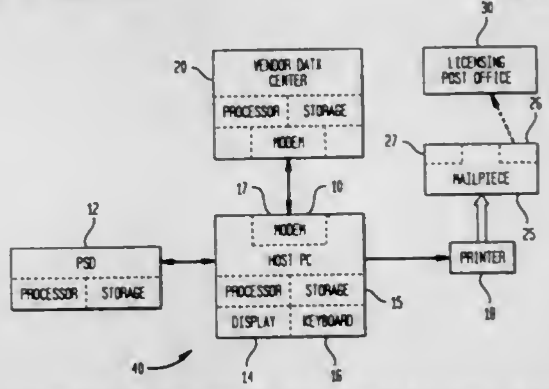
5,841,117
METHOD FOR THE DETECTION OF METER RELOCATION USING RETURN ADDRESS

Steven J. Pauly, New Milford, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 24, 1996, Ser. No. 773,508

Int. Cl.^{6} G06F *15/20*

U.S. Cl. 235—375 **9 Claims**



1. A method for detecting the relocation of a postage metering system, the method comprising the steps of:

initializing the postage metering system with a user postal code;
storing the user postal code in the postage metering system;
preparing a mailpiece;
comparing a return address postal code to be printed on the mailpiece with the user postal code;

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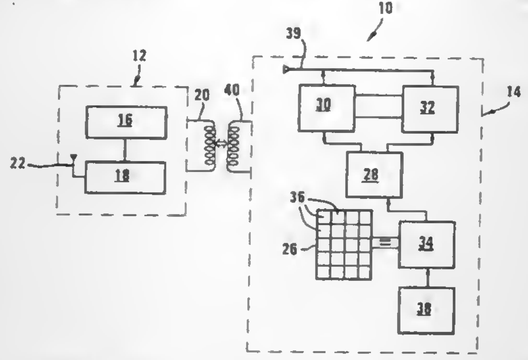
identifying when the return address postal code is different than the user postal code;
and printing the mailpiece when the user postal code is confirmed as being allowable.

5,841,118
REMOTE CONTROL OPERATING DEVICE FOR USE WITH AN ELECTRONIC BANKING MACHINE

Errol Peter East, Westville, and Frank Brooks, Pinetown, both of South Africa, assignors to Impro Technologies (PTY) Ltd., Pinetown, South Africa
Filed Jun. 10, 1997, Ser. No. 872,096
Int. Cl.^{6} G06F *17/60*
U.S. Cl. 235—379 **16 Claims**



1. A remote control operating device for use with an EBM having processing means and code receiving means for receiving coded information and for communicating the coded information received to the processing means, the EBM including auxiliary power supply means, the remote control operating device being in the form of a portable unit and including

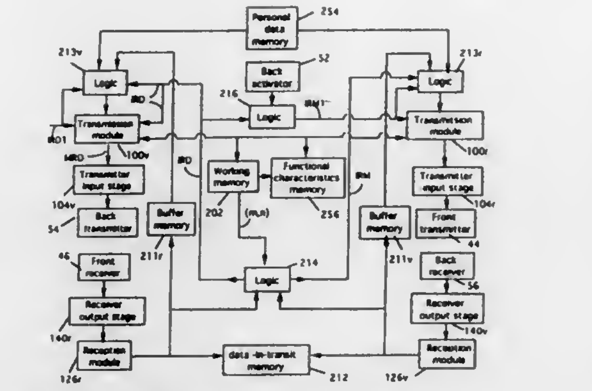
a keypad which permits a person wishing to perform a transaction via the EBM, to enter a confidential code associated with such person;
memory means for storing a preset code containing information on the banking account of a person wishing to perform a transaction via the EBM the memory means permitting the transferral of the preset code to the code receiving means of the EBM;
signal generating means for generating a confidential coded electronic signal from the confidential code, that can be transmitted through space;
transmitting means for transmitting the confidential coded signal to the code receiving means of the EBM;
power supply means that is energized when in predetermined proximity with the auxiliary power supply means of the EBM for providing the required power for the operation of the remote control operating device; and
processing means for controlling the operation of the signal generating means and the transmitting means.

5,841,119
SMART TOOL FOR COMMUNICATION AND AN APPLIANCE MAKING USE THEREOF

Olivier Rouyrre, 13 rue de Bruxelles, 75009 Paris, and Patrick Labbe', 14 rue Exelmans, 78140 Velizy, both of France
PCT No. PCT/FR95/00062, § 371 Date May 30, 1996, § 102(e) Date May 30, 1996, PCT Pub. No. WO95/21421, PCT Pub. Date Aug. 10, 1995
PCT Filed Jan. 20, 1995, Ser. No. 647,908
Claims priority, application France, Feb. 2, 1994, 94 01128
Int. Cl.^{6} G06K *9/05*
U.S. Cl. 235—380 **5 Claims**

1. A smart card for direct data interchange between two or more individuals, said card being adapted to be coupled to several other cards of the same kind, in order to interchange data by both-way copying;

said card having two faces and comprising;
an electrical power source;
a micro-controller and memories;
an operating and control software stored in one of said memories;
a personal data memory and an acquired data memory;
on each of its two faces, a respective manual activator and a respective pair of signal transmitter and receiver members, said members being disposed in such a manner that when several cards are stacked together a two-way link can be established between each pair of contiguous cards;
means for putting the card temporarily into an operative state in response to manual action exerted on at least one of the activators;
said control software including:
means for determining the feasibility of an interchange data operation;
means for copying personnel data memories from the card into the acquired data of other cards of the stack;
said two faces respectively referred to as "front" and "back" such that, in an ordered stack of tools, the accessible front face is that of the first card in the stack and the accessible back face is that of the last card in the stack, the accessible activator of the first card of the stack being suitable for triggering the implementation of means for determining the feasibility of the operation and of means for interchanging personal data between all the cards.

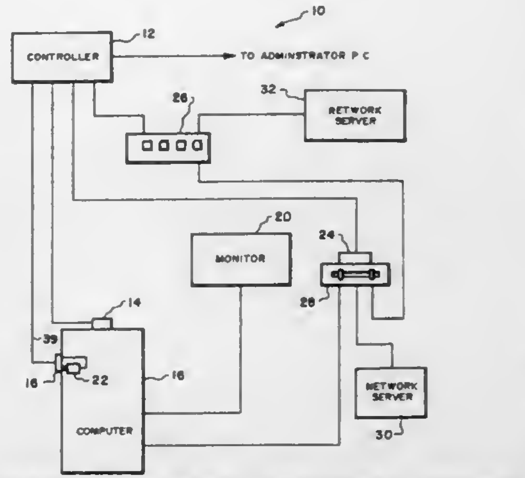


5,841,120
SECURED NETWORK SYSTEM

Stephen W. Bouthillier; Ross E. Seybold; Sydney R. Blowers, all of Ridgecrest, Calif.; Robert V. Sulkowski, Jr., Houston, and Randall P. Morse, Grove City, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Aug. 15, 1997, Ser. No. 919,181
Int. Cl.^{6} G06F *17/00;17/60;* G06K *5/00*
U.S. Cl. 235—382 **8 Claims**

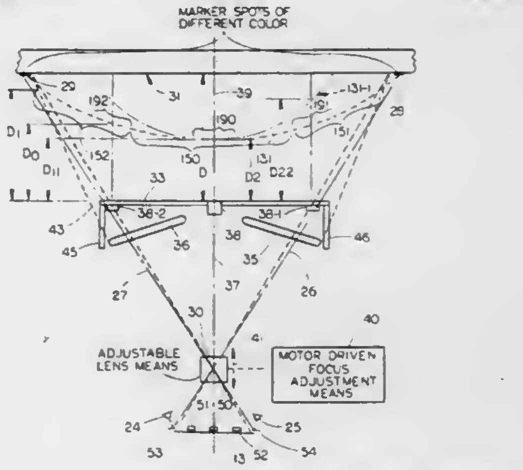
1. A secured network system comprising:
a computer having a power supply;
card reader means located in proximity to said computer, said card reader means being adapted to receive a microchip embedded card authorizing a user to activate said computer, said card reader means providing an authorization signal whenever said microchip embedded card is presented to said card reader means and received by said card reader means;
a readykey controller connected to said card reader means to receive said authorization signal, said readykey controller, responsive to said authorization signal, generating an enable signal;
a power relay switch having a primary relay connected to said readykey controller and said computer, said primary relay having a coil and a pair of normally open contacts, said authorization signal energizing the coil of said primary relay closing the pair of normally open contacts of said primary relay which couples the power supply of said computer to an external source of power to activate said computer; and

said power relay switch including a tamper switch connected to said readykey controller, said tamper switch being activated by an unauthorized removal of said power relay switch from said computer, said tamper switch sending an electrical signal to said readykey controller which indicates that an unauthorized person has attempted to bypass said power relay switch.



5,841,121
HAND-HELD OPTICALLY READABLE CHARACTER SET READER HAVING AUTOMATIC FOCUS CONTROL FOR OPERATION OVER A RANGE OF DISTANCES

Steven E. Koenck, Cedar Rapids, Iowa, assignor to Norand Technology Corporation, Wilmington, Del.
Continuation of Ser. No. 309,334, Sep. 19, 1994, Pat. No. 5,576,529, and a continuation-in-part of Ser. No. 345,268, Nov. 28, 1994, which is a continuation of Ser. No. 972,822, Nov. 6, 1992, abandoned, which is a division of Ser. No. 616,602, Nov. 21, 1990, abandoned, which is a continuation-in-part of Ser. No. 238,701, Aug. 31, 1988, Pat. No. 5,019,699, said Ser. No. 309,334 is a continuation-in-part of Ser. No. 215,112, Mar. 17, 1994, Pat. No. 5,640,001. This application Nov. 19, 1996, Ser. No. 752,370
Int. Cl.^{6} G06K *7/10*
U.S. Cl. 235—472 **2 Claims**



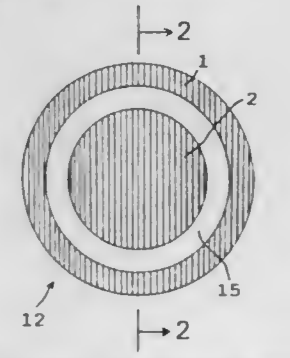
1. An optical indicia reader for reading information encoded in optical indicia located externally of the reader, said optical indicia reader comprising:

(a) a photosensor area array, located in the reader, positioned to capture an image of an imaging area, said photosensor area array outputting a signal descriptive of the imaging area;
(b) an optical system configured to focus the imaging area onto said photosensor area array;
(c) a marker system directed to visibly indicate the neighborhood of the imaging area of said photosensor area array; and
(d) a reading system having an input accepting the signal output by said photosensor area array, said reading system further having an analysis system capable of converting the inputted signal into a decoded signal representative of information contained within an imaged optical indicia, when such optical indicia is located within the imaging area;

the optical indicia reader being capable of generating a decoded signal regardless of the orientation of the optical indicia relative to said photosensor area array.

5,841,122
SECURITY STRUCTURE WITH ELECTRONIC SMART CARD ACCESS THERETO WITH TRANSMISSION OF POWER AND DATA BETWEEN THE SMART CARD AND THE SMART CARD READER PERFORMED CAPACITIVELY OR INDUCTIVELY

Gerhard Kirchhoff, Iserlohn, Germany, assignor to Dorma GmbH + Co. KG, Ennepetal, Germany
Filed May 10, 1996, Ser. No. 644,537
Claims priority, application Germany, Sep. 13, 1994, 44 32 324.7
Int. Cl.^{6} G06K *19/06*
U.S. Cl. 235—492 **19 Claims**



1. A security arrangement for preventing unauthorized access, said security arrangement comprising:

- at least one device to be at least read;
- device reader means to read said at least one device;
- said at least one device comprising:
  - a first electronic circuit for processing and storing data; and
  - device antenna means;
- said device antenna means being disposed on said at least one device;
- said device reader means comprising:
  - power supply means for supplying power to said at least one device, said power supply means comprising means for generating and transmitting magnetic energy in a predetermined magnetic frequency range;
  - a second electronic circuit for processing and storing data; and
  - device reader antenna means;
- said device reader antenna means being disposed on said device reader means;
- at least one of said device reader antenna means and said device antenna means comprising means for transmitting data between said device reader antenna means and said device antenna means;
- at least one of said device reader antenna means and said device antenna means comprising means for transmitting power between said device reader antenna means and said device antenna means;
- at least one of said device reader antenna means and said device antenna means comprising both:
  - a magnetic inductive element; and
  - a capacitive element;
- said magnetic inductive element and said capacitive element being disposed one on top of the other;
- said capacitive element having a substantially higher impedance in a predetermined magnetic frequency range than said mag-

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netic inductive element to thereby substantially reduce loading of said magnetic energy by said capacitive element;

said means for transmitting data between said device reader antenna means and said device antenna means comprising one of said magnetic inductive element and said capacitive element;

said means for transmitting power between said device reader antenna means and said device antenna means comprising the other of said one of said magnetic inductive element and said capacitive element;

said capacitive element comprising a high-resistance, electrically-conductive substance; and

said high-resistance, electrically-conductive substance comprising at least one of: a resist, a carbon conducting varnish, a carbon semiconducting varnish, a plastic and a plastic film.

5,841,123
PASSIVE CARD WITHOUT CONTACT

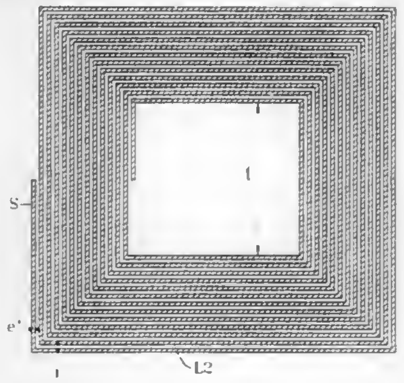
Yves Thorigne, Verson, and Jacky Bouvier, Meylan, both of France, assignors to France Telecom, Paris, and La Poste, Boulogne Billancourt, both of France

Filed Jun. 20, 1996, Ser. No. 667,127

Claims priority, application France, Jun. 22, 1995, 95 07514

Int. Cl.^{6} G06K *19/077*

U.S. Cl. 235—492 **15 Claims**



1. A micro-electronic component for a passive card without contact intended to be electromagnetically coupled to a remote station for the bidirectional transfer of data between the card and the station, said component comprising:

a surface on a substrate of the component, said surface having a total surface area;

processing means produced in integrated circuit technology on said surface of the component for processing a signal representative of transferred data, said processing means occupying a surface area substantially smaller than said total surface area;

a coil for supplying a supply voltage to the processing means by induction and for inductive transfer with the station of said signal representative of data, the turns of said coil being produced in flat integrated technology by metallisation and engraved directly on said surface of the component in an area substantially unoccupied by the processing means;

wherein the turns of the coil cover at least about 50% of said total surface area of the component; and

wherein the number of turns of the coil and the width of the turns are selected based, at least in part, on the yield of the supply voltage by induction, the total surface area of the component, the surface area occupied by the processing means, and the variation in voltage at terminals of the processing means during the bidirectional transfer of data.

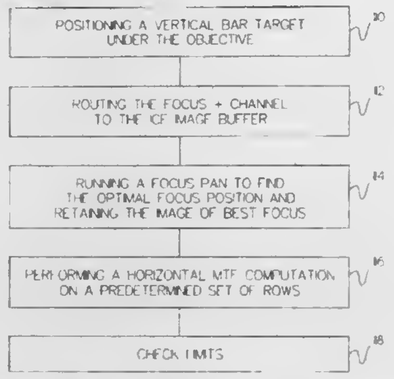
5,841,124
CYTOLOGICAL SYSTEM AUTOFOCUS INTEGRITY CHECKING APPARATUS

William E. Ortyn, Devall; Jon W. Hayenga, and Louis R. Piloco, both of Kent, all of Wash., assignors to NeoPath, Inc., Redmond, Wash.

Division of Ser. No. 666,748, Jun. 19, 1996, Pat. No. 5,654,535. This application Mar. 20, 1997, Ser. No. 823,793

Int. Cl.^{6} G02B *7/28;* G06K *9/00*

U.S. Cl. 250—201.3 **2 Claims**


POSITIONING A VERTICAL BAR TARGET UNDER THE OBJECTIVE
10
ROUTING THE FOCUS + CHANNEL TO THE ICF IMAGE BUFFER
12
RUNNING A FOCUS PAN TO FIND THE OPTIMAL FOCUS POSITION AND RETAINING THE IMAGE OF BEST FOCUS
14
PERFORMING A HORIZONTAL MTF COMPUTATION ON A PREDETERMINED SET OF ROWS
16
CHECK LIMITS
18

1. An automated method for checking focus camera MTF in a system including an automated microscope having an objective, the system further including a plus focus camera and a minus focus camera, further including focus camera filters comprising a plus focus camera filter and a minus focus camera filter, the automated method comprising the steps of:

a) positioning a target under the objective;

b) running a focus pan and retaining an image nearest to a best focus position;

c) performing a modulation transfer function computation on a predetermined set of video lines from the focus camera filters to obtain a result; and

d) comparing the result of the modulation transfer function computation against predetermined limits.

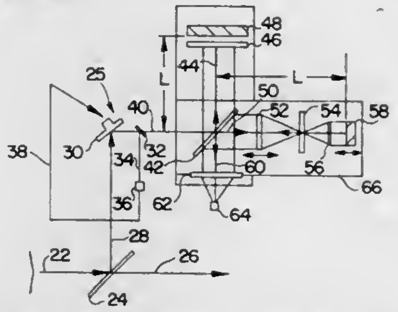
5,841,125
HIGH ENERGY LASER FOCAL SENSOR (HELFS)

Peter M. Livingston, Palos Verdes, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Jun. 6, 1997, Ser. No. 870,901

Int. Cl.^{6} G01J *1/20*

U.S. Cl. 250—201.9 **32 Claims**



1. A high energy laser focal sensor comprising:

tilt-correcting means for correcting the tilt of an input beam;

beam splitting means for splitting the input beam into a reference-arm beam and a sample beam;

means for generating a reference beam from the reference-arm beam;

means for modulating the reference beam with a high-frequency dither signal;

an axially adjustable lens means for effecting wavefront changes in the reference beam;

means for recombining the sample beam and the reference beam to produce an interference pattern;

detection means for generating electrical signals indicative of the interference pattern;

an electrical circuit connected to the detection means, the electrical circuit comprising synchronous detector means for removing dither-frequency components from the electrical signals, and means for providing a focal shift correction signal from the electrical signals; and

means for coupling the focal shift correction signal to the axially adjustable lens means so that the adjustable lens means is automatically adjusted to match a phase curvature of the reference beam wavefront to that of the sample beam.

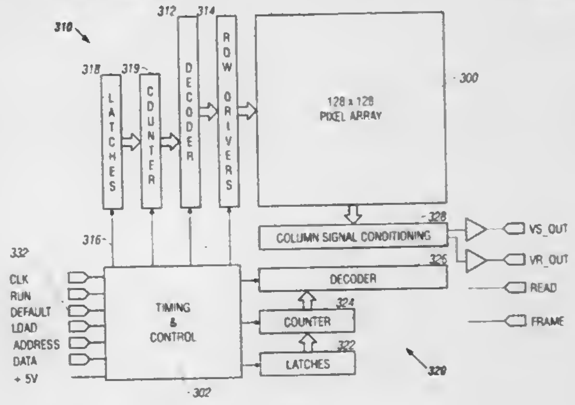
5,841,126
CMOS ACTIVE PIXEL SENSOR TYPE IMAGING SYSTEM ON A CHIP

Eric R. Fossum, La Crescenta, and Robert Nixon, Shadow Hills, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Continuation-in-part of Ser. No. 558,521, Nov. 16, 1995, which is a continuation of Ser. No. 188,032, Jan. 28, 1994, Pat. No. 5,471,515. This application Jan. 24, 1997, Ser. No. 789,608

Int. Cl.^{6} H01L *27/14:27/146*

U.S. Cl. 250—208.1 **2 Claims**



1. A camera on a chip, comprising:

a substrate, including an array of pixel areas, and at least one control area integrated on the same substrate;

said pixel areas comprising a plurality of light collecting elements which each receive light and store an electronic information in an amount indicative of an amount of light received during an integration period;

said control area including:

a timing element;

a readout control element,

wherein circuitry in said control area are formed of CMOS, and said pixel area is formed of a logic family that is compatible with CMOS.

5,841,127
POSITION SENSOR

Kraisorn Throngnumchai, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Kanagawa, Japan

Filed Mar. 11, 1997, Ser. No. 815,360

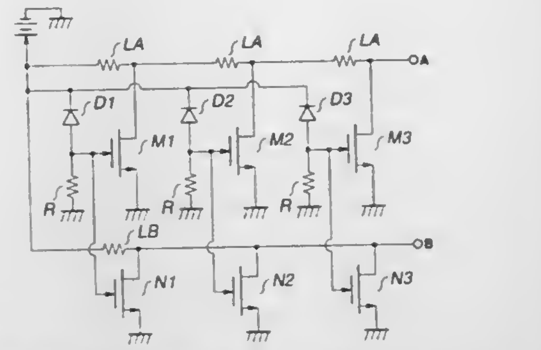
Claims priority, application Japan, Mar. 11, 1996, 8-082031

Int. Cl.^{6} H01J *40/14*

U.S. Cl. 250—208.1 **22 Claims**

1. A position sensor comprising:

a plurality of photodetectors in a row, each of said plurality of photodetectors being operative to convert optical energy of incident light that falls thereon to electrical energy to generate an electrical signal;



a first amplifier circuit operative to amplify the generated electrical signal to produce a first output signal that depends on which of said plurality of photodetectors the incident light falls on; and

a second amplifier circuit operative to amplify the generated electrical signal to produce a second output signal that is independent of which of said plurality of photodetectors the incident light falls on.

5,841,128
OPTICAL SENSOR FOR READING A PATTERN

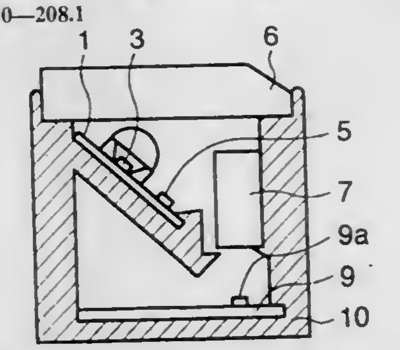
Yoshiki Shibuya; Takeo Ando, and Mayumi Masui, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Mar. 21, 1997, Ser. No. 822,922

Claims priority, application Japan, Jun. 26, 1996, 8-165472

Int. Cl.^{6} H01J *40/14;* H01L *27/14*

U.S. Cl. 250—208.1 **23 Claims**



1. An optical read sensor, comprising:

a circuit board having light-emitting elements mounted thereon, said light-emitting elements emitting light;

a transparent cover having a surface on which an original is placed;

light-receiving elements, receiving light reflected by the original through said transparent cover; and

a lens array formed of a plurality of optical fibers arranged in parallel in a row, each of the optical fibers having an optical axis with a first focal point on a light incidence side and second focal point on a light exiting side, said lens array guiding the light reflected by the original to said light-receiving elements;

wherein the light emitted from said light-emitting elements has a substantially uniform distribution of intensity in a volume parallel to the surface of the transparent cover after the light has passed through the transparent cover, the volume being within a predetermined range of distance from the transparent cover, the optical axis passing through the volume.

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5,841,129
DEVICE FOR OPTICAL SCANNING OF OBJECTS ON A SCANNING SURFACE AND PROCESS FOR OPERATING IT

Wolfgang Bacsa, Avenue Chanel 10, CH-1110 Morges, Switzerland

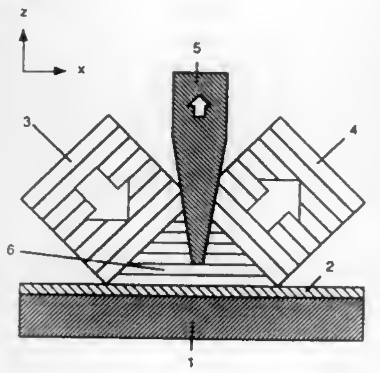
PCT No. PCT/CH96/00165, § 371 Date Mar. 3, 1997, § 102(e) Date Mar. 3, 1997, PCT Pub. No. WO96/35136, PCT Pub. Date Nov. 7, 1996

PCT Filed Apr. 29, 1996, Ser. No. 765,335

Claims priority, application Switzerland, May 2, 1995, 01 240/95

Int. Cl.^{6} H01J *3/14*

U.S. Cl. 250—216 **13 Claims**



1. A device for the optical scanning of objects on a scanning surface, the device comprising: a substrate including an opaque layer and a transparent layer, the transparent layer having a scanning surface and being disposed on the opaque layer; a light source for producing a monochromatic light beam incident on the scanning surface; and an optical probe for monitoring a monochromatic standing wave formed by the superposition of the monochromatic light beam and a reflected beam, the optical probe being displaceable with respect to the scanning surface and having an aperture oriented towards the scanning surface, wherein the transparent layer is transparent to the monochromatic light beam.

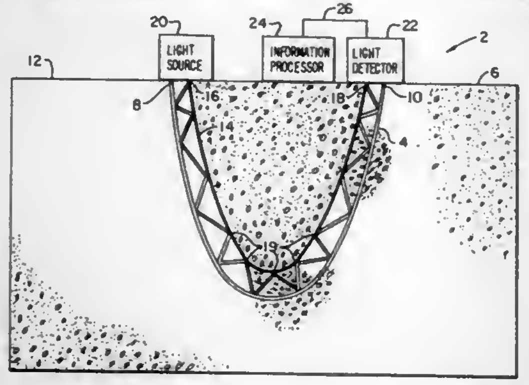
5,841,130
SYSTEM FOR MONITORING STRAIN IN CONCRETE STRUCTURES

Falih H. Ahmad, Clinton, Miss.; James A. Evans, Tallulah, La.; Barry D. Fehl, Vicksburg, Miss.; Anthony A. Bombich, Clinton, Miss., and Lonnie L. Smith, Vicksburg, Miss., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 14, 1997, Ser. No. 795,526

Int. Cl.^{6} H01J *5/16*

U.S. Cl. 250—227.14 **4 Claims**



1. A system for monitoring strain in concrete structures, said system comprising:

a frame for embedding in the structure with first and second ends of said frame proximate an edge of the structure;

a fiber-optic cable mounted on said frame and extending substantially from said frame first end to said frame second end;

a light source in communication with a first end of said cable;

a light detector in communication with a second end of said cable; and

an information processor in communication with said light detector;

said cable being adapted to propagate light from said light source to said light detector, and said information processor being adapted to identify strain in the structure from data generated by said light detector.

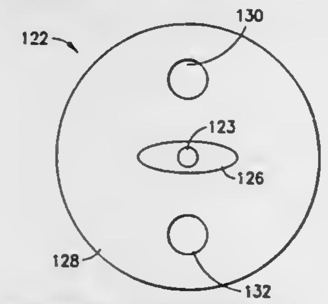
5,841,131
FIBER OPTIC PRESSURE TRANSDUCERS AND PRESSURE SENSING SYSTEM INCORPORATING SAME

Robert J. Schroeder, Newtown, Conn., and Eric Udd, Troutdale, Oreg., assignors to Schlumberger Technology Corporation, Ridgefield, Conn.

Filed Jul. 7, 1997, Ser. No. 888,566

Int. Cl.^{6} H01J *5/16*

U.S. Cl. 250—227.17 **27 Claims**



1. A fiber optic transducer, comprising:

a) a fiber optic core having at least one grating formed along at least one portion thereof;

b) a first cladding surrounding said core;

c) birefringence means for enhancing birefringence in said core; and

d) pressure responsive means for converting isotropic pressure forces to anisotropic forces on said core.

5,841,132
OPTICAL DISPLACEMENT SENSOR AND TORQUE SENSOR EMPLOYING RELATIVELY MOVABLE SLIT PATTERNS

Steven John Horton, West Midlands; Adrian Leslie Trace, Birmingham, and David Rees, West Midlands, all of England, assignors to Lucas Industries public Limited Company, England

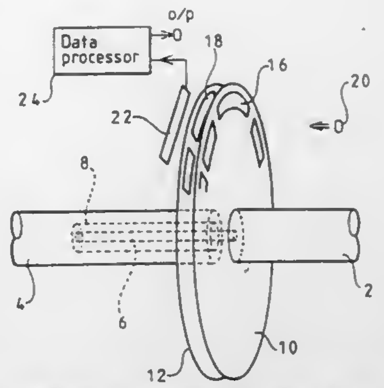
PCT No. PCT/GB95/02017, § 371 Date May 9, 1997, § 102(e) Date May 9, 1997, PCT Pub. No. WO96/06330, PCT Pub. Date Feb. 29, 1996

PCT Filed Aug. 25, 1995, Ser. No. 793,404

Claims priority, application United Kingdom, Aug. 25, 1994, 9417190.7; Feb. 18, 1995, 9503193.6

Int. Cl.^{6} G01D *5/34*

U.S. Cl. 250—231.13 **29 Claims**



1. An optical displacement sensor comprising a source of optical radiation, an array of radiation detectors, and first and second elements, each of which comprises alternating first and second regions, the first regions having greater optical transmissivities than the optical transmissivities of the second regions, each of the first and second elements being movable so that the first and second regions pass between the source and the array so as to modulate the radiation falling on different regions of the array, the improvement wherein an image of said first and second regions of the first and second elements is formed on the array which image has light and dark portions with edges and the sensor also includes a data processor connected to the array to receive therefrom signals representing the intensity of radiation falling on each detector of the array, said data processor operating to determine the relative positions of the first and second elements by determining the position of at least one edge of a dark portion of the image caused by one of the second regions of one element relative to at least one edge of a dark portion of the image caused by one of the second regions of the other element.

5,841,133
OPTICAL DISPLACEMENT DETECTING APPARATUS HAVING GRATINGS AND A LIGHT RECEIVING CHIP

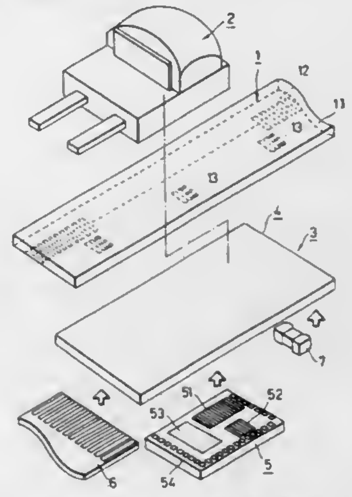
Toshihiro Omi, Kawasaki, Japan, assignor to Mitutoyo Corporation, Kawasaki, Japan

Filed Oct. 27, 1997, Ser. No. 958,154

Claims priority, application Japan, Oct. 28, 1996, 8285541

Int. Cl.^{6} G01D *5/34*

U.S. Cl. 250—231.13 **9 Claims**



1. An optical displacement detecting apparatus, comprising:

a first member having a first optical grating;

a light radiating device for radiating light to the first optical grating of said first member; and

a second member having a second optical grating, disposed opposite to said first member through a gap so that said first member and said second member can be relatively moved, for receiving the light radiated from said light radiating device through the first optical grating and the second optical grating so as to detect the relative displacement between said first member and said second member,

wherein said second member has a transparent substrate which has a front surface opposite to the first member with the gap and a reverse surface on which thin film electrodes are disposed, and a light receiving chip which has a light detecting device for receiving the light and solder bumps formed on the light receiving chip corresponding to the thin film electrodes on the reverse surface of the transparent substrate, said light receiving chip being disposed on the reverse surface of the transparent substrate through the solder bumps and the thin film electrodes by face-down bonding method, and

wherein the second optical grating is disposed on at least one of the transparent substrate and the light receiving chip.

5,841,134
PHOTO-ELECTRIC DISTANCE-AND ANGLE-MEASUREMENT SYSTEM FOR MEASURING THE DISPLACEMENT OF TWO OBJECTS WITH RESPECT TO EACH OTHER

Reiner Burgschat, Jena, and Joerg Willhelm, Wetzlar, both of Germany, assignors to Carl Zeiss Jena GmbH, Jena, Germany

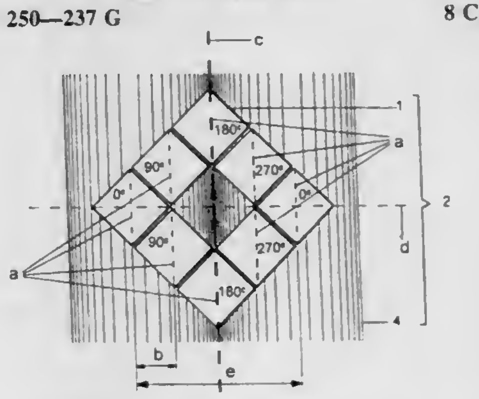
PCT No. PCT/EP96/03276, § 371 Date Mar. 26, 1997, § 102(e) Date Mar. 26, 1997, PCT Pub. No. WO97/05457, PCT Pub. Date Feb. 13, 1997

PCT Filed Jul. 25, 1996, Ser. No. 809,591

Claims priority, application Germany, Jul. 26, 1995, 195 27 287.0

Int. Cl.^{6} G01B *11/00*

U.S. Cl. 250—237 G **8 Claims**



1. In a photoelectric path- and angle-measurement system for measuring the displacement of two objects relative to one another, having a light source, a reference grating, and a scale grating for generating an optical fringe pattern, having photoreceivers, and having an evaluating circuit, wherein a quantity of photoreceivers corresponding to N=n·4 is provided, where N is the quantity of photoreceivers and n is an even number greater than or equal to 2, and wherein diagonals passing through centroids of all photoreceivers are parallel to one another, and photoreceivers of the same phase position are electrically connected with one another, an improvement comprising:

diagonals extending parallel to one another being arranged parallel to fringes of the optical fringe pattern and, in each instance, passing through the centroids of photoreceivers which detect signals of the same phase position; and

wherein every two adjacent diagonals have the same spacing from one another and the photoreceivers associated therewith detect signals which are out of phase by 90° relative to one another.

5,841,135
METHOD AND APPARATUS FOR MEASURING FORMATION DENSITY AND THE FORMATION PHOTO-ELECTRIC FACTOR WITH A MULTI-DETECTOR GAMMA-GAMMA TOOL

Christian Stoller, Kingwood; Nihal I. Wijeyesekera, Stafford; Urmi DasGupta, Houston; Donald C. McKeon, Katy, all of Tex., and Peter D. Wraight, Ridgefield, Conn., assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Feb. 19, 1997, Ser. No. 800,976

Int. Cl.^{6} G01V *5/12*

U.S. Cl. 250—269.3 **23 Claims**

1. An apparatus for determining characteristics of an earth formation surrounding a borehole, comprising:

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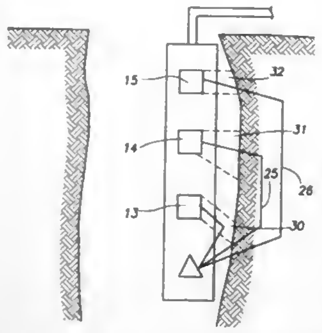


a) a source for irradiating said earth formation with gamma radiation;

b) short, mid, and long spaced detectors located in said apparatus, respectively, said detectors being capable of generating signals indicative of the energy of the gamma radiation detected by each of the detectors and said detectors being fixed successively at greater distances from said gamma radiation source such that each detector signal exhibits a negative response to increasing density of said formation;

c) a housing that contains said gamma radiation source and detectors, said housing being capable of maintaining its mechanical properties in hostile borehole environments;

d) a means for calculating formation density from said detector signals; and,

e) a means for calculating the photo-electric factor of said earth formation from said detector signals.

5,841,136
DEVICE AND METHOD FOR INTRODUCTION OF SAMPLE SUPPORTS INTO A MASS SPECTROMETER

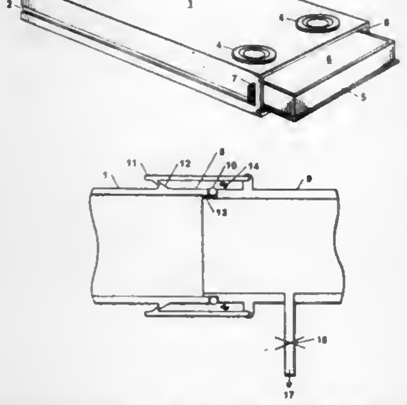
Armin Holle, Oyten; Claus Köster, Lilienthal, and Jens Rebettge, Schwanewede, all of Germany, assignors to Bruker-Franzen Analytik, GmbH, Bremen, Germany

Filed Jul. 10, 1997, Ser. No. 890,981

Claims priority, application Germany, Jul. 12, 1996, 196 28 112.1

Int. Cl.^{6} H01J *47/04*

U.S. Cl. 250—288 **7 Claims**



1. A system for feeding at least one flat sample support with applied analyte samples into a vacuum system of a mass spectrometer, the system comprising:

(a) an evacuable cassette containing the sample support, and

(b) an introduction port at the mass spectrometer capable of being connected to the cassette in a vacuum-tight connection, the connection being such that an external surface of the cassette is exposed to an environment outside of a vacuum shared between an interior of the cassette and an interior of the introduction port, while a passage is provided for the introduction of the sample support to the mass spectrometer.

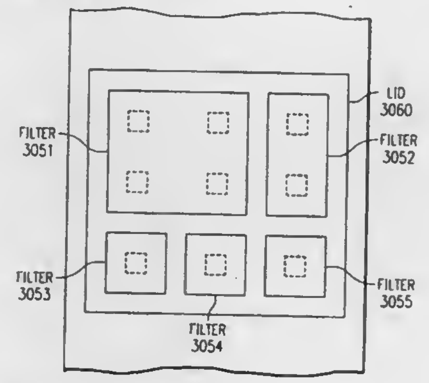
5,841,137
DUPLICATIVE DETECTOR SENSOR

Julie G. Whitney, Georgetown, Ky., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 19, 1996, Ser. No. 684,157

Int. Cl.^{6} G01N *21/35;21/61*

U.S. Cl. 250—338.5 **5 Claims**



1. A gas sensor, comprising:

(a) a radiation source;

(b) a plurality of radiation detectors spaced from said source;

(c) a lid over said radiation detectors;

(d) first and second passband radiation filters on said lid, said first passband radiation filter adjacent a first set of said radiation detectors and said second passband radiation filter adjacent a second set of said radiation detectors with said first and second sets having different numbers of detectors.

5,841,138
METHOD OF AN APPARATUS FOR NONDESTRUCTUVE WORKPIECE TESTING

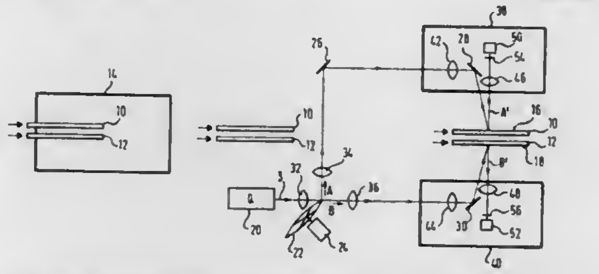
Helmut Prekel, Lindau, and Horst Adams, Nonnenhorn, both of Germany, assignors to Wagner International AG, Altstatten, Switzerland

Filed Dec. 10, 1996, Ser. No. 763,245

Claims priority, application Germany, Dec. 21, 1995, 195 48 036.8

Int. Cl.^{6} G0IN *15/08*

U.S. Cl. 250—341.1 **18 Claims**



1. A method for nondestructive testing of a workpiecc, comprising:

directing a continuous electromagnetic excitation beam (S) periodically in different directions to provide a plurality of intensity modulated beams (A and B) which are directed at different noninterfering points of examination on a workpiece surface (**16**, **18**) to produce thermal radiation at said points of examination distinguishable from the incident electromagnetic excitation beam; and

detecting said thermal radiation emitted by said points of examination for evaluation.

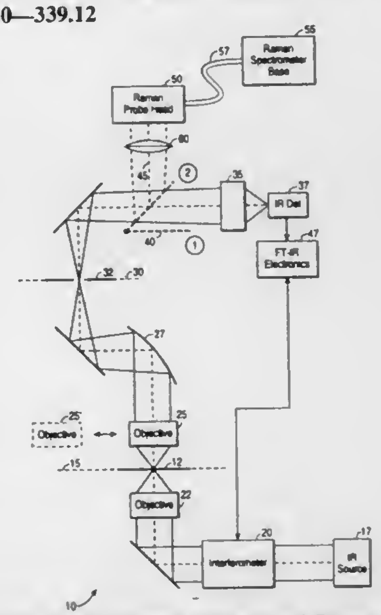
5,841,139
OPTICAL INSTRUMENT PROVIDING COMBINED INFRARED AND RAMEN ANALYSIS OF SAMPLES

Ronald Y. Sostek, Newton Center, and Norman A. Wright, Billerica, both of Mass., assignors to Bio-Rad Laboratories, Inc., Hercules, Calif.

Filed Feb. 28, 1997, Ser. No. 808,745

Int. Cl.^{6} G01J *3/44;21/65;21/35*

U.S. Cl. 250—339.12 **17 Claims**



1. Apparatus for performing infrared and Raman spectroscopic analysis of a sample, the apparatus comprising:

a sample stage for holding the sample;

an infrared source of infrared light for illuminating the sample;

an excitation source of excitation light for illuminating the sample;

an infrared detector;

a Raman detector;

a configurable optical path for selectively (a) in a first mode, optically coupling (a1) said infrared source so as to illuminate the sample, and (a2) said infrared detector so as to detect infrared light emanating from the sample, or (b) in a second mode, optically coupling (b1) said excitation source so as to illuminate the sample, and (b2) said Raman detector so as to receive Raman scattered light emanating from the sample; and

an interferometer disposed in a common path segment of said configurable optical path such that (a) in said first mode, said light from said infrared source passes through said interferometer before encountering the sample, and (b) in said second mode, said Raman scattered light emanating from the sample passes through said interferometer before encountering said Raman detector.

5,841,140
GAMMA CAMERA FOR PET AND SPECT STUDIES

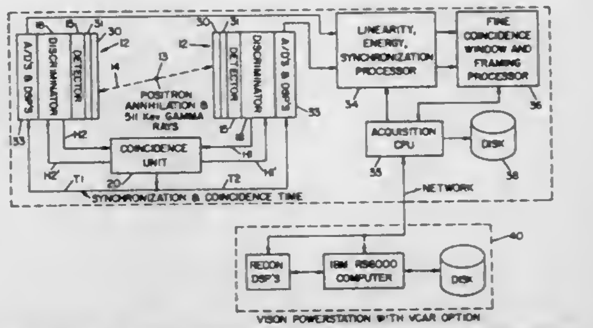
William K. Mc Croskey, Solon; Christ H. Heipp, Chagrin Falls, and David S. Vickers, Independence, all of Ohio, assignors to SMV America, Inc., Twinsburg, Ohio

Filed Jan. 8, 1997, Ser. No. 780,647

Int. Cl.^{6} G01T *1/172*

U.S. Cl. 250—363.03 **32 Claims**

1. In a gamma camera having two detector heads between which a patient is positioned for SPECT studies; each detector head spanning a discrete area vis-a-vis a plurality of PMTs behind a scintillation crystal, each PMT generating a pulse signal in response to a scintillation; an event detector circuit detecting when any given PMT pulse signal becomes a triggering pulse signal indicative of a scintillation radiation event and quantifying the energy of said triggering pulse signal; centroid calculator means for grouping with a PMT triggering pulse signal a plurality of pulse signals from PMTs adjacent that PMT which generated said triggering pulse signal and digital signal processors for determining by weighting the signals within each bundle the corrected intensity and pixel position of each scintillation event, the improvement comprising:


A/D'S & DSP'S
DISCRIMINATOR
DETECTOR
POSITRON ANNIHILATION & 511 Kev GAMMA RAYS
DETECTOR
DISCRIMINATOR
A/D'S & DSP'S
LINEARITY, ENERGY, SYNCHRONIZATION PROCESSOR
FINE COINCIDENCE WINDOW AND FRAMING PROCESSOR
COINCIDENCE UNIT
ACQUISITION CPU
DISK
SYNCHRONIZATION & COINCIDENCE TIME
NETWORK
RECON DSP'S
IBM RS6000 COMPUTER
DISK
VISION POWERSTATION WITH VCAR OPTION
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a) timing signal means for generating from each triggering pulse signal a trigger timing signal;

b) coincident means for determining when any given triggering timing signal from one head occurs within a set coarse time from any triggering timing signal from the opposite detector head and grouping any two triggering timing signals originating from opposite detector heads and occurring within said coarse time into matched pairs;

c) time stamping means for marking each triggering timing signal in a matched pair with a time stamp signal indicative of the difference in time between the triggering signals in each matched pair; and

d) timing signal digital signal processor means for correcting said difference in time between said time stamp signals as a function of the corrected position of said scintillation events in turn established for each triggering pulse signal in each matched pair by said camera's digital signal processors whereby each matched pair establishes a LOR for tomographic imaging when the gamma camera is used for PET studies.

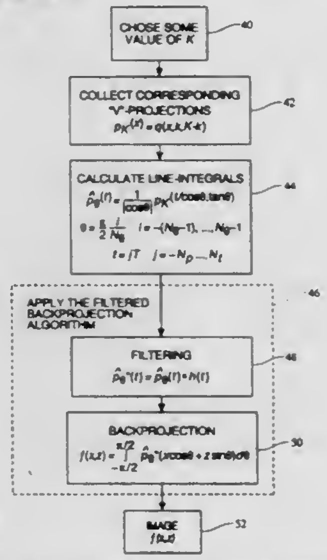
5,841,141
IMAGE RECONSTRUCTION FROM V-PROJECTIONS ACQUIRED BY COMPTON CAMERA

Grant T. Gullberg; Gengsheng Lawrence Zeng, and Roman Basko, all of Salt Lake City, Utah, assignors to The University of Utah, Salt Lake City, Utah

Filed Jun. 3, 1997, Ser. No. 868,273

Int. Cl.^{6} G01T *1/164*

U.S. Cl. 250—363.04 **29 Claims**



1. A method of generating an image representation of a region of interest of a subject having radiation emitted therefrom, the radiation being detected by a first Compton camera, the method comprising:

collecting radiation data from the detected radiation as a v-shaped projection defined by converging lines;

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- converting the v-shaped projection into a parallel projection; and
- reconstructing an image representation from the parallel projection.

5,841,142
PROCESS AND SYSTEM FOR DETERMINING EXPOSURE IN AIRPLANES

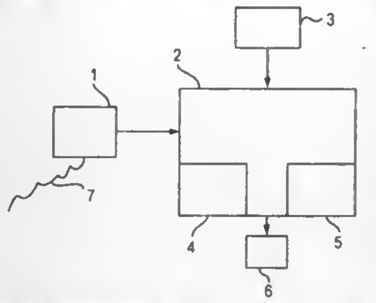
Klaus E. Duftschmid, Franz-Schmid-G. 3, A-2352 Gumpoldskirchen; Christian Schmitzer, Gattringerstr. 95, A-2345 Brunn/Geb., and Christian Strachotinsky, Wollzeile 34, A-1010 Vienna, all of Austria

Filed Feb. 24, 1995, Ser. No. 394,331

Claims priority, application Austria, Mar. 1, 1994, 425/94

Int. Cl.^{6} G01T *1/02*

U.S. Cl. 250—395 **14 Claims**



1. A process for determining one of a radiation exposure and a dose of radiation prevailing in an airplane in flight, the process comprising:

- measuring, aboard the airplane, a plurality of doses for one of a plurality of types of radiation, each of the plurality of types of radiation being included within a total radiation spectrum within the airplane;
- determining, by a predefined algorithm, a plurality of contribution factors, each contribution factor associated with the one of the plurality of types of radiation, and determined in accordance with an altitude of the airplane and a geographical position of the airplane, the geographical position including a geomagnetic longitude and latitude;
- multiplying each of the plurality of measured doses for the one of the plurality of types of radiation by the determined contribution factor associated with the one of the plurality of types of radiation and associated with the current geographical position of the airplane to produce a product; and
- at least one of indicating, evaluating and storing each product as a representative of one of the radiation exposure and the dose of the radiation prevailing in the airplane.

5,841,143
INTEGRATED FLUORESCENE

Margaret Tuma, Strongsville, assignor to The United States of America as represented by Administrator of The National Aeronautics and Space Administration, Washington, D.C.

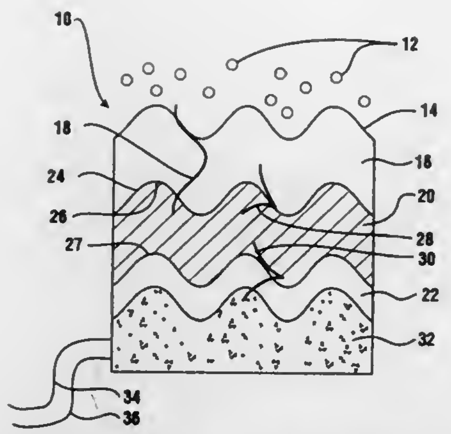
Filed Jul. 11, 1997, Ser. No. 903,184

Int. Cl.^{6} G01N *21/64*

U.S. Cl. 250—458.1 **31 Claims**

1. An article for analyzing fluorescence from a fluorescent material comprising:

- fluorescent material in close proximity to a first surface of a dielectric waveguide layer,
- wherein said waveguide layer supports waveguide modes at the wavelength of fluorescence and wavelength of absorption of said fluorescent material, wherein said waveguide modes penetrate into said fluorescent material and excite the fluorescence of said fluorescent material, whereby the fluorescence of said fluorescent material is enhanced;
- a corrugated metal film layer positioned adjacent to a second surface of said waveguide layer, wherein said metal film layer supports a first plurality of plasmons positioned at the interface of said metal film layer and said adjacent waveguide layer, wherein each of said first plurality of plasmons is excited by all fluorescent wavelengths within said waveguide layer, and said first plurality of plasmons produces a first field,
- a sensor layer, wherein said sensor layer is capable of absorbing optical energy and generating a corresponding electrical signal,
- wherein said metal film layer supports a second plurality of plasmons, wherein said second plurality of plasmons is positioned within said first plasmon field and is excited by said first plasmon field at a wavelength interval which includes the wavelength of fluorescence to produce a second plasmon field, wherein said second plasmon field penetrates said sensor layer,
- whereby said sensor layer generates an electrical signal corresponding to the fluorescence intensity of the fluorescent material at the wavelength of fluorescence.



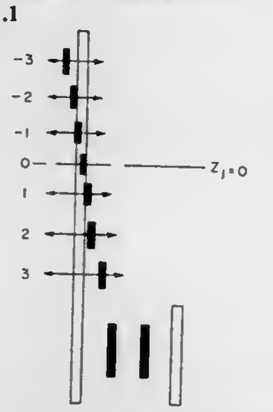
5,841,144
OVERLAY TARGET AND MEASUREMENT PROCEDURE TO ENABLE SELF-CORRECTION FOR WAFER-INDUCED TOOL-INDUCED SHIFT BY IMAGING SENSOR MEANS

Michael William Cresswell, Frederick, Md., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Continuation-in-part of Ser. No. 382,973, Feb. 3, 1995, Pat. No. 5,617,340. This application Apr. 25, 1995, Ser. No. 428,036

Int. Cl.^{6} G01B *11/00*

U.S. Cl. 250—491.1 **8 Claims**



4. A method for calibrating optical measurements of overlay exhibited with respect to successive steps in fabrication of a multiple layer planar product, comprising the steps of:

- providing a test structure having first and second layers formed on a substrate, said first layer having optically readable reference members in a fixed spatial relation to a number of test point locations, said second layer overlying said first layer and having optically readable reference marks for optical scanning of the relation thereof to said reference members, said second layer also having a series of features spaced successively greater distances in both a positive and negative direction from a baseline in fixed relation to said reference marks;
- whereby the optically measured overlay values can be corrected in accordance with a predetermined algorithm by determining which of said features is closest to the transition from the positive to the negative direction.

5,841,145
METHOD OF AND SYSTEM FOR EXPOSING PATTERN ON OBJECT BY CHARGED PARTICLE BEAM

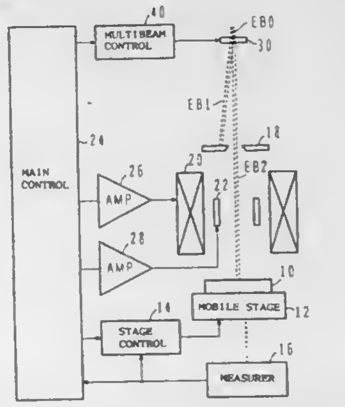
Takamasa Satoh; Yoshihisa Oae; Soichiro Arai; Kenichi Miyazawa; Hiroshi Yasuda; Manabu Ohno; Hitoshi Watanabe; Junichi Kai; Tomohiko Abe; Akio Yamada, and Yasushi Takahashi, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 4, 1996, Ser. No. 610,350

Claims priority, application Japan, Mar. 3, 1995, 7-044651; May 29, 1995, 7-130683; Aug. 23, 1995, 7-214498; Nov. 10, 1995, 7-292650

Int. Cl.^{6} H01J *37/302*

U.S. Cl. 250—492.22 **45 Claims**



1. A method of exposing a pattern on an object using pattern bit map data formed from individual bits, a charged particle beam, a blanking aperture array means having a plate, an aperture array on said plate, and a pair of electrodes on said plate for each aperture of said aperture array, said blanking aperture array means being positioned in a path of said charged particle beam, a charged particle beam radiating apparatus for making a multibeam by projecting said charged particle beam on to said blanking aperture array means, a multibeam control means for selectively providing voltage between each of said pairs of electrodes, based upon the pattern bit map data, to radiate said charged particle beam through said aperture array on to said object, and a deflector for deflecting said multibeam, said method comprising the steps of:

- forming a first band area having a first end by scanning aid multibeam in a band direction,
- forming a second band area having a second end by scanning said multibeam in said band direction such that the first an second ends overlap by using pattern bit map data corresponding to the first end and the second end;
- modulating pattern bit map data corresponding to the first end by validating/invalidating individual bits of said pattern bit map data with first modulation data; and
- modulating pattern bit map data corresponding to the second end by validating/invalidating individual bits of said pattern bit map data with second modulation data,
- wherein said first and said second modulation data are approximately complementary at corresponding bits, and a sum of bit values, on a line running at a right angle to said band direction increase or decrease along said band direction.

5,841,146
REFLECTOR

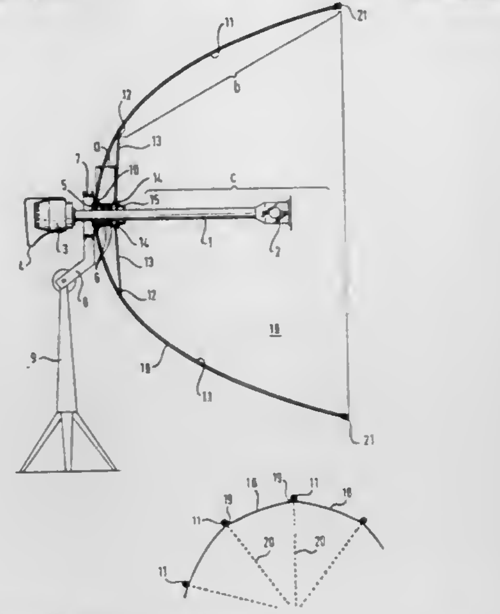
Hans-Werner Briese, Johannkamp 3, D-22459 Hamburg, Germany

Filed Apr. 15, 1997, Ser. No. 838,088

Claims priority, application Germany, May 8, 1996, 196 18 434.9

Int. Cl.^{6} G03B *15/02*

U.S. Cl. 250—493.1 **18 Claims**



1. An umbrella reflector, comprising:

- a bearing body (5) into which a tubular carrying means (1) is inserted so that said tubular carrying means is displaceably held within said bearing body (5);
- a ring of articulated joints (10) arranged on said bearing body (5) and to which umbrella stretchers (11) are hingedly attached, a reflecting umbrella covering (18) fastened to umbrella stretchers (11);
- a sliding means (15) being displaceable on said tubular carrying means (1)
- a ring of toggle joints (14) arranged on said sliding means to which expanding stretchers (13) are mounted, the end of expanding stretchers (13) being secured to umbrella stretchers (11) by articulated expanding joints (12), said expanding stretchers (13) being dimensioned so that when opening the reflectors, said sliding means (15) is displaceable to a point past the plane of said articulated expanding joints (12), where the resilient restoring forces provide an arrestment holding the reflector in an open position, and
- an element (2) emitting electromagnetic or acoustic waves which is arranged at the end of said tubular carrying means (1) facing the interior of said umbrella reflector so that by displacing said tubular carrying means (1) within said bearing body (5) said element (2) is moved into different positions in relation to the opened reflector.

5,841,147
INTERMODAL MODULAR SPENT NUCLEAR FUEL TRANSPORTATION SYSTEM

James E. Steinke, Smithfield; Richard K. Feamster, Jr., Gloucester, and Hugh E. Thompson, Gloucester Point, all of Va., assignors to Newport News Shipbuilding and Dry Dock Company, Newport News, Va.

Filed Aug. 29, 1997, Ser. No. 920,651

Int. Cl.^{6} G21F *5/00*

U.S. Cl. 250—507.1 **34 Claims**

1. An intermodal modular nuclear material transport system for transporting nuclear material including spent nuclear fuel rods, nuclear vitrified waste, broken nuclear fuel rods, and contaminated

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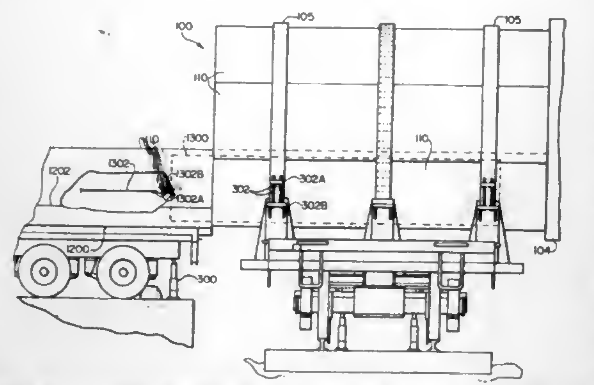


material, between destinations, said destinations including nuclear waste disposal sites, nuclear power facilities, and intermodal transfer points, said transport system comprising:

- at least one nuclear material canister for containing said nuclear material;
- a transportation means for transporting said nuclear material;
- an overpack bundle coupled to said transportation means, said overpack bundle comprising a plurality of overpacks for receiving said at least one nuclear material canister;
- a cradle assembly coupled to said transportation means and said overpack bundle for supporting and facilitating rotational movement of said overpack bundle about a longitudinal axis; and
- a turntable coupled to said transportation means, said cradle assembly, and said overpack bundle, said turntable for rotating said cradle assembly and said overpack bundle in a horizontal plane about a central vertical axis to selectively position said overpack bundle for transferring said at least one nuclear material canister into and out of one of said plurality of overpacks in said overpack bundle.

5,841,148
IMAGE PROCESSING APPARATUS

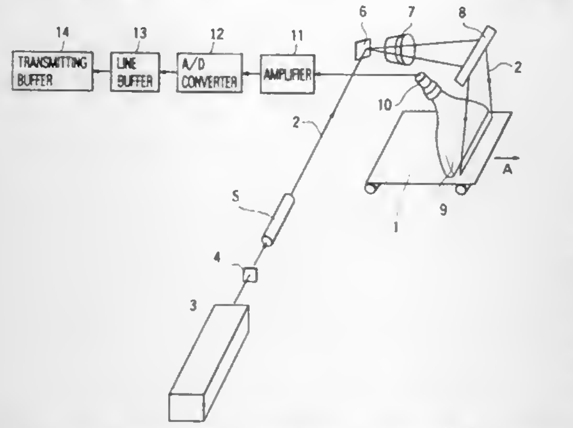
Masato Some; Hiromi Shibata, both of Kanagawa-ken, and Kunihiro Takahashi, Akita, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 30, 1997, Ser. No. 792,191

Claims priority, application Japan, Feb. 2, 1996, 8-040643; Feb. 2, 1996, 8-040644

Int. Cl.^{6} G01N *23/04*

U.S. Cl. 250—584 **18 Claims**



1. An image processing apparatus comprising temporary memory means for two-dimensionally mapping and temporarily storing image data containing image data regions corresponding to at least two image regions having similar shape and stored in image data storing means, display means for reproducing an image based on the image data stored in the temporary memory means, pixel specifying means for specifying pixels corresponding to at least two-equivalent points in at least two image regions having similar shape in the image displayed on the display means, data correcting means for effecting, between micro region image data corresponding to micro regions including coordinates of the at least two pixels specified by the pixel specifying means as center coordinates, rotation and movement correction and enlargement/reduction magnification correction on the micro region image data in the image data corresponding to one image region so that a rotation angle and an enlargement/reduction magnification of the one image region coincide with those of a reference image region which is one of the at least two image regions, template matching means for effecting template matching on the micro region image data corrected by the data correcting means and the micro region image data in the image data corresponding to the reference image region, and affine converting means for effecting affine conversion on the image data stored in the temporary memory means based on the result of the template matching effected by the template matching means.

5,841,149
METHOD OF DETERMINING THE DISTANCE OF A FEATURE ON AN OBJECT FROM A MICROSCOPE, AND A DEVICE FOR CARRYING OUT THE METHOD

Roger Spink, Balgach; Bernhard Braunecker, Rebsteom, both of Switzerland; Klaus-Peter Zimmer, Heerbrigg, Switzerland; Thomas Mayer, Hohenems, Austria, and John Rice Rogers, Heerbrugg, Switzerland, assignors to Leica Mikroskopie Systeme AG, Heerbrugg, Switzerland

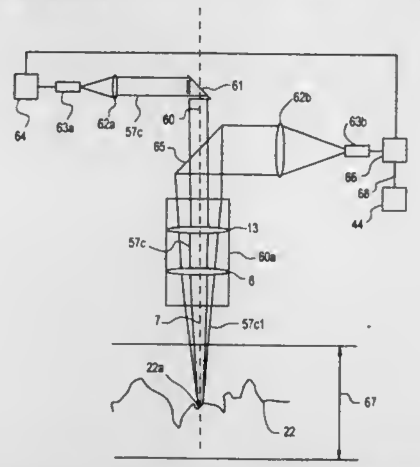
PCT No. PCT/EP95/01301, § 371 Date Dec. 12, 1996, § 102(e) Date Dec. 12, 1996, PCT Pub. No. WO95/27917, PCT Pub. Date Oct. 19, 1995

PCT Filed Apr. 9, 1995, Ser. No. 722,021

Claims priority, application Switzerland, Apr. 11, 1994, 1088/94; Apr. 11, 1994, 1089/94; Apr. 11, 1994, 1090/94; Apr. 11, 1994, 1091/94; Apr. 11, 1994, 1092/94

Int. Cl.^{6} G01N *21/86;* **G01B** *11/24*

U.S. Cl. 250—559.29 **17 Claims**



1. A method for determining the distance of a feature (**22***a*) on an object from a microscope in the direction of a central axis (**7**) of the microscope, in which at least one measurement signal is compared with a reference signal, the measurement signal comprising a light bundle along a light path (**57***c*) from a light source (**64**) assigned to the microscope to the feature (**22***a*) on the object, the bundle being directed from the light source (**64**) onto the feature (**22***a*) on the object in order to be reflected or scattered there, the reflected or scattered light bundle being fed at least partly to a receiving unit having at least one sensor (**66**), wherein:

- the light path (**57***c*) is positioned in the vicinity of the central axis (**7**) of the microscope, and its axis is positioned at least approximately parallel thereto, and
- the receiving unit is connected optically and/or electronically to the light source (**64**), light from the light bundle detected at the sensor (**66**) in the receiving unit being compared and/or combined with light emitted from the light source (**64**), whereupon transit-time differences between the light pulses or modulations superimposed on the light bundle, and/or instances of interference or interference phenomena which occur are used to determine at least one variable which is a function of the difference between the two signals and which is used to derive the distance between the microscope and the feature (**22***a*) on the object.

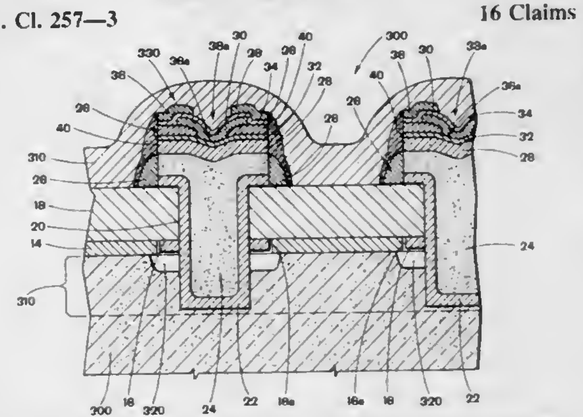
5,841,150
STACK/TRENCH DIODE FOR USE WITH A MULTI-STATE MATERIAL IN A NON-VOLATILE MEMORY CELL

Fernando Gonzalez, and Ray Turi, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Continuation of Ser. No. 483,760, Jun. 7, 1995, abandoned. This application Feb. 12, 1997, Ser. No. 799,515

Int. Cl.^{6} H01L *47/00*

U.S. Cl. 257—3 **16 Claims**



1. A chalcogenide-based memory cell having a first node and a second node, said cell comprising:

- a silicon base;
- an oxide layer disposed above said silicon base;
- a diode container extending from a top surface of said oxide layer downwardly into a trench formed in said silicon base, said first node being disposed in electrical communication with a perimeter of said container;
- a diode disposed inside said container; and
- a chalcogenide memory element electrically coupled between said diode and said second node of said memory cell.

5,841,151
QUASI TYPE II SEMICONDUCTOR QUANTUM WELL DEVICE

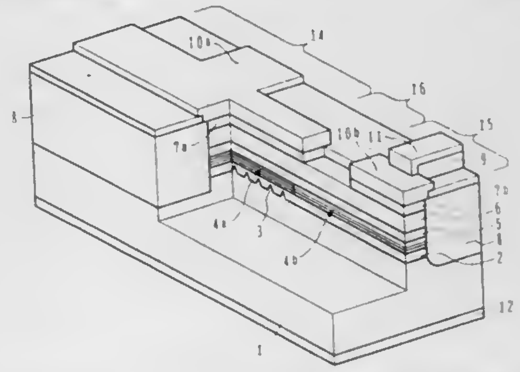
Richard Sahara, Watertown, Mass., assignor to Fujitsu Limited, Kanagawa, Japan

Filed Oct. 17, 1995, Ser. No. 544,088

Claims priority, application Japan, Mar. 20, 1995, 7-061013

Int. Cl.^{6} H01L *29/06*

U.S. Cl. 257—14 **7 Claims**



1. A semiconductor device having a quantum well structure, the quantum well structure comprising:

- a first quantum well layer for forming a quantum well for electrons, said first quantum well layer having a first band structure;
- a second quantum well layer for forming a quantum well for holes, said second quantum well layer having a second band structure different from the first band structure; and
- an intermediate layer interposed between said first and second quantum well layers having a third band structure different from the first and second band structures,
- wherein said first quantum well layer forms a potential barrier to holes, said second quantum well layer forms a potential barrier to electrons, and said third band structure forms a quantum well for electrons and holes.

5,841,152
OPTICAL SEMICONDUCTOR DEVICE PROVIDED WITH STRAINED QUANTUM WELL LAYER FORMED ON A TERNARY COMPOUND SEMICONDUCTOR SUBSTRATE

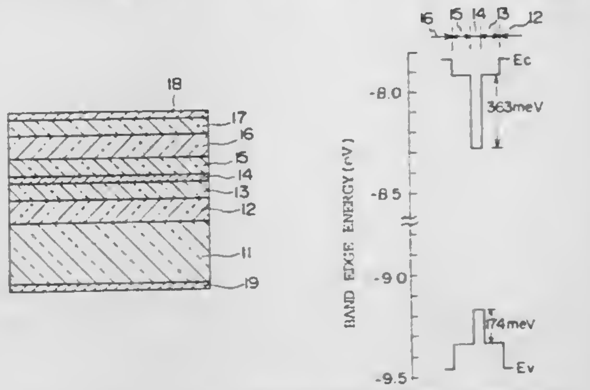
Hiroshi Ishikawa, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 700,088, Aug. 20, 1996, abandoned, which is a continuation of Ser. No. 190,366, Feb. 2, 1994, abandoned. This application Apr. 17, 1997, Ser. No. 843,963

Claims priority, application Japan, Mar. 23, 1993, 5-063778

Int. Cl.^{6} H01L *29/06*

U.S. Cl. 257—14 **14 Claims**



1. A heterostructure optical semiconductor device comprising:

- a compound semiconductor substrate made of a ternary crystal formed from elements of groups III and V;
- first and second barrier layers formed on the compound semiconductor substrate, the first and second barrier layers having respective lattice constants that are substantially the same as that of the compound semiconductor substrate, the first and second barrier layers having respective energy gaps that are larger than that of the compound semiconductor substrate;
- third and fourth barrier layers formed between the first and second barrier layers and having respective lattice constants that are substantially the same as those of the first and second barrier layers and the compound semiconductor substrate, the third and fourth barrier layers having respective energy gaps that are smaller than those of the first and second barrier layers; and
- a strained quantum well layer sandwiched between the third and fourth barrier layers, the strained quantum well layer having a lattice constant that is substantially different from those of the compound semiconductor substrate and the first through fourth barrier layers to cause strain therein, the strained quantum well having an energy gap that is smaller than those of the third and fourth barrier layers, the first through fourth barrier layers and the strained quantum well layer being formed from elements of Groups III and V,
  - the third and fourth barrier layers acting as optical confinement layers to confine light in the strained quantum well layer, and
  - the third and fourth barrier layers and the strained quantum well layer respectively having band edges, the band edges of the strained quantum well layer constituting a deeper

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potential well with respect to the band edges of the third and fourth barrier layers.

5,841,153
SRAM SEMICONDUCTOR DEVICE

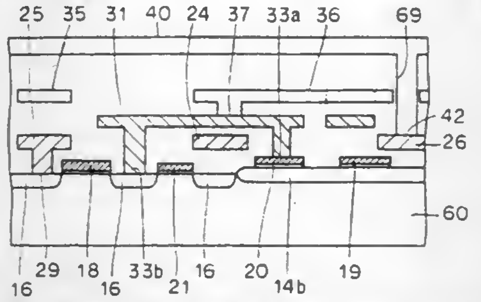
Hirotada Kuriyama; Masahiro Ishida, and Yoshiyuki Ishigaki, all of Hyogo, Japan, assignors to Mitsubishi DenkiKabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 693,497, Aug. 7, 1996, Pat. No. 5,619,056, which is a continuation of Ser. No. 260,428, Jun. 15, 1994, abandoned. This application Mar. 5, 1997, Ser. No. 810,786

Claims priority, application Japan, Dec. 16, 1993, 5-316634

Int. Cl.^{6} H01L *29/76;31/036;27/11*

U.S. Cl. 257—69 **3 Claims**



1. A SRAM memory cell having a load transistor formed of a thin film transistor (TFT) comprising:

a polysilicon layer being divided into a TFT gate electrode portion and a connecting interconnection portion; wherein

said connecting interconnection portion comprises a first contact portion being in contact with a gate electrode of a driver transistor, a second contact portion being in contact with an active layer and a third contact portion being in contact with a drain region of said thin film transistor,

said first, second and third contact portions are not superimposed on each other, and

said second contact portion and said TFT rate electrode portion are not superimposed on each other.

5,841,154
LIGHT-EMITTING DIODE DEVICE WITH REDUCED SCATTER

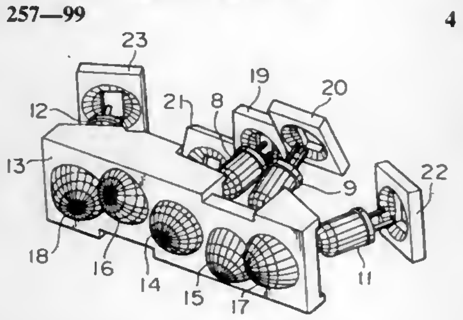
Masatoshi Uchio; Kazuyoshi Yamagata; Yuichi Umeda, all of Fukushima-ken, and Junichi Saito, Miyagi-ken, all of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Oct. 10, 1996, Ser. No. 731,376

Claims priority, application Japan, Oct. 17, 1995, 7-268741

Int. Cl.^{6} H01L *33/00*

U.S. Cl. 257—99 **4 Claims**



1. A light-emitting diode device comprising:

light-emitting diode having a light source covered by a light-emitting surface;

lens cap made of synthetic resin, for covering said light-emitting surface of said light-emitting diode;

a light-diffusion filter disposed on the front of said lens cap; and refractive layer formed between said light-emitting surface and said lens cap, said refractive layer having a composition with a refractive index different from the refractive index of said synthetic resin.

5,841,155
SEMICONDUCTOR DEVICE CONTAINING TWO JOINED SUBSTRATES

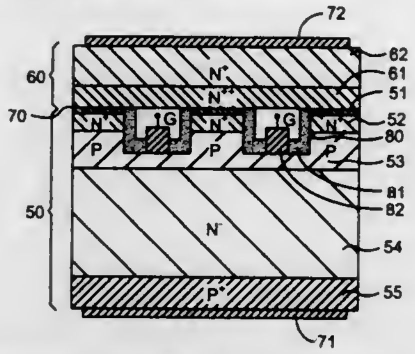
Yoshio Terasawa, Hitachinaka, Japan, assignor to NGK Insulators, Ltd., Japan

Filed Feb. 6, 1996, Ser. No. 597,228

Claims priority, application Japan, Feb. 8, 1995, 7-020416

Int. Cl.^{6} H01L *29/74*

U.S. Cl. 257—138 **6 Claims**



1. A joined-type semiconductor device comprising:

a first semiconductor substrate having a substrate body with a first impurity concentration, and first and second main surfaces which are opposed to each other, said first main surface having a gate structure formed therein;

a first main electrode formed on the second main surface of the first semiconductor substrate;

a second semiconductor substrate having a substrate body with a second impurity concentration, and first and second main surfaces which are opposed to each other, said first main surface having a highly-doped semiconductor layer formed therein, which has a third impurity concentration higher than the second impurity concentration of the substrate body, said first main surface of the second substrate being joined with said first main surface of the first substrate;

a second main electrode formed on said second main surface of the second substrate;and

a diffusion layer formed in the first main surface of the first substrate by thermal diffusion of impurity ions from said highly-doped semiconductor layer into said first main surface of the first substrate, said diffusion layer having impurity concentration higher than said first impurity concentration of the substrate body of the first substrate.

5,841,156
SEMICONDUCTOR DEVICE INCLUDING TI GAAS LAYER

Yasutomo Kajikawa, and Zempei Kawazu, both of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 22, 1997, Ser. No. 861,582

Claims priority, application Japan, Oct. 11, 1996, 8-270118

Int. Cl.^{6} H01L *31/0328;31/0336;31/072;31/109*

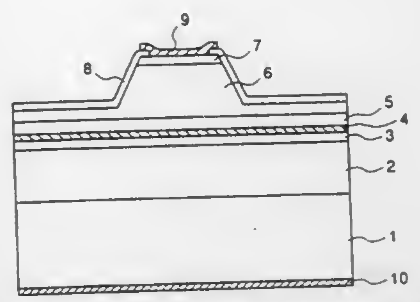
U.S. Cl. 257—183 **4 Claims**

1. A semiconductor device comprising:

a GaAs substrate having a first conductivity type and a lattice constant;

a first conductivity type lower cladding layer disposed on the GaAs substrate;

a TlGaAs active layer having a lattice constant larger than the lattice constant of the GaAs substrate and making a pseudomorphic lattice match with the GaAs substrate;



an upper cladding layer of a second conductivity type, opposite the first conductivity type, disposed on the active layer; and

a second conductivity type contact layer disposed on the upper cladding layer.

5,841,157
SEMICONDUCTOR INTEGRATED CIRCUIT INCLUDING A HIGH DENSITY CELL

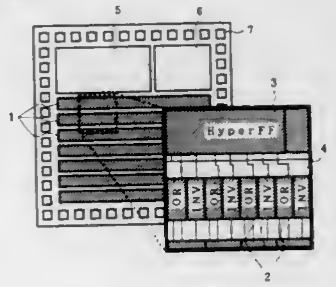
Hirofumi Kojima, and Yutaka Kamakura, both of Hyogo, Japan, assignors to Mitsubishi Electric Semiconductor Software Co., Ltd., Hyogo, and Mitsubishi Denji Kabushiki Kaisha, Tokyo, both of Japan

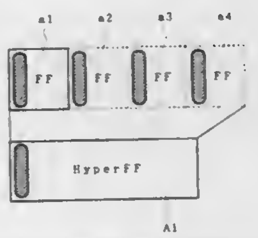
Filed Dec. 19, 1996, Ser. No. 772,050

Claims priority, application Japan, Jul. 23, 1996, 8-193392

Int. Cl.^{6} H01L *27/10*

U.S. Cl. 257—202 **4 Claims**





1. A semiconductor integrated circuit device comprising at least one high density cell including a single basic gate structure and a plurality of cells, each cell of the plurality of cells having an identical circuit configuration, and all of the plurality of cells sharing the basic gate structure, whereby the high density cell occupies less area than occupied by complete cells in the same number as the plurality of cells, each complete cell including a cell and an individual basic gate structure.

5,841,158
LOW-STRESS PHOTODIODE WITH REDUCED JUNCTION LEAKAGE

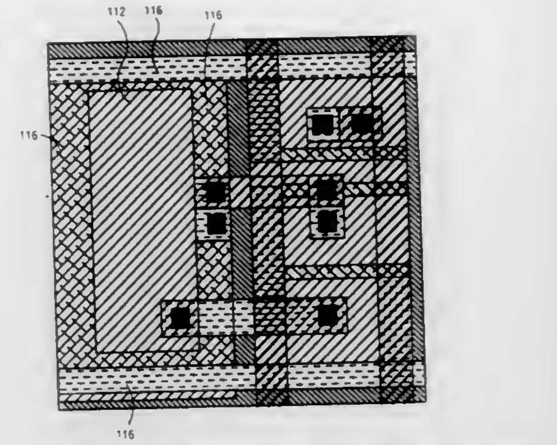
Richard Billings Merrill, Daly City, Calif., assignor to Foveonics, Inc., Cupertino, Calif.

Filed Mar. 1, 1996, Ser. No. 609,566

Int. Cl.^{6} H01L *27/148*

U.S. Cl. 257—233 **7 Claims**

1. A photodiode formed in a semiconductor substrate of a first conductivity type, the photodiode comprising:



a region of a second conductivity type formed in the substrate such that an upper surface of the region adjoins an upper surface of the substrate;

a layer of dielectric material formed over the upper surface of the substrate; and

a single layer of conductive material formed over the layer of dielectric material such that the single layer of conductive material is formed over the upper surface of the substrate that adjoins the upper surface of the region to enclose the region.

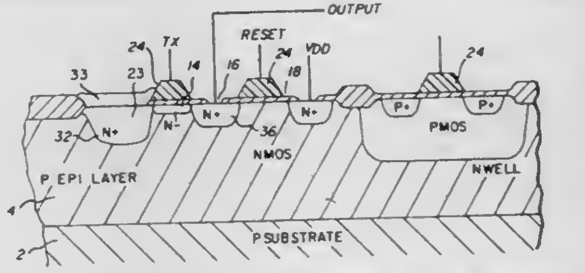
5,841,159
ACTIVE PIXEL SENSOR INTEGRATED WITH A PHOTOCAPACITOR

Paul P. Lee, Pittsford; Robert M. Guidash, Rush; Teh-Hsuang Lee, Webster, and Eric Gordon Stevens, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 421,173, Apr. 13, 1995, Pat. No. 5,625,210. This application Dec. 20, 1996, Ser. No. 770,414

Int. Cl.^{6} H01L *31/062;31/113*

U.S. Cl. 257—291 **13 Claims**



1. An active pixel image sensor comprising: a plurality of active pixels with at least one of the active pixels having as a light sensing means, at least one buried channel photocapacitor operatively coupled to CMOS control circuitry.

5,841,160
SEMICONDUCTOR DEVICE HAVING A CAPACITOR ELECTRODE MADE OF IRIDIUM

Takashi Nakamura, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Filed Apr. 25, 1996, Ser. No. 637,443

Claims priority, applicatioo Japan, Apr. 28, 1995, 7-105589

Int. Cl.^{6} H01L *29/76;29/00;23/48*

U.S. Cl. 257—295 **2 Claims**

1. A semiconductor device comprising:

a semiconductor substrate having a semiconductor element zone, said semiconductor substrate made of silicon;

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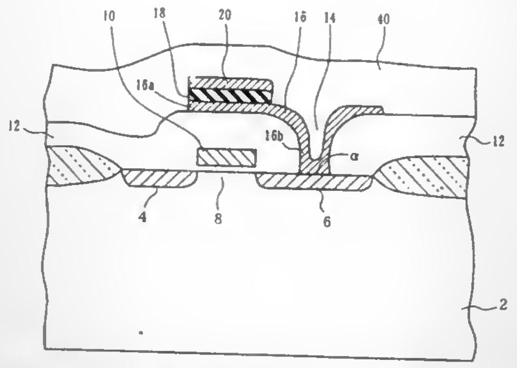


an insulation layer on said semiconductor substrate, said insulation layer having an opening so as to expose a part of said semiconductor element zone; and

a wiring section on said insulation layer, said wiring section comprising a barrier layer made of iridium oxide on said insulation layer and a main conducting layer made of iridium on said barrier layer, said barrier layer being connected to said semiconductor element zone.

5,841,161

FLASH MEMORY AND METHOD FOR FABRICATING THE SAME

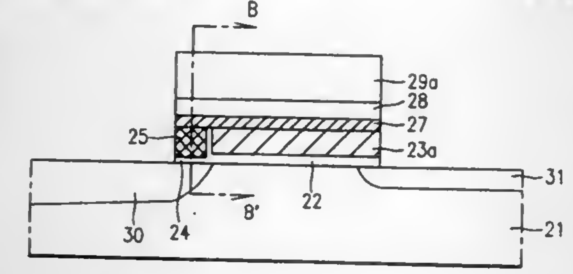
Min Gye Lim, and Eun Jeong Park, both of Chungcheongbuk-do, Rep. of Korea, assignors to LG Semicon Co., Ltd., Chungcheongbuk-do, Rep. of Korea

Filed Mar. 3, 1997, Ser. No. 807,979

Claims priority, application Rep. of Korea, Apr. 12, 1996, 1996 11064

Int. Cl.^{6} H01L *29/788*

U.S. Cl. 257—315 **14 Claims**



1. A flash memory comprising:

a substrate of a first conductivity-type having first and second impurity regions of a second conductivity-type spaced apart from each other;

a floating gate formed above said substrate, said floating gate having a first floating gate portion of said first conductivity-type formed partially over said first impurity region, and a second floating gate portion of said second conductivity-type formed over said second impurity region and said first floating gate portion;

an insulator structure disposed between said floating gate and said substrate;

a control gate formed above said floating gate on a side of said floating gate opposite from said substrate; and

a first insulating layer between said control gate and said floating gate.

5,841,162

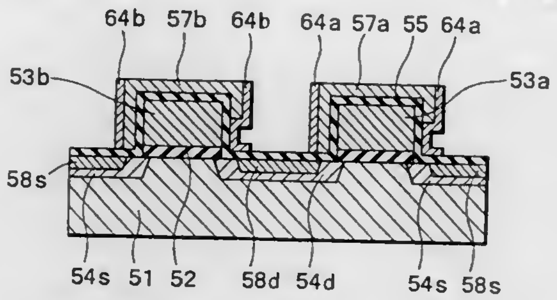
NON-VOLATILE SEMICONDUCTOR MEMORY WITH FLOATING GATE AND CONTROL GATE AND FABRICATION PROCESS THEREFOR

Shuichi Enomoto, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Mar. 24, 1997, Ser. No. 822,906

Int. Cl.^{6} H01L *29/788;29/792*

U.S. Cl. 257—315 **10 Claims**



1. A non-volatile semiconductor memory device with floating gate and control gate comprising:

a semiconductor substrate;

memory cells formed on said semiconductor substrates, each of said memory cells including,

a tunnel insulation layer selectively formed on the surface of said semiconductor substrate;

a floating gate formed on the surface of said tunnel insulation layer, said floating gate having an upper surface and a pair of side surfaces;

an insulation layer formed on said floating gate;

a control gate formed on said insulation layer only at the portion aligning said upper surface and at least a part of said side surfaces of said floating gate exposing a portion of said insulating layer formed on the side surfaces of said floating gate; and

a side control gate electrically connected to the control gate and formed on the sides of the control gate and on said exposed portion of said insulating layer aligned the side surfaces of said floating gate.

5,841,163

INTEGRATED CIRCUIT MEMORY DEVICES HAVING WIDE AND NARROW CHANNEL STOP LAYERS

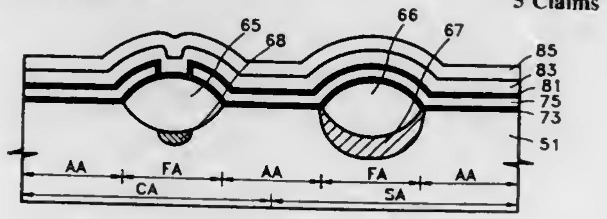
Kyung-joong Joo, Kyungki-do, and Jeong-hyuk Choi, Seoul, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Aug. 22, 1996, Ser. No. 701,627

Claims priority, application Rep. of Korea, Aug. 24, 1995, 1995-26502

Int. Cl.^{6} H01L *29/788;29/76;29/94*

U.S. Cl. 257—316 **5 Claims**



1. An integrated circuit memory device comprising:

a semiconductor substrate including a memory cell area and a select transistor area;

a first field insulation layer in said memory cell area;

a first channel stop impurity layer beneath said first field insulation layer, and which is narrower than said first field insulation layer;

a second field insulation layer in said select transistor area; and

a second channel stop impurity layer beneath said second field insulation layer, and which is wider than said second field insulation layer.

5,841,164

TEST STRUCTURE FOR DIELECTRIC FILM EVALUATION

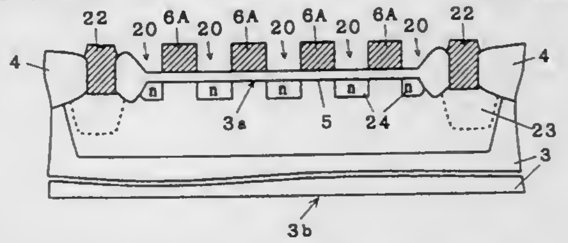
Mitsunori Tsujino, and Mikihiro Kimura, both of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 10, 1996, Ser. No. 630,454

Claims priority, application Japan, Oct. 30, 1995, 7-281223

Int. Cl.^{6} H01L *29/788;29/76;29/94;31/062*

U.S. Cl. 257—316 **18 Claims**



1. A dielectric film evaluating test structure, comprising:

a semiconductor substrate having one main surface and the other main surface;

a field oxide formed on said one main surface of said semiconductor substrate to surround a plurality of first regions on said one main surface;

a dielectric film formed in said at least one first region and having its end coupled with said field oxide; and

at least one gate electrode formed over said plurality of first regions and including an electrode material formed on said dielectric film;

wherein said at least one gate electrode has its shape determined by a plurality of openings formed on said dielectric film by etching said electrode material and a source, drain region is not formed under a part of said dielectric film exposed in the plurality of openings.

5,841,165

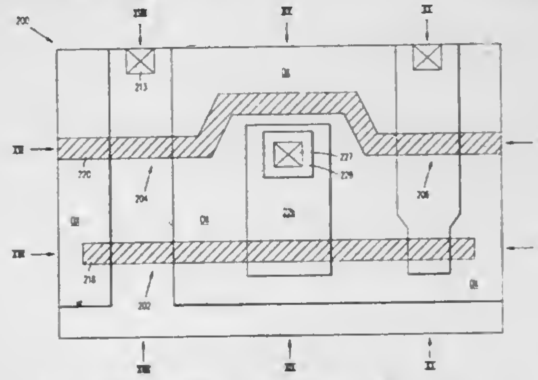
PMOS FLASH EEPROM CELL WITH SINGLE POLY

Shang-De Ted Chang, Fremont, and Jayson Giai Trinh, Milpitas, both of Calif., assignors to Programmable Microelectronics Corporation, San Jose, Calif.

Continuation-in-part of Ser. No. 560,249, Nov. 21, 1995. This application Dec. 22, 1995, Ser. No. 577,405

Int. Cl.^{6} H01L *29/788*

U.S. Cl. 257—318 **11 Claims**



1. A P-channel memory cell comprising:

a P+ source and a P+ drain formed in an N-well;

a channel extending between said source and said drain;

a floating gate overlying said channel;

a first P-type diffusion region formed in said N-well and underlying a first portion of said floating gate, said first P-type diffusion region serving as a control gate of said cell;

a second P-type diffusion region formed in said N-well and underlying a second portion of said floating gate, said second P-type diffusion region serving as an erase gate of said cell; and

a third P-type diffusion region formed in said N-well and underlying a third portion of said floating gate, said third P-type diffusion region serving as an additional erase gate of said cell.

5,841,166

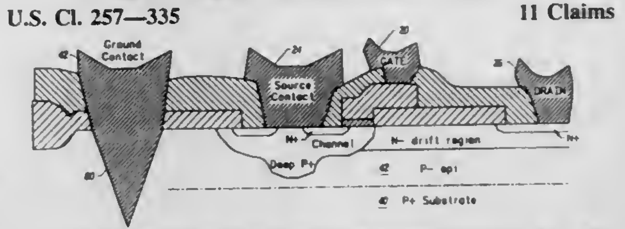
LATERAL DMOS TRANSISTOR FOR RF/MICROWAVE APPLICATIONS

Pablo E. D'Anna, Los Altos, and Francois Hébert, Sunnyvale, both of Calif., assignors to Spectrian, Inc., Sunnyvale, Calif.

Filed Sep. 10, 1996, Ser. No. 711,495

Int. Cl.^{6} H01L *29/76;29/94;31/062;31/113*

U.S. Cl. 257—335 **11 Claims**



1. An insulated gate field effect transistor (IGFET) for radio frequency and microwave applications comprising:

a semiconductor body including a substrate and an epitaxial layer on the substrate, the epitaxial layer having a surface,

a source region of first conductivity type formed in the epitaxial layer and abutting the surface,

a drain region of the first conductivity type formed in the epitaxial layer abutting the surface and spaced from the source region,

a channel region of second conductivity type formed in the epitaxial layer abutting the surface, the channel region having a width which abuts the source region and the drain region,

a sinker contact region extending from the surface through the epitaxial layer to the substrate, the sinker contact region being aligned with the source region and spaced beyond the width of the channel region, with no portion of the sinker contact region positioned between the source region and the channel region, and

an interconnect material interconnecting the source region and the sinker contact region.

5,841,167

MOS-TECHNOLOGY POWER DEVICE INTEGRATED STRUCTURE

Antonio Grimaldi, Mascalucia; Antonino Schillaci, Messina; Ferruccio Frisina, Sant'Agata Li Battiati, and Giuseppe Ferla, Catania, all of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, and Consorzio per la Ricerca sulla Microelettronica nel Mezzogiorno, Catania, both of Italy

Filed Dec. 23, 1996, Ser. No. 772,657

Claims priority, application European Pat. Off., Dec. 28, 1995, 95830542

Int. Cl.^{6} H01L *29/76;29/94;31/062;31/113*

U.S. Cl. 257—341 **47 Claims**

29. A power MOSFET comprising:

a semiconductor material layer of a first conductivity type that is lightly doped with dopants of the first conductivity type;

a first web structure of a second conductivity type formed in a first surface of the semiconductor material layer, the first web structure including the plurality of body portions of the second conductivity type formed in the semiconductor material

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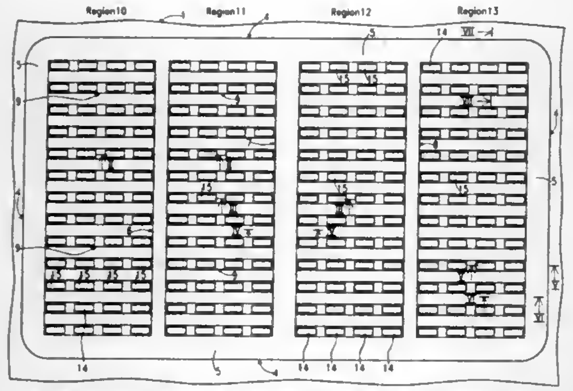


layer, at least one first portion of the second conductivity type formed in the semiconductor material layer extending in a direction substantially orthogonal to the plurality of body portions, and a frame portion of the second conductivity type formed in the semiconductor material layer and surrounding the plurality of body portions and the at least one first portion, the at least one first portion being merged with the frame portion at each end of the at least one first portion, some of the plurality of body portions having an end that is merged with the frame portion and some of the plurality of body portions having an end that is merged with the at least one first portion.

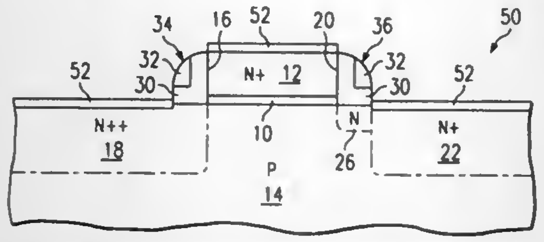
5,841,168
HIGH PERFORMANCE ASYMMETRICAL MOSFET STRUCTURE AND METHOD OF MAKING THE SAME

Mark I. Gardner, Cedar Creek; Fred Hause, and Daniel Kadosh, both of Austin, all of Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Division of Ser. No. 743,522, Nov. 4, 1996, Pat. No. 5,763,311. This application Sep. 19, 1997, Ser. No. 934,509

Int. Cl.^{6} H01L *29/76;29/94;31/062;31/113*

U.S. Cl. 257—344 **13 Claims**



1. A high performance asymmetrical field effect transistor (FET) device comprising:

a gate oxide and a gate electrode formed on a layer of semiconductor material of a first conductivity type, said gate electrode having a first side edge proximate a first region of said semiconductor material and a second side edge proximate a second region of said semiconductor material;

a lightly doped region of a second conductivity type extending at least between the second side edge and the second region in said semiconductor material; and

sidewall spacers proximate the first and second side edges of said gate electrode, each sidewall spacer including a composite of a first and a second spacer material, wherein the first region includes a source region having a first dopant concentration and the second region includes a drain region having a second dopant concentration, further wherein the first dopant concentration is greater than the second dopant concentration by an order of magnitude and the second dopant concentration is greater than the dopant concentration of the lightly doped region.

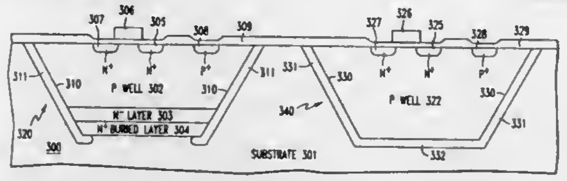
5,841,169
INTEGRATED CIRCUIT CONTAINING DEVICES DIELECTRICALLY ISOLATED AND JUNCTION ISOLATED FROM A SUBSTRATE

James Douglas Beasom, Melbourne Village, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Jun. 27, 1996, Ser. No. 671,243

Int. Cl.^{6} H01L *23/62;29/00*

U.S. Cl. 257—355 **27 Claims**



1. An integrated circuit comprising:

a semiconductor substrate of a first conductivity type; and

a plurality of islands comprising interconnected semiconductor devices, at least one of said islands comprising full dielectric isolation on sidewalls and bottom, and at least one other of said islands comprising dielectric sidewalls and junction bottom for providing a low thermal resistance island and to be junction isolated from said substrate.

5,841,170
FIELD EFFECT TRANSISTOR AND CMOS ELEMENT HAVING DOPANT EXPONENTIALLY GRADED IN CHANNEL

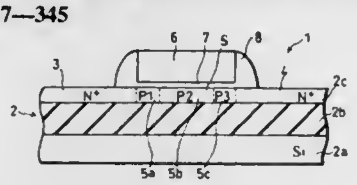
Alberto Oscar Adan, Ikoma, and Seiji Kaneko, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

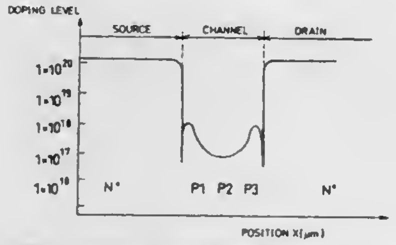
Filed Jan. 14, 1997, Ser. No. 782,251

Claims priority, application Japan, Apr. 25, 1996, 8-105915

Int. Cl.^{6} H01L *27/12;27/105;29/786*

U.S. Cl. 257—345 **25 Claims**





1. A field effect transistor comprising:

a channel region of a first conductivity type formed in a superficial semiconductor layer overlying an electrically insulating substrate;

a source region and a drain region of a second conductivity type different from said first conductivity type, said source and drain regions being disposed with said channel region therebetween;

a highly doped portion provided in said channel region at least in a section adjacent to said source region, said highly doped portion having a doping profile N(x) formed so that a concentration of impurities of said first conductivity type is substantially monotonically lowered toward a center portion of said channel region; and

a gate electrode insulated from said channel region by an electrically insulating layer,

wherein said doping profile N(x) substantially conforms to the expression:

$$N(x)=N_0+N_{B0}\cdot\exp\left[-(\eta\cdot x)^g\right]$$

where N_0 is a minimum doping level, N_{B0} is a maximum doping level, x is a displacement in μm from said highly doped portion toward said center portion of said channel region, g is a doping profile sharpness, and η is a doping profile gradient coefficient.

5,841,171
SOI SEMICONDUCTOR DEVICES

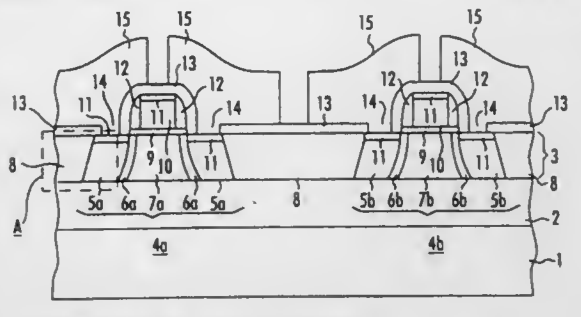
Toshiaki Iwamatsu; Takashi Ipposhi, and Yasuo Inoue, all of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 18, 1996, Ser. No. 746,951

Claims priority, application Japan, May 8, 1996, 8-113854

Int. Cl.^{6} H01L *29/00*

U.S. Cl. 257—347 **8 Claims**



1. A semiconductor device comprising:

a silicon wafer;

a buried oxide film formed on said silicon wafer;

a semiconductor active region formed on said buried oxide film;

an element isolating region contiguous with said active region formed on said buried oxide film; and

a nitrogen-containing region at the interface between said active region and said element isolating region.

5,841,172
SOI INPUT PROTECTION CIRCUIT

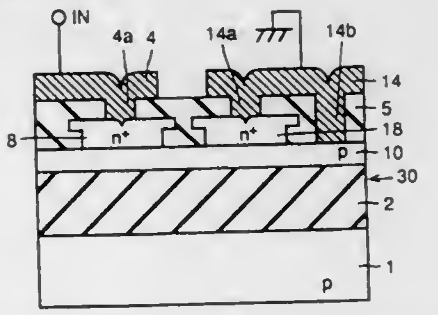
Fukashi Morishita, and Kazutami Arimoto, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 559,264, Nov. 15, 1995. This application Apr. 14, 1997, Ser. No. 833,200

Claims priority, application Japan, Jul. 6, 1995, 7-170832

Int. Cl.^{6} H01L *23/62*

U.S. Cl. 257—355 **8 Claims**



1. An SOI input protection circuit being provided between an input pad and an internal circuit, comprising:

an SOI substrate consisting of a silicon substrate, a buried oxide film being formed on said silicon substrate, and a first conductivity type silicon layer being formed on said buried oxide film;

a second conductivity type first conductive layer being provided on said silicon layer to be connected with said silicon layer;

a second conductivity type second conductive layer being formed in separation from said first conductive layer and provided on said silicon layer to be connected to said silicon layer;

a first wire being connected to said first conductive layer and having an end being connected to said input pad and another end being connected to said internal circuit; and

a second wire being connected to said second conductive layer,

an input voltage being limited by a punch through across said first and second conductive layers.

5,841,173
MOS SEMICONDUCTOR DEVICE WITH EXCELLENT DRAIN CURRENT

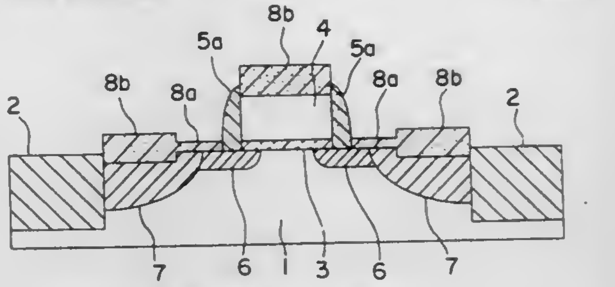
Kyoji Yamashita, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 13, 1996, Ser. No. 664,957

Claims priority, application Japan, Jun. 16, 1995, 7-150112

Int. Cl.^{6} H01L *29/76;29/94;31/062;31/113*

U.S. Cl. 257—384 **5 Claims**



1. A MOS semiconductor device, comprising:

a first conductivity type silicon layer having a main surface;

a gate insulating film selectively formed on said main surface of said silicon layer;

a gate electrode provided on the gate insulating film;

an insulating side wall formed on the side of said gate electrode; and

source/drain regions formed in said silicon layer;

wherein said source/drain regions comprise:

a first diffusion layer of second conductivity type formed in said silicon layer; and

a second diffusion layer of second conductivity type formed in said silicon layer on the outside of said first diffusion layer and having a PN-junction depth larger than that of said first diffusion layer;

wherein said MOS semiconductor device further comprises a conductive layer covering at least part of said first diffusion layer and at least part of said second diffusion layer;

wherein said conductive layer comprises a first part having a first thickness and a second part having a second thickness larger than said first thickness; and

said first part of said conductive layer covers said at least part of said second diffusion layer.

5,841,174
SEMICONDUCTOR APPARATUS INCLUDING SEMICONDUCTOR DEVICES OPERATED BY PLURAL POWER SUPPLIES

Norihisa Arai, Omiya, Japan, assignor to Kabushiki Kaisa Toshiba, Japan

Filed Oct. 5, 1995, Ser. No. 539,723

Claims priority, application Japan, Oct. 6, 1994, 6-242648

Int. Cl.^{6} H01L *29/76*

U.S. Cl. 257—392 **17 Claims**

1. A semiconductor apparatus comprising:

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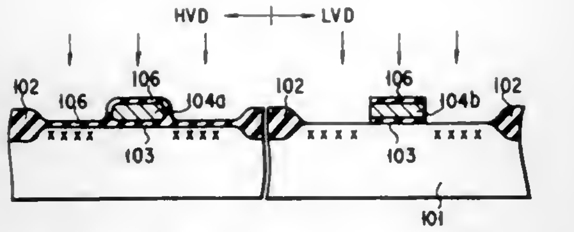


a device isolation insulating film, formed in a semiconductor substrate, for separating a surface region of the semiconductor substrate into a first region and a second region;

a first MOS transistor provided in said first region and supplied with a first power supply voltage, said first MOS transistor having a gate electrode insulated from said semiconductor substrate by a gate insulating film, and diffusion layers functioning as a source and a drain provided in said semiconductor substrate on both sides of the gate electrode, and said gate electrode having a bird's beak on an edge portion adjoining the semiconductor substrate; and

a second MOS transistor provided in said second region and supplied with a second power supply voltage lower than said first power supply voltage, said second MOS transistor having a gate electrode insulated from said semiconductor substrate by a gate insulating film, and diffusion layers functioning as a source and a drain provided in said semiconductor substrate on both sides of the gate electrode, said diffusion layers having a higher impurity concentration than the diffusion layers of said first MOS transistor, and said diffusion layers of said second MOS transistor being deeper than said diffusion layers of said first MOS transistor.

5,841,175
SEMICONDUCTOR DEVICE IN WHICH AN INCREASE IN THRESHOLD VOLTAGE, RESULTING FROM BACK-GATE BIAS EFFECT IS MITIGATED, AND METHOD OF MANUFACTURING THE SAME

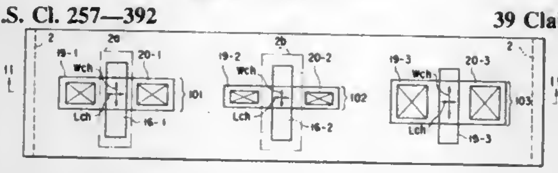
Soulchi Sugiura, Fishkill, N.Y., and Masaru Koyanagi, Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

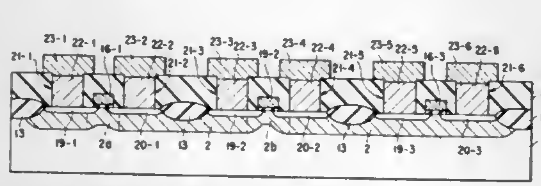
Continuation of Ser. No. 360,594, Dec. 21, 1994, abandoned. This application May 27, 1997, Ser. No. 863,601

Claims priority, application Japan, Dec. 27, 1993, 5-347246; Dec. 16, 1994, 6-313000

Int. Cl.^{6} H01L *29/78*

U.S. Cl. 257—392 **39 Claims**





1. A semiconductor device comprising:

a semiconductor substrate;

a well region of a first conductivity type formed in said semiconductor substrate, said well region including a first portion of the first conductivity type having a first surface impurity concentration and a second portion of the first conductivity type having a second surface impurity concentration higher than the first surface impurity concentration; and

insulated-gate field-effect transistors formed in said well region, each of said insulated-gate field-effect transistors having a channel region and the channel region of a first one of said insulated-gate field-effect transistors formed in said first portion of said well region and the channel region of a second one of said insulated-gate field effect transistors formed in said second portion of said well region.

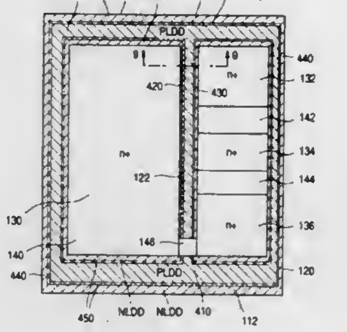
5,841,176
ACTIVE PIXEL SENSOR CELL THAT MINIMIZES LEAKAGE CURRENT

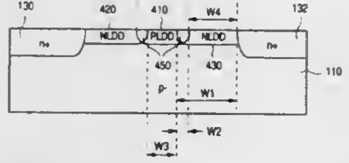
Richard Billings Merrill, Woodside, Calif., assignor to Foveonlcs, Inc., Cupertino, Calif.

Continuation-in-part of Ser. No. 664,191, Jun. 10, 1996, abandoned, which is a continuation-in-part of Ser. No. 609,566, Mar. 1, 1996. This application May 2, 1997, Ser. No. 850,604

Int. Cl.^{6} H01L *27/146;31/09;31/0352*

U.S. Cl. 257—446 **10 Claims**





1. An active pixel sensor cell formed on a semiconductor substrate of a first conductivity type, the cell comprising:

a plurality of spaced-apart active regions of a second conductivity type formed in the substrate, the active regions including a photodiode region and a row-select region, the photodiode and row-select regions each having a doping concentration;

a first isolation region of the second conductivity type formed in the substrate to adjoin the photodiode region, the first isolation region having a doping concentration substantially less than the doping concentration of the photodiode region;

a second isolation region of the first conductivity type formed in the substrate to adjoin the first isolation region, the second isolation region having a doping concentration which is approximately the same as the doping concentration of the first isolation region; and

a third isolation region of the second conductivity type formed in the substrate to adjoin the second isolation region and the row-select region, the third isolation region having a doping concentration which is approximately the same as the doping concentration of the first isolation region.

5,841,177
MULTICOLOR LIGHT EMITTING DEVICE

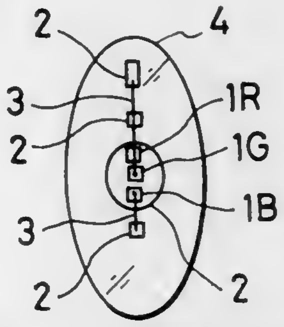
Satoshi Komoto, Tokyo; Toshiaki Tanaka, and Norio Fujimura, both of Fukuoka-ken, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 525,071, Sep. 8, 1995, abandoned, which is a continuation of Ser. No. 264,365, Jun. 23, 1994, abandoned. This application Jul. 10, 1997, Ser. No. 890,927

Claims priority, application Japan, Jun. 25, 1993, 5-155177

Int. Cl.^{6} H01L *27/14;31/00;33/00;27/15*

U.S. Cl. 257—431 **4 Claims**



1. A light emitting device, comprising:

a plurality of semiconductor light emitting elements aligned in a row for emitting at least two different colors of light;

a lead frame connected with said semiconductor light emitting elements for supplying electric energy to said semiconductor light emitting elements; and

a transparent molding for sealing said semiconductor light emitting elements and providing an exterior convex ellipsoidal surface through which the light rays of said at least two different colors are passed, a cross section of said molding containing said light emitting elements being an ellipse having a major axis parallel to said row of semiconductor elements and a minor axis perpendicular to said row of elements, said exterior convex ellipsoidal surface having a long radius of exterior surface curvature in the direction of the major axis and a short radius in the direction of the minor axis, thereby to provide a region of enhanced color mixture of the light rays passed through the exterior convex ellipsoidal surface corresponding to a ratio of the long radius to the short radius.

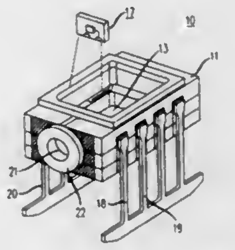
5,841,178
OPTICAL COMPONENT PACKAGE

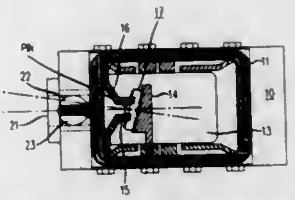
Timothy Butrie, Orefield; Mindaugas Fernand Dautartas, Alburtis, and Shaun P. Scrak, Souderton, all of Pa., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Oct. 4, 1996, Ser. No. 720,888

Int. Cl.^{6} H01L *31/0203*

U.S. Cl. 257—433 **7 Claims**





1. An optical package comprising a floor with integral sidewalls for housing an optical assembly, said package including an optical component assembly comprising:

a substrate including a first major surface and a second major surface, with at least one side surface therebetween, the first major surface including electrical connection leads and associated bond pad sites; and

an optical component bonded to the electrical connection leads on the first major surface; and

the package floor including electrical contact regions, the substrate attached to said package floor in a manner such that the one side surface is adjacent to said package floor and the substrate bond pad sites are solder bonded to the package floor electrical contact regions.

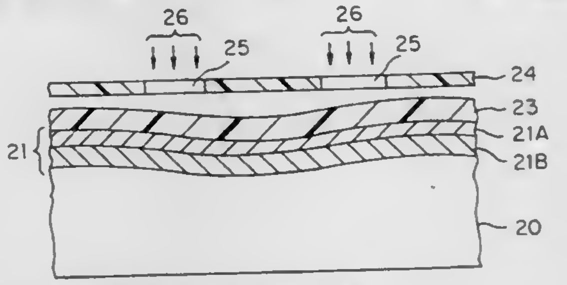
5,841,179
CONDUCTIVE LAYER WITH ANTI-REFLECTIVE SURFACE PORTION

Shekhar Pramanick, Fremont; Bhanwar Singh, Morgan Hill, and Che-Hoo Ng, San Martin, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Aug. 28, 1996, Ser. No. 704,162

Int. Cl.^{6} H01L *31/0236*

U.S. Cl. 257—437 **18 Claims**



1. A semiconductor device comprising:

a substrate;

an insulating layer formed on the substrate; and

a conductive layer having an upper surface and a lower surface formed above the insulating layer; wherein

the upper surface comprises an ion implanted, converted anti-reflective upper portion extending into the conductive layer, which anti-reflective upper portion is formed by ion implantation thereby altering the reflectivity and converting the upper surface of the conductive layer into the anti-reflective upper portion, and the reflectivity of the upper portion was reduced to less than about 50% of the reflectivity of the remainder of the conductive layer.

5,841,180
PHOTOELECTRIC CONVERSION DEVICE, METHOD OF DRIVING PHOTOELECTRIC CONVERSION DEVICE, AND SYSTEM HAVING THE DEVICE

Isao Kobayashi, Atsugi, and Noriyuki Kaifu, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 26, 1997, Ser. No. 824,333

Claims priority, application Japan, Mar. 27, 1996, 8-072501; Oct. 24, 1996, 8-282343

Int. Cl.^{6} H01L *31/00*

U.S. Cl. 257—448 **27 Claims**

1. A photoelectric conversion device, which has a photoelectric conversion element formed by stacking, on an insulating substrate, successively, a first electrode layer, a first insulating layer for blocking passage of both a carrier of a first type and a carrier of a second type having a different polarity from a polarity of the carrier of the first type, a photoelectric conversion semiconductor layer, an injection blocking layer for blocking injection of the carrier of the first type into said semiconductor layer, and a second electrode layer, comprising:

switch means for repetitively performing in a predetermined order, following three operation modes for applying an electric field to the individual layers of said photoelectric conversion element:

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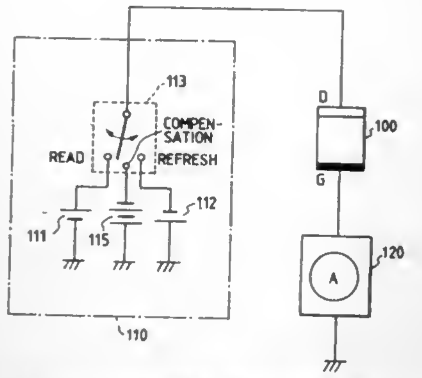


(1) a photoelectric conversion mode for producing and accumulating a charge in correspondence with an incident light amount;

(2) a refresh mode for refreshing the charge accumulated in said photoelectric conversion element; and

(3) a flat-band voltage shift restraining mode for restraining a shift of a flat-band voltage of said photoelectric conversion element.

5,841,181
SEMICONDUCTOR APPARATUS HAVING FIELD LIMITING RINGS

Kazuhisa Sakamoto, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

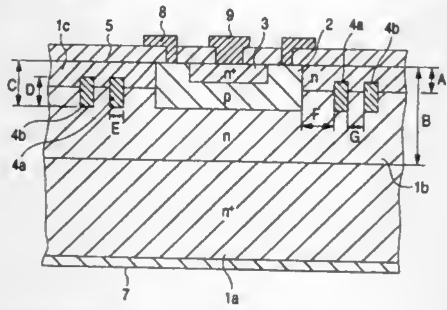
PCT No. PCT/JP96/00367, § 371 Date Sep. 20, 1996, § 102(e) Date Sep. 20, 1996, PCT Pub. No. WO96/26547, PCT Pub. Date Aug. 29, 1996

PCT Filed Feb. 19, 1996, Ser. No. 716,412

Claims priority, application Japan, Feb. 20, 1995, 7-031147

Int. Cl.^{6} H01L *23/58;27/082*

U.S. Cl. 257—487 **3 Claims**



1. A semiconductor apparatus comprising:
- a semiconductor layer of a first conduction type;
- a semiconductor region of a second conduction type provided in said semiconductor layer to form a semiconductor device;
- a field-limiting ring of a second conduction type provided external to a perimeter of said semiconductor region to improve the breakdown voltage;
- an epitaxial layer of the first conduction type on a surface of the semiconductor layer of the first conduction type and covering the entire surface of the semiconductor layer of the first conduction type but not covering the semiconductor region of the second conduction type; and
- an insulating layer covering a surface of the epitaxial layer and the semiconductor region of the second conduction type;
- whereby any field-limiting ring is spaced from said insulating layer by a layer of the first conduction type.

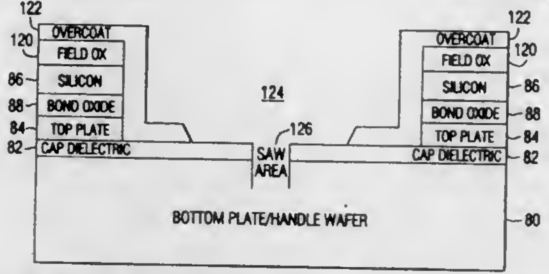
5,841,182
CAPACITOR STRUCTURE IN A BONDED WAFER AND METHOD OF FABRICATION

Jack Howard Linn, Melbourne, and Gregg Douglas Croft, Palm Bay, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Continuation of Ser. No. 326,037, Oct. 19, 1994, abandoned. This application Oct. 28, 1996, Ser. No. 741,639

Int. Cl.^{6} H01L *27/108;21/02*

U.S. Cl. 257—532 **23 Claims**



1. A bonded integrated circuit with an embedded capacitor comprising:
- a device substrate having an integrated circuit comprising a plurality of semiconductor devices;
- a handle substrate for supporting all of the devices in the device substrate and comprising a top surface doped to form a first capacitor plate;
- a capacitor comprising a capacitor dielectric on the first capacitor plate and a second capacitor plate on the capacitor dielectric; and
- a bonding layer over and between the capacitor and the device substrate for bonding the capacitor and the handle substrate to the device substrate so that the handle substrate supports all the devices in the device substrate.

5,841,183
CHIP RESISTOR HAVING INSULATING BODY WITH A CONTINUOUS RESISTANCE LAYER AND SEMICONDUCTOR DEVICE

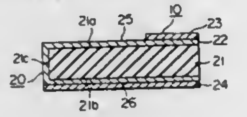
Shogo Ariyoshi, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Toyko, Japan

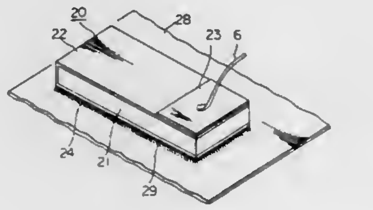
Filed Jun. 22, 1993, Ser. No. 79,735

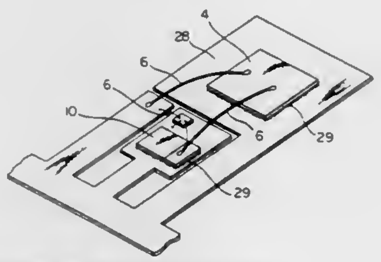
Claims priority, application Japan, Jun. 23, 1992, 4-165006

Int. Cl.^{6} H01L *29/00*

U.S. Cl. 257—536 **3 Claims**







3. A semiconductor device comprising:
- a lead frame including a plurality of leads;

- at least one electronic component mounted on a first of the leads of the lead frame;
- a chip resistor comprising:
  - a resistor body comprising an insulating substrate having first and second opposed major surfaces and side surfaces smaller in area than the first and second major surfaces and joining the first and second major surfaces;
  - a continuous resistance layer disposed on the first and second major surfaces and on at least one of the side surfaces of the insulating substrate;
  - a wire-bonding electrode for attachment of a wire by wire bonding, the wire-bonding electrode being disposed on and directly contacting the resistance layer at the first major surface of the insulating substrate; and
  - a soldering electrode for soldering to a metallic body, the soldering electrode being disposed on and directly contacting the resistance layer opposite all of the second major surface of the insulating substrate;
- a wire wire-bonded at a first end to the wire bonding electrode and connected at a second end to the electronic component; and
- solder connecting all of the soldering electrode to a second of the leads of the lead frame.

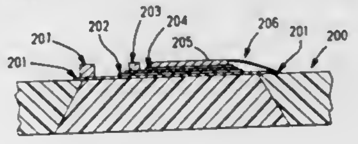
5,841,184
INTEGRATED EMITTER DRAIN BYPASS CAPACITOR FOR MICROWAVE/RF POWER DEVICE APPLICATIONS

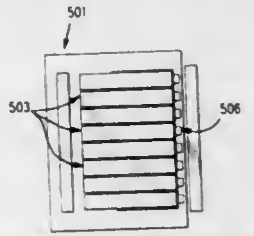
Ping Li, Nashua, N.H., assignor to The Whitaker Corporation, Wilmington, Del.

Filed Sep. 19, 1997, Ser. No. 933,644

Int. Cl.^{6} H07L *27/082*

U.S. Cl. 257—580 **10 Claims**





1. A bipolar junction transistor mounted on a HMIC substrate having a silicon pedestal electrically connected to ground. said bipolar junction transistor having a first emitter contact and a ballasting resistance connected thereto; and a second emitter contact connected to a bypass capacitance circuit disposed on said HMIC substrate.

5,841,185
SEMICONDUCTOR DEVICE HAVING CMOS TRANSISTORS

Akio Ishikawa, Tokyo, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan

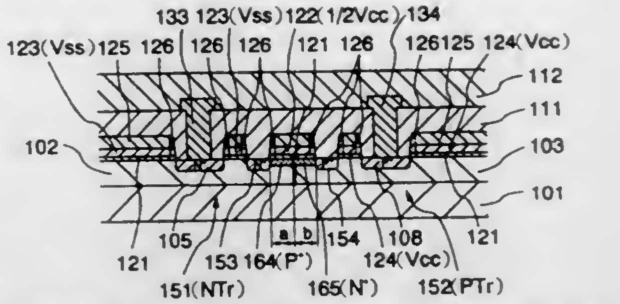
Filed Feb. 15, 1996, Ser. No. 601,799

Claims priority, application Japan, Feb. 17, 1995, 7-053247; Feb. 2, 1996, 8-040504

Int. Cl.^{6} H01L *23/58*

U.S. Cl. 257—630 **10 Claims**

1. A semiconductor device comprising:
- a semiconductor substrate having N- and P-channel regions formed therein, said N-channel region including an impurity of a first conductivity type and said P-channel region including an impurity of a second conductivity type different from said first conductivity type;



- at least one first transistor formed in said N-channel region and having a drain and a source;
- at least one second transistor formed in said P-channel region and having a drain and a source; and
- a field shield element-isolation structure having an insulation film formed on said semiconductor substrate and a single shield plate electrode formed on said insulation film, said field shield element-isolation structure being formed on said semiconductor substrate at a boundary region between said P- and N-channel regions for isolating said first and second transistors from each other;
- wherein said P-channel region has a first area disposed just below said field shield element-isolation structure and a second area other than said first area, said first area including the impurity of said second conductivity type at an impurity concentration higher than an impurity concentration in said second area, so that said element-isolation structure is in direct contact with said first area of said P-channel region and in direct contact with an area of said N-channel region including the impurity of said first conductivity type.

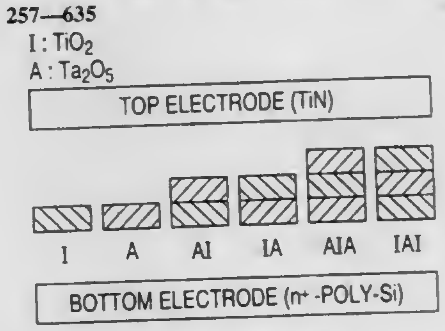
5,841,186
COMPOSITE DIELECTRIC FILMS

Shi-Chung Sun, Taipei, and Tsai-Fu Chen, Kaoshiung Hsien, both of Taiwan, assignors to United Microelectronics Corp., Taiwan

Filed Aug. 19, 1997, Ser. No. 912,867

Int. Cl.^{6} H01L *23/58*

U.S. Cl. 257—635 **8 Claims**



1. A composite dielectric film comprising:
- an n+ polysilicon phosphorus-doped bottom electrode formed using rapid thermal nitration in ammonia at about 900° C. for about 60 seconds;
- a titanium dioxide layer on the n^+ Polysilicon bottom electrode;
- a tantalum Pentaoxide layer on the titanium dioxide layer; and
- a top electrode over the tantalum pentaoxide layer.

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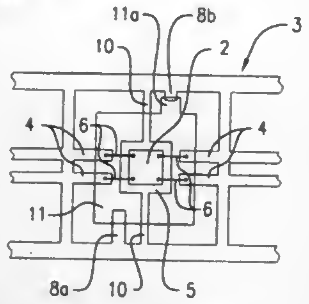
5,841,187
MOLDED ELECTRONIC COMPONENT

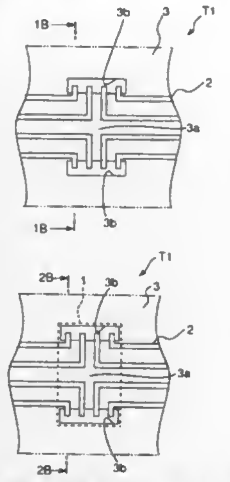
Syuichi Sugimoto, Siga; Shinji Nakamura; Motonari Fujikawa, both of Kyoto, and Yui Tada, Ibaragi, all of Japan, assignors to Omron Corporation, Kyoto, Japan
Continuation of Ser. No. 493,174, Jun. 21, 1995, abandoned. This application Mar. 27, 1997, Ser. No. 827,156
Claims priority, application Japan, Jun. 22, 1994, 6-164767
Int. Cl.^{6} H01L *23/495*
U.S. Cl. 257—666 **3 Claims**



1. An electronic component comprising
an electronic component element,
a connection terminal electrically connected with said electronic component element for connection with an external component,
a first conductive support member for supporting said electronic component element,
a second conductive support member substantially in a same plane as said first conductive support member,
a first insulating member for covering a surface of said electronic component element, said connection terminal, said first conductive support member and said second conductive support member,
said second conductive support member being insulated from said electronic component element and said first conductive support member, and supporting said first insulating member, and
a second insulating member for covering an exposed surface of said first conductive support member.

5,841,188
TAPE CARRIER STRUCTURE FOR A TAPE CARRIER PACKAGE

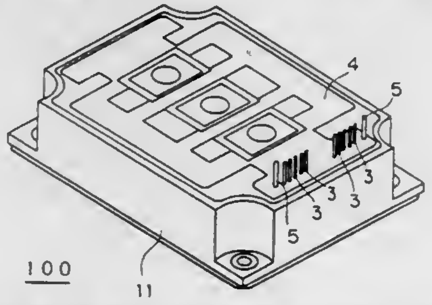
Yasuhiro Murasawa, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 24, 1995, Ser. No. 562,511
Claims priority, application Japan, Aug. 17, 1995, 7-209571
Int. Cl.^{6} H01L *21/56;21/58;21/60*
U.S. Cl. 257—668 **15 Claims**



1. A tape carrier structure for a tape carrier package on which at least one semiconductor chip is mounted, said tape carrier structure comprising:
a polyimide tape
leads joined onto said polyimide tape, an inner end of each of said leads being connected to one of a plurality of connecting portions of said semiconductor chip corresponding thereto,
said connecting portions being provided on a first surface of said semiconductor chip,
said polyimide tape covering the entire first surface of said semiconductor chip except at void portions aligned with said connecting portions.

5,841,189
SEMICONDUCTOR DEVICE AND MANUFACTURING METHOD THEREOF

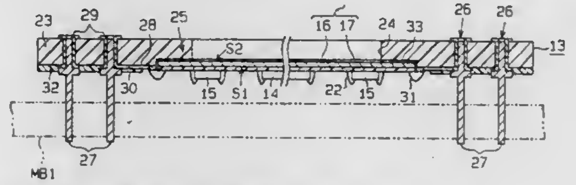
Eiju Shitama, Fukuoka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 5, 1995, Ser. No. 567,525
Claims priority, application Japan, May 31, 1995, 7-133985
Int. Cl.^{6} H01L *23/02;23/12;23/48;* **H01J** *5/00*
U.S. Cl. 257—678 **11 Claims**



1. A semiconductor device with structure in which a plurality of guide pins and at least one electroconductive signal pin project to the outside in parallel to one another, comprising:
a case in the form of a box having an opening at one end;
a lid which covers said opening; and
a circuit board fixed to said case and accommodated in an accommodation room formed inside with said case and said lid,
said plurality of guide pins and said at least one signal pin being fixed to said circuit board and projecting to said outside, passing through said lid.

5,841,190
HIGH DENSITY MULTI-LAYERED PRINTED WIRING BOARD, MULTI-CHIP CARRIER AND SEMICONDUCTOR PACKAGE

Kouta Noda; Tooru Inoue, and Benzhen Yuan, all of Gifu-Ken, Japan, assignors to Ibiden Co., Ltd., Ogaki, Japan
PCT No. PCT/JP95/00964, § 371 Date Feb. 23, 1996, § 102(e) Date Feb. 23, 1996
PCT Filed May 19, 1995, Ser. No. 601,046
Int. Cl.^{6} H0IL *23/28;23/12*
U.S. Cl. 257—678 **23 Claims**

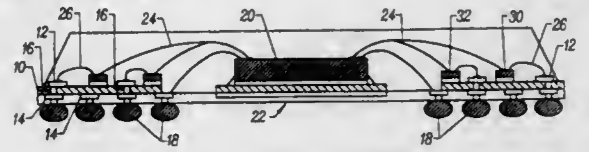


1. A multi-chip carrier assembly comprising:
a high density multi-layered printed wiring board including:
a substrate made of a material having a higher heat conductivity than that of resins;
a build-up layer formed on a first side of said substrate, said build-up layer being provided with interlayer insulations and conductive layers that are alternately laminated;

an electronic parts mounting area defined on a top surface of said build-up layer; and
a first plurality of I/O terminals provided, on the top surface of said build-up layer, at an area between said electronic parts mounting area and an edge of said substrate: and
a substrate supporter including:
a printed wiring board part consisting essentially of a resin material;
a window formed in said printed wiring board part and dimensioned for receipt of said high density multi-layered printed wiring board while a second side of said substrate, which is opposite to the first side of said substrate, is exposed from the window;
a plurality of bonding pads surrounding the window;
a second plurality of I/O terminals surrounding the group of said plurality of bonding pads; and
at least one conductive pattern for electrically connecting respective bonding pads and respective I/O terminals of said first plurality of I/O terminals.

5,841,191
BALL GRID ARRAY PACKAGE EMPLOYING RAISED METAL CONTACT RINGS

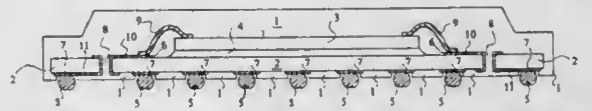
Chok J. Chia; Qwai H. Low, and Manlam Alagaratnam, all of Cupertino, Calif., assignors to LSI Logic Corporation, Milpitas, Calif.
Filed Apr. 21, 1997, Ser. No. 837,530
Int. Cl.^{6} H01L *23/52;23/48*
U.S. Cl. 257—691 **12 Claims**



1. An integrated circuit package comprising:
a substrate having a top surface, a bottom surface, a metal layer interconnect pattern, and a plurality of bonding pads on the top surface contacting the interconnect pattern,
at least one conductive ring mounted on the top surface of the substrate and having a bonding surface raised above the top surface,
an integrated circuit chip mounted on the top surface of the substrate, the chip having a plurality of bonding pads, and
a plurality of wire bonds interconnecting bonding pads on the integrated circuit chip to bonding pads on the top surface of the substrate and to the bonding surface of the conductive ring.

5,841,192
INJECTION MOLDED BALL GRID ARRAY CASING

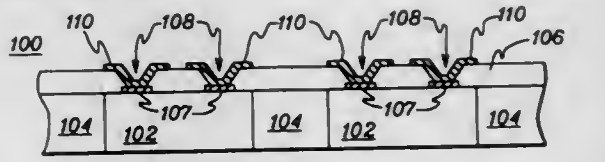
Juan Exposito, Saint Nazaire les Eymes, France, assignor to SGS-Thomson Microelectronics S.A., Saint Genis, France
Filed Jul. 13, 1995, Ser. No. 502,206
Claims priority, application France, Jul. 21, 1994, 94 09251
Int. Cl.^{6} H0IL *23/053*
U.S. Cl. 257—701 **32 Claims**



1. A casing for mounting an integrated circuit chip, the casing comprising:
an insulating plate having an upper surface for receiving the chip, a lower surface and a peripheral side surface extending between the upper and lower surfaces, the upper surface, the peripheral side surface and a periphery of the bottom surface each being at least partially coated with an epoxy resin that extends from the upper surface of the plate over the peripheral side surface and further extends from the peripheral side surface onto the periphery of the lower surface of the plate;
a plurality of connection balls disposed on the lower surface of the plate;
a plurality of coupling paths for respectively coupling the plurality of connection balls to the chip, each of the coupling paths including:
a first connection pad disposed on the upper surface of the plate and being couplable to the chip;
a second connection pad disposed on the lower surface of the plate and being coupled to a corresponding one of the plurality of connection balls; and
a metallized hole disposed in the plate and coupling the first and second connections pads,
wherein the epoxy resin coats the lower surface of the plate between the connection balls.

5,841,193
SINGLE CHIP MODULES, REPAIRABLE MULTICHIP MODULES, AND METHODS OF FABRICATION THEREOF

Charles William Eichelberger, Schenectady, N.Y., assignor to EPIC Technologies, Inc., Woburn, Mass.
Filed May 20, 1996, Ser. No. 650,628
Int. Cl.^{6} H01L *23/34*
U.S. Cl. 257—723 **30 Claims**



1. A multichip module comprising:
a plurality of chips, each chip comprising an unpackaged chip having at least one side surface, an upper surface, a lower surface, and at least one contact pad at said upper surface;
a structural material surrounding and physically contacting the at least one side surface of each chip of said plurality of chips and mechanically interconnecting in spaced, planar relation said plurality of chips, said structural material having an upper surface substantially co-planar with an upper surface of each chip of said plurality of chips to form a first substantially co-planar surface, said first substantially co-planar surface comprising a front surface, and such that a lower surface of said structural material is substantially parallel with a lower surface of each chip of said plurality of chips to form a second surface, said second surface comprising a back surface; and
an in situ processed layer disposed on said front surface, said in situ processed layer comprising a material different from said structural material mechanically interconnecting said plurality of chips, said in situ processed layer including via openings to at least some contact pads at the upper surfaces of said plurality of chips for electrical connection thereto.

5,841,194
CHIP CARRIER WITH PERIPHERAL STIFFENER AND SEMICONDUCTOR DEVICE USING THE SAME

Masahide Tsukamoto, Nara, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Mar. 14, 1997, Ser. No. 814,984
Claims priority, application Japan, Mar. 19, 1996, 8-063405
Int. Cl.^{6} H01L *23/06*
U.S. Cl. 257—729 **19 Claims**

7. A semiconductor device comprising a carrier substrate, a peripheral stiffener provided at the periphery of said carrier substrate, and a semiconductor chip mounted in a recess defined by said carrier substrate and said peripheral stiffener, where said carrier substrate comprises:

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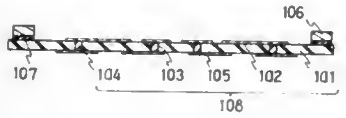
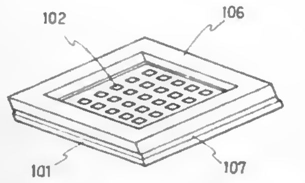
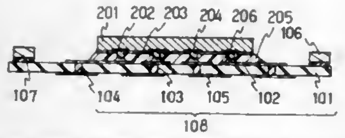






- a flexible insulating substrate containing aramid fiber as a reinforcer,
- first bonding pads formed on one face of said flexible insulating substrate, and
- second bonding pads formed on the other face of said flexible insulating substrate, said first bonding pads and said second bonding pads being electrically bonded to each other by via-holes punched in said flexible insulating substrate, wherein said peripheral stiffener is made of materials whose thermal expansion coefficient is sufficiently higher than that of said carrier substrate to resist warping of the carrier substrate due to temperature fluctuations.

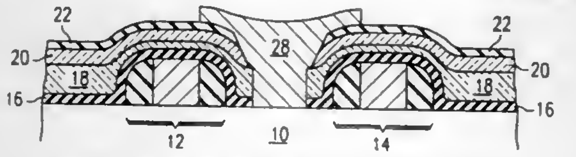
5,841,195
SEMICONDUCTOR CONTACT VIA STRUCTURE

Yih-Shung Lin, Carrollton; Lun-Tseng Lu, Grand; Fu-Tai Liou, Carrollton; Che-Chia Wei, Plano, and John Leonard Walters, Carrollton, all of Tex., assignors to STMicroelectronics, Inc., Carrollton, Tex.

Continuation of Ser. No. 71,561, Jul. 26, 1993, abandoned, which is a division of Ser. No. 832,088, Feb. 6, 1992, Pat. No. 5,246,883. This application May 24, 1995, Ser. No. 448,703

Int. Cl.^{6} H01L *23/532*

U.S. Cl. 257—774 **24 Claims**



1. A via structure in an integrated circuit comprising:
- a base layer;
- an undoped oxide layer overlying and in contact with the base layer;
- a planarization layer of a planarizing material overlying the undoped oxide layer;
- a first buffer layer overlying said planarization layer, the first buffer layer having a first level of dopants therein;
- a second buffer layer overlying the first buffer layer at a buffer junction, the second buffer layer having a second level of dopants therein, the second level of dopants in the second buffer layer being substantially higher than the first level of dopants in the first buffer layer, and the first and second levels of dopants being unequal at the buffer junction;
- an opening extending through the first buffer layer, the second buffer layer, the planarization layer and the undoped oxide layer, the opening exposing a portion of the base layer and the opening having an upper region at the first and second buffer layers having a gradually increasing diameter caused by the first and second buffer layers having a sloped profile at a less inclined angle than the profile of the opening of said undoped oxide layer and said planarization layer; and
- a conductive layer overlying portions of the second buffer layer and extending into the opening, and making electrical contact with the base layer.

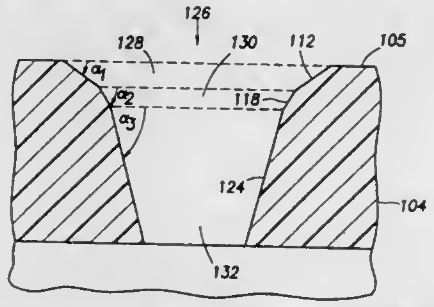
5,841,196
FLUTED VIA FORMATION FOR SUPERIOR METAL STEP COVERAGE

Subhash Gupta, Saratoga, Calif.; Robert Flores, Austin, Tex.; Michael Ross Stamm, Austin, Tex.; Eric Thomas Sharp, Austin, Tex.; Erich W. E. Denninger, Buda, Tex.; Pamela G. Dye; Joel Samuel Utz, both of Austin, Tex., and James K. Kai, San Francisco, Calif., assignors to Advanced Micro Devices, Inc.

Division of Ser. No. 696,774, Aug. 13, 1996, Pat. No. 5,746,884. This application Nov. 14, 1997, Ser. No. 970,314

Int. Cl.^{6} H01L *21/00*

U.S. Cl. 257—774 **5 Claims**



1. In a semiconductor device, an interlevel contact structure comprising:
- a first conductive layer formed on an upper surface of a semiconductor substrate;
- an interlevel dielectric layer formed on said first conductive layer wherein said interlevel dielectric layer includes a fluted via defined by an annular sidewall of said dielectric layer wherein said annular sidewall extends from an upper surface of said dielectric layer to an upper layer of said first conductive layer and wherein said annular sidewall includes a first stage sidewall extending from said upper surface of said dielectric layer to a second sidewall stage of said annular sidewall at an angle of less than 50° and further wherein said second sidewall stage extends from said first sidewall stage to a third sidewall stage at an angle of between 40° and 70° and wherein said third sidewall stage extends from said second sidewall stage to an upper surface of said first conductive layer at an angle of between 60° and 80°; and
- a second conductive layer formed on said inter-level dielectric and within said fluted via such that said second conductive layer contacts said first conductive layer.

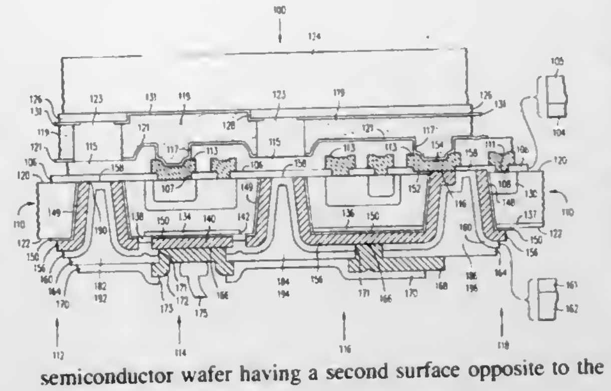
5,841,197
INVERTED DIELECTRIC ISOLATION PROCESS

Fred W. Adamic, Jr., 866 Willow Glen Way, San Jose, Calif. 95125

Continuation of Ser. No. 342,193, Nov. 18, 1994, abandoned. This application Sep. 5, 1996, Ser. No. 711,376

Int. Cl.^{6} H01L *23/48;23/52;29/40;29/00*

U.S. Cl. 257—777 **65 Claims**



1. A semiconductor structure comprising:
- a semiconductor wafer having a doped element layer upon which a plurality of semiconductor devices are laterally arranged on a first surface of the semiconductor wafer, the semiconductor wafer having a second surface opposite to the first surface;
- a thermally conductive bond layer forming a conformal bond with the first surface of the semiconductor wafer;
- a dielectric layer coupling the first surface to the bond layer;
- a support substrate coupled to the semiconductor wafer by the bond layer; and
- a plurality of empty isolation trenches extending from the second surface substantially to the dielectric layer overlying the first surface and enclosing and mutually electrically isolating the plurality of semiconductor devices, the empty isolation trenches being formed into the semiconductor wafer to remove all inactive regions so that only active regions in the semiconductor devices remain.

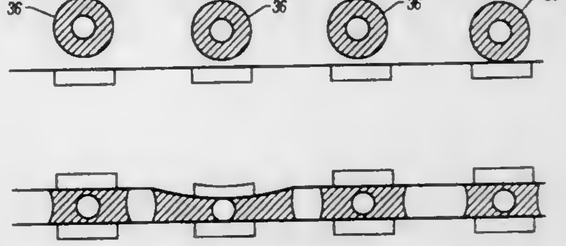
5,841,198
BALL GRID ARRAY PACKAGE EMPLOYING SOLID CORE SOLDER BALLS

Chok J. Chia, Cupertino; Patrick Variot, San Jose, and Maniam Alagaratnam, Cupertino, all of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed Apr. 21, 1997, Ser. No. 837,685

Int. Cl.^{6} H01L *23/48;23/52;29/40*

U.S. Cl. 257—780 **6 Claims**



1. A ball grid array package comprising:
- a substrate for mounting an integrated circuit chip on one surface thereof, said substrate having a plurality of wire bonding pads receiving wire bonds from said chip and a plurality of solder ball pads,
- an integrated circuit chip mounted on said substrate,
- a plurality of wire bonds interconnecting said chip and said wire bonding pads, and
- a plurality of solder balls for interconnecting said solder ball pads to pads on a mother board, said solder balls having central cores of an alloy of lead and tin having a higher melting point than solder material surrounding said cores, said central cores functioning as spacers between said substrate and the surface of a motherboard, and material encapsulating said integrated circuit chip and wire bonds on said substrate.

5,841,199
STRUCTURE OF SEMICONDUCTOR DEVICE

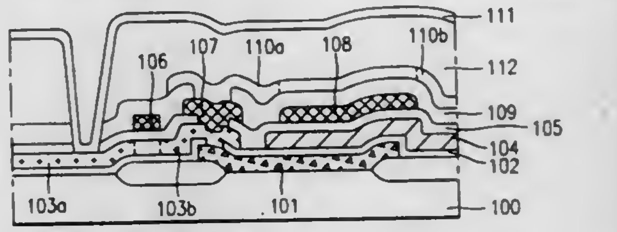
Hae Chang Yang, Chungcheongbuk-do, Rep. of Korea, assignor to LG Semicon Co., Ltd., Chungcheongbuk-do, Rep. of Korea

Filed Dec. 23, 1996, Ser. No. 771,983

Claims priority, application Rep. of Korea, Dec. 26, 1995, 1995 56317

Int. Cl.^{6} H01L *27/11*

U.S. Cl. 257—903 **4 Claims**



1. An SRAM comprising:
- a semiconductor substrate of a first conductivity type;
- a drive transistor formed on said substrate having a first gate insulating film formed between a first gate electrode and said substrate;
- first impurity regions formed in said substrate on opposite sides of said first gate electrode;
- an insulating film formed on the entire surface of said substrate and having a contact hole exposing a part of said first gate electrode;
- a first semiconductor layer formed on said insulating film and connected to said first gate electrode through said contact hole;
- a second gate insulating film formed on said first semiconductor layer and having a contact hole exposing a part of said first semiconductor layer;
- an access transistor formed on said substrate, said access transistor having a second gate electrode formed on said second gate insulating film;
- second impurity regions formed in said first semiconductor layer on opposed sides of said second gate electrode; and
- a load transistor coupled to a first one of said second impurity regions.

5,841,200
PROCESS FOR THE PRODUCTION OF NUCLEAR FUEL PELLETS BASED ON MIXED (U, PU)O_2 OXIDE WITH THE ADDITION OF AN ORGANIC, SULPHUR PRODUCT

Mireille Bauer, Manosque; Yves Marc, Aix eu Provence; Danielle DeMarc, Peyrolles, and Monique Seiss, Manosque, all of France, assignors to Commissariat a l'Energie Atomique, Paris, and Compagnie Generale des Matieres Nucleaires, Velizey Villacoublay, both of France

Filed Aug. 9, 1996, Ser. No. 689,521

Claims priority, application France, Aug. 25, 1995, 95 10088

Int. Cl.^{6} C21C *21/00;* **C01G** *57/00*

U.S. Cl. 264—0.5 **26 Claims**

1. Process for the production of nuclear fuel pellets based on mixed uranium and plutonium oxide having a specified plutonium content, from a UO_2 and PuO_2 powder charge by lubrification, pelletizing and sintering, in which the powder charge subject to lubrification, pelletizing and sintering is prepared by the following successive stages:

a) dosing a first mixture of UO_2 and PuO_2 powders having a plutonium content higher than the specified content, an organic, solid, sulphur product being incorporated into the mixture,

b) milling said first mixture of powders,

c) forced screening of said milled mixture through a screen having openings with a size equal to or smaller than 250 µm,

d) addition of a UO_2 powder to said first mixture of milled powders to obtain a second mixture of powders having the specified plutonium content and

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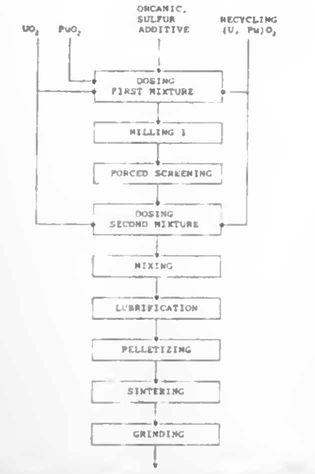


e) mixing the complete charge for collecting the powder charge which is to undergo the lubrification, pelletizing and sintering operations, characterized in that the solid, organic, sulphur product incorporated into the mixture during stage a) is a zwitterion and in that stage e) of mixing the charge is a simple stirring operation.

5,841,201

HYBRID VEHICLE DRIVE SYSTEM HAVING A DRIVE MODE USING BOTH ENGINE AND ELECTRIC MOTOR

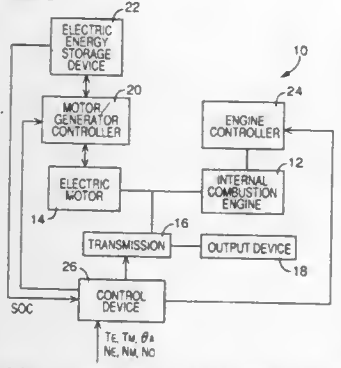
Atsushi Tabata, Okazaki; Yutaka Taga, Aichi-ken; Ryuji Ibaraki, Toyota; Tsuyoshi Mikami, Toyota, and Hiroshi Hata, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Feb. 24, 1997, Ser. No. 805,164

Claims priority, application Japan, Feb. 29, 1996, 8-042943; May 27, 1996, 8-132105

Int. Cl.^{6} H02P *9/04*

U.S. Cl. 290—40 C **12 Claims**



1. A hybrid drive system for a motor vehicle, comprising:

an engine operated by combustion of a fuel;

an electric energy storage device for storing an electric energy;

an electric motor operated with the electric energy stored in said electric energy storage device;

normal drive control means for controlling said engine and said electric motor so as to establish a normal drive state in which one of said engine and said electric motor is operated as a drive power source to drive the motor vehicle;

power drive control means for controlling said engine and said electric motor so as to establish a power drive state in which there is available a power drive mode in which both of said engine and said electric motor are operated as the drive power source to drive the motor vehicle;

power drive selecting means manually operated by an operator of the motor vehicle when the operator desires to drive the motor vehicle in said power drive mode; and

power drive restricting means for permitting said power drive control means to establish said power drive state if said power drive selecting means is not manually operated, and inhibiting said power drive control means from establishing said power drive state, to thereby inhibit the motor vehicle from being driven in said power drive mode, if said power drive selecting means is not manually operated.

5,841,202

EMI PREVENTION CIRCUIT FOR A CAR-MOUNTED ELECTRONIC CONTROL UNIT

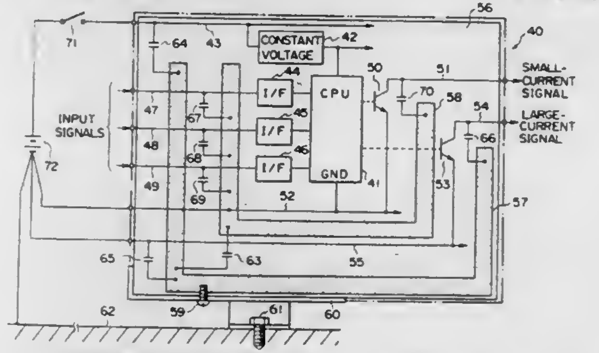
Yoichi Noguchi; Nobuo Sasagake, and Hiroshi Ohsawa, all of Higashimatsuyama, Japan, assignors to ZEXEL Corporation, Tokyo, Japan

Filed May 15, 1997, Ser. No. 856,580

Claims priority, application Japan, May 22, 1996, 8-150167

Int. Cl.^{6} F02P *15/00*

U.S. Cl. 307—10.1 **6 Claims**



1. An EMI prevention circuit for a car-mounted electronic control unit comprising;

a small-current ground line that is connected to a ground side of a car battery through which a small current flows;

a large-current ground line that is connected to the ground side of said car battery independently from said small-current ground line through which a large current larger than said small current flows;

a first ground pattern that is formed in a printed circuit board and is grounded to a car body through a metal case containing said printed circuit board, said large-current ground line being connected to said first ground pattern by way of a first EMI condenser; and

a second ground pattern that is formed in said printed circuit board electrically independent from said first ground pattern and is connected to said first ground pattern by way of a second EMI condenser, said small-current ground line being directly connected to said second ground pattern without using any EMI condenser in between to prevent a ground potential of said second ground pattern from fluctuating by fluctuations in a ground potential of said first ground pattern.

5,841,203

AUTOMATIC HEADLAMP ACTIVATION SYSTEM FOR MOTOR VEHICLES

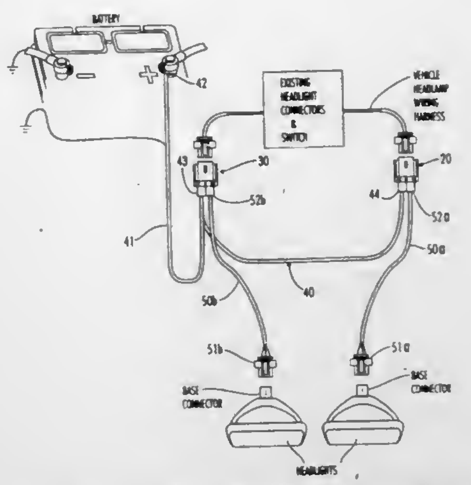
Kevin K. Chambers, P.O. Box 627, Anchor Point, Ak. 99556, and Robert A. Baker, 160 NW. 10th St., Cedaredge, Colo. 81413

Filed Apr. 24, 1995, Ser. No. 427,351

Int. Cl.^{6} B60Q *1/26*

U.S. Cl. 307—10.8 **25 Claims**

1. In a motor vehicle which has been factory equipped with an engine, a vehicle electrical and charging system, and having headlamps each attached to a standard factory supplied headlamp base, each headlamp base having a standard base connector for removably receiving a cable connector, a headlamp wiring harness having a harness connector which removably attaches to the headlamp base connector and electrically connects the headlamps to the vehicle electrical and charging system, and a battery having an ungrounded battery terminal, an automatic headlight activation system for retrofitting in the vehicle comprising:



a. a master module having a harness input connector means for mechanically and electrically connecting the activation system directly to the headlamp wiring harness through the harness connector on the headlamp wiring harness such that no modification of or splicing to the headlamp wiring harness or harness connector is required, a control circuit, and a control output;

b. a slave module having a control input and a first headlamp power output;

c. a control cable which electrically connects the master module control output to the slave module control input;

d. a first headlamp power output cable which electrically connects the first headlamp power output to at least one of the headlamps, the first headlamp power output cable including a first headlamp power output cable removable connector means for mechanically and electrically connecting the first headlamp power output cable directly to at least one of the headlamp base connectors such that no modification of or splicing to the headlamp base or base connector is required;

e. power input connector means for electrically connecting the vehicle electrical and charging system to the activation system; and

f. whereby the control circuit is integral to the master and slave modules and includes means to automatically activate the headlamps in response to operation of the vehicle engine.

5,841,204

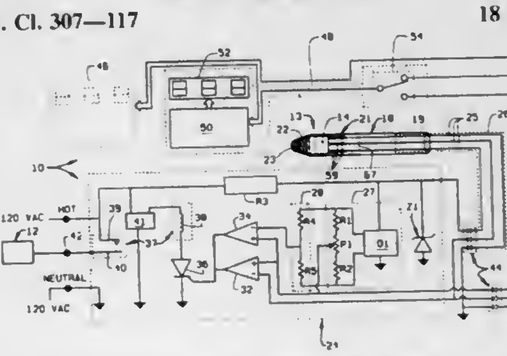
TEMPERATURE CONTROL SYSTEM AND METHOD

Larry G. English, 2625 Heritage Landing, St. Charles, Mo. 63303

Filed Mar. 21, 1997, Ser. No. 822,779

Int. Cl.^{6} H01H *37/00*

U.S. Cl. 307—117 **18 Claims**



1. A temperature control system for regulating the temperature of an external device, comprising:

a temperature sensing apparatus disposed in a heat transfer relationship with the external device for generating an output signal having a variable magnitude, the output signal being representative of the actual ambient temperature of the external device;

an adjustable signal generating circuit for generating a set point signal having a manually adjustable magnitude within a predetermined range, the set point signal being representative of a desired temperature for the external device;

a fixed reference signal generating circuit for generating a reference signal having a predetermined magnitude;

first comparison device for comparing the magnitudes associated with the set point signal and the output signal generated by the temperature sensing apparatus, the first comparison device generating an output signal having a first voltage level when the magnitude of set point signal is greater than or equal to the magnitude of the output voltage of the temperature sensing apparatus, and having a second voltage level when the magnitude of the set point signal is less than the magnitude of the output voltage of the temperature sensing apparatus;

second comparison device for comparing the magnitudes associated with the fixed reference signal and the set point signal, the second comparison device generating an output signal having a first voltage level when the magnitude of the set point signal is greater than or equal to the magnitude of the reference signal, and having a second voltage level when the set point signal is less than the reference signal; and

means for varying the temperature of the external device by selectively energizing and deenergizing the external device based upon the voltage levels associated with the first and second output signals, the temperature varying means energizing the external device when the output signals of the first comparison device and the second comparison device are at the first voltage levels, the temperature varying means deenergizing the external device when the output signals of the first comparison device or the second comparison device is at the second voltage level.

5,841,205

BRANCHING UNIT FOR UNDERWATER TELECOMMUNICATIONS SYSTEMS

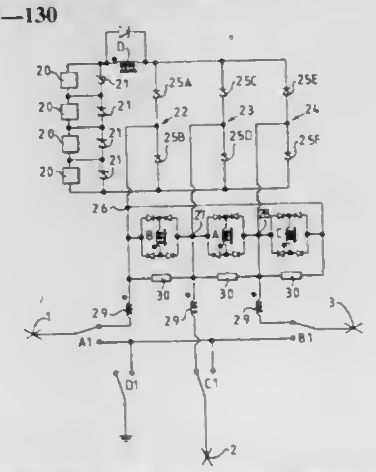
Stephen Michael Webb, London, England, assignor to STC Submarine Systems Limited, Great Britain

Filed Mar. 3, 1995, Ser. No. 397,964

Claims priority, application United Kingdom, Mar. 5, 1994, 9404271; Mar. 10, 1994, 9404631

Int. Cl.^{6} H04B *13/02*

U.S. Cl. 307—130 **12 Claims**



1. A branching unit for an underwater communications system, the unit providing remote hot switching for electrical power, comprising at least three terminations each for a different one of at least three line cables, one or more power demand circuits requiring an electrical power feed from the line cables a first switching circuit actuable based upon relative line cable voltage so as to complete a current path between an appropriate pair of the at least three terminations via said one or more power demand circuits, and a second switching means actuable after actuation of said first switching circuit based upon current supplied to the power demand circuit(s) rising above that which occurs upon actuation of said first

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switching circuit and effective to complete a circuit between the non-paired termination(s) and a fourth termination for a sea earth.

5,841,206

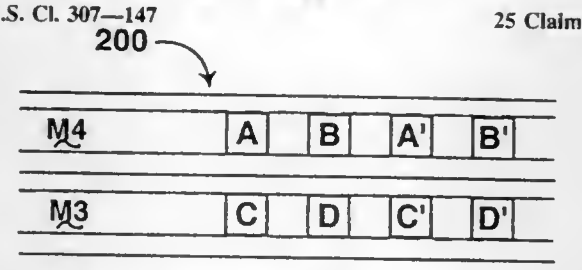
METHODS FOR WIRING ELECTRICAL SYSTEMS AND ELECTRICAL SYSTEMS WIRED TO REDUCE NOISE

Bassam J. Mohd, Sunnyvale, Calif., assignor to Sun Microsystems, Inc., Palo Alto, Calif.

Filed Dec. 3, 1996, Ser. No. 759,779

Int. Cl.⁶ H01B *11/02*

U.S. Cl. 307—147 **25 Claims**



1. A method for wiring an electrical system having a first bus and a second bus, the method comprising the acts of:

routing a wire A and a wire A' within the first bus:

routing a wire B between wires A and A' within the first bus to reduce noise on wire B, the wire B intended to transmit a first signal, the wire A intended to transmit a second signal, the wire A' intended to transmit a third signal associated with the second signal;

routing a wire C and a wire C' within the second bus:

routing a wire D between wires C and C' within the second bus to reduce noise on wire D, the wire D intended to transmit a fourth signal, the wire C intended to transmit a fifth signal, and the wire C' intended to transmit a sixth signal associated with the fifth signal;

arranging the first and second buses such that A is adjacent to C, B is adjacent to D, and A' is adjacent to C'; and

arranging the first bus to be substantially parallel with the second bus along a portion of a length of the second bus.

5,841,207

MODULAR TWO-COORDINATE PLANAR MOTOR

Nico Correns, Weimar; Jürgen Löbel, Jena, and Eckhard Wendorff, Suhl, all of Germany, assignors to Paslm Mikrosystemtechnik GmbH, Suhl, Germany

Filed Oct. 16, 1995, Ser. No. 543,596

Claims priority, application Germany, Oct. 17, 1994, 9-44-36-865.8

Int. Cl.⁶ H02K *1/12;41/00*

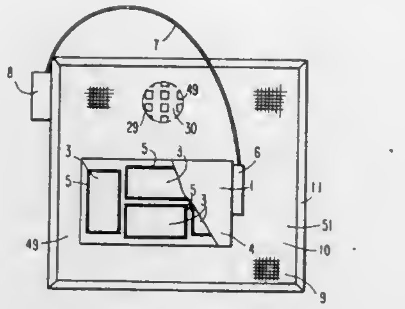
U.S. Cl. 310—12 **6 Claims**

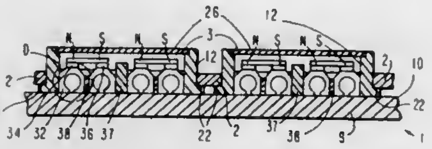
1. A modular planar motor, comprising:

a stator;

a mounting plate mounted on the stator and having a bottom surface and a plurality of openings therein, the openings having inner walls;

at least two modular components accommodated in the openings of the mounting plate, each of the modular components having a housing with an outer wall and a peripheral ridge extending from the outer wall so as to define an outer surface, at least one winding arranged in the housing, at least one air nozzle arranged in the housing so as to permit generation of an individual air gap between the modular component and a surface of the stator, wherein the housing, the openings, the bottom surface of the mounting plate and the outer surface of the peripheral ridge are configured so that an alignment and gluing gap is formed between the outer wall of the housing and the inner wall of a corresponding one of the openings, and between the outer surface of the peripheral ridge and the bottom surface of the mounting plate; and





an adhesive composition, which is slightly elastic and maintains elasticity after hardening, arranged to fill the alignment and gluing gap.

5,841,208

MOTOR CAPABLE OF GENERATING AN ELECTRIC SIGNAL HAVING A PARTICULAR AND PRECISE FREQUENCY AND A ROTARY MAGNETIC HEAD APPARATUS USING THE SAME

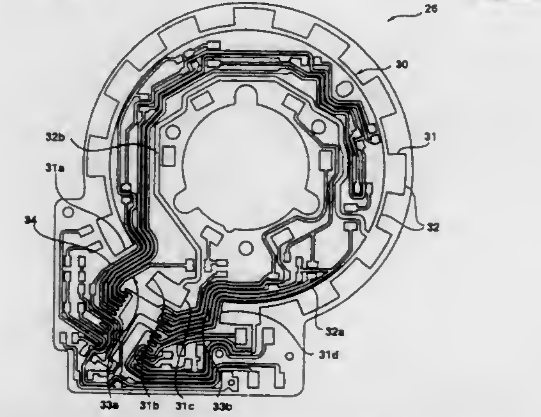
Hiroyuki Abe, Chiba, Japan, assignor to Sony Corporation, Japan

Filed Dec. 20, 1996, Ser. No. 770,905

Claims priority, application Japan, Dec. 22, 1995, 7-350644

Int. Cl.⁶ H02K *17/00*

U.S. Cl. 310—67 R **7 Claims**



1. A motor for generating an electric signal having a frequency, the motor comprising:

a rotor;

a stator;

a magneto disposed on said rotor, the magneto having alternately magnetized portions around a circumference thereof for creating a changing magnetic field when said rotor rotates;

a wiring pattern disposed on said stator opposite said magneto, wherein said signal is generated in said wiring pattern, said wiring pattern having a substantially square wave shape extending along a substantially circular line and forming two gaps in a spaced relationship along said substantially circular line, and wherein said wiring pattern is an electric path formed as a closed loop with no part of said electric path traversing said gaps.

5,841,209

DRIVING AXLE FOR AN INDUSTRIAL TRUCK

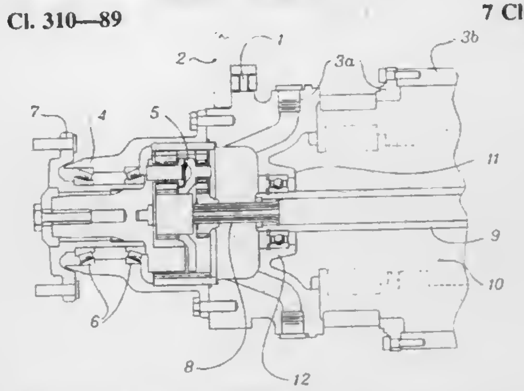
Matthias Appeldorn, Hamburg, Germany, assignor to Still GmbH, Germany

Filed Jul. 1, 1996, Ser. No. 674,156

Claims priority, application Germany, Jul. 5, 1995, 195 24 524.5

Int. Cl.⁶ H02K *5/00*

U.S. Cl. 310—89 **7 Claims**



1. An industrial truck comprising:

an axle housing (3*a*, 3*b*, 3*c*) having an exterior portion and an inside portion, said axle housing having mounting locations (**1**, **13**) disposed thereon;

a driving axle which is fixed to the industrial truck at at least two mounting locations and positioned within said inside portion of said axle housing;

a bearing bracket (**17**) detachably fixed to said axle housing;

an electric propulsion motor having at least one rotor disposed within said inside portion of said axle housing, said rotor of the propulsion motor being mounted rotatably at least at one axial end on said bearing bracket.

5,841,210

ELECTRIC DRIVE MOTOR WITH A COMPOUND BEARING ASSEMBLY

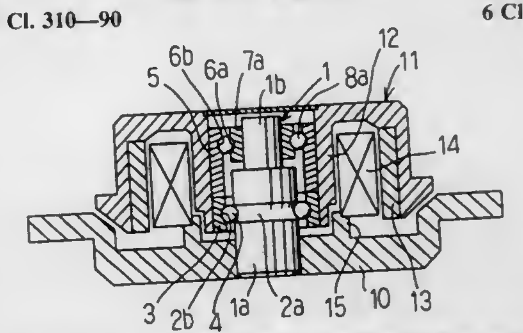
Rikuro Obara, Nagano-ken, Japan, assignor to Minebea Kabushiki-Kaisha, Nagano-ken, Japan

Filed Aug. 8, 1996, Ser. No. 694,232

Claims priority, application Japan, Aug. 9, 1995, 7-224761; Aug. 9, 1995, 7-224762

Int. Cl.⁶ H02K *5/16*

U.S. Cl. 310—90 **6 Claims**



1. An electric drive motor with a compound bearing assembly characterized in that:

an annular inner raceway groove (**2***a*) is directly formed in an outer peripheral surface of a large-diameter portion (**1***a*) of a stepped-diameter shaft (**1**) provided with said large-diameter portion (**1***a*) and a small-diameter portion (**1***b*);

a plurality of first balls (**4**) are rotatably mounted between said inner raceway groove (**2***a*) and an annular outer raceway groove (**2***b*) formed in an inner peripheral surface of a first short outer race ring (**3**) disposed over said large-diameter portion (**1***a*) of said stepped-diameter shaft (**1**);

a plurality of second balls (**8***b*) are rotatably mounted between an inner race ring (**7***a*) and a second short outer race ring (**7***b*) in a ball bearing unit (**7**);

a sleeve-like spacer (**16**) is sandwiched between said second short outer race ring (**7***b*) and said first short outer race ring (**3**) over said large-diameter portion (**1***a*) of said stepped-diameter shaft (**1**);

said inner race ring (**7***a*) of said ball bearing unit (**7**) is fixedly mounted on said small-diameter portion (**1***b*) of said stepped-diameter shaft (**1**) in an insertion manner;

whereby a compound bearing assembly is assembled;

said compound bearing assembly has a base-end portion of said large-diameter portion (**1***a*)of said stepped-diameter shaft (**1**) fixedly mounted on a base member (**10**) of a motor at right angles to permit said stepped-diameter shaft (**1**) to extend upward; and

said compound bearing assembly is fixedly mounted in a central hub portion (**12**) of a rotor (**11**) of said motor in an insertion manner to complete an electric drive motor with said compound bearing assembly.

5,841,211

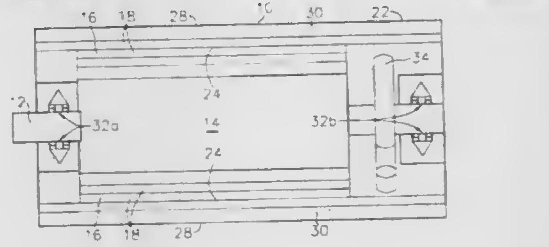
SUPERCONDUCTING GENERATOR AND SYSTEM THEREFOR

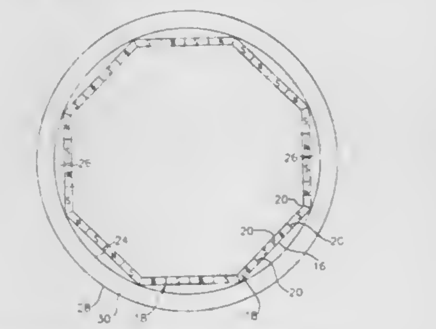
Thomas G. Boyes, 4772 Big Draw Dr., Las Vegas, Nev. 89031

Continuation-in-part of Ser. No. 275,365, Jul. 15, 1994, abandoned, and Ser. No. 365,703, Dec. 29, 1994, abandoned. This application Sep. 6, 1996, Ser. No. 709,511

Int. Cl.⁶ H02K *9/00*

U.S. Cl. 310—90 **9 Claims**





1. A superconducting generator comprising:

(i) a shaft;

(ii) an armature mounted on the shaft for rotation therewith;

(iii) a stator including a plurality of rare earth permanent magnets stacked in alternating polarity with intervening Type II superconducting filament rods;

(iv) a cryogenic housing for the armature and stator;

(v) superconducting bearing means to levitate the shaft for rotation;

(vi) means for maintaining said housing at substantially a critical temperature T_C;

(vii) an asymmetric flywheel coupled to the shaft to maintain rotation of the shaft;

(viii) means for imparting rotation to the shaft; and

(ix) an evacuated cryogenic housing enclosing the armature, stator, superconducting bearing means and flywheel, said superconducting bearing means adapted to journal and levitate the shaft for rotation within the housing.

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5,841,212
PERMANENT MAGNET FIELD TYPE ROTATING MACHINE

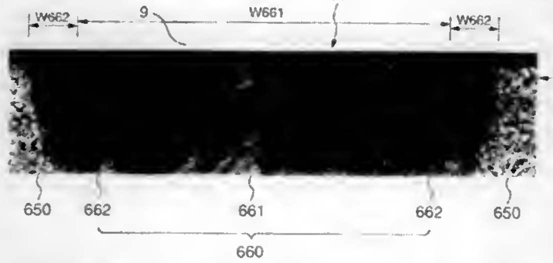
Masahiro Mita, and Takashi Sasaki, both of Fukaya, Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Apr. 8, 1997, Ser. No. 833,624

Claims priority, application Japan, Apr. 15, 1996, 8-092631

Int. Cl.⁶ H02K *21/14*

U.S. Cl. 310—156 **6 Claims**



1. A permanent magnet field type rotating machine comprising an inner magnet type rotor whose rotor core has a plurality of permanent magnets mounted therein, wherein said rotor core is made of a single chemical composition material comprising ferromagnetic and nonmagnetic zones, said nonmagnetic zones including a remolten and solidified metal structure and a non-melting heat treatment metal structure, and being present at portions of said rotor core where leakage flux is produced.

5,841,213

Patent Not Issued For This Number

5,841,214
IDENTIFICATION MARK OPERATING WITH ACOUSTIC SURFACE WAVES

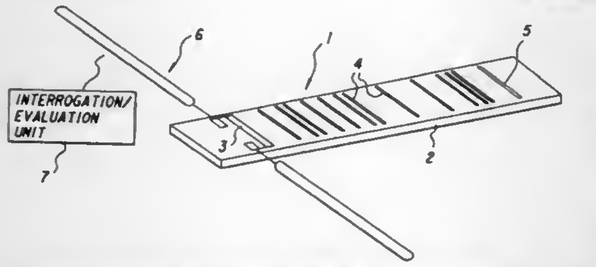
Frank Schmidt; Valentin Mágori, both of München; Leonhard Reindl, Stephanskirchen, and Thomas Ostertag, Ulm, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 22, 1996, Ser. No. 701,492

Claims priority, application Germany, Feb. 22, 1994, 4405647.8

Int. Cl.⁶ G01S *13/80*

U.S. Cl. 310—313 D **3 Claims**



1. In an identification system having an identification mark or ID tag operating with acoustic surface waves, and an interrogation/evaluation unit interrogating the identification mark with a wirelessly transmitted interrogation signal and evaluating an encoded response signal sent back from the identification mark, the identification mark, comprising:

ID tag reflectors having a reflectivity and having a number and position defining an encoding of the response signal; and

at least one further reflector having greater reflectivity than the reflectivity of said reflectors defining the encoding, said at least one further reflector receiving an interrogation pulse and returning an echo pulse within an assigned time window for identifying a presence of the ID tag, said at least one further reflector responding to the interrogation pulse having an energy level below a threshold level of interrogation by said ID tag reflectors.

5,841,215
CONTROL APPARATUS FOR VIBRATION WAVE MOTOR

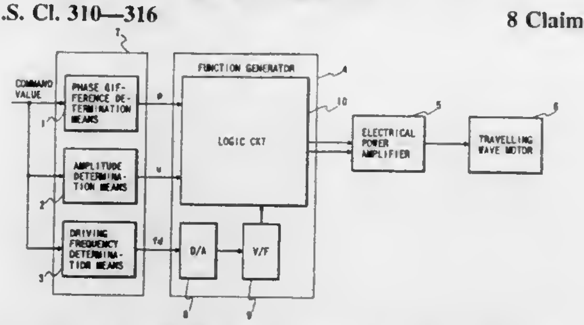
Hiroaki Takeishi, Utsunomiya, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 526,410, Sep. 12, 1995, abandoned. This application Nov. 12, 1997, Ser. No. 962,889

Claims priority, application Japan, Sep. 14, 1994, 6-220044

Int. Cl.⁶ H02N *2/00*

U.S. Cl. 310—316 **8 Claims**


7
COMMAND VALUE
PHASE DIFFERENCE DETERMINATION MEANS
AMPLITUDE DETERMINATION MEANS
DRIVING FREQUENCY DETERMINATION MEANS
1
2
3
φ
V
fd
FUNCTION GENERATOR
4
10
LOGIC CKT
D/A
V/F
8
9
5
ELECTRICAL POWER AMPLIFIER
6
TRAVELLING WAVE MOTOR

1. A control apparatus for a vibration wave driving device, which apparatus outputs two-phase driving signals to driving electro-mechanical energy conversion elements in the vibration wave driving device for generating two-phase standing waves in an elastic member by applying two-phase driving signals to the driving electro-mechanical energy conversion elements, and exciting an elliptic motion in surface particles of a driving surface of the elastic member, comprising:

(a) first compensation means for receiving an arbitrary real number value as an input, and determining a phase difference between the two-phase driving signals;

(b) second compensation means for receiving the same real number value as the real number value inputted to said first compensation means, and determining an amplitude of the two-phase driving signals; and

(c) third compensation means for receiving the same real number value as the real number value inputted to said first and second compensation means, and determining a frequency of the two-phase driving signals.

5,841,216
COMPOSITE PIEZOELECTRIC MULTILAYER ELEMENT AND METHOD OF MANUFACTURING SUCH AN ELEMENT

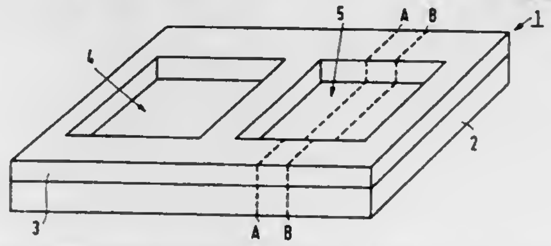
Benedictus C. H. Fransen; Bauke Oppedijk, and Henricus A. C. Didden, all of Roermond, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 21, 1997, Ser. No. 784,674

Claims priority, application European Pat. Off., Jan. 18, 1996, 96200122

Int. Cl.⁶ H01L *41/04*

U.S. Cl. 310—328 **4 Claims**



1. A composite piezoelectric multilayer element of which, in operation, only a part is piezoelectrically active, characterized in that the piezoelectrically inactive part has a larger dimension in a direction normal to the layers than the part which, in operation, is piezoelectrically active when a voltage is applied across the electric connections of the element, and in that the inactive part is built up of ceramic foils and electrode layers whose thickness and composition correspond to the thickness and composition of the part of the element which, in operation, is piezoelectrically active.

5,841,217
SURFACE MOUNTING CRYSTAL UNIT

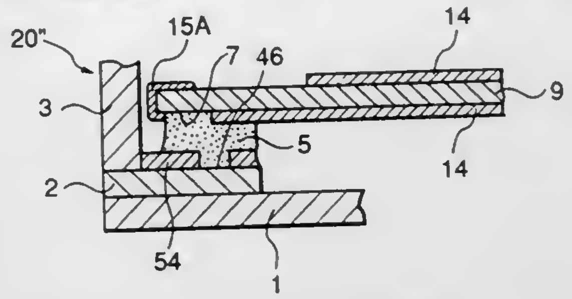
Shigeru Kizaki, Hanno; Yoshikazu Sakaguchi, Niiza; Hachiro Kimura; Kazuo Murata, both of Sayama; Issei Nakayama, Tokorozawa; Takamasa Tanaka, Nagano, and Toshihide Ohi, Saku, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Mar. 12, 1997, Ser. No. 815,710

Claims priority, application Japan, Mar. 14, 1996, 8-056596

Int. Cl.⁶ H01L *41/08*

U.S. Cl. 310—348 **11 Claims**



1. A surface mounting crystal unit comprising:

a quartz plate;

a terminal member resembling a receptacle and holding the quartz plate inserted from an opening thereof so as to be able to oscillate the quartz plate therein, said terminal member having quartz plate fixture mounts, one of said quartz plate fixture mounts disposed on each of two ends of said terminal member, said quartz plate fixture mounts having electrode pads; and

a lid covering the opening of the terminal member,

said quartz plate being formed in the shape of a rectangular parallelepiped by cutting in the direction of an AT cut relative to a crystallographic axis and disposed such that one or both of shorter sides thereof at the opposite longitudinal ends are fixedly attached on one or both of quartz plate fixture mounts in said terminal member by use of one of a silicone-based, urethane-based, or polymide-based electrically conductive adhesive of high plasticity,

said electrode pads being provided with non-pad portions each formed in the shape of a square or circle in the middle part or on the edge thereof so that the quartz plate is fixedly attached to one or both of the quartz plate fixture mounts by adhering said electrically conductive adhesive to both the electrode pads and the non-pad portions, and

said lid being airtighly bonded to the opening of the terminal member with use of a solder composed of one of an alloy made of gold and tin, an alloy made of lead, silver, and tin, or an alloy made of lead and tin, the terminal member airtightly sealed being vacuumized.

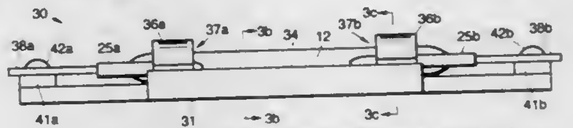
5,841,218
LASER HEAD HAVING A CONDUCTIVELY COOLED FLASHLAMP

Eduard Gregor, Pacific Palisades; Tzeng S. Chen, Rancho Palos Verdes; Mario P. Palombo, Manhattan Beach, and James S. Sorce, Torrance, all of Calif., assignors to Hughes Electronics, Los Angeles, Calif.

Filed Feb. 20, 1996, Ser. No. 603,670

Int. Cl.⁶ H01J *1/02;7/24;* **H01K** *1/58*

U.S. Cl. 313—46 **20 Claims**



1. A conductively cooled flashlamp (**30**) characterized by:

an elongated heat sink that has a reflective channel (**32**) formed in a center portion thereof;

a flashlamp tube (**12**) having an outer envelope (**34**) disposed in the channel (**32**) and having its respective ends extending beyond the center portion of the channel (**32**);

first and second heat conducting gaskets (**37***a*, **37***b*) disposed around respective ends of the envelope (**34**) of the flashlamp tube (**12**), and which separate the flashlamp tube (**12**) from the center portion of the heat sink (**31**) to provide an air gap (**35**) therebetween;

first and second clamps (**36***a*, **36***b*) that contact the gaskets (**37***a*, **37***b*) to secure the envelope (**34**) of the flashlamp tube (**12**) to the heat sink (**31**);

first and second electrodes (**25***a*, **25***b*) disposed at respective distal ends of the flashlamp tube (**12**) that extend a short distance longitudinally along an axis the tube (**12**) away from the ends of the tube (**12**);

electrically conductive wires **38***a*, **38***b* connected to the respective electrodes (**25***a*, **25***b*) that extend longitudinally further along the axis the tube (**12**) away from the respective electrodes (**25***a*, **25***b*) and beyond the distal ends of the heat sink (**31**);

first and second heat conducting, electrically insulating heat sink members (**41***a*, **41***b*) disposed at opposite distal ends of the heat sink (**31**); and

first and second wire clamps **42***a*, **42***b* for securing the respective wires **38***a*, **38***b* to the heat conducting, electrically insulating heat sink members (**41***a*, **41***b*).

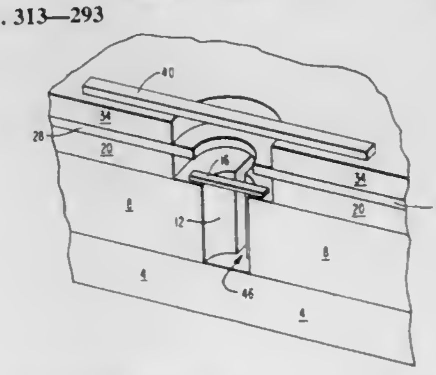
5,841,219
MICROMINIATURE THERMIONIC VACUUM TUBE

Laurence P. Sadwick; R. Jennifer Hwu, both of Salt Lake City; J. Mark Baird, Sandy, and Sherman Holmes, Bountiful, all of Utah, assignors to University of Utah Research Foundation, Salt Lake City, Utah

Continuation of Ser. No. 547,670, Oct. 17, 1995, which is a continuation of Ser. No. 126,075, Sep. 22, 1993. This application Jan. 6, 1997, Ser. No. 778,789

Int. Cl.⁶ H01J *1/62*

U.S. Cl. 313—293 **14 Claims**



1. A microminiature thermionic vacuum tube device comprising

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- a substrate made of electrically resistive material, electrically conductive material disposed on the substrate to define and surround a first void extending from the substrate upwardly through the electrically conductive material,
- cathode means disposed on the material to bridge over the first void, for emitting electrons when heated,
- first electrically resistive material disposed on said electrically conductive material to surround the cathode means and define a second void thereabove,
- electrically conductive grid means disposed on the electrically resistive material to project partially into the second void to define an opening in the grid means above the cathode means, for allowing the passage of electrons therethrough,
- second electrically resistive material disposed on the grid means to define a third void above the opening in the grid means,
- electrically conductive anode means disposed on the second electrically resistive material over the third void to receive electrons emitted by the cathode means and passing through the opening in the grid means, and thereby produce an electrical current,
- means for heating the electrically conductive material to thereby heat the cathode means, and
- means for selectively supplying a voltage to the grid means to control the magnitude of the flow of electrons through the opening therein, and thereby control the electrical current produced in the anode means.

5,841,220
LOW-PRESSURE MERCURY DISCHARGE LAMP

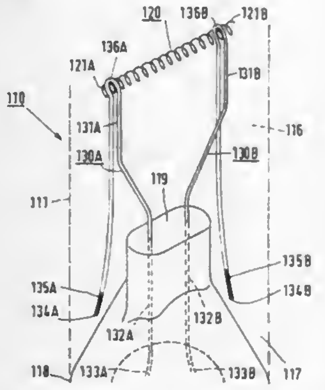
Pieter C. Ooms, Terneuzen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 15, 1996, Ser. No. 680,097

Claims priority, application European Pat. Off., Jul. 21, 1995, 95202013

Int. Cl.^{6} H01J *61/28*

U.S. Cl. 313—565 **17 Claims**



1. A low-pressure mercury discharge lamp comprising a tubular discharge vessel having end portions and containing an ionizable filling which comprises mercury and a rare gas, an electrode arranged at an end portion in the discharge vessel, current supply conductors which issue through said end portion to outside of the discharge vessel, the electrode being fastened to the current supply conductors, and an amalgam supported by at least one current supply conductor, the amalgam covering a zone of said at least one current supply conductor which is removed from said end portion by a path along the current supply conductor.

5,841,221
COLLECTOR FOR AN ELECTRON BEAM TUBE

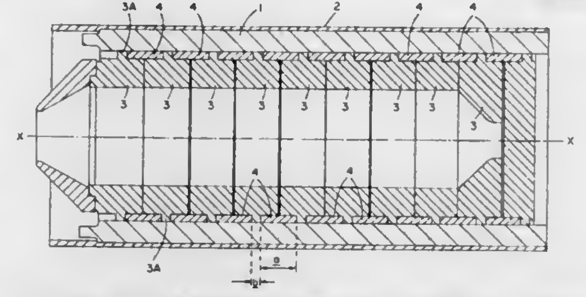
Alan Griggs, Heybridge, United Kingdom, assignor to EEV Limited, Chelmsford, United Kingdom

Filed Apr. 9, 1997, Ser. No. 835,427

Claims priority, application United Kingdom, Apr. 20, 1996, 9608250

Int. Cl.^{6} H01J *23/02*

U.S. Cl. 313—326 **26 Claims**



1. A collector for an electron beam tube comprising: a ceramic cylinder having an inner surface and a longitudinal axis, and a plurality of rings of a first material and of rings of a second material different from said first material located adjacent one another and adjacent said inner surface of said cylinder coaxial with said axis, said rings being located such that regions of said first material alternate with regions of said second material along said axis, the ratio of axial lengths of adjacent regions of said first and second material at said inner surface being such that the overall change in axial length of said plurality with temperature variation is substantially that of the change in axial length of said ceramic cylinder.

5,841,222
LOW-PRESSURE DISCHARGE LAMP

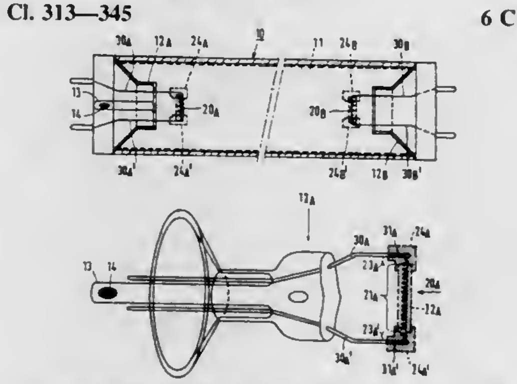
Jean J. Heuvelmans, Eindhoven, Netherlands, and Hui-Meng Chow, Briarcliff, N.Y., assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 27, 1996, Ser. No. 757,531

Claims priority, application European Pat. Off., Dec. 1, 1995, 95203304

Int. Cl.^{6} H01J *1/14*

U.S. Cl. 313—345 **6 Claims**



1. A low-pressure discharge lamp provided with a discharge vessel (**10**) which is closed in a gastight manner and which contains an ionisable filling comprising an inert gas, electrodes being arranged inside the discharge vessel, between which electrodes a discharge path extends, while at least one of the electrodes has a coil ($\mathbf{20}_A$) of a refractory metal which is electrically connected to current supply conductors ($\mathbf{30}_A$, $\mathbf{30}_A$') which extend to outside the discharge vessel, the coil ($\mathbf{20}_A$) having a central zone ($\mathbf{21}_A$) covered with an electron emitting material ($\mathbf{22}_A$), and, on either side, a boundary zone ($\mathbf{23}_A$, $\mathbf{23}_A$') between the central zone ($\mathbf{21}_A$) and a respective current supply conductor ($\mathbf{30}_A$, $\mathbf{30}_A$'), the boundary zones ($\mathbf{23}_A$, $\mathbf{23}_A$') having a covering ($\mathbf{24}_A$, $\mathbf{24}_A$') of a protective material, characterised in that the protective material comprises a ceramic material having a specific resistance less than 1000 μΩ.cm.

5,841,223
COLOR CATHODE RAY TUBE AND METHOD OF MANUFACTURING THE SAME

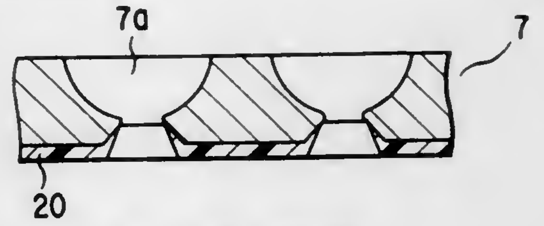
Sachiko Muramatsu, Tatebayashi, and Yasuhisa Ohtake, Fukaya, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 25, 1995, Ser. No. 378,719

Claims priority, application Japan, Jan. 26, 1994, 6-006713; Jan. 10, 1995, 7-002142

Int. Cl.^{6} H01J *29/07*

U.S. Cl. 513—402 **12 Claims**



1. A color cathode ray tube comprising:
- a phosphor screen;
- a shadow mask with a large number of apertures arranged in the vicinity of said phosphor screen; and
- an electron gun generating an electron beam passing through said apertures of said shadow mask to excite said phosphor screen,
- wherein said shadow mask has a coating which is formed on an electron gun side of said shadow mask, said coating containing an aluminum-phosphorus compound and fine particles of at least one of tungsten oxide and bismuth oxide.

5,841,224
SECOND GRID FOR AN ELECTRON GUN HAVING APERTURES AND ROTARY ASYMMETRICAL PORTIONS FACING THE FIRST AND THIRD GRIDS

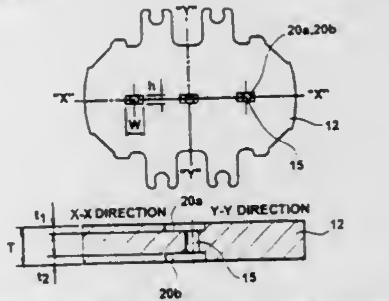
Won Hyun Kim, Kyungsangbuk-do; Hee Won Yun; Sung Kil Kim, both of Daeku-si; Hyun Chul Kim, Kyungsangbuk-do; Sung Ho Cho, Kyungsangbuk-do, and Sung Ki Ahn, Kyungsangbuk-do, all of Rep. of Korea, assignors to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Dec. 22, 1994, Ser. No. 361,376

Claims priority, application Rep. of Korea, Jul. 7, 1994, 1994/16384

Int. Cl.^{6} H01J *29/56;29/51*

U.S. Cl. 313—412 **11 Claims**



1. An electron gun for a large-sized color cathode ray tube comprising:
- three cathodes heated by a heater for emitting thermoelectrons;
- a first grid placed next to said cathodes on one side of said cathodes for controlling the emitted thermoelectrons;
- a second grid placed next to said first grid on the side of said first grid opposite said cathodes to accelerate the emitted thermoelectrons, said second grid having electron beam passing holes and further having similarly shaped and oriented rotary asymmetrical portions in both side faces around the electron beam passing holes;
- a plurality of electrodes sequentially placed on the side of said second grid opposite said first grid for accelerating and focusing the incoming electron beams; and
- a bead glass for fixing said respective electrodes spaced apart by predetermined distances.

5,841,225
DEFLECTION RING OF SINTERED MGZN-FERRITE MATERIAL, CATHODE RAY TUBE COMPRISING SUCH A RING AND MOULDING MADE FROM THIS MATERIAL

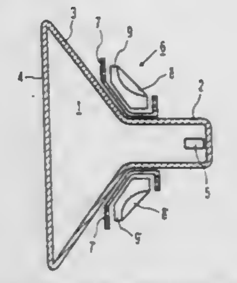
Pieter J. Van Der Zaag, Eindhoven, Netherlands; Pieter J. Van Der Valk, Azuqueca de Henares, Spain, and Hendrik J. De Wit, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 7, 1995, Ser. No. 553,229

Claims priority, application European Pat. Off., Nov. 9, 1994, 94203263

Int. Cl.^{6} C04B *35/26;* **H01J** *29/70*

U.S. Cl. 313—440 **8 Claims**



7. A deflection ring of sintered MgZn-ferrite material having low heat dissipation properties when measured at induction levels of 20 to 25 mT and frequencies of 16 kHz, and multiples thereof, at room temperature, wherein the structure of at least about 90% of the grains of the sintered material comprise only one magnetic domain.

5,841,226
DEFLECTION YOKE

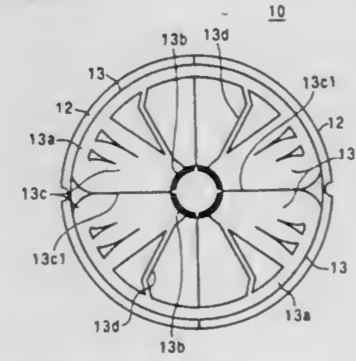
Tsutomu Hichiwa, Koga, Japan; Masahiko Nakagawa, Syouwa-machi, Japan; Masayuki Shimada, Koshigaya, Japan, and Masaaki Itoh, Iwai, Japan, assignors to Victor Company of Japan, Ltd., Tokyo, Japan

Filed Jan. 24, 1997, Ser. No. 788,541

Claims priority, application Japan, Jan. 25, 1996, 8-032902

Int. Cl.^{6} H01J *29/70;29/76*

U.S. Cl. 313—440 **8 Claims**



1. A deflection yoke comprising:
- a pair of saddle type horizontal deflection coils having large and small diameter rims at front and rear ends thereof respectively;
- a pair of vertical deflection coils;
- a separator interposed between said pair of horizontal deflection coils and said pair of vertical deflection coils for insulating said pairs of coils from each other;
- rib means formed on parts of said separator and interposed between said pair of horizontal deflection coils; and

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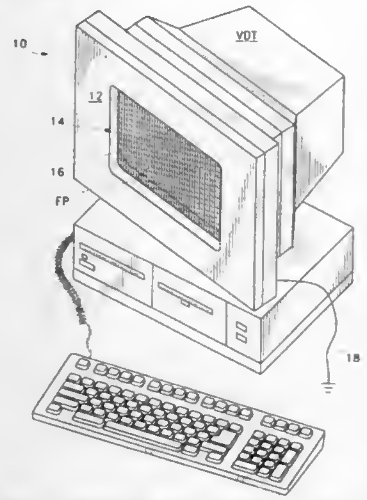
each of said pair of horizontal deflection coils respectively having a confronting end which confronts the end of the other horizontal coil, wherein said confronting ends ar electrically insulated from each other but physically and directly face each other and are spaced from each other by a distance smaller than the thickness of said rib means where said rib means is not formed on said separator.

5,841,227
RADIATION SHIELD WITH OPAQUE AND TRANSPARENT PORTION

David J. Terpin, 1054 S. Holt Ave., Los Angeles, Calif. 90035
Filed Jan. 24, 1996, Ser. No. 590,535
Int. Cl.^{6} H04H ***5/65***
U.S. Cl. 313—479 **15 Claims**



1. An auxiliary radiation shield for mounting in front of a faceplate of a CRT-type video display terminal, comprising:

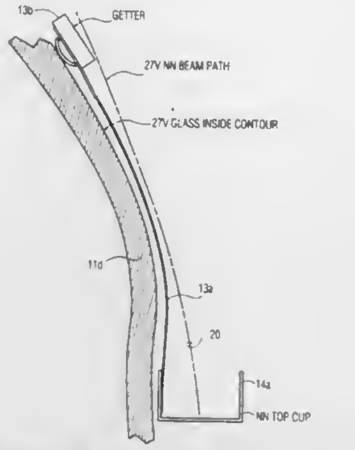
a conductive planar central shield portion that is transparent to visible light, that has an area at least equal to that of the faceplate, and that is adapted to be disposed in front of the faceplate, to thereby block any electrical or electromagnetic radiation from the faceplate towards any user in front of the video display terminal but not block any visible image then being displayed on the CRT-type video display, and

a conductive planar outer shield portion that is opaque to visible light, that surrounds and is coplanar with the central shield portion, and that is adapted to extend above and to either side of the video display terminal, to thereby block at least a portion of any electrical or electromagnetic radiation from the sides and top of the video display terminal towards that user and also enhance the visibility of said visible image,

wherein the planar outer shield portion has an area at least equal to that of the planar central shield portion and the outer shield portion has height and width dimensions greater than the corresponding dimensions of the video display terminal.

5,841,228
GETTER ASSEMBLY WITH STIFFENED GETTER WAND AND CRT

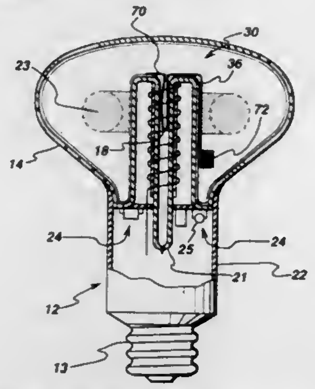
Chin Y. Cha, Bloomfield; Shridhar V. Iyer, Ann Arbor, and Thomas W. Penird, Ypsilanti, all of Mich., assignors to U.S. Philips Corporation, New York, N.Y.
Filed Jun. 19, 1996, Ser. No. 666,050
Int. Cl.^{6} H01J ***29/94***
U.S. Cl. 313—481 **7 Claims**



6. A getter assembly for a cathode ray tube having a sealed envelope comprising a display window, a funnel and a neck, a cathodluminescent screen disposed on the inside surface of the display window and an electron gun assembly, including a cup-shaped element at the top thereof, mounted in the neck for directing at least one electron beam onto the screen; said assembly comprising a getter container and an elongated strip-shaped wand, one end of which wand is attached to the getter container, and the other end of which wand is attached to the cup-shaped element of the electron gun assembly, the wand having a spring bias extending along the inside surface of the funnel and holding the getter container in contact with said surface; characterized in that the wand has a curvature in its width direction in the range of from about 35 to 55 percent of the radius of curvature of the cup-shaped element, said curvature imparting a trough-shape to the wand, and increasing the spring bias of the wand, along a substantial portion of the length of the rod, which spring bias is such that the wand extends along an inside surface of the funnel and holds the getter container in contact with said inside surface.

5,841,229
AMALGAM SUPPORT ARRANGEMENT FOR AN ELECTRODELESS DISCHARGE LAMP

Joseph Christopher Borowiec, Schenectady, N.Y.; Martin Geoffrey Scott; Shaun Adrian Malin, both of Leicester, United Kingdom, and Erno Soos, Nagykanizsa, Hungary, assignors to General Electric Company, Schenectady, N.Y.
Continuation of Ser. No. 547,076, Oct. 23, 1995, abandoned. This application Aug. 1, 1997, Ser. No. 905,301
Int. Cl.^{6} H01J ***61/28***
U.S. Cl. 313—490 **14 Claims**



1. An electrodeless discharge lamp, comprising:

a light-transmissive envelope containing an ionizable, gaseous fill for sustaining an arc discharge when subjected to a radio frequency magnetic field and for emitting ultraviolet radiation as a result thereof, said envelope having an interior phosphor coating for emitting visible radiation when excited by said ultraviolet radiation, said envelope having a re-entrant cavity therein;

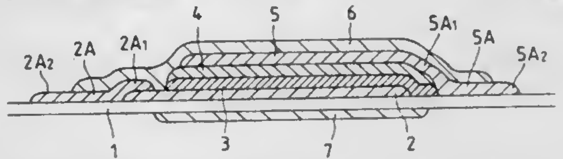
an excitation coil contained within said re-entrant cavity for providing said radio frequency magnetic field when excited by a radio frequency power supply;

an exhaust tube extending through said re-entrant cavity;

at least one amalgam disposed on a first portion of a support member in a position within the interior of said envelope that is optimized to maximize light output from the lamp, said support member having a second portion thereof secured within said exhaust tube in a manner so as to avoid a glass-to-metal seal condition, said support member supporting said amalgam within the interior of said envelope such that neither the amalgam nor the support member contacts or degrades the envelope or the phosphor coating and further do not interfere with light output from the lamp.

5,841,230
ELECTROLUMINESCENT LIGHTING ELEMENT WITH A LIGHT-PERMEABLE REFLECTION LAYER AND MANUFACTURING METHOD FOR THE SAME

Heiji Ikoma; Koji Tanabe, and Yosuke Chikahisa, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Feb. 24, 1997, Ser. No. 804,963
Claims priority, application Japan, Mar. 4, 1996, 8-045751
Int. Cl.^{6} H05B ***33/00***
U.S. Cl. 313—506 **12 Claims**



8. An electroluminescent lighting element, comprising:

an insulating transparent film serving as a base member of the electroluminescent lighting element;

a transparent electrode layer formed on a surface of said insulating transparent film in a predetermined pattern;

a phosphor layer formed on said transparent electrode layer in a predetermined pattern;

a dielectric layer formed on said phosphor layer in a predetermined pattern;

a back-surface electrode layer formed on said dielectric layer in a predetermined pattern;

a first collecting electrode formed into a predetermined pattern so as to have one end connected to said transparent electrode layer and the other end arranged into an external connecting portion;

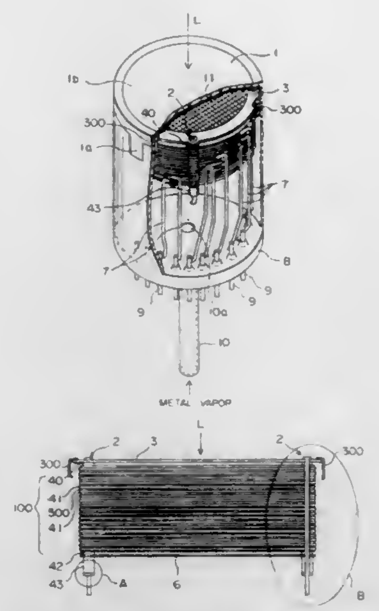
a second collecting electrode formed into a predetermined pattern so as to have one end connected to said back-surface electrode layer and the other end arranged into an external connecting portion;

an insulating coat layer formed so as to cover entirely an upper surface region of accumulated layers except for said external connecting portions; and

a light-permeable reflection layer formed on an opposite surface of said insulating transparent film in a predetermined pattern so as to cover a back surface of said phosphor layer.

5,841,231
PHOTOMULTIPLIER HAVING LAMINATION STRUCTURE OF FINE MESH DYNODES

Suenori Kimura; Masuo Ito, and Atsuhide Suzuki, all of Hamamatsu, Japan, assignors to Hamamatsu Photonics K.K., Hamamatsu, Japan
Filed May 17, 1996, Ser. No. 649,305
Claims priority, application Japan, May 19, 1995, 7-121492
Int. Cl.^{6} H01J ***43/04***
U.S. Cl. 313—532 **21 Claims**



1. A photomultiplier comprising:

a photocathode for emitting photoelectrons according to light incident thereto;

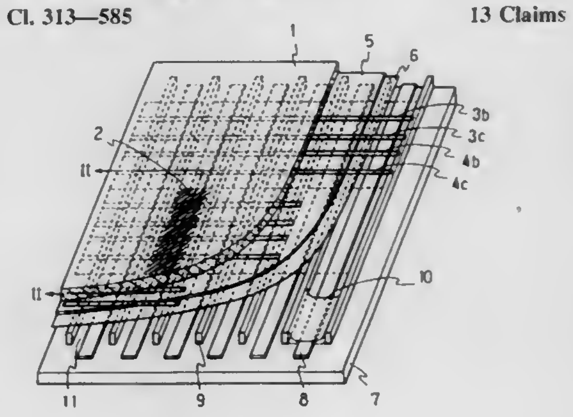
an electron multiplier unit for cascade-multiplying the photoelectrons emitted from said photocathode, said electron multiplier unit being formed by laminating a plurality of dynode units spaced at predetermined intervals from each other through an insulator having a through hole extending along a direction of incidence of said light, wherein each dynode unit comprises a fine mesh dynode having at least 1000 or more lines per inch, an upper electrode having an aperture portion for exposing said fine mesh dynode and a through hole extending along the direction of incidence of said light, and a lower electrode having an aperture portion for exposing said fine mesh dynode and a through hole extending along the direction of incidence of said light and holding an edge portion of said fine mesh dynode in a sandwich structure in cooperation with said upper electrode;

an anode for collecting secondary electrons emitted from said electron multiplier unit, said anode having a through hole extending along the direction of incidence of said light; and

a pipe penetrating a space defined by at least the through hole of said insulator, the through holes of said dynode units, and the through hole of said anode along the direction of incidence of said light, said pipe comprising an outside pipe made of an insulating material and an inside pipe made of a conductive material and penetrating said outside pipe.

5,841,232
AC PLASMA DISPLAY PANEL

Kazunori Hirao; Toru Hirayama, and Koji Aoto, all of Osaka, Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan
Filed Apr. 9, 1997, Ser. No. 833,759
Claims priority, application Japan, Apr. 17, 1996, 8-095703
Int. Cl.^{6} H01J ***17/49***
U.S. Cl. 313—585 **13 Claims**



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1. An AC plasma display panel comprising
first and second glass substrates that face each other and define a discharge space therebetween,
a plurality of scanning electrodes and maintaining electrodes that are parallel to each other, formed on the first glass substrate,
a dielectric layer that covers said scanning electrodes and said maintaining electrodes, and
a plurality of ribs and data electrodes that are formed on the second glass substrate and arranged orthogonally to said scanning electrodes and said maintaining electrodes,
wherein a discharge cell, which is formed by division of said discharge space by a pair of adjacent ribs, comprises said plurality of scanning electrodes and maintaining electrodes,
wherein said scanning electrodes and said maintaining electrodes are opaque to visible light and said first glass substrate is provided at a display side of the panel.

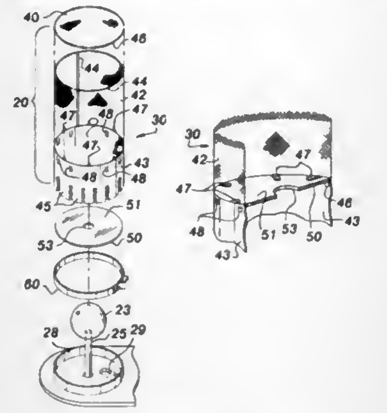
5,841,233
METHOD AND APPARATUS FOR MOUNTING A DICHROIC MIRROR IN A MICROWAVE POWERED LAMP ASSEMBLY USING DEFORMABLE TABS

Michael Ury, Bethesda; Frank Sowers, Frederick; Curt Harper, Wheaton, and Wayne Love, Olney, all of Md., assignors to Fusion Lighting, Inc., Rockville, Md.

Filed Jan. 26, 1996, Ser. No. 592,475

Int. Cl.^{6} H01J *65/04*

U.S. Cl. 315—39 **16 Claims**



7. A microwave powered lamp comprising:
a microwave cavity having a boundary wall comprised of a metal sheet having at least a mesh section and deformable members defined in said metal sheet;
coupling means for delivering microwave energy to said cavity;
a discharge envelope mounted in said cavity and containing fill material therein responsive to excitation by microwave energy applied thereto for emitting light therefrom; and
an electrically non-conductive reflector;
mounting means for mounting said reflector in said cavity to define an optically isolated light-transmitting chamber in said cavity wherein said reflector is positioned to reflect said light emitted from said envelope into said chamber and out through said mesh section, said mounting means comprising said deformable members deformed radially to define respective support planes in which said deformable members engage opposite surfaces of said reflector.

5,841,234
DEVICE FOR SHIELDING ELECTRIC FIELD EMITTED BACKWARD FROM VIDEO DISPLAY APPLIANCE

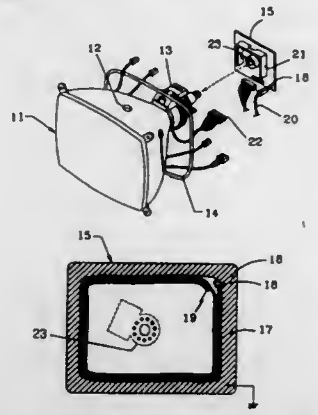
Seok Hwa Jeong, Kumi, Rep. of Korea, assignor to LG Electronics, Inc., Rep. of Korea

Filed Jul. 29, 1997, Ser. No. 901,928

Claims priority, application Rep. of Korea, Jul. 30, 1996, 1996 31428

Int. Cl.^{6} H01J *1/52*

U.S. Cl. 315—85 **3 Claims**



1. A device for shielding an electrical field emitted backward from a video display appliance including a CRT having an anode to which a high voltage is supplied, a deflection yoke for deflecting electron beams produced from electron guns, and a video board for processing and outputting video signals to the CRT, the device comprising:
a first patterned section printed on a periphery of a back of the video board and connected to ground; and
a second patterned section printed inside the first patterned section, the second patterned section having a pulse applying portion to which a pulse voltage having a polarity opposite to the electric field waveform is applied and a termination portion.

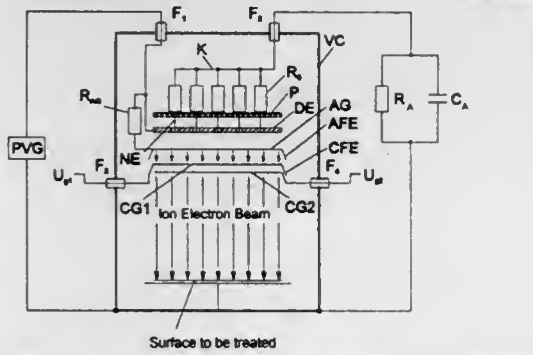
5,841,235
SOURCE FOR THE GENERATION OF LARGE AREA PULSED ION AND ELECTRON BEAMS

Vladimir Engelko, Petersburg, Russian Federation; Harald Giese, Stutensee, Germany; Georg Müller; Sven Schalk, both of Karlsruhe, Germany; Christoph Schultheiss, Berghausen, Germany, and Hermann Würz, Bietigheim, Germany, assignors to Forschungszentrum Karlsruhe GmbH, Karlsruhe, Germany

Filed May 30, 1997, Ser. No. 866,551

Int. Cl.^{6} H01J *37/00*

U.S. Cl. 315—111.21 **6 Claims**



1. A source for the generation of large area pulsed ion or electron beams, comprising: a vacuum containment, a vacuum arc plasma source with an expansion space and an extraction system disposed in said containment, said arc plasma source consisting of a predetermined arrangement of wire electrodes connected to a current collector rail by way of parallel resistors (R_o) and a plate-like anode discharge electrode having an arrangement of openings disposed at a distance (Δ) from each other, each receiving an end of one of said wire electrodes such that said wire electrodes are centered within said openings, an anode grid (AG) disposed at a distance (D) from said anode discharge electrode and being electrically connected, by way of an anode resistor (R_{AG}), to said anode discharge electrode such that, under consideration of the limit

$$R_{AG}>>TeleI_{io}(1-\alpha),$$

(Te—electron temperature in the plasma, e=electron elementary charge, l_{io}=ion saturation current; α=anode grid transparency) said anode grid (AG) assumes the floating potential of an anode plasma generated by said wire electrodes in said anode discharge electrode, said current collector rail being electrically connected, by way of a parallel circuit including a condenser (C_A) and a resistor (R_A), to said vacuum containment for a secure triggering of the arc discharge between the wire electrodes and the anode discharge electrode and for the control of the ion flux, the dimensioning of the electrical components R_o, R_A, C_A being subjected to the limitation

$$T/[(R_A+R_{11})/R_A\times R_{11}]>>C_A>>T/[(R_A+R_{\Pi})/RA\times R_{11}]$$

wherein
$R_{\Pi}=R_o/n$ and Δ<D are maintained, (T—duration of the high voltage impulse, R_A—external resistor, R_{Π}—total wire electrode resistance, T—time period required for the development of the arc discharge, n—number of resistors) a plate disposed between said anode discharge electrode and said parallel resistors, said plate having bores through which said electrode wires extend, and separating the space in which said parallel resistors are arranged from the space in which said anode discharge electrode is arranged, said wire electrodes consisting of materials, and being arranged in said anode discharge electrode with a distribution, corresponding to the desired ion composition of the ion beam to be generated by said source.

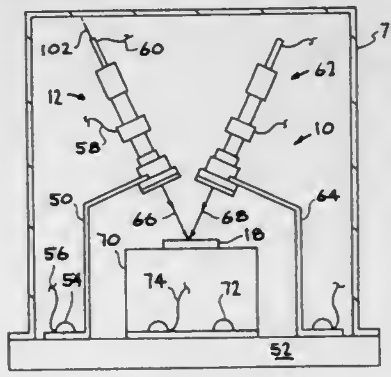
5,841,236
MINIATURE PULSED VACUUM ARC PLASMA GUN AND APPARATUS FOR THIN-FILM FABRICATION

Ian G. Brown, Berkeley; Robert A. MacGill, Richmond; James E. Galvin, Emmeryville; David F. Ogletree, and Miquel Salmeron, both of El Cerrito, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Continuation-in-part of Ser. No. 773,112, Oct. 8, 1991, abandoned, which is a continuation of Ser. No. 415,616, Oct. 2, 1989, abandoned. This application Sep. 14, 1994, Ser. No. 326,667

Int. Cl.^{6} H01J *7/24*

U.S. Cl. 315—111.41 **23 Claims**



1. A coating apparatus, comprising:
a) one or more miniature pulsed vacuum arc plasma guns, each gun comprising a solid electrically conductive cathode, an annular anode, and a trigger electrode,
b) an electrical pulser comprising a trigger pulse generator connected to the trigger electrode and an arc power supply connected between the cathode and anode for pulsing said one or more plasma guns to produce a plasma between the cathode and anode,
c) a holder for supporting a target substrate or substrates to be coated with material from the cathode of each plasma fun so that the plasma formed by each plasma gun is directed onto a surface of the substrate or substrates,
d) a vacuum chamber which envelops the one or more plasma guns and the holder.

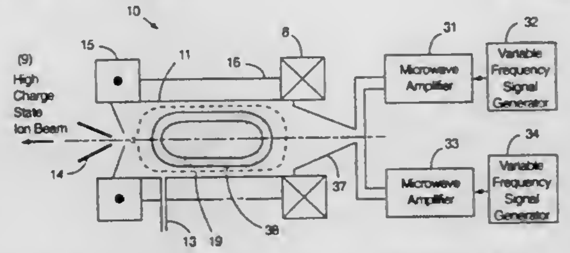
5,841,237
PRODUCTION OF LARGE RESONANT PLASMA VOLUMES IN MICROWAVE ELECTRON CYCLOTRON RESONANCE ION SOURCES

Gerald D. Alton, Kingston, Tenn., assignor to Lockheed Martin Energy Research Corporation, Oak Ridge, Tenn.

Filed Jul. 14, 1997, Ser. No. 892,492

Int. Cl.^{6} H05H *1/00*

U.S. Cl. 315—111.81 **9 Claims**



1. In an electron cyclotron resonance (ECR) ion source for producing high charge state high-intensity ion beams, said ion source having a B-minimum magnetic field for confining a plasma, and wherein said plasma is excited by microwaves from a microwave source inputted to said ion source through a waveguide, and wherein said ion source is operable to produce an electron cyclotron resonance zone to resonantly heat plasma electrons within said plasma by absorption of microwaves from said microwave source;
the improvement wherein said waveguide is a broadband waveguide having a bandwidth chosen to fall within the resonant frequency distribution of the magnetic field of said ion source; and said microwave source comprises a microwave amplifier and a variable frequency signal generator, said microwave amplifier operable to produce microwaves and inject them into said broadband waveguide, and said variable frequency signal generator operable to input a continuously varying frequency signal to said microwave amplifier such that a large volume ECR zone is produced within said plasma.

5,841,238
DIMMER PROTECTION FOR COMPACT FLUORESCENT

Robert H. Van Veldhuizen, Terneuzen, and Leonardus G. J. Verhees, Eindhoven, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 17, 1996, Ser. No. 733,292

Claims priority, application European Pat. Off., Oct. 18, 1995, 95202816

Int. Cl.^{6} H05B *37/02*

U.S. Cl. 315—119 **13 Claims**

1. A circuit arrangement for operating a discharge lamp comprising:
input terminals for connection to an AC supply voltage source,
rectifying means coupled to the input terminals for recufying a supply voltage delivered by the supply voltage source,
capacitive means coupled to the rectifying means,
a DC-AC converter coupled to the capacitive means and provided with terminals for connection to a discharge lamp,
means for detecting periodic current pulses having an amplitude greater than a given value W1, and

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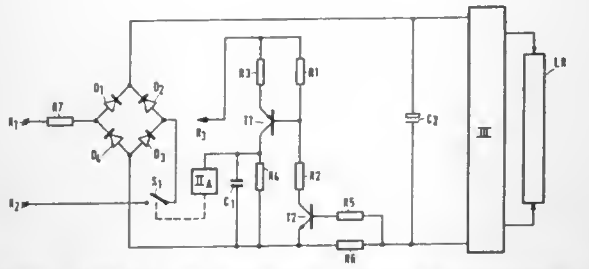


means coupled to the detecting means for changing the operational state of the circuit arrangement only when a plurality of said periodic current pulses having an amplitude greater than the given value W1 are detected within a given time period.

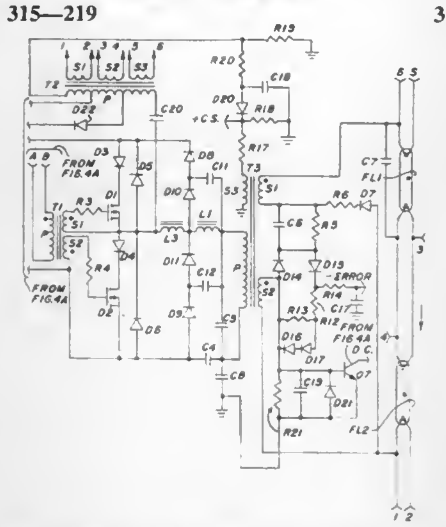
5,841,239
CIRCUIT FOR DIMMING COMPACT FLUORESCENT LAMPS

Charles R. Sullivan, Berkeley, Calif.; Scott R. Jurell, Mertztown, and David G. Luchaco, Macungie, both of Pa., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.

Continuation of Ser. No. 345,054, Nov. 25, 1994, abandoned, which is a continuation of Ser. No. 936,815, Aug. 27, 1992, abandoned, which is a division of Ser. No. 543,271, Jun. 25, 1990, Pat. No. 6,173,643. This application Jun. 27, 1996, Ser. No. 671,277

Int. Cl.^{6} G05F *1/00*

U.S. Cl. 315—219 **37 Claims**



1. A control system for providing power from a source to a gas discharge lamp of the type having a pair of electrodes each formed of a resistive filament, comprising:

(a) circuit means operatively connected to said source for producing a variable pulse-duration-modulated voltage;

(b) inverter means, including first and second controllably conductive devices and corresponding first and second commutation diodes, responsive to said pulse-duration-modulated voltage for producing an ac driving voltage;

(c) a single resonant circuit, including a series connected inductor and capacitor, responsive to said driving voltage for providing a substantially sinusoidal voltage;

(d) first transformer means having (i) a primary winding for receiving said variable pulse-duration-modulated voltage electrically connected across said series connected inductor and capacitor, and (ii) a pair of secondary windings respectively connected to the resistive filament forming each of said pair of electrodes for providing a voltage across each of said filaments;

(e) a second capacitor connected in series with the primary winding of said first transformer means for blocking any DC component of said driving voltage, whereby the RMS value of said filament voltage is substantially constant over a range of pulse durations of said pulse-duration-modulated voltage; and

(f) second transformer means having (i) a primary winding connected across the capacitor of said series connected, inductor and capacitor, and (ii) a secondary winding connected to said electrodes for providing a voltage between said electrodes.

5,841,240
EFFICIENT DISCHARGE LAMP ELECTRODE HEATING CIRCUIT OPERABLE OVER WIDE TEMPERATURE AND POWER RANGE

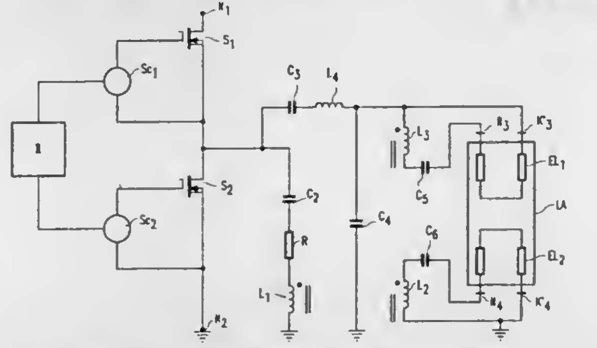
Marcel Beij, Eindhoven; Hendrikus J. W. Schenkelaars, Oss, and Arnold W. Buij, Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 18, 1996, Ser. No. 733,993

Claims priority, application Belgium, Oct. 20, 1995, 09500874

Int. Cl.^{6} H05B *37/02*

U.S. Cl. 315—219 **20 Claims**



11. A circuit for operating a discharge lamp comprising:
input terminals for connection to a source of supply voltage for the circuit,
a load circuit including means for connection to the discharge lamp,
means coupled to the input terminals and to the load circuit for generating a high-frequency voltage for the load circuit,
an inductive ballast coupling said high-frequency voltage generating means to the load circuit,
means coupled to the high-frequency voltage generating means for adjusting the lamp power as a function of the frequency of the generated high-frequency voltage,
a transformer having a primary winding and first and second secondary windings with each secondary winding coupled to respective first and second lamp electrode branches during lamp operation, and
a circuit branch permanently coupled in parallel with the load circuit and including the transformer primary winding and a frequency-dependent impedance whereby the transformer primary winding is not influenced by the voltage across the discharge lamp.

5,841,241
ELECTRONIC BALLAST FOR FLUORESCENT LAMPS

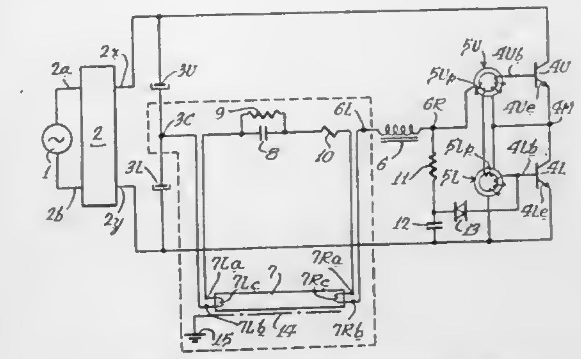
Ole K. Nilssen, Caesar Dr., Rte. 5, Barrington, Ill. 60010, assignor to Ole K. Nilssen, Barrington, Ill.

Continuation of Ser. No. 158,104, Feb. 16, 1988, abandoned, Ser. No. 541,489, Oct. 13, 1983, abandoned, and Ser. No. 342,107, Jan. 25, 1982, abandoned. This application Feb. 19, 1992, Ser. No. 839,065

Int. Cl.^{6} H05B *37/00*

U.S. Cl. 315—244 **12 Claims**

1. A system for powering a gas discharge lamp having a a first and a second pair of cathode terminals, comprising:
a source having a pair of source terminals between which there is available an inductively limited AC current;
load circuit comprising a pair of load terminals with a capacitor means connected in circuit therebetween, one of said load



terminals and one of said source terminals constituting a first pair of ballast terminals, the other load and source terminals constituting a second pair of ballast terminals;
non-linear voltage-limiting impedance means connected across at least one of said pairs of ballast terminals; and
means for connecting said first and second pairs of cathode terminals respectively with said first and second pairs of ballast terminals.

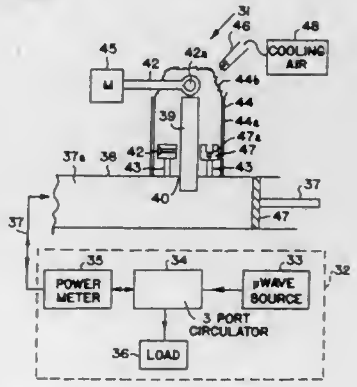
5,841,242
ELECTRODELESS LAMP WITH ELIMINATION OF ARC ATTACHMENT

James E. Simpson, Gaithersburg, and Mohammad Kamarehi, N. Potomac, both of Md., assignors to Fusion Lighting, Inc., Rockville, Md.

Division of Ser. No. 176,273, Dec. 30, 1993, abandoned, which is a continuation-in-part of Ser. No. 71,027, Jun. 3, 1993, Pat. No. 5,404,076, Ser. No. 805,563, Dec. 13, 1993, abandoned, Ser. No. 953,056, Dec. 30, 1992, abandoned, Ser. No. 976,938, Nov. 18, 1992, abandoned, said Ser. No. 71,027 and a continuation of Ser. No. 604,487, Oct. 25, 1990, abandoned. This application Mar. 3, 1997, Ser. No. 811,467

Int. Cl.^{6} H05B *41/16*

U.S. Cl. 315—248 **5 Claims**



1. An electrodeless lamp, comprising,
a bulb comprised of an envelope and a discharge forming medium in said envelope,
excitation means for generating excitation electromagnetic power,
a coaxial fixture having inner and outer conductors for coupling said excitation electromagnetic power to said bulb, said excitation power being so large as to cause arc attachment to occur in the bulb near said inner conductor if the bulb is not rotated in such manner as to prevent arc attachment from occurring, and
means for rotating said bulb at a sufficiently high speed and in a direction such that different parts of the bulb are proximate said center conductor as the bulb rotates, to prevent arc attachment from occurring.

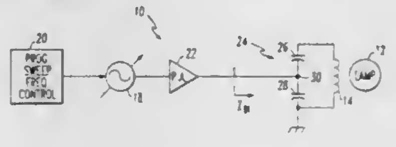
5,841,243
LOAD MATCHED EXCITATION CIRCUIT FOR AN ELECTRODELESS LAMP INCLUDING A FREQUENCY SWEPT RF EXCITATION SOURCE

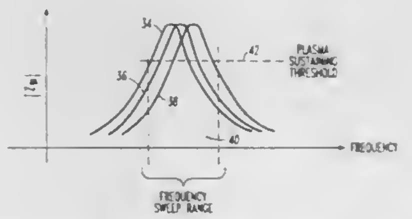
Edward H. Hooper, Baltimore, Md., assignor to Northrop Grumman Corporation, Los Angeles, Calif.

Filed May 23, 1997, Ser. No. 863,052

Int. Cl.^{6} H05B *37/02*

U.S. Cl. 315—248 **20 Claims**





1. An excitation circuit for an electrodeless lamp, including a light bulb containing an inert gas and one or more predetermined chemical elements, comprising:
an RF signal source for generating an RF excitation signal for said light bulb;
means for applying the RF excitation signal to said light bulb;
means for varying the frequency of the RF excitation signal in a controlled manner; and
an impedance matching network connected between said RF signal source and said means for applying the RF excitation signal to said light bulb, and wherein the frequency of the RF excitation signal is varied over a predetermined frequency range so as to substantially cover the entire range of possible load matching tuning conditions of said impedance matching network due to the fact that the temperature of a plasma generated in the bulb when excited varies as a function of excitation and has a resistance and reactance which comprise tuning parameters of the matching network.

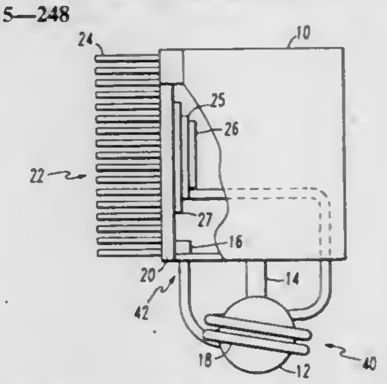
5,841,244
RF COIL/HEAT PIPE FOR SOLID STATE LIGHT DRIVER

Robin E. Hamilton, Millersville; Paul G. Kennedy, Grasonville, and Raymond A. Smith, Severna Park, all of Md., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Jun. 18, 1997, Ser. No. 877,848

Int. Cl.^{6} H05B *41/16*

U.S. Cl. 315—248 **20 Claims**



1. Apparatus for exciting a high intensity electrodeless light bulb, comprising:

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- a housing on which an electrodeless light bulb is mounted and including a heat exchanger;
- a driver circuit for exciting the said light bulb and including an excitation coil having relatively high heat conducting properties wrapped around said light bulb and extending to and terminating at said heat exchanger, said coil being operable not only to generate a magnetic excitation field for said light bulb, but also to transfer heat generated along the length of said coil and heat radiated from said light bulb to said heat exchanger.

5,841,245

DISCHARGE LAMP IGNITION CIRCUIT HAVING A BANDPASS FILTER CONNECTING THE PULSE TRANSFORMER TO THE LAMP

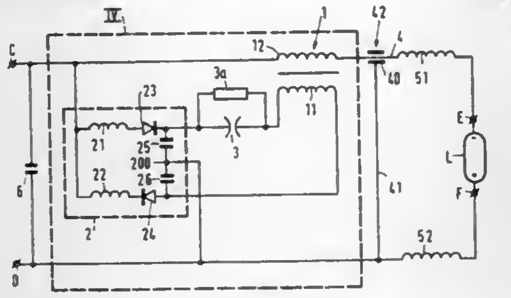
Anton C. Blom, and Frans Slegers, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 413,059, Mar. 29, 1995, abandoned. This application Jul. 23, 1996, Ser. No. 685,156

Claims priority, application European Pat. Off., Apr. 6, 1994, 94200930

Int. Cl.^{6} H05B *41/14*

U.S. Cl. 315—289 **5 Claims**



1. A circuit arrangement for igniting a high-pressure discharge lamp, comprising:
- a pair of input terminals for connection to a supply source;
- a pulse-generating circuit having a natural frequency and provided with a voltage-dependent breakdown element, said circuit being connected across said input terminals;
- a pulse transformer having a primary winding and a secondary winding, the primary winding being included in said pulse-generating circuit, the secondary winding having a first terminal connected to a first of said input terminals; and
- coupling means for (i) coupling a second terminal of the secondary winding of the pulse transformer to a first connection terminal of said lamp, and (ii) coupling a second of said input terminals to a second connection terminal of said lamp; characterized in that:
- said coupling means comprises filter elements which form, in combination with the secondary winding, a bandpass filter which is tuned to a frequency at or adjacent said natural frequency of the pulse-generating circuit, said filter elements including inductive means coupled in series between each of said input terminals and each of the lamp connection terminals;
- whereby pulses generated by the pulse-generating circuit are coupled by said bandpass filter to said lamp to produce ignition thereof, but high-frequency signals produced by said lamp upon ignition thereof are substantially blocked by said bandpass filter from reaching the input terminals of said circuit arrangement.

5,841,246

CIRCUIT ARRANGEMENT FOR CONTROLLING LUMINOUS FLUX OF A DISCHARGE LAMP

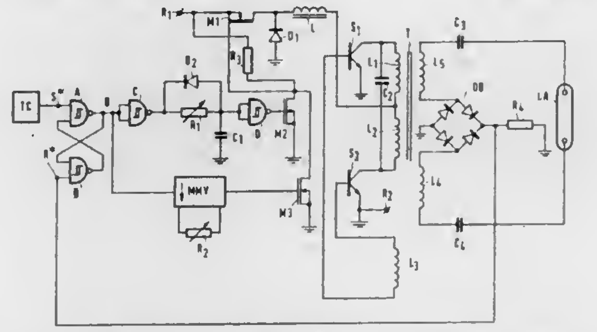
Stephan Manders, Eindhoven, Netherlands, assignor to Flat Panel Display Co. (FPD) B.V. Prof. Holstlaan 4, Eindhoven, Netherlands

Filed Jul. 9, 1996, Ser. No. 677,241

Claims priority, application European Pat. Off., Jul. 10, 1995, 95201880

Int. Cl.^{6} H05B *41/00*

U.S. Cl. 315—307 **6 Claims**



1. A circuit arrangement for operating a discharge lamp by means of a high-frequency voltage, comprising
- input terminals for connection to a supply voltage source,
- means I for generating the high-frequency voltage from a supply voltage delivered by the supply voltage source,
- means II for the substantially square-wave modulation of the amplitude of the high-frequency voltage, provided with means III for controlling the duty cycle of the square wave,

characterized in that the means III are provided with a measuring circuit for detecting the ignition of the discharge lamp during each cycle of the substantially square-wave modulation and with a timer circuit coupled to the measuring circuit for rendering the amplitude of the high-frequency voltage substantially equal to zero when a time interval has elapsed after the ignition of the discharge lamp for each cycle, wherein the length of the time interval during which the lamp burns is controlled.

5,841,247

CATHODE RAY TUBE, DISPLAY SYSTEM INCORPORATING SAME AND COMPUTER INCLUDING CONTROL MEANS FOR DISPLAY SYSTEM

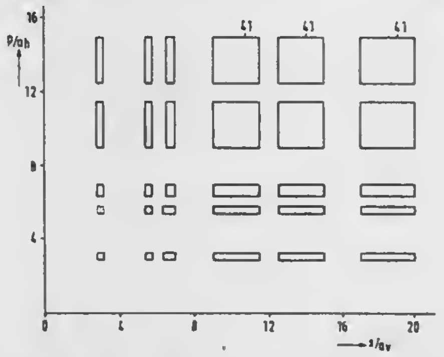
Leendert Vriens, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 15, 1996, Ser. No. 749,444

Claims priority, application European Pat. Off., Nov. 24, 1995, 9520327

Int. Cl.^{6} H01J *29/56*

U.S. Cl. 315—370 **10 Claims**



1. A display system comprising a cathode ray tube which is provided with a shadow mask having a large number of apertures, which apertures are arranged in columns, a means for generating electron beams and a means for deflecting said electron beams across; the shadow mask, and a means for controlling the deflection of the electron beams across the shadow mask in dependence upon incoming signals, characterized in that the display system comprises comparison means to compare the distance s between scanning lines of the incoming signals with a distance a$_v$ between apertures in a column, and modification means to change, in dependence upon the ratio s/a$_v$ the deflection of the electron beams.

5,841,248

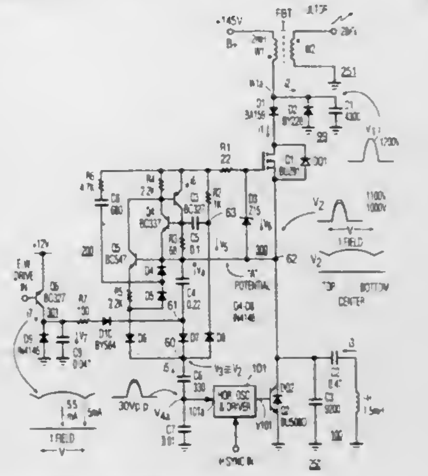
CHARGE CONTROLLED RASTER CORRECTION CIRCUIT

Peter Eduard Haferl, and Rudolf Weber, both of Adliswil, Switzerland, assignors to RCA Thomson Licensing Corporation, Princeton, N.J.

Filed Apr. 30, 1997, Ser. No. 846,342

Int. Cl.^{6} H01J *29/56*

U.S. Cl. 315—371 **19 Claims**



1. A video display apparatus, comprising:
- a deflection winding included in a retrace resonant circuit, during a retrace interval;
- a first switch responsive to a first switch control signal at a frequency related to a first deflection frequency and coupled to said deflection winding for generating a deflection current in said deflection winding;
- a first capacitor;
- a sampling switch coupled to said deflection winding and to said first capacitor for sampling a signal indicative of a magnitude of said deflection current and for applying the sampled signal, during a first portion of a given deflection cycle, to said first capacitor to store in said first capacitor a first charge that is indicative of a magnitude of said deflection circuit;
- a source of a modulation signal at a frequency related to a second deflection frequency coupled to said first capacitor for storing, during a second portion of said given deflection cycle, in said first capacitor a second charge indicative of a magnitude of said modulation signal, in an opposite direction to said first charge;
- a comparator responsive to a signal developed in said first capacitor from said first and second charges for generating a second switch control signal, in accordance with a difference therebetween; and
- a third switch responsive to said second switch control signal and coupled to said deflection winding for controlling said deflection current in a manner to correct a raster distortion.

5,841,249

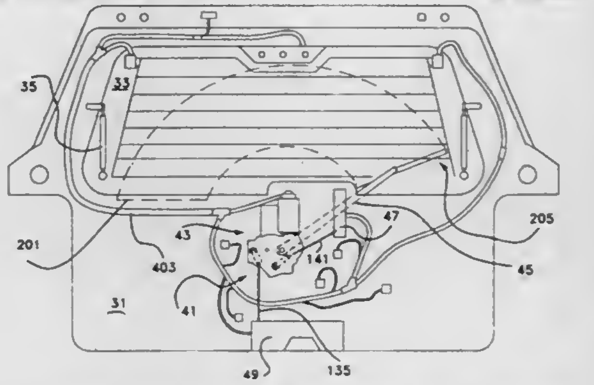
MULTI-FUNCTIONAL APPARATUS EMPLOYING AN INTERMITTENT MOTION MECHANISM

William Carl Zimmer, Columbus, and James Wayne Gibson, Mississippi, both of Mich., assignors to UT Automotive Dearborn, Inc., Dearborn, Mich.

Filed Apr. 28, 1995, Ser. No. 430,388

Int. Cl.^{6} H02K *7/10*

U.S. Cl. 318—10 **46 Claims**



1. A multi-functional automotive vehicle apparatus comprising:
- a main gear having a set of external teeth;
- at least one drive pin projecting substantially parallel to a rotational axis of said main gear;
- an electromagnetic device selectively rotating said main gear;
- a first intermittent rotary motion mechanism having a driven interfacing surface engagable with said at least one drive pin for changing orientation of said first intermittent motion mechanism; and
- a second intermittent rotary motion mechanism having a driven interfacing surface engagable with said at least one drive pin for changing orientation of said second intermittent motion mechanism.

5,841,250

STAGE APPARATUS AND LINEAR MOTOR, AND EXPOSURE APPARATUS AND DEVICE PRODUCTION METHOD USING THE STAGE APPARATUS

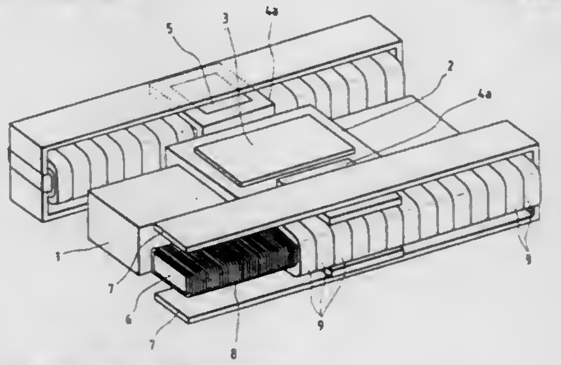
Nobushige Korenage, and Ryuichi Ebinuma, both of Utsunomiya, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1996, Ser. No. 725,401

Claims priority, application Japan, Oct. 9, 1995, 7-286345; Jul. 9, 1996, 8-196924

Int. Cl.^{6} H02K *41/00;41/02*

U.S. Cl. 318—135 **21 Claims**



1. A stage apparatus comprising:
- a stage movable in a predetermined direction;
- stage accelerating/decelerating thrust generation means arranged along the moving direction;
- stage speed control thrust generation means arranged to be parallel to said stage accelerating/decelerating thrust generation means;

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accelerating means for generating a stage accelerating thrust at a portion corresponding to a stage accelerating interval of said stage accelerating/decelerating thrust generation means;

decelerating means for generating a stage decelerating thrust at a portion corresponding to a stage decelerating interval of said stage accelerating/decelerating thrust generation means; and

speed control means for controlling a stage thrust generated by said stage speed control thrust generation means at least within a predetermined range between the accelerating interval and the decelerating interval,

wherein each of said stage accelerating/decelerating thrust generation means and said stage speed control thrust generation means comprises a linear motor whose movable unit has a magnet with its one pole opposing coils of a fixed unit, and said fixed unit comprises a yoke for applying a predetermined magnetic field to part of said coils in accordance with a position of said magnet over an entire stroke of said stage, and, as said coils, a single-phase speed control coil wound on said yoke and a plurality of polyphase accelerating/decelerating coils.

5,841,251

TEST SIGNALS AND TEST SIGNAL GENERATORS FOR USE WITH PAL PLUS TELEVISIONS

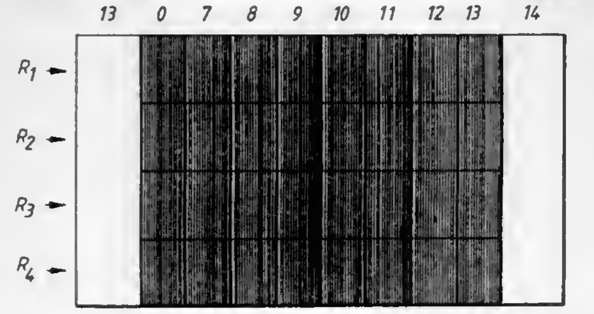
Rene Vroemen, Vriezenveen, Netherlands, and Rolf Putzhofen, Struenhuetten, Germany, assignors to Fluke Corporation, Everett, Wash.

Filed May 31, 1996, Ser. No. 655,996

Claims priority, application European Pat. Off., Jun. 2, 1995, 95303833

Int. Cl.^{6} H04N *17/00*

U.S. Cl. 348—181 **16 Claims**



1. A test signal provided at the output terminal of a signal generator for testing a television signal decoder which decodes a television signal by attenuating high frequency luminance components in dependence on detected changes, with respect to time, in the chrominance content of elements of a picture defined by the signal, the test signal containing a high frequency luminance component, and defining picture areas each containing a plurality of cycles of said high frequency luminance component and each having a chrominance content which varies with respect to time at a rate which is constant within the area but different from rates in other areas.

5,841,252

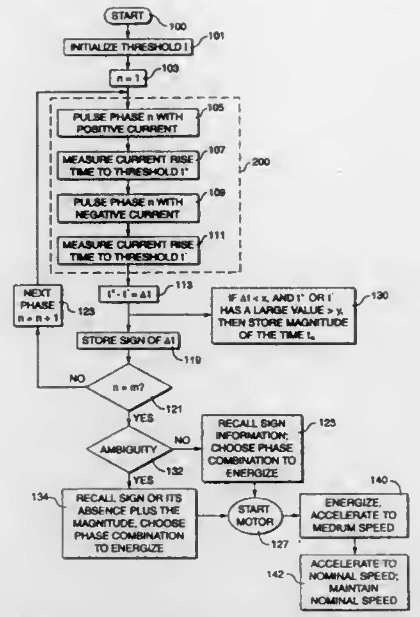
DETECTION OF STARTING MOTOR POSITION IN A BRUSHLESS DC MOTOR

John C. Dunfield, Santa Cruz, Calif., assignor to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Mar. 31, 1995, Ser. No. 414,312

Int. Cl.^{6} H02P *7/00*

U.S. Cl. 318—254 **14 Claims**


START
100
INITIALIZE THRESHOLD I
101
n = 1
103
PULSE PHASE n WITH POSITIVE CURRENT
105
MEASURE CURRENT RISE TIME TO THRESHOLD I⁺
107
200
PULSE PHASE n WITH NEGATIVE CURRENT
109
MEASURE CURRENT RISE TIME TO THRESHOLD I⁻
111
NEXT PHASE n = n + 1
123
I⁺ - I⁻ = ΔI
113
IF ΔI < x, AND I⁺ OR I⁻ HAS A LARGE VALUE > y, THEN STORE MAGNITUDE OF THE TIME t
130
STORE SIGN OF ΔI
119
NO
n = m?
121
YES
AMBIGUITY
NO
RECALL SIGN INFORMATION; CHOOSE PHASE COMBINATION TO ENERGIZE
125
132
YES
134
RECALL SIGN OR ITS ABSENCE PLUS THE MAGNITUDE, CHOOSE PHASE COMBINATION TO ENERGIZE
START MOTOR
127
140
ENERGIZE, ACCELERATE TO MEDIUM SPEED
142
ACCELERATE TO NOMINAL SPEED; MAINTAIN NOMINAL SPEED

1. In a brushless DC motor having n phases corresponding to phase windings arranged as a stator and a rotor for n an integer greater than zero, a method for starting the motor in a predetermined direction of rotation of the rotor, the method comprising the steps of:

initializing a threshold induced voltage level;

mapping electrical position of the rotor including the steps of:

pulsing a phase of the n phases with positive current to provide positively induced voltage without appreciably altering the electrical position of the rotor and to provide a positively pulsed phase;

measuring a first rise time for the positively induced voltage for the positively pulsed phase to reach the threshold induced voltage level;

again pulsing the phase of the n phases but this time with negative current to provide negatively induced voltage without appreciably altering the electrical position of the rotor and to provide a negatively pulsed phase;

measuring a second rise time for the negatively induced voltage for the negatively pulsed phase to reach the threshold induced voltage level;

determining a difference between the first and the second rise time as measured in each of the measuring steps;

determining and storing any sign of the difference;

determining if the difference is too small to resolve the electrical position of the rotor;

determining and storing, if the difference is too small to resolve the electrical position of the rotor, a magnitude of one of the first and the second rise time associated with the difference; and

repeating the steps comprising the step of mapping until each of the n phases is processed;

determining, based on the difference for each of the n phases, whether the electrical position of the rotor is ambiguous; and

recalling and comparing the sign of the difference plus the magnitude of an associated one of the first and the second rise time, if the electrical position is ambiguous, with predetermined stored motor electrical position information to energize at least one of the n phases to start the motor in the predetermined direction of rotation.

5,841,253

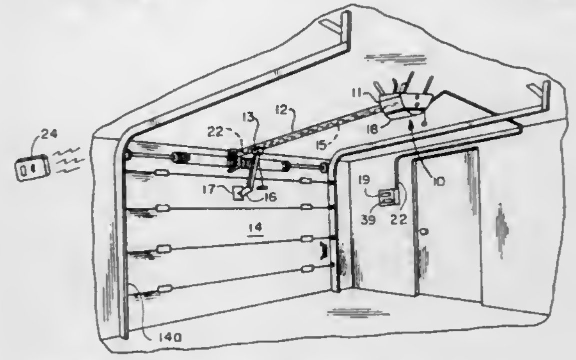
GARAGE DOOR OPERATOR WITH MOTOR CONTROL CIRCUIT FAULT DETECTION

James J. Fitzgibbon, Streamwood, and Colin B. Willmott, Buffalo Grove, both of Ill., assignors to The Chamberlain Group, Inc., Elmhurst, Ill.

Continuation of Ser. No. 588,227, Jan. 18, 1996, Pat. No. 5,684,372, which is a continuation of Ser. No. 465,606, Jun. 5, 1995, abandoned, which is a continuation of Ser. No. 367,920, Jan. 3, 1995, abandoned, which is a continuation of Ser. No. 200,292, Feb. 22, 1994, abandoned, which is a continuation of Ser. No. 964,566, Oct. 21, 1992, abandoned, which is a continuation of Ser. No. 682,671, Apr. 9, 1991, abandoned. This application Mar. 25, 1997, Ser. No. 823,727

Int. Cl.^{6} H02P *3/00*

U.S. Cl. 318—280 **23 Claims**



1. Apparatus for raising and lowering a door comprising:

a source of motor driving voltage;

a motor having an up winding which, when energized by said motor driving voltage, raises said door and a down winding which, when energized by said motor driving voltage, lowers said door;

control means for generating control signals defining door movement;

first switching means responsive to said control signals during fault free operation for connecting said motor driving voltage to a selected one of said up winding and an intermediate conductor;

second switching means responsive to said control signals during fault free operation for selectively connecting said intermediate conductor from said first switching means to said down winding;

third switching means responsive to said control signals during fault free operation for selectively connecting said motor driving voltage to said up winding; and

means for fault detecting a malfunction in the operation of said motor control circuitry, said control means being responsive to said fault detecting means detecting motor operation differing from said control signals defining door movement for generating a motor control command specifying energizing said motor for upward movement to raise a closing door.

5,841,254

TORQUE MAXIMIZATION AND VIBRATION CONTROL FOR AC LOCOMOTIVES

Edgar Thomas Balch; Ajith Kuttannair Kumar, both of Erie; Luzern Arthur Richter, North East, all of Pa., and Sean Erin Gleason, Indianapolis, Ind., assignors to General Electric Company, Erie, Pa.

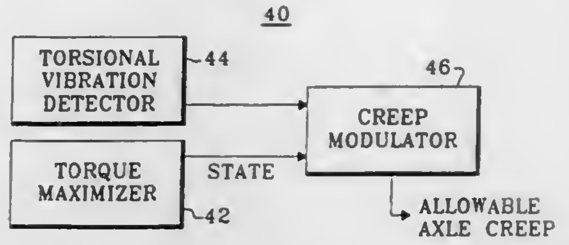
Filed Jul. 9, 1997, Ser. No. 890,220

Int. Cl.^{6} B60K *1/00;* **B61C** *15/08*

U.S. Cl. 318—430 **12 Claims**

1. A traction control system for use in an electric traction motor propulsion system, comprising:

a torque maximizer for measuring performance level of the traction motor propulsion system and for determining a torque maximizer state for maximizing traction performance;



a torsional vibration detector for processing estimated torque feedback for detecting torsional vibration level; and

a creep modulator for processing the torque maximizer state and torsional vibration level in order to control operating creep level.

5,841,255

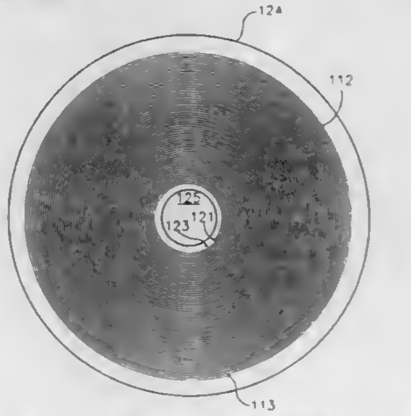
FLUX DETECTOR SYSTEM

Ronald G. Canada, Knoxville; Eugene F. Pardue, Lenoir City, and James C. Robinson, Knoxville, all of Tenn., assignors to CSI Technology, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 915,069, Aug. 20, 1997, which is a continuation-in-part of Ser. No. 697,335, Aug. 22, 1996, Pat. No. 5,726,911. This application Jan. 26, 1998, Ser. No. 13,011

Int. Cl.^{6} G01R *31/02*

U.S. Cl. 318—490 **17 Claims**



12. A flux detector for sensing flux generated by an electric machine, said detector comprising:

a nonconductive substrate having opposed first and second surfaces, said first and second surfaces being substantially flat and substantially parallel to each other, defining a width of said substrate therebetween, said substrate including a through opening originating at said first surface and traversing the width of the substrate to said second surface; and

an electrically conductive trace adjacent at least said first surface for sensing flux generated by an electric machine, said conductive trace forming a substantially repetitive geometric pattern and being positioned in a plane which is substantially parallel to said first surface.

5,841,256

ARRANGEMENT FOR CONTROLLING THE LOADING ELEMENT OF A CRANE

Hannu Oja, and Matti Kemppainen, both of Hyvinkää, Finland, assignors to KCI Konecranes International Corporation, Hyvinkaa, Finland

Filed May 15, 1997, Ser. No. 856,799

Claims priority, application Finland, Jan. 7, 1997, 970072

Int. Cl.^{6} B66C *13/40;* **G05B** *11/26*

U.S. Cl. 318—562 **16 Claims**

1. An arrangement for controlling a loading element of a crane, the loading element supported by the crane including an actuator, a

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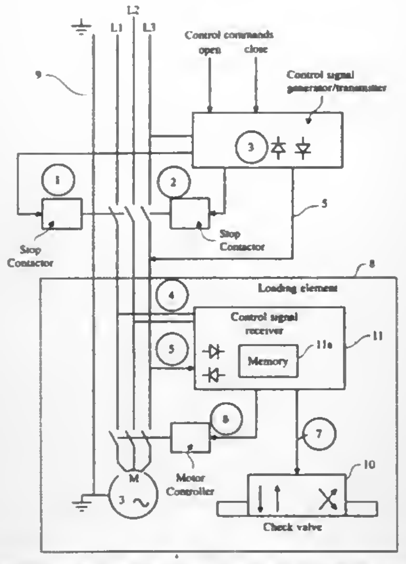


current supply cable for supplying current to the loading element, and a drum supported by the crane for supplying a necessary length of the current supply cable to the loading element in accordance with the lifting height, the arrangement for controlling the loading element comprising:

- transmission means for generating and transmitting control signals for controlling the actuator of the loading element,
- reception means for receiving the control signals in the loading element, and

a transmission path for transmitting the control signals from the transmission means to the reception means, wherein the transmission path for transmitting the control signals is provided by the conductors of current supply cable supplying current to the loading element,

- wherein the information for controlling the actuator is transmitted through the conductors of the current supply cable of the loading element before power is switched to the loading element.

5,841,257

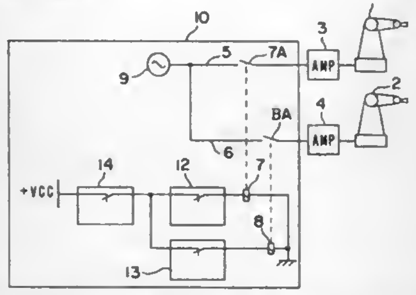
CIRCUIT FOR SUPPLYING/INTERRUPTING POWER TO ROBOTS

Yoshiki Hashimoto, Hadano; Yasuyuki Shimoda, and Yasuhiro Matsuo, both of Minamitsuru-gun, all of Japan, assignors to Fanuc, Ltd., Minamitsuru-gun, Japan

Continuation of Ser. No. 185,950, Jan. 18, 1994, abandoned. This application Jan. 26, 1996, Ser. No. 592,446

Int. Cl.^{6} B25J *9/18*

U.S. Cl. 318—568.11 **8 Claims**



1. A circuit for supplying/interrupting power to robots in a robot control system for controlling robots using a single controller, each of said robots coupled to said single controller, said circuit comprising:

power supply means for supplying power to said robots;

- a common power interrupting circuit, coupled between said robots and said power supply means, which simultaneously interrupts the power being supplied to said robots; and
- a plurality of power interrupting circuits, each power interrupting circuit of said plurality of power interrupting circuits corresponding to a respective robot of said robots, each said power interrupting circuit individually interrupting the power supplied to the corresponding and respective robot.

5,841,258

REMOTE CONTROL SYSTEM FOR LEGGED MOVING ROBOT

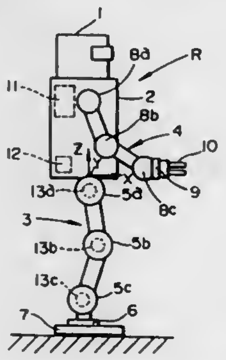
Toru Takenaka, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 2, 1998, Ser. No. 17,373

Claims priority, application Japan, Jan. 31, 1997, 9-018468

Int. Cl.^{6} B25J *13/04;* **G05D** *3/12*

U.S. Cl. 318—568.12 **6 Claims**



1. A remote control system for remotely controlling a legged moving robot, comprising:

- a master unit for manipulating the legged moving robot in a master-slave configuration;
- said master unit having a foot support mechanism for movably supporting a foot of an operator, a foot support mechanism actuating device for actuating said foot support mechanism, an upper body support mechanism for supporting an upper body of the operator, and master foot acting force detecting means for detecting forces acting on the foot of the operator;
- said legged moving robot having robot foot acting force detecting means for detecting forces acting on a foot of the legged moving robot from a floor, and a leg actuating device; and
- foot position/orientation control means for determining a target position and/or orientation for the foot of the operator with respect to the upper body thereof and a target position and/or orientation for the foot of the robot with respect to the upper body thereof, based on the forces detected by said master foot acting force detecting means and the forces detected by said robot foot acting force detecting means, in order to associate the forces acting on the foot of the operator and the forces acting on the foot of the legged moving robot with respect to each other in a predetermined relationship, controlling said foot support mechanism with said foot support mechanism actuating device according to the determined target position and/or orientation for the foot of the operator and the determined target position and/or orientation for the foot of the robot, and controlling said leg actuating device of the legged moving robot.

5,841,259

VACUUM CLEANER AND CONTROL METHOD THEREOF

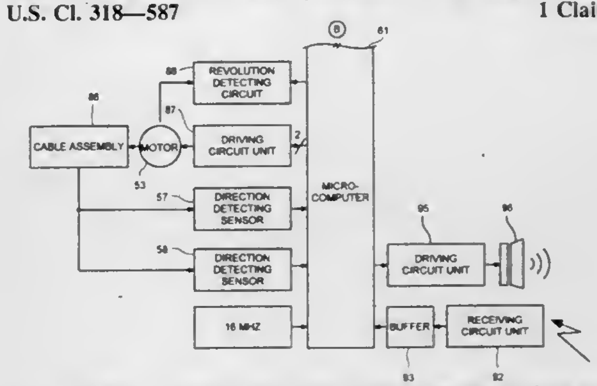
Ji-Hyun Kim; Suk-Jin Han, both of Suwon, and Jae-Bong Lee, Seoul, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Division of Ser. No. 287,272, Aug. 8, 1994. This application Apr. 17, 1996, Ser. No. 633,375

Claims priority, application Rep. of Korea, Aug. 7, 1993, 93-15373

Int. Cl.^{6} B64C *13/18;* **A47L** *9/00;* **B65H** *75/48;* **H02G** *11/00*

U.S. Cl. 318—587 **1 Claim**



1. A method of controlling a self-propelled, self-directed vacuum cleaner, and maintaining a substantially constant tension on an electric power supply cord of the vacuum cleaner as the power cord is extended from and retracted onto a reel, the method comprising the steps of:

- A) actuating an object detecting mechanism disposed on the vacuum cleaner for detecting a reference surface in a room being cleaned and for detecting obstacles in a path of travel of the vacuum cleaner;
- B) driving drive wheels disposed on the vacuum cleaner to advance the vacuum cleaner along a path spaced at a substantially constant distance from the reference surface in the absence of detected obstacles in the path of travel;
- C) selectively driving the drive wheels to steer the vacuum cleaner away from detected obstacles; D) connecting an outer end of a spiral plate spring to the reel, so that during steps B and C the outer portion of the plate spring is wound up during extension of the cord from the reel and is unwound during retraction of the cord onto the reel;
- E) connecting an inner end of the plate spring to a reversible motor;
- F) sensing the rotation direction of the reel; and
- G) actuating the motor in the same direction as the reel to unwind the inner portion of the spring during extension of the cord and wind up the inner portion of the plate spring during retraction of the cord.

5,841,260

DISK DEVICE WITH FAILURE PREDICTION FUNCTION AND MOTOR START ERROR PREDICTION METHOD IN THE DEVICE

Hiroshi Imai, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 17, 1997, Ser. No. 785,593

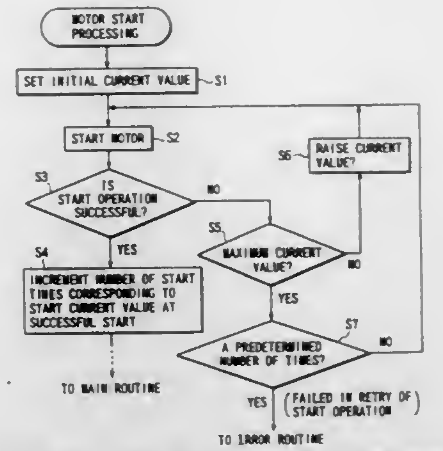
Claims priority, application Japan, Mar. 29, 1996, 8-077547

Int. Cl.^{6} H02P *3/00*

U.S. Cl. 318—638 **13 Claims**

1. A disk device comprising:

- a motor for rotating a disk serving as a recording medium;
- means for performing a motor start operation at a predetermined initial current value, for, when the motor start operation at the initial current value has failed, performing a motor start operation by increasing a start current value stepwise up to a predetermined maximum current value as an upper limit value until said motor is started successfully, and for, when the motor start operation at the maximum current value has failed, repeating the motor start operation at the maximum current value within a predetermined number of times as an upper limit;
- monitor means for monitoring the numbers of start times of said motor in units of predetermined start current values; and
- determination means for determining based on the numbers of motor start times in units of start current values monitored by said monitor means whether or not said device is in a risky state in terms of a motor start error.


MOTOR START PROCESSING
SET INITIAL CURRENT VALUE
S1
START MOTOR
S2
S6
RAISE CURRENT VALUE?
S3
IS START OPERATION SUCCESSFUL?
NO
S5
S4
YES
MAXIMUM CURRENT VALUE?
NO
INCREMENT NUMBER OF START TIMES CORRESPONDING TO START CURRENT VALUE AT SUCCESSFUL START
YES
S7
A PREDETERMINED NUMBER OF TIMES?
NO
TO MAIN ROUTINE
YES
(FAILED IN RETRY OF START OPERATION)
TO ERROR ROUTINE

5,841,261

SYSTEM FOR CONTROLLING STEPPING MOTOR FOR DIVIDING A SINGLE STEP OF THE MOTOR INTO PLURAL SECTIONS AND APPLYING VOLTAGES WHOSE LEVELS ARE DETERMINED IN ACCORDANCE WITH THE SECTIONS

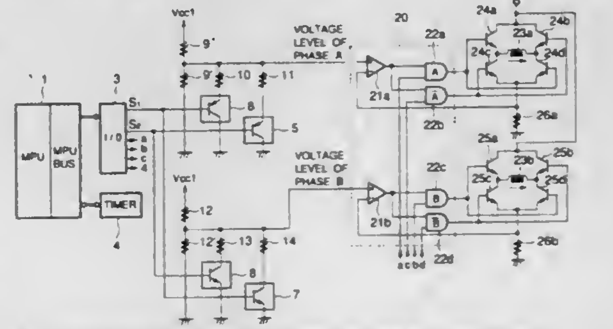
Takashi Nojima, Mitaka; Soichi Hiramatsu, Hachioji; Hideki Yamaguchi; Hiroyuki Inoue, both of Yokohama; Hitoshi Nakamura, Kawasaki; Akira Kida, Yokohama; Hideaki Kawakami, Yokohama, and Takeshi Iwasaki, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 3, 1995, Ser. No. 552,389

Claims priority, application Japan, Nov. 10, 1994, 6-301360

Int. Cl.^{6} H02P *8/00*

U.S. Cl. 318—696 **10 Claims**



1. A system for controlling a stepping motor, comprising:

- a stepping motor;
- drive means for driving said stepping motor, said drive means receiving a step drive signal for changing the excitation phase of said stepping motor and to determine a drive current of said stepping motor in accordance with an input voltage input thereto;
- step drive signal generating means for supplying the step drive signal to said drive means to step-drive said stepping motor;
- signal generation means for generating a plurality of control signals in a range of a single step driving of said stepping motor; and
- level setting voltage generating means for dividing said single step driving range of said stepping motor into a plurality of sections in accordance with the plurality of control signals

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generated by said signal generation means and for supplying voltages whose levels are determined in accordance with said divided sections to said drive means.

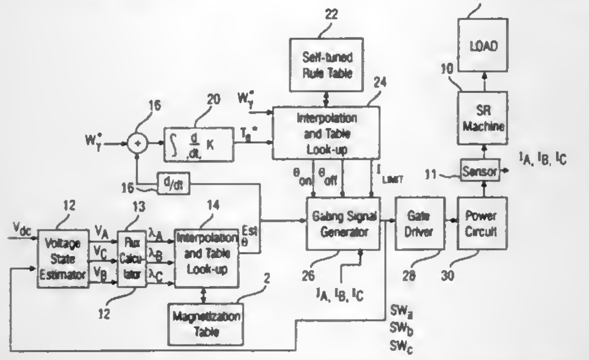
5,841,262
LOW-COST UNIVERSAL DRIVE FOR USE WITH SWITCHED RELUCTANCE MACHINES

Yifan Tang, St. Louis, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Mar. 25, 1997, Ser. No. 826,313

Int. Cl.^{6} H02F *8/00*

U.S. Cl. 318—701 **17 Claims**



1. A universal drive for a switched reluctance machine (SRM), said drive comprising:

means for automatically storing information pertaining to magnetic flux, current, and rotor angle of said SRM to form a magnetization table;

means for automatically storing information relating the torque of said SRM to turn-on and turn-off angles to form a rule table;

a first sensor coupled to said SRM for sensing the currents of the phases of said SRM;

a second sensor for sensing a dc bus voltage;

estimation means coupled to said magnetization table for estimating a reference angle using information in said magnetization table and said sensed voltage and currents;

interpolation means coupled to said rule table for obtaining the turn-on and turn-off angles from said rule table based upon said desired speed; and

current driving means coupled to said estin.ation and interpolation means for turning the phase currents of the SRM on at the turn-on angle in relation to the reference angle and turning the phase current off in relation to the reference angle and the turn-off angle.

5,841,263
FREQUENCY DEPENDENT CURRENT CONTROL SYSTEM FOR AN AC MOTOR

Satoru Kaneko, Urizura-machi; Ryoso Masaki, Hitachi; Sanshiro Obara, Tokai-mura, and Yuusuke Takamoto, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed May 20, 1997, Ser. No. 859,087

Claims priority, application Japan, May 20, 1996, 8-124674

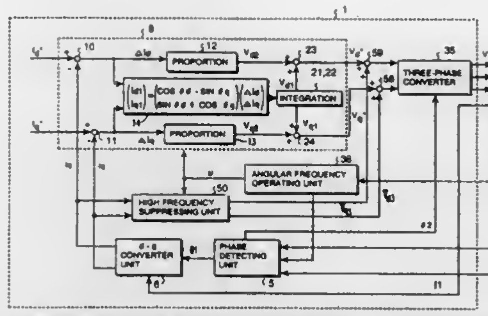
Int. Cl.^{6} A47B *51/00*

U.S. Cl. 318—807 **9 Claims**

1. Motor control equipment for a high frequency AC driven motor, comprising:

a power converter with a maximum output frequency of at least 500 Hz and;

a digital arithmetic unit which outputs an AC voltage command to the power converter by performing current-feedback control of the AC motor up to a maximum output frequency of the power converter, wherein the digital arithmetic unit comprises:



a first subtracting unit for calculating a d-axis current deviation between a detected value of d-axis current, which controls magnetic flux of the AC motor, and a d-axis current command value;

a second subtracting unit for calculating a q-axis current deviation between a detected value of q-axis current, orthogonal to the d-axis current, and a q-axis current command value;

a phase calculating unit for calculating a d-axis phase based on resistance and reactance components of an impedance of the d-axis, and a q-axis phase based on resistance and reactance components of an impedance of the q-axis;

a voltage control signal calculating unit for calculating a d-axis voltage control signal and a q-axis voltage control signal based on the d-axis and q-axis current deviations, and on the d-axis phase and the q-axis phase; and

means for providing the AC voltage command to said power converter, based on the d-axis voltage control signal and the q-axis voltage control signal.

5,841,264
METHOD OF STEPWISE VOLTAGE CONTROL FOR SUPPLYING AN INDUCTION MOTOR

Claude Caën, 1 rue Louise Pasteur, 92100 Boulogne Billancourt, France, assignor to Claude Caen, Boulogne Billancourt, and Cecile Kohen, Antony, both of France

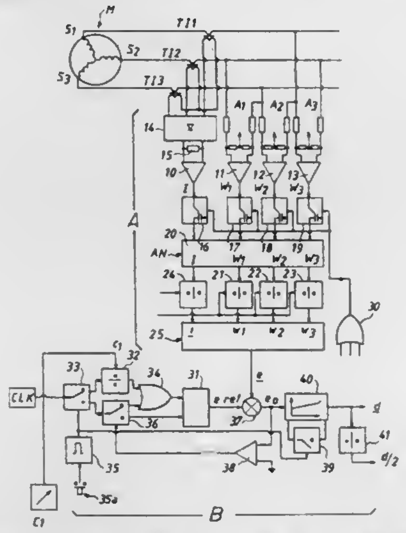
PCT No. PCT/FR95/00817, § 371 Date Dec. 19, 1996, § 102(e) Date Dec. 19, 1996, PCT Pub. No. WO95/35594, PCT Pub. Date Dec. 28, 1995

PCT Filed Jun. 20, 1995, Ser. No. 750,597

Claims priority, application France, Jun. 22, 1994, 94/07635

Int. Cl.^{6} H02P *5/34;7/622*

U.S. Cl. 318—727 **7 Claims**



1. A method for controlling a multiphase induction motor during the time interval of predetermined transient operating conditions, said motor driving a load the resisting torque of which varies with the speed in accordance with a predetermined law, wherein the method comprises the steps of:

supplying said motor at constant frequency and variable voltage via static switches (I_1, I_2, I_3) by varying periods of conduction of said switches;

reading from a memory, in a predetermined sequence, a succession of prerecorded information representative of a succession of desired electromotive force amplitudes corresponding to a predetermined torque variation sequence during said predetermined transient operating conditions;

determining, during the same said time interval, the voltages (W_1, W_2, W_3) applied to said motor and the current (I) passing through its stator;

deducing from said voltages and said current, during the same time interval, the variation of the rotor electromotive force amplitude (e) developed by motor M; and

controlling said static switches (I_1, I_2, I_3) by acting on their conduction intervals in order to permanently adjust said rotor electromotive force amplitude (e) to simultaneously read-in-memory electromotive force amplitude (e_{ref}) corresponding to said predetermined torque variation sequence during said predetermined transient operating conditions.

5,841,265
CHARGE/DISCHARGE CONTROL CIRCUIT AND CHARGEABLE ELECTRIC POWER SOURCE APPARATUS

Minoru Sudo; Takayuki Takashina; Yoshikazu Kojima; Sadashi Shimoda, and Hiroshi Mukainakano, all of Tokyo, Japan, assignors to Seiko Instruments Inc., Japan

Division of Ser. No. 154,463, Nov. 17, 1993. This application Mar. 12, 1997, Ser. No. 816,196

Claims priority, application Japan, Nov. 24, 1992, 4-313515; Jan. 12, 1993, 5-3561; Mar. 11, 1993, 5-51110; Mar. 12, 1993, 5-52476; Mar. 16, 1993, 5-56208; Mar. 17, 1993, 5-57563; Mar. 17, 1993, 5-57564; Mar. 22, 1993, 5-62259; Mar. 22, 1993, 5-62260; Mar. 24, 1993, 5-65758; Mar. 25, 1993, 5-67132; Apr. 21, 1993, 5-94677; May 21, 1993, 5-120198; May 27, 1993, 5-126238; Sep. 3, 1993, 5-220279; Sep. 8, 1993, 5-223647; Sep. 9, 1993, 5-224186; Oct. 19, 1993, 5-261285

Int. Cl.^{6} H01M *10/46*

U.S. Cl. 320—134 **2 Claims**

1. A charge/discharge control circuit comprising:

an electric power source having a first electric power source and a second electric power source which are connected in series with each other;

first overcharge/overdischarge detection means and second overcharge/overdischarge detection means provided independently of said first electric power source and said second electric power source, respectively;

control means for outputting a signal for controlling the charge/discharge of said electric power source in accordance with signals from said first overcharge/overdischarge detection means and said second overcharge/overdischarge detection means; and

intermediate voltage receiving means for receiving a voltage of a junction connected between said first electric power source and said second electric power source and outputting a signal to inform a relation of relative voltage between them, operation of the intermediate voltage receiving means being controlled in accordance with the signal from said control means.

5,841,266
POWER SOURCE SYSTEM FOR A VEHICLE

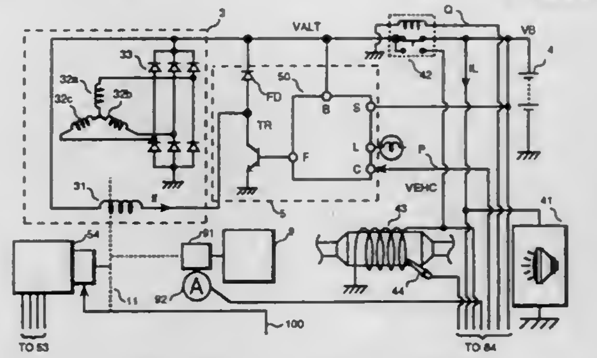
Sakae Hikita; Yoshiaki Honda, both of Hitachinaka; Masakatsu Fujishita, Mito; Sakae Ishida, Hitachinaka; Syouju Masumoto, Hitachiohta, and Naoyuki Takahashi, Hitachinaka, all of Japan, assignors to Hitachi Ltd., Tokyo, and Hitachi Car Engineering Co., Ltd., Hitachinaka, both of Japan

Filed Jan. 11, 1996, Ser. No. 584,395

Claims priority, application Japan, Jan. 10, 1995, 7-001707; Jun. 29, 1995, 7-163303

Int. Cl.^{6} H02J *1/00*

U.S. Cl. 322—8 **6 Claims**



1. A power source system for a vehicle comprising:

a generator which is driven by an internal combustion engine to generate electric power;

a battery means which is operable at a first voltage level and is charged with the electric power generated by the generator;

a heating means for an electrically heated catalyst system which is operable at a second voltage higher than the first voltage level and is heated with the electric power generated by said generator;

a switch means which changes over the connection of said generator from said battery means to said heating means or vice versa;

an engine control unit which generates a control signal P determining output voltages of said generator to be applied to said heating means for the electrically heated catalyst system and a switching signal Q for causing the changing over at said switching means;

power generation control unit which controls the field current of said generator depending on either the voltage of said battery means or the control signal P from said engine control unit and thereby controls the output voltage of said generator; and

a temperature detecting means for detecting temperature at the electrically heated catalyst system;

wherein the control signal P is generated when the rotation speed of the internal combustion engine is stabilized after starting the same, the control signal P is consisted of a first portion which causes said generator via said power generation control unit to generate an output of a third voltage level lower than the first voltage level for a determined period, a second portion following the first portion which causes said generator via said power generation control unit to increase the output voltage from the third voltage level to the second voltage level with a predetermined increment, a third portion following the second portion which causes said generator via said power generation control unit to hold the second voltage level until either said temperature detecting means detects that the temperature of the electrically heated catalyst system exceeds a predetermined temperature or until a predetermined time has passed after the generation of control signal P or until the rotation speed of the internal combustion engine exceeds a predetermined rotation speed, a fourth portion following the third portion which causes said generator via said power generation control unit to decrease the output voltage thereof from the second voltage level to the third voltage level with a predetermined decrement, and a fifth portion following the fourth portion which causes said generator via said power generation control unit to hold the output voltage thereof at the third voltage level for a predetermined period, and during

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the first portion of the control signal P said engine control unit generates the switching signal Q which changes over the connection of said generator from said battery means to said heating means for the electrically heated catalyst system and during the fifth portion of the control signal P said engine control unit generates the switching signal Q which changes over the connection of said generator from said heating means for the electrically heated catalyst system to said battery means.

5,841,267

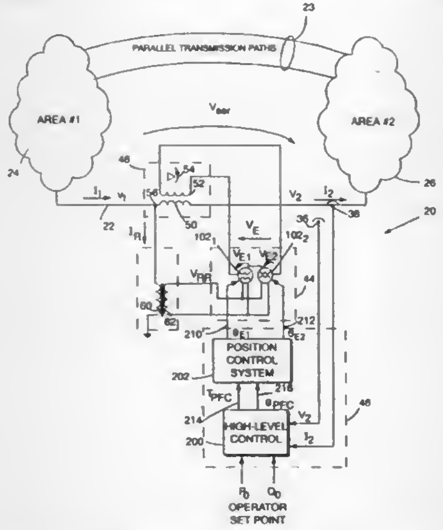
POWER FLOW CONTROL WITH ROTARY TRANSFORMERS

Einar Vaughn Larsen, Charlton, N.Y., assignor to General Electric Co., Schenectady, N.Y.

Continuation-in-part of Ser. No. 550,941, Oct. 31, 1995, abandoned, which is a continuation-in-part of Ser. No. 426,201, Apr. 21, 1995, abandoned. This application Mar. 11, 1997, Ser. No. 814,374

Int. Cl.^{6} G05F *5/04*

U.S. Cl. 323—215 18 Claims



1. A power flow controller connected on a transmission path between a first electrical area and a second electrical area, a first side of the transmission path being connected to the first electrical area, the apparatus comprising:

a first rotary phase shifting transformer having a first rotary phase shifting transformer first terminal and a first rotary phase shifting transformer second terminal;

a second rotary phase shifting transformer having a second rotary phase shifting transformer first terminal and a second rotary phase shifting transformer second terminal;

wherein the first rotary phase shifting transformer first terminal and the second rotary phase shifting transformer first terminal are connected in parallel to the first side of the transmission path and the first rotary phase shifting transformer second terminal and the second rotary phase shifting transformer second terminal are connected in series with the transmission path; and

a control system for applying control signals to the first rotary phase shifting transformer and the second rotary phase shifting transformer whereby an effective phase shift and a voltage magnitude ratio are provided between the first electrical area and the second electrical area.

5,841,268

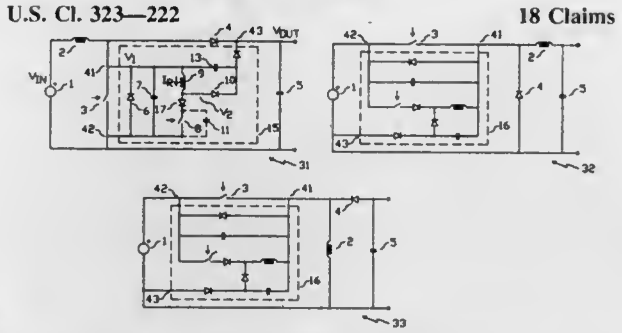
MULTI-RESONANT SOFT SWITCHING SNUBBER NETWORK FOR DC-TO-DC CONVERTER

Alexander Mednik, Campbell, Calif., assignor to Power Architects Corporation, Campbell, Calif.

Filed Sep. 29, 1997, Ser. No. 939,929

Int. Cl.^{6} G05F *1/56*

U.S. Cl. 323—222 18 Claims



1. A family of switching type DC-to-DC converters for converting voltage from an input DC voltage source to an output DC voltage for delivery electrical energy to an output load, said converters comprising:

an input adapted to receive electrical energy from said input DC voltage source;

an output adapted to deliver electrical energy to said output load;

an energy storage inductor adapted to store energy from said input DC voltage source and deliver said energy to said output load;

a controlled power switching means periodically biased conducting for connecting said energy storage inductor to said input DC voltage source;

a power rectifier biased conducting for connecting said energy storage inductor to said output load during intervals when said controlled power switching means is biased non-conducting;

an output filter capacitor adapted to be connected to said output load to absorb an AC component of the output current;

an active snubber network connected across said controlled power switching means;

said active snubber network including a first resonant capacitor, a body diode, a resonant inductor; a controlled auxiliary switching means, a first diode, a second resonant capacitor and a second diode;

said first resonant capacitor connected across said controlled power switching means;

said body diode connected across said controlled power switching means to provide a reverse current path thereacross;

said resonant inductor connected in series with said controlled auxiliary switching means and coupled across said first resonant capacitor;

said controlled auxiliary switching means biased conducting at zero current to provide resonant discharge of said first resonant capacitor prior to said controlled power switching means being biased conducting, therefore facilitating its zero-voltage turn-on;

said first diode connected in series with said second resonant capacitor and coupled across said resonant inductor to clamp the voltage across said controlled auxiliary switching means at zero and facilitate its lossless turn-off;

said second resonant capacitor adapted to absorb the resonant energy stored in said resonant inductor;

said second diode connected in series with said second resonant capacitor and adapted to limit the voltage across said second resonant capacitor during its resonant charging;

said second diode adapted to provide a discharge path for said second resonant capacitor when said controlled power switching means is biased non-conducting and to facilitate its lossless zero-voltage turn-off.

5,841,269

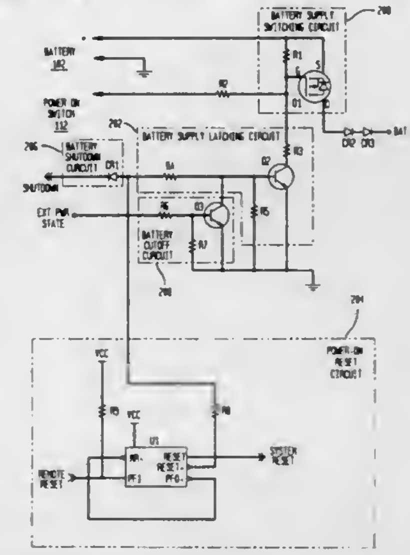
POWER-DOWN CIRCUIT

Richard P. Schoonmaker, Wilton, Conn.; Wei C. Chen, Malden, Mass.; Johanna Degroot-Thomas, New York, N.Y., and Edward J. Naclerio, Madison, Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Aug. 1, 1997, Ser. No. 905,480

Int. Cl.^{6} G05F *1/569;* H02H *3/18*

U.S. Cl. 323—276 16 Claims



1. A power-down circuit comprising:

a power supply switching circuit coupled to a power supply and responsive to a power-on signal, for supplying power from the power supply;

a power-on reset circuit, coupled to the power supply switching circuit, for determining whether the supplied power falls below a prescribed level and, in response, outputting a power suppression signal for at least a prescribed period of time; and

a power supply latching circuit, coupled to the power supply switching circuit and the power-on reset circuit, for switching on the power-on signal when the power suppression signal is not output, thereby supplying the power from the power supply.

5,841,270

VOLTAGE AND/OR CURRENT REFERENCE GENERATOR FOR AN INTEGRATED CIRCUIT

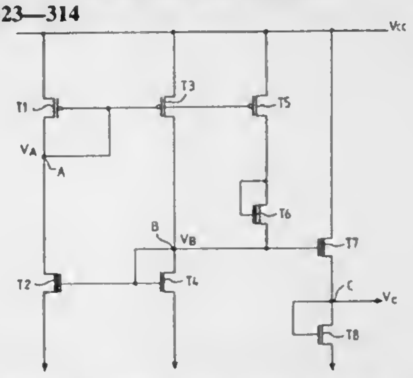
Tien-Dung Do, Villa Julia-Impasse des Mésanges, and David Naura, Tivoli-bât, both of France, assignors to SGS-Thomson Microelectronics S.A., Saint Genis, France

Filed Jul. 23, 1996, Ser. No. 685,434

Claims priority, application France, Jul. 25, 1995, 95 09023

Int. Cl.^{6} G05F *3/28;3/30*

U.S. Cl. 323—314 9 Claims



1. A reference generator implemented in a MOS technology integrated circuit with a current mirror device comprising:

a first current source arm connected at one end to a supply voltage line, and having a first transistor connected as a diode and connected in series with a second transistor that is native and resistive;

a second current source arm connected at one end to the supply voltage line, and having a third transistor connected in series with a fourth transistor that is connected as a diode, the connection between the third and fourth transistor defining a mid-point;

wherein said device comprises a third current source arm connected at one end to the supply voltage line, the third current source arm including a fifth transistor that is connected in series with a sixth transistor which is connected as a diodes and the third current source arm connected at another end to said mid-point;

the first, third and fifth transistors having the same conductivity type and their gates being connected together,

the second, fourth and sixth transistors having the same conductivity type and the second and fourth transistors having their gates connected together,

the fourth transistor having a conduction threshold greater than that of said second and sixth transistors so as to supply a stable voltage to said mid-point of the second current source arm.

5,841,271

TEST MODE POWER CIRCUIT FOR INTEGRATED-CIRCUIT CHIP

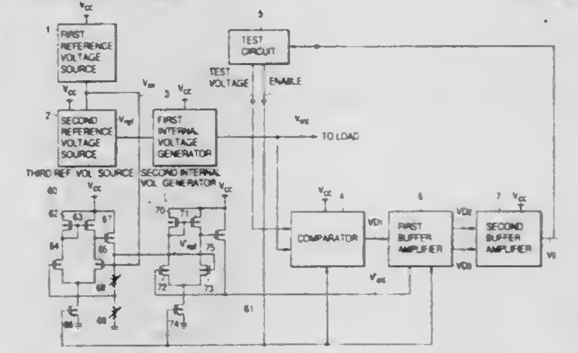
Hiroshi Nakayama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 341,076, Nov. 17, 1994, abandoned. This application Aug. 6, 1997, Ser. No. 906,824

Claims priority, application Japan, Nov. 17, 1993, 5-309669

Int. Cl.^{6} G05F *3/16*

U.S. Cl. 323—316 8 Claims


FIRST REFERENCE VOLTAGE SOURCE
TEST CIRCUIT
TEST VOLTAGE
ENABLE
SECOND REFERENCE VOLTAGE SOURCE
FIRST INTERNAL VOLTAGE GENERATOR
TO LOAD
THIRD REF VOL SOURCE
SECOND INTERNAL VOL GENERATOR
COMPARATOR
FIRST BUFFER AMPLIFIER
SECOND BUFFER AMPLIFIER

1. A power supply circuit for an integrated-circuit chip, comprising:

a first voltage reference source configured to output a first voltage reference V1;

a second voltage reference source connected to receive the first voltage reference V1 from the first voltage reference source and to output a second voltage reference V2;

a third voltage reference source connected to receive the first voltage reference V1 from the first voltage reference source and to output a third voltage reference V3, wherein the third voltage reference V3 is greater in magnitude than the second voltage reference V2;

a first internal voltage generator connected to receive the second voltage reference V2 from the second voltage reference source and to output a first internal voltage Vint1;

a second internal voltage generator connected to receive the third voltage reference V3 from the second voltage reference source and to output a second internal voltage Vint2, wherein the second internal voltage Vint2 is greater in magnitude than the first internal voltage Vint1;

a comparator connected to receive a test voltage output from a test circuit and the first internal voltage Vint1 output from the first internal voltage generator, the comparator being powered

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by the first internal voltage Vint1 and being configured to produce a first output voltage VD1 that is based on a difference between the first internal voltage Vint1 and the test voltage;

a first buffer amplifier connected to receive the first output voltage VD1 from the comparator and the second internal voltage Vint2 from the second internal voltage source, the first buffer amplifier being powered by the second internal voltage Vint2, the first buffer amplifier being configured to output a pair of voltages VD2 and VD3 which are based on the first output voltage VD1; and

a second buffer amplifier connected to receive the pair of voltages VD2 and VD3 output by the first buffer amplifier, the second buffer amplifier further connected to receive an externally supplied voltage, the second buffer amplifier providing an output voltage Vo to the test circuit, the output voltage Vo being based on the pair of voltages VD2 and VD3.

5,841,272

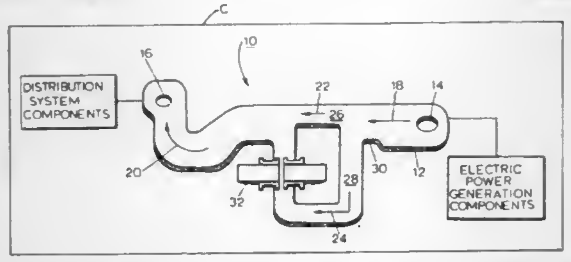
FREQUENCY-INSENSITIVE CURRENT SENSOR

Edward W. Smith, Pecatonica; Arthur A. Pershall, and William G. Durtschi, both of Rockford, all of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 20, 1995, Ser. No. 575,300

Int. Cl.^{6} G01R *33/00*

U.S. Cl. 324—117 H **22 Claims**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16
DISTRIBUTION SYSTEM COMPONENTS
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ELECTRIC POWER GENERATION COMPONENTS

1. An electrical device for sensing current flowing through an electrical circuit, comprising:

conductive means for bifurcating the current into first and second current paths, wherein each of the first and second current paths has an impedance comprising a nonzero inductance and a resistance wherein a predetermined relationship is maintained between the impedances in the first and second current paths over a frequency range; and

means for providing an output signal representing the current regardless of operating frequency in the circuit within the frequency range.

5,841,273

ELECTRONIC MAGNETIC POSITION SENSOR USING A MAGNETIC PATH LINKING AN ENERGIZING COIL AND TWO DETECTORS

Tetsuo Muraji, Odawara, Japan, assignor to Mikuni Corporation, Tokyo, Japan

Filed Oct. 18, 1995, Ser. No. 545,035

Claims priority, application Japan, Feb. 22, 1995, 7-034072

Int. Cl.^{6} G01B *7/14;7/30;* G01D *5/20*

U.S. Cl. 324—207.17 **19 Claims**

1. A magnetic position sensor comprising:

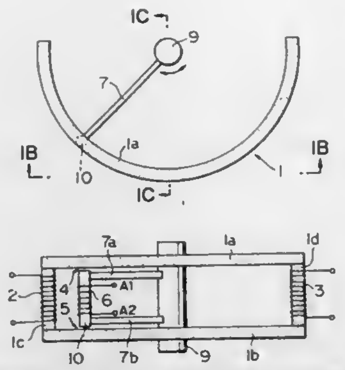
at least one energizing coil;

at least two magnetism detecting elements;

a magnetic path forming means for allowing a magnetic flux interlinking with said energizing coil to pass through said magnetism detecting elements said magnetic path forming means providing a magnetic reluctance corresponding to a current position of a movable member to be detected;

energizing means for energizing said energizing coil; and

a position signal generating means for generating a position signal indicating a current position of said movable member in accordance with the respective output signals issued from said magnetism detecting element, wherein said position signal generating means produces said position signal which is based on a ratio between an added value of said output signals and one of said output signals.



5,841,274

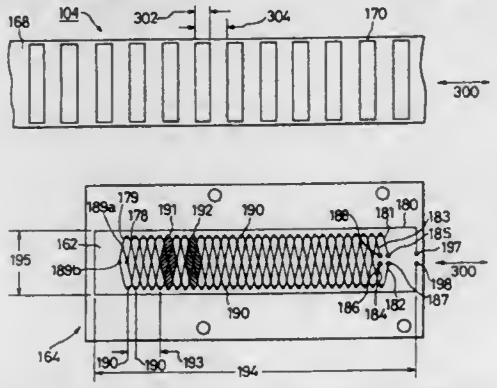
INDUCED CORRENT ABSOLUTE POSITION TRANSDUCER USING A CODE-TRACK-TYPE SCALE AND READ HEAD

Karl G. Masreliez, Bellevue; Nils Ingvar Andermo, and Kim W. Atherton, both of Kirkland, all of Wash., assignors to Mitutoyo Corporation, Kawasaki, Japan

Filed Jan. 29, 1997, Ser. No. 790,494

Int. Cl.^{6} G01B *7/02;7/14;* G01D *5/20;* H03M *1/22*

U.S. Cl. 324—207.17 **40 Claims**



1. An inductive absolute position transducer, comprising:

a scale member;

a read head member, the read head member and the scale member movable relative to each other along a measuring axis, and configured so that at least a portion of the read head member overlies at least a portion of the scale member;

a code track inductive position transducer comprising:

a code track transmitter winding formed on the read head member,

at least one set of code track receiver windings formed on the read head member, each set of code track receiver windings including a number n of separate receiver windings arranged along the measuring axis, each separate receiver winding capable of providing a set of output states, where n is a positive integer greater than 1, and

a code track formed on the scale member, the code track having a plurality of flux modulator zones distributed along the measuring axis, at least one flux modulator formed in at least some of the plurality of flux modulator zones; and

a signal generating and processing circuit electrically connected to the transmitter winding and each receiver winding of each set of code track receiver windings;

wherein:

the flux modulators modulate the inductive coupling between each code track receiver winding and the code track transmitter winding based on a relative position between the read head member and the scale member,

the flux modulators are distributed on the scale member such that each flux modulator zone is capable of producing one of the set of output states in an overlying receiver winding, the flux modulator zones forming a series of code elements extending along the measuring axis, each set of m adjacent code elements forming a unique codeword, and

each unique codeword defines an absolute position of the read head member relative to the scale member to a first resolution.

5,841,275

MAGNETIC MEASURING SYSTEM HAVING A PARTICULARLY ORIENTED AUXILIARY FIELD

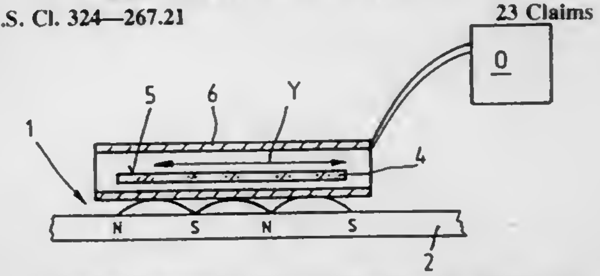
Alfons Spies, Seebruck, Germany, assignor to Johannes Heidenhain GmbH, Traunreut, Germany

Filed Mar. 24, 1995, Ser. No. 410,321

Claims priority, application European Pat. Off., Mar. 25, 1994, 94104762; Mar. 25, 1994, 95104763

Int. Cl.^{6} G01B *7/14;7/00;* G01D *5/245*

U.S. Cl. 324—267.21 **23 Claims**



1. A position measuring device for measuring the relative position of two objects which can be moved in relation to each other wherein a periodic, magnetic graduation in the measurement direction is scanned by a scanner unit comprising:

at lease one magnetic field sensitive element for generating position-dependent output signals, from which position measuring values can be determined in an evaluation device, wherein the at least one magnetic field sensitive element is disposed in a plane parallel to the graduation; and

means for momentarily rendering the magnetic field of the graduation ineffective, wherein the means for momentarily rendering the magnetic field of the graduation ineffective comprises:

a pulse generator;

a switching circuit controlled by the pulse generator including two switches which are alternately opened under control of the pulse generator;

a coil coupled to the pulse generator for receiving pulses from the pulse generator and generating an auxiliary magnetic field to bias the magnetic field sensitive element:

at least one sample and hold circuit coupled to the output of the differential amplifier; and

a differential amplifier having one input coupled to the sample and hold circuit and the other input coupled to the magnetic field sensitive element and an output.

5,841,276

MAGNETIC GEAR ROTATION SENSOR

Yasuaki Makino, Okazaki; Seiki Aoyama, Toyohashi, and Toshikazu Arasuna, Toyota, all of Japan, assignors to Nippondenso Co., Ltd, Kariya, Japan

Filed May 13, 1996, Ser. No. 645,261

Claims priority, application Japan, May 12, 1995, 7-114786

Int. Cl.^{6} G01B *7/14;* G01D *3/488;5/245;* G01P *3/488*

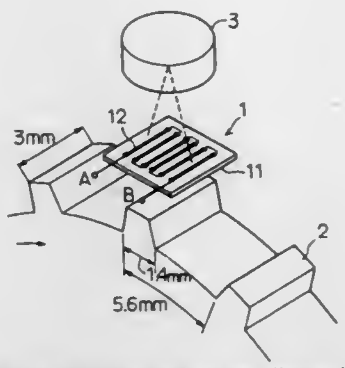
U.S. Cl. 324—207.21 **34 Claims**

1. A magnetic gear rotation sensor for detecting a rotation of a magnetic gear having teeth on a periphery thereof, comprising:

a bias magnet which applies a bias magnetic field to the magnetic gear, the bias magnetic field varying in response to the rotation of the magnetic gear;

a plurality of magneto-resistive elements disposed in parallel to each other along a moving direction of the teeth of the magnetic gear between the magnetic gear and the bias magnet and connected electrically in series, wherein the plurality of the magneto-resistive elements are disposed within a range shorter than one tooth pitch of the magnetic gear, and every space between two adjacent magneto-resistive elements has the same interval; and

an output terminal connected to one end of the magneto-resistive elements for outputting an electric signal corresponding to a composite value of all variations of resistance of the respective magneto-resistive elements and having one peak in every cycle corresponding to the tooth pitch of the magnetic gear.



5,841,277

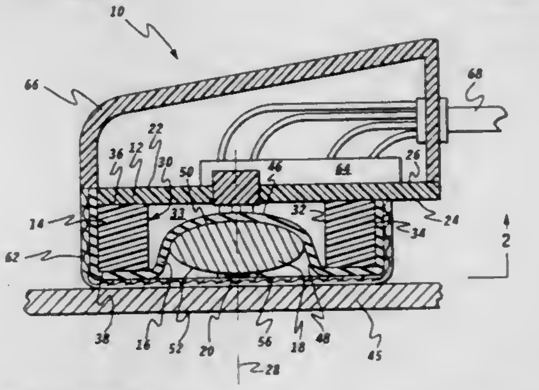
HAND-HOLDABLE PROBE HAVING A FLEXIBLE EDDY CURRENT SENSOR

Kristina Helena Valborg Hedengren; John David Young, both of Schenectady, N.Y.; Thomas Burrows Hewton, and Carl Granger, Jr., both of West Chester, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 21, 1997, Ser. No. 803,612

Int. Cl.^{6} G01R *33/12;* G01N *27/82:27/72*

U.S. Cl. 324—240 **8 Claims**



1. A probe comprising:

a) a support member movable proximate a surface of an object to be tested for flaws;

b) first means for providing a stand-off distance between said support member and said surface when said support member is moved proximate said surface, said first means in contact with said surface and said support member when said support member is moved proximate said surface; and

c) second means for providing a predetermined force to said surface when said first means contacts said surface, the entire second means disposed proximate said support member and moved proximate said surface when said support member is moved proximate said surface, said second means in contact with said surface when said first means contacts said surface, said predetermined force generally decoupled from any force applied to said surface by said first means when said first means contacts said surface, and said second means including a flexible sensor disposed proximate said surface when said first means contacts said surface.

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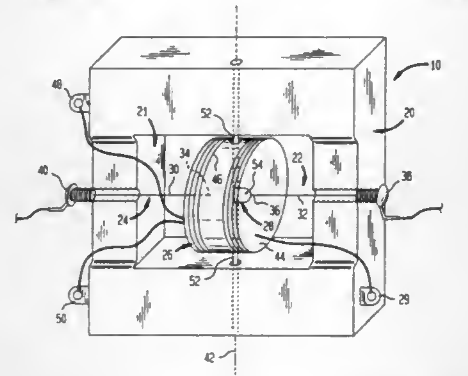
5,841,278
ELECTROMECHANICAL RF SWITCH ACTIVATED BY EXTERNAL MAGNETIC FIELD

Charles Green, Holbrook; Jan Votruba, Ridge, and Mark Gelbien, Levittown, all of N.Y., assignors to Fonar Corporation, Melville, N.Y.

Filed Jul. 17, 1996, Ser. No. 683,626

Int. Cl.⁶ G01V *3/00*

U.S. Cl. 324—318 **29 Claims**



1. An electromechanical switch for use in a magnetic resonance imaging apparatus which is operative for creating a first magnetic field, said switch comprising a frame of non-magnetic material, a first secondary contact supported by said frame, an electromagnet formed from non-magnetic material, said electromagnet being movably supported within said frame, and a primary contact mechanically connected to said electromagnet for movement therewith, said electromagnet and primary contact being movable between a first position in which said primary contact engages said first secondary contact and a second position in which said primary contact is disengaged from said first secondary contact, said electromagnet being arranged so that when in the presence of said first magnetic field, application of a current having a first polarity to said electromagnet will move said electromagnet and said primary contact to said first position, and so that application of a current having a second, opposite, polarity will move said electromagnet and said primary contact to said second position.

5,841,279
BODY COIL, GRADIENT COIL AND NMR APPARATUS

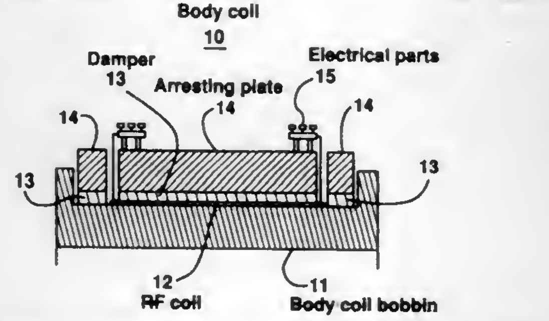
Yujiro Hayashi; Kazuhiko Hayakawa; Kazuhiko Sato, and Zenchi Hiyama, all of Tokyo, Japan, assignors to GE Yokogawa Medical Systems, Limited, Tokyo, Japan

Filed Dec. 23, 1996, Ser. No. 771,996

Claims priority, application Japan, Apr. 5, 1996, 8-084125

Int. Cl.⁶ G01V *3/00*

U.S. Cl. 324—318 **10 Claims**



1. An NMR apparatus for generating and receiving NMR signals comprising:

magnetic means for generating a static magnetic field in a measurement space where a body to be examined is to be placed;

gradient coil means for producing gradient magnetic fields, said gradient coil means being arranged inside said magnetic means; and

body coil means for exciting target nuclides in said body, said body coil means being arranged inside said gradient coil means with a space and including

a body coil bobbin,

an RF coil attached externally to said body coil bobbin,

dampers for covering said body coil bobbin and said RF coil, and

arresting plates attached externally to said dampers to arrest vibrations of said dampers.

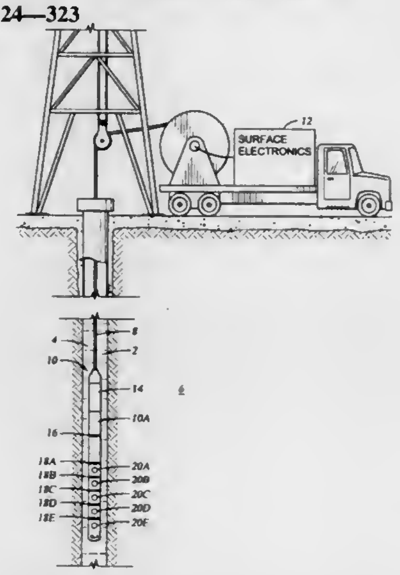
5,841,280
APPARATUS AND METHOD FOR COMBINED ACOUSTIC AND SEISMOELECTRIC LOGGING MEASUREMENTS

Gang Yu, Katy; Xiaoming Tang, Houston; Kurt-Martin Strack, Houston, and Arthur Chuen Hon Cheng, Houston, all of Tex., assignors to Western Atlas International, Inc., Houston, Tex.

Filed Jun. 24, 1997, Ser. No. 881,304

Int. Cl.⁶ G01V *11/00;1/40;3/18*

U.S. Cl. 324—323 **15 Claims**



1. A method for estimating porosity of an earth formation from measurements of acoustic energy traversing said formation and from measurements of seismoelectric voltages generated in said formation in response to said acoustic energy, the method comprising:

calculating synthetic seismoelectric voltages from said measurements of said acoustic energy using an initial value of said porosity;

determining a difference between said synthetic seismoelectric voltages and said measurements of said seismoelectric voltages; and

adjusting said initial value of said porosity, and repeating said steps of calculating said synthetic seismoelectric voltages, determining said difference and adjusting said value of porosity until said difference reaches a minimum.

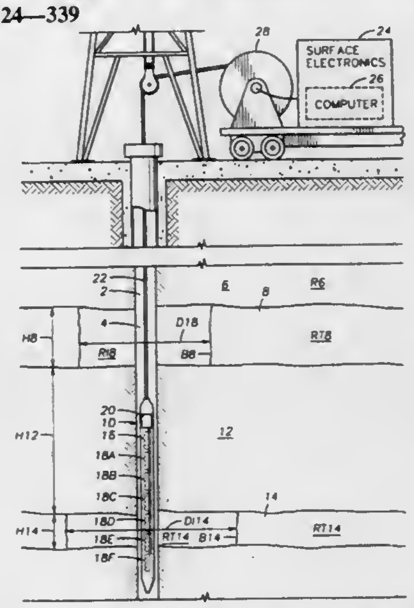
5,841,281
METHOD FOR DETERMINING ELECTRICAL CONDUCTIVITY OF EARTH FORMATIONS FROM ELECTROMAGNETIC INDUCTION VOLTAGE MEASUREMENTS

David R. Beard; Carlos A. Yanzig, and Leonty A. Tabarovsky, all of Houston, Tex., assignors to Western Atlas International, Inc., Houston, Tex.

Filed Mar. 22, 1996, Ser. No. 620,613

Int. Cl.⁶ G01V *3/28;3/10;3/15*

U.S. Cl. 324—339 **6 Claims**



1. A method of determining conductivity of earth formations penetrated by a wellbore, comprising:

inserting an induction well logging instrument into said wellbore, said instrument including a transmitter a source of alternating current connected to said transmitter and a receiver;

energizing said transmitter with said alternating current;

recording voltages induced in said receiver; and

determining area enclosed with respect to a baseline by voltage peaks within said detected voltages, said area corresponding to said conductivity.

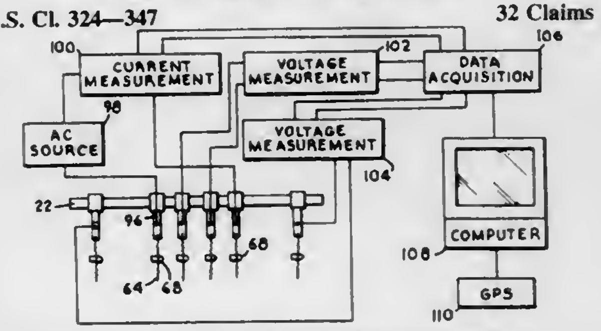
5,841,282
DEVICE FOR MEASURING SOIL CONDUCTIVITY

Colin Christy, 630 Gypsum, and Eric Lund, 2137 Hillside, both of Salina, Kans. 67401

Filed Feb. 10, 1997, Ser. No. 798,222

Int. Cl.⁶ G01R *27/26;* **A01C** *23/00*

U.S. Cl. 324—347 **32 Claims**



1. A system for measuring soil conductivity, comprising:

a frame adapted to be conveyed over a ground surface;

a plurality of soil engaging coulters insulatively mounted from said frame and insulated from each other;

means for passing a current between a first pair of said coulters through the soil;

means for measuring the current passed through said soil;

means for measuring the voltage resulting from said current between a second pair of said coulters; and

means for calculating the soil conductivity from said voltage measurement and said current measurement.

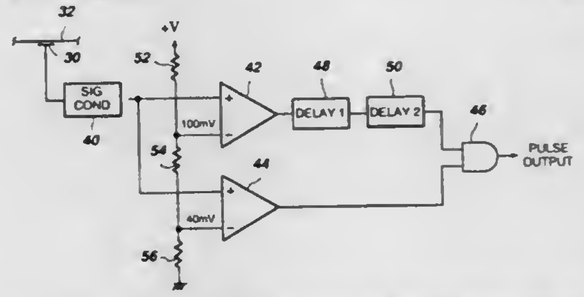
5,841,283
DISCRIMINATOR CIRCUIT FOR DETECTING THE EVENT SPARK PLUG IN A DISTRIBUTORLESS IGNITION SYSTEM

Hendrikus Franciscus Bonifatius Bloemen, Ootmarsum, Netherlands, assignor to Fluke Corporation, Everett, Wash.

Filed Aug. 12, 1997, Ser. No. 909,996

Int. Cl.⁶ F02P *17/00*

U.S. Cl. 324—399 **3 Claims**



1. A discriminator circuit for detecting an event spark plug in a distributorless ignition system having said event spark plug and a waste spark plug connected in series to form a closed loop with a secondary winding of an ignition coil, wherein a spark plug cable is interposed between said secondary winding and said event spark plug and carries a voltage signal representative of alternating event and waste ignition cycles, comprising:

a first comparator having a first input thereof coupled to said spark plug cable and receiving said voltage signal, and a second input thereof coupled to a first reference voltage, said first comparator switching from a first to a second logic state at the output thereof when said voltage signal exceeds said first reference voltage upon the firing of said event spark plug, and said first comparator switching back to said first logic state when said voltage signal at said first input thereof falls below said first reference voltage after the firing of said event spark plug;

a delay element having a delay input connected to the output of said first comparator and generating at a delay output said second logic state after a predetermined time period following receipt of said second logic state at said delay input;

a second comparator having a first input thereof coupled to said spark plug cable and a second input thereof coupled to a second reference voltage, said second comparator switching from said first to said second logic state at the output thereof when said signal voltage at said first input thereof exceeds said second reference voltage at the beginning of said event cycle, said second comparator switching back to said first logic state when said voltage signal at said first input thereof representing waste voltage in said waste ignition cycle falls below said second reference voltage; and

a logic gate having a first input coupled to the delay output of said delay element and a second input coupled to the output of said second comparator, said logic gate producing said second logic state at an output thereof indicating detection of said event spark plug when both said first and second inputs of said logic gate are at said second logic state.

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5,841,284
APPARATUS FOR MONITORING POWER OF BATTERY TO SUPPLY ELECTRIC POWER TO LOAD

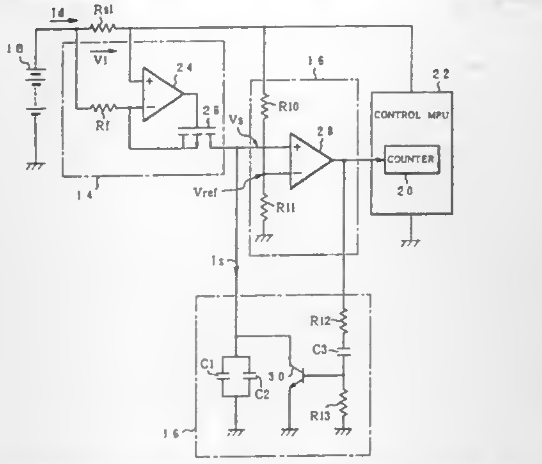
Susumu Takahashi, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 23, 1995, Ser. No. 494,059

Claims priority, application Japan, Nov. 11, 1994, 277288

Int. Cl.^{6} G01N *27/416;* **G01R** *31/36*

U.S. Cl. 324—428 **4 Claims**



1. An apparatus for monitoring power of a battery which supplies an electric power to a load, said apparatus comprising:

a micro current detection resistor Rs1′ which is inserted in a signal line connecting a plus terminal of said battery and said load such that current flow through said resistor generates a detection voltage V1 across said resistor that is proportional to a battery discharge current Id flowing from said battery to said load;

a current converting circuit having an operational amplifier to which said detection voltage generated across said current detection resistor is inputted through an input high resistor Rf, said current converting circuit including an FET which is driven by an output of said operational amplifier and which outputs a micro discharge detection current Is which is derived by multiplying said battery discharge current Id with a ratio Rs1/Rf;

an integrating circuit for charging a capacitor by the discharge detection current Is of said current converting circuit and forming an integration voltage;

a comparing circuit for resetting said integrating circuit and outputting one pulse signal when the integration voltage of said integrating circuit reaches a reference voltage indicative of a unit charge amount; and

a measuring unit for counting the number of pulse signals outputted from said comparing circuit and generating a count value, and measuring the discharge charge amount of the battery on the basis of said count value.

5,841,285
TEMPERATURE-COMPENSATED THERMOCHROMIC BATTERY TESTER

John C. Bailey, Columbia Station, Ohio, assignor to Eveready Battery Company, Inc., St. Louis, Mo.

Filed Jul. 25, 1997, Ser. No. 900,439

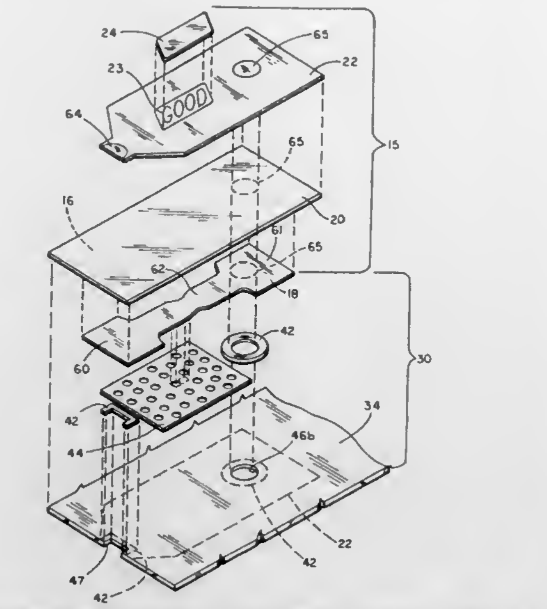
Int. Cl.^{6} G01N *27/416;* **H01M** *10/48*

U.S. Cl. 324—435 **40 Claims**

1. A battery tester comprising:

a heating element adapted to be coupled to opposite terminals of a battery for generating heat in response to current supplied from the battery; and

an indicator overlapping a portion of said heating element, said indicator having a visual property that changes in response to the heat generated by said heating element, wherein at least a portion of said heating element is made of a variable resistivity material having a resistivity that changes in response to ambient temperature.



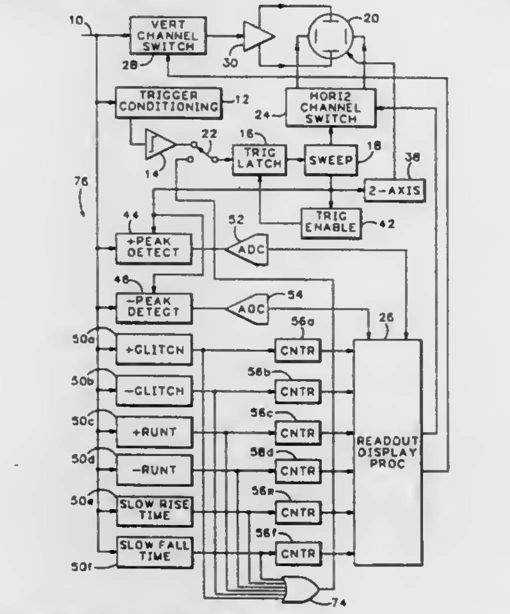
5,841,286
OSCILLOSCOPE WITH DETECTION OF ANOMALOUS EVENTS DURING BLIND INTERVALS

John F. Stoops, Portland, Oreg., assignor to Tektronix, Inc., Wilsonville, Oreg.

Continuation of Ser. No. 88,969, Jul. 7, 1993, abandoned. This application Feb. 17, 1995, Ser. No. 390,907

Int. Cl.^{6} G01R *31/28;13/20*

U.S. Cl. 324—511 **8 Claims**



1. An oscilloscope comprising:

a trigger circuit connected to detect a trigger event in the input signal for initiating display of a waveform of an input signal in response to the trigger event, the trigger event being the occurrence of a predefined behavior of the input signal,

display means for displaying the waveform in response to the initiation of the trigger circuit,

at least one detection circuit independent of the trigger circuit and responsive to the input signal for detecting occurrence of an anomalous event in the input signal during a blind interval of a measurement cycle of the oscilloscope, the blind interval being an interval during which the oscilloscope is unable to process the input signal to produce a waveform display, and

means for responding to the occurrence of the anomalous event by either recording the occurrence of the anomalous event or communicating the occurrence of the anomalous event to an operator.

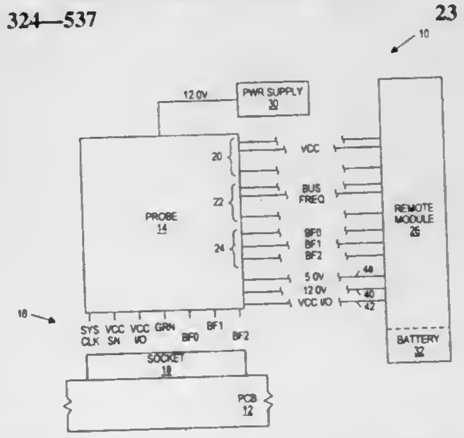
5,841,287
SYSTEM FOR DETECTING MOTHERBOARD OPERATION TO ENSURE COMPATIBILITY OF A MICROPROCESSOR TO BE COUPLED THERETO

Raymond S. Duley, Buda, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Feb. 26, 1997, Ser. No. 805,178

Int. Cl.^{6} G01R *31/28;* **G06F** *3/00*

U.S. Cl. 324—537 **23 Claims**



1. A mechanism for detecting electronic signals, comprising:

a printed circuit board configured to receive an integrated circuit wherein said printed circuit board comprises a power conductor and a clocking conductor, wherein said power conductor is adapted to provide a power signal to said integrated circuit and said clocking conductor is adapted to provide a clocking signal to said integrated circuit;

a probe releasably coupled to a socket which receives terminal ends of said power conductor and said clocking conductor;

detection circuit within said probe in operable communication with said power conductor and said clocking conductor for determining a voltage within said power conductor and said clocking signal within said clocking conductor; and

a visual display remotely coupled to the detection circuit for illustrating a magnitude of the voltage and a frequency of the clocking signal.

5,841,288
TWO-DIMENSIONAL MICROWAVE IMAGING APPARATUS AND METHODS

Paul M. Meaney, Windsor, Vt., and Keith D. Paulsen, Hanover, N.H., assignors to Microwave Imaging System Technologies, Inc., Hanover, N.H.

Filed Feb. 11, 1997, Ser. No. 798,885

Int. Cl.^{6} G01N *22/00;* **G01R** *29/08*

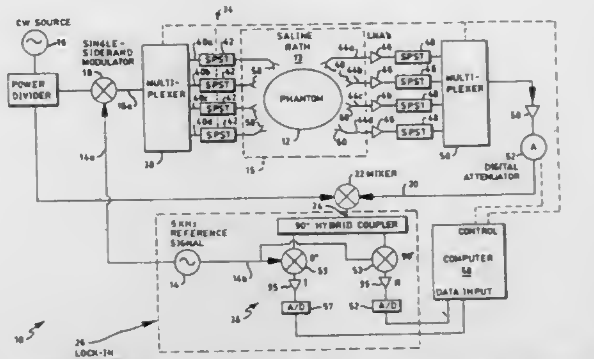
U.S. Cl. 324—639 **32 Claims**

1. A method of determining electric field properties of an inhomogeneous target, comprising the steps of:

(A) measuring the electric field external to a boundary that defines the target;

(B) estimating electric property distributions on a coarse mesh discretization of the target; and

(C) computing an electric field on a fine mesh discretization of the target, and at points external to the fine mesh discretization, the fine mesh having finer discretization than the coarse mesh and being overlapping with the coarse mesh.



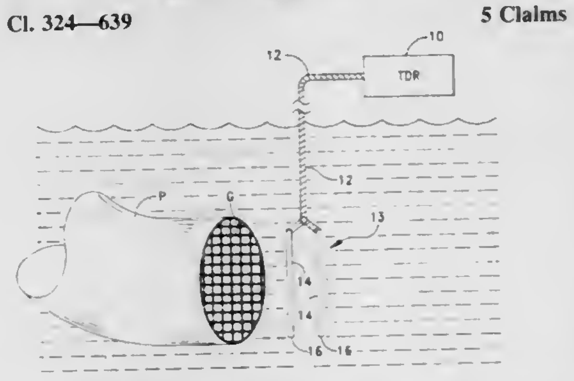
5,841,289
SYSTEM AND METHOD FOR DETECTING ACCRETION OF FRAZIL ICE ON UNDERWATER GRATINGS

Norbert E. Yankielun, Lebanon, and John J. Gagnon, Enfield, both of N.H., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 28, 1997, Ser. No. 789,889

Int. Cl.^{6} G01R *27/04*

U.S. Cl. 324—639 **5 Claims**



1. A method for detecting accretion of frazil ice on an underwater grating, said method comprising the steps of:

providing a pair of parallel electrically conductive bars mounted side-by-side and substantially co-extensive;

providing a time domain reflectometer;

connecting a first end of a coaxial transmission line to said bars and a second end of said coaxial transmission line to said reflectometer;

positioning said bars and said transmission line first end beneath the surface of the water, proximate and spaced from the grating, with said bars depending from said transmission line and having free distal ends extending downwardly and free floating;

positioning said reflectometer above the surface of the water and remote from said bars;

actuating said reflectometer to send electromagnetic pulses through said transmission line and through said bars to said distal ends of said bars, said bars and said transmission line facilitating return of the pulses to said reflectometer;

computing round trip time of travel of said pulses in said bars, and determining changes in pulse round trip times, and therefrom determining absence, presence and build-up of frazil ice volume on and around said bars;

thereby to obtain an indication of same on said grating.

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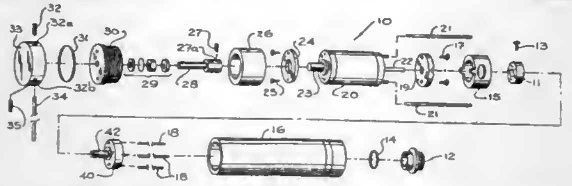
5,841,290
METHOD FOR SENSING THE PRESENCE AND ABSENCE OF AN OBJECT

Dean Bentzien, Brookfield; Hermann Dohl, Richfield; Frank Riedl, Sussex, and Armin Dohl, Germantown, all of Wis., assignors to TPS International, Inc., Sussex, Wis.

Division of Ser. No. 398,472, Mar. 3, 1995, Pat. No. 5,691,647. This application Mar. 20, 1997, Ser. No. 822,184

Int. Cl.⁶ G01R *27/02;* **G08B** *21/00*

U.S. Cl. 324—714 **2 Claims**



1. A method for sensing the presence and absence of an object using an object sensing device comprised of an object sensing mechanism, a resistive element, and a control mechanism, the object sensing mechanism being coupled to the resistive element, the control mechanism being communicatively coupled to both the object sensing mechanism and the resistive element the method comprising:

- actuating the object sensing mechanism so that it mechanically senses the location of the object;
- recording a first voltage, across the resistive element, in the control mechanism when the object sensing mechanism senses the location of the object;
- reactuating the object sensing mechanism at least one more time;
- measuring a second voltage across said resistive element when said object sensing mechanism is reactuated; comparing said second voltage with said first voltage; and sending a signal to said control mechanism when said second voltage is not substantially equal to the first voltage.

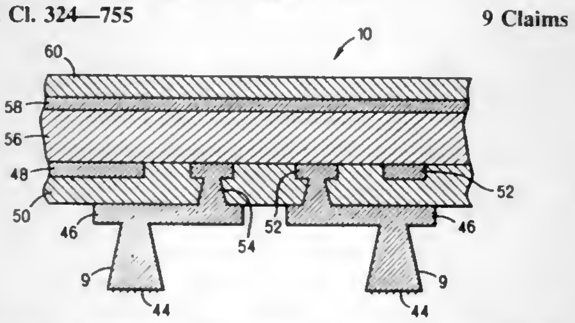
5,841,291
EXCHANGEABLE MEMBRANE PROBE TESTING OF CIRCUITS

Ken Kuang-Fu Liu, Saratoga; Byoung-Youl Min, Cupertino; Robert John Moti, San Jose, and Syed A. Husain, Milpitas, all of Calif., assignors to MicroModule Systems, Cupertino, Calif.

Division of Ser. No. 643,740, May 6, 1996, Pat. No. 5,623,213, which is a continuation of Ser. No. 303,498, Sep. 9, 1994, abandoned. This application Dec. 12, 1996, Ser. No. 764,511

Int. Cl.⁶ G01R *31/02*

U.S. Cl. 324—755 **9 Claims**



1. Apparatus for providing power and ground potentials between power and ground terminals of a power source associated with a tester structure and respective power and ground terminals of an electrical device under test, said apparatus comprising:

- a flexible substrate bearing conductive runs that provide electrical connections between the tester structure and one or more pads of the device under test;
- a first electrically conductive continuous region that is coupled to the flexible substrate and provides electrical connection to a ground terminal of the tester structure, the first electrically conductive continuous region and the conductive runs collectively occupying a substantial portion of the flexible substrate;
- a second electrically conductive region that is coupled to the substrate and provides electrical connection to said power terminal of said power source and said power terminal of said electrical device,
- a third electrically conductive region that is coupled to the substrate and provides electrical connection to said ground terminal of said power source and said ground terminal of said electrical device; and
- said second conductive region and said third conductive region collectively occupying a substantial portion of the flexible substrate, and being spaced from said first conductive region to filter noise components from said power and ground potentials.

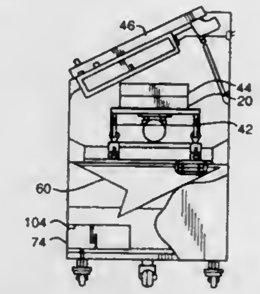
5,841,292
AUTOMATED TEST PIN LOADING APPARATUS

Robert J. Gallagher, Nashua, N.H., assignor to Star Technology Group, Inc., Nashua, N.H.

Filed Mar. 4, 1997, Ser. No. 811,543

Int. Cl.⁶ G01R *31/02*

U.S. Cl. 324—761 **6 Claims**



1. Apparatus for loading test pins into a test fixture having a plurality of holes to receive said test pins, comprising a shaker table for supporting a fixture to be loaded together with a pin cassette containing a plurality of pins with their bottom ends resting on the fixture, a funnel or chute located below the shaker table to catch spare pins and direct the pins into a collection container, wherein said collection container comprises one or more angled internal baffle walls for orienting the pins in the same direction.

5,841,293
METHOD AND APPARATUS FOR SCREENING INTEGRATED CIRCUIT CHIPS FOR LATCH-UP SENSITIVITY

James Marc Leas, South Burlington, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

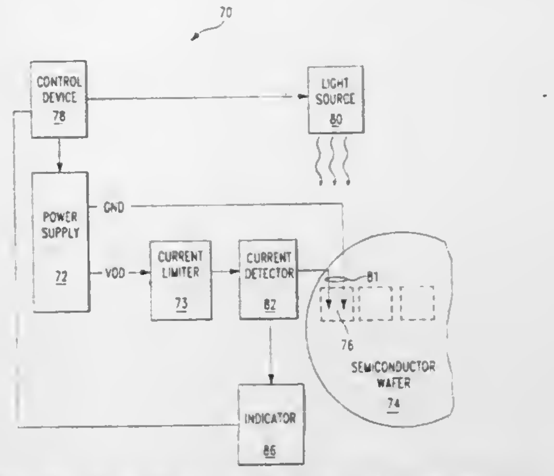
Filed Dec. 22, 1995, Ser. No. 581,861

Int. Cl.⁶ G01R *1/04;31/26*

U.S. Cl. 324—765 **19 Claims**

1. A method of screening a semiconductor chip for susceptibility to latch-up, the method comprising the steps of:

- a) applying power and ground voltage to the chip;
- b) limiting current flow in the chip to a compliance value;
- c) irradiating the powered-up chip with a pulse of radiation, said radiation providing an energy dose to the chip calibrated to trigger latch-up in a latch-up sensitive chip so as to distinguish passing and failing chips, wherein, following said radiation pulse, current in a failing chip remains approximately at said compliance value;
- d) detecting current in the chip after said irradiating step (c) is complete; and
- e) indicating the chip as passing or failing.



5,841,294
METHOD FOR MEASURING LEAKAGE CURRENT IN JUNCTION REGION OF SEMICONDUCTOR DEVICE

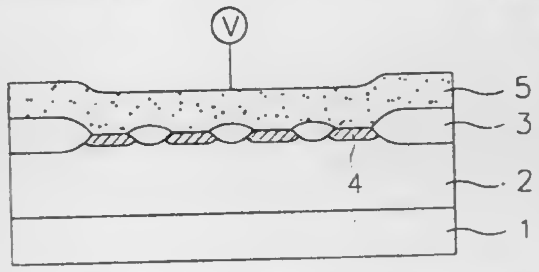
Se Aug Jang, and Tae Sik Song, both of Kyoungki-do, Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., Ichon-shi, Rep. of Korea

Filed Jun. 28, 1996, Ser. No. 672,927

Claims priority, application Rep. of Korea, Jun. 30, 1995, 1995-18861

Int. Cl.⁶ G01R *31/26*

U.S. Cl. 324—765 **16 Claims**



1. A method for measuring a junction leakage current in a semiconductor device, the method comprising:

- providing a first-conduction-type silicon substrate;
- forming a first-conduction-type well in the substrate;
- forming element-isolating oxide films on the well;
- implanting second-conduction-type impurity ions in the regions between the oxide films to form impurity diffusion regions;
- forming a conductive layer for an electrode over said oxide films and diffusion regions;
- patterning the conductive layer to define plural dies that each have plural cells that each include the impurity diffusion regions and the conductive layer; and
- applying a reverse voltage to the impurity diffusion regions and the substrate so as to measure the junction leakage current.

5,841,295
HYBRID PROGRAMMABLE LOGIC DEVICE

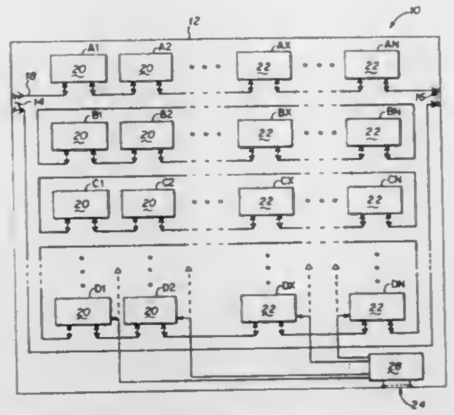
Alireza S. Kaviani, Toronto, Canada, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 9, 1996, Ser. No. 598,766

Int. Cl.⁶ H03K *19/177*

U.S. Cl. 326—39 **26 Claims**

1. A programmable monolithic integrated logic circuit, comprising:



- a plurality of integrated circuit input leads,
- a plurality of look up table circuits having inputs electrically connected to the input leads via a routing circuit,
- a plurality of programmable logic circuits having inputs electrically connected to the input leads via the routing circuit, each programmable logic circuit including:
  - a first stage of logic gates having input lines operatively connected to the input lines of the programmable logic circuit and having output lines,
  - a second stage of logic gates having input lines and having output lines operatively connected to the output lines of the programmable logic circuit, and
  - a crossbar switch having input lines operatively connected to the output lines of the first stage and output lines operatively connected to the input lines of the second stage, and
- output lines electrically coupled to output lines of the look up tables and output lines of the programmable logic circuits.

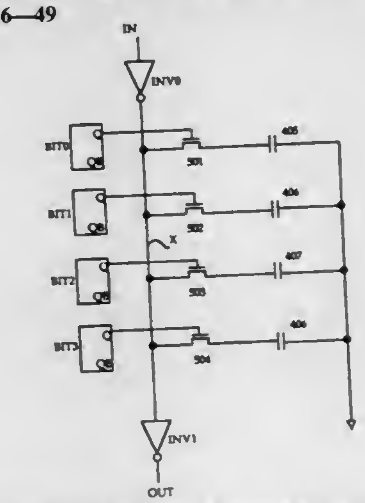
5,841,296
PROGRAMMABLE DELAY ELEMENT

Stephen Churcher, and Simon A. Longstaff, both of Edinburgh, Scotland, assignors to Xilinx, Inc., San Jose, Calif.

Filed Jan. 21, 1997, Ser. No. 786,819

Int. Cl.⁶ H03K *19/094*

U.S. Cl. 326—49 **11 Claims**



1. An integrated circuit which incorporates a system for post-fabrication equalization of signal delays within the integrated circuit comprising:

- a logic circuit;
- a plurality of programmable delay circuits connected to delay signals input to the logic circuit for adjusting the propagation delays of signals inputted to the logic circuit;
- means for programming the delay circuits after fabrication of the integrated circuit to alter a delay value of each of the programmable delay circuits so that together the delay circuits cause all of the input signal delays to the logic circuit to be equal.

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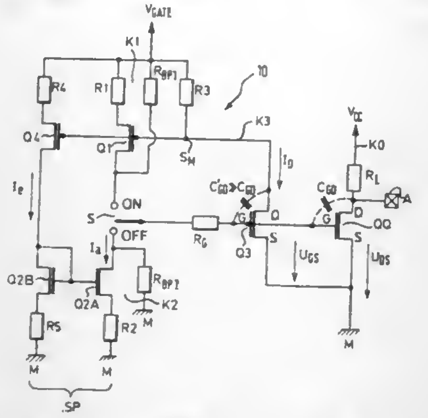
5,841,297
CIRCUIT ARRANGEMENT FOR DRIVING AN MOS FIELD-EFFECT TRANSISTOR ALLOCATED TO THE SUPPLY CIRCUIT OF AN ELECTRICAL LOAD

Erich Bayer, Piflas, and Konrad Wagensohner, Mauern, both of Germany, assignors to Texas Instruments Deutschland GmbH, Germany

Filed Jul. 25, 1996, Ser. No. 684,900

Int. Cl.^{6} H03K *19/0175;3/01*

U.S. Cl. 326—83 **14 Claims**



1. Circuit arrangement (10) for driving an MOS field-effect transistor (QO) allocated to the supply circuit (KO) of an electrical load (R_L), having a charging circuit (K1) that can be connected to the MOS field-effect transistor (QO) and a discharging circuit (K2), which can be connected to the MOS field-effect transistor (QO), via which the input capacitance of the MOS field-effect transistor (QO) can be charged or discharged according to a time constant (τ) that is dependent upon the magnitude of the input capacitance and the dimensional design of the charging or discharging circuit (K1, K2), characterised in that a sensing circuit (K3) is provided which delivers a measuring signal (S_M) that is representative of the gate-source voltage (U_{GS}) of the MOS field-effect transistor (QO) of the supply circuit (KO), and that, depending on this measuring signal (S_M), the internal resistance of the charging or discharging circuit (K1, K2) and/or a current (I_a) impressed upon these circuits (K1, K2) in the sense of a positive feedback is controlled in such a way, that the resulting time constant (τ), according to which the input capacitance of the MOS field-effect transistor (QO) of the supply circuit (KO) is charged or discharged, becomes continuously smaller during the transition of the MOS field-effect transistor (QO) from the off-state to the conducting state and continuously larger during the transition from the conducting to the off-state.

5,841,298
LOCALLY ASYNCHRONOUS, PIPELINE-ABLE LOGIC CIRCUITS FOR TRUE-SINGLE-PHASE SYNCHRONOUS LOGIC CIRCUIT

Hong-Yi Huang, Changhua, Taiwan, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Apr. 25, 1996, Ser. No. 637,468

Int. Cl.^{6} H03K *19/096;19/094*

U.S. Cl. 326—97 **10 Claims**

1. A pipeline-able asynchronous logic circuit that implements a subfunction of a logic function that is distributed into multiple sequential subfunctions, each subsequent subfunction being applied to a result of an immediately preceding subfunction of said sequence, said asynchronous logic circuit comprising:

an output node,

a differential logic circuit connected to said output node via a first path, for applying a particular subfunction to an inputted signal to produce a result signal,

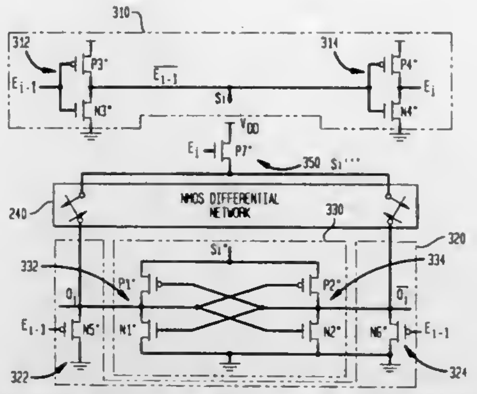
a sense amplifier, connected to said output node via a second path that is distinct from said first path, which, in response to being enabled, amplifies said result signal produced by said differential logic circuit and outputs said amplified result signal onto said output node,

a pre-charge circuit which pre-charges said output node to a first voltage, but only when said sense amplifier is disabled,

a first enable circuit which responds to receiving an enable signal by enabling said sense amplifier and outputting said enable signal only when said sense amplifier outputs said amplified result signal, and

a second enable circuit which enables said differential logic circuit in response to receiving said same enable signal that is received at said first enable circuit,

wherein said differential logic circuit drives said output node via said first path, and said sense amplifier drives said output node via said second path, to a voltage corresponding to said result signal.



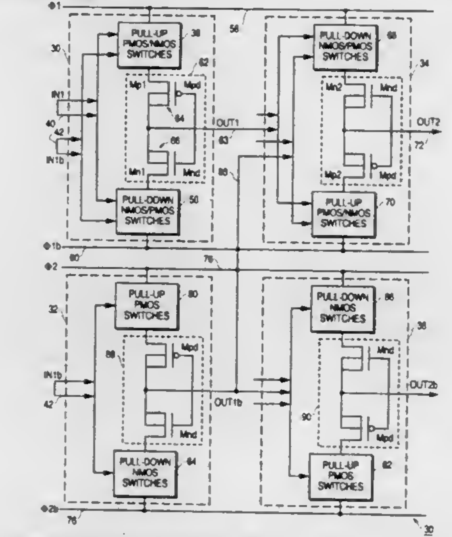
5,841,299
METHOD AND APPARATUS FOR IMPLEMENTING AN ADIABATIC LOGIC FAMILY

Vivek K. De, Hillsboro, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Feb. 6, 1997, Ser. No. 795,652

Int. Cl.^{6} H03K *19/00;19/0175*

U.S. Cl. 326—98 **26 Claims**



1. A lower power dissipation gate for use in a logic cascade, the gate comprising:

a pull-up switch arrangement that outputs a first logic signal which is a function of the pull-up switch arrangement, the pull-up switch arrangement comprising a first P-type switching device and a first N-type switching device, the first P-type switching device being coupled to receive a first input signal and the first N-type switching device being coupled to receive a second input signal which is the complement of the first input signal, and both the first P- and N-type switching devices being coupled to receive a first power clock waveform; and

a pull-down switch arrangement that outputs a second logic signal which is a function of the pull-down switch arrangement, the pull-down switch arrangement comprising a second N-type switching device and a second P-type switching device, the second N-type switching device being coupled to receive the first input signal and the second P-type device being coupled to receive the second input signal, and both the second N- and P-type switching devices being coupled to receive a second power clock waveform.

5,841,300
SEMICONDUCTOR INTEGRATED CIRCUIT APPARATUS

Fumio Murabayashi, Hatano; Tatsumi Yamauchi, Hitachioota; Takashi Hotta, and Hiromichi Yamada, both of Hatano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

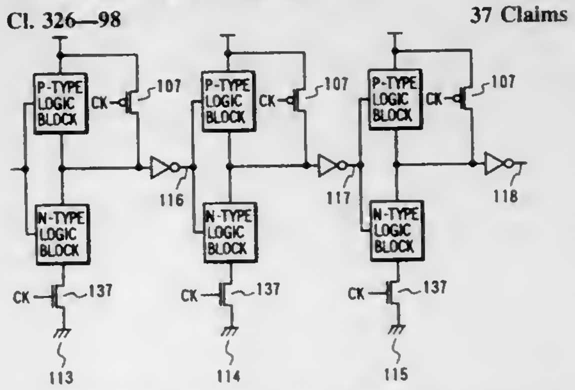
Continuation of Ser. No. 423,374, Apr. 18, 1995, abandoned.

This application Apr. 16, 1997, Ser. No. 838,193

Claims priority, application Japan, Apr. 18, 1994, 6-078363; Sep. 14, 1994, 6-219809

Int. Cl.^{6} H03K *19/096*

U.S. Cl. 326—98 **37 Claims**



1. A semiconductor integrated circuit apparatus comprising a completely complementary static CMOS circuit comprised of a plurality of complementary MOS transistor blocks each having a first block of MOS transistors of a first conductivity type which is connected to a first source and output parts and which receives input signals, and a second block of MOS transistors of a second conductivity type which is connected to said output parts and a second source and which receives said input signals, wherein the number of MOS transistors of the first conductivity type in the first block is equal to the number of MOS transistors of the second conductivity type in the second block, and wherein:

said plurality of complementary MOS transistor blocks are connected in series and the output signals of a first one of said series-connected complementary MOS transistor blocks are entered as input signals for a second one of said series-connected complementary MOS transistor blocks;

a potential setting circuit which sets the output signals of each of said series-connected complementary MOS transistor blocks to a potential of said second source in synchronization with a common clock signal is provided at each occurrence between adjacently disposed complementary MOS transistor blocks in said plurality of complementary MOS transistor blocks; and

signals are propagated from the first one of said series-connected complementary MOS transistor blocks to the second one of said series-connected complementary MOS transistor blocks by operation of said second block of MOS transistors in said first one of said series-connected complementary MOS transistor blocks.

5,841,301
VALUABLE THRESHOLD WAVEFORM SHAPING APPARATUS

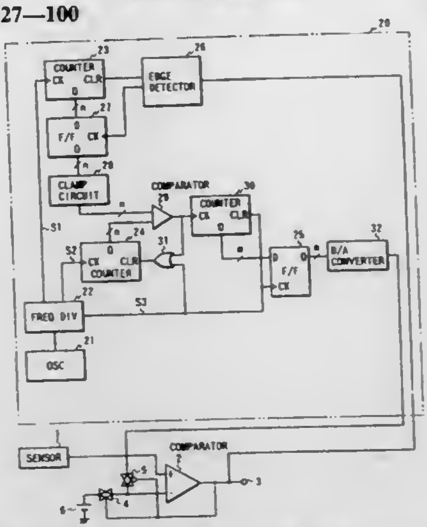
Masakiyo Horie, Toyohashi, and Takuya Harada, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 20, 1996, Ser. No. 618,620

Claims priority, application Japan, Mar. 31, 1995, 7-076431

Int. Cl.^{6} H03K *5/01*

U.S. Cl. 327—100 **7 Claims**



1. A waveform shaping apparatus comprising:

a) comparing means for comparing a sensor output signal with a threshold voltage to convert the sensor output signal into a waveform shaped signal, and outputting the waveform shaped signal; and

b) frequency-to-voltage converting means for generating the threshold voltage in response to a frequency of the output signal from the comparing means;

wherein the frequency-to-voltage converting means comprises:

- b1) clock signal generating means for generating a clock signal in response to the output signal from the comparing means, the clock signal having a period proportional to a period of the output signal from the comparing means;,
- b2) first counting means for counting pulses in the clock signal generated by the clock signal generating means for every given period, and outputting a signal representing a counted pulse number depending on the frequency of the output signal from the comparing means;
- b3) D/A converting means for converting the output signal from the first counting means into a voltage signal which depends on the counted pulse number; and
- b4) means for generating the threshold voltage in response to the voltage signal generated by the D/A converting means.

5,841,302
SEMICONDUCTOR INTEGRATED CIRCUIT FOR USE AS A TWO-MODULUS PRESCALER

Noriko Ishii, and Kenji Fujita, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed May 13, 1997, Ser. No. 855,613

Claims priority, application Japan, May 13, 1996, 8-118078

Int. Cl.^{6} H03B *19/00*

U.S. Cl. 327—117 **8 Claims**

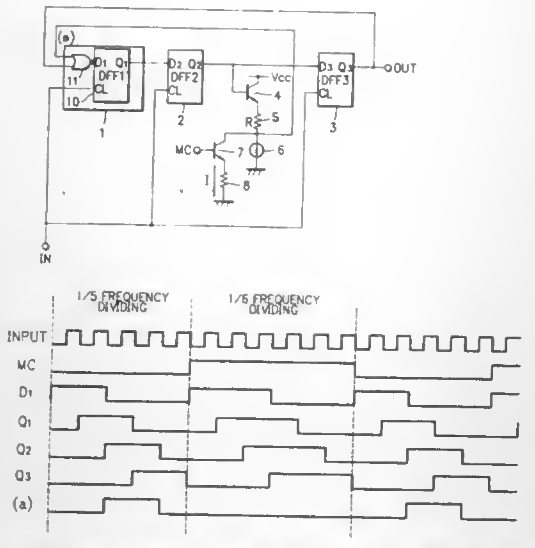
1. A semiconductor integrated circuit, comprising:

a frequency divider for selectively carrying out a frequency division with at least two frequency dividing ratios of an input signal according to a switch signal; and

a controller for changing operation states of the frequency divider between said at least two frequency dividing ratios utilizing said switch signal, the controller comprising a level shifter,

wherein said frequency divider comprises:

a first flip flop (FF) having a clock input for receiving the input signal to be divided and an output for providing an



output signal, said first FF receiving a signal from a NOR gate having first and second inputs,

a second FF having an input connected to receive the output from said first FF and an output for providing an output signal,

said level shifter having an input connected to receive the output from said second FF and an output for providing signal, said level shifter having a control input connected to receive said switch signal,

a third FF having an input connected to receive the output from said second FF and an output for providing an output signal which is the desired divided signal,

said first FF connected to receive said divided signal through said first input of said NOR gate and said output from said level shifter through said second input of said Nor gate.

5,841,303
DIGITAL PHASE-LOCKED LOOP CIRCUIT

Terumi Takashi, Ebina; Kazunori Iwabuchi, Yokohama; Minoru Kosuge, Odawara; Hiromi Matsushige, Odawara, and Hideki Miyasaka, Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 21,854, Feb. 24, 1993, Pat. No. 5,572,157. This application Oct. 31, 1996, Ser. No. 742,678

Claims priority, application Japan, Feb. 24, 1992, 4-36603

Int. Cl.^{6} H03L *7/085*

U.S. Cl. 327—156 **9 Claims**

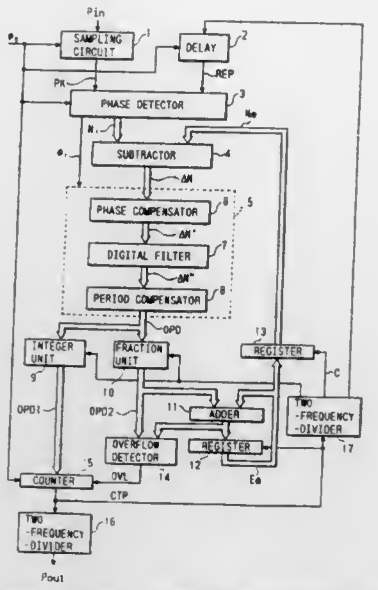
1. A signal processing circuit having a phase-locked loop circuit for generating a clock synchronized to an input signal, said phase-locked loop circuit comprising:

a phase detector for detecting a difference in phase between said input signal and a clock signal generated by an oscillator, and for producing a phase-difference output clock signal;

a filter for filtering said difference in phase, said filter being switchable between a plurality of gain operations; and

said oscillator for controlling an oscillation frequency with a filtered output signal from said filter;

wherein at least one of an input signal of said filter and an input signal of said oscillator is expressed by a discrete numerical value, and a gain switching of said filter is executed taking into account a timing of said phase-difference output clock signal from saiu phase detector.



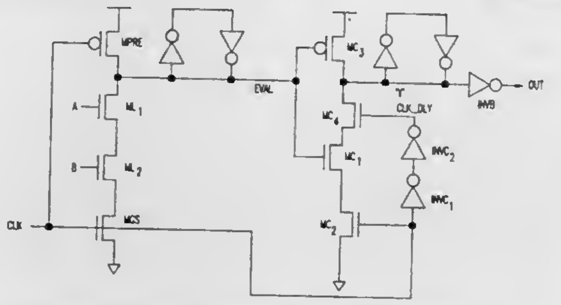
5,841,304
DYNAMIC-TO-STATIC CONVERTOR METHOD

Kenway W. Tam, Cupertino, Calif., assignor to Sun Microsystems, Inc., Palo Alto, Calif.

Filed Jun. 26, 1997, Ser. No. 883,545

Int. Cl.^{6} H03L *7/00*

U.S. Cl. 327—161 **4 Claims**



1. A dynamic-to-static conversion method comprising:

closing a pull-down switch device, operatively coupled between an output node and a ground, while an input node is at a precharge potential and opening the pull-down switch device while the input node is at a ground potential;

closing a pull-up switch device, operatively coupled between a source voltage and the output node, while the input node is at the ground potential and opening the pull-up switch device while the input node is at the precharge potential;

closing a pull-down path shutoff switch device, operatively coupled between the output node and the ground in series with said pull-down switch device, during each first phase of a clock signal and opening the pull-down path shutoff switch device during each second phase of the clock signal;

delaying the clock signal to obtain a delayed clock signal having first and second delayed phases which are delayed relative to the first and second phases of the clock signal; and

closing an activation switch device, operatively coupled between the output node and the series connection of said pull-down switch device and said pull-down shutoff switch device, during each first delayed phase of the delayed clock signal and opening the activation switch device during each second delayed phase of the delayed clock signal.

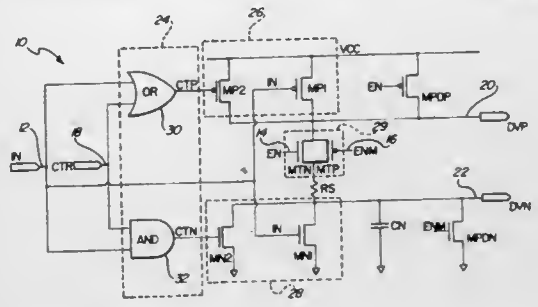
5,841,305
CIRCUIT AND METHOD FOR ADJUSTING DUTY CYCLES

James E. Wilson, Maple Valley, Wash., assignor to Cypress Semiconductor Corp., San Jose, Calif.

Filed Mar. 20, 1997, Ser. No. 821,617

Int. Cl.^{6} H03K *3/017*

U.S. Cl. 327—175 **17 Claims**



1. A circuit comprising:

a pullup device configured to provide a first output in response to: (i) a first input and (ii) a first control signal;

a pulldown device configured to provide a second output in response to: (i) said first input and (ii) a second control signal; and

a delay circuit configured to provide said first and second control signals in response to: (i) said first input and (ii) a second input, wherein said circuit provides said first and second outputs with a duty cycle adjusted with respect to said first input,in response to said second input.

5,841,306
PULSE GENERATOR FOR GENERATING OUTPUT PULSE OF A PREDETERMINED WIDTH

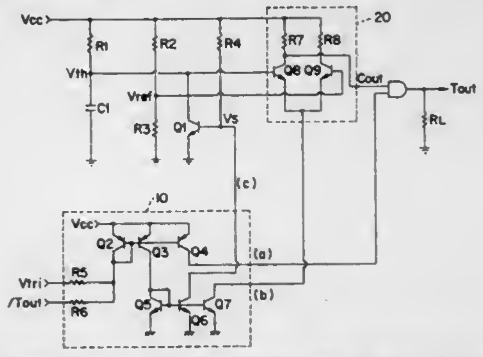
Chang-Sik Lim, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Continuation-in-part of Ser. No. 537,331, Oct. 2, 1995, abandoned, which is a continuation of Ser. No. 422,615, Apr. 13, 1995, abandoned, which is a continuation of Ser. No. 107,900, Aug. 18, 1993, abandoned. This application Dec. 13, 1996, Ser. No. 766,860

Claims priority, application Rep. of Korea, Aug. 18, 1992, 92-14861

Int. Cl.^{6} H03K *3/03*

U.S. Cl. 327—228 **5 Claims**



1. A pulse generator for generating output pulse of a predetermined width, comprising:

bias control means for determining one of a operating mode and power saving mode in accordance with a trigger input and an inverted version of the output signal, providing a control voltage of high level as well as forming a first and second current paths in the operating mode, and providing the control voltage of non-high level as well as cutting off the two current paths in the power saving mode;

an RC circuit having a resistor and capacitor connected in series between a supply voltage and ground, wherein said RC circuit provides a threshold voltage through the node between the resistor and the capacitor;

voltage dividing means for dividing the supply voltage by a predetermined ratio, and outputting the divided voltage as a reference voltage;

charge control means for causing the resistor to charge the capacitor of said RC circuit in response to the formation of the first current path and for discharging the capacitor in response to the cut-off of the first current path;

a comparator for comparing the threshold voltage with the reference voltage, to produce a predetermined output voltage in response to the result of the comparison, when the second current path is formed, and not operating when the second current path is cut off; and

an AND gate for performing a logical AND function to the output voltage of said comparator and the control voltage of said bias control means, and providing the result of the AND function as an output signal.

5,841,307
DELAY DEVICE AND DELAY TIME MEASUREMENT DEVICE USING A RING OSCILLATOR

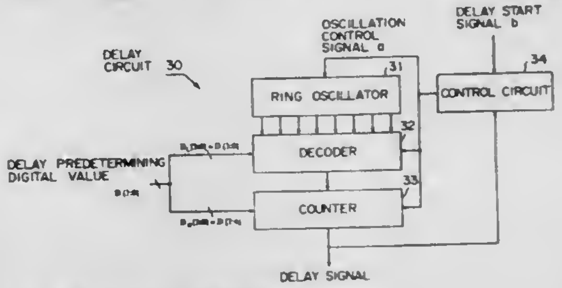
Hiroshi Yamazaki, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 3, 1996, Ser. No. 626,957

Claims priority, application Japan, Jun. 13, 1995, 7-146133

Int. Cl.^{6} H03K *5/13*

U.S. Cl. 327—265 **9 Claims**



1. A delay device, comprising:

a controller outputting a control signal;

a ring oscillator outputting a plurality of phases in response to said control signal;

a decoder for decoding an output from said ring oscillator based on said control signal controlling a data load from the ring oscillator to said decoder; and

a counter counting an output from said decoder based on said control signal controlling a data load from the decoder to said counter, and outputting a delay signal when a count value reaches a predetermined value.

5,841,308
AMPLIFIER FOR CANCELLING NOISE BETWEEN CIRCUIT SYSTEMS

Mitsuru Nagata, Kanagawa-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 29, 1997, Ser. No. 848,269

Claims priority, application Japan, May 20, 1996, 8-124649

Int. Cl.^{6} H03L *5/00*

U.S. Cl. 327—307 **20 Claims**

1. An amplifier comprising:

a first circuit system having an analog amplifier for amplifying a transmitting signal based on a reference potential of the first circuit system;

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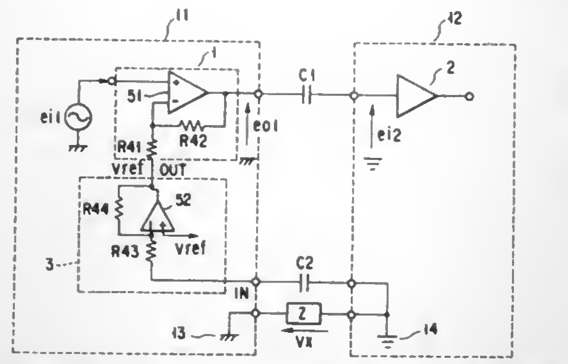


- a second circuit system for receiving an output signal of said analog amplifier based on a reference potential of the second circuit system; and
- a reference potential difference canceling circuit wherein the reference potential of said second circuit system is supplied to an input terminal, an output signal is supplied to the input terminal of said analog amplifier together with said transmitting signal, and a gain, from the input terminal to an output terminal of said analog amplifier, is 1.

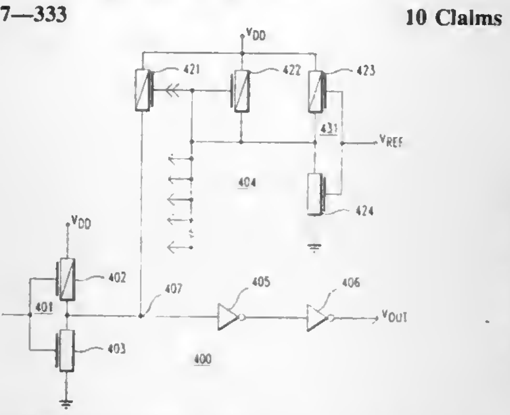
5,841,309
LOW VOLTAGE INPUT BUFFER FOR ASYMMETRICAL LOGIC SIGNALS

Anthony Richard Bonaccio, Shelburne, and Wilbur David Pricer, Charlotte, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 19, 1996, Ser. No. 769,976

Int. Cl.^{6} H03K *17/16*

U.S. Cl. 327—333 **10 Claims**



6. An input buffer circuit for receiving a logic input signal at an input terminal having a first voltage switching point, the input buffer circuit translating the logic input signal into a second voltage switching point, said input buffer circuit comprising:

- an input inverter connected to the input terminal for providing an output current at an output terminal of said input inverter; and
- a mirrored current source coupled to said output terminal of said input inverter, said mirrored current source biased by a reference voltage, wherein the reference voltage is substantially equal to a voltage magnitude at the first voltage switching point, said current mirrored source providing a mirrored current to the output terminal of said input inverter, said mirrored current having a current magnitude substantially equal to a current magnitude of the output current for offsetting the output current when the voltage magnitude of the first voltage switching point is substantially equal to the reference voltage.

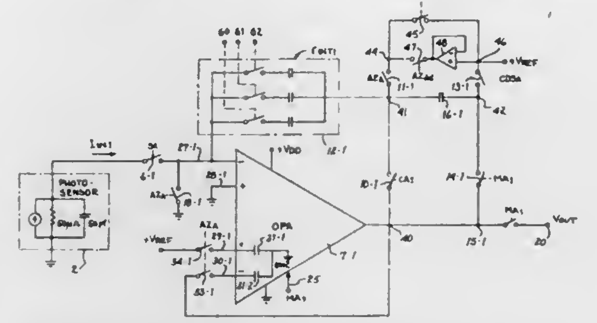
5,841,310
CURRENT-TO-VOLTAGE INTEGRATOR FOR ANALOG-TO-DIGITAL CONVERTER, AND METHOD

Timothy V. Kalthoff, and James L. Todsen, both of Tucson, Ariz., assignors to Burr-Brown Corporation, Tucson, Ariz.

Filed Apr. 8, 1997, Ser. No. 835,776

Int. Cl.^{6} G06G *7/64*

U.S. Cl. 327—337 **16 Claims**



1. An integrating circuit comprising in combination:

(a) an operational amplifier having an inverting input, an output, and a non-inverting input coupled to a first reference voltage conductor conducting a first reference voltage, the operational amplifier being powered by a first supply voltage applied thereto by a first supply voltage conductor and a second supply voltage applied thereto by a second supply voltage conductor;

(b) an integrating capacitor having a first terminal coupled to the inverting input and a second terminal coupled to the output;

(c) first switching circuitry coupled between the output and the second terminal and operative to decouple the output from the integrating capacitor during precharging of the integrating capacitor;

(d) a first conductor conducting a precise second reference voltage;

(e) second switching circuitry coupled between the first conductor and the second terminal and operative to couple the second terminal to the second reference voltage during the precharging; and

(f) third switching circuitry coupled between the second supply voltage conductor and the first terminal and operative to couple the first terminal to the first reference voltage conductor during the precharging,

the precharging occurring before each integration cycle,

each integration cycle including decoupling the first terminal from the first reference voltage conductor, decoupling the second terminal from the second reference voltage, coupling the output to the second terminal, and conducting an input current into or out of the inverting input, the operational amplifier adjusting its output voltage from the second reference voltage as necessary to maintain the inverting input at a voltage equal to the first reference voltage.

5,841,311
VOLTAGE SUBTRACTER CIRCUIT, VOLTAGE AMPLIFIER CIRCUIT, VOLTAGE DIVIDER CIRCUIT AND SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Hideharu Koike, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

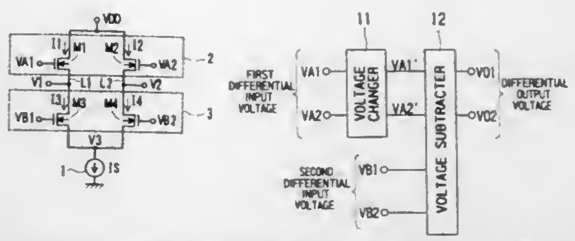
Filed Apr. 8, 1998, Ser. No. 56,629

Int. Cl.^{6} G06G *7/42*

U.S. Cl. 327—361 **18 Claims**

1. A voltage subtracter circuit for outputting a voltage depending on a differential voltage between a first differential input voltage which is a difference between first and second input voltages, and a second differential input voltage which is a difference between third and fourth input voltages, said voltage subtracter circuit comprising:

a first constant current source;



- first and second MOS transistors, one end of which are connected to a terminal with a predetermined voltage level, respectively and which have the same electric characteristics; and
- third and fourth MOS transistors, one end of which are connected to said first constant current source, respectively and which have the same electric characteristics, wherein:
  - said first and third MOS transistors are connected in series between said terminal of the predetermined voltage level and said first constant current source,
  - said second and fourth MOS transistors are connected in series between said terminal of the predetermined voltage level and said first constant current source,
  - said first differential input voltage are applied between gate terminals of said first and second MOS transistors, and said second differential input voltage are applied between gate terminals of said third and fourth MOS transistors, and
  - a differential voltage between said first differential input voltage and a voltage proportional to said second differential input voltage are outputted from a connecting point between said first and third MOS transistors and a connecting point between said second and fourth MOS transistors.

5,841,312
GATING CIRCUIT HAVING CURRENT MEASURING AND REGULATING ELEMENTS AND A TEMPERATURE MEASURING TRANSISTOR

Anton Mindl, Hildesheim; Hartmut Michel, Reutlingen; Bernd Bireckoven, Kusterdingen; Manfred Uebele, Reutlingen, and Ulrich Nelle, Sonnenbuehl, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

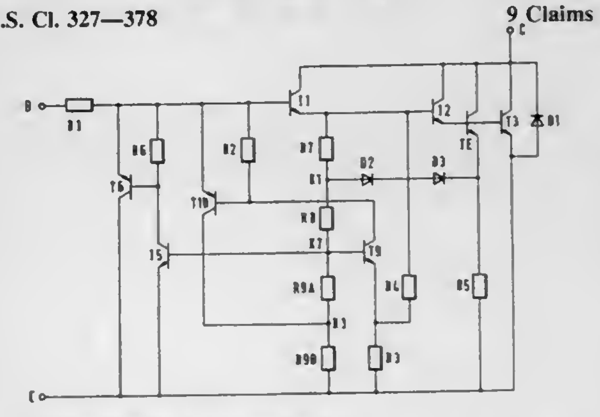
PCT No. PCT/DE95/00039, § 371 Date Jul. 1, 1996, § 102(e) Date Jul. 1, 1996, PCT Pub. No. WO95/20783, PCT Pub. Date Aug. 3, 1995

PCT Filed Jan. 14, 1995, Ser. No. 669,342

Claims priority, application Germany, Jan. 27, 1994, 44 02 340.5

Int. Cl.^{6} H03K *17/14*

U.S. Cl. 327—378 **9 Claims**



1. An integrated circuit comprising

- a power transistor (T1, T2, T3) having a base and an emitter;
- a current measuring resistor (R5) connected to the power transistor (T1, T2, T3) so that a voltage drop at the current measuring resistor (R5) is a measure of a current flowing through the power transistor (T1, T2, T3);
- a current regulating transistor (T5) having a base, a collector and an emitter, wherein said collector of the current regulating transistor (T5) is connected to the base of the power transistor via a resistor (R6) and the emitter of the current regulating transistor (T5) is connected to the emitter of the power transistor (T1, T2, T3);
- means for triggering the current regulating transistor (T5) with the voltage drop at the current measuring resistor (R5):
- a temperature measuring transistor (T9) having a base, a collector and an emitter and a further transistor (T10) connected with the temperature measuring transistor (T9) so that the further transistor (T10) is triggered by the temperature measuring transistor (T9) and a current flows through the further transistor (10) when a predetermined temperature is exceeded; and
- means for varying a voltage applied to the base of the current regulating transistor (T5) by means of the current flowing through the further transistor (T10) in such a way that the current flow through the power transistor (T1, T2, T3) is reduced when the predetermined temperature is exceeded.

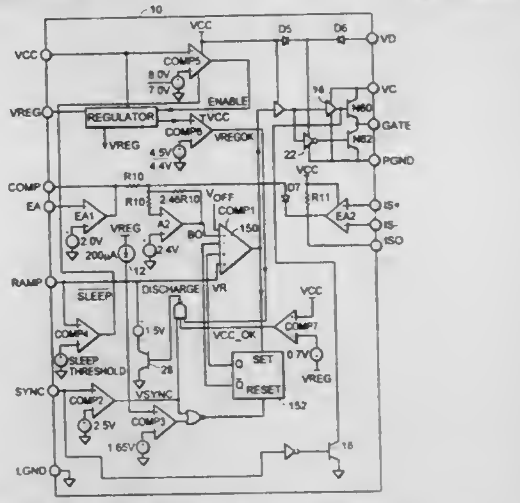
5,841,313
SWITCH WITH PROGRAMMABLE DELAY

Gedaly Levin, Acton, Mass.; Christopher J. Sanzo, Cranston, R.I.; Arthur R. Theroux, West Warwick, R.I.; George E. Schuellein, Narragansett, R.I., and Richard Patch, Forest, Va., assignors to Cherry Semiconductor Corporation, East Greenwich, R.I.

Filed Jul. 17, 1996, Ser. No. 682,153

Int. Cl.^{6} H03K *17/296;* G05F *1/40*

U.S. Cl. 327—393 **44 Claims**



1. A switch with programmable delay comprising:

- error sensing means, connected to receive a voltage sense signal and a reference signal, for producing an error control signal:
- means for receiving a sync signal;
- means for charging a capacitor in response to a starting edge of the sync signal;
- means for discharging the capacitor in response to an ending edge of the sync signal;
- a reset signal generator, coupled to the capacitor, for producing a reset signal when the capacitor has a voltage below a first predetermined level and the sync signal has a voltage below a second predetermined level;
- a comparator connected to receive a voltage from the error control signal and a voltage signal from the capacitor for generating a first state signal or a second state signal depending upon a comparison between the voltage from the error control signal and the voltage signal from the capacitor;
- means, connected to said reset signal generator and said comparator, for latching the first state signal until the reset signal is received; and
- an output driver, connected to a first terminal and a second terminal, switched in response to the first and second state signals to drive an output signal on the first terminal in response to the first state signal and to provide a low imped-

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ance path between the first terminal and the second terminal in response to the second state signal.

5,841,314
CHARGE PUMP TYPE OF NEGATIVE VOLTAGE GENERATOR CIRCUIT AND METHOD

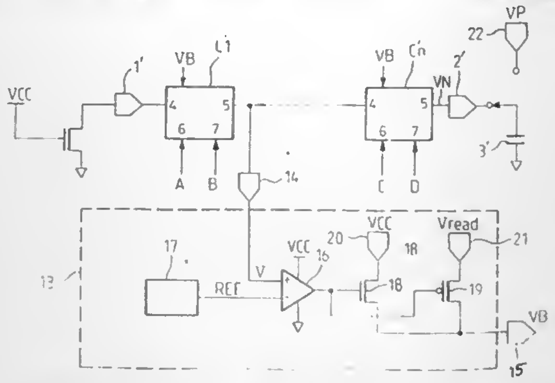
Alessandro Brigati, AIX en Provence; Nicolas Demange, Lessy; Maxence Aulas, St Haon le Vieux, and Marc Guedj, Pont Saint Esprit, all of France, assignors to SGS-Thomson Microelectronics S.A., Saint Genis, France

Filed Jun. 13, 1996, Ser. No. 663,524

Claims priority, application France, Jun. 21, 1995, 95 07621

Int. Cl.^{6} K03K *3/01;* G11C *7/00*

U.S. Cl. 327—536 **24 Claims**



1. A charge pump negative voltage generator circuit, constructed on a P type substrate and supplying a negative voltage at a pump output by pumping negative charges in n series-connected pumping cells, n being an integer, these pumping cells each having a cell output and comprising P type transistors having wells connected to a node to be positively biased,

wherein said circuit comprises switching means coupled to one of said pumping cells for selectively supplying, at the node, a first voltage for biasing of the wells that is greater than or equal to a potential present at the pump output so long as a potential at an output of the one pumping cell is greater than a positive reference voltage coupled to said switching means, and a second voltage of fixed value for biasing of the wells when the potential present at the output of the one pumping cell is smaller than said positive reference voltage.

5,841,315
MATCHED FILTER CIRCUIT

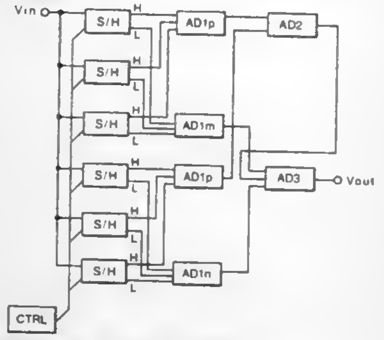
Guoliang Shou; Changming Zhou; Kazunori Motohashi; Xialing Qin; Shengmin Lin; Makoto Yamamoto, and Sunao Takatori, all of Tokyo, Japan, assignors to Yozan Inc., Tokyo, and Sharp Kabushiki Kaisha, Osaha, both of Japan

Filed Jul. 26, 1996, Ser. No. 686,958

Claims priority, application Japan, Jul. 28, 1995, 7-212438

Int. Cl.^{6} H03K *5/00;12/00;* G11C *27/02*

U.S. Cl. 327—552 **6 Claims**



1. A matched filter circuit comprising:

I) a plurality of sampling and holding circuits, each sampling and holding circuit comprising:
  i) a switch being connected to an input voltage,
  ii) a first capacitance being connected to an output portion of said switch,
  iii) a first inverted amplifying portion including an odd number of stages of MOS inverters and being connected to said first capacitance,
  iv) a first feedback capacitance connecting an output portion of said first inverted amplifying portion to its input portion,
  v) a first multiplexer receiving an output of said first inverted amplifying portion and a reference voltage and alternatively outputting said received signals, and
  vi) a second multiplexer receiving said output of said first inverted amplifying portion and said reference voltage and alternatively outputting said received signals opposite to said output from said first multiplexer;
II) a plurality of first addition portions, each first addition portion comprising:
  i) a plurality of second capacitances, each second capacitance being connected to an output portion of said first multiplexer of a corresponding sampling and holding circuit, and output portions of said second capacitances being connected with one another to form a common output,
  ii) a second inverted amplifying portion including odd number of stages of MOS inverters and being connected to said common output of said second capacitances, and
  iii) a second feedback capacitance connecting an output portion of said second inverted amplifying portion to its input portion;
III) a plurality of second addition portions, each second addition portion comprising:
  i) a plurality of third capacitances each third capacitance being connected to an output portion of siad second multiplexer of a corresponding sampling and holding circuit, and output portions of said capacitances being connected with one another to form a common output,
  ii) a third inverted amplifying portion having odd number of stages of MOS inverters and being connected to said common output of said third capacitances, and
  iii) a third feedback capacitance connecting an output portion of said third inverted amplifying portion to its input portion; and
IV) a control circuit for closing said switch of one of said sampling and holding circuits, opening said switches of other said sampling and holding circuits, and switching said first and second multiplexer of each said sampling and holding circuit by a predetermined combination.

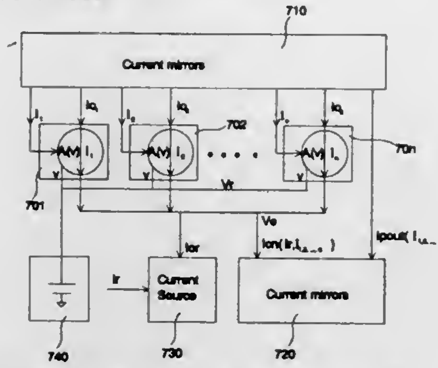
5,841,316
ANALOG SIGNAL PROCESSING CIRCUIT FOR GENERATING AUTOMATIC-GAIN CONTROLLED REFERENCE-SIGNAL-BIASED OUTPUT SIGNALS

Jeng-Jye Shau, 991 Amarillo Ave., Palo Alto, Calif. 94303

Filed May 24, 1996, Ser. No. 653,472

Int. Cl.^{6} G06G *7/12*

U.S. Cl. 327—560 **11 Claims**



1. An analog signal processing circuit comprising:

a plurality of input means for receiving a plurality of input signals S(i) therein, where i=1,2,3, . . . N and N is a positive integer;

a plurality of voltage controlled signal amplifiers VCSA(i) where i=1,2,3, . . . N, and each being connected to a corresponding input means for generating a plurality of VCSA output currents I'(i) where I'(i)=A(i) S(i) and A(i) being an amplification factor of said VCSA(i);

each of said VCSA(i) includes a VCSA input voltage means connected to a common VCSA input for providing a common amplification factor of A(VCSA)=A (i) where i=1,2,3, . . . N;

an amplitude control unit connected to all of said VCSA output current I'(i) for generating an amplitude control current I(ref) whereby ΣI'(i)=A(VCSA) ΣS(i)=I(ref) wherein Σ representing a sum over i=1,2,3, . . . N, whereby said amplification factor A(VCSA) can be adjusted by said amplitude control current I(ref).

5,841,317
DIFFERENTIAL AMPLIFIER CIRCUIT WITH A HIGH THROUGH PUT RATE AND REDUCED POWER CONSUMPTION

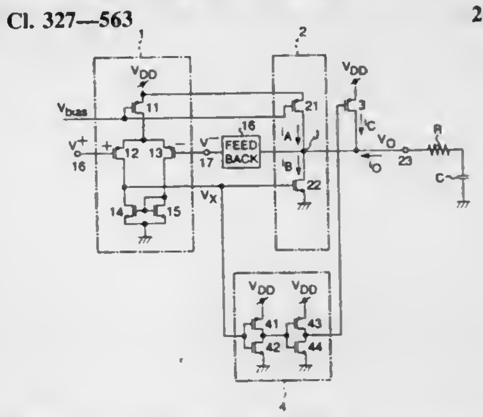
Tetsurou Ohmori, Hirakata; Yoshito Date, Otsu; Takashi Koizumi, Kusatsu; Yoshio Imamura, Otsu, and Osamu Sarai, Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Filed Feb. 26, 1996, Ser. No. 606,945

Claims priority, application Japan, Feb. 27, 1995, 7-038185; Dec. 7, 1995, 7-318943

Int. Cl.^{6} H03F *3/45;* H03K *3/023;17/04*

U.S. Cl. 327—563 **20 Claims**



1. A differential amplifier comprising:

a differential circuit, comprising a non-inverting input and an inverting input, for outputting a difference voltage relative to a difference between a first voltage applied to the non-inverting input and a second voltage applied to the inverting input;

an output circuit comprising a constant current supply transistor for supplying a constant current, and a control transistor controlled by said difference voltage, and a junction between said supply transistor and said control transistor;

a drive transistor connected to said junction for supplying current in a same direction as said constant current supply transistor; and

a switching circuit for supplying a drive signal to said drive transistor to enable said drive transistor when said difference voltage is below a predetermined threshold voltage, and to disable said drive transistor when said difference voltage is above said predetermined threshold voltage.

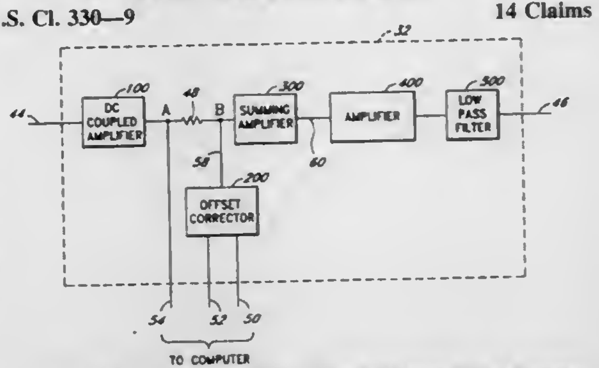
5,841,318
LOW NOISE PREAMPLIFIER FOR A MAGNETO-RESISTIVE HEAD TESTER

Robert M. Cram, Ramona, Calif., assignor to Phase Metrics, Inc., San Diego, Calif.

Filed Jan. 21, 1997, Ser. No. 792,940

Int. Cl.^{6} H03F *1/02;* G11B *5/02*

U.S. Cl. 330—9 **14 Claims**



1. An apparatus for amplifying a signal generated by a magnetoresistive transducer, the signal having an ac component and a dc component, comprising:

an amplifier circuit to amplify the signal;

an offset corrector circuit coupled to said amplifier circuit, said offset corrector circuit including,
  a reference circuit to generate a voltage reference,
  a filter circuit coupled to said reference circuit to filter said voltage reference, and
  a resistor summing network coupled to said filter circuit to generate an offset signal based on said voltage reference and a predetermined input signal, said offset signal being representative of a complement of the dc component of the signal; and

a circuit coupled to said amplifier circuit and said offset corrector circuit to subtract said offset signal from the signal and to provide an output signal representative of the ac component of the signal.

5,841,319
METHOD AND APPARATUS FOR CONTROLLING GAIN OF AN AMPLIFIER BY COMPARING A DETECTED OUTPUT ENVELOPE AND A REFERENCE SIGNAL

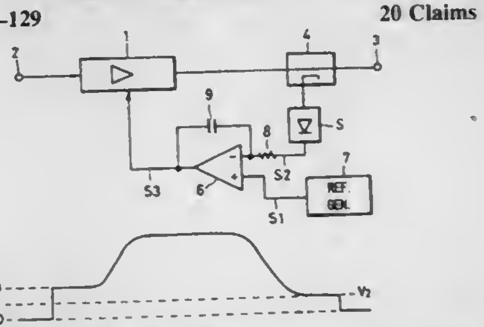
Hideaki Sato, Saitama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 21, 1997, Ser. No. 785,791

Claims priority, application Japan, Jan. 24, 1996, 8-030005

Int. Cl.^{6} H03G *3/20*

U.S. Cl. 330—129 **20 Claims**



1. A power amplifying circuit comprising:

a variable gain power amplifier receiving a transmission signal and producing a transmission output;

a detector for detecting an envelope level of an output of said variable gain power amplifier;

a reference signal generator for generating a reference signal to convert the envelope level of the output of said variable gain power amplifier to a smooth waveform; and

a negative feedback loop including means for comparing the envelope level of the output of said variable gain power

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amplifier detected by said detector with a waveform of the reference signal from said reference signal generator, thereby producing a control signal for controlling a gain of said variable gain power amplifier in accordance with a comparison output,

wherein a level of the reference signal from said reference signal generator is raised from a value lower than a rest value of said detector to a value higher than said rest value of said detector at a leading edge of the transmission output and is maintained at the value higher than the rest value of said detector and subsequently said level of the reference signal is smoothly raised.

5,841,320
VARIABLE GAIN AMPLIFYING DEVICE

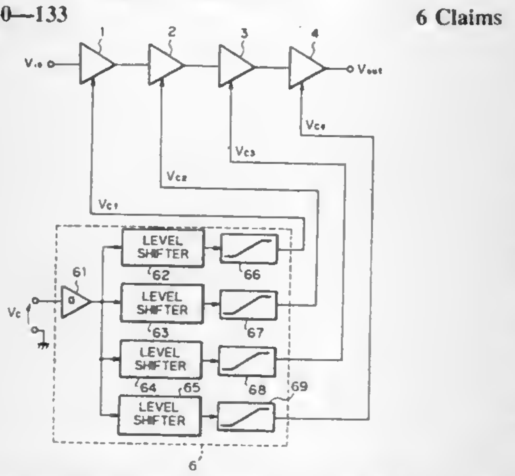
Masaki Ichihara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 7, 1996, Ser. No. 744,369

Claims priority, application Japan, Nov. 7, 1995, 7-288389

Int. Cl.⁶ A03G *3/30*

U.S. Cl. 330—133 **6 Claims**



5. A process for controlling M (where M is an integer greater than 1) variable gain amplifiers connected in series comprising the steps of:

generating a first control signal;

shifting said first control signal by M predetermined amounts, thereby generating M shifted control signals;

limiting voltage ranges of said M shifted control signals, thereby generating M limited shifted control signals; and

controlling said M variable gain amplifiers in response to said M limited shifted control signals.

5,841,321
AMPLIFYING CIRCUIT USING OFFSET VALUE VARIABLE CIRCUIT

Hideki Miyake, and Akira Ohmichi, both of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 17, 1997, Ser. No. 843,843

Claims priority, application Japan, Nov. 15, 1996, 8-304825

Int. Cl.⁶ H03F *3/26*

U.S. Cl. 330—255 **8 Claims**

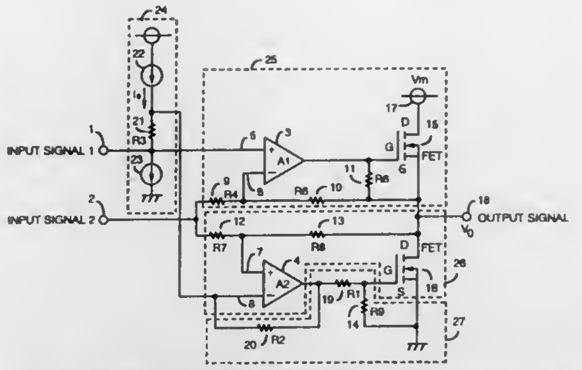
1. An amplifying circuit comprising:

a first amplifier having a first input terminal, a second input terminal, an operational amplifier, and an output terminal for pushing an output current;

a second amplifier having a first input terminal, a second input terminal, an operational amplifier, and an output terminal for pulling an output current;

a circuit for detecting an output current of the operational amplifier of the second amplifier; and

an offset voltage generating circuit for generating an offset voltage wherein the offset voltage is applied between the first input terminal of the first amplifier and the first input terminal of the second amplifier, the first input terminal of the first amplifier is connected to a first input signal terminal, the second input terminal of the first amplifier and the second input terminal of the second amplifier are connected to a second input signal terminal, and the output terminal of the first amplifier and the output terminal of the second amplifier are connected to each other at a connecting point, and the amplifying circuit supplies an output current from the connecting point.



5,841,322
PHASE DETECTOR USING CARRIER SUPPRESSION AND OSCILLATOR USING THE PHASE DETECTOR

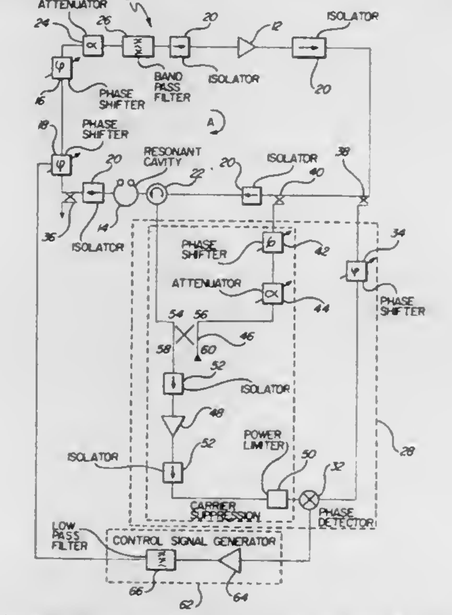
Eugene Nikolay Ivanov, 112 Brompton Road, Wembley Downs, Western Australia 6019; Michael Edmund Tobar, 14 Karo Place, Duncraig, Western Australia 6029, and Richard Alec Woode, 86 Murchison Street, Shenton Park, Western Australia 6008, all of Australia

Filed Nov. 25, 1996, Ser. No. 755,704

Claims priority, application Australia, May 25, 1994, PM5870

Int. Cl.⁶ H03B *1/04;* H03D *13/00*

U.S. Cl. 331—1 R **31 Claims**



1. A phase detector responsive to a first signal having a carrier frequency and a second signal, comprising a carrier suppression means responsive to the first and second signals, the second signal having a frequency such that the carrier suppression means produces a carrier suppressed signal from the first and second signals, mixing means response to the carrier suppressed signal and the carrier frequency to produce an output signal corresponding to the phase difference between the first and second signals, wherein an amplifier is provided between the carrier suppression means and the mixing means.

5,841,323
DIGITAL PLL USING PHASE AND FREQUENCY ERROR CALCULATING CIRCUITS

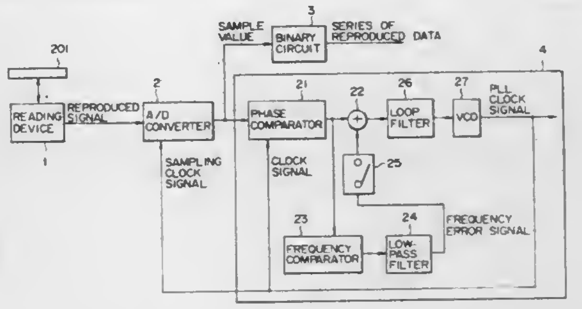
Kensuke Fujimoto, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 26, 1997, Ser. No. 938,320

Claims priority, application Japan, Oct. 1, 1996, 8-260666

Int. Cl.⁶ H03L *7/087*

U.S. Cl. 331—11 **9 Claims**



1. A converter device in which an analogue signal transferred from a predetermined transferring medium is converted into a digital data, said converter device comprises:

sampling means for sampling said analogue signal in synchronism with a clock signal and outputting a digital signal corresponding to said analogue signal;

first calculating means for calculating a phase error between a digital signal outputted by said sampling means and said clock signal;

second calculating means for calculating a frequency error between said digital signal and the clock signal in reference to said phase error;

generating means for generating said clock signal in correspondence with a sum of said phase error and the frequency error: and

processing means for processing said digital signal to generate said digital data.

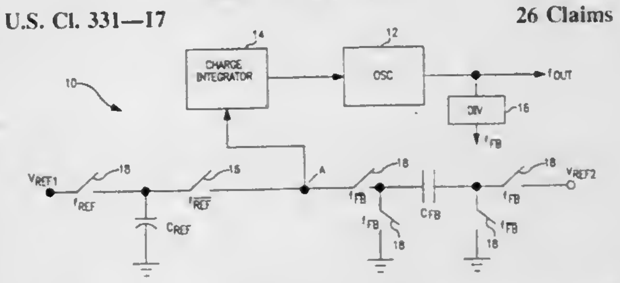
5,841,324
CHARGE-BASED FREQUENCY LOCKED LOOP AND METHOD

Brian Eric Williams, W. Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Jun. 20, 1996, Ser. No. 671,781

Int. Cl.⁶ H03L *7/099*

U.S. Cl. 331—17 **26 Claims**



6. A charge-based frequency locked loop (FLL) comprising an oscillator whose output frequency controls the amount of charge provided by a switched feedback capacitor to a charge integrator whose output voltage controls the frequency of said oscillator.

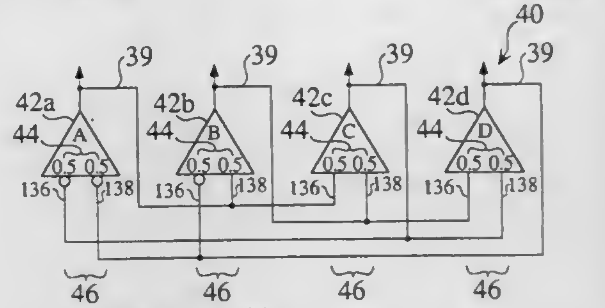
5,841,325
FULLY-INTEGRATED HIGH-SPEED INTERLEAVED VOLTAGE-CONTROLLED RING OSCILLATOR

Thomas A. Knotts, Palo Alto; Cheryl Stout, Fremont, and Richard C. Walker, Palo Alto, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 12, 1997, Ser. No. 854,429

Int. Cl.⁶ H03B *5/24*

U.S. Cl. 331—57 **20 Claims**



1. A ring oscillator, comprising:

at least three mixer cells, each of said mixer cells having a pair of first inputs, a pair of second inputs, a first output, and a second output, said second output being delayed relative to said first output;

each of said mixer cells being symmetrically connected to two other of said mixer cells; said first pair of inputs of each of said mixer cells being symmetrically connected to said first outputs of said two other of said mixer cells; and

said second pair of inputs of each of said mixer cells being symmetrically connected to said second delayed outputs of said two other of said mixer cells.

5,841,326
INTEGRATED OSCILLATION CIRCUIT USED FOR FREQUENCY CONVERSION CIRCUIT

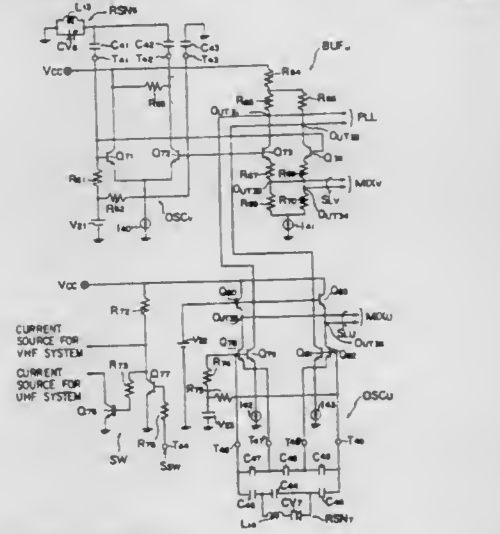
Shinichi Kitazono; Fumio Ishikawa; Shinichi Tsutsumi, and Naoyasu Gamou, all of Kanagawa, Japan, assignors to Sony Corporation, Japan

Continuation of Ser. No. 169,498, Dec. 20, 1993, Pat. No. 5,525,937. This application Nov. 15, 1995, Ser. No. 558,097

Claims priority, application Japan, Dec. 18, 1992, 4-362175; Dec. 18, 1992, 4-362176; Dec. 28, 1992, 4-362174

Int. Cl.⁶ H03B *5/12*

U.S. Cl. 331—117 R **5 Claims**



1. An oscillator comprising:

a first oscillating circuit including a first oscillation transistor connected to a first resonance circuit, and a first buffer transistor connected to said first oscillation transistor and a first load element and outputting a first oscillation signal having a first frequency;

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a second buffer transistor connected to said first load element and a second load element; and
a second oscillating circuit including a second oscillation transistor connected to a second resonance circuit and said second buffer transistor and outputting a second oscillation signal having a second frequency.

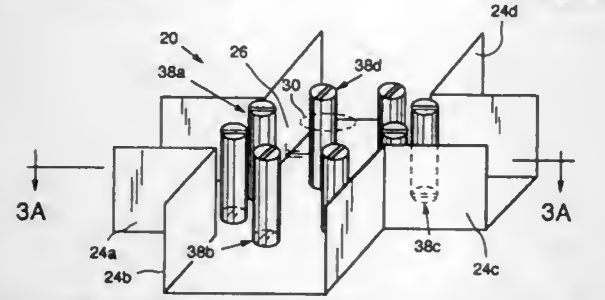
5,841,327
ELECTRICALLY SWITCHED MULTIPORT MICROWAVE LAUNCHER

John W. Gerstenberg, Lake Elsinore, and Ken W. Brown, Yucaipa, both of Calif., assignors to Raytheon Company, El Segundo, Calif.

Filed Mar. 8, 1996, Ser. No. 612,989

Int. Cl.^{6} H01P *1/14*

U.S. Cl. 333—101 **25 Claims**



1. A microwave device comprising a microwave source and launcher which couples microwave energy from the source into a selectable at least one of at least two waveguides, the microwave source and launcher including:
a hollow microwave cavity having an entry port and at least two exit ports, wherein the microwave cavity is in the form of a plus sign with ports located in the same plane and 90 degrees apart from each other
a single microwave source having a source output in communication with the entry port of the microwave cavity;
a controllable, electrically activated microwave barrier comprising a plasma source at each of the at least two exit ports, each microwave barrier including an electrical signal input whose activation controls the microwave barrier; and
a switching circuit including a voltage source for the electrical signal input of each of the microwave barriers.

5,841,328
DIRECTIONAL COUPLER

Katuhiko Hayashi, Tokyo, Japan, assignor to TDK Corporation, Tokyo, Japan

PCT No. PCT/JP95/00445, § 371 Date Nov. 19, 1996, § 102(e) Date Nov. 19, 1996, PCT Pub. No. WO95/32527, PCT Pub. Date Nov. 30, 1995

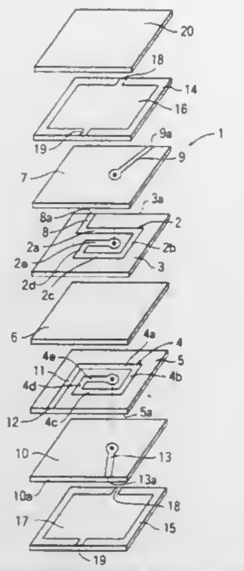
PCT Filed Mar. 16, 1995, Ser. No. 737,816

Claims priority, application Japan, May 19, 1994, 6-105490

Int. Cl.^{6} H01P *5/18*

U.S. Cl. 333—116 **15 Claims**

1. A directional coupler including:
a first spiral pattern structure comprising a first dielectric layer provided at least on one surface with a single first coupling line and a second dielectric layer provided at least on one surface with a single second coupling line, the dielectric layers being laid one over the other so that the first and second coupling lines are located with dielectric material interposed therebetween, one end of the first coupling line being connected with one end of the second coupling line through a conductor passing through the dielectric material interposed between the first and second coupling lines to form a first spiral coupling line pattern;
a second spiral pattern structure comprising a third dielectric layer provided at least on one surface with a single third coupling line and a fourth dielectric layer provided at least on one surface with a single fourth coupling line, the third and fourth dielectric layers being laid one over the other so that the third and fourth coupling lines are located with dielectric material interposed therebetween, one end of the third coupling line being connected with one end of the fourth coupling line through a conductor passing through the dielectric material interposed between the third and fourth coupling lines to form a second spiral coupling line pattern;



said first and second spiral pattern structure being laid one over the other so that the first and second spiral coupling line patterns are located with dielectric material interposed therebetween;
two outer dielectric layers each having a grounding electrode extending to cover substantially throughout the surface thereof, the outer dielectric layers being laid over outer surfaces of the first and the second spiral pattern structures, respectively, with dielectric material interposed between the spiral coupling line patterns and the grounding electrodes, each of the first and second spiral coupling line patterns including a coupling line of a convolute configuration of at least one turn;
wherein the dielectric layers located at opposite sides of each of the first and second coupling lines are made of a material having a high specific dielectric constant, and other dielectric layers are made of a material having a relatively low dielectric constant.

5,841,329
VARIABLE TRAP CIRCUIT

Frédéric Dutilleul, Le Neuburg, France, assignor to U.S. Philips Corporation, New York, N.Y.

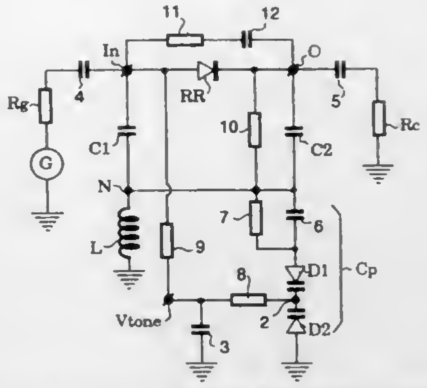
Filed Apr. 1, 1996, Ser. No. 625,960

Claims priority, application France, Apr. 5, 1995, 95 04040

Int. Cl.^{6} H03H *7/06*

U.S. Cl. 333—175 **10 Claims**

1. A trap circuit having an input terminal, an output terminal and an intermediate junction point, provided with a variable resistor between the input terminal and the output terminal, a first capacitance between the input terminal and the intermediate junction point, a second capacitance between the intermediate junction point and the output terminal, and an assembly constituted by an inductance in parallel with a capacitance referred to as parallel capacitance, which assembly is connected between the intermediate junction point and a fixed voltage source, characterized in that the parallel capacitance is variable and is constituted by at least one variable capacitance diode, in that the resistor is constituted by a controlled dynamic resistance element, in that a fixed resistor is connected in parallel with the controlled dynamic resistance element; and in that a capacitor is connected in series with the fixed resistor.



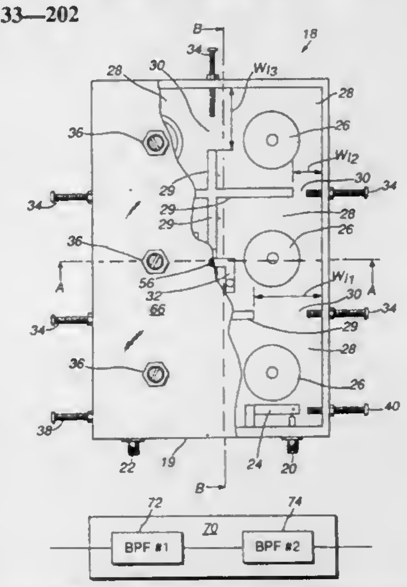
5,841,330
SERIES COUPLED FILTERS WHERE THE FIRST FILTER IS A DIELECTRIC RESONATOR FILTER WITH CROSS-COUPLING

Robert J. Wenzel, Woodland Hills; William G. Erlinger, West Hills, both of Calif.; Peter Melling, Sturbridge; Paul Bartley, West Newbury, both of Mass., and Lucy Bartley, Chester, N.H., assignors to Bartley Machines & Manufacturing, Amesbury, Mass.

Filed Mar. 23, 1995, Ser. No. 412,030

Int. Cl.^{6} H01P *1/20*

U.S. Cl. 333—202 **33 Claims**



30. A method of providing a band pass filter which will meet in-band and out-of-band electrical performance requirements for insertion loss, return loss and attenuation comprising the steps of:
providing a first band pass filter having a first pass-band width including a first center frequency, a first out-of-band suppression factor, and a first in-band insertion loss and return loss which meet the in-band electrical performance requirements of the bandpass filter; and
providing a second band pass filter, disposed in series with the first band pass filter, having a second center frequency that is substantially the same as the first center frequency and a second pass-band width that is broader than the first pass-band width of the first bandpass filter so that the first pass-band of the first bandpass filter is included within the second pass band of second bandpass filter, and a second out-of-band suppression factor sufficient, in combination with the first out-of-band suppression factor of the first bandpass filter, to suppress any spurious signals from the first band pass filter and to comply with the out-of-band attenuation electrical performance requirements of the bandpass filter;
wherein the first band pass filter is a dielectric resonator filter, comprising:
a multi-cavity housing having a plurality of vertical walls disposed at least partially between a base of the dielectric resonator filter and a cover of the dielectric resonator filter, defining a plurality of sequential dielectric resonator cavities that are sequentially oriented in first and second side-by-side rows;
a plurality of cylindrically shaped dielectric resonators, each cylindrically shaped dielectric resonator respectively disposed in one of the plurality of sequential dielectric resonator cavities;
at least one coupling device, disposed in a first wall of each of the plurality of sequential dielectric resonator cavities, for coupling an electromagnetic field between the respective resonators of the sequential dielectric resonator cavities; and
a cross-coupling device, disposed through a second wall of a first resonator cavity and a second non-sequential dielectric resonator cavity of the plurality of sequential dielectric resonator cavities, wherein the cross-coupling device providing cross-coupling of the electromagnetic field between the respective dielectric resonators of the first and second dielectric resonator cavities.

5,841,331
DIELECTRIC FILTER

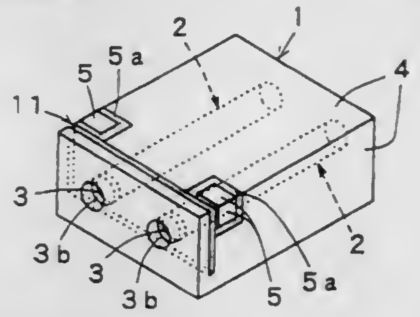
Tatsuya Tsujiguchi, Kanazawa, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Feb. 13, 1997, Ser. No. 799,276

Claims priority, application Japan, Feb. 16, 1996, 8-029364

Int. Cl.^{6} H01P *1/202;1/205*

U.S. Cl. 333—202 **56 Claims**



1. A dielectric filter comprising:
a dielectric block having a pair of end faces;
a plurality of inner conductors formed in said dielectric block such that said inner conductors extend between said pair of end faces and form corresponding resonators; and
an outer conductor formed on an outer surface of said dielectric block,
at least a single continuous slot being formed through said outer surface of said dielectric block and through a corresponding inner conductor at a respective location in the dielectric block so that said corresponding inner conductor is divided by said slot into two parts to form an electrically open end of said corresponding resonator at said location,
an input/output electrode being formed on a part of said outer surface of said dielectric block and insulated from said outer conductor by an outer-conductor-free area surrounding said input/output electrode;
said input/output electrode being capacitively coupled with a corresponding one of said inner conductors;
said outer-conductor-free area surrounding said input/output electrode being partially defined by said slot.

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5,841,332
DIELECTRIC FILTER AND METHOD OF ADJUSTING CENTRAL FREQUENCY OF THE SAME

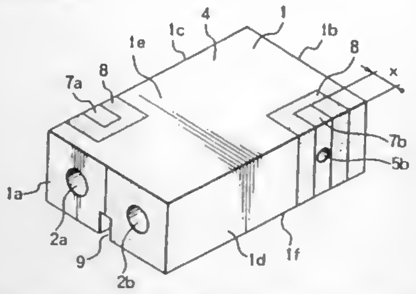
Seigo Hino, Nagoya, Japan, assignor to NGK Spark Plug Co., Ltd., Aichi-Ken, Japan

Filed Nov. 18, 1996, Ser. No. 751,621

Claims priority, application Japan, Nov. 16, 1995, 7-298638; Nov. 16, 1995, 7-298640

Int. Cl.⁶ H01P *1/205*

U.S. Cl. 333—207 **5 Claims**



1. A dielectric filter comprising a dielectric ceramic block, of a rectangular parallelpiped shape, having a top surface and including at least two through holes extending in parallel to each other from one end surface of the dielectric ceramic block, to the other end surface opposite to said one end surface, each of said through holes having an interior surface provided with an inner conductive film forming a resonance conductor, and each of said resonance conductors having one end connected to an outer conductor formed on outer surfaces of said dielectric ceramic block to make a short-circuit end and the other end separated from said outer conductor to make an open-circuit end, said dielectric ceramic block having a bottom surface, said through holes having longitudinal axes and the filter further comprising:

- an auxiliary through holes extending from positions close to short-circuit ends of the first and last outermost resonance conductors to respective opposed lateral side surfaces of said dielectric ceramic block in directions perpendicular to the direction of the longitudinal axes of said through holes;
- input/output conductors comprising conductive films provided on the interior surfaces of said auxiliary through holes and connected to said first and last outermost resonance; and
- transmission paths each extending from a bottom edge of said respective lateral side surfaces to the top surface of said dielectric ceramic block and connected to said respective input/output conductors to obtain a desired center frequency for the filter, said transmission paths each having side portions separated from the outer conductor therearound.

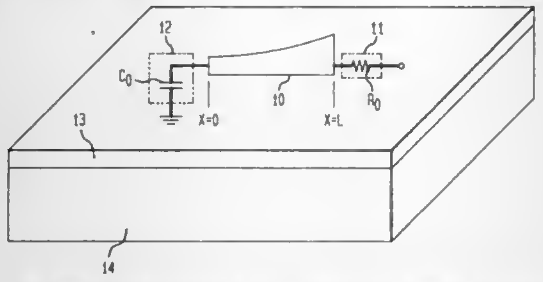
5,841,333
MINIMAL DELAY CONDUCTIVE LEAD LINES FOR INTEGRATED CIRCUITS

John Philip Fishburn, Murray Hill, N.J., and Catherine Anne Schevon, Philadelphia, Pa., assignors to Lucent Technologies, Murray Hill, N.J.

Filed Nov. 26, 1996, Ser. No. 756,695

Int. Cl.⁶ H01P *3/08*

U.S. Cl. 333—238 **9 Claims**



1. In an electrical circuit device comprising a substrate having a layer of dielectric material, a source of an electrical signal characterized by a driving resistance R_0, a load for receiving said signal characterized by a load capacitance C_0, and a conductive lead in contact with said dielectric layer extending along a length x measured from said load to said source, said lead characterized by an area capacitance C_S, a sheet resistance R_S and a length L, the improvement wherein the width of said lead w(x) is the function of x given by:

$$w(x) = \frac{2C_0}{C_sL}\, W\left(\frac{L}{2}\sqrt{\frac{R_sC_s}{R_0C_0}}\; e^{2w\left(\frac{L}{2}\sqrt{\frac{R_sC_s}{R_0C_0}}\right)x/L}\right.$$

where W is the inverse of the function xe^x.

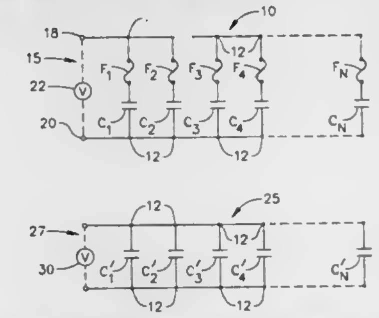
5,841,334
RF CAPACITOR CIRCUIT AND METHOD OF ELECTRONICALLY TUNING SAME

Allen M. East, Romford, England, assignor to Ericsson Inc., Research Triangle Park, N.C.

Filed Dec. 24, 1996, Ser. No. 773,747

Int. Cl.⁶ H03J *5/24*

U.S. Cl. 334—55 **20 Claims**



1. A method of electronically tuning a capacitor circuit having a plurality of capacitors connected in parallel relation so that a desired total capacitance for said capacitor circuit is attained, comprising the following steps:

(a) connecting a fuse in series relation with each said capacitor, wherein each said fuse has a designated current rating above which it prevents current from passing to its associated capacitor; and

(b) providing a voltage to an input of said capacitor circuit so that a current runs therethrough that exceeds the current rating of a designated number of said fuses, wherein the capacitor associated with each designated fuse is electronically eliminated in order to attain said desired total capacitance for said capacitor circuit.

5,841,335
CHOKE COIL

Kazuaki Onishi; Hidenori Uematsu; Tsunetsugu Imanishi, all of Matsusaka, and Munekazu Sato, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP95/00790, § 371 Date Nov. 30, 1995, § 102(e) Date Nov. 30, 1995, PCT Pub. No. WO95/29493, PCT Pub. Date Nov. 2, 1995

PCT Filed Apr. 21, 1995, Ser. No. 553,506

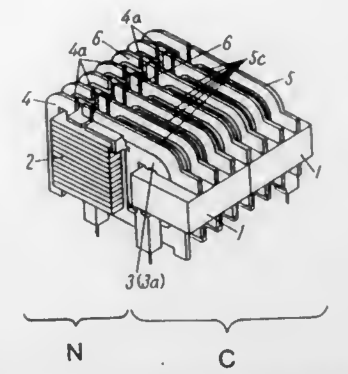
Claims priority, application Japan, Apr. 26, 1994, 6/088313

Int. Cl.⁶ H01F *27/28;27/24*

U.S. Cl. 336—170 **26 Claims**

1. A choke coil comprising:

- a power source for generating a line current;
- a first magnetic core having limbs;
- a second magnetic core having limbs;
- a first coil wound on one of the limbs of the first magnetic core for generating a first magnetic flux in a first direction in the limbs of the first magnetic core by the line current;



- a second coil wound on one of the limbs of the second magnetic core for generating a second magnetic flux in a second direction in the limbs of the second magnetic core by the line current; and
- a third coil wound in such a manner as to cover the one of the limbs of the first magnetic core which is wound with the first coil for generating a third magnetic flux in a third direction which is opposite to the first direction in the limbs of the first magnetic core by the line current and to cover a portion of the second magnetic core for generating a fourth magnetic flux in the second direction in the limbs of the second magnetic core by the line current.

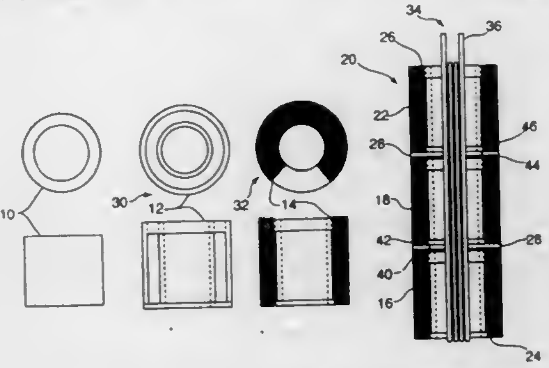
5,841,336
MAGNETIC CORE-COIL ASSEMBLY FOR SPARK IGNITION SYSTEMS

William R. Rapoport, Bridgewater, N.J., and Paul A. Papanestor, Milford, Pa., assignors to AlliedSignal Inc., Morris Township, N.J.

Continuation-in-part of Ser. No. 639,498, Apr. 29, 1996. This application Jan. 27, 1997, Ser. No. 790,339

Int. Cl.⁶ H01F *27/24;27/28;38/20*

U.S. Cl. 336—212 **11 Claims**



1. A magnetic core-coil assembly for generating an ignition event in a spark ignition internal combustion system having at least one combustion chamber, said assembly comprising:

- a magnetic core composed of ferromagnetic amorphous metal alloy, said core having a common primary coil for low voltage excitation and a secondary coil for a high voltage output;
- secondary coil comprising a plurality of stacked 360 degree toroidal core-coil sub-assemblies connected in series with each other that are simultaneously energized in response to the low voltage excitation of said common primary coil, each of said core-coil sub-assemblies comprising a toroidally wound section having a secondary winding wound in a predetermined direction that alternates between clockwise and counterclockwise for adjacent core-coil sub-assemblies such that adjacently stacked core-coil sub-assemblies are not wound in the same predetermined direction and said secondary windings cover approximately 180 to 300 degrees of the 360 degrees of each of said core-coil sub-assemblies;
- said core-coil sub-assemblies, when simultaneously energized by said common primary coil, producing secondary voltages that are additive, said high voltage output being the sum of said secondary voltages which are collectively fed to a spark plug to generate the ignition event in the internal combustion system; and
- said magnetic core-coil sub-assembly repeatedly generating said high voltage output in said secondary coil within a predetermined period of time following the low voltage excitation of said common primary coil.

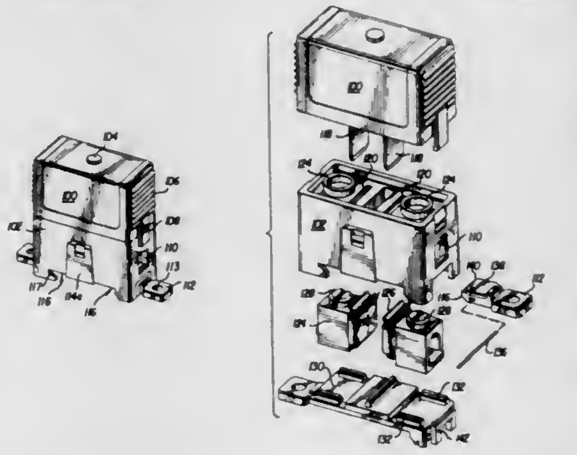
5,841,337
TOUCH SAFE FUSE MODULE AND HOLDER

Robert Stephen Douglass, Wildwood, Mo., assignor to Cooper Technologies Company, Houston, Tex.

Filed Jan. 17, 1997, Ser. No. 784,389

Int. Cl.⁶ H01H *85/22;85/02;85/48;85/20*

U.S. Cl. 337—198 **22 Claims**



21. A safety fuse system comprising:

- a safety fuse including a fuse casing having a bottom surface and opposing end surfaces at each longitudinal end of the bottom surface; a fuse element having a first and a second ends, and extending longitudinally inside the fuse casing; a pair of electrical contacts connected to the fuse element, the electrical contacts extending substantially perpendicular to the bottom surface through openings in the bottom surface of the fuse casing to an exterior of the fuse casing; the openings being located at a distance from the opposing end surfaces so that the electrical contacts are remote from the opposing ends; and electrical connectors that extend substantially parallel to the bottom surface and that connect the fuse element to the electrical contacts so that the first and the second ends of the fuse element are closer to the opposing end surfaces of the fuse casing than the electrical contacts;
- a fuse holder including a fuse holder casing having a top surface, the top surface including apertures for receiving the electrical contacts of the safety fuse, the apertures being in alignment with the safety fuse openings when the safety fuse is engaged with the fuse holder;
- metal contacts within the fuse holder casing for receiving the electrical contacts.

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5,841,338
FUSE COMBINATION, METHOD OF MAKING THE SAME, AND FUSE CIRCUIT INCLUDING THE SAME

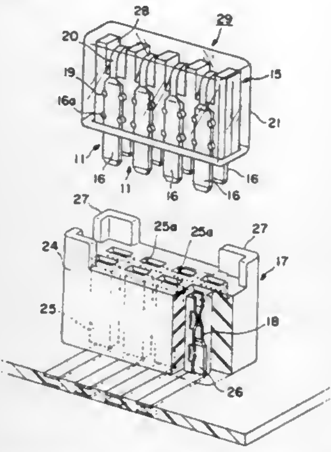
Jun Yasukuni, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Japan

Filed Apr. 15, 1997, Ser. No. 843,333

Claims priority, application Japan, Apr. 17, 1996, 8-095737; Apr. 17, 1996, 8-095739

Int. Cl.^{6} H01H *85/045;85/12;85/50*

U.S. Cl. 337—293 **20 Claims**



1. A fuse combination comprising a plurality of fuse elements arranged in a plane and an insulative support therefor, said fuse elements comprising first contacts at first ends of said fuse elements and second contacts at second ends of said fuse elements, and fusible portions between said first contacts and said second contacts, said first contacts having first depths, said second contacts having second depths, and said fusible portions having third depths, said third depths being thinner than said first depths or said second depths, said fuse elements in parallel and spaced apart relationship to each other in said plane,

said support being generally complementary to said plane, having a dimension parallel to said plane and shorter than a distance between said first ends and said second ends, said support being provided with cavities corresponding to said fusible portions, said fuse elements being affixed to said support, said support, with said fuse elements secured thereto, being bent into a U-shape.

5,841,339

Patent Not Issued For This Number

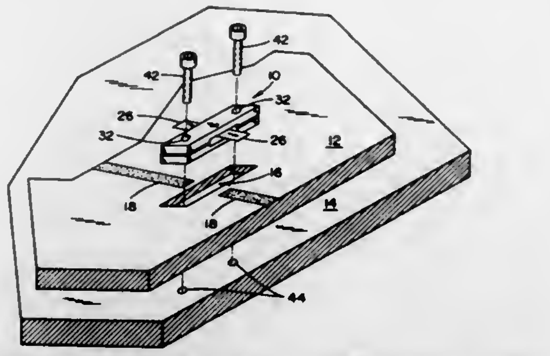
5,841,340
SOLDERLESS RF POWER FILM RESISTORS AND TERMINATIONS

Thomas J. Passaro, Jr., Commack; Thomas J. Dowling, Port Jefferson, and Paul S. Davidsson, Mount Sinai, all of N.Y., assignors to RF Power Components, Inc., Bohemia, N.Y.

Filed May 7, 1996, Ser. No. 646,053

Int. Cl.^{6} H01C *1/08*

U.S. Cl. 338—51 **10 Claims**



1. A solderless RF power film electrical resistor comprising:

a. a base plate functioning as a heat sink and having a flat mounting surface, which base plate is to be secured to a further mounting heat sink;

b. a substrate providing an RF power resistive film and also having a flat mounting surface positioned against the flat mounting surface of the base plate;

c. clamping means including a clamping plate for clamping the flat surface of the substrate securely against the flat surface of the base plate, wherein the clamping plate includes two hollow lugs positioned on opposite sides of the substrate, and the base plate includes two lug holes positioned on opposite sides of the substrate, and each lug being inserted through a hole in the base plate and plastically deformed therein to clamp the flat surface of the substrate securely against the flat surface of the base plate, thereby eliminating a soldered interface connection between the flat mounting surface of the substrate and the base plate; and

d. said further mounting heat sink, and wherein a torqued mounting screw extends through each hollow lug and each hole in the base plate and is threadedly secured in a threaded hole in the mounting heat sink, further clamping the flat surface of the substrate securely against the flat surface of the base plate, and also clamping the base plate, substrate and clamping means securely against the mounting heat sink.

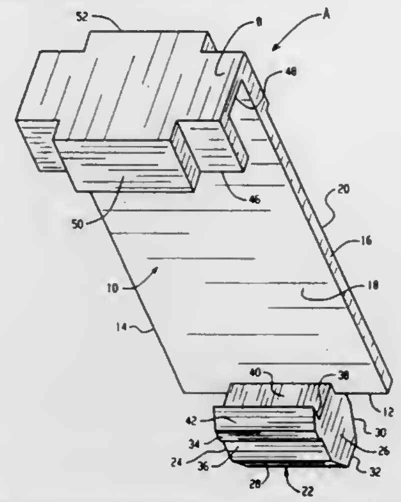
5,841,341
CLIP FOR PTC DEVICES

Jeffrey A. West, Bellville, Ohio, assignor to Therm-O-Disc, Incorporated, Mansfield, Ohio

Filed Sep. 27, 1996, Ser. No. 702,381

Int. Cl.^{6} H01R *37/38*

U.S. Cl. 338—321 **26 Claims**



1. A one piece substantially rectangular nonmetallic dielectric clip for holding PTC devices, said clip having a substantially flat base with top and bottom ends and opposite sides, a central projection adjacent said bottom end and having a latch finger thereon, bottom guide projections extending outwardly from said base at said bottom end thereof on opposite sides of said central projection, top guide projections extending outwardly from said base at said top end thereof in alignment with said bottom guide projections, said guide projections having guide surfaces, a peripheral wall extending outwardly from said front face, said peripheral wall being interrupted along said guide projections and said central projection, said peripheral wall having a height outwardly from said front face and said guide surfaces being located outwardly from said front face intermediate said peripheral wall height, said clip being positionable with a corresponding clip to provide a housing defined by a pair of clips reversely positioned end-for-end with their peripheral walls abutting and their front faces opposed to one another in spaced relationship to define a housing cavity and with the top end on each clip received beneath the latch finger on the other clip and the guide surfaces on said bottom guide projections of one clip aligned with the guide surfaces on said top guide projections of the other clip in opposed spaced relationship to provide passages for electrical terminals on a PTC device.

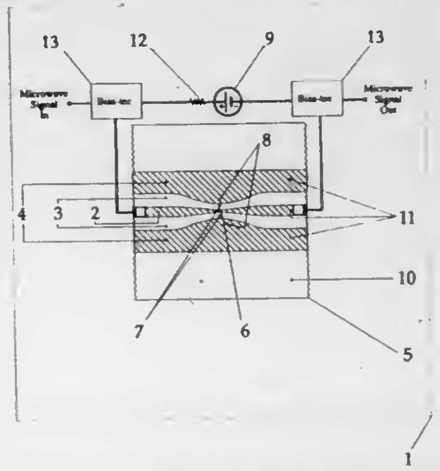
5,841,342
VOLTAGE CONTROLLED SUPERCONDUCTING MICROWAVE SWITCH AND METHOD OF OPERATION THEREOF

Frank A. Hegmann, Santa Barbara, Calif.; Steven H. Moffat, Hamilton, Canada; John S. Preston, Dundas, Canada, and Darcy G. Poulin, Ontario, Canada, assignors to Com Dev Ltd., Cambridge, Canada

Filed Oct. 13, 1995, Ser. No. 542,813

Int. Cl.^{6} H01P *1/00*

U.S. Cl. 338—325 **17 Claims**



1. A voltage controlled superconducting microwave switch, said switch comprising an insulating substrate having a superconducting film thereon, said film having a thermal switching current, said superconducting film being shaped to form a microwave transmission line, said transmission line having a line input and a line output and being connected into a circuit, said circuit containing a constant DC voltage source connected into said transmission line by connecting means to minimize perturbation of the transmission line, said voltage source creating a current in said transmission line when said voltage source is on, said switch having a microwave signal input and a microwave signal output so that a microwave signal passes through said connecting means from said signal input to said signal output when said switch is "on" and virtually no signal passes through said switch when said switch is "off", said switch being "on" when the DC voltage is turned off and said switch switching to "off" when said DC voltage is turned on, said constant voltage causing said film to change from being superconducting to being normal, said film returning to being superconductive when said voltage is off, said constant voltage being at a level so that said current is below said thermal switching current.

5,841,343
BUZZER WITH ROTARY VOLUME ADJUSTMENT

Kenyon A. Hapke, Libertyville, Ill.; William Roos, Colgate, and Spencer C. Schantz, Dousman, both of Wis., assignors to U.S. Controls Corporation, New Berlin, Wis.

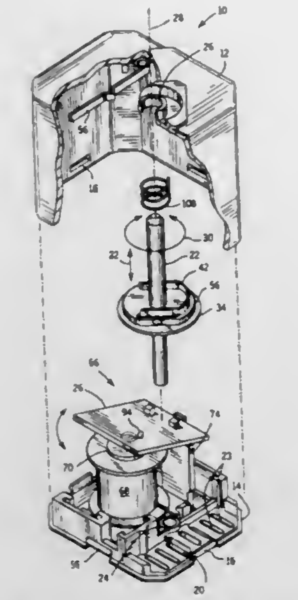
Filed Aug. 15, 1995, Ser. No. 515,343

Int. Cl.^{6} G08B *3/00*

U.S. Cl. 340—390.1 **16 Claims**

1. A rotating shaft assembly comprising:

a cover having an aperture;



a shaft passing through the aperture of the cover to rotate about an axis through a first and second range of angular positions;

a detent assembly between the shaft and cover, the detent assembly having a spring-loaded pawl and a toothed surface, the spring loaded pawl engaging the toothed surface when the shaft is in the second range of angular positions and free from engagement with the toothed surface when the shaft is in the first range of angular positions; and

a stop assembly between the shaft and cover having a first and second stop wall that abut each other when the shaft is at an angular position separating the first and second angular range, wherein the second stop wall is pivotally mounted to flex in one direction to allow rotation of the shaft from the first range of angular positions to the second range of angular positions but not to flex in an opposite direction to allow rotation from the second range of angular positions to the first range of angular positions;

whereby the shaft may be inserted into the cover when positioned in the first angular range without interference between the spring-loaded pawl and the toothed surface and then rotated to and retained in the second angular range.

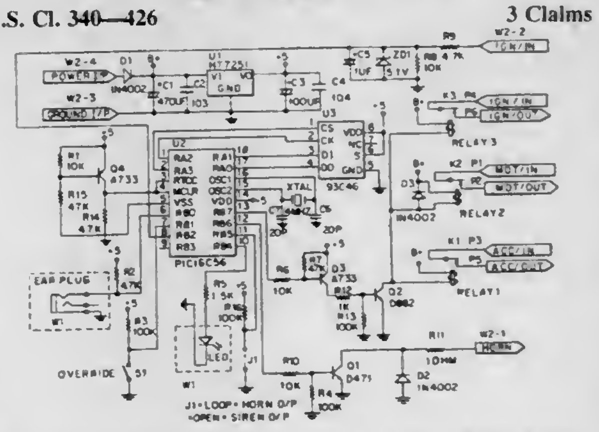
5,841,344
VEHICLE SECURITY SYSTEM WITH ANTI-ROBBERY FUNCTION

Michael Chen, Taipei Hsien, Taiwan, assignor to Advance Security Inc., Taipei Hsien, Taiwan

Filed Jun. 30, 1997, Ser. No. 886,033

Int. Cl.^{6} B60R *25/10*

U.S. Cl. 340—426 **3 Claims**



1. A vehicle security system with anti-robbery function, comprising:

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a mainframe having an upper lid, a lower casing and a Printed Circuit (PC) board having a Central Processing Unit (CPU) with a software recorded therein, a permanent memory and relays;

a preset code being stored in said permanent memory;

said relays being coupled respectively to a power-on circuitry, an ignition circuitry and an engine starting circuitry associated with an engine ignition switch of a vehicle;

a button controlled key receiving means including an upper cover, a lower half, a key insertion device, two connecting wires, a connector plug connected to a button by said two connecting wires and said button being mounted on top of said key insertion device;

said two connecting wires electrically connecting said key insertion device to said connector plug;

a contact-type relief key having a code identical to said code preset in said permanent memory unit stored at the front tip thereof;

said button controlled key receiving means being connected to said PC board of said mainframe by way of said conductor plug;

whereby when said contact-type relief key bearing a code is inserted in the key insertion device of said key receiving means, said code will be input into said mainframe for comparison with said preset code in said permanent memory unit; if said codes match with each other, the engine of said vehicle can be started; as the engine is started, said button disposed on top of said key insertion device is pressed down to render the vehicle into an anti-robbery mode; and after a period of time, said CPU will cause the vehicle's horn to alarm and head lights and direction indicating lights of said vehicle to flash continuously; in case the engine of said vehicle is stopped, said relays can set the ignition circuitry of said vehicle in an open state so as to prevent said power-on circuitry, said ignition circuitry and said engine starting circuitry controlled by said ignition switch of the vehicle from operation even with an ignition key and said relief key are used; said anti-robbery mode is removed by turning on said ignition switch and inserting said relief key in and pulling the same out of said key insertion device repeatedly a number of times, within a period of time and then turning off said ignition switch within a fixed period of time.

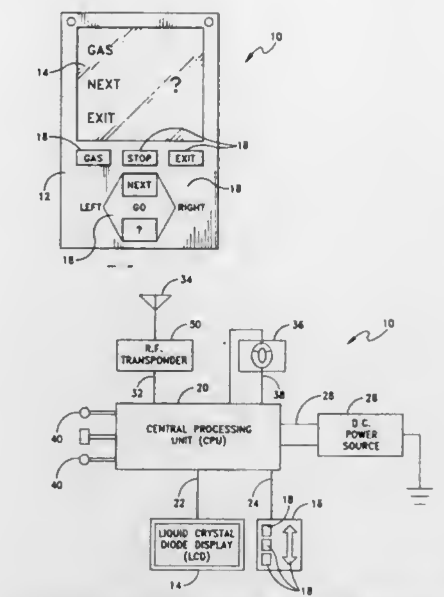
5,841,345
TWO-WAY COMMUNICATION DEVICE HAVING EMERGENCY DETECTING COMPONENT

Howard J. Kestenberg, 59 Sowams Rd., Barrington, R.I. 02806

Filed Jul. 9, 1997, Ser. No. 890,487

Int. Cl.^{6} B60Q *1/00*

U.S. Cl. 340—440 **12 Claims**



1. A two-way communication device comprising:

a central processing unit;

a power source in electrical communication with the central processing unit;

a transmitter/receiver unit capable of transmitting and receiving electromagnetic signals, said transmitter/receiver unit being in electrical communication with the central processing unit;

a display in electrical communication with the central processing unit, said display being capable of displaying messages;

a key pad in electrical communication with the central processing unit, said key pad having a plurality of keys, each of which being capable of generating a specific message; and

an emergency detecting component in electrical communication with the central processing unit, said emergency detecting component being capable of detecting a specific emergency and relating information about the emergency to the central processing unit, wherein upon such detection of an emergency by the emergency detecting component, the transmitter/receiver unit transmits a message about the emergency on the display of another identically constructed device.

5,841,346
PISTOL DETECTION SYSTEM

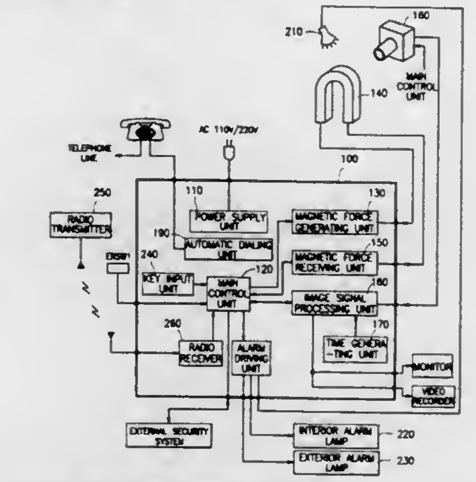
Byung Yong Park, Samik Apartment 4-306, 193-4, Seochodong, Seochoku, Seoul, Rep. of Korea, assignor to Bangsan Chemical Corporation, and Byung Yong Park, both of Seoul, Rep. of Korea

Filed Mar. 30, 1998, Ser. No. 50,050

Claims priority, application Rep. of Korea, Dec. 20, 1997, 97-71287

Int. Cl.^{6} G08B *21/00*

U.S. Cl. 340—540 **2 Claims**



1. A pistol detection system comprising:

a power supply unit for supplying electric power to various constituting units of the system;

a main control unit for controlling an image pickup based on a detection of a pistol while controlling all constituting units of the system based on an ON state of an emergency switch or a radio transmission signal to carry out the generation of an alarm or an automatic dialing;

a magnetic force generating unit for generating a control signal for a generation of magnetic fluxes under the control of the main control unit;

a gate having a portion adapted to generate magnetic fluxes of a desired intensity in response to the control signal from the magnetic force generating unit and a portion adapted to receive the generated magnetic fluxes, thereby generating an induced voltage;

a magnetic force receiving unit for detecting the induced voltage generated from the gate, determining whether or not a person who passes through the gate carries a pistol, based on the detected induced voltage, and applying the result of the determination to the main control unit;

a camera installed in the vicinity of the gate, the camera serving to pick up an image of the person who passes through the gate while carrying a pistol, under the control of the main control unit;

a time generating unit for outputting time information;

an image signal processing unit for composing an image signal generated from the camera with the time information generated from the time generating unit, storing the resultant signal, and applying the stored signal to a monitor or video recorder when a replay function is selected;

an automatic dialing unit for automatically dialing a previously set telephone number under the control of the main control unit;

an alarm driving unit for controlling external alarm units under the control of the main control unit;

a searchlight for emitting light to the gate under the control of the alarm driving unit when the camera carries out an image pickup operation thereof;

an interior alarm lamp for generating an alarm and emitting light in the interior of a place where the system is installed, when a pistol is detected, under the control of the alarm driving unit;

an exterior alarm lamp for generating an alarm and emitting light in the exterior of the place where the system is installed, when a pistol is detected, under the control of the alarm driving unit;

a key input unit for selecting and adjusting functions of various units of the system including a volume adjustment and ON/OFF control for the interior and exterior alarm lamps, next-dialing ON/OFF control, telephone setting, and receiving magnetic force sensitivity control;

a radio transmitter for selecting desired functions of the system in a radio manner; and

a radio receiver for receivng a transmission signal from the radio transmitter indicative of a selected function, and sending the transmission signal to the main control unit.

5,841,347
ONE-TOUCH DOORLOCK DEVICE WITH FUNCTION OF OUTPUTTING SPEECH MESSAGE

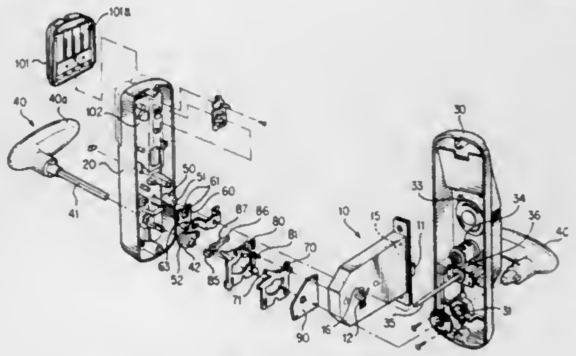
Sung-Ki Kim, Ansan, Rep. of Korea, assignor to Duk Poong Mool San Co., Ltd., Seoul, Rep. of Korea

Filed Aug. 16, 1996, Ser. No. 697,006

Claims priority, application Rep. of Korea, Aug. 16, 1995, 1995 21109

Int. Cl.^{6} E05B *45/06*

U.S. Cl. 340—542 **10 Claims**



1. An one-touch doorlock device comprising:

a lock unit having a latching bolt and a locking bolt;

a doorlock body provided with doorknobs having a common shaft to operate the latching bolt of the lock unit;

door locking means for moving the locking bolt to its locked position, the door locking means having a rotating member operatively connected to the doorknobs in such a manner that the rotating member rotates by a manipulation of the doorknobs, thereby moving the locking bolt between its extended position corresponding to the locked position and its retracted position;

lock releasing means for rotating the rotating member in such a direction that the locking bolt moves to its retracted position, the lock releasing means being activated by a signal output from a key input unit;

a key unit for rotating the rotating member by a manipulation of a key selectively coupled to the key unit in such a direction that the locking bolt moves to its retracted position;

bolt direction switching means for switching the manipulation direction of the doorknobs between left and right directions in accordance with a door opening direction;

lock state sensing means for sensing a locked/unlocked state of the locking bolt;

speech outputting means for outputting the sensed state of the locking bolt in the form of a speech signal;

control means for controlling the lock releasing means and the speech outputting means, the control means including the key input unit; and

power supply means for supplying power to the lock releasing means, the speech outputting means and the control means.

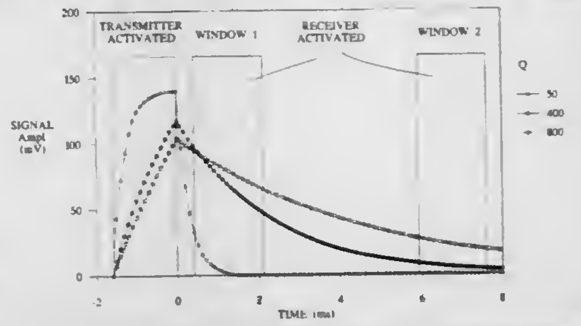
5,841,348
AMORPHOUS MAGNETOSTRICTIVE ALLOY AND AN ELECTRONIC ARTICLE SURVEILLANCE SYSTEM EMPLOYING SAME

Giselher Herzer, Bruchkoebel, Germany, assignor to Vacuumschmelze GmbH, Hanau, Germany

Filed Jul. 9, 1997, Ser. No. 890,723

Int. Cl.^{6} G08B *13/24*

U.S. Cl. 340—551 **54 Claims**



33. A magnetomechanical electronic article surveillance system comprising:

a marker comprising a bias element and a resonator, said resonator formed by an annealed amorphous magnetostrictive alloy having a composition $Fe_aCo_bNi_cSi_xB_y$, wherein a, b, c, x and y are at % and a+b+c+x+y=100, and a ranges from about 15 to about 30, b is at least about 12, c ranges from about 30 to about 50, and $79<a+b+c<85$, said resonator having a linear B-H loop up to a minimum field strength of about 8 Oe, a quality Q between about 100 and 600, an anisotropy field H_k of at least about 10 Oe and, when excited to resonate in the presence of a bias magnetic field H_b, producing a signal at a mechanical resonant frequency f_r having an amplitude at approximately 1 ms after excitation which is no more than 15 dB below an amplitude of said signal immediately after excitation and an amplitude at approximately 7 ms after excitation which is at least 15 dB below said amplitude at 1 ms after excitation;

transmitter means for exciting said marker for causing said resonator to mechanically resonate and to emit said signal at a resonant frequency;

receiver means for receiving and integrating said signal from said resonator at said resonant frequency;

synchronization means connected to said transmitter means and to said receiver means for activating said receiver means for receiving and integrating said signal at said resonant fre-

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quency from said resonator in a first detection window beginning at approximately 0.4 ms after excitation of said resonator by said transmitter means and in a second detection window beginning at approximately 7 ms after excitation of said resonator by said transmitter means; and

an alarm, said receiver means comprising means for triggering said alarm if said signal at said resonant frequency from said resonator integrated in said second detection window is substantially below said signal at said resonant frequency from said resonator integrated in said first detection window.

5,841,349
ALARM TAG

Bertil Holmgren, Rang Sandsvigen 59, S-235 91, Vellinge, Sweden

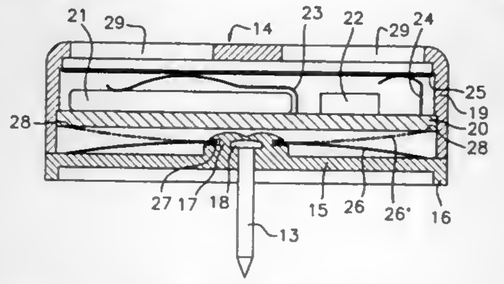
PCT No. PCT/SE95/00385, § 371 Date Dec. 20, 1996, § 102(e) Date Dec. 20, 1996, PCT Pub. No. WO95/27959, PCT Pub. Date Oct. 19, 1995

PCT Filed Apr. 11, 1995, Ser. No. 732,358

Claims priority, application Sweden, Apr. 12, 1994, 9401218

Int. Cl.⁶ G08B *13/14*

U.S. Cl. 340—572 **9 Claims**



1. Alarm tag for a product comprising:

a first part to be located on one side of the product;

a pin attached to the first part, the pin extendible through the product when the first part is located on said one side of the product;

a second part to be located on the opposite side of the product for locking engagement with the pin of the first part;

means providing locking engagement between the pin and the second part;

an alarm device in said first part, the alarm device being electronically activated;

a power source for said alarm device in said first part;

an electronic control circuit in said first part for controlling interconnection of the power source and the alarm device;

a conductive first contact element integrally connected with the electronic control circuit; and

a conductive second contact element wherein the second contact element is a bistable contact element in the first part, said bistable contact element having a first stable position which is the normal position thereof and in which the bistable contact element is separated from the first contact element, the electronically controlling interconnection thereby being interrupted and the alarm device being silent, and said bistable contact element having a second stable position in which the bistable contact element engages the first contact element, the electronically controlling interconnection thereby being closed and the alarm device being activated, the pin being operatively connected with the bistable contact element to switch momentarily the bistable element from the normal first stable position to the second stable position thereof in order to activate the alarm device at attempt to separate the first and second parts of the alarm tag when in locking engagement with each other.

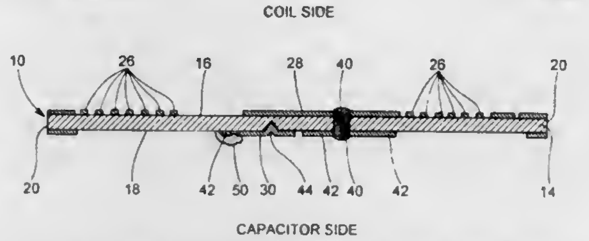
5,841,350
ELECTRONIC SECURITY TAG USEFUL IN ELECTRONIC ARTICLE INDENTIFICATION AND SURVEILLANCE SYSTEM

Lawrence Appalucci, Villanova, Pa.; John H. Bowers, Clarksburg, N.J.; Gary T. Mazoki, Sewell, N.J.; Thomas J. McKeown, Pennsauken, N.J.; Anthony F. Piccoli, Audubon, N.J.; Mark J. Rankin, Media, Pa., and Stanley Tocker, Wilmington, Del., assignors to Checkpoint Systems, Inc., Thorofare, N.J.

Filed Jun. 27, 1997, Ser. No. 884,409

Int. Cl.⁶ G08B *13/14*

U.S. Cl. 340—572 **27 Claims**



1. A resonant tag circuit useful as an electronic security device, comprising a layered planar structure having a dielectric substrate with first and second opposing principal surfaces; a resonant circuit capable of resonating at at least one predetermined frequency and comprising a pattern of conductive material carried on each of the opposing surfaces of the dielectric substrate, said resonant circuit including at least one activation or deactivation point for creating a short circuit or open circuit in the resonant circuit upon exposure of the resonant circuit to an activation or deactivation field at a predetermined energy level; and a semiconductive antistatic material having an ionizable salt dissolved therein, said antistatic material being applied on a portion of one surface of the dielectric substrate to provide a semiconductive bridge across at least one activation or deactivation point in the resonant circuit by contacting conductive material in the circuit on both sides of the point.

5,841,351
AUTOMATED SYSTEM FOR STORING CYCLES, IN PARTICULAR BICYCLES

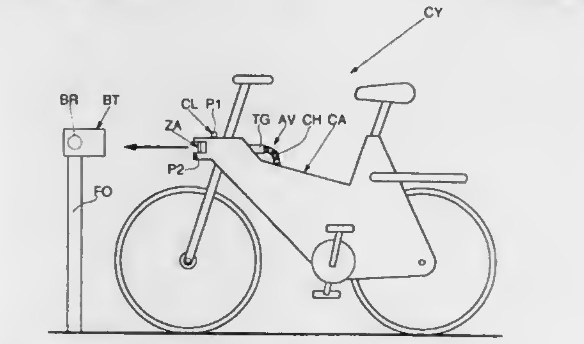
Pascal Rey, Bruxelles, Belgium, assignor to More Group Belgium S.A., Bruxelles, Belgium

Filed Aug. 21, 1997, Ser. No. 916,020

Claims priority, application European Pat. Off., Apr. 30, 1997, 97107156.8

Int. Cl.⁶ G08B *13/14*

U.S. Cl. 340—572 **19 Claims**



1. Automated cycle storage system, comprising:

a plurality of cycles (CY), each having a fastening region (ZA) for temporarily storing it, an identification means (P1,P2) containing an identifier associated in a one-to-one way with said cycle and an antitheft device (AV) firmly attached to the cycle and designed so as to prevent the cycle from being stolen during temporary use of the cycle by a user, this anti-theft device being actuable by means of a removable key (CL) containing at least part of the identification means (P1), and

at least one storage station (ST) comprising a number of storage locations (EMP) each capable of removably housing a cycle, a number of controllable automatic cycle-locking/unlocking devices (CRH), each capable of engaging in said fastening region of a cycle, and read devices (LP1, LP2) capable of reading the identification means of the cycles housed in the storage locations.

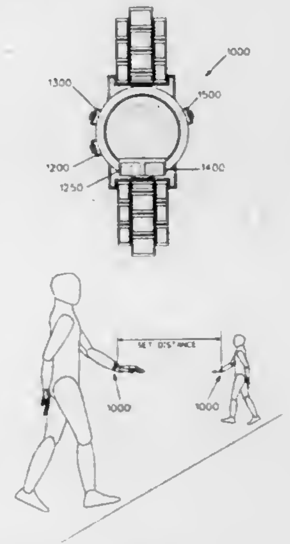
5,841,352
CHILD MONITOR

Sushil Prakash, 26941 Patrick Ave., Hayward, Calif. 94544

Filed Jun. 18, 1997, Ser. No. 878,220

Int. Cl.⁶ G08B *23/00*

U.S. Cl. 340—573 **7 Claims**



1. An alarm system comprising:

first and second watches for wear by first and second users, each watch having a transceiver assembly comprising:

- transmitting means for sending a signal;
- means for providing a periodic sending of said signals by said transmitting means;
- receiver means for receiving said transmitted signals from the other watch;
- means for powering said transmitting and receiving means;
- signal producing means for producing a base signal indicative of a strength of a signal received by one watch if transmitted from the other watch at a preselected distance;
- comparator means for comparing a signal transmitted by the other watch and received by said receiving means to said base signal produced in said watch receiving said signal, said comparator means producing a comparator signal upon a strength of said received signal from the other watch being less than a strength of said produced base signal;
- a relay responsive to said produced comparator signal;
- alarm means connected to said relay, a closure of said relay in response to said comparator signal connecting said power means to said alarm means, whereby to energize said alarm means, said energized alarm means indicative of one of said watches receiving a signal transmitted from the other watch from a distance beyond said preselected distance.

5,841,353
RELATING TO THE DETERMINATION OF VERTICALITY IN TALL BUILDINGS AND OTHER STRUCTURES

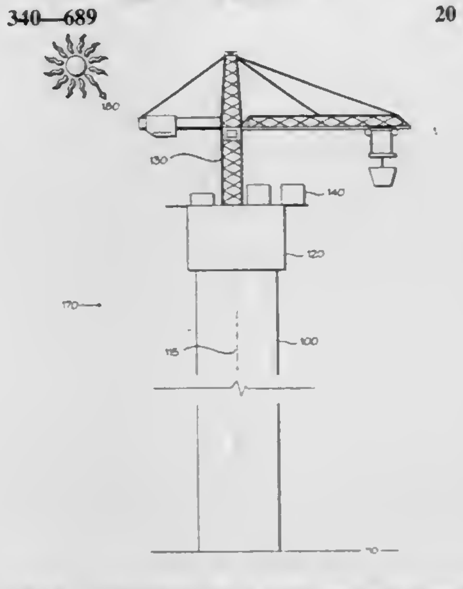
Gary Sedman Chisholm; Jason Scott Daly, and Michael Anthony Hansby, all of Christchurch, New Zealand, assignors to Trimble Navigation Limited, Sunnyvale, Calif.

Filed Aug. 1, 1996, Ser. No. 691,209

Claims priority, application New Zealand, Aug. 16, 1995, 272792

Int. Cl.⁶ G08B *21/00*

U.S. Cl. 340—689 **20 Claims**



1. A method of monitoring tilt in a tall structure, comprising:

placing a plurality of tilt detection devices along a reference line on the structure,

calibrating each tilt detection device in a known tilt state of the structure,

determining a position for each detection device along the reference line,

receiving a tilt measurement from each detection device in a subsequent tilt state of the structure, and

characterising the subsequent tilt state by analysing tilt dependence on position along the reference line.

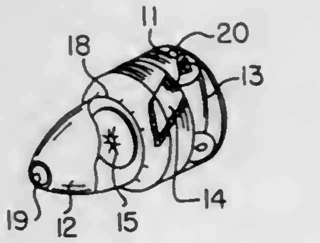
5,841,354
POSITION-SENSING WAKING SYSTEM AND METHOD

Tae Hong Bae; Sang Yun Bae, and Sang Il Bae, all of 6898 Old Annapolis Rd., Linthicum, Md. 21090

Filed Feb. 27, 1997, Ser. No. 807,150

Int. Cl.⁶ G08B *23/00*

U.S. Cl. 340—575 **20 Claims**



1. A position-sensing waking system comprising:

an ear plug for inserting into an orifice of an ear; and

a housing connected to said ear plug and being rotatable, said housing including,

- alarm means for generating an alarm sound,
- a system switch for controlling said alarm means,
- a detection switch disposed inside said housing, and
- a control circuit for controlling said position-sensing waking system,

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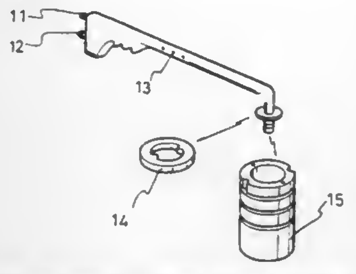
wherein said system switch is turned on by rotating said ear plug into said housing in a first direction until a maximum rotation position is reached.

5,841,355
OPTIMUM ELECTROLYTE LEVEL SENSING METHOD AND THE AUTOMATIC TOPPING UP APPARATUS FOR STORAGE WET CELL

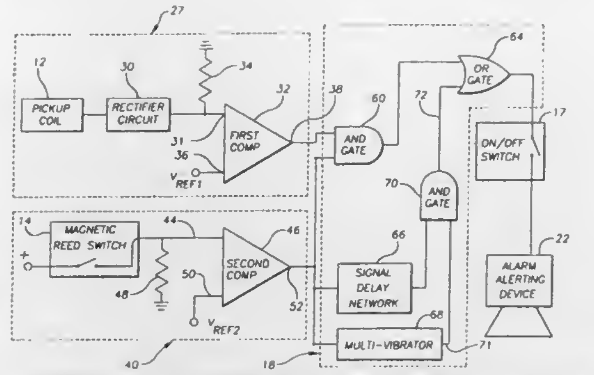
Sang-Min Bae, Seo-Ku; Young-Joon Son, and Jae-Won Lee, both of Yoosung-Ku, all of Rep. of Korea, assignors to Korea Atomic Energy Research Institute, Daejeon, Rep. of Korea
Division of Ser. No. 556,837, Nov. 2, 1995. This application Dec. 19, 1996, Ser. No. 769,531
Claims priority, application Rep. of Korea, Jun. 2, 1995, 95-14639
Int. Cl.^{6} G08B *21/00*
U.S. Cl. 340—635 **3 Claims**



1. A movable automatic topping apparatus for storage battery wet cells comprising: a distilled water storage tank (**1**), a distilled, water storage vessel (**30**) in said storage tank, an injector placing room (**4**) in said storage tank for keeping an injector (**40**), said injector comprising, an arc shaped body, a control wire connector (**11**) for connecting control wire to a rear portion of said body, an injection hose quick coupling (**12**) for connecting an injection hose to the rear portion of said body, a switch (**13**) and indication lamps (**13***a*, **13***b*) installed in the middle of said body (**40**) for an indication of distilled water injection state, an injection outlet portion (**15**) fitted to a leading end of said body (**40**) and to be put into an opening of said storage cell, and an adjusting ring (**14**) installed on an upper portion of said injection outlet portion (**15**) in accordance with a shape of said storage cell, said injector being connected to said distilled water storage vessel (**30**) for supplying distilled water into said storage battery wet cells, a connecting terminal box (**6**) for control wires and an injection hose connected to said injector, a return reel (**3**) in said terminal box for winding said control wires and said injection hose and another reel (**5**) for winding an external power source line.

5,841,356
APPLIANCE SAFETY ALARM

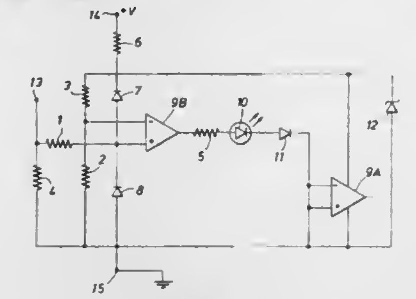
James Woodruff, and Elizabeth Woodruff, both of 279 Mt. Moriah Rd., Auburn, Ga. 30203
Filed Jan. 15, 1997, Ser. No. 783,278
Int. Cl.^{6} G08B *21/00;* **H05B** *1/02*
U.S. Cl. 340—635 **7 Claims**

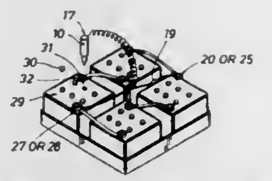


1. An appliance safety alarm comprising:
- a first sensing circuit for detecting operation of the appliance, said first sensing circuit including an inductive coil positionable adjacent to a power supply cord of an appliance, said first sensing circuit generating a first sensed output signal responsive to a coil output signal, said first sensed output signal having a first value when said coil signal output indicates operation of an appliance and a second value when said coil signal output indicates non-operation of an appliance;
- a second sensing circuit including a magnetically actuated reed switch and a permanent magnet, said reed switch and said permanent magnet being positionable in relation to an access cover of an appliance in a manner such that the position of the access cover effects the state of the reed switch, said second sensing circuit generating a second sensed output signal responsive to a reed switch output signal, said second sensed output signal having a third value when said reed switch output signal indicates a closed access cover and a fourth value when said reed switch output signal indicates an open access cover;
- a control circuit having a first control input responsive to said first sensed output signal, a second control input responsive to said second sensed output signal, and a control circuit output generating a control output signal responsive to said first and second control inputs; and
- an audible alerting device responsive to said control output signal of said control circuit;
- said control circuit generating a control output signal activating said audible alerting device after receiving a said first sensed output signal having said second value and a second sensed output signal having said fourth value for a continuous first predetermined delay period.

5,841,357
BATTERY ELECTROLYTE MONITOR

Ricky Joe Henry, and Ernest Gene Horne, both of Katy, Tex., assignors to Stewart & Stevenson Services, Inc., Sealy, Tex.
Filed Jul. 30, 1996, Ser. No. 688,308
Int. Cl.^{6} G08B *21/00*
U.S. Cl. 340—636 **1 Claim**



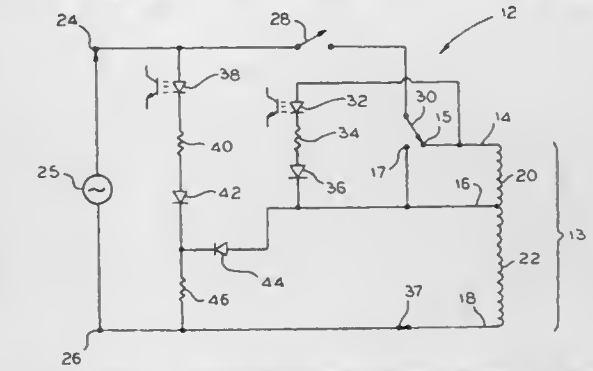


1. A portable electrolyte fluid monitor for inserting into a fill opening in a wet cell battery, comprising:
- a conductive probe composed of antimonial lead, adapted for insertion into the battery fill opening to a depth corresponding with a minimum acceptable electrolyte fluid level, said probe providing a variable voltage representative of the electrolyte voltage, wherein said probe is adapted for testing by touching said probe to a source of positive voltage;
- a glass infused polypropylene housing that prevents said probe from contacting the battery case around the fill opening; and
- electrical circuitry coupled to said probe and disposed within said housing, said electrical circuitry comprising:
  - a first conductor enclosed in an acid resistant coiled cable;

  - a second conductor enclosed in an acid resistant coiled cable;
  - reverse polarity, over voltage, and over current protection circuitry; and
  - an operational amplifier configured as a comparator for comparing said variable
- voltage to a reference voltage and delivering current to an LED if said input voltage exceeds said reference voltage.

5,841,358
MOTOR CURRENT STATUS SENSOR

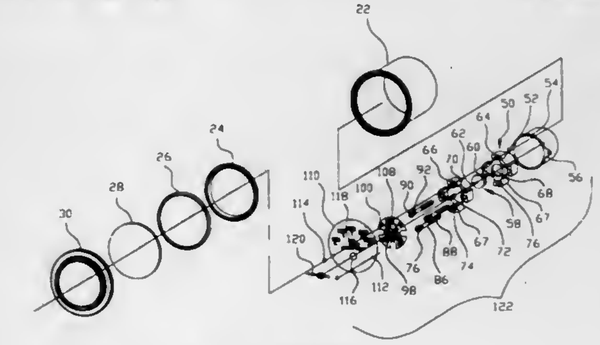
J. Scott Jamieson, Waukesha, Wis., assignor to Johnson Service Co., Milwaukee, Wis.
Continuation of Ser. No. 755,687, Nov. 25, 1996, abandoned, which is a continuation of Ser. No. 105,272, Aug. 12, 1993, abandoned. This application Jul. 25, 1997, Ser. No. 903,266
Int: Cl.^{6} B60C *23/00*
U.S. Cl. 340—648 **8 Claims**



1. A method for establishing the operating status of a direct drive, multiple speed motor, having at least first and second speed motor windings and a power supply for selectively applying a source voltage to the first and second speed motor windings for energizing said motor at different speeds, the method comprising the steps of:
- (a) sensing a presence of an induced voltage between the first and second speed windings of the motor;
- (b) sensing a presence of the source voltage on one of the first and second speed motor windings; and
- (c) providing an indication when the induced voltage is present and the source voltage is present for signifying motor operation.

5,841,359
VISUAL ALARM GAUGE

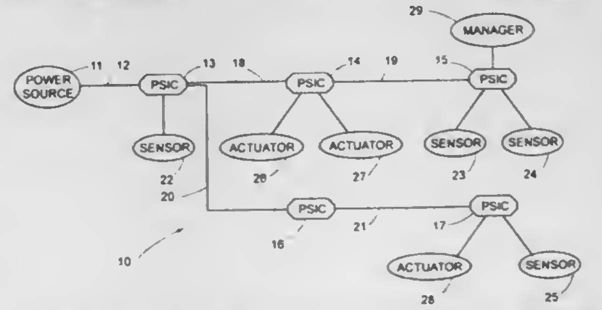
Henry Garratt Grilk, Lancaster, Pa., assignor to Datcon Instrument Company, East Petersburg, Pa.
Continuation of Ser. No. 381,076, Jan. 31, 1995, abandoned. This application Mar. 26, 1997, Ser. No. 832,335
Int. Cl.^{6} G08B *21/00*
U.S. Cl. 340—688 **9 Claims**



1. A panel meter gauge comprising:
- (a) an outer case having an inner recess;
- (b) an electrical movement having a rotatable armature assembly disposed within a coil said coil being wound around a bobbin with shoulders, said movement having a spindle, said movement disposed within said inner recess and connected to an electrical lead passing through said outer case and being electrically insulated therefrom;
- (c) a dial having an aperture, said spindle passing through said aperture of said dial;
- (d) a circuit board having an orifice, said board having a light and a single dual comparator integrated circuit comparator circuit mounted thereon, said board being disposed within said inner recess between said movement and said dial with said orifice and said aperature being axially aligned with the spindle passing therethrough; said board being electrically connected to said electrical movement;
- (e) a gauge calibration resistor electrically connected to said comparator circuit to adjust gauge calibration;
- (f) a trimming resistor electrically connected to said comparator circuit to adjust the set point of said light; and
- (e) a crystal sealably fixed to the outer case so that said electrical movement, said circuit board and said dial are housed within said inner recess.

5,841,360
DISTRIBUTED SERIAL CONTROL SYSTEM

Yehuda Binder, 30 Yeshurun St., Hod Hasharon, Israel, 45200
Filed Oct. 22, 1996, Ser. No. 734,921
Int. Cl.^{6} G06F *15/46*
U.S. Cl. 340—825.07 **24 Claims**



1. A network topology allowing distributed sensing, control and communication, comprising:
- a power source,
- a plurality of line-Powered, Serially connected Intelligent Cells (PSICs) coupled to the power source and to each other via respective communication channels each allowing mutually independent communication in either or both directions and comprising at least two electrical conductors,
- addressing means for uniquely referencing each of said PSICs, and
- at least one payload element coupled to one of the PSICs for operating in accordance with control logic embedded in or fed to said one of the PSICs.

5,841,361
KEYLESS LOCKING SYSTEM

Ronald J. Hoffman, 33165 Cannon Rd., Solon, Ohio 44139
Filed Mar. 18, 1996, Ser. No. 616,074
Int. Cl.^{6} G06F *7/04;* **E05B** *49/00*
U.S. Cl. 340—825.31 **19 Claims**

1. A keyless locking system for operation by a user, said system comprising:
- locking means movable between a locked position and an unlocked position; and control means for controlling said locking means, said control means comprising:
  - means for selecting one of a plurality of operating states of said control means, said operating states including a lock combination programming mode for entering a pro-

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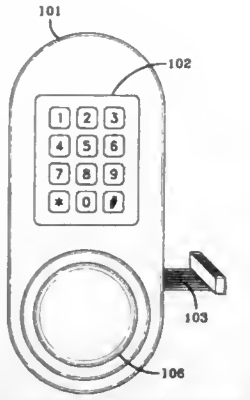


grammed lock combination code having variable length, a locked mode for moving said locking means to the locked position, and an unlocked mode for moving said locking means to the unlocked position, said selecting means having an idle state and an active state wherein putting said selecting means temporarily in said active state and returning to said idle state causes said control means to enter said lock mode if said locking means is in said unlocked position, and causes said control means to enter said unlocked mode if said locking means is in said locked position, and putting said select means into said active state for a specified period of time causes said control means to enter said program mode, and

memory means for storing the programmed lock combination code and the programmed lock combination code length, said control means storing the programmed lock combination code and the programmed lock combination code length in said memory means only if the programmed lock combination code has a length that is greater than or equal to a minimum combination code length and less than or equal to a maximum combination code length.

5,841,362
OPTIONAL APPARATUS CONNECTABLE TO OTHER APPARATUS

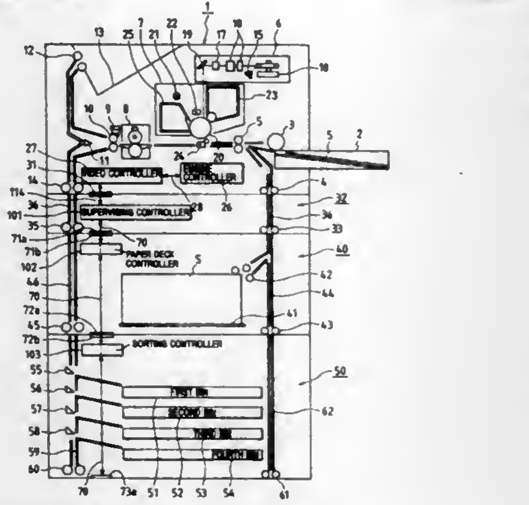
Akihiro Nakamura, Kawasaki; Junichi Kimizuka, Yokohama; Hiroshi Hashimoto, Tokyo; Soya Endo, Tokyo, and Hitoshi Machino, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 6, 1996, Ser. No. 597,275

Claims priority, application Japan, Feb. 10, 1995, 7-046459; Feb. 10, 1995, 7-046460; Feb. 10, 1995, 7-046461

Int. Cl.^{6} G03G *21/00*

U.S. Cl. 340—825.03 **17 Claims**



1. A communication apparatus, comprising:

communication means for communicating data between a first apparatus and a second apparatus, said first apparatus on an upstream side and said second apparatus on a downstream side; and

controlling means for controlling said communication apparatus in accordance with data received by said communication means;

said communication means including:

first receiving means for receiving data from said first apparatus;

first transmitting means for transmitting said data received by said first receiving means to said second apparatus;

second receiving means for receiving data from said second apparatus;

second transmitting means for transmitting said data received by said second receiving means to said first apparatus; and

returning means for returning said data transmitted by said first transmitting means to said second transmitting means,

wherein said returning means is activated when a communication with said second apparatus is not available.

5,841,363
LOCKING SYSTEM ESPECIALLY FOR AUTOMOBILES

Marquardt Jakob, Rietheim-Weilheim, and Karl Mueller, Rottweil-Neufra, both of Germany, assignors to Marquardt GmbH, Rietheim-Weilheim, Germany

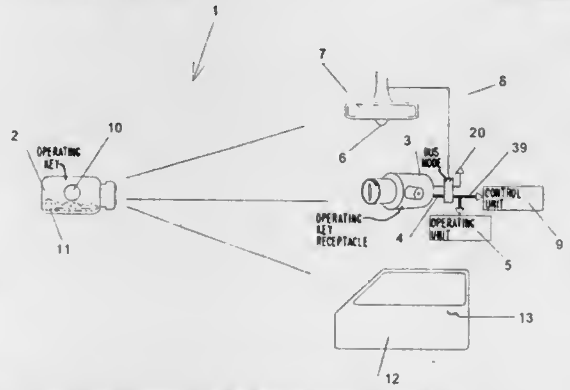
PCT No. PCT/DE94/01131, § 371 Date Mar. 29, 1996, § 102(e) Date Mar. 29, 1996, PCT Pub. No. WO95/09746, PCT Pub. Date Apr. 13, 1995

PCT Filed Sep. 29, 1994, Ser. No. 624,413

Claims priority, application Germany, Oct. 1, 1993, 43 33 505.5; Nov. 26, 1993, 93 20 270 U

Int. Cl.^{6} H06F *7/00*

U.S. Cl. 340—825.31 **16 Claims**



1. A locking system for an automobile, comprising:

an operating key;

an operating key receptacle;

an operating unit associated with the operating key receptacle;

a light guide in the operating key receptacle; and

electro-optical converter elements, including luminous elements and photocells arranged in the operating key and in the operating key receptacle, optically coupled to the light guide, for transmitting an optical energy signal through the light guide from the operating key receptacle to the operating key for supplying energy for operation of the operating key, and for transmitting coded operating signals through the light guide, including a second operating signal transmitted from the operating key receptacle to the operating key and a first operating signal transmitted from the operating key to the operating key receptacle, wherein the second operating signal operates jointly with the first operating signal in a bidirectional communication to constitute an alternating code for activation of the operating unit upon a successful decoding of the two transmitted operating signals.

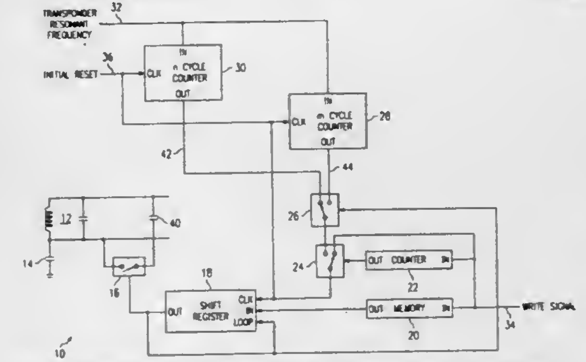
5,841,364
METHOD AND APPARATUS FOR TRANSFERING INFORMATION FROM A TRANSPONDER

Andreas Hagl, Dachau, and Josef H. Schuermann, Oberhummel, both of Germany, assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 320,471, Oct. 7, 1994, abandoned. This application Mar. 13, 1997, Ser. No. 816,928

Int. Cl.^{6} H04Q *1/00*

U.S. Cl. 340—825.54 **15 Claims**



6. A transponder for transferring information, comprising:

a resonant circuit operable to generate a transponder resonant frequency signal, said transmit frequency signal having one of a first frequency and a second frequency, said first frequency representing data bits of information having a binary zero value, said second frequency representing data bits of information having a binary one value;

a control circuit operable to select one of said first and second frequencies for said transponder resonant frequency signal associated with each data bit of information, said control circuit transmitting each data bit of information with a same bit length regardless of which of said first and second frequencies is selected for said transponder resonant frequency signal;

wherein said control circuit includes a first counter circuit associated with said first frequency and a second counter circuit associated with said second frequency, said first counter circuit operable to count down from a first value, said second counter circuit operable to count down from a second value, said first value being different than said second value to achieve said same bit length.

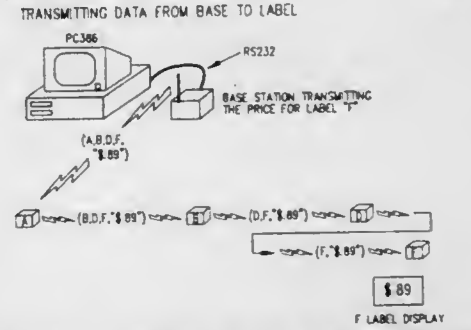
5,841,365
METHOD AND APPARATUS FOR COMMUNICATING WITH A PRODUCT LABEL

Joseph Shannon Rimkus, Bothell, Wash., assignor to Seattle Silicon Corporation, Bellevue, Wash.

Continuation-in-part of Ser. No. 125,518, Sep. 22, 1993, abandoned. This application Feb. 10, 1994, Ser. No. 195,311

Int. Cl.^{6} G09G *3/20*

U.S. Cl. 340—825.35 **20 Claims**



1. In a wireless product label identification system comprising a host transceiver and a plurality of individually addressed product labels having transceivers, the transceivers being capable of transmitting and receiving radio frequency (RF) electromagnetic signals, wherein at least some of the individually addressed product labels serve as relays between 1) the host transceiver or one of the individually addressed product labels and 2) another of the individually addressed product labels, a method for communicating information to the product label having a specific address, the method comprising the steps of:

a) determining a path through the plurality of individually addressed product labels, from the host transceiver to the product label having the specific address, along which the information can be communicated;

b) generating a message representing the path and the information to be communicated; and

c) transmitting the message as an RF electromagnetic signal to the product label having the specific address.

5,841,366
TRAVELING-PATH DEDUCTION APPARATUS AND METHOD FOR VEHICLES

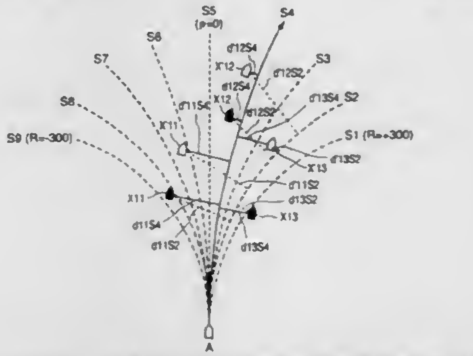
Yasunori Yamamoto, Hiroshima; Ayumu Doi, Hatsukaichi; Tomohiko Adachi, Higashihiroshima, and Tohru Yoshioka, Hiroshima, all of Japan, assignors to Mazda Motor Coporaton, Hiroshima-ken, Japan

Filed Jul. 18, 1996, Ser. No. 683,143

Claims priority, application Japan, Jul. 20, 1995, 7-207609

Int. Cl.^{6} G08B *1/00*

U.S. Cl. 340—901 **34 Claims**



1. A traveling-path deduction apparatus which detects objects existing ahead of a vehicle and deduces a traveling path of the vehicle, comprising:

(a) object detection means for detecting the positions of objects existing ahead of the vehicle;

(b) traveling-path temporary-setting means for setting at least one temporary traveling path as a line having a predetermined curvature, extending from the vehicle as an original point, based on results of detection by said object detection means;

(c) distance calculation means for calculating distances between the temporary traveling path set by said traveling-path temporary-setting means and the objects detected by said object detection means; and

(d) traveling-path deduction means for deducing the traveling path of the vehicle, based on a time change amount in the distances calculated by said distance calculation means.

5,841,367
ELECTRONIC EQUIPMENT FOR PREVENTION OF COLLISIONS BETWEEN VEHICLES

Caico Giovanni, Via Lama N. 12, P.O. Box 74020, I-74020 Lama, Italy

Continuation of Ser. No. 915,735, Sep. 3, 1992, abandoned. This application Jan. 17, 1995, Ser. No. 374,391

Claims priority, application Italy, Nov. 7, 1990, 40453/90

Int. Cl.^{6} G08G *1/00*

U.S. Cl. 340—903 **13 Claims**

1. An early detection and collision avoidance system for providing communication between a first vehicle and a plurality of vehicles comprising:

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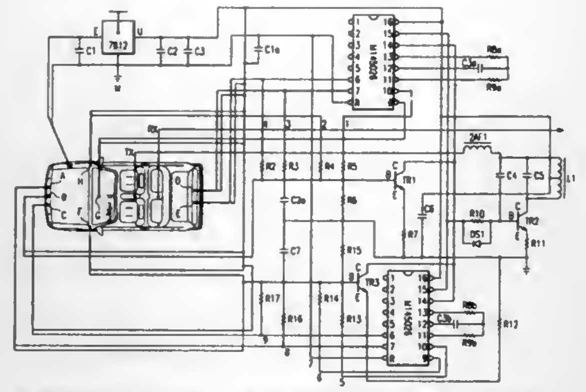
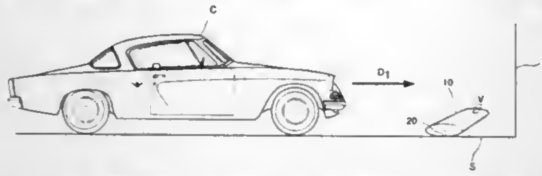


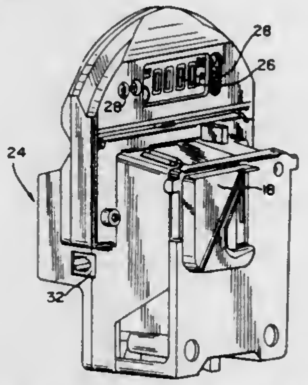
at least one impact sensor mounted on the first vehicle which detects an impact between the first vehicle and an object, said at least one impact sensor producing an impact signal in response thereto;
an alarm signal generator mounted on the first vehicle and connected to said at least one impact sensor for generating an alarm signal in response to the impact signal produced by the impact sensor; and
a transmitter mounted on the first vehicle and connected to the alarm signal generator for transmitting a transmitter alarm signal in response to receiving said alarm signal generated by the alarm signal generator, said transmitter alarm signal being transmitted to the plurality of vehicles;
wherein each respective vehicle of the plurality of vehicles includes:
a receiver for receiving the transmitter alarm signal generated by the transmitter; and
a proximity detector connected to the receiver for determining the distance between the first vehicle and the plurality of vehicles.

5,841,368
DEVICE FOR POSITIONING A VEHICLE IN RELATION TO THE WALLS OF A GARAGE, AND/OR IN RELATION TO AN ADJACENT VEHICLE
Jim Samuel Bryant, 2876 SE. Fairway West, Stuart, Fla. 34997
Filed Jan. 26, 1995, Ser. No. 378,494
Claims priority, application Canada, Mar. 31, 1994, 2120412
Int. Cl.⁶ B60Q *1/08*
U.S. Cl. 340—932.2 **9 Claims**



1. A self-contained portable vehicle parking assistance device for resting upon a surface, upon which a vehicle travels, comprising:
an air filled flexible portable body having an exterior, two sides, a front and an interior containing the air at ambient pressure, the body for removable positioning on said surface, said body extending the full width of a vehicle and for engaging at least one tire of a vehicle being parked proximate the front of the body, the body being placed proximate a predetermined position on said surface so as to ensure the vehicle is not damaged while parking or when parked, the body having disposed therein extending from the interior to the exterior of the body a signaling device responsive to a compressive force of the at least one tire against the body forcing the air to pass through the signaling device from the interior to the exterior of the body and thereby effect an audible signal once the vehicle has reached the predetermined position, said signaling device being capable of producing at least two different types of audible signals, one signal type indicates when both tires are positioned correctly at the predetermined position and the vehicle is centered, and a different signal type indicates when only one tire has engaged the device and the vehicle is off center, whereby when at least one tire of said vehicle comes into contact with said flexible body, the audible signal will alert the driver of the vehicle that the at least one tire of the vehicle has contacted said flexible body and the driver must stop or risk damaging the vehicle and further that the vehicle is centered in the predetermined position.

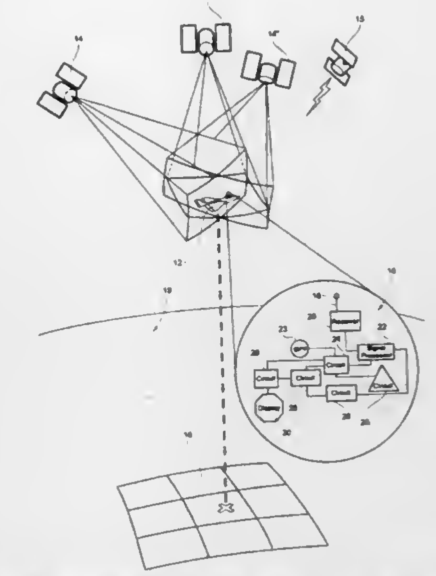
5,841,369
PARKING METER WITH PERIPHERAL FUNCTIONS
Joseph H. Sutton, Harrison, Ark.; Ralph H. Carmen, Merritt Island, Fla., and Gorm Tuxen, Antioch, Tenn., assignors to Duncan Industries Parking Control Systems, Harrison, Ark.
Filed Apr. 18, 1997, Ser. No. 844,159
Int. Cl.⁶ B60Q *1/48*
U.S. Cl. 34—932.2 **10 Claims**



1. In a parking meter construction having a housing, a meter mechanism supported within the housing, a card or coin receiver to initiate meter operation, a microprocessor for controlling the parking time operation, and an interface accessible from the meter exterior by means of a portable electronic unit for communication between the unit and the microprocessor, the improvement comprising a peripheral port comprising a connector mounted on the mechanism and serving as a local bus interface separate and independent of the first-mentioned interface, said local bus interface being connected to the mircoprocessor whereby messages can be transmitted through the peripheral port to and from the microprocessor, transmission lines connected to the peripheral port, and at least one external device connected to the transmission lines, said external device performing a designated function, said transmission lines including a data line for transmitting a signal to said microprocessor that an event has occurred to thereby enable said microprocessor to initiate an on-line function either in the meter or in the external device.

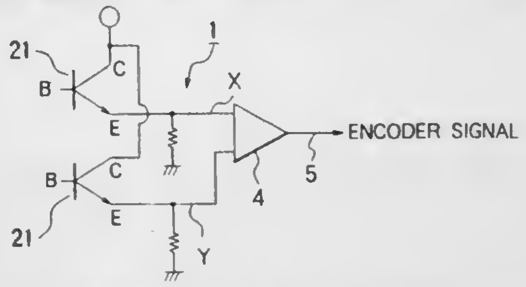
5,841,370
METHOD AND APPARATUS FOR DETERMINING AIRCRAFT BANK ANGLE USING SATELLITE NAVIGATIONAL SIGNALS
Thomas A. Lempicke, 2129 Squire Rd., Rock Hill, S.C. 29730
Filed Dec. 30, 1996, Ser. No. 774,756
Int. Cl.⁶ G01C *23/00*
U.S. Cl. 340—975 **14 Claims**

1. Apparatus for determining the bank angle of an aircraft comprising:
receiver means for receiving navigational signals from satellites in orbit about the earth;
signal processing means for demodulating the satellite navigational signals;
means for determining the rate of change of the aircraft track heading from said navigational signals;
means for determining a sensitivity value for said apparatus said sensitivity value being defined as the amount of bank angle displayed per rate of chance of track heading; and



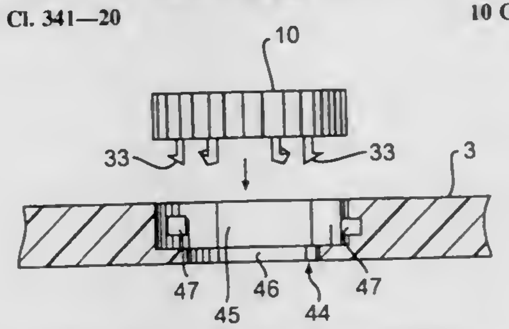
means for determining the bank angle of the aircraft from said rate of change in track heading and said sensitivity value wherein said bank angle is proportional to said rate of change in track heading and said sensitivity value;
wherein said apparatus includes an electronic circuit having a predetermined value of sensitivity applied thereto and means for adjusting said predetermined value accessible by a pilot, and said sensitivity determining means includes an electronic circuit configured to detect and evaluate said sensitivity value.

5,841,371
ENCODER SIGNAL GENERATING DEVICE
Shigeo Seki, Iida, Japan, assignor to Tamagawa Seiki Kabushiki Kaisha, Nagano-ken, Japan
Filed Feb. 28, 1997, Ser. No. 808,646
Claims priority, application Japan, Dec. 17, 1996, 8-337139
Int. Cl.⁶ H03M *1/22*
U.S. Cl. 341—13 **1 Claim**



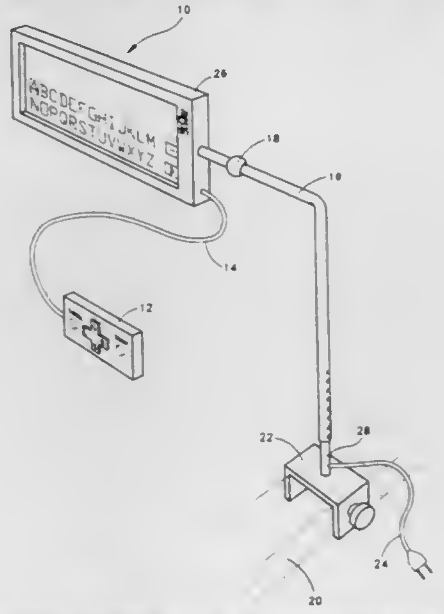
1. An encoder signal generating device comprising:
a light emitting element for emitting light;
a rotary code plate having a code portion which is formed thereon and represents a code;
a light receiving element for receiving light from said light emitting element,
wherein light emitted from said light emitting element is applied to said light receiving element through said code portion representing the code, which is formed on said rotary code plate,
wherein an encoder signal is obtained from said light receiving element,
wherein said light receiving element is constituted by a one-chip planar type phototransistor that has a plurality of light receiving portions;
wherein a light blocking portion made of aluminum is formed on a periphery of each of said light receiving portions; and
wherein said code portion has an absolute code section that is formed in a multi-channel manner, and wherein said light receiving element has said light receiving portions of a number which is equal to a number of channels corresponding to the absolute code section.

5,841,372
OPERATION INFORMATION INPUT DEVICE
Isao Matsumoto, Tokyo, Japan, assignor to Kabushiki Kaisha Sega Enterprises, Ltd., Tokyo, Japan
Filed Sep. 5, 1996, Ser. No. 708,599
Claims priority, application Japan, Sep. 6, 1995, 7-229506
Int. Cl.⁶ H03M *11/00*
U.S. Cl. 341—20 **10 Claims**



1. An operation information input device comprising:
a control panel;
a control lever projecting outwardly from said control panel; and
a frame having channels for limiting the movement of said control lever and being releasably and rotatably attached to said control panel.

5,841,373
SIMPLIFIED ALPHABETIC COMMUNICATOR FOR HANDICAPPED OR INFIRMED PERSONS
Donny L. Mason, 4924 Morro Blvd., Portsmouth, Va. 23701
Filed Jul. 5, 1994, Ser. No. 270,693
Int. Cl.⁶ H03K *17/94*
U.S. Cl. 341—21 **2 Claims**



1. A simplified alphabetic message communicator for handicapped or infirmed persons comprising:
an enclosure housing having a substantially rectangular shape;
a liquid crystal display screen forming at least part of one wall of said enclosure;
a programmable computer means, comprising an E-prom chip, mounted within the enclosure for controlling the display means;

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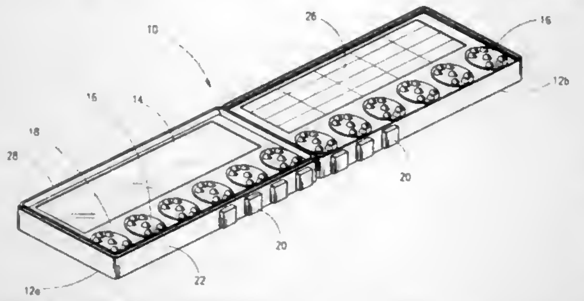
means remote form the enclosure, connected to the computer means for providing and controlling input by said handicapped or infirmed persons, comprises:
a user held control pad;
a plurality of switches;
one of said switches controls a display cursor;
another one of said switches controls the selection of a display letter; and
another one of said switches cancels a display letter; arm means, for supporting the enclosure housing, comprising a ball joint allowing for adjustment in three dimensions of the display means; and
a clamp means forming one end of the arm means for securing the arm to a selected base structure.

5,841,374
MICRO WORD-PAD WITH TACTILE MULTIFUNCTIONAL KEYS

Joseph N. Abraham, 515 Roosevelt, Lafayette, La. 70503
Filed Jan. 28, 1997, Ser. No. 790,047
Int. Cl.⁶ H03M *11/00*

U.S. Cl. 341—34 **16 Claims**



12. A compact portable, word processor key and keyboard arrangement comprising the combination of:

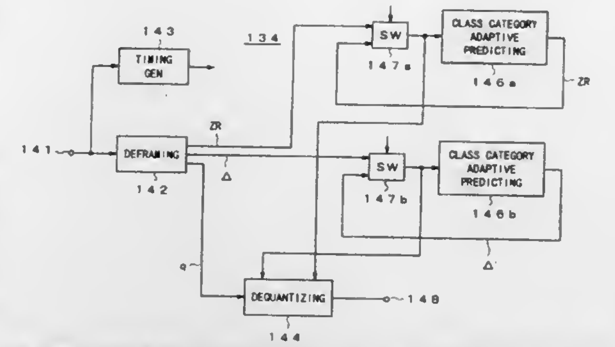
a) a portable word processing, microcomputer having a self-contained keyboard and a display screen integral with said keyboard; and

b) a single row of twelve, multifunctional toggle keys capable of performing all the functions of a QWERTY type computer key board including the function keys and number pad in a single mode, located on a face of said keyboard, said toggle keys having a distance between adjacent keys sufficient to permit unhindered, tactile operation by an operator's finger, each of said keys having a plurality of switching elements having up to nine functions, and a means connected thereto to produce a different distinguishable functional response to tactile displacement of said switching elements by an operator's finger tips; and a plurality of thumb keys arranged linearly along a vertical side of said keyboard adjacent said multifunctional keys in a manner sufficient to permit unhindered operation by an operator's thumbs when the operator's fingers are in contact with said multifunctional toggle keys.

5,841,375
INFORMATION SIGNAL ENCODING APPARATUS, ENCODING METHOD THEREOF, INFORMATION SIGNAL DECODING METHOD, AND INFORMATION SIGNAL MEDIUM THEREOF

Tetsujiro Kondo; Yasuhiro Fujimori; Kenji Takahashi, and Kunio Kawaguchi, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan
Division of Ser. No. 687,085, Jul. 23, 1996. This application Feb. 10, 1998, Ser. No. 21,672
Claims priority, application Japan, Jul. 28, 1995, 7-212685
Int. Cl.⁶ H03M *3/00*

U.S. Cl. 341—50 **1 Claim**

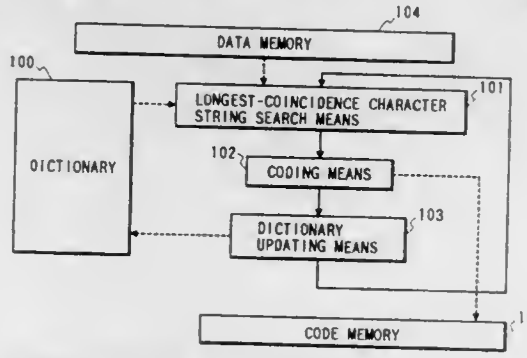


1. An information signal decoding method for decoding data that has been quantized by a zero position flag and a quantizing flag, the zero position flag representing a code of quantized output data that includes 0, the method comprising the steps of:
predicting the zero position flag and the quantizing step;
converting the quantized output data to a representative value by the zero position flag and a predicted value of the quantizing step; and
block desegmenting dequantized difference signals and restoring original sequence of data.

5,841,376
DATA COMPRESSION AND DECOMPRESSION SCHEME USING A SEARCH TREE IN WHICH EACH ENTRY IS STORED WITH AN INFINITE-LENGTH CHARACTER STRING

Takaaki Hayashi, Yokohama, Japan, assignor to Kyocera Corporation, Kyoto, Japan
Filed May 8, 1996, Ser. No. 646,516
Claims priority, application Japan, Sep. 29, 1995, 7-253433; Apr. 25, 1996, 8-105506
Int. Cl.⁶ H03M *7/30*

U.S. Cl. 341—51 **7 Claims**


104
DATA MEMORY
100
101
LONGEST-COINCIDENCE CHARACTER STRING SEARCH MEANS
DICTIONARY
102
CODING MEANS
103
DICTIONARY UPDATING MEANS
105
CODE MEMORY

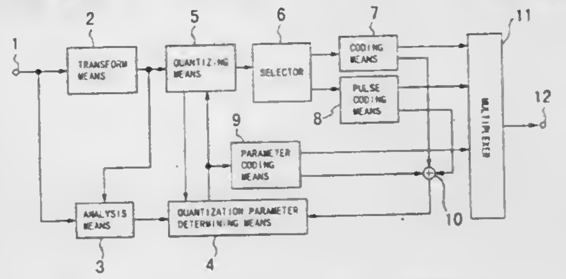
1. A data compressing apparatus comprising:
a data memory for storing input data;
a code memory for storing codes obtained by compressing the input data;
a dictionary having a plurality of entries each for storing a first pointer that indicates a character string of the input data stored in the data memory, the dictionary being expressed by a search tree including a main node for storing the first pointer, and a branching node for representing branching in the search tree,
longest-coincidence character string search means for searching for a longest-coincidence character string that coincides with a character string to be coded over a longest length from among the character strings indicated by the respective first pointers, the longest length being a longest-coincidence length;
coding means for coding the longest-coincidence length and an index of an entry storing a first pointer indicating the longest-coincidence character string, and for writing a resulting code to the code memory; and
dictionary updating means for adding to the dictionary an entry storing the first pointer indicating the coded character string,

wherein the dictionary allows registration of the entries with no limitation on lengths thereof by storing the first pointers in the respective entries, whereby a character string having an arbitrary length stored in the data memory can be found and coded by designating an index of an entry and the longest-coincidence length.

5,841,377
ADAPTIVE TRANSFORM CODING SYSTEM, ADAPTIVE TRANSFORM DECODING SYSTEM AND ADAPTIVE TRANSFORM CODING/DECODING SYSTEM

Yuichiro Takamizawa, and Masahiro Iwadare, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Jul. 1, 1997, Ser. No. 886,470
Claims priority, application Japan, Jul. 1, 1996, 8-171423
Int. Cl.⁶ H03M *7/00*

U.S. Cl. 341—51 **18 Claims**

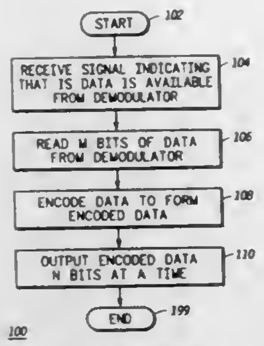


1. An adaptive transform coding system comprising:
a transform means for transforming an input signal into a frequency domain signal;
an analysis means for analyzing said input signal and said frequency domain signal to derive an allowable quantization error;
a quantizing means for quantizing the amplitude value of said frequency domain signal on the basis of a quantization step size to derive a quantized value and a quantization error,
a quantization parameter determining means for determining said quantization step size with reference to said allowable quantization error and said quantization error and a total code amount;
a selector for analyzing the quantized value of said frequency domain signal to derive a first signal and a second signal;
a first coding means for coding said quantized value of said first signal with reference to said second signal to derive a first code and a first code amount;
a second coding means for coding said quantized value of said second signal to derive a second code and a second code amount;
a parameter coding means for coding said quantization step size to derive a third code and a third code amount;
an adder for deriving said total code amount of said first code amount, said second code amount and said third code amount; and
a multiplexer for multiplexing said first code, said second code and said third code to generate a bit stream.

5,841,378
SYSTEM AND APPARATUS FOR, AND METHOD OF, INTERFACING A DEMODULATOR AND A FORWARD ERROR CORRECTION DECODER

Jeffrey T. Klayman, Mansfield, Mass., and Fay Yew, Madison, Ala., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Oct. 25, 1996, Ser. No. 738,130
Int. Cl.⁶ H04J *4/00*

U.S. Cl. 341—61 **26 Claims**

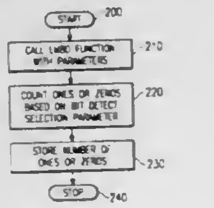

START
102
RECEIVE SIGNAL INDICATING THAT IS DATA IS AVAILABLE FROM DEMODULATOR
104
READ M BITS OF DATA FROM DEMODULATOR
106
ENCODE DATA TO FORM ENCODED DATA
108
OUTPUT ENCODED DATA N BITS AT A TIME
110
END
199
100

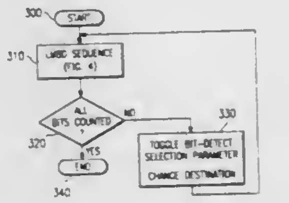
1. A method for interfacing a demodulator and a decoder, the demodulator outputting a first number of bits per baud having a first encoding at a first baud rate, and the decoder requiring a second number of bits per baud having a second encoding at a second baud rate, the method comprising the steps of:
(a) receiving from the demodulator the first number of bits per baud having the first encoding at the first baud rate;
(b) encoding the first number of bits per baud to form encoded data bits having the second encoding different than the first encoding; and
(c) sending the encoded data bits to the decoder by outputting the encoded data bits formatted as the second number of bits per baud at the second baud rate.

5,841,379
METHOD AND APPARATUS FOR SELECTIVELY COUNTING CONSECUTIVE BITS

Natarajan Seshan, Houston, and Laurence R. Simar, Jr., Richmond, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Jan. 24, 1997, Ser. No. 788,751
Int. Cl.⁶ H03M *7/46*

U.S. Cl. 341—63 **1 Claim**


START
200
CALL LMBO FUNCTION WITH PARAMETERS
210
COUNT ONES OR ZEROS BASED ON BIT DETECT SELECTION PARAMETER
220
STORE NUMBER OF ONES OR ZEROS
230
STOP
240



1. In a computer having a processor capable of executing instructions, and having a memory, a method for automated compression of a digital data, wherein a group of consecutive bits having the same binary value is represented by a result number corresponding to the number of said consecutive bits, comprising the steps of:
a) providing a block of digital data to be compressed;
b) providing a bit detect selection parameter that determines a bit value to be counted for counting consecutive bits, said bit detect selection parameter being capable of being toggled between a first setting and a second setting, said respective settings determining respective different bit values to be counted;
c) instructing the processor, in a first step of instructing, to count from a first end of said block of digital data toward a second

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end of said block of digital data the number of consecutive bits having said bit value determined by said bit detect selection parameter;

d) if said first step of instructing results in all bits in said block of digital data being counted, storing a number representing the number of bits so counted as a first stored result number and indicating the completion of the method for said block of digital data;

e) otherwise, if said first step of instructing does not result in all bits in said block of digital data being counted, storing the number of bits so counted in said first step of instructing, toggling said bit detect selection parameter to another, current value and instructing said processor, in a second step of instructing, to count from the last bit counted in said first step of instructing toward said second end of said block of digital data the number of bits having the bit value determined by said current bit detect selection parameter;

f) if said second step of instructing results in all bits in said block of digital data being counted, storing a number representing the number of bits so counted in said second step of instructing as a second stored result number and indicating the completion of the method for said block of digital data; and

g) otherwise, if said second step of instructing does not result in all bits in said block of digital data being counted, repeating steps e) and f), storing successive numbers representing the number of bits counted in successive counts as successive stored result numbers, until said second step of instructing results in all bits in said block of digital data being counted, and then indicating the completion of the method for said block of digital data.

5,841,380

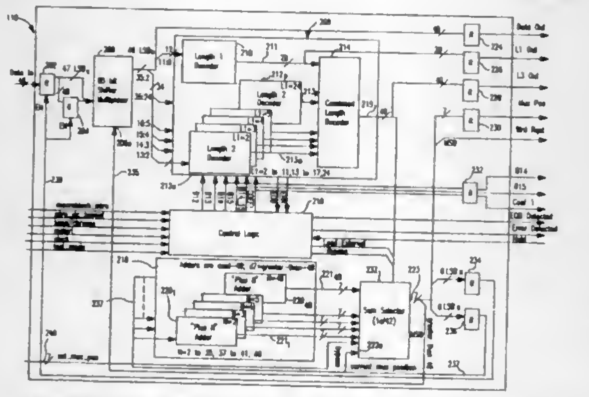
VARIABLE LENGTH DECODER AND METHOD FOR DECODING TWO CODES PER CLOCK CYCLE

Richard Sita, Audubon, N.J., and Edward M. Brosz, King of Prussia, Pa., assignors to Matsushita Electric Corporation of America, Secaucus, N.J.

Filed Mar. 29, 1996, Ser. No. 623,651

Int. Cl.^{6} H03M *7/40*

U.S. Cl. 341—67 **15 Claims**



1. Apparatus for determining the lengths of a plurality of variable length encoded data values included in a data stream within a single clock cycle, the apparatus comprising:

shifting means for receiving the data stream and responsive to a shift control signal for transmitting a subset of the plurality of variable length encoded data values;

first length decoding means, coupled to receive the subset of the plurality of encoded data values for performing a first decoding operation to determine a length of a first one of the encoded data values in the subset;

second length decoding means, coupled to receive the subset of the plurality of encoded data values for performing a second decoding operation to individually determine a length of a second one of the encoded data values in the subset without decoding the length of the first encoded data value in the second length decoding means, the second encoded data value immediately following the first encoded data value in the subset, said first and second decoding operations being performed simultaneously;

combined length decoding means responsive to the lengths of the first and second encoded data values for outputting a combined length of the first and second data values; and

shift controlling means, responsive to the combined length of the first and second data values, for forming the shift control signal so as to identify a position of a next encoded data value within the shifting means, said next encoded data value immediately following the second encoded data value, said shift controlling means transmitting the shift control signal to the shifting means.

5,841,381

HUFFMAN CODING/DECODING USING AN INTERMEDIATE CODE NUMBER

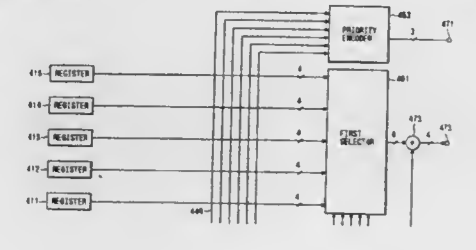
Tadayoshi Nakayama, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

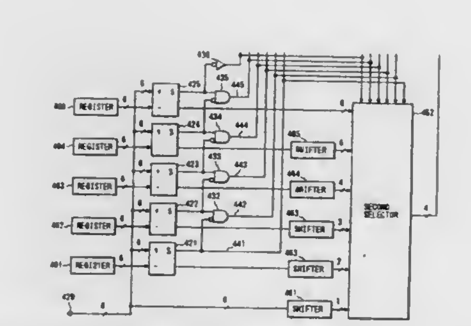
Continuation of Ser. No. 358,879, Dec. 19, 1994, abandoned. This application Dec. 4, 1997, Ser. No. 985,316

Claims priority, application Japan, Dec. 20, 1993, 5-319989

Int. Cl.^{6} H03M *7/40*

U.S. Cl. 341—67 **25 Claims**





1. A device for decompressing Huffman encoded data, comprising:

a) calculation means for generating by calculation, from a sequence of bits which includes a Huffman code to be decoded, a code length and a code number of the Huffman code to be decoded, the code number being determined based on the rank of the Huffman code when compared to plural other reference Huffman codes with respect to relative probabilities of occurrence; and

b) conversion means for converting the code number into a fixed-length decoded code corresponding to a code which has been encoded,

wherein said calculation means includes holding means for holding boundary values corresponding to boundaries for plural reference code lengths and a part of plural reference code numbers corresponding to said boundary values, and also includes comparison means for comparing the Huffman code to be decoded with the boundary values to determine the code length.

5,841,382

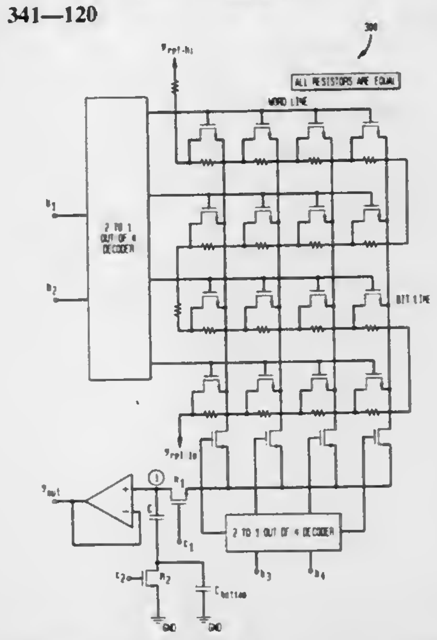
FAST TESTING OF D/A CONVERTERS

Robert W. Walden, Bethlehem; Ramin Kholni-Poorfard, Allentown, and William E. Burchanowski, Bethlehem, all of Pa., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Mar. 19, 1997, Ser. No. 820,819

Int. Cl.^{6} H03M *1/10*

U.S. Cl. 341—120 **17 Clalms**



1. An integrated circuit having a D/A converter, comprising:

(a) a plurality of resistors configured in a resistor string and adapted to receive two reference voltages;

(b) a plurality of switches connected to the plurality of resistors;

(c) decoder circuitry adapted to control the switches based on a code value to generate a corresponding tap voltage;

(d) an output amplifier configured to generate an analog output voltage based on the tap voltage;

(e) a normal-mode capacitor coupled to an input of the output amplifier to reduce power consumption during normal-mode operation of the D/A converter; and

(f) a test-mode capacitor switchably coupled to the normal-mode capacitor to reduce settling time during test-mode operation of the D/A converter.

5,841,383

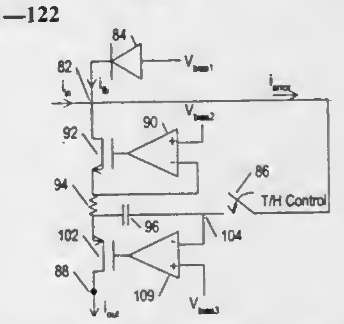
CURRENT MODE TRACK AND HOLD CIRCUIT

Christopher G. Regier, Cedar Park, Tex., assignor to National Instruments Corporation, Austln, Tex.

Filed Jun. 12, 1997, Ser. No. 874,064

Int. Cl.^{6} H03M *1/00;* G11C *27/02*

U.S. Cl. 341—122 **22 Claims**



1. A current mode track and hold (T/H) circuit for sampling an input current signal and providing an output current signal comprising:

an input node configured to receive an input current signal;

an output node configured to transmit an output current signal;

a switched integrator having an input coupled to the input node wherein the switched integrator is configured to produce a control signal, and;

a current source connected between the input and output nodes, wherein the current source includes an input receiving the control signal output by the integrator, whereby current flowing between the input and output nodes is controlled by the control signal of the switched integrator, wherein the control signal causes the output current signal to substantially track the input current signal.

5,841,384

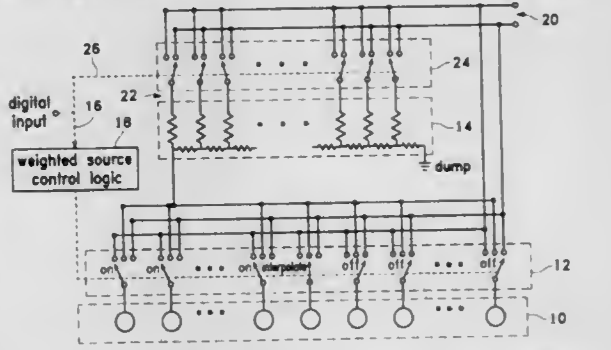
NON-LINEAR DIGITAL-TO-ANALOG CONVERTER AND RELATED HIGH PRECISION CURRENT SOURCES

Ray Michael Herman, Huntington Beach; Anthony Lenardo McKay, Long Beach, and Neng-Tze Yang, Palos Verdes Estates, all of Calif., assignors to Hughes Electronics, Los Angeles, Calif.

Filed Aug. 18, 1994, Ser. No. 292,652

Int. Cl.^{6} H03M *1/62*

U.S. Cl. 341—138 **29 Claims**



1. A non-linear digital-to-analog converter (DAC), for producing an analog output that is a non-linear function of a digital input quantity, the DAC comprising:

a plurality (n) of non-linearly weighted current sources;

a digital input circuit for inputting a digital input quantity;

an analog output circuit;

an interpolation network; and

current source selection logic, responsive to a selected number of bits of significance of the digital input quantity, for selecting one of the current sources for connection to the interpolation network and a subset of the remaining current sources for connection to the analog output circuit, wherein the current sources connected to the analog output circuit provide a combined current approximately proportional to a nonlinear function of the digital input quantity;

and wherein the interpolation network includes an input circuit into which the current source selected for connection to the interpolation network injects an input current, interpolation control logic, responsive to a selected number of bits of lesser significance of the digital input quantity, and a plurality of output taps from which various fractions of the input current are selected for combination with current from the remaining current sources, whereby a high degree of accuracy is obtained without the need for a large number of current sources.

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5,841,385

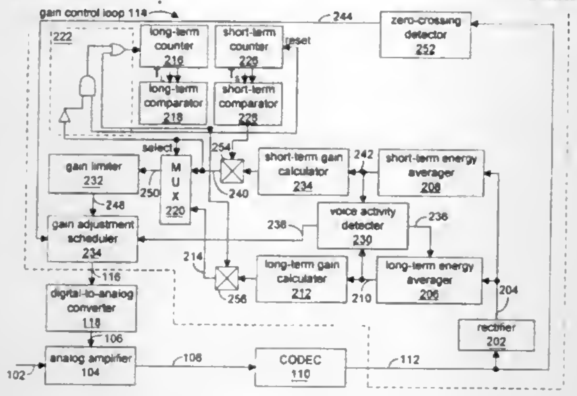
SYSTEM AND METHOD FOR PERFORMING COMBINED DIGITAL/ANALOG AUTOMATIC GAIN CONTROL FOR IMPROVED CLIPPING SUPPRESSION

Zheng-Yi Xie, Richardson, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Sep. 12, 1996, Ser. No. 712,773

Int. Cl.^{6} H03M *1/18*

U.S. Cl. 341—139 **19 Claims**


gain control loop 114
244
zero-crossing detector 252
222
long-term counter 216
short-term counter 226
reset
long-term comparator 218
short-term comparator 228
select
MUX 220
254
gain limiter 232
250
242
short-term gain calculator 234
short-term energy averager 208
248
gain adjustment scheduler 234
240
voice activity detector 230
238
236
214
long-term gain calculator 212
long-term energy averager 206
256
210
204
116
digital-to-analog converter 118
106
rectifier 202
102
analog amplifier 104
108
CODEC 110
112

1. A system which performs automatic gain control on received audio data, comprising:

an analog amplifier with an adjustable gain which receives an analog audio input signal and an analog gain input and generates an analog audio output signal, wherein said amplifier selectively adjusts the gain of said analog audio output signal according to said analog gain input; and

a codec which receives said analog audio output signal and converts said analog audio output signal to a digital audio output signal;

a digital-to-analog converter having an input and an output, wherein said output is coupled to said analog gain input; and

a gain control loop coupled to said input of said digital-to-analog converter which receives said digital audio output signal, wherein said gain control loop generates a digital gain output signal provided to said digital-to-analog converter input, wherein said digital-to-analog converter converts said digital gain output signal to an analog gain output signal provided to said analog gain input to selectively adjust said gain of said amplifier, wherein said control loop comprises a digital signal processor, wherein said gain control loop is configured to periodically calculate a long-term energy average according to a long-term gain adjustment period, and wherein said gain control loop is configured to periodically calculate a short-term energy average according to a short-term gain adjustment period, wherein said long-term energy average is utilized to generate said digital gain output signal upon said periodic calculation of said long-term energy average, and wherein said short-term energy average is utilized to generate said digital gain output signal upon said periodic calculation of said short-term energy average;

a voice activity detector coupled to receive said long-term energy average and said short-term energy average in order to detect a substantial absence of voice activity on said audio input signal, wherein said voice activity detector inhibits adjusting said audio input signal during said substantial absence of voice activity.

5,841,386

SIMPLE HIGH RESOLUTION MONOLITHIC DAC FOR THE TUNING OF AN EXTERNAL VCQO (VOLTAGE CONTROLLED QUARTZ OSCILLATOR)

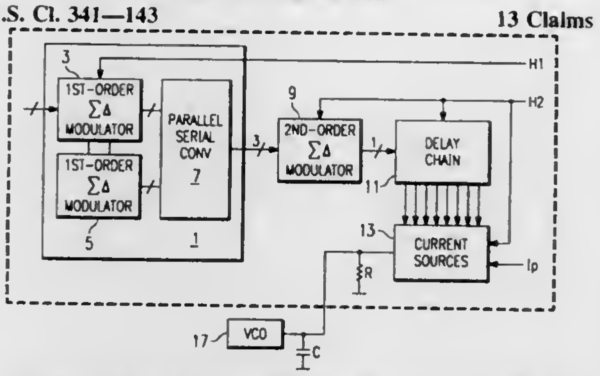
Yves Leduc, Roquefort-Les-Pins, France, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 21, 1997, Ser. No. 786,524

Claims priority, application France, Jan. 18, 1996, 96 00548

Int. Cl.^{6} H03M *3/02*

U.S. Cl. 341—143 **13 Claims**



1. A high-resolution digital/analogue converter, comprising:

a first second-order Sigma-Delta modulator (**1**) connected in paralled with an input for receiving a first sequence of digital words to be converted, and with a first modulated signal output for providing a second sequence of digital words at a first rate responsive to a first clock signal;

a second Sigma-Delta modulator (**9**) with an input connected to the first modulated signal output, and with a second modulated signal output for providing a third sequence of digital words at a second rate responsive to a second clock signal; and

a digital/analog conversion circuit (**11**, **13**) with an input directly connected only to the second modulated signal output, and with an analog signal output for providing a high-resolution quasi-stable D.C. voltage source.

5,841,387

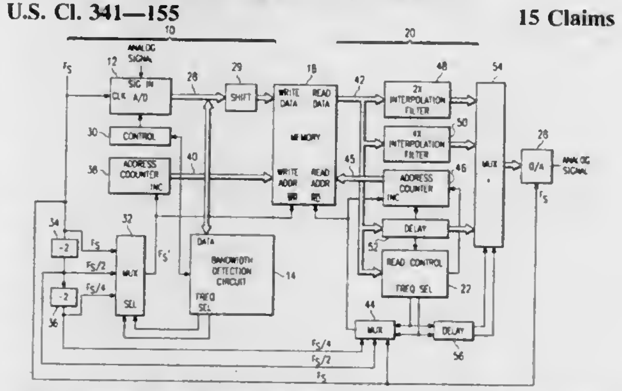
METHOD AND SYSTEM FOR ENCODING A DIGITAL SIGNAL

James E. VanBuskirk, Richmond, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 1, 1993, Ser. No. 116,233

Int. Cl.^{6} H03M *1/00;* G11B *5/02*

U.S. Cl. 341—155 **15 Claims**



7. A system for encoding an analog signal having a bandwidth comprising:

an analog-to-digital converter for converting said analog signal to a digital signal comprising a sequence of samples, said analog-to-digital converter including a digital signal output;

a bandwidth detection circuit coupled to said digital signal output of said analog-to-digital converter, said bandwidth detection circuit for determining said bandwidth and comparing said bandwidth with a selected threshold bandwidth and generating a control signal based on a result of said comparison;

a memory circuit for storing selected ones of said sequence of samples wherein said selected ones are selected based upon said control signal, said memory circuit including a data input operatively coupled to said digital signal output of said analog-to-digital converter.

5,841,388

A/D CONVERTER APPARATUS WITH FREQUENCY CONVERSION FUNCTION AND RADIO APPARATUS USING THE SAME

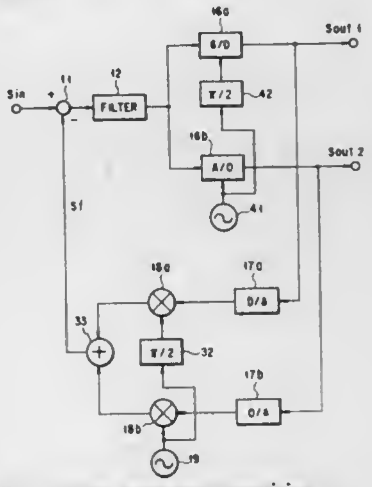
Akira Yasuda, Kawasaki; Tetsuro Itakura, Tokyo, and Takafumi Yamaji, Ichikawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 13, 1995, Ser. No. 527,638

Claims priority, application Japan, Sep. 14, 1994, 6-220643

Int. Cl.^{6} H03M *3/00*

U.S. Cl. 341—155 **12 Claims**



12. An A/D converter apparatus comprising:

a negative feedback loop having a main signal line supplied with an input signal of a predetermined frequency and a feedback signal line receiving a feedback signal;

A/D conversion means connected in said main signal line and having a first frequency conversion function for frequency-converting the input signal to a frequency-converted signal having a frequency different from that of the input signal;

D/A conversion means connected in said feedback signal line and having a second frequency conversion function for frequency-converting the feedback signal to a frequency-converted feedback signal having a frequency substantially equal to that of the input signal; and

subtraction means for subtracting the frequency-converted feedback signal from said D/A conversion means from the input signal to supply a subtraction result signal to said A/D conversion means, and

wherein said A/D conversion means comprises a first reference signal generator for generating first orthogonal reference signals and a pair of A/D converters connected in said main signal line for A/D-converting the input signal in accordance with the first orthogonal reference signals to output a pair of A/D converted signals corresponding to the frequency-converted signal, and wherein said D/A conversion means comprises a second reference signal generator for generating second orthogonal reference signals, a pair of D/A converters connected in said feedback signal line for D/A-converting feedback signals corresponding to A/D-converted signals from said A/D converters in accordance with the second orthogonal reference signals to output quadrature A/D-converted signals, and an adder for adding the quadrature A/D-converted signals together to output the frequency-converted feedback signal.

5,841,389

TWO-STEP PARALLEL A/D CONVERTER

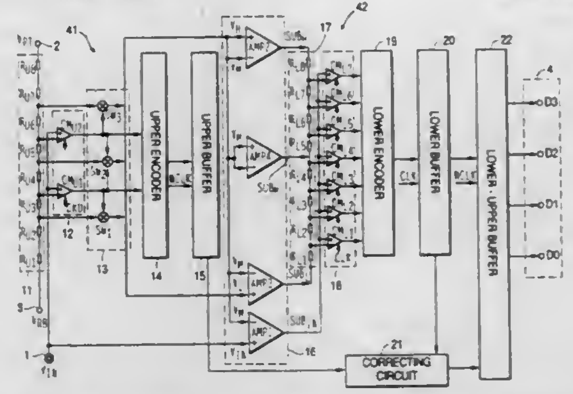
Norihide Kinugasa, Kyoto; Mitsuhiko Otani, Hyogo; Katsumi Hironaka, and Shinichi Ogita, both of Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 11, 1997, Ser. No. 833,965

Claims priority, application Japan, Apr. 16, 1996, 8-093916; Jul. 22, 1996, 8-192263

Int. Cl.^{6} H03M *1/36*

U.S. Cl. 341—159 **18 Claims**



1. A two-step parallel A/D converter for performing A/D conversion of an input analog signal by upper bit conversion and lower bit conversion, comprising:

means for expanding a first voltage range for the upper bit conversion to set a second voltage range for the lower bit conversion by amplifying upper and lower limit voltages of the first voltage range on the basis of a median voltage thereof, irrespective of a voltage of the input analog signal.

5,841,390

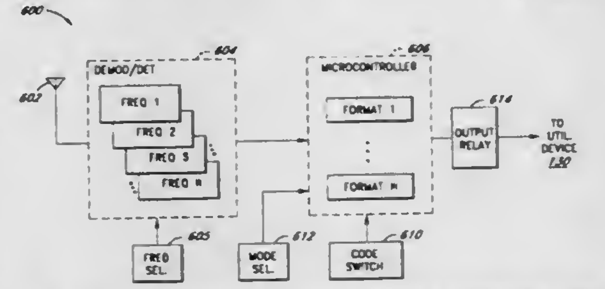
REMOTE TRANSMITTER-RECEIVER CONTROLLER FOR MULTIPLE SYSTEMS

Philip Y. W. Tsui, 3513 Ingram Rd., Mississauga, Ontario, Canada, L5L 4M4

Continuation-in-part of Ser. No. 583,883, Jan. 11, 1996, Pat. No. 5,680,134, which is a continuation of Ser. No. 270,374, Jul. 5, 1994, abandoned. This application Mar. 24, 1997, Ser. No. 823,789

Int. Cl.^{6} G08C *19/12*

U.S. Cl. 341—173 **10 Claims**



1. In a transmitter-receiver system in which a transmitter transmits at least two coded signals to a receiver, said transmitter comprising:

a plurality of switches that are selectable to provide an address;

a microcontroller coupled to said plurality of switches, said microcontroller generates a first and a second coded signals in a first and a second data transmission formats, said first and said second transmission formats being provided using different modulation techniques, each said first and second coded signals including the selected address; and

a circuit coupled to said microcontroller, said circuit having a plurality of frequency switches that are selectable to provide one of a plurality of transmission frequencies, said circuit

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serially transmits said first and second coded signals at a selected one of a plurality of transmission frequencies.

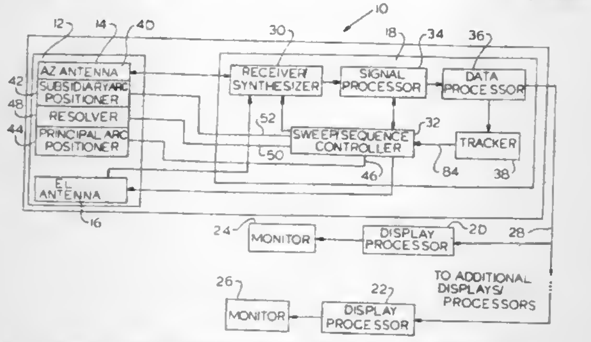
5,841,391
COMBINED AIR SURVEILLANCE AND PRECISION APPROACH RADAR SYSTEM

Charles D. Lucas, Jr., Newbury Pk; Jeffrey Nemit, Oxnard; Daniel Kikuta, Los Angeles, and Gary Kentosh, Bell Canyon, all of Calif., assignors to ITT Manufacturing Enterprises, Inc., Wilmington, Del.

Filed Jun. 11, 1997, Ser. No. 872,702

Int. Cl.^{6} G01S *13/93*

U.S. Cl. 342—34 **22 Claims**



1. A radar system suitable for use at an airport site proximate to a runway for producing data signals representing (1) air surveillance information indicative of aircraft within a 360° azimuth space around said site and (2) precision approach information indicative of the elevation and azimuth of aircraft within a portion of said 360° azimuth space centered on said runway, said system comprising:

- a radar head having an azimuth antenna portion for directionally radiating a source beam in a first direction and for receiving a reflected beam in response thereto;
- a principal scan apparatus coupled to said azimuth antenna portion for scanning said source beam radiation at an essentially constant rate through a principal scan rotation corresponding to said 360° azimuth space;
- a subsidiary scan apparatus coupled to said azimuth antenna portion for varying the direction of said source beam during each said principal scan rotation;
- a sequence controller for periodically initiating said principal scan rotation and said subsidiary scan within each said principal scan rotation; and
- a signal generator for applying an air surveillance source signal and a precision approach source signal to said azimuth antenna portion during a selected portion of each said principal scan rotation.

5,841,392
PULSE-ECHO RANGING SYSTEM WITH IMPROVED TARGET

Hiroshi Kishimoto, Kanagawa-ken, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Oct. 1, 1996, Ser. No. 724,214

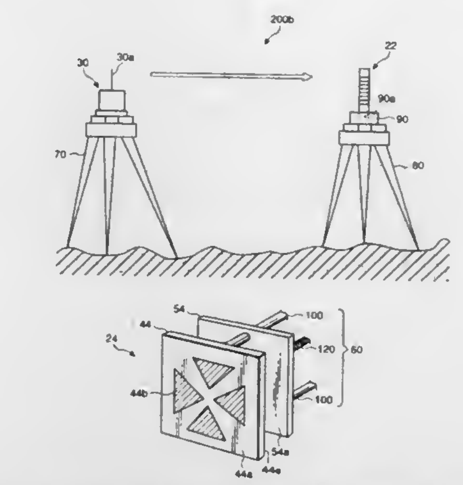
Claims priority, application Japan, Oct. 2, 1995, 7-278450; Oct. 2, 1995, 7-278451

Int. Cl.^{6} G01S *13/32*

U.S. Cl. 342—125 **5 Claims**

1. A pulse-echo ranging system comprising:

- a target positioned at a measurement location; and
- a ranging device comprising a transmitter for emitting pulses of electromagnetic radiation toward said target and a receiver for receiving reflected pulses, wherein said ranging device comprising a radar device for emitting and receiving radio frequency electromagnetic radiation comprising said pulses reflected from said target toward said ranging device;



- said target comprising a modulating mechanism for modulating said reflected pulses in a predetermined manner, wherein said modulating mechanism comprises a reflector which reflects said pulses at plural distances from said ranging device, wherein said reflector comprises first and second reflective surfaces, said first reflective surface being at a position closer to said ranging device than a position of said second reflective surface, wherein said first reflective surface is semitransparent to said pulses and said second reflective surface is not transparent to said pulses, said first reflective surface creating a first set of reflected pulses and said second reflective surface creating a second set of reflected pulses, wherein a ratio of an intensity of reflected pulses of said first set to an intensity of reflected pulses of said second set being a predetermined value.

5,841,393
FAILURE DETERMINATION DEVICE OF RADAR APPARATUS

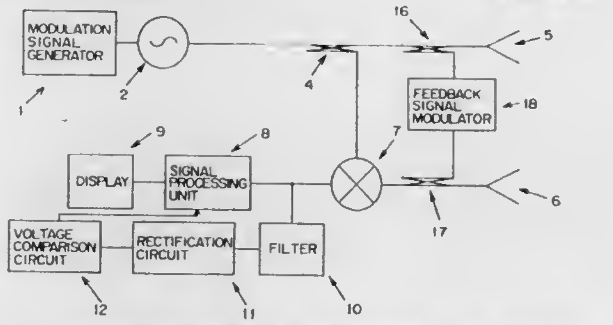
Tamio Saito, Kawasaki, and Osamu Isaji, Kobe, both of Japan, assignors to Fujitsu Limited, Kawasaki, and Fujitsu Ten Limited, Kobe, both of Japan

Filed Mar. 11, 1997, Ser. No. 814,408

Claims priority, application Japan, Aug. 16, 1996, 8-216216

Int. Cl.^{6} G01S *7/40*

U.S. Cl. 342—165 **30 Claims**


MODULATION SIGNAL GENERATOR
1
2
4
16
5
FEEDBACK SIGNAL MODULATOR
18
9
8
7
DISPLAY
SIGNAL PROCESSING UNIT
6
17
VOLTAGE COMPARISON CIRCUIT
RECTIFICATION CIRCUIT
FILTER
12
11
10

1. A failure determination device included in a radar apparatus, the radar apparatus for outputting a high frequency signal frequency-modulated by a modulation signal, receiving a reflected signal back from a target object, and converting the received reflected signal by using a signal which is obtained by splitting a part of a sending signal to be a local oscillation signal for a receiver, comprising:

- a feedback loop circuit for further splitting the sending signal after previously splitting and mixing the further split feedback signal with the received reflected signal;
- a feedback signal modulator for modulating the feedback signal in the feedback loop circuit;

- a detection circuit for detecting modulated elements originated from the feedback signal modulator from the converted signal;
- a failure determination circuit for determining whether or not a failure has occurred, based on the modulated elements detected by the detection circuit, by comparing the detected modulated elements with a preset reference level.

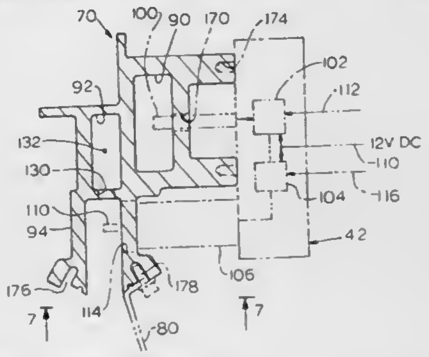
5,841,394
SELF CALIBRATING RADAR SYSTEM

William G. Sterns, Newhall; David M. Cook, Granada Hills, and Richard J. Ouwerkerk, Los Angeles, all of Calif., assignors to ITT Manufacturing Enterprises, Inc., Wilmington, Del.

Filed Jun. 11, 1997, Ser. No. 872,899

Int. Cl.^{6} G01S *7/40*

U.S. Cl. 342—174 **14 Claims**



1. A radar system, comprising:

- a radar horn which is elongated in a predetermined first direction, and which has an open end facing in a second direction that is primarily perpendicular to said first direction;
- a linear array of units having microwave outputs coupled to said horn at horn locations spaced along said first direction;
- a calibration waveguide coupled to said horn at a plurality of pickoff locations that are spaced along said first direction;
- a pickup coupled to said calibration waveguide, said pickup constructed to indicate at least the amplitude of microwave energy in said calibration waveguide.

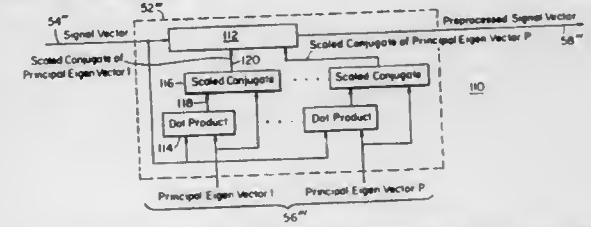
5,841,395
LOCALIZED INTERFERENCE NULLING PREPROCESSOR

Joseph D. Simone, Chelmsford, Mass., assignor to Raytheon Corporation, Lexington, Mass.

Filed Sep. 12, 1997, Ser. No. 928,563

Int. Cl.^{6} G01S 7/292

U.S. Cl. 342—196 **4 Claims**



1. A localized interference nulling preprocessor for a Fast Fourier Transform (FFT) system, comprising:

- means for forming the dot product of the signal vector and each of the preprocessed eigen vectors of the virtual interference covariance matrix of a predetermined localized interference;
- means for scaling the conjugate of said principal eigen vectors by said dot product; and
- means for subtracting from the signal vector the product of each said dot product and conjugate of said principal eigen vectors to generate a preprocessed signal vector modified to produce a localized nulling of said predetermined localized interference by a Fast Fourier Transform (FFT) system.

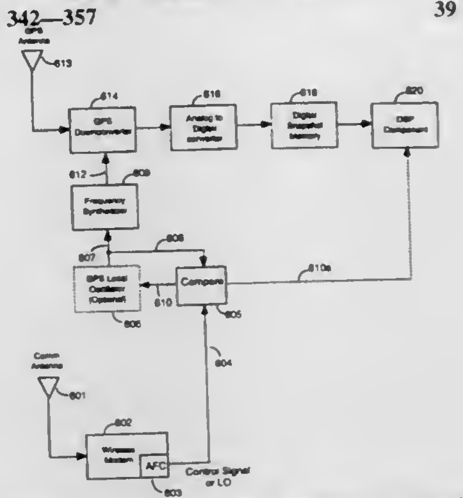
5,841,396
GPS RECEIVER UTILIZING A COMMUNICATION LINK

Norman F. Krasner, San Carlos, Calif., assignor to SnapTrack, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 612,582, Mar. 8, 1996. This application Dec. 4, 1996, Ser. No. 759,523

Int. Cl.^{6} H04B *7/185;* **G01S** *5/02*

U.S. Cl. 342—357 **39 Claims**



1. A method of calibrating a local oscillator in a mobile GPS receiver, said method comprising:

- receiving a precision carrier frequency signal from a source providing said precision carrier frequency signal;
- automatically locking to said precision carrier frequency signal and providing a reference signal;
- calibrating said local oscillator with said reference signal, said local oscillator being used to acquire GPS signals.

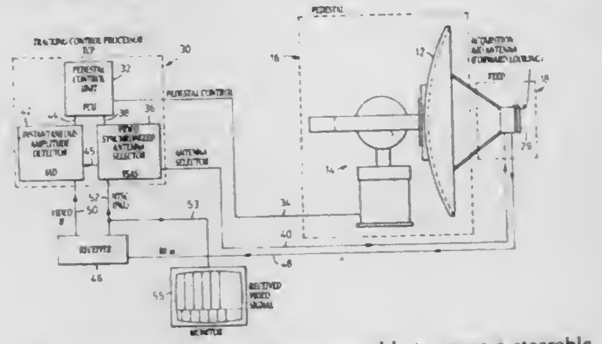
5,841,397
AUTOTRACKING ANTENNA SYSTEM

Jeffery G. Hopkins, Valencia, Calif., assignor to Wescam Inc., Flamborough, Canada

Filed Aug. 7, 1996, Ser. No. 693,741

Int. Cl.^{6} H01Q *3/00*

U.S. Cl. 342—359 **3 Claims**



1. An autotracking antenna system operable to cause a steerable antenna assembly to automatically track a moving RF video signal source, said system having:

- a reflector:
  - a rotator for positioning the reflector at any desired position in azimuth and elevation,
  - a primary antenna element positioned to receive an RF video signal reflected from the centre of the reflector,
  - a series of offset antenna elements each positioned to receive an RF video signal reflected from a different off-centre location on the reflector.

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a tracking control processor operable to select and receive video signals from the primary antenna element and the offset antenna elements and to control the rotator, and

a signal receiver to receive video signals from the antenna element and having a video signal output,

the tracking control processor operating to periodically obtain consecutive samples of the signals from the primary antenna element and the offset antenna element during a predetermined off-screen line of video frames of the RF video signal, and to control the rotator to position the reflector such that the signals received by the offset antenna elements are of substantially equal strength, whereby the primary antenna element receives a signal of maximum possible strength from the RF video source.

5,841,398

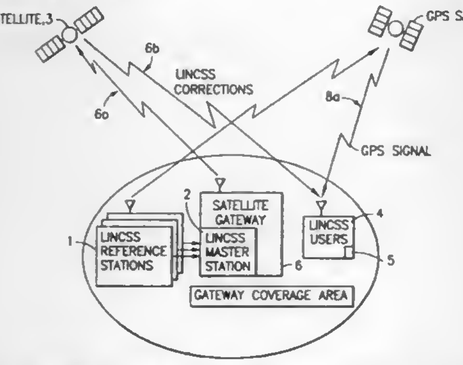
INTEGRATED NAVIGATION AND COMMUNICATION SATELLITE SYSTEM

J. Kurt Brock, Mountain View, Calif., assignor to Space Systems/Loral, Inc., Palo Alto, Calif.

Filed Nov. 20, 1996, Ser. No. 753,111

Int. Cl.^{6} G01S ***5/02***

U.S. Cl. 342—357 **15 Claims**



1. A satellite system for integrating navigation and communications information, comprising:

navigational satellite means for providing navigational reference signals;

communications satellite means for receiving transmitted communications signals and re-transmitting communications signals indicative thereof;

transmitting means, in said communications satellite means, for transmitting signals indicative of said navigational reference signals; and receiver station means for receiving communications signals re-transmitted from said communications satellite means, and comprising:

means, receiving navigational reference signals directly from said navigational satellite means and said indicative navigational reference signals from said transmitting means in said communications satellite means, for performing calculations using both of said reference signals to provide enhanced position and time information for said receiver station means; and

wherein said transmitting means comprises:

means for receiving navigational reference signals directly from said navigational satellite means; and

means for converting said navigational reference signals to indicative navigational reference signals for transmitting to said receiver station means.

5,841,399

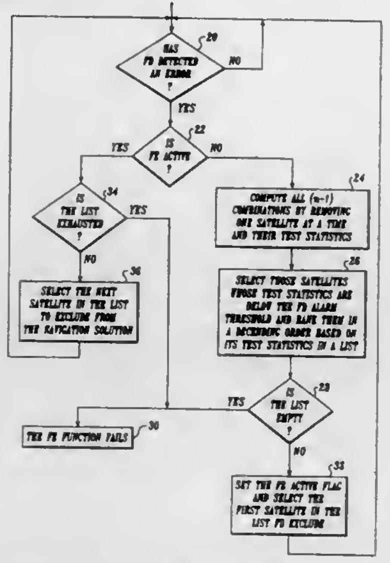
FAULT DETECTION AND EXCLUSION USED IN A GLOBAL POSITIONING SYSTEM GPS RECEIVER

Jimmy Y. Yu, Olathe, Kans., assignor to Alliedsignal Inc., Morristown, N.J.

Filed Apr. 10, 1997, Ser. No. 838,571

Int. Cl.^{6} H04B ***7/185;*** **G01S** ***5/02***

U.S. Cl. 342—357 **17 Claims**


HAS FD DETECTED AN ERROR ?
20
NO
YES
IS FD ACTIVE ?
22
YES
NO
IS THE LIST EXHAUSTED ?
34
YES
NO
SELECT THE NEXT SATELLITE IN THE LIST TO EXCLUDE FROM THE NAVIGATION SOLUTION
36
COMPUTE ALL (n-1) COMBINATIONS BY REMOVING ONE SATELLITE AT A TIME AND THEIR TEST STATISTICS
24
SELECT THOSE SATELLITES WHOSE TEST STATISTICS ARE BELOW THE FD ALARM THRESHOLD AND RANK THEM IN A DESCENDING ORDER BASED ON ITS TEST STATISTICS IN A LIST
26
IS THE LIST EMPTY ?
28
YES
NO
THE FD FUNCTION FAILS
30
SET THE FD ACTIVE FLAG AND SELECT THE FIRST SATELLITE IN THE LIST FD EXCLUDE
32

1. A fault detection and exclusion system for detecting satellite anomalies in a global positioning system (GPS) and excluding the data from the satellite with the anomaly from the navigation solution, the system comprising:

means for detecting a first and a second satellite anomaly;

means for computing the test statistics for a predetermined number of satellites at least when said first satellite anomaly is detected; and

means for excluding data from one of the satellites, when said second satellite anomaly is detected, as a function of the test statistics calculated for said first satellite anomaly condition.

5,841,400

ESTIMATOR OF DIRECTION OF DESIRED SIGNAL

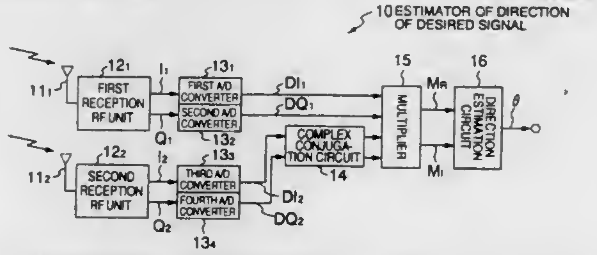
Katsuhiko Hiramatsu, Yokohama, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 7, 1997, Ser. No. 946,433

Claims priority, application Japan, Oct. 20, 1996, 8-297573; Jan. 24, 1997, 9-024541

Int. Cl.^{6} G01S ***3/16;3/28***

U.S. Cl. 342—382 **16 Claims**



1. An estimator of direction of desired signal for estimating a direction of a desired signal comprising:

first and second antennas for receiving said desired signal;

first and second signal conversion circuits for orthogonal-detecting output signals of said first and second antennas and converting the detected output signals into first and second baseband signals, respectively;

a complex conjugation circuit for generating a complex conjugation signal by calculating a complex conjugation of said second baseband signal;

a multiplier for multiplying said first baseband signal and said complex conjugation signal; and

a direction estimation circuit for estimation the direction of said desired signal by effecting an inverse tangent calculation and an inverse cosine calculation on an output signal of said multiplier.

5,841,401

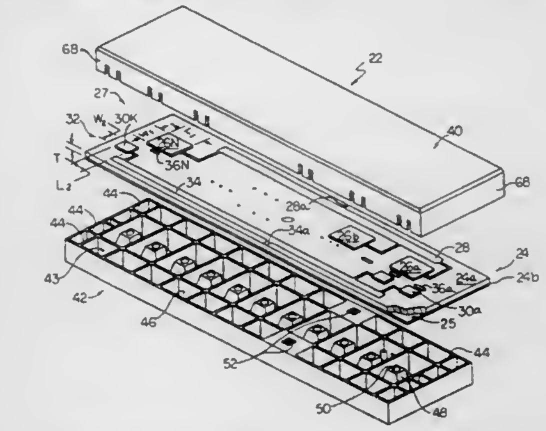
PRINTED CIRCUIT ANTENNA

Martin R. Bodley, Sudbury; Michael G. Sarcione, Millbury; Fernando Beltran, Pramingham, and Haywood Hartwell, Southboro, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Aug. 16, 1996, Ser. No. 698,626

Int. Cl.^{6} H01Q ***1/38***

U.S. Cl. 343—700 MS **17 Claims**



1. An antenna having first and second antenna ports, the antenna comprising:

a substrate having a first surface with a ground plane disposed over at least a portion thereof and having a second surface;

a first plurality of strip conductors disposed along a first longitudinal axis of the second surface of said substrate, each of said first plurality of strip conductors having a first shape;

a first feed circuit having a first port coupled to a first one of the first and second antenna ports and having a plurality of second ports, each of the second ports coupled to one of said first plurality of strip conductors;

a second plurality of strip conductors disposed along a second different longitudinal axis of the second surface of said substrate, each of said second plurality of strip conductors having a second shape;

a second feed circuit having a first port coupled to a second one of the first and second antenna ports and having a plurality of second ports, each of the second ports coupled to one of said second plurality of strip conductors;

a radome having first and second opposing surfaces with the first surface of said radome disposed over and spaced a predetermined distance from the second surface of said substrate with the spacing between the first surface of said radome and the second surface of said substrate filled with air;

a third plurality of strip conductors disposed on the first surface of said radome, above the first plurality of strip conductors; and

a fourth plurality of strip conductors disposed on the first surface of said radome, above the second plurality of strip conductors.

5,841,402

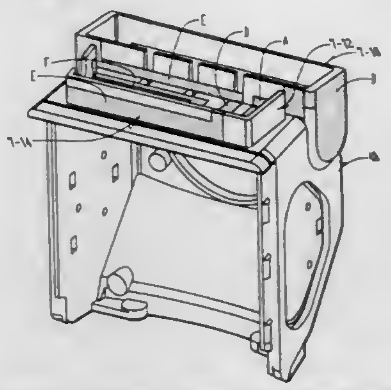
ANTENNA MEANS FOR HAND-HELD RADIO DEVICES

Daniel R. Dias, Cedar Rapids; Robert J. Kraus, Vinton; Guy J. West, Cedar Rapids; William T. Gibbs, Cedar Rapids; Patrick H. Davis, Cedar Rapids; Bradley E. Eckley, Cedar Rapids; Richard C. Arensdorf, Ely, and James R. Hutton, Cedar Rapids, all of Iowa, assignors to Norand Corporation, Cedar Rapids, Iowa

Continuation of Ser. No. 19,481, Feb. 18, 1993, Pat. No. 5,555,459, which is a continuation-in-part of Ser. No. 859,510, Mar. 27, 1992. This application Sep. 9, 1996, Ser. No. 711,287

Int. Cl.^{6} H01Q ***1/24***

U.S. Cl. 343—702 **29 Claims**



1. An improved antenna system for a hand-held transceiver terminal having a terminal housing, the improved antenna system comprising:

a radiating element comprising an antenna, and having a connection means for connection to a transceiver circuit;

a second housing enclosing the antenna at least partially; and

the second housing closely conforming to the shape of the terminal housing and separating the antenna from the terminal housing.

5,841,403

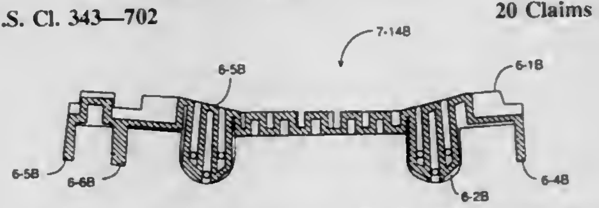
ANTENNA MEANS FOR HAND-HELD RADIO DEVICES

Guy J. West, Duluth, Ga., assignor to Norand Corporation, Cedar Rapids, Iowa

Continuation of Ser. No. 552,590, Nov. 3, 1995, abandoned, which is a continuation-in-part of Ser. No. 428,535, Apr. 25, 1995, abandoned. This application Jun. 30, 1997, Ser. No. 885,321

Int. Cl.^{6} H01Q ***1/24;1/36***

U.S. Cl. 343—702 **20 Claims**



1. An antenna system for a portable data terminal comprising a terminal housing and a radio circuit unit having a three dimensional shape, said terminal housing receiving the radio circuit unit, said antenna system comprising:

an antenna assembly comprising a backing layer and a radiating layer;

said backing layer being constructed of a non-conductive material having an overall width, and having a three dimensional shape closely conformed to at least part of the three dimensional shape of the radio circuit unit;

said radiating layer comprising conductive material having a weaved pattern disposed on said backing layer in a three dimensional shape;

said terminal housing encloses said antenna assembly; and

said antenna assembly being coupled to the radio circuit unit to form a unitary assembly independent from the terminal housing.

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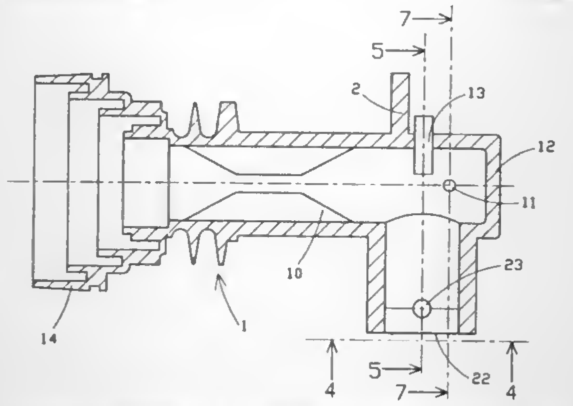
5,841,404
ELECTROMAGNETIC WAVE TRANSMITTING AND TRANSFERRING DEVICE WITH HIGH POLARIZATION ISOLATION PERFORMANCE

Kerl Yen, No. 3, Tzu Chiang I Rd., Chung Li City, Tao Yuan Hsien, Taiwan
Filed Feb. 4, 1997, Ser. No. 796,062
Int. Cl.^{6} H01Q *13/00*
U.S. Cl. 343—786 **3 Claims**



1. An electromagnetic wave transmitting and transferring device with high polarization isolation performance, comprising:

a circular waveguide having a hollow configuration with an opening at a front end portion and a closed surface at a rear end thereof, said opening of said circular waveguide having an outwardly projecting horn, said horn being formed with multiple windings, said circular waveguide having a polarizer, a first probe, a metallic post and said closed end surface serving as a conductive back surface disposed therein, said first probe being perpendicular to said metallic post and both said first probe and metallic post being inclined with respect to said polarizer by 45 degrees;

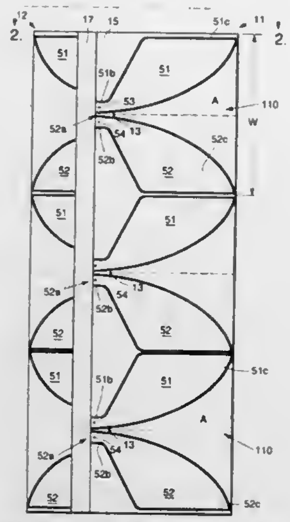
a rectangular waveguide disposed perpendicular to said circular waveguide and the central axis of said rectangular waveguide being in aligned relationship with said first probe disposed within said circular waveguide, said rectangular waveguide having a second probe and a conductive back surface serving as a closed end surface, said second probe being disposed on a central axis of a wide side of said rectangular waveguide to collect and receive a reflected signal which has been polarized and is parallel to said metal post and coplanar to said first probe of said circular waveguide.

5,841,405
OCTAVE-BAND ANTENNAS FOR IMPULSE RADIOS AND CELLULAR PHONES

J. J. Lee, Irvine, and Stan W. Livingston, Fullerton, both of Calif., assignors to Raytheon Company, Lexington, Mass.
Filed Apr. 23, 1996, Ser. No. 636,621
Int. Cl.^{6} H01Q *21/00*
U.S. Cl. 343—795 **3 Claims**

1. An antenna comprising:

a first planar array of N side by side substantially identical first expanded shape dipole elements, each first expanded shape dipole element including a pair of symmetrical planar conductors that extend away from feed ends of the planar conductors and having facing edges that diverge away from each other with distance from the feed ends along a central axis to form a radiation aperture between the facing edges, said symmetrical planar conductors including (a) a pair of transition section conductors that extend away from the feed ends and (b) a pair of expanded shape dipole wing conductors that extend from the transition section conductors and which have a lateral extent that is greater than a lateral extent of the pair of transition section conductors;



said first expanded shape dipole elements being arranged with respective central axes parallel to each other and with the radiation apertures facing in a first direction;

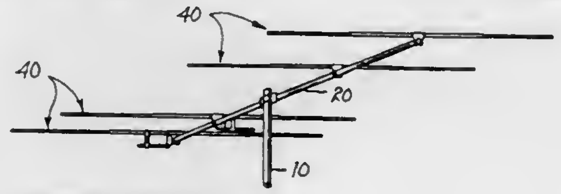
a second planar array of N side by side substantially identical second expanded shape dipole elements which are substantially identical to said first substantially identical first expanded shape dipole elements, each second expanded dipole element including a pair of symmetrical planar conductors that extend away from feed ends of the planar conductors and having facing edges that diverge away from each other with distance from the feed ends along a central axis to form a radiation aperture between the facing edges, said symmetrical planar conductors including (b) a pair of transition section conductors that extend away from the feed ends and (b) a pair of expanded shape dipole wing conductors that extend from the transition section conductors and which have a lateral extent that is greater than a lateral extent of the pair of transition section conductors;

said second expanded shape dipole elements being arranged with respective central axes being parallel and with the radiation apertures facing in a second direction that is opposite said first direction;

said first planar array and said second planar array being parallel to each other and positioned such that each phase center of the first planar array and a corresponding phase center of the second planar array is on a line that is orthogonal to the planar extent of the first planar array and the second planar array.

5,841,406
CRITICALLY COUPLED BI-PERIODIC DRIVER ANTENNA

Sidney C. Smith, 5638 W. Alice Ave., Glendale, Ariz. 85302
Filed Aug. 19, 1996, Ser. No. 697,033
Int. Cl.^{6} H01Q *21/12*
U.S. Cl. 343—815 **3 Claims**



1. An antenna comprising:

i) a mast;

ii) a boom assembly;

iii) a boom-to-mast mounting bracket for attaching the boom assembly to the mast;

iv) first and second driven element assemblies, said first driven element assembly having a length approximately one half of the operating frequency wavelength of the antenna, and said second driven element assembly having a length greater than one half of the operating frequency wavelength of the antenna and the distance between the first and second driven element assemblies is approximately 0.1 of the operating frequency wavelength of the antenna;

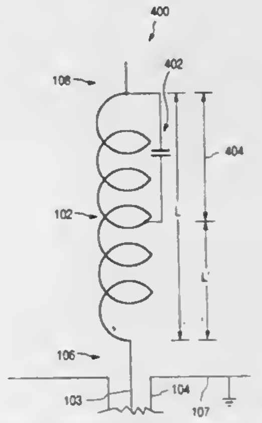
v) two element drivers, one for each element assembly, for electrically driving the element assembly, said element driver having a matching arm with an aperture at a first end, a stand-off insulator attached at one end to the element assembly and at an opposite end to the first end of the matching arm, and a shorting strap attached at one end to the element assembly and at an opposite end to a second end of the matching arm;

vi) first and second driven element saddle brackets, the first and second driven element saddle brackets attaching the first and second driven element assemblies to the boom assembly respectively, wherein the first driven element saddle bracket has an element attachment portion with an enlarged contact surface area contoured to closely fit the first element assembly, a boom mounting portion attached to the element attachment portion, and a RP connector attachment portion connected to the boom mounting portion, the second driven element saddle bracket has an element attachment portion with an enlarged contact surface area contoured to closely fit the second element assembly, and a boom mounting portion attached to the element attachment portion; and

vii) an electrical circuit comprising a radio frequency transmitter/receiver, a coaxial cable connected at one end to the radio frequency transmitter/receiver and connected at an opposite end to the RF connector which is attached to the RF connector attachment portion of the first driven element saddle bracket, a 0.66 velocity factor phasing delay line with at least a first conductor and a second conductor, said first conductor attached at one end to a center post on the RF connector and jumpered to the element driver on the first drive n element assembly and attached at an opposite end to the element driver on the second driven element assembly, and said second conductor attached at one end to a first driven element saddle bracket and attached at an opposite end to a second driven element saddle bracket.

5,841,407
MULTIPLE-TUNED NORMAL-MODE HELICAL ANTENNA

Thomas J. Birnbaum, Scotts Valley, Calif., assignor to ACS Wireless, Inc., Scotts Valley, Calif.
Filed Oct. 11, 1996, Ser. No. 729,428
Int. Cl.^{6} H01Q *1/36*
U.S. Cl. 343—895 **19 Claims**



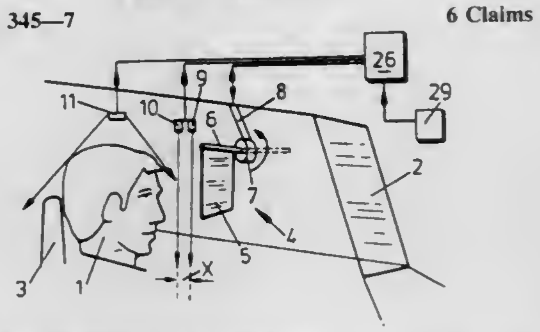
1. An antenna for coupling to a wave launching structure, comprising:

a conductive coil having a first end and a second end, the first end being coupled to the wave launching structure; and

capacitance creating means coupled to the conductive coil for creating a capacitance that acts electrically in parallel with at least one portion of the conductive coil, wherein the capacitance creating means creates an amount of capacitance that acts electrically in parallel with the at least one portion of the conductive coil to cause the antenna to exhibit a frequency response having at least a first resonance frequency and a second resonance frequency.

5,841,408
HEAD-UP DISPLAYS

Stephen Rickard, Ruthin Clwyd, United Kingdom, assignor to Pilkington P.E. Limited, St. Asaph, United Kingdom
Filed Oct. 10, 1995, Ser. No. 540,461
Claims priority, application United Kingdom, Oct. 8, 1994, 9420315
Int. Cl.^{6} G09G *5/00*
U.S. Cl. 345—7 **6 Claims**



1. A head-up display system comprising:

a combiner for positioning in front of a pilot's head in-line with the pilot's normal line of sight and in a plane substantially transverse to said line of sight;

sensor means for detecting motion of the pilot's head towards the combiner and for generating a trigger signal, prior to impact between the pilot's head and the combiner, if the velocity of said motion exceeds a threshold velocity, the sensor means including first and second sensors spaced apart from one another and positioned between the normal position of the pilot's head and the combiner and arranged to be sequentially activated by motion of the pilot's head toward the combiner, and means for calculating, from the time difference between the activation of the two sensors, the velocity of the pilot's head toward the combiner and generating said trigger signal if the calculated velocity exceeds the threshold velocity; and

retraction means coupled to the sensor means for receiving therefrom said trigger signal and, in response to receipt of said trigger signal, for retracting the combiner out of the trajectory of the pilot's head prior to impact between the head and the combiner.

5,841,409
IMAGE DISPLAY APPARATUS

Kenji Ishibashi, Izumi; Yasushi Tanijiri, Sakai, and Yasumasa Sugihara, Hashimoto, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan
Filed Apr. 16, 1996, Ser. No. 633,167
Claims priority, application Japan, Apr. 18, 1995, 7-092747; Jun. 12, 1995, 7-144488; Jun. 12, 1995, 7-144490
Int. Cl.^{6} G09G *5/00*
U.S. Cl. 345—8 **19 Claims**

1. An image display apparatus worn by a user on the head, comprising:

an angle sensor for detecting an angle of rotation of the head;

an angular velocity sensor operable independently of said angle sensor for detecting a velocity of rotation of the head;

a calculator for calculating an angle of rotation of the head, based on an output from the angle sensor or the angular velocity sensor; and

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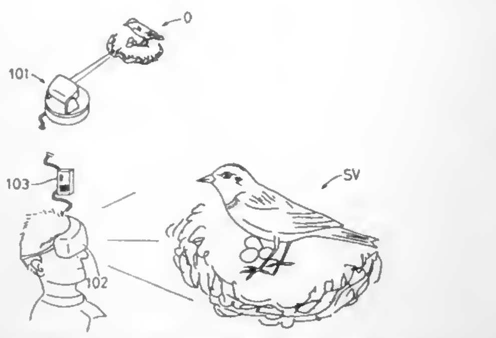


a display controller for displaying an image of a direction in accordance with the angle calculated by the calculator.

5,841,410
ACTIVE MATRIX LIQUID CRYSTAL DISPLAY AND METHOD OF DRIVING THE SAME

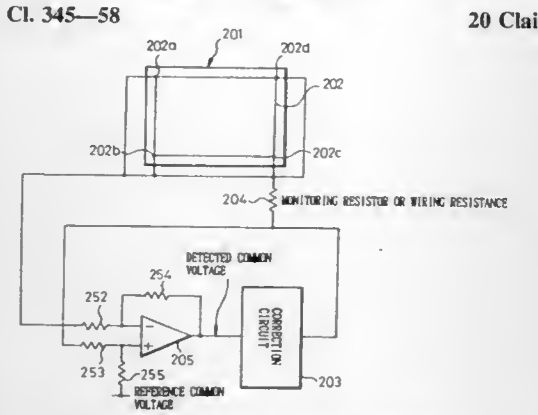
Masami Oda; Munehiro Haraguchi, both of Kawasaki; Tadahisa Yamaguchi, Tenri; Kazuhiro Takahara, Kawasaki; Takayuki Hoshiya, Kawasaki, and Akira Yamamoto, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 96,814, Jul. 28, 1993, abandoned. This application Jan. 15, 1997, Ser. No. 783,788

Claims priority, application Japan, Oct. 20, 1992, 4-281530; Nov. 6, 1992, 4-297337; Jul. 21, 1993, 5-180375

Int. Cl.^{6} G09G *3/20*

U.S. Cl. 345—58 **20 Claims**



1. An active matrix liquid crystal display comprising:

a liquid crystal panel having a liquid crystal layer, display electrodes to which data voltages are selectively applied and a common electrode to which a common voltage is applied, said liquid crystal layer being disposed between said display electrodes and said common electrode to define liquid crystal cells and said liquid crystal display being driven by common and data voltages, the polarity of the data voltage, relative to the common voltage, periodically inverting;

detection means for detecting distortion of a common voltage applied to said common electrode and producing a detected distortion waveform of the common voltage;

an integration circuit which receives the detected distortion waveform of the common voltage detected by the detection means and produces a correction voltage output by averaging the detected distortion waveform of the common voltage as an integration waveform, and which correction voltage output is supplied thereby to said common electrode to correct the distortion of said common voltage; and

said detection means further comprises a monitoring resistor which couples the correction voltage output of said integration circuit to said common electrode, a connection between said monitoring resistor and said common electrode being used for detecting distortion of said common voltage.

5,841,411
ACTIVE MATRIX LIQUID CRYSTAL DISPLAY DEVICE WITH CROSS-TALK COMPENSATION OF DATA SIGNALS

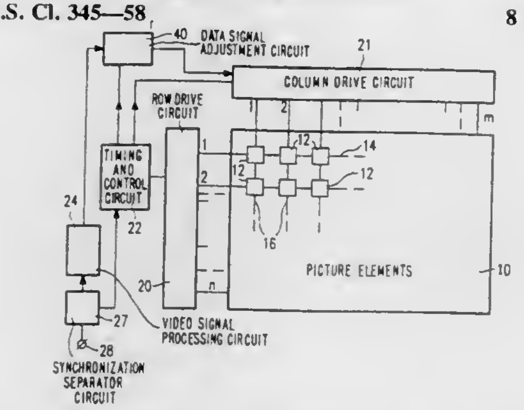
Andrew M. Francis, Reigate, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 14, 1997, Ser. No. 856,477

Claims priority, application United Kingdom, May 17, 1996, 9610381; Mar. 19, 1997, 9705703

Int. Cl.^{6} G09G *3/20:3/36*

U.S. Cl. 345—58 **8 Claims**


40
DATA SIGNAL ADJUSTMENT CIRCUIT
21
COLUMN DRIVE CIRCUIT
ROW DRIVE CIRCUIT
TIMING AND CONTROL CIRCUIT
1
2
m
12
14
16
24
22
20
n
PICTURE ELEMENTS
10
27
VIDEO SIGNAL PROCESSING CIRCUIT
28
SYNCHRONIZATION SEPARATOR CIRCUIT

1. An active matrix display device having a row and column array of picture elements comprising rows of liquid crystal display elements with switching means coupled thereto, sets of row and column address lines coupled to the rows and columns of picture elements respectively, and a drive circuit for applying data signals to the column address lines and for scanning the row address lines to select each row of picture elements in sequence so as to drive the display elements of a selected row in accordance with the data signals applied to their associated column address lines, which is characterised in that the drive circuit includes a data signal adjustment circuit for adjusting input data signals prior to their application to the column address lines according to a cross-talk compensation value and supplying the adjusted data signals to the column address lines for use in driving the display elements so as to compensate for cross-talk effects due to stray capacitive couplings with the display elements, and in which the adjustment circuit is arranged to derive the cross-talk compensation value for a picture element from the data signals intended to be applied in the period until that picture element is next selected to the column address line associated with the column of picture elements in which that picture element lies and to at least one of the column address lines associated with the adjacent columns of picture elements.

5,841,412
ELECTROOPTICAL DISPLAY DEVICE

Heihachiro Ebihara, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 731,912, Oct. 22, 1996, abandoned, which is a continuation of Ser. No. 364,420, Dec. 27, 1994, Pat. No. 5,583,528, which is a continuation of Ser. No. 729,123, Jul. 12, 1991, abandoned. This application Oct. 17, 1997, Ser. No. 954,053

Claims priority, application Japan, Jul. 13, 1990, 2-184147

Int. Cl.^{6} G09G *3/20*

U.S. Cl. 345—58 **4 Claims**

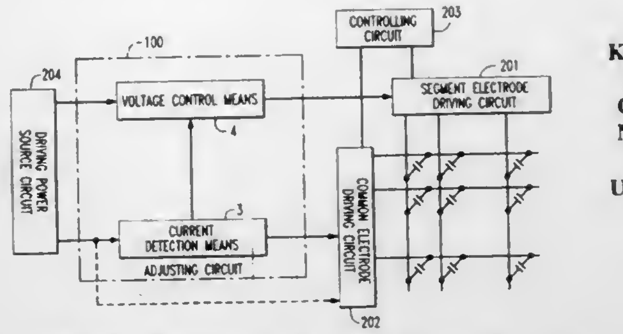
1. An electrooptical display device, comprising:

a display panel including a plurality of common electrodes and a plurality of segment electrodes;

a common electrode driving circuit for driving said plurality of common electrodes;

a segment electrode driving circuit for driving said plurality of segment electrodes; and

an adjusting circuit including current determining means for determining an amount of change in current by detecting an amount participating in a change of current flowing instantaneously through said display panel, and voltage control means for steeply increasing or decreasing at least one level of driving voltages applied to said segment electrodes and said common electrode driving circuits from a normal level thereof for a short period in accordance with the determination result of said current determining means.



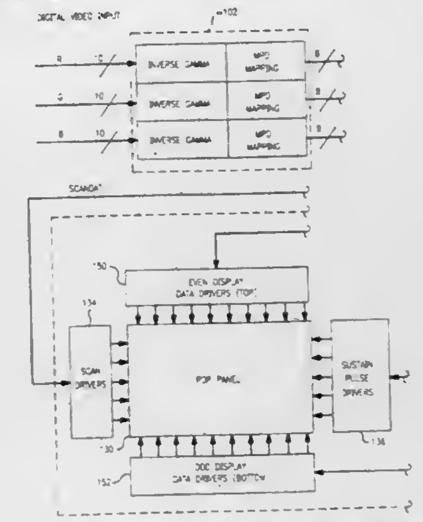
5,841,413
METHOD AND APPARATUS FOR MOVING PIXEL DISTORTION REMOVAL FOR A PLASMA DISPLAY PANEL USING MINIMUM MPD DISTANCE CODE

Daniel Qiang Zhu, Columbus, and Thomas James Leacock, Medford, both of N.J., assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 13, 1997, Ser. No. 874,773

Int. Cl.^{6} G09G *3/28*

U.S. Cl. 345—63 **10 Claims**



1. A method of displaying a sequence of video image frames on a display device, wherein a plurality of subfield periods are defined for each video image frame, each of the subfield periods having a respective illumination level which is applied to the display device, and each video image frame including a plurality of picture elements (pixels), each pixel being displayed at a respective pixel position on the display device and each pixel having a respective intensity value of a set of intensity values, the method comprising the steps of:

a) defining at least one combination of subfield periods and respective illumination levels for each one of the set of intensity values to form a set of minimum moving pixel distortion (MPD) codes so as to minimize moving pixel distortion on the display device between successive frames or within a frame;

b) mapping the intensity value of each respective pixel into a respective one of the set of minimum MPD codes; and

c) displaying the sequence of video image frames by using, for each pixel, the respective combination of subfield periods and respective illumination levels produced by mapping each pixel intensity value into the respective defined one of minimum MPD codes.

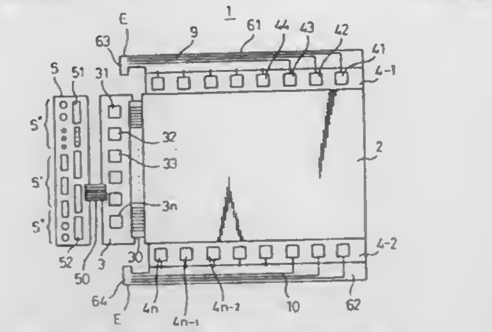
5,841,414
LIQUID CRYSTAL DISPLAY DEVICE

Kazuo Tanaka, Tanashi, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 291,934, Aug. 16, 1994, Pat. No. 5,654,730. This application Jul. 3, 1997, Ser. No. 888,277

Int. Cl.^{6} G09G *3/36*

U.S. Cl. 345—87 **14 Claims**



1. A liquid crystal display apparatus comprising:

a liquid crystal display panel;

common electrode drive IC groups and segment electrode drive IC groups arranged on the periphery of said liquid crystal display panel to drive said panel;

a control circuit substrate having a connector means for individually driving and controlling said common electrode drive IC groups and segment electrode drive IC groups;

a first connection portion for electrically connecting said common electrode drive IC groups to common electrodes of said liquid crystal display panel;

a second connection wiring portion made of a flexible cable having a connector insertion means for electrically connecting said segment electrode drive IC groups to said control circuit substrate by inserting said connector insertion means to said connector means on said control circuit substrate; and

a third connection wiring portion for electrically connecting said control circuit substrate to said common electrode drive IC groups;

said common electrode drive IC groups are provided on an extended glass portion of the glass substrate of said liquid crystal display panel by chip on glass mounting technology,

said third connection wiring portion are made of a flexible cable, and

said segment electrode drive IC groups are provided on an extended portion of another glass substrate of said liquid crystal display panel by chip on glass mounting technology.

5,841,415
METHOD AND DEVICE FOR DRIVING AN LCD TO COMPENSATE FOR RC DELAY

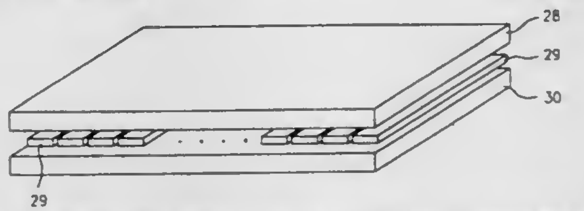
Oh-Kyong Kwon, and Kwang-Ho Lee, both of Seoul, Rep. of Korea, assignors to LG Semicon Co., Ltd., Cheongju, Rep. of Korea

Filed Jan. 3, 1996, Ser. No. 582,262

Claims priority, application Rep. of Korea, Jul. 28, 1995, 1995/22833

Int. Cl.^{6} G09G *3/36*

U.S. Cl. 345—90 **13 Claims**



1. A method for driving pixels in a display device comprising the steps of:

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arranging a plurality of common electrodes between a first substrate having transistors and a second substrate having filters; and

applying different compensating voltages to respective ones of groups of common electrodes to compensate for variations in a respective pixel voltage due to a delay time of a gate line that is based on a distance of each of said groups to a gate driver.

5,841,416
METHOD OF AND APPARATUS FOR DRIVING LIQUID-CRYSTAL DISPLAY DEVICE

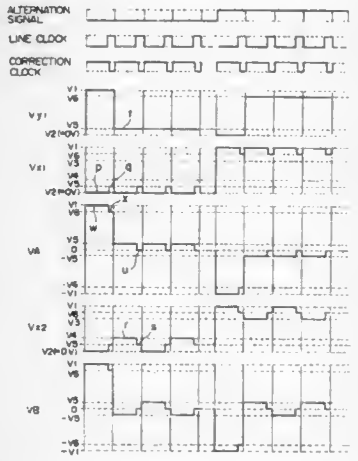
Hiroyuki Mano, Chigasaki; Tatsuhiro Inuzuka; Satoshi Konuma, both of Yokohama; Toshio Futami, and Kohji Takahashi, both of Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Video & Information System, Inc., Yokohama, both of Japan

Filed Apr. 2, 1992, Ser. No. 862,509

Claims priority, application Japan, Apr. 2, 1991, 3-069869; Nov. 13, 1991, 3-297387

Int. Cl.^{6} G09G *3/36*

U.S. Cl. 345—94 **26 Claims**



1. A method of driving a liquid-crystal display device wherein voltages which correspond to potential differences between scanning voltages from a Y drive circuit and display voltages from an X drive circuit are applied to liquid-crystal cells at intersection points between scanning electrodes (Y electrodes) and data electrodes (X electrodes), thereby presenting a display conforming to display data, the method comprising the steps of:

providing a correction time period for correcting a display voltage to be output from said X drive circuit at least once every scanning period of one line such that each scanning period of one line includes at least one correction time period; and

outputting a correction voltage at a voltage level which is intermediate between a voltage level in an ON-display state and a voltage level in an OFF-display state instead of said display voltage from said X drive circuit within each correction time period in each scanning period of one line.

5,841,417
METHOD OF DRIVING OPTICAL MODULATION DEVICE

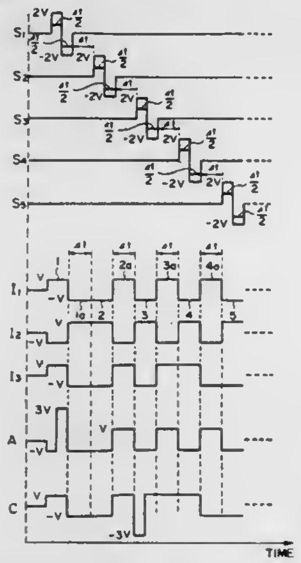
Junichiro Kanbe; Kazuharu Katagiri, both of Yokohama, and Syuzo Kaneko, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 139,162, Dec. 21, 1987, Pat. No. 5,448,383, which is a continuation of Ser. No. 7,408, Jan. 27, 1987, abandoned, which is a continuation of Ser. No. 598,800, Apr. 10, 1984, Pat. No. 4,655,561. This application Jun. 5, 1995, Ser. No. 463,781

Claims priority, application Japan, Apr. 19, 1983, 58-68659; Apr. 19, 1983, 58-68660; Jul. 30, 1983, 58-138707; Jul. 30, 1983, 58-138710; Aug. 4, 1983, 58-142954

Int. Cl.^{6} G09B *3/36*

U.S. Cl. 345—96 **5 Claims**



1. A liquid crystal apparatus, comprising:

a liquid crystal device comprising a group of scanning lines and a group of signal lines intersecting each other to form a matrix of picture elements, and a chiral smectic liquid crystal disposed so as to form the picture elements, and the chiral smectic liquid crystal being placed in a non-helical alignment structure; and

drive means for:

(a) applying a scanning selection signal and a scanning non-selection signal to the scanning lines, said scanning selection signal comprising a voltage of one polarity and a voltage of the other polarity, respectively with reference to a voltage level of said scanning non-selection signal,

(b) applying a data signal having a voltage determined according to an environmental temperature for causing one orientation state of said chiral smectic liquid crystal selectively to the signal lines in a period of applying said voltage of one polarity to a scanning line and applying a data signal having a voltage determined according to an environmental temperature for causing another orientation state of said chiral smectic liquid crystal selectively to the signal lines in a period of applying said voltage of the other polarity to the scanning line, and

(c) periodically applying the scanning selection signal to the scanning lines,

where each picture element in a period of receiving the scanning non-selection signal receives at least two types of voltage signal pulses having mutually different pulse widths including a voltage signal pulse having a larger pulse width which is set so as not to exceed the threshold voltage.

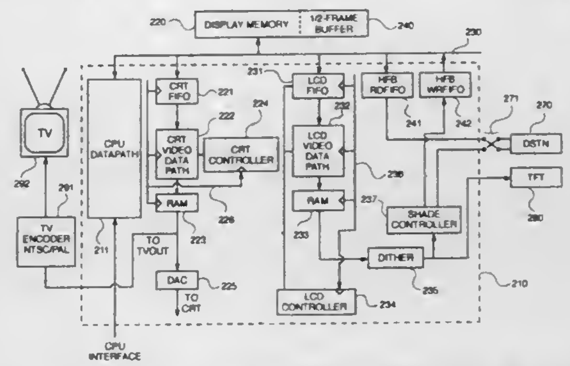
5,841,418
DUAL DISPLAYS HAVING INDEPENDENT RESOLUTIONS AND REFRESH RATES

Vald Bril, Campbell; Rakesh Bindlish, San Jose; Ken Fuiks, Fremont; Robin Sungsoo Han, Saratoga; Sridhar Kotha, Fremont, and Alexander Julian Eglit, San Carlos, all of Calif., assignors to Cirrus Logic, Inc., Fremont, Calif.

Filed Jun. 7, 1995, Ser. No. 483,584

Int. Cl.^{6} G09G *5/00*

U.S. Cl. 345—3 **21 Claims**



8. An apparatus for simultaneously generating first and second display signals for first and second video displays, the first and second display signals having independent refresh rates and pixel resolutions, said apparatus comprising:

a display memory data bus, for coupling the apparatus with a display memory;

a first display data clock having a frequency characteristic of refresh rate and pixel resolution of a first display;

an second display data clock having a frequency characteristic of refresh rate and pixel resolution of an second display independent of said first display data clock;

a first display data pipeline, coupled to said display memory data bus and said first display data clock, for processing first display data synchronous with said first display data clock; and

an second display data pipeline, parallel to the first display data pipeline, coupled to said display memory data bus and said second display data clock, for processing second display data synchronous with said second display data clock.

5,841,419
CONTROL METHOD FOR FERROELECTRIC LIQUID CRYSTAL MATRIX DISPLAY

Paolo Maltese, Rome, Italy, assignor to Universita' Degli Studi Di Roma 'La Sapienza', Rome, Italy

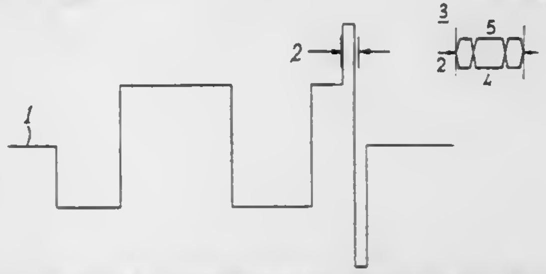
PCT No. PCT/IT94/00138, § 371 Date Feb. 13, 1996, § 102(e) Date Feb. 13, 1996, PCT Pub. No. WO95/06308, PCT Pub. Date Mar. 2, 1995

PCT Filed Aug. 18, 1994, Ser. No. 596,187

Claims priority, application Italy, Aug. 20, 1993, RM93 A 000567

Int. Cl.^{6} G09G *3/36*

U.S. Cl. 345—97 **42 Claims**



1. A method for controlling a matrix panel in which each of a plurality of picture elements includes an electro-optical bistable cell with a ferroelectric liquid crystal, the bistable cell switching between a first state and a second state in response to spaced apart rectangular pulses having alternately opposite polarities and a constant rms voltage amplitude Vhf applied between the spaced apart rectangular pulses, when switching pulses having a large enough product of a switching pulse time and a switching pulse voltage, such large enough product having a minimum value Amin when the switching pulse voltage ranges from one to eight tenths of a minimum voltage Vtmin which allows a minimum switching pulse time, the method comprising:

applying a selection voltage waveform to at least one bistable cell, the selection voltage waveform including

a last pulse having an absolute value of the time integral of the last pulse voltage in the range of 0.2 Amin to 1 Amin,

a last-but-one pulse immediately preceding the last pulse having an absolute value of the time integral of the last-but-one pulse voltage in the range of 0.2 Amin to 3 Amin,

a last-but-two pulse having an absolute value of the time integral of the last-but-two pulse voltage in the range of 0.8 Amin to 3 Amin, and

a last-but-three pulse having an absolute value of the time integral of the last-but-three pulse voltage in the range of 1 to 10 times the absolute value of the time integral for the last-but-two pulse and a polarity opposite the last-but-two pulse,

such that a control time window is produced for the at least one bistable cell, which control time window partially overlaps the last-but-one pulse to an extent of at least two fifths and nor more than four fifths of an entire duration of the control time window; and

applying a data voltage waveform to the at least one bistable cell during at least the control time window.

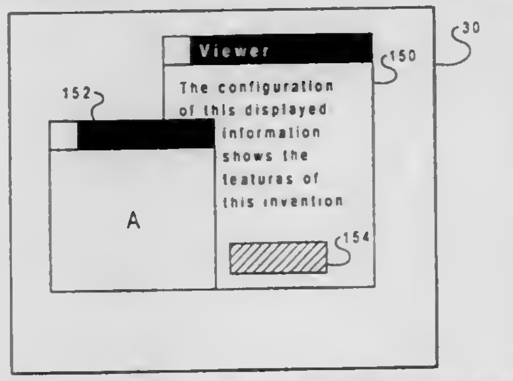
5,841,420
METHOD AND SYSTEM IN A DATA PROCESSING SYSTEM WINDOWING ENVIRONMENT FOR DISPLAYING PREVIOUSLY OBSCURED INFORMATION

Michael Aaron Kaply, Delray Beach, and Antony Edward Martinez, Boca Raton, both of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 18, 1995, Ser. No. 516,663

Int. Cl.^{6} G09G *5/00*

U.S. Cl. 345—118 **9 Claims**


Viewer
150
30
152
The configuration of this displayed information shows the featuras of this invention
A
154

1. A method in a data processing system for displaying information, wherein said data processing system includes a display and an operating system, said method comprising the steps of:

displaying information within a first window in said display utilizing information display software;

detecting a second window displayed within said display at a location which obscures a portion of said information displayed within said first window;

notifying said information display software that said portion of said information displayed within said first window is obscured; and

automatically relocating said portion of said information displayed within said first window that had been obscured to an unobscured portion of said first window in response to said notification such that said portion of said information may be visually accessed.

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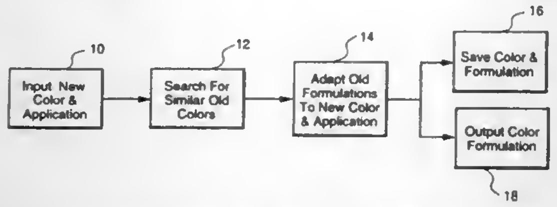
5,841,421
METHOD AND SYSTEM FOR SELECTING A PREVIOUS COLOR MATCH FROM A SET OF PREVIOUS COLOR MATCHES THAT BEST MATCHES A COLOR STANDARD

William Estel Cheetam, Clifton Park, N.Y., and John Frederick Graf, Vienna, W. Va., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 18, 1995, Ser. No. 574,013
Int. Cl.^{6} G01J *3/50*

U.S. Cl. 345—150 **11 Claims**


10
Input New Color & Application
12
Search For Similar Old Colors
14
Adapt Old Formulations To New Color & Application
16
Save Color & Formulation
Output Color Formulation
18

1. A computer-implemented method for selecting a previously used color match from a plurality of previously used color matches that best matches a color standard, each of the plurality of previously used matches identified with a spectral reflectance and a color formula, the method comprising the steps of:

measuring a color spectrum and spectral reflectance of the color standard;

processing the spectral reflectance of each of the plurality of the previously used color matches;

searching the processed plurality of previously used color matches for a set of previous color matches that have a high probability of being adapted to attain the color spectrum and spectral reflectance of the color standard;

determining a color match that provides the best match with the color of the standard from the set of previous color matches;

using the color formula of the best match to reproduce the color of the standard; and

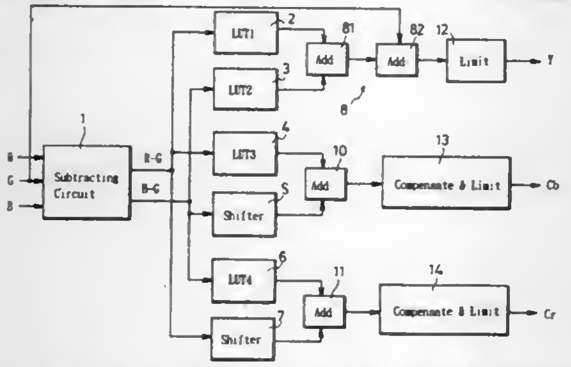
adapting the color formula of the best match until there is an acceptable match with the color of the standard.

5,841,422
METHOD AND APPARATUS FOR REDUCING THE NUMBER OF MATRIX OPERATIONS WHEN CONVERTING RGB COLOR SPACE SIGNALS TO YCBCR COLOR SPACE SIGNALS

Rong-Fuh Shyu, Hsinchu, Taiwan, assignor to Winbond Electronics Corp., Hsinchu, Taiwan

Filed Dec. 10, 1996, Ser. No. 763,539
Int. Cl.^{6} H04N *9/67*

U.S. Cl. 345—154 **25 Claims**



1. A method for reducing the number of matrix operations when converting digitized RGB color space signals to digitized YCbCr color space signals comprising the steps of:

generating at least two color difference signals, each being in terms of any two of the digitized RGB color space signals; and

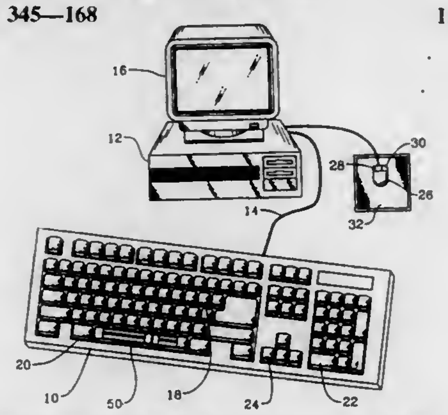
performing first, second, third and fourth matrix multiplication operations of said color difference signals, said first and second matrix multiplication operations having first and second results to be used in conversion for the digitized Y color space signal, said third matrix multiplication operation having a third result to be used in conversion for the digitized Cb color space signal, said fourth matrix multiplication operation having a fourth result to be used in conversion for the digitized Cr color space signal.

5,841,423
MULTIFUNCTION SPACE BAR FOR VIDEO SCREEN GRAPHICS CURSOR CONTROL

George L. Carroll, Jr., 16 E. Olive St., Arlington Hts., Ill. 60004, and Michael A. Slavin, 4440 PGA Blvd. Ste. 402, Palm Beach Gardens, Fla. 33410

Continuation-in-part of Ser. No. 656,573, Feb. 15, 1991, Pat. No. 5,479,192. This application Dec. 26, 1995, Ser. No. 578,846
Int. Cl.^{6} G09G *5/00*

U.S. Cl. 345—168 **11 Claims**



1. A multi-function space bar device occupying the traditional single position space bar location or each of the dual position space bar locations with said device capable of supplying information signals determining rotational, sliding, and switch depression movements for control of a video screen graphics cursor on a microprocessor based computer system having input control electronics for receipt of information signals, said device comprising:

at least one space bar support structure, each said space bar support structure having a front, top, and back surface with first and second ends, said top surface having an elongated cylindrical slot along the longitudinal length thereof;

a rotatively movable elongated cylindrical bar positioned spanning the first end and second end of said support structure with a portion of said cylindrical bar protruding above said elongated slot;

means for generating a first output in relation to the rotational movement of said cylindrical bar for control of a graphics cursor along a vertical Y-axis of a video screen; and

a touch sensitive panel integrated into said cylindrical bar for use in generating a second output in relation to a finger movement along the longitudinal length of said cylindrical bar for control of a graphics cursor along a horizontal X-axis of a video screen;

whereby said first and second outputs supply informational signals to said input control electronics for manipulation of said video screen graphics cursor on said microprocessor based system.

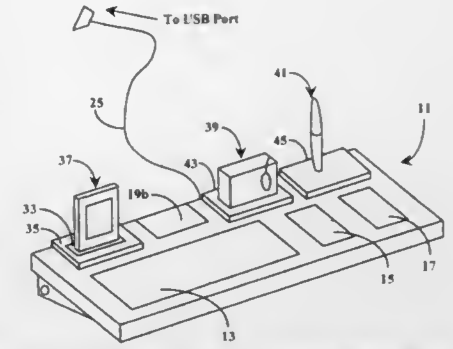
5,841,424
USB TO MULTIPLE CONNECT AND SUPPORT BAYS FOR PERIPHERAL DEVICES

Dan Kikinis, Saratoga, Calif., assignor to Lextron Systems, Inc., Saratoga, Calif.

Filed Mar. 3, 1997, Ser. No. 811,118
Int. Cl.^{6} G09G *5/00*

U.S. Cl. 345—168 **15 Claims**

8. A PC Universal-Serial-Bus-compatible keyboard, comprising:



a Universal Serial Bus (USB) communication link adapted to connect an on-board keyboard controller to a USB node;

translator circuitry implemented as a part of the on-board keyboard controller and coupled to the USB communication link;

an industry standard serial communication link other than USB coupled to the translator circuitry; and

a docking bay adapted to physically and electrically connect an industry standard serial computer peripheral device other than USB to the industry standard serial communication link other than USB;

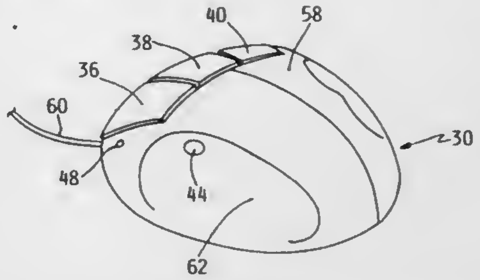
wherein the translator circuitry is adapted to translate industry standard serial code other than USB code to USB code and USB code to industry standard serial code other than USB in a bi-directional manner between the USB link and the industry standard serial communication link other than USB.

5,841,425
AMBIDEXTROUS COMPUTER INPUT DEVICE

Charles Vernon Zenz, Sr., Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 31, 1996, Ser. No. 688,972
Int. Cl.^{6} G09G *5/08*

U.S. Cl. 345—163 **25 Claims**



1. A computer input device comprising:

an output transmitter for communicating with a computer; and

a control circuit coupled to the output transmitter, the control circuit comprising:

at least a first sensor; and

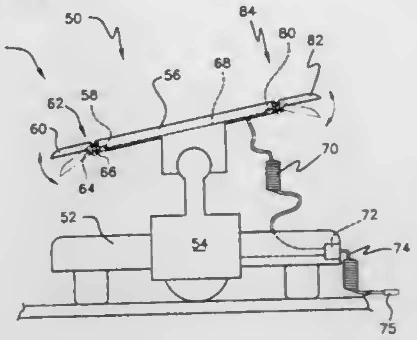
a configuration circuit coupled to the first sensor to automatically determine the handedness of the computer input device independent of motion of any component of the computer input device, wherein the configuration circuit causes the computer input device to be in a first-handed mode when the first sensor is activated, and causes the computer input device to be in a second-handed mode when the first sensor is not activated.

5,841,426
FOOT OPERATED COMPUTER MOUSE

Dean Dodson, 2337 Hilo Ave. N., Oakdale, Minn. 55128, and Timothy Kelley, 11204 Dellwood Rd., Stillwater, Minn. 55082

Filed Nov. 18, 1996, Ser. No. 751,394
Int. Cl.^{6} G09G *5/08*

U.S. Cl. 345—163 **3 Claims**



1. A foot operated controller that rests on a floor for generating computer command signals to a computer comprising:

a base having a top side and a bottom side, a ball signal generator attached to said bottom side of said base for generating position signals, said ball signal generator including a ball depending from said bottom side of said base, so that said ball contacts the floor;

a platform located on said top side of said base, said platform adapted to cooperate with and support a user's foot, said platform engaged with a pivot means for pivotal movement with respect to said base;

support legs depending from said bottom side of said base, said support legs being disposed about said ball, where said support legs are in contact with the floor such that said base is held in a generally parallel relationship with the floor and that said ball is also held in contact with the floor and is universally rotatable within said base; and

switch means disposed on said platform for generating an execution signal when said platform pivots through a limited range about said pivot means in at least a first direction; whereby

said controller is placed on the floor and the user's foot may be used to both generate said position signals to a computer by movement of said platform and said base, along with said depending ball, on the floor, and to generate execution signals by activation, also by the user's foot, of said switch means on said platform, thus allowing the user to operate mouse driven menus on the computer by means of one or another of their feet.

5,841,427
METHOD AND APPARATUS FOR CANCELING AN OFFSET SIGNAL IN AN ELECTROSTATIC DIGITIZING TABLET

Jerzy A. Teterwak, Colorado Springs, Colo., assignor to Symbios, Inc., Fort Collins, Colo.

Filed Dec. 22, 1995, Ser. No. 576,894
Int. Cl.^{6} G08C *21/00*; G09G *5/00*

U.S. Cl. 345—173 **16 Claims**

1. A method for generating an output signal in a digitizer, comprising the steps of:

generating a first signal when a user contacts a sensor panel, said first signal having a first component and a second component;

generating a second signal which is substantially identical to said first component of said first signal; and

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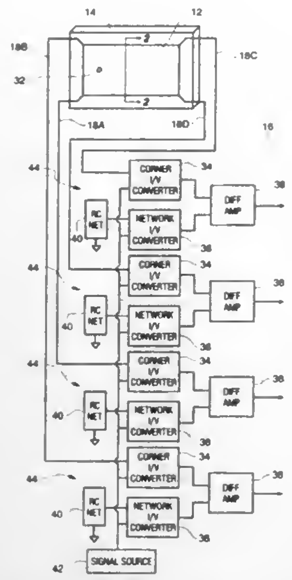


using said second signal to cancel out said first component of said first signal so as to generate the output signal which is substantially identical to said second component of said first signal.

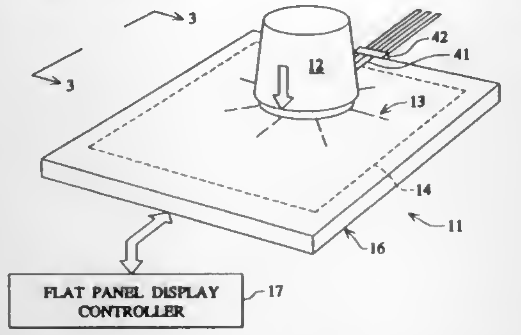
5,841,428
ROTARY CIRCUIT CONTROL DEVICES WITH CHANGEABLE GRAPHICS

Denny Jaeger, and Kenneth M. Twain, both of Oakland, Calif., assignors to Intertactile Technologies Corporation, Oakland, Calif.

Continuation-in-part of Ser. No. 644,888, May 10, 1996, abandoned, which is a continuation-in-part of Ser. No. 420,438, Apr. 10, 1995, Pat. No. 5,572,239, which is a continuation of Ser. No. 225,782, Apr. 11, 1994, abandoned, which is a continuation-in-part of Ser. No. 174,545, Nov. 15, 1993, abandoned. This application Sep. 20, 1996, Ser. No. 725,201

Int. Cl.^{6} G09G *5/00*

U.S. Cl. 345—184 **48 Claims**



1. A control device for an electrical circuit which control device has a base member and a turnable knob coupled thereto, the knob being turnable to any of a plurality of different angular orientations to change an electrical condition in the circuit, wherein the improvement comprises:

said base member being affixed to an electronic image display device which has an image display area at which instantly changeable images are displayed, said base member and knob being in front of said image display device and wherein at least a portion of said knob overlays the image display area of said image display device, and

a control signal producing circuit which produces a signal indicative of the current angular orientation of said knob.

5,841,429
METHOD AND APPARATUS FOR MANAGING A CHARACTER PATTERN

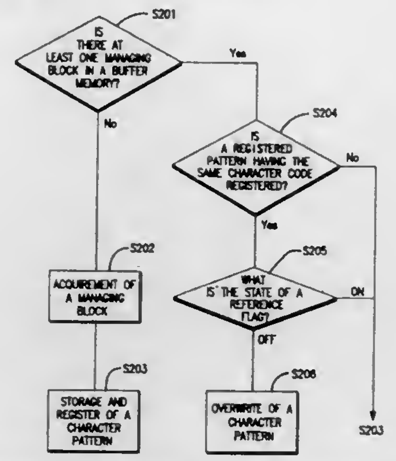
Nobuhiro Kasaki, Niigata, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 23, 1996, Ser. No. 653,697

Claims priority, application Japan, May 23, 1995, 7-123530

Int. Cl.^{6} G06F *3/12*

U.S. Cl. 345—192 **9 Claims**


S201
IS THERE AT LEAST ONE MANAGING BLOCK IN A BUFFER MEMORY?
Yes
No
S204
IS A REGISTERED PATTERN HAVING THE SAME CHARACTER CODE REGISTERED?
No
Yes
S202
ACQUIREMENT OF A MANAGING BLOCK
S205
WHAT IS THE STATE OF A REFERENCE FLAG?
ON
OFF
S203
STORAGE AND REGISTER OF A CHARACTER PATTERN
S206
OVERWRITE OF A CHARACTER PATTERN
S203

1. An apparatus for managing a character pattern, comprising:

means for storing a character pattern and individual information thereof, said individual information including a first flag indicating a first processing state of said character pattern and a character code assigned to said character pattern;

means for detecting said individual information of a previously stored said character pattern; and

means for storing a new said character pattern in said storing means according to said detected individual information.

5,841,430
DIGITAL VIDEO DISPLAY HAVING ANALOG INTERFACE WITH CLOCK AND VIDEO SIGNALS SYNCHRONIZED TO REDUCE IMAGE FLICKER

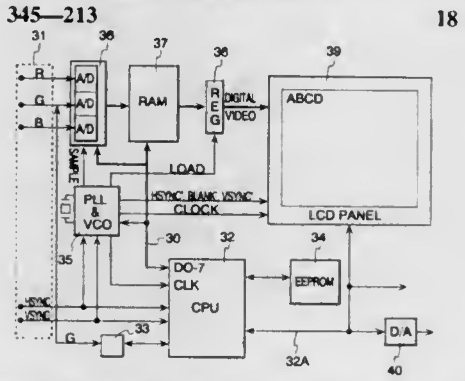
Jarmo Kurikko, Espoo, Finland, assignor to ICL Personal Systems OY, Helsinki, Finland

Continuation of Ser. No. 256,751, Jul. 22, 1994, abandoned. This application Jun. 24, 1997, Ser. No. 881,793

Claims priority, application Finland, Jan. 30, 1992, 920416

Int. Cl.^{6} G09G *5/00;3/36*

U.S. Cl. 345—213 **18 Claims**



1. Analog video interface for a digital video display, comprising an analog video input for receiving at least one analog video signal having a video frequency and having composite or separate horizontal and vertical deflection signals;

digitizing means for digitizing said at least one analog video signal;

means for generating a basic clock signal having a frequency which is at least n times a desired video frequency, where n≧1;

means for generating control signals for the digital display and a sampling clock signal for the digitizing means in synchronization with the basic clock signal;

means for determining the video frequency of the analog video signal on the basis of said received signals; and

said means for generating the basic clock signal comprises a programmable frequency synthesizer means responsive to said determining means for synthesizing the basic clock signal of a frequency which is at least n times said determined video frequency, where n≧1 and

wherein a sampling clock period of the digital display comprises n basic clock periods; an active edge of the sampling pulse is timed to coincide with a stable invariable moment of the analog video signal; a horizontal deflection period and a horizontal synchronizing pulse of the digital video display are formed by a programmable number of basic clock periods; and a vertical deflection period and a vertical synchronizing pulse are formed by a programmable number of horizontal deflection periods.

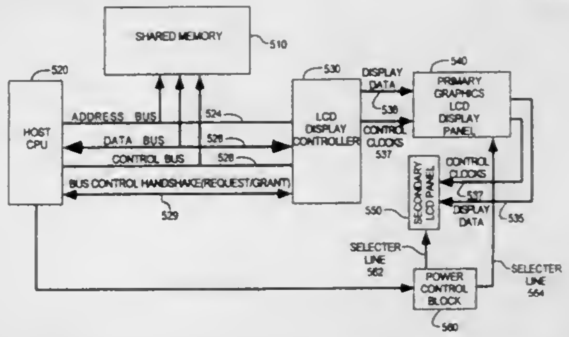
5,841,431
APPLICATION OF SPLIT- AND DUAL-SCREEN LCD PANEL DESIGN IN CELLULAR PHONES

Charles Russell Simmers, Phoenix, Ariz., assignor to Intel Corporation, Santa Clara, Calif.

Filed Nov. 15, 1996, Ser. No. 749,486

Int. Cl.^{6} G09G *5/00;3/36;* **G06F** *1/00;1/16*

U.S. Cl. 345—211 **11 Claims**



1. In an information device having a CPU, display controller and a display panel, said display panel split logically into sub-panels, an apparatus comprising:

a plurality of segment drivers coupled between said display panel and said display controller, said segment drivers receiving input data from said controller, said segment drivers translating said data into pixels displayable on said display panel; and

a power control block coupled to said CPU and to said segment drivers to disable a first power source which powers down a first set of said segment drivers, said powering down disabling a first set of sub-panels of said display panel from outputting pixels, said power control block disabling said first power source upon receiving a command from said CPU that said first set of sub-panels are to be powered down, said information device functioning as one of a cellular communications device and a personal digital assistant, said first set of sub-panels displaying information relevant to said personal digital assistant function, further wherein said display panel includes a second set of sub-panels displaying information relevant to said cellular communications functions.

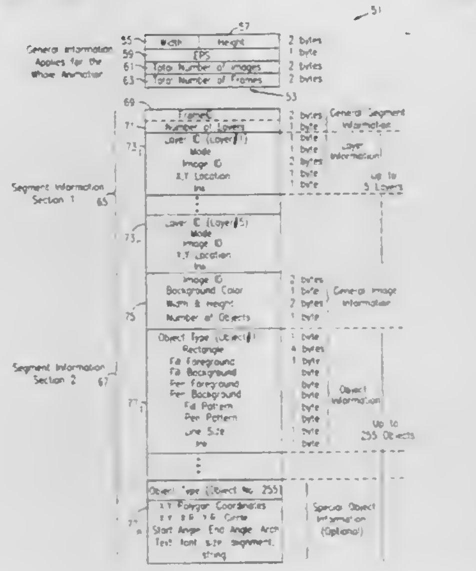
5,841,432
METHOD AND SYSTEM OF BUILDING AND TRANSMITTING A DATA FILE FOR REAL TIME PLAY OF MULTIMEDIA, PARTICULARLY ANIMATION, AND A DATA FILE FOR REAL TIME PLAY OF MULTIMEDIA APPLICATIONS

Sharon Carmel, 25 Kakal Street; Tzur Daboosh, 236 David Ben-Gurion Street, both of Givataim; Eli Reifman, 19 Nordau Street, Rishon Le-Zion, all of Israel, and Naftali Shani, 6 Hamishna Street, Telaviv, Israel, 62917

Filed Feb. 9, 1996, Ser. No. 594,890

Int. Cl.^{6} G06T *1/00*

U.S. Cl. 345—302 **3 Claims**



1. A method for conveying a multimedia program from a source computer to a destination computer, comprising:

providing at the source computer a series of data segments, including a predetermined number of such data segments, each data segment corresponding to a frame displayed in the multimedia program;

producing a general information block including information indicative of the predetermined number of data segments in the series;

transmitting the general information block to the destination computer; and

transmitting the series of data segments to the destination computer, such that the destination computer executes the program and terminates the program responsive to the information in the general information block after the predetermined number of segments has been reached, wherein transmitting the series comprises transmitting the series of data segments substantially without setting a segment delimiter.

5,841,433
DIGITAL TELEVISION SYSTEM CHANNEL GUIDE HAVING A LIMITED LIFETIME

John William Chaney, Noblesville, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Continuation of Ser. No. 572,132, Dec. 14, 1995, abandoned, which is a continuation of Ser. No. 363,263, Dec. 23, 1994, abandoned. This application Feb. 13, 1997, Ser. No. 799,901

Int. Cl.^{6} H04N *5/445*

U.S. Cl. 345—327 **6 Claims**

1. A television system for receiving a plurality of digitally-encoded television programs wherein each of said digitally-encoded television programs is associated with at least one of a plurality of digital data transmission channels, each of said digital data transmission channels has the capacity to transmit at least one digitally-encoded television program and at least one of said plu-

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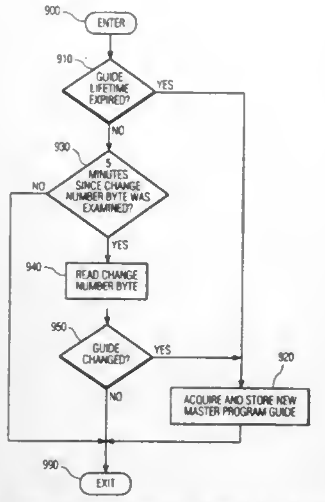


rality of digital data transmission channels includes television program schedule data, said system comprising:

means responsive to a control signal for selecting a particular digital data transmission channel from said plurality of digital data transmission channels; and

control means coupled to said selecting means for generating said control signal;

said television program schedule data being updated at predetermined time intervals and comprising:

a first data structure defining the relationship of each of said television programs to respective ones of said plurality of digital data transmission channels,

a second data structure indicative of a time period during which said defined relationships are valid, and

a third data structure indicative of a change in said defined relationships;

said control means causing said first data structure of said television program schedule data to be acquired and stored when said second data structure indicates that said valid time period is less than a predetermined time period or when said third data structure indicates that said defined relationships have changed;

said control means examining said third data structure more often than said second data structure.

5,841,434

SYSTEM AND METHOD FOR MULTI-PLATFORM IMPLEMENTATION OF OBJECTS ON WINDOWING COMPUTER SYSTEMS

Sreedhar Reddy Arda; Todd Michael Wiese, and Leigh Allen Williamson, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 19, 1996, Ser. No. 753,028

Int. Cl.^{6} G06F *15/00*

U.S. Cl. 345—335 **22 Claims**

13. An apparatus for implementing compound documents in a graphical user interface-based computer system having a display device which includes an on-screen area, comprising:

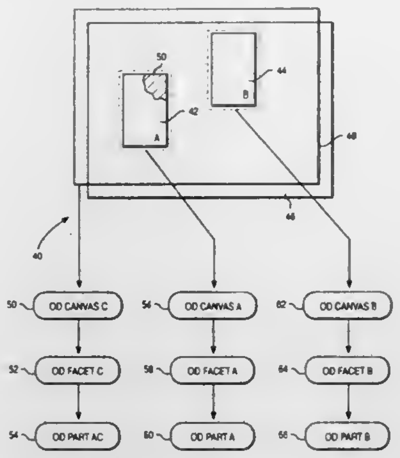
means for detecting a request for a Part;

means for defining spatial characteristics of said Part comprising a first portion of said screen area;

means for creating an ODObject CanvasObject comprising a generic ODPlatformCAnvas Object and one of a plurality of Platform-specific Canvas objects, each of said plurality of Platform-specific Canvas Objects corresponding to a different sub-area of said on-screen area;

means for creating a Facet corresponding to said characteristics of said Part with said one of said Plurality of Canvas Objects;

means for retrieving said ODPlatformCanvas Object; and



means for creating a platform-specific window in response to said retrieving said ODPlatformCanvas Object, said window corresponding to said first portion of said on-screen area.

5,841,435

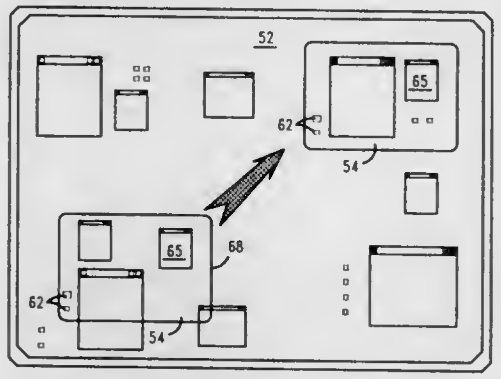
VIRTUAL WINDOWS DESKTOP

Norman J. Dauerer, Hopewell Junction; Edward E. Kelley, Wappingers Falls, and Franco Motika, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 26, 1996, Ser. No. 686,835

Int. Cl.^{6} G06F *15/00*

U.S. Cl. 345—339 **5 Claims**



1. A process for visually organizing multiple computer application objects on a computer screen, said objects being adapted to execute a computer program with a graphical user interface comprising the steps of:

a) providing a virtual display, said virtual display adapted to display application objects arranged thereon, said virtual display having a single, continuous virtual area larger than the screen when said application objects are resolvable on the screen and configurable to any desired size;

b) providing a physical display adapted to be displayed on the screen or a portion thereof for displaying said application objects, said physical display being smaller than said virtual display;

c) moving said physical display in a single, continuous movement to locate said physical display at a position corresponding to at least one of said application objects on said virtual display;

d) viewing said at least one of said application objects through said physical display;

e) moving said physical display in discreet movements equal to the size of the physical display to locate said physical display at a position corresponding to another one of said application objects on said virtual display;

f) viewing said another one of said application objects through said physical display;

g) grouping a plurality of said application objects encompassing an area of said virtual display independent of the size of said physical display, together for viewing and moving as a group, and

h) moving the group of application objects on said virtual display with said physical display, and viewing said group through said physical display.

5,841,436

APPARATUS AND METHOD FOR CONTROLLING DISPLAY OF WINDOW TITLES

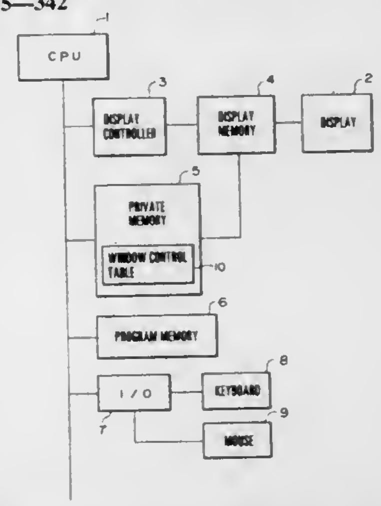
Osamu Nakamura, Fukuoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 298,954, Sep. 1, 1994, abandoned. This application Apr. 19, 1996, Ser. No. 633,699

Claims priority, application Japan, Sep. 6, 1993, 5-221086

Int. Cl.^{6} G05B *13/00*

U.S. Cl. 345—342 **11 Claims**



1. A window display control apparatus comprising:

display means for displaying data in a plurality of windows including a first window and a second window;

storing means for storing information regarding positional relationships among said plurality of windows; and

display control means for controlling said display means to display said plurality of windows by overlapping said plurality of windows on said display means, in accordance with said information stored in said storing means;

wherein said display control means comprises:

detecting means for detecting, in accordance with portions of said information associated with said first window and said second window, whether said first window overlays a predetermined area of said second window; and

changing means for moving, when said detecting means has detected that said first window overlays said predetermined area of said second window, said second window as a whole relative to said first window so that said first window no longer overlays said predetermined area of said second window and so that said predetermined area of said second window is displayed.

5,841,437

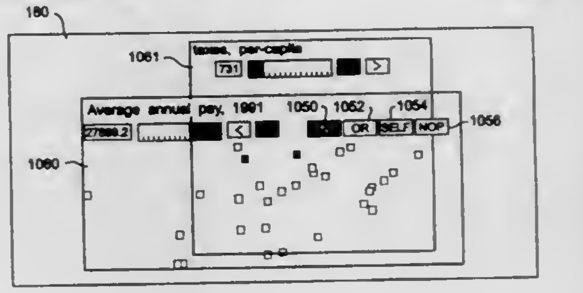
METHOD AND APPARATUS FOR INTERACTIVE DATABASE QUERIES VIA MOVABLE VIEWING OPERATION REGIONS

Kenneth P. Fishkin, Redwood City; Maureen C. Stone, Los Altos, and Jock D. Mackinlay, Palo Alto, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 96,193, Jul. 21, 1993, Pat. No. 5,479,603. This application Jun. 7, 1995, Ser. No. 484,759

Int. Cl.^{6} G06T *3/00*

U.S. Cl. 345—346 **18 Claims**



1. A method of operating a machine comprising the steps of:

generating in a memory of the machine a database comprised of a plurality of objects and a plurality of sets of data attributes, each of the objects having one of the sets of data attributes linked thereto;

displaying on a display device of the machine a plurality of images each of the plurality of images representing one of the plurality of objects;

generating a first viewing operation region having a first viewing operation for selecting a first type of data attribute of the plurality of attributes;

positioning the first viewing operation region over a portion of the plurality of images on the display device;

operating the first viewing operation ot the first viewing operation region to select data corresponding to the first type of data attribute, whereby the first viewing operation automatically filters data according to a predetermined criteria as the first viewing operation region is moved;

generating a second viewing operation region having a second viewing operation for selecting a second type of data attribute and further having a composition mode;

positioning the second viewing operation region over a portion of the plurality of images on the display device, the positioning of the second viewing operation region being done to be at least partially coextensive with the first viewing operation region, such that the first viewing operation region and the second viewing operation region are positioned over at least some of the same images displayed on the display device;

operating the second viewing operation of the second viewing operation region to select data corresponding to the second type of data attribute, whereby the second viewing operation automatically filters data according to a predetermined criteria as the second viewing operation region is moved, and for operating on the data selected by the first viewing operation and the data selected by the second viewing operation in accordance with the composition mode, for those images over which the first viewing operation region and the second viewing operation region are coextensively positioned; and,

altering at least one of the images on the display device in response to results of the operation based on the composition mode.

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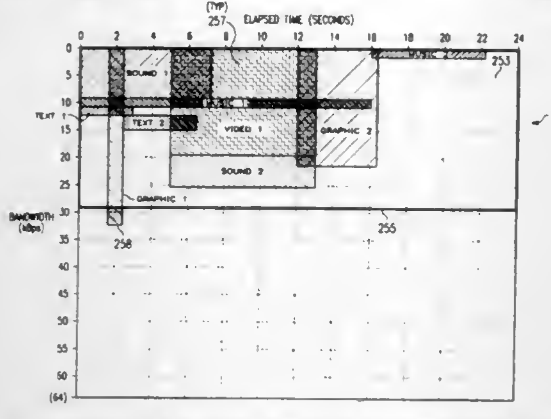
5,841,438
VISUAL AID FOR BANDWIDTH ALLOCATION IN MULTIMEDIA SCRIPTING TOOLS

Ellis K. Cave, Garland, Tex., assignor to InterVoice Limited Partnership, Reno, Nev.

Filed Oct. 10, 1997, Ser. No. 949,062

Int. Cl.^{6} G06F *15/00*

U.S. Cl. 345—348 **53 Claims**



1. A method for allocating bandwidth in a multimedia scripting tool, the method comprising the steps of:

(a) writing a playback script calling for the playback of a plurality of media objects each having a known data size, the playback script comprising a plurality of playback icons deployed on a playback score, each playback icon representing a corresponding media object, each playback icon deployed on the playback score according to a preselected period in real time in which the playback script calls for the corresponding media object to be played back;

(b) responsive to step (a), robotically deploying download icons on a download score to create a download script corresponding to the playback script, one download icon deployed for each media object represented by a playback icon deployed on the playback score, deployment of a download icon on the download score representing delivery of the corresponding media object in real time to feed playback thereof in the playback script;

(c) introducing a constraint of bandwidth in which the download script must deliver media objects to feed playback thereof in the playback script; and

(d) manually rearranging and adapting the shapes of the download icons on the download score so that the delivery script delivers media objects within the constraint of bandwidth to keep up with demand therefor in the playback script.

5,841,439
UPDATING GRAPHICAL OBJECTS BASED ON OBJECT VALIDITY PERIODS

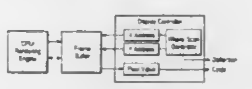
Ronald David Pose, Caulfield North, and Matthew James Regan, Glen Waverley, both of Australia, assignors to Monash University, Clayton, Australia

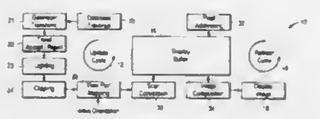
Division of Ser. No. 307,330, Sep. 16, 1994, abandoned. This application Apr. 24, 1997, Ser. No. 847,567

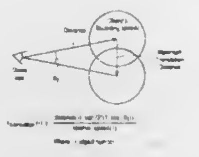
Claims priority, application Australia, Jul. 22, 1994, PM 701 3/98

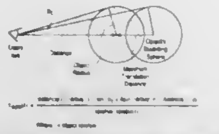
Int. Cl.^{6} G06T *15/00*

U.S. Cl. 345—418 **26 Claims**









1. A graphic display system comprising:

a set of rendering engines;

a plurality of data storage units, wherein each data storage unit in said set of data storage units is coupled to at least one rendering engine in said set of rendering engines; and

a selection means for selecting a data storage unit in said plurality of data storage units, wherein said selected data storage unit is to be used for storing data representing an object to be displayed by said graphic display system and said selected data storage unit is selected based on a validity period of the object,

wherein said selection means includes means for determining the validity period of the object, said means for determining the validity period of the object including:

means for determining a size validity period of the object, and means for determining a translational validity period of the object according to the following equation:

$$\tau_{trans} = \frac{\text{distance} * \text{sqrt}(2 * (1 - \cos(\theta_1)))}{\text{relative\_speed}}$$

wherein the translational validity period is a time required for the object to change by a predetermined translational threshold, wherein said predetermined translational threshold is a first angle extending from a line, wherein the line passes through both a reference point and the object, wherein:

τ_{trans} is the translational validity period,

distance is a length of a portion of the line, wherein the portion extends from the reference point to a center of the object,

relative speed is a speed of the object relative to the reference point, and

θ_1 is the predetermined translational threshold.

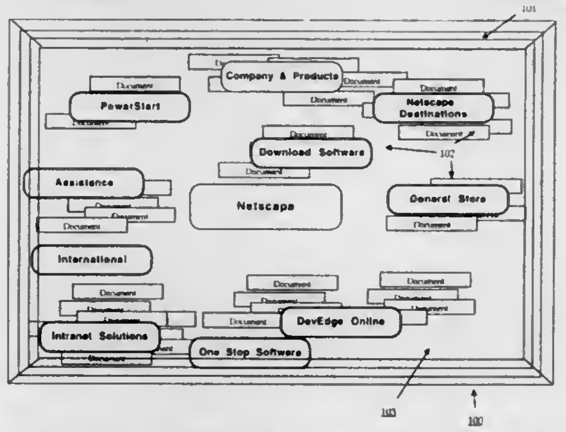
5,841,440
SYSTEM AND METHOD FOR USING A POINTING DEVICE TO INDICATE MOVEMENT THROUGH THREE-DIMENSIONAL SPACE

Ramanathan V. Guha, Los Altos, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Dec. 17, 1996, Ser. No. 767,693

Int. Cl.^{6} G06T *15/00*

U.S. Cl. 345—419 **32 Claims**



1. A method for displaying movement through a virtual three-dimensional space, comprising:

a) determining a viewpoint position in the three-dimensional space;

b) displaying a two-dimensional projection of the three-dimensional space onto a plane, based on the viewpoint position;

c) identifying a point on the plane;

d) identifying a destination position in the three-dimensional space based on the identified point on the plane;

e) moving the viewpoint position in the direction of the destination position; and

f) displaying a two-dimensional projection of the three-dimensional space based on the moved viewpoint position.

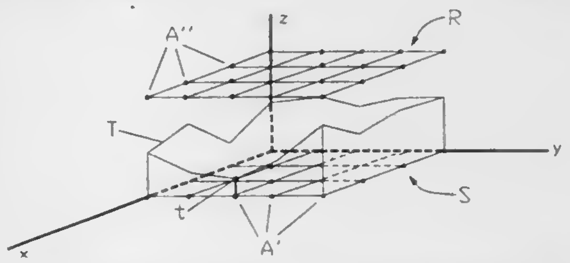
5,841,441
HIGH-SPEED THREE-DIMENSIONAL TEXTURE MAPPING SYSTEMS AND METHODS

David A. Smith, Cary, N.C., assignor to Virtus Corporation, Cary, N.C.

Filed Jan. 19, 1996, Ser. No. 588,997

Int. Cl.^{6} G06T *17/30*

U.S. Cl. 345—430 **7 Claims**



1. A method of mapping a three-dimensional texture onto a surface which is displayed on a graphical display, comprising the steps of:

storing a first array of points representing the surface, each point of the first array having an element of the three-dimensional texture and a texture distance which locates the element with respect to the surface, associated therewith;

in response to a command to move the surface, computing a new location for each point in the first array to obtain a corresponding second array representing the moved surface;

for each point in the first array, computing a three-dimensional reference displacement between the corresponding point of the second array and a reference location spaced a reference distance apart from the point;

computing a scaled three-dimensional reference displacement for each point of the first array by dividing the corresponding three-dimensional reference displacement by the corresponding reference distance;

computing a three-dimensional texture displacement for each element of the three-dimensional texture associated with each point of the first array by multiplying the corresponding scaled three-dimensional reference displacement by the texture distance associated with the element; and

computing a location for each element of the three-dimensional texture associated with each point in the first array by adding the corresponding texture displacement to the location of the corresponding point in the second array.

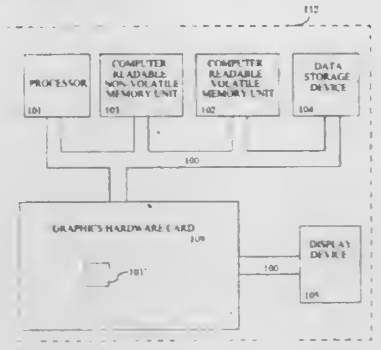
5,841,442
METHOD FOR COMPUTING PARAMETERS USED IN A NON-HOMOGENEOUS SECOND ORDER PERSPECTIVE TEXTURE MAPPING PROCESS USING INTERPOLATION

Mark Alan Einkauf, Leander, and Michael Kerry Larson, Austin, both of Tex., assignors to Cirrus Logic, Inc., Fremont, Calif.

Filed Dec. 30, 1996, Ser. No. 777,558

Int. Cl.^{6} G06F *15/00*

U.S. Cl. 345—430 **19 Claims**



1. In a computer controlled graphics display system, a method of determining input parameters for driving a texture mapping procedure, said method comprising the computer implemented steps of:

a) accessing from memory a triangle primitive representing an image for physical display in (x, y) coordinates on a screen, said triangle primitive having a minimum vertex, a middle vertex, and a maximum vertex;

b) solving for coefficients of a first quadratic expression representing texel coordinate values (u) across a major slope of said triangle primitive from said minimum vertex to said maximum vertex;

c) based on step b), solving for the parameter du—main and the parameter d2u_main, wherein du_main is the rate of change of u over y and d2u_main is the rate of change of du_main over y;

d) assigning u_main equal to the u coordinate of said minimum vertex;

e) solving a set of relationships comprising a set of quadratic relationships each representing texel coordinate values across a scan line within said triangle primitive to obtain a first coefficient associated with one scan line, a second coefficient associated with all scan lines, and a parameter du_ortho_add;

f) based on said first and said second coefficients of said step e), solving for the parameter du_ortho and the parameter d2u_ortho, wherein du_ortho is the rate of change of u over x and d2u_ortho is the rate of change of du_ortho over x; and

g) supplying u_main, du_main, d2u_main, du_ortho, d2u_ortho, and du_ortho_add to said texture mapping process.

5,841,443
METHOD FOR TRIANGLE SUBDIVISION IN COMPUTER GRAPHICS TEXTURE MAPPING TO ELIMINATE ARTIFACTS IN HIGH PERSPECTIVE POLYGONS

Mark Alan Einkauf, Leander, Tex., assignor to S3 Incorporated, Santa Clara, Calif.

Filed Feb. 20, 1997, Ser. No. 803,460

Int. Cl.^{6} G06F *15/00*

U.S. Cl. 345—430 **20 Claims**

1. In a computer controlled graphics display system wherein objects are represented by data structures defining: the orientation

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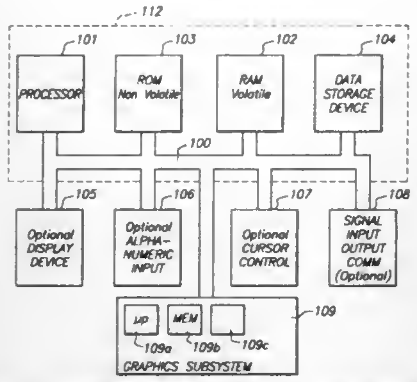


and location of a plurality of polygons; and texture data defining surface characteristics of said object, said data structures at least partially stored in computer memory prior to rendering on a display screen, a method for subdividing polygons having a high degree of perspective, said method comprising the steps of:

(a) selecting, from said computer memory, a selected polygon from said plurality of polygons that at least partially define a depiction of said object, said selected polygon comprising at least three vertices wherein each vertex has a perspective term, W, associated therewith that defines a display perspective of said associated vertex with respect to a given viewing angle;

(b) determining perspective ratios for each pair of adjacent vertices of said at least three vertices of said selected polygon;

(c) subdividing said selected polygon to generate a plurality of new polygons provided any of said perspective ratios exceeds a preselected perspective threshold amount; and

(d) rendering and displaying said selected polygon on a display screen of said computer controlled graphics display system provided none of said perspective ratios exceeds said preselected perspective threshold amount.

5,841,444

MULTIPROCESSOR GRAPHICS SYSTEM

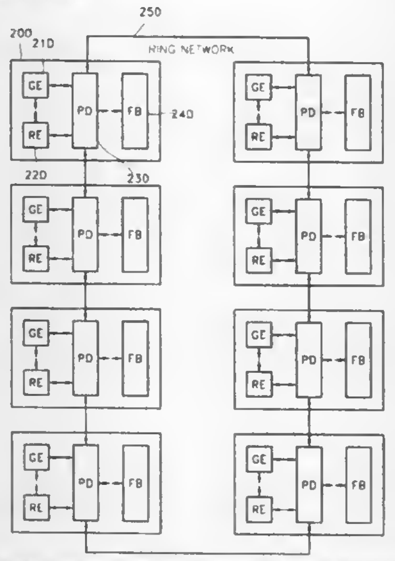
Byung-in Mun, Cheonan, and Kil-su Eo, Seoul, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

Filed Mar. 21, 1997, Ser. No. 823,041

Claims priority, application Rep. of Korea, Mar. 21, 1996, 1996-7730

Int. Cl.^{6} G06T *1/20*

U.S. Cl. 345—506 **8 Claims**



1. A multiprocessor graphics system having a pixel link architecture, comprising:

a plurality of sub-graphics systems each assigned to each of a plurality of sub-screens provided by sectioning a display screen; and

a ring network for connecting said plurality of sub-graphics systems,

wherein each of said sub-graphics systems comprises:

a geometry engine for receiving three dimensional object data from a host processor and performing a floating point operation including transformation, lighting of reflecting the effect of light on color, clipping, perspective projection and triangle division;

a raster engine for calculating the color value, a z-depth value and coordinates of each pixel processed in the geometry engine and performing triangle rasterization, interpolation and bit block transmission;

a local frame buffer for storing data belonging to a sub-screen assigned to said local frame buffer; and

a pixel distributor for receiving data processed in said raster engine, checking a pixel address, storing said data in said local frame buffer if said pixel address belongs to its own local frame section, and transmitting said data to another sub-graphics system via said ring network if said pixel address does not belong to its own local frame section.

5,841,445

IMAGE DISPLAYING APPARATUS

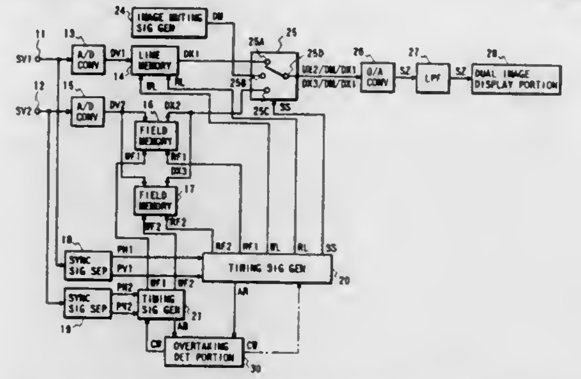
Toshihiko Hamamatsu, Saitama; Masayuki Suematsu, Chiba, and Makoto Kondo, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 18, 1996, Ser. No. 666,595

Claims priority, application Japan, Jun. 30, 1995, 7-165356

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 345—508 **7 Claims**



1. An image displaying apparatus comprising;

line memory means in which each of line period segments of a first video signal is successively written and from which each written line period segment of the first video signal is read during a reading period corresponding substantially to a half line period intermittently to produce a first half line period video signal segment,

first field memory means in which a first every other field period portions of a second video signal is successively written and from which each of line period segments contained in each written field period portion of the second video signal is read during a reading period corresponding substantially to a half line period intermittently to produce a second half line period video signal segment,

second field memory means in which a second every other field period portion of the second video signal is successively written and from which each of line period segments contained in each written field period portion of the second video signal is read during a reading period corresponding substantially to a half line period intermittently to produce a third half line period video signal segment,

signal selecting means operative to perform selectively a first operation for extracting alternately the first half line period video signal segment obtained from the line memory means and the second half line period video signal segment obtained from the first field memory means to form a first field period video signal portion and a second operation for extracting alternately the first half line period video signal segment obtained from the line memory means and the third half line period video signal segment obtained from the second field memory means to form a second field period video signal portion,

dual image display means for displaying double window picture images corresponding to images represented by the first and second video signals, respectively, in response to the first and second field period video signal portions obtained alternately and successively from the signal selecting means,

overtaking detecting means for detecting a condition of overtaking reading of the line period segment possibly caused in the first and second field memory means, and

writing and reading controlling means operative to control a timing for writing and reading of the first every other field period portion of the second video signal in the first field memory means and a timing for writing and reading of the second every other field period portion of the second video signal in the second field memory means so as to suppress defects of display resulting from the overtaking reading and appearing on the double window picture images displayed on the dual image display means when the condition of overtaking reading of the line period segment is detected by the overtaking detecting means.

5,841,446

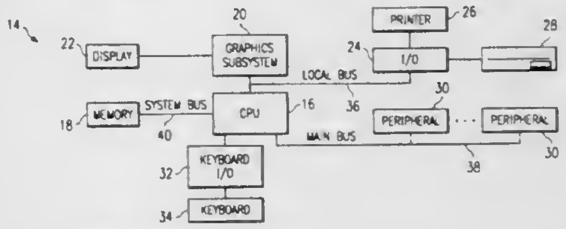
METHOD AND APPARATUS FOR ADDRESS MAPPING OF A VIDEO MEMORY USING TILING

Dayang Dai, Houston, Tex., assignor to Compaq Computer Corp., Houston, Tex.

Filed Nov. 1, 1996, Ser. No. 742,881

Int. Cl.^{6} G09G *5/00*

U.S. Cl. 345—516 **20 Claims**



1. A video subsystem, comprising:

a video memory including a plurality of storage elements addressed by multiple bit physical addresses;

a video display including a plurality of pixels addressed by multiple bit logical addresses, wherein a number of bytes necessary to store information for a plurality of pixels across the screen is not equal to an integral power of two and the logical addresses of the plurality of pixels are arranged in tiles; and

address conversion circuitry for converting the logical addresses of the pixels to physical addresses in the video memory by dividing lower significant bits of the logical address to convert the logical addresses to the physical addresses.

5,841,447

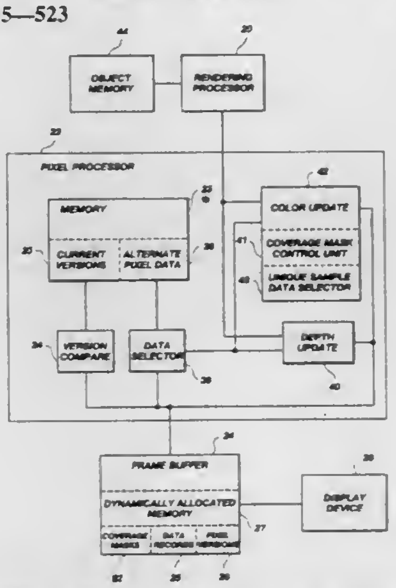
SYSTEM AND METHOD FOR IMPROVING PIXEL UPDATE PERFORMANCE

Michael D. Drews, Sandy, Utah, assignor to Evans & Sutherland Computer Corporation, Salt Lake City, Utah

Filed Aug. 2, 1995, Ser. No. 510,508

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 345—523 **24 Claims**



1. A computer graphics system for displaying dynamic images on a display device using multiple sample pixel data representative of said dynamic images, comprising:

a processor to generate multiple samples of data per pixel;

a coverage mask control unit to manage coverage masks associated with said multiple samples of data per pixel;

a data memory for storing said coverage masks and said multiple samples of data per pixel;

a display device for displaying dynamic images represented by said multiple samples of data per pixel stored in said memory.

5,841,448

SUBSTRATE FOR INK-JET HEAD, HAVING AN OPTICAL ELEMENT INK-JET HEAD, AND INK-JET APPARATUS

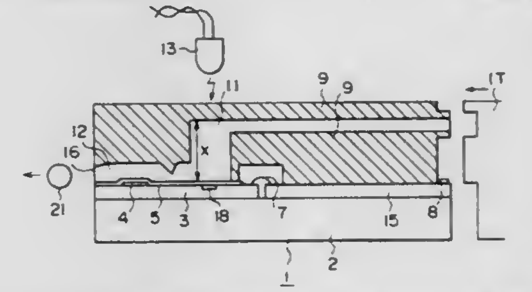
Jiro Moriyama, Kawasaki; Sadayuki Sugama, Tsukuba; Hiromitsu Hirabayashi, Yokohama; Hiroshi Tajika, Yokohama; Noribumi Koitabashi, Yokohama; Yuji Akiyama, Yokohama; Yoshiyuki Imanaka, Yokohama, and Masaaki Izumida, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaishi, Tokyo, Japan

Filed Dec. 28, 1994, Ser. No. 365,024

Claims priority, application Japan, Dec. 28, 1993, 5-336704; Dec. 27, 1994, 6-324402

Int. Cl.^{6} B41J *29/393;2/195*

U.S. Cl. 347—19 **16 Claims**



1. An ink-jet head for performing recording by discharging an ink, comprising:

a discharge port for discharging the ink;

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an ink channel which communicates with said discharge port and is provided with a discharge energy generating element for discharging the ink; and

a substrate on which said discharge energy generating element is disposed,

wherein an optical element comprising at least one of a light emitting portion for performing transmission of light and a light receiving portion for performing reception of light is arranged at a position on said substrate corresponding to said ink channel, of said ink-jet head.

5,841,449
HEATER POWER COMPENSATION FOR PRINTING LOAD IN THERMAL PRINTING SYSTEMS

Kia Silverbrook, Leichhardt, Australia, assignor to Eastman Kodak Company, Rochester, N.Y.

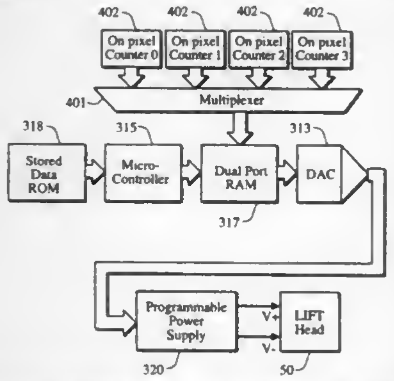
PCT No. PCT/US96/04885, § 371 Date Dec. 5, 1996, § 102(e) Date Dec. 5, 1996, PCT Pub. No. WO96/32271, PCT Pub. Date Oct. 17, 1996

PCT Filed Apr. 9, 1996, Ser. No. 765,035

Claims priority, application Australia, Apr. 12, 1995, PN 2316

Int. Cl.^{6} B41J *2/06*

U.S. Cl. 347—55 **13 Claims**



1. In a printing apparatus having a plurality of separately energizable pixel actuator elements, an improved power control system comprising:

(a) a logic unit adapted to determine and signal a number of pixel actuator elements to be energized during a forthcoming energization period; and

(b) a power control unit which receives signals from said logic unit and varies a power supply voltage V_{PS} to said pixel actuator elements during energization periods in response to said signals thereto, wherein the power supply voltage is determined according to the equation:

$$V_{PS}=\left(1+\frac{R_{out}}{npR_H}\right)V_H$$

where

(1) V_H is a voltage required to be supplied to the pixel actuator elements,

(2) R_{OUT} is an output resistance of the programmable power supply,

(3) R_H is the resistance of a single pixel actuator element,

(4) p an integer representing the number of pixel actuator elements that are turned on in the current enable period, and

(5) n is a constant equal to the number of pixel actuator elements represented by one least significant bit of p.

5,841,450
INK JET PRINT RECORDING APPARATUS

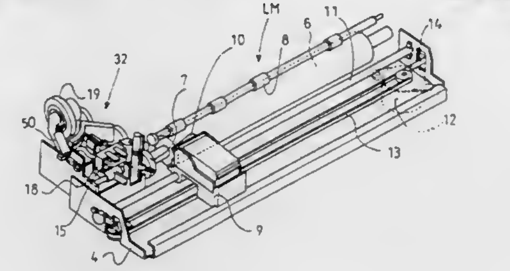
Hiroki Kawamura, Nisshin, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

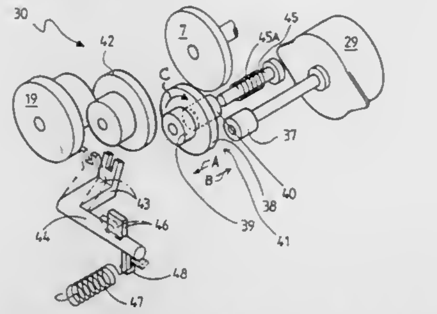
Filed Dec. 12, 1995, Ser. No. 570,935

Claims priority, application Japan, Dec. 26, 1994, 6-337784

Int. Cl.^{6} B41J *2/165*

U.S. Cl. 347—32 **20 Claims**





1. An ink jet print recording apparatus having an ink jet type print head for jetting ink from an ink discharge port onto a print medium to print an image on the print medium, recovering means for recovering the print head, a feeding roller for feeding the print medium and a driving motor for driving said recovery means and said feeding roller, comprising:

a recovery gear provided to said recovery means;

a feeding gear provided to said feeding roller;

a transmission gear which is driven by said driving motor and switchably linked to one of said recovery gear and said feeding gear; and

engagement control means for controlling said driving motor to reciprocatively rotate said transmission gear in an angular range which is equal to or smaller than a half of the tooth width of said transmission gear when a link target of said transmission gear is switched, thereby performing a smooth gear switching operation, wherein said transmission gear is moved in a shaft direction to switch the link target.

5,841,451
SCAN INTERVAL CONTROL IN INK JET RECORDING APPARATUS

Hiromitsu Hirabayashi, Yokohama; Shigeyasu Nagoshi; Atsushi Arai, both of Kawasaki; Yuji Akiyama, Yokohama; Hitoshi Sugimoto, Kawasaki; Miyuki Matsubara, Tokyo; Fumihiro Gotoh, Yokohama, and Masaya Uetuki, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 9,320, Jan. 26, 1993, abandoned. This application Jun. 17, 1997, Ser. No. 877,312

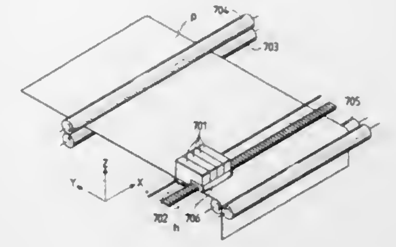
Claims priority, application Japan, Jan. 28, 1992, 4-013046

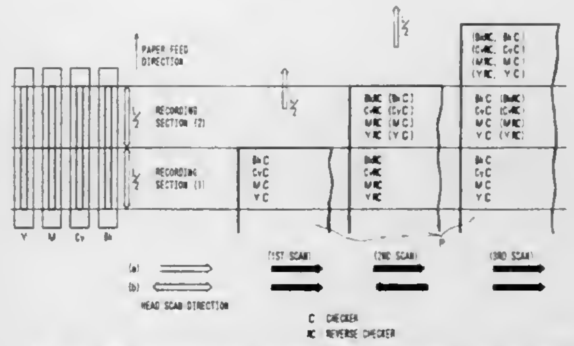
Int. Cl.^{6} B41J *2/47*

U.S. Cl. 347—41 **36 Claims**

1. An ink jet recording apparatus for performing recording by ejecting an ink onto a recording medium using a recording head having a plurality of ink ejection portions, comprising:

image forming means for completing image formation on the recording medium by performing a plurality of number of times of record scans of the recording head for an image area; and





scan interval management means for managing a scan interval so that a difference between scan intervals relating to continuous record scans of the plurality of number of times of record scans for the image area by said image forming means falls within a predetermined time range,

wherein said scan interval comprises a record scan time and an interval between said continuous record scans, and wherein during an interval a process other than a recording process can be performed,

wherein said scan intervals, which correspond to said record scans respectively, include a relatively long scan interval and relatively shorter scan intervals, and said scan interval management means varies the intervals between continuous record scans so that the relatively short scan intervals before and after the relatively longer scan interval are caused to gradually approach the relatively longer interval.

5,841,452
METHOD OF FABRICATING BUBBLEJET PRINT DEVICES USING SEMICONDUCTOR FABRICATION TECHNIQUES

Kia Silverbrook, Wollahra, Australia, assignor to Canon Information Systems Research Australia Pty Ltd, and Canon Kabushiki Kaisha, both of Tokyo, Japan

Continuation of Ser. No. 827,986, Jan. 29, 1992, abandoned. This application Sep. 15, 1994, Ser. No. 306,537

Claims priority, application Australia, Jan. 30, 1991, PK4374; Feb. 22, 1991, PK4731; Feb. 22, 1991, PK4732; Feb. 22, 1991, PK4733; Feb. 22, 1991, PK4734; Feb. 22, 1991, PK4735; Feb. 22, 1991, PK4736; Feb. 22, 1991, PK4737; Feb. 22, 1991, PK4738; Feb. 22, 1991, PK4739; Feb. 22, 1991, PK4740; Feb. 22, 1991, PK4741; Feb. 22, 1991, PK4742; Feb. 22, 1991, PK4743; Feb. 22, 1991, PK4744; Feb. 22, 1991, PK4745; Feb. 22, 1991, PK4746

Int. Cl.^{6} B41J *2/14*

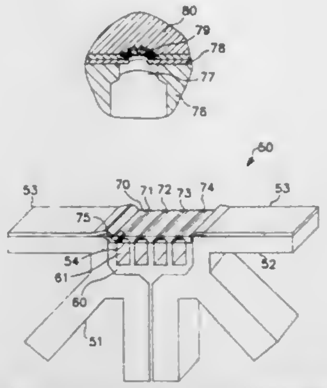
U.S. Cl. 347—47 **10 Claims**

1. A method of fabricating a bubblejet print device using semiconductor fabrication techniques, said method comprising the steps of:

forming a heater means and an electrical connection to said heater means on a substrate;

forming a first hole adjacent to said heater means from one side of said substrate where said heater means is arranged, said first hole being served as an ejecting port for ejecting an ink; and

forming a second hole on said substrate from the other side of said substrate which is opposite to the one side of said substrate where said heater means is arranged to communicate



between said first and said second holes, thereby forming a through hole including said first and said second holes.

5,841,453
INK JETTING APPARATUS

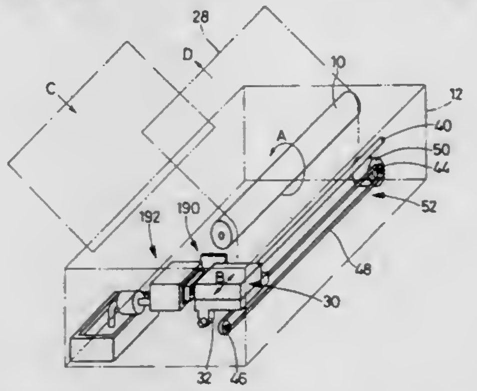
Toyonori Sasaki, Anjo, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Dec. 18, 1995, Ser. No. 574,361

Claims priority, application Japan, Dec. 27, 1994, 6-325346

Int. Cl.^{6} B41J *2/175;2/14*

U.S. Cl. 347—86 **43 Claims**



1. An ink jetting apparatus comprising:

an ink container which contains an ink therein and has an ink outlet through which said ink container supplies said ink;

an ink-jetting head which jets said ink supplied from said ink container; and

a head holder which supports said ink-jetting head and which includes a connecting device connecting between the ink-jetting head and said ink outlet of said ink container detachably attached to said head holder,

said ink container including at least one first engageable portion provided in a head-side portion thereof which is connectable to said ink-jetting head by said connecting device of said head holder, said ink outlet being provided in said head-side portion,

said head holder including at least one second engageable portion which is engageable with said first engageable portion of said ink container,

respective shapes and positions of said first and second engageable portions being predetermined such that said ink container is rotatable by a user relative to said head holder about a rotation center defined by the engaged first and second engageable portions, so that the ink container is attachable to, and detachable from, the head holder.

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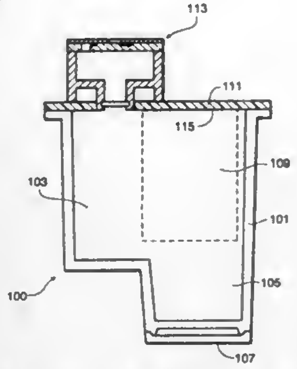
5,841,454

INK-JET PEN GAS SEPARATOR AND PURGE SYSTEM

Ronald W. Hall, and David R. Otis, Jr., both of Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 25, 1995, Ser. No. 519,384
Int. Cl.^{6} B41J *2/175*
U.S. Cl. 347—87 14 Claims



8. A free-ink ink-jet pen for an ink-jet hard copy apparatus, said apparatus including a suction device adapted to be coupled selectively to said pen and an off-board ink reservoir having a fluidic coupling to said pen, the pen comprising:

a pen body including an ink containment chamber having a refillable supply of ink within said ink containment chamber;
a printhead mechanism, mounted on said pen body and having a fluidic coupling to said ink containment chamber;
regulator means, incorporated within said pen, for filling said ink containment chamber from said off-board ink reservoir and for regulating back-pressure at said printhead mechanism; and
means, mounted on said pen body and cooperative with said regulator means, for cyclically separating and purging gas from said ink within said ink containment chamber of said pen body by cyclically coupling said suction device to said means for cyclically separating and purging gas.

5,841,455

INK CONTAINER FOR INK JET RECORDING HAVING TWO DIFFERENT INK ABSORBING MATERIALS INCLUDING A FIBROUS MATERIAL

Shigeaki Tanaka, Kawasaki; Masami Ikeda, Tokyo; Naohito Asai, Yokohama; Nobuyuki Kuwabara, Tokyo; Makiko Kimura, Sagamihara; Teruo Arashima, and Masaaki Izumida, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

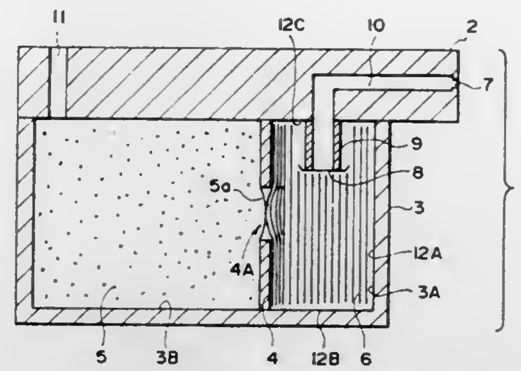
Division of Ser. No. 368,056, Jan. 3, 1995, Pat. No. 5,621,446, which is a continuation of Ser. No. 801,360, Dec. 2, 1991, abandoned. This application Jan. 6, 1997, Ser. No. 779,310

Claims priority, application Japan, Nov. 30, 1990, 2-329748; Nov. 30, 1990, 2-329749; Nov. 30, 1990, 2-329751; Nov. 30, 1990, 2-329752; Nov. 30, 1990, 2-329753; Nov. 30, 1990, 2-329754

Int. Cl.^{6} B41J *2/175*
U.S. Cl. 347—87 31 Claims

1. An ink container connectable with an ink supply tube of a recording head, comprising:

a container body;
an ink supply portion, provided at a first position of said container body, for receiving the ink supply tube to supply ink to said recording head;
an air vent, provided at a second position of said container body, for fluid communication between an inside and an outside of said container body;
a first ink absorbing material, of fibrous material, for retaining the ink therein, said first ink absorbing material accommodated in a part of said container body so as to cover said ink supply portion; and



a second ink absorbing material, of porous material, for retaining the ink therein, said second ink absorbing material occupying substantially an entire space in said container body except for said first ink absorbing material;
wherein said first ink absorbing material and said second ink absorbing material are at least partly in contact with each other, said first ink absorbing material being in the form of a block of fibers extending in a direction toward said ink supply portion, said fibrous material being abutted by an end of the ink supply tube; and
wherein said first ink absorbing material has a capillary force which is larger than that of said second ink absorbing material.

5,841,456

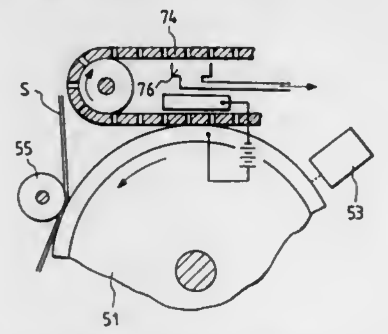
TRANSFER PRINTING APPARATUS WITH DISPERSION MEDIUM REMOVAL MEMBER

Katsumori Takei; Tsuyoshi Kitahara; Takahiro Katakura; Toshihisa Saruta; Toshio Kumagai, and Tohru Fukushima, all of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Aug. 20, 1992, Ser. No. 932,699

Claims priority, application Japan, Aug. 23, 1991, 3-212082; Sep. 12, 1991, 3-233403; Nov. 26, 1991, 3-336149; Jul. 8, 1992, 4-206026

Int. Cl.^{6} B41T *2/01;* G03G *15/10*
U.S. Cl. 347—103 14 Claims



12. A transfer printing apparatus comprising:

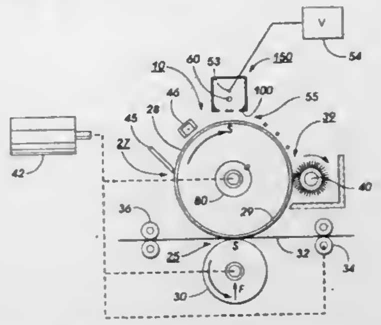
means for writing an image, corresponding to recording information, by projecting liquid ink including a dispersion medium and a coloring material;
a recording image transfer medium receiving, directly from said means for writing an image, said projected liquid ink corresponding to said image written by said means for writing an image;
means, disposed adjacent to said writing means, for removing by absorption said dispersion medium from the ink in said image without removing said coloring material, wherein said means disposed adjacent to said writing means does not contact said recording image transfer medium; and
means for transferring said ink in said recording image with the dispersion medium removed therefrom to a recording medium.

5,841,457

ION STREAM SPLITTING AND PRE-FOCUSING

Richard F. Bergen, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 24, 1996, Ser. No. 670,832 .
Int. Cl.^{6} B41J *2/415*
U.S. Cl. 347—120 18 Claims



1. An ionographic printing apparatus, comprising:

an ion source;
a charge receptor positioned to receive ions from said ion source;
means for moving the charge receptor in a predetermined direction at a predetermined velocity;
an imaging apparatus including an ion deposition control device operatively interposed between the ion source and the charge receptor, the control device being adapted to narrow ions emitted from the ion source into an ion stream of a predetermined cross-sectional area, and to displace the ion stream to a predetermined position on the charge receptor, the ion deposition control device including a substrate defining at least two rows of apertures therethrough for the passage of ions from the ion source to the charge receptor, and an electrode positioned on said substrate and facing said ion source for creating an electric field passing from a surface of the substrate adjacent the ion source through the apertures in the substrate; and
an ion stream splitting member positioned a predetermined distance between said ion source and said ion deposition control device for splitting ions from said ion source into two separate uniform streams of ions focused into the two rows of apertures to increase the efficiency of said ionographic image printing apparatus.

5,841,458

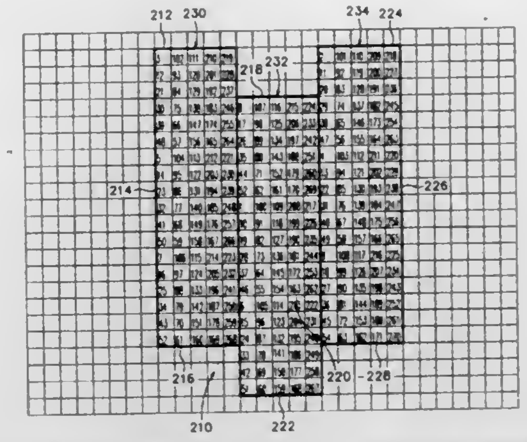
HALFTONING METHOD FOR MULTI-COLOR LASER PRINTER

Stephen M. Kroon, Sherwood, Oreg., assignor to Tektronix, Inc., Wilsonville, Oreg.

Filed May 28, 1996, Ser. No. 655,018
Int. Cl.^{6} B41J *2/47*
U.S. Cl. 347—131 6 Claims

1. In an electrophotographic imaging system, a method of creating a halftone pattern using nonaligned primary color halftone screens to synthesize a multi-color image having rich, saturated colors, comprising:

defining multiple color planes in a spatially aligned overlay, each one of the color planes corresponding to a different primary color and belonging to one of first and second different sets;
developing halftone cells for the color planes, each of the halftone cells having a first darkened pixel and a last darkened pixel at predetermined positions, each of the halftone cells in the first set of color planes having pixels designated for spot growth in a first spot fill order from the first to the last darkened pixels and in the second set of color planes having pixels designated for spot growth in a second spot fill order from the first to the last darkened pixels; and
synthesizing the multi-color image by darkening the pixels of the halftone cells in each color plane belonging to the first set to achieve spot growth in the first spot fill order and darkening the pixels in the halftone cells in each color plane belonging to the second set of color planes having pixels to achieve spot growth in the second spot fill order that is the reverse of the first spot fill order.

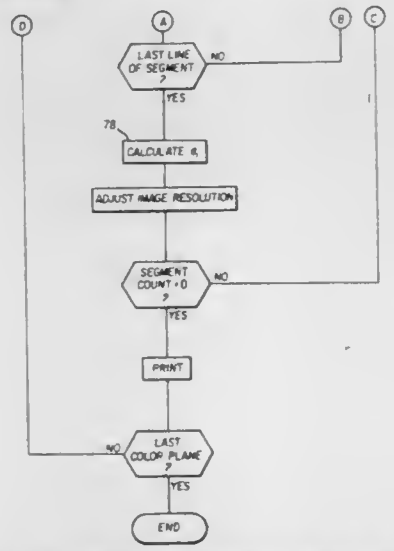


5,841,459

COLOR-TO-COLOR REGISTRATION IN THERMAL PRINTERS BY ADJUSTING IMAGE RESOLUTION BASED ON IMAGE CONTENT

Xin Wen, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 24, 1996, Ser. No. 637,315
Int. Cl.^{6} B41J *2/325*
U.S. Cl. 347—176 17 Claims



1. A color thermal dye transfer printer for producing superposed color plane images of varying image densities on a receiver medium, the printer comprising:

a printhead movable in a print direction relative to the receiver medium to produce images on the receiver medium at a printing rate, the images being of selectable resolution along the print direction;
means for determining the image density of each color plane image; and
means for setting the image resolution for each color plane according to the image densities of the color plane images.

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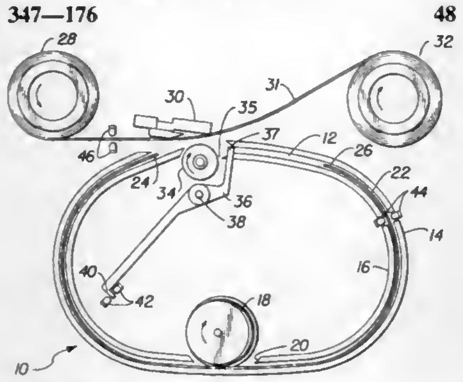
5,841,460
THERMAL PRINTER WHICH RECIRCULATES RECEIVER SHEET BETWEEN SUCCESSIVE PRINTING PASSES

Daniel Charles Maslanka; Terrence Lee Fisher, and Vlade Josif Kordovich, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 30, 1996, Ser. No. 641,250

Int. Cl.⁶ B41J *13/00*

U.S. Cl. 347—176 **48 Claims**



1. A thermal printer for printing onto a receiver sheet having a leading edge and a trailing edge, the printer comprising:

an elongated rotatable platen having a peripheral surface;

an elongated thermal print head positioned parallel to the platen;

a closed loop pathway for recirculating a receiver sheet in a printing direction from the platen and back to the platen, the platen being positioned for rotation in the printing direction with at least a portion of the peripheral surface in the pathway to engage a receiver sheet or a dye donor web;

a supply roll of dye donor web positioned up stream of the print head;

means for moving the print head into the pathway opposite the portion of the peripheral surface to press the print head into engagement with the dye donor web, the dye donor web into engagement with the receiver sheet, and the receiver sheet into engagement with the platen, with sufficient force (a) upon operation of the print head for thermal transfer of dye to the receiver sheet and (b) upon rotation of the platen in the printing direction for transport of either the dye donor web or both the dye donor web and the receiver sheet between the print head and the platen;

means for rotating the platen in the printing direction to move either the dye donor web or both the dye donor web and the receiver sheet between the print head and the platen; and

means for recirculating the receiver sheet through the closed loop pathway in the printing direction for successive thermal transfers of different dyes from the dye donor web.

5,841,461
ACCUMULATED HEAT CORRECTION METHOD AND APPARATUS

Nobuo Katsuma, Saitama, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 16, 1996, Ser. No. 698,695

Claims priority, application Japan, Aug. 17, 1995, 7-209779

Int. Cl.⁶ B41J *3/20*

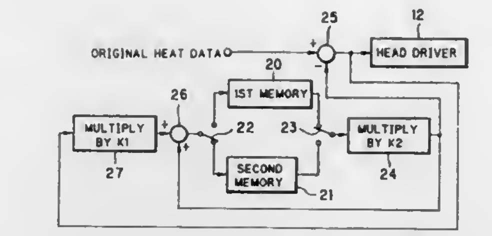
U.S. Cl. 347—195 **7 Claims**

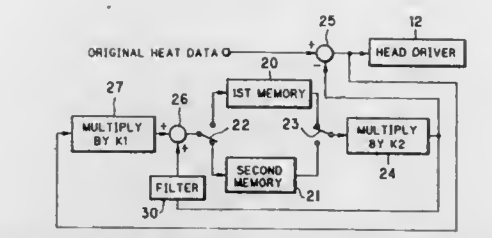
1. A method of correcting accumulated heat for a thermal printer having a thermal head with a plurality of heating elements disposed in line, the method comprising the steps of:

multiplying corrected heat data of an Nth line by a coefficient K1 to obtain first data of an (N+1)th line;

adding accumulated heat correcting data of the Nth line to said first data of the (N+1)th line in dot-to-dot correspondence, to obtain second data of the (N+1)th line;

multiplying said second data of the (N+1)th line by a coefficient K2 to obtain accumulated heat correcting data of the (N+1)th line,





subtracting said accumulated heat correcting data of the (N+1)th line from said original heat data of the (N+1)th line to provide corrected heat data of the (N+1)th line, and

applying the corrected heat data of the (N+1)th line to a head driver which drives the thermal head to print (N+1)th line.

5,841,462
THERMAL TRANSFER PRINTING METHOD

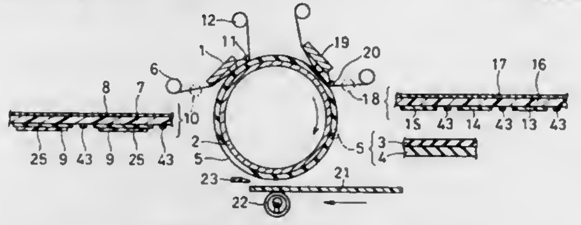
Hiroyuki Matsuo, Neyagawa; Yasuo Fukui, Kadoma; Akihiro Imai; Nobuyoshi Taguchi, both of Ikoma; Atsushi Sogami, Sanda, and Masanori Yoshikawa, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd.

Continuation of Ser. No. 297,300, Aug. 29, 1994, abandoned. This application Oct. 11, 1996, Ser. No. 730,316

Claims priority, application Japan, Sep. 1, 1993, 5-217276

Int. Cl.⁶ B41J *2/325*

U.S. Cl. 347—213 **24 Claims**



1. A thermal transfer printing method comprising:

(a) a color developing layer transfer process which comprises:
  (i) providing a color developing layer transfer sheet having at least one color developing layer including a binder resin on a surface of a substrate, said binder resin having a flow softening point, and said substrate exhibiting an increasing force of adhesion to said color developing layer with increasing temperature,
  (ii) applying pressure to said color developing layer to apply said color developing layer to a surface layer of an intermediate medium, said surface layer exhibiting an decreasing force of adhesion to said color developing layer with increasing temperature,
  (iii) heating said color developing layer to a temperature not less than the flow softening point of the color developing layer binder resin,
  (iv) cooling said color developing layer to a temperature not greater than the point of intersection between a temperature-dependent variation curve of the adhesive force between said color developing layer substrate and said color developing layer and a temperature-dependent variation curve of the adhesive force between said color developing layer and said intermediate medium, and
  (v) separating said substrate of said color developing layer transfer sheet from said surface layer of said intermediate medium in order to transfer said color developing layer from said substrate of said color developing layer transfer sheet to said surface layer of said intermediate medium,

(b) a recording process which comprises:
  (i) providing a dye layer transfer sheet having at least a dye layer including a binder resin having a flow softening point, on a surface of a substrate,
  (ii) applying pressure to said dye layer to apply said dye layer to said color developing layer on said surface layer of said intermediate medium,
  (iii) heating said dye layer to a temperature not less than the flow softening point of the dye layer binder resin so as to form a recorded image by transferrng dyes from said dye layer to said color developing layer on said surface layer of said intermediate medium means,
  (iv) cooling said dye layer and color developing layer to a temperature not greater than either of the flow softening point of the binder resin of said dye layer or the flow softening point of the binder resin of said color developing layer, and
  (v) separating said substrate of said dye layer transfer sheet from said surface layer of said intermediate medium; and

(c) a transfer process which comprises
  (i) heat-transferring said color developing layer having said recorded image formed thereon on the surface of said surface layer of said intermediate medium means to a color receiving sheet and
  (ii) separating said color receiving sheet from said surface layer of said intermediate medium.

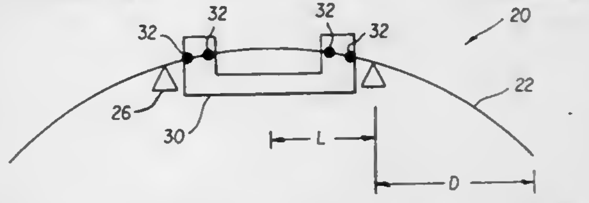
5,841,463
ALIGNMENT CORRECTION FOR LASER PRINT HEADS

John R. Debesis, Penfield, and Kenneth L. Baker, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 27, 1996, Ser. No. 672,161

Int. Cl.⁶ B41J *2/47;* **G02B** *26/00*

U.S. Cl. 347—242 **29 Claims**



1. A method of manufacturing a laser print head comprising the steps of:

mounting a laser array comprised of a plurality of diode lasers on a print head block;

measuring misalignment of said diode lasers in said laser array to determine a correction factor;

mounting a cylinder lens on upright posts of a cylinder lens holder;

inducing a predetermined bend into the cylinder lens corresponding to said correction factor by allowing the cylinder lens to sag on said upright posts of said cylinder lens holder;

attaching said cylinder lens to a sub-mount;

attaching flexures to said sub-mount;

aligning said cylinder lens to said laser array; and

attaching said flexures to said print head block.

5,841,464
APPARATUS AND METHOD FOR MAKING GRAPHIC PRODUCTS BY LASER THERMAL TRANSFER

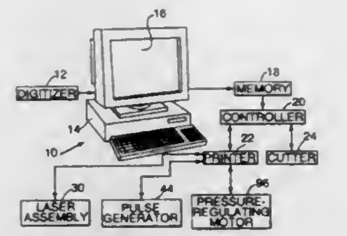
Raymond Phillips, Portland, Conn., assignor to Gerber Scientific Products, Inc., Manchester, Conn.

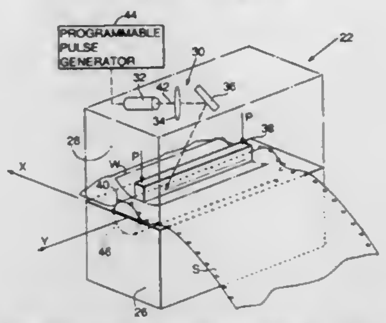
Filed Oct. 25, 1995, Ser. No. 548,235

Int. Cl.⁶ B41J *2/47;3/20;* **G01D** *6/14*

U.S. Cl. 347—253 **31 Claims**

1. An apparatus for printing graphic products on any of a plurality of types of sheet materials with any of a plurality of types of ink webs bearing ink, comprising:





a platen for supporting the sheet material with the ink web overlying and in turn supported by the sheet material;

a laser source for transmitting a beam of radiation at a predetermined wavelength into the ink web along a line of laser impingement on the ink web for heating and in turn transferring ink from the ink web to the sheet material in accordance with a printing program of image data for printing graphic images on the sheet material;

a laser window mounted over the platen for pressing the ink web against the sheet material and hence the sheet against the platen along the line of laser impingement to facilitate the transfer of ink from the web to the sheet material, the laser window being transmissive at the predetermined wavelength along the line of laser impingement to permit the beam of radiation to pass through the window and into the ink web and thereby print the graphic images on the sheet material; and

means for controlling the laser for printing the graphic products on the selected sheet material, said means including means for selecting the level of radiation energy transmitted into the ink web based on at least one of the type of the ink web and the type of the sheet material for effecting a transfer of ink from the ink web to the sheet material.

5,841,465
LIGHT BEAM FOCAL POSITION DETECTING DEVICE, LIGHT BEAM PROJECTING DEVICE, AND LIGHT BEAM RECORDING APPARATUS

Hideki Fukunaga; Shoji Yamaguchi, and Takashi Nomiyama, all of Nakai-machi, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 2, 1996, Ser. No. 725,324

Int. Cl.⁶ B41J *2/47*

U.S. Cl. 347—258 **17 Claims**

1. A light beam focal position detecting device for detecting a focal position of a light beam which is emitted by a light source and focused by a focusing optical system, said device comprising:

light beam detection means disposed on the optical path of said light beam, at a position where said light beam from said focusing optical system converges toward the focal position or at a position where said light beam diverges from the focal position, and adapted to receive said light beam and produce a signal which depends on a diameter of said light beam; and

focal position detecting means which compares said beam diameter signal with a prescribed value and produces, based on the

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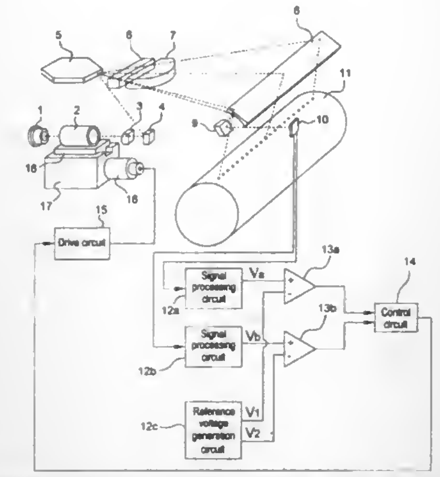

5
6
7
8
11
1
2
3
4
9
10
16
18
17
15
Drive circuit
13a
14
Signal processing circuit
Va
12a
13b
Control circuit
Signal processing circuit
Vb
12b
Reference voltage generation circuit
V1
V2
12c

difference thereof, a focal position signal indicative of a positional relation of the focal position of said light beam with a prescribed focal position.

5,841,466
OPTICAL VISUALIZING APPARATUS AND METHOD OF CONTROLLING THE SAME

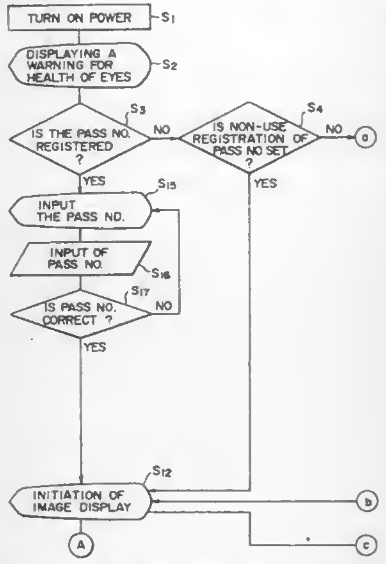
Motoshi Mizoguchi; Daiji Takahashi, and Yoshio Okoshi, all of Kanagawa, Japan, assignors to Sony Corporation, Japan

Filed Sep. 20, 1996, Ser. No. 717,277

Claims priority, application Japan, Sep. 28, 1995, 7-250009

Int. Cl.^{6} H04N *7/00;* H04L *9/00*

U.S. Cl. 348—5.5 **26 Claims**


TURN ON POWER
S1
DISPLAYING A WARNING FOR HEALTH OF EYES
S2
S3
IS THE PASS NO. REGISTERED ?
NO
S4
IS NON-USE REGISTRATION OF PASS NO SET ?
NO
a
YES
YES
S15
INPUT THE PASS NO.
INPUT OF PASS NO.
S16
S17
IS PASS NO. CORRECT ?
NO
YES
S12
INITIATION OF IMAGE DISPLAY
b
c
A

1. An optical visualizing apparatus, comprising:
- image display means for displaying images based on an image signal;
- password input means for receiving an input password;
- memory means for storing the input password inputted into said password input means and for storing at least one correct password; and
- a controller for comparing the input password inputted into said password input means with at least one correct password stored in said memory means to cause said image display means to display an image only when both the input and the correct passwords match, wherein said controller requests input of the input password at a predetermined time period after a start time of the image display on said image display means before continuing said image display after the predetermined time period.

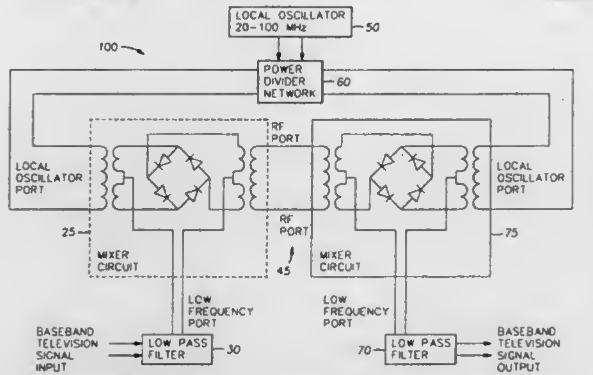
5,841,467
GROUND ISOLATION CIRCUIT FOR ISOLATING A TRANSMISSION LINE FROM GROUND INTERFERENCE

Craig A. Davidson, Webster, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 1, 1996, Ser. No. 595,312

Int. Cl.^{6} H04N *7/10;* H04B *1/26*

U.S. Cl. 348—6 **5 Claims**



1. An isolation circuit for coupling a component to a transmission line, comprising:
- a first mixer circuit receiving a baseband data signal at a low frequency port and providing a modulated signal at a high frequency port;
- a second mixer circuit receiving said modulated signal at a high frequency port and providing a demodulated baseband signal at a low frequency port; and
- a local oscillator coupled to both said first mixer circuit and to said second mixer circuit to provide a carrier signal to said first mixer circuit for modulation and to provide a signal to said second mixer for demodulation, wherein each port of said first and second mixer circuits is transformer coupled, and wherein the baseband signal comprises a video signal with a lower and upper frequency range.

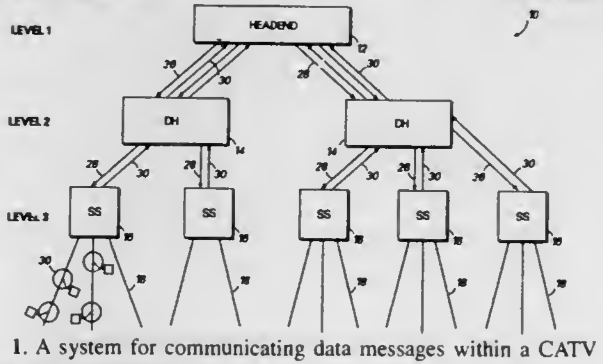
5,841,468
SYSTEM AND METHOD FOR ROUTING DATA MESSAGES THROUGH A CABLE TRANSMISSION SYSTEM

Terry Wright, Norcross, Ga., assignor to Convergence. Com, Suwanee, Ga.

Filed Apr. 26, 1996, Ser. No. 638,280

Int. Cl.^{6} H04N *7/173;7/16*

U.S. Cl. 348—6 **28 Claims**



1. A system for communicating data messages within a CATV network comprising:
- a headend for generating a transmission signal having broadcast and data signals;
- a plurality of service sites, each service site being coupled to said headend by a transmission cable and a return cable, said transmission cable to each service site providing said transmission signal to said service site;
- a plurality of service lines extending from each of said service sites to couple a plurality of subscribers to each said service site and to provide said transmission signal received from said headend at each said service site to said subscribers coupled to each said service site; and
- a spectrum parallel router (SPR) in each of said service sites, said SPR being coupled to said service lines extending from said service site, each said SPR for receiving data messages from said subscribers in a return spectrum of said service lines coupled to said SPR, said SPR in each of said service sites routing data messages received from one subscriber to another subscriber coupled to said SPR through one of said services lines in response to a destination address in said received data messages identifying one of said subscribers in said plurality that is coupled to said SPR and said SPR in each of said service sites placing said received data messages on said return cable for transmission to said headend in response to said destination address in a received data message not corresponding to one of said subscribers coupled to said SPR so that said data messages from one service site are isolated from data messages from other service sites by said return cable.

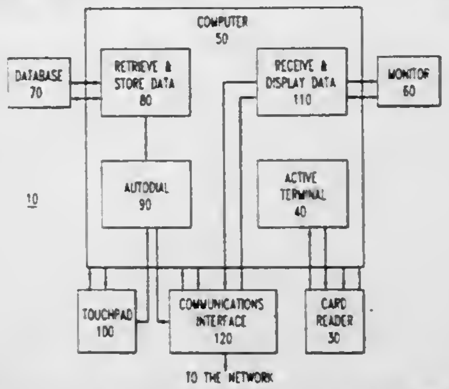
5,841,469
AUDIOVISUAL TELECOMMUNICATION METHOD AND APPARATUS USING A DIGITAL NETWORK

Karen Martita Freeman, Washington, D.C.; Herman Joseph Pieters, Miami, Fla., and Jack Andrew Pitman II, Germantown, Md., assignors to Lucent Technologies Inc., Murray Hill, N.J., and Herman J. Pieters, Miami, Fla.

Filed May 23, 1995, Ser. No. 448,239

Int. Cl.^{6} H04M *11/00;* H04N *7/14*

U.S. Cl. 348—15 **25 Claims**



1. A network of audiovisual communication terminals interconnected by a communication medium, wherein each terminal comprises:
- a) a monitor system for playing out and receiving voice and picture information, the monitor system including a display screen, the monitor system further including a microphone and video camera for video teleconferencing;
- b) a card reader adapted to activate the terminal only after reading the balance in an account on a debit card;
- c) a communication interface device that conditions, for reception, audiovisual signals from others of said terminals that pass to the monitor system via the communication medium, and that conditions, for transmission, audiovisual signals to be sent to others of said terminal via the communication medium;
- d) a dial-up device adapted to make contact with at least one specified other of said terminals;
- e) a destination database at least of some other of said terminals;
- f) an information-retrieval device adapted, upon request, to retrieve from the destination database information about others of said terminals and, responsive to the retrieved information, to display on the screen a selectable listing of other terminals to which contact may be made;
- g) a user-activated selection device adapted to automatically direct the dial-up device to make contact with a terminal selected by a user from the displayed listing; and
- h) an administrative office interconnectable with each of said terminals, an administrative database included within the administrative office, and means for sending data from the administrative office to each said terminal and storing said data at each said terminal, wherein said administrative database comprises a schedule of reserved timeslots for designated terminals, and said sending and storing means are adapted to transfer, from said schedule to each of the designated terminals, reservation information pertaining to the respective timeslot reserved for that terminal.

5,841,470
CODING AND DECODING VIDEO SIGNALS

William John Welsh, Felixstowe, England, assignor to British Telecommunications public limited company, London, England

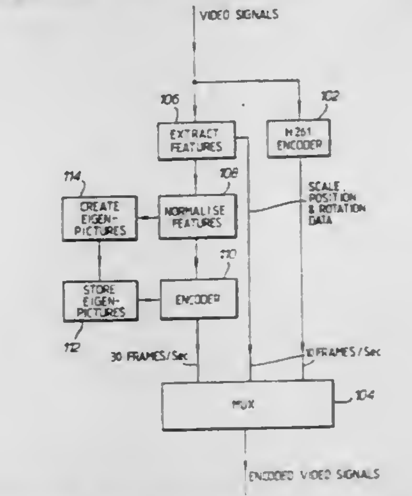
PCT No. PCT/GB93/01352, § 371 Date Jan. 17, 1995, § 102(e) Date Jan. 17, 1995, PCT Pub. No. WO94/00951, PCT Pub. Date Jan. 6, 1994

PCT Filed Jun. 29, 1993, Ser. No. 360,830

Claims priority, application European Pat. Off., Jun. 29, 1992, 92305963

Int. Cl.^{6} H04N *7/28*

U.S. Cl. 348—397 **16 Claims**



1. A method on encoding video signals comprising:
- providing a series of frames supplied at an original frame rate in which the frames are encoded by a first encoder
- providing a first coder output from said first encoder at a first frame rate which is less than the original frame rate
- said method further including a step wherein one or more portions of the image area of the series of frames is/are encoded by a second encoder to provide a second coded output at a second frame rate greater than the first frame rate.

5,841,471
TIMING CONTROL FOR A DIGITALLY INTERFACED CAMERA USING VARIABLE LINE READOUT INTERVALS

Jay A. Endsley, Fairport; Thomas N. Berarducci, Webster, and Kenneth A. Parulski, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 12, 1996, Ser. No. 712,689

Int. Cl.^{6} H04N *5/76;5/225;7/00*

U.S. Cl. 348—231 **7 Claims**

1. A digital camera for capturing images and transferring the captured images to a host computer, said camera comprising:
- an image sensor exposed to image light for capturing the images and generating image signals;
- a timing generator, incorporating a line request control signal, for controlling the readout of lines of photosites from the

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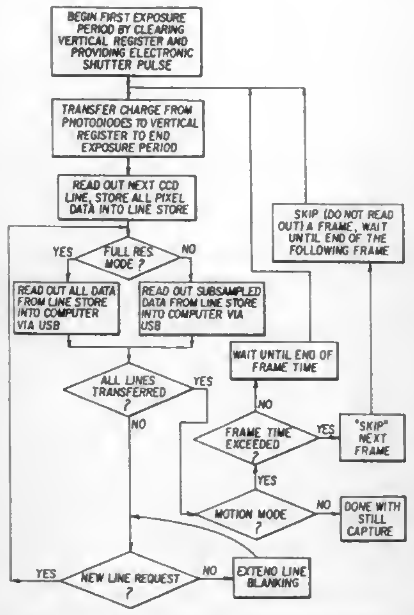

BEGIN FIRST EXPOSURE PERIOD BY CLEARING VERTICAL REGISTER AND PROVIDING ELECTRONIC SHUTTER PULSE
TRANSFER CHARGE FROM PHOTODIODES TO VERTICAL REGISTER TO END EXPOSURE PERIOD
READ OUT NEXT CCD LINE, STORE ALL PIXEL DATA INTO LINE STORE
FULL RES MODE ?
YES
NO
READ OUT ALL DATA FROM LINE STORE INTO COMPUTER VIA USB
READ OUT SUBSAMPLED DATA FROM LINE STORE INTO COMPUTER VIA USB
SKIP (DO NOT READ OUT) A FRAME, WAIT UNTIL END OF THE FOLLOWING FRAME
WAIT UNTIL END OF FRAME TIME
ALL LINES TRANSFERRED ?
FRAME TIME EXCEEDED ?
"SKIP" NEXT FRAME
MOTION MODE ?
DONE WITH STILL CAPTURE
NEW LINE REQUEST ?
EXTEND LINE BLANKING

image sensor, wherein consecutive line readout is separated by a blanking time and the timing generator varies the blanking time between lines;

an A/D converter for converting the image signals into digital image data;

a digital memory for storing at least one line of digital image data; and

a digital interface for providing the digital image data read from the digital memory to the host computer, wherein the timing generator initiates a new line readout in response to the line request control signal indicating the fullness of the digital memory.

5,841,472
MPEG2 TRANSPORT DECODER

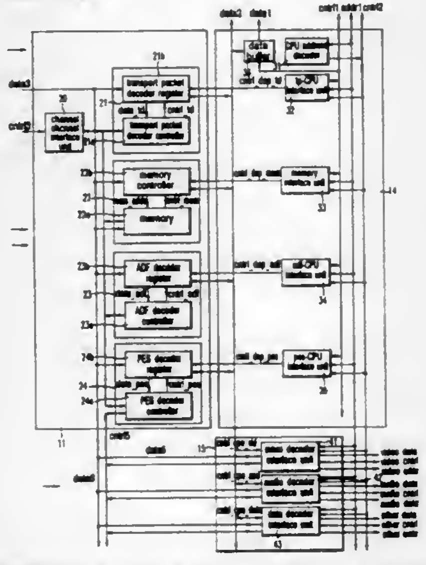
Chai Yeol Rim, and Hyun Soo Lee, both of Seoul, Rep. of Korea, assignors to LG Electronics Inc., Seoul, Rep. of Korea

Filed Nov. 20, 1995, Ser. No. 559,634

Claims priority, application Rep. of Korea, Nov. 23, 1994, 1994 30875

Int. Cl.^{6} H04N *7/24*

U.S. Cl. 348—390 **17 Claims**


data2
data1
ctrl1
addr1
ctrl2
data3
ctrl3
21b
transport packet decoder register
transport packet decoder controller
channel decoder interface unit
memory controller
memory
data buffer
CPU address decoder
CPU interface unit
video decoder interface unit
audio decoder interface unit
data decoder interface unit
11
14
15

1. An MPEG2 transport decoder comprising a channel decoder unit for outputting a signal received through a satellite or a cable by tuning or duplicating to a transport packet data; a transport decoder for decoding the transport packet data; and video, audio and data decoders for decoding the video, audio and data signals by the transport decoder, said transport decoder further comprising:

a transport parser unit for storing each syntax field value by parsing, outputting each data identified with the packet identifier (PID) after collecting from each packet data and outputting the interrupt signal if a pointed register value of register values is set;

a CPU interface unit for providing an interface between the resister file of said transport parser unit and each decoder and outputting a signal selecting a transport parser unit or a video decoder, an audio decoder, a data decoder and a memory by decoding the address;

a CPU for reading the interrupt register from said CPU interface unit once an interrupt signal is inputted, detecting if the interrupt signal is inputted from said transport parser unit or from the video decoder, the audio decoder and the data decoder, and decoding according to the program on a memory unit;

a memory unit for storing a program of the operations of said CPU; and

a decoder interface unit for controlling in order to exchange the data among said CPU, said transport parser unit and said video, audio, data decoders.

5,841,473
IMAGE SEQUENCE COMPRESSION AND DECOMPRESSION

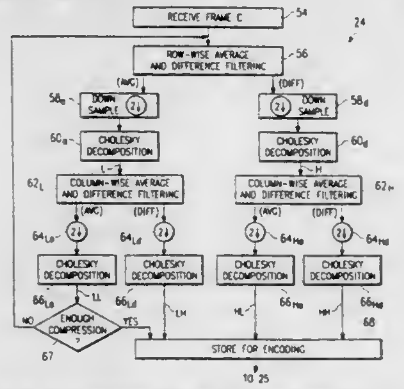
Charles K. Chui, Brazos County, and Jianrong Wang, Montgomery County, both of Tex., assignors to Software for Image Compression, N.V., Curacao, Netherlands Antilles

PCT No. PCT/US96/12326, § 371 Date Oct. 31, 1996, § 102(e) Date Oct. 31, 1996, PCT Pub. No. WO97/06642, PCT Pub. Date Feb. 20, 1997

PCT Filed Jul. 26, 1996, Ser. No. 732,491

Int. Cl.^{6} H04N *7/26;7/50*

U.S. Cl. 348—390 **16 Claims**



1. A method of compressing and decompressing a sequence of images, comprising the steps of:

compressing the sequence of images into a compressed sequence, by performing the steps of:

digitizing each image in the sequence into an image frame comprising an array of intensity coefficients arranged in first and second directions;

performing an intraframe decomposition of each image frame by the steps of:

performing averaging and differencing of the image frame in a first direction to generate average and difference coefficient sequences;

downsampling the average and difference coefficient sequences;

performing averaging and differencing of the image frame in a second direction; and

downsampling sequences from the step of performing averaging and differencing of the image frame in the second direction, to generate a decomposed image frame;

performing an interframe decomposition of groups of decomposed image frames to generate a compressed sequence of image frames;

decompressing the compressed sequence of images into a reconstructed sequence, by performing the steps of:

performing an interframe reconstruction of the groups of decomposed image frames; and

then performing an intraframe reconstruction of each image frame by the steps of:

upsampling the average and difference coefficient sequences;

performing average and difference combining of the upsampled sequences in the second direction;

upsampling sequences resulting from the step of performing average and difference combining; and

performing averaging and differencing of the image frame in the first direction, to generate a reconstructed image frame;

wherein one of the intraframe decomposition and intraframe reconstruction steps further comprises:

performing Cholesky filtering upon coefficient sequences corresponding to the image frame.

5,841,474
HIGH-EFFICIENCY ENCODER AND VIDEO INFORMATION RECORDING/REPRODUCING APPARATUS

Tomohiro Ueda; Takashi Itow; Yoshinori Asamura; Ken Onishi, and Hidetoshi Mishima, all of Nagaokakyo, Japan, assignors to Mitsubshi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 11,243, Jan. 29, 1993, Pat. No. 5,479,264. This application Nov. 15, 1995, Ser. No. 559,488

Claims priority, application Japan, Jan. 29, 1992, 4-013719; Feb. 25, 1992, 4-037599; Feb. 25, 1992, 4-037821; Feb. 28, 1992, 4-043075

Int. Cl.^{6} H04N *1/36;7/50*

U.S. Cl. 348—402 **55 Claims**

1. A high-efficiency encoder comprising:

encoding means for segmenting a digitized video signal into blocks of a predetermined size, and for encoding the blocks;

prediction means for performing motion-compensation prediction on each block to reduce a created code amount along a direction;

detection means for detecting the occurrence of a scene change in a motion-compensation prediction processing step; and

means for, when a scene change occurs, switching the direction along which the created code amount is reduced.

5,841,475
IMAGE DECODING WITH DEDICATED BIDIRECTIONAL PICTURE STORAGE AND REDUCED MEMORY REQUIREMENTS

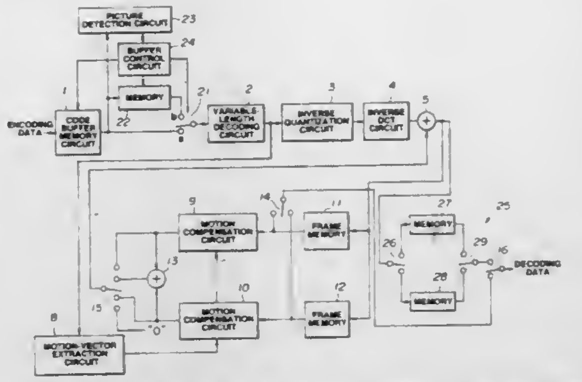
Kouichi Kurihara, and Shuji Abe, both of Kanagawa-ken, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 26, 1995, Ser. No. 548,487

Claims priority, application Japan, Oct. 28, 1994, 6-265834; Oct. 28, 1994, 6-265835; Oct. 28, 1994, 6-265836

Int. Cl.^{6} H04N *7/32*

U.S. Cl. 348—409 **6 Claims**


PICTURE DETECTION CIRCUIT
23
BUFFER CONTROL CIRCUIT
24
MEMORY
22
1
21
2
3
4
5
ENCODING DATA
CODE BUFFER MEMORY CIRCUIT
VARIABLE LENGTH DECODING CIRCUIT
INVERSE QUANTIZATION CIRCUIT
INVERSE DCT CIRCUIT
9
14
11
MOTION COMPENSATION CIRCUIT
FRAME MEMORY
27
25
MEMORY
26
29
16
DECODING DATA
28
13
10
12
15
8
"0"
MOTION-VECTOR EXTRACTION CIRCUIT

1. An image decoding apparatus comprising:

decoding means to which encoding data including bidirectional predictive encoding data which use forward and rearward reference images are inputted, for decoding inputted encoding data in predetermined blocks to output decoding data;

memory means for retaining said inputted bidirectional predictive encoding data;

control means for successively giving said inputted bidirectional predictive encoding data and bidirectional predictive encoding data which are stored in said memory means, to said decoding means, to cause decoding processings regarding the same bidirectional predictive encoding data to be executed twice;

first output means for retaining decoding data due to first decoding processing regarding said bidirectional predictive encoding data from said decoding means, corresponding to at least one block line, and for outputting decoding data of one field of the retained decoding data, in display order; and

second output means for retaining decoding data due to second decoding processing regarding said bidirectional predictive encoding data from said decoding means, corresponding to at least one block line, and for outputting the decoding data of the other field of the retained decoding data, in display order.

5,841,476
CODING APPARATUS FOR ENCODING MOTION PICTURE

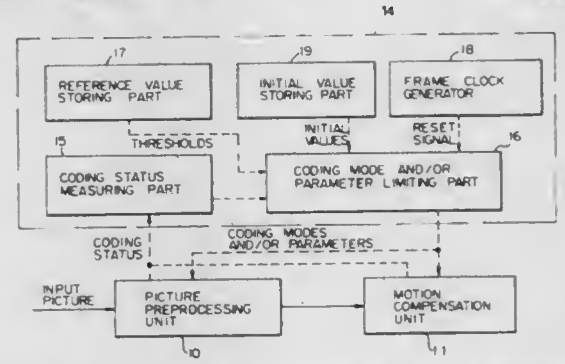
Yasuhiro Takishima; Shigeyuki Sakazawa, both of Tokyo, and Masahiro Wada, Kanagawa, all of Japan, assignors to Kokusai Denshin Denwa Co. Ltd., Tokyo, Japan

Filed Feb. 28, 1996, Ser. No. 608,511

Claims priority, application Japan, Mar. 3, 1995, 7-068865

Int. Cl.^{6} H04N *7/36*

U.S. Cl. 348—416 **16 Claims**


14
17
REFERENCE VALUE STORING PART
19
INITIAL VALUE STORING PART
18
FRAME CLOCK GENERATOR
15
THRESHOLDS
INITIAL VALUES
RESET SIGNAL
16
CODING STATUS MEASURING PART
CODING MODE AND/OR PARAMETER LIMITING PART
CODING STATUS
CODING MODES AND/OR PARAMETERS
INPUT PICTURE
PICTURE PREPROCESSING UNIT
MOTION COMPENSATION UNIT
10
11

1. A motion picture coding apparatus for searching a plurality of proposed coding modes and/or parameters, for selecting a suitable coding mode and/or a suitable parameter, and for encoding motion pictures using the selected coding mode and/or parameter, said apparatus comprising:

a measuring means for measuring histograms of magnitudes of motion vectors during coding processes to provide measured histograms; and

a limiting means for adaptively limiting a size of a search range of motion vectors depending upon the measured histograms.

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5,841,477

METHOD FOR RECTIFYING CHANNEL ERRORS IN AN IMAGE SIGNAL TRANSMITTED FROM A BLOCK-BASED ENCODER

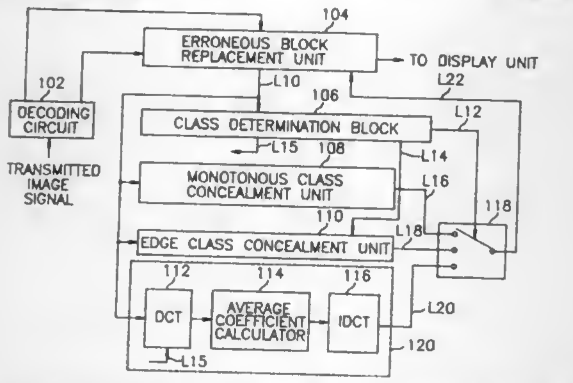
Jin-Hun Kim, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed May 22, 1996, Ser. No. 651,381

Claims priority, application Rep. of Korea, Dec. 29, 1995, 1995 64313

Int. Cl.^{6} H04N *7/12;11/02;11/04:7/00*

U.S. Cl. 348—420 **6 Claims**


104
ERRONEOUS BLOCK REPLACEMENT UNIT
TO DISPLAY UNIT
L10
L22
102
DECODING CIRCUIT
106
L12
CLASS DETERMINATION BLOCK
TRANSMITTED IMAGE SIGNAL
L15
108
L14
MONOTONOUS CLASS CONCEALMENT UNIT
L16
110
118
L18
EDGE CLASS CONCEALMENT UNIT
112
114
116
DCT
AVERAGE COEFFICIENT CALCULATOR
IDCT
L20
120
L15

1. A method, for use in an image signal decoding system, for concealing errors in an image signal transmitted in a block-by-block compressed form, the decoding system including a decoding circuit for decoding the transmitted image signal into a decoded image signal on a block-by-block basis and detecting an erroneous block which contains an error, the erroneous block having a predetermined number of surrounding blocks without containing an error therein, each of the surrounding blocks having a multiplicity of pixels therein, the method comprising the steps of:

- (a) classifying each of the surrounding blocks into one of a monotonous class, an edge class and a texture class in accordance with a variance of said each surrounding block and projection values of said each surrounding block resulting from directional projection process, the monotonous class representing a block without containing an edge therein, the edge class representing a block containing one edge therein, and the texture class representing a block containing more than one edge therein;
- (b) classifying the erroneous block as the edge class, if only one pair of the surrounding blocks positioned opposite each other with respect to the erroneous block is of the edge class and has an identical edge direction transversing the erroneous block; and, otherwise, as either the monotonous or the texture class depending on the number of the surrounding blocks having either the monotonous or the texture class; and
- (c) rectifying the erroneous block based on the classification thereof such that the pixels included in the erroneous block are of an identical value obtained by averaging the pixel values of the surrounding blocks if the erroneous block is of the monotonous class, such that the pixel values for the erroneous block are determined based on the pixel values forming said identical edge direction transversing the erroneous block if the erroneous block is of the edge class, and such that the pixel values for the erroneous blocks are determined based on the pixel values for the surrounding blocks of the texture class if the erroneous block is of the texture class;

wherein the surrounding blocks include four edge blocks surrounding the erroneous block by an edge distance and four corner blocks contiguous to the erroneous block by a corner distance;

wherein said identical value used in rectifying the erroneous block of the monotonous class is obtained by multiplying a first weight factor to the pixel values of the four edge blocks and a second weight factor to the pixel values of the four corner blocks and summing up the weighted pixel values;

wherein said errors are channel errors from a transmission of the image signal; and wherein the step (a) includes the steps of:

- (a1) calculating a variance for each of the surrounding blocks;
- (a2) comparing the variance for each of the surrounding blocks with a first threshold value;
- (a3) classifying a surrounding block having a variance larger than the first threshold value into a target surrounding block and classifying a surrounding block having a variance equal to or smaller than the first threshold value into the monotonous class;
- (a4) calculating a first difference between a vertical projection value and a horizontal projection value for the target surrounding block and calculating a second difference between a first diagonal projection value and a second diagonal projection value for the target surrounding block;
- (a5) comparing the first and the second differences with a second threshold; and
- (a6) classifying the target surrounding block into the edge class if only one of the differences is larger than or equal to the second threshold and classifying the target surrounding block into the texture class if both differences are smaller or larger than the second threshold.

5,841,478

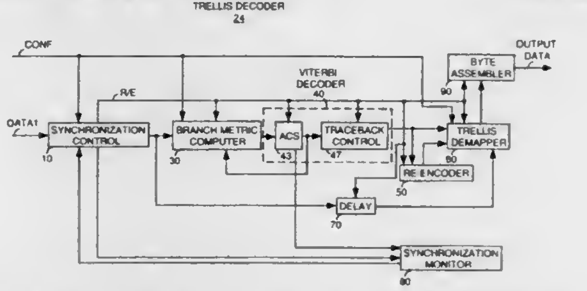
CODE SEQUENCE DETECTION IN A TRELLIS DECODER

Keren Hu, Plainsboro; William Wei-Lian Lin, East Windsor, and Maurice David Caldwell, Plainsboro, all of N.J., assignors to Thomson multimedia, S.A., France

Filed Apr. 9, 1996, Ser. No. 629,673

Int. Cl.^{6} H04N *5/21*

U.S. Cl. 348—426 **13 Claims**



1. In a system for processing video data comprising groups of interleaved trellis encoded data packets, apparatus for providing trellis decoded data comprising:

- means for generating decision data associated with trellis state transitions in response to said video data;
- a traceback network responsive to said decision data for identifying a sequence of antecedent trellis states, as determined by a state transition trellis, wherein said antecedent states are identified for a sequence of collocated interleaved packets said sequence of collocated interleaved packets comprising a first packet of interleaved data in a first intra-group position in a first group of said groups and a second packet of interleaved data in corresponding said first intra-group position in a second group of said groups; and
- means responsive to said identified sequence of antecedent trellis states, for providing said trellis decoded data.

5,841,479

TRANSFORM CODING AND DECODING OF AN EXTENDED DEFINITION VIDEO SIGNAL

Wilhelmus J. Van Gestel, and Leendert T. Rozendaal, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 19, 1996, Ser. No. 588,801

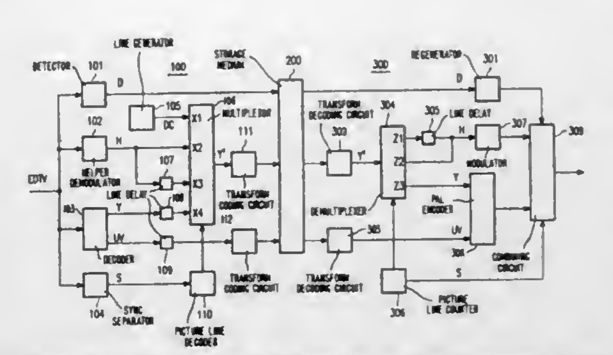
Claims priority, application European Pat. Off., Jan. 20, 1995, 95200144

Int. Cl.^{6} H04N *7/015*

U.S. Cl. 348—432 **23 Claims**

1. A device for coding an extended definition video signal representing pictures having a first series of picture lines with a compatible video signal and at least one second contiguous series of picture lines with a helper signal, comprising:

- transform coding means for coding each picture as an array of picture blocks of N picture lines and M pixels per line, and
- means for adding extra picture lines to at least one of the first and second series of picture lines of the extended definition video signal in order to bring the number of picture lines in the series to an integral multiple of N and to prevent picture blocks from including pixels of both the first and second series of picture lines.



5,841,480

FILM TO VIDEO FORMAT CONVERTER USING LEAST SIGNIFICANT LOOK-UP TABLE

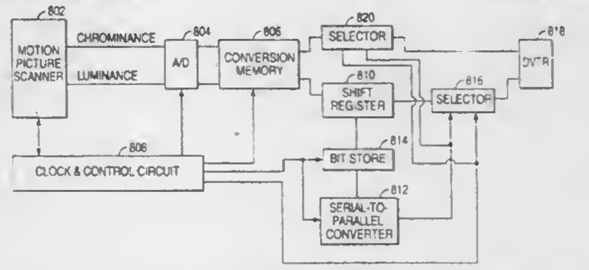
Charles W. Rhodes, Alexandria, Va., assignor to Advanced Television Technology Center, Alexandria, Va.

PCT No. PCT/US94/05081, § 371 Date Nov. 6, 1995, § 102(e) Date Nov. 6, 1995, PCT Pub. No. WO94/27405, PCT Pub. Date Nov. 24, 1994

Continuation-in-part of Ser. No. 57,495, May 6, 1993, Ser. No. 404,190, Sep. 7, 1989, Pat. No. 5,280,397, Ser. No. 53,230, Apr. 28, 1993, Pat. No. 5,504,532, and Ser. No. 404,190. This PCT application May 6, 1994, Ser. No. 307,594

Int. Cl.^{6} H04N *5/782*

U.S. Cl. 348—459 **34 Claims**



1. An apparatus for converting a motion picture film image signal from a first film image signal format to a second signal format, the second signal format compatible with a digital tape recorder, the first film image signal format having a first frame rate and the second signal format having a first field rate, the apparatus comprising:

- a memory for storing first lines of data, the first lines of data stored in an arrangement representing both the first film image signal format and the second signal format;
- first means, responsive to the first frame rate, for generating a first synchronizing signal;
- second means, responsive to the first field rate, for generating a second synchronizing signal; and
- control means, coupled to the memory and responsive to the first synchronizing signal and the second synchronizing signal, for storing the first lines of data in the memory in synchronism with the first synchronizing signal and for reading the first lines of data from the memory in synchronism with the second synchronizing signal.

5,841,481

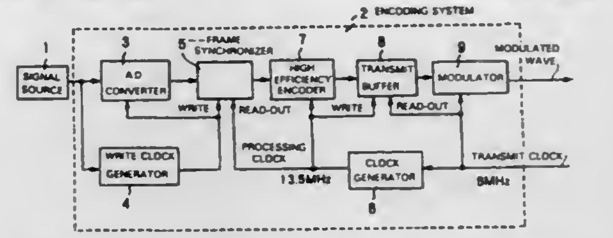
METHOD TO SYNCHRONIZE ENCODING AND DECODING FREQUENCIES

Wataru Yoshikawa, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Apr. 1, 1996, Ser. No. 626,684

Int. Cl.^{6} H04N *5/04*

U.S. Cl. 348—500 **6 Claims**



1. A method of accessing rows in a memory array, said memory array having a memory cell pitch and said rows being connected to a row decoder having a row decoder cell pitch, said method comprising the steps of:

- decoupling the row decoder cell pitch from the memory cell pitch; and
- driving a predetermined number of consecutive rows from opposite sides for row decoders.

5,841,482

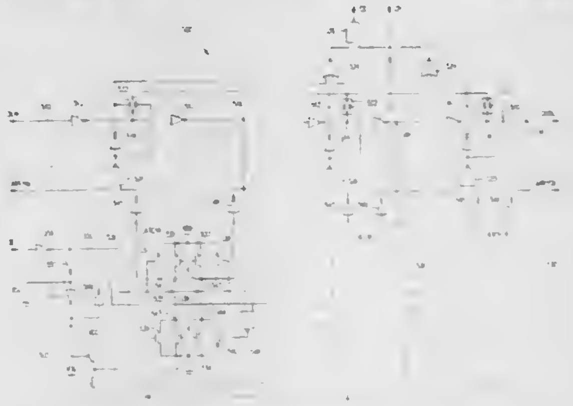
TRANSITION ALIGNED VIDEO SYNCHRONIZATION SYSTEM

Niantsu N. Wang, Milpitas; Sherman Tan King, San Francisco, and Guorjuh T. Hwang, Milpitas, all of Calif., assignors to AuraVision Corporation, Fremont, Calif.

Division of Ser. No. 509,912, Aug. 1, 1995, abandoned. This application Dec. 16, 1996, Ser. No. 768,361

Int. Cl.^{6} H04N *9/475*

U.S. Cl. 348—537 **9 Claims**



1. A synchronization circuit comprising:

- a plurality of delay line sections connected in series to form a delay line, each delay line section having a plurality of taps, wherein a clock signal applied to an end of the delay line provides a series of delayed signals at the taps, each delay line section delays the clock signal by less than a period of the clock signal, and the delay line delays the clock signal by more than the period of the clock signal;
- a plurality of selection units each coupled to taps in a corresponding delay line section, wherein each selection unit selects from among a plurality of delayed signals at the taps in the corresponding delay line section, and in response to one of the delayed signals having a desired phase relative to a transition in a reference signal, generates an output signal from that delayed signal; and
- a selection circuit which selects one of the output signals of the selection units and generates an output clock signal from the selected output signal.

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5,841,483

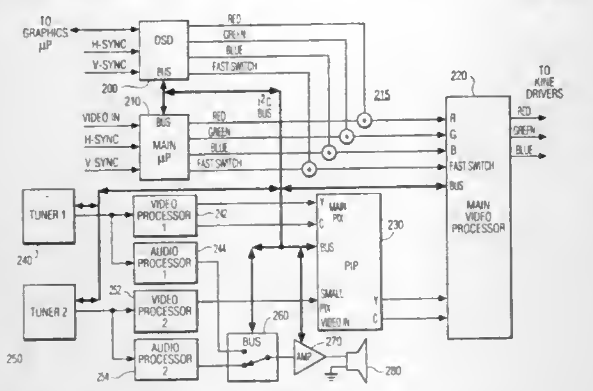
USE OF AN AUDIO PROCESSING CHANNEL IN A TELEVISION RECEIVER DURING A MULTIPICTURE MODE OF OPERATION

Kirk Edward Shafer, Carmel, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Continuation of Ser. No. 667,514, Apr. 4, 1996, abandoned, which is a division of Ser. No. 328,674, Oct. 25, 1994, abandoned. This application May 13, 1997, Ser. No. 855,609

Int. Cl.^{6} H04N *5/45*

U.S. Cl. 348—565 **5 Claims**



1. A television receiver, comprising:

only one tuner for tuning television channels in a repeating sequence for providing recurring samples of video signals at different television channels;

an audio processor for processing audio signals received from said tuner;

a video processor for processing a video signal received from said tuner;

picture-in-picture processor coupled to said video processor and deriving a signal from said video signal for producing an inset image;

a second video processor coupled to said picture-in-picture processor for producing a combined signal which when displayed comprises a video image of an array of inset images sampled from said different television channels; and

control means for controlling said tuner, said second video processor, and said picture-in-picture processor to produce said combined image;

said control means selecting one inset image of said array of inset images in response to an input of a user causing said tuner to cease updating samples of non-selected inset images, and to tune to the channel of said selected inset image and controlling said audio processor to reproduce an audio signal associated with said selected inset image while continuing to display said non-selected inset images along with said selected inset image.

5,841,484

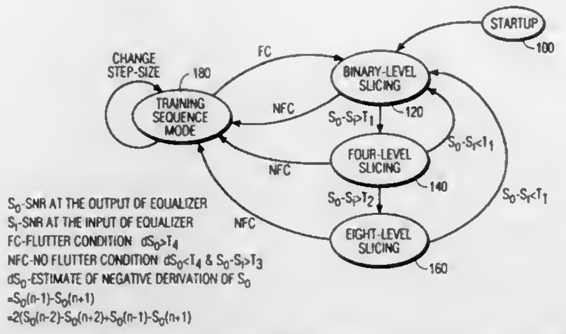
BLIND EQUALIZER METHOD AND APPARATUS FOR HDTY TRANSMISSION USING AN NTSC REJECTION FILTER FOR MITIGATING CO-CHANNEL INTERFERENCE

Samir N. Hulyalkar, Columbia, Md., and Monisha Ghosh, Mohegan Lake, N.Y., assignors to Philips Electronics North North America Corporation, New York, N.Y.

Continuation of Ser. No. 576,546, Dec. 21, 1995, abandoned, which is a continuation-in-part of Ser. No. 230,360, Apr. 20, 1994, Pat. No. 5,512,957, which is a continuation-in-part of Ser. No. 197,773, Feb. 10, 1994, Pat. No. 5,452,015. This application Jul. 2, 1997, Ser. No. 887,406

Int. Cl.^{6} H04N *5/21*

U.S. Cl. 348—607 **44 Claims**


STARTUP
100
CHANGE STEP-SIZE
180
FC
BINARY-LEVEL SLICING
TRAINING SEQUENCE MODE
NFC
S_0-S_I>T_1
120
S_0-S_I<T_1
FOUR-LEVEL SLICING
NFC
140
S_0-S_I>T_2
S_0-S_I<T_1
S_0-SNR AT THE OUTPUT OF EQUALIZER
S_I-SNR AT THE INPUT OF EQUALIZER
NFC
FC-FLUTTER CONDITION dS_0>T_4
NFC-NO FLUTTER CONDITION dS_0<T_4 & S_0-S_I>T_3
dS_0-ESTIMATE OF NEGATIVE DERIVATION OF S_0
=S_0(n-1)-S_0(n+1)
=2(S_0(n-2)-S_0(n+2)+S_0(n-1)-S_0(n+1)
EIGHT-LEVEL SLICING
160

38. A blind-equalization method for equalization of a channel of a digital receiver, the digital receiver having a rejection filter corresponding to a precoder for which precoding is implemented at a transmitter for combating co-channel interference, the transmitter for transmitting a digital signal, the digital receiver further having an equalizer, the equalizer having an input and an output, said method comprising the steps of:

initiating an equalization with a blind slicing mode; and

changing the equalization to a training sequence mode upon an occurrence of a no flutter condition, and upon an occurrence of a flutter condition, returning the equalization from the training sequence mode to the blind slicing mode, wherein a determination of the occurrence of the flutter condition is based upon an estimate of a negative derivative of the Signal-to-Noise Ratio (SNR) at the output of the equalizer, dS_o, being greater than a first prescribed threshold.

5,841,485

VIDEO SIGNAL PROCESSING AND PROCESSOR TAKING RATIO OF INTERMEDIATE FILTERED SIGNALS

Avigdor Steinberg, Hampshire, Great Britain, assignor to Snell & Wilcox Limited, Hampshire, England

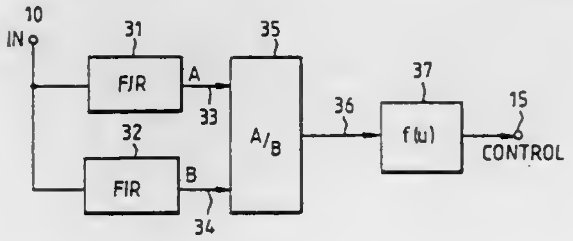
PCT No. PCT/GB93/01236, § 371 Date Feb. 21, 1995, § 102(e) Date Feb. 21, 1995, PCT Pub. No. WO94/01932, PCT Pub. Date Jan. 20, 1994

Continuation of Ser. No. 360,712, Feb. 21, 1996. This PCT application Jun. 10, 1993, Ser. No. 648,826

Claims priority, application United Kingdom, Jul. 3, 1992, 9214214

Int. Cl.^{6} H04N *9/77*

U.S. Cl. 348—663 **12 Claims**



1. A method of filtering an input video signal, comprising the steps of:

conducting first and second filtering operations on the input: signal to derive respective first and second intermediate signals;

taking a ratio of said intermediate signals to derive a control signal; and

modifying the frequency spectrum of the input signal in dependence upon the control signal.

5,841,486

COMPENSATION VOLTAGE GENERATING APPARATUS FOR MULTIPICTURE DISPLAY AND VIDEO DISPLAY INCLUDING THE SAME

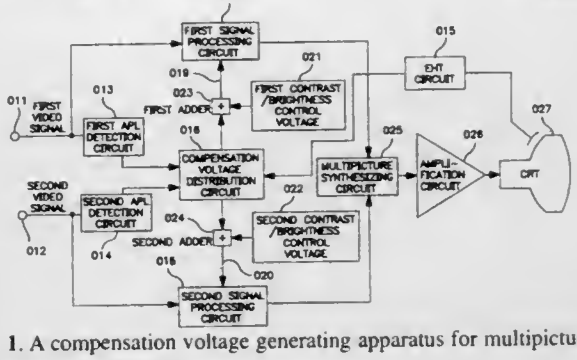
Hiroshi Ando, and Atsuhisa Kageyama, both of Ibaraki, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 27, 1996, Ser. No. 607,385

Claims priority, application Japan, Feb. 27, 1995, 7-038327

Int. Cl.^{6} H04N *5/45;5/57*

U.S. Cl. 348—673 **9 Claims**


017
FIRST SIGNAL PROCESSING CIRCUIT
015
EHT CIRCUIT
019
021
023
FIRST CONTRAST /BRIGHTNESS CONTROL VOLTAGE
011
FIRST VIDEO SIGNAL
013
FIRST ADDER
FIRST APL DETECTION CIRCUIT
018
COMPENSATION VOLTAGE DISTRIBUTION CIRCUIT
025
MULTIPICTURE SYNTHESIZING CIRCUIT
026
AMPLIFICATION CIRCUIT
027
CRT
SECOND VIDEO SIGNAL
SECOND APL DETECTION CIRCUIT
022
024
SECOND CONTRAST /BRIGHTNESS CONTROL VOLTAGE
SECOND ADDER
012
014
016
020
SECOND SIGNAL PROCESSING CIRCUIT

1. A compensation voltage generating apparatus for multipicture display comprising:

compensation voltage generation means for generating a picture quality compensation amount for each picture in a multipicture video signal to simultaneously display a plurality of pictures on a picture display device;

a plurality of average picture level detection means for detecting an average picture level for each of said pictures; and

compensation voltage sharing means for sharing the picture quality compensation amount of each picture to said multipicture video signal, according to each respective average picture level of said pictures detected at said plurality of average picture level detection means.

5,841,487

CIRCUIT ARRANGEMENT FOR CONTROLLING A PICTURE DISPLAY TUBE

Matthias Peters, Neu Wulmsdorf, and Christian Brun, Lüneburg, both of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

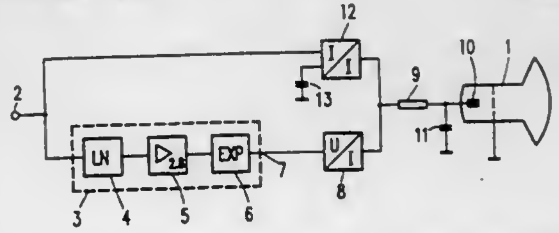
PCT No. PCT/IB95/00717, § 371 Date May 13, 1996, § 102(e) Date May 13, 1996, PCT Pub. No. WO96/08920, PCT Pub. Date Mar. 21, 1996

PCT Filed Aug. 30, 1995, Ser. No. 640,974

Claims priority, application Germany, Sep. 15, 1994, 44 32 844.3

Int. Cl.^{6} H04N *5/202;5/20;9/69*

U.S. Cl. 348—674 **5 Claims**



1. A circuit arrangement for controlling a picture display tube having a non-linear voltage/current characteristic by means of a picture signal which is precorrected for compensating the non-linear characteristic of the picture display tube, characterized in that the circuit arrangement comprises:

a non-linear compensation circuit having an input for receiving the picture signal, said non-linear compensation circuit cancelling the precorrection of the picture signal;

a controlled current source having an input coupled to an output of said non-linear compensation circuit, an output of said current source being coupled to a cathode of the picture display tube;

a differentiator for differentiating the picture signal; and

a voltage-controlled compensation current source having an input for receiving the picture signal, a control input coupled to said differentiator enabling said differentiator to differentiate the picture signal, and an output also coupled to the cathode of the picture display tube for a picture signal-dependent reversal of a charge of a parasitic input capacitance of said picture display tube.

5,841,488

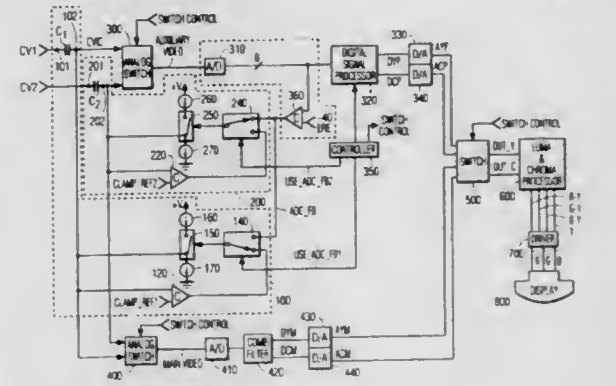
MULTIPLE VIDEO INPUT CLAMPING ARRANGEMENT

Mark Francis Rumreich, Indianapolis, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Dec. 28, 1995, Ser. No. 579,723

Int. Cl.^{6} H04N *5/16;5/18*

U.S. Cl. 348—694 **13 Claims**



1. Apparatus comprising:

comparison means including an analog comparator means for comparing a first signal to a first reference level and a digital comparator means for comparing a second signal to a second reference level, said first signal being an analog signal, said second signal being a digital signal derived from said first signal;

adjusting means responsive to said analog comparator means for adjusting said first signal such that during a first mode of operation said first signal is clamped to said first reference level, said adjusting means being responsive to said digital comparator means during a second mode of operation such that said second signal is clamped to said second reference level; and

means for selecting between said first mode of operation and said second mode of operation for said adjusting means.

5,841,489

PHASE-ONLY OPTICALLY-ADDRESSED TYPE SPATIAL LIGHT MODULATOR

Narihiro Yoshida; Naohisa Mukohzaka; Haruyoshi Toyoda, all of Hamamatsu; Terushige Hori, Osaka; Yuji Kobayashi, and Tsutomu Hara, both of Hamamatsu, all of Japan, assignors to Hamamatsu Photonics K.K., Shizuoka-ken, Japan

Filed Jul. 30, 1993, Ser. No. 99,548

Claims priority, application Japan, Jul. 30, 1992, 4-203505; Mar. 12, 1993, 5-079078

Int. Cl.^{6} C02F *1/135;1/137;* **G06K** *9/76*

U.S. Cl. 349—17 **31 Claims**

1. A spatial light modulator for receiving write light having a spatial distribution in its intensity and for receiving read light to spatially modulate the read light in accordance with the spatial distribution in the intensity of the write light, comprising:

a photoconductive layer formed of photoconductive material, said photoconductive layer receiving write light having a

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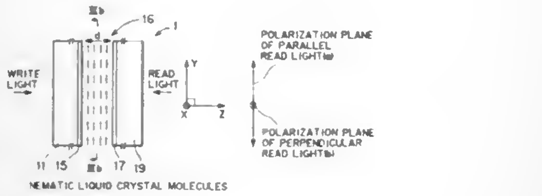
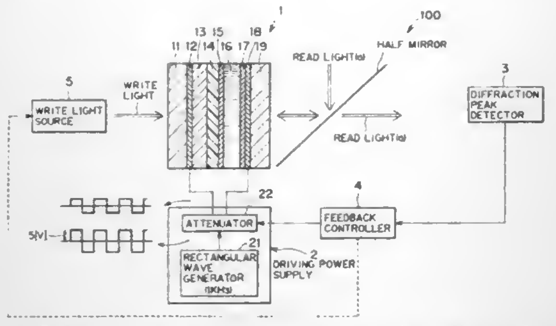

IIIb
16
1
d
WRITE LIGHT
READ LIGHT
Y
X
Z
POLARIZATION PLANE OF PARALLEL READ LIGHT(a)
POLARIZATION PLANE OF PERPENDICULAR READ LIGHT(b)
11
15
IIIb
17
19
NEMATIC LIQUID CRYSTAL MOLECULES



spatial distribution in its intensity and changing resistivity of the photoconductive material dependently on the spatial distribution in the intensity of the received write light;

a liquid crystal layer formed of liquid crystal molecules of nematic phase, said liquid crystal layer receiving read light and presenting birefringence with respect to the received read light;

electric voltage applying means for applying an electric voltage through said photoconductive layer and said liquid crystal layer to thereby produce an electric field in said liquid crystal layer, said photoconductive layer changing the electric field produced in said liquid crystal layer in accordance with the resistivity of the photoconductive material so as to electrically control the birefringence of the liquid crystal molecules, said liquid crystal layer modulating the received read light in accordance with the birefringence which is electrically controlled in accordance with the spatial distribution in the intensity of the write light received by said photoconductive layer;

detecting means for detecting the modulated read light and for outputting a signal indicative of the-modulated read light; and

feedback control means for receiving the signal outputted from said detecting means and feedback controls at least one of a value of the voltage applied by said voltage applying means and a mean value of the spatially distributed intensity of the write light so that said liquid crystal layer may modulate the read light with a desired modulating state.

5,841,490

LIQUID CRYSTAL DISPLAY DEVICE AND ITS FABRICATING METHOD

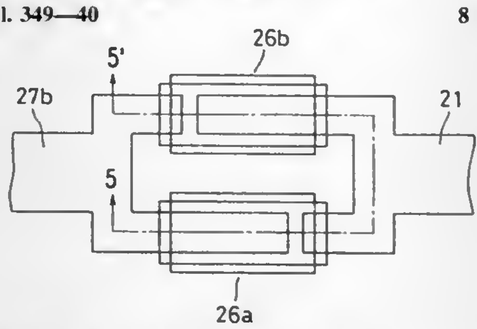
Shigeki Matsuo, Yohkaichi, Japan, assignor to Kyocera Corporation, Kyoto, Japan

Filed Oct. 31, 1995, Ser. No. 550,721

Claims priority, application Japan, Oct. 31, 1994, 6-267819; Feb. 24, 1995, 7-037318; Jun. 29, 1995, 7-163369

Int. Cl.^{6} G02F *1/1333*

U.S. Cl. 349—40 **8 Claims**



1. A liquid crystal display device comprising:

a plurality of image signal lines and a plurality of scan signal lines provided so as to cross each other via an insulating film;

pixel electrodes and switching devices for feeding an image signal to the pixel electrodes, in which the pixel electrodes and the switching devices are provided at intersecting points of the image signal lines and the scan signal lines, the switching devices each having at least a gate electrode, the insulating film, a semiconductor film, a source electrode, and a drain electrode; and

a liquid crystal material which is sandwiched between the pixel electrodes and opposite electrodes provided opposite to the pixel electrodes, wherein

the pixel electrodes and the drain electrodes of the switching devices are provided on the same surface of the insulating film;

a short-circuit ring line to which the plurality of image signal lines are connected via a transistor having at least a gate electrode, an insulating film, a source electrode and a drain electrode; and

the gate electrode and the source electrode or the drain electrode of said transistor are capacitance-coupled to each other via the insulating film of said transistor.

5,841,491

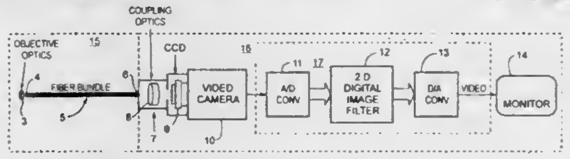
FIBERSCOPE ENHANCEMENT SYSTEM

David A. D'Alfonso, Goleta, and Jordan C. Christoff, Santa Barbara, both of Calif., assignors to Envision Medical Corp., Goleta, Calif.

Continuation of Ser. No. 458,437, Jun. 2, 1995, abandoned, which is a continuation of Ser. No. 136,663, Oct. 14, 1993, abandoned. This application Jul. 23, 1996, Ser. No. 687,086

Int. Cl.^{6} H04N *7/18*

U.S. Cl. 348—65 **39 Claims**



1. A fiber optic endoscope, comprising:

an optical fiber bundle having a configuration of fibers and having a distal end and a proximal end for transmitting an image of an object from the distal end to the proximal end, the image having a spatial frequency content of image spatial frequencies, and the bundle, while transmitting the image spatial frequencies, introduces a distortion component relating to the configuration of fibers within the bundle and having a spatial frequency content of distortion spatial frequencies, and the bundle also limits in frequency the image spatial frequencies to provide limited image spatial frequencies which are more distinguishable from the distortion spatial frequencies than the image spatial frequencies;

imaging means optically coupled to the proximal end of the bundle for receiving the image of the object as transmitted by the bundle and the distortion component, and for producing a signal having an image portion representative of the image of the object as transmitted by the bundle, and a distortion portion representative of the distortion component;

output means;

a signal path extending from the imaging means to the output means; and

a filter, which is configured to substantially distinguish between the distortion and limited image spatial frequencies on the basis of frequency, and allow significant passage of the limited image spatial frequencies to the output means while preventing significant passage of the distortion spatial frequencies without significant degradation of image quality, and which is situated along the signal path to receive the signal having the image portion thereof, and pass a filtered version thereof to the output means such that the signal having the image portion thereof representative of the image of the object as transmitted by the bundle is replaced with the filtered version thereof.

5,841,492

LIQUID CRYSTAL DISPLAY DEVICE

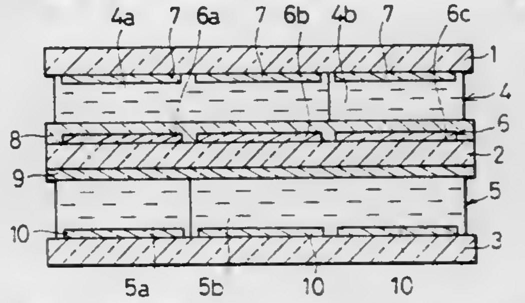
Kenichi Iwauchi, Funabashi; Kazuhiko Tsuda, Tenri, and Naofumi Kimura, Nabari, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 2, 1995, Ser. No. 556,816

Claims priority, application Japan, Nov. 2, 1994, 6-269438; Feb. 27, 1995, 7-038801

Int. Cl.^{6} G02F *1/1347*

U.S. Cl. 349—74 **25 Claims**



1. A liquid crystal display device comprising:

a filter layer said filter layer being solely a single filter layer, said single filter layer including a set of a cyan color filter portion, a magenta color filter portion, a yellow color filter portion for each pixel, each of said color filter portions being aligned in parallel with each other;

a first liquid crystal layer, provided for said color filter portions, for changing transmittance of light within a first range of wavelengths when an external electric field is applied thereto; and

a second liquid crystal layer, provided for said color filter portions, for changing transmittance of light within a second range of wavelength when an external electric field is applied thereto, said first range of wavelengths being different from said second range of wavelengths.

5,841,493

METHOD FOR THE MAKING OF A FILM OF POLYMER-BASED MATERIAL

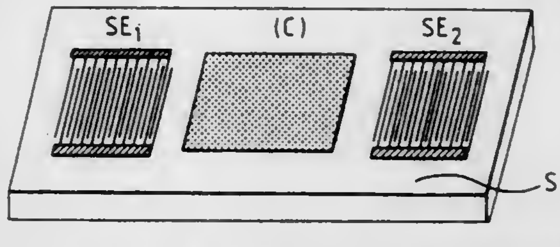
Jean-Francois Lipskier, Verrieres le Buisson, France, assignor to Thomson—CSF, Paris, France

Filed Sep. 18, 1996, Ser. No. 715,498

Claims priority, application France, Sep. 19, 1995, 95 10951

Int. Cl.^{6} G02F *1/1333;1/13*

U.S. Cl. 349—86 **2 Claims**



1. A method for the manufacture of a device comprising a film based on polymer P, comprising the following steps:

forming a cell C comprising between a substrate S_1 and a substrate S_2, a compound comprising a precursor of the polymer P; wherein at least one of the substrates S_1 or S_2 is such that S_1 is soluble in solvent Σ_1 or S_2 is soluble in a solvent Σ_2; and wherein said polymer P is not soluble in either said solvent Σ_1 , or said solvent Σ_2;

polymerizing said polymer P within the cell C;

immersing said cell C in at least one of Σ_1 or Σ_2 so as to eliminate the substrate S_1 and/or the substrate S_2;

wherein said polymer P is an open-core cross-linked, macroporous material with molecular imprints having cavities whose steric and functional configuration is specifically adapted to the capturing of particular entities G' within the cavities.

5,841,494

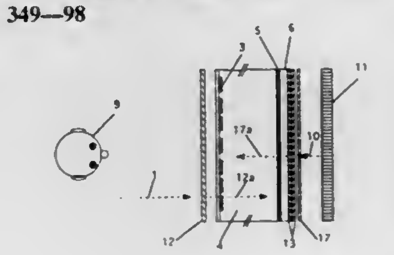
TRANSFLECTIVE LCD UTILIZING CHIRAL LIQUID CRYSTAL FILTER/MIRRORS

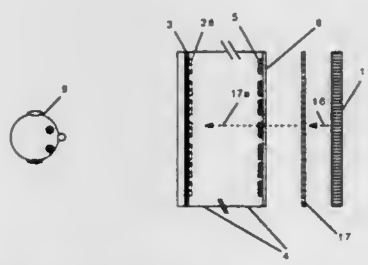
Dennis R. Hall, 7075 SW. Hoodview Pl., Beaverton, Oreg. 97008

Filed Jun. 26, 1996, Ser. No. 670,451

Int. Cl.^{6} G02F *1/1347;1/1335*

U.S. Cl. 349—98 **21 Claims**





1. A spatial display means composed of:

A first light polarizing filter, and

an array of polarization modulation cells, and

a multi-element chiral liquid crystal filter/mirror, and

a second light polarizing filter, and

a light source, wherein

ambient room light being polarized by said first light polarizing filter passes into said array of polarization modulating cells, said cells having a first switched state that transmits at least one color of said light in a first polarization state and said cells having a second switched state that transforms at least said one color of light to a second polarization state, with

light of said first or second polarization states being imposed upon said multi-element chiral liquid crystal filter/mirror, and

said liquid crystal filter/mirror providing transmission of said light of at least one color, being of said first polarization state, with

said transmitted light being either absorbed by said second polarizing filter or passed into said light source, and

said liquid crystal filter/mirror providing reflection of said light of at least one color, being of said second polarization state, with

said reflected light transiting said polarization modulation cell and said first polarizing filter to a viewer, and

said spatial display means having the option to activate said light source, whereupon,

light from said light source, being of at least one specific color, is polarized by said second polarizing filter, and

transits said multi-element chiral liquid crystal filter/mirror into,

said array of polarization modulation cells, said cells having a first switched state that transmits said light in a first polar-

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ization state and said cells having a second switched state that transforms said light to a second polarization state, with

said light of said first or second polarization states being imposed upon said first polarizing filter, whereupon

light of said first polarization state is absorbed by said first polarizing filter and light of said second polarization state is transmitted to a viewer.

5,841,495

Patent Not Issued For This Number

5,841,496
REFLECTIVE LIQUID CRYSTAL DISPLAY DEVICE

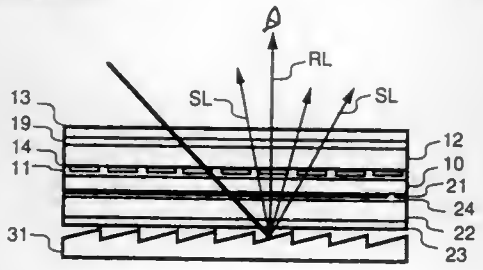
Osamu Itoh, Hitachi; Katsumi Kondo, Hitachinaka; Ikuo Hiyama, Hitachi; Tatsuhisa Fujii, Mobara; Naoki Kikuchi, Mobara, and Jun-ichi Hirakata, Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 2, 1996, Ser. No. 626,330

Claims priority, application Japan, Apr. 4, 1995, 7-078601

Int. Cl.^{6} G02F *1/1333;1/136;1/1335;1/133*

U.S. Cl. 349—113 **6 Claims**



1. A reflective liquid crystal display device comprising:

a reflector;

a liquid crystal cell formed by laminating upper and lower orientation layers, upper and lower electrodes, upper and lower substrates, and upper and lower polarizers arranged in order above and below a liquid crystal layer, respectively;

said liquid crystal cell is provided with a viewing angle dependence so that a transmission ratio of a dark display section to a bright display section for light incident upon said liquid crystal cell is less than 2 at a viewing angle range which includes a direction which is normal to a plane of a surface of said reflector;

wherein the direction of the viewing angle range is aligned with the normal with respect to said liquid crystal cell;

wherein a dark display shadow is substantially extinguished; and

wherein the surface tilt angle of said reflector with respect to the plane of extension of said reflector is within a range of 10° to 35°.

5,841,497
LIQUID CRYSTAL DEVICE AND LIQUID CRYSTAL APPARATUS

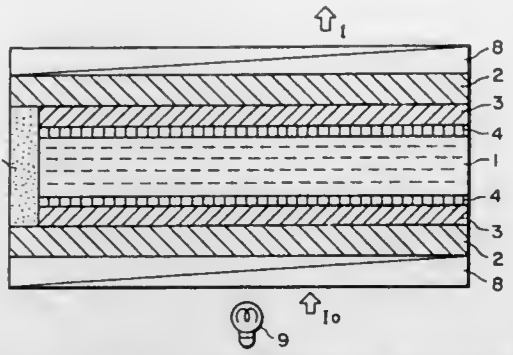
Koichi Sato; Kenji Shinjo, both of Atsugi; Masahiro Terada, Hadano, and Syuji Yamada, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 23, 1996, Ser. No. 681,350

Claims priority, application Japan, Jul. 28, 1995, 7-211374; Jul. 28, 1995, 7-211431

Int. Cl.^{6} G02F *1/1337*

U.S. Cl. 349—128 **21 Claims**



1. A liquid crystal device, comprising: a pair of substrates each having thereon an electrode for voltage application, a chiral smectic liquid crystal composition disposed between the substrates,

wherein at least one of the substrates is provided with an alignment control layer having a thickness of at most 200 Å and having been subjected to rubbing, the substrates having been subjected to different aligning treatments at their opposite faces each contacting the chiral smectic liquid crystal composition , and

the chiral smectic liquid crystal composition comprises at least three fluorine-containing mesomorphic compounds each comprising a fluorocarbon terminal portion having at least one catenary ether oxygen atom and a hydrocarbon terminal portion, the terminal portions being connected with a central core, the compounds having smectic mesophase or latent smectic mesophase; said at least three mesomorphic compounds comprising at least one species of a compound having a fluorocarbon terminal portion containing one catenary ether oxygen atom, at least one species of a compound having a fluorocarbon terminal portion containing two catenary ether oxygen atoms, and at least one species of a compound having a fluorocarbon terminal portion containing three catenary ether oxygen atoms.

5,841,498
LIQUID CRYSTAL DISPLAY DEVICES HAVING A PARALLEL ELECTRIC FIELD AND β_{O}, WHICH IS NOT 0 DEGREES OR 90 DEGREES

Günter Baur, Freiburg; Waltraud Fehrenbach, München; Barbara Weber Ne Staudacher, Ettenheim; Friedrich Windscheid, Freiburg-Tiengen, and Rudolf Kiefer, Vorstetten, all of Germany, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Germany

Division of Ser. No. 466,068, Jun. 6, 1995, Pat. No. 5,576,867, which is a continuation of Ser. No. 363,968, Dec. 23, 1994, abandoned, which is a continuation of Ser. No. 877,187, Aug. 6, 1992, abandoned. This application Apr. 4, 1996, Ser. No. 627,387

Claims priority, application Germany, Jan. 9, 1990, 40 00 451.1

Int. Cl.^{6} G02F *1/1343;1/1337;1/1141*

U.S. Cl. 349—141 **102 Claims**

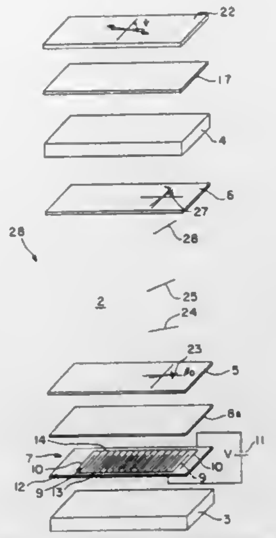
1. An electro-optical display device comprising a plurality of liquid crystal switching elements which comprise a liquid crystal layer comprising liquid crystal molecules and having a surface for display of an image which is switched under control of an electric field having a component predominantly parallel to said surface, wherein said liquid crystal molecules have an orientation angle β_o, $0° < \beta_o < 90°$, and said plurality of liquid crystal switching elements is arranged in a matrix, wherein said liquid crystal switching elements further comprise:

(a) said liquid crystal molecules which are twistable;

(b) a substrate; and

(c) an electrode structure which generates said electric field having a component predominantly parallel to the surface of said liquid crystal layer and

wherein said electrode structure is arranged alternately in at least two different planes in parallel with said substrate.



5,841,499
REFLECTION MODE LIQUID CRYSTAL DISPLAY DEVICES HAVING A PARALLEL ELECTRIC FIELD AND α_o WHICH IS $\leqq 30°$

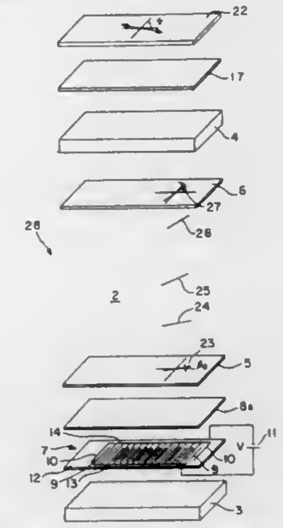
Günter Baur, Freiburg; Waltraud Fehrenbach, München; Barbara W. Ne Staudacher, Ettenheim; Friedrich Windscheid, Freiburg-Tiengen, and Rudolf Kiefer, Vorstetten, all of Germany, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Germany

Division of Ser. No. 466,068, Jun. 6, 1995, Pat. No. 5,576,867, which is a continuation of Ser. No. 363,968, Dec. 23, 1994, abandoned, which is a continuation of Ser. No. 877,187, Aug. 6, 1992, abandoned. This application Apr. 4, 1996, Ser. No. 627,388

Claims priority, application Germany, Jan. 9, 1990, 40 00 451.1

Int. Cl.^{6} G02F *1/1343;1/1337;1/141*

U.S. Cl. 349—141 **90 Claims**



1. An electro-optical display device comprising a plurality of liquid crystal ,switching elements which comprise a liquid crystal layer comprising liquid crystal molecules and having a surface for display of an image which is switched under control of an electric field having a component predominantly parallel to said surface, and, sandwiching said liquid crystal layer, a polarizer/analyzer and a reflector, wherein said liquid crystal molecules have a pretilt angle α_o, $0° \leqq \alpha_o < 30°$, wherein said liquid crystal switching elements further comprise:

(a) said liquid crystal molecules which are twistable;

(b) a substrate; and

(c) an electrode structure which generates said electric field having a component predominantly parallel to the surface of said liquid crystal layer, and

wherein said electrode structure is arranged alternately in at least two different planes in parallel with said substrate.

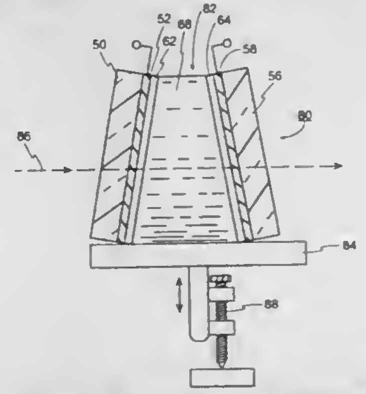
5,841,500
WEDGE-SHAPED LIQUID CRYSTAL CELL

Jayantilal Patel, State College, Pa., assignor to Tellium, Inc., Oceanport, N.J.

Filed Jan. 9, 1997, Ser. No. 780,925

Int. Cl.^{6} G02F *1/1343;1/13;1/03;* **H04J** *14/06*

U.S. Cl. 349—141 **19 Claims**



1. A liquid-crystal cell, comprising two substrate assemblies with a wedge-shaped gap fixed between said assemblies and filled with a liquid crystal comprising a twisted nematic liquid crystal;

wherein each of said assemblies comprises at least one electrode and an alignment layer aligned in an alignment direction and disposed adjacent to said gap;

wherein said alignment layers of said two assemblies have respective directions of alignment that are substantially perpendicular to each other; and

wherein said twisted nematic liquid crystal has a minimum transmissivity condition for a size of said gap intermediate between minimum and maximum sizes of said gap.

5,841,501
LIQUID CRYSTAL DISPLAY DEVICE

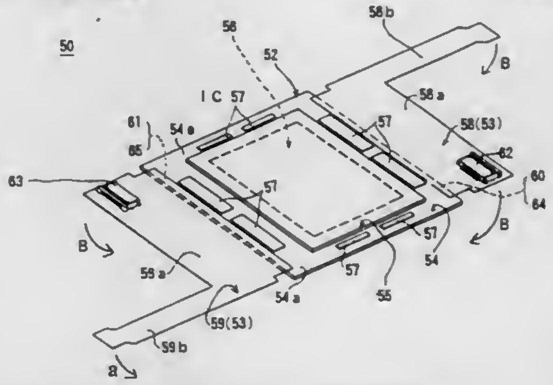
Takayuki Eiraku, and Isao Edane, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 11, 1996, Ser. No. 584,616

Claims priority, application Japan, Aug. 14, 1995, 7-207217

Int. Cl.^{6} G02F *1/1345;1/1333*

U.S. Cl. 349—150 **21 Claims**



1. A liquid crystal display device comprising:

a light valve loaded with a liquid crystal display element and electronic components which drive said liquid crystal display

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element, said light valve further having on a periphery thereof input terminal parts to which signals for driving said liquid crystal display element are supplied;

a flexible circuit substrate connected with said input terminal parts;

wherein said circuit substrate is divided into a plurality of division substrates, whereby the number of said plurality of division substrates corresponds to the number of said input terminal parts, and each of said plurality of division substrates is electrically connected to one of said input terminal parts; and

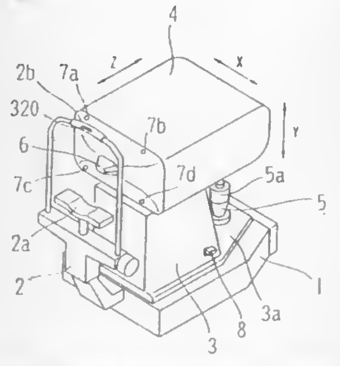
connectors for electrically connecting said plurality of division substrates with each other, wherein each of said connectors comprises an extended portion integrally formed in each of said plurality of division substrates, and connection parts provided in positions facing and connected with said extended portions respectively.

5,841,502
OPHTHALMIC APPARATUS

Tetsuyuki Miwa, Aichi, Japan, assignor to Nidek Co., Ltd., Japan

Filed Dec. 1, 1997, Ser. No. 982,255
Claims priority, application Japan, Nov. 29, 1996, 8-334591
Int. Cl.^{6} A61B *3/13*

U.S. Cl. 351—209 20 Claims



1. An ophthalmic apparatus including measuring means for measuring or inspecting an eye to be examined, comprising:

moving means for moving said measuring means relatively to the eye;

alignment detecting means for detecting alignment condition between said measuring means and the eye by projecting an alignment target to the eye, then detecting an image of the target which is projected;

movement-controlling means for performing alignment by driving and controlling said moving means based on results detected by said alignment detecting means;

returning means for causing said measuring means, which is moved by said moving means, to return to a standard position;

returning-instruction means for instructing said returning means to start movement;

returning-control means for controlling movement of said returning means in response to instruction by said returning-instruction means;

risk sensing means for sensing whether there is risk that the apparatus touches the eye caused by movement of said returning means; and

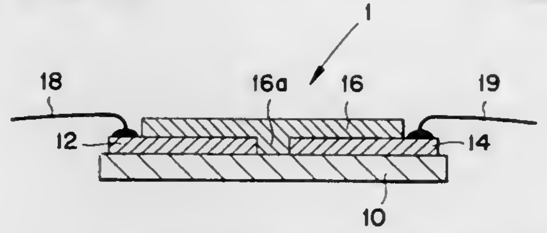
prohibiting means for prohibiting said returning means from moving to all or predetermined directions at the time when said risk sensing means senses that there is risk that the apparatus touches the eye.

5,841,503
HIGH MOLECULAR LIQUID CRYSTAL DEVICE AND METHOD OF MANUFACTURING THE SAME

Katsumi Yoshino, Osaka-fu, Japan, and Kent Skarp, Lindome, Sweden, assignors to Mitsui Chemicals, Inc., Tokyo, Japan

Filed May 14, 1996, Ser. No. 646,309
Claims priority, application Japan, Sep. 28, 1994, 6-232696
Int. Cl.^{6} G02F *1/1333;1/13*

U.S. Cl. 349—158 32 Claims



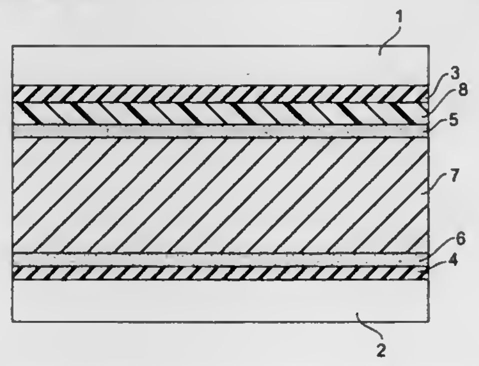
1. A method of manufacturing high molecular liquid crystal device, characterized by that a high molecular liquid crystal layer which functions as an active layer of the device is formed by applying a high molecular liquid crystal solution directly on a substrate, and evaporating the solvent.

5,841,504
DISTORTED HELIX FERROELECTRIC LIQUID CRYSTAL CELL

Jürg Fünfschilling, Basel, and Martin Schadt, Seltisberg, both of Switzerland, assignors to Rolic AG, Basel, Switzerland

Continuation of Ser. No. 504,984, Jul. 20, 1995, abandoned, which is a continuation of Ser. No. 241,096, May 11, 1994, abandoned. This application Oct. 31, 1996, Ser. No. 741,451
Claims priority, application Switzerland, May 19, 1993, 1527/93
Int. Cl.^{6} G02F *1/13;1/1343*

U.S. Cl. 349—172 4 Claims



1. A distorted helix ferroelectric liquid crystal cell which comprises:

(a) two transparent substrates, each substrate having an electrode and orientation means;

(b) capacitance means; and

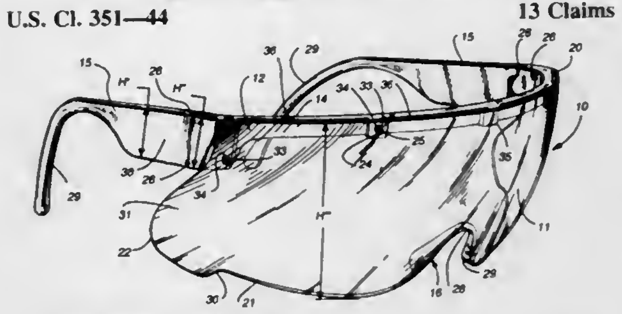
(c) a liquid crystal layer disposed between the two substrates; wherein the substrates, capacitance means and liquid crystal layer are coupled so that the capacitance means is electrically in series with the liquid crystal layer and wherein the series capacitance is smaller than the effective capacitance of the cell without the series capacitance.

5,841,505
SUNGLASSES

Maurice J. Bolle', Oyonnax, France, assignor to Etablissements Bolle' S.N.C., Oyonnax, France

Continuation of Ser. No. 284,039, Aug. 1, 1994, abandoned. This application Sep. 29, 1995, Ser. No. 536,046
Int. Cl.^{6} G02C *7/10;11/08;1/04*

U.S. Cl. 351—44 13 Claims



1. Sunglasses, comprising:

an elongated curved frame having a plurality of forwardly projecting blocks extending therefrom defining a plurality of notches of the frame therebetween;

a pair of opposing hinge supports, one each mounted to an end of the curved frame;

a pair of opposing elongated temples, each having a depending ear piece at a first end thereof and an opposed widened portion hingedly mounted to one of said hinge supports at a second end thereof;

a unitary, double-curved nondistorting wraparound lens having an upper curved edge corresponding in curvature to said frame, integral side peripheral vision panels extending therefrom below said hinge supports generally parallel to said temples, and a lower edge having a recess defined in a central portion of said lens and defining an integral nosepiece on said lens; and

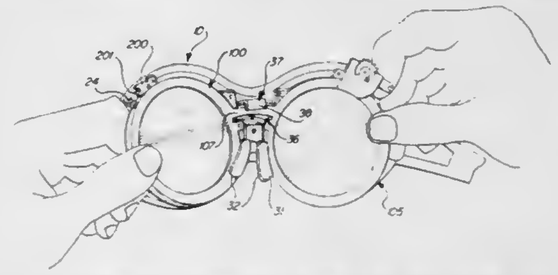
a plurality of fasteners securing said lens to forward surfaces of a plurality of said blocks spacing said lens from said frame at said notches between said blocks and leaving one of said blocks adjacent said central portion of said lens unsecured to said lens.

5,841,506
SUPERIMPOSABLE EYEGLASSES

Naoki Karasawa; Toshio Totsuka, and Takuro Tsukatani, all of Ann Arbor, Mich., assignors to Ozmix, Inc., Ann Arbor, Mich.

Continuation-in-part of Ser. No. 646,461, May 8, 1996, abandoned. This application Jun. 30, 1997, Ser. No. 885,582
Int. Cl.^{6} G01C *9/00:7/12*

U.S. Cl. 351—47 19 Claims



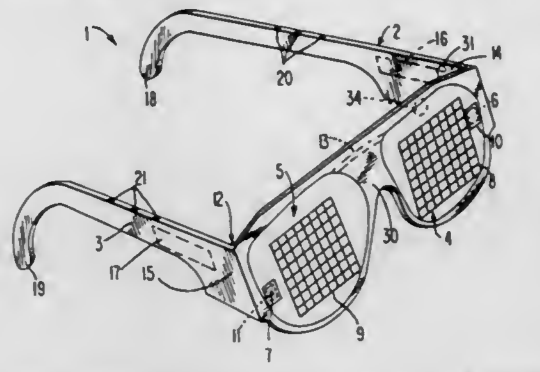
1. A lens assembly comprising at least first and second removably superimposed eyewear elements each comprising a frame member including framing means for at least one lens, each said frame member having a first longitudinal curvature in an unassembled condition of said lens assembly, and at least said at least second eyewear element further having a flexible intermediate portion providing for longitudinal flexibility of said at least second eyewear element along a transverse medial axis thereof such that said at least second eyewear element is deformable to define a second longitudinal curvature complimentary with said first longitudinal curvature of said at least first eyewear element when said at least first and second eyewear elements are removably axially superimposed in longitudinal alignment.

5,841,507
LIGHT INTENSITY REDUCTION APPARATUS AND METHOD

Elwood E. Barnes, Rte. 3, Box 316, Cochranville, Pa. 19330

Continuation of Ser. No. 476,421, Jun. 7, 1995, Pat. No. 5,671,035. This application Jul. 31, 1997, Ser. No. 904,396
Int. Cl.^{6} G02C *7/12*

U.S. Cl. 351—49 18 Claims



1. A device that selectively reduces the intensity of light in the field of view of an optical instrument, comprising:

a power source;

a light sensor capable of obtaining light direction and intensity data and of generating at least one light signal corresponding to the direction and light intensity of selected segments in the field of view;

a means for digitizing the light signal to n bits of digital resolution;

a plurality of programmable shutter elements connected to a lens of the optical instrument, wherein each shutter element can be independently selected and each has controllable transmission characteristics enabling a shutter element to be modified only to the extent required by the light intensity conditions;

a memory; and

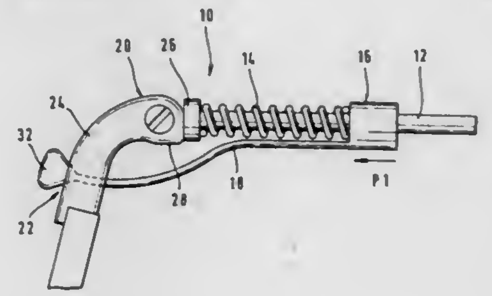
processing circuitry, connected to the power source, to the memory, to the light sensor and to the shutter elements, which processes the digitized light signals with respect to predetermined values stored in the memory, and modifies the light transmission characteristics of certain of the shutter elements if required depending on the processing results.

5,841,508
SPRING HINGE ASSEMBLY HAVING A TENSION BAR FOR ENERGIZING THE SPRING

Wilhelm Groscurth, Passau, Germany, assignor to Owp Brillen GmbH

Filed Oct. 22, 1996, Ser. No. 735,143
Int. Cl.^{6} G02C *5/16:5/22*

U.S. Cl. 351—113 9 Claims



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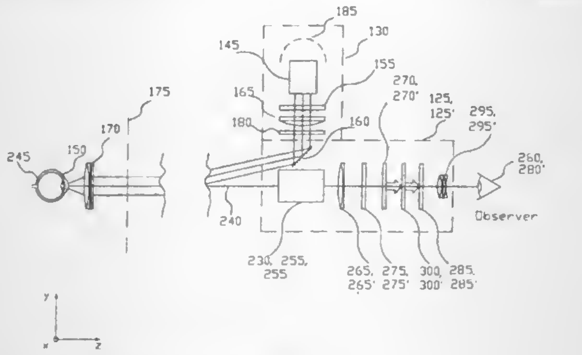
1. A spring hinge assembly adapted for use with a temple of a pair of eyeglasses, said spring hinge comprising:
- a first abutment movably disposed on the temple;
- a joint for pivotally mounting the temple to the eyeglasses;
- a second abutment disposed adjacent said joint;
- a resilient element operatively engaged with said first abutment and providing a yielding resistance to translation of said first abutment with respect to the temple; and
- a tensioning member attached to and extending from said first abutment member for engaging said second abutment as the temple approaches an opened position to cause said first abutment to translate relative to the temple toward said joint against the yielding resistance of the resilient element.

5,841,509
ELECTRO-OPTIC BINOCULAR INDIRECT OPHTHALMOSCOPE

Mark Harooni, 151 L St., Apt. 1, South Boston, Mass. 02127, and Kameran Lashkari, 330 Dartmouth St., Boston, Mass. 02114

Filed Jul. 29, 1996, Ser. No. 681,713
Int. Cl.^{6} A61B *3/10;3/14*

U.S. Cl. 351—221 **67 Claims**



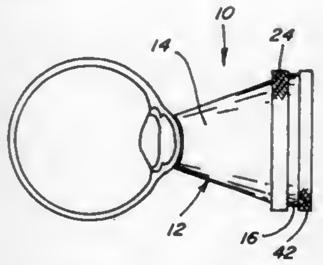
1. An ophthalmoscope comprising:
- means for illuminating the interior of a patient's eye with light; and
- means for electro-optically imaging and displaying images of the interior of the patient's eye to an observer, said images formed from light reflected from the interior of the patient's eye and taken along two different optical paths.

5,841,510
ROTATABLE DIAGNOSTIC LENS FOR EVALUATION OF THE IRIDO-CORNEAL ANGLE, RETINA AND OTHER PORTIONS OF THE EYE

David L. Roggy, 1409 Criterion Ave., St. Louis, Mo. 63138

Filed Feb. 11, 1998, Ser. No. 22,214
Int. Cl.^{6} A61B *3/13*

U.S. Cl. 351—218 **23 Claims**



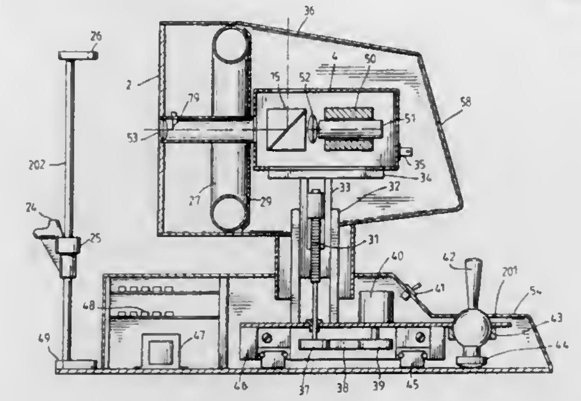
1. A lens device for examining portions of the human eye comprising an inner and an outer member each having opposed end portions and associated wall means, said outer member having a viewing lens positioned adjacent one end portion thereof, said inner member being rotatably mountable within said outer member and having at least one mirror associated therewith, said at least one mirror being located adjacent said viewing lens when said inner member is mounted within said outer member, said inner member being rotatably movable relative to said outer member such that said at least one mirror is selectively positionable relative to said viewing lens.

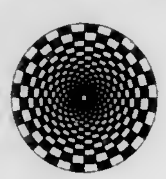
5,841,511
METHOD OF CORNEAL ANALYSIS USING A CHECKERED PLACIDO APPARATUS

Henry M. D'Souza, Cypress, Tex.; Edwin J. Sarver, Merritt Island, Fla., and Youssef S. Wakil, Houston, Tex., assignors to Eyesys Technologies, Inc., Irvine, Calif.

Continuation-in-part of Ser. No. 891,961, Jun. 2, 1992, abandoned. This application Oct. 23, 1996, Ser. No. 736,348
Int. Cl.^{6} A61B *3/10*

U.S. Cl. 351—212 **1 Claim**





1. A method of corneal analysis using a checkered placido comprising the following steps:
- a) projecting the image of said checkered placido onto a patient's cornea;
- b) detecting an image of said checkered placido reflected off of said cornea;
- c) detecting a plurality of nodal points from said reflected image of said checkered placido;
- d) determining mean curvature of said cornea at a plurality of said nodal points; and
- e) analyzing said mean curvature at said plurality of said nodal points to produce a graphic display of the estimated actual curvature of said cornea.

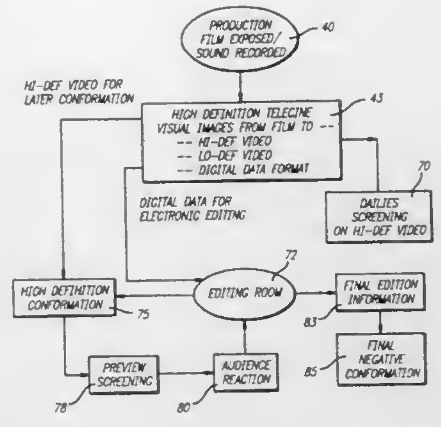
5,841,512
METHODS OF PREVIEWING AND EDITING MOTION PICTURES

Dean Kenneth Goodhill, 8942 Wonderland Park Ave., Los Angeles, Calif. 90046

Filed Feb. 27, 1996, Ser. No. 607,791
Int. Cl.^{6} G03B *31/00*

U.S. Cl. 352—56 **16 Claims**

1. A method for editing motion pictures, the method comprising:
- transferring visual images from motion picture film to a high definition video storage medium;
- transferring the visual images from at least one of the group consisting of the motion picture film and the high definition video storage medium to a digital data storage format adapted for use with digital nonlinear motion picture editing equipment;
- after the visual images have been transferred to the digital data storage format, using the digital nonlinear motion picture editing equipment to generate an edit decision list;
- conforming the visual images that have been transferred to the high definition video storage medium to the edit decision list for preview screening on a big theater-like screen that simulates cinema resolution and picture quality;
- using the digital nonlinear motion picture editing equipment to generate a negative cutting list based on audience reaction to the preview screening; and
- conforming the motion picture film to the negative cutting list.


PRODUCTION FILM EXPOSED/ SOUND RECORDED
40
HI-DEF VIDEO FOR LATER CONFORMATION
HIGH DEFINITION TELECINE VISUAL IMAGES FROM FILM TO -- -- HI-DEF VIDEO -- LO-DEF VIDEO -- DIGITAL DATA FORMAT
43
70
DIGITAL DATA FOR ELECTRONIC EDITING
DAILIES SCREENING ON HI-DEF VIDEO
72
HIGH DEFINITION CONFORMATION
EDITING ROOM
FINAL EDITION INFORMATION
75
83
FINAL NEGATIVE CONFORMATION
PREVIEW SCREENING
AUDIENCE REACTION
85
78
80

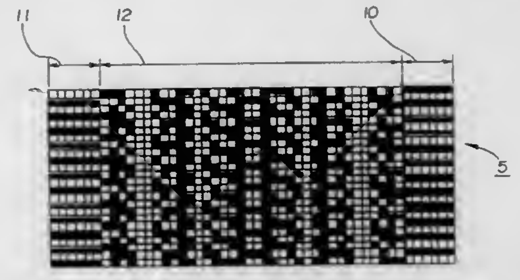
5,841,513
APPARATUS FOR REPRODUCING SOUND SIGNALS RECORDED ON A MOTION PICTURE FILM WITH DIGITAL SOUND TRACK

Shunji Yoshimura, Tokyo; Yoshiyuki Akiyama, Kanagawa; Kiyoshi Ohsato, Chiba; Isao Ichimura; Toshio Watanabe, both of Kanagawa, and Shinji Katsuramoto, Chiba, all of Japan, assignors to Sony Corporation, Japan

Continuation of Ser. No. 450,729, May 25, 1995, abandoned, which is a division of Ser. No. 158,767, Nov. 30, 1993, Pat. No. 5,550,603. This application Apr. 24, 1997, Ser. No. 847,776

Claims priority, application Japan, Nov. 30, 1992, 4-320918; Dec. 22, 1992, 4-356935; Jun. 16, 1993, 5-168397
Int. Cl.^{6} G03B *31/02*

U.S. Cl. 352—27 **29 Claims**



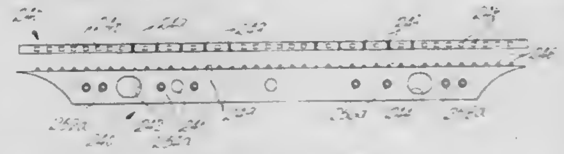
1. An apparatus for reproducing digitally recorded sound signals, comprising:
- motion picture film having formed thereon an optically-readable digital sound track and plural images, the motion picture film having a direction of travel, the motion picture film comprising an elongate, flexible substrate, the substrate having opposed edges and having a line of sprocket holes formed therein adjacent to each of the edges, an elongate digital pattern recording area on the substrate in the vicinity of one of the lines of sprocket holes, the digital pattern recording area having plural dots formed therein in a rectangular array of tracks substantially perpendicular to the direction of travel of the motion picture film, and columns in the direction of travel, each of the dots being in one of a first state and a second state optically distinct from one another, the digital pattern recording area being divided along the tracks into a first tracking pattern area and a second tracking pattern area, the dots in each tracking pattern area being in opposite states in consecutive tracks to form a vertical synchronizing pattern, and a signal pattern area disposed between the first tracking pattern area and the second tracking pattern area, the states of the dots in the signal pattern area representing a digital sound signal of at least one channel;
- a line sensor aligned perpendicular to the direction of travel of the motion picture film, the line sensor operative to read the digital pattern recording area;
- a timing circuit operative to generate a timing signal based upon the vertical synchronizing pattern read by the line sensor;
- a tracking servo circuit responsive to the timing signal, the tracking servo circuit operative to generate scanning timing signals for controlling reading by the line sensor; and
- a sound signal reproducing circuit operative to generate sound signals based upon the states of the dots in the signal pattern area read by the line sensor.

5,841,514
FILM ADVANCE MECHANISM FOR MOTION PICTURE APPARATUS

Leland R. Schmidt, Simi Valley, Calif., assignor to Iwerks Entertainment, Inc., Burbank, Calif.

Continuation-in-part of Ser. No. 518,463, Aug. 23, 1995, Pat. No. 5,633,696, which is a continuation-in-part of Ser. No. 250,055, May 27, 1994, abandoned, which is a continuation of Ser. No. 4,511, Jan. 14, 1993, Pat. No. 5,341,182. This application Apr. 4, 1997, Ser. No. 835,095
Int. Cl.^{6} G03B *1/00;1/52*

U.S. Cl. 352—184 **8 Claims**



1. A film advance mechanism comprising
- film input mechanism for moving film along a path past an aperture;
- film take-up mechanism taking up film having passed the aperture;
- first and second rows of register pins arranged in linear fashion along opposite edges of the path between the film input mechanism and the film take-up mechanism for engaging perforated openings on the film;
- means for providing fine tuned position adjustment of the first row of register pins relative to the second row of register pins.

5,841,515
SUBSTRATE CONTAINER CASSETTE, INTERFACE MECHANISM, AND SUBSTRATE PROCESSING

Masami Ohtani, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Jul. 31, 1996, Ser. No. 688,749

Claims priority, application Japan, Sep. 27, 1995, 7-249748
Int. Cl.^{6} G03B *27/32;27/42;* **B65G** *65/23*

U.S. Cl. 355—27 **15 Claims**

1. A cassette for containing a plurality of substrates, comprising:
- a) a plurality of supporting means alternately stacked with gap spaces, each of said plurality of supporting means including a plurality of top points to horizontally support one substrate, said plurality of top points being horizontally distributed within an area smaller than a size of each substrate; and
- b) holding means for holding said plurality of supporting means.

5,841,516
PHOTOGRAPHIC PROCESSING APPARATUS

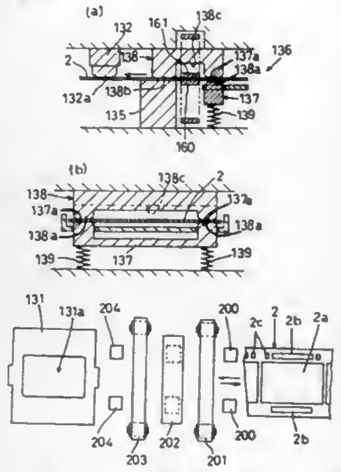
Hiroshi Miyawaki; Keiji Morimoto; Takahisa Miyamori; Shinji Azuma, all of Wakayama, and Mitsuhiko Itojima, Wakayama-ken, all of Japan, assignors to Noritsu Koki Co., Ltd., Wakayama, Japan

Continuation-in-part of Ser. No. 418,983, Apr. 7, 1995, Pat. No. 5,655,252. This application Mar. 27, 1997, Ser. No. 825,283

Claims priority, application Japan, Apr. 1, 1996, 8-078771

Int. Cl.⁶ G03B *27/52;* **B08B** *11/02*

U.S. Cl. 355—30 **13 Claims**



1. A photographic processing apparatus for processing a photographic film based on magnetic information recorded in a magnetic recording portion of the film, comprising:

transporting means for transporting the photographic film along a film transport passage in a film transporting direction;

a magnetic head disposed in the film transport passage; and

first cleaning means disposed upstream relative to the magnetic head in the film transport passage for cleaning the magnetic recording portion of the film;

wherein the first cleaning means includes a stationary head member and a movable head member which members are disposed across the film surface, with the movable head member being elastically urged against the stationary head member.

5,841,517
PRINTER SYSTEM FOR PRINTING COMBINED IMAGES ON A SAME PHOTOSENSITIVE SHEET

Tohru Tanibata, Wakayama, Japan, assignor to Noritsu Koki Co., Ltd., Wakayama, Japan

Continuation-in-part of Ser. No. 100,998, Aug. 3, 1993, abandoned. This application Aug. 8, 1995, Ser. No. 512,402

Int. Cl.⁶ G03B *27/52*

U.S. Cl. 355—40 **24 Claims**

1. An image printer comprising:

an exposure means for exposing a photosensitive material to an original image projected from a medium,

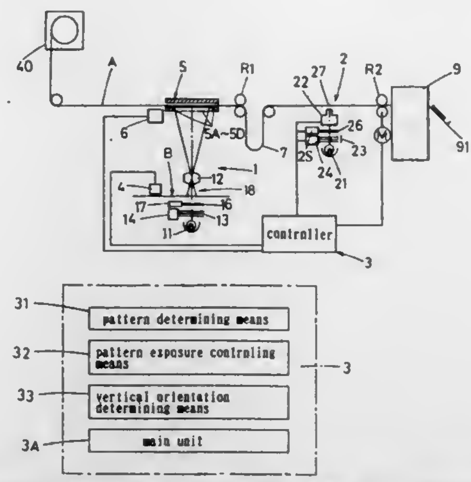
an attribute information detecting means for detecting an attribute data from the medium,

a pattern determining means for determining a pattern image to be printed in accordance with the attribute data detected by the attribute information detecting means,

a pattern exposure controlling means for controlling an exposure of the pattern image determined by said pattern determining means,

a pattern exposure means for exposing the photosensitive material to the pattern image determined by the pattern determining means,

a vertical orientation data detecting means for detecting vertical orientation data indicative of an upward and downward orientation of the original image within an image plane from the medium,


40
A
5
R1
22
27
2
R2
9
6
5A~5D
7
26
25
23
91
8
1
12
18
24
21
4
17
16
14
13
11
controller
3
31
pattern determining means
32
pattern exposure controling means
3
33
vertical orientation determining means
3A
main unit

a vertical orientation determining means for determining the upward and downward orientation of the original image within the image plane on the photosensitive material from the vertical orientation data detected by the vertical orientation detecting means,

adjustable masking plates completely masking a part of the photosensitive material from a projected illumination of said exposure means, said part of the photosensitive material being a portion in which the pattern image is to be printed on the photosensitive material external an area in which the original image is printed by said exposure means,

a masking plate driving means for changing a masking position and a masking area of said masking plates according to a position and area of said pattern image, and

a controller for estimating a printing direction of said pattern image and the masking position and masking area of said masking plates from the upward and downward orientation determined by the vertical orientation determining means, and for controlling said masking plates driving means in accordance with a thus obtained estimation.

5,841,518
IMAGE IDENTIFICATION APPARATUS AND IMAGE IDENTIFICATION METHOD

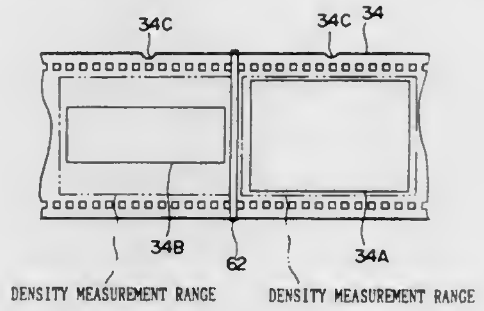
Kazuhiko Kajiwara, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 26, 1996, Ser. No. 639,898

Claims priority, application Japan, Apr. 28, 1995, 7-106738; Apr. 28, 1995, 7-106739; Apr. 28, 1995, 7-106740

Int. Cl.⁶ G03B *27/52;27/80*

U.S. Cl. 355—40 **20 Claims**



1. An image size identification apparatus comprising:

density measurement means for measuring densities at a plurality of measurement points in a measurement area including an image recording range on a photographic film on which an image is recorded;

extraction means for extracting an image area estimated to correspond to an image portion from the measurement area on the basis of the densities at the measurement points measured by the density measurement means; and

determination means for determining an image size on the basis of a distribution of the image area extracted by the extraction means in the measurement area.

5,841,519
PRINTER CONTROL FILM, FILM CARRIER, AND METHOD FOR MANAGING A PRINTER CONTROL FILM

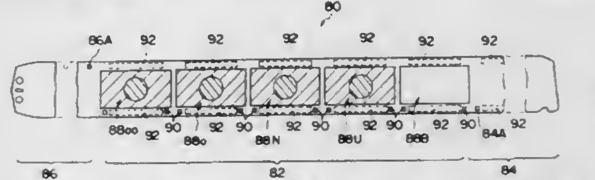
Shuji Ajimu, and Mitsukazu Hosoya, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 28, 1996, Ser. No. 670,933

Claims priority, application Japan, Jun. 29, 1995, 7-164087

Int. Cl.⁶ G03B *27/72:27/52*

U.S. Cl. 355—40 **7 Claims**



1. A printer control film used for setting exposure conditions during exposure a for printing onto a printing paper images of a photographic film loaded onto a film carrier of a photographic printer, said printer control film comprising:

an image recording region in which an image is recorded which has been formed through exposure under predetermined exposure conditions;

a perforation indicating the position of the image in said image recording region; and

a magnetic recording region into which are recorded at least information specifying a photographic printer for which said film is used, and information regarding use, including a start time of use and the number of times of use, as well as exposure conditions for said image.

5,841,520
EXPOSURE APPARATUS AND METHOD THAT USE MARK PATTERNS TO DETERMINE IMAGE FORMATION CHARACTERISTICS OF THE APPARATUS PRIOR TO EXPOSURE

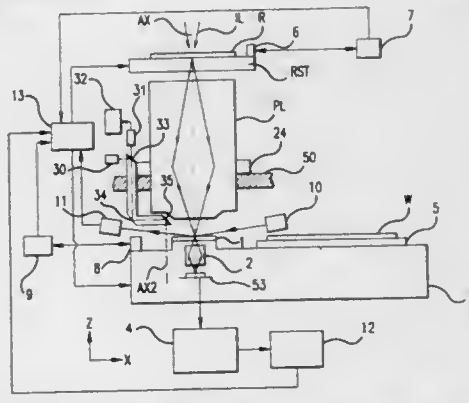
Tetsuo Taniguchi, Yokohama, Japan, assignor to Nikon Corporatioin, Tokyo, Japan

Filed Aug. 2, 1996, Ser. No. 691,377

Claims priority, application Japan, Aug. 9, 1995, 7-224813; Sep. 12, 1995, 7-259367; Oct. 13, 1995, 7-292091; Dec. 1, 1995, 7-313791

Int. Cl.⁶ G03B *27/42;* **G01N** *21/86*

U.S. Cl. 355—53 **68 Claims**



1. A scanning type exposure apparatus, provided with a mask stage for scanning a mask across an illumination area on the mask, a projection optical system for projecting an image of a pattern on the mask onto a photosensitive substrate, and a substrate stage for scanning the photosensitive substrate across an exposure area which is conjugate to the illumination area in relation to the projection optical system, comprising:

a photoelectric detector, including a light-receiving section provided on the substrate stage, for photoelectrically detecting an image of a mark pattern on the mask; and

a combining system for combining signals outputted from the photoelectric detector during a period in which the light-receiving section is scanned across the exposure area in synchronization with scanning for the mark pattern across the illumination area; wherein a position of the image of the mark pattern is detected on the basis of an output of the combining system.

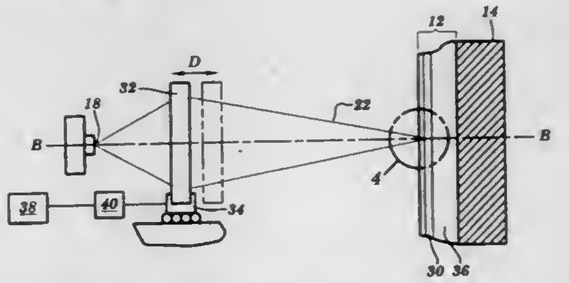
5,841,521
METHOD AND APPARATUS FOR OBTAINING A LITHOGRAPHIC PLATE

Henry A. Kelley, Woburn, Mass.; Jos Alfons Vaes, and Johan Hubert Van Hunsel, both of Mortsel, Belgium, assignors to Agfa Division, Bayer Corporation, Wilmington, Mass.

Division of Ser. No. 373,664, Jan. 17, 1995, Pat. No. 5,616,445. This application May 24, 1995, Ser. No. 449,458

Int. Cl.⁶ B41N *1/00;* **G03B** *27/54*

U.S. Cl. 355—67 **23 Claims**



1. An apparatus for making a lithographic printing plate according to the silver salt diffusion transfer process comprising:

means for image-wise exposing an image: and

means for developing a thus obtained image-wise exposed imaging element with a developing agent and silver halide solvent;

wherein the imaging element includes, on a support in the order given, a silver halide emulsion layer and a physical development nuclei layer;

wherein said means for image-wise exposing includes means for focusing a high intensity short time scanning exposure substantially within said silver halide emulsion layer of said imaging element.

5,841,522
PHASE DETECTOR

Robert F. Dillon, Stoneham, and Michael B. Michalik, Waltham, both of Mass., assignors to Lumen Laboratories, Inc., Burlington, Mass.

Continuation-in-part of Ser. No. 908,219, Aug. 7, 1997. This application Jul. 28, 1997, Ser. No. 901,218

Int. Cl.⁶ G01C *3/08;* **C01S** *13/00*

U.S. Cl. 356—5.1 **22 Claims**

1. A quadrature phase detector comprising:

a mixer circuit responsive to an input signal and a reference signal to produce an error signal which is a function of the phase difference between said input signal and reference signal;

a phase shifting circuit for varying the phase difference between said input and reference signal;

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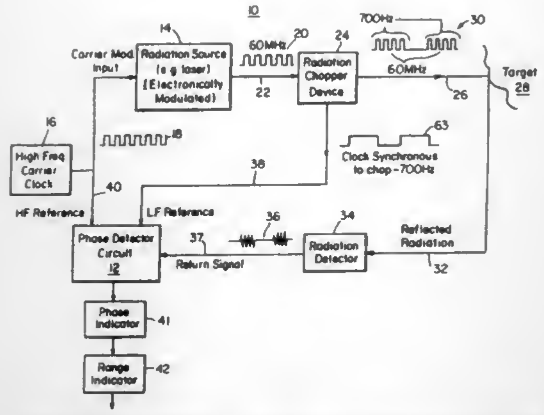


a control circuit responsive to said error signal, for providing a drive signal to said phase shifting circuit to set to quadrature the phase difference between said input and reference signals; and

a phase indicator device responsive to said drive signal to indicate the phase difference between said input and reference signals.

5,841,523

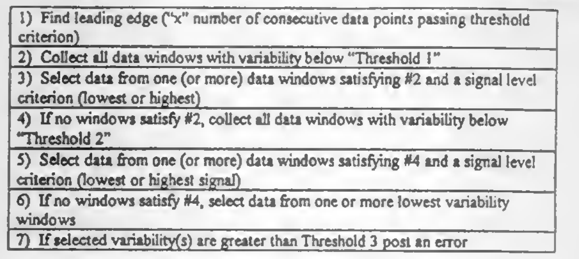
METHOD FOR PERFORMING SPECTROSCOPIC ANALYSIS OF INHOMOGENEOUS TEST SAMPLES

Beat R. Degen, Bellingham, and Michael F. Garyantes, Medfield, both of Mass., assignors to Chiron Diagnostics Corporation, E. Walpole, Mass.

Filed Apr. 20, 1995, Ser. No. 425,559

Int. Cl.^{6} G01N *33/48;21/00;* G01J *3/00*

U.S. Cl. 356—72 **28 Claims**



1) Find leading edge ("x" number of consecutive data points passing threshold criterion)

2) Collect all data windows with variability below "Threshold 1"

3) Select data from one (or more) data windows satisfying #2 and a signal level criterion (lowest or highest)

4) If no windows satisfy #2, collect all data windows with variability below "Threshold 2"

5) Select data from one (or more) data windows satisfying #4 and a signal level criterion (lowest or highest signal)

6) If no windows satisfy #4, select data from one or more lowest variability windows

7) If selected variability(s) are greater than Threshold 3 post an error

1. A method for spectroscopic analysis of fluid test samples comprising:

(a) providing a test sample for spectroscopic analysis to an optical cell;

(b) performing a plurality of signal measurements on said test sample;

(c) selecting from said signal measurements one or more sets of measurements having both low variability relative to the range of variation of the signal measurements or a defined threshold, and either signal level maxima or signal level minima; and

(d) analyzing the test sample utilizing said one or more selected set of signal measurements.

5,841,524

COMPACT DEVICE FOR MONITORING THE COATING OF A MOVING FILAMENTARY PRODUCT

Bernard Floch, Chaumont En Vexin, and Didier Rolland, Sannois, both of France, assignors to Alcatel Alsthom Compagnie Generale D'Electricite, Paris, France

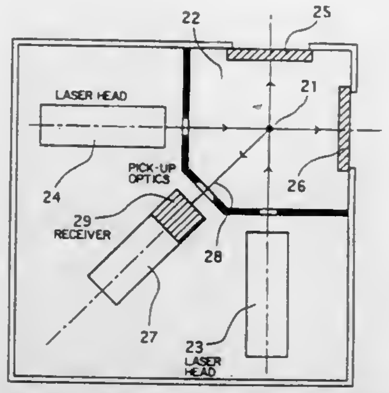
Filed Dec. 26, 1996, Ser. No. 773,359

Claims priority, application France, Dec. 28, 1995, 95 15660

Int. Cl.^{6} G01N *21/00;* G01B *11/14;* C03B *37/07;* B05D *3/14*

U.S. Cl. 356—73 **11 Claims**

1. A device for monitoring a coating applied by a coating means onto a moving filamentary product, comprising:



two light sources for emitting light beams which cross at the center of said filamentary product;

means for monitoring the centering of said filamentary product relative to said coating means, said means for monitoring the centering of said filamentary product receiving said emitted light beams from said two light sources after said emitted light beams have interacted with said filamentary product; and

an optical receiver for monitoring the quality of said coating, said optical receiver disposed to receive said light beams emitted from said two light sources and reflected by said coating.

5,841,525

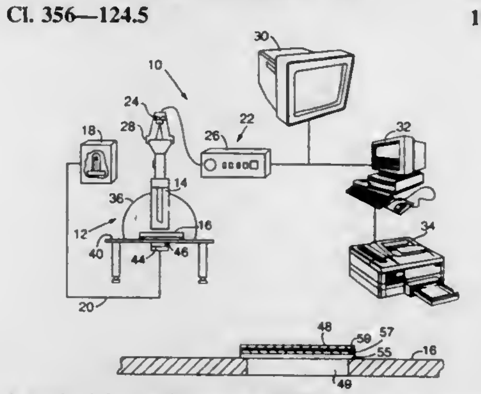
METHOD AND APPARATUS FOR PERFORMING MODULATION TRANSFER FUNCTION TESTS ON ENDOSCOPES

Eric Rosow, Avon, and Finton Beatrice, Vernon, both of Conn., assignors to Hartford Hospital, Hartford, Conn.

Filed Mar. 20, 1997, Ser. No. 822,330

Int. Cl.^{6} G01M *11/00*

U.S. Cl. 356—124.5 **10 Claims**



1. A method for performing an MTF test on an endoscope and evaluating the results of the test, comprising:

generating a beam having an intensity which is uniform along a first direction and which varies periodically along a second direction transverse to the first direction, the beam thereby defining a first frequency in accordance with the rate at which the intensity varies along the second direction;

transmitting the generated beam through the endoscope;

generating intensity signals indicative of the transmitted beam intensity;

filtering noise signals from the intensity signals; and

generating signals indicative of the modulation at a predetermined location within the transmitted beam in dependence on the filtered intensity signals.

5,841,526

Patent Not Issued For This Number

5,841,527

LASER REFERENCE LEVEL SETTING DEVICE

Hiroto Shibuya, and Toshikazu Adegawa, both of Tokyo, Japan, assignors to Kabushiki Kaisha TOPCON, Tokyo-to, Japan

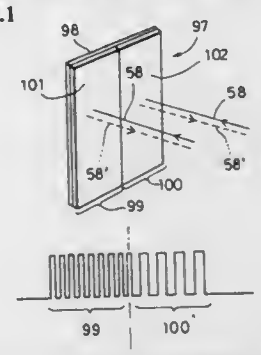
PCT No. PCT/JP96/01325, § 371 Date Jan. 13, 1997, § 102(e) Date Jan. 13, 1997, PCT Pub. No. WO96/37755, PCT Pub. Date Nov. 28, 1996

PCT Filed May 20, 1996, Ser. No. 765,567

Claims priority, application Japan, May 25, 1995, 7-150893; Jul. 11, 1995, 7-198190; Feb. 29, 1996, 8-069364

Int. Cl.^{6} G01B *11/26;* G01C *1/00*

U.S. Cl. 356—139.1 **6 Claims**



1. A laser reference level setting device, comprising a laser sighting device and a target, wherein said target has a plurality of reflection surfaces for indicating a given position on the target, and said laser sighting device comprises a laser oscillating device having an emitting means rotatably supported for emitting a laser beam and a light receiving means for receiving a reflection laser beam, a driving unit for rotating at least the laser beam emitting means of the laser oscillating device, a control unit for controlling the driving unit to direct the laser beam to a given position on the target according to the light receiving condition of the reflected laser beam reflected from the reflection surface of the target, and a liquid crystal shutter arranged on at least one of said reflection surfaces of said target.

5,841,528

ANTI COUNTERFEIT APPARATUS

Keith Loder Lewis, and Kevin Roy Welford, both of Malvern, Great Britain, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, Hants, United Kingdom

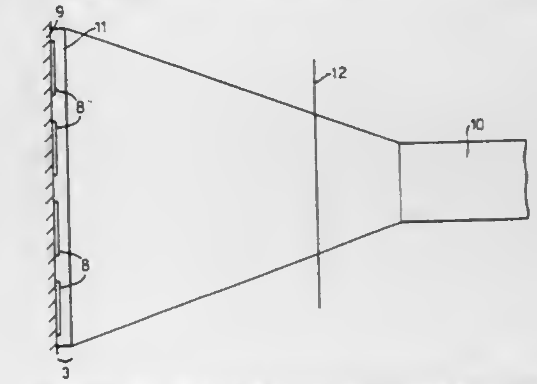
PCT No. PCT/GB95/01036, § 371 Date Nov. 8, 1996, § 102(e) Date Nov. 8, 1996, PCT Pub. No. WO95/30972, PCT Pub. Date Nov. 16, 1995

PCT Filed May 9, 1995, Ser. No. 737,293

Claims priority, application United Kingdom, May 9, 1994, 9409128

Int. Cl.^{6} G01N *21/00*

U.S. Cl. 356—237 **10 Claims**



1. A system for checking the authenticity of an article comprising:

a first optical filter applied to a genuine article, the first optical filter having a first transmittance versus wavelength characteristic; and

a second optical filter through which a suspect article is examined, the second optical filter having a second transmittance versus wavelength characteristic;

wherein the transmittance versus wavelength characteristic of each of the optical filters has a plurality of peaks or troughs wherein at least one peak or trough present in the first characteristic corresponds in wavelength to at least one peak or trough in the second characteristic indicating authenticity of said suspect article.

5,841,529

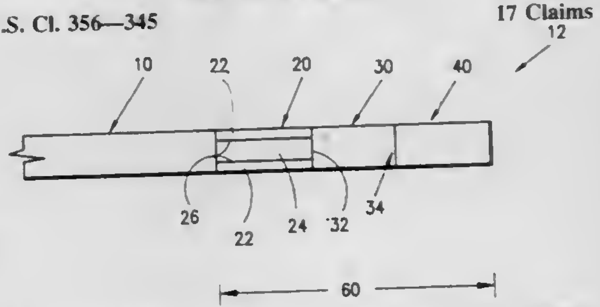
FIBER OPTIC STRAIN SENSOR

James S. Sirkis, College Park, Md., and Harmest Singh, Simsbury, Conn., assignors to University of Maryland, College Park, Md.

Filed Mar. 25, 1997, Ser. No. 824,207

Int. Cl.^{6} G01B *9/02*

U.S. Cl. 356—345 **17 Claims**



1. An optical fiber sensor device for measuring strain, comprising:

a first portion which generates a first signal;

a second portion which generates a second signal and is located proximate said first portion; and

a third portion which generates a third signal and is located proximate said second portion opposite said first portion;

wherein said first portion is made of a first type of optical fiber, said second portion is made of a second type of optical fiber that differs from said first type, and wherein said third portion is made of a third type of optical fiber that differs from both said first and second types.

5,841,530

INDUSTRIAL VIEWING STATION FOR INSPECTION OF DEFECTS

Frederick G. Hewitt, 545 Chapel Ln., Eagan, Minn. 55121-2329, and Steven J. Orfield, 5624 Edgewater Blvd., Minneapolis, Minn. 55417

Continuation of Ser. No. 580,760, Dec. 29, 1995, Pat. No. 5,686,987. This application Sep. 24, 1997, Ser. No. 936,638

Int. Cl.^{6} G01N *21/00*

U.S. Cl. 356—237 **21 Claims**

1. An industrial viewing station for inspection of defects in a vehicle surface to be examined; said industrial viewing station comprising:

a) a visual surround defining an interior sized to receive at least a portion of the vehicle;

  i) said visual surround covering the interior in order to selectively control entry of outside light into the interior and to selectively control internal luminance;

b) a lighting arrangement having: a first selected lighting condition and a second selected lighting condition;

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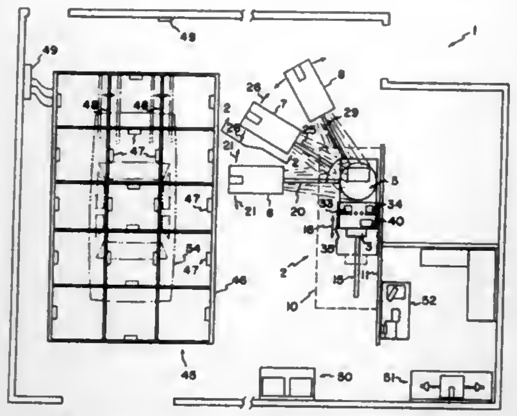


- i) said first selected lighting condition comprising directional lighting selectively oriented to direct light at the surface to be examined;
- ii) said second selected lighting condition comprising surround illuminating light selectively oriented to illuminate the visual surround; and
- c) a control system for selectively activating said first selected lighting condition and said second selected lighting condition.

5,841,531
SPECTROMETER WITH DISCHARGE LIMITING MEANS

Craig William Gliddon, Dandenong, Australia, assignor to Varian Associates, Inc., Palo Alto, Calif.

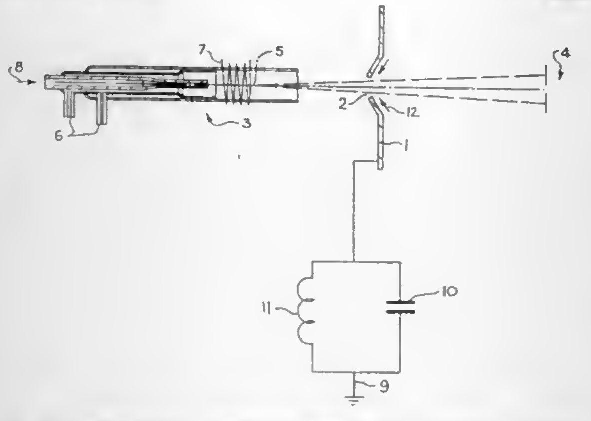
PCT No. PCT/AU95/00856, § 371 Date Jun. 20, 1997, § 102(e) Date Jun. 20, 1997, PCT Pub. No. WO96/19716, PCT Pub. Date Jun. 27, 1996

PCT Filed Dec. 19, 1995, Ser. No. 849,943

Claims priority, application Australia, Dec. 20, 1994, PN0152; Jan. 11, 1995, PN0478

Int. Cl.⁶ G01N *21/68;* G01J *3/433*

U.S. Cl. 356—316 **15 Claims**



1. An inductively coupled plasma spectrometer including shielding/sampling means located between a plasma torch having an enclosure and an optical system of the spectrometer, said shielding/sampling means being connected with said enclosure surrounding the plasma torch such that a relatively high impedance path is established for limiting flow of electrical current between said shielding/sampling means and said enclosure as compared with the flow of electrical current from said enclosure if directly connected to said shielding/sampling means.

5,841,532
METHOD FOR EVALUATING OXYGEN CONCENTRATING IN SEMICONDUCTOR SILICON SINGLE CRYSTAL

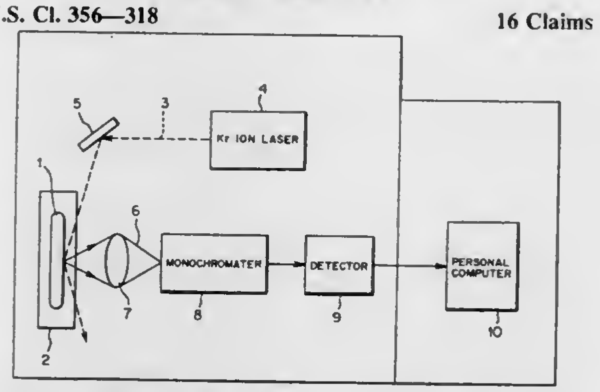
Tomosuke Yoshida, Annaka, and Yutaka Kitagawara, Takasaki, both of Japan, assignors to Shin-Etsu Handotai Co., Ltd., Tokyo, Japan

Filed Feb. 14, 1997, Ser. No. 800,393

Claims priority, application Japan, Feb. 22, 1996, 8-059967

Int. Cl.⁶ G01N *21/64*

U.S. Cl. 356—318 **16 Claims**



1. A method for evaluating a semiconductor silicon single crystal, which is doped with boron of a concentration of 10^{17} atoms/cm^3 or higher, in regard to oxygen concentration therein, which comprises the following steps of:

- irradiating a test sample from the single crystal with a light having a greater energy than that of bandgap of the semiconductor silicon; and
- measuring a spectrum of photoluminescence intensity in the vicinity of a photon energy of 0.96 eV which is emitted from the sample.

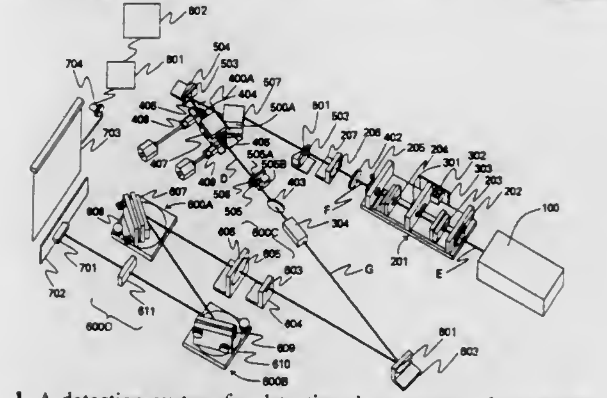
5,841,533
INTRACAVITY LASER SPECTROSCOPY FOR HIGH SENSITIVITY DETECTION OF CONTAMINANTS IN GAS

George H. Atkinson, Tucson, Ariz., assignor to Innovative Lasers Corporation, Tucson, Ariz.

Continuation-in-part of Ser. No. 522,963, Sep. 1, 1995, Pat. No. 5,689,334. This application Jun. 13, 1997, Ser. No. 874,960

Int. Cl.⁶ G01N *21/35;* G01J *3/10;3/42*

U.S. Cl. 356—326 **12 Claims**



1. A detection system for detecting the presence of a contaminant in a sample, comprising:

- a chamber suitably configured to be evacuated of contaminants to be detected in the sample, said chamber including therewithin an intracavity laser comprising a laser crystal contained within an intracavity resonator defined by an optical path between three mirrors, said sample suitably placed within an astigmatically compensated region of said resonator;
- a spectrometer assembly; and
- a detector assembly suitably connected to a computer system programmable to interpret the spectral data acquired by said spectrometer assembly and provide an output indicative of the presence and/or concentration of contaminant in the sample.

5,841,534
APPARATUS FOR DETERMINING THE DENSITY, SIZE OR SIZE DISTRIBUTION OF PARTICLES

Gerhard Lorenz, Katlenburg-Lindau, Germany, assignor to Gerhard Lorenz Innovative Technik + Messgerätebau, Katlenburg-Lindau, Germany

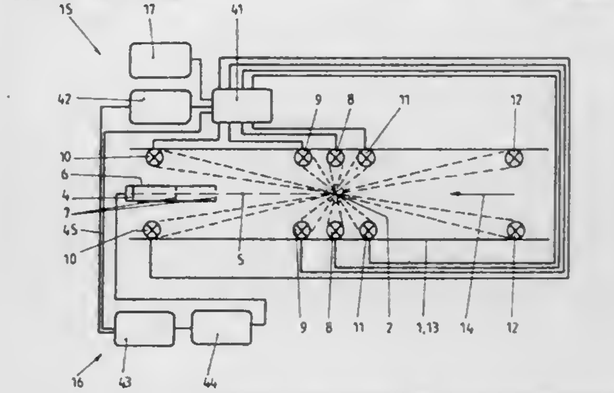
PCT No. PCT/EP95/01521, § 371 Date Jan. 13, 1997, § 102(e) Date Jan. 13, 1997, PCT Pub. No. WO95/29393, PCT Pub. Date Nov. 2, 1995

PCT Filed Apr. 21, 1995, Ser. No. 732,307

Claims priority, application Germany, Apr. 22, 1994, 44 14 166.1

Int. Cl.⁶ G01N *21/00;15/02;* G08B *17/10*

U.S. Cl. 356—336 **13 Claims**



1. Apparatus for determining the density, size or size distribution of particles (**3**) suspended in a carrier medium by measuring the light scatter of the particles, the apparatus comprising:

- at least one light source (**8**, **9**, **10**, **11**, **12**) which directs beams of light towards a light-scattering center (**2**) in a carrier medium having particles (**3**) suspended therein;
- a first receiver (**4**) having a central axis (**5**) and for receiving at least a portion of the light scattered from the light-scattering center (**2**);
- an evaluating device (**16**) connected downstream of the receiver (**4**),
- an elongated detection chamber having a central axis bounded radially by a wall of a housing (**1**),
- said housing (**1**) constructed to form a duct for the carrier medium with the particles to flow therethrough,
- wherein said each at least one light source (**8**, **9**, **10**, **11**, or **12**) is positioned substantially near the wall of the housing (**1**) and emits light toward the central axis of the detection chamber so that the light-scattering center (**2**) is formed in a region around the central axis of the detection chamber,
- said axis (**5**) of the first receiver (**4**) is coaxial with the central axis of the detection chamber, and
- a diaphragm system having a receiver housing (**6**) and a diaphragm (**7**) is associated with the first receiver (**4**) in such a way that the angle of view of the first receiver (**4**) does not cover the wall of the housing (**1**) surrounding the light-scattering center (**2**) but only a narrow region around the central axis of the detection chamber, characterized in that the housing (**1**) is formed by a tube section (**13**) and that the diaphragm system comprises an elongated receiver housing (**6**) which projects into the tube section (**13**), wherein the first receiver is arranged at a first end of the receiver housing (**6**) and a diaphragm (**7**) is arranged at its other end.

5,841,535
MULTIAXIS DISTANCE MEASURING DEVICE REQUIRING ALIGNMENT ALONG ONLY ONE AXIS

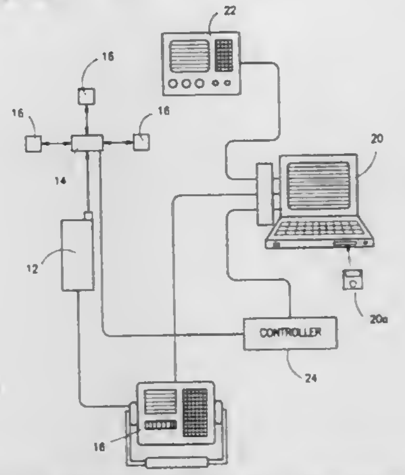
Tatsuya Aoki, and Kazunori Tanaka, both of Kanagawa, Japan, assignors to Sokkia Company Limited, Tokyo, Japan

Filed Jul. 26, 1996, Ser. No. 686,606

Claims priority, application Japan, Aug. 31, 1995, 7-223500

Int. Cl.⁶ G01B *9/02*

U.S. Cl. 356—345 **6 Claims**



1. A multiaxis distance measuring device comprising:

- a laser head including a light emitting part for emitting a laser beam and a light receiving part including only a single interference detector for receiving an interference beam,
- a multiaxis interferometer that is structurally independent of and spaced apart from said laser head and which is disposed on the optical axis of the light emitting part and the light receiving part and equipped with a plurality of light splitting mechanisms for splitting the incident laser beam into at least two orthogonal directions, each of which is manually mounted so as to be positionable in front of said laser beam emitted by said laser head and which includes a switching means for the light splitting mechanisms for moving the mechanisms and switching the direction of said laser beam and allowing only a single distance along one of said multiple axes to be measured at any one time, all of said distances being measured by said single interference detector,
- one or more reflecting targets which are fixed to the measurement position on the measured object and which receive the laser beam emitted from the above-mentioned beam splitting mechanisms and reflect the laser beam towards the multiaxis interferometer, and
- a controller for controlling the switching mechanism.

5,841,536
POLARIZATION INTERFEROMETER APPARATUS USING THE POLARIZATION DEPENDENT PHASE LAG IN A BIREFRINGENT RETARDER

Timothy E. Dimmick, Glenville, Pa., assignor to The United States of America as represented by the Director of the National Security Agency, Washington, D.C.

Filed Aug. 1, 1997, Ser. No. 904,535

Int. Cl.⁶ G01B *9/02*

U.S. Cl. 356—346 **5 Claims**

1. A polarization interferometer apparatus using the polarization dependent phase lag in a birefringent retarder, comprising:

- a controllable birefringent element for accepting light and varying retardance so as to change the polarization of the accepted light in response to control inputs and transmitting that light of changed polarization;
- a first bulk optic polarizing beamsplitter for dividing the light received from said controllable birefringent element into two orthogonally polarized components, having a principle axis,

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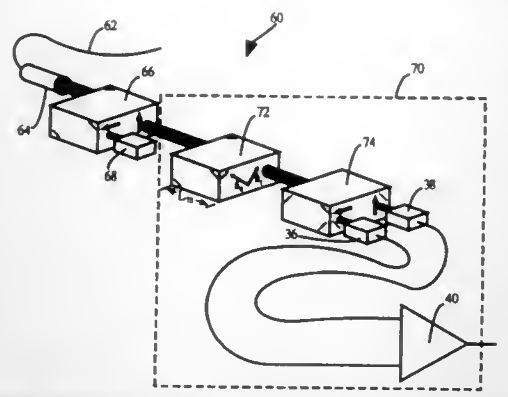


orthogonal to the direction of travel of the received light, a first output port for providing one of the orthogonally polarized components of the received light, and a second output port for providing the other component of the orthogonally polarized components of the received light;

an undesired polarization output photodetector arranged to detect the light provided by the first output port of said first bulk optic polarizing beamsplitter and to produce an undesired polarization output photodetector photocurrent;

power minimizing means to accept the undesired polarization output photodetector photocurrent from said undesired polarization output photodetector and provide control inputs to said controllable birefringent element such that the undesired polarization output photodetector photocurrent from said undesired polarization output photodetector is minimized;

a bulk optic birefringent retarder, having a fast, a slow, and another principle axes, arranged to receive light of linear polarization from the second output port of said first bulk optic polarizing beamsplitter and to transmit components of light polarized along the fast and slow axes, with the fast and slow axes oriented at an angle non-orthogonal and non-parallel to the direction of linear polarization and the other principle axis oriented in the direction of propagation of the received light;

a second bulk optic polarizing beamsplitter for dividing received light into two orthogonally polarized components, arranged to receive the transmitted components of light polarized along the fast and slow axes of said bulk optic birefringent retarder, having a principle axis, oriented to accept the light exiting said bulk optic birefringent retarder such that the principle axis is non-orthogonal and non-parallel to both the fast and slow axes of said bulk optic birefringent retarder, a first output port for providing one of the orthogonally polarized components of the received light, and a second output port for providing the other component of the orthogonally polarized components of the received light;

a first photodetector arranged to detect the light provided by the first output port of said second bulk optic polarizing beamsplitter and having means for producing a first photocurrent that corresponds to the power of the detected light on its photocurrent output;

a second photodetector arranged to detect the light provided by the second output port of said second bulk optic polarizing beamsplitter and having means for producing a second photocurrent that corresponds to the power of the detected light on its photocurrent output; and

means for comparing the first and second photocurrents produced by said first and second photodetectors and providing an output signal that corresponds to the ratio of the photocurrent produced by said first photodetector to the photocurrent produced by said second photodetector which in turn corresponds to the wavelength of the light received by said controllable birefringent element.

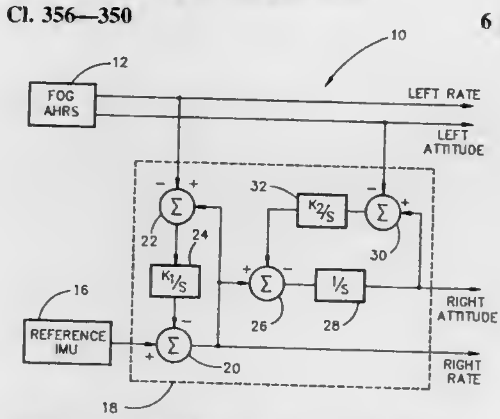
5,841,537
SYNTHESIZED ATTITUDE AND HEADING INERTIAL REFERENCE

James H. Doty, Cedar Rapids, Iowa, assignor to Rockwell International, Costa Mesa, Calif.

Filed Aug. 11, 1997, Ser. No. 909,479

Int. Cl.^{6} G01C *19/66*

U.S. Cl. 356—350 **6 Claims**



1. A high integrity sensor system consisting of:

a precision sensor system, a less precise secondary sensor system, and means to allow detection of a fault in the precision sensor system by utilizing signals from both sensor systems, wherein said means to allow detection of a fault utilizes a short-term stability characteristic of said secondary sensor system to detect faults while concomitantly correcting longer-term errors in said secondary sensor system.

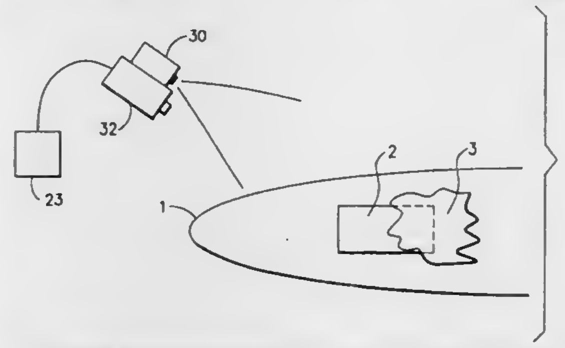
5,841,538
APPARATUS FOR DETECTING A POLARIZATION ALTERING SUBSTANCE ON A SURFACE

Daniel Schoeffler, Huntington; Howard Stern, Greenlawn, and Pat V. Costa, Nissequogue, all of N.Y., assignors to Robotic Vision Systems, Inc., Hauppauge, N.Y.

Division of Ser. No. 487,249, Jun. 13, 1995. This application Jul. 10, 1996, Ser. No. 677,785

Int. Cl.^{6} G01J *4/00;* G08B *19/02*

U.S. Cl. 356—369 **3 Claims**



1. An apparatus for detecting a polarization altering substance, comprising:

a retroreflector on a surface;

a first polarizing filter on said retroreflector;

said first polarizing filter having at least first and second regions adjacent one another;

each of said at least first and second regions of said first polarizing filter having different polarizing characteristics;

a light source for illuminating said retroreflector through said first polarizing filter;

said retroreflector is effective to produce a returned light returned toward said light source when said light source illuminates said retroreflector;

a second polarizing filter in a path of said returned light;

said second polarizing filter having a characteristic that operates differently on said returned light from each of said at least first and second regions of said first polarizing filter; and

means for detecting said returned light through said second polarizing filter, whereby a presence of said polarization altering substance is detected by a change in a relationship of said returned light passing through each of said at least first and second regions of said first polarizing filter, polarized light and ambient nonpolarized light reflected from said surface; and

said means for detecting includes viewing means for viewing said retroreflective substance through said second polarizing filter effective for determining a presence of said polarization altering substance.

5,841,539
THREE-DIMENSIONAL MEASURING APPARATUS AND THREE-DIMENSIONAL MEASURING METHOD

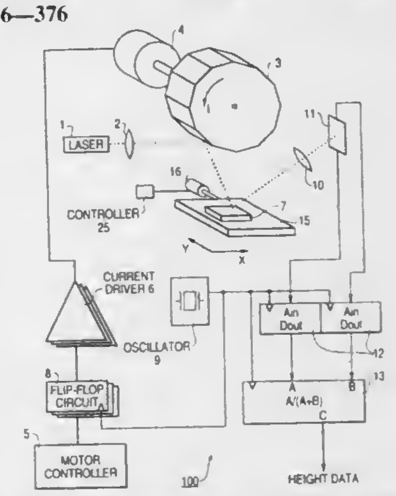
Kazuhiro Ikurumi, Katano; Masaharu Tsujimura, Osaka, and Yoichiro Ueda, Nabari, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Filed Aug. 7, 1997, Ser. No. 911,371

Claims priority, application Japan, Aug. 9, 1996, 8-210914

Int. Cl.^{6} G01B *11/24;11/06;* G01D *5/30;* G01N *21/00*

U.S. Cl. 356—376 **12 Claims**



1. A three-dimensional measuring apparatus comprising:

an optical beam scanning unit for scanning a projected-and-depressed surface of an object to be measured with an optical beam while controlling a scanning operation; and

a detector unit for receiving a reflected optical beam reflected by the projected-and-depressed surface through the scanning operation, thereby obtaining height information about projections and depressions of the object, and transmitting the height information from the detector unit excluding noise information due to noise generated during the control of the scanning operation with the optical beam in said optical beam scanning unit.

5,841,540
DICHOTOMOUS SCAN SYSTEM FOR DETECTION OF EDGES OF OBJECTS AND OVERLAPPED OBJECTS HAVING RELATIVELY UNIFORM SURFACES

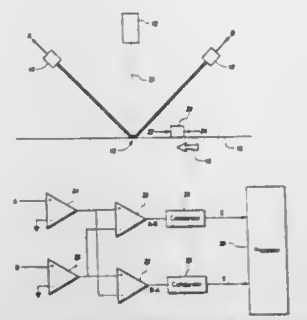
George Randolph Mondie, Bedford, Tex., assignor to Siemens ElectroCom L.P., Arlington, Tex.

Continuation of Ser. No. 482,827, Jun. 7, 1995, Pat. No. 5,659,396. This application Aug. 15, 1997, Ser. No. 912,918

Int. Cl.^{6} G01B *11/06*

U.S. Cl. 356—381 **13 Claims**

1. An electro-optical edge detector for detecting an edge of an object moving along a defined path, comprising:



a radiation source emitting radiation directed toward a spot on the path;

a first radiation sensor positioned to receive radiation reflected from the spot, movement of the object along the defined path causes a first edge of the object to substantially block radiation reflected from the spot to said first radiation sensor, said first radiation sensor generating a first output signal;

a second radiation sensor positioned to receive radiation reflected from the spot, movement of the object along the defined path causes a second edge of the object to substantially block radiation reflected from the spot to said second radiation sensor, said second radiation sensor generating a second output signal; and

a detector comprising an amplifier receiving the first output signal and the second output signal and generating an edge signal when the magnitude of the first output signal exceeds the magnitude of the second output signal identifying the edge of the object.

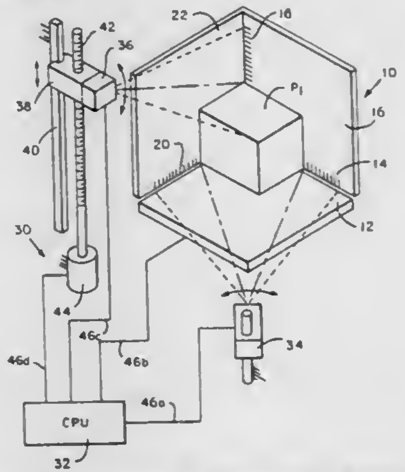
5,841,541
APPARATUS AND METHOD FOR DIMENSIONAL WEIGHING UTILIZING A ROTATING SENSOR

Daniel F. Dlugos, Shelton, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 31, 1996, Ser. No. 775,213

Int. Cl.^{6} G01B *11/02;11/06;11/28*

U.S. Cl. 356—383 **16 Claims**



1. A method for measuring the dimensions of a parcel, comprising the steps of:

(a) placing a parcel in a corner of a field of measurement; said field of measurement comprising a flat surface; said flat surface meeting at substantially right angles with two upright adjacent walls; said adjacent walls having at their base a corresponding calibrated reflective strip; said adjacent walls further having a reflective strip on at least one of said adjacent walls along the angle where said adjacent walls meet and running from the point where said adjacent walls meet said flat surface upward to a height less than, or equal to, the height of said at least one upright adjacent wall;

(b) activating a first sensor placed at a second corner of said field of measurement wherein said second corner is directly opposite said corner in which said parcel is placed;

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(c) having said first sensor measure a length and a width of said placed parcel by counting a first visible set of calibration marks along said base of said adjacent upright walls, subtracting said first set of visible calibration marks from a first predetermined number of possible calibration marks and thereby calculating said length and width of said placed parcel; and

(d) activating a second sensor wherein said second sensor is in a position above said first sensor and high enough above said flat surface of said measurement field so as to measure a height of said placed parcel by counting a second visible set of calibration marks along said angle formed where said adjacent upright walls meet, subtracting said second set of visible calibration marks from a second predetermined number of possible calibration marks and thereby calculating said height of said placed parcel.

5,841,542
OPTO-ELECTRONIC MEASURING APPARATUS FOR CHECKING LINEAR DIMENSIONS

Emilio Milana, Pontecchio Marconi, and Giovanni Graziani, Ozzano Emilia, both of Italy, assignors to Marposs Societa' Per Azioni, Bentivoglio, Italy

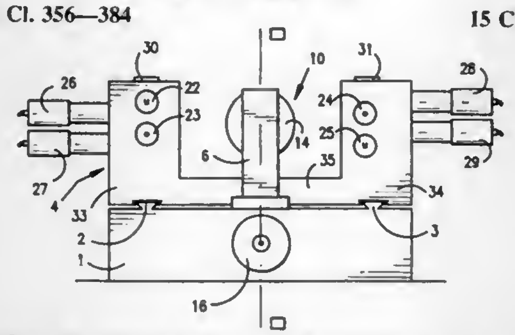
PCT No. PCT/EP96/01444, § 371 Date Oct. 7, 1997, § 102(e) Date Oct. 7, 1997, PCT Pub. No. WO96/32624, PCT Pub. Date Oct. 17, 1996

PCT Filed Apr. 2, 1996, Ser. No. 930,761

Claims priority, application Italy, Apr. 13, 1995, B095A0162

Int. Cl.^{6} G01B *11/08*

U.S. Cl. 356—384 **15 Claims**



1. Opto-electronic measuring apparatus for checking geometric features of a workpiece (**10**; **10'**) according to the shadow casting technique, including a first support (**1**; **1'**), defining a supporting location for the workpiece, a second support (**4**; **4'**), coupled with the first support, with two portions (**33**,**34**; **33'**,**34'**) oppositely arranged with respect to said supporting location, a first generating system for generating optical radiations (**22**,**23**; **22'**) for providing a first beam of light with a section directed towards the workpiece, a first photosensitive linear system (**28**,**29**; **26'**) coupled to one (**34**; **34'**) of the two oppositely arranged portions for receiving said first beam after it is intercepted by the workpiece, a second generating system for generating optical radiations (**24**,**25**; **22"**) for providing a second beam of light with a section directed towards the workpiece, a second photosensitive linear system (**26**,**27**; **26"**) for receiving said second beam after it is intercepted by the workpiece, and detecting and control circuits (**20**,**21**; **20'**,**21'**) connected to the first and the second photosensitive linear system (**26–29**; **26'**,**26"**) and adapted to receive the signals from the first and second photosensitive linear system and to combine said signals for achieving a measurement of the workpiece in a single cross-section, characterized in that the second system for generating optical radiations (**24**,**25**; **22"**) is adapted for providing the second beam of light with a section directed towards the workpiece (**10**;**10'**), in an opposite direction with respect to that of said section of the first beam of light, and in that there are foreseen two beam splitter devices (**30**,**31**; **30'**,**31'**), each of said devices being connected to one of said oppositely arranged portions (**33**,**34**; **33'**,**34'**), and being adapted to receive both one and the other of said first and second beams, and to partially divert one of the beams towards the relevant photosensitive linear system (**26–29**), the second photosensitive linear system (**26**,**27**; **26"**) being coupled to the other (**33**; **33'**) of said two oppositely arranged portions, said two beam splitter devices (**30**,**31**; **30'**,**31'**) being located between the first and second photosensitive linear system (**26–29**; **26"**) and said supporting location.

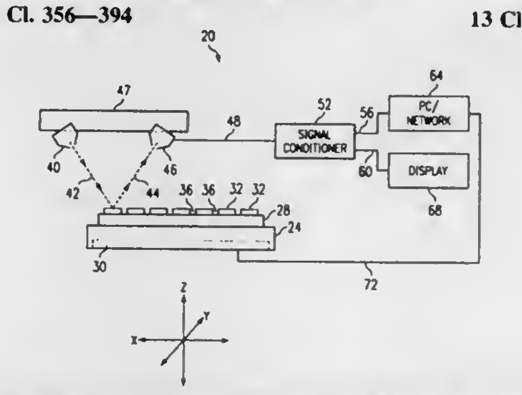
5,841,543
METHOD AND APPARATUS FOR VERIFYING THE PRESENCE OF A MATERIAL APPLIED TO A SUBSTRATE

Richard L. Guldi, Dallas, and Douglas E. Paradis, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 9, 1995, Ser. No. 401,741

Int. Cl.^{6} G01N *11/00*

U.S. Cl. 356—394 **13 Claims**



1. A process for evaluating a film overlying a substrate, comprising the steps of:

a. providing a substrate having a surface which supports a plurality of electronic circuit components being assembled upon said substrate;

b. applying a film in overlying relation to at least one of a portion of said substrate and some of said plurality of circuit components;

c. providing a single light source and directing an incident light beam from said source at a plurality of positions along said substrate;

d. generating from each of said substrate positions a reflected beam, each of said reflected beams having a profile that is representative of a feature of the position from which the beam is reflected, said incident and reflected beams traveling along substantially non-overlapping paths;

e. detecting at least one of said reflected beams; and

f. comparing the profile of each of said detected beams with a reference profile stored in memory.

5,841,544
METHOD FOR POSITIONING OPTICAL SUBASSEMBLY FOR TESTING

Mindaugas Fernand Dautartas, Alburtis, and Edward A. Pitman, Grantville, both of Pa., assignors to Lucent Technologies, Inc., Murray Hill, N.Y.

Filed Dec. 13, 1996, Ser. No. 764,958

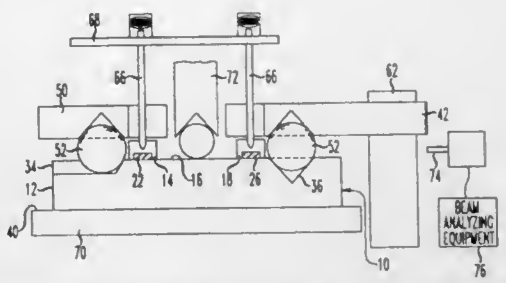
Int. Cl.^{6} G01B *11/00;* B23K *31/02;* G02B *31/02;6/36;* H05K *7/02*

U.S. Cl. 356—399 **15 Claims**

1. A method of precisely aligning optical components disposed on an optical subassembly with optics of a test fixture, the test fixture including at least an optical fiber and defined as comprising an optical axis, the method comprising the steps of:

positioning the optical subassembly within a capture zone on a support surface of the test fixture;

engaging a least two test fixture probes in contact with surfaces of respective ones of a corresponding number of precisely located fiducials in a surface of the optical subassembly;



translating the optical subassembly into more precise alignment with optics of the test fixture by moving at least two probes further into the respective fiducials;

engaging a third probe in contact with a surface of the optical subassembly such that the optical subassembly is spatially aligned along the X, Y, and Z axes with respect to the test fixture optical axis and the test fixture optical fiber is angularly aligned along Θ_x, Θ_y, and Θ_z with respect to the optics of the optical subassembly; and

wherein a metalized region is located on the optical subassembly for energizing the component on said optical subassembly.

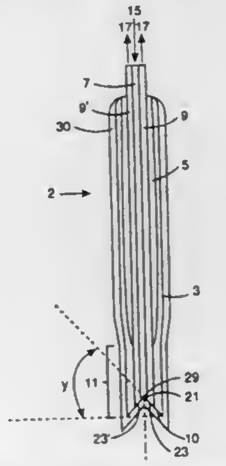
5,841,545
MULTI-FUNCTION DIAMOND FILM FIBEROPTIC PROBE AND MEASURING SYSTEM EMPLOYING SAME

Jack P. Young, Oak Ridge, Tenn., assignor to Lockheed Martin Energy Systems, Inc., Oak Ridge, Tenn.

Continuation-in-part of Ser. No. 316,306, Sep. 30, 1994, abandoned, and Ser. No. 308,855, Sep. 19, 1994, abandoned. This application Sep. 15, 1995, Ser. No. 529,128

Int. Cl.^{6} G01N *21/00*

U.S. Cl. 356—436 **20 Claims**



1. A fused fiberoptic probe for conducting spectral measurements comprising:

a. an exciting optical fiber having a terminus;

b. at least two collection optical fibers, each having a terminus;

c. an immersible probe head enclosing the terminuses of and being fused to said exciting optical fiber and said collection optical fibers, said immersible probe head having a longitudinal axis and a perpendicular axis, said probe head further having a probe-tip having a conical indentation at its tip, said conical indentation being co-axial with said longitudinal axis, said conical indentation defining a conical surface of an inverted cone-shaped probe tip wherein said terminuses of said exciting optical fiber and said collection optical fibers are within the conical surface of the inverted cone of the conical indentation and thus are angled toward said longitudinal axis at an angle between 10° and 85° with respect to said perpendicular axis, said angle being dependent upon the effective refractive index of a sample medium, said inverted cone-shaped probe tip having a center apex, said center apex being intersected by said longitudinal axis;

d. said exciting optical fiber having said terminus at said center apex of said inverted cone-shaped probe tip, said exciting optical fiber for transmitting exciting optical energy to said probe tip in order to generate an optical signal within said sample medium;

e. said collection optical fibers being juxtaposed with said exciting optical fiber, said collection optical fibers for transmitting said optical signal from said probe tip; and

f. a translucent cover means disposed in the path of said exciting optical energy and disposed over at least a portion of said probe tip.

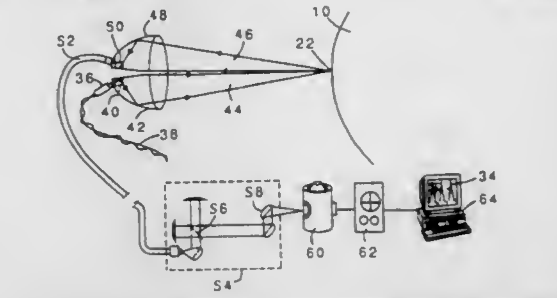
5,841,546
NON-CONTACT SPECTROSCOPY SYSTEM AND PROCESS

Robert M. Carangelo, Glastonbury, Conn.; Mark A. Druy, Arlington, Mass.; William A. Stevenson, Concord, Mass., and Paul J. Glatkowski, Littleton, Mass., assignors to Foster-Miller, Inc., Waltham, Mass.

Filed Mar. 1, 1996, Ser. No. 609,648

Int. Cl.^{6} G01N *21/35;21/55*

U.S. Cl. 356—445 **19 Claims**



1. A spectroscopy system for non-contact analysis comprising analyzing apparatus, a source of radiation for generating a beam of radiation,

scanning head structure comprising transmitting optics in said scanning head structure for directing radiation in said beam of radiation onto a surface of material to be analyzed that spaced from said scanning head structure, said transmitting optics focusing said beam of radiation in a region that is spaced at least 0.1 meter from said scanning head structure and that has a dimension of about one centimeter, and receiving optics in said scanning head structure for collecting radiation reflected from the surface of said material, and

optical fiber structure having a core portion of less than one millimeter diameter for receiving said collected radiation and transmitting said collected radiation to said analyzing apparatus.

5,841,547
DIGITAL IMAGE FORMING APPARATUS PROVIDING PLURAL BOOKBINDING MODES

Motomi Takemoto, and Eiichi Yoshida, both of Toyokawa, Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Oct. 30, 1996, Ser. No. 739,916

Claims priority, application Japan, Nov. 1, 1995, 7-306396

Int. Cl.^{6} H04N *1/00;* G03B *27/32;* G03G *15/00*

U.S. Cl. 358—296 **5 Claims**

3. A digital image forming apparatus capable of forming images respectively on both front faces and back faces of record paper sheets, and said digital image forming apparatus comprising:

an image reading means for reading a document composed of a plurality of document pages and converting said document into image signals;

an image signal storing means having a plurality of image storing regions, each for storing the image signals corresponding to one of the document pages;

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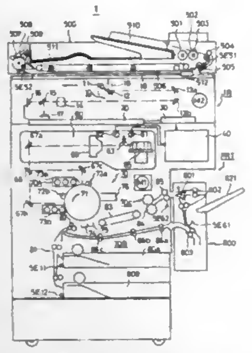
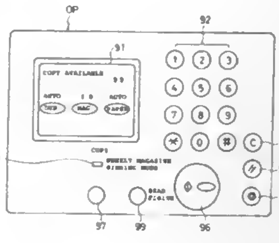




an image forming means for recording images on the record paper sheets based on the image signals stored in the image signal storing means;

a bookbinding mode selecting means for selecting one of a first bookbinding mode, and a second bookbinding mode,

- a) in said first bookbinding mode, a first document page being recorded on a first face of a first record paper sheet having a size twice as large as a designated size, a second document page being recorded on a second face of the first record paper sheet, unrecorded pages of a third document page and so forth being successively recorded on both faces of second record paper sheets having the designated size, and said first record paper sheet being folded in two with said second record paper sheets being inserted and bound within the folded first record paper sheet, and
- b) in said second bookbinding mode, the document pages being successively recorded in accordance with a predetermined order on both faces of record paper sheets having the size twice as large as the designated size, and the record paper sheets being folded in two and bound at a folded edge; and

a controlling means for successively designating the image storing regions, and for outputting the image signals to the image forming means such that the document pages are recorded on the record paper sheets in a predetermined order in accordance with a total number of document pages,

the controlling means controlling the bookbinding mode selecting means to select the first bookbinding mode when the total number of pages of the document exceeds a predetermined number of sheets and to select the second bookbinding mode when the total number of pages of the document is equal to or less than the predetermined number of sheets.

5,841,548
PRINTING APPARATUS FOR REPRODUCING COPY SETS CONTAINING VARIABLE PAGES AND A SORTING MEANS FOR SEPARATING THE DIFFERENT COPY SETS

Kazuyuki Mitome, and Kazuyoshi Tokunaga, both of Ibaraki, Japan, assignors to Hitachi Koki Co., Ltd., Tokyo, Japan
Filed Feb. 28, 1996, Ser. No. 607,930
Claims priority, application Japan, Mar. 10, 1995, 7-050855
Int. Cl.^{6} H04N *1/04;1/40;* **G06F** *15/00;* **G03G** *21/00*
U.S. Cl. 358—296 **7 Claims**

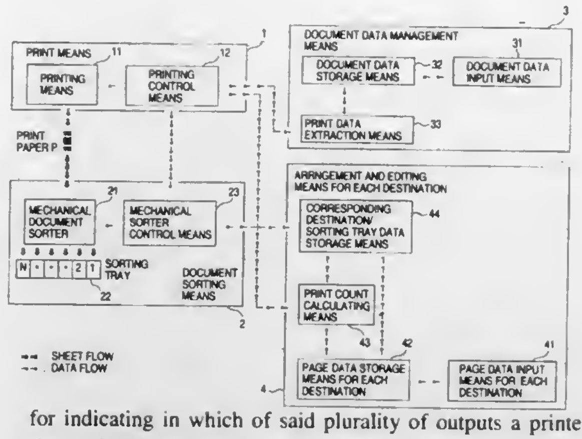
1. A printing apparatus for printing a predetermined quantity of selected pages of an input document, comprising:

print means for printing characters on sheets of paper;

document sorting means for sorting said sheets provided by said print means into a plurality of outputs;

document data management means for supplying data relating to the selected pages to be printed to said print means, including data indicating a number of sets of copies to be produced from an input document, data indicating a number of copies of each page of said input document to be copied, and data indicating for each set of copies whether each page of said input document is included in said set of copies; and

arrangement and editing means for transmitting the printed sheets to said document sorting means in a required order and

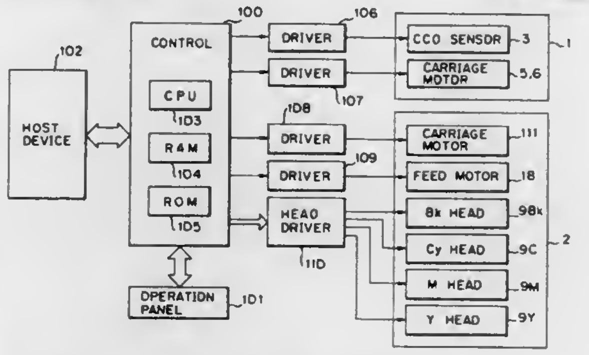

PRINT MEANS
11
PRINTING MEANS
PRINTING CONTROL MEANS
12
1
PRINT PAPER P
MECHANICAL DOCUMENT SORTER
21
MECHANICAL SORTER CONTROL MEANS
23
N
2
1
SORTING TRAY
22
DOCUMENT SORTING MEANS
2
DOCUMENT DATA MANAGEMENT MEANS
3
DOCUMENT DATA STORAGE MEANS
32
31
DOCUMENT DATA INPUT MEANS
PRINT DATA EXTRACTION MEANS
33
ARRANGEMENT AND EDITING MEANS FOR EACH DESTINATION
CORRESPONDING DESTINATION/ SORTING TRAY DATA STORAGE MEANS
44
PRINT COUNT CALCULATING MEANS
43
42
41
PAGE DATA STORAGE MEANS FOR EACH DESTINATION
PAGE DATA INPUT MEANS FOR EACH DESTINATION
4
SHEET FLOW
DATA FLOW

for indicating in which of said plurality of outputs a printed sheet will be deposited,

wherein said document data management means supplies the data to said print means so that only the selected pages of the input document are produced in each set of copies, respectively.

5,841,549
METHOD AND APPARATUS FOR FORMING SINGLE-COLOR AND MULTI-COLOR IMAGES

Atsushi Munakata, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 280,126, Jul. 25, 1994, abandoned.
This application May 28, 1997, Ser. No. 864,527
Claims priority, application Japan, Jul. 26, 1993, 08080126
Int. Cl.^{6} H04N *1/46*
U.S. Cl. 358—296 **20 Claims**



1. An image-forming apparatus comprising:

transport means for transporting a recording medium;

generation means for generating image data;

a plurality of recording heads arranged along a scanning direction different from a direction of transporting said recording medium for recording an image in accordance with said image data;

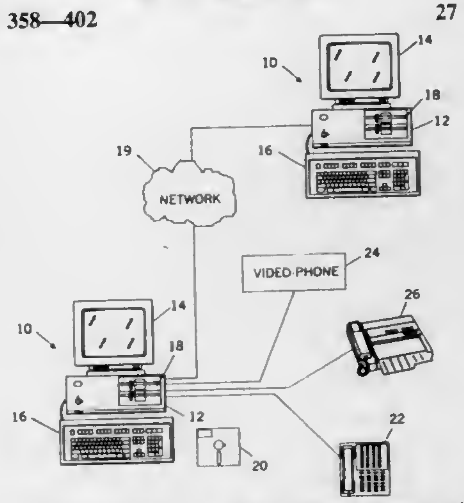
movement means for moving said plurality of recording heads in said scanning direction to perform a recording movement;

selection means for selecting either a first mode in which a multicolor image is formed by said plurality of recording heads during a period of moving in one direction or a second mode in which a single-color image is formed by one of said plurality of recording heads in two opposite directions; and

control means for controlling said recording movement of said plurality of recording heads in accordance with said mode selected by said selection means.

5,841,550
METHOD AND SYSTEM FOR SPECIFICATION OF TIME DEPENDENT ACKNOWLEDGEMENT TRANSMISSION MEDIA

William J. Johnson, Flower Mound, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 366,702, Dec. 30, 1994, abandoned.
This application Nov. 20, 1996, Ser. No. 752,772
Int. Cl.^{6} H04N *1/00*
U.S. Cl. 358—402 **27 Claims**



1. A method, performed in a data processing system, which data processing system includes a plurality of diverse transmission media selected from the group of electronic mail, voice telephone, video-phone and facsimile, for selecting among transmission media in response to time of receipt of a message and automatically transmitting an acknowledgement of receipt using the selected transmission medium, said method comprising the computer implemented steps of:

specifying rules for acknowledgement of receipt, said rules including at least two nonidentical and nonoverlapping time partitions, each such time partition having an associated transmission medium for transmission of acknowledgement of receipt, wherein the transmission medium associated with each such time partition differs from the transmission medium associated with another such time partition;

transmitting a message, said message having associated therewith said rules;

receiving the message;

determining the time of receipt of the message;

determining whether said time of receipt falls within any of said time partitions; and

in response to a determination that said time of receipt falls within one of said time partitions, automatically transmitting an acknowledgement of receipt using the transmission medium associated with said one time partition.

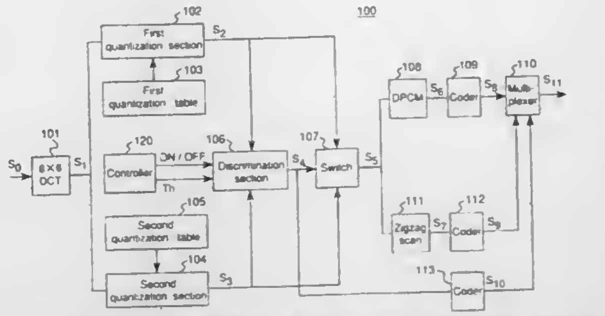
5,841,551
DATA PROCESSOR

Munehiro Nakatani, Toyohashi; Hiroyuki Suzuki, and Kazuomi Sakatani, both of Toyokawa, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan
Division of Ser. No. 267,711, Jun. 28, 1994, Pat. No. 5,517,327.
This application Jan. 25, 1996, Ser. No. 591,712
Claims priority, application Japan, Jun. 30, 1993, 5-162016; Jul. 22, 1993, 5-181268; Aug. 5, 1993, 5-194654
Int. Cl.^{6} H04N *1/41;1/415*
U.S. Cl. 358—426 **5 Claims**

1. A data processor comprising:

a first blocking device for dividing image data into a plurality of first processing blocks;

a second blocking device for dividing the image data into a plurality of second processing blocks, wherein each of said second processing blocks has a size larger than that of each of



said first processing blocks, and wherein each of said second processing blocks includes at least one of said first processing blocks;

a first orthogonal transformation device for performing orthogonal transformation of the image data of one of said first processing blocks to send first coefficient data;

a second orthogonal transformation device for performing orthogonal transformation of the image data of one of said second processing blocks to send second coefficient data;

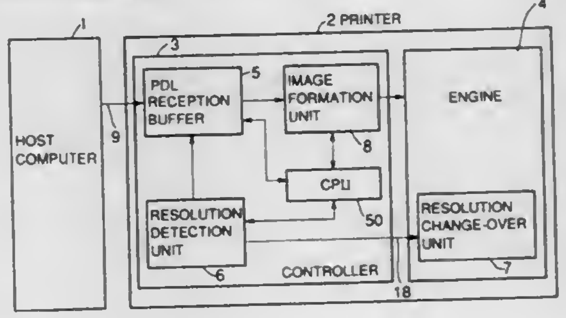
a discrimination device, responsive to said second orthogonal transformation device, for discriminating if the image data of one of said first processing blocks is a character image, a dot image or a half-tone image;

a quantization device, comprising a plurality of quantization tables suitable for a character image, a dot image and a half-tone image, for selecting one of the quantization tables according to a result of discrimination by said discrimination device and for quantizing the first coefficient data with the selected quantization table; and

a coder for coding quantized data received from the quantization device.

5,841,552
IMAGE PROCESSED APPARATUS FOR PROCESSING IMAGES HAVING DIFFERENT RESOLUTIONS

Hiroshi Atobe, and Atsushi Shoji, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 870,317, Apr. 17, 1992, abandoned.
This application Jan. 24, 1995, Ser. No. 377,510
Claims priority, application Japan, Apr. 19, 1991, 3-113731; Apr. 24, 1991, 3-094372
Int. Cl.^{6} H04N *1/00*
U.S. Cl. 358—447 **7 Claims**



1. An image processing apparatus comprising:

input means for inputting input information describing an image;

conversion means for converting the input information into pixel information;

specification means for specifying a resolution, at which the image is to be printed, in accordance with the input information for the image;

a print unit having a plurality of light scanning means in which a plurality of cells are arranged on a line, with a density of cells in each of said light scanning means being different from one another, wherein the printing resolution is variably adjusted by selectively using one of said plurality of light scanning means; and

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- setting means for setting a printing resolution of said print unit which variably adjusts a printing resolution in a predetermined range of resolutions, with said setting means setting a printing resolution as one of the specified resolution and a different resolution,
- wherein when the specified resolution is lower than the predetermined range, said setting means sets, as the printing resolution of said print unit, i times the specified resolution (i being an integer ≧2) in the predetermined range of resolutions.

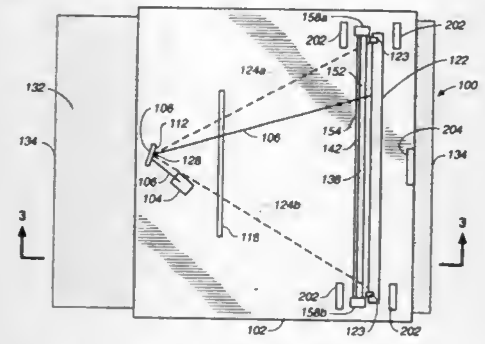
5,841,553
COMPACT DOCUMENT SCANNER OR PRINTER ENGINE

Armand P. Neukermans, Palo Alto, Calif., assignor to XROS, Inc., Mountain View, Calif.

Filed Dec. 24, 1996, Ser. No. 773,097

Int. Cl.^{6} H04N *1/04;* **G01J** *1/00;* **G02B** *26/08*

U.S. Cl. 358—494 **22 Claims**



1. A compact medium scanner for scanning a surface of a medium, the medium scanner comprising:
- a medium transport mechanism for advancing the surface of the medium along a medium transport path through a scanning station located within the medium scanner;
- a light source for producing a beam of light;
- a micromachined torsional scanner having a reciprocating mirror plate upon which the beam of light impinges, reciprocation of the mirror plate of said micromachined torsional scanner during a time interval of a single reciprocation deflecting the beam of light over a generally fan-shaped region having a substantially fixed optical path, the mirror plate being supported within said micromachined torsional scanner by a pair of coaxially aligned torsion bars disposed on opposite sides of the mirror plate, the torsion bars and the mirror plate being one piece;
- mirror-plate drive means for rotating the mirror plate about the torsion bars from a rest position; and
- scanner optics for directing and focusing the beam of light onto the surface of the medium then present in the scanning station to thereby scan across the surface of the medium with the beam of light.

5,841,554
IMAGE PICKUP APPARATUS

Shizuo Hasegawa, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

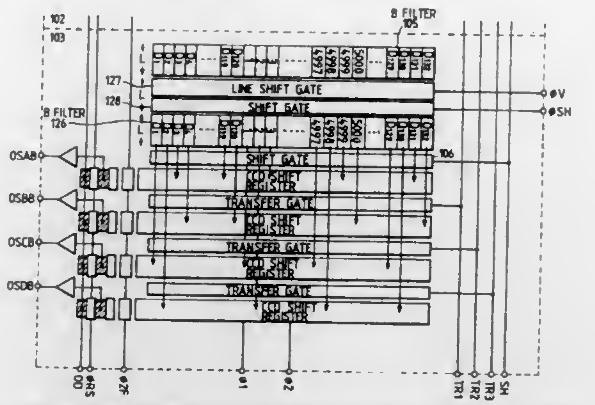
Continuation of Ser. No. 380,800, Jan. 30, 1995, abandoned. This application Jan. 8, 1997, Ser. No. 781,929

Claims priority, application Japan, Jan. 31, 1994, 6-009874

Int. Cl.^{6} H04N *1/195*

U.S. Cl. 358—514 **20 Claims**

1. An image pickup apparatus comprising:
- m first line sensors for photoelectrically converting light of a first color, where m is an integer greater than or equal to 1;



- n second line sensors for photoelectrically converting light of a second color different from said first color, in which n is an integer larger than m,
- wherein each of said second line sensors generates an output and has a line length in a first direction and a same width in a second direction perpendicular to the first direction, and wherein said second line sensors and an object are moved relatively in the second direction by a pitch substantially equal to the width, said second line sensors being arranged in parallel in the second direction with a same space between each adjacent pair of said second line sensors being substantially equal to a predetermined multiple of said pitch; and
- synthesizing means for synthesizing, at one of the second line sensors, outputs of said second line sensors, which are output at an interval corresponding to said predetermined multiple of said pitch respectively.

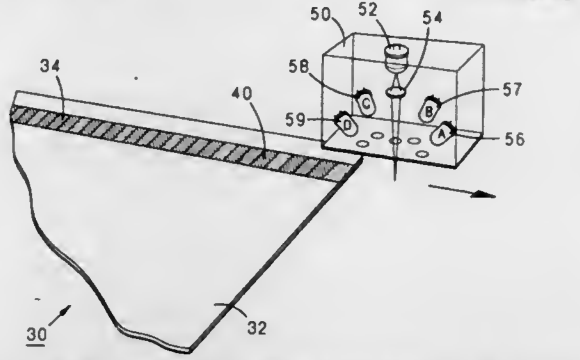
5,841,555
SECURE OPTICAL IDENTIFICATION METHOD AND MEANS

James S. Bianco, Enfield, Conn., and David J. Horan, Westfield, Mass., assignors to Control Module Inc., Enfield, Conn.

Continuation of Ser. No. 497,778, Jul. 3, 1995, Pat. No. 5,627,663, which is a continuation of Ser. No. 115,412, Aug. 31, 1993, abandoned. This application May 6, 1997, Ser. No. 852,181

Int. Cl.^{6} G03H *1/00;* **G06K** *7/10;* **B42D** *15/00*

U.S. Cl. 359—2 **12 Claims**



1. A method of providing secure identification for an article, comprising:
- (a) providing on said article a diffraction grating strip comprising a pattern of a series of diffraction grating elements, each said diffraction grating element to diffract light, from a light source, in one of at least three selected different planes, a given length of adjacent ones of said series of diffraction grating elements representing a grating number;
- (b) serially illuminating said diffraction grating elements, detecting transitions between changes in plane of diffracted light as said diffraction grating elements are serially illuminated, and generating first information representative of said changes in plane to determine said grating number, said first information being generated from said transitions without the use of a clock;
- (c) storing said first information representative of said changes in plane;
- (d) subsequently, serially illuminating said diffraction grating elements, detecting transitions between changes in plane of diffracted light as said diffraction grating elements are serially illuminated, and generating second information representative of said changes in plane, said second information being generated from said transitions without the use of a clock; and
- (e) then, comparing said first and second information to determine the authenticity or not of said article.

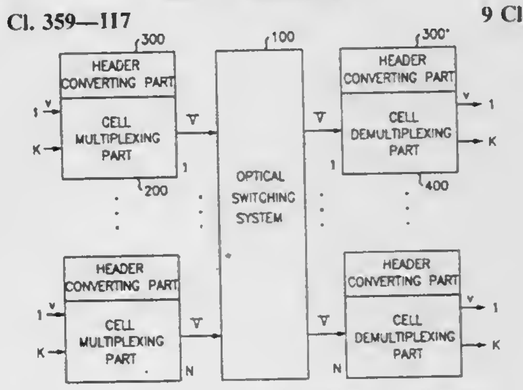
5,841,556
OPTICAL SWITCHING SYSTEM WITH COMBINED SPACE AND WAVELENGTH DIVISION MULTIPLEX BASED ON THE REPEATED CONTENTION RESOLUTION TECHNIQUE

Hyun Ha Hong, and Yong Hyub Won, both of Daejeon, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon, Rep. of Korea

Filed Dec. 26, 1996, Ser. No. 780,122

Int. Cl.^{6} H04J *14/00*

U.S. Cl. 359—117 **9 Claims**



1. An optical switching system including a plurality of subsystems, the subsystems including:
- a plurality of input cell processing means for extracting a destination address from a cell input from a multiplexing means within the system, inspecting a state value related to the destination address, adding routing information to a header of the cell, performing a wavelength conversion for the cell in response to wavelength information, wherein the state value is one of state values which correspond to the subsystems in the ratio of one to one, wherein the input cell processing means converts a wavelength of the cell in response to the wavelength information, and wherein the input cell is transmitted to a space division switching means to be routed to a destination port at a present or next time slot;
- a space division switching means for receiving the output of the input cell processing means, examining whether the routing information is added to the cell or not, and coupling the cells which undergo the wavelength conversion, wherein the space division switching means delays the cells for one time slot if the routing information is added to the cell, and wherein the space division switching means outputs the cells without delay time if the routing information is not added to the cell;
- a plurality of wavelength group demultiplexing means for receiving the output of the space division switching means, demultiplexing the coupled cells; and
- an output means for receiving the output of the wavelength group demultiplexing means, filtering the demultiplexed cells by fixed wavelengths filters,
- wherein each of the wavelength group demultiplexing means is coupled to each of the output means within each of the subsystem.

5,841,557
METHOD AND APPARATUS FOR SCRAMBLING THE POLARIZATION OF SIGNAL LIGHTS FORMING A WAVELENGTH DIVISION MULTIPLEXED SIGNAL LIGHT

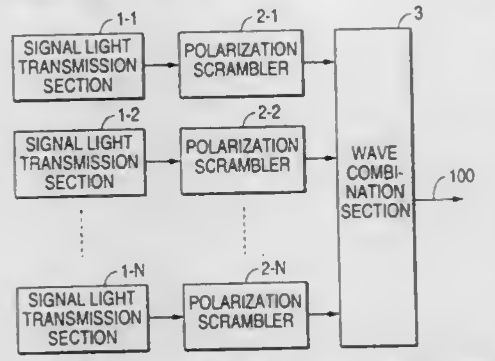
Kazue Otsuka; Hiroshi Onaka; Takafumi Terahara, and Takao Naito, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 22, 1996, Ser. No. 734,605

Claims priority, application Japan, Nov. 17, 1995, 7-300303

Int. Cl.^{6} H04J *14/06*

U.S. Cl. 359—122 **42 Claims**



25. An apparatus for scrambling a polarization of signal lights, comprising:
- a polarization scrambling mechanism which scrambles the polarization of a signal light with a scrambling frequency; and
- a combining mechanism which combines the polarization scrambled signal light with at least one other signal light to form a wavelength division multiplexed signal light, wherein the polarization scrambling mechanism includes
  - a plurality of polarization scramblers which scramble the polarization of a plurality of signal lights, respectively, at a scrambling frequency, the polarization of each signal light being scrambled at the same scrambling frequency, and
- the combining mechanism combines the plurality of polarization scrambled signal lights to form the wavelength division multiplexed signal light, where
  - each signal light of the plurality of signal lights has a different frequency, and respective signal lights are defined as being adjacent when the frequencies of the respective signal lights are adjacent to each other in a frequency spectrum without the frequency of a different signal light therebetween, and,
  - before the polarization of the plurality of signal lights is scrambled by the plurality of polarization scramblers, the polarization of each signal light is different from the polarization of signal lights adjacent to the respective signal light.

5,841,558
AUXILIARY-SIGNAL TRANSMISSION SYSTEM

Yuji Tamura; Hiroyuki Itou; Tsukasa Takahashi, all of Sapporo; Michikazu Shima, Kawasaki; Yumiko Kawasaki, Kawasaki, and Kazuo Yamane, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Division of Ser. No. 388,357, Feb. 14, 1995, Pat. No. 5,625,481. This application Jan. 22, 1997, Ser. No. 787,391

Claims priority, application Japan, Jun. 21, 1994, 6-138479

Int. Cl.^{6} H04B *10/16*

U.S. Cl. 359—124 **15 Claims**

1. An optical transmission apparatus comprising:
- an optical amplifier for amplifying an input main optical signal and outputting a first optical signal containing an amplified main optical signal and spontaneously emitted light; and
- modulating means for modulating said spontaneously emitted light contained in said first optical signal in accordance with

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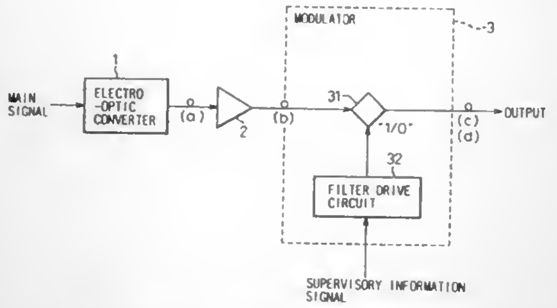


an auxiliary signal to output a second optical signal containing said amplified main optical signal and an auxiliary optical signal.

5,841,559

Patent Not Issued For This Number

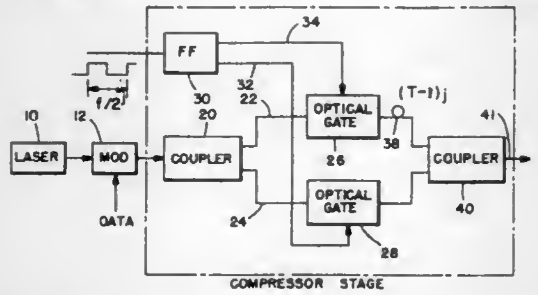
5,841,560
SYSTEM FOR OPTICAL PULSE TRAIN COMPRESSION AND PACKET GENERATION

Paul R. Prucnal, Princeton, N.J., assignor to The Trustees of Princeton University, Princeton, N.J.

Filed Sep. 30, 1996, Ser. No. 721,762

Int. Cl.^{6} H04J *14/08*

U.S. Cl. 359—138 **6 Claims**



1. An optical compressor having a sequence N of compression stages, where N is an integer >1, for compressing a pulse train having a repetition time T and a repetition rate of f, to a pulse train with a repetition time t, where t<T, each compression stage comprising:

a first optical path including a first gate and a delay element having a time delay (T−t)j, where j is a sequence number of the respective compression stage;

a second optical path including a second gate;

first coupling means for inducing said pulse train onto said first optical path and second optical path;

gate control means, for applying gating/nongating signals having a repetition rate of $f/2^j$ to said first gate and complementary non-gating/gating signals having a repetition rate of $f/2^j$ to said second gate; and

second coupling means for combining outputs from said first optical path and second optical path and applying a combined output therefrom to a next one of said sequence of N compression stages, if any.

5,841,561

Patent Not Issued For This Number

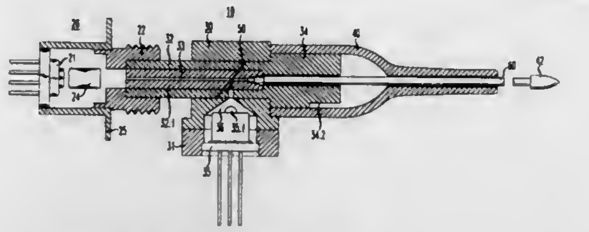
5,841,562
BIDIRECTIONAL MODULAR OPTOELECTRONIC TRANSCEIVER ASSEMBLY

Sabbir S. Rangwala, and Thomas Stanley Stakelon, both of Allentown, Pa., assignors to Lucent Technologies, Inc., Murray Hill, N.J.

Continuation of Ser. No. 756,218, Nov. 25, 1996, abandoned. This application Nov. 12, 1997, Ser. No. 968,958

Int. Cl.^{6} H04B *10/24*

U.S. Cl. 359—152 **3 Claims**



1. A transceiver assembly comprising:

a transmitter module including a housing, a source of an outgoing optical signal mounted in a wall of said housing, an aperture in a wall of said housing, a socket including a cylindrical bore disposed within said aperture, and a lens for coupling said outgoing signal through said aperture, and

a receiver-splitter module having a cavity and a transverse bore optically coupled thereto, a detector of an incoming optical signal mounted in said cavity, a first ferrule having a flat first endface and an opposite oblique endface, said first ferrule containing a fiber segment, the fiber segment having a first flat endface coplanar with said first ferrule flat first endface and having an oblique endface coplanar with said first ferrule oblique endface wherein the fiber segment oblique endface includes a coating adapted to partially transmit said outgoing signal and to partially reflect said incoming signal into said detector, the flat first endface of said first ferrule being insertable into said socket cylindrical bore so that said fiber segment receives said outgoing signal, and a second ferrule having an oblique first endface and an opposite flat endface, said second ferrule containing a fiber segment, the fiber segment having a first oblique endface coplanar with said second ferrule first oblique endface including a coating adapted to partially transmit said outgoing signal and to partially reflect said incoming signal into said detector, the oblique endfaces of said first and second ferrules being insertable into the receiver-splitter transverse bore such that the respective oblique faces are parallel to one another and the respective coatings are in physical contact and disposed in optical alignment with the detector disposed within the receiver-splitter cavity.

5,841,563
METHOD AND SYSTEM FOR EFFICIENT OPTICAL TRANSMISSION OF NTSC VIDEO

Frank J. Effenberger, New Providence, N.J., assignor to Bell Communications Research, Inc., Morristown, N.J.

Filed Oct. 29, 1996, Ser. No. 738,648

Int. Cl.^{6} H04B *10/04;* **H04J** *14/08*

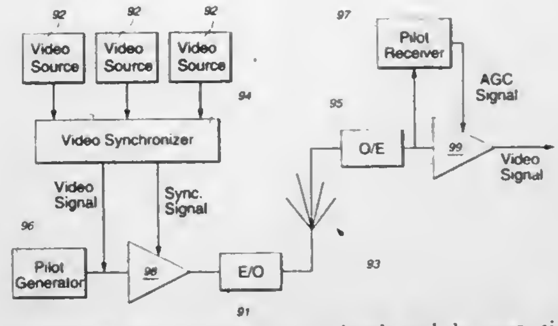
U.S. Cl. 359—158 **18 Claims**

1. A method for reducing distortion in an NTSC video signal comprising the steps of:

a) providing a plurality of video signals from respective sources;

b) synchronizing the video signals and generating a sync. signal associated therewith;

c) modulating the video signals and the sync. signal with a transmitting RF amplifier, the gain of the transmitting amplifier being reduced a predetermined amount during a sync. period during which the sync. signal is transmitted, the predetermined amount being measured relative to the gain of the transmitting amplifier during periods during which the video signals are transmitted; and



d) receiving the modulated video signals and the sync. signal with a receiver that is tuned and detected by automatic gain control circuitry, the automatic gain circuitry detecting a relative decline in power during the sync. period and forcing a gain increase corresponding to the predetermined amount.

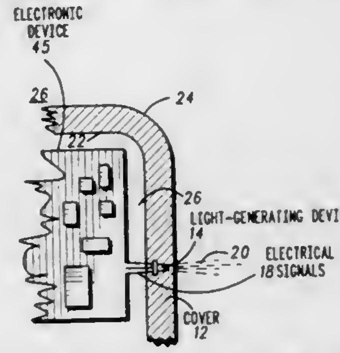
5,841,564
APPARATUS FOR COMMUNICATION BY AN ELECTRONIC DEVICE AND METHOD FOR COMMUNICATING BETWEEN ELECTRONIC DEVICES

Kevin J. McDunn, Lake In The Hills, and Gerald W. Ballard, West Dundee, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 31, 1996, Ser. No. 775,663

Int. Cl.^{6} H04B *10/00*

U.S. Cl. 359—161 **14 Claims**



1. An apparatus for communication by an electronic device, comprising:

a first housing defining a first chamber, the first chamber sized to enclose at least a portion of an electronic device, the first housing having an inner surface and an outer surface, at least a portion of the first housing being transparent; and

a light-generating device disposed at least in part between the inner surface and the outer surface of the transparent portion of the first housing, the light-generating device having a first end and a second end, the first end responsive to electrical signals and the second end responsive to optical signals,

wherein when a first electronic device is disposed at least partially in the first chamber, the first electronic device is in contact with a cooling fluid and the first electronic device transmits electrical signals to the first end, and wherein the second end translates the electrical signals to optical signals and transmits the optical signals through the outer surface.

5,841,565
SEMICONDUCTOR DEVICE, LIGHT-RECEIVING MODULE AND METHOD FOR MANUFACTURING SAME

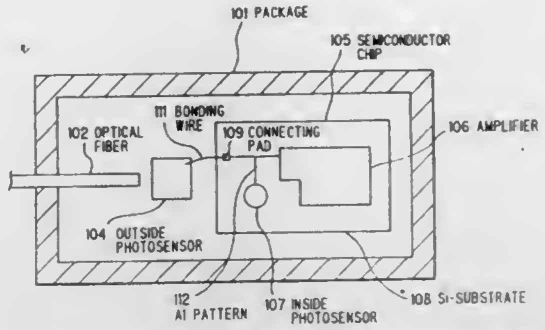
Tatsuo Kanai, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 20, 1998, Ser. No. 44,901

Int. Cl.^{6} H04B *10/00*

U.S. Cl. 359—189 **6 Claims**

1. A semiconductor chip comprising:



a semiconductor amplifier unit mounted on a substrate for amplifying an electrical signal supplied from an outside of said substrate,

a photosensor mounted on said substrate for converting a light incident thereon into an electrical inspection signal for inspecting said semiconductor amplifier unit, and

electrical inspection signal transmission means inserted between an output port of said photosensor and an input port of said semiconductor amplifier unit, which is interrupted on condition that said semiconductor amplifier unit has been recognized as suitable for specifications in said inspection.

5,841,566
MULTI-BEAM SCANNING OPTICAL DEVICE

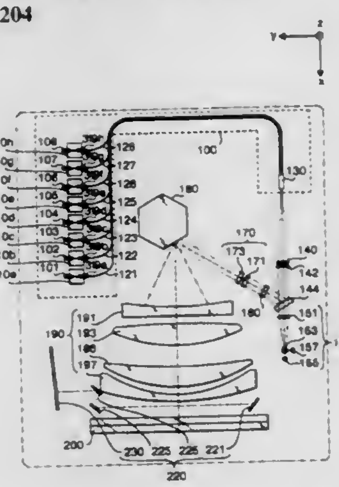
Tadashi Minakuchi; Masahiro Oono; Mitsunori Iima, and Hiroshi Kanazawa, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 31, 1997, Ser. No. 791,985

Claims priority, application Japan, Jan. 31, 1996, 8-037266

Int. Cl.^{6} G02B *26/08*

U.S. Cl. 359—204 **10 Claims**



1. A multi-beam scanning optical device in which light fluxes emitted from a plurality of light emitting elements are deflected by a deflector to form a plurality of scanning lines per scan through a scanning lens system, comprising:

a wavelength error Δλ (unit:nm) of each of said plurality of light emitting elements from a reference wavelength that satisfies a formula:

$$|\Delta\lambda|<7.6\times10^{3}/(\alpha\times D),$$

where D is a resolution of said scanning optical device (unit:dots per inch (dpi)) and α is a ratio of a lateral chromatic aberration (unit:μm) per change in wavelength of 1 nm at an edge of a scanning range.

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5,841,567

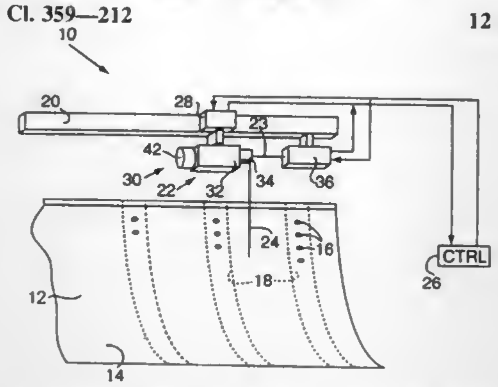
METHOD AND APPARATUS FOR IMAGING AT A PLURALITY OF WAVELENGTHS

David P. Squires, Lebanon, and Joseph A. Wheeler, Vernon, both of Conn., assignors to Barco Gerber Systems, South Windsor, Conn.

Filed Jul. 2, 1996, Ser. No. 674,766

Int. Cl.^{6} G02B *26/08*

U.S. Cl. 359—212 **12 Claims**



1. An imaging system for imaging a substrate surface at a plurality of imaging wavelengths, the system comprising:

a replaceable beam generating module for generating an imaging beam in dependence on beam command signals, said imaging beam having a wavelength which is a one of the plurality of imaging wavelengths, said beam generating module further for presenting said imaging beam along a prescribed path, said beam generating module further for generating wavelength signals indicative of the imaging beam wavelength;

a spinning mirror for receiving said imaging beam from along said prescribed path and for substantially reflecting said imaging beam onto the substrate surface and for advancing the reflected imaging beam, as said mirror spins, across the substrate surface in a direction defining a scan line, wherein said spinning mirror is capable of substantially reflecting a received beam having any one of the plurality of imaging wavelengths; and

controller means for receiving said wavelength signals, and for generating said beam command signals in dependence on said wavelength signals, wherein said beam command signals control generation of said imaging beam in accordance with a prescribed pattern to image upon the substrate surface.

5,841,568

OPTICAL MODULATOR AND METHOD OF MANUFACTURING THE SAME

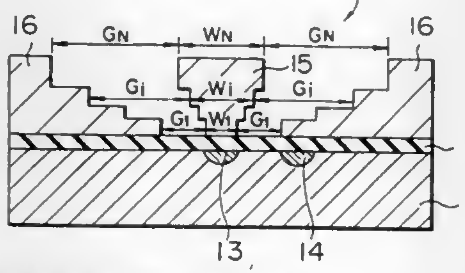
Tosiya Miyakawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 28, 1996, Ser. No. 623,926

Claims priority, application Japan, Mar. 29, 1995, 7-071010

Int. Cl.^{6} G02F *1/03*

U.S. Cl. 359—245 **8 Claims**



1. An optical modulator comprising:

a substrate having an electrooptic effect;

an optical waveguide formed on a surface of said substrate; and

a control electrode formed on said substrate to oppose said optical waveguide, said control electrode is formed by stacking a plurality of layers in a direction perpendicular to the substrate surface, said control electrode comprising a signal electrode and a ground electrode formed to oppose said signal electrode, wherein a ratio of a width of said signal electrode in a direction parallel to the substrate surface to an electrode gap between said signal electrode and said ground electrode is kept constant throughout the layers of said control electrode.

5,841,569

METHOD OF MANUFACTURING AN ARRAY OF THIN FILM ACTUATED MIRRORS

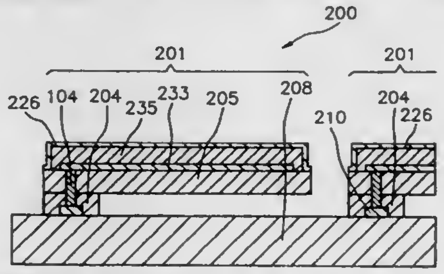
Dong-Kuk Kim, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Continuation of Ser. No. 504,874, Jul. 20, 1995, Pat. No. 5,608,569. This application Dec. 27, 1996, Ser. No. 774,835

Claims priority, application Rep. of Korea, Jul. 21, 1994, 1994-17571

Int. Cl.^{6} G02B *26/00*

U.S. Cl. 359—291 **8 Claims**



1. A method for manufacturing an array of actuated mirrors for use in an optical projection system on a substrate having an array of connecting terminals, the method comprising the steps of:

forming a sacrificial layer on top of the substrate;

removing portions of the sacrificial layer around each of the connecting terminals to expose the connecting terminals;

forming a supporting member, made of an insulating material, in each of the removed portions of the sacrificial layer;

depositing an elastic layer on top of the sacrificial layer and the supporting members; forming an array of conduits;

forming an array of first electrodes on top of the elastic layer;

forming an array of electrodisplacive members, wherein each of the electrodisplacive members covers each of the first electrodes;

heat treating the electrodisplacive members to allow a phase transition to take place;

patterning the elastic layer into an array of elastic members:

forming an array of second electrodes, wherein each of the second electrodes covers each of the electrodisplacive members; and

removing the sacrificial layer, thereby forming the array of actuated mirrors.

5,841,570

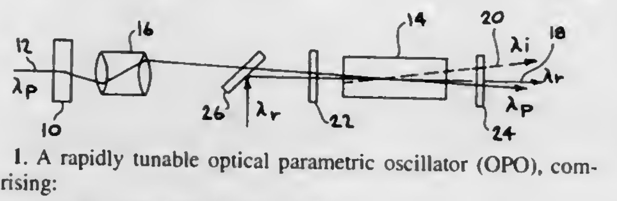
FREQUENCY AGILE OPTICAL PARAMETRIC OSCILLATOR

Stephan P. Velsko, Livermore, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Filed Jan. 31, 1997, Ser. No. 791,340

Int. Cl.^{6} G02F *1/39*

U.S. Cl. 359—330 **14 Claims**



1. A rapidly tunable optical parametric oscillator (OPO), comprising:

means for generating a pump beam;

a beam deflector for changing the angle of said pump beam about a pivot point;

a nonlinear crystal;

a resonator cavity formed around said nonlinear crystal; and

a relay telescope to relay the image of said pump beam at said pivot point to an image plane located within said nonlinear crystal.

5,841,571

OPTICAL RECEIVER HAVING A FUNCTION FOR SUPPRESSING USELESS INTENSITY MODULATION COMPONENTS

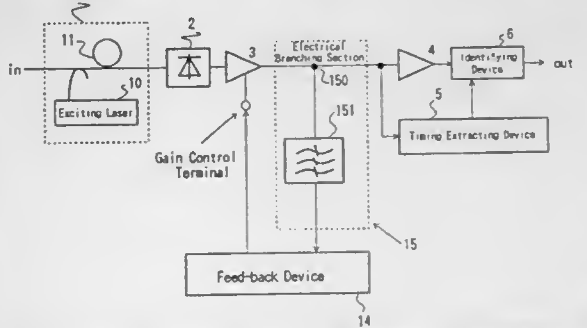
Takafumi Terahara, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 19, 1996, Ser. No. 618,209

Claims priority, application Japan, Jun. 20, 1995, 7-153075

Int. Cl.^{6} H04B *10/14;10/16*

U.S. Cl. 359—341 **5 Claims**



1. An optical receiver having a function of suppressing an intensity modulation component comprising:

an optical to electrical converter for converting an optical main signal to an electrical signal;

an optical amplifier for amplifying the optical main signal provided on a preceding stage of the optical to electrical converter;

a detector for detecting an intensity modulation component of the optical main signal due to polarization scrambling frequency or a monitor control signal frequency; and

a feed-back device for feeding the detected signal obtained by the detector back to the optical amplifier so as to control a gain in a frequency band of the intensity modulation component signal, the frequency band being lower than a frequency band of the optical main signal.

5,841,572

LENS ARRAY SHEET, SURFACE LIGHT SOURCE, AND TRANSMISSION TYPE DISPLAY DEVICE

Rika Ando; Haruo Ono; Hisanori Ishida; Michiko Takeuchi; Toshikazu Nishio, and Nobu Masubuchi, all of Tokyo-to, Japan, assignors to Dai Nippon Printing Co., Ltd., Japan

Division of Ser. No. 523,609, Sep. 5, 1995. This application Apr. 30, 1998, Ser. No. 69,966

Claims priority, application Japan, Sep. 6, 1994, 6-236017; May 18, 1995, 7-142386; Jun. 12, 1995, 7-167861

Int. Cl.^{6} G03B *21/00*

U.S. Cl. 359—456 **18 Claims**

1. An edge light type surface light source, comprising:

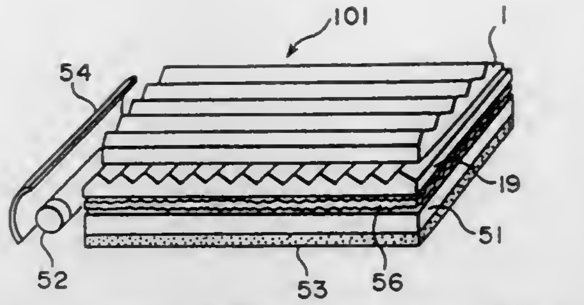
an optical conductor composed of at least a transparent flat plate;

a light source unit disposed adjacent to at least one of the side edge surfaces of said optical conductor;

a light reflection layer formed on the rear surface of said optical conductor; and

one or two lens array sheets, each lens array sheet, comprising:

- a transparent substrate;
- a lens array having lens elements that are one-dimensionally or two-dimensionally arranged on the front surface of said transparent substrate; and
- a cluster having a large number of cluster members randomly formed in a prism shape on the rear surface of said transparent substrate, wherein each of the length, the width, and the height of each of the cluster members is in the range from the wave length of source light to 500 µm and disposed on a light emitting surface of the front surface of said optical conductor so that the rear surface of said lens array sheets face the front surface of said optical conductor.



5,841,573

BACKWARD LIGHT CUTTING-OFF APPARATUS HAVING TRANSMITTING LIGHT DETECTING STAGES AND METHOD FOR DETECTING TRANSMITTING LIGHT USING THE APPARATUS

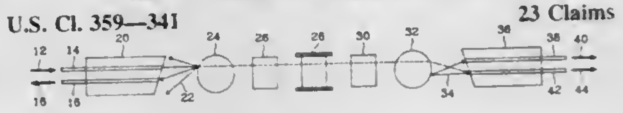
Yeong-Ju Kim, Gumi, Rep. of Korea, assignor to SamSung Electronic Co., Ltd., Kyungki-do, Rep. of Korea

Filed Mar. 10, 1997, Ser. No. 814,504

Claims priority, application Rep. of Korea, Mar. 11, 1996, 6343/1996

Int. Cl.^{6} H01S *3/00;* **G02B** *27/10;6/26*

U.S. Cl. 359—341 **23 Claims**



1. An optical amplifier, comprising:

an input optical fiber transmitting an input signal light to an output-stage in a forward direction, the input signal light being transmitted in the forward direction when the input signal light is transmitted in a direction from the input optical fiber to the output-stage;

a first detecting optical fiber transmitting a first detection-stage signal indicating a state of the input signal light to a control unit;

an input-stage isolator unit suppressing transmission in a backward direction of the input signal light, the backward direction being opposite to the forward direction;

an excited light source amplifying the input signal light when the input signal light is weaker than a predetermined level;

a wavelength division multiplexer receiving an optical signal having a first wavelength emitted from the excited light source when the input signal light is weaker than the predetermined level, receiving the input signal light from the input-stage backward cutting-off unit having a second wavelength, coupling the received optical signal and input signal light to form a coupled signal, and outputting the coupled signal in the forward direction; an amplifying fiber amplifying the coupled signal received from the wavelength division multiplexer, and outputting an amplified optical signal in the forward direction;

a second detecting optical fiber transmitting a second detection-stage signal, indicating a gain state of the amplified optical signal, to the control unit;

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- an output-stage backward light cutting-off unit suppressing transmission in the backward direction of the amplified optical signal, and receiving the amplified optical signal from the amplifying fiber;
- an output optical fiber receiving the amplified optical signal from the output-stage backward light cutting-off unit and transmitting the amplified optical signal to the output-stage;
- a third detecting optical fiber transmitting a third detection-stage signal, indicating a state of light reflected from the output optical fiber toward the output-stage backward light cutting-off unit, to the control unit; and
- the control unit detecting the first, second and third detection-stage signals, and controlling the excited light source.

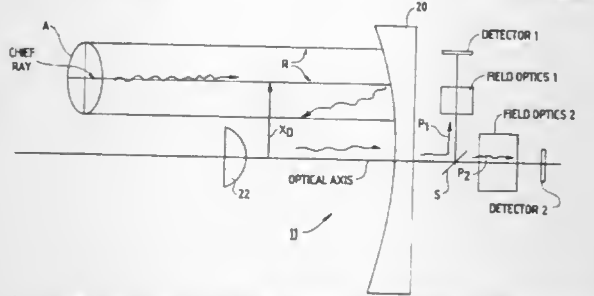
5,841,574
MULTI-SPECIAL DECENTERED CATADIOPTRIC OPTICAL SYSTEM

Gilbert W. Willey, Arlington Heights, Ill., assignor to Recon/Optical, Inc., Barrington, Ill.

Filed Jun. 28, 1996, Ser. No. 672,452

Int. Cl.⁶ G02B *17/08;13/14;23/04;23/06*

U.S. Cl. 359—351 **37 Claims**



1. A dual spectrum terrestrial aerial reconnaissance camera optical system, comprising:

- a) a first detector means for imaging a scene from radiation in a first broad portion of the electromagnetic spectrum;
- b) a second detector means for imaging said scene from radiation in a second broad portion of the electromagnetic spectrum;
- c) a multi-spectral decentered aperture catadioptric optical system comprising a primary mirror and a secondary mirror for directing radiation from said scene onto said first detector means and second detector means, said optical system having a single entrance aperture for said radiation in said first and second broad portions of the electromagnetic spectrum for imaging by said first and second detector means and an optical axis, wherein said entrance aperture is displaced relative to said optical axis, said optical system further comprising:
  - 1) a means for separation of said radiation into first and second optical paths,
  - 2) a first field optical assembly in said first optical path for directing radiation in said first broad portion of said spectrum onto said first detector means, and
  - 3) a second field optical assembly for directing said radiation from said scene in said second broad portion of said spectrum onto said second detector means;
- d) wherein radiation impinging on said first and second detectors passes through said single entrance aperture and wherein said primary and secondary mirrors and said first and second field optical assemblies are constructed so as to permit high resolution images to be generated from said first and second detectors in respective first and second broad portions of the electromagnetic spectrum from said radiation.

5,841,575
TELESCOPE WITH A LARGE FIELD OF VISION

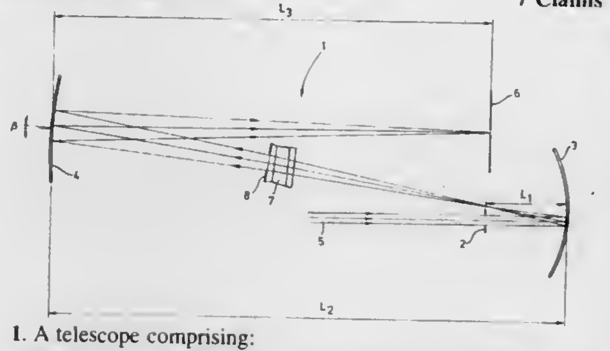
Huib Visser, Zevenhuizen, and Bart Snijders, Rotterdam, both of Netherlands, assignors to Nederlandse Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek (TNO), Delft, Netherlands

Filed Dec. 23, 1996, Ser. No. 773,517

Claims priority, application Netherlands, Dec. 21, 1995, 1001952

Int. Cl.⁶ G02B *5/10;17/06;23/02*

U.S. Cl. 359—365 **7 Claims**



1. A telescope comprising:

- a first reflecting element and a second reflecting element, in which a light beam impinging on the first reflecting element is reflected to and then reflected from the second reflecting element, and in which the first and second reflecting elements have concave reflecting surfaces; and
- an aperture stop, comprised of a first diaphragm positioned between the first and second reflecting elements substantially in a focus of the second reflecting element; wherein an angle of inclination and a radius of curvature of the first and second reflecting elements are such that the telescope has a field of vision wider than 30 degrees in one direction.

5,841,576
MICROSCOPE CAPABLE OF BEING FITTED WITH STRAP

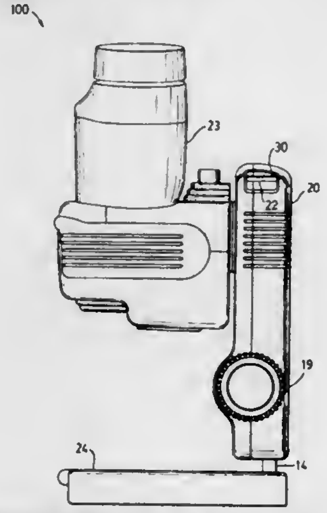
Yasuyuki Aikawa, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Oct. 23, 1996, Ser. No. 735,749

Claims priority, application Japan, Feb. 9, 1996, 8-023890

Int. Cl.⁶ G02B *21/00;21/24*

U.S. Cl. 359—383 **4 Claims**



1. A microscope for observing an object, fitted with a strap, the microscope comprising:

- a microscope unit incorporating an optical system;
- a movable focusing unit supporting said microscope unit to focus said optical system on the object;
- a stage unit to support said focusing unit; and
- a strap fitting portion to secure the strap,

wherein said strap fitting portion is positioned on said focusing unit.

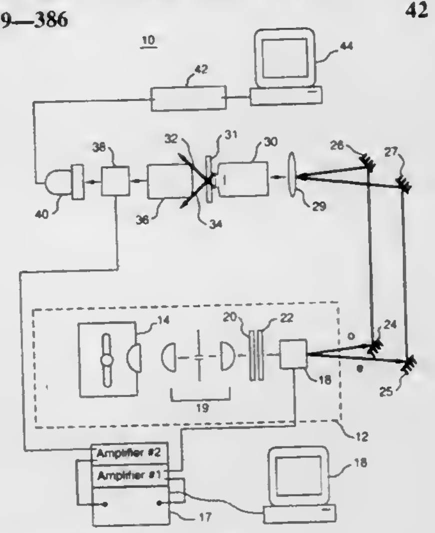
5,841,577
LIGHT MICROSCOPE HAVING ACOUSTO-OPTIC TUNABLE FILTERS

Elliot S. Wachman; Daniel L. Farkas, and Wen-Hua Niu, all of Pittsburgh, Pa., assignors to Carnegie Mellon University, Pittsburgh, Pa.

Filed Feb. 16, 1996, Ser. No. 603,030

Int. Cl.⁶ G02B *21/06;* **G02F** *1/33*

U.S. Cl. 359—386 **42 Claims**



1. A light microscope, comprising:

- a light source;
- an acousto-optic tunable filter for receiving light from said light source and for producing two light streams of different polorization therefrom;
- a first amplifier for applying a tuning signal to said filter;
- means for combining said two light streams into a combined light stream;
- input optics for focusing said combined light stream onto a sample; and
- imaging means for receiving light from the sample and for producing an image therefrom.

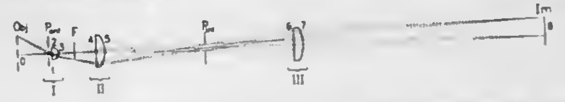
5,841,578
INTEGRATED OPTICAL SYSTEM FOR ENDOSCOPES AND THE LIKE

Jan Hoogland, 8982 N. Applegate Rd., Grants Pass, Oreg. 97527

Continuation of Ser. No. 351,481, Dec. 6, 1994, Pat. No. 5,633,754. This application Jul. 30, 1996, Ser. No. 687,910

Int. Cl.⁶ G02B *23/00*

U.S. Cl. 359—434 **9 Claims**



1. An endoscopic imaging system, including an optical system having an optical axis, said optical system comprising an objective and a relay system of elements, said relay system forming an image, each of said elements having an input surface and an output surface wherein at least one of said surfaces has a non-zero curvature, said elements chosen and arranged such that the sum of absolute values of all non-zero surface curvatures results in a value less than approximately 1.5/mm when the length of said optical system is standardized to 100 mm.

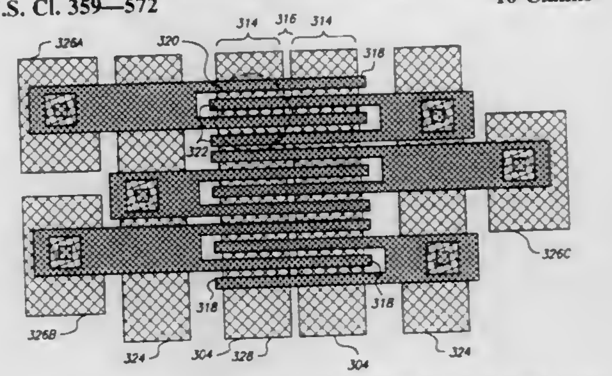
5,841,579
FLAT DIFFRACTION GRATING LIGHT VALVE

David M. Bloom, Portola Valley; Dave B. Corbin, Los Altos Hills; William C. Banyal, East Palo Alto, and Bryan P. Straker, Palo Alto, all of Calif., assignors to Silicon Light Machines, Sunnyvale, Calif.

Filed Jun. 7, 1995, Ser. No. 482,188

Int. Cl.⁶ G02B *5/18;26/00;26/08;* **G09G** *3/34*

U.S. Cl. 359—572 **10 Claims**



1. A modulator for modulating an incident beam of light comprising:

- a. a plurality of elongated elements, each element having a first end and a second end and a light reflective planar surface, wherein the elements are grouped into a first group and a second group such that the elements of the first group are interdigitated with the elements of the second group, the elements being arranged parallel to each other;
- b. means for suspending the elements of the first group and the second group by their ends;
- c. means for electrically coupling all the elongated elements of the first group in each row together;
- d. means for electrically coupling all the elongated elements of the second group in each row together;
- e. means for applying a first bias voltage to the first group and means for applying a second bias voltage to the second group such that the reflective surfaces are substantially coplanar and in a first plane such that the incident beam of light is reflected; and
- f. means for selectively deflecting the elements of the first group perpendicular to the first plane toward a second plane which is parallel to the first plane such that the incident beam of light is diffracted.

5,841,580
INTEGRATED CIRCUIT I/O USING A HIGH PERFORMANCE BUS INTERFACE

Michael Farmwald, Berkeley, and Mark Horowitz, Palo Alto, both of Calif., assignors to Rambus, Inc., Mountain View, Calif.

Division of Ser. No. 448,657, May 24, 1995, Pat. No. 5,638,334, which is a division of Ser. No. 222,646, Mar. 31, 1994, Pat. No. 5,513,327, which is a continuation of Ser. No. 954,945, Sep. 30, 1992, Pat. No. 5,319,755, which is a continuation of Ser. No. 510,898, Apr. 18, 1990, abandoned. This application Feb. 10, 1997, Ser. No. 798,520

Int. Cl.⁶ G11C *7/00*

U.S. Cl. 365—194 **22 Claims**

14. A memory device comprising:

- at least one memory section: and
- a device interface coupling the memory section to a bus, the device interface receiving a bus transaction request from the bus, the device interface comprising at least one register including an access-time register whose contents indicate a

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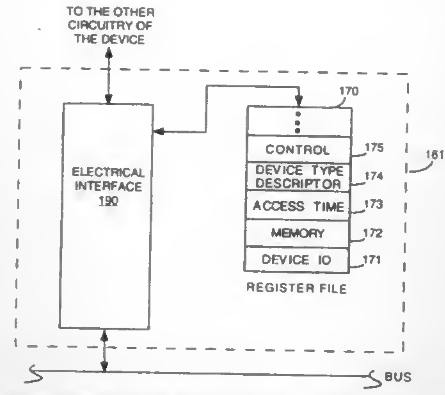
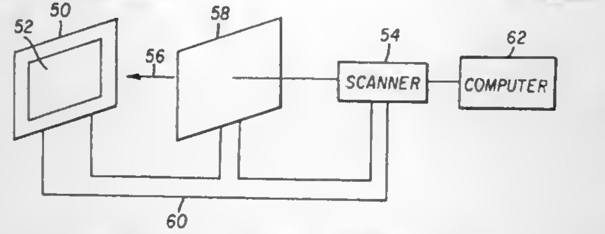


delay time after which the memory device responds to the bus transaction request.

5,841,581
METHOD AND APPARATUS FOR MAKING A SPATIALLY SELECTIVE HIGH RESOLUTION LIGHT FILTER

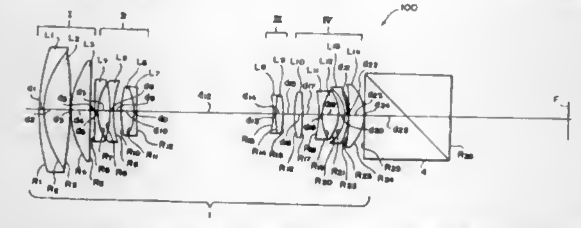
Lee W. Tutt, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Continuation of Ser. No. 259,826, Jun. 15, 1994, abandoned. This application Mar. 5, 1996, Ser. No. 611,354
Int. Cl.⁶ G02B *5/30*
U.S. Cl. 359—489 **6 Claims**



1. A system for producing a filter, comprising:
a frame holding the filter, the filter having regions in which different light polarizations can be depolarized; and
a light scanner projecting a beam of changing polarization onto the filter in said frame to thermally depolarize the different polarizations of the regions to produce regions of different polarizations.

5,841,582
ZOOM LENS OPTICAL SYSTEM

Kuniaki Ono, Saitama-ken, Japan, assignor to Fugi Photo Optical Co., Ltd., Saitama-ken, Japan
Filed Mar. 4, 1993, Ser. No. 26,504
Claims priority, application Japan, Mar. 27, 1992, 4-070863
Int. Cl.⁶ G02B *15/14*
U.S. Cl. 359—688 **5 Claims**



1. A zoom lens optical system having a variable magnification comprising a first lens set having a positive refracting power, a second lens set having a negative refracting power, a third lens set having a negative refracting power, a fourth lens set having a positive refracting power, and an optical path splitting means, the first through fourth lens sets and the optical path splitting means being located in the above-stated order from the plane of image formation, wherein the zoom lens optical system satisfies the conditions

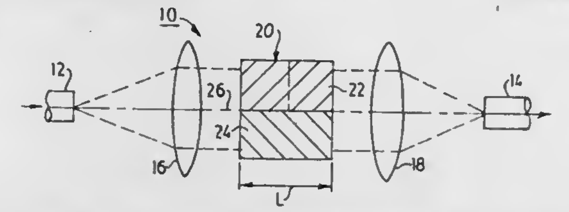
$$1.2\,fw<f1<2.4\,fw \qquad (1)$$

$$0.4\,fw/m<f3/f2<0.8\,fw/mm. \qquad (2)$$

where fw is a number equal to the minimum focal length of the whole system in millimeters, f1 is a number equal to the composite focal length of the first lens set in millimeters, f2 is a number equal to the composite focal length of the second lens set in millimeters, and f3 is a number equal to the composite focal length of the third lens set in millimeters.

5,841,583
MULTI-PATH INTERFERENCE FILTER

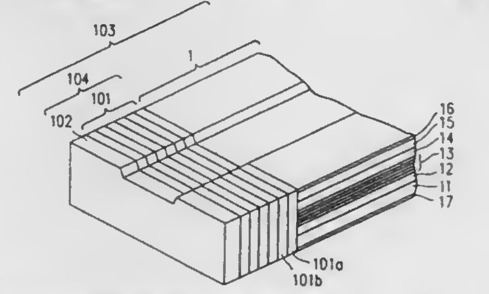
Venkata A. Bhagavatula, Big Flats, N.Y., assignor to Corning Incorporated, Corning, N.Y.
Filed Jan. 15, 1997, Ser. No. 784,020
Int. Cl.⁶ G02B *5/28*
U.S. Cl. 359—577 **27 Claims**



1. A multi-path interference filter that modifies a spectral power distribution of a multi-wavelength beam of light comprising:
an input optical pathway that transmits an input beam incorporating a range of different wavelengths;
an output optical pathway that transmits an output beam confined within an optical waveguide;
an optical path length difference generator having a plurality of equal physical length intermediate pathways that extend in a direction of beam propagation, exhibit different effective refractive indices, and transmit separate portions of the input beam through different optical path lengths; and
a focusing optic that recombines the separate beam portions into the output beam having a spectral power distribution that is modified with respect to the input beam as a result of interference between the separate beam portions.

5,841,584
DIELECTRIC MULTILAYERED REFLECTOR

Kunihiro Takatani, Kashiba, and Toshiyuki Okumura, Tenri, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Apr. 26, 1996, Ser. No. 639,989
Claims priority, application Japan, Apr. 26, 1995, 7-102471
Int. Cl.⁶ G02B *1/10*
U.S. Cl. 359—586 **18 Claims**

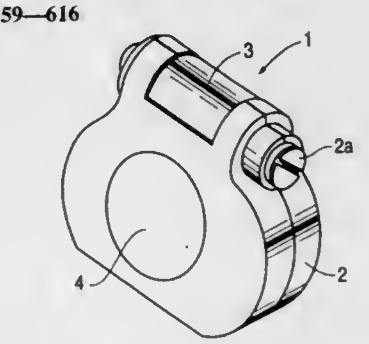


1. A dielectric multilayered reflector, which is formed on at least one of two emitting surfaces of a semiconductor laser device,

comprising: a multilayered structure formed by stacking a plurality of layers on one of the emitting surfaces of the semiconductor laser device; and a layer made of magnesium difluoride, wherein the multilayered structure comprises at least one layer made of an oxide dielectric material and the layer made of magnesium difluoride is formed on a surface of an outermost layer of the multilayered structure.

5,841,585
LIGHT PATTERN PROJECTING DEVICE

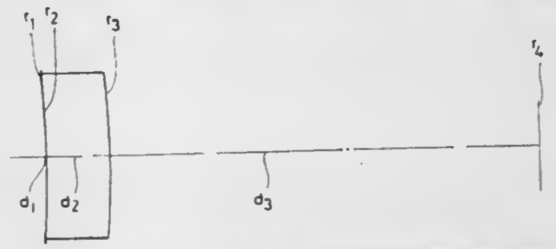
Hideyuki Katou, and Atsushi Ishii, both of Tokyo, Japan, assignors to Tomy Company, Ltd., Tokyo, Japan
Filed May 8, 1996, Ser. No. 646,638
Claims priority, application Japan, Dec. 28, 1995, 7-014599
Int. Cl.⁶ G02B *23/00*
U.S. Cl. 359—616 **11 Claims**



1. A toy for projecting two designs and superimposing same, comprising:
a first design displaying body mounted to rotate about an axis;
means for rotating the first design displaying body about the axis;
a second design displaying body overlaying at least a portion of the first design displaying body;
a light source for illuminating said first and second design displaying bodies and for projecting superimposed designs of said first and second design displaying bodies;
wherein two designs of a first design displaying body and a second design displaying body, respectively, are projected so that a relative animation effect is achieved and a moire is formed by the superposition of said two designs of said first and second design displaying bodies.

5,841,586
OPTICAL SYSTEM

Toshiyuki Nagaoka, Akishima, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Mar. 19, 1997, Ser. No. 820,131
Claims priority, application Japan, Sep. 4, 1996, 8-252238
Int. Cl.⁶ G02B *3/00*
U.S. Cl. 359—654 **18 Claims**



1. An optical system comprising: at least one radial type gradient index lens which has a refractive index distribution from an optical axis in a radial direction in a medium thereof, wherein said optical system satisfies the following condition when a gradient of the refractive index distribution of said radial type gradient index lens component is different dependently on wavelengths:

$$\Delta\theta_{gF}<5 \qquad (1)$$

wherein the reference symbol $\Delta\theta_{gF}$ represents a value given by the following formula (b):

$$\Delta\theta_{gF}=|\theta_{gF}(D_e)-\theta_{gF}(0)| \qquad (b)$$

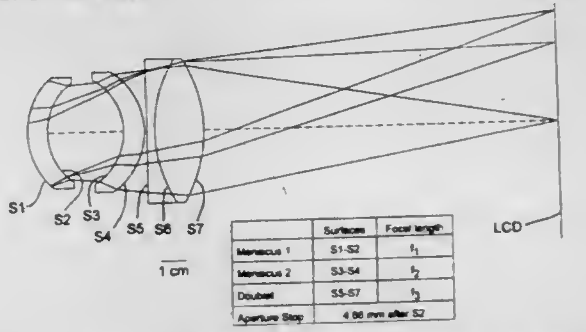
wherein the reference symbols $\theta_{gF}(D_e)$ and $\theta_{gF}(0)$ represent an effective diameter of said radial type gradient index lens component ($r=D_e$) and a partial dispersion ratio on an optical axis ($r=0$) respectively when a partial dispersion ratio at a point located at a radial distance of r is expressed by the following formula (c):

$$\theta_{gF}(r)=|n_g(r)-n_F(r)|/|n_F(r)-n_C(r)| \qquad (c)$$

wherein the reference symbol $n_g(r)$, $n_F(r)$ and $n_C(r)$ represent refractive indices at the point located at the radial distance of r for the g-line, F-line and C-line respectively.

5,841,587
LCD PROJECTION LENS

Jacob Moskovich, Cincinnati, Ohio, assignor to U.S. Precision Lens Inc., Cincinnati, Ohio
Filed Nov. 27, 1996, Ser. No. 757,341
Int. Cl.⁶ G02B *13/22;13/18*
U.S. Cl. 359—662 **17 Claims**



1. A projection lens for forming a magnified image of an object, said lens having an aperture stop, a short conjugate, and a long conjugate, said lens comprising:
(a) two meniscus elements having focal lengths f_1 and f_2, said meniscus elements being (i) concave to each other and (ii) located in the vicinity of the aperture stop, each meniscus element having at least one aspherical surface; and
(b) a color-correcting doublet having a focal length f_3 and comprising a positive crown element and a negative flint element, where:
(i) $f_3>0$;
(ii) $f_3<|f_1|$;
(iii) $f_3<|f_2|$;
(iv) the projection lens has an object side associated with the short conjugate and an image side associated with the long conjugate; and
(v) the two meniscus elements are on the object side of the projection lens and the color-correcting doublet is on the image side of the projection lens.

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5,841,588
ZOOM LENS SYSTEM WITH VIBRATION REDUCTION MEANS

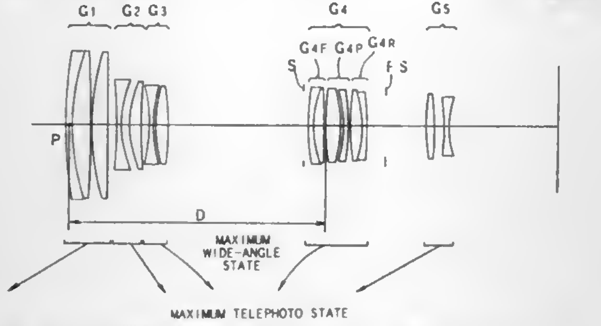
Kenzaburo Suzuki, Yokohama, and Masayuki Aoki, Oyama, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Mar. 6, 1997, Ser. No. 812,284

Claims priority, application Japan, Mar. 6, 1996, 8-079553; Oct. 31, 1996, 8-307001

Int. Cl.⁶ G02B *15/14*

U.S. Cl. 359—683 **37 Claims**



32. A zoom lens system with vibration-reduction function having an optical axis, said system comprising, in order from an object side:

a first lens group G_1 having a positive refractive power;

a second lens group G_2 having a negative refractive power;

a third lens group G_3 having a negative refractive power;

a fourth lens group G_4 having a positive refractive power; and

a fifth lens group G_5 having a negative refractive power;

whereby, when zooming, each of the distances between said first and second lens groups, said second and third lens groups, said third and fourth lens groups, and said fourth and fifth lens groups, respectively, changes;

said fourth lens group G_4 having a shift lens unit G_{4P} moveable across said optical axis, said shift lens unit G_{4P} having a positive refractive power and satisfies the following conditions:

$$1.0<f_{4P}/f_4<2.5$$

where f_{4P} is the focal length for said lens unit G_{4P} with a vibration-reduction function in said fourth lens group G_4, and f_4 is the focal length for said fourth lens group G_4.

5,841,589
PANORAMIC OPTICS ASSEMBLY HAVING AN INITIAL FLAT REFLECTIVE ELEMENT

John E. Davis, Claremont, Calif.; Kenneth R. Castle, Tucson, Ariz.; Marion N. Todd, Monrovia, Calif.; Tilman W. Stuhlinger, and Mitchell Ruda, both of Tucson, Ariz., assignors to Boeing North American, Inc., Seal Beach, Calif.

Filed Sep. 26, 1995, Ser. No. 533,801

Int. Cl.⁶ G02B *17/00;13/06*

U.S. Cl. 359—726 **2 Claims**

1. An optics assembly for observing a panoramic scene, comprising:

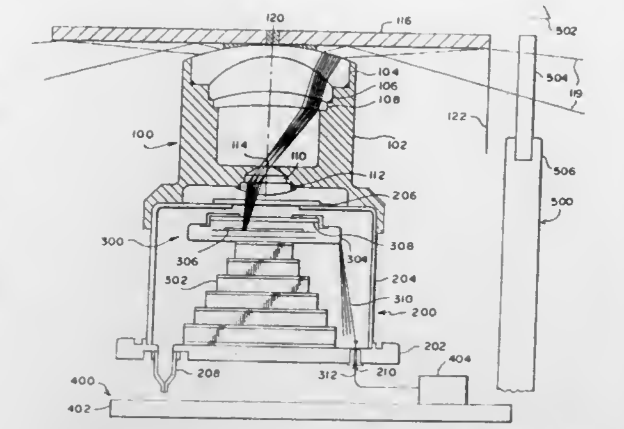
a plurality of optical elements, comprising:

a flat reflective element for re-directing light from a panoramic scene;

a plurality of refractive elements for successively receiving said redirected light from said reflective element and creating a real pupil;

an optical relay system for receiving light from a last said plurality of refractive elements and producing an annular image on a flat focal plane assembly;

wherein said optics assembly produces a flat image for field angles from said light from said panoramic scene at near perpendicular angles to an optical axis of the optics assembly.



5,841,590
ABERRATION CONTROLLABLE OPTICAL SYSTEM

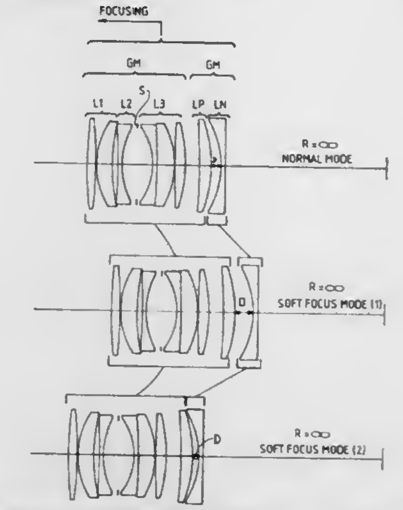
Haruo Sato, Kawaguchi, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Aug. 27, 1997, Ser. No. 917,844

Claims priority, application Japan, Aug. 27, 1996, 8-244285; Aug. 27, 1996, 8-244286

Int. Cl.⁶ G02B *9/60*

U.S. Cl. 359—763 **25 Claims**



1. An aberration-controllable optical system comprising:

a master lens G_M group having a positive refractive power, and

a converter lens G_C group having a negative refractive power, said master lens group and said converter lens group arranged in order from an object side of the system,

the master lens group including a first sub lens group L1 with a positive refractive power, a second sub lens group L2 with a negative refractive power, and a third sub lens group L3 with a positive refractive power in order from the object side of the system,

the converter lens group including a positive lens element L_P with a positive refractive power and a negative lens element LN with a negative refractive power in order from the object side, the positive lens element L_P and the negative lens element L_N forming an air gap therebetween that has a concave surface facing an aperture stop,

an on-axis air gap distance between the positive lens element and the negative lens element being varied to change mainly spherical aberrations,

the aberration-controllable optical system satisfying a condition:

$$-1<f_M/f_C<0$$

when f_M is a focal length of the master lens group during focusing an infinity object and f_C is a focal length of the converter lens group during focusing an infinity object and at a lens position with minimum spherical aberrations.

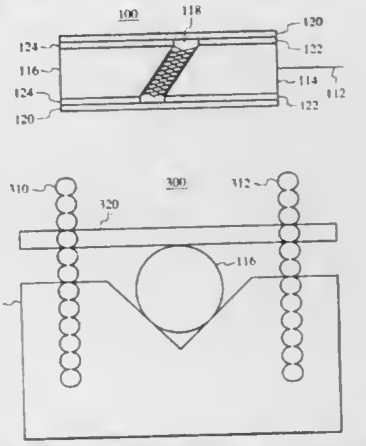
5,841,591
METHOD AND SYSTEM FOR ALIGNING A LENS AND A PIGTAIL

Steven Guoxin Zhu, Fremont, and Yu Zheng, Sunnyvale, both of Calif., assignors to Oplink Communications, Inc., San Jose, Calif.

Filed Aug. 4, 1997, Ser. No. 906,284

Int. Cl.⁶ G02B *7/02;6/36*

U.S. Cl. 359—819 **18 Claims**



10. A system for providing a collimator, the collimator including a lens, a pigtail, and a holder, the system comprising:

means for aligning the lens and the pigtail, the alignment being carried out in three dimensions;

means for affixing a position of the lens with respect to a position of the pigtail after the lens and the pigtail are aligned; and

means for placing the lens and pigtail in the holder after the lens and the pigtail are aligned.

5,841,592
OPTICAL BENCH AND USE THEREOF

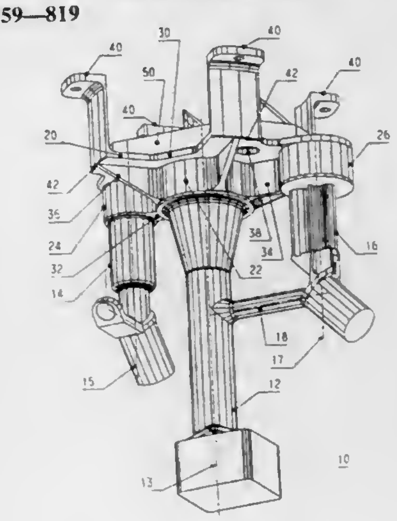
Andreas Herren, Benglen, and Saverio Sanvido, Glattbrugg, both of Switzerland, assignors to Oerlikon Contraves, Zuerich, Switzerland

Filed Nov. 11, 1997, Ser. No. 967,455

Claims priority, application Switzerland, Nov. 25, 1996, 2897/96

Int. Cl.⁶ G02B *7/02*

U.S. Cl. 359—819 **8 Claims**



1. An optical bench with a bench structure and at least two optical units fastened to the bench structure having axes which take up defined angular positions with respect to each other and relative to the bench structure, wherein each optical unit is fastened to a receiving element disposed on the bench structure and with its remaining area essentially projecting transversely away from the bench, wherein the improvement comprises:

the bench structure having arms arranged to connect the receiving elements, which receiving elements are embodied and arranged in such a way that, in case of heat dilatation of the arms, the receiving elements are displaced transversely with respect to the axes, without tilting, wherein the defined angular position of the axes is not changed.

5,841,593
OPTICAL SYSTEM SUPPORTING DEVICE WITH FLOWABLE DAMPING MATERIAL

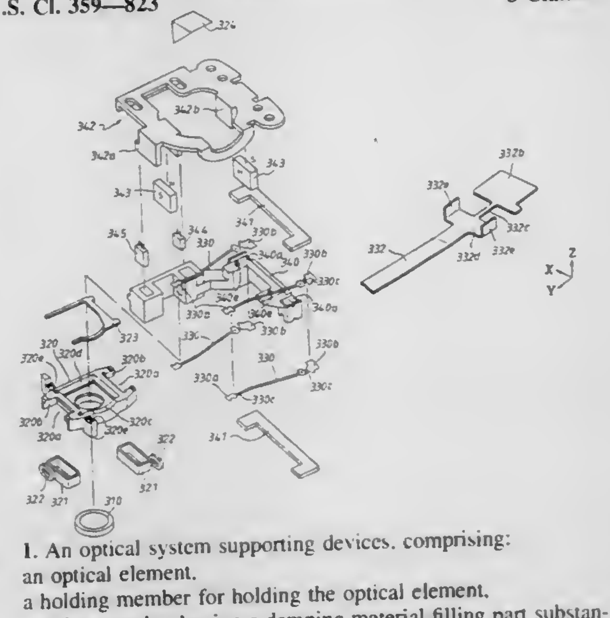
Tetsuo Ikegame; Masayasu Kanazawa, and Izumi Yamazaki, all of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Japan

Continuation of Ser. No. 658,152, Jun. 4, 1996, Pat. No. 5,777,806, which is a division of Ser. No. 236,566, Apr. 29, 1994, Pat. No. 5,579,176. This application Jan. 5, 1998, Ser. No. 982,804

Claims priority, application Japan, Apr. 30, 1993, 5-104395; Jun. 14, 1993, 5-167466

Int. Cl.⁶ G02B *7/02;* **G11B** *7/00*

U.S. Cl. 359—823 **8 Claims**



1. An optical system supporting devices, comprising:

an optical element,

a holding member for holding the optical element,

a fixing member having a damping material filling part substantially filled with a flowable damping material,

a connecting member for connecting the holding member and the fixing member, the connecting member including, at at least one location, an integral resistance increasing means for providing an enhanced damping effect positioned in the damping material.

5,841,594
PIVOT CONNECTION

Peter Rothe, Lonsdale, Australia, assignor to Britax Rainsfords PTY Ltd., Lonsdale, Australia

Filed Sep. 19, 1997, Ser. No. 933,554

Claims priority, application Australia, Sep. 27, 1996, PO2628

Int. Cl.⁶ G02B *5/08;7/18;* **F16M** *13/00;* **A47F** *7/14*

U.S. Cl. 359—841 **17 Claims**

1. A mirror for use on a motor vehicle comprising:

a mounting bracket for attachment to a motor vehicle having a primary pivot connection member;

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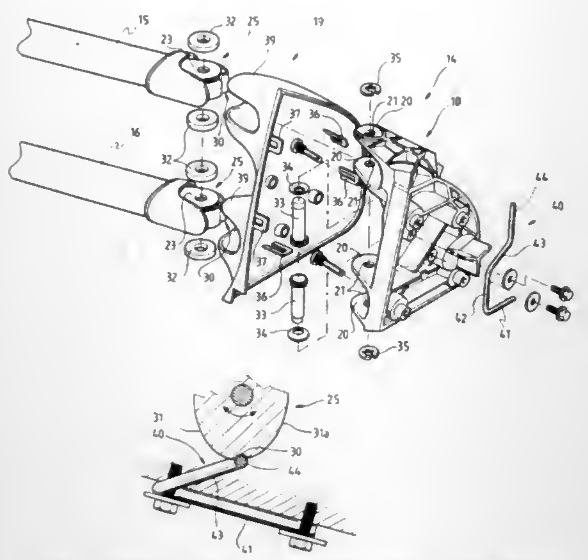


- a mirror assembly including a mirror, and a complementary pivot connection member for pivotal connection to said primary pivot connection member to allow angular movement of said mirror assembly in respect of said mounting bracket,
- at least one detent recess provided on a first one of said primary and complementary pivot connection members;
- a resilient arm attached at a first end thereof to the other of said primary and complementary pivot connection members; and
- a detent member located at a second end of said resilient arm and being positioned so that the detent member engages said detent recess to hold said mirror assembly with respect to said mounting bracket, said resilient arm being resiliently moveable to allow angular movement of said second end about said first end so that said detent member disengages said detent recess upon sufficient force being applied to said mirror assembly to, in turn, allow said mirror assembly to be rotated to a different position.

5,841,595

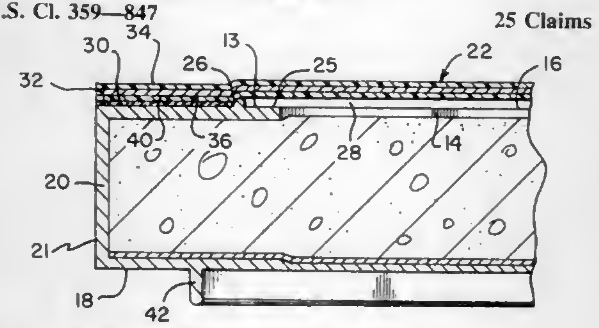
THIN FILM MIRROR FRAME

Eugene Eustaqulo Martinez, Sr., 3 Woodbine Rd., Irvington, N.Y. 10533

Filed Feb. 23, 1996, Ser. No. 606,367

Int. Cl.^{6} G02B *5/08;7/182*

U.S. Cl. 359—847 **25 Claims**



1. A frame defining a central region for supporting a film across said central region within a film plane, said frame comprising:

- at least one supporting member having an adhering surface and a forward surface;
- a supporting ridge located on said forward surface and spaced inwardly from the periphery of the at least one supporting member, said supporting ridge being generally parallel to the periphery of the at least one supporting member and positioned intermediate said adhering surface and said central region, said supporting ridge protruding from said forward surface by a predetermined distance and being adapted to support said film across said central region within said film plane;
- an adhesive provided on said adhering surface to adhere said film to said adhering surface;
- wherein said at least one supporting member includes a rearward surface having a stacking ridge located generally parallel to the periphery of said at least one supporting member and protruding from said rearward surface by a predetermined distance, said stacking ridge is positioned outwardly from said supporting ridge relative to said central region such that said frame is configured to be stacked atop a forward surface of another of said frame without contacting the supported film of said another frame.

5,841,596

LIGHTING SYSTEM WITH A MICRO-TELESCOPE INTEGRATED IN A TRANSPARENT PLATE

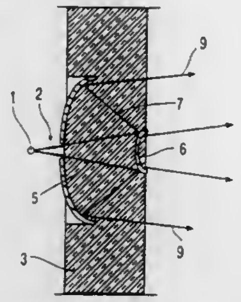
Piero Perlo, Sommariva Bosco; Luca Sardi, Sant'Ambrogio, and Sabino Sinesi, Piossasco, all of Italy, assignors to C.R.F. Societa' Consortile per Azioni, Torino, Italy

Filed Sep. 25, 1996, Ser. No. 719,547

Claims priority, application Italy, Sep. 26, 1995, TO95A0765; Sep. 26, 1995, TO95A0766

Int. Cl.^{6} G02B *17/06;* **F21V** *7/04*

U.S. Cl. 359—859 **13 Claims**



1. Micro mirror telescope lighting system, comprising:

- a transparent plate (**3**), having opposite, first and second major faces,
- a light source (**1**) arranged immediately adjacent to said second face of the transparent plate (**3**), or incorporated within the latter, and emitting a beam with a predetermined divergence,
- said plate (**3**) being provided with first and second reflective surfaces (**6**,**8**) on said first and second faces, respectively,
- said light source and said reflective surfaces being arranged with respect to each other so that the light beam emitted by the light source is directed towards the first face, reflected by said first reflective surface towards said second face, and reflected by said second reflective surface towards said first face, the light beam emerging from said first face of the plate as an expanded light beam having different vergence and shape than the light beam emitted by the light source,
- wherein said first reflective surface (**6**) is only partially reflective, so that part of the light beam emitted by the light source passes through said plate without being affected,
- said first face of the plate is formed so that the light beam which has undergone the double reflection on said second and first reflective means (**6**,**8**) is not further affected by said first face when passing through said first face after said double reflection, and
- said transparent plate (**3**) has a thickness between 2 mm and 15 mm, and a transverse dimension between 2 mm and 50 mm.

5,841,597

DIVIDED MASTER TAPE PRODUCTION DEVICE, DUBBING DEVICE AND DUBBING SYSTEM WHICH IS EQUIPPED WITH THESE DEVICES

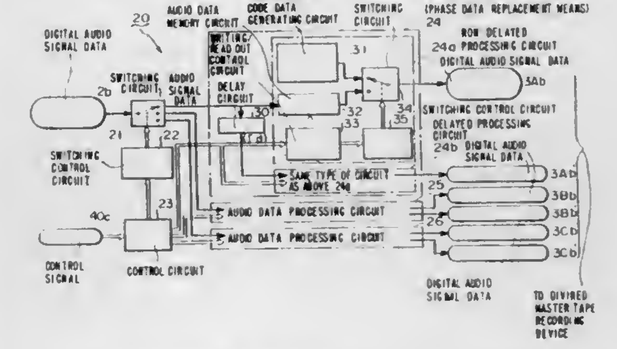
Michinori Mashimo, Mito, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Apr. 24, 1996, Ser. No. 644,659

Claims priority, application Japan, Apr. 27, 1995, 7-127043

Int. Cl.^{6} G11B *5/86*

U.S. Cl. 360—15 **7 Claims**


DIGITAL AUDIO SIGNAL DATA
29
AUDIO DATA MEMORY CIRCUIT
PHASE MATCHING CODE DATA GENERATING CIRCUIT
SWITCHING CIRCUIT
AUDIO DATA PROCESSING CIRCUIT (PHASE DATA REPLACEMENT MEANS)
24
NON DELATED PROCESSING CIRCUIT
24a
DIGITAL AUDIO SIGNAL DATA
WRITING/READ OUT CONTROL CIRCUIT
DELAY CIRCUIT
SWITCHING CIRCUIT
AUDIO SIGNAL DATA
2b
31
30
32
33
34
35
3Ab
SWITCHING CONTROL CIRCUIT
DELAYED PROCESSING CIRCUIT
24b
DIGITAL AUDIO SIGNAL DATA
SWITCHING CONTROL CIRCUIT
21
22
23
SAME TYPE OF CIRCUIT AS ABOVE 24
AUDIO DATA PROCESSING CIRCUIT
AUDIO DATA PROCESSING CIRCUIT
25
26
3Ab
3Bb
3Bb
3Cb
3Cb
40c
CONTROL SIGNAL
CONTROL CIRCUIT
DIGITAL AUDIO SIGNAL DATA
TO DIVIDED MASTER TAPE RECORDING DEVICE

1. A divided master tape production device which plays back a master tape and produces N (where N is an integer of 2 or more) divided master tapes comprising:

- master tape playback means for playing back a master tape at a nominal playback speed to obtain a continuous digital audio signal;
- dividing means for dividing the continuous digital audio signal obtained from the master tape playback means by a specified division unit to provide a plurality of data blocks in the digital audio signal and for converting the plurality of data blocks into the continuous digital signal to generate N systems of divided master tape playback signals;
- N units of phase data replacement means, corresponding in number to the N systems of divided master tape playback signals generated by the dividing means for replacing a certain fixed length section of each data block with phase matching code data; and
- N units of divided master tape recording means, corresponding in number to the N systems of divided master tape playback signals, in which a part of the data blocks has been replaced by phase matching code data by said phase data replacement means, wherein said N units of divided master tape recording means includes means for sequentially assigning and feeding the divided master tape playback signals and in order, for intermittently recording the data blocks with the phase matching code data therein onto tape at the nominal playback speed and for producing N divided master tapes,
- wherein each of said N units of the phase data replacement means includes a pair of processing circuits that comprise:
  - a phase matching code data generating circuit that outputs phase matching code data,
  - a memory circuit that sequentially outputs the input signal data while the input signal data is being recorded,
  - a writing/read out control circuit that controls an operation of the memory circuit,
  - a switching circuit for selectively switching an output of the phase matching code data generating circuit and the memory circuit, and
  - a switching control circuit for controlling an operation of the switching circuit at a specified timing, and
  - wherein a delay circuit, for delaying input signal data by the specified amount of time, is located at a stage prior to one of the pair of processing circuits.

5,841,598

INFORMATION RECORDING/REPRODUCING APPARATUS AND DATA PROCESSING METHOD

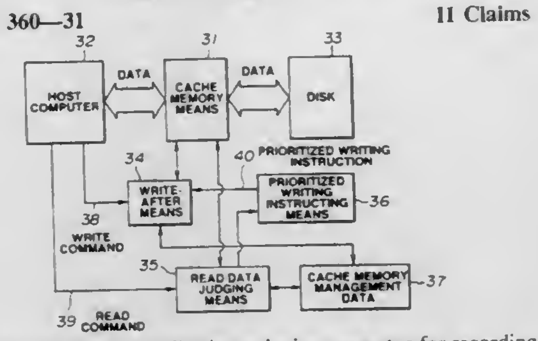
Tadashi Horiuchi; Toshihiro Ogata, both of Hachioji, and Takumi Soga, Sagamihara, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 19, 1995, Ser. No. 545,507

Claims priority, application Japan, Oct. 28, 1994, 6-265889; Mar. 17, 1995, 7-059321; Apr. 14, 1995, 7-089664

Int. Cl.^{6} G11B *27/36*

U.S. Cl. 360—31 **11 Claims**



1. An information recording/reproducing apparatus for recording or reproducing information on or from a recording medium in response to a command sent from a host computer, comprising:

- an intermediate memory means for temporarily storing information to be transferred to or from said host computer;
- a writing completion reporting means for reporting completion of writing of information to said host computer at the end of storing record data transferred from said host computer in said intermediate memory means in response to an information record command sent from said host computer;
- a medium writing means for writing said record data stored in said intermediate memory means on a recording medium independently of data transfer between said host computer and intermediate memory means;
- a write data Judging means for determining whether playback data requested with an information playback command sent from said host computer is consistent with unprocessed record data of which writing on a recording medium has not been completed and which is stored in said intermediate memory means; and
- a prioritized reading executing means that when playback data requested by said host computer is inconsistent with or no duplicate of unprocessed record data stored in said intermediate memory means, suspends writing of data from said intermediate memory means onto a recording medium and executing processing requested with an information playback command sent from said host computer as a top priority in response to said information playback command.

5,841,599

REPRODUCING APPARATUS VARYING REPRODUCTION SPEED ACCORDING TO MEMORY FULLNESS

Nobutoshi Takayama; Koji Takahashi; Taizou Hori, all of Kanagawa, and Kazuhiko Haruma, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 980,977, Nov. 24, 1992, abandoned. This application Nov. 21, 1994, Ser. No. 342,649

Claims priority, application Japan, Nov. 27, 1991, 3-312550; Jun. 30, 1992, 4-196589

Int. Cl.^{6} G11B *5/09*

U.S. Cl. 360—39 **33 Claims**

1. A reproducing apparatus comprising:

- (a) reproducing means for reproducing data recorded on a recording medium;
- (b) memory means for storing data obtained by said reproducing means, said memory means having a plurality of memory areas including a first memory area which receives the data

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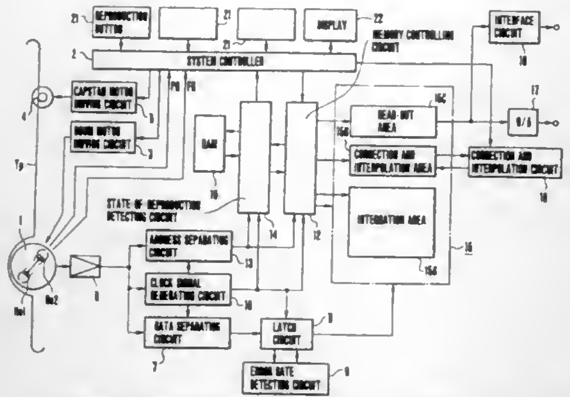

REPRODUCTION BUTTON
DISPLAY
MEMORY CONTROLLING CIRCUIT
INTERFACE CIRCUIT
SYSTEM CONTROLLER
CAPSTAN MOTOR DRIVING CIRCUIT
DRUM MOTOR DRIVING CIRCUIT
RAM
READ-OUT AREA
CORRECTION AND INTERPOLATION AREA
CORRECTION AND INTERPOLATION CIRCUIT
D/A
STATE OF REPRODUCTION DETECTING CIRCUIT
INTEGRATION AREA
ADDRESS SEPARATING CIRCUIT
CLOCK SIGNAL REGENERATING CIRCUIT
DATA SEPARATING CIRCUIT
LATCH CIRCUIT
ERROR RATE DETECTING CIRCUIT

from said reproducing means and a second memory area which receives data read out from the first memory area;

(c) reading means for reading the data from the second memory area at a predetermined timing; and

(d) controlling means for controlling a reproducing operation of said reproducing means and a transmitting timing of the data from the first memory area to the second memory area according to a data filling degree of the first memory area,

said controlling means controlling said reproducing means so as to vary the data amount obtainable per unit time gradually.

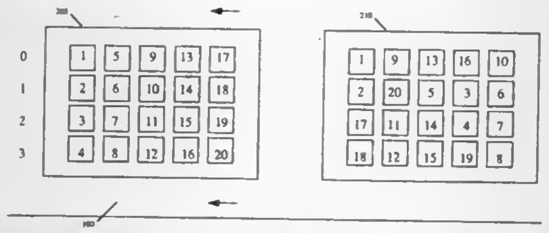
5,841,600
RANDOMLY ORDERED DATA BLOCK ENVELOPE TAPE FORMAT

Lawrence Kaplan, Marlboro, Mass., assignor to Quantum Corporation, Milpitas, Calif.

Filed Jan. 11, 1996, Ser. No. 584,652

Int. Cl.^{6} G11B *5/09*

U.S. Cl. 360—48 **9 Claims**



1. A method for arranging user data blocks into substantially rectangular, variable length data envelopes enclosing plural lineal recording tracks of a magnetic storage tape moving across plural read-after-write tape heads of a head structure of a multi-channel data storage system including a tape transport mechanism for transporting the tape and positioning the head structure laterally relative to a direction of movement of the tape, a controller for controlling data flow within the data storage system, an interface for receiving user data from a host computer, and a buffer memory for temporary storage of received blocks of user data, the method comprising the steps of:

a. storing a sequence of user data blocks received from the host via the interface into the buffer memory,

b. generating error correction code blocks from the user data blocks,

c. simultaneously writing a plurality of rows of the user data blocks and the error correction code blocks in a block arrangement comprising a preliminary data envelope having rows of substantially equal length,

d. reading each of the blocks of the preliminary data envelope immediately following writing thereof to determine if any uncorrectable errors are present in a said block of a particular row,

e. if an uncorrectable error is found to be present in a said block,

(1) extending the length of the preliminary data envelope by rewriting the block determined to contain the error at least to a different row than the particular row and rewriting such other blocks as may be needed to maintain said rows of substantially equal length within said length-extended preliminary data envelope,

(2) read verifying the reordered data blocks to determine that no uncorrectable error remains present, and,

(3) closing the length-extended preliminary data envelope as a present envelope, and

e. if an uncorrectable error is not found to be present in a said data block, closing the preliminary data envelope as the present envelope.

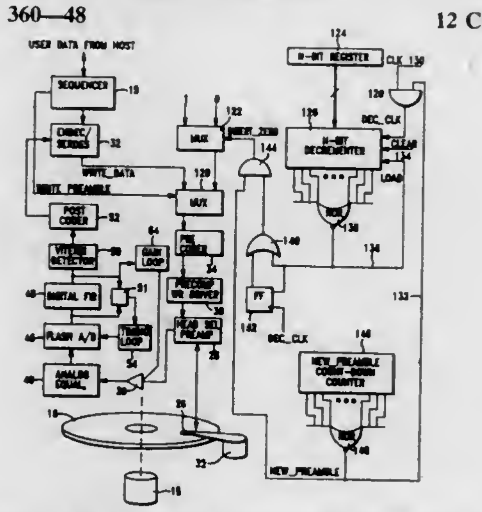
5,841,601
ELIMINATION OF INTER SYMBOL INTERFERENCE-INDUCED TIMING PHASE AND GAIN STEPS AT SECTOR START IN PRML DIGITAL MAGNETIC DATA STORAGE CHANNEL

Kevin D. Fisher, Palo Alto, Calif., assignor to Quantum Corporation, Milpitas, Calif.

Division of Ser. No. 600,015, Sep. 15, 1995, Pat. No. 5,600,502, which is a continuation of Ser. No. 222,908, Apr. 5, 1994, abandoned. This application Nov. 26, 1996, Ser. No. 756,731

Int. Cl.^{6} G11B *5/09*

U.S. Cl. 360—48 **12 Claims**



1. A hard disk drive including a rotating data storage disk, a data transducer head for writing data to the disk and reading data from the disk and manifesting a measurable periodic undershoot characteristic, a sequencer for sequencing user data blocks to and from the data storage surface, and a digital write-mode channel for writing a partial response class IV signal to the disk and comprising in series interconnection during a writing mode of the hard disk drive: the sequencer, an ENDEC/SERDES for encoding the data and for serializing encoded data into a serial data stream, a preamble insertion multiplexer for inserting a stream of preamble-producing data values into the serial data stream in lieu of serial data from the ENDEC/SERDES, a precoder for preceding the serial data stream in accordance with a predetermined code, a write precompensation/driver, a head select circuit and the data transducer, the write mode channel further comprising zero insertion circuitry for selectively phase shifting a preamble field by inserting zeros into a stream of ones supplied to the preamble insertion multiplexer for a preamble field interval during data writing to disk, the zero insertion circuitry in accordance with the periodic undershoot characteristic of the data transducer head.

5,841,602
PRML REGENERATING APPARATUS

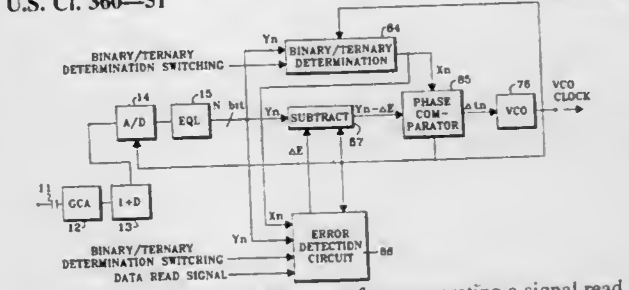
Masahide Kanegae, and Masao Kondou, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 400,720, Mar. 8, 1995. This application Sep. 17, 1996, Ser. No. 715,040

Claims priority, application Japan, Mar. 18, 1994, 6-074435; Mar. 18, 1994, 6-074436; Apr. 27, 1994, 6-112029; May 31, 1994, 6-141233; Jun. 3, 1994, 6-145338

Int. Cl.^{6} G11B *5/09*

U.S. Cl. 360—51 **2 Claims**



1. A PRML regenerating apparatus for regenerating a signal read by a head from a storage medium, comprising:

a waveform equalizing circuit for waveform-equalizing the read signal;

a maximum-likelihood decoder for maximum-likelihood-decoding a determination value by comparing the equalized output with upper and lower slice levels; and

a phase synchronizing circuit for generating a clock which phase-synchronizes with the read signal,

said phase synchronizing circuit including:

a ternary determination unit for making a ternary determination of the equalized output;

an error detector for detecting an offset error when the ternary determination value is zero using the equalized output of the read signal from within a gap pattern, and holding this offset error;

a subtractor for subtracting the detected offset error value from the equalized output when the ternary determination value is zero;

a phase comparator for calculating a phase error value from the equalized output undergoing the subtraction and the ternary determination value; and

a voltage control oscillator for generating a synchronous clock having a phase corresponding to the phase error value.

5,841,603
ARRANGEMENT COMPRISING A MAGNETIC WRITE HEAD, AND WRITE AMPLIFIER WITH CAPACITIVE FEED-FORWARD COMPENSATION

Joao N. V. L. Ramalho, Eindhoven, Netherlands, and Eric B. M. F. Desbonnets, Caen, France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 20, 1996, Ser. No. 752,866

Claims priority, application European Pat. Off., Nov. 21, 1995, 95203187

Int. Cl.^{6} G11B *5/02*

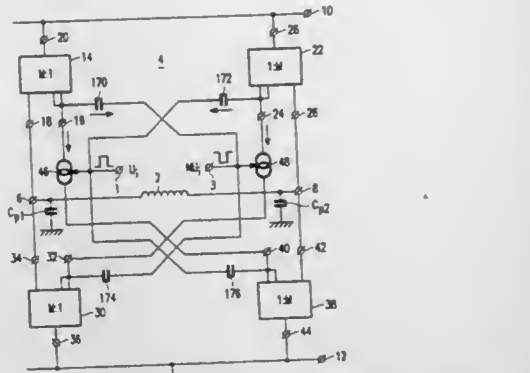
U.S. Cl. 360—68 **17 Claims**

1. A write amplifier for enabling recording of a digital information signal by an inductive write head on a magnetic record carrier; said write amplifier comprising:

a first signal terminal (**1**) and a second signal terminal (**3**) for respectively supplying first and second signals corresponding to opposite digital values of the information signal;

a first write terminal (**6**) and a second write terminal (**8**) coupled to said write head to supply recording current thereto in a direction which corresponds to the digital value of the information signal;

a first voltage supply terminal (**10**) and a second voltage supply terminal (**12**) for providing a supply voltage to the write amplifier;



a first current mirror (**14**) having a first current input terminal (**16**), a first current output terminal (**18**) coupled to the first write terminal (**6**), and a first common current terminal (**20**) coupled to the first voltage supply terminal (**10**);

a second current mirror (**22**) having a second current input terminal (**24**), a second current output terminal (**26**) coupled to the second write terminal (**8**), and a second common current terminal (**28**) coupled to the first voltage supply terminal (**10**);

first current switching means including a first current source (**46**) coupled to the first signal terminal (**1**) for supplying current in a first current path to the first current input terminal (**16**), thereby causing said first current mirror (**14**) to supply recording current to said write head in a direction from the first write terminal (**6**) to the second write terminal (**8**) whenever the information signal has a first digital value;

second current switching means including a second current source (**48**) coupled to the second signal terminal (**3**) for supplying current in a second current path to the second current input terminal (**24**), thereby causing said second current mirror (**22**) to supply recording current to said write head in a direction from the second write terminal (**8**) to the first write terminal (**6**) whenever the information signal has a second digital value; and

at least one of:

(i) first capacitive means (**170**) for supplying to said first current path a capacitive current which supplements current produced in said first current path by said first current source (**46**) when the information signal changes to said first digital value; and

(ii) second capacitive means (**172**) for supplying to said second current path a capacitive current which supplements current produced in said second current path by said second current source when the information signal changes to said second digital value.

5,841,604
MASTERLESS SPINDLE SYNCHRONIZATION IN A MULTIPLE DISK DRIVE STORAGE SYSTEM

Louis Supino, Boulder, Colo., assignor to Cirrus Logic, Inc., Fremont, Calif.

Continuation of Ser. No. 432,449, May 1, 1995, abandoned, which is a continuation-in-part of Ser. No. 167,778, Dec. 15, 1993, abandoned. This application May 6, 1997, Ser. No. 851,552

Int. Cl.^{6} G11B *15/46*

U.S. Cl. 360—73.03 **22 Claims**

1. A masterless method for synchronizing a plurality of rotating storage disks, wherein:

(a) each storage disk having an index mark recorded thereon and a read head positioned there above;

(b) each storage disk having a phase angle measured from the read head to the index mark; and

(c) each storage disk having a counter having a terminal count output, the terminal count outputs being ORed together to generate a synchronizing signal;

the masterless method comprising the steps of:

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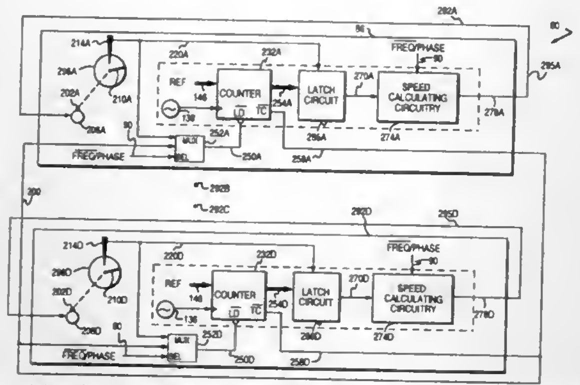


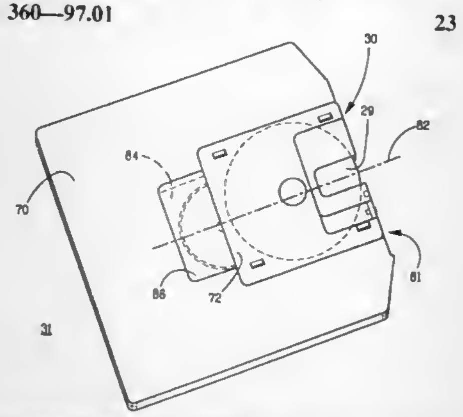
(a) spinning up each storage disk to a predetermined initial rotation frequency;
(b) loading each counter with a value corresponding to a target rotation frequency;
(c) decrementing each counter at a predetermined clock rate;
(d) when the read head detects the index mark, generating a control signal in response to a count value stored in the counter and reloading the counter with the value corresponding to the target rotation frequency;
(e) repeating steps (b) through (d) until a rotation frequency of each storage disk substantially matches the target rotation frequency;
(f) switching to a phase lock mode;
(g) detecting the first counter to reach terminal count;
(h) reloading each counter with the value corresponding to the target rotation frequency;
(i) when the read head detects the index mark, generating a control signal for the corresponding storage disk in response to a count value stored in the corresponding counter;
(j) controlling the rotation frequency of each storage disk in response to the corresponding control signal;
(k) when the counters simultaneously reach terminal count, reloading each counter with the value corresponding to the target rotation frequency; and
(l) repeating steps (i) through (k) until the storage disks are substantially phase locked to the storage disk corresponding to the counter in step (g).

5,841,605
CADDY FOR CARTRIDGE AND DISK DRIVE ACCOMODATING A CADDY

David Foster, Ogden, Utah; George T. Krieger, Carmel, Calif.; Shane Nowell; Fred Thomas, III, both of Ogden, Utah, and Brent J. Watson, Bountiful, Utah, assignors to Iomega Corporation, Roy, Utah

Filed Nov. 6, 1996, Ser. No. 746,084
Int. Cl.^{6} G11B *23/03*

U.S. Cl. 360—97.01 **23 Claims**



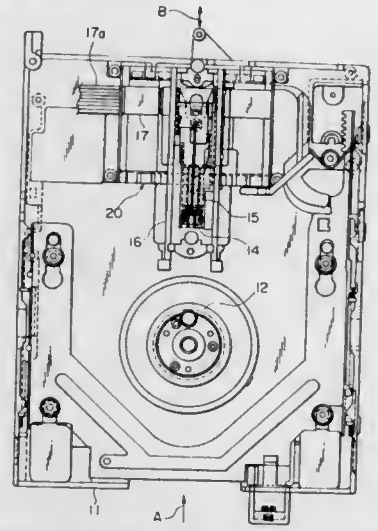
1. An apparatus for use in a disk drive that accepts a removable cartridge for reading and writing data, the disk drive having driving means for rotating a medium disposed within said removable cartridge, comprising:
  a body having a size and shape substantially similar to the removable medium cartridge;
  means for coupling a second removable cartridge to said body, said second removable medium being different in size from said removable cartridge accepted by the disk drive;
  means coupled to said body for translating the driving means to said second removable cartridge.

5,841,606
MAGNETIC RECORDING/REPRODUCING DEVICE WITH MAGNETIC SHIELD BETWEEN VOICE COIL MOTOR AND FLEXIBLE CABLE

Teruo Shimazu, Atsugi; Toshiharu Shimizu, Machida; Yoshihide Majima, Hatano, and Toshimitsu Itoh, Atsugi, all of Japan, assignors to Mitsumi Electric Co., Ltd., Tokyo, Japan

Filed May 20, 1997, Ser. No. 859,677
Claims priority, application Japan, May 21, 1996, 8-125684
Int. Cl.^{6} G11B *5/016;5/012*

U.S. Cl. 360—99.01 **4 Claims**



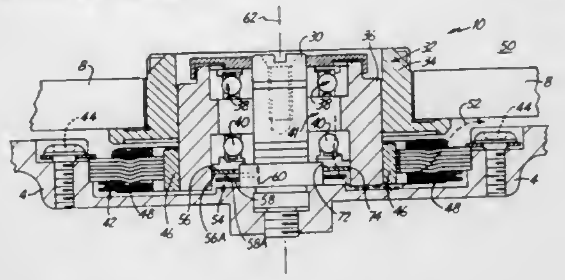
1. A magnetic recording/reproducing device comprising:
a main frame;
a disk table rotatably mounted on said main frame for receiving and driving a recording medium thereon;
a magnetic head for recording data onto and/or reproducing data from said recording medium;
a magnetic head carriage spaced from said main frame and supporting said magnetic head;
a voice coil motor mounted on said main frame for driving said magnetic head carriage in a predetermined radial direction with respect to said magnetic recording medium on said disk table, said voice coil motor comprising a voice coil, a drive shaft mounted on said main frame and extending in parallel to said predetermined radial direction, and a magnetic yoke for generating a magnetic field intersecting a drive current flowing through said voice coil;
a flexible printed cable disposed adjacent to said voice coil and extending outside of said magnetic recording/reproducing device, said flexible printed cable comprising first conductive patterns connected to said voice coil for feeding said drive current to said voice coil and second conductive patterns connected to said magnetic head for transmitting a write signal to said magnetic head and a read-out signal from said magnetic head; and
a magnetic shield element disposed in a gap between said voice coil and said flexible printed cable.

5,841,607
HYDRODYNAMIC SEAL FOR DISC DRIVE SPINDLE MOTOR

Raquib U. Khan, Pleasanton, and Mohamed M. Rahman, San Jose, both of Calif., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Apr. 7, 1997, Ser. No. 835,241
Int. Cl.^{6} G11B *17/02*

U.S. Cl. 360—99.08 **17 Claims**



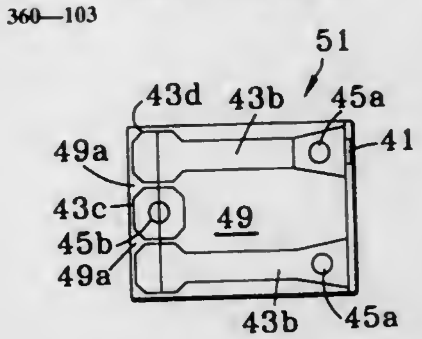
1. A disc drive comprising:
a housing providing a substantially contaminant-free cavity;
a central axis;
a stationary member which is fixed with respect to the housing and coaxial with the central axis;
a rotatable member which is rotatable about the central axis with respect to the stationary member;
at least one data storage disc carried by the rotatable member within the contaminant-free cavity;
a bearing interconnecting the stationary member and the rotatable member;
an air flow path from the bearing to the contaminant-free cavity; and
a viscous pump seal positioned within the air flow path, between the bearing and the contaminant-free cavity, and forming an air flow restriction in the air flow path, wherein the viscous pump seal comprises first and second annular plates which are separated by a gap, wherein the first annular plate is carried by one of the stationary member and the rotatable member and defines a first pump surface facing the gap and wherein the second annular plate is carried by the other of the stationary member and the rotatable member and defines a second, grooved Pump surface facing the gap.

5,841,608
HEAD SLIDER WITH PROJECTIONS ARRANGED ON RAILS THEREOF

Yoshiharu Kasamatsu; Toru Yokohata; Takayuki Yamamoto; Takashi Toyoguchi; Seiji Yoneoka, and Yoshifumi Mizoshita, all of Kanagawa, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 30, 1995, Ser. No. 521,265
Claims priority, application Japan, Aug. 30, 1994, 6-205474; Feb. 3, 1995, 7-017341; Apr. 17, 1995, 7-091196
Int. Cl.^{6} G11B *5/60*

U.S. Cl. 360—103 **9 Claims**



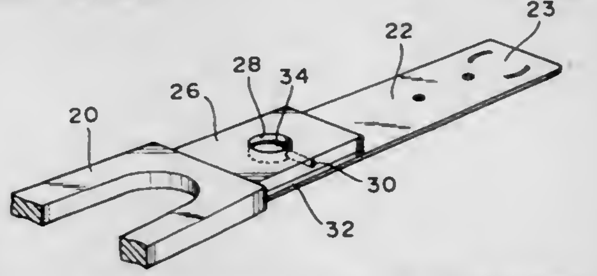
1. A head slider for a magnetic recording drive, comprising:
a substrate having an air inflow end and an air outflow end and defining a main plane facing a magnetic disk, said substrate holding a transducer at said air outflow end, information being read or written from/in said magnetic disk by said transducer;
a front rail formed on said main plane near said air inflow end, said front rail defining a front rail plane facing said magnetic disk;
first and second side rails defining first and second side rail planes, said first and second side rail planes facing said magnetic disk, said first and second side rails arranged on said substrate for receiving a floating force caused by rotation of said magnetic disk;
a first projection arranged on said front rail and extending from said front rail plane, said first projection placed near said air inflow end of said substrate;
a second projection arranged on said second side rail and extending from said second side rail plane, said second projection placed nearer said air outflow end of said substrate than said first projection; and
a third projection arranged on said first side rail and extending from said first rail plane, said third projection placed nearer said air outflow end of said substrate than said first projection;
whereby a loading force from said head slider upon said magnetic disk when said head slider is in contact with said magnetic disk is divided solely among said first projection, said second projection and said third projection.

5,841,609
ASSEMBLY CONNECTING SUSPENSION TO ACTUATOR ARM UTILIZING ADHESIVE INJECTING HOLE

Kazunori Tochiyama, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 12, 1996, Ser. No. 747,305
Claims priority, application Japan, Jun. 17, 1996, 8-155169
Int. Cl.^{6} G11B *5/48;21/16*

U.S. Cl. 360—104 **3 Claims**



1. An actuator arm assembly of a disk drive having a base, comprising:
  an actuator arm rotatably mounted on said base, said actuator arm having one end portion formed with a first hole and a second hole substantially perpendicular to said first hole and communicating with said first hole;
  a suspension having one end portion for supporting a head; and
  a spacer fixed to the other end portion of said suspension, said spacer having a cylindrical projection inserted in said first hole and fixed to said one end portion of said actuator arm by means of an injected adhesive, said injected adhesive injected through said second hole into said first hole.

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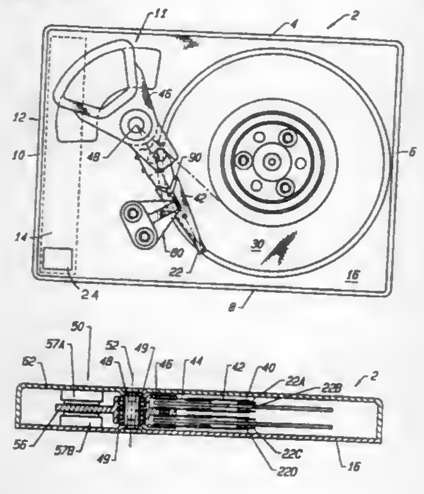
5,841,610
MINIATURE HARD DISC SYSTEM HAVING SINGLE VOICE COIL MAGNET MOTOR

Ramgopal Battu, Los Angeles County; Iraj Jabbari, Santa Clara County, and Sanjoy Ghose, Santa Cruz County, all of Calif., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Continuation of Ser. No. 484,685, Jun. 7, 1995, abandoned, which is a division of Ser. No. 181,888, Jan. 14, 1994, abandoned, which is a continuation of Ser. No. 56,984, May 3, 1993, abandoned, which is a continuation of Ser. No. 932,922, Aug. 20, 1992, abandoned, which is a continuation of Ser. No. 807,793, Dec. 12, 1991, abandoned, which is a continuation of Ser. No. 477,747, Feb. 9, 1990, abandoned. This application Apr. 28, 1997, Ser. No. 847,934

Int. Cl.^{6} G11B *5/54*

U.S. Cl. 360—106 **11 Claims**



1. A disc drive comprising:

at least one hard disc;

supporting means for supporting the or each hard disc and for rotating the or each hard disc at a constant speed;

transducer means for writing to and reading from digital information from the or each hard disc;

positioning means for selectively positioning the or each transducer means with respect to a respective disc, said positioning means including an actuator arm rotatable about a pivot having said transducer means on one side of the pivot and a voice coil motor on the other side of the pivot, and at least one flexure coupled to a respective transducer means and means for lifting each transducer means from the disc, said lifting means comprising a ridge extending over a predetermined length of said flexure functioning as a cam co-operating with a substantially linear ramp located at the side of the or each disc so as to lift the associated transducer as the transducer is moved to the side of the respective disc;

said voice coil motor having a rotor and stators and a compact design having reduced thickness in which said stators are mounted directly to the ceiling and base of a housing in which the said or each disc, supporting means, transducer means and positioning means are disposed, and are contained entirely within said housing;

said ramp being mounted to one of said housing base or ceiling within said housing.

5,841,611
MAGNETORESISTANCE EFFECT DEVICE AND MAGNETORESISTANCE EFFECT TYPE HEAD, MEMORY DEVICE, AND AMPLIFYING DEVICE USING THE SAME

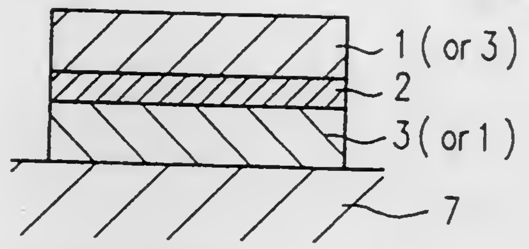
Hiroshi Sakakima, Tsuzuki-gun; Yousuke N Irie, Kadoma; Mitsuo Satomi, Katano, and Yasuhiro Kawawake, Uji, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Apr. 27, 1995, Ser. No. 429,714

Claims priority, application Japan, May 2, 1994, 6-093257; Jun. 7, 1994, 6-125072; Jun. 30, 1994, 6-149229; Jul. 28, 1994, 6-176822; Jul. 29, 1994, 6-178078; Aug. 9, 1994, 6-187484; Aug. 12, 1994, 6-190457; Dec. 7, 1994, 6-303615; Dec. 16, 1994, 6-313147; Mar. 10, 1995, 7-051630; Mar. 13, 1995, 7-053067

Int. Cl.^{6} G11B *5/127*

U.S. Cl. 360—113 **60 Claims**



1. A magnetoresistance effect device comprising:

a substrate: and

a multilayer structure formed on the substrate, the multilayer structure including a hard magnetic film comprising at least one of CoPt, CoTaCr and CoPtCr, a soft magnetic film, and a non-magnetic film for separating the hard magnetic film from the soft magnetic film,

wherein a direction of a magnetization easy axis of the hard magnetic film substantially agrees to a direction of a magnetic field to be detected.

5,841,612
SLIDING TYPE MAGNETIC HEAD FOR MAGNETO-OPTICAL RECORDING

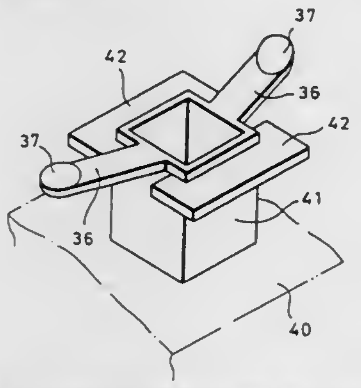
Shinichi Nanjyo, Miyagi, Japan, assignor to Sony Corporation, Tokyo, Japan

Division of Ser. No. 475,765, Jun. 7, 1995, abandoned, which is a division of Ser. No. 291,492, Aug. 17, 1994, Pat. No. 5,508,869, which is a continuation of Ser. No. 56,915, May 5, 1993, abandoned. This application Jan. 6, 1997, Ser. No. 778,852

Claims priority, application Japan, May 14, 1992, 4-122253

Int. Cl.^{6} G11B *5/127*

U.S. Cl. 360—114 **6 Claims**



1. A sliding type magnetic head for magneto-optical recording, comprising:

a head body, said head body having a head element and a sliding portion which comes in sliding contact with a recording medium, wherein said sliding portion is integrally formed in one piece with a top of a coil bobbin independently of a flange portion of said coil bobbin of said head element.

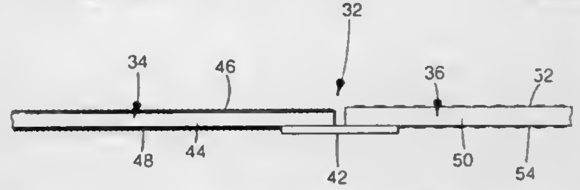
5,841,613
TAPE CASSETTE FOR CLEANING VCR HEADS AND TRANSPORT COMPONENTS

Robert D. DeMaster, Afton; Alexander R. Mitka, Roseville; John V. Nowicki, Oakdale, all of Minn.; Alexander S. Sinclair, Twickenham, England; Richard E. Skare, Stillwater, and Mark W. Weavers, Little Canada, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 35,744, Mar. 23, 1993, abandoned. This application Aug. 24, 1994, Ser. No. 295,225

Int. Cl.^{6} G11B *5/10*

U.S. Cl. 360—128 **19 Claims**



1. A VCR component cleaning cassette for cleaning at least VCR heads and tape guides comprising:

a videocassette housing having an opening through which tape is pulled during a play mode;

a supply reel mounted in the housing;

a takeup reel mounted in the housing;

a length of tape mounted between the supply reel and the takeup reel, wherein the tape comprises a tape portion, a leader portion, and means for connecting the tape portion to the leader portion, wherein the tape portion has a front side comprising a recordable front side scrubbing material suitable for cleaning the heads and a backside comprising a backside scrubbing material suitable for cleaning the tape guides, wherein the front side scrubbing material differs from the backside scrubbing material, and wherein the leader portion cleans the capstan; wherein the leader portion comprises scrubbing material on at least one of the front side of the tape and the backside of the tape for cleaning the capstan, and wherein the scrubbing material on the tape portion differs from the scrubbing material on the leader portion, and wherein when the cleaning cassette is inserted into the VCR the tape is capable of cleaning the heads, tape guides, and capstan with only the front side of the tape portion contacting the heads, regardless of the internal configuration of these components in the VCR.

5,841,614
HIGH VOLTAGE CIRCUIT BREAKER WITH INSERTION OF RESISTANCE ON CLOSURE

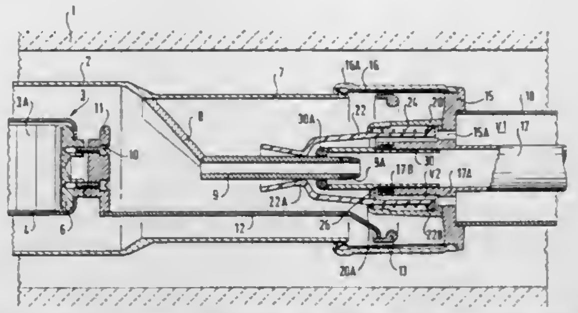
Michel Perret, Bourgoin-Jallieu, France, assignor to GEC Alsthom T & D SA, Paris, France

Filed May 9, 1997, Ser. No. 853,253

Claims priority, application France, May 13, 1996, 96 05910

Int. Cl.^{6} H01H *9/30*

U.S. Cl. 361—14 **2 Claims**



1. A high voltage circuit breaker having an open position and a closed position, comprising, an enclosure containing a fixed main contact, a fixed arcing contact mounted to the fixed main contact, and a fixed resistor having an end and operative to be inserted momentarily on closure of the circuit breaker, an insertion electrode being connected by at least one arm to the end of the resistor; the enclosure also containing a moving assembly comprising a movable main contact, inner and outer coaxial cylinders fixedly connected to the movable main contact and which are mechanically secured to each other so as to move together, defining a blast volume, said moving assembly further comprising a blast nozzle and an arcing contact, wherein the blast nozzle and the arcing contact of the moving assembly are fixedly secured to each other and constitute a semi-moving subassembly which is movable relative to a remainder of the moving assembly, the insertion electrode being disposed in line with the fixed main contact and at a distance from an end of the movable main contact that is greater than an insulation distance when the circuit breaker is in the open position, the semi-moving subassembly being urged by a spring in a direction tending to move the semi-moving subassembly away from the fixed arcing contact, the distance between an end of the fixed arcing contact and an end of the arcing contact of the moving assembly, when the circuit breaker is in the open position, being greater than the distance between the insertion electrode and the end of the movable main contact.

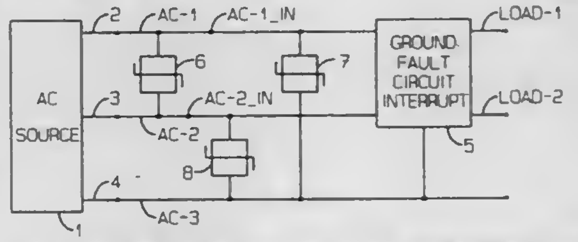
5,841,615
GROUND FAULT CIRCUIT INTERRUPT SYSTEM INCLUDING AUXILIARY SURGE SUPPRESSION ABILITY

Bernard Gershen, Centerport, N.Y., assignor to Leviton Manufacturing Co., Inc., Little Neck, N.Y.

Continuation of Ser. No. 504,211, Jul. 19, 1995, Pat. No. 5,654,857. This application Apr. 16, 1997, Ser. No. 839,888

Int. Cl.^{6} H02H *3/00*

U.S. Cl. 361—42 **3 Claims**



1. A ground fault circuit interrupt system with auxiliary surge suppression capability, comprising:

a) line-side phase, neutral and ground system terminals adapted to be electrically coupled to phase, neutral and ground terminals of an AC power source, respectively;

b) load-side phase, neutral and ground system terminals adapted to be electrically coupled to phase, neutral and ground terminals of an electrical load, respectively;

c) a ground fault circuit interrupter comprising: line-and-load-side phase and neutral ports, wherein said line-side phase and neutral ports are electrically coupled by first and second electrical conductors, respectively, to said line-side system phase and neutral terminals and said load-side phase and neutral ports are electrically coupled to said load side system phase and neutral terminals for controlling a state of conduction of AC power between said AC power source and said electrical load in accordance with a detection of an interrupt condition;

d) an electrical conductor coupling a ground terminal of said AC power source to a ground terminal of said electrical load;

e) a first magnetic core adjacent said line-side phase and neutral ports, with said first electrical conductor extending therethrough;

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f) a first secondary winding on said first magnetic core to produce a first signal indicative of a current flowing from said AC power source into said system;

g) a second magnetic core adjacent said line-side phase and neutral ports with said second electrical conductor extending therethrough;

h) a second secondary winding on said second magnetic core to produce a second signal indicative of the current flowing from said system back to said AC power source;

i) detecting means coupled to said first and second secondary windings to produce an interrupt signal indicative of an interrupt condition when said first signal and said second signals are not equal to end conduction of AC power between said AC power source and said electrical load; and

j) first, second and third transient voltage surge suppressors electrically connected between said line-side system terminals and all of the following: phase and neutral terminals, phase and ground terminals and neutral and ground terminals for transient voltage surge suppression protection.

5,841,616
MODULE FOR USE WITH A MINIATURE CIRCUIT BREAKER

Mark David Crosier, Gwynedd, Great Britain, assignor to Delta Circuit Protection & Controls Limited, United Kingdom

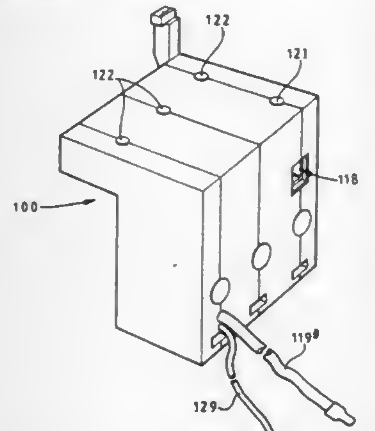
PCT No. PCT/GB95/01692, § 371 Date Apr. 9, 1997, § 102(e) Date Apr. 9, 1997, PCT Pub. No. WO96/03759, PCT Pub. Date Feb. 8, 1997

PCT Filed Jul. 18, 1995, Ser. No. 776,173

Claims priority, application United Kingdom, Jul. 23, 1994, 9414869

Int. Cl.⁶ H02H *3/00*

U.S. Cl. 361—102 **21 Claims**



1. A module for use with a miniature circuit breaker of the kind intended to be mounted in side-by-side relationship with other circuit breakers, the module being arranged to be mounted upon an end of a housing of a previously assembled miniature circuit breaker, the module overlying a terminal of the miniature circuit breaker and being arranged to perform a monitoring and/or control function associated with the miniature circuit breaker or a circuit controlled thereby in use, the module including an electrical contact which protrudes therefrom to engage said terminal of the miniature circuit breaker in use, whereby the module defines its power supply from said terminal of the miniature circuit breaker in use.

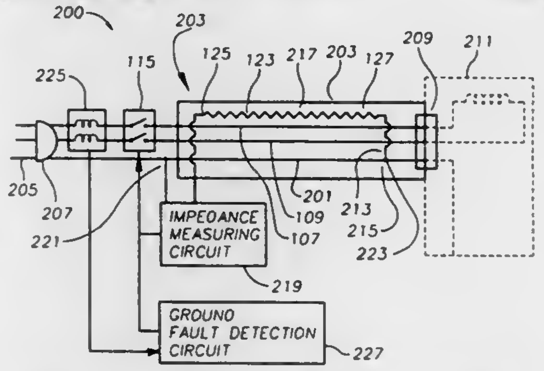
5,841,617
ELECTRICAL SAFETY DEVICE WITH CONDUCTIVE POLYMER SENSOR

Kenneth S. Watkins, Jr., Dahlonea, Ga., and Shelby J. Morris, Jr., Hampton, Va., assignors to BPW, Inc., Cumming, Ga.

Filed Apr. 7, 1997, Ser. No. 826,780

Int. Cl.⁶ H02H *5/04*

U.S. Cl. 361—106 **31 Claims**



1. An electrical apparatus for reducing electrical hazards due to overtemperature, the apparatus comprising:
- a power cord comprising a first end and a second end;
- a plug disposed at the first end of the power cord, the plug insertable in an electrical plug receptacle;
- a first conductor disposed in the cord extending from the plug to the second end of the power cord;
- a first strip and a second strip;
- said first strip comprising an electrically conductive polymer material and extending along a first portion of the cord between the plug and the second end, the first portion extending substantially the length of the cord, the conductive polymer material having a positive temperature coefficient of resistivity, the positive temperature coefficient of resistivity increasing with temperature;
- said second strip comprising a conductive material, the second strip connected with the first strip to form a series connected sensor,
- a controller connected to the series connected sensor; and
- an interrupter connected to the controller and in series with the first conductor, the interrupter disconnecting power to the apparatus when the resistance of the series connected sensor increases to a predetermined value.

5,841,618
POWER-LINE TRIP CIRCUIT

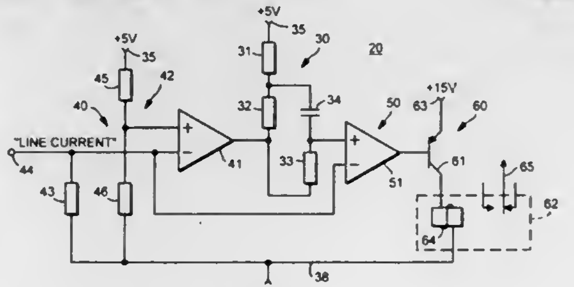
Graham Dilkes, and Carl C. Ennis, both of Manchester, United Kingdom, assignors to GEC Alsthom Limited, United Kingdom

Filed Sep. 17, 1996, Ser. No. 714,851

Claims priority, application United Kingdom, Sep. 19, 1995, 9519086

Int. Cl.⁶ H02H *3/00*

U.S. Cl. 361—110 **6 Claims**



1. A power-line trip circuit for an autorecloser, comprising:
- a detection means for detecting the presence of an over-current in power lines with which said autorecloser is associated, the detection means having an input connected to an input of the trip circuit, said trip-circuit input receiving, in use, a signal representative a value of current flowing in said power lines,
- a transient simulation means for simulating characteristics of a decaying transient component of said over-current when said over-current appears, said transient simulation means having an input connected to an output of said detection means and an output for providing a signal possessing said simulated transient characteristics,
- a comparison means for comparing said signal possessing said simulated transient characteristics with a signal proportional to current flowing through said power lines, said comparison means having a first input connected to said trip-circuit input and a second input connected to said output of said transient simulation means, and
- a circuit-breaker tripping means for tripping a circuit breaker associated with said power lines, said circuit-breaker tripping means being connected to an output of said comparison means, the trip circuit being arranged to trip said circuit breaker only when an amplitude of said signal proportional to current exceeds an amplitude of said signal possessing said simulated transient characteristics.

5,841,619
INTERFACE CIRCUIT FOR USE IN A SEMICONDUCTOR INTEGRATED CIRCUIT

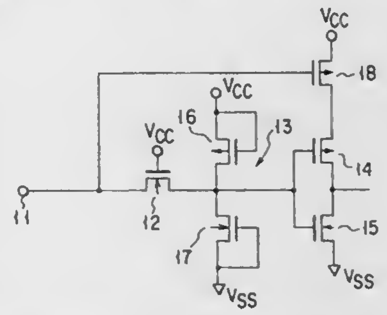
Hiroshi Shigehara, Oita; Yasunori Tanaka, Yokosuka, and Junya Masumi, Sagamihara, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 5, 1995, Ser. No. 567,709

Claims priority, application Japan, Dec. 6, 1994, 6-302222

Int. Cl.⁶ H02H *3/00*

U.S. Cl. 361—111 **21 Claims**



1. An interface circuit for use in a semiconductor integrated circuit comprising:
- an external terminal;
- a first N-channel MOS transistor for suppressing a voltage having a source-to-drain current path connected at a first end thereof to said external terminal and a gate connected to an internal supply voltage; and
- a protection circuit against surge voltage connected to a second end of said current path of said first N-channel MOS transistor, wherein said protection circuit comprises:
  - a second N-channel MOS transistor having a first end connected to said internal supply voltage, a gate connected to a reference supply voltage and a second end connected to the second end of said current path of said first N-channel MOS transistor; and
  - a third N-channel MOS transistor having a first end and a gate connected to said reference supply voltage and a second end connected to the second end of said current path of said first N-channel MOS transistor.

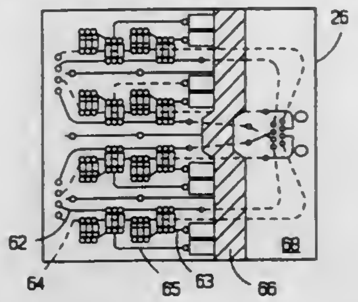
5,841,620
TRANSMISSION BANDWIDTH EXTENDER/CATEGORY 5 PROTECTOR

Mohammad Masghati, Carol Stream, Ill., assignor to Illinois Tool Works Inc., Glenview, Ill.

Continuation-in-part of Ser. No. 577,548, Dec. 22, 1995, Pat. No. 5,706,160. This application Sep. 26, 1997, Ser. No. 938,069

Int. Cl.⁶ H02H *9/06*

U.S. Cl. 361—119 **18 Claims**



1. A surge protector module for protecting telephone communications equipment and the like from power and transient surges, comprising:
- housing means for receiving and enclosing a printed circuit board;
- circuit surge protector means;
- said printed circuit board being disposed within said housing for mounting said circuit surge protector means;
- said printed circuit board including a first tip conductive trace formed on a top side thereof and a first ring conductive trace formed on a bottom side thereof defining a first pair of tip and ring conductive traces;
- said circuit surge protector means including first voltage suppressor means coupled to said first tip and ring conductive traces;
- said circuit surge protector means further including diode means interconnected between said first tip conductive trace and said first ring conductive trace and in series with said voltage suppressor means for reducing the capacitance with respect to ground caused by said voltage suppressor means;
- said circuit surge protector means further including second voltage suppressor means coupled to said first tip and ring conductive traces;
- said printed circuit board further including a second tip conductive trace formed on the top side thereof and a second ring conductive trace formed on the bottom side thereof defining a second pair of tip and ring conductive traces;
- said first tip conductive trace being positioned close to said corresponding first ring conductive trace, but not so that they overlap each other;
- said first and second pairs of tip and ring conductive traces being formed of a relatively wide width, a relatively short length, and made relatively straight so as to reduce the series resistance and inductive reactance for extending the bandwidth of said protector module; and
- a ground shield disposed between said first and second pairs of tip and ring conductives so as to improve crosstalk therebetween.

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5,841,621

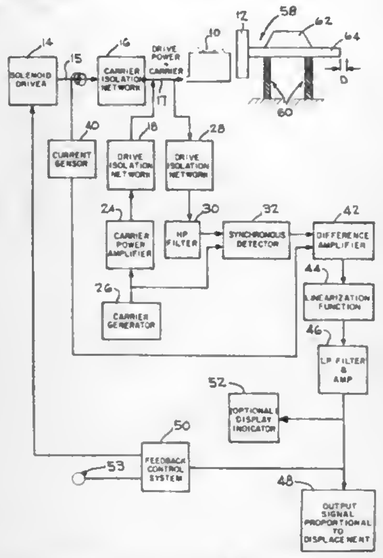
SENSORLESS MEASUREMENT OF ELECTROMAGNETIC ACTUATOR DISPLACEMENT DEVICE

Arthur L. Dean, Indiana, Pa., and Michael Steven Giusto, Cupertino, Calif., assignors to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 214,479, Mar. 17, 1994, abandoned. This application Jun. 4, 1996, Ser. No. 659,066

Int. Cl.^{6} G08B *21/00*

U.S. Cl. 361—185 **8 Claims**



1. A device incorporated with a load bearing vibratory structure for managing vibratory motion and measuring, adjusting and controlling electromagnetically induced vibratory displacement in the load bearing vibratory structure wherein the vibratory displacement is created by imposing a constant frequency and amplitude excitation wave on a solenoid coil through a fixed impedance of a drive isolation network, the device comprising:

- a carrier generator to generate a carrier signal at a predetermined frequency to provide the constant frequency and amplitude excitation wave;
- an electromagnetic solenoid coil;
- an armature disposed apposite said solenoid;
- a drive to provide power to said solenoid;
- carrier isolation network including a network of passive components forming a parallel resonant frequency to isolate inductance of said solenoid coil wherein said resonant frequency is equal to said carrier signal at said predetermined frequency; and
- said armature integrally attached to said load bearing vibratory structure,
- said carrier generator, said electromagnetic solenoid, said armature, said drive, said carrier isolation network and said drive isolation network being in one of operative electrical and electromagnetic communication to enable said measurement of the vibratory displacement of the load bearing vibratory structure to thereby control acceleration, deceleration and braking of the load bearing vibratory structure.

5,841,622

REMOTELY ACTIVATED ELECTRICAL DISCHARGE RESTRAINT DEVICE USING BICEPS' FLEXION OF THE LEG TO RESTRAIN

James F. McNulty, Jr., 1290 3rd. St., Calimesa, Calif. 92320

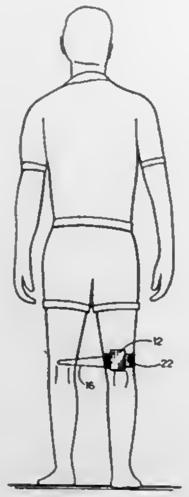
Filed Feb. 4, 1998, Ser. No. 18,268

Int. Cl.^{6} H05C *01/00*

U.S. Cl. 361—232 **7 Claims**

1. A remotely activated electrical discharge restraint device configured for attachment to a human body; the device comprising:

- an electrical circuit for generating a selected high voltage signal;



- a housing for containing said circuit and attaching said circuit to a human body;
- a first contact connected to said circuit and available exterior of said housing for contacting a first location on a human body;
- a second contact connected to said circuit and available exterior of said housing for contacting a second location on a human body;
- the respective positions of and spacing between said first and second locations being selected to induce involuntary flexing contractions of the biceps of both legs upon transfer of said signal to said human body.

5,841,623

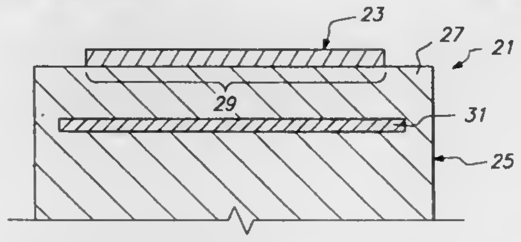
CHUCK FOR SUBSTRATE PROCESSING AND METHOD FOR DEPOSITING A FILM IN A RADIO FREQUENCY BIASED PLASMA CHEMICAL DEPOSITING SYSTEM

Dean R. Denison, San Jose; David R. Pirkle, Soquel, and Alain Harrus, Palo Alto, all of Calif., assignors to Lam Research Corporation, Fremont, Calif.

Filed Dec. 22, 1995, Ser. No. 577,535

Int. Cl.^{6} H02N *13/00*

U.S. Cl. 361—234 **14 Claims**



1. A chuck for processing a substrate in a plasma reaction chamber, comprising:

- a chuck body having a dielectric layer, the dielectric layer including a substrate on a substrate receiving surface, the substrate receiving surface being at least as large as a substrate to be processed on the chuck;
- an electrode buried in the chuck body, the electrode being larger than the substrate receiving surface such that edges of a radio frequency field generated by the electrode are substantially disposed beyond the substrate receiving surface, the electrode having an outer periphery located between an outer periphery of the substrate and an outer periphery of the chuck body.

5,841,624

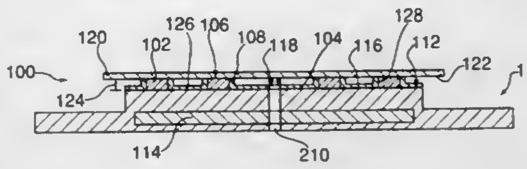
COVER LAYER FOR A SUBSTRATE SUPPORT CHUCK AND METHOD OF FABRICATING SAME

Zheng Xu, Foster City; Fusen Chen, Cupertino, and Jianming Fu, San Jose, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Jun. 9, 1997, Ser. No. 871,740

Int. Cl.^{6} H02N *13/00*

U.S. Cl. 361—234 **20 Claims**



1. A cover layer for covering a support surface of a workpiece support chuck comprising:

- a plurality of conductive pads contacting said support surface, where each of the conductive pads has a top surface; and
- an insulating material coating covering said support surface and exposing said top surface of each of said conductive pads, said insulating material coating and said conductive pads being patterned for supporting a workpiece in a spaced-apart relation to the support surface of the workpiece support chuck.

5,841,625

CERAMIC MULTILAYER CAPACITOR

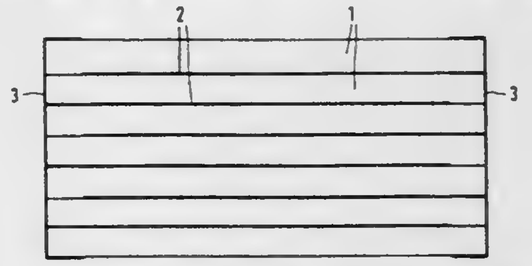
Detlev Hennings; Herbert Schreinemacher, both of Aachen, Germany, and Henricus H.M. Wagemans, Heijthuijsen, Netherlands, assignors to U.S. Phillips Corporation, New York, N.Y.

Filed Jun. 10, 1997, Ser. No. 872,643

Claims priority, application European Pat. Off., Jun. 14, 1996, 962016770

Int. Cl.^{6} H01G *4/06;4/20;4/228*

U.S. Cl. 361—321.4 **4 Claims**



1. A ceramic multilayer capacitor comprising a number of ceramic layers of a doped $BaTiO_3$ as well as a number of electrode layers of Ni, the ceramic layers and the electrode layers being alternately stacked to form a multilayer structure which is provided with electric connections at two side faces, said electric connections being connected to a number of the electrode layers, characterized in that the doped $BaTiO_3$ comprises a main component having a composition that corresponds to the formula

$(Ba_{1-a-b}Ca_aSr_b)(Ti_{1-c-d-e-f}Zr_cAl_dMn_eNb_f)_kO_{3+\delta}$

wherein:

$0.02 \leqq a \leqq 0.08$
$0.002 \leqq b \leqq 0.03$
$0.15 \leqq c \leqq 0.20$
$0.00 < d \leqq 0.03$
$0.001 \leqq e \leqq 0.02$
$0.0005 \leqq f \leqq 0.01$
$1.001 \leqq k \leqq 1.005$

and δ being such that said composition is electrically neutral.

5,841,626

DIELECTRIC CERAMIC COMPOSITION AND MONOLITHIC CERAMIC CAPACITOR USING SAME

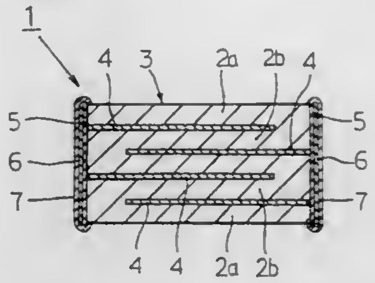
Harunohu Sano, Kyoto; Hiroyuki Wada, Shiga-ken, and Yukio Hamaji, Otsu, all of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Jul. 7, 1997, Ser. No. 888,841

Claims priority, application Japan, Jul. 5, 1996, 8-176729; Nov. 26, 1996, 8-315210

Int. Cl.^{6} H01G *4/06;* **C04B** *35/46*

U.S. Cl. 361—321.5 **19 Claims**



1. A dielectric ceramic composition comprising:

- a main component of barium titanate, scandium oxide, yttrium oxide, manganese oxide and nickel oxide having the compositional formula:

$$(1-\alpha-\beta)\{BaO\}_m.TiO_2+\alpha M_2O_3+\beta(Mn_{1-x}Ni_x)O$$

where M_2O_3 is at least one member selected from the group consisting of Sc_2O_3 and Y_2O_3, and

α, β, m and x are as follows:

$0.0025 \leqq \alpha \leqq 0.020$
$0.0025 \leqq \beta \leqq 0.04$
$\beta/\alpha \leqq 4$
$0 \leqq x < 1$
$1.000 < m \leqq 1.035$;

- magnesium oxide in an amount of from about 0.5 to 3.0 mols in terms of MgO and silicon oxide in an amount of from about 0.2 to 5.0 mols in terms of SiO_2, relative to 100 mols of the main component.

5,841,627

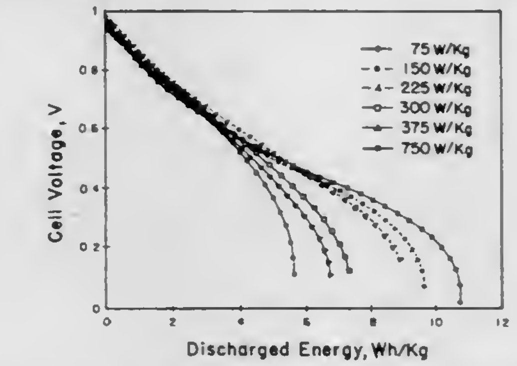
PSEUDO-CAPACITOR DEVICE FOR AQUEOUS ELECTROLYTES

Jai Prakash, 3849 NW. 65th Ave., Gainesville, Fla. 32653; Michael M. Thackeray, 1763 Cliffside Ct., Naperville, Ill. 60565; Dennis W. Dees, 6224 Middaugh Ave., Downers Grove, Ill. 60516; Donald R. Vissers, 611 Clover Ct., Naperville, Ill. 60540, and Kevin M. Myles, 1231 60th Pl., Downers Grove, Ill. 60516-1856

Filed Jun. 3, 1997, Ser. No. 868,176

Int. Cl.^{6} H01G *9/00*

U.S. Cl. 361—502 **3 Claims**



1. A pseudo-capacitor electric energy storage device comprising lead ruthenate and/or lead iridium electrodes, wherein said electrodes have a large number of micropores and a capacitance arising

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from double layer capacitance due to charge separation in the micropores of said electrodes and further arising from a Faraday redox reaction, and wherein said lead ruthenate and/or lead iridium electrodes include high surface area carbon disposed between particles of said lead ruthenate and/or lead iridium for increasing electrical contact between said particles and the double layer capacitance due to charge separation, and wherein said electrodes have the formula

$$A_2[B_{2-x}Pb_x]O_{7-y},$$

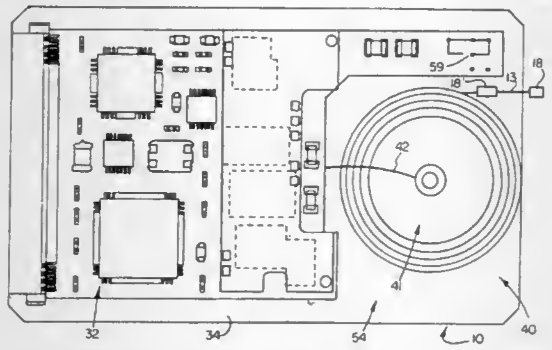
where
A=Pb and/or Bi,
B=Ru and/or Ir,
and

$$0<x\leqq 1,$$

$$0<y<0.5.$$

5,841,628
MINIATURE CIRCUIT CARD WITH RETRACTABLE CORD ASSEMBLY

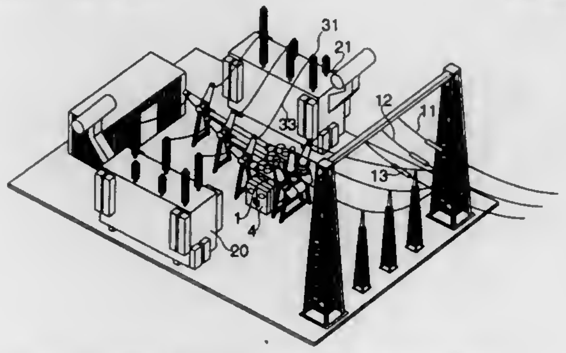
Martin C. Alpert, Moreland Hills, and Timothy R. Ponn, Mentor, both of Ohio, assignors to Click Technologies, Inc., Moreland Hills, Ohio
Continuation of Ser. No. 719,329, Sep. 25, 1996, Pat. No. 5,655,143, which is a continuation of Ser. No. 231,203, Apr. 21, 1994, abandoned. This application Jul. 30, 1997, Ser. No. 903,129
Int. Cl.⁶ G06F *3/00*
U.S. Cl. 361—600 **7 Claims**



1. A PCMCIA circuit card, comprising:
- a PCMCIA card housing, said housing including a pair of generally planar parallel walls; and
- a support for electronic components and a retractable cord mechanism mounted with respect to said support within said housing;
- said retractable cord mechanism comprising an electrical cable having one end electrically connected to said electronic components and another end which can be selectively withdrawn from said housing
- said housing having an aperture at one end from which said electrical cable may be withdrawn to expose a relatively long length of said cable, and a connector on said another end of said electrical cable for attaching the cable to another connector,
- said retractable cord mechanism also including a storage reel mounted in said housing in generally coplanar relation to said housing between respective generally planar walls of said housing, means for mounting said storage reel for rotation in said housing for withdrawing electrical cable from said storage reel for drawing electrical cable back onto said storage reel to retract the electrical cable retracted back into said housing, and
- said retractable cord mechanism comprising a spring biased storage reel for taking up said cable within said housing as said cable is retracted back into said housing, and further comprising a selectively operable lock means for locking and unlocking rotation of said storage reel.

5,841,629
HIGH VOLTAGE HYBRID DESIGN SWITCHGEAR

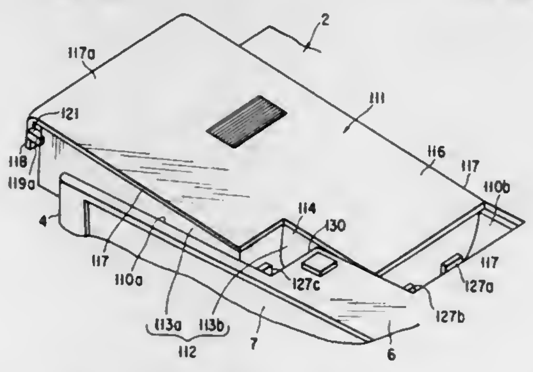
Klaus-Dieter Jeske, Herzogenaurach, and Manfred Meinherz, Berlin, both of Germany, assignors to Siemens Aktiengesellschaft, München, Germany
Filed Sep. 26, 1997, Ser. No. 938,726
Claims priority, application Germany, Sep. 27, 1996, 196 41 391.5
Int. Cl.⁶ H02B *5/00*
U.S. Cl. 361—603 **8 Claims**



1. A high-voltage hybrid design switchgear comprising:
- three power switch enclosures arranged next to one another in series; and
- three horizontally arranged cylindrical adapter boxes, each adapter box having an axis, wherein:
- each of the power switch enclosures is connected to a respective one of the adapter boxes,
- the adapter boxes are arranged with their axes substantially in parallel to each other, and
- each adapter box includes at least one high-voltage outdoor terminal, the outdoor terminals of the adapter boxes being arranged at different distances from the power switch enclosures.

5,841,630
COMPACT ELECTRONIC APPARATUS HAVING BATTERY PACK DETACHABLE RETAINED BY FOUR ENGAGING PORTIONS AND LATCH MEMBER

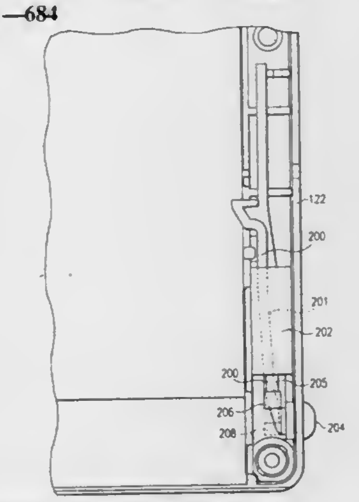
Masaru Seto, and Naohiro Yokoyama, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation of Ser. No. 84,808, Jun. 29, 1993, abandoned. This application Jan. 24, 1995, Ser. No. 377,675
Claims priority, application Japan, Jul. 17, 1992, 4-190352
Int. Cl.⁶ G06F *1/16;* **H05K** *7/10;* **H01M** *2/10*
U.S. Cl. 361—683 **18 Claims**



8. A compact electronic apparatus comprising:
- a base unit including a bottom surface, an opening in the bottom surface, and a storing portion provided in the base unit and communicating with the opening, the storing portion including a first side wall having a first receiving portion and a second side wall facing the first side wall and having a second receiving portion;
- a pack unit detachably stored in the storing portion, and including an outer surface, a first engaging portion removably engaged with the first receiving portion and a second engaging portion removably engaged with the second receiving portion, the pack unit being movable in the storing portion, in a direction substantially parallel to the bottom surface and across the first and second side walls, between a detaching position wherein the pack unit is installed in the storing portion and a connecting position wherein the first and second engaging portions are engaged with the first and second receiving portions, respectively, the outer surface being flush with the bottom surface and covering the opening when the pack unit is in the connecting position; and
- lock means provided at the base unit, for locking the pack unit in the connecting position.

5,841,631
LATCH BLOCK CONTROL FOR MEDIA BAY MODULE

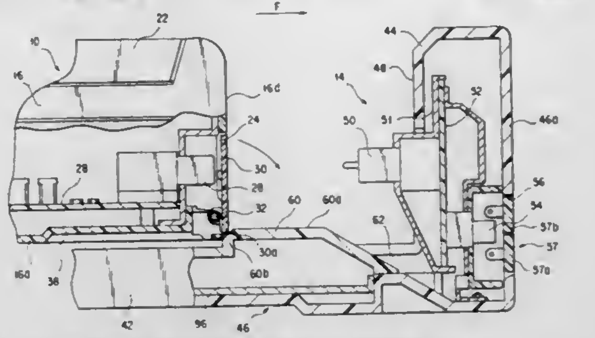
Seong S. Shin, Cupertino; Manpo Kwong, San Jose, both of Calif., and Scot Andrews, Pendelton, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Jun. 14, 1996, Ser. No. 663,502
Int. Cl.⁶ G06F *1/16;* **H05K** *5/02*
U.S. Cl. 361—684 **9 Claims**



1. A computing system comprising:
- a processor controlled by software and connected to a system bus;
- a module that inserts into said computing system and is connected to said system bus;
- a mechanism that locks and releases said module to and from said computing system, wherein said mechanism further includes:
  - a primary lever which engages said module;
  - a manual button which moves said primary lever and disengages said primary lever from said module;
  - a pin that moves from a blocking position in front of said manual button to a non-blocking position clear of said manual button; and
  - a solenoid that controls movement of said pin; and
- means for controlling said mechanism responsive to said processor under software control to move said mechanism to an un-locked position when directed by software and when said system is turned off.

5,841,632
ELECTRONIC PROCESSING SYSTEM

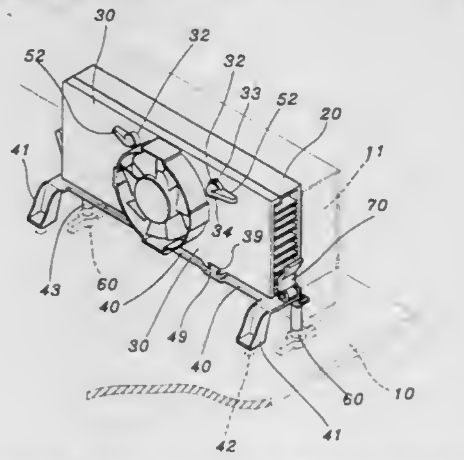
Yasuyuki Horii; Naohiro Yokoyama, both of Tokyo, and Mitsuhiro Yoshida, Hanno, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Mar. 31, 1997, Ser. No. 829,644
Claims priority, application Japan, May 13, 1996, 8-117914
Int. Cl.⁶ G06F *1/16;* **H05K** *7/14*
U.S. Cl. 361—686 **15 Claims**



1. An electronic processing system comprising:
- an electronic apparatus having an apparatus casing including a bottom wall and a rear wall continuous with the bottom wall and formed having an aperture, a first connector located in the apparatus casing so as to face the aperture, and a connector cover provided on the rear wall of the apparatus casing to be rotatable between a closed position in which the aperture is closed and an open position in which the aperture is open; and
- a connectable apparatus connectable with the electronic apparatus;
- the connectable apparatus including:
  - a carrying surface capable of detachably carrying thereon at least the rear portion of the casing of the electronic apparatus,
  - a second connector located adjacent to the carrying surface and connectable with the first connector of the electronic apparatus placed on the carrying surface, and
  - a pushing portion provided on the carrying surface, for abutting the connector cover to rotate the connector cover to the open position, when the apparatus casing placed on the carrying surface is moved toward the second connector.

5,841,633
CUP AND HEAT SINK MOUNTING ARRANGEMENT

Chuan-Wen Huang, No. 18, Lane 42, Alley 266, Futo 1 Road, Hsi-Chih, Taipei Hsien, Taiwan
Filed Sep. 16, 1997, Ser. No. 931,657
Int. Cl.⁶ H05K *7/20*
U.S. Cl. 361—695 **5 Claims**



1. A CPU and heat sink mounting arrangement comprising a CPU shell mounted on a printed circuit board in a vertical position, a heat sink attached to one side of said CPU shell, a fan mount

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covered on said heat sink and fastened to said CPU shell to hold said heat sink in place, and fastening means adapted to fasten said fan mount and said heat sink to said CPU shell, wherein: said CPU shell comprises a plurality of oval mounting holes; said heat sink comprises a plurality of through holes respectively connected to the oval mounting holes of said CPU shell; said fan mount comprises a plurality of through holes respectively connected to the through holes of said heat sink and the oval mounting holes of said CPU shell; said fastening means comprises a plurality of plug shafts respectively inserted into the through holes of said fan mount and said heat sink and the oval mounting holes of said CPU shell and forced into engagement with the oval mounting holes of said CPU shell through rotary motion within a limited angle, each of said plug shafts having a handle at one end for turning by hand, and an oval locating plate at one end inserted into one oval mounting hole of said CPU shell and turned with said handle through an angle into engagement with the respective oval mounting hole of said CPU shell.

5,841,634

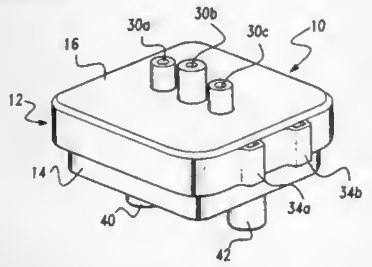
LIQUID-COOLED BAFFLE SERIES/PARALLEL HEAT SINK

Roy Alan Visser, Greentown, Ind., assignor to Delco Electronics Corporation, Kokomo, Ind.

Filed Mar. 12, 1997, Ser. No. 815,545

Int. Cl.^{6} H05K *7/20*

U.S. Cl. 361—699 **18 Claims**



1. A liquid-cooled heat sink comprising:

a cooling housing including at least one chamber, said at least one chamber including at least one wall that is to be cooled;

a fluid inlet port in fluid communication with the housing;

a fluid outlet port in fluid communication with the housing; and

at least one baffle positioned within said chamber, said baffle including a horizontal dividing wall separating the chamber into a top chamber portion and a bottom chamber portion, said horizontal wall including at least one set of jet ports, said set of jet ports directing liquid coolant onto the at least one wall that is to be cooled, said baffle including at least one top dividing wall separating the top chamber portion into first and second top plenums, and at least one bottom dividing wall separating the bottom chamber portion into first and second bottom plenums, said horizontal wall further including at least one transfer port, wherein liquid coolant enters the bottom chamber portion through the fluid inlet port into the first bottom plenum and is forced into the first top plenum through the at least one set of jet ports to contact the at least one wall that is to be cooled, and flows from the first top plenum through the at least one transfer port to the second bottom plenum.

5,841,635

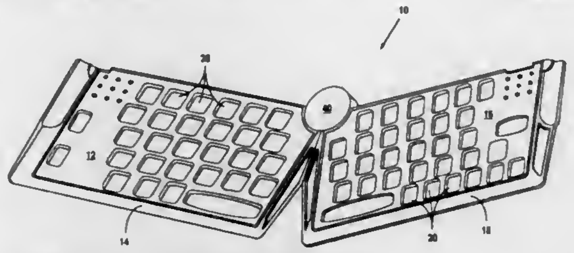
FLEXIBLE PRINTED CIRCUIT FOR SPLIT KEYBOARD AND METHOD OF ASSEMBLY

John T. Sadler; Thomas D. Snyder, and Jason D. Mareno, all of Raleigh, N.C., assignors to Ericsson, Inc., Research Triangle Park, N.C.

Filed Sep. 29, 1997, Ser. No. 939,543

Int. Cl.^{6} H05K *05/03;* G06F *01/16*

U.S. Cl. 361—749 **12 Claims**



1. A flexible circuit member, comprising:

a first planar portion disposed in a predefined plane;

a second planar portion disposed in a plane parallel to said predefined plane and movable with respect to said first planar portion about an axis perpendicular to said predefined plane; and

a web portion extending between said first and said second planar portions and having at least a portion thereof circumjacently disposed about said perpendicular axis in spaced relationship therefrom and in perpendicular relationship with said predefined plane.

5,841,636

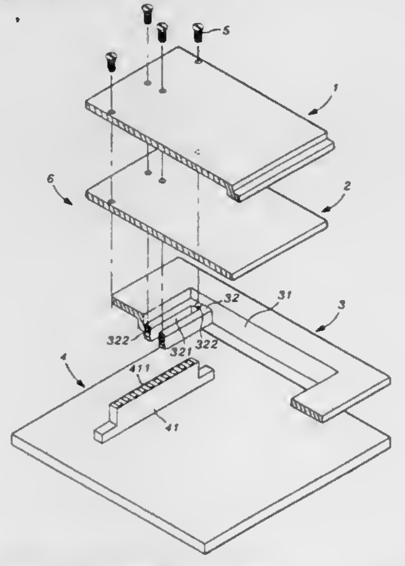
EXPANSION STRUCTURE FOR INSTALLATION OF COMPACT COMPUTER EXPANSION CIRCUIT BOARDS

Jen Chieh Hsu, 4th Fl., No. 58, Hou-Kang St., Shi-Ling Disct., Taipei, Taiwan, and Chuan-Pin Hsiung, 3rd Floor, No. 10-2, Lane 109, Mu-Cha Rd., Sec. 2, Taipei, Taiwan

Filed Jan. 16, 1997, Ser. No. 783,876

Int. Cl.^{6} H05K *5/00*

U.S. Cl. 361—752 **8 Claims**



1. An expansion structure, comprising:

a base board on which an expansion circuit board having an array of electrical connection pins is replaceably mounted;

an enclosure having at least one engaging slot for accommodating said base board therein;

a main board which is mounted in said enclosure and formed with an electrical connection; and

securing means provided on said enclosure;

wherein said base board is inserted into said engaging slot, allowing the electrical connection pins on said expansion circuit board to come into electrical contact with the electrical connector on said main board; and wherein said securing means secures said expansion circuit board in position in said enclosure.

5,841,637

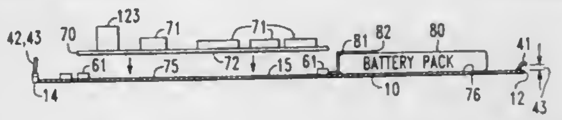
ESD-PROTECTIVE HOUSING FOR ELECTRONICALLY OPERATED LOCK

Kn Singh Chhatwal, Melbourne, Fla., assignor to Intellikey Corporation, Melbourne, Fla.

Filed Mar. 25, 1996, Ser. No. 618,068

Int. Cl.^{6} H05K *7/04*

U.S. Cl. 361—753 **14 Claims**



1. A housing assembly for protectively mounting an electronically operated lock mechanism with a door comprising:

an electrically conductive plate which serves as a first wall of said housing assembly, a first portion of said plate having a first attachment fitting configured to engage a first portion of a sidewall of either of a mortise type protective casing and an escutcheon type protective casing, a second portion of said plate having a second attachment fitting configured to engage a second portion of a sidewall of said mortise type protective casing, and a third portion of said plate having a third attachment fitting configured to engage a second portion of a sidewall of said escutcheon type protective casing;

said mortise type protective casing having a sidewall, and a basewall having a first height above said plate when said first attachment fitting engages said first portion of the sidewall of said mortise type protective casing and said second attachment fitting engages said second portion of the sidewall of said mortise type protective casing, so that said electrically conductive plate and said mortise type protective casing form a mortise housing assembly, said basewall of said mortise type protective casing further including a first aperture sized to accommodate partial entry therethrough of an electrical power supply mounted to said plate, and said sidewall of said mortise type protective casing being configured for attachment with a door mortise;

said escutcheon type protective casing having a sidewall, and a basewall that has a second height above said plate when said first attachment fitting engages said first portion of the sidewall of said escutcheon type protective casing, and said third attachment fitting engages said second portion of the sidewall of said escutcheon type protective casing, so that said electrically conductive plate and said escutcheon type protective casing form an escutcheon housing assembly;

a circuit board containing electronic circuitry for operating said lock mechanism, said circuit board being mounted to said electrically conductive plate and having a ground conductor layer which is electrically connected to said electrically conductive plate; and

said electrical power supply mounted to said electrically conductive plate and extending a third height above said plate greater than said first height, and being electrically connected to and supplying electrical power to said electronic circuitry; and

wherein one of said mortise type and said escutcheon type protective casings is engaged with said electrically conductive plate by way of attachment fittings therefor, so that said electrically conductive plate and said one of said mortise type and said escutcheon type protective casings together form said housing assembly, thereby enclosing therein said circuit board and said electrical power supply.

5,841,638

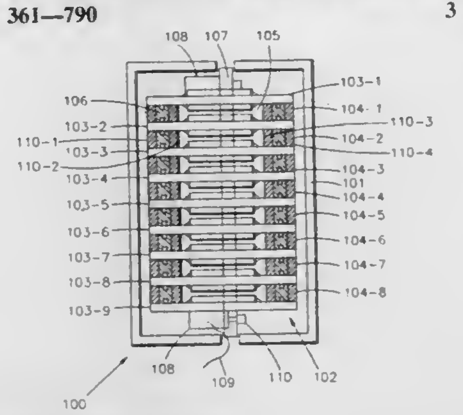
STACKED MEMORY FOR FLIGHT RECORDERS

Gregory W. Purdom, Sarasota, and Endre M. Berecz, Bradenton, both of Fla., assignors to L3 Communications

Filed Feb. 15, 1996, Ser. No. 602,066

Int. Cl.^{6} H01R *9/09;4/58;* H05K *7/14;* B65D *81/02*

U.S. Cl. 361—790 **3 Claims**



1. A flight recorder comprising:

(a) a crash housing:

(b) A memory module located within said crash housing including:

(b1) a stacked plurality of printed circuit boards at least one of which has at least one memory device on at least one board surface;

(b2) at least one conductive pad incorporated into electrical circuitry printed on and within the perimeter of each of an adjacent pair of board surfaces;

(b3) means for interconnecting conductive pads located on and within the perimeter of an adjacent pair of board surfaces;

(b4) spacer means for separating and supporting said stacked plurality of printed circuit boards;

(b5) alignment means for registering conductive pads located on adjacent pairs of printed circuit boards; and

(b6) means for fastening together said stacked plurality of printed circuit boards and said spacer means;

(c) thermal insulation for protecting said memory module from heat, wherein no flammable foam is located between adjacent pairs of printed circuit boards; and

(d) means for coupling electrical signals between an external source and said at least one memory device, said means for coupling further comprising:

(d1) means for communicating electrical signals between said external source and said at least one memory device via a connector means to which said means for communicating is attached; and

(d2) a locking mechanism for securing said means for communicating to said connector means.

5,841,639

EXPANSION MODULE FOR A COMMUNCATIONS NETWORK

William John Schnoor, Hummelstown; Bret Allen Matz, Mechanicsburg, both of Pa., and Nathan Ross Fritts, Wake Forest, N.C., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Feb. 29, 1996, Ser. No. 609,142

Int. Cl.^{6} H05K *7/14*

U.S. Cl. 361—796 **22 Claims**

1. An expansion module to connect additional communication ports to a hub of a communications network comprising:

an enclosure containing additional communication ports on a motherboard,

a hub receiving portion on an exterior of the enclosure to mount to a hub of a communications network,

a mating interconnection board to electrically connect with a first electrical connector on the hub when the enclosure is

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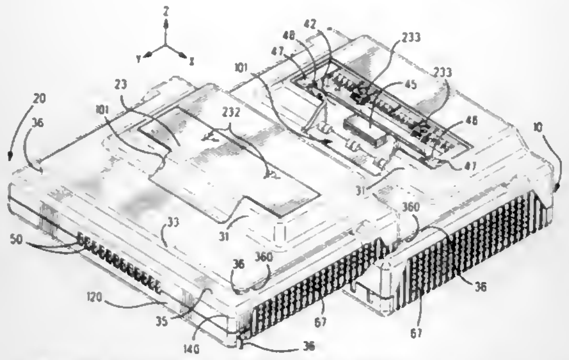


mounted to the hub, whereby the additional communication ports are connected to communications network circuitry in the hub,

a hub connection cavity in the enclosure,

the mating interconnection board being connected to the motherboard and facing the hub connection cavity,

an interconnection board carrying a second electrical connector,

an expansion port opening in the enclosure,

the second electrical connector facing the expansion port opening for connection to a duplicate expansion module containing additional communication ports and a mating interconnection board for connection to the second electrical connector, when a duplicate expansion module is mounted over the expansion port opening in the enclosure.

5,841,640
IC SOCKET

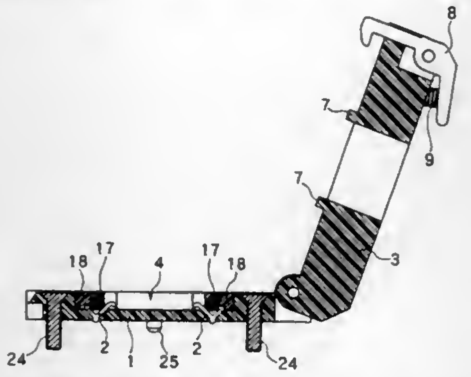
Sueji Shibata, Tokyo, Japan, assignor to Yamaichi Electronics Co., Ltd., Tokyo, Japan

Filed Jul. 31, 1997, Ser. No. 904,264

Claims priority, application Japan, Aug. 2, 1996, 8-204994

Int. Cl.^{6} H05K ***01/18;*** **H01R** ***09/09***

U.S. Cl. 361—820 **21 Claims**



1. An IC socket comprising a socket body including a plurality of contacts for interconnecting an IC and a wiring board;

said contacts each comprising a contacting arm including an upper end contact portion for a lead of an IC to overlie and contact, and a lower end contact portion including a downwardly facing projection capable of abutting with a wiring portion of said wiring board, and a pressing element projecting backwardly of said contact arm from an area in the vicinity of a connecting portion between said projection and said contacting arm:

said projection of said lower end contact portion being received in an upwardly and downwardly open through-hole formed in said socket body, so as to be subjected to abutment with said wiring portion, a resilient body held by said socket body being interposed between said pressing element and said contacting arm to retain a standby posture of said contact; and

said contact being turned forwardly about said projection received in said through-hole to thereby cause said pressing element to compress said resilient body, so that a contacting pressure between said upper end contact portion of said contacting arm and said IC lead is obtained by a restoring force of said resilient body.

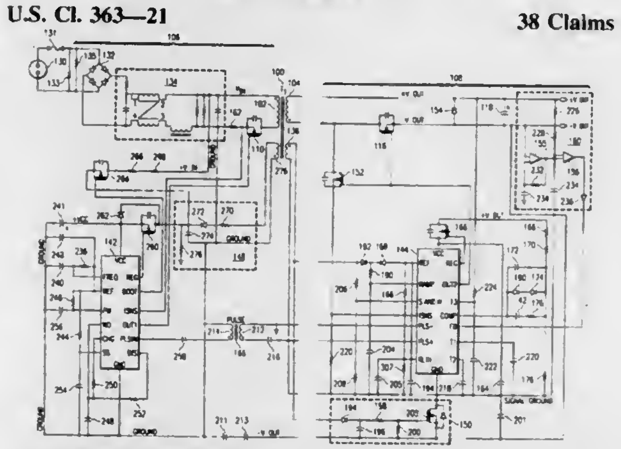
5,841,641
PROTECTED ZERO-CROSSING DETECTION USING SWITCHING TRANSISTOR'S ON-RESISTANCE

Richard A. Faulk, Cypress, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Filed Dec. 31, 1996, Ser. No. 777,787

Int. Cl.^{6} H02M ***3/335***

U.S. Cl. 363—21 **38 Claims**



1. A circuit, comprising:

first and second power transistors connected to turn on and turn off together;

a first voltage-sensing stage which is operatively connected, through current-carrying terminals of said second transistor, to sense the voltage across current-carrying terminals of said first transistor;

said first voltage-sensing stage being implemented without a type of transistor of said first transistor;

wherein said first transistor is connected to interrupt a load current;

whereby said second transistor protects said first voltage-sensing stage from voltages which may appear on said first transistor when said first transistor is off.

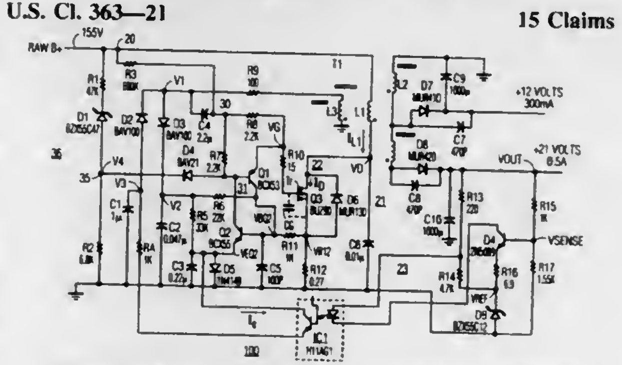
5,841,642
TUNED SWITCH-MODE POWER SUPPLY WITH CURRENT MODE CONTROL

William Vincent Fitzgerald, Zionsville, Ind., assignor to Thomson Consumer Electronics, Inc,, Indianapolis, Ind.

Continuation of Ser. No. 537,965, Oct. 2, 1995, abandoned. This application Jul. 10, 1997, Ser. No. 891,843

Int. Cl.^{6} H02M ***3/335;3/24;1/16***

U.S. Cl. 363—21 **15 Claims**



1. A tuned switch mode power supply apparatus, comprising:

a source of an input supply voltage;

a tuned, resonant circuit including a capacitance and an inductance coupled to said source of said input supply voltage;

a first transistor switch coupled to said inductance and responsive to a periodic, switch control signal for generating current pulses in said inductance and resonant pulses in said resonant circuit, said inductance current pulses being coupled to a load circuit for generating an output of said power supply, said resonant pulses being coupled in a feedback manner to a control terminal of said first transistor switch, when said first transistor switch is turned off, for controlling when said first transistor switch becomes turned on, such that, when current starts flowing in said first transistor switch, a substantially zero voltage is maintained between a pair of main current conducting terminals of said first transistor switch to provide for zero voltage switching;

a source of a second signal for controlling said output of said power supply in accordance with said second signal; and

a modulator responsive to a given current pulse and to said second signal for generating said switch control signal such that said power supply output is current mode controlled, in accordance with said second signal on a current-pulse by current-pulse control basis.

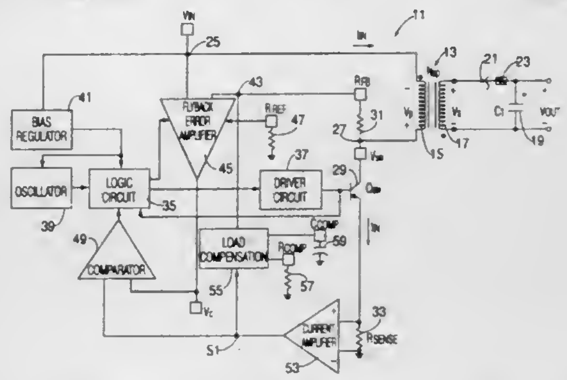
5,841,643
METHOD AND APPARATUS FOR ISOLATED FLYBACK REGULATOR CONTROL AND LOAD COMPENSATION

Jeffrey Schenkel, Burlington, Mass., assignor to Linear Technology Corporation, Milpitas, Calif.

Filed Oct. 1, 1997, Ser. No. 942,451

Int. Cl.^{6} H02M ***3/335***

U.S. Cl. 363—21 **31 Claims**



1. A flyback error amplifier circuit for use in a switching voltage regulator, the switching voltage regulator having a switching element, control circuitry which turns the switching element ON and OFF, and a transformer which couples an output side of the switching voltage regulator to an input side of the switching voltage regulator, the transformer generating a flyback voltage pulse across the input side of the transformer when the switching element is turned OFF, the flyback error amplifier comprising:

a scaling circuit that produces a scaled flyback voltage pulse from the flyback voltage pulse generated on the input side of the transformer when the switching element is turned OFF; and

adjustment circuitry, operatively coupled to the scaling circuit and the control circuitry, that compares the scaled flyback voltage pulse to an internal reference, for generating a difference signal based on the comparison, for integrating a portion of the difference signal, and for adjusting the ON-OFF cycle of the switching element based on the integrated portion of the difference signal.

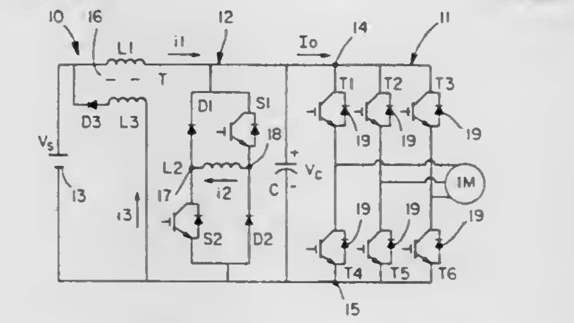
5,841,644
PASSIVELY CLAMPED QUASI-RESONANT DC LINK CONVERTERS

Thomas A. Lipo, Middleton, and Shaotang Chen, Madison, both of Wis., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Sep. 4, 1996, Ser. No. 711,674

Int. Cl.^{6} H02M ***5/45***

U.S. Cl. 363—37 **11 Claims**



1. A converter for providing a regulated AC output power from a DC power source to a load, comprising:

(a) an output inverter having a pair of first and second input terminals and a plurality of inverter switches;

(b) a passively clamped quasi-resonant DC link coupled between the DC power source and the input terminals of the output inverter, and controllable so as to minimize switching losses of the output inverter, the DC link comprising:

a clamp transformer having a certain turns ratio and including a primary magnetizing inductance connected in series with the DC power source and serving as a resonant inductance and a secondary connected in parallel to the DC power source and serving as a clamp winding, the clamp transformer having a means for leakage inductance control,

a capacitor coupled between the input terminals of the output inverter,

an auxiliary inductance, and

at least one auxiliary switching means connected in series with the auxiliary inductance, wherein the auxiliary switching means in series with the auxiliary inductance, respectively, are coupled in parallel with and between the input terminals of the output inverter; and

(c) a controlling means for gating said at least one auxiliary switching means, such that once a switching of at least one of the inverter switches is commanded, said at least one auxiliary switching means must first be turned "ON" to initiate a resonant transient and to cause a link voltage to reach zero, thereby causing commanded switching of the output inverter.

5,841,645
MULTI-LEVEL INVERTER WITH LOW LOSS SNUBBING CIRCUITS

Shinji Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 30, 1997, Ser. No. 841,388

Claims priority, application Japan, Jun. 3, 1996, 8-139798

Int. Cl.^{6} H02M ***1/12***

U.S. Cl. 363—43 **9 Claims**

1. A multi-level inverter, comprising:

an AC output terminal;

at lease four DC input terminals with different potentials including a first DC input terminal with a maximum potential and a second DC input terminal with a minimum potential;

a positive arm connected between said first DC input terminal and said AC output terminal;

a negative arm connected between said second DC input terminal and said AC output terminal;

each of said positive and negative arms including a plurality of series connected switching devices;

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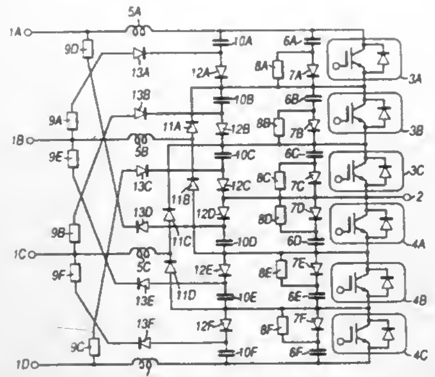


- a plurality of clamp diodes, each corresponding to one of said DC input terminals other than said first and second DC input terminals and also corresponding to one of said positive and negative arms, each of the plurality of clamp diodes connected between the corresponding DC input terminal and the corresponding arm;
- a plurality of first snubber circuits, each corresponding to one of said switching devices and including a series circuit of a snubber capacitor and a snubber diode and connected in parallel with the corresponding one of said switching devices; and
- a plurality of discharging circuits, each corresponding to one of said first snubber circuits and one of said DC input terminals, each of the plurality of discharging circuits including at least a resistor and connected between the corresponding snubber circuit and the corresponding DC input terminals.

5,841,646

RESONANCE INVERTER POWER SUPPLY CONTROL DEVICE INCLUDING TRANSISTOR SWITCH-OVER DECISION SIGNALS

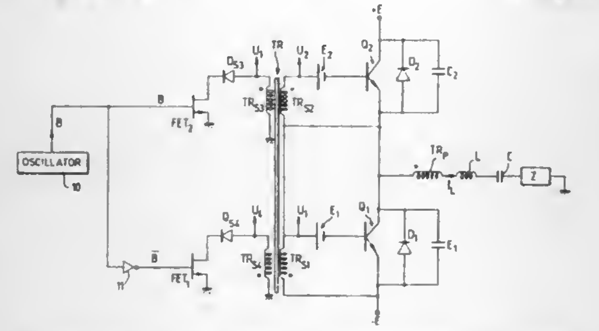
René Cornec, La Chapelle St. Mesmin, France, assignor to Cepem, St Jean de la Ruelle, France

Filed Jan. 30, 1997, Ser. No. 790,996

Claims priority, application France, Jan. 30, 1996, 96 01059

Int. Cl.^{6} H02H *7/122*

U.S. Cl. 363—56 **4 Claims**



1. An apparatus with a device for controlling a circuit having a resonance inverter power supply for at least one load with an inductive component, comprising:

the inverter power supply having,

two switching transistors series-connected between terminals of a DC voltage supply so as to form two switches that are alternately conductive under an effect of the device for controlling,

two freewheeling rectifiers each parallel-connected to respective of the two transistors,

two snubber capacitors each parallel-connected to respective of the two transistors,

a common junction point between the two switching transistors, the freewheeling rectifiers and the capacitors being series-connected to a terminal of said load

the device for controlling comprising

first means delivering, for each switch, a two-state switch-over decision signal representing a decision to open or to close the switch, each switch-over decision signal being associated, by a power interface, with one of the two switches, the two switch-over decision signals being in phase opposition so as to decide a periodic opening and closing of each switch alternately,

means for detecting changes of direction of a current in the load;

a current transformer including,

a primary winding series-connected between the load and the common junction point between the switches, the free-wheeling rectifiers and the snubber capacitors,

a first secondary winding connected between the emitter of one of the two switches and the first terminal of a first DC supply, the second supply terminal being connected to the base of the switch,

a second secondary winding connected between the emitter of the other switch and the first terminal of a second DC supply, the second supply terminal being connected to the base of the other switch,

a third secondary winding and a fourth secondary winding coupled respectively to the second and first secondary windings, the third and fourth secondary windings being each connected between a ground and one of the power interfaces, wherein

biases of the different windings being chosen such that opening of at least one of the switches takes place as soon as the associated switch-over decision signal is in a state representing a decision to open, and such that closing of at least one of the switches takes place when the associated switch-over decision signal is in a state representing a decision to close, and substantially when the current in the load has changed direction.

5,841,647

POWER CONVERSION SYSTEM

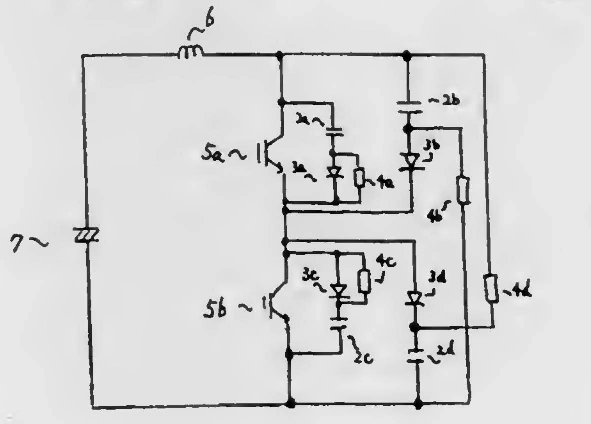
Kimihiro Hoshi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 3, 1997, Ser. No. 943,805

Claims priority, application Japan, Oct. 7, 1996, 8-264973

Int. Cl.^{6} H02M *7/122;7/5387*

U.S. Cl. 363—56 **11 Claims**



1. A power conversion system, comprising:

a series circuit of an upper arm and a lower arm connected between a positive terminal and a negative terminal of a DC power source;

each of said upper and lower arms being composed of a power device having a large dv/dt withstand value and a first snubber circuit connected in parallel with said power device;

each of said first snubber circuits being composed of at least a first capacitor having a fixed capacitance; and

two second snubber circuits, each composed of a series circuit of a second diode and a second capacitor, connected in parallel with one of said upper and lower arms, and a second resistor connected between a connecting point of said second diode and said second capacitor and one of said negative and positive terminals of said DC power source, respectively.

5,841,648

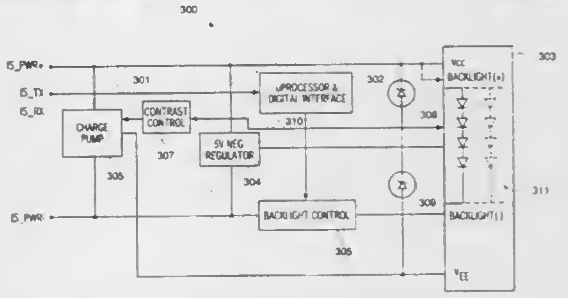
ADJUSTABLE VOLTAGE CONVERTER UTILIZING A CHARGE PUMP

William M. Mansfield, Lafayette, Colo., assignor to Micro Motion, Inc.

Filed May 29, 1997, Ser. No. 865,052

Int. Cl.^{6} H02M *3/335;3/18*

U.S. Cl. 363—59 **25 Claims**



1. An adjustable voltage converter comprising:

an oscillator operative to generate an oscillating signal;

a charge pump operative to generate a variable output voltage from a substantially fixed external power supply voltage responsive to said oscillating signal and to a control signal, said charge pump including:

a charging element operative to periodically develop a charging voltage from said external power supply voltage according to said oscillating signal;

a filter element operative to receive charge from said charging element and to develop said output voltage therefrom; and

output control means, operatively associated with said charging element and responsive to said control signal, for controlling said periodic charging voltage according to said control signal to thereby control said output voltage.

5,841,649

CURRENT-SENSING MOSFETS IN PARALLELED MOSFET POWER CIRCUIT

David T. Willett, Santa Barbara, and Edward M. Halimi, Montecito, both of Calif., assignors to Turbodyne Systems, Inc., Carpinteria, Calif.

Filed Jan. 10, 1997, Ser. No. 782,566

Int. Cl.^{6} H02M *3/24*

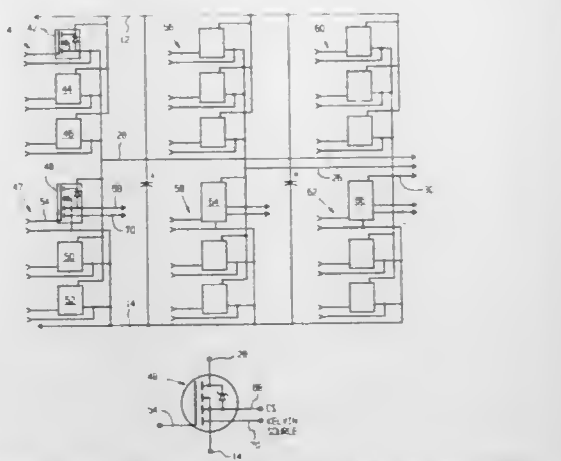
U.S. Cl. 363—98 **15 Claims**

1. A power circuit comprising:

a plurality of MOSFETs connected in parallel to control the current in an electric power circuit, each of said MOSFETs having a power source and a drain connected in said power circuit and each of said MOSFETs having a gate for controlling current flow in said MOSFET,

at least one of said MOSFETs having a separately metallized sense pad for sensing current flow in said at least one MOSFET to represent current flow through all said parallel connected MOSFETs;

and a circuit connected with said gates and with said separately metallized sense pad, said circuit, in response to a signal from



said sense pad, operating said MOSFET gates to limit MOSFET current in said plurality of MOSFETS.

5,841,650

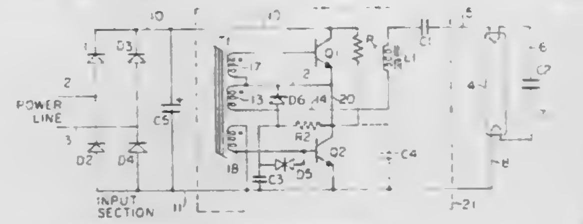
HIGH FREQUENCY INVERTER

Carlile R. Stevens, P.O. Box 8728, Horseshoe Bay, Tex. 78657

Filed Jul. 28, 1997, Ser. No. 901,013

Int. Cl.^{6} H02M *7/537;* **H05B** *37/02*

U.S. Cl. 363—131 **2 Claims**



1. A high frequency inverter comprising:

a source of direct current power;

a pair of switching transistors connected in series across said source of DC power with the collector of the first transistor connected to the positive source of said DC power the emitter of said first transistor connected to the collector of the second transistor, the emitter of said second transistor connected to the negative polarity of said source of DC power;

a resonant network and load comprised of an inductor and capacitor connected in series with the load connected across or in parallel with said capacitor, the combination of said load and said capacitor connected at one end of their parallel connection to the negative polarity of said source of DC power, the opposite end of said capacitor and load combination connected to said inductor;

a drive transformer comprising one primary and two secondary windings the first secondary winding connected between the base and emitter of said first transistor the second secondary winding connected between the base and emitter of said second transistor said first and second secondary windings connected in opposite polarity to each other;

the primary of said drive transformer connected such that the polarity of the primary is the same as the secondary winding driving said first transistor and opposite to the polarity of the secondary winding driving said second transistor;

said primary connected to the junction of said first and second transistors, collector and emitter in such a manner that when current flows into said primary from said junction said first transistor will be turned on by current flowing from said first secondary;

a DC blocking capacitor connected in series with said primary of said drive transformer and said resonate network inductor;

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the core of said drive transformer to be selected as the saturating type and calculated to saturate in both the positive and negative direction during operation of the described circuit with a time fast enough to operate said switching transistors at a frequency higher than the natural resonant frequency of the inductor, capacitor and load combination.

5,841,651

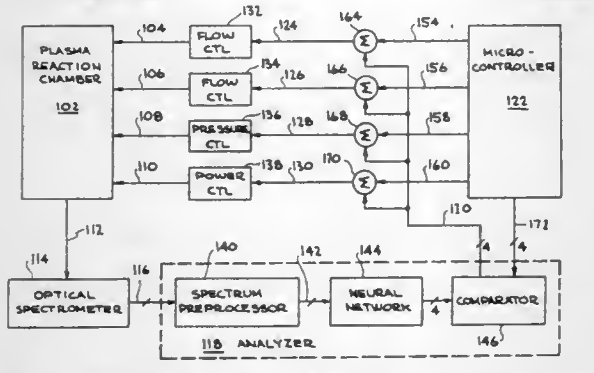
CLOSED LOOP ADAPTIVE CONTROL OF SPECTRUM-PRODUCING STEP USING NEURAL NETWORKS

Chi Yung Fu, San Francisco, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 9, 1992, Ser. No. 973,865

Int. Cl.^{6} G01R *29/00*

U.S. Cl. 364—148 **8 Claims**



1. A method for closed-loop adaptive control of spectrum-producing plasma processes, comprising the steps of:

producing a plasma adjacent to a subject surface of a workpiece, said plasma having characteristics dependent upon a plurality of process input parameters;

while said plasma is adjacent to said subject surface, observing the optical frequency spectrum produced by said plasma;

while said plasma is adjacent to said subject surface, controlling one of said process parameters in response to said optical frequency spectrum;

wherein said step of observing comprises passing spectral emissions from said plasma through a window in a chamber containing said plasma and said subject surface; preventing deposition of material on the inside surface of said window; and analyzing the frequency spectrum of said emissions as viewed through said window.

5,841,652

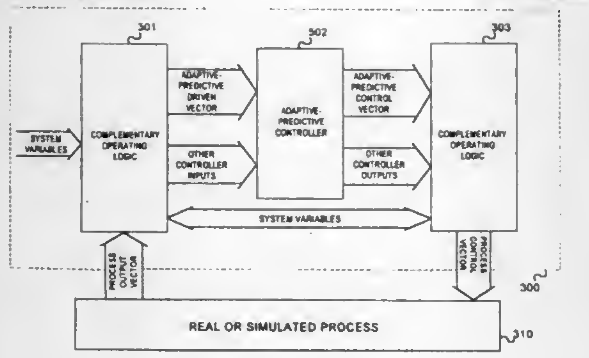
ADAPTIVE-PREDICTIVE CONTROL AND OPTIMIZATION SYSTEM

Juan Martin Sanchez, Madrid, Spain, assignor to Scap Europa, S.A., Spain

Filed Apr. 3, 1996, Ser. No. 627,055

Int. Cl.^{6} G05B *13/02*

U.S. Cl. 364—164 **95 Claims**


301
302
303
ADAPTIVE-PREDICTIVE DRIVEN VECTOR
ADAPTIVE-PREDICTIVE CONTROL VECTOR
SYSTEM VARIABLES
COMPLEMENTARY OPERATING LOGIC
ADAPTIVE-PREDICTIVE CONTROLLER
OTHER CONTROLLER INPUTS
OTHER CONTROLLER OUTPUTS
COMPLEMENTARY OPERATING LOGIC
SYSTEM VARIABLES
PROCESS OUTPUT VECTOR
PROCESS INPUT VECTOR
300
REAL OR SIMULATED PROCESS
310

54. A method of generating a process control vector during each of a plurality of sampling instants, said process control vector comprising at least one process control variable and being applied to an apparatus which carries out a process having at least one process input variable and at least one process output variable, said at least one process input variable defining a process input vector and said at least one process output variable defining a process output vector, said apparatus varying said process input vector as a function of said process control vector, said method comprising the steps of:

(A) predicting a value of a driven vector during at least one future sampling instant, said driven vector being comprised of said at least one driven variable;

(B) generating, at each of said sampling instants, an outputted control vector that drives said value of said predicted driven vector to satisfy a predefined controller performance criterion at said at least one future sampling instant; and

(C) performing at least one complementary operating logic operation to control said predicting and generating steps such that said process is optimized in accordance with at least one predefined process performance criterion.

5,841,653

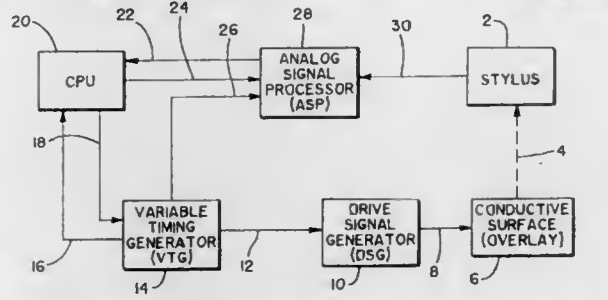
HIGH RESOLUTION SYSTEM FOR SENSING SPATIAL COORDINATES

Leonard Reiffel, Chicago; Wayne D Jung, Skokie; Thomas Rosevear, and Thomas Jakobs, both of Chicago, all of Ill., assignors to Goldstar Electron Co., Ltd., Chung Cheong Buk-Do, Rep. of Korea

Continuation of Ser. No. 996,734, Dec. 24, 1992, Pat. No. 5,317,502, which is a continuation of Ser. No. 746,285, Aug. 13, 1991, Pat. No. 5,251,123, which is a continuation of Ser. No. 616,732, Nov. 21, 1990, abandoned, which is a continuation of Ser. No. 363,287, Jun. 7, 1989, abandoned, which is a continuation of Ser. No. 110,140, Oct. 19, 1987, abandoned. This application May 27, 1994, Ser. No. 250,986

Int. Cl.^{6} G05B *19/18;* **G08C** *21/00*

U.S. Cl. 364—167.02 **50 Claims**


20
22
24
26
28
30
2
CPU
ANALOG SIGNAL PROCESSOR (ASP)
STYLUS
18
4
VARIABLE TIMING GENERATOR (VTG)
12
DRIVE SIGNAL GENERATOR (DSG)
CONDUCTIVE SURFACE (OVERLAY)
16
14
10
8
6

40. A method for determining the spatial position of an object with respect to a surface, comprising the steps of:

producing and detecting alternating electrical signals, the detected alternating electrical signals varying dependent upon the position of the object with respect to the surface;

generating control signals having a substantially fixed phase relationship with respect to the alternating electrical signals;

producing, in response to and synchronously with the control signals, integrated output signals based on the detected alternating electrical signals, and producing digital signals based on the integrated output signals; and

calculating the spatial position of the object with respect to the surface in response to the digital signals and the control signals.

5,841,654

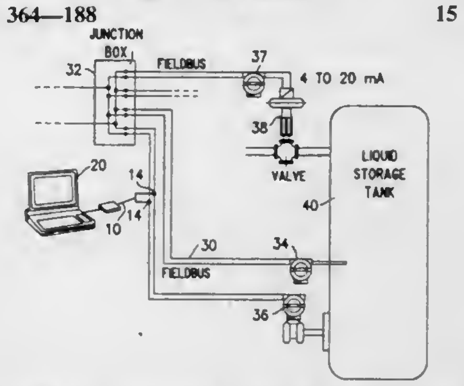
WINDOWS BASED NETWORK CONFIGURATION AND CONTROL METHOD FOR A DIGITAL CONTROL SYSTEM

Ernani Sperandio Verissimo, Ribeirão Preto; Gerson Valentin, Sertãozinho; Marco A. O. Pagnano, Sertãozinho; Omar Sacllotto Donaires, Ribeirão Preto, and Vanderlei L. D. Miranda, Sertãozinho, all of Brazil, assignors to SMAR Research Corporation, Ronkonkoma, N.Y.

Filed Oct. 16, 1995, Ser. No. 543,434

Int. Cl.^{6} G05B *9/02*

U.S. Cl. 364—188 **15 Claims**



1. A system for configuring a process control system having intelligent field mounted devices coupled to a data communications bus, the system for configuring comprising:

a computer including a display device, a storage device and a data communications device; and

an interface device for coupling to the data communications device of the computer for communicating data between the computer and the data communications bus of the process control system,

wherein the storage device of the computer stores a program for controlling the computer to:

receive configuration information specifying the field mounted devices and function blocks of the field mounted devices to be included in the process control system;

for each of the specified field mounted devices, retrieve, from the storage device, at least one of first data and second data, the first data indicating at least one input of the field mounted device, the second data indicating at least one output of the field mounted device;

generate a graphical representation of the process control system on the display device using the configuration information; and

download the configuration information to the field mounted devices via the interface device.

5,841,655

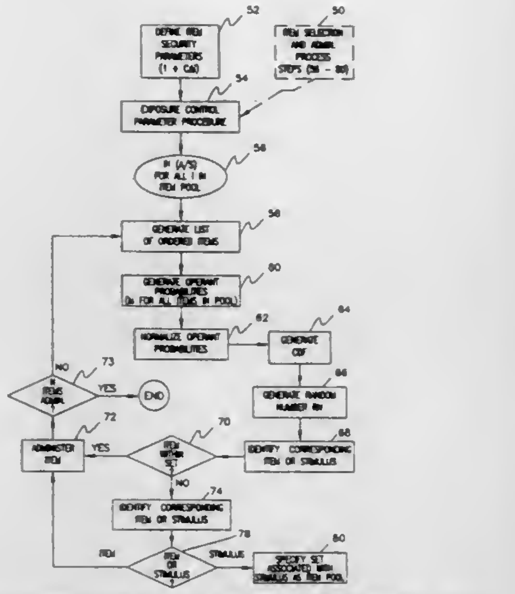
METHOD AND SYSTEM FOR CONTROLLING ITEM EXPOSURE IN COMPUTER BASED TESTING

Martha L. Stocking, Hopewell, and Charles Lewis, Skillman, both of N.J., assignors to Educational Testing Service, Princeton, N.J.

Filed Apr. 8, 1996, Ser. No. 629,365

Int. Cl.^{6} G05B *9/02*

U.S. Cl. 364—188 **22 Claims**



1. A method of controlling item exposure in a computer based test in which a predetermined number of items selected from an item pool associated with the computer based test are administered to a test taker at a computer workstation, the items being selected for administration based on defined criteria, the method comprising the steps of:

ordering the items in the item pool to form an item list based on at least some of the defined criteria so that the items are listed from most desirable to least desirable to administer;

generating a set of operant probabilities having a one-to-one correspondence with each item in the item pool, each operant probability being indicative of the probability that the corresponding item is administered given that all of the items being more desirable based on the item list are not administered first; and

randomly selecting an item for administration based upon the set of operant probabilities and defining said item as the current item.

5,841,656

PROGRAMMING SYSTEM FOR SEQUENCE CONTROL AND CONTROL UNIT FOR EXECUTING PROGRAM FOR SEQUENCE CONTROL

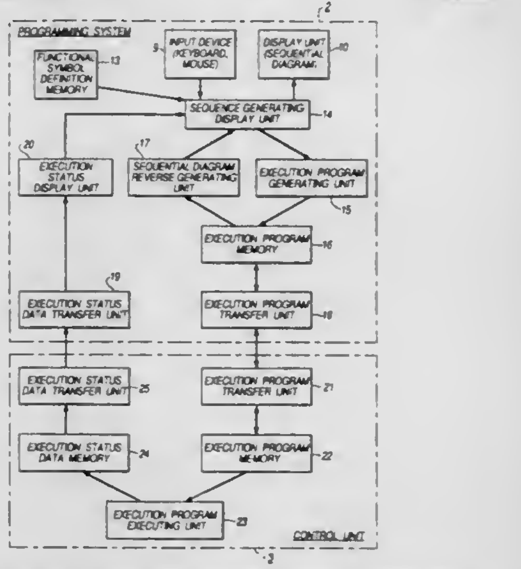
Hajime Taruishi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 9, 1996, Ser. No. 709,599

Claims priority, application Japan, Sep. 7, 1995, 7-230320

Int. Cl.^{6} G05B *19/42*

U.S. Cl. 364—191 **12 Claims**


2
PROGRAMMING SYSTEM
FUNCTIONAL SYMBOL DEFINITION MEMORY
13
9
INPUT DEVICE (KEYBOARD, MOUSE)
DISPLAY UNIT (SEQUENTIAL DIAGRAM)
10
SEQUENCE GENERATING DISPLAY UNIT
14
20
17
EXECUTION STATUS DISPLAY UNIT
SEQUENTIAL DIAGRAM REVERSE GENERATING UNIT
EXECUTION PROGRAM GENERATING UNIT
15
EXECUTION PROGRAM MEMORY
16
19
EXECUTION STATUS DATA TRANSFER UNIT
EXECUTION PROGRAM TRANSFER UNIT
18
EXECUTION STATUS DATA TRANSFER UNIT
25
EXECUTION PROGRAM TRANSFER UNIT
21
EXECUTION STATUS DATA MEMORY
24
EXECUTION PROGRAM MEMORY
22
EXECUTION PROGRAM EXECUTING UNIT
23
CONTROL UNIT
3

1. A programming system for sequence control, comprising:

display means;

functional symbol definition memory means for storing a plurality kinds of functional symbols, each for defining one of a plurality of steps in a sequence showing control procedure for a control object controlled by a control unit, respectively;

sequential diagram generating and display means including sequence table means;

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input means for inputting in order a plurality of said functional symbols along with process contents in a text style to be executed in said functional symbols, respectively, into said sequential diagram generating and display means;

said sequential diagram generating and display means displaying a plurality of said functional symbols along with said process contents inputted by said input means as a sequential diagram on a program generating screen of said display means and storing a plurality of said process contents inputted by said input means for each of said steps in said sequence table means;

execution program generating means for generating an execution program that is executable by said control unit for said sequential diagram based on the memory contents of said functional symbol definition memory means and said sequence table means;

execution program transfer means for transferring said execution program to said control unit;

sequential diagram reverse generating means for reversely generating said sequential diagram from said execution program; and

reversely generated sequential diagram display means for displaying said sequential diagram generated by said sequential diagram reverse generating means on said program generating screen.

5,841,657

SYSTEM DESIGNING METHOD OF A PRODUCTION LINE

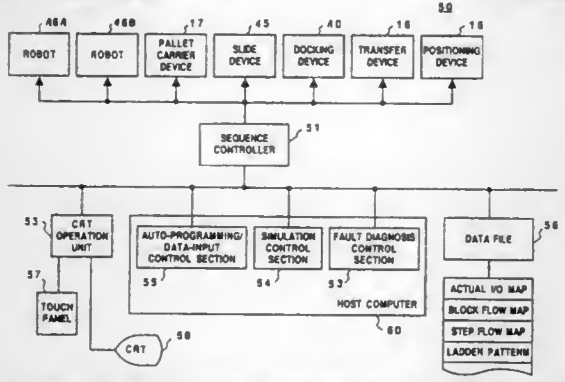
Toshihiko Hoshino, Hiroshima, and Shunji Sakamoto, Higashihiroshima, both of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Mar. 30, 1992, Ser. No. 860,793

Claims priority, application Japan, Mar. 30, 1991, 3-067290

Int. Cl.^{6} G06F *19/00;* G05B *19/18*

U.S. Cl. 364—468.1 **19 Claims**



1. A method of designing a system program which controls an operation of a plurality of operating production equipment units installed in a production line, comprising the steps of:

producing a data base including name data and operation data for each of a plurality of actuator devices included in the production equipment units, each name data enabling a user to identify a corresponding actuator device and each operation data expressing the corresponding actuator device;

dividing the system into a plurality of subsystems, each of which functions to realize a part of the operation of the plurality of production equipment units; and

attaining the operation data of an objective actuator device of each subsystem by searching the data base with each name data as a key,

wherein the function of each subsystem is realized.

5,841,658

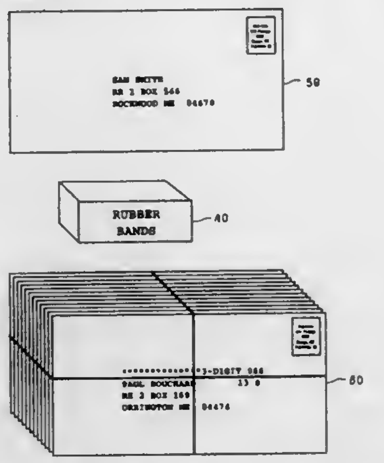
BULK MAIL ENTIRE PREPARATION METHOD AND KIT

Paul W. Bouchard, R.R. 2 Box 169, Orrington, Me. 04474

Filed Dec. 23, 1994, Ser. No. 363,703

Int. Cl.^{6} G07B *17/02;* G06F *19/00*

U.S. Cl. 364—464.16 **12 Claims**



1. A method of producing a bulk mail sorted sequence file of address entries and a mail sack label report, utilizing a computer and a printer, comprising the steps of:

(a) inputting at least L random or assorted addresses into a file in the computer, each address entry having state, and zip code designations;

(b) automatically sorting all address entries in the address file by zip code and by partial zip code designations;

(c) automatically separating omit all groups of address entries having X or more address entries with the same zip cod designation, and assigning information to accompany selected address entries;

(d) automatically separating out any remaining groups of address entries, after step (c), having Y or more address entries with the same partial zip code designation, and assigning information to accompany selected address entries;

(e) automatically separating out any remaining groups of address entries, after step (d), having Z or more address entries with certain partial zip codes designated by the post office for a state package or sack, and assigning information to accompany selected address entries;

(f) automatically assigning information to accompany all additional address entries remaining after step (e);

(g) automatically producing, with address entries in hulk mail order by package group, a file including endorsement lines which can cause some addressed mailpieces or labels to perform two specific different functions: one function being to eliminate the necessity of affixing a sticker such as "D", "3", "S", or "Ms" to the face mailpiece of each mailpiece group, and the other function being to indicate the face mailpiece label or mailpiece of each mailpiece group by a mere glance at a strip of labels or each mailpiece.

5,841,659

PRODUCTION PLAN GENERATING METHOD AND APPARATUS

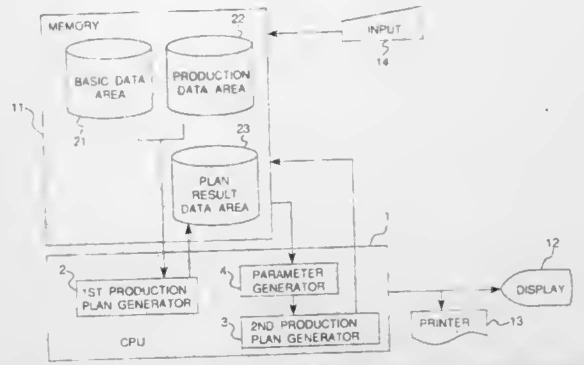
Masayuki Tanaka, Yawata; Toru Nakamura, Osaka; Hirokazu Kominami, Kakogawa; Yoshihisa Kuromiya, Higashiosaka, and Itsuhiro Yamada, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 643,405, May 6, 1996, abandoned, which is a continuation of Ser. No. 250,684, May 26, 1994, abandoned. This application Jun. 4, 1997, Ser. No. 868,537

Int. Cl.^{6} G06F *19/00*

U.S. Cl. 364—468 **26 Claims**

1. A production plan generating apparatus for generating a plurality of production plans for a plurality of different products, in sequential order, for producing a final product, in which said final product employs at least one component common to said plurality of different products, for a downstream process in which said final product is to be produced, and for a plurality of upstream processes which are used in forming said final product from a plurality of components, said production plan generating apparatus comprising:



an input device for inputting initial data including data relating to said downstream process in which said final product is to be produced;

a first memory for storing said initial data;

a first production plan generator for generating a first production plan including data relating to a first upstream process which needs to be performed in order to produce said final product, before said downstream process is performed, said first production plan generator generating said first production plan for said first upstream process, based upon at least some of said initial data and upon overall manufacturing process information;

a second memory for storing said first production plan:

a second production plan generator for generating a second production plan, that is stored in another memory distinct from the second memory, for a second of said upstream processes which needs to be performed in order to produce said final product, before said downstream process is performed, wherein said second production plan is generated based upon at least said first production plan stored in said second memory, and wherein said second upstream process is performed during the process of manufacturing said final product;

wherein said first production plan generator is provided for generating production plans which are independent of the requirements of any other processes or steps and which can therefore be generated before receiving information relating to any other processes or step: and

wherein said second production plan generator is provided for generating production plans utilizing variable allocation rules which are dependent upon at least one other process or step and require information from at least one other production plan before generation of a second production plan, in order to determine a production schedule for producing said final product in accordance with an availability of said at least one component common to said plurality of different products.

5,841,660

METHOD AND APPARATUS FOR MODELING PROCESS CONTROL

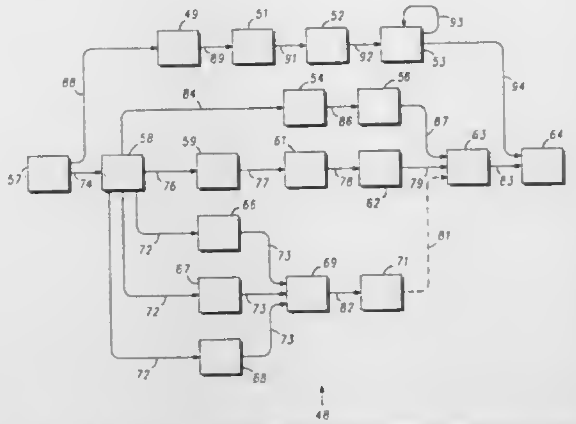
Jeffrey A. Robinson, Glendale; Udey Chaudhry, Mesa, and Timothy L. Olson, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 344,792, Nov. 23, 1994, abandoned, which is a continuation-in-part of Ser. No. 55,895, May 4, 1993, abandoned. This application Feb. 20, 1996, Ser. No. 603,514

Int. Cl.^{6} G06F *19/00;* G06G *7/64;7/66*

U.S. Cl. 364—468.22 **22 Claims**

1. A computer implemented method for modeling process tracking and control, including the steps of:



selecting a lot for tracking where said lot has a plurality of units identified by a first lot identifier;

selecting a process model of said lot from the computer:

providing a plurality of rules of precedence to control process flow;

applying one of the plurality of rules of precedence for linking a plurality of recordable process steps in said process model so that said lot resides at multiple locations in said plurality of recordable process steps while maintaining identification of said lot by said first lot identifier without splitting said lot into sublots; and

updating a database within the computer to reflect said rule of precedence.

5,841,661

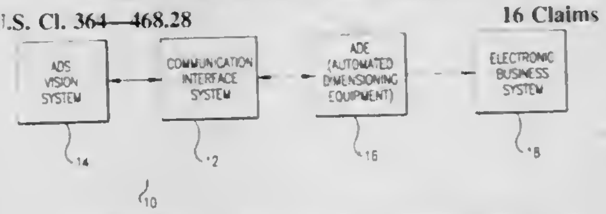
WAFER IMAGE (ADS) VISION SYSTEM TO AUTOMATED DIMENSIONING EQUIPMENT (ADE) COMMUNICATION INTERFACE SYSTEM

Curtis Paul Buchanan, Camas; Thomas Read Paine, Vancouver, and Scott Alan Cann, Washougal, all of Wash., assignors to Seh America, Inc., Vancouver, Wash.

Filed Aug. 26, 1996, Ser. No. 703,028

Int. Cl.^{6} G06F *19/00;* G06G *7/64;7/66*

U.S. Cl. 364—468.28 **16 Claims**


ADS VISION SYSTEM
COMMUNICATION INTERFACE SYSTEM
ADE (AUTOMATED DIMENSIONING EQUIPMENT)
ELECTRONIC BUSINESS SYSTEM
14
12
16
18
10

1. An arrangement for analyzing semiconductor wafers, comprising the combination of:

automated dimensioning equipment for examining wafers for selected characteristics;

a wafer image vision system for providing optical analysis of wafers in the wafer analysis system, the wafer image vision system having electrical signal incompatibility with the automated dimensioning equipment: and

a communication interface system coupled to the automated dimensioning equipment and to the wafer image vision system and providing an automated interface between the wafer image vision system and the automated dimensioning equipment, the interface system being responsive to signals in the automated dimensioning equipment to provide corresponding signals to the wafer image vision system that are compatible therewith and to signals in the wafer image vision system to provide corresponding signals to the automated dimensioning equipment that are compatible therewith.

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5,841,662

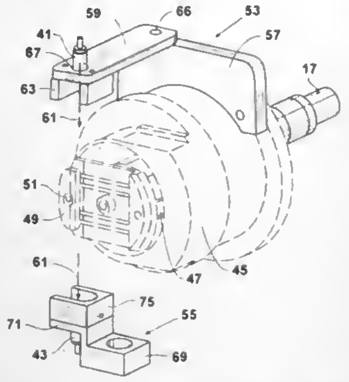
METHOD AND APPARATUS FOR CHUCKED WORK PIECE RECOGNITION

Merritt S. Cook; Raymond D. Gregory, both of Muskogee, and Charles C. Brissey, Broken Arrow, all of Okla., assignors to Coburn Optical Industries, Inc., Tulsa, Okla.

Filed Jul. 31, 1996, Ser. No. 688,733

Int. Cl.^{6} G06F *19/00*

U.S. Cl. 364—474.37 **20 Claims**



1. For identifying the type of work piece loaded onto a rotating tool shaft chuck having digital electronic means connected thereto for supplying control signals controlling the angular displacement of the chuck in relation to a first reference plane containing a rotational axis of the chuck, each type of work piece having a unique pattern of passages therethrough on a plane transverse to a rotational axis of the work piece which rotate into and out of alignment with a single line in the plane, the plane for each type of work piece intersecting its rotational axis at a point so as to be aligned with a second reference plane relative to the chuck on which the work piece is loaded and the lines for each type of work piece being coincident in relation to the rotational axis of the chuck, a recognition system comprising:

means fixed radially outwardly of the work piece for continuously transmitting a beam of light in a constant non-sweeping path toward the work piece and in the second reference plane during at least a part of one revolution of the chuck; and

means fixed radially outwardly of the work piece for receiving portions of said beam of light passing through the unique pattern of passages in the work piece as the work piece rotates through said at least a part of one revolution and for generating electrical signals to the digital electronic means in response thereto.

5,841,663

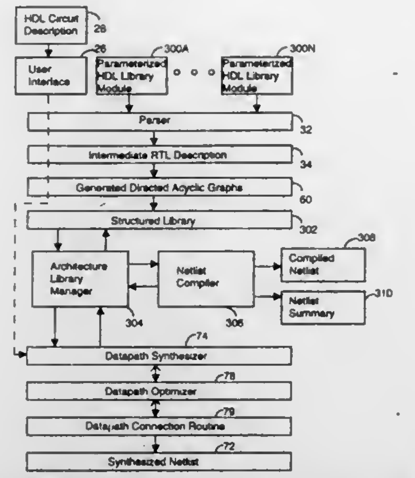
APPARATUS AND METHOD FOR SYNTHESIZING INTEGRATED CIRCUITS USING PARAMETERIZED HDL MODULES

Balmukund Sharma, Santa Clara; Mossaddeq Mahmood, San Jose, both of Calif., and Arnold Ginetti, Antibon, France, assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Sep. 14, 1995, Ser. No. 528,657

Int. Cl.^{6} G06F *17/50*

U.S. Cl. 364—490 **19 Claims**



1. A method of synthesizing a circuit netlist from a Hardware Description Language (HDL) circuit description, said method executed by a computer under the control of a program, said computer including a memory for storing said program, said method comprising the steps of:

receiving in said computer said HDL circuit description;

storing parameterized HDL modules in said memory each parameterized HDL module including a behavioral operation specified in HDL and an implementation operation specified HDL, each of said parameterized HDL modules specifying a logical operation;

matching with directed acyclic graphs, a selected logical operation of said HDL circuit description with a selected parameterized HDL module of said parameterized HDL modules which performs said selected logical operation; and

assigning parameter values to said selected parameterized HDL module to form a specific implementation of said selected parameterized HDL module that can be used to implement said HDL circuit description into a corresponding circuit netlist.

5,841,664

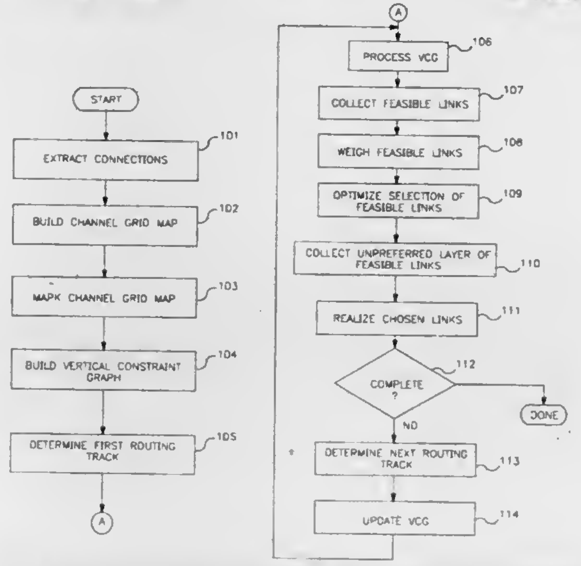
METHOD FOR OPTIMIZING TRACK ASSIGNMENT IN A GRID-BASED CHANNEL ROUTER

Yang Cai, San Jose, and Michael Chin-Hsen Lin, Fremont, both of Calif., assignors to Avant! Corporation, Fremont, Calif.

Filed Mar. 12, 1996, Ser. No. 614,129

Int. Cl.^{6} G06F *17/00;15/50*

U.S. Cl. 364—490 **16 Claims**



1. A grid-based method for routing wire connections through a routing channel area between nodes by an automated computer design system, the method comprising the steps of:

extracting from an externally supplied netlist specification a set of wire connection information that relates to a particular semiconductor integrated circuit design, wherein nodes that are described to be interconnected in pin-nets are decomposed into a plurality of mapped segments each comprising two-pin subnets, and wherein said mapped segments are each directly vectored between a pair of pins in a two-pin subnet;

building a channel grid map comprised of a plurality of metal layers interconnectable by a plurality of vias, wherein each metal layer defines a system of horizontal tracks or vertical tracks with one system of horizontal tracks or vertical tracks being preferred over another in particular metal layers, and such systems of horizontal tracks and vertical tracks in all said metal layers together defining an orthogonally overlapping grid within a channel routing area, and wherein individual said vias are used to connect a track of one metal layer to a criss-crossing track of another metal layer;

earmarking any existing wires and vias on said channel grid map;

building a vertical constraint graph (VCG) that identifies which portions of each vertical track in each of a corresponding said plurality of metal layers have already been earmarked for use by previously routed mapped segments, wherein a mapped segment currently being routed is constrained from using any already-earmarked portions of said vertical tracks in said plurality of metal layers;

computing a plurality of track assignments by first breaking cycles and longpaths between said nodes to reduce the number of interconnections with said channel routing area to complete a particular pin net according to said netlist specification, then by assigning a feasible set of wires and vias for each track to achieve a particular result;

controlling a layer assignment process through the use of a selected set of weighting functions chosen for each said metal layer to balance a plurality of objectives in a final design, and that provides a mechanism for an intelligent trade-off between computer run time and design-result quality;

completing all of a requisite routing within a minimal channel routing area on a row-by-row basis wherein a zigzag chain of individual feasible horizontal and vertical wire segment links with ideal zero line widths are assembled according to said layer assignment process and that attempt to approximate a direct vector of each said mapped segment; and

physically realizing each of said zigzag chains of individual feasible horizontal and vertical wire segment links with ideal zero line widths by assigning a finite line width to each.

5,841,665

Patent Not Issued For This Number

5,841,666

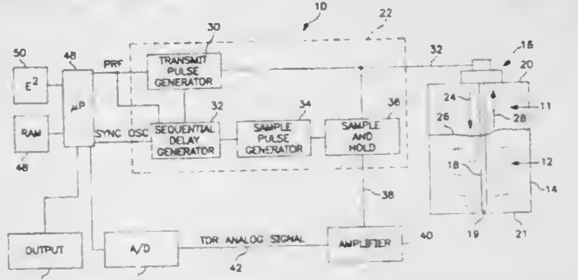
PROCESSOR APPARATUS AND METHOD FOR A PROCESS MEASUREMENT SIGNAL

Kenneth L. Perdue, Franklin; Gerd Wartmann, and Donald D. Cummings, both of Greenwood, all of Ind., assignors to Endress + Hauser GmbH + Co., Maulburg, Germany

Filed Dec. 21, 1995, Ser. No. 576,554

Int. Cl.^{6} G10K *11/00*

U.S. Cl. 364—551.01 **24 Claims**



1. A method for processing a time domain reflectometry (TDR) signal to generate an output result corresponding to a valid process variable, the method comprising the steps of:

processing the TDR signal using at least two different techniques for detecting a valid reflection pulse generated by the process variable to calculate an independent result using each of the at least two techniques;

applying a weighted factor to the independent results from each of the at least two different techniques to provide weighted output results;

comparing the weighted output results; and

selecting the valid output result from the weighted output results based on the comparing step.

5,841,667

EVALUATION OF SIGNAL-PROCESSOR PERFORMANCE

Andrew Louis Martin, Ferny Creek, Australia, assignor to Martin Communications Pty Ltd., Mount Waverley, Australia

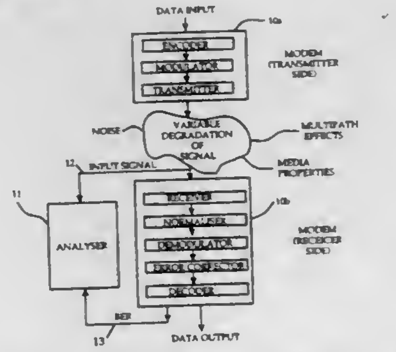
PCT No. PCT/AU95/00093, § 371 Date Aug. 26, 1996, § 102(e) Date Aug. 26, 1996, PCT Pub. No. WO95/23462, PCT Pub. Date Aug. 31, 1995

PCT Filed Feb. 24, 1995, Ser. No. 696,833

Claims priority, application Australia, Feb. 25, 1994, PM4112

Int. Cl.^{6} G06F *17/18*

U.S. Cl. 364—551.01 **16 Claims**



1. A method of evaluating the performance of a signal-processing device during a test period when an input signal is applied to the device and an output signal is generated thereby, the method comprising the steps of deriving for one of said input signal and said output signal a select profile of signal quality variation by increment of signal quality for time intervals in which the signal quality of the other of said input signal and said output signal falls within a predetermined range of values, and graphically representing said select profile as an indicator of device performance.

5,841,668

METHOD OF ASSESSING THREE DIMENSIONAL VOLUMETRIC ERRORS IN MULTIAXIS MACHINE TOOLS

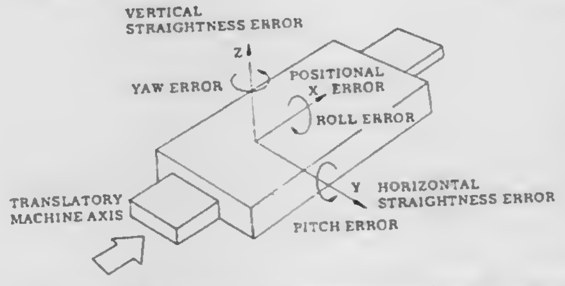
Heui Jae Pahk; Joon Hee Moon, and Chong Nam Chu, all of Seoul, Rep. of Korea, assignors to Snu Precision Co., Ltd., Seoul, Rep. of Korea

Filed May 30, 1997, Ser. No. 866,050

Claims priority, application Rep. of Korea, Nov. 29, 1996, 1996-59263

Int. Cl.^{6} B23Q *15/18*

U.S. Cl. 364—551.01 **8 Claims**



1. A method of assessing three-dimensional volumetric errors in a multiaxis machine tool, comprising:

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setting up a first radial error equation according to error in distance between commanded nominal coordinates of a spindle of the multiaxis machine tool and actually moved coordinates of the spindle with respect to a fixed center point to measure the volumetric errors of the multiaxis machine tool in three-dimensional working space;

modeling first positional error components along each of three orthogonal axes as a dimensionless polynomial function with corresponding positional error coefficients;

modeling second positional error components due to backlash along each of the three axes with corresponding amount of the backlash in the three axes;

modeling third positional error components along each of the three axes with corresponding amount of squareness errors between two nominally orthogonal axes among the three axes;

setting up three-dimensional volumetric error equation depending on kinematic configuration of the multiaxis machine tool;

setting up a second radial error equation by substituting the three-dimensional volumetric error equation, the first positional error components, the second positional error components, and the third positional error components for the first radial error equation;

solving the second radial error equation and calculating the positional error coefficients, the amounts of the backlash, and the amounts of squareness by means of an approximation technique and coordinates data.

5,841,669

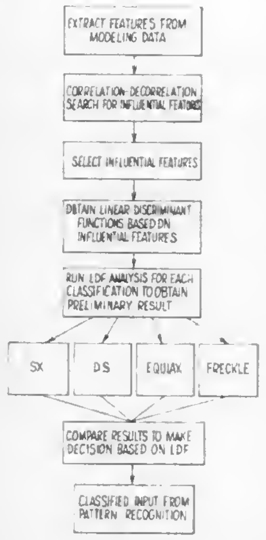
SOLIDIFICATION CONTROL INCLUDING PATTERN RECOGNITION

Andrew L. Purvis, Delavan, Ill.; Christopher R. Hanslits, Zuni, Va., and Randall S. Diehm, Whitehall, Mich., assignors to Howmet Research Corporation, Whitehall, Mich.

Filed Jan. 26, 1996, Ser. No. 592,723

Int. Cl.^{6} B22D *25/00*

U.S. Cl. 364—554 **5 Claims**


EXTRACT FEATURES FROM MODELING DATA
CORRELATION-DECORRELATION SEARCH FOR INFLUENTIAL FEATURES
SELECT INFLUENTIAL FEATURES
OBTAIN LINEAR DISCRIMINANT FUNCTIONS BASED ON INFLUENTIAL FEATURES
RUN LDF ANALYSIS FOR EACH CLASSIFICATION TO OBTAIN PRELIMINARY RESULT
SX
DS
EQUIAX
FRECKLE
COMPARE RESULTS TO MAKE DECISION BASED ON LDF
CLASSIFIED INPUT FROM PATTERN RECOGNITION

1. A method of altering a grain condition in a directionally solidified casting, comprising generating thermal history data for a directional solidification casting process, determining a plurality of casting process variables that statistically influence a plurality of different grain conditions, identifying each grain condition by determining a function containing values of each selected variable, and categorizing the selected variables with respect to variance among and between the selected variables and the grain conditions, and altering a selected variable of the casting process to alter a grain condition of a casting made thereby.

5,841,670

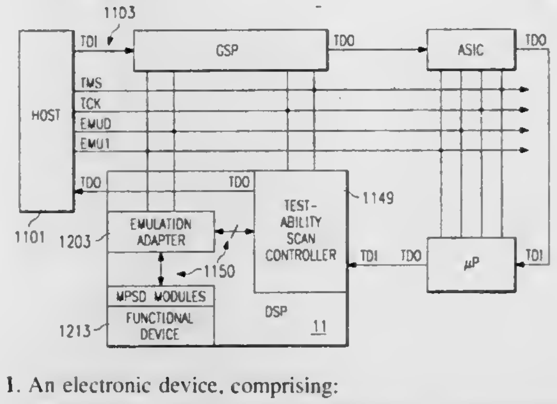
EMULATION DEVICES, SYSTEMS AND METHODS WITH DISTRIBUTED CONTROL OF CLOCK DOMAINS

Gary L. Swoboda, Sugar Land, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 589,425, Jan. 22, 1996, abandoned, which is a continuation of Ser. No. 208,469, Mar. 9, 1994, abandoned. This application Oct. 15, 1997, Ser. No. 950,469

Int. Cl.^{6} G06F *19/00*

U.S. Cl. 364—578 **15 Claims**



1. An electronic device, comprising:

a semiconductor chip having an integrated circuit fabricated thereon, said integrated circuit operable to perform predetermined operations, and comprising:

functional circuitry, arranged as a plurality of domains, for performing said operations at a first clock rate; and

additional circuitry for providing information regarding the machine state of the functional circuitry, comprising:

a scan path having a plurality of scan path sections extending through and operatively associated with respective ones of the plurality of domains of the functional circuitry for communication with the function circuitry and for scanning data through the functional circuitry at a second clock rate which differs from the first clock rate;

a plurality of clock control circuits, each physically located in an associated one of the plurality of domains of the functional circuitry;

a clock selection circuit for providing a clock selection signal; and

a plurality of latch circuits, each physically located in an associated one of the plurality of domains of the functional circuitry, each latch circuit having an input coupled to the clock selection circuit and having an output coupled to a respective one of the clock control circuits for selectively latching the clock selection signal and for applying the latched clock selection signal to the respective clock control circuit, each clock control circuit operable in response to the respective latched clock selection signal and independently from others of the plurality of domains of the functional circuitry, for supplying a selected one of a first clock signal at the first clock rate for use by its associated domain of the functional circuit and a second clock signal at the second clock rate for use by the associated scan path section of its associated domain of the functional circuitry.

5,841,671

APPARATUS FOR THE OPERATION OF A PLANT FOR PRODUCING DEINKED PULP WITH STATE ANALYSERS CONSTRUCTED IN THE FORM OF NEURAL NETWORKS FOR THE WASTE PAPER SUSPENSION

Herbert Furumoto, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, München, Germany

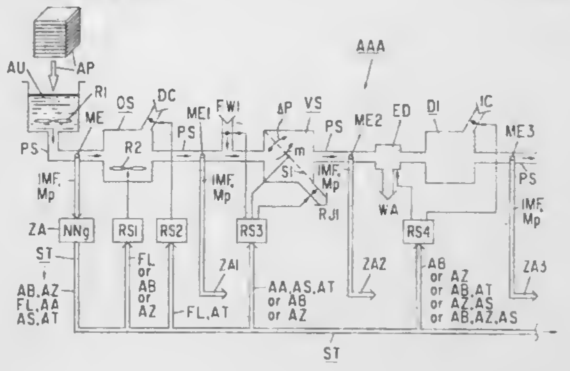
PCT No. PCT/EP94/02954, § 371 Date Mar. 19, 1996, § 102(e) Date Mar. 19, 1996, PCT Pub. No. WO95/08019, PCT Pub. Date Mar. 23, 1995

PCT Filed Sep. 5, 1994, Ser. No. 617,876

Claims priority, application European Pat. Off., Sep. 16, 1993, 93114965

Int. Cl.^{6} G06F *15/46*

U.S. Cl. 364—471.01 **21 Claims**



1. An apparatus for controlling operation of a plant for producing deinked pulp (RP) from waste paper, which includes at least a waste paper preparation (AAA) and a dewatering machine or at least one paper machine (PAM) arranged downstream of the waste paper preparation, comprising:

a) at least one measuring device (ME) for recording spectral or physical (IMf, Mp) characteristic values of a waste paper suspension (PS), which is fed to the waste paper preparation (AAA) or runs through the waste paper preparation (AAA),

b) closed-loop or open-loop control devices (RS1 . . . RS8) for operating means (DS, DC, FW1, VS, RJ1, ED, DI, IC, FW2, WS, CA, NS, RJ2, FS, MW) of the waste paper preparation (AAA), and

c) at least one state analyser (ZA), configured in the form of a neural network (NNg) or a plurality of parallel neural networks (NN1 . . . NN4), for the waste paper suspension (PS), said analyser outputing, by means of the characteristic values (IMf, MP) of the at least one measuring device (ME), controlled variables (ST: AB, AZ, FL, AA, AS, AT) for process control to closed-loop or open-loop control devices (RS1 . . . RS8) of operating means (DS, DC, FW1, VS, RJ1, ED, DI, IC, FW2, WS, CA, NS, RJ2, FS, MW) at least of the waste paper preparation (AAA):

where the following are determined as controlled variables (ST) for process control by a common neural network (NNg) or separately by a plurality of parallel neural networks (NN1, NN2) in the at least one state analyser:

i) the ratio (AB) of colored papers to white papers, or

ii) the ratio (AZ) of illustrated-magazine paper to newsprint paper in the amount of waste paper (AP) processed to form the waste paper suspension (PS).

5,841,672

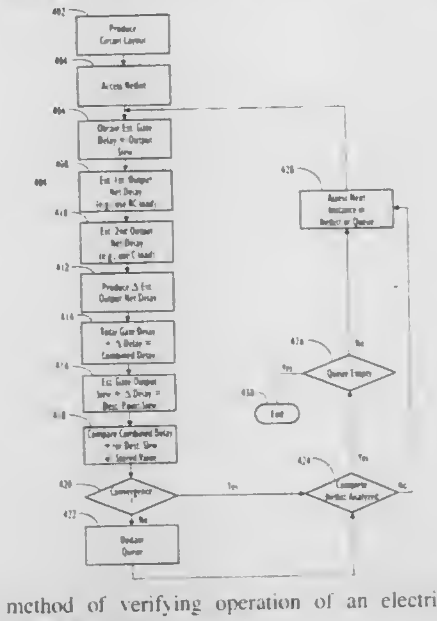
METHOD AND APPARATUS FOR VERIFYING SIGNAL TIMING OF ELECTRICAL CIRCUITS

Athanasius W. Spyrou, San Jose; Michael Grossman, Mt. View; Michael Misheloff, Dublin; Thomas Schaefer, Cupertino; Marie C. Salet, Fremont, and Clementina Bures, Santa Clara, all of Calif., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Feb. 13, 1996, Ser. No. 600,507

Int. Cl.^{6} G06F *17/50*

U.S. Cl. 364—488 **19 Claims**



1. A method of verifying operation of an electrical circuit comprising the steps of:

producing an electrical circuit having at least one gate and an output network connected with the gate;

obtaining an estimated total gate delay and an estimated gate output slew time of the gate using a gate timing model;

producing a differential estimated output network delay as a function of output network resistance and estimated gate driving strength for a destination point of the output network;

combining the estimated total gate delay and the estimated output network delay to produce a combined delay from an input of the gate to said destination point; and

using said combined delay to verify operation of said electrical circuit.

5,841,673

SYSTEM AND METHOD FOR PROCESSING GRAPHIC DELAY DATA OF LOGIC CIRCUIT TO REDUCE TOPOLOGICAL REDUNDANCY

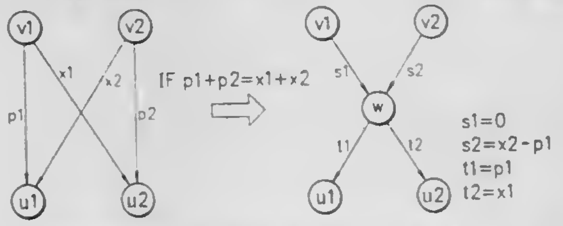
Noriya Kobayashi, Tokyo, Japan, and Sharad Malik, Princeton, N.J., assignors to NEC Corporation, Tokyo, Japan

Filed Jan. 30, 1996, Ser. No. 593,569

Claims priority, application Japan, Jan. 30, 1995, 7-033134

Int. Cl.^{6} G06F *17/00;17/50*

U.S. Cl. 364—489 **42 Claims**



1. A system for processing data representing delays in a logic network, comprising:

a data holding means for holding a first set of graphic data representing a first delay network composed of:

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a first set of vertices comprising a first vertex, a second vertex, a third vertex, and a fourth vertex, and

a first set of weighted directional edges extending between elements of the first set of vertices and containing a first directional edge extending from the first vertex to the fourth vertex having a weight x1, a second directional edge extending from the second vertex to the third vertex having a weight x2, a third directional edge extending from the first vertex to the third vertex having a weight p1, and a fourth directional edge extending from the second vertex to the fourth vertex having a weight p2;

means for determining that the first set of delay data meets the condition (x1+x2)=(p1+p2); and

a data processing means for processing the first set of graphic data to obtain a second set of graphic data representing a second delay network composed of:

a second set of vertices comprising the first vertex, the second vertex, the third vertex, the fourth vertex, and a fifth vertex not contained in the first set of vertices, and

a second set of weighted directional edges extending between elements of the second set of vertices and containing a fifth directional edge extending from the first vertex to the fifth vertex having a weight of zero, a sixth directional edge extending from the second vertex to the fifth vertex having a weight (x2−p1), a seventh directional edge extending from the fifth vertex to the third vertex having a weight p1, and an eighth directional edge extending from the fifth vertex to the fourth vertex having a weight x1.

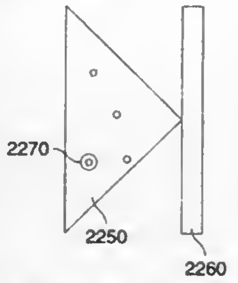
5,841,674
CIRCUIT DESIGN METHODS AND TOOLS

David L. Johannsen, San Gabriel, Calif., assignor to Viewlogic Systems, Inc., Marlboro, Mass.

Division of Ser. No. 572,520, Dec. 14, 1995. This application Apr. 29, 1997, Ser. No. 845,813

Int. Cl.⁶ G06F *17/50;7/52*

U.S. Cl. 364—489 **5 Claims**



1. A method for the operation of a circuit design tool to design a multiplier circuit, comprising the steps of

forming a netlist for a Wallace tree, whereby said Wallace tree comprises a tail of adders;

tracing a critical path for said netlist to a Dadda node in said Wallace tree and eliminating said Dadda node by replacing said Dadda node with a full-adder;

placing a half-adder at an initial part of said Wallace tree and removing an adder in said tail; and

repeating said steps of tracing and placing until a selected condition is reached.

5,841,675
METHOD AND APPARATUS FOR MONITORING QUALITY OF ELECTRICAL WIRE CONNECTIONS

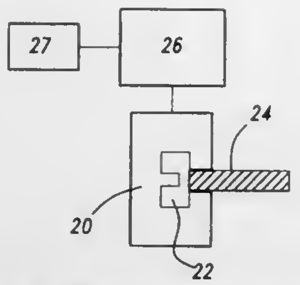
Kiet Ngo, London, Canada, assignor to Oes, Inc., London, Canada

Filed Feb. 10, 1997, Ser. No. 796,462

Int. Cl.⁶ H01R *43/04*

U.S. Cl. 364—507 **16 Claims**

1. A control for an electric wire crimp machine comprising:



a input operatively connected to a crimping machine and operable to receive information on the force during each cycle at the crimping machine;

said control be operable to move into a leaning mode and capture information on a predetermine number of sample force curves from the crimping machine, said control being operable to preset boundaries based upon said information;

said control also being operable to monitor subsequent crimping cycles and compare the particular information from each cycle with said boundaries to determine whether the particular force characteristics cross said boundaries; and

said control being operable to capture a force curve from the machine, and determine a peak and an area for each of said force curves, and said boundaries are set for at least each of said peak and said area based on a particular number of samples, said control presets outer and inner boundaries said control being operable to provide signals when a particular cycle crosses either said inner or said outer boundaries, said inner and outer boundaries are preset by determining both the mean and standard deviations for at least peak and area for said force curves, and setting said inner and outer boundaries a predetermined number of sample deviations away from said mean.

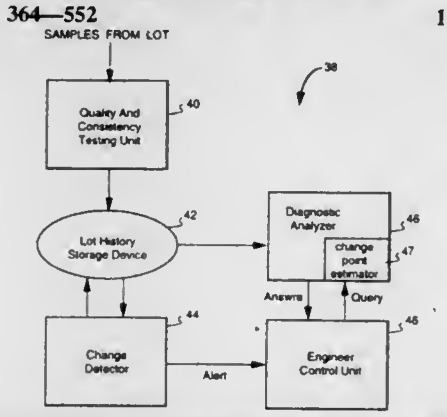
5,841,676
SYSTEM AND METHOD FOR ESTIMATING A CHANGE POINT TIME IN A MANUFACTURING PROCESS

Fatma Ozden Gur Ali, Schenectady; Frederick William Faltin, Ballston, and Necip Doganaksoy, Clifton Park, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 4, 1996, Ser. No. 743,069

Int. Cl.⁶ G06F *17/60*

U.S. Cl. 364—552 **12 Claims**



1. A system for estimating a change point time in a manufacturing process producing various products made on multiple lines in several lots, the system comprising:

a test device for measuring a plurality of product variables representing various properties of the manufactured products for each product made on a line in a lot;

a storage device for storing the plurality of measured properties from the test device in various groupings of lots, products, and lines;

a detector for detecting changes occurring in the groupings of properties in the storage device for each product made on a line in a lot, the detector comprising at least one control chart containing control limits for each respective grouping, the detector combining the plurality of measured properties in each grouping and determining if a control limit has been exceeded for any product made on a line in a lot;

a change point estimator for estimating a change point time for each grouping that has exceeded a control limit, the change point time indicating when a process change occurred which subsequently caused the control limit to be exceeded, the change point estimator estimating the change point time by estimating each point of the manufacturing process with a combination of an exponentially weighted moving average (EWMA) and an average of points before and after each particular point in time, the change point time being the particular point in time with a maximum absolute difference between at least one of the EWMA of points before and after the particular point, the average of points before and after the particular point and the EWMA of points before the particular point and the average after the particular point; and

a diagnostic analyzer coupled to the detector and the change point estimator for helping to identify sources causing the control limit to be exceeded, and to provide a basis for selecting actions to correct the sources.

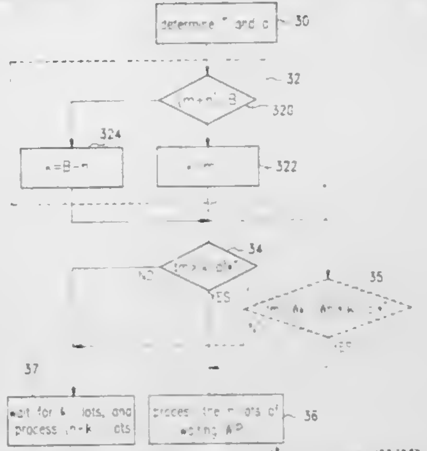
5,841,677
METHOD AND APPARATUS FOR DISPATCHING LOTS IN A FACTORY

Terry H. Yang, and Harry L. Chu, both of Hsinchu, Taiwan, assignors to Taiwan Semiconductor Manufacturing Co., Ltd., Hsinchu, Taiwan

Filed May 21, 1997, Ser. No. 859,952

Int. Cl.⁶ G06F *19/00;* **G06G** *7/66*

U.S. Cl. 364—569 **20 Claims**



20. Apparatus for dispatching work in process (WIP) lots in a factory, said apparatus comprising:

a succeeding tool configured to perform a succeeding process on a batch of lots, the succeeding tool having a maximum batch size B, an average process time T and an average batch size a;

a preceding tool configured to perform a preceding process on a batch of lots, wherein lots processed by the preceding tool are next processed by the succeeding tool; and

a control means, coupled to the succeeding tool and the preceding tool, for dispatching lots into the succeeding tool according to a lot waiting rule, the control means comprising:

means for determining an average process time of the succeeding tool;

means for determining an average number of lots per batch of the succeeding tool;

means for determining an allowable number k of additional lots for the succeeding tool, wherein when the succeeding tool becomes available to process lots,

the succeeding tool has n pending lots waiting to be dispatched into the succeeding tool,

the preceding tool has m lots being processed, the m lots being expected to arrive at the succeeding tool after an expected waiting time, and

the allowable lots k being equal to m when (n+m) does not exceed B and being equal to (B−n) when (n+m) exceeds B;

means for determining an allowable waiting time, wherein the allowable waiting time is proportional to k and T and inversely proportional to a; and

means for comparing the allowable waiting time to the expected waiting time, wherein the control means dispatches the n pending lots into the succeeding tool without waiting for the allowable lots when the expected waiting time exceeds the maximum waiting time and dispatches a batch including the n pending lots and the k allowable lots into the succeeding tool when the k allowable lots arrive at the succeeding machine.

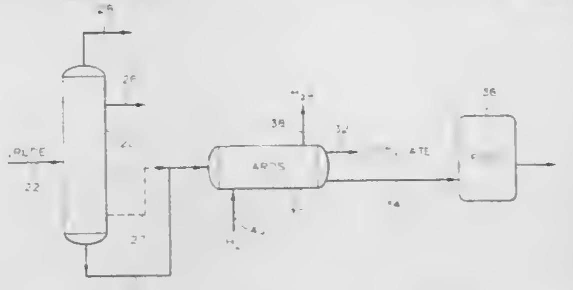
5,841,678
MODELING AND SIMULATION OF A REACTION FOR HYDROTREATING HYDROCARBON OIL

Daniel M. Hasenberg, and Joseph F. Campagnolo, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 17, 1997, Ser. No. 785,467

Int. Cl.⁶ G06G *7/58*

U.S. Cl. 364—578 **19 Claims**



1. A method for enhancing selection of a crude oil for future processing in a refinery, wherein the future crude oil is selected from a plurality of candidate crude oils containing sulfur, metal, and Conradson carbon contaminants, and wherein selection of an economical future crude oil for processing in said refinery is enhanced with the aid of a computer programmed for simulating a reaction for hydrotreating residuum oil fractions of said plurality of candidate crude oils in a reactor, said method comprising:

(a) providing said computer with a data base for said plurality of candidate crude oils, said data base including at least:

i) a set of reaction kinetics parameters unique to a residuum oil fraction for each of said plurality of candidate oils;

ii) a set of residuum oil properties, unique to each of said plurality of candidate oils;

(b) providing said computer with a mathematical model for use in said method, said model comprising a group of equations for predicting at least product yields and levels of contaminants of a hydrotreated residuum oil fraction, wherein said hydrotreated residuum oil is a reaction product of said reactor;

(c) selecting at least one of said residuum oil fractions to provide a selected residuum oil fraction for simulation in said computer;

(d) retrieving said set of reaction kinetics parameters, and said set of residuum oil properties from said data base for said selected residuum fraction, and providing said computer with desired operating conditions for said reaction for hydrotreating;

(e) computing adjusted reaction kinetics parameters, wherein said set of reaction kinetics parameters are adjusted for at least reactor conditions and catalyst deactivation;

(f) using said adjusted reaction kinetics parameters in said group of model equations for predicting at least product yields and levels of contaminants in said hydrotreated residuum oil fractions; and

(g) repeating steps (c) through (f) for a desired number of said residuum oil fractions, wherein selection of a desired crude oil for future processing in said refinery is guided by simulation of said reaction for hydrotreating.

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5,841,679
VECTOR COMPUTATION DEVICE AND VECTOR COMPUTATION METHOD

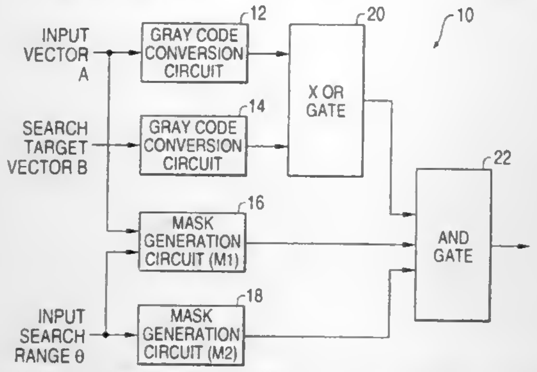
Yoichi Miura, and Masao Kumagishi, both of Saitama-ken, Japan, assignors to Wacom Co., Ltd., Japan

Filed Jun. 2, 1997, Ser. No. 867,415

Claims priority, application Japan, Apr. 26, 1996, 8-131192

Int. Cl.^{6} G06F *7/00;7/52;7/02*

U.S. Cl. 364—715.06 **16 Claims**


INPUT VECTOR A
SEARCH TARGET VECTOR B
INPUT SEARCH RANGE θ
GRAY CODE CONVERSION CIRCUIT
12
GRAY CODE CONVERSION CIRCUIT
14
MASK GENERATION CIRCUIT (M1)
16
MASK GENERATION CIRCUIT (M2)
18
X OR GATE
20
AND GATE
22
10

1. A vector computation device for receiving an input vector and for determining whether one element of a search target vector is within a predetermined search range of one element of the input vector, the search range having an upper limit value and a lower limit value bracketing the input vector, the device comprising;

- a first Gray code conversion means for converting the one element of the input vector to a first Gray code;
- a second Gray code conversion means for converting the one element of the search target vector to a second Gray code;
- a first mask generating means for generating first mask data by comparing Gray codes corresponding to the upper limit value and the lower limit value, the first mask data indicating the similarities between the Gray codes corresponding to the upper limit value and the lower limit value;
- a second mask generating means for generating second mask data by calculating the number of bits corresponding to the size of the search range; and
- means for determining whether the one element of the search target vector is within the search range by comparing the results of XOR operation between the first and the second Gray codes to the first and second mask data.

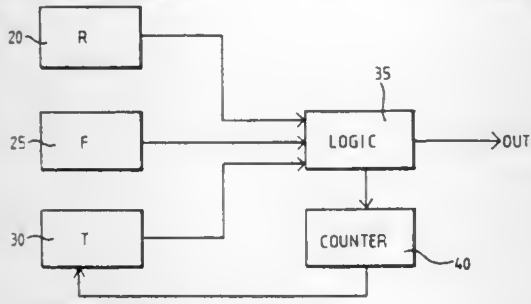
5,841,680
RANDOM PULSE GENERATION

John Adrian Lightfoot, Cumbria, United Kingdom, assignor to British Nuclear Fuels PLC, CHeshire, United Kingdom

Filed Jul. 28, 1995, Ser. No. 508,812

Int. Cl.^{6} G06F *1/02*

U.S. Cl. 364—717.03 **28 Claims**



1. A pulse generator comprising:

- a first probability generator for generating a first output comprising a first pulse stream having pulses which are output with a first probability;
- a second probability generator for generating a second output comprising a second pulse stream having pulses which are output with a second probability; and
- a logic circuit for combining the outputs of said first and second probability generators and configured to produce an output pulse stream to simulate the output from a neutron well, the pulse stream having output pulses in dependence upon the states of the outputs of said probability generators;
- wherein said first and second probability generators are designed to represent the values F and T respectively, wherein F represents the fraction of events in a random background that will have associated coincident pairs, and T represents a respective die-away time.

5,841,681
APPARATUS AND METHOD OF FILTERING A SIGNAL UTILIZING RECURSION AND DECIMATION

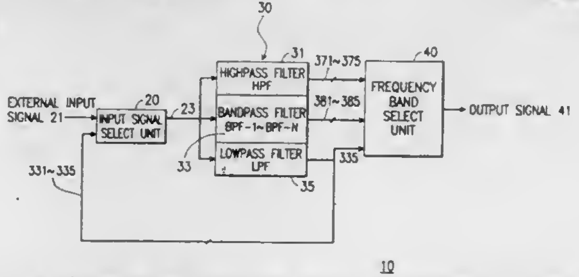
Yung-Lung Chen, Taichung; Chiao-Yen Tai; Chein-Wei Jen, both of Hsinchu, and Hwan-Rei Lee, Hsinchu Hsein, all of Taiwan, assignors to United Microelectronics Corporation, Taiwan

Filed Jul. 8, 1996, Ser. No. 679,430

Claims priority, application Taiwan, Apr. 10, 1996, 85104197

Int. Cl.^{6} G06F *17/10;* **G01R** *23/167*

U.S. Cl. 364—724.011 **33 Claims**



1. A digital signal filter bank device for filtering an external input signal to generate a filtered digital output signal, the device comprising:

- input signal selector means for selecting between the external input signal and a low-pass filtered feedback signal to provide a filter input signal;
- filter bank means for receiving the filter input signal and for filtering the filter input signal to concurrently generate both a high-pass filtered signal and a low-pass filtered signal, the low-pass filtered signal including a low-pass filtered output signal and the low-pass filtered feedback signal; and
- frequency band select means for receiving both the high-pass filtered signal and the low-pass filtered output signal directly from the filter bank means for generating the filtered digital output signal;
- wherein the filter bank means includés means for applying a distributed arithmetic algorithm to the filter input signal to generate first and second summations of product terms respectively representing the high-pass filtered signal and the low-pass filtered signal; and
- wherein the filter bank means further includes low-pass filter means for generating the low-pass filtered feedback signal using a decimated sampling rate.

5,841,682
INVERSE DISCRETE COSINE TRANSFORMATION SYSTEM USING LEE'S ALGORITHM

Sung-Up Choi, and Tae-Sung Kim, both of Seoul, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

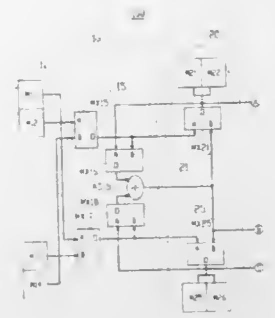
Filed Dec. 11, 1996, Ser. No. 763,611

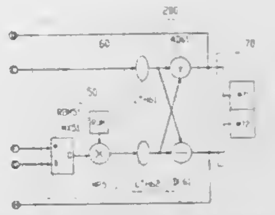
Claims priority, application Rep. of Korea, Dec. 13, 1995, 1995-49316

Int. Cl.^{6} G06F *17/14*

U.S. Cl. 364—725.03 **14 Claims**

1. An inverse discrete cosine transformation system using Lee's algorithm, comprising:





- initial operating means for receiving a discrete cosine transformation data and outputting the result of a first and second addition of the inverse discrete cosine transformation data using Lee's algorithm; and
- main operation means for receiving the result of the first and second addition of the inverse discrete cosine transformation using Lee's algorithm from said initial operation means and outputting the result of the multiplication operation and butterfly operation of the inverse discrete cosine transformation by using Lee's algorithm; and
- wherein said initial operating means comprises:
  - initial adding means for receiving the discrete cosine transformation data and selectively performing an addition to provide first added data and for selectively performing a second addition of the discrete cosine transformation data and said first added data to provide second added data;
  - first memory means for receiving and storing the first added data from said initial adding means and discrete cosine transformed data and for selectively returning first added data and discrete cosine transformed data to said initial adding means for use in the second addition to provide the second added data: and
  - second memory means for receiving, temporarily storing and outputting discrete cosine transformed data and the second added data received from said initial adding means.

5,841,683
LEAST SIGNIFICANT BIT AND GUARD BIT EXTRACTOR

Roland Albert Bechade, South Burlington, Vt.; Robert Hayosh, Austin, Tex., and Stephen Gerard Shuma, South Burlington, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

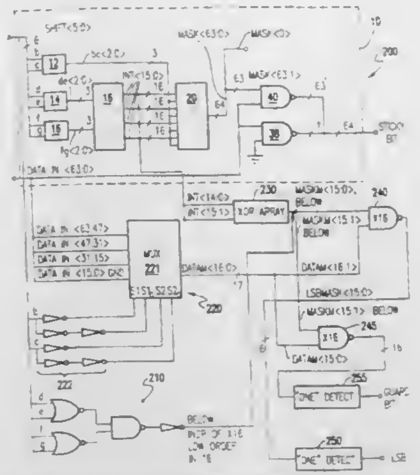
Filed Sep. 20, 1996, Ser. No. 718,272

Int. Cl.^{6} G06F *5/01*

U.S. Cl. 364—748.03 **8 Claims**

1. A method of extracting a bit of a binary number having a plurality of bits, said method including the steps of

- generating a first mask having a string of binary ones and a string of binary zeros and a single transition therebetween,
- performing a logical operation on adjacent bits of said mask to derive a second mask having one bit of distinct logic value from all other bits of said second mask.



- extracting said bit of said binary number from said plurality of bits corresponding to said one bit of distinct logic value.

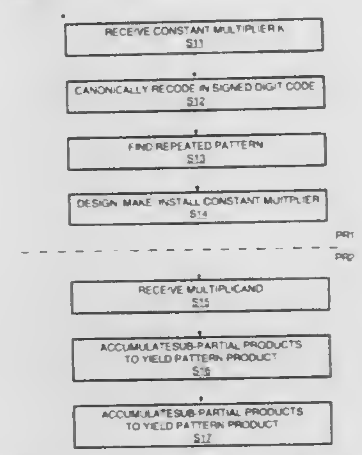
5,841,684
METHOD AND APPARATUS FOR COMPUTER IMPLEMENTED CONSTANT MULTIPLICATION WITH MULTIPLIERS HAVING REPEATED PATTERNS INCLUDING SHIFTING OF REPLICAS AND PATTERNS HAVING AT LEAST TWO DIGIT POSITIONS WITH NON-ZERO VALUES

Kenneth A. Dockser, San Jose, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Jan. 24, 1997, Ser. No. 789,151

Int. Cl.^{6} G06F *7/52*

U.S. Cl. 364—757 **9 Claims**


ME1
RECEIVE CONSTANT MULTIPLIER K
S11
CANONICALLY RECODE IN SIGNED DIGIT CODE
S12
FIND REPEATED PATTERN
S13
DESIGN MAKE INSTALL CONSTANT MULTIPLIER
S14
PR1
PR2
RECEIVE MULTIPLICAND
S15
ACCUMULATESUB-PARTIAL PRODUCTS TO YIELD PATTERN PRODUCT
S16
ACCUMULATESUB-PARTIAL PRODUCTS TO YIELD PATTERN PRODUCT
S17

1. A computer-readable memory for causing a computer to generate a description of a digital constant multiplication system for multiplying multiplicands by a constant multiplier expressible as a string of digits having plural instances of a pattern with at least two digit positions thereof having non-zero values, said memory comprising:

- a computer-readable storage medium; and
- a computer program stored in said storage medium, said computer program having an interface for receiving said multiplier, said computer program identifying in said multiplier said instances of said pattern, said computer program further generating a description of a multiplication system having input means for receiving a multiplicand,
  - a pattern-product accumulator for generating multiplicand replicas of said multiplicand shifted relative to each other and for accumulating said multiplicand replicas to yield a pattern product of said pattern and said multiplicand, said pattern product accumulator being coupled to said input means for receiving said multiplicand, and

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a final-product accumulator for accumulating partial products to yield a final product of said multiplicand and said multiplier, said final-product accumulator replicating said pattern product to provide pattern-product replicas shifted relative to each other, said partial products including said pattern-product replicas, said final-product accumulator being coupled to said pattern-product accumulator to receive said pattern product.

5,841,685
SEMICONDUCTOR DEVICE, AND OPERATING DEVICE, SIGNAL CONVERTER, AND SIGNAL PROCESSING SYSTEM USING THE SEMICONDUCTOR DEVICE

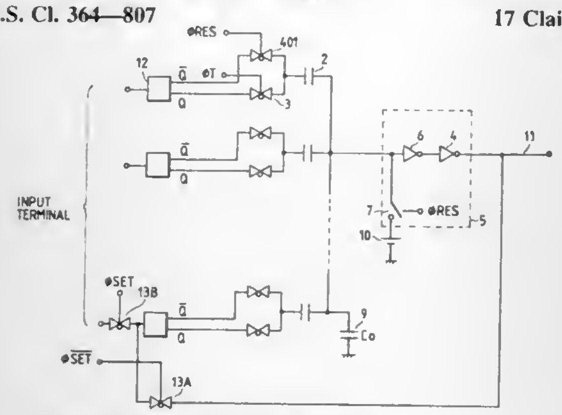
Tetsunobu Kochi, Hiratsuka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 26, 1995, Ser. No. 548,410

Claims priority, application Japan, Oct. 28, 1994, 6-265040

Int. Cl.^{6} G06G *7/00*

U.S. Cl. 364—807 **17 Claims**



1. A semiconductor device comprising:
a plurality of input terminals separated into at least two groups;
a plurality of capacitors, one terminal of each of which is electrically connected to a corresponding one of said input terminals via a switch; and
a sense amplifier, an input portion of which is commonly connected to remaining terminals of said capacitors,
wherein an output from said sense amplifier is connected to at least one of said input terminals, and the input terminal or terminals to which the output from said sense amplifier is inputted belong to only one of the at least two groups.

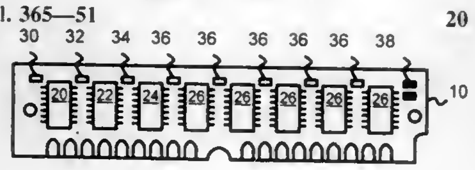
5,841,686
DUAL-BANK MEMORY MODULE WITH SHARED CAPACITORS AND R-C ELEMENTS INTEGRATED INTO THE MODULE SUBSTRATE

Tzu-Yih Chu, San Jose, and Abraham C. Ma, Union City, both of Calif., assignors to MA Laboratories, Inc.

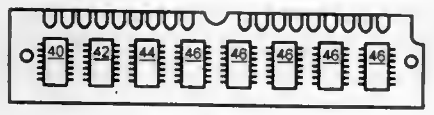
Filed Nov. 22, 1996, Ser. No. 755,546

Int. Cl.^{6} G11C *5/02*

U.S. Cl. 365—51 **20 Claims**



FRONT SIDE



BACK SIDE

1. A dual-bank memory module with shared capacitors comprising:
a substrate having wiring traces for conducting signals, the substrate also having power-supply traces and ground traces for connection to a power supply voltage and a ground voltage;
a plurality of leads along a bottom edge of the substrate, the plurality of leads including a power-supply lead and a ground lead and control leads and data leads, the plurality of leads for electrically connecting the dual-bank memory module to a system; and
pairs of DRAM chips, coupled to the plurality of leads, each pair having a first DRAM chip from a first bank and a second DRAM chip from a second bank, each pair of DRAM chips sharing a capacitor coupled between power-supply and ground pins of the first and second DRAM chips;
wherein all capacitors are mounted on a first surface of the substrate and no capacitors are mounted on a second surface of the substrate, the second surface opposite the first surface.

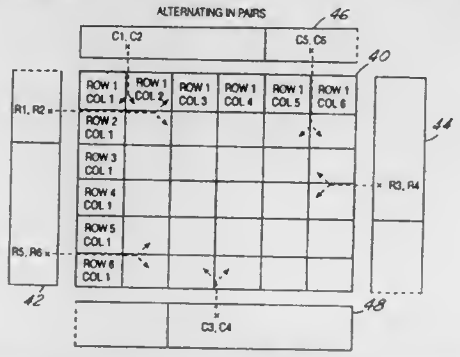
5,841,687
INTERDIGITATED MEMORY ARRAY

David B. Rees, Overton Hants, United Kingdom, assignor to Cypress Semiconductor Corporation, San Jose, Calif.

Continuation of Ser. No. 590,926, Jan. 24, 1996, abandoned. This application Feb. 14, 1997, Ser. No. 800,622

Int. Cl.^{6} G21C *5/06*

U.S. Cl. 365—63 **27 Claims**



1. A method to synchronize encoding and decoding frequencies, comprising the steps of:
generating a write clock which is synchronized with input video signals;
converting said input video signals into digital signals on the basis of said write clock;
writing said digital signals into a first frame synchronizer;
reading said digital signals out of said first frame synchronizer, on the basis of a processing clock synchronized with a transmission clock, and converting said digital signals into encoded signals on the basis of said processing clock;
modulating said encoded signals with a modulator into a modulated wave on the basis of said transmission clock;
receiving said modulated wave and demodulating said modulated wave with a demodulator to produce demodulated encoded signals;
generating a demodulated processing clock on the basis of the transmission clock obtained by demodulation with said demodulator; and
decoding said demodulated encoded signals with a decoder on the basis of said demodulated processing clock.

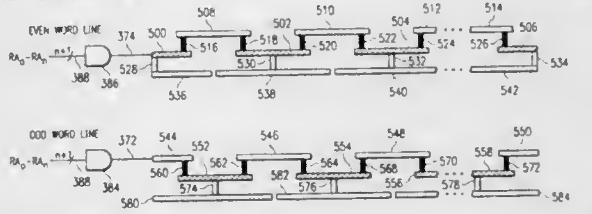
5,841,688
MATCHED DELAY WORD LINE STRAP

Shunichi Sukegawa, Ibaraki, Japan; Hugh P. McAdams, McKinney, Tex.; Tadashi Tachibana, Tsuchiura, Japan; Katsuo Komatsuzaki, Ibaraki, Japan, and Takeshi Sakai, Ohme, Japan, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 27, 1997, Ser. No. 883,738

Int. Cl.^{6} G11C *5/00*

U.S. Cl. 365—63 **21 Claims**



1. A circuit comprising:
a first lower conductor having two ends, one end of the first lower conductor being coupled to a first signal source;
a first upper conductor having two ends, the first upper conductor being spaced apart from the first lower conductor by a distance less than an allowable spacing between adjacent lower conductors, one end of the first upper conductor being coupled to a second signal source;
a second upper conductor having two ends, one end of the second upper conductor being coupled to another end of the first lower conductor for receiving a signal from the first signal source; and
a second lower conductor having two ends, the second lower conductor being spaced apart from the second upper conductor by a distance less than the allowable spacing between adjacent lower conductors, one end of the second lower conductor being coupled to another end of the first upper conductor for receiving a signal from the second signal source.

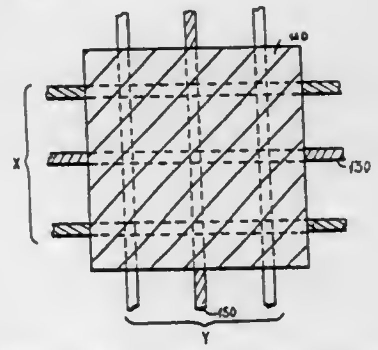
5,841,689
NON-VOLATILE RECORD CARRIER WITH MAGNETIC QUANTUM-OPTICAL READING EFFECT AND METHOD FOR ITS MANUFACTURE

Shimon Gendlin, 21 Reed La., Westbury, N.Y. 11590

Filed Nov. 29, 1996, Ser. No. 758,096

Int. Cl.^{6} H01L *43/08*

U.S. Cl. 365—145 **90 Claims**



1. A non-volatile cell of a carrier of record with optical reading comprising:
a basis;
a first light detector on said basis;
a first magnetic metal two layer film with low specific electroconductivity, consisting of two layers, wherein a bottom layer is amorphous, and a top layer is polycrystalline, generated on said basis;
a first address line from non-magnetic metal with high specific electroconductivity, generated on said polycrystalline layer of said first magnetic metal two layer film;
a second magnetic metal film with low electroconductivity to an electrical current and polycrystalline structure, generated on said first address line;
a second address line, located orthogonally to said first address line and generated on said second magnetic film;
a third magnetic metal film with low specific electroconductivity, consisting of two layers, as is the first film, but with an opposite arrangement of layers, wherein a bottom layer is polycrystalline, and a top layer is amorphous, generated on said second address line;
a cover on said top layer of said third film;
a second light detector located on said cover.

5,841,690
SEMICONDUCTOR MEMORY

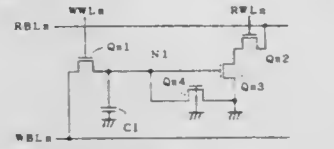
Koji Shibutani, and Hideshi Maeno, both of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

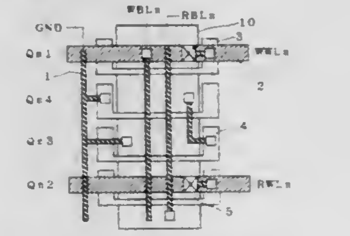
Continuation of Ser. No. 644,068, May 9, 1996, abandoned. This application Aug. 8, 1997, Ser. No. 908,587

Claims priority, application Japan, Dec. 12, 1995, 7-323149

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—149 **15 Claims**





1. A semiconductor memory comprising:
a write word line;
a write bit line;
a read word line;
a read bit line;
a first transistor of a predetermined conductivity type having a control electrode connected to said write word line, a first electrode connected to said write bit line and a second electrode;
a second transistor of the predetermined conductivity type having a control electrode connected to said read word line, a first electrode connected to said read bit line and a second electrode;
a third transistor of the predetermined conductivity type having a control electrode connected to the second electrode of said first transistor, a first electrode for receiving a first control voltage, and a second electrode connected to the second electrode of said second transistor; and
a fourth transistor of the predetermined conductivity type having a control electrode for receiving a second control voltage, a first electrode connected to the first electrode of said third transistor without connecting a fixed potential, and a second electrode connected to the second electrode of said first transistor without connecting a fixed potential,
wherein said second control voltage includes having the level at which said fourth transistor is turned off,
wherein said first to fourth transistors form a memory cell in which the control electrode of said third transistor is defined as a storage node and said first transistor and said third transistor are not separated by an insulating film, and
wherein an operational state of said fourth transistor controls whether said second electrode of said transistor is dielectrically isolated from said first electrode of said third transistor.

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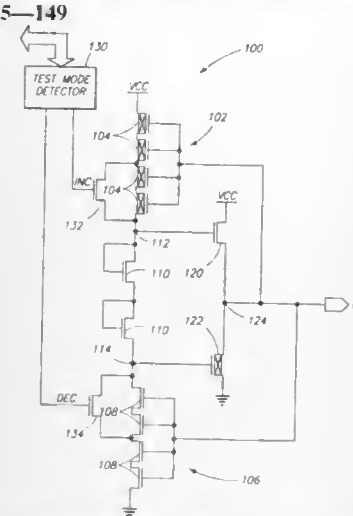
5,841,691
ADJUSTABLE CELL PLATE GENERATOR

William M. Fink, Princeton Junction, N.J., assignor to Micron Technology, Inc., Boise, Id.

Continuation of Ser. No. 800,715, Feb. 17, 1997, Pat. No. 5,771,188, Continuation of Ser. No. 568,833, Dec. 7, 1995, Pat. No. 5,640,340, which is a continuation of Ser. No. 374,840, Jan. 18, 1995, Pat. No. 5,500,824. This application Nov. 26, 1997, Ser. No. 979,403

Int. Cl.⁶ G11C *7/00*

U.S. Cl. 365—149 **15 Claims**



1. A dynamic random access memory device comprising:
a plurality of dynamic memory cells having respective capacitors including respective capacitor cell plates;
a cell plate voltage generator coupled to at least one of said cell plates, which produces a reference voltage at a nominal operating value, the cell plate generator including a plurality of series-connected voltage divider elements;
means for adjusting the reference voltage from the nominal operating value without requiring an externally-supplied adjusted reference voltage, the adjusting means including bypass transistors responding to test mode signals to adjust the reference voltage from its nominal operating voltage; and
a leads over chip (LOC) package, housing the plurality of dynamic memory cells, the cell plate voltage generator, and the adjusting means.

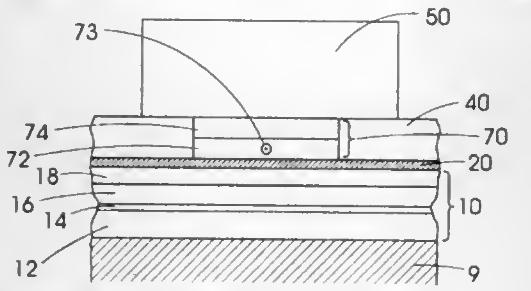
5,841,692
MAGNETIC TUNNEL JUNCTION DEVICE WITH ANTIFERROMAGNETICALLY COUPLED PINNED LAYER

William Joseph Gallagher, Ardsley, N.Y.; Stuart Stephen Papworth Parkin, San Jose, Calif.; John Casimir Slonczewski, Katonah, and Jonathan Zanhong Sun, Mohegan Lake, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 618,300, Mar. 18, 1996, Pat. No. 5,650,958. This application Jul. 16, 1997, Ser. No. 895,118

Int. Cl.⁶ G11C *11/15*

U.S. Cl. 365—173 **5 Claims**



1. A magnetic tunnel junction device comprising:
a planar pinned ferromagnetic layer having first and second generally parallel surfaces, the pinned layer comprising a sandwich of two antiferromagnetically coupled ferromagnetic layers separated by a metallic layer;
an antiferromagnetic layer formed on and in contact with the first surface of the pinned ferromagnetic layer for pinning the magnetization of the pinned ferromagnetic layer in a preferred direction and substantially preventing its rotation in the presence of an applied magnetic field;
an insulating tunnel barrier layer located on and in contact with the second surface of the pinned ferromagnetic layer;
a planar free ferromagnetic layer located on and in contact with the insulating tunnel barrier layer, the free ferromagnetic layer having a magnetization free to rotate in the presence of an applied magnetic field;
wherein the pinned and free ferromagnetic layers are in separate spaced-apart planes without overlap of the insulating tunnel barrier layer; and
a substrate, the pinned ferromagnetic layer, the antiferromagnetic layer, the tunnel barrier layer and the free ferromagnetic layer being formed on the substrate, whereby tunneling current passes through the tunnel barrier layer in a direction generally perpendicular to the planar pinned and free ferromagnetic layers when the planar pinned and free ferromagnetic layers are connected to electrical circuitry.

5,841,693
NON-VOLATILE MEMORY USING FIELD EFFECT TRANSISTORS HAVING DUAL FLOATING GATES FOR STORING TWO BITS PER CELL

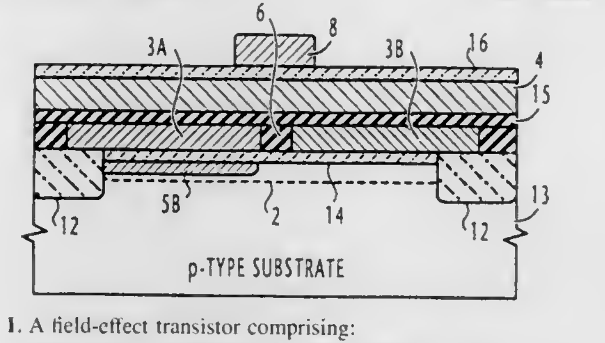
Masaru Tsukiji, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 25, 1997, Ser. No. 840,698

Claims priority, application Japan, Apr. 25, 1996, 8-105222

Int. Cl.⁶ G11C *16/04*

U.S. Cl. 365—185.01 **20 Claims**



1. A field-effect transistor comprising:
a semiconductor substrate of a first conductivity type;
first and second semiconductor regions in said substrate, the first and second semiconductor regions having a second conductivity type opposite to the first conductivity type and being arranged to form a channel region extending in a channel direction therebetween:
first and second floating gates formed above said channel region, said first and second floating gates being separated from each other along a line extending in a direction parallel to the channel direction of said channel region;
a control gate on said first and second floating gate;
a first insulating layer disposed between the channel region and the first and second floating gates;
a second insulating layer disposed between said first and second floating gates and said control gates; and
third and fourth semiconductor regions respectively located below said first and second floating gates for producing a first electric field adjacent said first floating gate when said first and second semiconductor regions are biased at a first potential difference and for producing a second electric field adjacent said second floating gate when the first and second semiconductor regions are biased at a second potential difference inverse to the first potential difference.

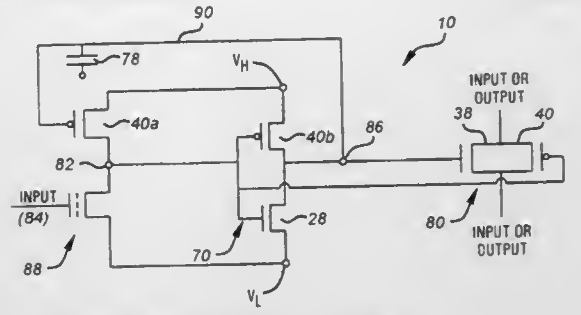
5,841,694
HIGH PERFORMANCE PROGRAMMABLE INTERCONNECT

Ting-wah Wong, Cupertino, Calif., assignor to Programmable Silicon Solutions, Sunnyvale, Calif.

Filed Jul. 30, 1997, Ser. No. 903,547

Int. Cl.⁶ G11C *7/00*

U.S. Cl. 365—185.05 **28 Claims**



1. A programmable interconnect comprising:
a memory cell capable of having a programmed state;
a first transistor having a gate electrode; and
a control circuit arranged to communicate either a positive or negative potential to said gate electrode of said first transistor depending on the programmed state of said memory cell.

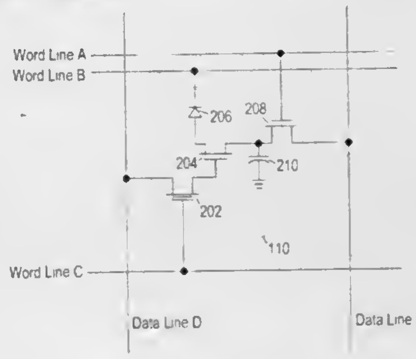
5,841,695
MEMORY SYSTEM USING MULTIPLE STORAGE MECHANISMS TO ENABLE STORAGE AND RETRIEVAL OF MORE THAN TWO STATES IN A MEMORY CELL

Thomas R. Wik, Livermore, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.

Filed May 29, 1997, Ser. No. 865,470

Int. Cl.⁶ G11C *16/02;11/56*

U.S. Cl. 365—185.08 **20 Claims**



1. A memory cell which uses multiple storage mechanisms, wherein said memory cell comprises:
a first transistor having a first gate, a floating gate, a first source, and a first drain, wherein said first gate is coupled to a first word line, wherein said floating gate is configured to store a first charge, and wherein said first source is coupled to a first data line;
a second transistor having a second gate, a second source, and a second drain, wherein said second gate is coupled to said first drain, and wherein said second source is coupled to a second word line;
a third transistor having a third gate, a third source, and a third drain, wherein said third gate is coupled to a third word line, wherein said third source is coupled to said second drain, and wherein said third drain is coupled to a second data line; and
a capacitance coupled between a predetermined potential and said third source.

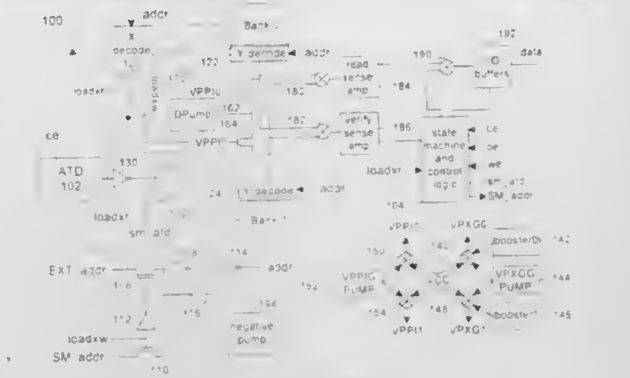
5,841,696
NON-VOLATILE MEMORY ENABLING SIMULTANEOUS READING AND WRITING BY TIME MULTIPLEXING A DECODE PATH

Johnny C. Chen, Cupertino, and Chung K. Chang, Santa Clara, both of Calif., assignors to Advanced Micro Devices, Inc.

Filed Mar. 5, 1997, Ser. No. 811,683

Int. Cl.⁶ G11C *16/04;16/06*

U.S. Cl. 365—185.11 **40 Claims**



1. A non-volatile memory, comprising:
a plurality of non-volatile memory cells;
address decode logic;
a plurality of access lines connecting said address decode logic to said memory cells; and
a plurality of electrical latches connected to at least a subset of said access lines;
wherein one of said latches is configured to hold a first word line at a write voltage while another of said latches is configured to hold a second word line at a read voltage.

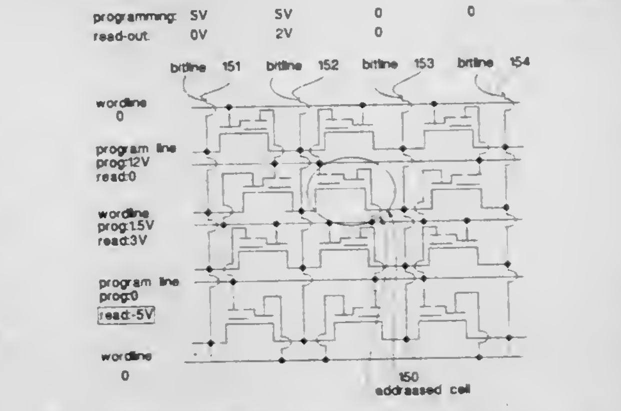
5,841,697
CONTACTLESS ARRAY CONFIGURATION FOR SEMICONDUCTOR MEMORIES

Jan F. Van Houdt, Bekkevoort; Guido Groeseneken, Leuven, and Herman Maes, Bierbeek, all of Belgium, assignors to Interuniversitair Micro-Elektronica Centrum, Leuven, Belgium

Continuation-in-part of Ser. No. 80,225, Jun. 21, 1993, Pat. No. 5,583,810, and Ser. No. 275,016, Jul. 13, 1994, Pat. No. 5,583,811, which is a continuation of Ser. No. 80,225, which is a continuation-in-part of Ser. No. 827,715, Jan. 29, 1992, abandoned. This application Apr. 21, 1995, Ser. No. 426,685

Int. Cl.⁶ G11C *11/34*

U.S. Cl. 365—185.14 **14 Claims**



10. A contactless memory array of cells comprising:
a plurality of cells wherein each cell defines an orientation and includes a semiconductor substrate including a source region, a drain region, a channel extending in a first direction between said source and drain regions, a floating gate extending over a portion of the channel and ending over said channel, said

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floating gate integrally including first and second floating gate portions, said first floating gate portion extending near said channel with a thin oxide layer therebetween, and said second floating gate portion extending away from said channel, a program gate capacitively coupled through a dielectric oxide layer to said second floating gate portion, and a control gate laterally remote in a second direction from said program gate and extending through a dielectric oxide layer over said first floating gate portion from above said source region said first direction being substantially perpendicular to said second direction;

said cells defining columns as well as rows;

a plurality of common polysilicon wordlines, where each of said wordlines interconnects said control gates of said cells on a particular row, and where said wordlines define a direction;

said cells on a particular row having alternating orientations in said direction of said wordline;

each column of cells having a separate diffusion line connected to the drain regions of the cells of said column; and

each two columns of cells having the same diffusion line connected to the source regions of the cells of said two columns, which establishes a contactless common source array.

5,841,698
SEMICONDUCTOR DEVICE

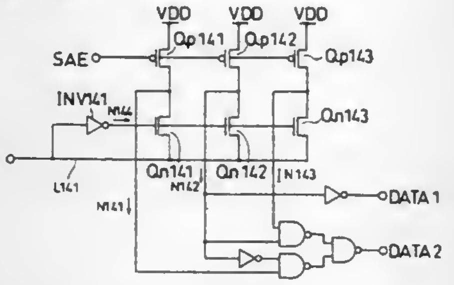
Hiroshige Hirano, Nara, and Toshiyuki Honda, Osaka, both of Japan, assignors to Matsushita Electric Inudustrial Co., Ltd., Osaka, Japan

Division of Ser. No. 494,827, Jun. 26, 1995, Pat. No. 5,594,697. This application Aug. 26, 1996, Ser. No. 697,511

Claims priority, application Japan, Jun. 28, 1994, 6-146267; Jul. 8, 1994, 6-157363

Int. Cl.^{6} G11C *16/06*

U.S. Cl. 365—185.21 **1 Claim**



1. The semiconductor device comprising:

a memory cell;

a data line connected to the memory cell;

a first group of a plurality of transistors whose sources are connected to the data line, the first group including at least a first and second transistors; and

a second group of a plurality of transistors which are disposed between a power supply and the drains of the first group of the transistors, and each of which is supplied with a first signal at gate thereof, the second group including at least a third and fourth transistors,

wherein the first transistor has a different current ability or a different threshold value from that of the second transistor, and

a plurality of data values are discriminated with a current value in one memory cell by using a signal from the drain of the first transistor and a signal from the drain of the second transistor.

5,841,699
STORAGE DEVICE AND METHOD TO DETECT ITS DEGRADATION

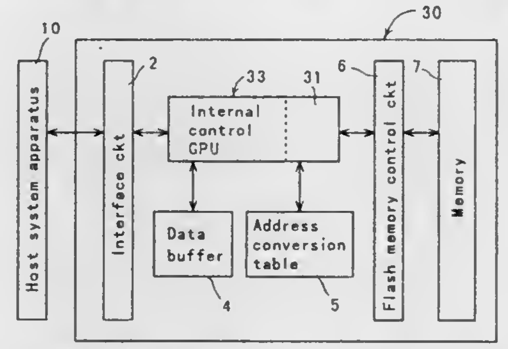
Shigenori Miyauchi, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 4, 1996, Ser. No. 760,558

Claims priority, application Japan, Jun. 10, 1996, 8-147175

Int. Cl.^{6} G11C *29/00;16/00*

U.S. Cl. 365—185.33 **17 Claims**



1. A storage device utilizing a block-erase type nonvolatile memory used in conjunction with a host system comprising an information processing device, comprising:

an interface circuit for connecting said storage device to the host system;

a memory comprising a plurality of block-erase type, nonvolatile memories that can be erased by applying voltage pulses;

a control circuit for managing and controlling said memory and for exchanging data with the host system through said interface circuit; and

an address conversion table for associating a logical sector address, which the host system uses for data management, with a physical sector address, which said storage device uses for data management therein;

said control circuit searching for an erase block with an empty area by referring to said address conversion table and issuing a command signal to said memory to cause said memory unit to apply voltage pulses to the erase block;

said memory checking to determine whether or not the erase operation has been completed every time the voltage pulse is applied to the erase block;

said control circuit, if the erase operation has not been completed, issuing another command signal to cause said memory unit to apply another voltage pulse to the erase block and determining the level of the degradation of the erase characteristic of the erase block based on the number of voltage pulses applied to the erase block.

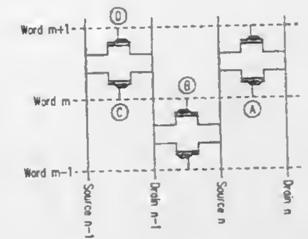
5,841,700
SOURCE-COUPLING, SPLIT GATE, VIRTUAL GROUND FLASH EEPROM ARRAY

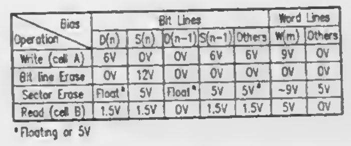
Ming-Bing Chang, Santa Clara, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 941,745, Sep. 8, 1992, Pat. No. 5,412,238. This application Jul. 1, 1997, Ser. No. 886,739

Int. Cl.^{6} G11C *16/00*

U.S. Cl. 365—185.18 **1 Claim**





Bias / Operation	Bit Lines					Word Lines	
	D(n)	S(n)	D(n−1)	S(n−1)	Others	W(m)	Others
Write (cell A)	6V	0V	0V	6V	6V	9V	0V
Bit line Erase	0V	12V	0V	0V	0V	0V	0V
Sector Erase	Float*	5V	Float*	5V	5V*	−9V	5V
Read (cell B)	1.5V	1.5V	0V	1.5V	1.5V	5V	0V

*Floating or 5V

1. A method of reading a selected EEPROM cell in a source-coupling, split-gate, virtual ground (SSVG) flash EEPROM array that is formed in a silicon substrate of P-type conductivity and includes a plurality of spaced-apart, parallel buried n+ bit lines formed in the silicon substrate to define alternating source and drain lines, a plurality of spaced-apart field oxide islands formed between adjacent source and drain lines to define substrate channel regions therebetween, and, for each channel region, a poly1 floating gate formed over a first portion of said channel region and separated therefrom by a layer of floating gate oxide, said floating gate including a tunnelling portion that extends over the source line associated with said channel region and is separated therefrom by tunnel oxide, and, for each floating gate, a poly2 word line formed over said floating gate and separated therefrom by a layer of oxide/nitride/oxide (ONO), said word line running perpendicular to the buried N+ bit lines and extending over a second portion of said channel region and separated from said second portion of said channel region by said layer of ONO, the read method comprising:

biasing the word line associated with the floating gate of the selected EEPROM cell at a read voltage while maintaining the remaining word lines in the array at ground: and

maintaining the drain bit line of the selected EEPROM cell at ground while biasing the remaining bit lines of the array at a read bias voltage with the sense amplifier attached to the source line of the selected cell.

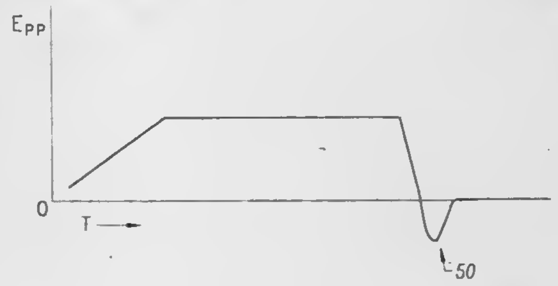
5,841,701
METHOD OF CHARGING AND DISCHARGING FLOATING GAGE TRANSISTORS TO REDUCE LEAKAGE CURRENT

Xiao-Yu Li, San Jose; Radu Barsan, Saratoga, and Sunil Mehta, San Jose, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jan. 21, 1997, Ser. No. 785,096

Int. Cl.^{6} G11C *11/34*

U.S. Cl. 365—185.28 **19 Claims**



1. A method for charging a floating gate of a floating gate transistor, the transistor including an active region adjacent to the floating gate with a tunnel dielectric disposed therein between, comprising:

applying a first potential to the active region: and

applying a program voltage to the floating gate over a period of time and at a magnitude by,

(A) increasing the program voltage from zero volts to the magnitude over a first period of at least 1 millisecond,

(B) maintaining the program voltage at the magnitude for a second period sufficient to place charge on the floating gate, and

(C) decreasing the program voltage from the magnitude during a third period to zero volts in not greater than 50 microseconds.

5,841,702
OUTPUT CIRCUIT FOR MEMORY DEVICE

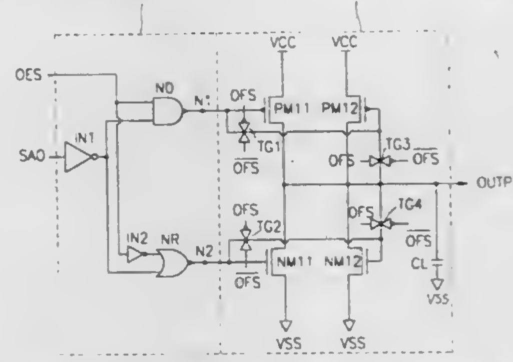
Yun Saing Kim, Cheongju, Rep. of Korea, assignor to LG Semicon Co., Ltd., Cheongju, Rep. of Korea

Filed Aug. 11, 1997, Ser. No. 907,648

Claims priority, application Rep. of Korea, Mar. 22, 1997, 1997 9981

Int. Cl.^{6} G11C *16/04*

U.S. Cl. 365—189.05 **22 Claims**



1. An output circuit, responsive to first and second signals, for a memory device, comprising:

an output buffer for buffering the first signal and the second signal:

an output driver coupled to said output buffer at first and second nodes, said output driver having first, second, third and fourth transistors, said first and third transistors forming a first pair of parallel coupled transistors and said second and fourth transistors forming a second pair of parallel coupled transistors, wherein said first and second pairs are coupled to an output node:

a first switch coupled to the first node and said third transistor;

a second switch coupled to the second node and said fourth transistor; and

a third switch directly connected to said third transistor and the output node.

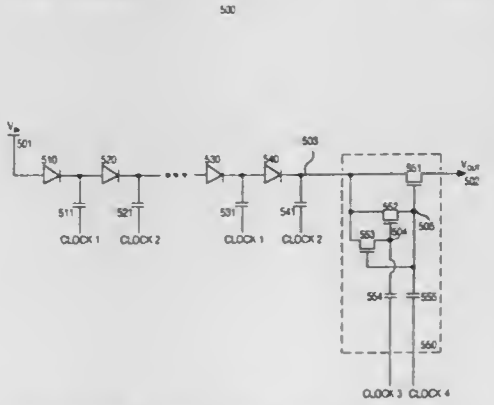
5,841,703
METHOD AND APPARATUS FOR REMOVAL OF VT DROP IN THE OUTPUT DIODE OF CHARGE PUMPS

Kenneth E. Wojciechowski, Rancho Cordova, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Dec. 31, 1996, Ser. No. 777,899

Int. Cl.^{6} H03K *5/153*

U.S. Cl. 365—189.09 **25 Claims**



1. A charge pump circuit, comprising:

a first stage configured to receive a first clock signal;

a second stage coupled to said first stage, said second stage configured to receive a second clock signal; and

an output diode coupled to said second stage, said output diode including a first switch circuit coupled to a first bootstrapping

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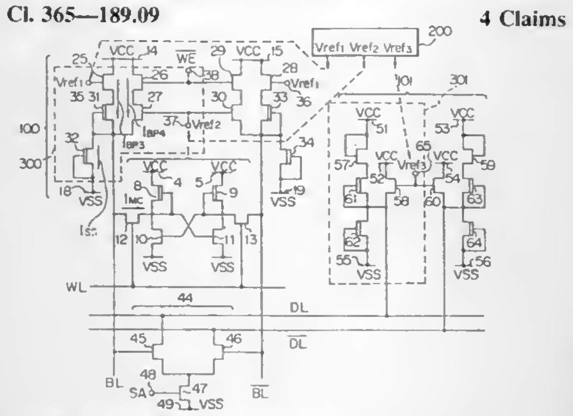
circuit, said first bootstrapping circuit configured to receive a first and a second non-overlapping clock signal.

5,841,704
STATIC RAM

Seishi Notomi, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 534,814, Sep. 27, 1995, abandoned, which is a continuation of Ser. No. 10,305, Jan. 28, 1993, abandoned. This application Apr. 10, 1997, Ser. No. 838,782
Claims priority, application Japan, Jan. 30, 1992, 4-15514
Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—189.09 **4 Claims**



1. A static RAM equipped with a bit line pull-up circuit comprising:

a reference voltage-forming circuit consisting only of a plurality of resistors, said reference voltage-forming circuit being connected to a first power-source line that feeds a first power-source voltage and being connected to a second power-source line that feeds a second power-source voltage smaller than the first power-source voltage, said reference voltage-forming circuit forming at least either one of a first reference voltage or a second reference voltage that does not change depending upon temperature, the first reference voltage and the second reference voltage being different from each other; and

a circuit which determines the logic voltage amplitude of a bit line during a reading operation based upon either a potential difference between the first reference voltage and the second reference voltage formed by said reference voltage-forming circuit or a potential difference between one of said power-source voltages and at least either one of the first or second reference voltages produced by said reference voltage-forming circuit,

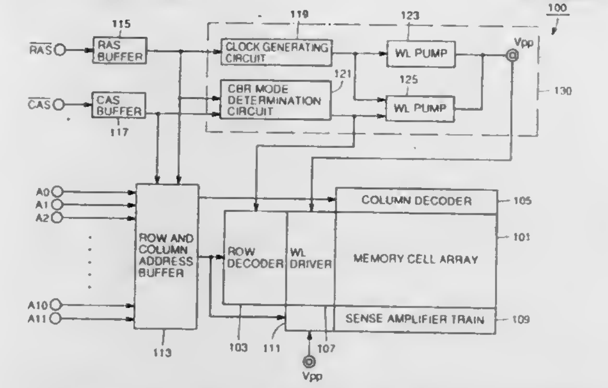
wherein said bit line pull-up circuit comprises a first field-effect transistor having a drain connected to the first power-source line that feeds the first power-source voltage and is supplied with the first reference voltage through its gate, a first constant-current source having a first end connected to a source of the first field-effect transistor and a second end connected to the bit line, a second constant-current source having a first end connected to the bit line and a second end connected to the second power-source line that feeds the second power-source voltage which is less than the first power-source voltage, a second field-effect transistor having a drain connected to the first power-source line and being supplied with a write enable signal through its gate, and a third field-effect transistor having a drain connected to a source of the second field-effect transistor, supplied with the second reference voltage through a gate of the third field-effect transistor, and having a source connected to the bit line.

5,841,705
SEMICONDUCTOR MEMORY DEVICE HAVING CONTROLLABLE SUPPLYING CAPABILITY OF INTERNAL VOLTAGE

Takeshi Hamamoto; Kiyohiro Furutani, and Yoshikazu Morooka, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 645,347, May 13, 1996, Pat. No. 5,699,303. This application Sep. 5, 1997, Ser. No. 924,501
Claims priority, application Japan, May 15, 1995, 7-116021(P)
Int. Cl.^{6} G11C *13/00*

U.S. Cl. 365—189.09 **6 Claims**



2. An internal voltage generating circuit responsive to an address strobe signal for controlling a semiconductor memory device for generating an internal voltage required for said semiconductor memory device, said address strobe signal having a prescribed inactivation period, said internal voltage generating circuit comprising:

clock signal generating means for generating a clock signal transiting to a first logic level in response to activation/inactivation of said address strobe signal and transiting to a second logic level upon expiration of a prescribed delay period after its transition to said first logic level, said delay period being longer than said inactivation period; and

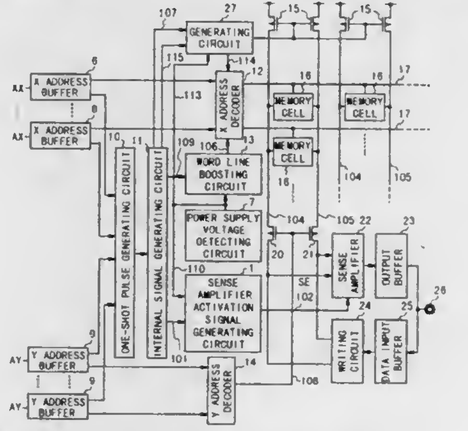
a charge pump circuit coupled to said clock signal generating means for generating said internal voltage in response to said clock signal.

5,841,706
SEMICONDUCTOR MEMORY DEVICE CAPABLE OF HIGH SPEED OPERATION IN LOW POWER SUPPLY VOLTAGE

Nobuyuki Umezaki, and Francis Matthews, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Feb. 13, 1997, Ser. No. 799,996
Claims priority, application Japan, Feb. 28, 1996, 8-041159
Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—189.11 **16 Clalms**



1. A semiconductor memory device comprising:

a memory cell array comprising a plurality of memory cells arranged in a matrix manner, wherein each of rows of said memory cell array is connected to a word line and each of columns of said memory cell array is connected to a pair of bit lines, and wherein one of the word lines and one of the pairs of bit lines are selected in accordance with an address such that one of said plurality of memory cells is selected;

internal signal generating means for generating a first activation signal in response to input of said address;

power supply voltage detecting means for determining whether a power supply voltage is higher than a predetermined voltage and generating a voltage detection signal when said power supply voltage is higher than said predetermined voltage, wherein the selected word line is normally set to said power supply voltage and is set to a boosted voltage in response to said voltage detection signal, the boosted voltage being higher than said power supply voltage;

timing control means for receiving said first activation signal and generating a second activation signal at a timing which is determined based on said voltage detection signal from said power supply voltage detecting means; and

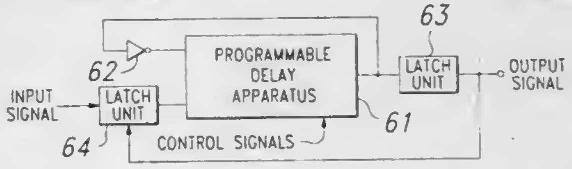
sense amplifier means responsive to said second activation signal, for amplifying potentials on the bit lines associated with the selected memory cell and outputting an amplified result as a data stored in the selected memory cell.

5,841,707
APPARATUS AND METHOD FOR A PROGRAMMABLE INTERVAL TIMING GENERATOR IN A SEMICONDUCTOR MEMORY

Danny R. Cline, Plano, Tex., and Francis Hii, Singapore, Singapore, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 25, 1996, Ser. No. 758,138
Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—194 **1 Claim**



1. A programmable time delay apparatus capable of being implemented in semiconductor memory technology, a time delay of said time delay apparatus determined in response to a plurality of control signals, comprising:

a plurality of time delay components coupled in a series configuration, each component including:
a time delay circuit;
a gate means responsive to a first state of a control signal for coupling an input terminal of said time delay circuit to an input signal, a second state of said control signal causing said input signal to by-pass said time delay circuit;
a counter unit coupled to an output terminal of said programmable time delay apparatus; and
an inverting amplifier coupled to said output terminal of said programmable time delay apparatus and to an input terminal of said programmable time delay apparatus.

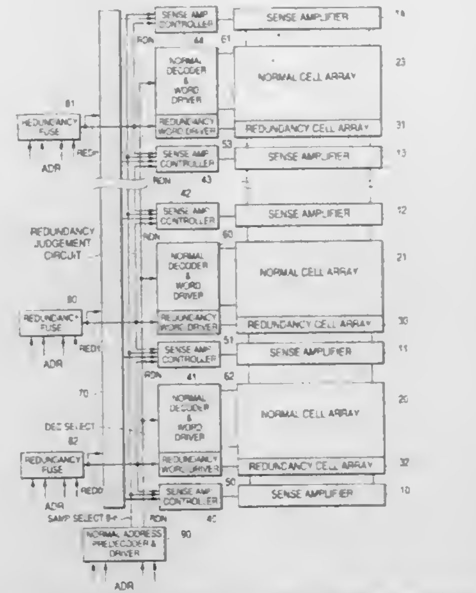
5,841,708
SEMICONDUCTOR MEMORY DEVICE HAVING SMALL CHIP SIZE AND REDUNDANCY ACCESS TIME

Kyoichi Nagata, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 18, 1996, Ser. No. 731,742
Claims priority, application Japan, Oct. 18, 1995, 7-268914
Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—200 **5 Claims**

2. A semiconductor memory device comprising:



a first normal memory cell array including at least one first main word line and a plurality of first sub-word lines;

a second normal memory cell array including at least one second main word line and a plurality of second sub-word lines, said second sub-word lines being equal in number to said first sub-word lines;

a redundancy memory cell array including a plurality of redundancy word lines which are smaller in number than said first sub-word lines, wherein said redundancy memory cell array further includes a plurality of additional redundancy word lines such that a total number of said redundancy word lines and said additional redundancy word lines is equal to the number of said first sub-word lines;

a first normal main word decoder provided to activate said first main word line; -

a second normal main word decoder provided to activate said second main word line;

a first normal sub-word circuit supplied with a set of word line drive signals and selecting one of said first sub-word lines when said first main word line is activated;

a second normal sub-word circuit supplied in common with said set of word line drive signals and selecting one of said second sub-word lines when said second main word line is activated; and

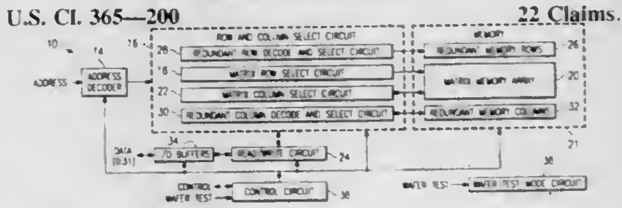
a redundancy word circuit supplied with a redundancy control signal and in common with said set of word line drive signals and selecting one of said redundancy word lines and said additional redundancy word lines when said redundancy control signal is activated.

5,841,709
MEMORY HAVING AND METHOD FOR TESTING REDUNDANT MEMORY CELLS

David C. McClure, Carrollton, Tex., assignor to STMicroelectronics, Inc., Carrollton, Tex.

Continuation-in-part of Ser. No. 582,424, Dec. 29, 1995, Pat. No. 5,612,918. This application Nov. 27, 1996, Ser. No. 758,586
Int. Cl.^{6} G11C *29/00*

U.S. Cl. 365—200 **22 Claims.**



1. A memory device, comprising:

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an array of matrix memory cells each corresponding to a matrix location within said matrix array;

an array of redundant memory cells each corresponding to a redundant location within said redundant array; and

address and test circuitry coupled to said matrix and redundant arrays, said circuitry operable during a first test mode to simultaneously address all of said matrix locations and select all of said redundant memory cells, said circuitry operable during a second test mode to simultaneously address all of said matrix locations and select only those of said redundant memory cells that are mapped to matrix locations.

5,841,710

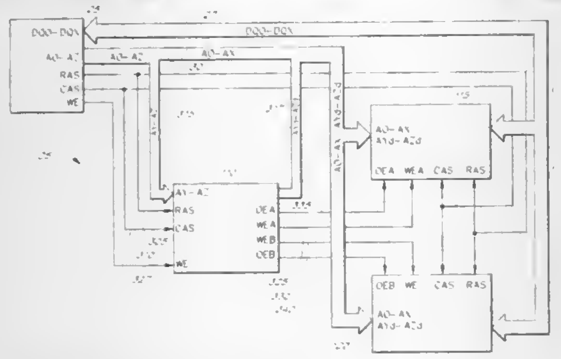
DYNAMIC ADDRESS REMAPPING DECODER

Corey L. Larsen, Marsing, Id., assignor to Micron Electronics, Inc.

Filed Feb. 14, 1997, Ser. No. 801,820

Int. Cl.^{6} G11C ***8/00***

U.S. Cl. 365—200 **19 Claims**



1. A memory system comprising:

a memory controller;

a first memory array comprising at least one section having all good memory locations, and at least one section having at least one faulty memory location;

a second memory array comprising at least one section having all good memory locations, and at least one section having at least one faulty memory location; and

a decoder coupled to said memory controller, said first memory array, and said second memory array, said decoder being responsive to said memory controller for selectively enabling data transfer between said controller and the sections of the first and second memory arrays having all good memory locations.

5,841,711

SEMICONDUCTOR MEMORY DEVICE WITH REDUNDANCY SWITCHING METHOD

Kazuo Watanabe, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 28, 1997, Ser. No. 918,668

Claims priority, application Japan, Aug. 30, 1996, 8-229646

Int. Cl.^{6} G11C ***7/00;29/00***

U.S. Cl. 365—200 **6 Claims**

1. A semiconductor memory device comprising:

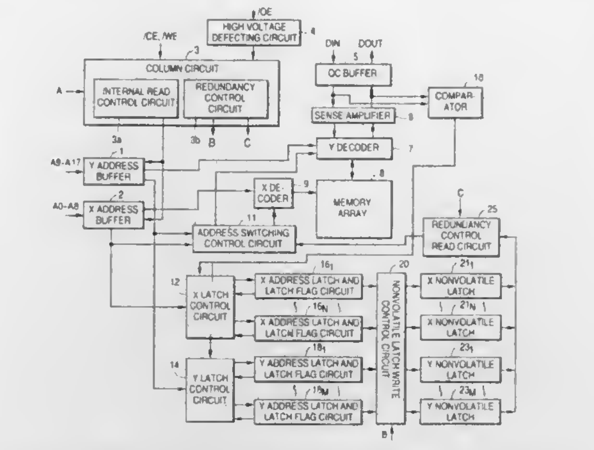
a main memory array having memory elements for storing external data;

a plurality of redundant memory cells for replacing defects in said main memory array;

reading means for reading a memory element of said main memory array which corresponds to an external address;

comparing means for comparing data read from said memory element with external expected value data corresponding to said external address;

latch means for latching information of a portion of said external address if the data read from said memory element and said external expected value data do not agree with each other;


/OE
HIGH VOLTAGE DEFECTING CIRCUIT
CE, WE
COLUMN CIRCUIT
INTERNAL READ CONTROL CIRCUIT
REDUNDANCY CONTROL CIRCUIT
DIN
DOUT
OC BUFFER
SENSE AMPLIFIER
COMPARATOR
Y DECODER
Y ADDRESS BUFFER
X ADDRESS BUFFER
X DECODER
MEMORY ARRAY
ADDRESS SWITCHING CONTROL CIRCUIT
REDUNDANCY CONTROL READ CIRCUIT
X LATCH CONTROL CIRCUIT
X ADDRESS LATCH AND LATCH FLAG CIRCUIT
Y LATCH CONTROL CIRCUIT
Y ADDRESS LATCH AND LATCH FLAG CIRCUIT
NONVOLATILE LATCH WRITE CONTROL CIRCUIT
X NONVOLATILE LATCH
Y NONVOLATILE LATCH

writing control means for writing the information of the portion of said external address latched by said latch means into nonvolatile memory elements; and

means for reading data from a redundant memory cell if said external address and the address, written in said nonvolatile memory elements, to be replaced by said redundant memory cell agree with each other.

5,841,712

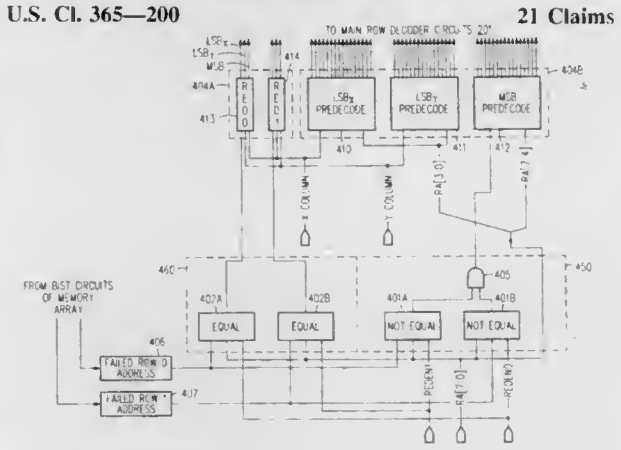
DUAL COMPARATOR CIRCUIT AND METHOD FOR SELECTING BETWEEN NORMAL AND REDUNDANT DECODE LOGIC IN A SEMICONDUCTOR MEMORY DEVICE

Dennis L. Wendell, Pleasanton, and Benjamin S. Wong, Castro Valley, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Sep. 26, 1997, Ser. No. 938,590

Int. Cl.^{6} G11C ***7/00***

U.S. Cl. 365—200 **21 Claims**



1. A semiconductor memory having a matrix of memory elements including normal memory elements and redundant memory elements, said semiconductor memory comprising:

a row predecode circuit including an enable node;

redundant row selection circuitry comprising:

- a dynamic logic circuit implementing an N-bit wide NOT comparator coupled into a row address path of said semiconductor memory and coupled to supply said enable node with an enable signal if at least one of N row address bits mismatch a corresponding bit of a failed row address; and
- a logic circuit implementing an N-bit wide TRUE comparator coupled into said row address path to supply a decode signal selective for a redundant row if all of said N row address bits match corresponding bits of said failed row address.

5,841,713

WAFER TEST METHOD CAPABLE OF COMPLETING A WAFER TEST IN A SHORT TIME

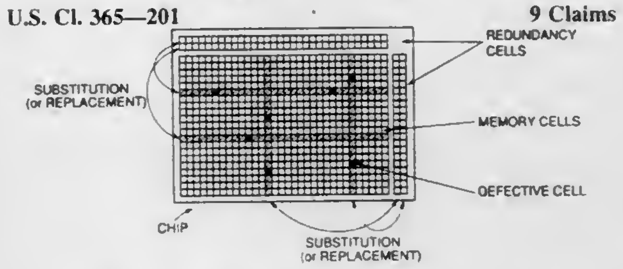
Tetsunori Maeda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 7, 1998, Ser. No. 111,158

Claims priority, application Japan, Jul. 7, 1997, 9-196437

Int. Cl.^{6} G11C ***7/00***

U.S. Cl. 365—201 **9 Claims**



1. A method of carrying out a wafer test for semiconductor wafers, equal in number to N (N being an integer greater than one), each of said semiconductor wafers comprising a plurality of chips, each chip comprising a memory unit, said method comprising:

an initial wafer test step of carrying out an initial wafer test for all of said semiconductor wafers to judge whether each chip of each of said semiconductor wafers is a good chip or a defective chip and whether or not each chip of each of said semiconductor wafers is a predictive good chip which is predicted as said good chip if subjected to trimming, said initial wafer test step producing an initial wafer test result representing that each chip of each of said semiconductor wafers is any one of said good chip, said defective chip, and said predictive good chip;

a trimming step of subjecting each of said predictive good chips to said trimming in response to said initial wafer test result to repair said predictive good chips into said good chips;

a final wafer test step of carrying out a final wafer test for a reduced number M (M being a positive integer less than N) of sampled wafers sampled among said semiconductor wafers to judge whether each chip of each of said sampled wafers is said good chip or said defective chip, said final wafer test step produce a final wafer test result representing that each chip of each of said sampled wafers is any one of said good chip and said defective chip;

an initial wafer test result modifying step of modifying the initial wafer test result for the semiconductor wafers except said sampled wafers to produce a modified wafer test result for the semiconductor wafers except said sampled wafers so that each chip represented as said predictive good chip by said initial wafer test result is also represented as said good chip by said modified wafer test result; and

an entire wafer test result producing step of producing an entire wafer test result for all of said semiconductor wafers by adding said modified wafer test result to said final wafer test result.

5,841,714

SUPERVOLTAGE CIRCUIT

Joseph C. Sher, and Todd A. Merritt, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Oct. 21, 1996, Ser. No. 734,504

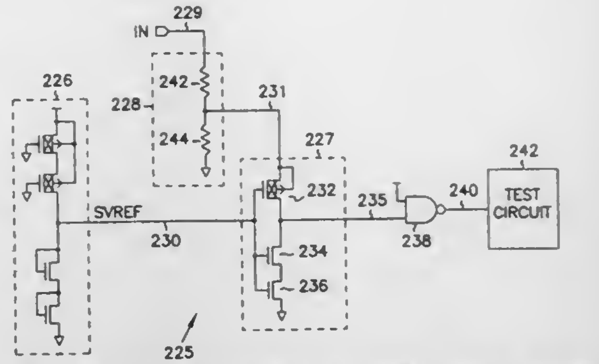
Int. Cl.^{6} G11C ***7/00***

U.S. Cl. 365—201 **21 Claims**

1. A supervoltage circuit comprising:

a reference voltage circuit for producing a reference voltage:

a resistor divider input circuit for receiving an input voltage and producing an output voltage, the resistor divider circuit operates as a voltage divider such that the output voltage remains constant over an operating temperature range; and



a compare circuit for comparing the reference voltage and the output voltage and producing an output signal in response thereto.

5,841,715

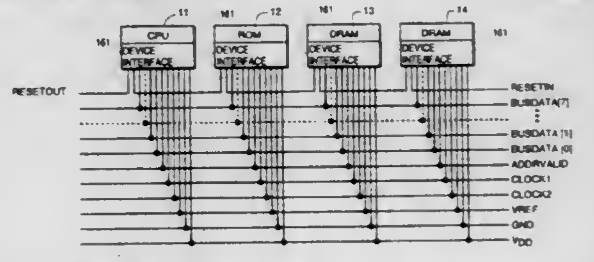
INTEGRATED CIRCUIT I/O USING HIGH PERFORMANCE BUS INTERFACE

Michael Farmwald, Berkeley, and Mark Horowitz, Palo Alto, both of Calif., assignors to Rambus, Inc., Mountain View, Calif.

Division of Ser. No. 448,657, May 24, 1995, Pat. No. 5,638,334, which is a division of Ser. No. 222,646, Mar. 31, 1994, Pat. No. 5,513,327, which is a continuation of Ser. No. 954,945, Sep. 30, 1992, Pat. No. 5,319,755, which is a continuation of Ser. No. 510,898, Apr. 18, 1990, abandoned. This application Feb. 10, 1997, Ser. No. 796,782

Int. Cl.^{6} G11C ***7/00***

U.S. Cl. 365—203 **11 Claims**



1. A memory device comprising:

an array of memory cells for storing data, the memory array organized in rows and columns; and

a plurality of sense amplifiers coupled to the array of memory cells, the plurality of sense amplifiers for receiving and latching data for a row of the memory array;

synchronous bus interface circuitry having an input to receive an external clock signal, the synchronous bus interface circuitry for coupling to an external bus and to the plurality of sense amplifiers and configured to receive operation control information from the external bus in response to the external clock signal, the operation control information including first and second access mode control information, wherein the first access mode control information specifies whether the memory device operates in a page mode or normal mode of operation, and wherein the second access mode control information specifies whether the memory device precharges at least one of the columns of the memory array or saves data in the sense amplifiers after an access of the type specified in the first access mode control information.

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5,841,716
STATIC TYPE SEMICONDUCTOR MEMORY DEVICE HAVING A DIGIT-LINE POTENTIAL EQUALIZATION CIRCUIT

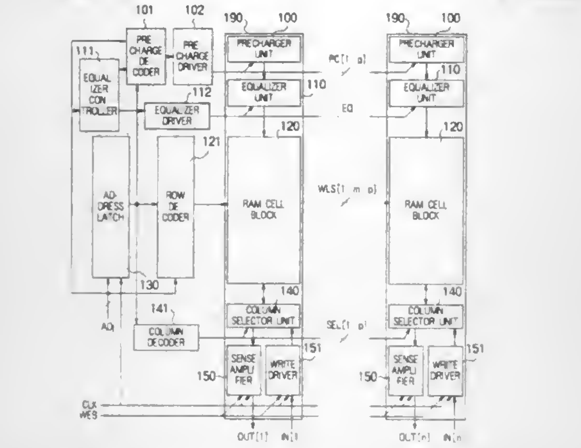
Hiroaki Iwaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 22, 1997, Ser. No. 934,854

Claims priority, application Japan, Sep. 26, 1996, 8-254434

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—203 **6 Claims**



1. A static-type semiconductor memory device comprising:

a RAM cell block including a plurality of digit line pairs each of which includes complementary digit lines, a plurality of word lines and a plurality of RAM cells connected to said digit line pairs and said word lines for storing data;

a precharging circuit for precharging only a predetermined digit line pair selected from among a plurality of digit line pairs by a column address input signal; and

an equalizing circuit for equalizing a potential of said complementary digit lines forming said plurality of digit line pairs at equal potential during a period when said predetermined digit line pair is not precharged.

5,841,717
SEMICONDUCTOR MEMORY DEVICE FACILITATING USE OF A HIGH FREQUENCY CLOCK SIGNAL

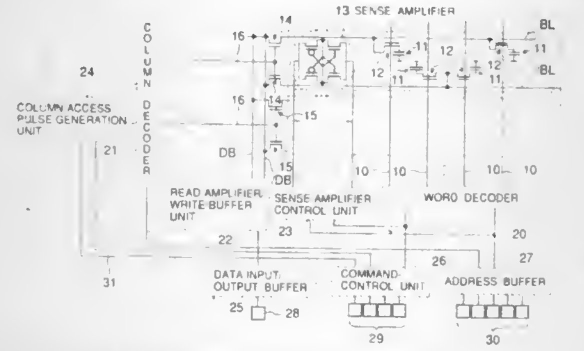
Shusaku Yamaguchi, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed May 15, 1997, Ser. No. 857,173

Claims priority, application Japan, Dec. 17, 1996, 8-337204

Int. Cl.^{6} G11C *7/00;7/02*

U.S. Cl. 365—205 **12 Claims**


13 SENSE AMPLIFIER
14
16
BL
11
12
24
COLUMN DECODER
COLUMN ACCESS PULSE GENERATION UNIT
15
21
DB
10
READ AMPLIFIER WRITE BUFFER UNIT
SENSE AMPLIFIER CONTROL UNIT
WORD DECODER
22
23
20
26
27
31
DATA INPUT/ OUTPUT BUFFER
COMMAND CONTROL UNIT
ADDRESS BUFFER
25
28
29
30

1. A semiconductor memory device comprising:

column-gate transistors which open in a data-write operation and a data-read operation to allow a passage of data therethrough; and

a control circuit controlling an open period of said column-gate transistors as a varying-length portion of a predetermined clock cycle such that said open period in said data-write operation is different from that in said data-read operation.

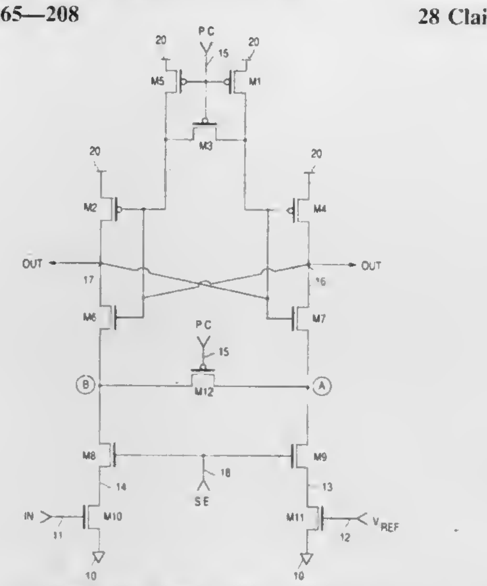
5,841,718
USE OF VOLTAGE EQUALIZATION IN SIGNAL-SENSING CIRCUITS

Lynne Watters, Sunnyvale; Sharlin Fang, San Jose, and Pochung Young, Fremont, all of Calif., assignors to Mosel Vitelic, Inc., Taiwan, China

Filed Aug. 8, 1997, Ser. No. 909,014

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—208 **28 Claims**



1. In an integrated circuit which is to be powered by a power supply voltage, an input buffer for receiving a logic signal from a source external to the integrated circuit and converting the logic signal from a first voltage level to a second voltage level, the input buffer comprising:

an input circuit for receiving the logic signal from the external source and providing a corresponding differential voltage on a first and second nodes, the input circuit further comprising a sense enable circuit for isolating the first and second nodes from the logic signal in a precharge operation;

a first circuit for coupling the first and second nodes to the supply voltage during the precharge operation to charge the first and second nodes to a precharge voltage relative to the power supply voltage, wherein during the precharge operation if the node voltage at only one of the first and second nodes is within a predetermined range relative to the power supply voltage, then the first circuit does not couple said one of the nodes to the power supply voltage and is incapable of charging the first and second nodes to equal voltages during the precharge operation; and

an equalization circuit for creating a conductive path between the first and second nodes only during the precharge operation to equalize the node voltages on the first and second nodes by an end of the precharge operation and a start of a voltage level conversion.

5,841,719
DATA LATCHING CIRCUIT FOR READ-OUT OPERATIONS OF DATA FROM MEMORY DEVICE

Masayoshi Hirata, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 27, 1997, Ser. No. 863,536

Claims priority, application Japan, May 24, 1996, 8-153049

Int. Cl.^{6} G11C *7/00*

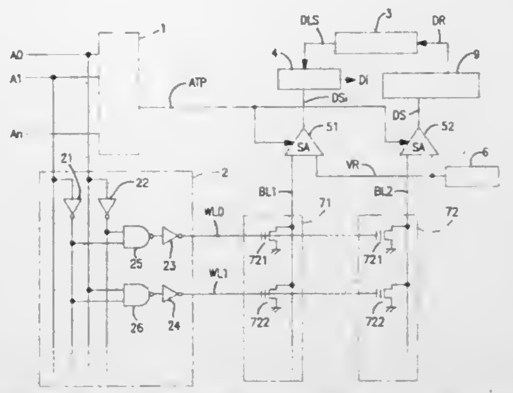
U.S. Cl. 365—210 **5 Claims**

2. A circuit for reading out data from the main memory cells, comprising:

main memory cells;

a main sense amplifier;

a data latching circuit for latching data read out from the main memory cells in accordance with a data latching signal;



a data latching signal generator for generating a data latching signal, wherein the data latching signal generator is further provided with dummy memory cells, a dummy sense amplifier for reading out data from the dummy memory cell, a data displacement detecting circuit for detecting data displacement points at a time when the dummy sense amplifier outputs data obtained from the dummy memory cell, and a delay circuit for receiving a data displacement detection signal from the data displacement detecting circuit as an input and outputting the data latching signal as a delay signal of the data displacement detection signal.

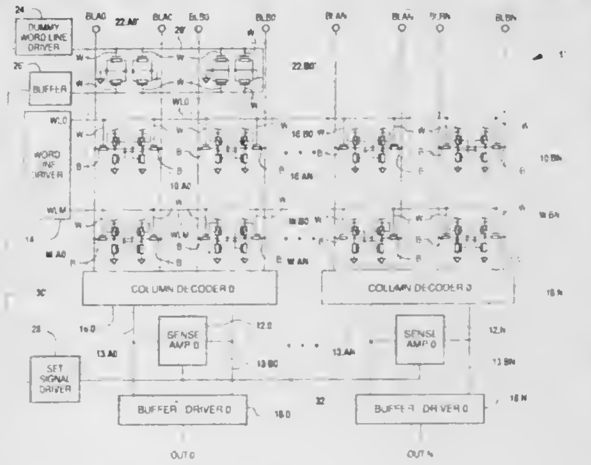
5,841,720
FOLDED DUMMY WORLD LINE

James J. Covino, Montpelier; Alan L. Roberts, Jericho, both of Vt., and Jose R. Sousa, Sunnyvale, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 26, 1997, Ser. No. 918,740

Int. Cl.^{6} G11C *7/02*

U.S. Cl. 365—210 **20 Claims**



1. A memory array comprising:

a number of memory cells;

at least one word line for transmitting a word line select signal, said word line extending from a first driver end to a second end; and

at least one dummy word line extending from said first driver end to the midpoint between said first driver end and said second end and back to said first driver end for transmitting a tracking signal responsive to said word line select signal.

5,841,721
MULTI-BLOCK ERASE AND VERIFICATION CIRCUIT IN A NONVOLATILE SEMICONDUCTOR MEMORY DEVICE AND A METHOD THEREOF

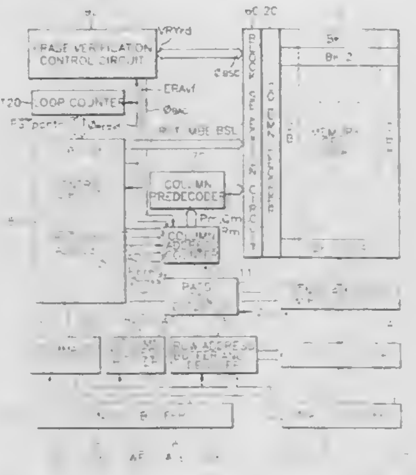
Seok-Chun Kwon, and Jin-Ki Kim, both of Seoul, Rep. of Korea, assignors to Samsung Electronics Co., Ltd, Kyungki-Do, Rep. of Korea

Division of Ser. No. 523,612, Sep. 5, 1995. This application Nov. 21, 1997, Ser. No. 975,704

Claims priority, application Rep. of Korea, Sep. 3, 1994, 1994-22167

Int. Cl.^{6} G11C *13/00*

U.S. Cl. 365—218 **7 Claims**



1. In a nonvolatile semiconductor memory device for use in erase verification comprising a memory cell array having a plurality of memory cells arranged in a matrix form of columns and rows, each memory cell including at least one memory transistor with a floating gate and a control gate, said memory cell array being divided into a plurality of memory blocks in a row direction, a plurality of bit lines connected to one end of each of said memory cells arranged in said row direction, a plurality of block selectors connected to said control gates in said memory cells of each memory block to select said memory block, an erase verification circuit connected to said plurality of bit lines, for verifying whether or not said memory cells within said memory block are successfully erased, characterized in that each of said block selectors comprises storing means for storing a reset flag in response to a reset signal and a block selection flag in response to block selection address signals, and judging means for generating an erase verification read signal when said storing means corresponding to the memory block designated by said block selection address signals stores said block selection flag during an erase verification operation, thereby performing said erase verification operation only for the memory block corresponding to the block selector generating said erase verification read signal.

5,841,722
FIRST-IN, FIRST-OUT (FIFO) BUFFER

Avigdor Willenz, Kamoon, Israel, assignor to Galileo Technologies Ltd., Karmiel, Israel

Filed Feb. 13, 1997, Ser. No. 799,136

Claims priority, application Israel, Feb. 14, 1996, 117134

Int. Cl.^{6} G11C *7/00*

U.S. Cl. 365—221 **2 Claims**

1. A variable sized, first-in, first-put (FIFO) buffer to be placed between a first and a second system, the FIFO buffer comprising:

a least one upper FIFO buffer for receiving data from said first system;

at least one lower FIFO buffer for writing data to said second system;

a random access memory element for receiving data from said at least one upper FIFO buffer when said at least one lower FIFO buffer is temporarily full; and

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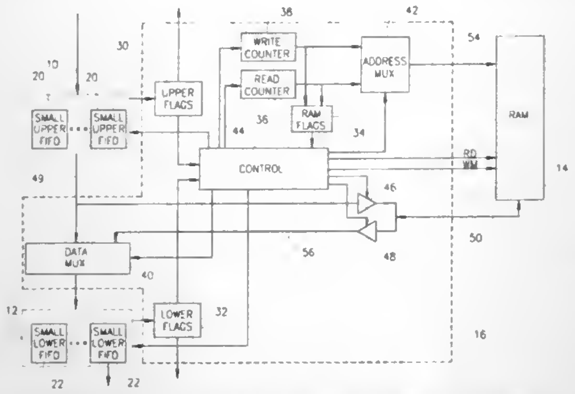


- a controller for writing data from said at least one upper FIFO buffer to said at least one lower FIFO buffer when said at least one lower FIFO buffer is not full and into random access memory element when said at least one lower FIFO buffer is full and for reading data from said random access memory element into said at least one lower FIFO buffer when there is data in said random access memory element and said at least one lower FIFO buffer is no longer full
  - wherein said controller includes a block generator for combining data from said at least one upper FIFO buffer into blocks for writing into said random access memory element and a block separator for separating blocks of data read from said random access memory element into separate words and for writing said separate words into said at least one lower FIFO buffer.

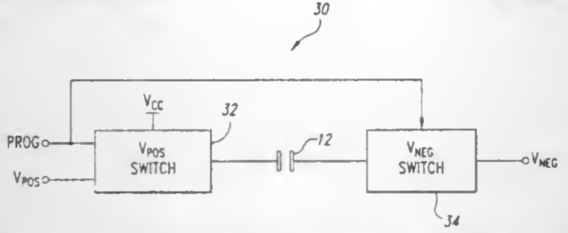
5,841,723
METHOD AND APPARATUS FOR PROGRAMMING ANTI-FUSES USING AN ISOLATED WELL PROGRAMMING CIRCUIT

Manny Ma, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Continuation of Ser. No. 653,964, May 28, 1996. This application Mar. 24, 1998, Ser. No. 47,759

Int. Cl.⁶ G11C *7/00*

U.S. Cl. 365—225.7 **69 Claims**



1. A programming circuit for programming an anti-fuse having first and second terminals, said programming circuit and said anti-fuse being fabricated in a common integrated circuit, said programming circuit comprising:

- a first switching circuit connected between a first externally accessible terminal of said integrated circuit and the first terminal of said anti-fuse, said first switching circuit further having an enable input, said first switching circuit being capable of coupling a first programming voltage having one polarity from said first externally accessible terminal to the first terminal of said anti-fuse responsive to a program enable signal being applied to the enable input of said first switching circuit; and
- a second switching circuit connected between a second externally accessible terminal of said integrated circuit and the second terminal of said anti-fuse, said second switching circuit further having an enable input, said second switching circuit being capable of coupling a second programming voltage having a polarity opposite to the polarity of the first programming voltage from said second externally accessible terminal to the second terminal of said anti-fuse responsive to said program enable signal being applied to the enable input of said second switching circuit whereby a voltage corresponding to the difference between said first and second programming voltages is applied to said anti-fuse responsive to said program enable signal.

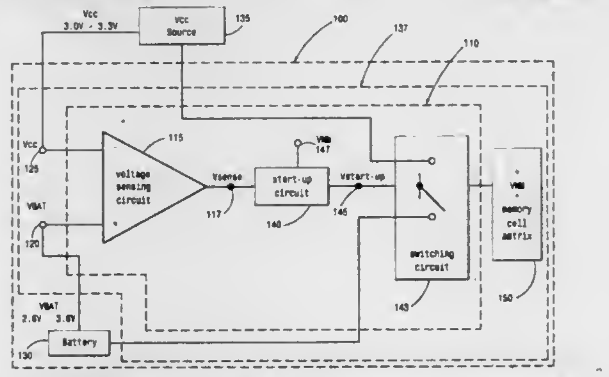
5,841,724
VOLTAGE SOURCE AND MEMORY-VOLTAGE SWITCH IN A MEMORY CHIP

Mark S. Ebel, Los Altos, and Robert Shen, Fremont, both of Calif., assignors to Enable Semiconductor, Inc., Milpitas, Calif.

Filed Jun. 12, 1997, Ser. No. 873,445

Int. Cl.⁶ G11C *7/00*

U.S. Cl. 365—226 **44 Claims**



1. A circuit for connecting a memory cell matrix to first and second voltage sources, comprising:

- a memory cell matrix for storing data;
- a voltage sensor responsive to the voltage levels of said first and second voltage sources by producing a sense signal;
- a voltage source coupler connected between said memory cell matrix and said voltage sensor, and responsive to said sense signal by driving the voltage level of said first voltage source into said memory cell matrix when the voltage level of said first voltage source is greater than a predetermined threshold voltage level and by driving the voltage level of said second voltage source into said memory cell matrix when the voltage level of said first voltage source falls to said threshold voltage level.

5,841,725
CHARGE PUMP CIRCUIT FOR A SEMICONDUCTOR MEMORY DEVICE

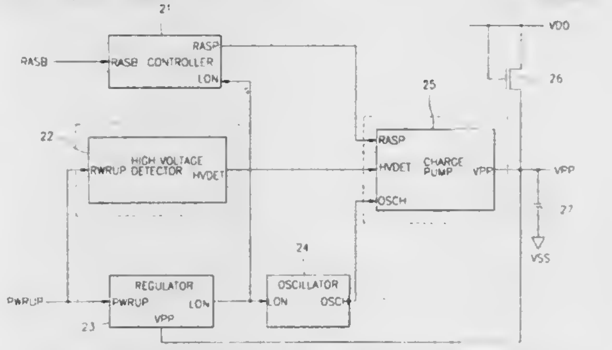
Chang-Man Kang, Kyungki-Do, and Young-Hyun Jun, Seoul, both of Rep. of Korea, assignors to LG Semicon Co., Ltd., Cheongju, Rep. of Korea

Filed Aug. 28, 1997, Ser. No. 918,667

Claims priority, application Rep. of Korea, Apr. 2, 1997, 1997 12109

Int. Cl.⁶ G11C *5/14*

U.S. Cl. 365—226 **19 Claims**



1. A charge pump circuit for a semiconductor memory device, comprising:

- a high voltage detector for outputting a high voltage detection signal when an applied supply voltage reaches a predetermined voltage level;
- a regulator for outputting a high level on signal when a raised voltage is lowered below a predetermined voltage while detecting the raised voltage being applied during a power-on;
- a controller being triggered at a descent edge of a row access strobe bar signal and outputting a high level row access strobe bar pulse signal;
- an oscillator for generating an oscillation pulse signal in accordance with the high level on-signal outputted from the regulator;
- a charge pump for carrying out a pumping operation until the oscillation pulse signal reaches a potential of (Vdd+2Vt) when the oscillation pulse signal is applied thereto from the oscillator, and for halting the pumping operation when the high-voltage detection signal of a high level is applied;
- a pull-up transistor for precharging the raised voltage to a potential value of (Vdd−Vt) when power is turned on; and
- a decoupling capacitor connected to a final output terminal and for carrying out a charge accumulation and a decoupling operation.

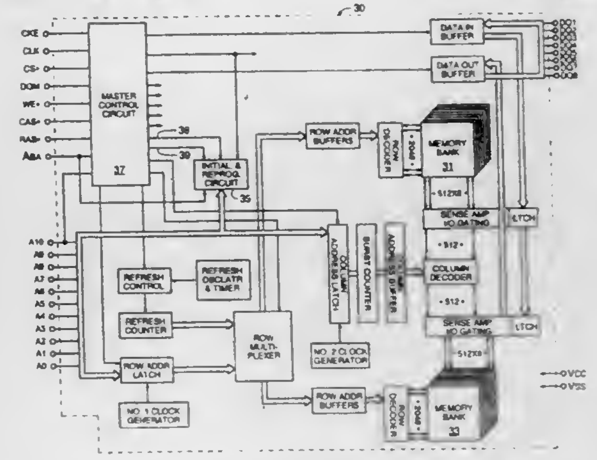
5,841,726
METHOD FOR INITIALIZING AND REPROGRAMMING A CONTROL OPERATION FEATURE OF A MEMORY DEVICE

Brett Williams, Eagle, and Scott Schaefer, Boise, both of Id., assignors to Micron Technology, Inc., Boise, Id.

Continuation of Ser. No. 719,811, Sep. 25, 1996, which is a continuation of Ser. No. 228,546, Apr. 15, 1994, abandoned. This application Jan. 13, 1997, Ser. No. 783,384

Int. Cl.⁶ G11C *7/00*

U.S. Cl. 365—230.03 **18 Claims**



1. A method for programming a control operation feature of a memory device having a plurality of memory banks, the method comprising the following steps:

- a. programming the memory device to have a first operating option of the control operation feature when the plurality of the memory banks are inactive;
- b. generating a bank activate signal capable of activating at least one of said memory banks of said plurality of memory banks; and
- c. reprogramming the memory device to have a second operating option of the control operation feature when said bank activate signal is present such that the at least one of said memory banks is active.

5,841,727
SEMICONDUCTOR MEMORY DEVICE

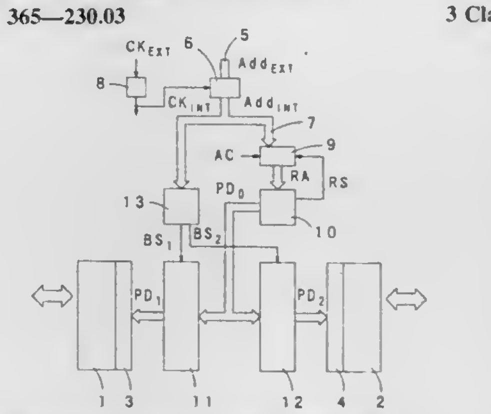
Shunichi Iwanari, and Hirohito Kikukawa, both of Osaka, Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed Jun. 3, 1997, Ser. No. 867,855

Claims priority, application Japan, Jun. 4, 1996, 8-141309

Int. Cl.⁶ G11C *8/00*

U.S. Cl. 365—230.03 **3 Claims**



1. A semiconductor memory device comprising:

- a plurality of memory cell array blocks;
- one address input circuit for inputting thereto an address common to the plurality of memory cell array blocks;
- an address select circuit for outputting a memory cell select signal common to the plurality of memory cell array blocks in correspondence with an address output from the address input circuit;
- a block-select-signal generating circuit for generating a block select signal to select one of the plurality of memory cell array blocks; and
- a plurality of memory-select-signal hold circuits provided for the plurality of memory cell array blocks, respectively, for holding the memory cell select signal and supplying the memory cell select signal being held to the plurality of memory cell array blocks,
- wherein said plurality of memory-select-signal hold circuits update contents being held in response to the block select signal corresponding to the plurality of memory cell array blocks.

5,841,728
HIERARCHIC MEMORY DEVICE HAVING AUXILIARY LINES CONNECTED TO WORD LINES

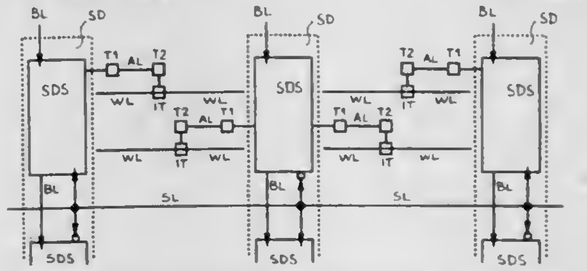
Luigi Pascucci, Sesto S. Giovanni; Paolo Rolandi, Volpedo; Marco Fontana, Milan, and Antonio Barcella, Trescore Balneario, all of Italy, assignors to SGS-Thomson Microelectronics, S.r.l., Italy

Filed Sep. 30, 1996, Ser. No. 724,495

Claims priority, application European Pat. Off., Sep. 29, 1995, 95830405

Int. Cl.⁶ G11C *8/00*

U.S. Cl. 365—230.06 **33 Claims**



1. A memory device having hierarchical row decoding architecture the memory device comprising:

- at least one main decoder and
- a plurality of secondary decoders having outputs coupled to a plurality of word lines.

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wherein said outputs are coupled to said word lines respectively through a plurality of auxiliary lines having first ends respectively connected to said outputs and second ends respectively connected to intermediate points of said word lines, and

wherein the resistivity of said auxiliary lines is lower than the resistivity of said word lines, whereby the uniformity of access time is improved and the duration of access time is reduced.

5,841,729
SEMICONDUCTOR MEMORY DEVICE IN WHICH DATA ARE READ AND WRITTEN ASYNCHRONOUSLY WITH APPLICATION OF ADDRESS SIGNAL

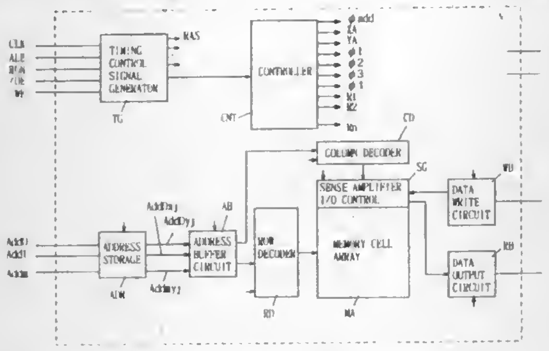
Tsukasa Ooishi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 768,077, Dec. 16, 1996, Pat. No. 5,691,954, which is a continuation of Ser. No. 589,223, Jan. 22, 1996, abandoned, which is a division of Ser. No. 329,912, Oct. 26, 1994, Pat. No. 5,517,459. This application Sep. 11, 1997, Ser. No. 950,049

Claims priority, application Japan, Nov. 16, 1993, 5-286882

Int. Cl.^{6} G11C *8/00*

U.S. Cl. 365—230.08 **27 Claims**



1. A semiconductor memory device comprising:

a memory array including a plurality of memory cells;

address storage means for sequentially incorporating address signals each designating at least a part of an address of said memory array to store a plurality of store address signals corresponding to said address signals and for generating an internal address signal to be used for selecting an addressed memory cell of said memory array, the internal address signal corresponding to one of said plurality of store address signals; and

a decoding circuit for receiving and decoding the internal address signal from said address storage means to select the addressed memory cell of said memory array.

5,841,730
SEMICONDUCTOR MEMORY DEVICE HAVING SYNCHRONOUS WRITE DRIVER CIRCUIT

Yasuyuki Kai, Yokohama; Katsushi Nagaba, Kawasaki, and Shigeo Ohshima, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Tokyo, Japan

Filed Jan. 29, 1997, Ser. No. 790,907

Claims priority, application Japan, Jan. 31, 1996, 8-015727

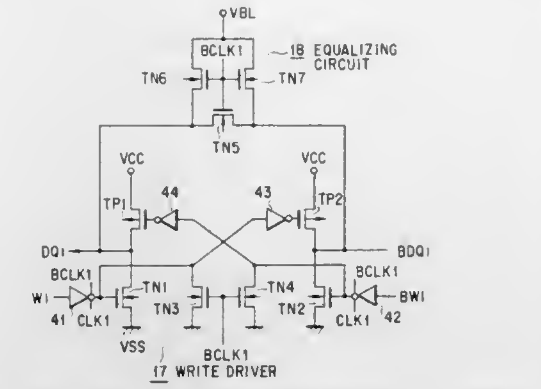
Int. Cl.^{6} G11C *8/00*

U.S. Cl. 365—233 **15 Claims**

1. A semiconductor memory device, comprising:

a memory cell array having a plurality of memory cells to which data can be written:

data lines to which data read from said memory cells and data to be written on said memory cells are transferred, said data lines comprising data line pairs for transferring complementary data;



a write driver circuit for driving said data lines in accordance with write data supplied from outside when data is written to said memory cells; and

an equalizing circuit for setting said data lines to predetermined potentials whenever said data lines are operated by said write driver circuit,

wherein said write driver circuit comprises:

a first signal inversion circuit having an input terminal connected to a node of first internal write data, a logical level of which is the same or opposite to a level of write data supplied from outside, and arranged to be operated when a level of a synchronizing signal is a first logical level;

a second signal inversion circuit having an input terminal connected to a node of second internal write data, a logical level of which is the other logical level which is the same or opposite to said level of write data supplied from the outside, and arranged to be operated when the level of said synchronizing signal is said first logical level;

a third signal inversion circuit having an input terminal connected to an output terminal of said first signal inversion circuit;

a fourth signal inversion circuit having an input terminal connected to an output terminal of said second signal inversion circuit;

a first N-channel transistor having an electric current path formed between the source and the drain thereof and inserted between either of data lines of said data line pair and a node of a first power source potential, and a gate connected to an output terminal of said first signal inversion circuit;

a second N-channel transistor having an electric current path formed between the source and the drain thereof and inserted between the other data line of said data line pair and said node of said first power source potential, and a gate connected to said output terminal of said second signal inversion circuit;

a third P-channel transistor having an electric current path formed between the source and the drain and inserted between a node of said second power source potential and either of data lines of said data line pair, and a gate connected to an output terminal of said fourth signal inversion circuit;

a fourth P-channel transistor having an electric current path formed between the source and the drain thereof and inserted between said node of said second power source potential and the other data line of said data line pair, and a gate connected to an output terminal of said third signal inversion circuit;

a fifth N-channel transistor having an electric current path formed by the source and the drain thereof and inserted between said output terminal of said first signal inversion circuit and said node of said first power source potential and arranged to be controlled in such a manner that said fifth N-channel transistor is electrically conducting when the level of said synchronizing signal is a second logical level: and

a sixth N-channel transistor having an electric current path formed between the source and the drain thereof and inserted between said output terminal of said second signal inversion circuit and said node of said first power source potential and arranged to be controlled in such a manner that said sixth N-channel transistor is electrically conducting when the level of said synchronizing signal is said second logical level.

5,841,731
SEMICONDUCTOR DEVICE HAVING EXTERNALLY SETTABLE OPERATION MODE

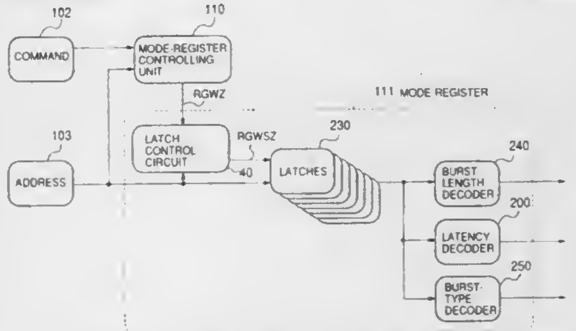
Naoharu Shinozaki, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed May 22, 1997, Ser. No. 862,298

Claims priority, application Japan, Dec. 13, 1996, 8-334273

Int. Cl.^{6} G11C *8/00*

U.S. Cl. 365—233 **11 Claims**



1. A semiconductor device which allows an input signal thereto to select one of N operation modes, and operates in said one of N operation modes, said semiconductor device comprising:

a selection circuit for selecting an operation mode from said N operation modes when said input signal indicates said operation mode, and for selecting a predetermined operation mode from said N operation modes when said input signal is an undefined signal indicating none of said N operation modes; and

an internal circuit operating in one of said operation mode and said predetermined operation mode selected by said selection circuit,

wherein selection of said predetermined operation mode prevents malfunction of said internal circuit when said input signal is said undefined signal.

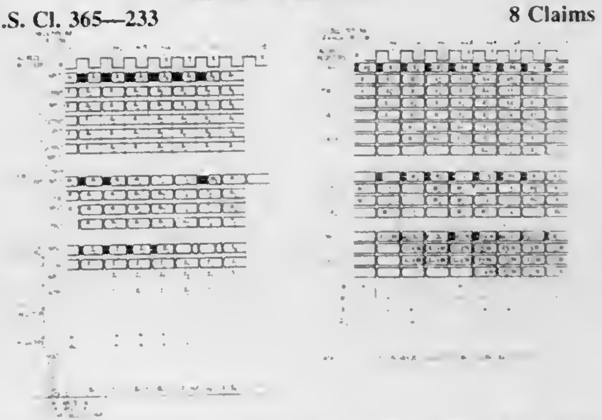
5,841,732
FULLY SYNCHRONOUS PIPELINED RAM

John R. Mick, San Jose, Calif., assignor to Integrated Device Technology, Inc., Santa Clara, Calif.

Division of Ser. No. 635,128, Apr. 19, 1996. This application May 28, 1997, Ser. No. 864,285

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 365—233 **8 Claims**



1. The method of writing data into memory and reading data from a memory system which includes said memory which comprises:

placing write data to be stored in said memory and the address at which said write data is to be stored into storage registers external to said memory,

storing said write data in said storage registers during the execution of one or more read cycles, reading said write data stored in said storage registers out of the memory system should the address of the data to be read from the memory system correspond to the address of the write data stored in said storage registers and reading the data out of said memory should the address of the data to be read from the memory system not correspond to the address of the write data stored in said storage registers; and

writing the write data stored in said storage registers into said memory on a subsequent write cycle.

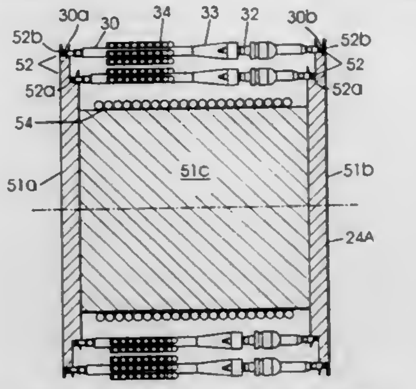
5,841,733
ACOUSTIC SOURCE ARRAY SYSTEM FOR UNDERWATER OPERATION

John V. Bouyoucos, Pittsford; David C. Charvoz, Fairport, and Dennis R. Courtright, Canandaigua, all of N.Y., assignors to Hydroacoustics Inc., Rochester, N.Y.

Filed May 21, 1997, Ser. No. 859,979

Int. Cl.^{6} G01V *1/38*

U.S. Cl. 367—15 **29 Claims**



1. And acoustic source array system compromising:

an array of acoustic signal sources towable while underwater behind a surface vessel, said array having a plurality of said sources. spreader bar assemblies including spreader bars to which said sources are attached at predetermined separation distances, wherein said spreaders bars provide manifolds which provide means for storing energy which operates said sources;

an umbilical connecting said arrays to said vessels: and

means for firing said sources to provide acoustic signals at selected times.

5,841,734
ROTATING ACOUSTIC TRANSDUCER HEAD FOR CEMENT BOND EVALUATION TOOL

Thomas E. Ritter, Katy; James Robert Birchak, Spring; James W. Stroud, Houston; Mack H. Brown, Houston; James E. Masino, Houston, and John W. Minear, Houston, all of Tex., assignors to Halliburton Energy Services, Inc., Houston, Tex.

Filed Jun. 5, 1997, Ser. No. 870,116

Int. Cl.^{6} G01V *1/00*

U.S. Cl. 367—35 **29 Claims**

1. An apparatus for logging a borehole, comprising:

a non-rotating component; and

a rotating component attached to said non-rotating component by a coupling that allows lateral movement of said rotating component with respect to said non-rotating component and including a logging head, said rotating component being centralized independently from said non-rotating component such that said rotating component remains centralized as it rotates,

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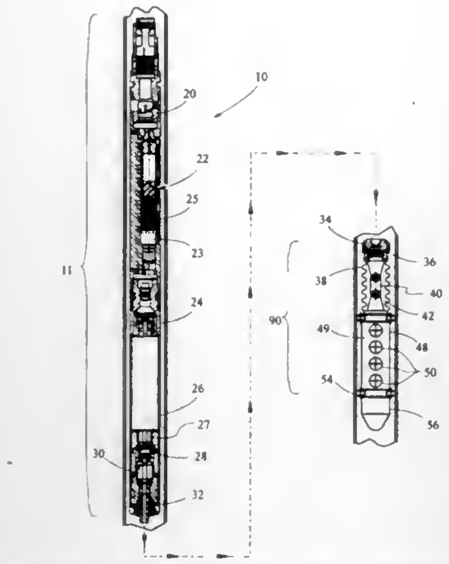


regardless of whether said non-rotating component is centralized.

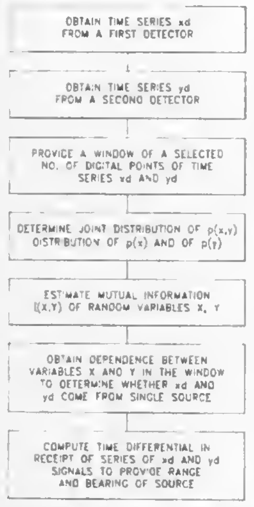
5,841,735
METHOD AND SYSTEM FOR PROCESSING ACOUSTIC SIGNALS

Azizul H. Quazi, East Lyme, Conn., assignor to The United States of America as represented by the Secretary of the Navy

Continuation-in-part of Ser. No. 677,205, Jul. 9, 1996, Pat. No. 5,668,778. This application Jul. 9, 1997, Ser. No. 890,479

Int. Cl.^{6} G01S *3/80;* **H04B** *11/00*

U.S. Cl. 367—124 **2 Claims**


OBTAIN TIME SERIES xd FROM A FIRST DETECTOR
OBTAIN TIME SERIES yd FROM A SECOND DETECTOR
PROVIDE A WINDOW OF A SELECTED NO. OF DIGITAL POINTS OF TIME SERIES xd AND yd
DETERMINE JOINT DISTRIBUTION OF p(x,y) DISTRIBUTION OF p(x) AND OF p(y)
ESTIMATE MUTUAL INFORMATION I(X,Y) OF RANDOM VARIABLES X, Y
OBTAIN DEPENDENCE BETWEEN VARIABLES X AND Y IN THE WINDOW TO DETERMINE WHETHER xd AND yd COME FROM SINGLE SOURCE
COMPUTE TIME DIFFERENTIAL IN RECEIPT OF SERIES OF xd AND yd SIGNALS TO PROVIDE RANGE AND BEARING OF SOURCE

1. A method for processing acoustic signals received by discrete first and second underwater signal detectors, spaced from each other, for detection and for determination of range and bearing of an underwater signal source, the method comprising the steps of:

obtaining a time series xd of first random variables X from the first detector;

obtaining a second time series yd of second random variables Y from the second detector;

providing a window of a selected number of digital points of time series xd and time series yd; and

determining joint probability distribution of p(x,y), distribution of p(x), and distribution of p(y), wherein:

p(x,y)=joint probability distribution,

p(x)=probability distribution of x, and

p(y)=probability distribution of y;

estimating mutual information I(X;Y) of the random variables X,Y by:

$$\begin{aligned} I(X;Y) &= \sum_{x}\sum_{y} \log \frac{p(x,y)}{p(x)p(y)} \\ &= H(X) - H(X/Y) \\ &= H(Y) - H(Y/X) \\ &= H(X) - H(Y) - \underline{H}(X,Y) \end{aligned}$$

wherein:

H(X)=entropy of X

H(Y)=entropy of Y

H(X/Y)=entropy of X given Y

H(X,Y)=joint entropy

to obtain a measure of dependence between the random variables X and Y in said window to determine whether xd and yd come from a single source;

if xd and yd are determined to have come from the same source, computing time differential in receipt of a series of the X and Y signals by said first and second spaced detectors to provide the range and bearing of the source from the first and second detectors.

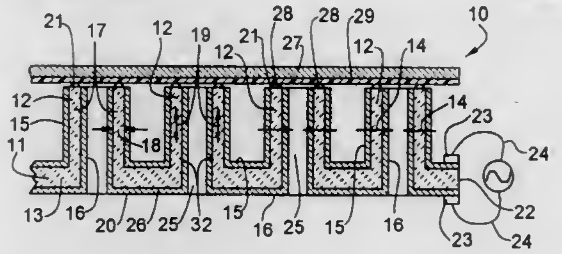
5,841,736
LOW VOLTAGE PIEZOELECTRIC TRANSDUCER AND METHOD

Leslie J. Bowen, Concord, and Craig D. Near, Acton, both of Mass., assignors to Materials Systems Incorporated, Littleton, Mass.

Filed Apr. 28, 1997, Ser. No. 847,435

Int. Cl.^{6} H04R *17/00;* **H01L** *41/08*

U.S. Cl. 367—140 **9 Claims**



1. A transducer comprising a composite body having an upper generally planar surface and a lower generally planar surface, said composite body comprising:

a ceramic body comprising a base having a lower surface, and an array of parallel, hollow, tube-shaped ceramic transducer elements of a strongly piezoelectric or electrostrictive ceramic material, wherein said tube-shaped elements are integral with and extend perpendicularly from said base, are fixedly supported in said array by said base, and have tube walls each having an outer surface, an inner surface, and an upper edge;

a first electrically conductive electrode contacting said tube wall inner surface;

a second electrically conductive electrode contacting said tube wall outer surface and electrically isolated from said first electrode and from said base lower surface;

wherein said first electrode extends onto said base lower surface for electrical connection to a source of electric power for driving said transducer across said tube walls for d_{31} mode vibration of said tube walls.

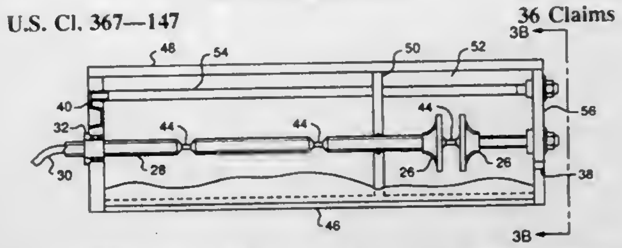
5,841,737
SPARKER SOURCE SYSTEMS

Raymond B. Schaefer, 11 Inverness Rd., Arlington, Mass. 02174

Filed Jul. 17, 1997, Ser. No. 896,221

Int. Cl.^{6} G01V *1/157*

U.S. Cl. 367—147 **36 Claims**



1. A sparker source for use with a liquid medium, the sparker source comprising:

a plurality of spaced electrodes,

an electrical driver constructed to generate electrical discharges in the medium between said electrodes, each discharge adapted to generate an impulse of acoustic energy, and

an enclosure having a spring constant defining the rigidity of said enclosure, said enclosure constructed to enclose said electrodes and said liquid medium to control the acoustic spectrum of said impulse.

5,841,738
DISPLAY UNIT STRUCTURE FOR ELECTRONIC DEVICE

Yuichi Kamei; Yasuo Kamiyama; Masao Mafune, and Yoshio Katsuki, all of Tanashi, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

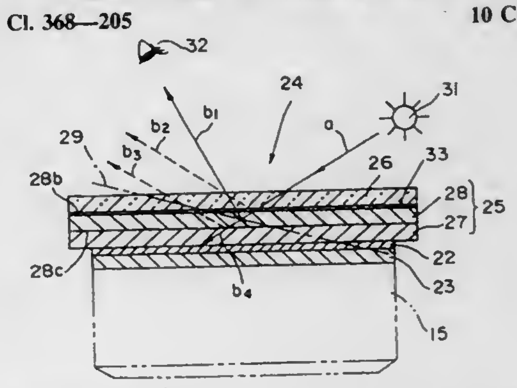
PCT No. PCT/JP96/03317, § 371 Date Jul. 14, 1997, § 102(e) Date Jul. 14, 1997, PCT Pub. No. WO97/18500, PCT Pub. Date May 22, 1997

PCT Filed Nov. 12, 1996, Ser. No. 860,858

Claims priority, application Japan, Nov. 14, 1995, 7-295139; Apr. 26, 1996, 8-107021

Int. Cl.^{6} G04B *1/00;19/00;* **G04C** *3/00*

U.S. Cl. 368—205 **10 Claims**



1. A display unit structure for an electronic device, comprising:

a solar cell, and

a display unit including a transparent base layer disposed on the solar cell, and a hologram layer laminated on the base layer and having a virtual mirror plane for reflecting a light with a predetermined wavelength, said virtual mirror plane of the hologram layer being inclined with respect to front and back surfaces of the hologram layer so that the light with the predetermined wavelength is reflected by the hologram layer and light other than the predetermined wavelength is transmitted to the solar cell through the hologram layer.

5,841,739
ACCESSING METHOD AND APPARATUS FOR USE IN HYBRID OPTICAL RECORDING DEVICE

Michihiko Iida, Kanagawa; Kazuhiro Watanabe, Tokyo, and Masanobu Nakamura, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

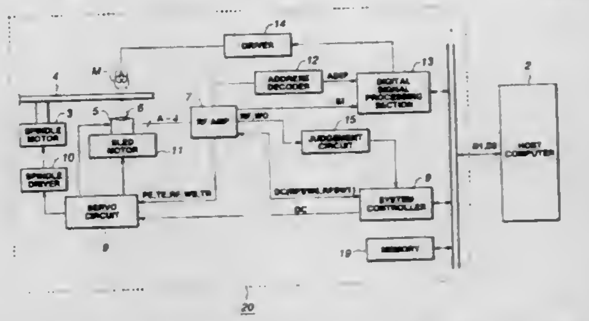
PCT No. PCT/JP96/00705, § 371 Date Feb. 26, 1997, § 102(e) Date Feb. 26, 1997, PCT Pub. No. WO96/29698, PCT Pub. Date Sep. 26, 1996

PCT Filed Mar. 18, 1996, Ser. No. 737,392

Claims priority, application Japan, Mar. 17, 1995, 7-084509

Int. Cl.^{6} G11B *17/22*

U.S. Cl. 369—32 **23 Claims**



1. A disc apparatus adapted for accessing a disc-shaped recording medium including recording tracks in a spiral form or in a concentrical form, the recording medium being such that the area thereon is divided, every predetermined position in a radial direction, into at least one reproduction only area and one recordable area, and that boundary recording track position information indicating a boundary recording track position between the reproduction only area and the recordable area which are adjacent to each other is recorded,

the apparatus comprising:

a head for providing an access to the disc-shaped recording medium;

head movement means for moving the head in the radial direction of the disc-shaped recording medium;

current position detecting means for detecting a recording track position that the head is accessing at present to output current position information indicating the current recording track position;

means for detecting the number of movement recording tracks, which is operative to detect, on the basis of target recording track position information indicating a target recording track position, the current position information and the boundary recording track position information, the number of movement recording tracks from the current recording track position up to the boundary recording track position when the boundary recording track position indicated by the boundary recording track position information exists between the current recording track position indicated by the current position information and the target recording track position indicated by the target recording track position information;

traverse signal generating means operative to generate, from a reproduction signal obtained by the head, a traverse signal of which signal level changes every time the head traverses the recording tracks at a first setting corresponding to the reproduction only area or a second setting corresponding to the recordable area selected on the basis of a switching signal when the head is being moved by the head movement means;

count means for counting, on the basis of the traverse signal, the number of recording tracks over which the head has been moved; and

switching signal generating means for outputting the switching signal to the traverse signal generating means on the basis of the number of movement recording tracks detected by the means for detecting the number of movement recording tracks and the number of recording tracks counted by the count means.

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5,841,740
APPARATUS FOR RECORDING AND REPRODUCING INFORMATION DATA USING RECORDING REGION DATA FOR REPRODUCTION WITH AUDIO AND VIDEO DATA

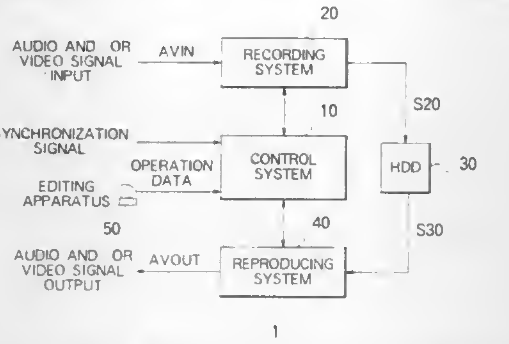
Horoyuki Fijita, and Norikazu Ito, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 5, 1996, Ser. No. 759,458

Claims priority, application Japan, Dec. 8, 1995, 7-320185; Dec. 8, 1995, 7-320186

Int. Cl.^{6} G11B *17/22*

U.S. Cl. 369—32 **9 Claims**



1. An information data recording and reproducing apparatus comprising:

an information data recording means for recording a plurality of series of information data in a randomly accessible recording medium;

a first recording region generating means for generating first recording region data showing the recording regions occupied by the plurality of series of information data in the recording medium; and

a combination reproducing means for reproducing by combination partial data which is part or all of the information data of stock data recorded in the recording medium,

the combination reproducing means having

a second recording region data generating means for generating second recording region data showing the recording regions occupied by the partial data to be reproduced by being combined in the recording medium based on the first recording region data of the stock data, and

a partial data reproducing means for reproducing the partial data from the recording medium based on the generated second recording region data.

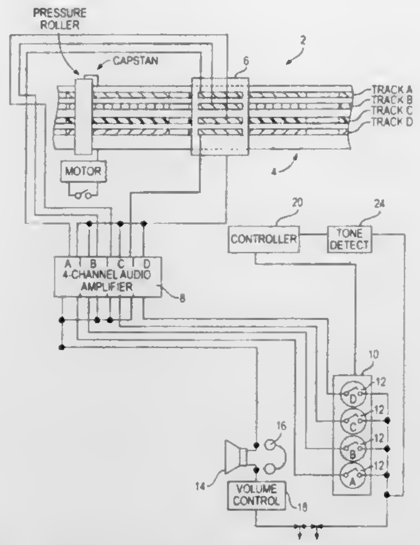
5,841,741
AUTOMATIC SEAMLESS BRANCHING STORY-TELLING APPARATUS

Michael J. Freeman, 1270 Avenue of the Americas, Suite 2401, New York, N.Y. 10020

Filed Apr. 14, 1997, Ser. No. 843,262

Int. Cl.^{6} G11B *17/22*

U.S. Cl. 369—33 **15 Claims**



1. A story-telling apparatus which comprises:

a storage media which comprises a plurality of temporally parallel data storage tracks containing story content, the story being stored on the temporally parallel data storage tracks in a plurality of temporally related information segments, each of the segments comprising a complete message reproducible in response to the selection of the track upon which the segments are stored, each of the information segments at any given time on a temporally parallel data storage track comprising information related in real-time and content to information contained in each information segment on each temporally parallel data storage track in an immediate prior time, the information stored on the temporally parallel data storage tracks in a predetermined timed sequence for providing story content varying dependent upon the temporally parallel data storage tracks selected during playback, the storage media further comprising random switching command codes for providing switching instructions to randomly switch between the temporally parallel data storage in order to provide random variation of the story content during playback thereof;

playback means for playing back the story content of a selected data storage track and for retrieving the random switching command codes from the storage media;

a code discriminator for identifying the random switching command codes retrieved from the storage media by the playback means;

a controller for receiving the random switching command codes from the code discriminator and for causing the playback means to select and playback a random one of the temporally parallel data storage tracks of the storage media in response to receiving a random switching command code, the playback means retrieving the information stored on the randomly selected temporally parallel data storage track to randomly vary the playback of the story content.

5,841,742
OPTICAL DISK UNIT USING A SINGLE DEMODULATOR CIRCUIT FOR DEMODULATING TWO DISK PLAYERS

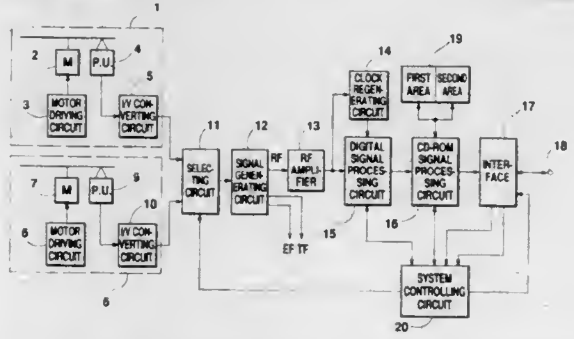
Akira Tsukihashi; Yutaka Kaneko, both of Ohra-gun; Takeshi Aoki, Ohta; Yoji Honda, Nitta-gun, and Takashi Iwasaki, Isesaki, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Jun. 24, 1997, Ser. No. 881,488

Claims priority, application Japan, Jul. 29, 1996, 8-199285

Int. Cl.^{6} G11B *17/22*

U.S. Cl. 369—33 **22 Claims**



1. A disc unit to read and play back signals digitally recorded on first and second discs, the disc unit comprising:

first and second disc drives for respectively reading first and second signals digitally recorded on the first and the second discs and outputting first and second read signals;

a selecting circuit connected to the first and second disc drives for switchably selecting one of the first and the second read signals from the first or the second disc drive;

a demodulator circuit for demodulating the first and the second read signals and for obtaining first and second demodulated data;

a memory for storing the first and the second demodulated data obtained by the demodulator circuit; and

a controlling circuit for controlling the selecting circuit in response to disc types being read from the first and second disc drives and in response to the amount of the first and the second demodulated data stored in the memory, the controlling circuit further controlling which of the first and the second demodulated data should be read from the memory depending on a command supplied from an external source.

5,841,743
OPTICAL DISK CHANGER SYSTEM AND METHOD OF MANAGING OPTICAL DISK CHANGER

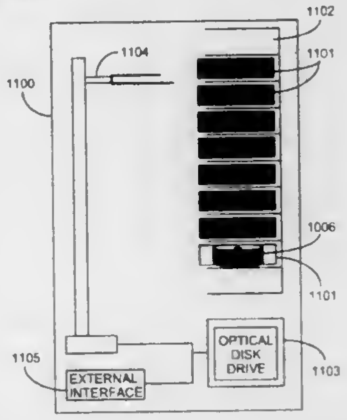
Susumu Kobayashi, Osakashi; Masaya Miyazaki, Ikedashi, and Masaki Horiuchi, Hirakatashi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Mar. 26, 1997, Ser. No. 825,019

Claims priority, application Japan, Mar. 29, 1996, 8-077010; Sep. 20, 1996, 8-249489

Int. Cl.^{6} G11B *17/22*

U.S. Cl. 369—34 **25 Claims**



1. An optical disk changer system comprising:

an optical disk changer including M magazines storing N optical disks (N, M: positive integers), where optical disks are inserted/extracted in each magazine and for managing data on a set of optical disks consisting of one or a plurality of optical disks as a volume having a series of logical addresses;

a volume management means including a volume management table for managing storage position information of optical disks constituting each volume and storage position information of unused optical disks and an unused optical disk management table for identifying storage position information of unused optical disks stored in each magazine and unused magazines storing N unused optical disks;

a volume creation information input means for receiving inputs of the number of optical disks or magazines to create the volume, and

a volume creation management means,

inquiring of the volume management means the storage position information of X unused optical disks to create a volume consisting of X optical disks when a positive integer X is input from the volume creation information input means as the number of the optical disks, and

inquiring of the volume management means storage position information of N×Z pieces of unused optical disks stored in Z pieces of unused magazines to create a volume consisting of N×Z pieces of optical disks stored in Z pieces of magazines, according to the number of unused magazines when the positive integer Z is input from the volume creation information input means as the number of magazines.

5,841,744
DEVICE FOR PLAYING, RECORDING, AND ISSUING DISCS

Wilhelm Menke; Boerge Heidersberger, and Ulrich Pitz, all of Bingen, Germany, assignors to NSM Aktiengesellschaft, Bingen, Germany

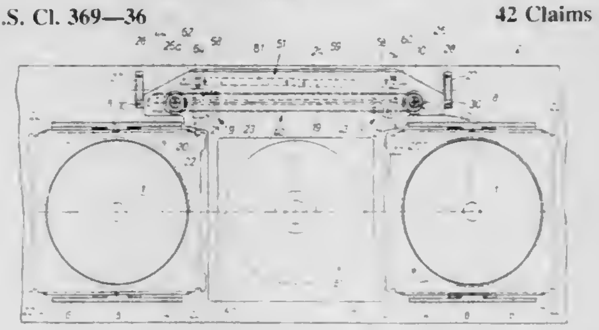
PCT No. PCT/DE95/00688, § 371 Date Nov. 25, 1996, § 102(e) Date Nov. 25, 1996, PCT Pub. No. WO95/32502, PCT Pub. Date Nov. 30, 1995

PCT Filed May 19, 1995, Ser. No. 737,786

Claims priority, application Germany, May 24, 1994, 44 18 116.7

Int. Cl.^{6} G11B *17/22;15/60*

U.S. Cl. 369—36 **42 Claims**



1. Playing and/or recording and/or issuing device for discs (**1**) configured as information carriers, particularly CDs, the device having

disc magazines (**4**) that are located opposite one another and receive disc holders (**7**) for at least one disc (**1**), the disc holders being located in horizontally superposed receiving compartments (**6**),

a computer-controlled transport device (**10**), disposed between the disc magazines (**4**), for selectively conveying a single disc holder (**7**), with the disc (**1**), back and forth between arbitrary receiving compartments (**6**), between a receiving compartment (**6**) and at least one running gear (**5**) for reading out or inputting information from or onto the disc (**1**), respectively, or between a receiving compartment (**6**) or running gear (**5**) and a disc loading and issuing slide (**11**), and

two extraction devices (**9**) for the disc holders (**7**), which devices can travel horizontally on the transport device (**10**),

characterized in that

the extraction devices (**9**) can simultaneously move in opposite directions relative to one another, crossing each other between a ready position (FIG. **10***a*) for extracting a disc holder (**7**) from the associated disc magazine (**4**) and a transport device position (FIG. **10***d*) for extracting a disc holder (**7**) from the transport device (**10**), wherein the extraction devices (**9**) alternatingly located in the ready position and the transport device position are able to be brought into a position in which they engage the disc holder (**7**).

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5,841,745

METHOD AND APPARATUS FOR ELIMINATING DISTURBANCES ENCOUNTERED DURING SCANNING OF AN INFORMATION CARRIER

Hans-Robert Kühn, St. Georgen, and Hartmut Richter, Villingen-Schwenningen, both of Germany, assignors to Deutsche Thomson-Brandt GmbH, Villingen-Schwennigen, Germany

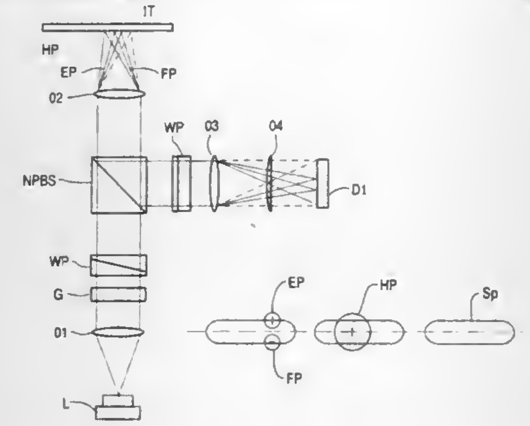
PCT No. PCT/EP94/00124, § 371 Date Dec. 2, 1996, § 102(e) Date Dec. 2, 1996, PCT Pub. No. WO94/17525, PCT Pub. Date Aug. 4, 1994

PCT Filed Jan. 19, 1994, Ser. No. 481,456

Claims priority, application Germany, Jan. 23, 1993, 43 01 827.0

Int. Cl.^{6} G11B *7/00*

U.S. Cl. 369—44.23 **7 Claims**



1. Method of scanning an optical information carrier having a scanning device which operates in accordance with the three-beam principle and which includes a beam splitting grating, lenses, beam deflection means and means for the difference formation of auxiliary light spot signals, said method comprising the steps of:

using the beam deflection means for providing auxiliary beams on the radius of a track of the information carrier, the auxiliary beams impinging in a side by side grouping on the track, the grouping being positioned ahead of a main light spot, forming a tracking error signal by difference formation to overcome disturbances in tracking, and eliminating disturbances by difference formation of auxiliary light spot signals produced by detectors reflecting the auxiliary beams.

5,841,746

APPARATUS FOR SCANNING AN OPTICALLY READABLE RECORD CARRIER

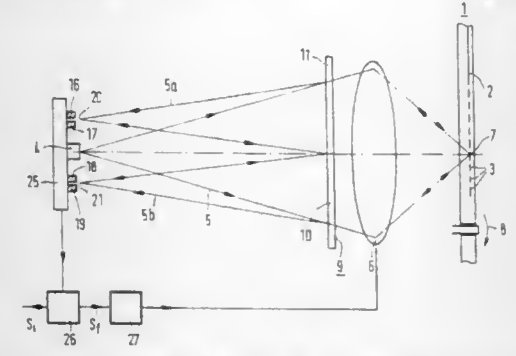
Josephus J. M. Braat, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 13, 1996, Ser. No. 764,189

Claims priority, application European Pat. Off., Dec. 27, 1995, 95203642

Int. Cl.^{6} G11B *7/09*

U.S. Cl. 369—44.35 **4 Claims**



1. Device for optically scanning an information layer on which information is stored, which device comprises a radiation source, an objective system for converging radiation emitted by the radiation source upon the information layer, a radiation-sensitive detection system arranged in the path of a radiation beam from the information layer for providing detector signals, and a first electronic circuit for forming a first focus error signal and a second focus error signal from the detector signals, characterized in that the first electronic circuit comprises a high-pass filter for filtering at least one of the detector signals such that high-frequency components of the detector signals are used to form the first focus error signal, in that the first electronic circuit also comprises at least one low-pass filter for filtering said at least one of the detector signals such that low-frequency components of the detector signals are used to form the second focus error signal, and in that the device includes a second electronic circuit for providing a control signal for controlling focus of the converging radiation, the control signal being: the first focus error signal when the converging radiation is close to focused upon the information layer; the second focus error signal when the converging radiation is far from focused upon the information layer; and a combination of the first and second focus error signals therebetween.

5,841,747

OPTICAL DISK DEVICE AND METHOD FOR SETTING RECORDING POWER AND ERASING POWER

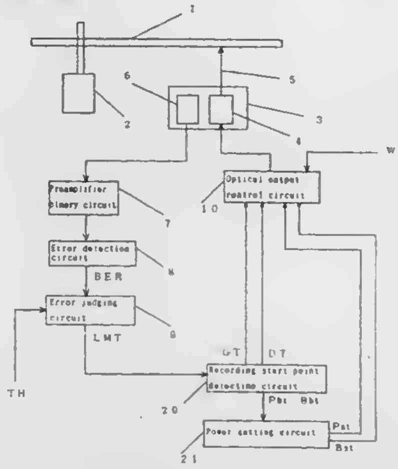
Shinji Kubota, Daito; Masatsugu Tanji, Mirakata, and Wataru Masuda, Kirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Aug. 21, 1996, Ser. No. 697,236

Claims priority, application Japan, Aug. 22, 1995, 7-213206; Apr. 18, 1996, 8-096508; May 17, 1996, 8-148107

Int. Cl.^{6} G11B *7/00*

U.S. Cl. 369—54 **24 Claims**



1. An optical disk device for recording and reproducing a signal using an optical disk, comprising:

an optical output control circuit for switching an optical output among a reproducing power, an erasing power, and a recording power; and

a recording start point detection circuit for detecting a recording power and an erasing power at a recording start point obtained by effecting a first cycle recording and thereafter at least a second cycle recording over the same area as said first cycle recording.

5,841,748

OPTICAL DISK DEVICE AND REPLACEMENT PROCESSING METHOD

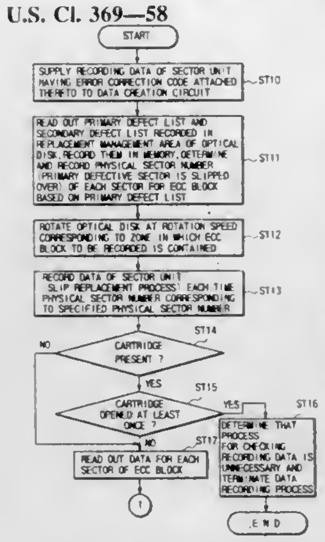
Mikio Yamamuro, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 24, 1997, Ser. No. 822,712

Claims priority, application Japan, Mar. 25, 1996, 8-068532

Int. Cl.^{6} G11B *7/00*

U.S. Cl. 369—58 **33 Claims**


START
SUPPLY RECORDING DATA OF SECTOR UNIT HAVING ERROR CORRECTION CODE ATTACHED THERETO TO DATA CREATION CIRCUIT
ST10
READ OUT PRIMARY DEFECT LIST AND SECONDARY DEFECT LIST RECORDED IN REPLACEMENT MANAGEMENT AREA OF OPTICAL DISK, RECORD THEM IN MEMORY, DETERMINE AND RECORD PHYSICAL SECTOR NUMBER (PRIMARY DEFECTIVE SECTOR IS SLIPPED OVER) OF EACH SECTOR FOR ECC BLOCK BASED ON PRIMARY DEFECT LIST
ST11
ROTATE OPTICAL DISK AT ROTATION SPEED CORRESPONDING TO ZONE IN WHICH ECC BLOCK TO BE RECORDED IS CONTAINED
ST12
RECORD DATA OF SECTOR UNIT (SLIP REPLACEMENT PROCESS) EACH TIME PHYSICAL SECTOR NUMBER CORRESPONDING TO SPECIFIED PHYSICAL SECTOR NUMBER
ST13
ST14
NO
CARTRIDGE PRESENT ?
YES
ST15
CARTRIDGE OPENED AT LEAST ONCE ?
YES
ST16
NO
ST17
READ OUT DATA FOR EACH SECTOR OF ECC BLOCK
DETERMINE THAT PROCESS FOR CHECKING RECORDING DATA IS UNNECESSARY AND TERMINATE DATA RECORDING PROCESS
1
END
1
REPRODUCE PHYSICAL SECTOR NUMBERS RECORDED IN HEAD PORTIONS OF SECTORS SUBJECTED RECORDING OPERATION, AND DEMODULATE AND REPRODUCE IN DATA FIELDS OF SECTORS
ST18
DETERMINE OCCURRENCE OF SECONDARY DEFECT AND DETERMINE IT AS OBJECT OF LINEAR REPLACEMENT PROCESS
ST19
LINEAR REPLACEMENT PROCESS
ST20
UPDATE AND RECORD PHYSICAL SECTOR NUMBER (ADDRESS OF DEFECTIVE BLOCK) OF FIRST SECTOR OF DEFECTIVE BLOCK AND PHYSICAL SECTOR NUMBER (ADDRESS OF REPLACEMENT BLOCK) OF FIRST SECTOR OF REPLACEMENT ECC BLOCK IN SECONDARY DEFECT LIST OF MEMORY AND TERMINATE DATA RECORDING OPERATION
ST21
END

1. A replacement processing method for an optical disk, the optical disk having tracks arranged in a concentric or spiral form for recording data using a format having a plurality of successive sector areas, each sector area having a preset track length and including an address field for recording physical address data indicating a physical position on the track and a recording field for recording a recording data and a logical address data indicating a logical position, wherein the recording data and logical data are recorded on the optical disk in units of one block area, each block area containing a preset number of sector areas among said plurality of sector areas and including an error correction data recording area in which error correction data items used for reproducing data recorded in said preset number of sector areas are collectively recorded, the method comprising:

detecting a defective sector area on said optical disk;

skipping the defective sector area in units of one sector area; and

recording the logical address data, the recording data and the error correction data into a next sector area where the logical address data, the recording data and the error correction data for a plurality of sector areas, in units of one block area, are recorded in order into said plurality of sector areas to which the physical address data on said optical disk are attached.

5,841,749

METHOD FOR RECORDING (SENDING) /REPRODUCING (RECEIVING) DATA, APPARATUS THEREOF AND DATA RECORDING MEDIUM

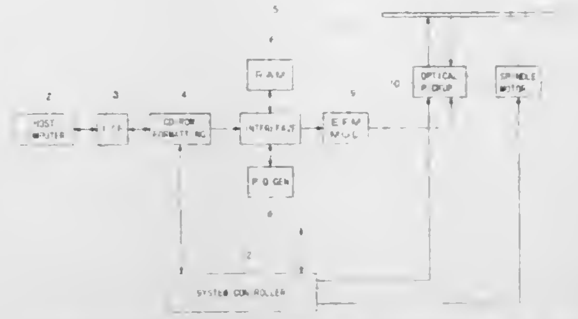
Yoichiro Sako, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 24, 1996, Ser. No. 719,181

Claims priority, application Japan, Sep. 28, 1995, 7-274846

Int. Cl.^{6} G11B *7/00*

U.S. Cl. 369—59 **12 Claims**



1. A data recording apparatus for recording groups of a predetermined number of frames on a record medium, each group including information data and sub-codes corresponding to the information data of the group, the data recording apparatus comprising:

encoding and interleaving means for encoding at least a plurality of the groups of frames with an error encoding code and for forming encoded interleaved frames by interleaving the error encoding code within said plurality of groups of frames at an interleaving length that is an integer multiple, greater than one, of the predetermined number; and

recording means for recording the encoded interleaved frames on the record medium.

5,841,750

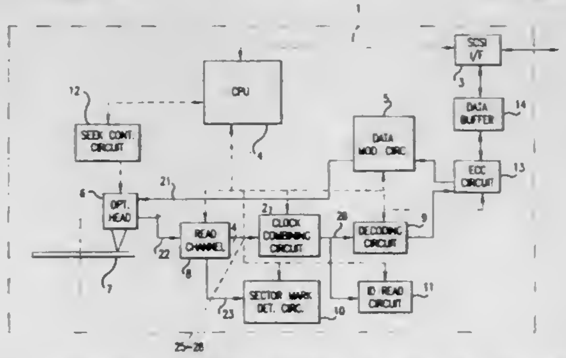
INFORMATION PLAYBACK APPARATUS

Shiro Suzuki, Zama; Isao Kimura, Tokyo, both of Japan, and Daniel Wu, Cerritos, Calif., assignors to Asahi Kasei Microsystems Co., Ltd., and Nikon Corporation, both of Tokyo, Japan

Filed Apr. 17, 1997, Ser. No. 842,887

Int. Cl.^{6} G11B *7/00*

U.S. Cl. 369—59 **35 Claims**



1. An information playback apparatus that plays back user data from a recording medium, the information playback apparatus including a clock combining circuit comprising:

(a) a FIFO circuit that accepts:

(i) a first-edge playback signal that has as data first edges of a playback signal obtained from recording domains formed in the recording medium, the first-edge playback signal being synchronized to a first-edge clock signal; and

(ii) a second-edge playback signal that has as data second edges of the playback signal, the second-edge playback signal being synchronized to a second-edge clock signal; the FIFO circuit causing the first-edge playback signal and the second-edge playback signal to be synchronized to the first-edge clock signal so as to output a delayed first-edge playback signal and a delayed second-edge playback signal, the delayed second-edge playback signal being delayed by −KT to +LT, where K and L are integers and T is the clock period;

(b) a signal combining circuit that combines the delayed first-edge playback signal and the delayed second-edge playback signal and outputs (K+L+1) combined signals; and

(c) a signal selecting circuit that detects marks in the playback signal, the marks being independent of the (K+L+1) combined signals, and outputs selected ones of the combined signals based on the detected marks.

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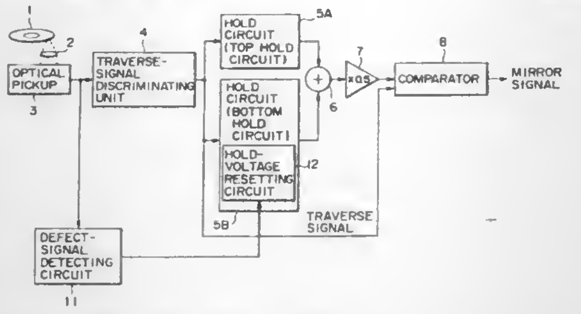
5,841,751
RECORDING-MEDIUM DRIVING APPARATUS AND RECORDING-MEDIUM DRIVING METHOD WITH PLAYBACK SIGNAL DEFECT DETECTOR

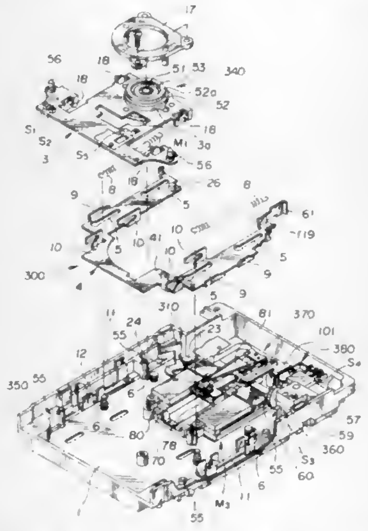
Takahiro Komazaki, and Keiichi Tsutsui, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed May 19, 1997, Ser. No. 859,459
Claims priority, application Japan, May 22, 1996, 8-126694
Int. Cl.^{6} G11B *7/00*
U.S. Cl. 369—59 **9 Claims**


1
2
OPTICAL PICKUP
3
4
TRAVERSE-SIGNAL DISCRIMINATING UNIT
HOLD CIRCUIT (TOP HOLD CIRCUIT)
5A
HOLD CIRCUIT (BOTTOM HOLD CIRCUIT)
HOLD-VOLTAGE RESETTING CIRCUIT
12
5B
6
7
×0.5
8
COMPARATOR
MIRROR SIGNAL
TRAVERSE SIGNAL
DEFECT-SIGNAL DETECTING CIRCUIT
11

1. A recording-medium driving apparatus for driving a recording medium, said apparatus comprising:
- a playback means for reproducing a playback signal from said recording medium;
- a low-frequency-component detecting means for detecting a low-frequency component out of said playback signal;
- a hold means for holding said low-frequency component;
- a binary conversion means for converting said low-frequency component by using a signal output by said hold means into a binary signal;
- a defect detecting means for detecting a defect in said playback signal; and
- a reset means for resetting said hold means in response to a signal output by said defect detecting means.

5,841,752
DISC DRIVE UNIT

Kiyoshi Ohmori; Sunao Aoki, both of Kanagawa; Takeshi Funahashi, Saitama, and Yoshikatsu Niwa, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Aug. 9, 1995, Ser. No. 512,889
Claims priority, application Japan, Aug. 11, 1994, 6-189185
Int. Cl.^{6} G11B *33/02;17/04*
U.S. Cl. 369—75.2 **10 Claims**

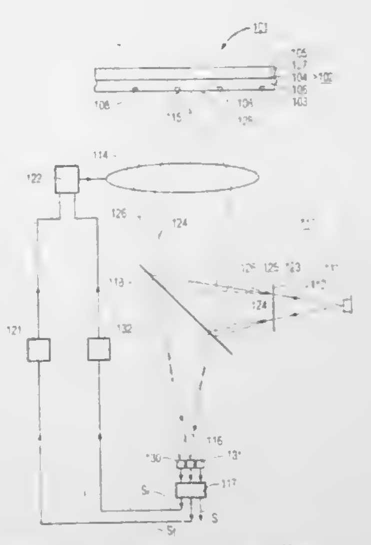


1. A disc driving apparatus for driving a disc recording medium accommodated in a disc cassette, said apparatus comprising:
- a chassis:
- a cassette holder having an upper wall section and a lower wall section spaced apart from said upper wall section by a distance slightly greater than a thickness of said disc recording medium, and being moveable up and down between an upper position and a lower position with respect to said chassis, and the disc cassette being injectable into and ejectable from an internal space defined between said upper and lower wall sections, said cassette holder having one of a first guide pin and a first guide surface;
- a disc rotating mechanism provided to be moveable up and down between an upper position and a lower position with respect to said chassis, and being chucked with said disc recording medium accommodated in said disc cassette at said upper position, for rotatively driving said disc recording medium, said disc rotating mechanism having one of a second guide pin and a second guide surface;
- height-level positioning members fixedly attached to said chassis so that at least an upper end of each of said height-level positioning members is located at a higher level than said lower wall section of said cassette holder, said upper ends of said positioning members define a non-movable reference plane relative to said chassis to support a bottom surface of the disc cassette thereon when said cassette holder is held at its lower position; and
- moving means for simultaneously moving said cassette holder from its upper position to its lower position and for shifting said disc rotating mechanism from its lower position to its upper position, during loading of said disc cassette, said moving means including a slide plate that is slideably mounted to said chassis, said slide plate having the other one of the first guide pin and first guide surface, and having the other one of the second guide pin and the second guide surface, wherein when said slide plate slides relative to said chassis from a first position to a second position, said first guide pin slides along said first guide surface to move said cassette holder from its upper position to its lower position, and said second guide pin slides along said second guide surface to shift said disc rotating mechanism from its lower position to its upper position.

5,841,753
MULTI-LAYER INFORMATION STORAGE SYSTEM WITH IMPROVED ABERRATION CORRECTION

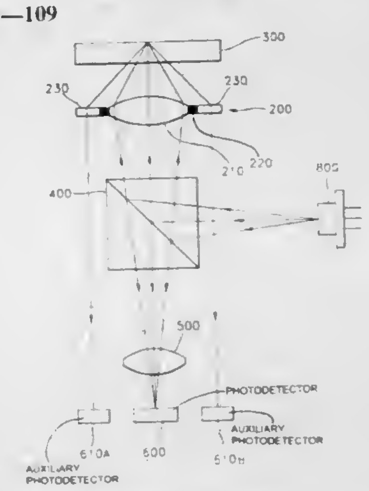
Antonius H. M. Holtslag; Derk Visser; Peter Coops, and Jacobus P. J. Heemskerk, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Division of Ser. No. 299,861, Sep. 1, 1994, Pat. No. 5,677,903, which is a continuation-in-part of Ser. No. 674,493, Mar. 25, 1991, Pat. No. 5,408,453. This application May 21, 1997, Ser. No. 861,351
Claims priority, application Netherlands, Dec. 21, 1990, 9002841; European Pat. Off., Aug. 23, 1994, 94202416
Int. Cl.^{6} G11B *7/00*
U.S. Cl. 369—94 **3 Claims**

1. An information storage system comprising an optical record carrier having a stack of information layers alternating with spacer layers,
- and a device for scanning the information layers, which device is provided with a radiation source and focusing means for selectively focusing a radiation beam from the radiation source on the separate information layers, and a focus servosystem,
- characterized in that the thickness of each spacer layer ranges between 1.5 and 4 times the refractive index of the spacer layer multiplied by the peak-to-peak distance of the S-curve of the focus servosystem.



5,841,754
OPTICAL PICKUP DEVICE HAVING AN OBJECTIVE LENS AND AUXILIARY LENSES EXTERIOR THEREOF

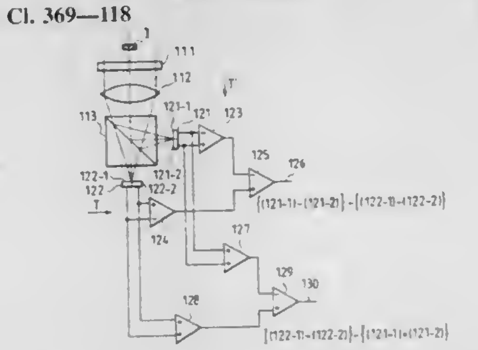
Chul-woo Lee, and Jang-hoon Yoo, both of Seoul, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Seoul, Rep. of Korea
Filed Dec. 23, 1996, Ser. No. 772,362
Claims priority, application Rep. of Korea, Dec. 22, 1995, 1995-54738
Int. Cl.^{6} G11B *7/00*
U.S. Cl. 369—109 **52 Claims**



1. An optical pickup device comprising:
- an objective lens unit having an objective lens facing a disc and having a predetermined effective diameter and at least two auxiliary lenses provided at exterior sides of said objective lens for directing 1st-order diffracted light of reflected incident light from the disc to a first light path different from a second light path of the incident light passing through said objective lens;
- a light source for irradiating the incident light onto the disc through said objective lens;
- a light splitter interposed between said light source and said objective lens for directing zero-order light of the incident light reflected from the disc to a third light path different from the second light path of the incident light from said light source;
- a photodetector for detecting the zero-order light reflected from the disc and traveling via said light splitter; and
- at least two diffracted light detectors for detecting the 1st-order diffracted light incident from said auxiliary lenses, respectively.

5,841,755
MAGNETOOPTICAL INFORMATION RECORDING AND REPRODUCING APPARATUS WHICH REPRODUCES INFORMATION BY DETECTING ONLY PORTIONS OF LIGHT FROM A RECORDING MEDIUM NOT SHIELDED BY A SHIELDING DEVICE

Masakuni Yamamoto, Yamato; Susumu Matsumura, Kawaguchi; Hiroaki Hoshi, Yokohama, and Eiji Yamaguchi, Zama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 138,118, Oct. 10, 1993, abandoned. This application Mar. 7, 1996, Ser. No. 612,504
Claims priority, application Japan, Oct. 21, 1992, 4-305907
Int. Cl.^{6} G11B *7/00*
U.S. Cl. 369—118 **9 Claims**



1. A magnetooptical information recording and reproducing apparatus comprising:
- radiating means for radiating a spot light beam onto a track containing information on information pits on a magnetooptical recording medium having a plurality of tracks;
- applying means for applying a predetermined magnetic field to the recording medium;
- shielding means for shielding a central portion of the light beam from the recording medium, said shielding means having a band-like shielding plate corresponding to a direction perpendicular to the tracks of the recording medium; and
- reproducing means for reproducing the information from the information containing track, radiated with the spot light beam, by detecting only portions of the light beam other than the central portion shielded by said shielding means, and by detecting a boundary of an information pit on the recording medium.

5,841,756
CARTRIDGE AUTO-CHANGER CAPABLE OF INTERCHANGING A CARTRIDGE

Makoto Shihoh, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 26, 1996, Ser. No. 638,502
Claims priority, application Japan, May 1, 1995, 7-107478; May 1, 1995, 7-107484
Int. Cl.^{6} G11B *15/68*
U.S. Cl. 369—192 **3 Claims**

1. A cartridge auto-changer including:
- a containing shelf containing a plurality of cartridges therein:
- a recording-reproducing apparatus for effecting recording and/or reproduction on recording media in said cartridges;
- a slot for loading said cartridges therethrough from the outside of said auto-changer into said auto-changer;
- conveying means for conveying said cartridges between said containing shelf and said recording-reproducing apparatus and

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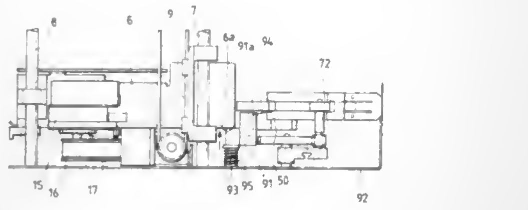
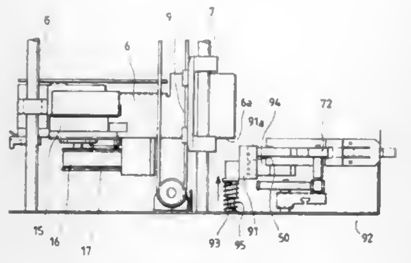




between said slot and said recording-reproducing apparatus, said conveying means being movable along said containing shelf;

stopping means for stopping a cartridge inserted through said slot on a conveyance route between said slot and a receiving position of said conveying means for said cartridges, wherein said stopping means includes a stopper adapted to be movable in a direction parallel to a moving direction of said conveying means and a direction perpendicular to an insertion direction of a cartridge into said slot; and

biasing means for biasing said stopper to a position on the conveyance route for hampering movement of the cartridge inserted through said slot when said stopper is parallel moved in the same direction as the moving direction with a biasing force of said biasing means,

wherein, when said conveying means is moved to a position corresponding to said slot, the bottom portion of the conveying means presses the stopper against the force of the biasing means and delivery of the cartridge inserted through said slot to said conveying means is permitted.

5,841,757
OPTICAL DISK HAVING A LARGE STORAGE CAPACITY

Hideharu Takeshima, Kanagawa; Hidemi Yoshida, Okayama, and Chiga Ueda, Kanagawa, all of Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Filed May 23, 1997, Ser. No. 862,386

Claims priority, application Japan, May 24, 1996, 8-153351; Apr. 7, 1997, 9-088142; Apr. 15, 1997, 9-097068

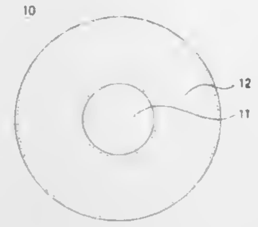
Int. Cl.⁶ G11B *7/24*

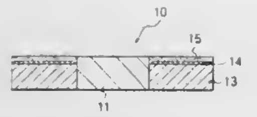
U.S. Cl. 369—275.3 **25 Claims**

1. An optical disk comprising a substrate and a recording layer formed on said substrate, said recording layer defining a data area divided into a plurality of ring-shaped zones, said zones including an innermost first zone through an outermost Mth zone arranged concentrically with each other, each of said zones including a plurality of physical tracks each divided into a plurality of sectors in the direction along the physical track, the improvement wherein a number N(k+1) of sectors per physical track in (k+1)th zone is expressed in terms of number N(k) of sectors per physical track in kth zone by the following relation:

for $k=1$ to $k=k_1-1$, $N(k+1)=N(k)+L$; and

for $k=k_1$ to $k=M-1$, $N(k+1)\leqq N(k)+L$ provided that $N(k+1)<N(k)+L$ holds for at least one of k's between K_1 and $M-1$,





wherein L is a fixed integer and K_1th zone resides in the vicinity of said Mth zone.

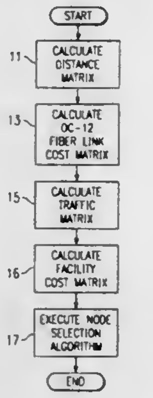
5,841,758
METHOD OF OPTIMALLY PLACING CONCENTRATOR SWITCHES IN A NETWORK

Cheng C. Chen, Carrollton, and David G. Way, Garland, both of Tex., assignors to MCI Communications Corporation, Washington, D.C.

Filed Dec. 27, 1996, Ser. No. 777,303

Int. Cl.⁶ H04J *11/00*

U.S. Cl. 370—238 **17 Claims**


START
11
CALCULATE DISTANCE MATRIX
13
CALCULATE OC-12 FIBER LINK COST MATRIX
15
CALCULATE TRAFFIC MATRIX
16
CALCULATE FACILITY COST MATRIX
17
EXECUTE NODE SELECTION ALGORITHM
END

1. A method of locating concentrator switches in an existing network including a plurality of sites interconnected by existing links so as to minimize total network cost in terms of transmission cost, equipment cost, and facility cost, said transmission cost including the cost of the links, said equipment cost including the cost per port of said concentrator switches, and said facility cost including the cost to install a concentrator switch at a location, said method comprising the computer implemented steps of:

(a) assigning to each site j an initial factor λ_j;

(b) selecting from said sites a set of core nodes j such that the facility cost v_j for each selected core node j is less than the factor λ_j for the site multiplied by the number of ports k_1 in a concentrator switch, thereby forming a set of remaining source nodes i;

(c) homing each one of the source nodes i to a single selected core node j such that the cost to connect a source node i to a selected core node j plus the factor λ_j for the selected core node j multiplied by the traffic a_i from said source node i is a minimum;

(d) calculating an upper bound and a lower bound for the cost of the network configured according to steps (b) and (c);

(e) adjusting the factor λ_j for each site j and repeating steps (b) through (d) until the difference between the upper bound and the lower bound is less than a preselected amount.

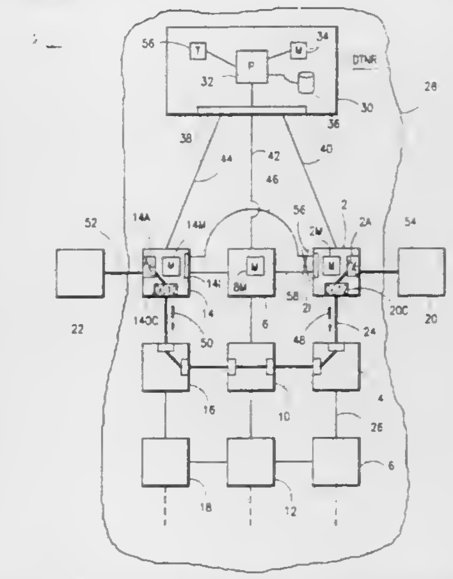
5,841,759
AUTOMATED PATH VERIFICATION FOR SHIN-BASED RESTORATION

Will Russ, Dallas, and Mark Wayne Sees, Plano, both of Tex., assignors to MCI Communications Corporation, Washington, D.C.

Continuation of Ser. No. 483,525, Jun. 7, 1995. This application Jan. 13, 1997, Ser. No. 781,495

Int. Cl.⁶ H04J *3/14*

U.S. Cl. 370—221 **11 Claims**



6. In a telecommunications network, a method of verifying the integrity of a communications path connecting two end nodes, comprising the steps of:

a) interfacing communication with each of said end nodes;

b) retrieving periodically from said each end nodes a path verification message said each end node sent to the other of said end nodes;

c) storing the path verification messages retrieved from said end nodes;

wherein after a fault has occurred to the communications path connecting said end nodes and an alternate communications path has allegedly been established to reconnect said end nodes,

d) retrieving from said each end node the path verification message sent to the other of said end nodes;

e) comparing the path verification messages retrieved from said end nodes subsequent to the establishment of said alternate communications path with the path verification messages retrieved from said end nodes stored just prior to said fault; and

f) verifying the integrity of said alternate communications path if no differences exist between the path verification messages of said end nodes stored prior to said fault and the path verification messages retrieved from said end nodes after the establishment of said alternate communications path.

5,841,760
TRANSPARENT MULTIPLEXER/DEMULTIPLEXER

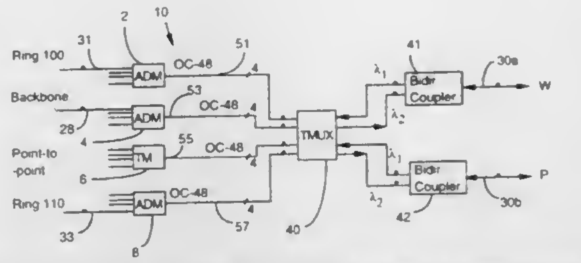
David Wright Martin, Nepean; Mohammed Ismael Tatar; Alan Glen Solheim, both of Kanata; Timothy James Armstrong, Stittsville; Mark Stephen Wight, Ottawa; Ronald J. Gagnon, Nepean, and David John Nicholson, Ottawa, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 24, 1997, Ser. No. 847,526

Int. Cl.⁶ H04J *1/16*

U.S. Cl. 370—242 **26 Claims**

1. A transparent multiplexer/demultiplexer (T-Mux) for transparently transporting a plurality (K) of trib signals between a first and a second site over a high rate span, each trib signal travelling on a corresponding trib network, comprising:



a multi-channel receiver for receiving a plurality of forward trib signals and delineating each said forward trib input signal into a forward trib data signal and a forward trib operation, administration, maintenance and provisioning (OAM&P) signal;

means for multiplexing all said forward trib data signals into a forward supercarrier data signal;

means for processing all said forward trib OAM&P signals and generating a forward supercarrier OAM&P signal; and

a supercarrier transmitter for mapping said forward supercarrier data signal and said forward supercarrier OAM&P signal into a forward supercarrier signal and transmitting same over said high rate span, where K is an integer selected according to the rate of each said tributary signal and the rate of said supercarrier signal.

5,841,761
SYSTEM FOR DETECTING A CONNECTION STATE BETWEEN TWO NODES IN A DIGITAL COMMUNICATION NETWORK

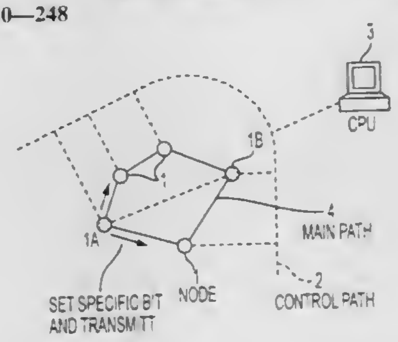
Hiroyuki Kawakami, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 13, 1995, Ser. No. 571,712

Claims priority, application Japan, Dec. 13, 1994, 6-309168

Int. Cl.⁶ H04J *3/14*

U.S. Cl. 370—248 **14 Claims**



1. A system for detecting a connection state between nodes in a digital communication network comprising:

a plurality of nodes for transmitting and receiving digital signals, each of said nodes having at least one port, and a plurality of transmission paths for connecting said nodes to each other, said transmission paths carrying digital signals, each node configured to relay said digital signals which arrive at a first port of said node to another port of said node;

said system further comprising a means for setting a transmit value of a specific bit of a transmitting digital signal;

each of said nodes having a detector for detecting a received value of said specific bit of a received digital signal, the received value of said specific bit being indicative of whether a transmission path connection exists between one of said nodes and another of said nodes; and

a CPU including a means for accessing each of said plurality of nodes to set the transmit value of the specific bit of a transmitting digital signal.

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5,841,762

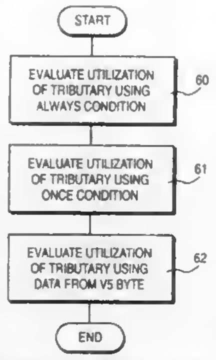
MONITORING A SYNCHRONOUS DIGITAL HIERARCHY TRANSMISSION PATH

Paul Christian Hershey, Manassas, Va., assignor to British Telecommunications public limited company, London, England

Filed Mar. 29, 1996, Ser. No. 624,298

Int. Cl.^{6} H04J *3/14*

U.S. Cl. 370—252 **9 Claims**


START
EVALUATE UTILIZATION OF TRIBUTARY USING ALWAYS CONDITION
60
EVALUATE UTILIZATION OF TRIBUTARY USING ONCE CONDITION
61
EVALUATE UTILIZATION OF TRIBUTARY USING DATA FROM V5 BYTE
62
END

1. A method of operating a utilisation monitoring system for monitoring utilisation of a tributary to a main synchronous digital hierarchy (SDH) transmission path, said main transmission path being arranged to transport a series of data frames each of which contains at least one virtual container, each virtual container having a path overhead and a payload, said tributary joining the main transmission path at a multiplexer which is arranged to load a data signal from said tributary into virtual containers in said frames which are reserved for carrying a data signal from said tributary, said method comprising the steps of:

examining virtual containers reserved for carrying a data signal from said tributary at a point on said main transmission path for the presence of a predetermined bit pattern; and

evaluating a parameter U indicative of the utilisation of said tributary from the results of said examining step,

wherein in said evaluating step, said parameter U is evaluated for each one of a series of measurement periods in accordance with the following equation:

$$U=(1-I),$$

where

$I=P/Q$

P=number of virtual containers examined in the measurement period having said bit pattern

Q=total number of virtual containers examined in the measurement period.

5,841,763

AUDIO-VIDEO CONFERENCING SYSTEM

Arthur P. Leondires, Mount Vernon; Bruce S. Allen, East Kingston; Marshall B. Garrison, Derry, all of N.H., and Philip J. Baun, Jr., Andover, Mass., assignors to MultiLink, Inc., Andover, Mass.

Filed Jun. 13, 1995, Ser. No. 489,742

Int. Cl.^{6} H04L *12/16;* **H04Q** *11/00*

U.S. Cl. 370—260 **62 Claims**

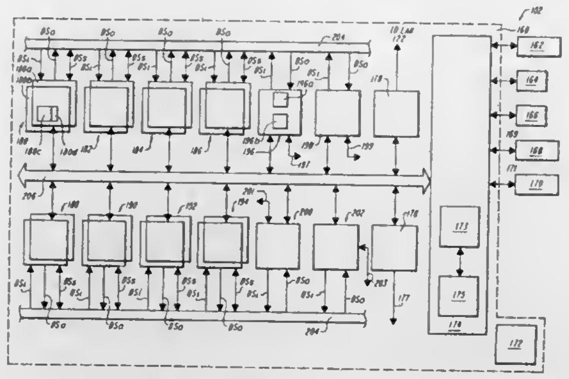
1. A processor unit for a multipoint audio-video conferencing system, said processor unit comprising:

a host processor for controlling operation of said audio-video conferencing system, wherein said operation includes performing a plurality of functions associated with servicing each of a plurality of communications connections, each of said connections being between a conferee terminal and the audio-video conferencing system; and

a plurality of digital signal processors in communication with each other over a first bus and in communication with and controlled by said host processor over a second bus,

wherein each digital signal processor includes associated configuration means for adaptively configuring each selected digital signal processor to perform processing required by a selected one of said functions associated with servicing said plurality of communications connections, and

wherein said processing required by said plurality of functions associated with servicing said plurality of communications connections is distributed among said plurality of digital signal processors.



5,841,764

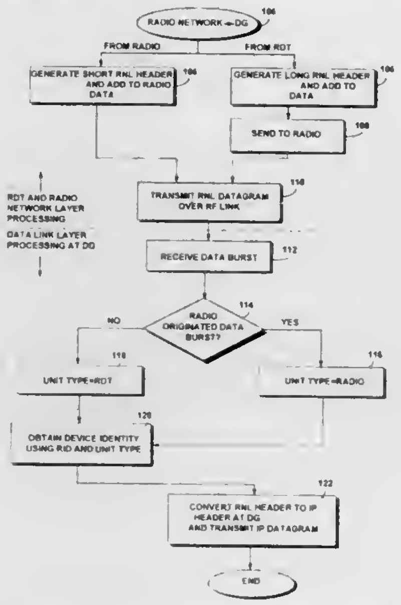
METHOD AND APPARATUS FOR PERMITTING A RADIO TO ORIGINATE AND RECEIVE DATA MESSAGES IN A DATA COMMUNICATIONS NETWORK

William J. Roderique, Lynchburg; Philip M. Hoge, Forest, and George M. Autry, IV, Lynchburg, all of Va., assignors to Ericsson Inc., Research Triangle Park, N.C.

Filed Oct. 30, 1995, Ser. No. 550,397

Int. Cl.^{6} H04L *12/66*

U.S. Cl. 370—310 **16 Claims**


RADIO NETWORK ⇌ DG
104
FROM RADIO
FROM RDT
GENERATE SHORT RNL HEADER AND ADD TO RADIO DATA
106
GENERATE LONG RNL HEADER AND ADD TO DATA
106
SEND TO RADIO
108
RDT AND RADIO NETWORK LAYER PROCESSING
DATA LINK LAYER PROCESSING AT DG
TRANSMIT RNL DATAGRAM OVER RF LINK
110
RECEIVE DATA BURST
112
RADIO ORIGINATED DATA BURST?
114
NO
YES
118
116
UNIT TYPE=RDT
UNIT TYPE=RADIO
120
OBTAIN DEVICE IDENTITY USING RID AND UNIT TYPE
122
CONVERT RNL HEADER TO IP HEADER AT DG AND TRANSMIT IP DATAGRAM
END

14. In a communications system permitting data communications between a first data processor associated with a computer communications network and a radio associated with a radio communications network and between the first data processor and a data processing terminal connected to the radio to transfer packets of information, each packet including a header and a message, a method comprising the steps of:

determining whether a message originates from the radio or the data processing terminal connected to the radio;

if the message originates from the radio, generating a short radio network header, adding the short radio network header to the message thereby generating a radio-originated datagram, and transmitting the radio-originated datagram over a radio link; and

if the message originates from the data processing terminal connected to the radio, generating a long radio network header longer than the short radio network header, adding the long radio network header to the message, thereby generating a terminal-originated datagram, and transmitting the terminal-originated datagram over the radio link.

5,841,765

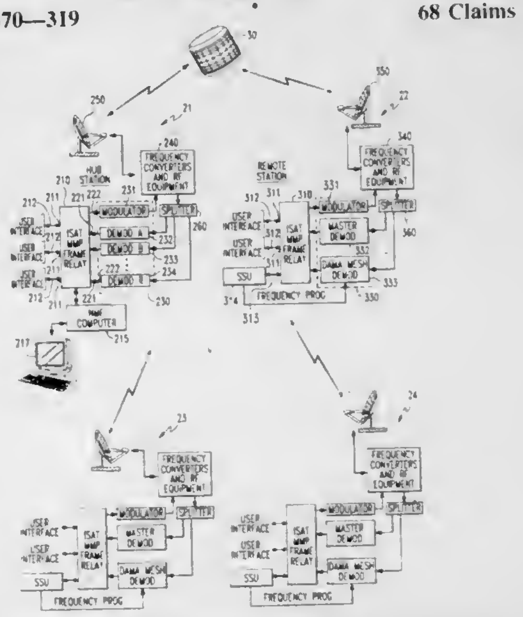
DEMAND-BASED CONNECTION MANAGEMENT INTEGRATED SERVICES ACCESS TERMINAL (ISAT) FOR SATELLITE COMMUNICATION SYSTEM

Dennis E. Fielding, Indialantic; Todd W. Gross, Palm Bay, and John P. Arnold, Melbourne, all of Fla., assignors to Skydata, Inc., West Melbourne, Fla.

Filed Oct. 10, 1996, Ser. No. 728,636

Int. Cl.^{6} H04B *7/208*

U.S. Cl. 370—319 **68 Claims**



1. A method of providing communication connectivity between any two of a plurality of geographically distributed terminal devices by way a satellite communication network having a communication satellite comprising the steps of:

(a) providing a plurality of geographically distributed earth stations, each earth station having a frame relay protocol-based switch for interfacing message signals between terminal devices served by said each earth station and a modulator and demodulators employed by said each earth station, said modulator having a transmission carrier frequency associated with said each earth station;

(b) coupling said modulator to an uplink port of the frame relay protocol-based switch of said each earth station;

(c) installing at one of said earth stations, termed a hub station, a plurality of demodulators, each of which is operative to demodulate messages modulated on carrier frequencies transmitted from other earth stations, termed remote stations, and coupling respective ones of said plurality of demodulators to respectively different downlink ports of the frame relay protocol-based switch of said hub station;

(d) at each remote station, installing a tunable demodulator which is operative to demodulate messages modulated on a carrier frequency transmitted from another earth station, and coupling said tunable demodulator to a downlink port of the frame relay protocol-based switch of said each remote station;

(e) in response to a request from a terminal device coupled to an originating remote station of said remote stations for communication connectivity with a terminal device coupled to a destination remote station of said remote stations, causing the modulator of said originating remote station to transmit a communication connectivity request message to said hub station; and

(f) at said hub station, in response to said communication connectivity request message, transmitting to said originating remote station an originating remote station demodulator tuning message for causing the tunable demodulator at said originating remote station to be tuned to the transmission carrier frequency associated with said destination remote station, and transmitting to said destination remote station a destination remote station demodulator tuning message for causing the tunable demodulator at said destination remote station to be tuned to the transmission carrier frequency associated with said originating remote station.

5,841,766

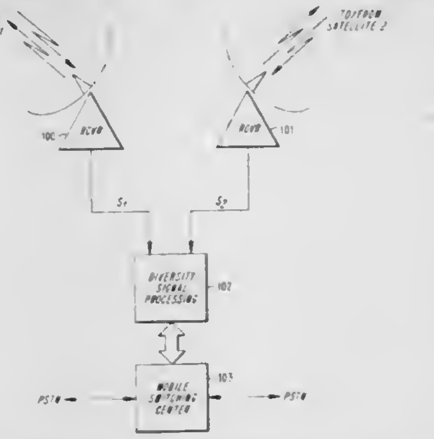
DIVERSITY-ORIENTED CHANNEL ALLOCATION IN A MOBILE COMMUNICATIONS SYSTEM

Paul W Dent, Stehag, and Magnus Ewerbring, Stockholm, both of Sweden, assignors to Ericsson Inc., Research Triangle Park, N.C.

Continuation of Ser. No. 354,904, Dec. 12, 1994, abandoned. This application Aug. 12, 1996, Ser. No. 695,729

Int. Cl.^{6} H04B *7/212*

U.S. Cl. 370—321 **27 Claims**



1. A method of communications with a plurality of ground terminals using a plurality of satellites transmitting time-division multiplexed signals, comprising the steps of:

transmitting from a first satellite to a first group of ground terminals using a first number of timeslots in a TDM frame period;

transmitting from said first satellite and a second satellite in alternate TDM frames to a second group of ground terminals using a second number of timeslots in said TDM frame period; and

transmitting from said second satellite to a third group of ground terminals using a third number of timeslots in said TDM frame period.

5,841,767

MOBILE COMMUNICATION SYSTEM USING EFFICIENT SERVICE AREA EXPANSION SCHEME

Yasuki Nishi, Yokosukashi; Kazuhito Ebina, Yokohamashi, and Susumu Ueno, Yokosukashi, all of Japan, assignors to NTT Mobile Communications Network Inc., Tokyo, Japan

Filed Jul. 19, 1996, Ser. No. 684,230

Claims priority, application Japan, Jul. 20, 1995, 7-184369; Dec. 8, 1995, 7-320792

Int. Cl.^{6} H04J *3/16*

U.S. Cl. 370—329 **30 Claims**

1. A method for expanding a service area of a mobile communication system, comprising the steps of:

setting a plurality of additional base stations for providing additional zones which covers additional areas for expanding the service area, each additional base station having base

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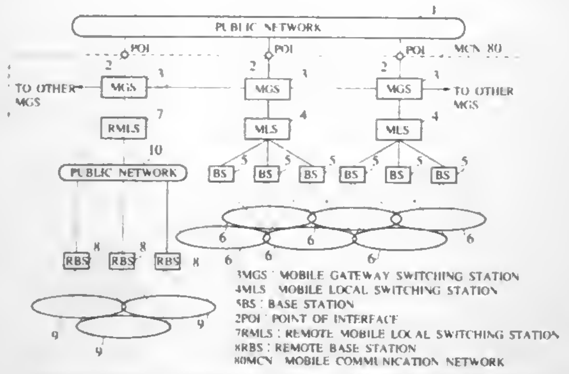

PUBLIC NETWORK
1
POI
2
3
MCN 80
TO OTHER MGS
MGS
RMLS
7
MLS
4
10
PUBLIC NETWORK
BS
5
6
RBS
8
9
3MGS : MOBILE GATEWAY SWITCHING STATION
4MLS : MOBILE LOCAL SWITCHING STATION
5BS : BASE STATION
2POI : POINT OF INTERFACE
7RMLS : REMOTE MOBILE LOCAL SWITCHING STATION
8RBS : REMOTE BASE STATION
80MCN : MOBILE COMMUNICATION NETWORK

station channel connection means for providing a connection with a public network;

providing an additional mobile local switching station for connecting the additional base stations to a mobile communication network, the additional mobile local switching station having switching station channel connection means for providing a connection with the public network; and

selectively connecting the additional base stations with the additional mobile local switching station through the public network by using the base station channel connection means and the switching station channel connection means.

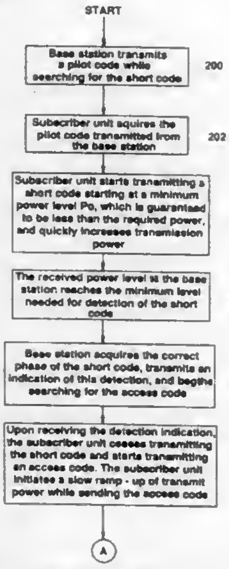
5,841,768
METHOD OF CONTROLLING INITIAL POWER RAMP-UP IN CDMA SYSTEMS BY USING SHORT CODES

Faith M. Ozluturk, Port Washington, and Gary R. Lomp, Cenerport, both of N.Y., assignors to InterDigital Technology Corporation, Wilmington, Del.

Filed Jun. 27, 1996, Ser. No. 670,162

Int. Cl.^{6} H04B *7/005;7/216*

U.S. Cl. 370—335 **21 Claims**


START
Base station transmits a pilot code while searching for the short code
200
Subscriber unit aquires the pilot code transmitted from the base station
202
Subscriber unit starts transmitting a short code starting at a minimum power level Po, which is guaranteed to be less than the required power, and quickly increases transmission power
204
The received power level at the base station reaches the minimum level needed for detection of the short code
206
Base station acquires the correct phase of the short code, transmits an indication of this detection, and begins searching for the access code
208
Upon receiving the detection indication, the subscriber unit ceases transmitting the short code and starts transmitting an access code. The subscriber unit initiates a slow ramp - up of transmit power while sending the access code
210
A

1. A method for controlling transmission power during the establishment of communications between a base station and at least one subscriber unit, the method comprising:

transmitting a first periodic signal from said subscriber unit at an initial power level, said initial power level being lower than the power level required for detection by said base station;

increasing said power level at a first ramp-up rate;

detecting said first periodic signal at said base station when a sufficient power for detection is achieved;

transmitting a confirmation signal from said base station when said first periodic signal has been detected;

receiving said confirmation signal at said subscriber unit;

ceasing said first ramp-up rate when said confirmation signal is received, and

transmitting a second periodic signal while increasing the power level of said second periodic signal at a second ramp-up rate, said second ramp-up rate being less than said first ramp-up rate.

5,841,769
DATA MESSAGE ROUTING SYSTEM FOR MOBILE OR FIXED TERMINALS WITHIN A NETWORK

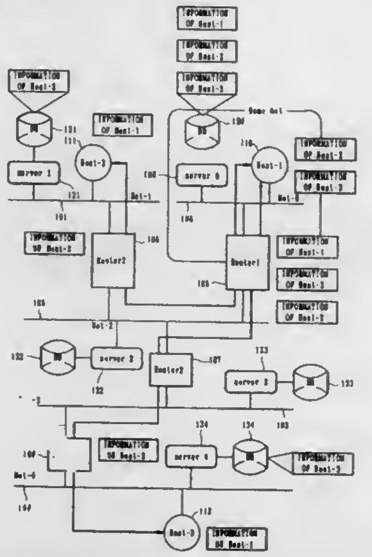
Kazuhiro Okanoue, and Tomoki Ohsawa, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Dec. 14, 1995, Ser. No. 572,749

Claims priority, application Japan, Dec. 16, 1994, 6-313385; Jan. 17, 1995, 7-004862; Feb. 24, 1995, 7-036663; Jul. 6, 1995, 7-170574

Int. Cl.^{6} H04L *12/46*

U.S. Cl. 370—338 **52 Claims**



1. A mobile packet communication system comprising:

a plurality of auxiliary networks;

a plurality of mobile terminals connected to said auxiliary networks, each of said mobile terminals having an inherent address independent of the auxiliary network to which the mobile terminal is connected and a positional address depending on the auxiliary network to which the mobile terminal is connected;

a router interconnecting said auxiliary networks;

each of said auxiliary networks having a database that stores data defining the association between the inherent and positional addresses of the mobile terminals connected thereto, and a server for managing said database;

each of said mobile terminals having a home network as one of said auxiliary networks which is determined by the inherent address of the mobile terminal, each of said mobile terminals being movable between said auxiliary networks;

each of said mobile terminals having:

a) an inherent address processing layer for adding a packet header based on said inherent address thereof to transmission data from a higher layer; and

b) a positional address processing layer for adding a packet header based on said positional address thereof to the transmission data to which the packet header based on said inherent address has been added by said inherent address processing layer;

c) the packet headers containing no header information representing an association between said inherent address and said positional address.

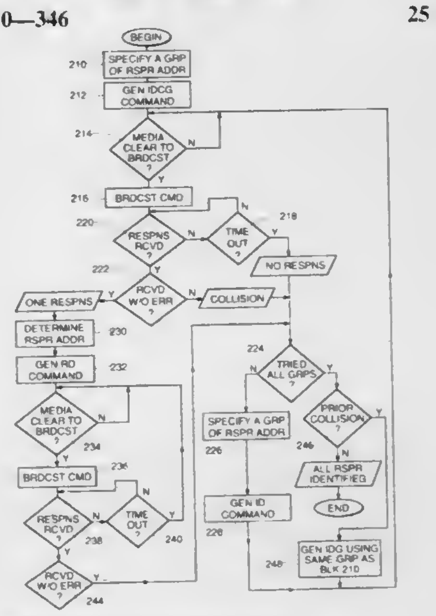
5,841,770
DATA COMMUNICATION SYSTEM USING INDENTIFICATION PROTOCOL

Charles K. Snodgrass, Boise, Id.; David H. Allen, Rochester, Minn.; John R. Tuttle, Boise, Id.; Robert R. Rotzoll, Boise, Id., and George E. Pax, Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Continuation of Ser. No. 263,210, Jun. 21, 1994, Pat. No. 5,583,850, which is a continuation of Ser. No. 990,918, Dec. 15, 1992, Pat. No. 5,365,551. This application Oct. 7, 1996, Ser. No. 726,560

Int. Cl.^{6} H04L *1/00*

U.S. Cl. 370—346 **25 Claims**



1. A communication system comprising:

a) a communication medium;

b) a plurality of first stations, each first station coupled to the medium and each comprising:

1) a first receiver for receiving a command signal, the command signal comprising a first address, the first address for exciting a response from a first portion of the plurality,

2) means, responsive to the command signal, for selecting a temporary self designation from a predetermined set of designations, the number of members in the set being more than one, and

3) a first transmitter for transmitting a reply signal characterized by the self designation, each of the first portion of the plurality transmitting substantially simultaneously after reception of the command signal; and

c) a second station coupled to the medium comprising:

1) a second transmitter for transmitting the command signal,

2) a second receiver for receiving the reply signal,

3) means for determining the self designation from the reply signal,

4) a first circuit for providing a collision detection signal, and

5) means responsive to the collision detection signal for specifying a second address different from the first address, the second address for exciting a second portion of the plurality.

5,841,771
TELECOMMUNICATIONS SWITCH APPARATUS AND METHOD FOR TIME SWITCHING

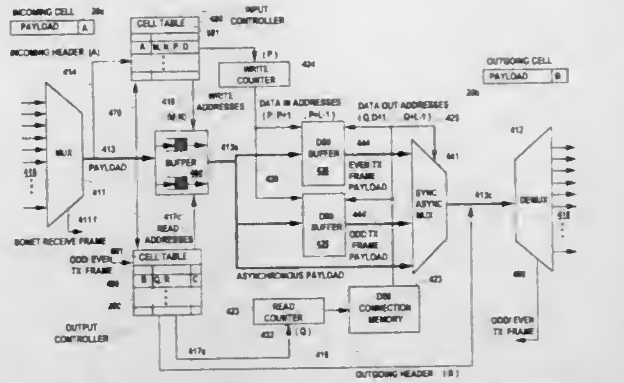
George Frank Irwin, Kanata, Canada, and Du-Tuan Lam, San Jose, Calif., assignors to Northern Telecom Limited, Montreal, Canada

Filed Jul. 3, 1996, Ser. No. 675,179

Int. Cl.^{6} H04L *12/52*

U.S. Cl. 370—360 **11 Claims**

4. A switch module being responsive to a controller, for switching data words periodically occurring in time slots in a time division multiplexed input signal stream organized in accordance



with frame and time slot timing signals, into a correspondingly organized output signal stream of time switched data words, the switch module comprising:

a plurality of connection memories each for having stored therein a write address sequence for defining storage locations for storing a frame of the data words and a read address sequence for defining those of the storage locations from whence a frame of the data words is to be read, either of the write address sequences and read address sequences being identical one with respect to another, the number of said addresses in each sequence being at least equal to the number of time slots in a frame divided by the number of the plurality of the connection memories;

a plurality of data memories, each data memory being connected with a corresponding one of the plurality of connection memories and each having storage locations being addressable for writing and reading by the write and read address sequences from the corresponding connection memory, each data memory storage location having a capacity for storing a data word assembled from a plurality of the data words corresponding in number to the plurality of data memories;

input means responsive to write control signals from the controller for assembling the data words for storage from the input signal stream;

output means responsive to read control signals from the controller, for selecting the time switched data words for the output signal stream from among data words read out from the data memories;

whereby a switched data word occurrence rate is faster than a cycle time of operation of the switch module.

5,841,772
ATM COMMUNICATION SYSTEM INTERCONNECT/TERMINATION UNIT

Thomas Daniel, Los Altos Hills; Dieter Nattkemper, San Jose, and Subir Varma, Sunnyvale, all of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed Mar. 7, 1996, Ser. No. 612,194

Int. Cl.^{6} H04J *3/02*

U.S. Cl. 370—395 **20 Claims**

1. A data-structure driven asynchronous transfer mode (ATM) communication device for receiving, processing, and transmitting a plurality of data cells in an ATM communication system network, said device comprising:

memory means for receiving, storing and recovering data cells, and data-structures of linked lists with memory address pointers to starting and ending memory addresses as well as internal memory address pointers to successive elements of said linked-list data structures by memory addresses in succession and regression;

a permanently pre-configured processor configured to segment ATM data cells for storage in said memory means, and to reassemble said segmented ATM data cells stored in said memory means, and using said memory address pointers to recover and reassemble said data cells;

input/output (I/O) port interface means for communicating said device with an ATM communication system network;

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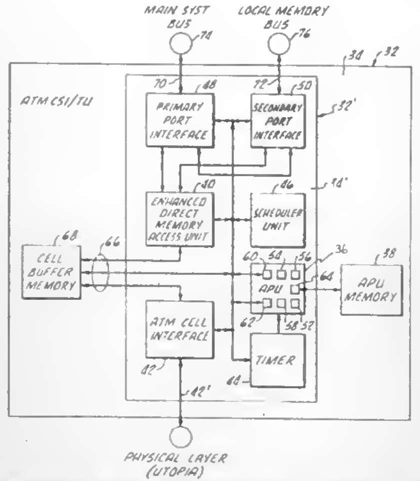


a programmable processor exercising executive control over said pre-configured processor and said input/output port interface means, said programmable processor creating in said memory means a descriptor for each of said data-structures of linked lists;

a timer unit including plural hardware-implemented timers; and

à scheduler unit including means for maintaining a calendar based schedule table with pointers to memory locations of virtual connections of said ATM communication system network to be serviced by said pre-configured processor in a particular ATM cell time slot;

wherein said programmable processor also includes means for exercising executive control over said timer unit and said scheduler unit.

5,841,773

ATM NETWORK SWITCH WITH CONGESTION LEVEL SIGNALING FOR CONTROLLING CELL BUFFERS

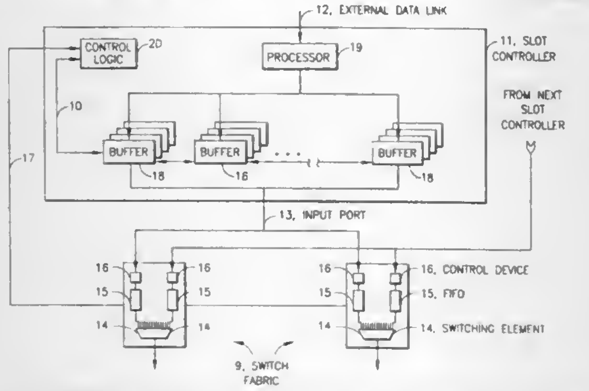
Trevor Jones, Maldon, United Kingdom, assignor to General DataComm, Inc., Middlebury, Conn.

Filed May 10, 1996, Ser. No. 644,308

Claims priority, application United Kingdom, May 10, 1995, 9509484

Int. Cl.^{6} H04J *3/24*

U.S. Cl. 370—395 **18 Claims**



1. An ATM network switch coupled to a plurality of external data links, comprising:

a) a switch fabric having a plurality of input ports; and

b) a plurality of slot controllers, each of said slot controllers being coupled to one of said input ports of said switch fabric, each slot controller having cell receiving means for receiving ATM cells from at least one of the external data links, cell transmitting means for transmitting ATM cells outwardly on the external data link, a plurality of first buffer means for storing ATM cells, one of said first buffer means for each other slot controller in said ATM network switch, and buffer control means for controlling the passing of cells from said plurality of first buffer means to said one of said input sorts of said switch fabric, wherein

said switch fabric comprises means for selectively switching a cell input on any one port to at least one other port thereto, and signalling means for providing a congestion signal back to said buffer control means in each slot controller an indication of the congestion level of each switching path through said switch fabric, such that said buffer control means controls the output of cells from said first buffer means in accordance with said congestion signals.

5,841,774

METHOD AND SYSTEM FOR CONTROLLING STATISTICALLY MULTIPLEXED ATM BUS

Hannu Flinck, Helsinki; Osmo Kaukanen, Hyvinkää; Timo Ylönen, Espoo, and Juha Seppänen, Helsinki, all of Finland, assignors to Nokia Telecommunication Oy, Espoo, Finland

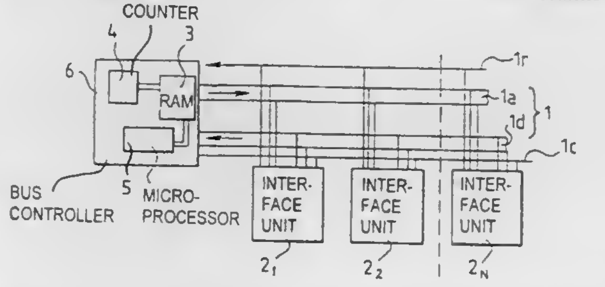
PCT No. PCT/FI95/00012, § 371 Date Jul. 16, 1996, § 102(e) Date Jul. 16, 1996, PCT Pub. No. WO95/19674, PCT Pub. Date Jul. 20, 1995

PCT Filed Jan. 13, 1995, Ser. No. 676,202

Claims priority, application Finland, Jan. 17, 1994, 940220

Int. Cl.^{6} H04J *3/24*

U.S. Cl. 370—399 **11 Claims**



11. A system for controlling a statistically multiplexed ATM bus, comprising:

an ATM bus having an address bus and a data bus;

a bus controller arranged for transmitting cells over said ATM bus;

a plurality of interface units connected to the controller by said ATM bus;

said bus controller being provided with a memory in which are stored addresses of said interface units such that, for each cell to be transmitted to said ATM bus by a respective said interface unit, the address of the respective said interface unit participating in the transmission can be read from the memory and set on said address bus of said ATM bus;

said bus controller being arranged to transmit ATM cells over said data bus of said ATM bus from said bus controller to only its respective ones of interface units and vice versa at such a rate that during the transmission of each such cell, said bus controller can fetch a respective next interface unit address for transmission of respective next such cell to said data bus; and

said ATM bus further including a synchronization bus for transmitting cell sync pulses from said bus controller;

said bus controller having an address space for said memory a memory access rate, and said data bus having transmission frequency, which are proportioned to one another such that all of said address space is arranged to be scanned between each two successive ones of said cell sync pulses by conducting a poll that covers the addresses of all of said interface units.

5,841,775

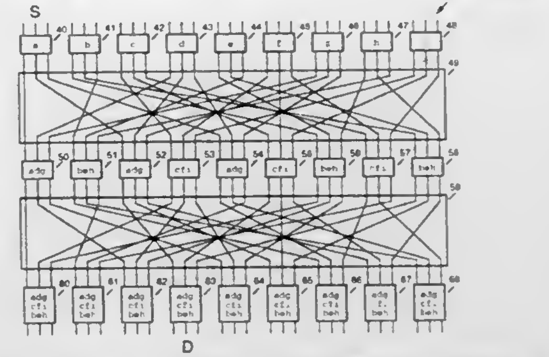
SCALABLE SWITCHING NETWORK

Alan Huang, 682 Sixteenth Ave., Menlo Park, Calif. 94025

Filed Jul. 16, 1996, Ser. No. 680,680

Int. Cl.^{6} H04L *12/54*

U.S. Cl. 370—422 **19 Claims**



13. A fault tolerant switching network having a plurality of inputs and outputs, said network comprising:

a plurality of rows of routers including a first row and a last row, where each router has (a) a plurality of top ports and bottom ports, (b) a destination based routing means, (c) an equivalent route load balancing means, and (d) a dynamic routing means;

a plurality of equivalent mapping interconnects each with a plurality of upper ports and lower ports where the upper ports of the mapping interconnect are connected to the lower ports of said mapping interconnect in a predetermined manner; wherein

the top ports of all except for the first row of routers are connected to lower ports of a mapping interconnect;

the bottom ports of all except for the last row of routers are connected to upper ports of a mapping interconnect; and

portions of the top ports of the first row of routers and the bottom ports of the last row of routers are the inputs and the outputs of the switching network.

5,841,776

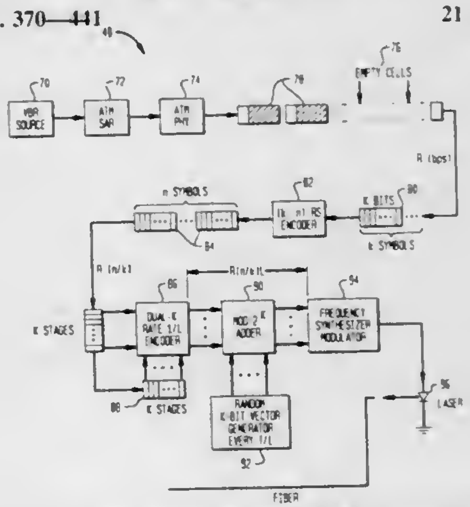
APPARATUS AND METHOD FOR A HIGH THROUGHPUT FIBER-OPTIC ACCESS NETWORK USING CODE DIVISION MULTIPLE ACCESS

Howard Zehua Chen, Berkeley Heights, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 29, 1995, Ser. No. 581,700

Int. Cl.^{6} H04J *13/00*

U.S. Cl. 370—441 **21 Claims**



1. A code division multiple access (CDMA) transmit apparatus for transmitting data over a fiber-optic communications network, said CDMA transmitter apparatus coupled to a terminal device in said network, said apparatus comprising:

a concatenated encoder for coding said data from said terminal device and providing an address code representative of said terminal device, said encoder including:

means for sequentially segmenting said data from said terminal device into K-bit source symbols;

an (n.k) Reed Solomon encoder for mapping k of said K-bit symbols into n symbols; and

a dual-K rate 1/L convolutional encoder for encoding each encoded K-bit symbol from said Reed-Solomon encoder into a total of L different K-bit symbols in a K-bit time period;

an adding device for modulo-$2^{\wedge}$ adding each of said L different K-bit symbols from said convolutional encoder with said address-code; and

a multiple frequency shift keying (MFSK) modulator for modulating encoded data from said adding device for transmission over said network, wherein terminal devices including said transmitter apparatus and coupled to said network transmit data signals at random over said network, said transmitter apparatus supporting multiple access of said fiber-optic communications network by said terminal devices.

5,841,777

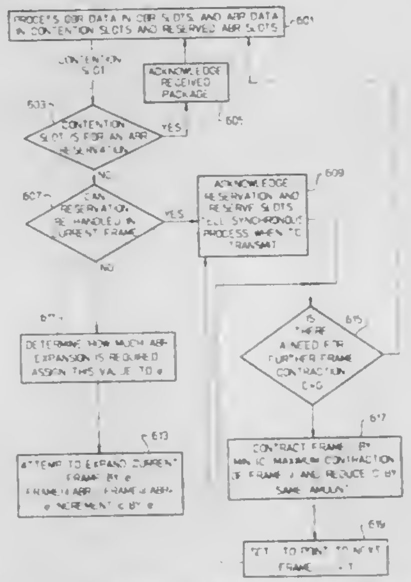
SYSTEM AND METHOD FOR ACCOMMODATING ABR AND CBR TRAFFIC ON A SHARED COMMUNICATIONS CHANNEL

Reuven Cohen, Haifa, Israel, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 30, 1996, Ser. No. 707,812

Int. Cl.^{6} H04B *7/212;* **H04J** *3/16*

U.S. Cl. 370—443 **7 Claims**


PROCESS CBR DATA IN CBR SLOTS AND ABR DATA IN CONTENTION SLOTS AND RESERVED ABR SLOTS
601
CONTENTION SLOT
ACKNOWLEDGE RECEIVED PACKAGE
603
CONTENTION SLOT IS FOR AN ABR RESERVATION
YES
605
NO
607
CAN RESERVATION BE HANDLED IN CURRENT FRAME
YES
ACKNOWLEDGE RESERVATION AND RESERVE SLOTS TELL SYNCHRONOUS PROCESS WHEN TO TRANSMIT
609
NO
DETERMINE HOW MUCH ABR EXPANSION IS REQUIRED ASSIGN THIS VALUE TO e
IS THERE A NEED FOR FURTHER FRAME CONTRACTION
615
613
ATTEMPT TO EXPAND CURRENT FRAME BY e
617
CONTRACT FRAME
619
FRAME

1. A method of transmitting a first and a second type of data from a client station to a master station via a shared communication channel in a communications system, comprising the steps of:

(A) dividing the channel into a plurality of frames, each having a set of consecutive constant time slots, the slots within each of the frames being apportioned into a first region for the first type of data and a second region for the second type of data;

(B) determining whether available slots in the second region of a current frame can accommodate a reservation request from the client station to transmit the second type of data with a predetermined data length;

(C) expanding the second region into the first region in the current frame to accommodate the reservation request and contracting the second region of subsequent frames by an amount equal to the expansion if the available slots in the second region of the current frame cannot handle the reservation request such that the average size of the second region of the current and subsequent frames remains unchanged.

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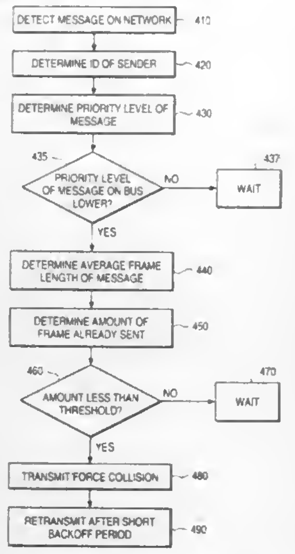
5,841,778
SYSTEM FOR ADAPTIVE BACKOFF MECHANISMS IN CSMA/CD NETWORKS

Shmuel Shaffer, Palo Alto, and William Joseph Beyda, Cupertino, both of Calif., assignors to Siemens Business Communication Systems, Inc., Santa Clara, Calif.

Filed Nov. 21, 1997, Ser. No. 975,988

Int. Cl.^{6} H04J *3/14*

U.S. Cl. 370—447 **13 Claims**


DETECT MESSAGE ON NETWORK
410
DETERMINE ID OF SENDER
420
DETERMINE PRIORITY LEVEL OF MESSAGE
430
435
PRIORITY LEVEL OF MESSAGE ON BUS LOWER?
NO
437
WAIT
YES
DETERMINE AVERAGE FRAME LENGTH OF MESSAGE
440
DETERMINE AMOUNT OF FRAME ALREADY SENT
450
460
AMOUNT LESS THAN THRESHOLD?
NO
470
WAIT
YES
TRANSMIT FORCE COLLISION
480
RETRANSMIT AFTER SHORT BACKOFF PERIOD
490

1. A method for transmitting a new message from a first station on a contention-based computer network, comprising the steps of:
- (a) determining whether another message is being transmitted on the computer network by a second station;
- (b) determining a priority level of the new message to be transmitted and the other message being transmitted on the computer network;
- (c) if the priority of the new message to be transmitted is greater than the priority of the other message being transmitted on the computer network, then reading an average frame length for a message having the priority level of the other message from a station profile table;
- (d) determining an extent to which a frame of the other message has been transmitted on the computer network;
- (e) comparing the extent of transmission for the frame of the other message to the average frame length;
- (f) if the extent of transmission for the frame of the other message is below a predetermined threshold, then preempting the transmission of the frame of the other message on the computer network; and
- (g) transmitting the new message before the other message is retransmitted.

5,841,779
HIERARCHICAL SYNCHRONIZATION METHOD

Jukka Kainulainen, Helsinski, Finland, assignor to Nokia Telecommunications Oy, Espoo, Finland

PCT No. PCT/FI95/00095, § 371 Date Aug. 14, 1996, § 102(e) Date Aug. 14, 1996, PCT Pub. No. WO95/24078, PCT Pub. Date Sep. 8, 1995

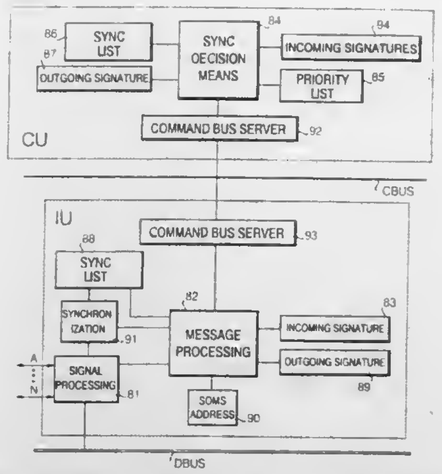
PCT Filed Feb. 23, 1995, Ser. No. 693,164

Claims priority, application Finland, Feb. 25, 1994, 940926

Int. Cl.^{6} H04J *3/06*

U.S. Cl. 370—514 **8 Claims**

1. A hierarchical synchronization method for a telecommunications system employing message-based synchronization and having a plurality of nodes which are interconnected by transmission lines and which include a centralized control unit for making decisions concerning node synchronization, and respective interface units forming respective interfaces by which each respective node is connected to others of said nodes, comprising the steps of:



- said nodes interchanging signals containing synchronization messages each having a respective synchronization signature which indicates the priority of the corresponding signal in an internal synchronization hierarchy of said system, and which signature is formed in each respective node in said control unit;
- forming a list for each node interface unit from said interfaces, of a group of interfaces appropriate for synchronization, in such a way that of those of said interfaces which, for a respective said node, are connected with respective neighboring ones of said nodes, the respective list only comprises interfaces connected with a neighboring node which, if selected as a node timing source, does not change the synchronization signature transmitted by the respective node;
- monitoring by each said node interface units of operation of the respective said control unit of their own said node, in order to detect if their own said node has lost its control unit;
- if a synchronization signature received by an interface on a respective said synchronization list changes, in a change, in such a way that the signature outgoing from the respective node should be changed and said change occurs when the respective interface unit has detected a loss of the control of the respective node, the respective interface unit informing the interface units for the others of said nodes of this change, and the interface units in response deleting this interface from the group of interfaces appropriate for synchronization; and
- if, as a result of said deleting, all interfaces are deleted from a respective said group of interfaces appropriate for synchronization before the interface units have detected that the respective control unit is restored, the interface units starting to use a failure situation procedure to find a new node synchronization source, and the respective node outgoing signature thereby changing to correspond to said failure situation procedure.

5,841,780
ISDN BRI LINK RESTORATION WITHOUT LOSS OF CALLS

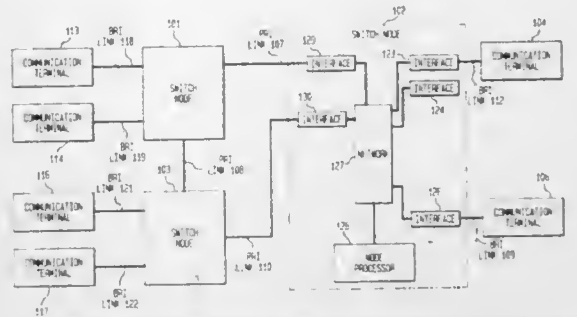
Bruce M. Bales, Louisville, and Forrest L. Coleman, Denver, both of Colo., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Aug. 29, 1996, Ser. No. 705,373

Int. Cl.^{6} H04M *3/42*

U.S. Cl. 370—524 **10 Claims**

1. A method of allowing the rearrangement of communication links connecting communication terminals to a telecommunication switching system while maintaining active telecommunication calls with the communication terminals, comprising the steps of:
- detecting an initialization of a communication terminal on a first telecommunication interface of the telecommunication switching system;
- requesting terminal identification information from the communication terminal;



- receiving the terminal identification information from the communication terminal;
- comparing the received terminal identification information with stored information to determine if the communication terminal is active on a telecommunication call on a second telecommunication interface of the telecommunication switching system; and
- connecting the telecommunication call to the first telecommunication interface upon the communication terminal being engaged in an active telecommunication call whereby the active telecommunication call is maintained to the communication terminal.

5,841,781
DATA SHUFFLING METHOD AND APPARATUS FOR SAME

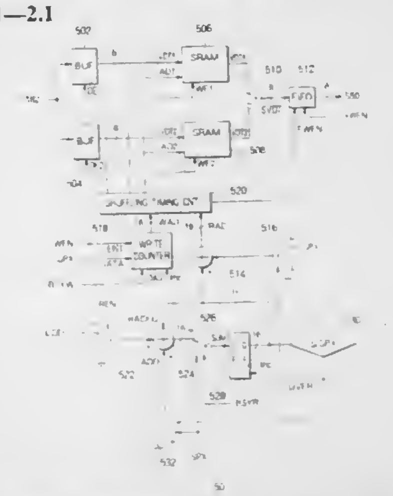
Takayuki Takeda, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 27, 1996, Ser. No. 673,193

Claims priority, application Japan, Jun. 30, 1995, 7-165377

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 371—2.1 **3 Claims**



1. A data shuffling apparatus for rearranging video data contained in a plurality of lines constituting a video frame, said data shuffling apparatus comprising:
- video data storing means for storing the video data contained in a plurality of processing blocks, each processing block being constituted by a predetermined number of lines;
- reading address generating means for performing for said each processing block a predetermined operation by using a predetermined coefficient corresponding to a respective processing block and for successively generating a reading address for reading the video data from the video data storing means; and
- video data shuffling means for successively reading the video data from the video data storing means based on the generated reading address for said each processing block thereby shuffling the video data.

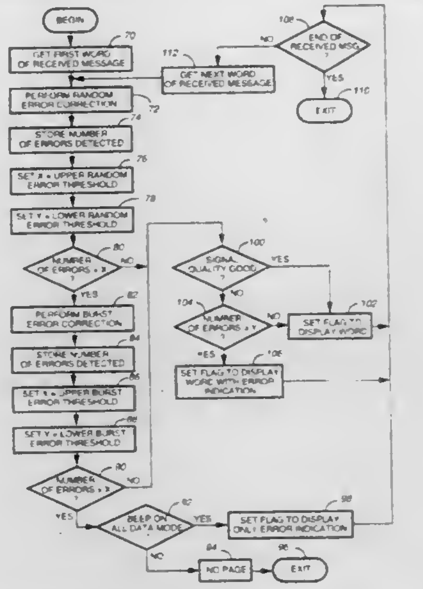
5,841,782
SYSTEM AND METHOD FOR INDICATING ERRORED MESSAGES

Von Alan Mock, Boynton Beach, and Ronald Hugh Evoy, West Palm Beach, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 22, 1995, Ser. No. 518,042

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 371—5.1 **6 Claims**


BEGIN
70
GET FIRST WORD OF RECEIVED MESSAGE
112
GET NEXT WORD OF RECEIVED MESSAGE
108
END OF RECEIVED MSG ?
NO
YES
110
EXIT
PERFORM RANDOM ERROR CORRECTION
72
74
STORE NUMBER OF ERRORS DETECTED
76
SET X = UPPER RANDOM ERROR THRESHOLD
78
SET Y = LOWER RANDOM ERROR THRESHOLD
80
NUMBER OF ERRORS ≥ X ?
NO
YES
100
SIGNAL QUALITY GOOD ?
YES
NO
82
PERFORM BURST ERROR CORRECTION
104
NUMBER OF ERRORS ≥ Y ?
NO
102
SET FLAG TO DISPLAY WORD
84
STORE NUMBER OF ERRORS DETECTED
YES
106
SET FLAG TO DISPLAY WORD WITH ERROR INDICATION
86
SET X = UPPER BURST ERROR THRESHOLD
88
SET Y = LOWER BURST ERROR THRESHOLD
90
NUMBER OF ERRORS ≥ X ?
NO
YES
92
BEEP ON ALL DATA MODE
YES
98
SET FLAG TO DISPLAY ONLY ERROR INDICATION
NO
94
NO PAGE
96
EXIT

1. A selective call receiver, comprising:
- a receiver for receiving a coded word transmission containing at least one message word;
- a memory for storing a first predetermined error threshold and a second predetermined error threshold;
- a display for displaying information to a user; and
- a processing system for correcting errors in a received message word to provide a corrected received message word, the processing system determining the number of errors in the received message word, comparing the number of errors to the first error threshold and to the second error threshold and controlling the display to display the corrected received message word and an error indication if the number of errors is greater than or equal to the first error threshold but less than or equal to the second error threshold.

5,841,783
FAIL ADDRESS ANALYSIS AND REPAIR SYSTEM FOR SEMICONDUCTOR TEST

Toshikazu Suzuki, and Yasuhiro Kawata, both of Tokyo, Japan, assignors to Advantest Corporation, Tokyo, Japan

Filed Nov. 22, 1996, Ser. No. 754,922

Claims priority, application Japan, Nov. 29, 1995, 7-310380

Int. Cl.^{6} G06F *11/00*

U.S. Cl. 371—5.1 **1 Claim**

1. A repair address analysis system for a semi-conductor test comprising
- a memory device having a redundancy repairing function,
- a repair line on which information corresponding to a plurality of addresses in said memory device is stored and, when a fail is produced in said memory device, the information corresponding to the address at which the fail is produced in said memory device is replaced,
- fail count means for counting fail bits for an address value of said memory device, and
- a fail count memory into which the fail bit count information counted by said fail count means is stored, and wherein
- said fail count means calculates replacement information of a fail address based on the fail bit count information stored in said fail count memory.

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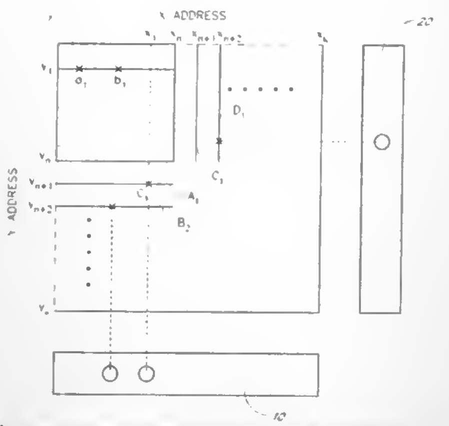
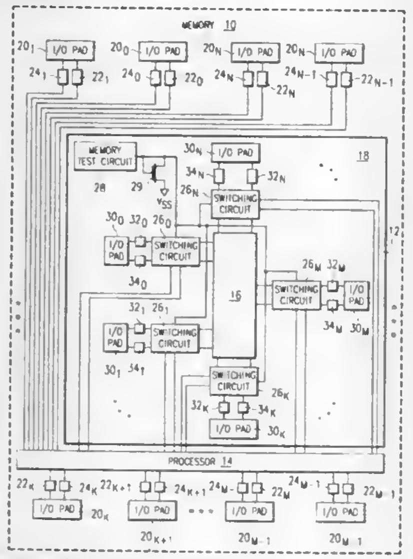


said fail count means counts fail bits of the repair line simultaneously with counting of fail bits corresponding to a plurality of addresses in said memory device.

5,841,784
TESTING AND REPAIR OF EMBEDDED MEMORY

Tsiu Chiu Chan, Carrollton, and Lawrence P. Eng, Dallas, both of Tex., assignors to STMicroelectronics, Inc., Carrollton, Tex.

Filed Apr. 2, 1996, Ser. No. 626,540
Int. Cl.^{6} G06F *11/00*
U.S. Cl. 371—21.1 **2 Claims**

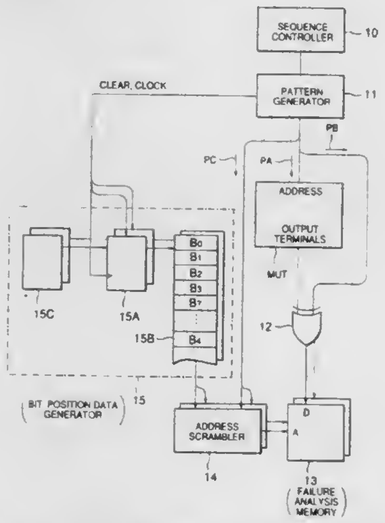


1. An integrated circuit comprising:
a digital signal processor;
a memory having a memory array and a memory interconnect pad, with the memory array and memory interconnect pad being coupled together;
a memory test pad for receiving a first and a second logic state;
a current limiting device having a large resistance n-channel transistor with a length to width ratio of about 100 to 1 coupled to the memory test pad and ground for reducing power dissipation when the first logic state is received; and
a switching circuit having a control input for receiving the logic states coupled to the current limiting device, a pair of n-channel transistors coupled to the control input and between the memory array and the processor, and an inverter with pair of p-channel transistors controlled by the inverter coupled to the control input and between the memory array and the memory interconnect pad, and with the switching circuit being responsive to the first logic state received at the control input thereof for coupling the memory array to the processor and decoupling the memory array from the memory interconnect pad and further being responsive to the second logic state received at the control input thereof for coupling the memory array to the memory interconnect pad and decoupling the memory array from the processor.

5,841,785
MEMORY TESTING APPARATUS FOR TESTING A MEMORY HAVING A PLURALITY OF MEMORY CELL ARRAYS ARRANGED THEREIN

Masayuki Suzuki, Hanyu, Japan, assignor to Advantest Corporation, Tokyo, Japan

Filed Jul. 10, 1996, Ser. No. 679,761
Claims priority, application Japan, Jul. 12, 1995, 7-175859
Int. Cl.^{6} G11C *29/00;* G01R *31/28*
U.S. Cl. 371—21.1 **2 Claims**

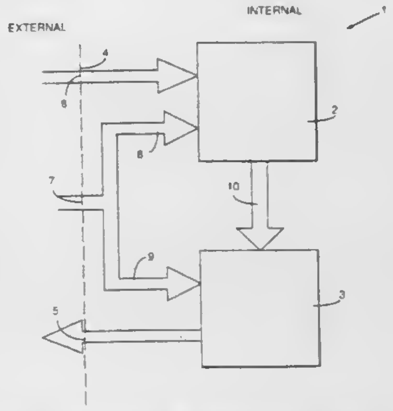


1. A memory testing apparatus for testing a memory, said memory comprising a plurality of memory cell arrays arranged in said memory and a first multiplexing circuit multiplexing a parallel signal read out of the plurality of memory cell arrays into a serial signal and outputting the serial signal, said memory cell arrays comprising memory cells, said memory testing apparatus comprising:
pattern generator means for generating at least a test pattern signal to be applied to said memory, an address signal, and an expected value signal;
means for generating a multiplexer driving signal and supplying the multiplexer driving signal to the first multiplexing circuit;
a comparator receiving the expected value signal from the pattern generator means and the serial signal from the memory, and comparing the serial signal to the expected value signal;
a failure analysis memory storing a pass/failure judgment result based on the comparison of the serial signal and the expected value signal, said pass/failure judgement result indicating a failed memory cell of the memory cells in said memory at an address specified by the address signal supplied from said pattern generator means, said failure analysis memory comprising a plurality of storage areas therein, a number of which is equal to that of bits of the multiplexer driving signal to be supplied to said first multiplexing circuit of said memory;
an address scrambler receiving the address signal to be supplied to said memory cell arrays of said memory output from said pattern generator means, and the multiplexer driving signal to be supplied to said first multiplexing circuit of said memory, and generating an altered address signal in which said multiplexer driving signal supplied to said first multiplexing circuit is added to higher-order bits of said address signal supplied to said memory cell arrays; and
means for accessing said failure analysis memory using said altered address signal and for writing the pass/failure judgment results corresponding to each of the memory cells of each of the memory cell arrays at a corresponding one of said storage areas in said failure analysis memory partitioned by said multiplexer driving signal.

5,841,786
TESTING OF MEMORY CONTENT

Edward Patrick Keyes, Ottawa, Canada, assignor to National Westminster Bank PLC, London, United Kingdom

PCT No. PCT/GB95/01642, § 371 Date Jan. 13, 1997, § 102(e) Date Jan. 13, 1997, PCT Pub. No. WO96/02917, PCT Pub. Date Feb. 1, 1996
PCT Filed Jul. 12, 1995, Ser. No. 765,368
Claims priority, application United Kingdom, Jul. 14, 1994, 9414266
Int. Cl.^{6} G11C *29/00;7/00*
U.S. Cl. 371—21.1 **20 Claims**



1. A method of testing an alterable memory operatively associated with an integrated circuit comprising the steps of:
writing test data to the memory for storage;
applying predetermined input data to the integrated circuit;
comparing said predetermined input data with said test data stored in the memory with said integrated circuit; and
issuing a verification output signal from the integrated circuit whereby the write function and the retention properties of the memory may be verified as correct or not according to the verification output signal.

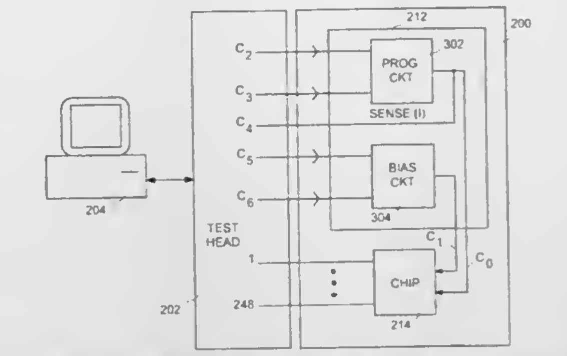
9. A method of testing the contents of a memory, the memory associated with a microprocessor comprising a module, the method comprising the steps of:
applying predetermined input data to the module;
encrypting said predetermined data;
comparing said encrypted predetermined data internally within the module with data stored in the memory; and
issuing a verification output signal from the module according to whether the memory contents is verified as correct or not by said comparison step.

5,841,787
MEMORY PROGRAMMING AND TEST CIRCUITRY AND METHODS FOR IMPLEMENTING THE SAME

Khushwinder S. Warring, Phoenix, and David K. Skaare, Chandler, both of Ariz., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Nov. 21, 1997, Ser. No. 975,598
Int. Cl.^{6} G06F *11/00*
U.S. Cl. 371—21.1 **23 Claims**

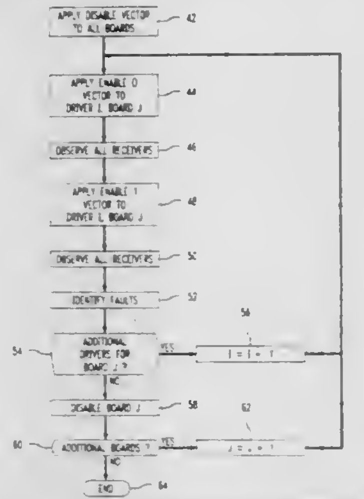
1. A loadboard, comprising:
a plurality of channel pins being arranged on the loadboard, the plurality of channel pins are electrically routed on the loadboard to a receptacle that is configured to receive I/O pins of an integrated circuit chip; and
a programming and test circuit is integrated on the loadboard and is coupled to a set of the plurality of channel pins to enable communication with the integrated circuit chip, the programming and test circuit includes a programming subcircuit for communicating a plurality of voltage levels set by a programming vector to the integrated circuit chip, and a bias sub-circuit for communicating a plurality of bias voltage levels set by the programming vector to the integrated circuit chip.



5,841,788
METHODS FOR BACKPLANE INTERCONNECT TESTING

Wuudiann Ke, Lawrenceville, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Oct. 18, 1996, Ser. No. 733,592
Int. Cl.^{6} G01R *31/28*
U.S. Cl. 371—22.3 **7 Claims**


APPLY DISABLE VECTOR TO ALL BOARDS
42
APPLY ENABLE 0 VECTOR TO DRIVER I, BOARD J
44
OBSERVE ALL RECEIVERS
46
APPLY ENABLE 1 VECTOR TO DRIVER I, BOARD J
48
OBSERVE ALL RECEIVERS
50
IDENTIFY FAULTS
52
ADDITIONAL DRIVERS FOR BOARD J?
54
YES
NO
56
I = I + 1
DISABLE BOARD J
58
62
ADDITIONAL BOARDS ?
60
YES
J = J + 1
NO
END
64

1. A method for boundary scan testing a system backplane in a system for faults, the system having a plurality of circuit boards mounted on the backplane in a multidrop configuration, the backplane having a plurality of interconnects, each circuit board having a plurality of drivers connected to the interconnects for providing output signals, a plurality of receivers connected to the interconnects for receiving the output signals provided by the drivers, a chain of boundary scan cells connected to the drivers and receivers, and a slave interface connected to the interconnects and the chain of boundary scan cells on that board, the method comprising the steps of:
(a) providing a disable vector to the slave interfaces of each board, the slave interfaces passing the disable vector to the boundary scan cells of each board so as to disable the drivers of each board;
(b) providing a plurality of test vectors to a given one of the circuit boards using the slave interface of that board to pass the test vectors to the boundary scan cells on that board, the boundary scan cells on that board providing the test vectors to the drivers on that board;
(c) using the boundary scan cells on all of the circuit boards to observe the signals on the interconnects received by the receivers in response to the test vectors provided to that given one of the circuit boards, the boundary scan cells passing the observed signals to the slave interfaces;
(d) identifying faults on said backplane based on the test vectors and the observed signals;

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(e) disabling the board to which the test vectors were provided in step (b) by providing a disable vector to slave interface of that board, the slave interface on that board passing the disable vector to the boundary scan cells on that board so as to disable the drivers of that board; and

(f) repeating steps (b), (c), (d), and (e) for each board.

5,841,789

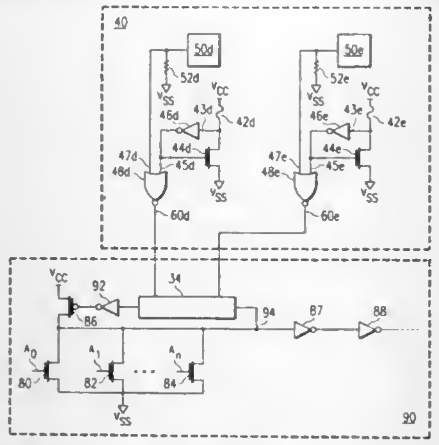
APPARATUS FOR TESTING SIGNAL TIMING AND PROGRAMMING DELAY

David Charles McClure, Carrollton, Tex., assignor to STMicroelectronics, Inc., Carrollton, Tex.

Division of Ser. No. 189,589, Jan. 31, 1994, Pat. No. 5,579,326. This application May 9, 1996, Ser. No. 647,222

Int. Cl.^{6} G01R *31/28;* G11C *29/00*

U.S. Cl. 371—22.1 **22 Claims**



1. A system for testing and programming signal timing in a device, comprising:

a programmable delay circuit;

a mode control circuit means for generating a mode enable signal responsive to receipt of a test voltage, said mode enable signal controlling said programmable delay circuit; and

an edge transition detection circuit, wherein said programmable delay circuit controls said edge transition detection circuit.

5,841,790

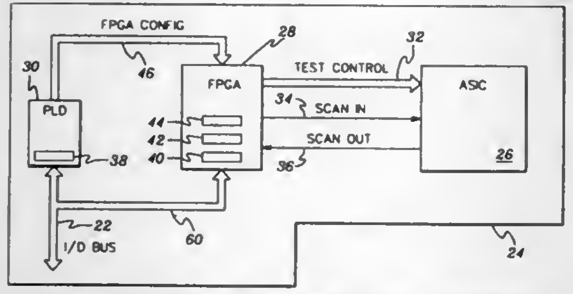
APPARATUS FOR TESTING AN ADAPTER CARD ASIC WITH RECONFIGURABLE LOGIC

Gerard M. Salem, Essex Junction, Vt., and Robert J. Lynch, Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 8, 1997, Ser. No. 831,542

Int. Cl.^{6} G01R *31/28*

U.S. Cl. 371—22.1 **12 Claims**



1. Apparatus for testing an application specific integrated circuit (ASIC) on an adapter card in a computer system, wherein the ASIC has at least one logic function, the apparatus comprising:

reconfigurable logic coupled to the ASIC and residing on the adapter card for causing data to be provided to the ASIC;

means residing on the adapter card for operating on the data with the at least one logic function to produce output data; and

means for determining whether there are any errors in the output data.

5,841,791

BYPASS SCAN PATH AND INTEGRATED CIRCUIT DEVICE USING THE SAME

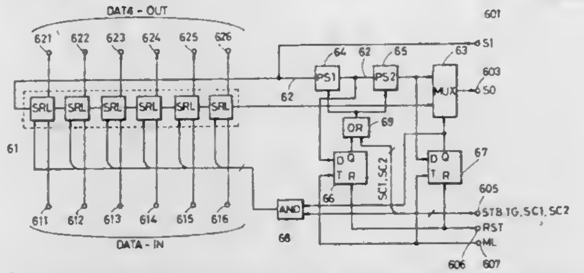
Takeshi Hashizume, Hyogo-ken, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 714,033, Sep. 11, 1996, abandoned, which is a continuation of Ser. No. 851,393, Mar. 13, 1992, abandoned. This application May 23, 1997, Ser. No. 862,600

Claims priority, application Japan, Mar. 20, 1991, 3-055255; Sep. 27, 1991, 3-249554

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 371—22.3 **14 Claims**



1. A bypass scan path for use in an integrated circuit device internally having at least one control point and at least one observation point and for propagating corresponding control point and for propagating observation point data obtained at a corresponding observation point and externally outputting the same, said bypass scan path comprising:

single data input terminal for inputting selection data for selecting a data propagation path and said control point data in a serial manner,

single data output terminal for serially outputting said observation point data,

scan register means including a serial connection of at least one shift register latch each coupled to said control point and/or said observation point and coupled to said single data input terminal to form a register path for shifting and holding said control point data and said observation point data,

a bypass path connected to said single data input terminal and enabling the data to bypass said scan register means,

a selection data propagation holding register provided in said bypass path connected to said single data input terminal, said selection data propagation holding register shifting and holding said selection data input from said single data input terminal, and

a selector having a first selection input coupled to said bypass path including said selection data propagation holding register and a second selection input coupled to said register path and configured to select either the register path formed by said scan register means or the bypass path including said selection data propagation holding register as a propagation path of said control point data and said observation point data and connect the selected path to said single data output terminal in response to the selection data held by said selection data propagation holding means,

said bypass path together with said selection data propagation holding register being coupled between said data input terminal and said selection register,

said selection data propagation holding register including

a selection data shift register provided in said bypass path configured to be operable in either selection data shifting state or a data through state wherein no shift operation is performed,

a selection data latch connected to an output of said selection data shift register, said selection data latch having an output connected to a control input of said selector.

5,841,792

PROCESSING SYSTEM HAVING A TESTING MECHANISM

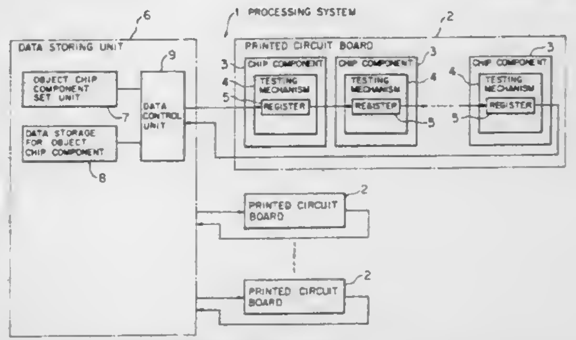
Kayoko Kawano, and Yasushi Takaki, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 24, 1996, Ser. No. 718,872

Claims priority, application Japan, Oct. 6, 1995, 7-260541; May 22, 1996, 7-127434

Int. Cl.^{6} G01R *31/28*

U.S. Cl. 371—22.5 **12 Claims**



1. A processing system, comprising:

a printed circuit board having plural chip components;

a plurality of testing mechanisms respectively disposed in each of the chip components, wherein each testing mechanism is a JTAG circuit having a boundary scan architecture, each of said JTAG circuits comprising:

a boundary scan register to capture and hold a signal appearing at each terminal of the respective chip component;

a JTAG instruction register for storing an instruction to control a system logical circuit;

a JTAG data register for storing data to be written into the system logical circuit or data read out from the system logical circuit;

an instruction register for storing an instruction to designate one register among said data registers;

a data register selecting unit for selecting a register according to the instruction stored in said instruction register; and

an output data selecting unit for outputting data from the register selected by said data register selecting unit, wherein each of said boundary scan register, said JTAG instruction register, said JTAG data register and said instruction register is connected like a chain with corresponding registers in the other chip components via said output data selecting unit; and

a data storing unit, comprising:

an object chip component set unit for designating an object chip component having a register for data storage;

a data storage for object chip component for storing data to be written into the register of the designated object chip component; and

a data control unit for writing the data held in said data storage for object chip component into the register of the designated object chip component.

5,841,793

OPTICAL REPRODUCTION SYSTEM HAVING FUNCTION OF RATIONALLY CHANGING ERROR DATA CHUNK AND REPRODUCING MULTIMEDIA INFORMATION AS CODE DATA

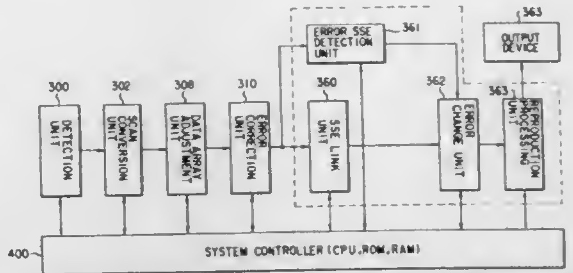
Hiroyuki Fukuda, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 26, 1996, Ser. No. 592,567

Claims priority, application Japan, Feb. 2, 1995, 7-015813

Int. Cl.^{6} H03M *13/00;* G11B *5/09*

U.S. Cl. 371—37.01 **21 Claims**



1. An information reproduction system comprising:

read means for optically reading a code from a recording medium having a portion where multimedia information including at least one of audio information, video information, and digital code data is recorded as an optically readable code;

restoration means for demodulating the code read by said read means and outputting demodulated data;

reproduction means for performing processing associated with error correction of the demodulated data output from said restoration means;

output means for outputting the data output from said reproduction means as the recognizable original multimedia information;

in which the data output from said reproduction means includes, as header information, attribute information representing a type of data as an output target,

said output means outputs the multimedia information of the corresponding data in accordance with the attribute information;

attribute information detection means for detecting, from the attribute information, an omitted portion or a portion for which error correction by said reproduction means has failed; and

default value setting means for replacing the attribute information of the data as the output target with a default value when the attribute information is not detected by said attribute information detection means.

5,841,794

ERROR CORRECTION PROCESSING METHOD AND APPARATUS FOR DIGITAL DATA

Takao Inoue; Tadaaki Yoshinaka; Fumiaki Henmi, and Minoru Kawahara, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

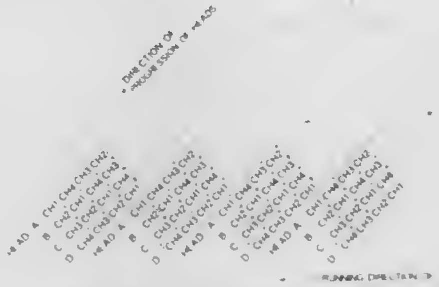
PCT No. PCT/JP94/00844, § 371 Date Mar. 2, 1995, § 102(e) Date Mar. 2, 1995, PCT Pub. No. WO94/28546, PCT Pub. Date Dec. 8, 1994

PCT Filed May 27, 1994, Ser. No. 374,638

Claims priority, application Japan, May 28, 1993, 5-127606

Int. Cl.^{6} H03M *13/00*

U.S. Cl. 371—37.4 **25 Claims**


DIRECTION OF PROGRESSION OF HEADS
HEAD A
B
C
D
RUNNING DIRECTION OF MAGNETIC TAPE

1. A digital data error correction coding apparatus which performs error correction coding of digital data using inner codes and outer codes constituting product codes, wherein said digital data is arranged in groups of bytes, each group including a multiple of data bytes and at least one outer error code byte, and wherein each said group of bytes is distributed amongst a plurality of recording medium tracks,

said digital data coding apparatus comprising:

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block shuffling means (5A) for shuffling the data every block comprised of (m×n) number of data so as to disperse the effects of errors occurring in said data;

block outer code adding means (4A) for adding said at least one outer error code byte to each said group of bytes such that when the resulting total number of bytes in said group of bytes is divided by the number of said tracks the quotient is a whole number, and such that the number of added outer error code bytes is a multiple of said whole number, said multiple being greater than or equal to one;

channel data dispersion means (22) for dispersing said data to which the outer codes have been added among a plurality of channels; and

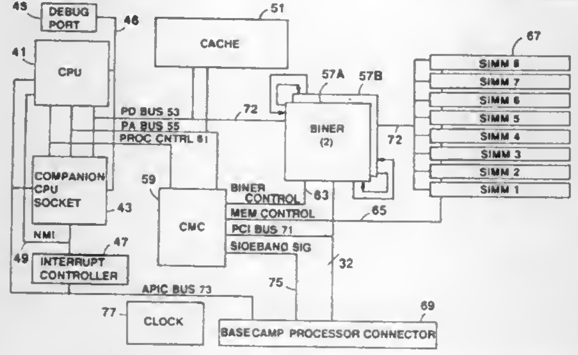
block inner code adding means (7A) for adding inner codes for every block of said dispersed data.

5,841,795
ERROR CORRECTION CODES
Sompong Paul Olarig, Cypress, and William L. Walker, Houston, both of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Filed Feb. 12, 1996, Ser. No. 599,757

Int. Cl.^{6} G11C *29/00;* **G06F** *11/10*

U.S. Cl. 371—40.13 **29 Claims**



1. A method of detecting and correcting errors in a computer, comprising the steps of:

beginning a write operation of N data bits to a memory;
generating M check bits from said N data bits;
writing said N data bits and said M check bits to the memory;
reading said N data bits and M check bits from the memory;
generating X syndrome bits from said N data bits and said M check bits;
using said X syndrome bits to detect and correct any single bit error within said N data bits and said M check bits, to detect any double bit error within said N data bits and said M check bits, and to detect any four bit error within four adjacent bits of said N data bits.

5,841,796
APPARATUS AND METHOD FOR CALCULATING VITERBI PATH METRIC USING EXPONENTIALLY-WEIGHTED MOVING AVERAGE
John S. Snyder, Jr., Frederick, Md., assignor to Comsat Corporation, Bethesda, Md.

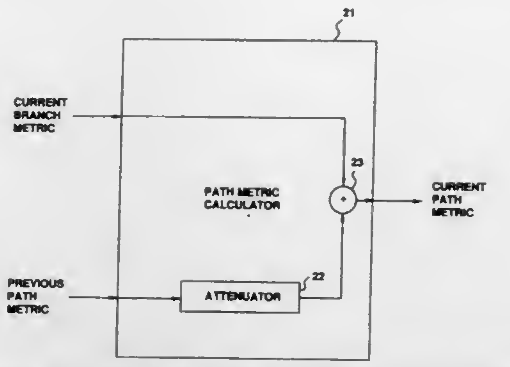
Filed Mar. 14, 1995, Ser. No. 404,653

Int. Cl.^{6} H03M *13/12*

U.S. Cl. 371—43.6 **23 Claims**

13. A maximum likelihood decoding apparatus for recreating data from a sequence of received symbols representing that data, said apparatus comprising means for storing in memory a trellis of a plurality of encoder states and symbols associated with a transition from each encoder state to another encoder state, whereby a plurality of paths through said trellis are each associated with a respective symbol sequence, means for selecting a symbol sequence and associated path through said trellis most likely represented by said sequence of received symbols, and means for recreating said data in accordance with said selected symbol sequence, said means for selecting comprising determining means for determining a current path metric as a function of at least a previous path metric and a current branch metric, said determining means comprising:

means for attenuating said previous path metric; and
means for adding said current branch metric to said attenuated path metric to form said current path metric.

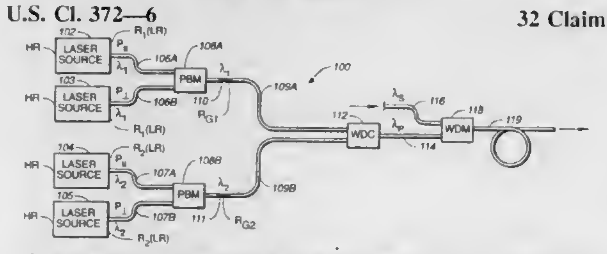


5,841,797
APPARATUS FOR STABILIZING MULTIPLE LASER SOURCES AND THEIR APPLICATION
Brian F. Ventrudo, 2636 Cedar Hill Road, British Columbia, Canada, V8T 3H2, and Peter G. Berrang, 1256 St. Dennis, Victoria, British Columbia, Canada, V8S5A7

Continuation-in-part of Ser. No. 415,129, Mar. 30, 1995, Pat. No. 5,589,684, which is a continuation-in-part of Ser. No. 267,785, Jun. 28, 1994, Pat. No. 5,485,481. This application Dec. 24, 1996, Ser. No. 773,016

Int. Cl.^{6} H01S *3/10*

U.S. Cl. 372—6 **32 Claims**



1. Apparatus for stabilizing multiple laser sources comprising:

a plurality of semiconductor laser sources having respective lasing cavities capable of lasing within a narrow bandwidth of wavelengths and providing spectral beam outputs at their respective laser exit facets having distinguishable optical characteristics from one another;

optical transfer means for coupling the spectral beam outputs from said laser sources via said laser exit facets;

means coupled to receive said optical transfer means to combine said spectral beam outputs into a single beam onto an output optical fiber;

at least one fiber grating formed in said apparatus, said at least one fiber grating having a reflectivity band for reflecting back from either said spectral beam outputs or said single beam to at least one of said laser sources a small portion of selected wavelengths within a gain bandwidth of said at least one of laser sources;

said at least one fiber grating having a reflectivity level approximately equal to or less than the reflectivity level of the exit facet said at least one of said laser sources;

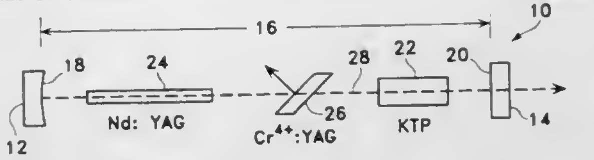
said at least one fiber grating positioned to have an optical separation from said at least one of said laser sources that is approximately equal to or longer than a coherence length of at least one of said laser sources to cause the same to operate in multiple longitudinal modes broadening the spectral output thereof by several orders of magnitude.

5,841,798
EYESAFE LASER TRANSMITTER WITH BREWSTER ANGLE Q SWITCH IN SINGLE RESONATOR CAVITY FOR BOTH PUMP LASER AND OPTICAL PARAMETRIC OSCILLATOR
Tzeng S. Chen, Rancho Palos Verdes, and Robert D. Stultz, Bellflower, both of Calif., assignors to Raytheon Company, El Segundo, Calif.

Continuation-in-part of Ser. No. 646,200, May 7, 1996, Pat. No. 5,687,186. This application Apr. 24, 1997, Ser. No. 845,267

Int. Cl.^{6} H01S *3/10*

U.S. Cl. 372—11 **5 Claims**



1. A laser comprising:

a resonator cavity having an optical axis and an outcoupler reflective surface at least one end of the optical axis for at least partially reflecting light of first and second wavelengths within the resonator cavity and for at least partially transmitting light of the second wavelength out from the resonator cavity;

a pump laser disposed within the resonator cavity and aligned with the optical axis for supplying light at said first wavelength to the laser cavity;

an optical parametric oscillator disposed within the resonator cavity and aligned with the optical axis for converting light at said first wavelength having a predetermined linear polarization to light of said second wavelength also having said predetermined linear polarization, and

a saturable absorber Q-switch disposed between the pump laser and the optical parametric oscillator and intersecting said optical axis, wherein

- the Q-switch has an associated Brewster angle and has a surface aligned at the Brewster angle with respect to the optical axis such that only light having said predetermined linear polarization is transmitted through the Q-switch in a direction parallel to the optical axis:
- once the light of the first wavelength has reach a predetermined saturation intensity, the Q-switch is substantially transparent to both said first and said second wavelengths,
- at least when said Q-switch is in its substantially transparent condition, substantially all of the light of the first wavelength that is transmitted along the optical axis with said predetermined polarization and that has not yet been converted to said second wavelength is reflected back and forth along the entire length of the resonator cavity with said predetermined linear polarization, and
- substantially all of the light of the second wavelength that is output from the optical oscillator retains said predetermined polarization and is reflected back and forth along the entire length of the resonator cavity until it is eventually transmitted through the partially transmissive outcoupler surface.

5,841,799
SEMICONDUCTOR LASER, MODULATION METHOD THEREFOR AND OPTICAL COMMUNICATION SYSTEM USING THE SAME
Tamayo Hiroki, Zama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 11, 1995, Ser. No. 570,654

Claims priority, application Japan, Dec. 17, 1994, 6-334063; Dec. 17, 1994, 6-334064; Dec. 17, 1994, 6-334065

Int. Cl.^{6} H01S *3/10*

U.S. Cl. 372—19 **34 Claims**

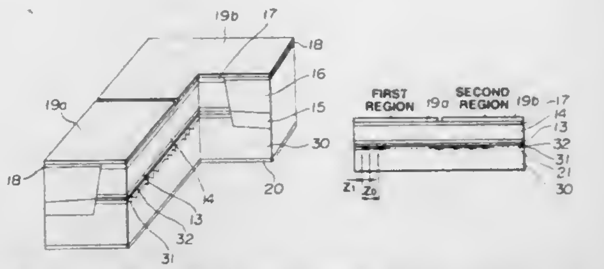
1. A semiconductor laser comprising:

a semiconductor laser structure having a waveguide extending along a resonance direction;

an active layer formed at least in a part of said waveguide; and

control means for controlling the excited state of said semiconductor layer structure to adjust the relationship between respective wavelengths, or propagation constants, and threshold gains for a transverse electric (TE) mode and a transverse magnetic (TM) mode of said laser structure

wherein the respective threshold gains for the TE mode and the TM mode alternately reach a minimum value under the control of said control means, and wherein a wavelength difference between center wavelengths of the TE and TM mode reflection spectra is equal to substantially half the wavelength difference between adjacent peak reflection wavelengths of either mode.

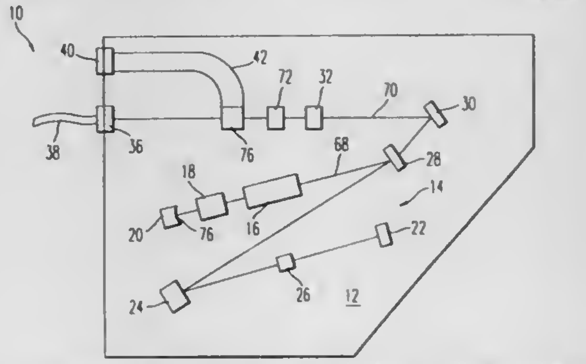


5,841,800
DESKTOP MEDICAL LASER GENERATOR
Scott A. Davenport, Half Moon Bay, and Michael Hodel, Fremont, both of Calif., assignors to Laserscope, San Jose, Calif.

Filed Jul. 28, 1995, Ser. No. 508,517

Int. Cl.^{6} H01S *3/10*

U.S. Cl. 372—22 **5 Claims**



1. In a medical laser generating apparatus of the frequency doubling type having: a base plate; a lamp housing mounted on said base plate; a lamp and a rod generally enclosed within said lamp housing such that said rod will lase when excited by said lamp, to emit a laser beam from said lamp housing; a first mirror, an output coupling type second mirror, a third mirror and optionally a fourth mirror arranged such that light emitted from said lamp housing will reflect from said first mirror, through said rod, to said second mirror, to said third mirror and optionally to said fourth mirror and back to said third mirror, thence to said second mirror, through said rod and to said first mirror; and a frequency doubling means in the path of said laser beam so that at least one of said first mirror, said second mirror, said third mirror or/and said optional fourth mirror is adapted to reflect light at the frequency produced by the rod and said second mirror pass light at double the frequency produced by the rod the improvement comprising:

a) said first mirror is concave,
b) the ratio of the focal length of said second mirror divided by the focal length of the third mirror is greater than 2.5; and
c) the spacing of:
  i) the concave first mirror;
  ii) the frequency doubling means; and
  iii) said second, third and optional fourth mirrors in the system are adjusted with respect to the rod and amongst themselves to provide increased stability at low power levels and without need for attenuators.

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5,841,801

DOUBLE WAVELENGTH LASER

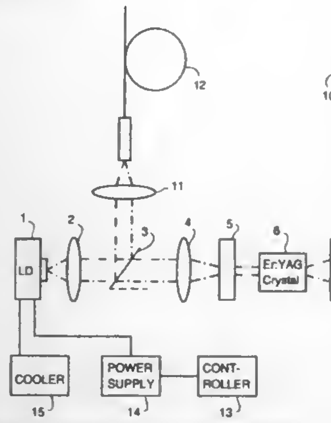
Yoshikazu Suzuki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 9, 1996, Ser. No. 762,167

Claims priority, application Japan, Dec. 13, 1995, 7-323403

Int. Cl.^{6} H01S *3/10*

U.S. Cl. 372—23 **6 Claims**



1. A double wavelength laser comprising:

a laser medium composed of either a solid or a solid crystal;

a laser diode which emits pumping light to the laser medium at a first wavelength;

a collector lens for collecting the pumping light in the laser medium;

laser pumping means which includes the laser medium and obtains laser beams at a second wavelength by pumping the laser medium with the pumping light;

switching means which is located between the laser diode and the collector lens and switches an optical path of the pumping light;

a first light guide means for guiding the pumping light at the first wavelength switched with the switching means to the outside; and

a second light guide means for guiding the laser beams at the second wavelength pumped from the laser pumping means to the outside.

5,841,802

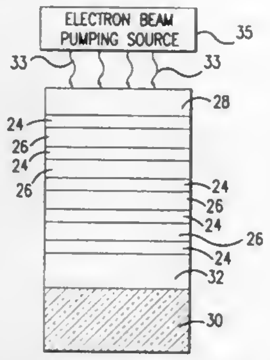
MULTIPLE, ISOLATED STRAINED QUANTUM WELL SEMICONDUCTOR LASER

J. Stanley Whiteley, Bridgeton; Neil F. Ruggieri, Florissant, and Robert R. Rice, Chesterfield, all of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Aug. 30, 1996, Ser. No. 705,732

Int. Cl.^{6} H01S *3/18*

U.S. Cl. 372—45 **16 Claims**



1. An electron beam pumped semiconductor laser, comprising:

a substrate;

an optical gain structure provided on said substrate, said optical gain structure being comprised of plurality of alternating strained quantum well layers and isolation layers, wherein said strained quantum well layers are spaced apart from one another by respective, intervening ones of said isolation layers by a sufficient distance to substantially isolate said strained quantum well layers from one another and to permit substantially complete relaxation of strain associated with said strained quantum well layers, whereby said strained quantum well layers are quantum mechanically uncoupled;

wherein said strained quantum well layers are positioned non-coincident with antinodes of a standing laser field generated in said optical gain structure,

wherein each of said strained quantum well layers has a thickness less than a pseudomorphic strain limit thickness, and a total thickness of said optical gain structure is sufficient to enable said optical gain structure to be coupled to excitation of an electron beam produced by an electron beam pumping device and incident upon said optical gain structure;

wherein each of said strained quantum well layers effectively functions as an independent optical gain region; and

wherein all of said strained quantum well layers have substantially coincident spectral gain regions.

5,841,803

Patent Not Issued For This Number

5,841,804

METHOD AND APPARATUS FOR REGENERATING GAS USED IN CARBON DIOXIDE LASER GENERATOR

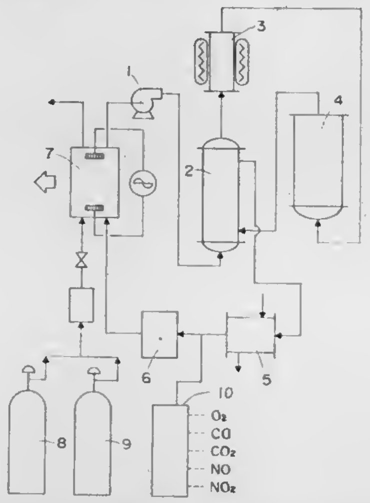
Masami Toshikuni, and Setsuo Shibata, both of Oarai-machi, Japan, assignors to JGC Corporation, Tokyo

Continuation-in-part of Ser. No. 851,933, Mar. 16, 1992, abandoned. This application Dec. 27, 1994, Ser. No. 364,197

Claims priority, application Japan, Mar. 14, 1991, 3-49657

Int. Cl.^{6} H01S *3/22;* **B01J** *38/12;* **B01D** *53/00*

U.S. Cl. 372—59 **2 Claims**



1. A method of regenerating He—N_2—CO_2 mixed gas for carbon dioxide gas laser comprising:

contacting mixed gas used in the laser and containing 50 –200 ppm H_2O with a noble metal catalyst at a mixed gas temperature exceeding 200° C. and up to 350° C. to cause reaction of CO with O_2 and NO_x in the used gas so as to regenerate CO_2 and N_2, and to cause reaction of H_2O with CO to regenerate CO_2 and form H_2, and to react O_2 with thus formed H_2;

utilizing reaction heat generated by the catalytic reactions to preheat the unreacted mixed gas;

cooling the reacted mixed gas to a temperature usable in the laser;

removing dust from the mixed gas; and

recycling the mixed gas to the laser.

5,841,805

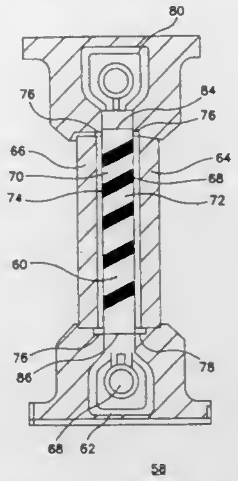
THREE-LEVEL LASER SYSTEM

Hagop Injeyan, and Jacqueline G. Berg, both of Glendale, Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Jan. 14, 1997, Ser. No. 783,646

Int. Cl.^{6} H01S *3/09*

U.S. Cl. 372—69 **36 Claims**



1. A solid state laser gain medium for use in a laser apparatus, comprising:

(a) a gain layer having pump regions and a first and a second contact region, the gain layer generating laser radiation at a lasing wavelength in response to pumping radiation pulses at the pump regions;

(b) a first transparent layer optically connected to the first contact region of the gain layer by diffusion bonding; and

(c) a second transparent layer optically connected to the second contact region of the gain layer by diffusion bonding;

wherein the transparent layers are transparent to the lasing wavelength to reduce absorption of the laser radiation by the transparent layers and wherein each transparent layer is sized to be retained by a retainer.

5,841,806

METHOD AND APPARATUS FOR THE TRANSMISSION OF ENERGY-SCALED VARIABLE RATE DATA

Klein S. Gilhousen, Bozeman, Mont.; Irwin M. Jacobs, La Jolla; Roberto Padovani, San Diego, both of Calif.; Lindsay A. Weaver, Jr., Boulder, Colo.; Charles E. Wheatley, III, Del Mar, and Andrew J. Viterbi, La Jolla, both of Calif., assignors to QUALCOMM Incorporated, San Diego, Calif.

Continuation of Ser. No. 825,147, Jan. 24, 1992, Pat. No. 5,416,797, which is a continuation of Ser. No. 543,496, Jun. 25, 1990, Pat. No. 5,103,459. This application May 16, 1995, Ser. No. 441,894

Int. Cl.^{6} H04L *27/30*

U.S. Cl. 375—206 **16 Claims**

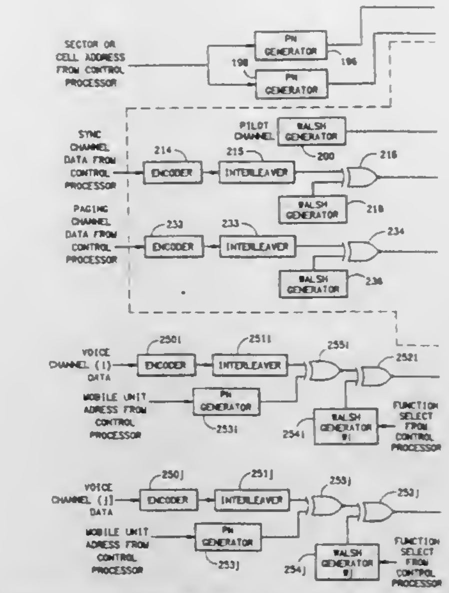
8. In a spread spectrum communication system, an apparatus for transmitting variable rate data, comprising:

an interleaver having an input and an output, said interleaver converting variable rate symbol data to constant rate symbol data and interleaving said constant rate symbol data;

a spread spectrum modulator having an input and an output, said modulator input coupled to said interleaver output and said modulator for direct sequence spread spectrum modulating said interleaved constant rate symbol data;

finite impulse response filter having an input and an output, said filter input coupled to said modulator, said filter energy scaling said modulated symbols by predetermined energy scaling factors to provide an energy scaled signal; and

a transmitter having an input coupled to said filter output for transmitting said energy scaled signal.



5,841,807

SPREAD SPECTRUM DATA COMMUNICATOR

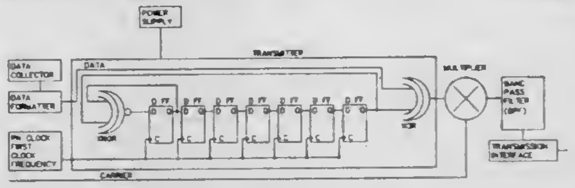
Robert S. Hannebauer; Sean C. Carroll, and Xu Tan, all of Vancouver, Canada, assignors to Intracoastal System Engineering Corporation, Burnaby, Canada

Filed Feb. 20, 1996, Ser. No. 604,095

Claims priority, application Canada, Jul. 20, 1995, 2,154,298

Int. Cl.^{6} H04B *1/707*

U.S. Cl. 375—206 **17 Claims**



1. A spread spectrum direct sequence communication system comprising:

a plurality of transmitters for uni-directionally simultaneously transmitting through a transmission medium to a single receiver, a plurality of data streams, one data stream for each transmitter in said plurality of transmitters, each data stream comprising a plurality of direct sequence data packets,

each transmitter of said plurality of transmitters comprising a data collector, a data formatter, a transmission device, a transmission interface, and a power supply,

said data collector for collecting data and passing to said data formatter, said data formatter for formatting said data into a serial data packet comprising a preamble, a transmitter identity and said data, and said data formatter serially shifting said data packet into said transmission device,

said transmission device for XOR combination of said data packet with a fixed length, repeated pseudo random noise digital chip sequence at a first clock frequency, and modulation of a resulting pseudo noise signal with a carrier to a carrier centre frequency,

said transmission interface transmitting a resulting carrier modulated pseudo noise signal containing said data packet as said data stream from said transmission device into said transmission medium, whereby said data is transmitted at a constant data rate,

said signal receiver having a second clock frequency and comprising a linear front-end, a carrier demodulator for simultaneously demodulating a plurality of said carrier modulated pseudo noise signals containing said data packets, means for

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simultaneous detection of said pseudo noise signals, and means for simultaneous correlation of said pseudo noise signals with a replica of said pseudo noise signal,

said single receiver further comprising means for simultaneous reconstruction of said data packets, and means from stripping said data from said data packets once reconstructed.

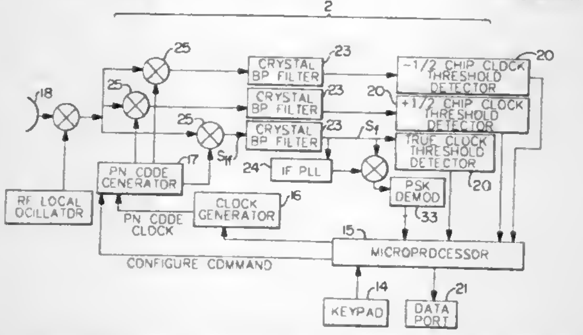
5,841,808
SPREAD SPECTRUM CHIP RATE TRACKING SYSTEM

Michael A. Rizzo, Garden Grove, and Robert E. Gorney, Riverside, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Mar. 23, 1995, Ser. No. 409,763

Int. Cl.^{6} H04B *1/69*

U.S. Cl. 375—208 **14 Claims**



1. A spread spectrum communications system having a transmitter for transmitting a spread spectrum signal containing data and a digital code and a receiver for receiving the spread spectrum signal and for demodulating the spread spectrum signal with the same digital code, the improvement in said receiver comprising:

a. means for selecting a base digital code identical to the digital code used by the transmitter,

b. means for generating a leading digital code identical to the base digital code and leading the base digital code by a fixed phase shift,

c. means for generating a lagging digital code identical to the base digital code and lagging the base digital code by the fixed phase shift,

d. means for individually mixing the leading digital code, the base digital code, and the lagging digital code with the spread spectrum signal to thereby generate a leading information signal, a base information signal and a lagging information signal, respectively,

e. means for comparing relative power levels of the leading information signal and the lagging information signal,

f. feedback means for altering the rate at which the leading digital code, the base digital code and the lagging digital code are clocked based upon the relative power levels of the leading information signal and the lagging information signal until the respective power levels of the leading information signal and the lagging information signal are equal, and

g. means for out-putting the base information signal once the respective power levels of the leading information signal and the lagging information signal are equal to thereby maximize the base information signal.

5,841,809
ACCESS LINE TERMINATION UNIT

Nobukazu Koizumi, and Yutaka Awata, both of Kawasaki, Japan, assignors to Fujitsu Limimited, Kanagawa, Japan

Filed Dec. 11, 1996, Ser. No. 763,831

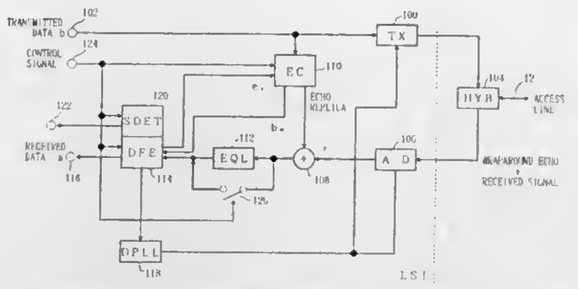
Claims priority, application Japan, Jun. 3, 1996, 8-140380

Int. Cl.^{6} H03H *7/30*

U.S. Cl. 375—233 **8 Claims**

1. A line termination circuit for an access line, comprising:

an echo canceler for generating an echo replica from transmitted data;



a subtracter for subtracting said echo replica from a signal supplied via the access line;

an equalization filter for equalizing a circuit loss of the access line;

a decision feedback equalizer for equalizing an output signal from said equalization filter so as to determine a reception symbol; and

a received signal detection circuit for detecting a received signal, wherein

a post-cursor tap coefficient of said decision feedback equalizer is used as a tap coefficient for said echo canceler during a cold-start echo canceler training period in which communication startup training is started in an initial start and during a cold-start received signal detection period.

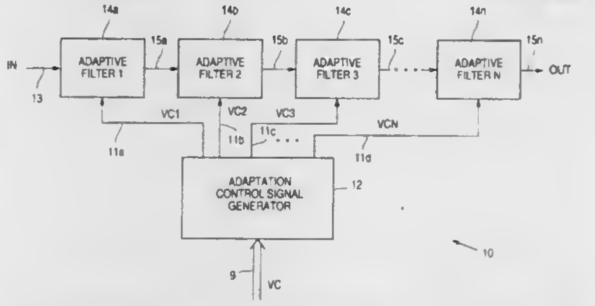
5,841,810
MULTIPLE STAGE ADAPTIVE EQUALIZER

Hee Wong, San Jose, and Abhijit Phanse, Santa Clara, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jan. 30, 1997, Ser. No. 791,382

Int. Cl.^{6} H03H *7/30;* H03K *5/159*

U.S. Cl. 375—232 **16 Claims**



1. An apparatus including an adaptive equalizer with multiple, serially coupled adaptive filter stages for use in adaptively equalizing a data signal received via a communications path having a signal loss magnitude which increases with signal frequency, comprising:

a first adaptive filter circuit configured to receive a first adaptation control signal and in accordance therewith receive, filter and magnitude weight a first input signal in a form of an input data signal corresponding to a plurality of data and in accordance therewith provide a first output signal in a form of a first equalized data signal corresponding to said plurality of data, wherein a frequency domain ratio of said first equalized data signal to said input data signal represents a first adaptive filter transfer function;

a second adaptive filter circuit, coupled to said first adaptive filter circuit, configured to receive a second adaptation control signal and in accordance therewith receive, filter and magnitude weight a second input signal in a form of said first equalized data signal and in accordance therewith provide a second output signal in a form of a second equalized data signal corresponding to said plurality of data, wherein a frequency domain ratio of said second equalized data signal to said first equalized data signal represents a second adaptive filter transfer function; and

an equalizer controller, coupled to said first and second adaptive filter circuits, configured to receive an equalization control signal and in accordance therewith provide said first and second adaptation control signals;

wherein

said input data signal is received via a communications path which includes a plurality of serially connected, respective communications path sections,

said communications path has associated therewith a communications path transfer function with a signal loss magnitude which increases with signal frequency,

said plurality of serially connected, respective communications path sections has associated therewith a plurality of corresponding, respective communications path section transfer functions,

a product of said corresponding, respective communications path section transfer functions equals said communications path transfer function,

said first adaptive filter transfer function is an approximate inverse of a first one of said plurality of corresponding, respective communications path section transfer functions,

said second adaptive filter transfer function is an approximate inverse of a second one of said plurality of corresponding, respective communications path section transfer functions,

said equalization control signal has a magnitude which corresponds to said communications path transfer function,

said first adaptation control signal has a magnitude which corresponds to said first one of said plurality of corresponding, respective communications path section transfer functions, and

said second adaptation control signal has a magnitude which corresponds to said second one of said plurality of corresponding, respective communications path section transfer functions.

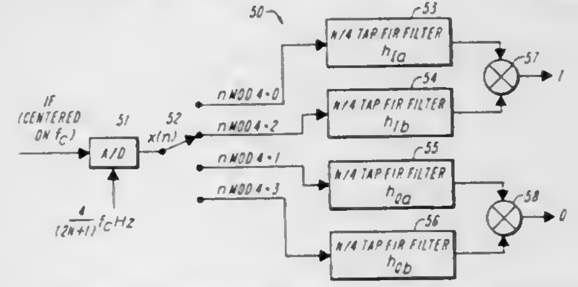
5,841,811
QUADRATURE SAMPLING SYSTEM AND HYBRID EQUALIZER

William S. Song, Lexington, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 320,164, Oct. 7, 1994, abandoned. This application Feb. 28, 1996, Ser. No. 599,554

Int. Cl.^{6} H03H *7/30;7/40;* H03K *5/159*

U.S. Cl. 375—235 **13 Claims**


50
53
N/4 TAP FIR FILTER h_{Ia}
54
N/4 TAP FIR FILTER h_{Ib}
55
N/4 TAP FIR FILTER h_{Qa}
56
N/4 TAP FIR FILTER h_{Qb}
57
I
58
Q
IF (CENTERED ON f_C)
51
A/D
52
x(n)
n MOD 4 = 0
n MOD 4 = 2
n MOD 4 = 1
n MOD 4 = 3
$\frac{4}{(2N+1)} f_C$ Hz

1. A quadrature sampling system which converts input signals to baseband inphase and quadrature signal components, said system comprising:

a signal receiver which receives said input signal having a frequency centered around a predetermined carrier frequency;

a signal processor which continuously samples said input signal at a ratio of said carrier frequency to produce discrete sequences of 2K input samples, where K is an integer;

an inphase signal channel including a first set of K filters each having respective filter coefficients, said first set of filters arranged to receive said discrete sequences, and a first signal summer which sums the outputs of said first set of K filters to produce said inphase signal component;

a quadrature signal channel including a second set of K filters each having respective filter coefficients, said second set of filters arranged to receive said discrete sequences, and a second signal summer which sums the outputs of said second set of K filters to produce said quadrature signal component; and

means for providing said input samples to said inphase and quadrature signal channels so that each filter of both channels receives one input sample of each sequence.

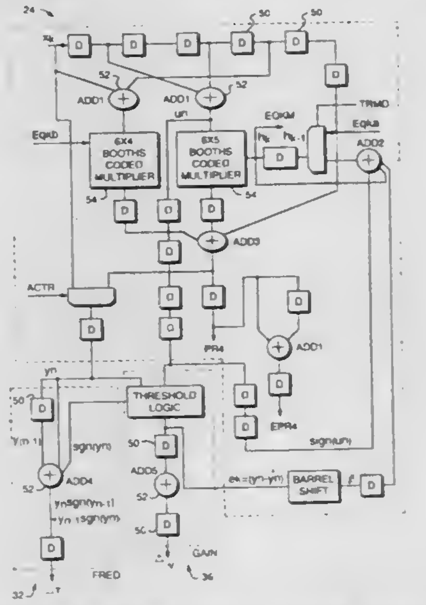
5,841,812
NMOS PASS TRANSISTOR DIGITAL SIGNAL PROCESSOR FOR A PRML SYSTEM

Paul Shepherd, Abingdon, England, and John Blake, Limerick, Islamic Rep. of Iran, assignors to Analog Devices, Inc., Norwood, Mass.

Filed Sep. 6, 1995, Ser. No. 524,082

Int. Cl.^{6} H04L *27/06*

U.S. Cl. 375—341 **6 Claims**



1. A digital data signal processor for a PRML system comprising:

an NMOS pass transistor gain and control circuit responsive to a digital data signal for adjusting the gain of the digital data signal;

an NMOS pass transistor phase control circuit responsive to said digital data signal for adjusting the phase of said data signal; and

an NMOS pass transistor Viterbi maximum likelihood detector circuit for determining the most probable sequence of symbols in said data signal;

wherein said circuits each include NMOS pass transistor arithmetic components which include multipliers; and

in which said multipliers each include a Booth encoder; a Wallace tree full adder array; an intermediate delay register; a Wallace tree half adder array; a parallel adder; and an output delay register.

5,841,813
DIGITAL COMMUNICATIONS SYSTEM USING COMPLEMENTARY CODES AND AMPLITUDE MODULATION

Didier J. R van Nee, De Meern, Netherlands, assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Sep. 4, 1996, Ser. No. 707,692

Int. Cl.^{6} H04L *27/10*

U.S. Cl. 375—279 **19 Claims**

1. A method of encoding data for transmission to a receiver comprising the steps of

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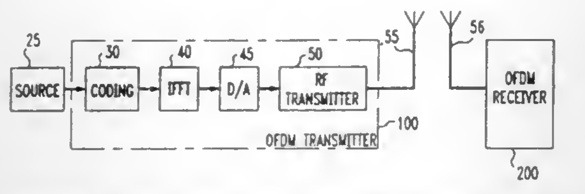


selecting a kernel code formed from a predetermined number of bits and applying independent phase rotations, ϕ_i, to each of said bits as a function of a predetermined transformation to generate respective complementary codes, θ_i,

selecting, as a function of a first group of bits of a series of bits to be encoded, one of a plurality of amplitude patterns each defined by predetermined pattern of at least two elements,

assigning the remaining groups of bits forming said series with respective ones of said phase rotations,

converting the complementary codes into phase vectors,

associating each of said phase vectors with a corresponding one of the elements forming the selected amplitude pattern, and

modulating carrier signals using respective ones of the resulting vectors and transmitting the modulated carrier signals to a receiver.

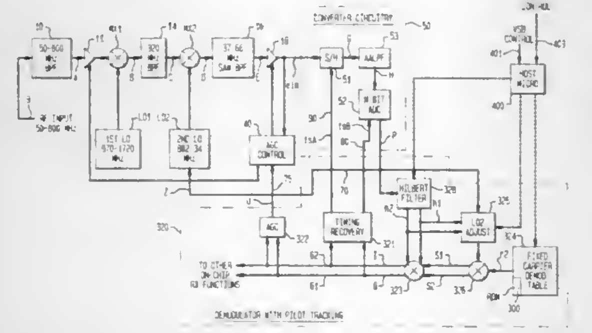
5,841,814
SAMPLING SYSTEM FOR RADIO FREQUENCY RECEIVER

Robert L. Cupo, Eatontown, N.J., assignor to Oaradyne Corporation, Largo, Fla.

Filed Oct. 17, 1995, Ser. No. 544,244

Int. Cl.^{6} H04B *1/26;* **H03D** *1/24;* **H04N** *5/455;5/46*

U.S. Cl. 375—321 **28 Claims**



13. A radio frequency (RF) receiver adapted to receive digitally modulated signals including quadrature amplitude modulated (QAM) and vestigial side band (VSB) RF signals, comprising:

an input terminal adapted to receive a digitally modulated RF signal, said input terminal having an output which comprises said RF signal with a frequency band centered at a first center frequency;

a signal conditioning circuit electrically coupled to said input terminal, said signal conditioning circuit receiving said RF signal and producing a first intermediate frequency (IF) signal centered at a first intermediate center frequency;

a sample and hold circuit electrically coupled to said signal conditioning circuit, said sampling and hold circuit producing a second IF signal centered at a second intermediate center frequency;

a filter electrically coupled to said sample and hold circuit, said filter isolating said second IF signal;

an analog to digital (A/D) converter electrically coupled to said filter, said A/D converter producing a digitized IF signal from said second IF signal; and

a demodulator circuit electrically coupled to said A/D converter, said demodulator circuit adapted to demodulate said digitized IF signal, producing a baseband signal.

5,841,815
DATA RECEIVER FOR CORRECTING A PHASE OF A RECEIVED PHASE-MODULATED SIGNAL

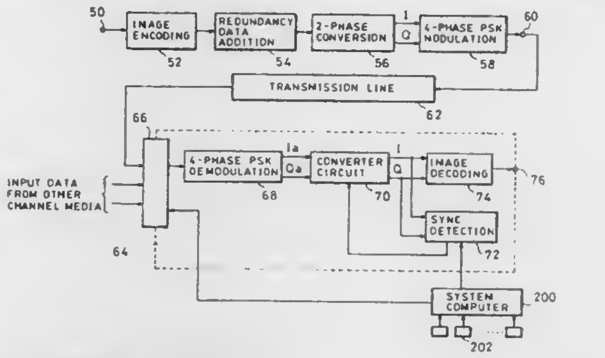
Hiroshi Takizawa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 260,924, Jun. 15, 1994, abandoned. This application Sep. 9, 1996, Ser. No. 711,081

Claims priority, application Japan, Jun. 24, 1993, 5-153641

Int. Cl.^{6} H04L *27/14*

U.S. Cl. 375—326 **26 Claims**



1. A data receiver comprising:

input means for inputting a received phase-modulated signal including information data and sync data;

detection means for detecting the sync data in the received signal;

control means for generating a control signal at a set cycle according to an output of said detection means;

setting means for manually setting the cycle; and

changing means for changing a state of the information data in response to the control signal.

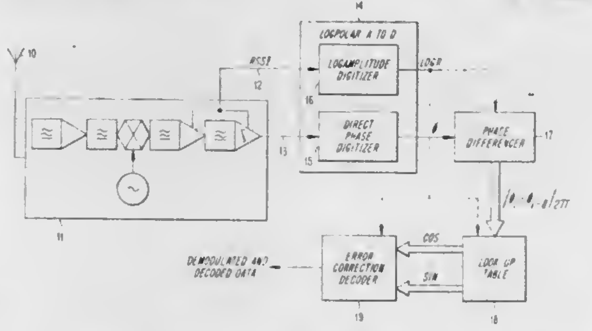
5,841,816
DIVERSITY PI/4-DQPSK DEMODULATION

Paul W. Dent, Stehags, Sweden, and Thomas M. Croft, Cary, N.C., assignors to Ericsson Inc., Research Triangle Park, N.C.

Continuation-in-part of Ser. No. 965,848, Oct. 22, 1992, Pat. No. 5,335,250. This application Mar. 28, 1994, Ser. No. 218,236

Int. Cl.^{6} H04L *27/22;1/06;7/04;* **H04B** *7/08*

U.S. Cl. 375—331 **54 Claims**



1. A method of demodulating and decoding quaternary phase modulated signals comprising the steps of:

receiving said quaternary phase modulated signals and producing a hardlimited intermediate frequency signal,

directly phase digitizing said hardlimited intermediate frequency signal to produce a stream of numerical values representing instantaneous phase angles,

computing phase differences between pairs of said numerical values spaced one quaternary symbol period apart,

converting said phase differences using a sine/cosine look-up table to produce pairs of values representing pairs of soft data bits, and

processing said pairs of values using an error correction algorithm to assess the credibility of said pairs of values.

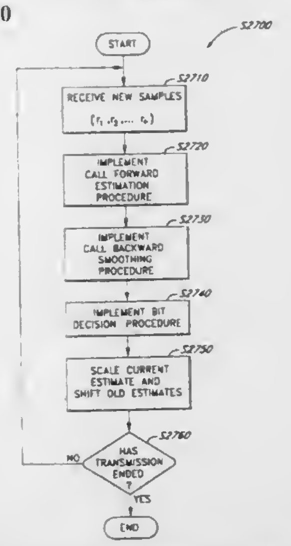
5,841,817
APPARATUS AND METHODS FOR SIGNAL RECOVERY IN A DIGITAL COMMUNICATION SYSTEM

Abraham Krieger, San Diego, and Mark Kent, Vista, both of Calif., assignors to ADC Telecommunications, Inc., Minnetonka, Minn.

Filed Oct. 27, 1995, Ser. No. 549,565

Int. Cl.^{6} H03D *1/00*

U.S. Cl. 375—340 **54 Claims**


S2700
START
S2710
RECEIVE NEW SAMPLES
S2720
IMPLEMENT CALL FORWARD ESTIMATION PROCEDURE
S2730
IMPLEMENT CALL BACKWARD SMOOTHING PROCEDURE
S2740
IMPLEMENT BIT DECISION PROCEDURE
S2750
SCALE CURRENT ESTIMATE AND SHIFT OLD ESTIMATES
S2760
HAS TRANSMISSION ENDED ?
NO
YES
END

1. A method of recovering transmitted signals in a digital communications system, comprising the steps of:

(a) obtaining n samples of a received signal for a respective time p, p−1, p−2, . . . , p−j and digitizing the n samples to provide (j+1) sets of n digitized samples;

(b) providing (j+1) vectors based on the (j+1) sets of n digitized samples, each vector having signal estimates of a transmitted signal for a respective time (p−t), where t=0 to j;

(c) storing the j vectors; and

(d) providing an estimate vector having signal estimates of the transmitted signal for time (p−j), based on the (j+1) vectors.

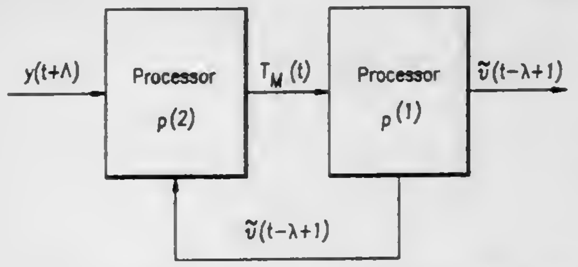
5,841,818
DECODING METHOD FOR TRELLIS CODES EMPLOYING A CONVOLUTIONAL PROCESSOR

Mao-Chao Lin, Taipei Hsien, and Jia-Yin Wang, Taipei, both of Taiwan, assignors to Chung-Chin Chen, Alexandria, Va.

Filed Jan. 17, 1996, Ser. No. 587,478

Int. Cl.^{6} H03M *13/12*

U.S. Cl. 375—341 **9 Claims**



1. A decoding method for a trellis code T for which the encoding can be implemented by feeding an information sequence $\bar{u}$ ={. . . , $\bar{u}$(t−1), $\bar{u}$(t), . . . } into an encoder of a convolutional code C followed by a convolutional processor P and a signal mapper S for generating output sequences $\bar{v}$= {. . . , $\tilde{v}$(t−1), $\tilde{v}$(t), . . . }, $\bar{s}$={. . . , $\tilde{s}$(t−1),$\tilde{s}$(t), . . . }, and $\bar{\omega}$={. . . , $\omega(\tilde{s}(t-1))$, $\omega(\tilde{s}(t))$, . . . } respectively, wherein $\bar{u}$(t) is an information symbol to be encoded during a t-th time unit, $\bar{v}$(t) is an associated output branch symbol of the encoder of C, $\tilde{s}$(t) is an associated output symbol of P, and $\omega(\tilde{s}(t))$ is an associated output symbol of S which represents a signal point of a signal space Ω, and wherein the convolutional processor P is characterized by a transfer function matrix $G=[G^{(p,q)}(X)]$ with $G^{(p,q)}(X)\neq 0$ for some p≠q, comprising the decoding steps of:

(a) Determining, in a processor $P^{(2)}$, a branch metric $M_{\bar{v}}(t)$ for each of the possible $\bar{v}$(t) based on the received sequence $\bar{y}$={. . . , y(t−1), y(t), . . . }, the transfer function matrix G, and the previously recovered symbols $\tilde{v}$(t−i), i≧λ, wherein λ is a positive constant and y(t) is a possibly noise-corrupted form of $\omega(\tilde{s}(t))$;

(b) Applying, in a processor $P^{(1)}$, the Viterbi algorithm to the trellis of C to recover $\tilde{u}$(t−λ+1) and $\tilde{v}$(t−λ+1) based on a metric sequence {. . . , $T_{M(t-1)}$, $T_{M(t)}$}, wherein $T_{M(t)}$ is a set consisting of $M_{\bar{v}(t)}$ for all the possible $\bar{v}$(t).

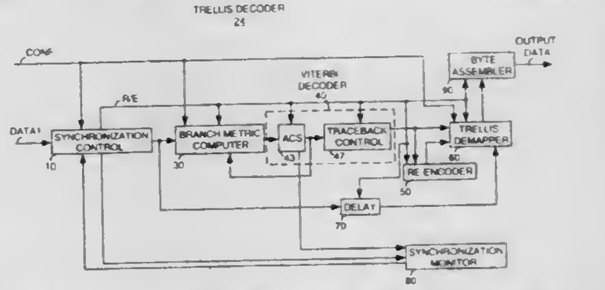
5,841,819
VITERBI DECODER FOR DIGITAL PACKET SIGNALS

Keren Hu, Plainsboro; William Wei-Lian Lin, East Windsor, and Maurice David Caldwell, Plainsboro, all of N.J., assignors to Thomson multimedia, S.A., France

Filed Apr. 9, 1996, Ser. No. 629,672

Int. Cl.^{6} G06F *11/10;* **H03M** *13/12*

U.S. Cl. 375—341 **16 Claims**



1. In a system for processing a trellis encoded video input signal exhibiting one of a plurality of signal formats, a method comprising the steps of:

generating branch metric values in response to said trellis encoded video signal wherein said branch metric values associated with one of said formats includes a substantially replicated value; and

Viterbi decoding said video input signal in response to said branch metric values including said replicated value.

5,841,820
DATA COMPARISON AGC SYSTEM FOR VSB RECEIVER

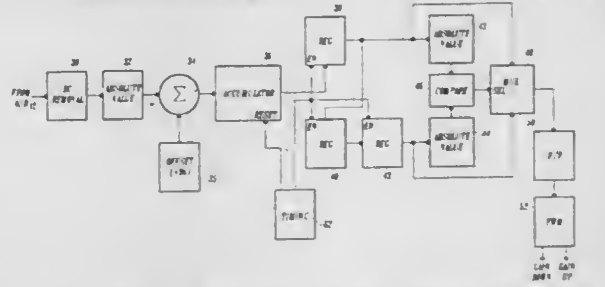
Gopalan Krishnamurthy, Wheeling, and Rudolf Turner, Hawthorn Woods, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Oct. 7, 1996, Ser. No. 726,501

Int. Cl.^{6} H04L *27/08*

U.S. Cl. 375—345 **8 Claims**

1: A method of operating an AGC system in a receiver that receives a plurality of digital signals having different average data symbol levels and average sync symbol levels, comprising.



processing a received signal to determine successive average symbol levels;

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comparing pairs of the determined average symbol levels; and
using the smaller of the compared average symbol levels to develop an AGC voltage.

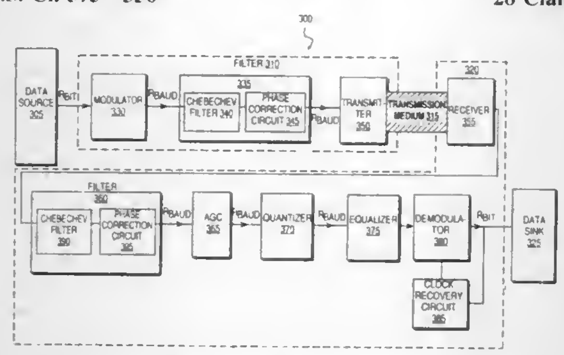
5,841,821
BI-DIRECTIONAL LOW PASS FILTERING METHOD AND APPARATUS

James T. Doyle, and Carl F. Liepold, both of Chandler, Ariz., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 408,270, Mar. 21, 1995, Pat. No. 5,694,439. This application Dec. 12, 1996, Ser. No. 764,513

Int. Cl.^{6} H04B *1/10*

U.S. Cl. 375—350 **28 Claims**



1. A method for attenuating out-of-baseband components of encoded data comprising the steps of:
filtering the encoded data using a bi-directional low pass filter to produce a first phase response; and
correcting the first phase response using the bi-directional low pass filter to produce a second phase response, wherein said second phase response opposes said first phase response in order to eliminate group delay variations in the filtered encoded data.

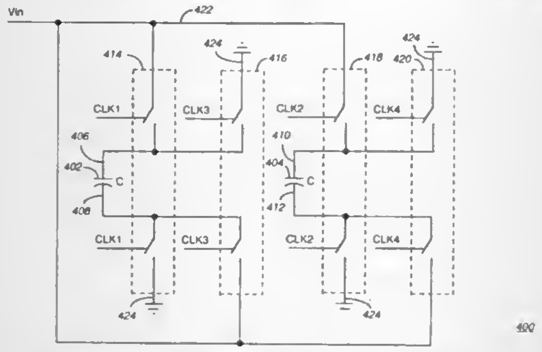
5,841,822
BAND-PASS SIGMA-DELTA CONVERTER AND COMMUTATING FILTER THEREFOR

James Gregory Mittel, Lake Worth; Raymond Louis Barrett, Jr., Ft. Lauderdale, and Walter Davis, Parkland, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 684,716, Jul. 22, 1996, Pat. No. 5,768,315. This application Dec. 1, 1997, Ser. No. 982,179

Int. Cl.^{6} H04B *1/10*

U.S. Cl. 375—350 **4 Claims**



1. A commutating filter for filtering a signal having a signal polarity, the commutating filter comprising:
a plurality of capacitors each having a capacitor polarity; and
a commutating circuit coupled to the plurality of capacitors, the commutating circuit arranged to periodically alternate a relative polarity between the signal and the plurality of capacitors by performing one of:
(a) periodically alternating the signal polarity while leaving the capacitor polarity fixed; and
(b) periodically alternating the capacitor polarity while leaving the signal polarity fixed.

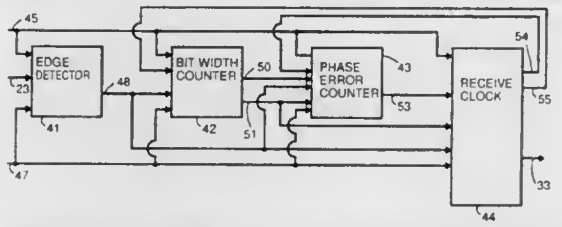
5,841,823
METHOD AND APPARATUS FOR EXTRACTING A CLOCK SIGNAL FROM A RECEIVED SIGNAL

Roland Van Der Tuijn, Mougins, France, assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Oct. 13, 1995, Ser. No. 542,870

Int. Cl.^{6} H03D *3/24*

U.S. Cl. 375—373 **14 Claims**



1. A method for extracting a clock signal from a received signal, the method comprising the steps of:
(a) detecting edges of the received signal where the received signal transitions between a logic 0 and a logic 1;
(b) determining a center between each pair of consecutive edges detected in step (a);
(c) discarding each center determined in step (b) which is not within an associated correction window; and,
(d) generating the extracted clock signal, the phase of the extracted clock signal is varied on based on the centers determined in step (b) which are not discarded in step (c).

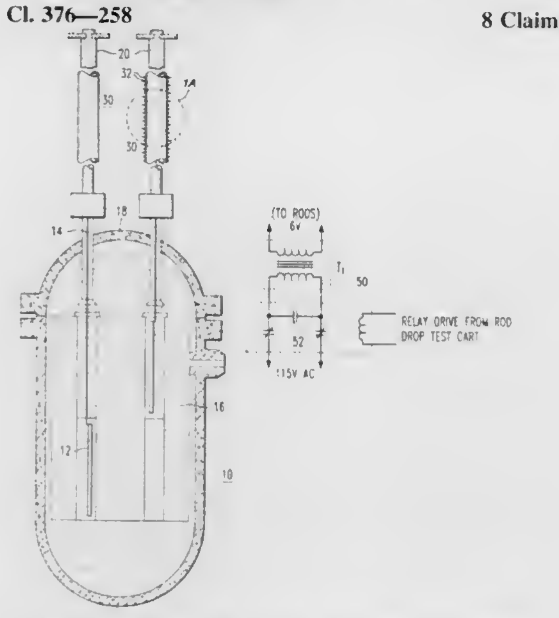
5,841,824
SYSTEM AND METHOD FOR TESTING THE FREE FALL TIME OF NUCLEAR REACTOR CONTROL RODS

Kinglsey F. Graham, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 13, 1997, Ser. No. 855,274

Int. Cl.^{6} G21C *17/12*

U.S. Cl. 376—258 **8 Claims**



7. A method for measuring the free fall time of a plurality of control rod clusters within the core of a nuclear reactor, having a drive rod connected to each control rod cluster which is operative to move the cluster into and out of the reactor core, and a plurality of position sensors associated with each control rod cluster and located in tandem along the path of movement of each drive rod, with each position sensor within the tandem array being energized by a common transformer, including the steps of:
disconnecting the transformer primary from the power supply;
shorting the transformer; and
providing a measure of the current through the secondary winding of the transformer.

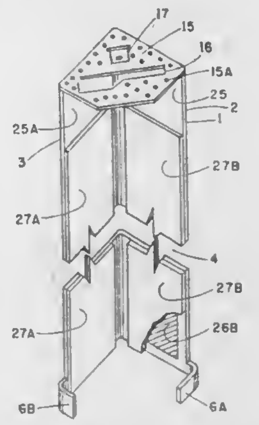
5,841,825
NEUTRON ABSORBING APPARATUS

Paul Roberts, 3057 SE. Waveland Pl., Stuart, Fla. 34996

Continuation of Ser. No. 506,184, Jul. 25, 1995, Pat. No. 5,629,964, which is a continuation-in-part of Ser. No. 208,866, Mar. 11, 1994, Pat. No. 5,479,463. This application Apr. 29, 1997, Ser. No. 840,378

Int. Cl.^{6} G21C *7/00;19/40*

U.S. Cl. 376—272 **34 Claims**



29. A method of increasing the absorption of neutrons to maintain sub-criticality in a nuclear fuel assembly storage pool in which a pressurized water reactor fuel assembly is located, the fuel assembly positioned in a storage cell formed by the interior walls of a fuel storage rack located within the storage pool, the pressurized water reactor fuel assembly having a lower tie plate, a guide tube having an upper end and a lower end which is connected to the lower tie plate, spacer grids spaced along the guide tube, an upper flow nozzle which is attached to the upper end of the guide tube, a plurality of elongated substantially parallel nuclear fuel rods which are spaced radially and supported along the guide tube by the spacer grids, the method comprising the steps of:
(a) inserting an elongated substantially flat plate having a neutron absorber material into a position between the outermost fuel rods of the fuel assembly and an interior wall of the storage cell;
(b) securing the elongated substantially flat plate to the nuclear fuel assembly in the position between the outermost fuel rods of the fuel assembly and the interior wall of the storage cell.

5,841,826
METHOD OF USING A CHEMICAL SOLUTION TO DISLODGE AND DISLOCATE SCALE, SLUDGE AND OTHER DEPOSITS FROM NUCLEAR STEAM GENERATORS

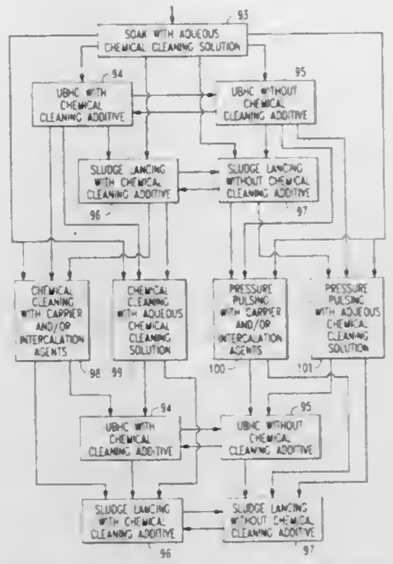
Michael W. Rootham, Pittsburgh, Pa., and Mark J. Parvin, Pittsford, N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 521,059, Aug. 29, 1995, Pat. No. 5,764,717. This application Feb. 25, 1997, Ser. No. 805,004

Int. Cl.^{6} B08B *3/08;* **F22B** *37/48*

U.S. Cl. 376—316 **50 Claims**

1. A method for removing sludge, scale, or deposits from an interior of a heat exchanger vessel, which comprises:
introducing an aqueous chemical cleaning solution into said interior of said heat exchanger vessel, said aqueous chemical cleaning solution comprising a chemical cleaning agent consisting of a carrier agent and an intercalation agent; and.
removing said aqueous chemical cleaning solution and at least a portion of said sludge, scale or deposits from said interior of said heat exchanger vessel.


93
SOAK WITH AQUEOUS CHEMICAL CLEANING SOLUTION
94
UBHC WITH CHEMICAL CLEANING ADDITIVE
95
UBHC WITHOUT CHEMICAL CLEANING ADDITIVE
SLUDGE LANCING WITH CHEMICAL CLEANING ADDITIVE
SLUDGE LANCING WITHOUT CHEMICAL CLEANING ADDITIVE
96
97
CHEMICAL CLEANING WITH CARRIER AND/OR INTERCALATION AGENTS
CHEMICAL CLEANING WITH AQUEOUS CHEMICAL CLEANING SOLUTION
PRESSURE PULSING WITH CARRIER AND/OR INTERCALATION AGENTS
PRESSURE PULSING WITH AQUEOUS CHEMICAL CLEANING SOLUTION
98
99
100
101
94
UBHC WITH CHEMICAL CLEANING ADDITIVE
95
UBHC WITHOUT CHEMICAL CLEANING ADDITIVE
SLUDGE LANCING WITH CHEMICAL CLEANING ADDITIVE
SLUDGE LANCING WITHOUT CHEMICAL CLEANING ADDITIVE
96
97

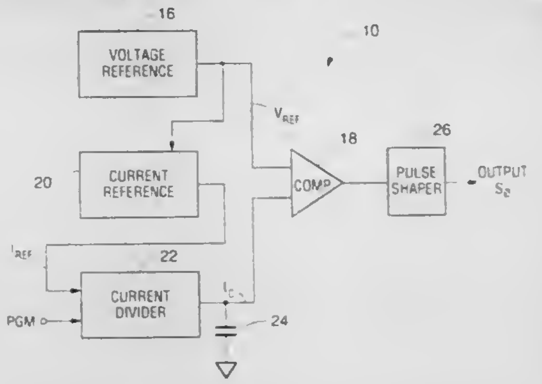
5,841,827
TIMER CIRCUIT WITH PROGRAMMABLE DECODE CIRCUITRY

Christophe J. Chevallier, Palo Alto, Calif., assignor to Micron Quantum Devices, Inc., Santa Clara, Calif.

Continuation of Ser. No. 508,847, Jul. 28, 1995, Pat. No. 5,579,356. This application Sep. 20, 1996, Ser. No. 716,987

Int. Cl.^{6} H03K *1/04*

U.S. Cl. 377—20 **23 Claims**



1. A timer circuit comprising:
a timer element which generates a periodic timing signal;
a frequency divider responsive to the periodic timing signal and configured to provide a plurality of different frequency divided outputs;
a non-volatile data storage unit configured to store a plurality of decode parameters; and
a decoder, operably coupled to the frequency divider and to the data storage unit, said decoder being configured to combine selected ones of the frequency divided outputs based upon the decode parameters and to generate a timer circuit output pulse having a duration determined by the selected ones of the frequency divided outputs.

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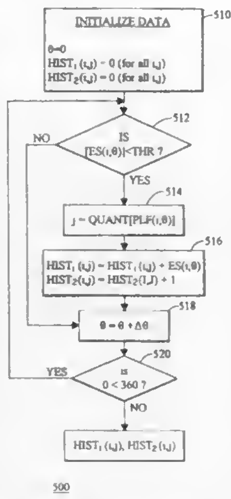
5,841,828
SELF CALIBRATING RING SUPPRESSION FILTER FOR USE IN COMPUTED TOMOGRAPHY SYSTEMS

Bernard M. Gordon, Magnolia, and Lai Ching-Ming, Wakefield, both of Mass., assignors to Analogic Corporation, Peabody, Mass.

Continuation of Ser. No. 614,660, Mar. 13, 1996, abandoned. This application Apr. 29, 1997, Ser. No. 840,681

Int. Cl.^{6} A61B *6/03*

U.S. Cl. 378—4 **14 Claims**



1. A computed tomography system for creating a tomographic image of a scanned object and including a source of X-rays and channel defining means for defining a plurality of signal processing channels characterized by a corresponding plurality of transfer functions, said plurality of signal processing channels comprising means, including a corresponding plurality of detectors of a detector array for detecting X-rays emitted from said source, for generating a plurality of data signals as a function of the X-rays detected by the corresponding detectors at each of a plurality of projection angles of a tomographic scan through the corresponding signal processing channels, said system further including:

means for automatically calibrating the transfer functions of said channels with an error correction histogram characterizing the error in each channel as a function of projection amplitude obtained from data signals generated during at least one previous scan of a patient so as to minimize ring artifacts in tomographic images produced from said data signals.

5,841,829
OPTIMAL CHANNEL FILTER FOR CT SYSTEM WITH WOBBLING FOCAL SPOT

Enrico Dolazza, Boston, and Hans Weedon, Salem, both of Mass., assignors to Analogic Corporation, Peabody, Mass.

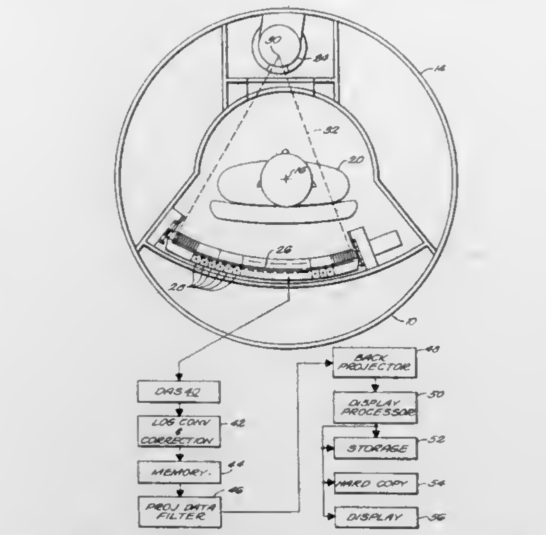
Filed May 13, 1997, Ser. No. 855,207

Int. Cl.^{6} A61B *6/03*

U.S. Cl. 378—4 **32 Claims**

1. A data acquisition system of the type for use in a CT scanner including (a) means for defining a focal spot of an x-ray source, and (b) means for shifting the focal spot between at least two positions in accordance with a function w(t) so as to acquire sample measurements with respect to ray paths during a scan defined by the positions of the focal spot during the views of the scan, said system comprising:

at least one detector for generating a signal G(t) in response to the sample measurements acquired during a scan; and



filter means for filtering the signal G(t) and having a time response F(t) as a function of w(t).

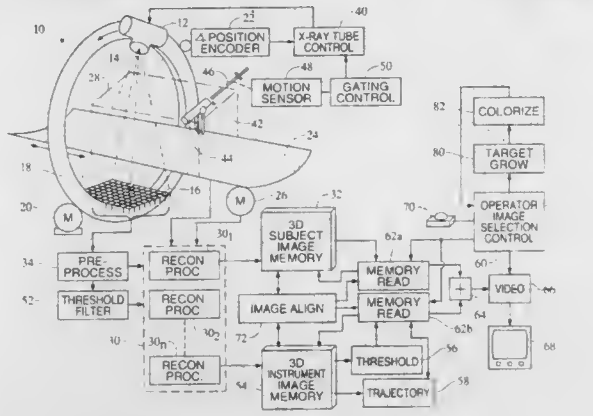
5,841,830
3D CT FLUOROSCOPY

John J. Barni, Mayfield Village; Kenneth L. Freeman, Stow; Gary A. Kaufmann, Hinckley, and Darrell M. Smith, Cleveland Heights, all of Ohio, assignors to Picker International, Inc., Highland Heights, Ohio

Filed Feb. 19, 1997, Ser. No. 802,618

Int. Cl.^{6} A61B *6/03*

U.S. Cl. 378—15 **16 Claims**



1. A CT scanner comprising:

and x-ray source for generating a low energy cone-beam of radiation through an imaging volume;

a two-dimensional detector array disposed across the imaging volume from the x-ray source for receiving x-rays which have traversed the imaging volume and converting the x-rays into digital data;

a rotary drive for rotating at least the x-ray source around the imaging volume and a linear drive for moving a patient support and the x-ray source longitudinally relative to each other;

a control which coordinates the rotary drive and the linear drive such that the cone-beam of radiation traverses a spiral around and along the imaging volume;

a reconstruction processor for reconstructing image data from the two-dimensional array;

a volumetric, diagnostic image memory which is continuously updated with the reconstructed image data from the reconstruction processor to store a continuously updated volumetric image representation;

a memory access circuit for accessing the diagnostic image memory to withdraw selected portions of the continuously updated volumetric image representation to generate a continuously updated real-time display on a human-readable monitor; and

an x-ray source control for selectively causing the x-ray source to produce x-rays of a preselected lower intensity in a fluoroscopic mode of operation.

5,841,831
X-RAY COMPUTED TOMOGRAPHY APPARATUS

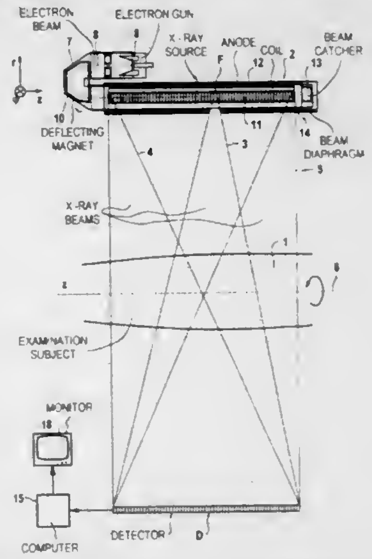
Erich Hell, Erlangen; Peter Schardt, Roettenbach, and Guenter Schwierz, Neunkirchen, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 28, 1997, Ser. No. 847,622

Claims priority, application Germany, May 9, 1996, 196 18 749.4

Int. Cl.^{6} G01N *23/00*

U.S. Cl. 378—19 **1 Claim**



1. An x-ray computed tomography apparatus having a system axis, said apparatus comprising:

a radiation detector;

an x-ray source having an anode extending parallel to said system axis, an electron gun which emits an electron beam, and deflection means for deflecting said electron beam onto said anode at a focus which moves along said anode parallel to said system axis;

a primary radiation diaphragm disposed between said anode and said system axis;

means for conducting a scan of an examination subject stationarily disposed parallel to said system axis by rotating said x-ray source and said detector around said system axis and moving said primary radiation diaphragm parallel to said system axis synchronously with movement of said focus on said anode for causing a pyramid-shaped x-ray beam to be emitted through said primary radiation diaphragm which always fully strikes said detector, said detector generating electrical signals as a result of x-rays incident thereon;

computer means for reconstructing an image of a selected volume of said examination subject from said electrical signals; and

display means for displaying said image.

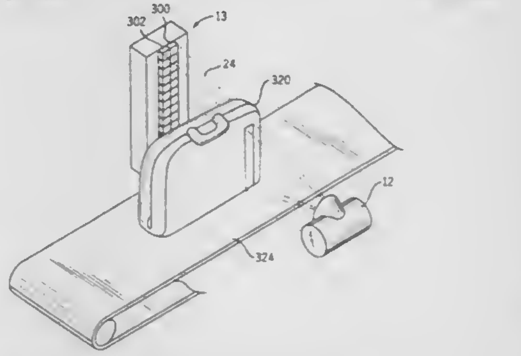
5,841,832
DUAL-ENERGY X-RAY DETECTOR PROVIDING SPATIAL AND TEMPORAL INTERPOLATION

Richard B. Mazess, and David M. Gauntt, both of Madison, Wis., assignors to Lunar Corporation, Madison, Wis.

Continuation-in-part of Ser. No. 814,368, Mar. 11, 1997, Ser. No. 73,264, Jun. 7, 1992, Pat. No. 5,228,068, and Ser. No. 810,875, Mar. 5, 1995, Pat. No. 5,745,544, which is a continuation of Ser. No. 551,685, Nov. 1, 1995, abandoned, which is a continuation-in-part of Ser. No. 241,270, May 10, 1994, Pat. No. 5,509,042, and a division of Ser. No. 344,328, Nov. 23, 1994, abandoned, which is a continuation-in-part of Ser. No. 976,797, Nov. 16, 1992, Pat. No. 5,287,546, said Ser. No. 241,270 is a continuation-in-part of Ser. No. 67,651, May 26, 1993, Pat. No. 5,291,537, which is a division of Ser. No. 944,626, Sep. 14, 1992, said Ser. No. 814,368 is a continuation-in-part of Ser. No. 551,685, said Ser. No. 73,264 is a continuation of Ser. No. 862,096, Apr. 2, 1992, abandoned, which is a continuation of Ser. No. 655,011, Feb. 13, 1991, Pat. No. 5,287,546. This application Sep. 26, 1997, Ser. No. 938,992

Int. Cl.^{6} A61B *6/00*

U.S. Cl. 378—56 **14 Claims**



14. A baggage scanning system comprising:

(a) an x-ray source producing a beam of x-ray radiation;

(b) a bag conveyor moving the bag across the beam;

(c) a dual energy detector receiving the beam after it has passed through baggage to generate electrical signals indicating the attenuation of the beam by the baggage within distinct first and second energy ranges, the dual energy detector including at least two multi-element rows separating low energy detector elements detecting incident low energy photons each over a predetermined detector area from high energy detector elements detecting incident high energy photons each over a predetermined detector area; wherein the first and second rows are side by side so as to simultaneously receive photons but from different portions of the baggage; and

(d) an electronic computer receiving and combining the electrical signals to produce a material differentiating image based on the attenuation of the x-ray radiation in the first and second energy ranges.

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5,841,833

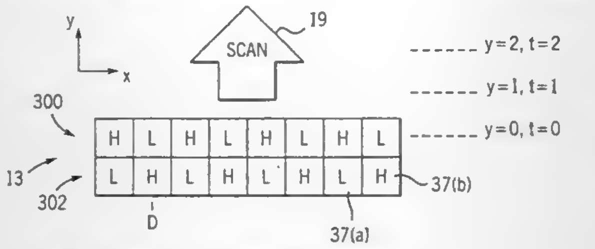
DUAL-ENERGY X-RAY DETECTOR PROVIDING SPATIAL AND TEMPORAL INTERPOLATION

Richard B. Mazess, and David M. Gauntt, both of Madison, Wis., assignors to Lunar Corporation, Madison, Wis.

Continuation-in-part of Ser. No. 73,264, Jun. 7, 1993, Pat. No. 5,306,306, and Ser. No. 551,685, Nov. 1, 1995, abandoned, which is a continuation-in-part of Ser. No. 241,270, May 10, 1994, Pat. No. 5,509,042, which is a continuation-in-part of Ser. No. 67,651, May 26, 1993, Pat. No. 5,291,537, which is a division of Ser. No. 944,626, Sep. 14, 1992, Pat. No. 5,228,068, said Ser. No. 73,264 is a continuation of Ser. No. 862,096, Apr. 2, 1992, abandoned, which is a continuation of Ser. No. 655,011, Feb. 13, 1991, abandoned. This application Mar. 11, 1997, Ser. No. 814,368

Int. Cl.^{6} H05G *1/64*

U.S. Cl. 378—98.9 **16 Claims**



1. A dual energy x-ray detector comprising:
low energy solid state x-ray detector elements detecting incident low energy x-ray photons each over a predetermined detector area to produce a first electronic signal proportional to the incident low energy photons; and
high energy solid state x-ray detector elements detecting incident high energy x-ray photons each over a predetermined detector area to produce a second electronic signal proportional to the incident high energy photons;
wherein the low and high energy x-ray detector elements are arranged in at least one row of alternating high and low energy detector elements.

5,841,834

FILTER ARRANGEMENT IN A RADIOGRAPHY APPARATUS

Esa Pekka Suuronen, Espoo, Finland, assignor to Orion-Yhtyma OY, Helsinki, Finland

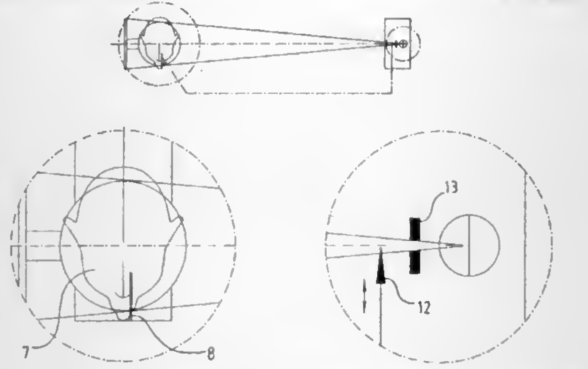
PCT No. PCT/FI95/00069, § 371 Date Nov. 29, 1996, § 102(e) Date Nov. 29, 1996, PCT Pub. No. WO95/21571, PCT Pub. Date Aug. 17, 1995

PCT Filed Feb. 14, 1995, Ser. No. 693,166

Claims priority, application Finland, Feb. 15, 1994, 940707

Int. Cl.^{6} A61B *6/08*

U.S. Cl. 378—156 **9 Claims**



1. A filter arrangement in a radiography apparatus in order to filter the radiation beam incident upon a patient, the radiography apparatus incorporating a source of X ray radiation (2), a movable filter placed in front of the source, means (5) for supporting the patient in order to keep an object (7) to he radiographed immobile relative to the beam of X-rays, and there being in alignment with the patient light-emitting means (8) to indicate a dimension of the filtered portion of the radiation beam at a given time, and there being a signal communication between the said light-emitting means (8) and the movable filter in order to effect a positional dependency between them, characterized in that to the movable filter there are coupled circuit means (9–11) producing an electric signal dependent on the position of the filter, there being provided for the circuit means a further signal communication to light emitting means (8) arranged in a row, fitted in the vicinity of the object to be imaged, in such a manner that a certain light emitter or certain light emitters will become illuminated according to the position of the movable filter to indicate the boundary of the filtered radiation beam.

5,841,835

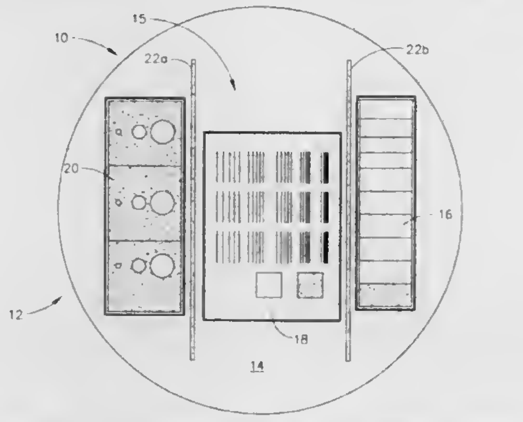
APPARATUS AND METHOD FOR AUTOMATIC MONITORING AND ASSESSMENT OF IMAGE QUALITY IN X-RAY SYSTEMS

Richard Aufrichtig, Wauwatosa, and Alexander Y. Tokman, Waukeshe, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Mar. 31, 1997, Ser. No. 823,037

Int. Cl.^{6} G01D *18/00*

U.S. Cl. 378—207 **7 Claims**



1. A method for processing a digital x-ray image to automatically assess image quality of a system, comprising the steps of:
providing a digital image of a composite phantom, including images of inserts including a resolution pattern, a contrast detail phantom, a multiple level copper step wedge, and lead wire phantoms; and
applying processing means to the digital image for computing x-ray system image quality measurements, wherein the step of applying processing means includes
calculating derivatives through cross-sections of the digital image to provide initial localization of the resolution pattern, step wedge, contrast detail phantom and lead wire phantoms;
providing localized filtration with N×N edge enhancement kernels in areas around initial estimates;
precisely specifying locations of the resolution, step wedge, contrast-detail phantom, and lead wire phantoms;
tracking a circular edge of the image to obtain additional localization information;
performing a second order polynomial warping to automatically predict location of regions of interest on the image;
calculating first and second order statistics and their variates at each region of interest to estimate system resolution, uniformity, dynamic range, contrast-to-noise, and noise; and
estimating system distortion from polynomial fitting of the edge tracking data from the two lead wire phantoms.

5,841,836

NETWORK TERMINATION EQUIPMENT

Anthony G. Dunn, Billericay, and Jonathan J. Kingan, Ipswitch, both of Great Britain, assignors to British Telecommunications public limited company, London, United Kingdom

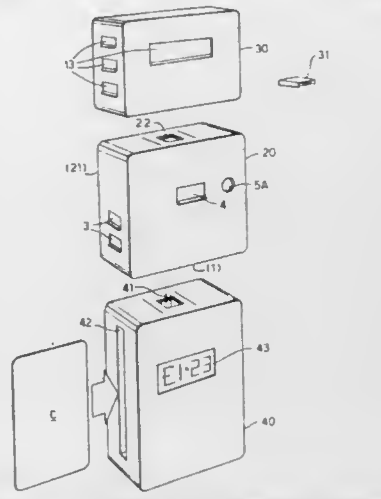
PCT No. PCT/GB95/01098, § 371 Date Feb. 11, 1997, § 102(e) Date Feb. 11, 1997, PCT Pub. No. WO95/32575, PCT Pub. Date Nov. 30, 1995

PCT Filed May 16, 1995, Ser. No. 737,582

Claims priority, application United Kingdom, May 17, 1994, 9409842; Aug. 17, 1994, 9416597; European Pat. Off., Sep. 30, 1994, 94307186

Int. Cl.^{6} H04M *3/08;1/00;* H01R *21/00*

U.S. Cl. 379—29 **32 Claims**



1. Telecommunications equipment, comprising a network termination equipment for forming the physical termination of a telecommunications network and providing a connection by which a user can access the network by use of telecommunications apparatus, the network termination equipment having:
first connection point for making connection with the head end of a telecommunications network,
at least one second connection point for making connection with a telecommunications apparatus,
operative means for generating signals for transmission to the head end, and
a further connection arranged to allow the connection of different complementary elements, such that the topology of the connection of the elements can be varied to allow the network termination to perform different functions.

5,841,837

METHOD AND APPARATUS FOR PROCESSING TELEPHONE CALLS

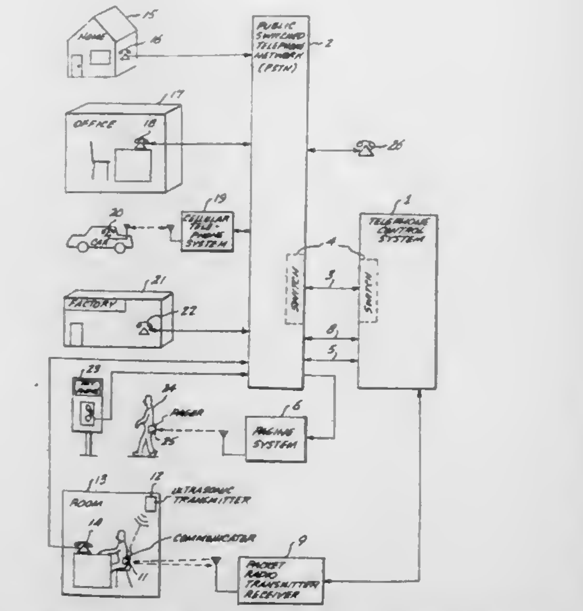
Robert M. Fuller, Redmond; Frederick A. Epler, Issaquah, and Maxwell E. Manowski, Enumclaw, all of Wash., assignors to Acessline Technologies, Inc., Bellevue, Wash.

Division of Ser. No. 249,453, May 26, 1994, which is a division of Ser. No. 480,242, Feb. 15, 1990, Pat. No. 5,375,161, which is a continuation-in-part of Ser. No. 439,601, Nov. 21, 1989, abandoned, which is a continuation-in-part of Ser. No. 841,931, Mar. 20, 1986, Pat. No. 4,893,335, which is a continuation-in-part of Ser. No. 650,821, Sep. 14, 1984, abandoned. This application May 11, 1995, Ser. No. 439,254

Int. Cl.^{6} H04Q *7/08;7/14*

U.S. Cl. 379—57 **16 Claims**

13. A method of processing incoming telephone calls directed to a user from a calling party, said method comprising the steps of:
(a) collecting information regarding the telephone number at which the calling party is presently located;
(b) processing an incoming telephone call from the calling party, including answering the call and transmitting a courtesy message to the calling party;



(c) transmitting a page to a paging device having a display device, said page including the information regarding the telephone number at which the calling party is presently located for display on said display device.

5,841,838

TELEPHONE ANSWERING UNIT WITH CALLER IDENTIFICATION AND MESSAGE RECORDING FUNCTION

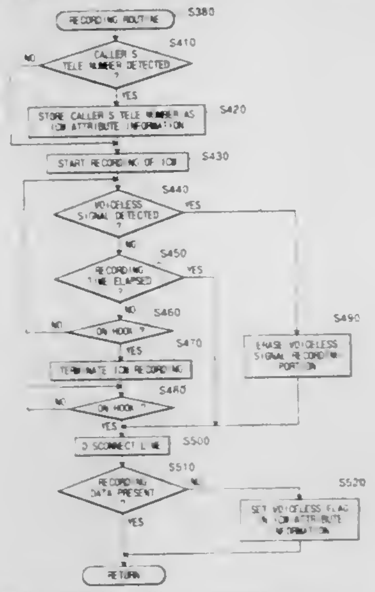
Shingo Itoh, Komaki, and Junji Hatamura, Nagoya, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Nov. 16, 1995, Ser. No. 559,114

Claims priority, application Japan, Nov. 17, 1994, 6-283674; Nov. 17, 1994, 6-283675; May 10, 1995, 7-111884

Int. Cl.^{6} H04M *1/64*

U.S. Cl. 379—67 **21 Claims**



1. A versatile telephone unit comprising:
call signal detection means for detecting a call signal from a remote telephone, the call signal being transmitted over a telephone line via a switchboard;
a memory medium;
first response control means for connecting a line to the remote telephone;

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second response control means for automatically connecting the line to the remote telephone, for automatically transmitting a preset response message to the remote telephone, and for automatically storing in said memory medium an incoming message from a caller after transmission of the preset response message is completed and then automatically disconnecting the line from the remote telephone, said first response control means and said second response control means being selectively activated when said call signal detection means detects the call signal;

storage control means for, when said first response control means is activated, storing in said memory medium a caller's telephone number transmitted with the call signal from the switchboard when said call signal detection means detects the call signal a predetermined number of times, and for, when said second response control means is activated, storing in said memory medium the caller's telephone number in correspondence with the incoming message;

a display;

display control means for displaying on said display the caller's telephone number stored in said memory medium;

reproduction means for audibly reproducing the incoming message stored in said memory medium, wherein the caller's telephone number is being displayed throughout the reproduction of the corresponding incoming message;

first determination means for determining, when said second response control means is activated, whether or not a voice is included in the incoming message from the caller; and

deletion means for erasing the incoming message from said memory medium when said first determination means determines that a voice is not included in the incoming message.

5,841,839

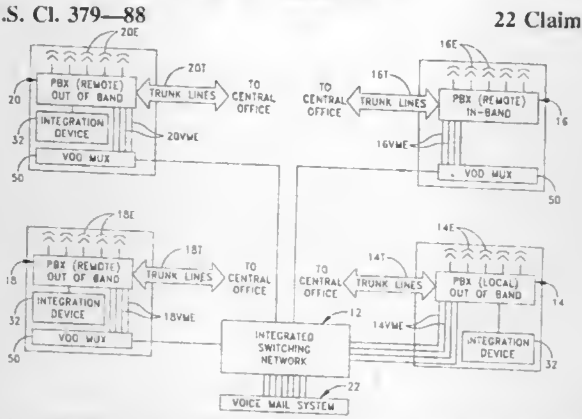
INTEGRATED TELEPHONE SWITCHING APPARATUS FOR FULLY INTEGRATING MULTIPLE BUSINESS TELEPHONE SYSTEMS WITH A SINGLE VOICE MAIL SYSTEM

Shawn D. T. Fogg; David C. Fogg, and Pamela Tripode Fogg, all of 250 Stone Ridge Dr., East Greenwich, R.I. 02818

Filed Dec. 6, 1996, Ser. No. 761,356

Int. Cl.^{6} H04M *1/64*

U.S. Cl. 379—88 **22 Claims**



1. Apparatus for providing call information integration and call switching from a plurality of different PBX's to a single voice mail system, said apparatus comprising:

a switching apparatus including a plurality of input ports connected to voice mail extensions on each of a plurality of different PBX's, a plurality of output ports connected to a plurality of voice mail ports of a single voice mail system, and a switching circuit interconnecting the input ports to the output ports for selectively cross-connecting calls from said input ports to said output ports; and

a switching control apparatus coupled to said switching apparatus for selectively controlling cross-connecting of said calls from said input ports to said output ports, said switching control apparatus including

means for communicating with each of said PBX's for exchanging call information between said PBX's and said switching control apparatus,

means for communicating with said voice mail system for exchanging call information between said switching control apparatus and said voice mail system,

database means for storing input port assignments identifying each of said voice mail extensions of each of said plurality of PBX's, communication protocols for defining communication between said switching control apparatus and each of said plurality of PBX's, and a communication protocol for communicating with said voice mail system, and

means for generating a new set of call information for each call to be cross-connected to said voice mail system,

said switching control apparatus being operative for receiving a set of call information from a respective one of said PBX's, said set of call information being associated with a call forwarded from said respective PBX on said voice mail extension and received on one of said input ports, said set of call information at least identifying the called party and the respective voice mail extension to which the call has been forwarded, said switching control apparatus further being operative for determining an available voice mail port, creating a new set of call information at least identifying the called party and the respective voice mail port to which the call is being forwarded, communicating said new set of call information to said voice mail system to identify said call to said voice mail system, and cross-connecting said call from said input port to said available output port.

5,841,840

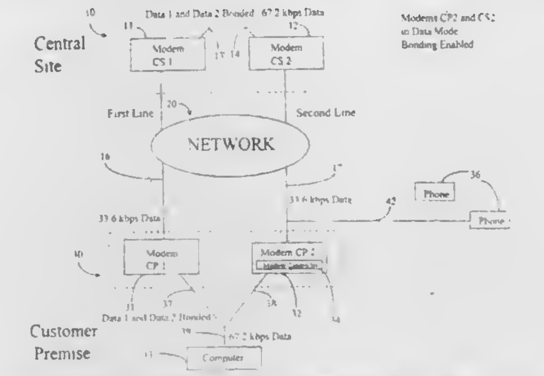
MULTIPLE LINE MODEM AND METHOD FOR PROVIDING VOICE ON DEMAND

Richard K. Smith, Seminole, and Thomas J. Bingel, Belleair Beach, both of Fla., assignors to Paradyne Corporation, Largo, Fla.

Filed Dec. 23, 1996, Ser. No. 772,734

Int. Cl.^{6} H04M *11/00*

U.S. Cl. 379—93.01 **17 Claims**



1. A method for increasing the data transfer rate of a data connection, comprising the steps of:

providing a plurality of individual serial data lines;

operating each of said plurality of individual serial data lines in a data transfer mode during a period in which voice service is not requested;

operating at least one of said plurality of individual serial data lines in a voice service mode when voice service is requested, while continuing to operate a remainder of said plurality of individual serial data lines in said data transfer mode and redirecting data that would otherwise be transferred over the at least one serial data line operating in voice service mode to at least one of the remaining serial data lines; and

returning said at least one of said plurality of individual serial data lines to said data service mode from said voice service mode when said voice service is complete and redistributing the transfer of data across each of the plurality of serial data lines.

5,841,841

NETWORKING COMPUTERS VIA SHARED USE OF VOICE TELEPHONE LINES

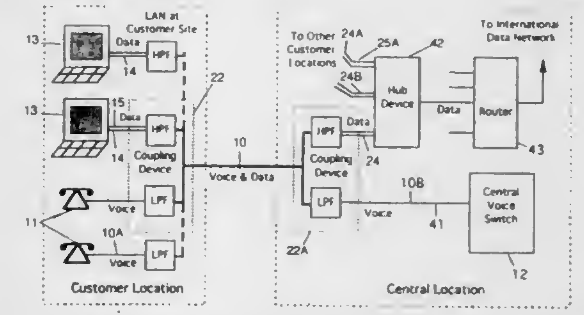
David E. Dodds, and Gregory J. Erker, both of Saskatoon, Canada, assignors to Telecommunications Research Laboratories, Edmonton, Canada

PCT No. PCT/CA96/00168, § 371 Date Nov. 17, 1997, § 102(e) Date Nov. 17, 1997, PCT Pub. No. WO96/29808, PCT Pub. Date Sep. 26, 1996

PCT Filed Mar. 14, 1996, Ser. No. 913,439

Int. Cl.^{6} H04M *11/00*

U.S. Cl. 379—93.08 **12 Claims**



1. A communication network for transmitting data and voice communication simultaneously over telephone lines which connect diverse independent residential and business locations to a central location, the network comprising:

a central location;

a plurality of diverse independent customer locations;

a plurality of telephone lines arranged such that each customer location is connected to the central location by a respective one of the telephone lines;

at least some of the customer locations including a computer arranged to generate binary data signals, the computer being connected to the respective telephone line such that the binary data signals from the computer are applied to the respective telephone line for reception and reading at the central location and such that binary data signals are applied from the central location to the respective telephone line for reception and reading at the computer;

each computer having a first highpass filter connected between the computer and the respective telephone line, the first high pass filter being arranged to attenuate energy in said voice frequencies to a level such that the energy does not interfere with the binary data signals from the central hub device to the computer and to attenuate the voice frequency energy in the binary data signals from the computer to the central hub device so that the data signal energy does not interfere with voice communications;

at least some of the customer locations having a voice telephone set with terminals for receiving and transmitting voice communications in the form of a voltage varying at voice frequencies;

each customer location having a second lowpass filter connecting the terminals of the telephone set at the respective customer location to the respective telephone line for transmitting said voice communications to and from the voice telephone set on the respective telephone line with the second lowpass filter being arranged to attenuate energy in a range higher than said voice frequency so as to communicate from said telephone line to said voice telephone set substantially only the voice communication frequencies;

the central location including a voice switching system having a plurality of voice ports for receiving and switching voice communications and a central data hub device having a first connection to a central data network or an international data network and a second multiplex connection to a plurality of data ports, each of the telephone lines being connected to a respective one of the data ports and each of the telephone lines being also connected to a respective one of the voice ports;

the central location including a third lowpass filter between each telephone line and the respective voice port, the third lowpass filter being arranged to attenuate energy in a range higher than said voice frequency so as to communicate from said telephone line to said voice port substantially only the voice communication frequencies;

the central location including a fourth highpass filter between each telephone line and the respective data port, the fourth high pass filter being arranged to attenuate energy in said voice frequencies to a level such that the energy does not interfere with the binary data signals from the to the computer central hub device and to attenuate the voice frequency energy in the binary data signals from the central hub device to the computer so that the data signal energy does not interfere with voice communications;

at least some of the customer locations each including a plurality of voice telephone sets, each telephone set including or having associated therewith a respective second lowpass filter, the plurality of telephone sets at each customer location all connecting directly to the respective single telephone line at the customer location for the purpose of voice communication with each other and through the single telephone line with the voice switching system;

at least some of the customer locations each including a plurality of computers, each computer having associated therewith a respective first high pass filter, the computers at each customer location all connecting directly to the respective single telephone line, such that the single telephone line forms a local area network (LAN) for the plurality of computers at the customer location, by which LAN communication of data between any of the computers at the customer location and the central data hub is effected and by which LAN communication can take place between any two of the computers at the customer location;

and the central data hub device being arranged so as to provide no direct data connection between the telephone lines such that connection of each customer location through the central data hub device to the central data network or International data network is independent of the other customer locations and such that the central data hub device prevents direct communication between computers at different customer sites.

5,841,842

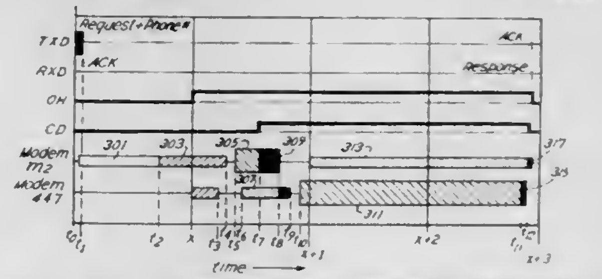
TELEPHONE CALL ROUTING AND SWITCHING TECHNIQUES FOR DATA COMMUNICATIONS

Marc S. Baum; Robert C. Suffern, both of Chicago; Donald Balton, Skokie, and Daniel L. Schoo, Island Lake, all of Ill., assignors to U.S. Robotics Access Corp., Skokie, Ill.

Division of Ser. No. 212,515, Mar. 11, 1994. This application Jun. 13, 1996, Ser. No. 662,686

Int. Cl.^{6} H04M *11/00*

U.S. Cl. 379—93.32 **18 Claims**



1. A method of establishing and conducting high speed asynchronous data communication between a remotely located call originator and a network access server linked to a host computer system, said call originator comprising a data terminal and a remote modem, said network access server comprising a host modem, the method comprising the steps of:

transmitting data from said data terminal to said remote modem;

establishing an asymmetrical communication session during a call set-up phase between said remote modem and said host modem, comprising the steps of:

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(a) transmitting a first signal associated with high speed asynchronous transmission from said remote modem to said host modem;

(b) said host modem detecting said first signal and responsively issuing a predetermined pattern to said remote modem; and

(c) said remote modem initiating high speed training with said host modem in response to said pattern, said remote modem transmitting at a high speed, said host modem transmitting at a relatively low speed; and thereafter

transmitting data from said remote modem to said host modem at a high speed, said host modem transmitting said data to said host computer system;

reversing the transmission rates of said remote and host modems, such that said host modem initiates transmission at high speed and said remote modem initiates transmission at a relatively low speed; and

transmitting a second signal from said host modem to said remote modem at high speed, said second signal responsive to said data transmission from said data terminal.

5,841,843

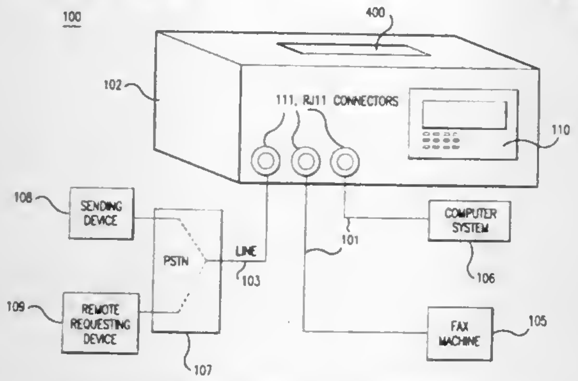
FACSIMILE FORWARDING METHOD AND SYSTEM USING A SIMULATED TELEPHONE LINE INTERFACE

Stephen D. Bristow, Los Altos, and Christopher B. Wright, San Francisco, both of Calif., assignors to Brother International Corporation, Somerset, N.J.

Filed Jan. 2, 1996, Ser. No. 582,178

Int. Cl.^{6} H04M *11/00;* **H04N** *1/32*

U.S. Cl. 379—100.09 **12 Claims**



1. A facsimile forwarding phone system comprising:

a facsimile forwarding device capable of receiving facsimile data, storing the facsimile data and transmitting the stored facsimile data;

a first connector for connecting the facsimile forwarding device to a public switched telephone network, the fax forwarding device receiving the facsimile data from the public switched telephone network; and

a second connector for connecting the facsimile forwarding device to a destination device capable of receiving facsimile data, the fax forwarding device transmitting the received and stored fax data to the destination device;

wherein the facsimile forwarding device comprises:

an input circuit for inputting facsimile data from the first connector;

a storage circuit for storing the received facsimile data; and

a simulated telephone line interface for generating and outputting public switched telephone signals to the second connector and for outputting the received and stored facsimile data to the second connector in response to a received forwarding request.

5,841,844

METHOD FOR AUTOMATICALLY CONFIRMING LINE CONNECTION UPON INSTALLATION OF A FACSIMILE SYSTEM

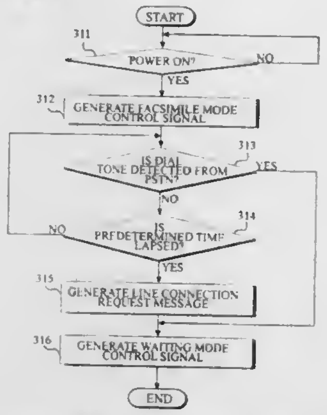
Sang-Cheol Park, Gumi, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Mar. 26, 1997, Ser. No. 824,603

Claims priority, application Rep. of Korea, Mar. 27, 1996, 8633/1996

Int. Cl.^{6} H04M *11/00*

U.S. Cl. 379—100.14 **12 Claims**


START
311
POWER ON?
NO
YES
312
GENERATE FACSIMILE MODE CONTROL SIGNAL
313
IS DIAL TONE DETECTED FROM PSTN?
YES
NO
314
IS PREDETERMINED TIME LAPSED?
NO
YES
315
GENERATE LINE CONNECTION REQUEST MESSAGE
316
GENERATE WAITING MODE CONTROL SIGNAL
END

1. A method for automatically confirming a line connection upon installation of a facsimile system having a telephone handset incorporated therein, first and second connection terminals for connecting to a telephone line and an extension line respectively, and a relay for forming a communication path between said telephone handset and one of said first and second connection terminals during a telephone mode, and for forming a communication path between a modem and said first connection terminal during a facsimile mode, said method comprising the steps of:

generating a facsimile mode control signal when said facsimile system is turned on, and determining whether a dial tone is detected from the telephone line via said first connection terminal;

generating a waiting mode control signal for continued operation of said facsimile system, when said dial tone is detected from the telephone line via said first connection terminal; and

alternatively, generating a line connection request message for requesting line connection of the telephone line via said first connection terminal, when said dial tone is not detected from the telephone line via said first connection terminal.

5,841,845

DIALING PLAN FOR SPECIAL ACCESS APPLICATIONS SUCH AS TELEMETRY SYSTEMS

Stuart Mandel Garland, Morton Grove, and David B. Smith, Hinsdale, both of Ill., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 18, 1996, Ser. No. 768,823

Int. Cl.^{6} H04M *11/00*

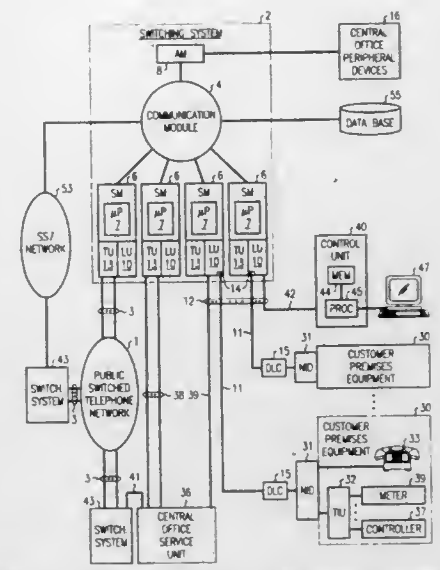
U.S. Cl. 379—106.01 **14 Claims**

1. In a telecommunications system comprising a switching system connected to customer premise equipment over a plurality of customer lines, said customer lines terminating at ports on the switching system, a method for establishing a connection between a first customer premise equipment and a second customer premise equipment comprising the steps of:

correlating said ports to dialing numbers unrelated to directory numbers assigned to the customer premise equipment;

receiving one of said dialing numbers from said first customer premise equipment at said switching system;

identifying one of said ports correlating to said one of said dialing numbers, and



initiating a connection between said first customer premise equipment and said one of said ports.

5,841,846

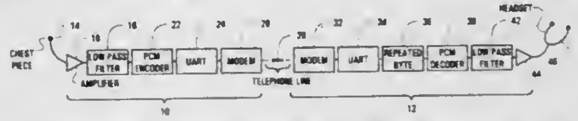
DIGITAL TELEPHONIC SYSTEM FOR STETHOSCOPE SIGNAL PROCESSING

C. Richard Abbruscato, Burnsville, Minn., assignor to American TeleCare, Inc., Eden Prairie, Minn.

Filed Sep. 16, 1996, Ser. No. 714,671

Int. Cl.^{6} H04M *11/00;* **A61B** *7/04*

U.S. Cl. 379—106.02 **19 Claims**



1. A method for converting, encoding and decoding analog and digital signals, while maintaining the quality and fidelity of auscultation sounds originating from a stethoscope, to enable a patient at a patient station to transmit the sounds to a doctor at a remote doctor station comprising the steps of:

amplifying analog signals from a chest piece at said patient station;

filtering said signals to get resultant signals;

feeding said resultant signals to a PCM encoder to transform said analog signals into a stream of binary data;

transferring said stream of binary data to a UART and to an ADPCM encoder and subsequently to a first modem;

sending said binary data from said first modem to a telephone line;

receiving said binary data from said telephone line via a second modem at said doctor station;

transferring said binary data from said second modem to a UART and to a repeated byte error handling circuit;

transferring said binary data from said repeated byte error handling circuit to an ADPCM decoder;

decoding said binary signal to extract said analog signal via a PCM decoder;

filtering said signal; and

amplifying said signal to be received by a headset at said doctor station.

5,841,847

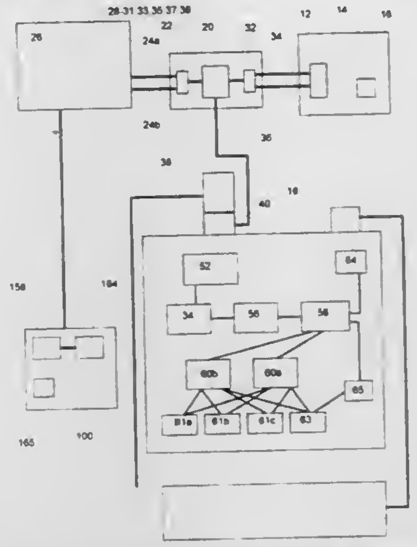
BILLING SYSTEM

R. William Graham, Dayton, Ohio, and David M. Tumey, San Antonio. Tex., assignors to Protel, Inc., Dayton, Ohio

Filed Apr. 11, 1997, Ser. No. 827,784

Int. Cl.^{6} H04M *15/00*

U.S. Cl. 379—114 **18 Claims**



10. A billing system for a service provider-client environment, which includes:

a service provider site;

a communications linking device disposed at said service provider site;

a first CPU disposed at said service provider site operably associated with said communication linking device and having billing software means resident on said first CPU for enabling logging of client data and service provider data, wherein said billing software means prompts a service provider to select one of a logging and no logging of time, said billing software means includes means for accruing an amount of time and associating said time with one client upon selection of said logging and said billing software means includes means for transmitting a signal in response to said time and associated client; and

a second CPU disposed at a remote site operably associated with said communication linking device in a manner to permit communication with said first CPU having complimentary software means resident thereon for enabling communication with said software on said first CPU in order to receive said signal corresponding to said amount of time and said client and for manipulating said data corresponding to said amount of time and said client in a manner to produce a billing output.

5,841,848

SYSTEM AND METHOD FOR COMPLETING TELEPHONE CALLS TO EMERGENCY TELEPHONE NUMBERS IN HIGHLY CONCENTRATED ACCESS SYSTEMS

James Patrick Dunn, Sandwich, Ill., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed May 7, 1996, Ser. No. 646,445

Int. Cl.^{6} H04M *15/00:11/04*

U.S. Cl. 379—128 **5 Claims**

1. A method for handling telephone calls during periods of telephone access congestion, said telephone access congestion comprising a predetermined utilization level of telephone access facilities, wherein a predetermined number of said telephone access facilities are reserved for emergency calls, said method comprising the steps of:

receiving from a caller a selection of a destination telephone number;

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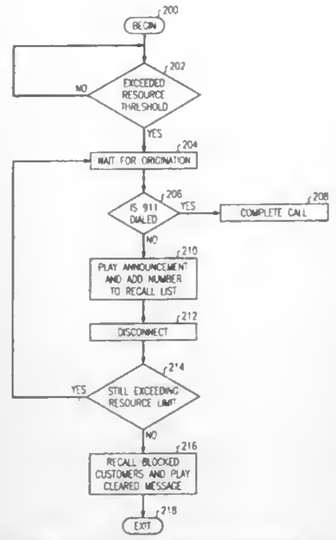

BEGIN
200
EXCEEDED RESOURCE THRESHOLD
202
NO
YES
WAIT FOR ORIGINATION
204
IS 911 DIALED
206
YES
COMPLETE CALL
208
NO
PLAY ANNOUNCEMENT AND ADD NUMBER TO RECALL LIST
210
DISCONNECT
212
STILL EXCEEDING RESOURCE LIMIT
214
YES
NO
RECALL BLOCKED CUSTOMERS AND PLAY CLEARED MESSAGE
216
EXIT
218

determining from said destination telephone number selection and exclusive of other interaction with said caller whether a telephone call is for an emergency number;

responsive to a determination that said call is for an emergency number, routing said call to said emergency number on one of said reserved telephone access facilities; and

responsive to a determination that said call is not for an emergency number, routing said call to announcement and disconnecting said call in order to free telephone access facilities occupied by said call.

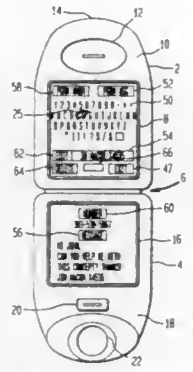
5,841,849
USER INTERFACE FOR PERSONAL TELECOMMUNICATION DEVICES

James Joseph Macor, Jackson, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Oct. 31, 1996, Ser. No. 739,668

Int. Cl.^{6} H04M *1/56;1/00;9/00*

U.S. Cl. 379—142 **25 Claims**



1. An ergonomic user interface system for a personal telecommunication device comprising:

a first base member having an inner surface, an outer surface, a first end and a first hinged end opposite the first end;

a second base member having an inner surface, an outer surface, a second end and a second hinged end opposite the second end;

a first display mounted on the inner surface of the first base member for displaying information;

a second display mounted on the inner surface of the second base member for displaying information;

a microphone supported by one of the first and second base members;

a speaker supported by one of the first and second base members;

a hinge connecting the first hinged end to the second hinged ends; and

a manipulatable member supported by one of the first and second base members and functionally connected to at least one of the displays to alter an appearance of displayed information on at least one of the first and second displays in response to a manipulation of the manipulatable member thereby allowing the user to completely operate the telecommunication device.

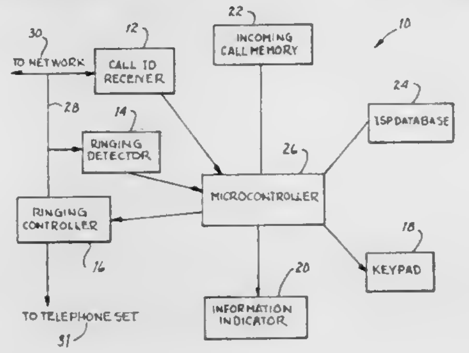
5,841,850
INTELLIGENT CALLER IDENTIFICATION APPARATUS FOR NOTIFYING A SELECTED TELEPHONE NUMBER OF THE ARRIVAL OF SPECIAL INFORMATION

Yuan-Neng Fan, 15045 N. 49th St., Scottsdale, Ariz. 85254

Filed Mar. 31, 1997, Ser. No. 829,148

Int. Cl.^{6} H04M *1/56;15/06*

U.S. Cl. 379—142 **21 Claims**



1. An intelligent caller identification apparatus for notifying a selected telephone number of the arrival of special information comprising, in combination:

a ringing detector circuit coupled to a telephone line of a selected telephone service provider for receiving an incoming telephone call which has been made to said selected telephone number;

a ringing control circuit coupled to a telephone set and to said telephone line for signalling said telephone set to ring when said incoming call to said selected telephone number has been received;

a caller identification receiver coupled to said telephone line for decoding identification information of said incoming telephone call to said selected telephone number;

a microcontroller coupled to said ringing detector circuit, said ringing control circuit, and said caller identification receiver for disabling said ringing control circuit immediately after said ringing detector circuit detects said incoming telephone call to said selected telephone number;

an ISP Database coupled to said microcontroller for storing a list of information service providers for enabling said microcontroller to compare said identification information of said incoming telephone call to a list of information service providers; and

said microcontroller further generates an incoming message signal and continues to disable said ringing control circuit when said identification information of said incoming telephone call matches data of at least one information service provider on said list of information service providers otherwise said microcontroller enables said ringing control circuit to signal said telephone set to ring to indicate said incoming telephone call is from a noninformation service provider.

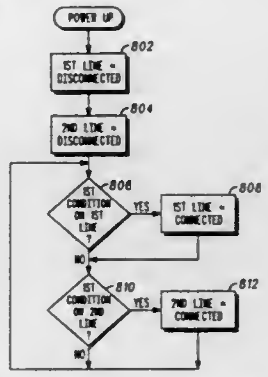
5,841,851
METHOD OF AND APPARATUS FOR CONTROLLING OPERATION OF A MULTI-LINE TELEPHONE APPARATUS

Thomas Stuart Recht, Glencoe, and James Francis Goedken, Arlington Height, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 20, 1995, Ser. No. 546,460

Int. Cl.^{6} H04M *1/00*

U.S. Cl. 379—156 **7 Claims**



4. A method of configuring a user interface in a multi-line telephone apparatus, the method comprising the steps of:

detecting if a first connection to a first land line exists;

detecting if a second connection to a second land line exists;

assigning a first part of the user interface for use with the first land line when the first connection exists and the second connection does not exist;

assigning the first part of the user interface for use with the second land line when the second connection exists and the first connection does not exist; and

assigning the first part of the user interface for use with the first land line and assigning the second part of the user interface for use with the second land line when both the first connection and second connection exist.

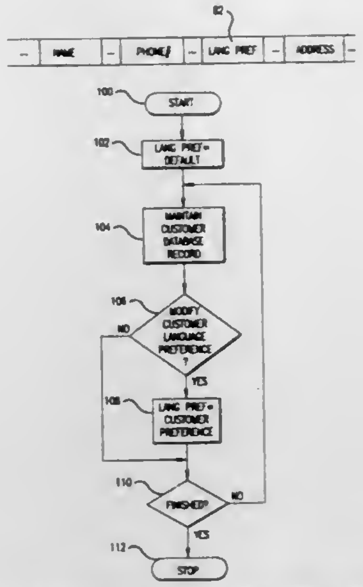
5,841,852
METHOD AND SYSTEM FOR TELECOMMUNICATIONS LANGUAGE SUPPORT

Jingsha He, Plano, Tex., assignor to MCI Communications Corporation, Washington, D.C.

Filed Dec. 29, 1995, Ser. No. 581,725

Int. Cl.^{6} H04M *3/00*

U.S. Cl. 379—201 **14 Claims**


82
NAME
PHONE#
LANG PREF
ADDRESS
100
START
102
LANG PREF = DEFAULT
104
MAINTAIN CUSTOMER DATABASE RECORD
106
MODIFY CUSTOMER LANGUAGE PREFERENCE ?
NO
YES
108
LANG PREF = CUSTOMER PREFERENCE
110
FINISHED?
NO
YES
112
STOP

1. A method for automatically enabling language support within a telecommunications system, comprising the steps of:

associating a language preference indicator of a customer record with a telephone call being managed by said telecommunications system, wherein said language preference indicator is previously selected by a customer from among a plurality of language preference indicators, said step of associating said language preference indicator with said telephone call made by said customer comprising the steps of:

- detecting telephone off hook status of said customer;
- comparing the telephone number of said customer to the telephone number in said customer record;
- retrieving said language preference indicator from said customer record; and
- maintaining said language preference indicator with said telephone call as said telephone call is managed by said telecommunication system;

comparing said language preference indicator to a language support database to determine an action to be performed by said telecommunications system that affects the management of said telephone call; and

managing said telephone call in accordance with said action.

5,841,853
TELEPHONE APPARATUS WITH INTERRUPT CALL PROCESSING CAPABILITY

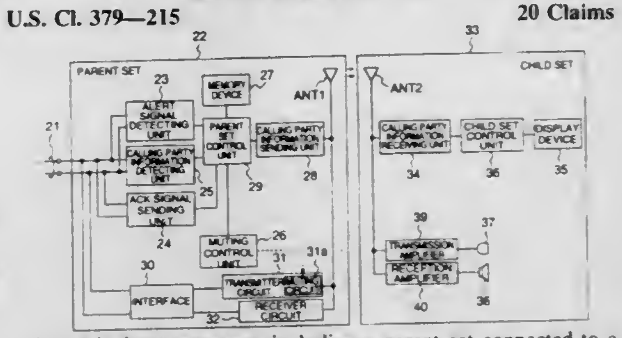
Koji Yamanishi, Fukuoka; Takako Ito, Dazaifu, and Kouichi Kamimoto, Fukuoka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 16, 1996, Ser. No. 698,691

Claims priority, application Japan, Sep. 7, 1995, 7-229833

Int. Cl.^{6} H04M *1/00;3/42*

U.S. Cl. 379—215 **20 Claims**



1. A telephone apparatus including a parent set connected to a telephone line and a child set capable of wireless communication with said parent set, wherein said parent set comprises:

a transmitter circuit for sending a speech signal onto said telephone line,

a receiver circuit for receiving a speech signal from said telephone line,

alert signal detecting means for detecting an alert signal sent from a telephone exchange in response to a call from a third party during a telephone conversation through said telephone apparatus, and

calling party information detecting means for detecting calling party information incoming from said telephone exchange via said telephone line after said alert signal;

wherein said child set comprises:

- a microphone,
- a speaker,
- transmission and reception amplifier means for transmitting to and receiving from said parent set speech signals of said telephone conversation, and
- calling party information receiving means for receiving the calling party information, detected by and sent from said parent set; and

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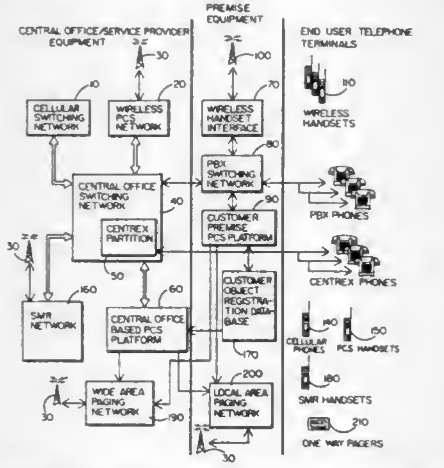
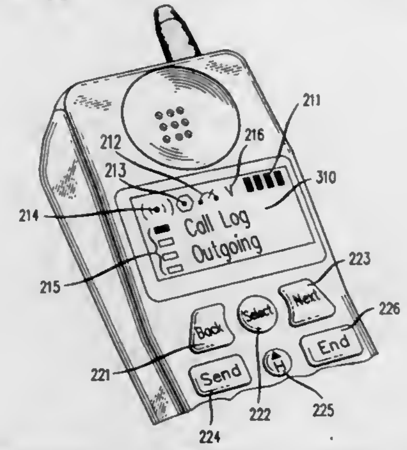
wherein at least one of said parent and child sets further comprises muting control means for speech-signal muting of said telephone conversation upon receipt of said calling party information sent by said telephone exchange.

5,841,854
WIRELESS TELEPHONE INTEGRATION SYSTEM AND METHOD FOR CALL CENTERS AND WORKGROUPS
Gregory D. Schumacher, Holliston; Robert F. Penfield, Maynard, and Patrick J. McLampy, Pepperell, all of Mass., assignors to Priority Call Management, Inc., Wilmington, Mass.
Continuation of Ser. No. 473,674, Jun. 7, 1995, abandoned, which is a continuation-in-part of Ser. No. 198,032, Feb. 16, 1994, abandoned. This application Aug. 4, 1997, Ser. No. 905,589
Int. Cl.^{6} H04M *3/00*
U.S. Cl. 379—265 **18 Claims**


CENTRAL OFFICE/SERVICE PROVIDER EQUIPMENT
CUSTOMER PREMISE EQUIPMENT
END USER TELEPHONE TERMINALS
30
100
10
20
70
110
CELLULAR SWITCHING NETWORK
WIRELESS PCS NETWORK
WIRELESS HANDSET INTERFACE
WIRELESS HANDSETS
80
PBX SWITCHING NETWORK
CENTRAL OFFICE SWITCHING NETWORK
40
90
CUSTOMER PREMISE PCS PLATFORM
PBX PHONES
CENTREX PARTITION
50
CENTREX PHONES
160
60
SMR NETWORK
CENTRAL OFFICE BASED PCS PLATFORM
CUSTOMER OBJECT REGISTRATION DATA BASE
140
150
CELLULAR PHONES
PCS HANDSETS
170
200
180
WIDE AREA PAGING NETWORK
LOCAL AREA PAGING NETWORK
SMR HANDSETS
190
210
ONE WAY PAGERS

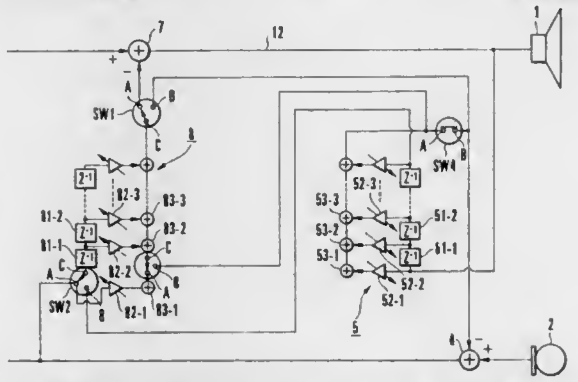
13. A system for automatic distribution of a telephone communication from a caller, to a selected one of a plurality of agents, having respective wireless telephone terminals registered in a wireless telephone network, wherein the selected agent is not predetermined by the caller and is a member of at least one of a plurality of groups of agents, each member of each of said groups being capable of performing at least one of a plurality of agent services needed by the caller, said system comprising:
- a matrix switch;
- a call control platform in electrical communication with said matrix switch, said call control platform connecting said switch and a first telephone line in response to a first telephone call from the caller via said first telephone line, and, in further response to the first call, connecting said matrix switch to a second telephone line accessible by said plurality of agents across said wireless telephone network;
- an agent selection processor that gathers and analyzes a plurality of caller criteria and determines whether the first call is directed to one of the plurality of groups, and, if so, determines which of the plurality of agent services provided by the agents within said group is needed by the caller, and selects at least one of said agents within said group as the agent to be connected to said caller in a manner based at least in part upon which of said agents within said group can provide said needed agent service at the time of said call from said caller;
- said call control platform being in electrical communication with said selection processor to access information identifying said selected agent, and to said matrix switch to connect said first telephone line to a communication path interconnecting said matrix switch and said wireless telephone network via said second telephone line, thereby establishing a telephone communication link between said caller and said selected agent's wireless telephone terminal via said wireless telephone network.

5,841,855
MENU LEVEL INDICATOR FOR A TELEPHONE TERMINAL
Joanne W. Davidson, Keansburg; William F. Dudley, Jr., Jackson, both of N.J.; David M. Gresham, East Hampton, N.Y.; Michael L. Moroze, Broomfield, Colo.; Elizabeth Bauer-Nilsen Sanders, Columbus, Ohio; Alessandro A. Subrizi, San Francisco, Calif., and Susan L. Tuttle, East Windsor, N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.
Filed Nov. 15, 1995, Ser. No. 559,516
Int. Cl.^{6} H04M *1/00;3/42*
U.S. Cl. 379—387 **20 Claims**



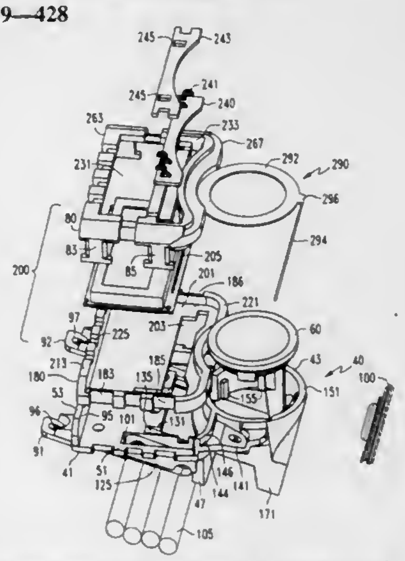
1. An arrangement for configuring a telephone terminal for identifying selectable features displayable at the terminal, the arrangement comprising:
- means for displaying on a display screen a plurality of symbols having a substantially identical shape wherein the number of symbols is indicative of a total number of selectable features available for display at each one of a plurality of selectable levels in the telephone terminal; and
- means for identifying which one in the total number of selectable features is being displayed at each one of the plurality of selectable levels, and for identifying which one of said selectable levels is being displayed.

5,841,856
HANDS-FREE TELEPHONE SET
Yoshiyuki Ide, Tokyo, Japan, assignor to NEC Corporation, Japan
Filed May 21, 1997, Ser. No. 861,382
Claims priority, application Japan, May 22, 1996, 8-126183
Int. Cl.^{6} H04M *9/08*
U.S. Cl. 379—406 **9 Claims**



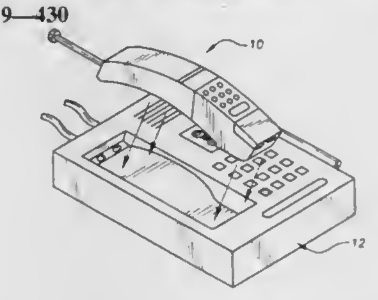
8. A hands-free telephone set which operable in both an analog and a digital cellular mode, comprising:
- a first Finite Impulse Response (FIR) filter for estimating an acoustic echo on a transmission path when said telephone set is operated in an analog cellular mode;
- a first adder for inverting said acoustic echo estimated by said first FIR filter and adding said inverted echo to a transmission signal on said transmission path, said first FIR filter and said first adder constituting an acoustic echo canceler for canceling an acoustic echo generated when reception speech leaks to said transmission path;
- a second FIR filter for estimating a line echo on a reception path when said telephone set is operated in said analog cellular mode;
- a second adder for inverting said line echo estimated by said second FIR filter and adding said inverted echo to a reception signal on said reception path, said second FIR filter and said second adder constituting a line echo canceler for canceling a line echo generated when transmission speech leaks to said reception path; and
- switch means inputting an inverted output from said second FIR filter to said second adder when said telephone set is operated in said analog cellular mode, and disconnecting said second FIR filter from said second adder and cascading said second FIR filter to said FIR filter when said telephone set is operated in said digital cellular mode, so as to input an inverted output from said cascaded first and second FIR filters to said first adder,
- wherein when said telephone set is operated in said digital cellular mode, said second adder and said cascaded first and second FIR filters constitute an acoustic echo canceler for canceling an acoustic echo generated when reception speech leaks to said transmission path.

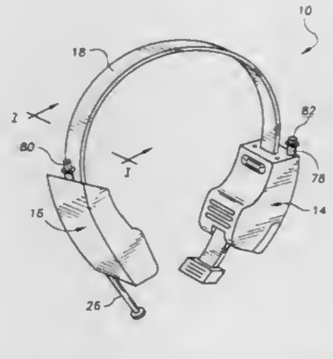
5,841,857
TELEPHONE TEST SET LCD PANEL CARRIER
Edward J. Zoiss, Moorpark, Calif.; and Joseph E. Gleason, Eagan, Minn., assignors to Harris Corporation, Melbourne, Fla.
Filed Nov. 20, 1996, Ser. No. 753,101
Int. Cl.^{6} H04M *1/02*
U.S. Cl. 379—428 **33 Claims**



1. An arrangement for mounting a plurality of components within a utility device comprising a unitary carrier having a first portion configured to support a display panel in a shock-resilient manner adjacent to a viewing panel of said utility device, and a second portion configured to support an acoustic transducer adjacent to an acoustic coupling port of said utility device, and wherein said carrier is configured to maintain a visibility condition of said display panel irrespective of ambient humidity conditions in which said utility device is used, and including a third portion which contains a material that is fluid communication with said first portion and is operative to maintain said visibility condition of said display panel irrespective of ambient humidity conditions in which said utility device is used.

5,841,858
PHONE HANDSET HOUSING ASSEMBLY
William C. Frierson, 1550 Sagamore Dr., NE., Atlanta, Ga. 30345-4182
Filed May 19, 1997, Ser. No. 858,608
Int. Cl.^{6} H04M *1/00*
U.S. Cl. 379—430 **20 Claims**





1. A phone handset housing assembly comprising:
- an upper handset housing unit;
- a lower handset housing unit; and
- a resilient over-the-head combined support band/communications conduit interconnected between said upper handset housing unit and said lower handset housing unit;
- each of said upper and lower handset housing units having a circuit compartment formed therein for housing telephone handset operational components;
- said upper and lower handset housing units being configurable in hand-held configuration for use in a hand-held mode and in a head-set configuration for use in a hand-less mode:
- said upper and lower handset housing units being rigidly attached by a connecting assembly including at least one securing pin and at least one securing socket and said resilient over-the-head combined support band/communications conduit being stored within an upper and a lower band storage chamber formed, respectively, within said upper and lower handset housing units when said upper and lower handset housing units are configured in said hand-held configuration;
- said upper and lower handset housing units being positioned away from each other and connected by said resilient over-the-head combined support band/communications conduit, said resilient over-the-head combined support band/communications conduit being formed in a manner to resiliently assume a curved U-shape that is sufficient for use in supporting said upper and lower handset housing units on either side of a user's head and against a user's ears when said upper and lower handset housing units are configured in said head-set configuration;
- said lower handset housing unit including an extendable microphone support structure, a fixed microphone opening, and a lower handset housing unit earpiece opening;
- said upper handset housing unit including an upper handset housing unit top earpiece opening and an upper handset housing unit bottom earpiece opening.

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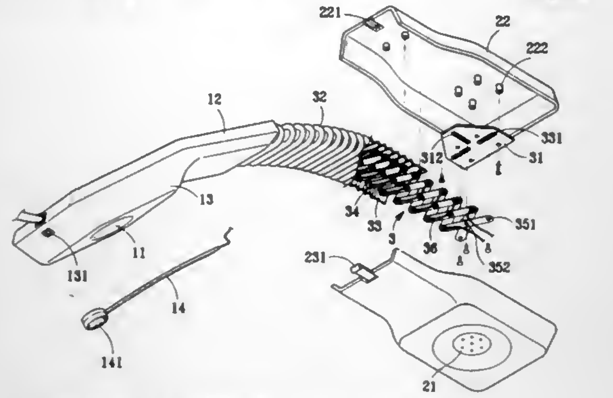
5,841,859
STRUCTURE OF A TELEPHONE RECEIVER

Ping Huang Chen, No. 77, Hsia Cho, Kuo Ko, Hsi-An Li, Pu-Tai Cheng, Chia Yi Hsisn, Taiwan

Filed Dec. 26, 1996, Ser. No. 773,962

Int. Cl.^{6} H04M *1/00*

U.S. Cl. 379—433 **5 Claims**



1. A structure of a telephone receiver, comprising:
a transmission portion;
a receiving portion;
a transmitter installed on one side of an end portion of said transmission portion;
a receiver installed on one side of an end portion of said receiving portion;
a first positioning piece mounted in said transmission portion;
a second positioning piece mounted in said receiving portion; and
an expansion bracket formed by a plurality of serially connected relatively pivotable linking pieces which are alternately crossed, said expansion bracket having a first end and a second end which are connected to said first and second positioning pieces, respectively, such that said expansion bracket is connected between said transmission portion and said receiving portion;
wherein the crossing angles between said linking pieces and the length of said expansion bracket are changed by contraction and expansion of said expansion bracket so that said transmission portion and said receiving portion are combinable to form an integral body and, alternatively, are separable to hang over the respective ears of a user.

5,841,860

Patent Not Issued For This Number

5,841,861
OPTICAL RECORDING MEDIUM AND REPRODUCING APPARATUS FOR OPTICAL RECORDING MEDIUM

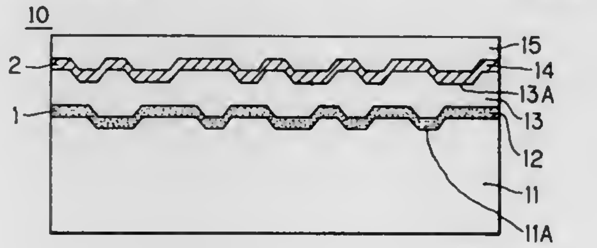
Tetsuya Kondo, and Hirofumi Nagano, both of Yokohama, Japan, assignors to Victor Company of Japan, Ltd., Tokyo, Japan

Filed Oct. 3, 1996, Ser. No. 724,775

Claims priority, application Japan, Oct. 6, 1995, 7-286447

Int. Cl.^{6} H04L *9/00*

U.S. Cl. 380—4 **5 Claims**



1. An optical recording medium comprising:
a plurality of layers of recorded digital data with at least one layer having digital data arranged as original data groups in a form of marks or pits readable by optical means,
said original digital data groups of said one layer being divided into a plurality of sub-data groups,
each of said plurality of sub-data groups containing an amount of data smaller than a full recordable capacity of each of said plurality of layers, and
said plurality of sub-data groups distributed among said plurality of layers so that said original digital data groups of at least said one layer becomes discontinuous within each of said plurality of layers.

5,841,862
MOBILE RADIO COMMUNICATIONS APPARATUS

Arata Obayashi, Hino; Masayuki Tanaka, Kokubunji, and Masatomo Kanbara, Hino, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

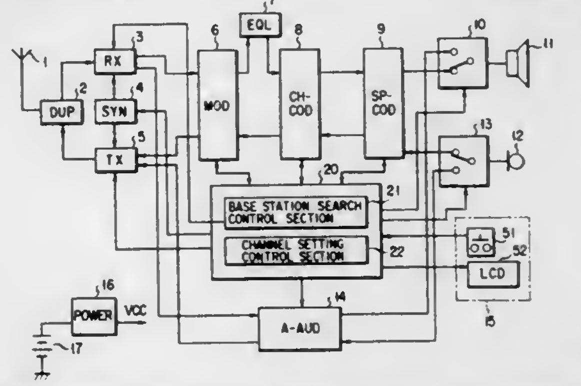
PCT No. PCT/JP94/00602, § 371 Date Oct. 12, 1995, § 102(e) Date Oct. 12, 1995, PCT Pub. No. WO94/24778, PCT Pub. Date Oct. 27, 1994

PCT Filed Apr. 11, 1994, Ser. No. 530,371

Claims priority, application Japan, Apr. 15, 1993, 5-088574

Int. Cl.^{6} H04L *9/00*

U.S. Cl. 380—9 **16 Claims**



14. A mobile radio communications apparatus for communicating with base stations, comprising:
a receiver for receiving signals from said base stations;
a transmitter for transmitting signals to said base stations; and
a control circuit including:
a format input control section for determining in which one of a plurality of transmission/reception formats said mobile radio communications apparatus is set;
a base station search control section for searching control channels received by said receiver to determine which, if any, of said base stations use a transmission/reception format corresponding to the transmission/reception format in which said mobile radio communications apparatus is set and which, if any, of said base stations use a transmission/reception format not corresponding to the transmission/reception format in which said mobile radio communication apparatus is set; and
a call channel setting section for generating a request for setting a communication channel in accordance with the determination by said base station search control section, and for supplying the request to said transmitter for transmission over a selected one of the control channels.

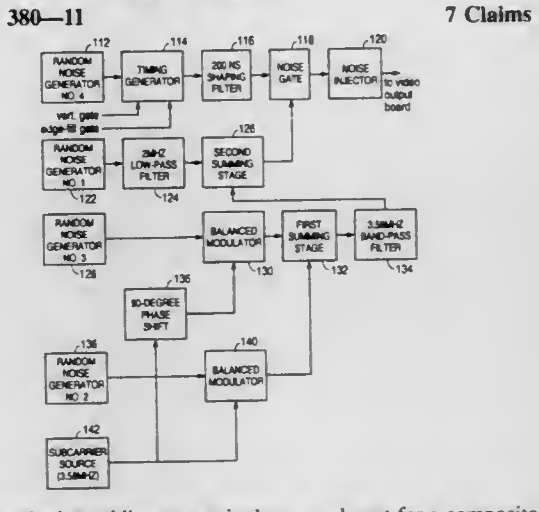
5,841,863
METHOD AND APPARATUS FOR SCRAMBLING AND DESCRAMBLING OF VIDEO SIGNALS WITH EDGE FILL

John O. Ryan, Cupertino, and James R. Holzgrafe, Morgan Hill, both of Calif., assignors to Macrovision Corporation, Sunnyvale, Calif.

Division of Ser. No. 202,349, Feb. 28, 1994, Pat. No. 5,438,620, which is a continuation of Ser. No. 795,890, Nov. 19, 1991, abandoned. This application Mar. 8, 1995, Ser. No. 401,015

Int. Cl.^{6} H04N *7/169*

U.S. Cl. 380—11 **7 Claims**



1. A method providing sync wiggle concealment for a composite video signal when viewed on a television, comprising the step of in each of a plurality of lines of the composite video signal, timeshifting the location of the horizontal sync signal relative to the beginning of the horizontal blanking interval, the amount of timeshifting in each successive line changing at a predetermined frequency.

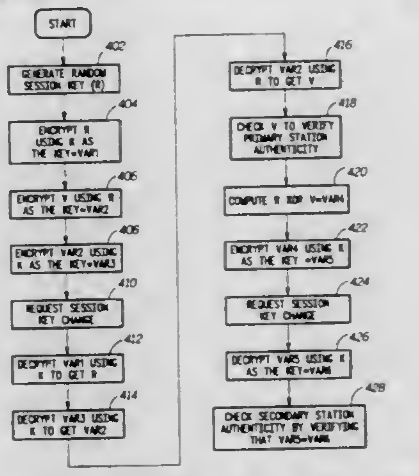
5,841,864
APPARATUS AND METHOD FOR AUTHENTICATION AND SESSION KEY EXCHANGE IN A COMMUNICATION SYSTEM

Jeffrey T. Klayman, Mansfield, Mass.; Louis D. Finkelstein, Wheeling, and Christopher L. Clanton, Forest Park, both of Ill., assignors to Motorola Inc., Schaumburg, Ill.

Filed Aug. 5, 1996, Ser. No. 693,688

Int. Cl.^{6} H04L *9/08*

U.S. Cl. 380—21 **12 Claims**


START
402
GENERATE RANDOM SESSION KEY (R)
404
ENCRYPT R USING K AS THE KEY=VAR1
406
ENCRYPT V USING R AS THE KEY=VAR2
408
ENCRYPT VAR2 USING K AS THE KEY=VAR3
410
REQUEST SESSION KEY CHANGE
412
DECRYPT VAR1 USING K TO GET R
414
DECRYPT VAR3 USING K TO GET VAR2
416
DECRYPT VAR2 USING R TO GET V
418
CHECK V TO VERIFY PRIMARY STATION AUTHENTICITY
420
COMPUTE R XOR V=VAR4
422
ENCRYPT VAR4 USING K AS THE KEY =VAR5
424
REQUEST SESSION KEY CHANGE
426
DECRYPT VAR5 USING K AS THE KEY=VAR6
428
CHECK SECONDARY STATION AUTHENTICITY BY VERIFYING THAT VAR5=VAR6

1. A method for authentication and session key exchange between a first station and a second station over a communication medium, the method comprising the steps of:

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establishing a secret key shared by both the first station and the second station;
generating, by the first station, a first key (R);
encrypting, by the first station, the first key (R) using a first portion (K) of the secret key to form a second key (VAR1);
encrypting, by the first station, a second portion (V) of the secret key using the first key (R) to form a third key (VAR2);
encrypting, by the first station, the third key (VAR2) using the first portion (K) of the secret key to form a fourth key (VAR3); and
sending, by the first station to the second station, the second key (VAR1) and the fourth key (VAR3).

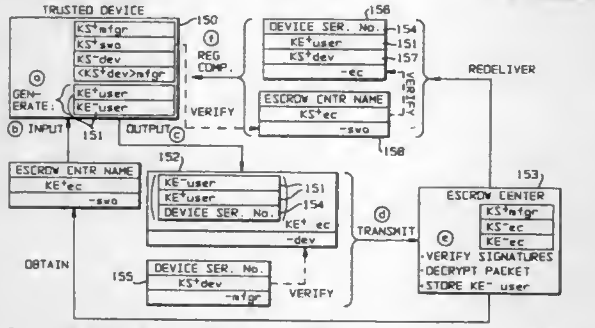
5,841,865
ENHANCED CRYPTOGRAPHIC SYSTEM AND METHOD WITH KEY ESCROW FEATURE

Frank Wells Sudia, New York, N.Y., assignor to CertCo LLC, New York, N.Y.

Continuation of Ser. No. 272,203, Jul. 8, 1994, abandoned, which is a continuation-in-part of Ser. No. 181,859, Jan. 13, 1994, abandoned. This application Apr. 11, 1997, Ser. No. 840,227

Int. Cl.⁶ H04L *9/32*

U.S. Cl. 380—21 **50 Claims**



1. A method for generating verifiably trusted communication among a plurality of users, comprising the steps of:
escrowing at a trusted escrow center a plurality of secret asymmetric cryptographic keys to be used by a plurality of users;
verifying each of said plurality of keys at the escrow center;
certifying each of said plurality of keys upon verification; and
initiating a communication from each of said plurality of users using a respective one of said plurality of keys contingent upon said certification.

5,841,866
SECURE TOKEN INTEGRATED CIRCUIT AND METHOD OF PERFORMING A SECURE AUTHENTICATION FUNCTION OR TRANSACTION

Frederick Johannes Bruwer; Pieter Jacobus Pretorius, and Theodor Johannes Dippenaar, all of Verwoerdburg, South Africa, assignors to Microchip Technology Incorporated, Chandler, Ariz.

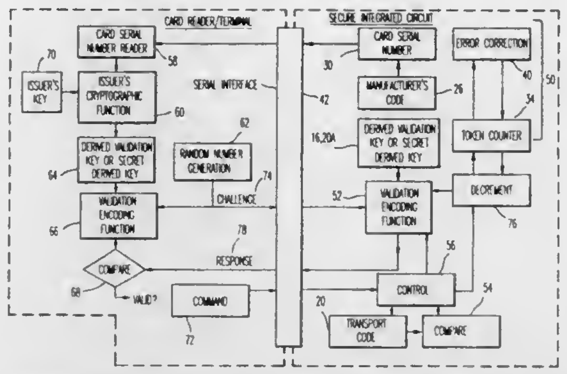
Filed Sep. 29, 1995, Ser. No. 537,292

Claims priority, application South Africa, Sep. 30, 1994, 94/7654; Oct. 5, 1995, 95/8377

Int. Cl.⁶ H04L *9/00*

U.S. Cl. 380—23 **50 Claims**

50. A circuit which includes:
first storage means for storing a serial number;
second storage means for storing a secret derived key derived from the serial number, an issuer's key and a first encoding function;
token counter means;
interface means for receiving a challenge and a decrement command;
means for decrementing a count in the token counter means in response to the decrement command;



means, in response to a successful count decrement, for producing an encoded value, from the secret derived key, the challenge and a second encoding function;
means for providing an encoded response based on the challenge, a key, an algorithm and information on the circuit; and
means for presenting the encoded value to the interface means.

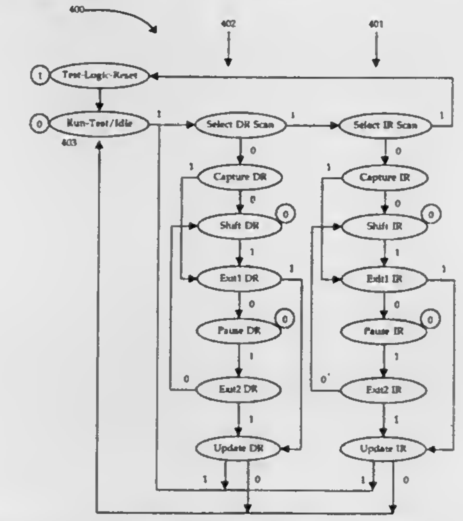
5,841,867
ON-CHIP PROGRAMMING VERIFICATION SYSTEM FOR PLDS

Neil G. Jacobson, Mountain View, and Derek R. Curd, San Jose, both of Calif., assignors to Xilinx, Inc., San Jose, Calif.

Filed Nov. 1, 1996, Ser. No. 742,711

Int. Cl.⁶ H04L *9/00*

U.S. Cl. 380—25 **27 Claims**



24. A method of verifying the program of a PLD comprising a system logic including at least one logic gate, and at least one writable memory cell coupled to the system logic, comprising the steps of:
loading an initial address of said at least one writable memory cells in an address generator;
updating the address generator with a new address for said at least one writable memory cell;
coupling the data output of said at least one writable memory cell to a signature analyzer;
said signature analyzer generating a signature checksum based upon the data output of said at least one writable memory cell; and
comparing said generated signature checksum with an expected signature checksum value.

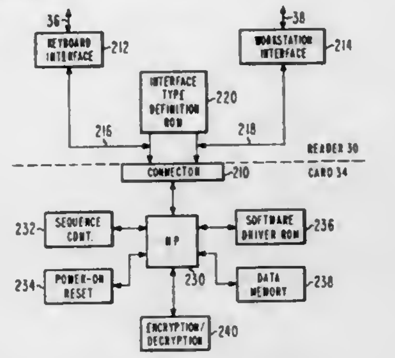
5,841,868
TRUSTED COMPUTER SYSTEM

Walter Allen Helblg, Sr., 186 Nahma Trail, Medford Lakes, Burlington, N.J. 08055

Filed Sep. 21, 1993, Ser. No. 124,954

Int. Cl.⁶ H04L *9/32;9/00*

U.S. Cl. 380—25 **3 Claims**



1. A trusted computing system, comprising:
a computing apparatus including a keyboard port, and responsive to keyboard signals applied to said keyboard port;
a keyboard including a plurality of keys and an output port, for generating, at said output port of said keyboard, keyboard signals representing keystrokes;
a card reader electrically and mechanically coupled to said output port of said keyboard and to said keyboard port of said computing apparatus, said card reader being for electrically coupling a removable access control card to said keyboard output port and to said keyboard port of said computing apparatus; and
a plurality of removable access cards, each of which is physically arranged to be mechanically and electrically coupled to said card reader, each of said access cards including memory means preloaded with personal identification information, and comparison means coupled to said memory means, for, when inserted into said card reader, assuming first and second modes of operation, and for, in said first mode of operation, comparing said keyboard signals with said personal identification information, and for, when said comparison matches said keyboard signals with said personal identification information, switching to said second mode of operation, and for, in said second mode of operation, coupling said keyboard signals to said keyboard port of said computing apparatus.

5,841,869
METHOD AND APPARATUS FOR TRUSTED PROCESSING

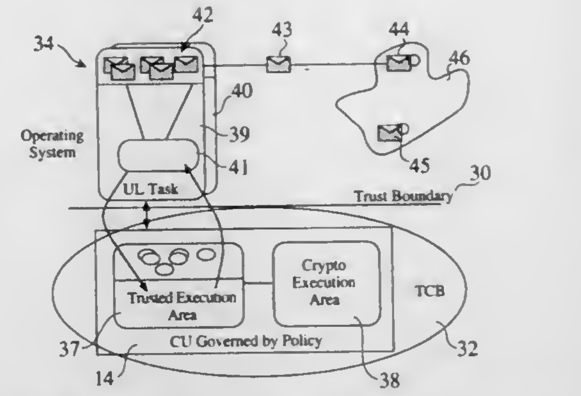
Roger Merkling, Palo Alto; Helmut Fieres, Mountain View, and Kelth Klemba, Palo Alto, all of Calif., assignors to Cheyenne Property Trust, San Francisco, Calif.

Filed Aug. 23, 1996, Ser. No. 702,332

Int. Cl.⁶ H04L *9/00*

U.S. Cl. 380—25 **38 Claims**

1. A trusted processor, comprising:
a process that executes a task within a system, said process having one or more partitions that define trusted modules;
a trust boundary established by a trusted element; and
a trusted computing base, including a trusted execution area;
wherein said trusted computing base is separated from said process by said trust boundary, and wherein each of said trusted modules separately access said trusted computing base and are each executed locally within said trusted execution area.



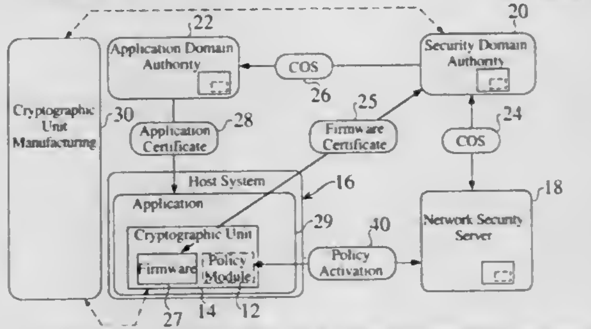
5,841,870
DYNAMIC CLASSES OF SERVICE FOR AN INTERNATIONAL CRYPTOGRAPHY FRAMEWORK

Helmut Fieres, Mountain View; Roger Merckllng, and Keith Klemba, both of Palo Alto, all of Calif., assignors to Cheyenne Property Trust, San Francisco, Calif.

Filed Nov. 12, 1996, Ser. No. 748,085

Int. Cl.⁶ H04L *9/00*

U.S. Cl. 380—25 **60 Claims**



1. A method for validating that an application rightfully executes a certain class of service, comprising the steps of:
either defining classes of service with an application domain authority or creating classes of service with a security domain authority;
wherein said classes of service are validated by said security domain authority which has policies defined to meet said security domain authorities' security interests and requirements, where said class of service has a unique identification that is not reused by said security domain authority;
granting said level of authority from said application domain authority in the form of a certificate containing valid classes of services; and
tightly binding said application to said certificate.

5,841,871
METHOD FOR AUTHENTICATING A USER WORKING IN A DISTRIBUTED ENVIRONMENT IN THE CLIENT/SERVER MODE

Denis Pinkas, Chaville, France, assignor to Bull S.A., Louveciennes, France

Filed Nov. 18, 1996, Ser. No. 751,740

Claims priority, application France, Nov. 20, 1995, 95 13741

Int. Cl.⁶ H04L *9/00*

U.S. Cl. 380—25 **8 Claims**

1. A method for authenticating a user working in a distributed environment in a client/server mode, said authentication method being applicable in a system employing a one-time password

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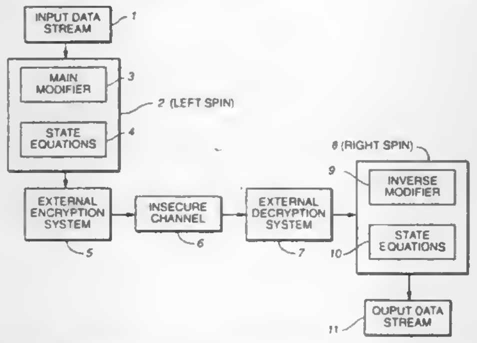
(OTP) method, integrated with a Kerberos system, said authentication method comprising the steps of installing two items of specific information in an authentication server prior to performing an authentication; authenticating the user based only on a memorized "passphrase", said passphrase being a predetermined length and having a predetermined duration of usage, deriving said specific information from said passphrase, calculating a first item of information by the OTP method, furnishing a verification value called the "seed" and a tally from the calculated first item of information which is a current tally m, and calculating a second item of information as follows:

> Kerberos password=irreversible function ("passphrase", constant I),

where the constant I is a public value, whereby it is possible to use a single irreversible function for both the one-time password system used alone and an OTP system integrated with a Kerberos system.

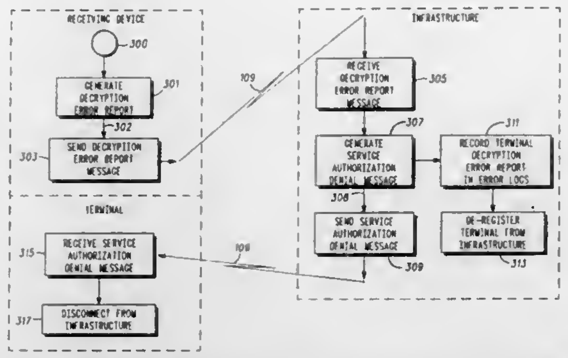
5,841,872
ENCRYPTION ENHANCEMENT SYSTEM
Bryan Colvin, Sr., San Jose, Calif., assignor to Allsoft Distributing Incorporated, San Jose, Calif.
Filed Jul. 1, 1996, Ser. No. 675,285
Int. Cl.^{6} H04K *1/00*
U.S. Cl. 380—28 **9 Claims**



1. A data encryption system, comprising:
an input for receiving a stream of input data that is to be encrypted;
a data modifier that uses a pseudo-random number stream to modify the input data to produce a stream of modified data, the data modifier having a random number generator that uses the value of the input data to generate the pseudo-random sequence of numbers; and
an output for outputting the stream of modified data.

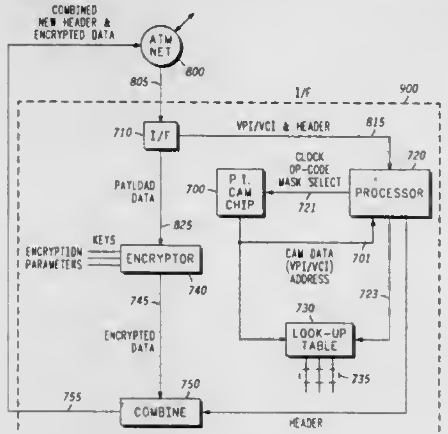
5,841,873
METHODS OF DETECTING DECRYPTION ERRORS
Thomas W. Lockhart, Richmond, Canada; Farzan Mamaghani, Bothell, Wash.; Karl A. Reardon, Surrey, Canada; William H. Kilner, Monroe, Wash.; Richard Mosher, Ladner, Canada; Bud Fraser, Vancouver, Canada, and Nazira Chatur, Richmond, Canada, assignors to Motorola, Inc., Schaumburg, Ill.
Continuation of Ser. No. 486,446, Jun. 8, 1995, abandoned. This application Aug. 14, 1997, Ser. No. 911,405
Int. Cl.^{6} H04L *9/00*
U.S. Cl. 380—49 **2 Claims**

1. In a data communications system, including an infrastructure arranged to communicate messages comprising user information data over a data channel with a plurality of data terminals, a method of operation of one of said plurality of data terminals, the method comprising the steps of:
receiving an encrypted data packet;
decrypting said encrypted data packet using a decryption key to provide a decrypted data packet;


RECEIVING DEVICE
300
GENERATE DECRYPTION ERROR REPORT
301
302
303
SEND DECRYPTION ERROR REPORT MESSAGE
109
INFRASTRUCTURE
RECEIVE DECRYPTION ERROR REPORT MESSAGE
305
307
311
GENERATE SERVICE AUTHORIZATION DENIAL MESSAGE
RECORD TERMINAL DECRYPTION ERROR REPORT IN ERROR LOGS
308
SEND SERVICE AUTHORIZATION DENIAL MESSAGE
DE-REGISTER TERMINAL FROM INFRASTRUCTURE
309
313
TERMINAL
315
RECEIVE SERVICE AUTHORIZATION DENIAL MESSAGE
108
317
DISCONNECT FROM INFRASTRUCTURE

comparing a reference value to a portion of said decrypted data packet to determine when a predetermined relationship is satisfied thereby detecting a decryption error in said user information data;
generating a decryption error report message when said predetermined relationship is not satisfied such that said decryption error is detected in said user information data;
sending the decryption error report message corresponding to said decryption error to the infrastructure;
receiving a service authorization denial message responsive to said step of sending; and
disconnecting from the infrastructure, responsive to said step of receiving said service authorization denial message.

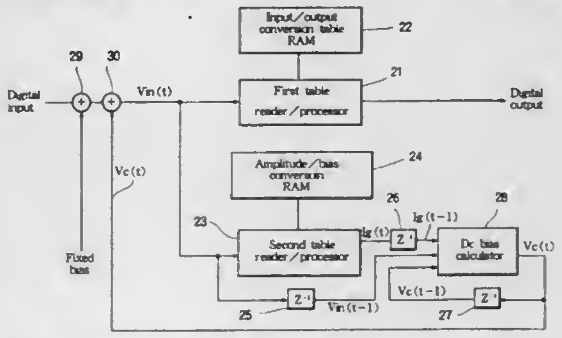
5,841,874
TERNARY CAM MEMORY ARCHITECTURE AND METHODOLOGY
Robert Alan Kempke, Tempe, Ariz., and Anthony J. McAuley, Bloomfield, N.J., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Aug. 13, 1996, Ser. No. 696,453
Int. Cl.^{6} H04L *9/00*
U.S. Cl. 380—50 **21 Claims**



16. A memory system for providing secure asynchronous transfer mode (ATM) communications for an ATM network that transmits a plurality of data cells, each of the plurality of data cells comprising payload data and header data comprised of virtual path identifier (VPI) address data and virtual channel identifier (VCI) address data, the memory system receiving a plurality of data input signals, encryption VPI and VCI addresses, and associate key data signals, the memory system comprising:
a ternary content addressable memory (TCAM) subsystem for storing a first one of the data input signals as stored ternary data, and for determining a match output address by comparing another one of the data input signals to the stored ternary data;
an addressable lookup table subsystem for storing the key data signals and selectively outputting the key data signals in accordance with the match output address;

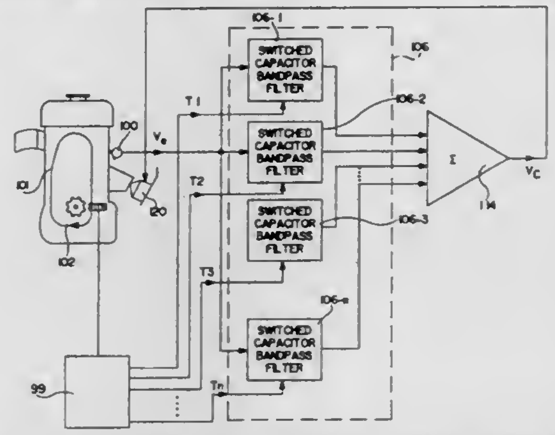
wherein the TCAM subsystem and the addressable lookup table subsystem form a memory subsystem;
means for initializing the memory subsystem comprising:
  means for storing the encryption VPI and VCI addresses in the TCAM subsystem;
  means for storing the key data associated with the encryption VPI and VCI addresses in the lookup table;
  means for separating the payload data from the header data for each of the data cells;
  means for delivering the separated header data to the TCAM, wherein the TCAM selectively outputs the match output address when the separated header data matches one of the stored VPI and VCI addresses;
  wherein the lookup table outputs the key data associated with the respective match output address;
  means for encrypting the payload data in accordance with the key data; and
  means for combining the encrypted payload data with the separated header data to form an encrypted data cell.

5,841,875
DIGITAL AUDIO SIGNAL PROCESSOR WITH HARMONICS MODIFICATION
Ryuichiro Kuroki, and Tsugio Ito, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan
Continuation of Ser. No. 968,539, Oct. 29, 1992, abandoned. This application Jan. 18, 1996, Ser. No. 588,288
Claims priority, application Japan, Oct. 30, 1991, 3-311609
Int. Cl.^{6} H03G *3/00*
U.S. Cl. 381—61 **24 Claims**



1. An audio signal processor having a harmonies modifier for processing an input audio signal to produce an output audio signal, wherein the harmonics modifier comprises:
translating means for sequentially translating the input audio signal into an address signal according to a sampled amplitude of the input audio signal;
memory means for storing an input/output conversion table containing amplitude values in addressable manner;
conversion means for accessing the memory means in response to the address signal to effect input/output conversion to read out a sequence of the amplitude values which form the output audio signal containing desired harmonic components according to results of the input/output conversion; and
DC bias means disposed upstream of the translating means for adding a variable DC bias to the input audio signal, the variable DC bias being varied according to an amplitude level of the input signal, thereby varying a distribution of the harmonic components contained in the output audio signal,
wherein the DC bias means includes an amplitude/bias conversion table used for conversion of the amplitude level of the input audio signal into the variable DC bias, the amplitude/bias conversion table representing an input-voltage/grid-current characteristic of a vacuum-tube amplifier.

5,841,876
HYBRID ANALOG/DIGITAL VIBRATION CONTROL SYSTEM
Carl S. Gifford, Gilbert, Ariz.; Owen Jones, Alreford Colchester, and Michael Charles John Trinder, East Bereholt, both of England, assignors to Noise Cancellation Technologies, Inc., Linthicum, Md.
Continuation of Ser. No. 380,789, Jan. 30, 1995, Pat. No. 5,469,018, which is a continuation of Ser. No. 45,486, Apr. 7, 1993. This application Nov. 15, 1996, Ser. No. 749,718
Int. Cl.^{6} A61F *11/06*
U.S. Cl. 381—71.14 **26 Claims**


106-1
SWITCHED CAPACITOR BANDPASS FILTER
106
T1
106-2
100
V_e
SWITCHED CAPACITOR BANDPASS FILTER
Σ
V_C
101
120
T2
114
SWITCHED CAPACITOR BANDPASS FILTER
106-3
102
T3
106-n
SWITCHED CAPACITOR BANDPASS FILTER
99
Tn

1. An active feedback noise cancellation system, comprising:
a sensor for detecting a residual vibration having a periodic component, said residual vibration comprising the sum of an unwanted vibration to be canceled and a canceling vibration which operates to cancel the unwanted vibration, and generating a residual signal according to said detected residual vibration;
a control circuit connected to said sensor for receiving said residual signal from said sensor, wherein said control circuit includes a plurality of narrow bandpass filters connected in parallel that filter said residual signal to produce an electrical canceling signal, wherein each narrow bandpass filter of the plurality of narrow bandpass filters has an adjustable center frequency responsive to the frequency of said periodic component and adjusted to maintain within its passband a frequency related to said periodic component of said residual signal in order to achieve stability of said active feedback noise cancellation system over a wide range of harmonic frequency components;
an actuator connected to said control circuit for receiving said filtered electrical canceling signal and generating the canceling vibration according to said filtered residual signal; and
a means for testing said noise cancellation system connected to said sensor; wherein each said filter is tuned to the frequency of said periodic component so that said periodic component of said residual signal is transmitted to said actuator.

5,841,877
VEHICLE ARMREST TRANSDUCING
Eiji Mihara, Yokohama, Japan, assignor to Bose Corporation, Framingham, Mass.
Filed Oct. 21, 1991, Ser. No. 779,948
Int. Cl.^{6} H04B *1/00*
U.S. Cl. 381—86 **12 Claims**

1. A vehicle electroacoustical transducing system comprising,
a vehicle armrest having a bass enclosure,
said enclosure having a length, width and height corresponding substantially to the length, width and height, respectively, of the vehicle armrest,
wherein said bass enclosure is substantially rectangular having top and bottom panels, side panels and first and second end panels with an internal baffle extending along the length of

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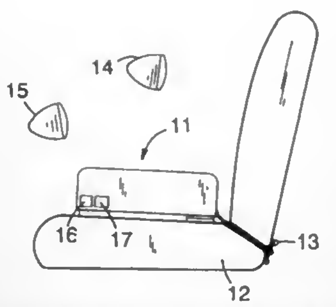


said enclosure and formed with an opening for accommodating a loudspeaker driver near said first end panel.

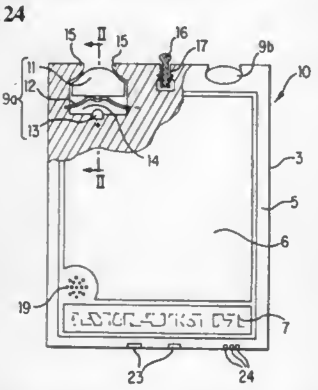
5,841,878
MULTIMEDIA COLLECTIBLE

John J. Arnold, 40 Maple St., Roslyn Heights, N.Y. 11577, and Lawrence I. Wechsler, Great Neck, N.Y., assignors to John J. Arnold, Roslyn Heights, N.Y.

Filed Feb. 13, 1996, Ser. No. 600,851

Int. Cl.^{6} G09F *27/00*

U.S. Cl. 381—124 **8 Claims**



1. A multimedia collectible capable of presenting a particular subject of interest via a plurality of media representations, said multimedia collectible comprising:

a housing having structure presenting rigid exterior obverse and reverse sides;

said housing including means for receiving visual data, said visual data including at least one of a visual representation of the subject and textual information, in a manner permitting at least partial external viewing thereof from both said obverse and said reverse sides;

means integral with said housing for audibly reproducing at least one stored sound segment, said means for reproducing including external activation means;

said housing including a switch access hole formed crosswise to a plane of said housing, said switch access hole having an opening in at least one of said obverse and reverse sides; and

said activation means including a biased activation switch disposed in said access hole for operable movement in a direction common to said plane of said housing, there being sufficient space between said biased activation switch and a peripheral inner boundary of said switch access hole to permit reception of a finger therethrough and allow depression of said switch against said biasing as desired.

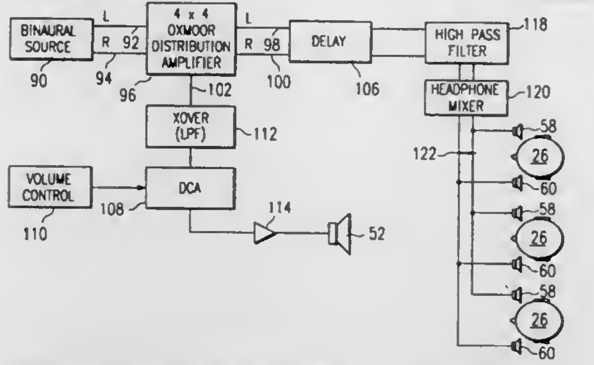
5,841,879
VIRTUALLY POSITIONED HEAD MOUNTED SURROUND SOUND SYSTEM

William Clayton Scofield, Birmingham, and Stevan Otha Saunders, Chelsea, both of Ala., assignors to Sonics Associates, Inc., Birmingham, Ala.

Continuation of Ser. No. 753,259, Nov. 21, 1996, Pat. No. 5,661,812. This application Apr. 2, 1997, Ser. No. 832,377

Int. Cl.^{6} H04R *5/00*

U.S. Cl. 381—309 **12 Claims**



1. A sound system for an individual listener, comprising:

a receiver for receiving the individual decoded speaker signals for a sound system comprised or at least three independent speaker signals designed for driving associated speakers disposed in predetermined relative positions about a listener;

a head mounted speaker system having a right head mounted speaker disposed proximate to the right ear of the listener and a left head mounted speaker disposed proximate to the left ear of the listener, each of said right and left head mounted speakers fixed in position relative to the head of the listener and for all positions thereof;

a virtual positioning system for positioning each of said three independent speaker signals relative to the listener as virtually positioned speaker signals representative of the predetermined relative positions of the associated speakers such that said virtually positioned speaker signals can be transmitted proximate to the right and left ears of the listener through said right and left head mounted speakers, but are actually perceived by the listener as being at the predetermined relative positions of said three independent speaker signals and their associated speakers;

an external speaker disposable relative to the listener;

an audio signal conditioner for extracting predetermined portions of said speaker signals;

a combiner for combining non-extracted portions of said virtually positioned speaker signals such that all of said non-extracted portions of said virtually positioned speaker signals are combined to drive said right and left head mounted speakers; and

a summation circuit for summing together said extracted portions of said speaker signals as a composite signal for output to said external speaker.

5,841,880
MULTI-POINT DRIVE TYPE SPEAKER

Yoshio Sakamoto, Hachiouji, Japan, assignor to Kabushiki Kaisha Kenwood, Tokyo, Japan

Filed Sep. 3, 1996, Ser. No. 707,295

Claims priority, application Japan, Sep. 4, 1995, 7-248291

Int. Cl.^{6} H04K *25/00*

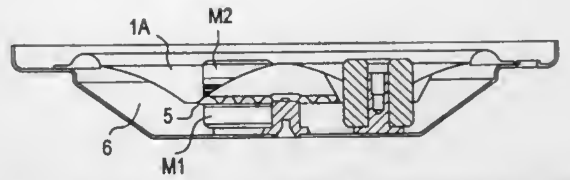
U.S. Cl. 381—401 **2 Claims**

1. A loudspeaker comprising:

a diaphragm including a sloped portion;

voice coils mounted to at least two points of said diaphragm so that at least part of each of said voice coils is disposed on the sloped portion of said diaphragm; and

magnetic circuit units, each for generating a magnetic field for each of said voice coils,



wherein the sloped portion on which at least part of each of said voice coils is disposed is provided with a voice coil mount which has a conical slope extending a horizontal flat peripheral edge of an opening through which each of said voice coils is inserted, the horizontal flat peripheral edge of the opening being a joint line between each of said voice coils and said diaphragm.

5,841,881
LABEL/WINDOW POSITION DETECTING DEVICE AND METHOD OF DETECTING LABEL/WINDOW POSITION

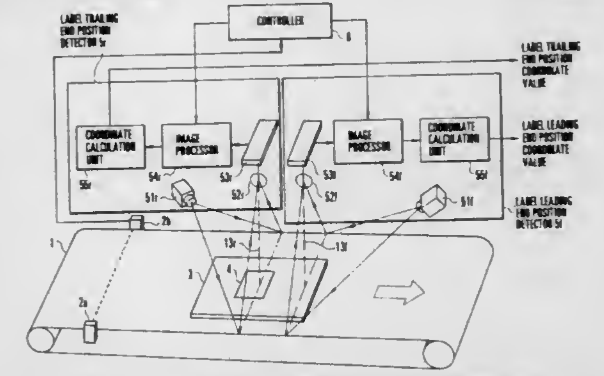
Masato Iwakawa, Tokyo; Tomoaki Fukano, Kanagawa, and Hiroyuki Mutoh, Tokyo, all of Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Sep. 22, 1995, Ser. No. 532,974

Claims priority, application Japan, Sep. 22, 1994, 6-227624

Int. Cl.^{6} G01N *21/86*

U.S. Cl. 382—101 **12 Claims**


LABEL TRAILING END POSITION DETECTOR 5r
CONTROLLER
6
LABEL TRAILING END POSITION COORDINATE VALUE
COORDINATE CALCULATION UNIT
IMAGE PROCESSOR
IMAGE PROCESSOR
COORDINATE CALCULATION UNIT
LABEL LEADING END POSITION COORDINATE VALUE
LABEL LEADING END POSITION DETECTOR 5f
2b
2a
1
3
4

1. A label/window position detecting device comprising:

convey means for conveying a target object having a label/window;

light-emitting means for illuminating the target object which is being conveyed by said convey means;

optical means for forming an image of the target object illuminated with said light-emitting means;

photoelectric converting means for photoelectrically converting image light incident through said optical means into image signals;

image processing means for binarizing the image signals obtained from said photoelectric converting means into monochrome binary image signals, using a predetermined threshold; and

label/window position calculating means for calculating a label/window position of the target object on the basis of the binary image signals from said image processing means, which correspond to at least one of leading and trailing edge portions of the label/window perpendicular to a convey direction of the target object,

wherein said image processing means comprises:

a binary image memory for storing the binary images from binarization of the image signals;

a linear equation calculating means for calculating a linear equation from the binary image signals stored in said binary image memory;

distance calculating means for calculating distances between all white pixels and the linear equation calculated by said linear equation calculating means;

adding means for calculating a sum of the distances calculated by said distance calculating means; and

reliability determining means for changing the predetermined threshold when the sum from said adding means exceeds a predetermined value.

5,841,882
AUTOMATIC PROCESS FOR THE MACERAL ANALYSIS AND THE DETERMINATION OF THE REFLECTANCE OF VITRINITE IN COALS

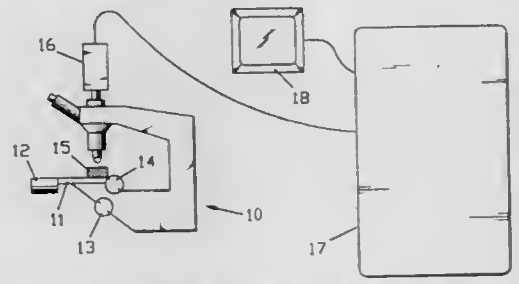
Jean-Claude Celeski, Fos-Sur-Mer, France, assignor to Sollac, Puteaux, France

Filed Dec. 9, 1994, Ser. No. 355,233

Claims priority, application France, Dec. 10, 1993, 93 14884

Int. Cl.^{6} G06F *9/00*

U.S. Cl. 382—109 **8 Claims**



1. A process of maceral analysis of a sample of crushed coal coated with resin to determine a vitrinite content of the crushed coal, the process comprising the steps of:

scanning a surface of said sample with a microscope to obtain successive fields in said microscope;

measuring a reflectance of said vitrinite by forming a gray scale digitized image of said sample for each said field;

eliminating fields containing a quantity of resin higher than a given threshold according to the gray scale digitized image; and

analyzing each said field not eliminated in the previous step according to the following process:

a) determining a distribution of the gray levels;

b) determining gradients of said gray levels;

c) forming a binary image corresponding to zones of vitrinite by using said gradients;

d) determining at least one of the distribution of said gray levels and densitometry values within said zones of vitrinite; and

e) calculating values corresponding to said reflectance of said vitrinite.

5,841,883
METHOD OF DIAGNOSING A PLANT AUTOMATICALLY AND DEVICE FOR EXECUTING METHOD THEREOF

Yasushi Kono, and Keiko Kobayashi, both of Susono, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Oct. 27, 1995, Ser. No. 549,207

Claims priority, application Japan, Oct. 27, 1994, 6-263359

Int. Cl.^{6} G06K *9/00*

U.S. Cl. 382—110 **12 Claims**

5. An automatic plant diagnostic method comprising steps of:

reading a color image of a plant to be taken and subsequently extracting a leaf image thereof from said color image of said plant;

counting numbers of colors of each of a plurality of picture elements forming said leaf image extracted in sequence and accumulating said numbers of colors;

processing said accumulated numbers of colors by total numbers of said picture elements thereby obtaining hues of said leaf and subsequently storing said hues in correspondence with a time when said extracting step is executed;

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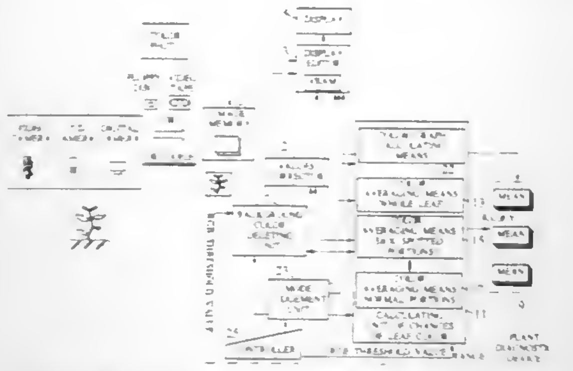


further extracting an image of normal portions of said leaf and an image of sick spotted portions thereof when said color image is read:

calculating an area ration of said normal portions to said sick spotted portions by respective numbers of picture elements contained in said normal portions and said sick spotted portions and subsequently storing said area ratio in correspondence with said time; and

displaying both said hues stored at this time and other hues stored in the past in a second display form and displaying both said area ratio stored at this time and another area ratio stored in the past in said second display form.

5,841,884
WATER QUALITY MONITORING APPARATUS

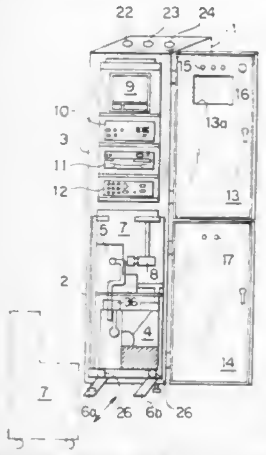
Takahiro Yamamoto, Fukuoka, Japan, assignor to Anima Electronics Co., Ltd., Fukuoka, Japan

Filed Nov. 6, 1996, Ser. No. 744,823

Claims priority, application Japan, Nov. 6, 1995, 7-287576

Int. Cl.⁶ G06K *9/00*; H04M *7/18*

U.S. Cl. 382—110 **13 Claims**



1. A water quality monitoring apparatus comprising:

a monitoring water tank for accommodating raw water to breed fish under observation said raw water;

a video camera for photographing said fish from a front surface side of said monitoring water tank; and

image analysis means for analyzing a picture taken by said video camera to monitor a quality of said raw water within said monitoring water tank,

wherein said monitoring water tank includes:

an inflow opening made in one side surface of said monitoring water tank to form a first water flowing path running from said one side surface toward the other side surface thereof which is in opposed relation to said one side surface;

a plurality of straightening plates each having a plurality of water communicating holes and provided in said first water flowing path to be perpendicular thereto and to be separated from each other to define a monitoring section for breeding said fish therebetween;

a perforated plate having a plurality of water communicating holes and placed below and in parallel to said first water flowing path to establish a second water flowing path coupled to said first water flowing path under said plurality of straightening plates: and

an outflow opening made in said second water flowing path.

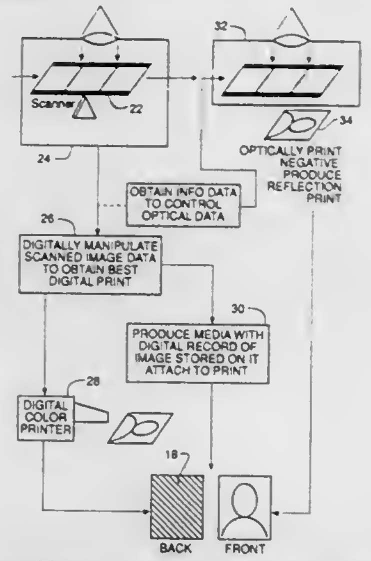
5,841,885
PRINT AND METHOD AND APPARATUS FOR PRINTING, STORING AND RETRIEVING AN IMAGE RECORD

Lynn Kwasny Neff, Rochester, and Anthony Ronald Berardi, Rush, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 413,147, Mar. 29, 1995, abandoned. This application Mar. 13, 1997, Ser. No. 816,474

Int. Cl.⁶ G06K *9/00*; G03B *17/24*;*27/52*

U.S. Cl. 382—112 **38 Claims**


32
Scanner
22
34
OPTICALLY PRINT NEGATIVE PRODUCE REFLECTION PRINT
24
OBTAIN INFO DATA TO CONTROL OPTICAL DATA
26
DIGITALLY MANIPULATE SCANNED IMAGE DATA TO OBTAIN BEST DIGITAL PRINT
30
PRODUCE MEDIA WITH DIGITAL RECORD OF IMAGE STORED ON IT ATTACH TO PRINT
28
DIGITAL COLOR PRINTER
18
BACK
FRONT

1. A photographic print made on photographic paper having an image and a digital record which is representative of the image, said photographic print being made from an original photographic film negative having an image thereon, and said digital record being made from the same original photographic film negative by scanning said original photographic film negative, said digital record containing data sufficient so as to reproduce the image on the photographic print.

5,841,886
SECURITY SYSTEM FOR PHOTOGRAPHIC IDENTIFICATION

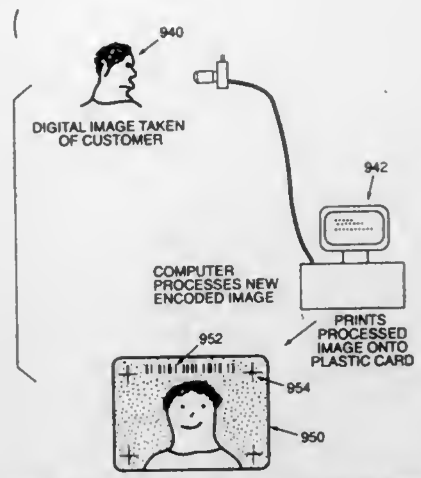
Geoffrey B. Rhoads, West Linn, Oreg., assignor to Digimarc Corporation, Lake Oswego, Oreg.

Continuation of Ser. No. 512,993, Aug. 9, 1995, abandoned, and a continuation-in-part of Ser. No. 327,426, Oct. 21, 1994, Pat. No. 5,768,426, which is a continuation-in-part of Ser. No. 215,289, Mar. 17, 1994, abandoned, which is a continuation-in-part of Ser. No. 154,866, Nov. 18, 1993, abandoned, said Ser. No. 512,993 is a continuatinn-in-part of Ser. No. 436,098, May 8, 1995, Pat. No. 5,636,292, Ser. No. 436,099, May 8, 1995, Pat. No. 5,710,834, Ser. No. 436,102, May 8, 1995, Pat. No. 5,748,783, Ser. No. 436,134, May 8, 1995, Pat. No. 5,748,763, and Ser. No. 438,159, May 8, 1995. This application Dec. 4, 1996, Ser. No. 763,847

Int. Cl.⁶ G06K *9/00*

U.S. Cl. 382—115 **56 Claims**

1. A method of correlating, with a photograph, information about an individual whose image appears in the photograph, the method comprising:


940
DIGITAL IMAGE TAKEN OF CUSTOMER
942
COMPUTER PROCESSES NEW ENCODED IMAGE
PRINTS PROCESSED IMAGE ONTO PLASTIC CARD
952
954
950

steganographically encoding into a photograph multi-bit information that pertains to said individual, said encoding serving to add noise to the photograph, said noise not being perceptible as a representation of said multi-bit information except by computer analysis, said encoding not visibly interrupting the photograph, wherein the encoded photograph appears to convey only an image of said individual to human viewers thereof;

decoding the encoded multi-bit information; and

making an authentication decision about the individual whose image appears in the photograph based, at least in part, on said decoded multi-bit information.

5,841,887
INPUT DEVICE AND DISPLAY SYSTEM

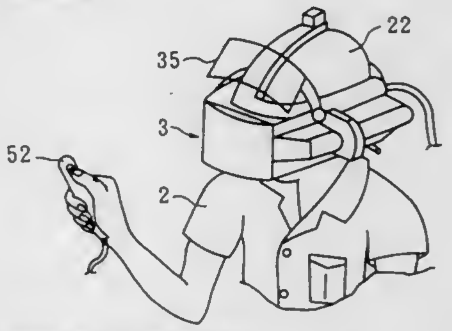
Yukiko Kuwayama, and Hisashi Amafuji, both of Kyoto, Japan, assignors to Shimadzu Corporation, Kyoto, Japan

Filed Jul. 22, 1996, Ser. No. 685,984

Claims priority, application Japan, Jul. 25, 1995, 7-210082

Int. Cl.⁶ G06K *9/00*; G09G *5/08*

U.S. Cl. 382—118 **4 Claims**



1. An input device, comprising:

an input device body which is present in the actual space;

means for sensing the three-dimensional physical position and orientation of the input device body in the actual space and for sensing a change in the three-dimensional physical position and orientation of the input device body in the actual space;

an operating member which is present in the actual space;

the operating member being able to be operated without changing the three-dimensional position and orientation of the input device body;

means for sensing the manipulated variable of the operating member; and

means for generating a pointing image on a screen according to the three-dimensional position and orientation of the input device body and the manipulated variable of the operating member; wherein

the point indicated by the pointing image on the screen is changed according to the change of the three-dimensional physical position and orientation of the input device body and the change of the manipulated variable of the operating member.

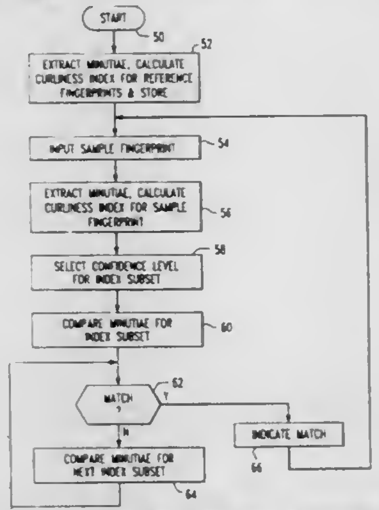
5,841,888
METHOD FOR FINGERPRINT INDEXING AND SEARCHING

Dale R. Setlak, Melbourne; John C. Schmitt, Indialantic, and Mark E. Boss, West Melbourne, all of Fla., assignors to Harris Corporation, Palm Bay, Fla.

Filed Jan. 23, 1996, Ser. No. 589,064

Int. Cl.⁶ G06K *9/00*

U.S. Cl. 382—124 **52 Claims**


START
50
52
EXTRACT MINUTIAE, CALCULATE CURLINESS INDEX FOR REFERENCE FINGERPRINTS & STORE
INPUT SAMPLE FINGERPRINT
54
EXTRACT MINUTIAE, CALCULATE CURLINESS INDEX FOR SAMPLE FINGERPRINT
56
58
SELECT CONFIDENCE LEVEL FOR INDEX SUBSET
COMPARE MINUTIAE FOR INDEX SUBSET
60
62
MATCH ?
Y
N
INDICATE MATCH
66
COMPARE MINUTIAE FOR NEXT INDEX SUBSET
64

1. A method for indexing and searching a plurality of reference fingerprints from a relatively large, selected population of individuals to determine if a sample fingerprint matches one of the reference fingerprints, the method comprising the steps of:

determining respective index values for the reference fingerprints and the sample fingerprint based upon ridge flow characteristics of the fingerprints wherein the index values are both generally evenly distributed and continuous over the relatively large population of individuals;

sorting the reference index values to define a generally continuous and generally monotonically varying function of the ridge flow fingerprint characteristics of the selected relatively large population of individuals;

selecting a first subset of the reference fingerprints having index values along the generally continuous and generally monotonically varying function within a first range relative to the index value of the sample fingerprint; and

comparing the sample fingerprint to each fingerprint of the first subset of reference fingerprints to thereby determine if there is a match between the sample fingerprint and one of the reference fingerprints and without comparing the sample fingerprint to all of the reference fingerprints.

5,841,889
ULTRASOUND IMAGE TEXTURE CONTROL USING ADAPTIVE SPECKLE CONTROL ALGORITHM

Mir Said Seyed-Bolorforosh, Brookfield, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Dec. 29, 1995, Ser. No. 581,668

Int. Cl.⁶ G06K *9/00*

U.S. Cl. 382—128 **17 Claims**

1. A method for adjusting speckle in an image, comprising the steps of:

acquiring an input waveform $S_{in}(x, y)$ representing an input image;

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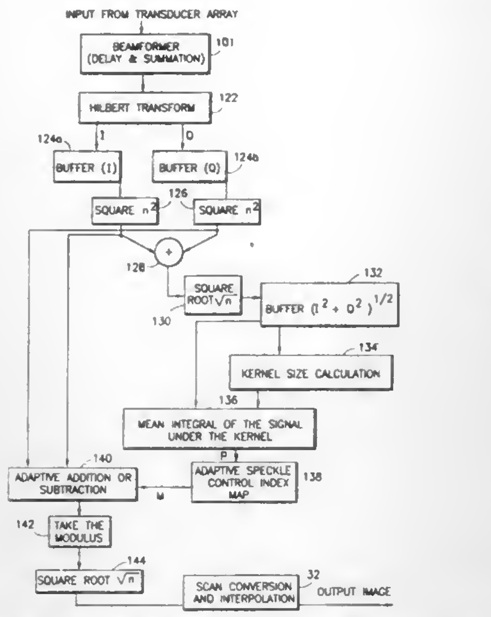


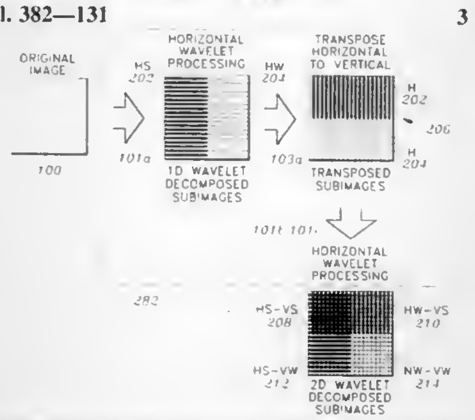
transforming said input waveform to form an in-phase component ($Re(S_{in}(x, y))$ and a quadrature phase component ($Im(S_{in}(x, y))$ of said input waveform; and

computing an output waveform $S_{out}(x, y)$ representing a speckle-modulated region of said input image in accordance with the following equation:

$$S_{out}(x,y)=|\{(Re(S_{in}(x,y))^2+M(Im\ (S_{in}(x,y))^2\}|^{0.5}$$

wherein M is an adaptive speckle control index having a value in a range $-1 \leqq M < 1$.

5,841,890
MULTI-DIMENSIONAL WAVELET TOMOGRAPHY
Wolfgang F. Kraske, Whittier, Calif., assignor to Northrop Grumman Corporation, Los Angeles, Calif.
Filed May 6, 1996, Ser. No. 643,584
Int. Cl.^{6} G06K *9/00*
U.S. Cl. 382—131 **3 Claims**


ORIGINAL IMAGE
100
HS 202
HORIZONTAL WAVELET PROCESSING
101a
1D WAVELET DECOMPOSED SUBIMAGES
HW 204
TRANSPOSE HORIZONTAL TO VERTICAL
103a
H 202
206
H 204
TRANSPOSED SUBIMAGES
HORIZONTAL WAVELET PROCESSING
282
HS-VS 208
HW-VS 210
HS-VW 212
NW-VW 214
2D WAVELET DECOMPOSED SUBIMAGES

2. A method for performing multi-dimensional wavelet tomography, said method comprising the steps of:

a) iteratively projecting a multi-dimensional original image so as to produce a plurality of one-dimensional projections thereof;

b) performing wavelet decomposition upon the one-dimensional projections to form a plurality of subimages thereof, the step of performing wavelet decomposition comprising:

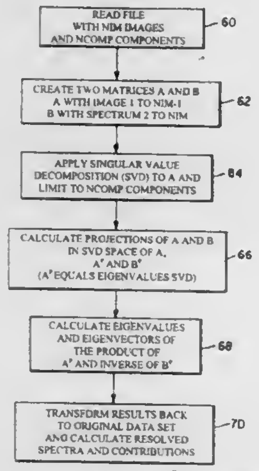
i) performing wavelet decomposition upon a two-dimensional array of one-dimensional projections in a first direction to form first scale and wavelet images;

ii) transposing the first scale and wavelet images; and

iii) performing wavelet decomposition upon the transposed first scale and wavelet images to form a horizontal scale vertical scale subimage, a horizontal scale vertical wavelet subimage, a horizontal wavelet vertical scale subimage, and a horizontal wavelet vertical wavelet subimage;

c) wherein such wavelet decomposition facilitates segmentation and reconstruction of a selected portion of the original image.

5,841,891
IMAGE ANALYSIS USING THE DIRECT EXPONENTIAL CURVE RESOLUTION ALGORITHM
Willem Windig, and Brian J. Antalek, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Apr. 2, 1997, Ser. No. 832,424
Int. Cl.^{6} G06K *9/00*
U.S. Cl. 382—131 **4 Claims**


READ FILE WITH NIM IMAGES AND NCOMP COMPONENTS
60
CREATE TWO MATRICES A AND B A WITH IMAGE 1 TO NIM-1 B WITH SPECTRUM 2 TO NIM
62
APPLY SINGULAR VALUE DECOMPOSITION (SVD) TO A AND LIMIT TO NCOMP COMPONENTS
64
CALCULATE PROJECTIONS OF A AND B IN SVD SPACE OF A, A' AND B' (A' EQUALS EIGENVALUES SVD)
66
CALCULATE EIGENVALUES AND EIGENVECTORS OF THE PRODUCT OF A' AND INVERSE OF B'
68
TRANSFORM RESULTS BACK TO ORIGINAL DATA SET AND CALCULATE RESOLVED SPECTRA AND CONTRIBUTIONS
70

1. A method of enhancing a series of images comprising the steps of:

providing x digital image files, each image file including a matrix of n rows×m columns of pixels;

producing a matrix of said x digital image files of x rows of m×n pixels per row, where each row is an unfolded image of an x digital image;

splitting the produced matrix into two data sets A and B, each data set with an equal amount of images less than x;

applying singular value decomposition (SVD) to data set A and limiting the SVD space to a number of expected components;

calculating the projections A^p and B^p of data set A and data set B into the SVD space of A, with the eigenvalues of the SVD representing the projection of A;

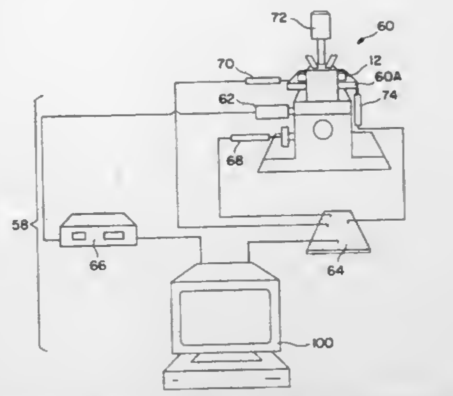
calculating the eigenvalues and eigenvectors of the product of A^p and the inverse of B^p; and

transforming the results of the latter calculation back to the original data set and calculating the resolved images and their contributions into the original images.

5,841,892
SYSTEM FOR AUTOMATED ANALYSIS OF 3D FIBER ORIENTATION IN SHORT FIBER COMPOSITES
John J. McGrath, DeWitt, Mich., and Jeffrey M. Wille, Mission, Tex., assignors to Board of Trustees operating Michigan State University, East Lansing, Mich.
Continuation of Ser. No. 455,516, May 31, 1995, abandoned.
This application Jul. 13, 1997, Ser. No. 903,709
Int. Cl.^{6} G06T *7/60;9/20;17/10;* **G01N** *33/44*
U.S. Cl. 382—141 **27 Claims**

1. A method for detecting a three-dimensional fiber orientation in an injection molded sample which comprises:

(a) providing a transparent molded sample of a continuous phase of a polymeric material with impregnated reinforcing fibers having a refractive index similar to the refractive index of the polymeric material and at least one tracer fiber which is optically distinguishable from the polymeric material and the reinforcing fibers in the sample;



(b) mounting the sample under an optical microscope which is provided with a computer means for recording images of the tracer fiber at layers within the sample in a field of view of the microscope along a line of sight of the microscope through the sample; and

(c) analyzing the recorded images using the computer means to reduce the amount of data and reveal parameters in the recorded images by removing voxels from a group of voxels to create at least one chain of single voxels to provide a thinned image; and

(d) analyzing the thinned image using the computer means to determine the orientation of at least one tracer fiber in the sample which includes the steps of:

(i) searching the thinned image to locate a set voxel;

(ii) moving along at least one chain of voxels contiguous with the set voxel until an endpoint or junction is reached, to determine a location of each voxel in the chain of voxels;

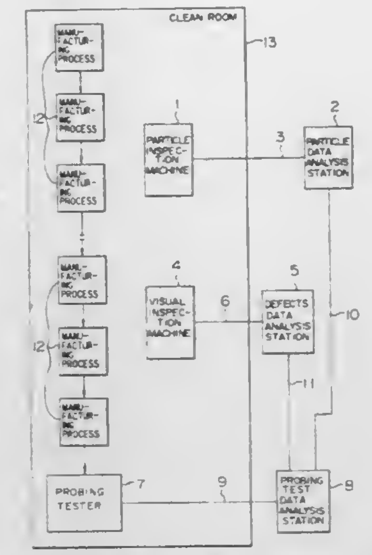
(iii) storing the locations of each voxel in at least one chain of voxels;

(iv) calculating an inertia tensor about a center of mass of a rigid body by using the locations of the voxels in at least one chain of voxels as point masses belonging to the rigid body; and

(v) determining a smallest principle moment of inertia for the rigid body to determine an axis of the tracer fiber to determine the orientation of fibers in the sample.

5,841,893
INSPECTION DATA ANALYZING SYSTEM
Seiji Ishikawa, Yokohama; Masao Sakata, Ebina; Jun Nakazato, Tokyo; Sadao Shimoyashiro, Fujisawa; Hiroto Nagatomo, Nishitama; Yuzo Taniguchi, Higashimurayama; Osamu Satou, Koganei; Tsutomu Okabe, Kodaira; Yuzaburo Sakamoto, Takasaki; Kimio Muramatsu, Takasaki; Kazuhiko Matsuoka, Takasaki; Taizo Hashimoto, Takasaki; Yuichi Ohyama, Isesaki; Yutaka Ebara, Maebashi; Isao Miyazaki, Isesaki, and Shuichi Hanashima, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Continuation of Ser. No. 550,942, Jul. 11, 1990, abandoned.
This application Jun. 30, 1992, Ser. No. 908,550
Claims priority, application Japan, Jul. 12, 1989, 1-177934
Int. Cl.^{6} G06K *9/00*
U.S. Cl. 382—145 **12 Claims**

1. In an inspection data analysis system in a semiconductor device manufacturing line, including a foreign particle inspection machine for inspecting at least a size, a number, and coordinates of foreign particles on a wafer after working of the wafer in an appropriate process, a probing test machine for testing product character of individual chips of each wafer in an inspection process, and an inspection data analysis station connected to said foreign particle inspection machine and said probing test machine by communication lines, said inspection data analysis station comprising:



a storage section for storing inspection data of said foreign particle inspection machine, test data of said probing test machine, and chip arrangement information of each type of wafer;

input means for accepting an analysis instruction, a type of wafer, a name of a process which the wafer has been subjected to, a lot number, or a wafer number which is selected and inputted by an analysis operator;

time series foreign particles trend display means for outputting a graph displaying a frequency of a number of foreign particles per any one of wafer, lot, day, week, and month, or a frequency of a number of foreign particles for each particle diameter, on the basis of the inspection and test data stored in said storage section;

inter-process foreign particle number trend display means for outputting a graph displaying a frequency of a number of foreign particles or a frequency of a number of foreign particles for each particle diameter in each process in the order of inspection on the basis of the inspection and test data stored in said storage section; and

foreign particle yield correlation display means for outputting a primary regression line obtained from a plurality of points which are plotted on a graph, each of said points representing a wafer yield corresponding to a number of foreign particles for each wafer of a specified type and lot number, on the basis of the inspection and test data stored in said storage section; and

yield for each foreign particle diameter display means for displaying on a graph a yield for each of chips having no foreign particle and for each of chips having foreign particles, by classifying each chip in each wafer of a specified type and lot number in accordance with the presence or absence of foreign particles and a maximum particle diameter of foreign particles attached to said each chip, said classifying being performed on the basis of the inspection and test data and the chip arrangement information for each type of wafer stored in said storage section.

5,841,894
THREE-DIMENSIONAL DETECTING METHOD AND THREE-DIMENSIONAL DETECTING APPARATUS
Masahiro Horie, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan
Filed Oct. 15, 1996, Ser. No. 730,230
Claims priority, application Japan, Oct. 16, 1995, 7-267201
Int. Cl.^{6} G06K *9/00;* **G01B** *11/24*
U.S. Cl. 382—154 **14 Claims**

1. A method of detecting a three-dimensional shape of a sample, comprising the steps of:

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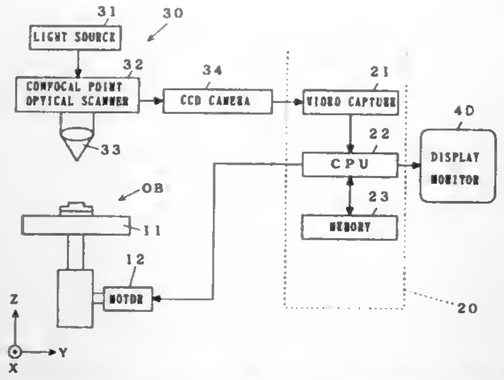


- a) detecting respective confocal images of said sample at different heights from said sample, to thereby obtain a plurality of light-intensity levels for each pixel at said different heights;
- b) comparing said plurality of light-intensity levels with each other to determine a maximum light-intensity level for each pixel;
- c) determining one of said different heights providing said maximum light-intensity to obtain a height value for each pixel;
- d) selecting an objective pixel among an arrangement of pixels on which each confocal image is defined;
- e) correcting said height value of said objective pixel with correction values to obtain a corrected height value,

wherein said correction values include said height value and said maximum light-intensity level of at least one neighboring pixel locating a neighborhood of said objective pixel;

- f) repeating the steps d) and e) while updating selection of said objective pixel among said arrangement of pixels to obtain a distribution of corrected height values; and
- g) determining said three-dimensional shape of said sample in accordance with said distribution of corrected height values.

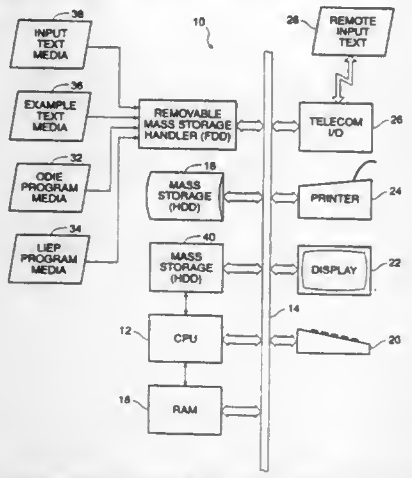
5,841,895
METHOD FOR LEARNING LOCAL SYNTACTIC RELATIONSHIPS FOR USE IN EXAMPLE-BASED INFORMATION-EXTRACTION-PATTERN LEARNING

Scott B. Huffman, Menlo Park, Calif., assignor to PriceWaterhouseCoopers, LLP, New York, N.Y.

Filed Oct. 25, 1996, Ser. No. 736,890

Int. Cl.⁶ G06K *9/62;* G06F *15/18*

U.S. Cl. 382—155 **4 Claims**



1. In a computerized example-based pattern learning element of an information-extraction system, said element having as input, texts containing user-identified events and as output, information-extraction patterns that can be used to extract similar events from similar texts, a method for learning local syntactic relationships to be used as components within information-extraction patterns learned by said pattern learning element, said method comprising the steps of:

- analyzing an example text and event given to the learning element to establish that the learning element contains an incomplete current dictionary of local syntactic relationships needed to form paths of relationships between all constituents of the text that participate in the event, thus making the learning element unable to form a new extraction pattern from said example text and event;
- thereupon finding the closest pair of constituents within the example text that cannot be related by local syntactic relationships in the current dictionary;
- inferring a new local syntactic relationship between said closest pair, said new local syntactic relationship being expressed as a finite state machine;
- adding said finite state machine to said dictionary so that said finite state machine can be embedded in patterns produced by said learning element; and
- re-invoking the learning element on said example text and said example event to learn an information extraction pattern from said example text and said example event by making use of the newly-inferred local syntactic relationship finite state machine.

5,841,896
METHOD AND APPARATUS FOR DISPLAYING THE HUE OF A SIGNAL BY UTILIZING AN INDICATOR STRIP HAVING A NUMBER OF CHARACTERS OR SYMBOLS REPRESENTING RESPECTIVE HUES

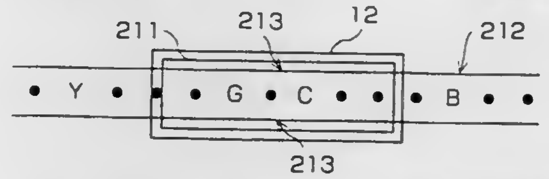
Kazuhisa Tsuchiya, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 13, 1995, Ser. No. 558,916

Claims priority, application Japan, Nov. 15, 1994, 6-280948

Int. Cl.⁶ G06K *9/00*

U.S. Cl. 382—162 **20 Claims**



1. Apparatus for displaying hue of a video signal, said apparatus comprising:

- detecting means for detecting the hue of the video signal;
- means for generating a control data signal corresponding to the hue of the video signal detected by the detecting means; and
- a display device having only a single movable indicator strip with a plurality of characters each representing a respective hue and having only a single display window, said display device being operative to move said single indicator strip in accordance with said control data signal so as to align the character corresponding to the detected hue of the video signal in said display window so as to provide an identifiable indication of said detected hue for view by an operator.

5,841,897
METHOD FOR THE TONAL CONTROL OR ADJUSTMENT OF REPRODUCED COLOR IMAGE AND PICTURE PRODUCING SYSTEM MAKING USE OF SAID METHOD

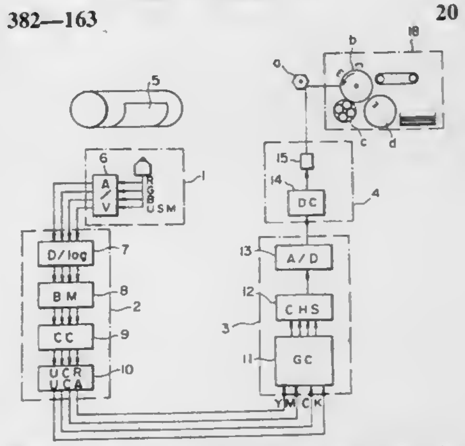
Takashi Numakura; Iwao Numakura, both of Tokyo, and Susumu Kitazawa, Kanagawa-ken, all of Japan, assignors to Yamatoya & Co., Ltd., Tokyo, Japan

Filed May 22, 1996, Ser. No. 651,607

Claims priority, application Japan, May 23, 1995, 7-146935; Jul. 12, 1995, 7-197891

Int. Cl.⁶ H04N *1/54*

U.S. Cl. 382—163 **20 Claims**



1. A method for the control or adjustment of a color tone of pixels of a color plate during production of a reproduced color image by tonal conversion of a light quantity of each pixel of a color original image into a halftone, the light quantity of each pixel having been obtained from the color original image recorded on a predetermined recording medium based on a characteristic curve of the recording medium, the characteristic curve being a correlation curve between light quantities which have entered the recording medium and corresponding densities formed on the recording medium, wherein said method comprises the following steps:

- i) setting, at a desired position between a highlight area and a shadow area in the color original image, a color tone control point M_1 for controlling the color tone of the reproduced color image;
- ii) defining color tone adjustment conditions at the color tone control point M_1 in terms of dot percent values of desired plural individual color plates to be employed for the production of the reproduced color image;
- iii) introducing, into a tonal conversion formula, (a) a light quantity at the color tone control point M_1 from the color original image, (b) the dot percent values of the individual color plates and (c) desired dot percent values set in advance for highlight areas and shadow areas of the individual color plates, to determine values γ for the individual color plates so as to provide respective tonal conversion formulas for the individual color plates for converting, into dot percent values, light quantities of all pixels ranging from the highlight areas to the shadow areas of the individual color plates; and
- iv) subjecting light quantities from the color original image corresponding to individual pixels of the respective color plates to tonal conversion based on the respective tonal conversion formulas for the individual color plates and controlling or adjusting color tones of the individual pixels of the individual color plates based on the respective tonal conversion formulas for the individual color plates;

wherein the tonal conversion formula is represented as follows.

$$y_n-y_H=[\alpha(1-10^{-\kappa x})(y_S-y_H)/(\alpha-\beta)]$$

where

- x: (x_n-x_H), a base light quantity obtained by subtracting a light quantity (x_H), which corresponds to a density information value (D_H) of the highlight area of the color original image as determined using the characteristic curve of the recording medium, from a light quantity (x_n) corresponding to a density information value (D_n) of a desired pixel point (point: n) on the color original image as determined using the characteristic curve of the recording medium:
- y_n: a dot percent value set for a pixel on the reproduced color image, the pixel corresponding to the desired pixel point (point: n) on the color original image;
- y_H: a dot percent value set in advance for the highlight area on the reproduced color image corresponding to the highlight area on the color original image;
- y_S: a dot percent value set in advance for the shadow area on the reproduced color image corresponding to the shadow area on the color original image;
- α: a surface reflectivity of an image expressing medium for recording the reproduced color image;
- β: value determined by $\beta=10^{-\gamma}$;
- κ: a value determined by $\kappa=\gamma/(x_S-x_H)$ in which x_S represents a light quantity corresponding to a density information value (D_S) of the shadow area of the color original image determined by using the characteristic curve of the recording medium; and
- γ: a desired coefficient.

5,841,898
UTILIZATION OF SCANNED IMAGES IN AN IMAGE COMPOSITING SYSTEM

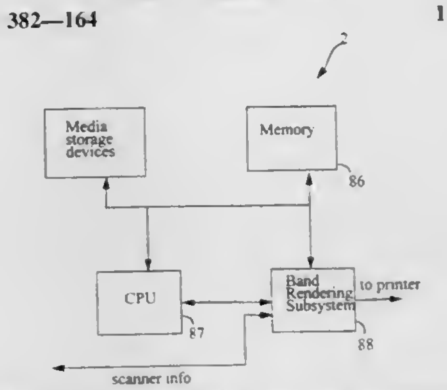
Vincenzo Liguori, North Ryde, Australia, assignor to Canon Information Systems Research Australia Pty Ltd., New South Wales, Australia, and Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 7, 1995, Ser. No. 524,515

Claims priority, application Australia, Sep. 16, 1994, PM8221

Int. Cl.⁶ H04N *1/56*

U.S. Cl. 382—164 **12 Claims**



1. A method of composing images made up of pixels and derived from a multiplicity of objects having associated color data and scanned image data made up of pixel data, said method comprising the steps of:

- assigning said color data of a first predetermined number of objects to be color data derived from corresponding pixel data of said scanned image data,
- preparing a band intersection list of said objects, and
- band rendering such objects using said band intersection list to derive said image made up of pixels.

5,841,899
SPECIFIC COLOR FIELD RECOGNITION APPARATUS AND METHOD

Kenichi Ide, Tokyo, and Takahisa Nakano, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 20, 1996, Ser. No. 700,097

Claims priority, application Japan, Aug. 21, 1995, 7-212159

Int. Cl.⁶ G06K *9/00;9/34*

U.S. Cl. 382—168 **20 Claims**

1. A specific color field recognition apparatus comprising:

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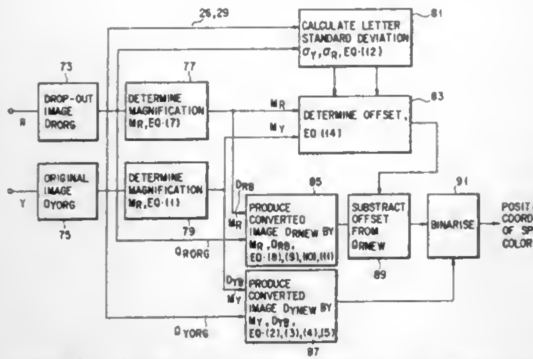
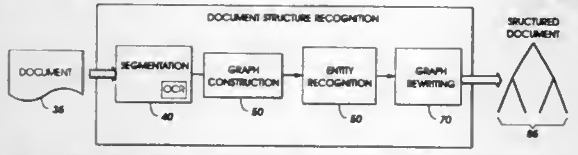

26,29
CALCULATE LETTER STANDARD DEVIATION σY,σR, EQ.(12)
81
73
DROP-OUT IMAGE DRORG
77
DETERMINE MAGNIFICATION MR,EQ.(7)
DETERMINE OFFSET, EQ.(14)
83
ORIGINAL IMAGE OYORG
DETERMINE MAGNIFICATION MR,EQ.(1)
MR
MY
DRB
85
PRODUCE CONVERTED IMAGE DRNEW BY MR,DRB, EQ.(8),(9),(10),(11)
SUBSTRACT OFFSET FROM DRNEW
91
BINARISE
POSITIONAL COORDINATE OF SPECIFIC COLOR FIELD
75
79
ORORG
89
DYB
PRODUCE CONVERTED IMAGE DYNEW BY MY, DYB, EQ.(2),(3),(4),(5)
OYORG
87
R
Y

means for picking up an image of an object having a specific color field to be recognized and outputting a first image including the specific color;
means for outputting a second image of the object to be recognized from which information on the specific color is subtracted;
means for outputting a first density histogram and a second density histogram representing the number of pixels for each density of the first image and the second image, respectively;
first conversion means for detecting a plurality of first densities corresponding to local maxima from the first density histogram and converting the density of the first image to a third image in such a manner that a minimum of the plurality of first densities represents the lowest density of a third density histogram of the third image and a maximum of the plurality of first densities represents the highest density of the third density histogram;
second conversion means for detecting a plurality of second densities corresponding to local maxima from the second density histogram and converting the density of the second image to a fourth image in such a manner that a minimum of the plurality of the second densities represents the lowest density of a fourth density histogram of the fourth image, and a third density which having maximum pixels of the second densities, represents a fourth density which is converted by the first conversion means, the fourth density having maximum pixels of the first densities; and
means for recognizing the specific color field from the first image on the basis of the third image and the fourth image.

5,841,900
METHOD FOR GRAPH-BASED TABLE RECOGNITION

M. Armon Rahgozar, Penfield, N.Y., and Robert Cooperman, Somerville, Mass., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 11, 1996, Ser. No. 585,142
Int. Cl.^{6} G06K *9/34*
U.S. Cl. 382—176 **22 Claims**

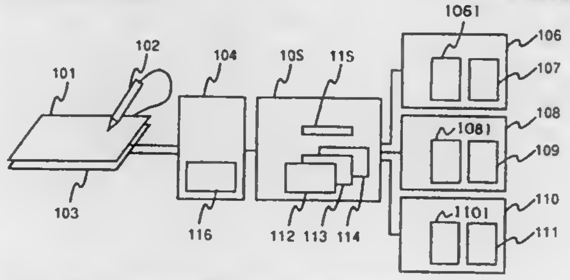


21. A graph-based method for recognizing tables present in a document represented as digital image data, including the steps of:
segmenting the digital image data to identify textual and image entities within the document;
building a layout graph of the document using the entities;
automatically tagging each of the text entities with a label from a document node alphabet to produce a labeled graph;
automatically rewriting the labeled graph, by manipulating the text entities therein, using at least one rewriting rule, to identify the logical structure of the document, wherein the logical structure includes an identified table and where the rewriting rule comprises
a production rule,
an embedding function,
an attribute transfer functions, and
an application condition.

5,841,901
PATTERN RECOGNITION SYSTEM

Toshifumi Arai, Hitachi; Hiroshi Shojima, Hitachiota; Masaki Miura, and Yasushi Fukunaga, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 67,793, May 27, 1993, abandoned.
This application Jun. 2, 1995, Ser. No. 460,599
Claims priority, application Japan, May 27, 1992, 4-135303
Int. Cl.^{6} G06K *9/70*
U.S. Cl. 382—187 **9 Claims**

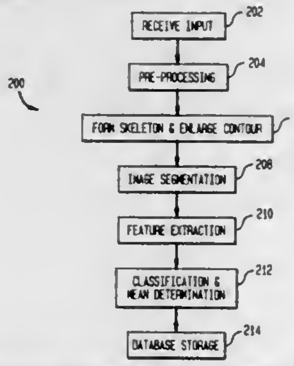


1. A pattern recognition system comprising:
input means for accepting a handwritten pattern;
a plurality of recognizers each providing at least one candidate corresponding to said handwritten pattern, said plurality of recognizers thereby providing a plurality of candidates for said handwritten pattern; and
a recognition controller including:
calculation means for giving each of said plurality of recognizers a value indicating reliability of each of said plurality of recognizers based on previous recognition results including recognition results changed by user,
recognition means for selecting one of said plurality of candidates as a recognition result based on the value indicating reliability given to each of said plurality of said recognizers, and
correction means for accepting, from a user, a correction for said recognition result and changing said recognition result in accordance with said correction.

5,841,902
SYSTEM AND METHOD FOR UNCONSTRAINED ON-LINE ALPHA-NUMERICAL HANDWRITING RECOGNITION

Lo-Ting Tu, Taipei, Taiwan, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan

Continuation of Ser. No. 313,686, Sep. 27, 1994, abandoned.
This application Oct. 1, 1996, Ser. No. 725,345
Int. Cl.^{6} G06K *9/00;9/46;9/66;9/68*
U.S. Cl. 382—187 **27 Claims**

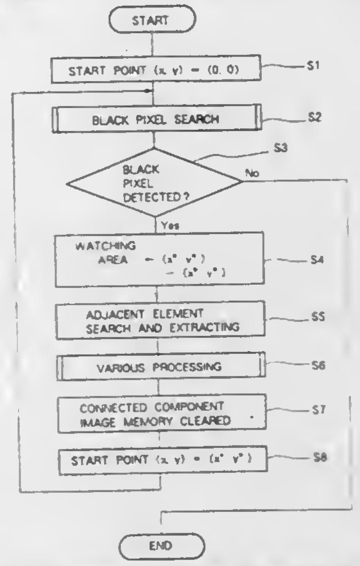


1. A method for recognizing a to-be-recognized character using a character recognition database comprising the step of constructing said character recognition database by performing the steps of:
inputting a plurality of character specimens for each model character to be recognized,
for each inputted model character, organizing said specimens into at least one class, wherein the character specimens of at least one model character are organized into plural classes,
extracting values of a feature vector, containing plural features, of each of said inputted character specimens, to produce a feature value vector, containing plural feature values, for each of said character specimens,
for each of said classes, forming a mean feature value vector, containing plural mean feature values, as an unweighted average of said feature value vectors of said character specimens of said respective classes,
storing as said character recognition database said plural mean feature value vectors, including plural mean feature value vectors for said at least one of said model characters for recognizing a to-be-recognized character as a respective model character, and
for at least one model character, adjusting said classes of said character specimens to stabilize said classes for character recognition by reassigning one or more character specimens to different classes of said respective model character and repeating said step of forming said mean feature value vectors of said adjusted classes.

5,841,903
METHOD AND DEVICE FOR EXTRACTING A CONNECTED COMPONENT OF IMAGE DATA

Takeshi Kikuchi, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Continuation-in-part of Ser. No. 4,434, Jan. 14, 1993, abandoned. This application Aug. 5, 1994, Ser. No. 286,546
Claims priority, application Japan, Jan. 17, 1992, 4-26027
Int. Cl.^{6} G06K *9/46*
U.S. Cl. 382—203 **38 Claims**

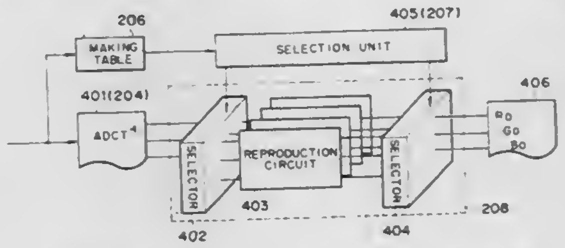

START
START POINT (x, y) = (0, 0)
S1
BLACK PIXEL SEARCH
S2
S3
BLACK PIXEL DETECTED?
No
Yes
WATCHING AREA = (x' y') ~ (x" y")
S4
ADJACENT ELEMENT SEARCH AND EXTRACTING
S5
VARIOUS PROCESSING
S6
CONNECTED COMPONENT IMAGE MEMORY CLEARED
S7
START POINT (x, y) = (x" y")
S8
END

1. An image processing device for extracting at least one connected component from binary image data so as to thereafter process the extracted connected component, wherein the binary image data designates pixels arranged in a main rasterizing scan direction and a sub-scanning direction perpendicular to the main rasterizing scan direction, each pixel is either black or white, and the connected component is composed of a contiguous group of black pixels, the image processing device comprising:
a first memory means for storing the binary image data;
a first means for searching the binary image data to detect a black pixel which is part of the connected component, wherein the black pixel detected by the first means is determined as a first watching area;
a second means for searching the binary image data to detect a line segment at least a part of which is included in the first watching area, the line segment being part of the connected component and consisting of all contiguous black pixels that extend in the main rasterizing scan direction;
a third means for canceling data of the detected line segment from the binary image data in the first memory means;
a fourth means for storing the data of the detected line segment in a second memory means as a part of object image data to be extracted as the connected component;
a fifth means for determining two next watching areas, one of the next watching areas being adjacent to the detected line segment in the sub-scanning direction and the other of the next watching areas being adjacent to the detected line segment in a direction that is 180° opposite to the sub-scanning direction, each of the next watching areas containing at least as many pixels as the detected line segment;
a sixth means for searching the binary image data to detect at least one line segment at least a part of which is included in one of the next watching areas, the line segment being part of the connected component and consisting of all contiguous black pixels that extend in the main rasterizing scan direction;
a seventh means for canceling data of each line segment detected by the sixth means from the binary image data in the first memory means;
an eighth means for storing data of each line segment detected by the sixth means in the second memory means, while maintaining the position of each detected line segment with respect to any previously-detected line segments;
a ninth means for determining next watching areas that include one next watching area adjacent to each line segment detected by the sixth means in the sub-scanning direction and another next watching area adjacent to each line segment detected by the sixth means in a direction that is 180° opposite to the sub-scanning direction, each of the next watching areas that are determined for one of the line segments detected by the sixth means containing at least as many pixels as the corresponding detected line segment; and
a tenth means for repeatedly operating the sixth, seventh, eighth, and ninth means until the sixth means does not detect any line segment at least a part of which is included in one of the next watching areas.

5,841,904
IMAGE PROCESSING METHOD AND APPARATUS

Susumu Sugiura, Atsugi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 858,623, Mar. 27, 1992, abandoned.
This application Jan. 23, 1995, Ser. No. 376,371
Claims priority, application Japan, Mar. 29, 1991, 3-066234
Int. Cl.^{6} G06K *9/36*
U.S. Cl. 382—233 **23 Claims**



1. An image processing method comprising the steps of:
inputting coded image data and a coding parameter for use in processing the coded image data, wherein the coding parameter includes a quantizing parameter and is transmitted together with the coded image data;
decoding the coded image data to produce decoded image data in accordance with the coding parameter;
estimating a deterioration factor based on the coding parameter;
selecting a suitable correction parameter in accordance with the deterioration factor; and

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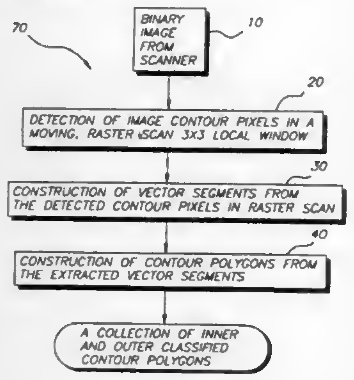
correcting the decoded image data in accordance with the correction parameter.

5,841,905
BUSINESS FORM IMAGE IDENTIFICATION USING PROJECTED PROFILES OF GRAPHICAL LINES AND TEXT STRING LINES

Yongchun Lee, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Oct. 25, 1996, Ser. No. 738,206
Int. Cl.^{6} G06K *9/00*
U.S. Cl. 382—203 **5 Claims**


70
BINARY IMAGE FROM SCANNER
10
20
DETECTION OF IMAGE CONTOUR PIXELS IN A MOVING, RASTER SCAN 3X3 LOCAL WINDOW
30
CONSTRUCTION OF VECTOR SEGMENTS FROM THE DETECTED CONTOUR PIXELS IN RASTER SCAN
40
CONSTRUCTION OF CONTOUR POLYGONS FROM THE EXTRACTED VECTOR SEGMENTS
A COLLECTION OF INNER AND OUTER CLASSIFIED CONTOUR POLYGONS

1. A method for identifying business forms by constructing contour polygons from linear line segments that have been derived from a windowed raster scan of an image of the business form comprising the steps of:

a) detecting the binary values of the pixels within the scanning window as the window is scanned over the image;

b) positioning each of the binary values into an assigned and ordered position forming a string of binary values for each window scan with each string of binary values forming an integer number;

c) directing the formed integer number to a look-up-table that translates each integer number into one or more output template commands;

d) joining linear line segments into at least one contour polygon in response to the one or more output template commands;

e) examining each contour polygon to determine if it represents a text component or a graphic component;

f) grouping all text contour polygons and graphic contour polygons;

g) profiling each of the contour polygons in the text group and the graphics group;

h) accumulating the profiles for each of the groups; and

i) comparing the accumulated profiles of step h against a Library of stored profiles of known forms so as to determine a best match thereby identifying the unknown form.

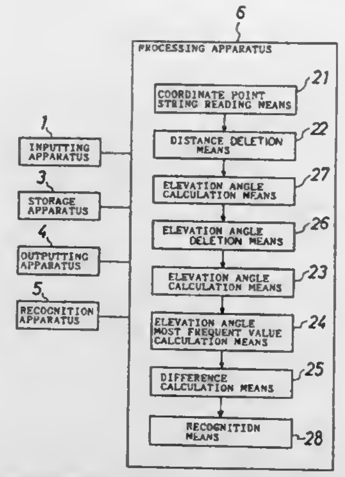
5,841,906
GRAPHIC FORM RECOGNITION APPARATUS

Shigeru Saito, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Continuation of Ser. No. 364,225, Dec. 27, 1994, abandoned. This application Nov. 21, 1997, Ser. No. 976,184
Claims priority, application Japan, Dec. 28, 1993, 5-334647
Int. Cl.^{6} G06K *9/46*
U.S. Cl. 382—203 2 Claims

1. A graphic form recognition apparatus, comprising:

coordinate point string reading means for reading in a string of coordinate points of an inputted graphic form of lines inputted from an inputting apparatus;

a storage apparatus for storing the string of coordinate points read in by said coordinate point string reading means;


6
PROCESSING APPARATUS
1
INPUTTING APPARATUS
3
STORAGE APPARATUS
4
OUTPUTTING APPARATUS
5
RECOGNITION APPARATUS
COORDINATE POINT STRING READING MEANS
21
DISTANCE DELETION MEANS
22
ELEVATION ANGLE CALCULATION MEANS
27
ELEVATION ANGLE DELETION MEANS
26
ELEVATION ANGLE CALCULATION MEANS
23
ELEVATION ANGLE MOST FREQUENT VALUE CALCULATION MEANS
24
DIFFERENCE CALCULATION MEANS
25
RECOGNITION MEANS
28

distance deletion means for distance deletion processing for individual coordinate points of the string of coordinate points stored in said storage apparatus at a fixed distance between the coordinate points;

elevation angle calculation means for calculating values of angles of elevation provided by a remaining coordinate point string after the distance deletion processing by said distance deletion means for the individual coordinate points of the string;

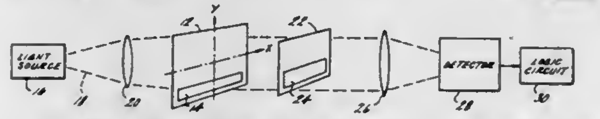
elevation angle most frequent value calculation means for calculating a most frequent value which appears most frequently among all of the values of the angles of elevation calculated by said elevation angle calculation means;

difference calculation means for calculating differences between the values of the angles of elevation calculated by said elevation angle calculation means and the most frequent value calculated by said elevation angle most frequent value calculation means; and

recognition means for recognizing the inputted graphic form of lines as a straight line when the most frequent value is less than a first predetermined value and as a curved line when the most frequent value exceeds the first predetermined value, and for recognizing each coordinate point at which the difference of the value of the angle of elevation and the most frequent value exceeds a second predetermined value as a singular point of the inputted graphic form of lines.

5,841,907
SPATIAL INTEGRATING OPTICAL CORRELATOR FOR VERIFYING THE AUTHENTICITY OF A PERSON, PRODUCT OR THING

Bahram Javidi, Storrs, Conn.; Fai Mok, Torrance, and Demetri Psaltis, Pasadena, both of Calif., assignors to The University of Connecticut, Storrs, Conn.
Continuation of Ser. No. 339,987, Nov. 14, 1994, abandoned. This application Jul. 11, 1997, Ser. No. 890,380
Int. Cl.^{6} G06K *9/76;* **G02B** *27/46*
U.S. Cl. 382—210 93 Claims



1. A method of verifying the authenticity of an object, the method comprising the steps of:

associating an input mask with the object, said input mask including a two dimensional function N(x,y);

scanning in one dimension said input mask with a light source to generate an input image;

projecting said input image at a reference mask in the spatial domain to generate a spatially integrated correlation image, said reference mask includes a two dimensional function M_{SDF} (x,y) which includes possible shifts in the y-direction and is defined by,

$$M_{SDF}(x,y)=\sum_{i=1}^{m_0} M(x,y-i)$$

where m_0 is the severity of misalignment in a y-direction for a system designed to detect a two dimensional function M(x,y) by one dimensional correlation, and

said correlation image has a function defined by,

$$R(x',y_0)=\iint N(x-x',y-y_0)M_{SDF}(x,y)\,dx\,dy;$$

detecting said correlation image to provide a correlation signal indicative of said correlation image; and

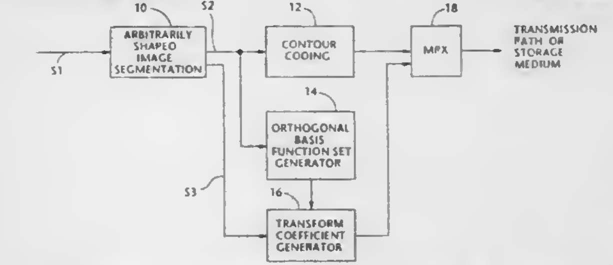
comparing said correlation signal to at least one threshold level to verify to the authenticity of the object.

5,841,908

Patent Not Issued For This Number

5,841,909
METHOD OF GENERATING AN ORTHOGONAL BASIS FUNCTION SET IN AN IMAGE PROCESSING SYSTEM

Yutaka Yokoyama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Continuation of Ser. No. 266,765, Jun. 28, 1994, abandoned. This application Nov. 26, 1996, Ser. No. 756,712
Claims priority, application Japan, Jun. 28, 1993, 5-156504
Int. Cl.^{6} G06K *9/36*
U.S. Cl. 382—243 **4 Claims**


10
S2
12
18
ARBITRARILY SHAPED IMAGE SEGMENTATION
CONTOUR CODING
MPX
TRANSMISSION PATH OR STORAGE MEDIUM
S1
14
ORTHOGONAL BASIS FUNCTION SET GENERATOR
S3
16
TRANSFORM COEFFICIENT GENERATOR

1. A method of generating a set of orthogonal basis functions in an image processing system, comprising the steps of:

(a) generating a contour signal of an arbitrarily shaped image segment;

(b) receiving said contour signal and determining a set of orthonormal basis functions with respect to a rectangular region of n pixels long by m pixels wide which includes said arbitrarily shaped image segment, at least one of n and m being an integer greater than one;

(c) determining a set of orthogonal basis function candidates using a set of said orthonormal basis functions;

(d) numbering said orthogonal basis function candidates along a zigzag scan so as to obtain a numbered order of pixels within said rectangular region;

(e) extracting a first orthogonal basis function candidate from the set of said orthogonal basis function candidates numbered at step (d) and defining said first orthogonal basis function candidate as a first orthogonal basis function;

(f) extracting a next orthogonal basis function candidate in the numbered order;

(g) determining an orthogonal component with respect to the next orthogonal basis function candidate, the orthogonal component being perpendicular to a hyperplane spanned by the orthogonal basis function;

(h) checking to see if an absolute value of said orthogonal component obtained at step (g) exceeds a threshold;

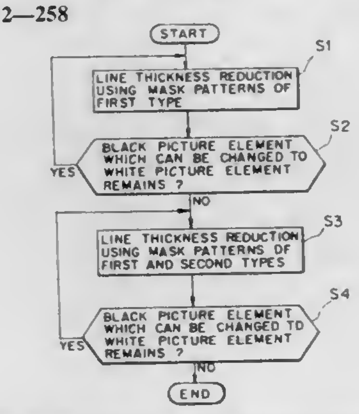
(i) returning to step (f) if said absolute value is equal to or less than said threshold;

(j) selecting said orthogonal component obtained at step (g) as a next orthogonal basis function if said absolute value exceeds said threshold; and

(k) returning to step (f) if the number of the orthogonal basis functions thus far obtained does not reach a number of pixels in said arbitrarily shaped image segment, and terminating generation of additional orthogonal basis functions if the number of orthogonal basis functions thus far obtained reaches the number of pixels.

5,841,910
IMAGE PROCESSING METHOD AND IMAGE PROCESSING SYSTEM

Nobuo Ogawa, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Continuation of Ser. No. 592,445, Jan. 26, 1996, abandoned, which is a continuation of Ser. No. 282,597, Jul. 29, 1994, abandoned. This application Jun. 19, 1997, Ser. No. 879,217
Claims priority, application Japan, Oct. 29, 1993, 5-271655
Int. Cl.^{6} G06K *9/44*
U.S. Cl. 382—258 **10 Claims**


START
S1
LINE THICKNESS REDUCTION USING MASK PATTERNS OF FIRST TYPE
S2
BLACK PICTURE ELEMENT WHICH CAN BE CHANGED TO WHITE PICTURE ELEMENT REMAINS ?
YES
NO
S3
LINE THICKNESS REDUCTION USING MASK PATTERNS OF FIRST AND SECOND TYPES
S4
BLACK PICTURE ELEMENT WHICH CAN BE CHANGED TO WHITE PICTURE ELEMENT REMAINS ?
YES
NO
END

1. An image processing method wherein image data read by image reading means and converted into binary image data of white and black by binary digitization is repetitively processed to change a black picture element of the image data positioned at the center of a mask pattern in the form of a matrix to a white picture element when the image data coincides with the mask pattern, thereby to reduce the line thickness of the image data, comprising the steps of:

repetitively performing first processing to thin a line, using a plurality of mask patterns of a first type each provided for changing a black picture element protruding at a boundary portion of an area of black picture elements of the image data to a white picture element so as not to produce a branch which will make a branch-shaped thin line, the first processing being done by matching the mask patterns of the first type with the image data;

adding a plurality of mask patterns of a second type to the mask patterns of the first type when the image data has no black picture elements which may be changed to a white picture element using the mask patterns of the first type, the mask patterns of the second type being provided for changing a black picture element of the image data at the center of the matrix to a white picture element to thereby remove a boundary portion of the area of black picture elements of the image data and produce branches; and

repetitively performing second processing to thin a line using the mask patterns of the first type and the second type, the second processing being done by matching the mask patterns of the first and second types with the image data.

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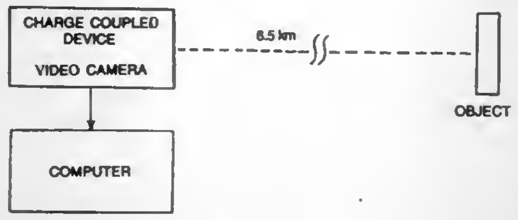
5,841,911
METHOD FOR THE RESTORATION OF IMAGES DISTURBED BY THE ATMOSPHERE

Norman S. Kopeika, Beer-Sheva, and Dan Sadot, Rehovot, both of Israel, assignors to Ben Gurion, University of the Negev, Beer-Sheva, Israel

Filed Jun. 6, 1995, Ser. No. 470,344

Int. Cl.^{6} G06K *9/40*

U.S. Cl. 382—254 **9 Claims**



1. A method for restoring an image distorted by the atmosphere comprising the steps of:

imaging a distant object with means to convert electromagnetic radiation to electrical signals of the image g.

calculating the Fourier Transform G(u,v) of the image g where u and v are the spatial frequency coordinates;

determining the atmospheric Modulation Transfer Function (MTF) H(u,v);

calculating an Average Squared Atmospheric Function $E\{H^2(u,v)\}$ according to:

$$E\{H'^2(u,v)\}\propto H^2(u,v)\iint H^2(u',v')H(u'+u,v'+v)H(u'-u,v'-v)du'dv'$$

where E denotes the statistical expected value function;

calculating a turbulence term S_{n1n1} by the formula

$$S_{n1n1}=E\{H'^2\}-H^2; \text{ and}$$

applying a restoration filter to the transformed image G wherein said filter is calculated by

$$F(u,v)=\frac{G(u,v)}{H(u,v)}\cdot\frac{|H(u,v)^2|}{|H(u,v)^2|+[S_{n1n1}+S_{n2n2}(u,v)/S_{ff}(u,v)]};$$

where S_{n2n2} is the power spectral density of the additive noise of the imaging device, S_{ff} is the power spectral density of the image and $\hat{F}$ is the Fourier Transform of the restored image, and

restoring the image transformed.

5,841,912
OPTICAL SWITCHING DEVICE

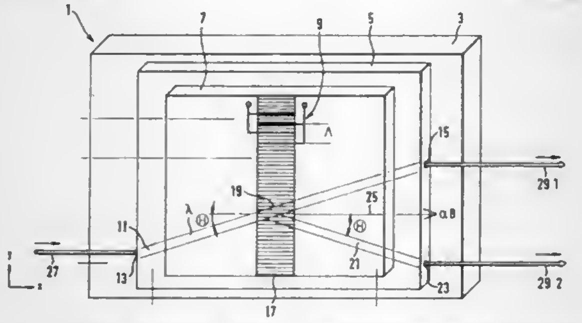
Roland Mueller-Fiedler; Gottfried Flik, both of Leonberg, and Hagen Schmidt, Leipzig, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 24, 1997, Ser. No. 804,940

Claims priority, application Germany, Apr. 27, 1996, 196 16 934.8

Int. Cl.^{6} G02F *1/335*

U.S. Cl. 385—7 **14 Claims**



1. An optical switching device comprising an optical layer (**5**) provided with at least one optical waveguide (**11**) having an entrance (**13**) and an outlet (**15**) and at least one other optical waveguide (**21**) provided in the optical layer (**5**) with another outlet (**23**); a piezoelectric layer (**7**) arranged on the optical layer (**5**); electrodes (**9**) for producing an acoustic wave provided on the piezoelectric layer (**7**); and means for performing a Bragg light deflection with optical frequency shift by one of activating and deactivating said electrodes to optically couple the entrance (**13**) of the at least one optical waveguide (**11**) with one of said outlet (**15**) of the at least one optical waveguide (**11**) and said another outlet (**23**) of the at least one other optical waveguide (**21**).

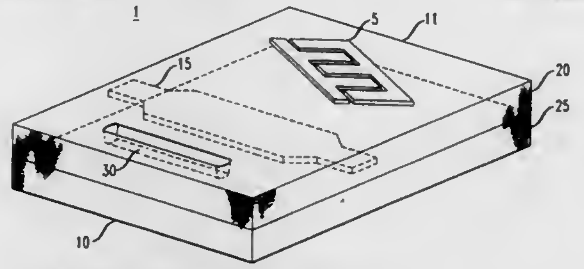
5,841,913
ACOUSTO-OPTIC PLANAR WAVEGUIDE MODULATORS

Dietrich Marcuse, Lincroft, and Herman Melvin Presby, Highland Park, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed May 21, 1997, Ser. No. 861,287

Int. Cl.^{6} G02B *6/10*

U.S. Cl. 385—7 **39 Claims**



1. An acousto-optic modulator comprising:

a planar waveguide structure formed within silica glass, said waveguide structure having an input section connected to a multimode waveguide section connected to an output section, said input and output sections being single mode sections capable of propagating an optical signal in a first transmission mode, said multimode section capable of propagating an optical signal in said first transmission mode as well as a second transmission mode; and

a controllable surface acoustic wave (SAW) source positioned relative to said waveguide structure to selectively direct a surface acoustic wave at a particular phase matching angle relative to said multimode section for coupling signal power between said first and second transmission modes for an optical signal propagating from said input section through said multimode section, wherein said coupling causes an attenuation of said optical signal propagating into said output section in said first transmission mode.

5,841,914
MOLECULAR DETECTION APPARATUS AND METHOD USING OPTICAL WAVEGUIDE DETECTION

Chan-Long Shieh, Paradise Valley, Ariz.; Donald E. Ackley, Lambertville, N.J.; George N. Maracas, Phoenix, and Thomas B. Harvey, III, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 634,103, Apr. 17, 1996, Pat. No. 5,671,303. This application May 22, 1997, Ser. No. 861,927

Int. Cl.^{6} G02B *6/00;* **G01N** *21/41*

U.S. Cl. 385—12 **10 Claims**

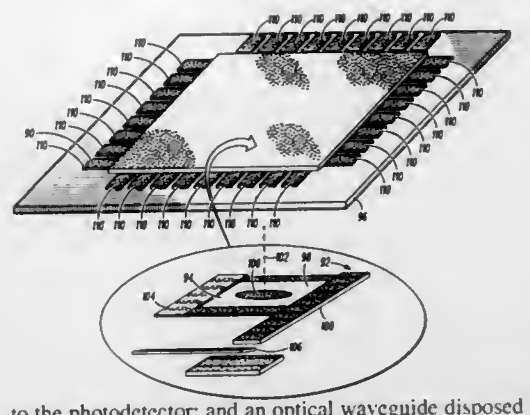
1. A molecular detection apparatus comprising:

a substrate;

a first layer disposed on the substrate;

a photodetector disposed on the first layer, the photodetector electrically coupled to the first layer; a second layer disposed on the photodetector, the second layer electronically coupled

to the photodetector; and an optical waveguide disposed adjacent the photodetector on the substrate, the optical waveguide having a surface defining a detection site.



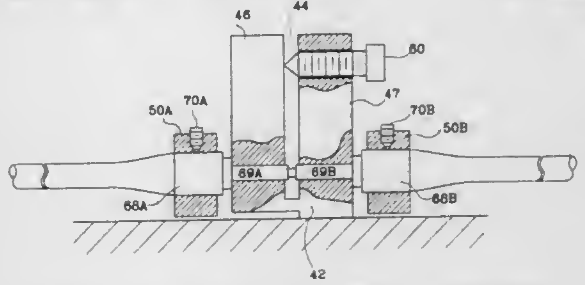
5,841,915
APPARATUS FOR DETERMINING THE EFFECT OF MODAL NOISE ON A COMMUNICATION SYSTEM BY AFFECTING AN OPTICAL FIBER DISCONTINUITY

Simon M. Rabinovich, Plano, and David F. Smith, Dallas, both of Tex., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 4, 1996, Ser. No. 743,369

Int. Cl.^{6} G02B *6/00*

U.S. Cl. 385—13 **20 Claims**



1. Apparatus for determining the effect of modal noise on a communication system, comprising:

a source of an optical signal;

an optical signal receiver;

a preselected length of optical fiber connected in signal communicating association between said source and said receiver, said optical fiber having a discontinuity along its length defined by first and second disconnected termini of said optical fiber;

means for causing a preselected change in the physical relationship of said first and second termini of said optical fiber while said optical signal is being transmitted from said source to said receiver; and

means for determining the effect of said preselected change in the physical condition of said optical fiber on said optical signal as said optical signal is transmitted through said optical fiber between said source and said receiver.

5,841,916
FRUSTRATED TOTAL INTERNAL REFLECTION DEVICE

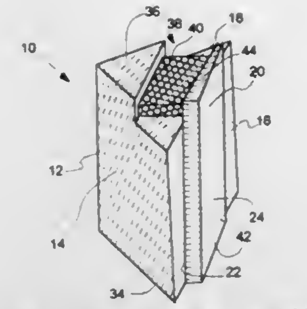
Richard H. Laughlin, Richardson, Tex., assignor to Optical Switch Corporation, Richardson, Tex.

Continuation of Ser. No. 709,090, Sep. 6, 1996, abandoned, which is a continuation-in-part of Ser. No. 480,144, Jun. 7, 1995, Pat. No. 5,555,327. This application Nov. 17, 1997, Ser. No. 971,944

Int. Cl.^{6} G02B *5/12*

U.S. Cl. 385—16 **30 Claims**

1. A device for processing an optical signal, comprising:



a refractor having a reflecting surface operable to reflect the optical signal by total internal reflection;

an actuator having one end coupled to the refractor and an opposing end; and

a switchplate coupled to the opposing end of the actuator, the switchplate having a first position spaced apart from the refractor and a second position in proximal contact with the refractor to frustrate the total internal reflection of the optical signal;

wherein the actuator is operable to apply peel forces to the switchplate to move the switchplate from the second position to the first position.

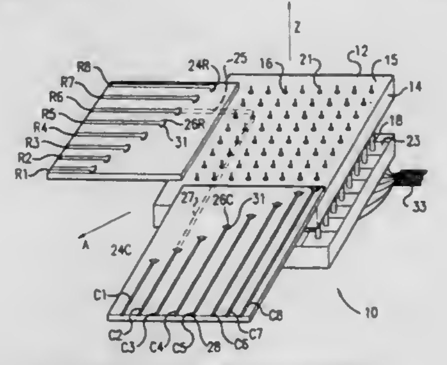
5,841,917
OPTICAL CROSS-CONNECT SWITCH USING A PIN GRID ACTUATOR

Roger Lee Jungerman, Petaluma, and David M. Braun, Santa Rosa, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 31, 1997, Ser. No. 792,593

Int. Cl.^{6} G02B *6/26*

U.S. Cl. 385—17 **15 Claims**



1. An optical cross-connect switch, comprising:

a pin grid actuator, including,

a housing having a planar top surface and an array of holes through the housing orthogonal to the planar top surface,

an array of pins, each pin penetrating one of the holes and having a first end proximate to the planar top surface and a second end distal to the planar top surface,

an array of actuators, each actuator coupled to a corresponding pin at the second end and each actuator having a control line and linearly moving the corresponding pin in a direction perpendicular to the planar top surface to one of a retracted position and an extended position, according to a signal applied to the control line;

a plurality of input fibers, each input fiber having an input lens at its end and providing an incident optical beam propagating parallel to the planar top surface;

an array of optical elements, each optical element attached to the first end of each of the pins, forming a redirected optical beam from the incident optical beam when the pin is in the extended position and the optical element intercepts the incident optical beam;

a plurality of output fibers, each output fiber having an output lens at its end and receiving the redirected beams; and

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at least one substrate attached to the planar top surface, securing the positions of the input fibers and output fibers.

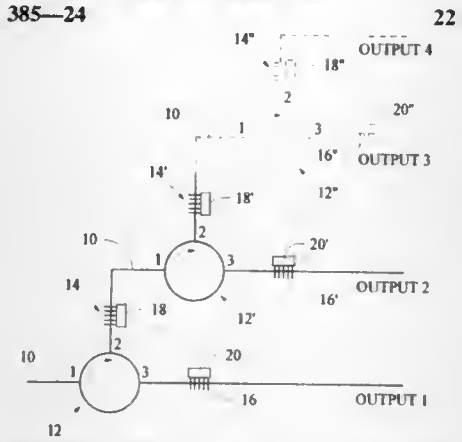
5,841,918
WAVELENGTH AND BANDWIDTH TUNABLE OPTICAL SYSTEM

Jinghui Li, Ontario, Canada, assignor to JDS Fitel Inc., Ontario, Canada

Filed Aug. 26, 1996, Ser. No. 703,034

Int. Cl.^{6} G02B *6/28*

U.S. Cl. 385—24 **22 Claims**



19. A tunable optical filter device for modifying an optical signal comprising:

an optical circulator having an input port for receiving an optical signal, a plurality N of second ports and an output port;

a first optical filter having a reflection spectrum and coupled to a first of said second ports, for producing a reflected band from said optical signal within said reflection spectrum;

a plurality N-1 of consecutive optical filters coupled to said respective second ports of said optical circulator, said consecutive optical filters each having a reflection spectrum, for producing a reflected band within said reflection spectrum, from a reflected band received from a preceding optical filter; and

tuning means for tuning at least one of said first optical filter and said consecutive optical filter such as to cause said reflection spectrum of said first filter to partly overlap in a predetermined manner the bandwidth of said optical signal and to cause said reflection spectra of said consecutive optical filters to overlap in a predetermined manner.

5,841,919
OPTICAL WAVELENGTH MULTIPLEXER/ DEMULTIPLEXER

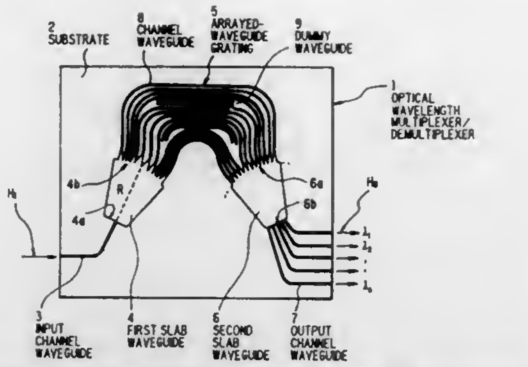
Kenji Akiba, and Morihiko Ikegaya, both of Ibaraki, Japan, assignors to Hitachi Cable, Ltd., Tokyo, Japan

Filed Feb. 28, 1997, Ser. No. 808,748

Claims priority, application Japan, Aug. 2, 1996, 8-204948

Int. Cl.^{6} G02B *6/26*

U.S. Cl. 385—37 **9 Claims**


2 SUBSTRATE
8 CHANNEL WAVEGUIDE
5 ARRAYED-WAVEGUIDE GRATING
9 DUMMY WAVEGUIDE
1 OPTICAL WAVELENGTH MULTIPLEXER/ DEMULTIPLEXER
4b
R
4a
6a
6b
3 INPUT CHANNEL WAVEGUIDE
4 FIRST SLAB WAVEGUIDE
6 SECOND SLAB WAVEGUIDE
7 OUTPUT CHANNEL WAVEGUIDE

1. An optical wavelength multiplexer/demultiplexer incorporated in a substrate, comprising:

at least one input channel waveguide for receiving a wavelength division multiplexed signal;

a first slab waveguide having an input boundary and a fan-shaped output boundary, said input channel waveguide being connected to said input boundary of said first slab waveguide;

an arrayed-waveguide grating comprising N channel waveguides which provides a predetermined waveguide length difference from each other, an input end of said arrayed-waveguide grating being connected to said fan-shaped output boundary;

a second slab waveguide having a fan-shaped input boundary and an output boundary, an output end of said arrayed-waveguide grating being connected to said fan-shaped input boundary of said second slab waveguide; and

a plurality of output channel waveguides connected to said output boundary of said second slab waveguide for each receiving an demultiplexed optical signal having a desired wavelength;

wherein input ends of said N channel waveguides of said arrayed-waveguide grating are arranged along said fan-shaped output boundary of said first slab waveguide such that an angle 0 between the central axis of "i"th (i=1, 2, . . . N) channel waveguide and the symmetric axis of said fan-shaped output boundary of said first slab waveguide satisfies the equations in that;

$$\int_{\theta_i-\Delta\theta/2}^{\theta_i+\Delta 0/2} Eg(\theta)d\theta=A\times E(i),$$

$$\theta_i-\Delta\theta/2=\theta_{i-1}+\Delta\theta_{i-1}/2$$

where Eg(θ) is an electric field distribution at the fan-shaped output boundary of said first slab waveguide, E(i) is a desired electric field amplitude to be coupled to said "i"th channel waveguide, $\Delta\theta_i$ is an angle made by the central axis perpendicular to a gap on the right side of said "i"th channel waveguide and that on the left side thereof, and A is a constant.

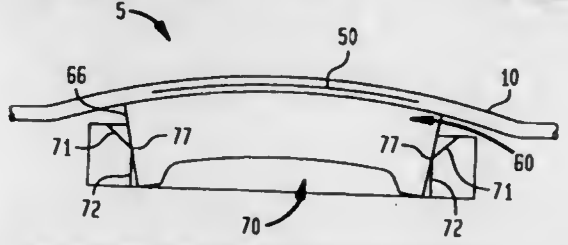
5,841,920
FIBER GRATING PACKAGE

Paul Joseph Lemaire, Morris, and George John Shevchuk, Middlesex, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Mar. 18, 1997, Ser. No. 819,824

Int. Cl.^{6} G02B *6/34*

U.S. Cl. 385—37 **24 Claims**



1. A temperature compensating optical waveguide device, comprising:

an optical fiber for passage of light therethrough and including a grating located and configured for reflecting light passing through the fiber within a range about a central wavelength that varies with changes in temperature of the device and with changes in an axial strain applied to the fiber at the grating;

a compensating member having a first portion affixed to said fiber proximate said grating and a second portion spaced from said first portion, said compensating member being formed of a material having a first temperature expansion coefficient; and

a tension adjusting member formed of a material having a second temperature expansion coefficient greater than said first temperature expansion coefficient and connected to said compensating member so that a decrease in temperature of said device causes a differential contraction of said tension adjusting member relative to said compensating member by which the tension adjusting member applies to said compensating member second portion a force that imparts a curvature to said first portion and an axial strain to the affixed fiber at said grating to vary the central wavelength of reflected light passing through the fiber and thereby compensate for central wavelength variations introduced by the decrease in temperature.

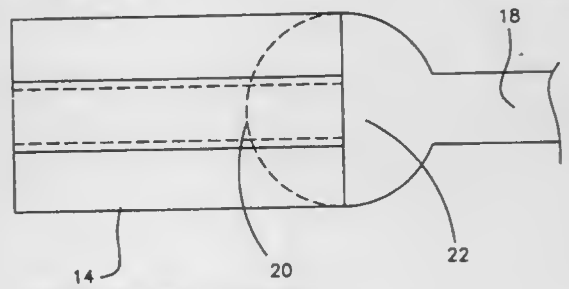
5,841,921
OPTICAL COUPLING DEVICE

Troy B. Wallace, P.O. Box 438, Georgetown, Me. 04548

Filed Jan. 31, 1997, Ser. No. 792,663

Int. Cl.^{6} G02B *6/26;* F21V *7/04*

U.S. Cl. 385—46 **10 Claims**



1. An optical coupler, comprising:

a first optical fiber having a first end, said first end being convex; and

an array of optical fibers, each of said optical fibers having a diameter, said array having an end portion wherein said optical fibers are in essentially a parallel relationship to one another, said end portion being adapted to receive said convex end of said first optical fiber whereby radiant energy from said first optical fiber is transferred uniformly to each of said optical fibers of said array.

5,841,922
OPTICAL FIBER TERMINAL WITH OPTICAL ISOLATOR AND SEMICONDUCTOR LASER MODULE USING THE SAME

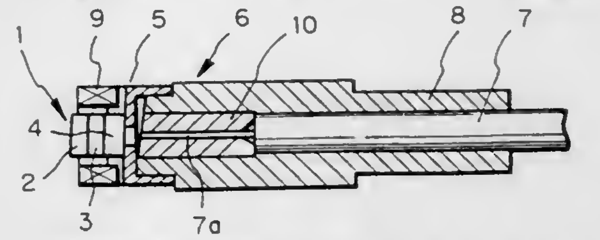
Shinji Iwatsuka; Makoto Sekijima, and Kenjiro Hata, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Jun. 3, 1997, Ser. No. 868,205

Claims priority, application Japan, May 6, 1996, 8-143001

Int. Cl.^{6} G02B *6/36*

U.S. Cl. 385—76 **4 Claims**



1. An optical fiber terminal provided with an optical isolator, which comprises:

an optical fiber retained in a ferrule;

an optical isolator element including at least one optical polarizer and at least one Faraday rotator;

a permanent magnet for applying a magnetic field to said Faraday rotator;

an attaching member for fixedly supporting said optical isolator element and the permanent magnet, said attaching member being fixed to said ferrule for integrally uniting said optical isolator, said permanent magnet and said ferrule together;

an air layer between an end of said optical fiber and said optical isolator element;

a first outer periphery of said ferrule having a maximum diameter of said optical fiber terminal;

a second outer periphery of said ferrule on the side of the optical isolator element having a diameter smaller than said maximum diameter; and

the outer periphery of said permanent magnet being exposed to the air.

5,841,923
LIGHT-EMITTING MODULE

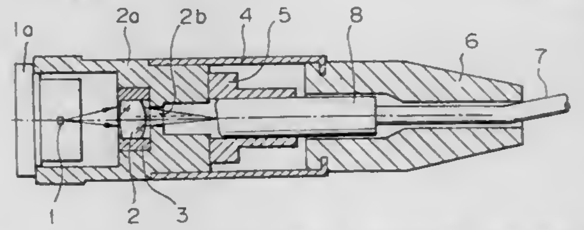
Shouichi Kyoya, Miyagi-ken, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Jan. 31, 1997, Ser. No. 791,969

Claims priority, application Japan, Feb. 5, 1996, 8-019136

Int. Cl.^{6} G02B *6/255*

U.S. Cl. 385—93 **7 Claims**



1. A light-emitting module in which a laser diode, a lens, and an optical fiber having an end face cut at an angle are co-axially disposed,

said lens having an aperture eccentrically disposed opposite to the vertical direction with respect to an end face of said optical fiber so that light refracted by an end face of the core of said optical fiber travels in the axial direction.

5,841,924
OPTICAL APPARATUS HAVING A FERRULE HOLDER, A LENS HOLDER AND AN OPTICAL SEMICONDUCTOR DEVICE PACKAGE HOLDER

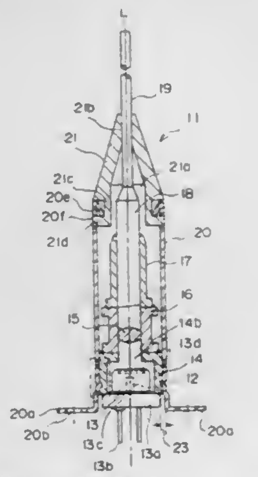
Hiroshi Mugiya, and Kouichi Iwaida, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 21, 1997, Ser. No. 845,152

Claims priority, application Japan, Nov. 11, 1996, 8-298987

Int. Cl.^{6} G02B *6/00;6/36*

U.S. Cl. 385—93 **11 Claims**



1. An optical apparatus, comprising:

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a ferrule holder in which a ferrule connected with an end of an optical fiber cable is held;

a lens holder in which a lens is held, the lens holder being fixed to the ferrule holder;

a package holder in which an optical semiconductor device package having an optical semiconductor device is held, the package holder being fixed to the lens holder

a protecting tube which is formed by rolling up a metal plate to have a joint line extending in a height direction and is arranged around the ferrule holder, the lens holder and the package holder;

a flange which is formed by bending a flange portion projected from the metal plate toward an outer direction of the protecting tube;

a hole arranged in the flange; and

a cap made of rubber or resin for covering one end of the protecting tube, the optical fiber cable passing through a cable inserting hole of the cap.

5,841,925

Patent Not Issued For This Number

5,841,926
OPTICAL FIBERS FOR OPTICAL ATTENUATION

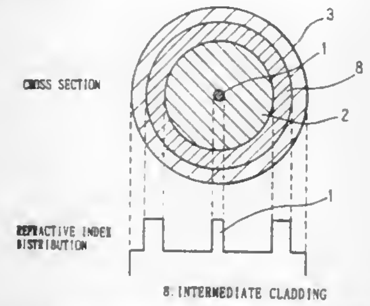
Yoshiaki Takeuchi; Ryo Nagase; Seiko Mitachi, all of Mito; Yuichi Morishita, Yokohama; Akira Kumagai; Yumi Ariga, both of Kanagawa; Kenichi Muta, Kawasaki; Kazunari Sugi, Kanagawa, and Masashi Saijo, Saitama, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, and Showa Electric Wire & Cable Co., Ltd., both of Japan

Filed Dec. 27, 1996, Ser. No. 777,205

Claims priority, application Japan, Jan. 4, 1996, 8-000004; May 22, 1996, 8-126633

Int. Cl.^{6} G02B *6/02*

U.S. Cl. 385—123 **26 Claims**



14. An optical attenuator for attenuation of intensity of optical signals, said optical attenuator including an optical fiber attenuator comprising:

a core having a first refractive index;

a cladding including:

a first cladding portion adjacent to and surrounding said core and having a second refractive index lower than said first refractive index; and

a second cladding portion surrounding said first cladding portion;

at least a first attenuation dopant for significantly attenuating the intensity of optical signals, said first attenuating dopant being incorporated into at least one of said core and said first cladding portion; and

at least a second attenuation dopant, for significantly attenuating the intensity of optical signals, incorporated into said second cladding portion.

5,841,927
OPTICAL WAVEGUIDE DEVICE AND OPTICAL WAVEGUIDE APPARATUS

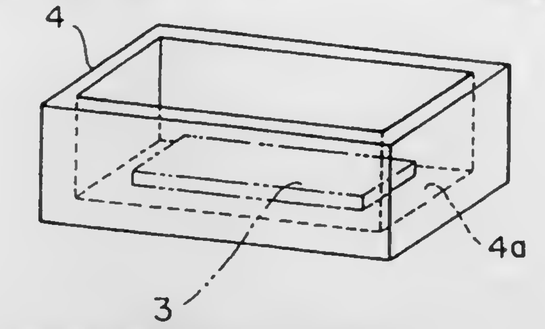
Junko Watanabe; Hironao Hakogi; Akiko Tanno, all of Kawasaki; Toshihiro Otani, and Shinya Sawae, both of Sapporo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 16, 1994, Ser. No. 306,892

Claims priority, application Japan, Sep. 20, 1993, 5-233063

Int. Cl.^{6} G02B *6/10*

U.S. Cl. 385—129 **16 Claims**



1. An optical waveguide device comprising:

an optical waveguide element produced by forming an optical waveguide on the surface of a dielectric crystal substrate; and

an element housing having said optical waveguide element fixed to an inner wall thereof with the entire rear surface of said optical waveguide element uniformly attached to the inner wall with an adhesive, wherein

said element housing includes a wall having a thickness which has a resonant frequency different from a resonant frequency of said optical waveguide element.

5,841,928
PLANAR WAVEGUIDES MADE BY USE OF PHOTOSENSITIVE CHANGES TO THE REFRACTIVE INDEX OF A DEPOSITED LAYER

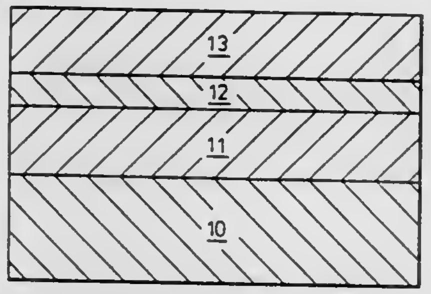
Graeme Douglas Maxwell, and Benjamin James Ainslie, both of Ipswich, United Kingdom, assignors to British Telecommunications public limited company, London, England

Filed Mar. 7, 1997, Ser. No. 809,045

Claims priority, application European Pat. Off., Sep. 23, 1994, 94306987

Int. Cl.^{6} G02B *6/10*

U.S. Cl. 385—129 **19 Claims**



1. A planar wave guide which comprises:

first and second confining layers and a center layer located between and in contact with each of said first and second confining layers,

wherein a portion of said center layer comprises both path regions and confining regions,

said portion being formed of a host glass composition with a first additive to increase the refractive index thereof and a second additive to decrease the refractive index thereof,

the ratio of said first and second additives being such as to provide a refractive index equal to that of the first and second confining layers,

wherein one of the additives is adapted to increase the photosensitivity of the host glass and the refractive index variation associated with the path region is substantially independent of the chemical composition of the glass.

5,841,929
LIGHT WAVELENGTH FILTERING CIRCUIT AND MANUFACTURING METHOD THEREOF

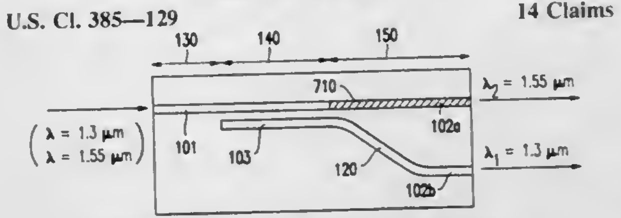
Keiro Komatsu; Masako Hayashi; Kiichi Hamamoto; Tatsuya Sasaki, and Takeshi Takeuchi, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Dec. 26, 1996, Ser. No. 780,189

Claims priority, application Japan, Dec. 26, 1995, 7-339154

Int. Cl.^{6} G02B *6/26*

U.S. Cl. 385—129 **14 Claims**



1. A light wavelength filtering circuit, comprising:

an input light waveguide to which a wavelength-multiplexed light signal is incident;

a light wavelength discriminating element, connected to the input light waveguide, for separating said wavelength-multiplexed light signal for wavelengths present therein, to form wavelength light signals; and

a plurality of output light waveguides, connected to the light wavelength discriminating element, for spatially separating each of the wavelength light signals separated by the light wavelength discriminating element,

wherein an output light waveguide of said output light waveguides for outputting a first wavelength signal light comprises a linear light waveguide and an output waveguide for outputting a second wavelength signal light comprises a curved light waveguide,

said first wavelength light signal having a wavelength greater than that of said second wavelength light signal,

said curved light waveguide having a radius of curvature for causing a radiation loss of said first wavelength light signal and for substantially preventing radiation loss of said second wavelength light signal.

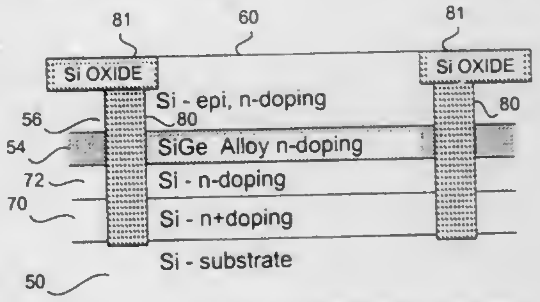
5,841,930
SEMICONDUCTOR OPTICAL WAVEGUIDE

Stephen J. Kovacic, Kanata, and Jugnu J. Ojha, Oakville, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Division of Ser. No. 609,930, Feb. 29, 1996, Pat. No. 5,682,455. This application Jul. 24, 1997, Ser. No. 899,884

Int. Cl.^{6} G02B *6/10*

U.S. Cl. 385—131 **29 Claims**



1. A semiconductor optical channel waveguide comprising:

a silicon substrate;

a bottom cladding layer made of silicon formed on the silicon substrate;

a top cladding layer made of silicon;

a core formed between the bottom cladding layer and the top cladding layer and comprising at least one layer of a silicon semiconductor alloy, the core having a predetermined increase in the index of refraction relative to the top and bottom cladding layers; and

first and second spaced trench regions extending through at least a portion of the top cladding layer and filled with a material, the material having an index of refraction less than that of the cladding in the case the trenches do not penetrate the core, the material having an index of refraction less than that of the core in the case the trenches do penetrate the core, thereby defining lateral boundaries of a channel in the core.

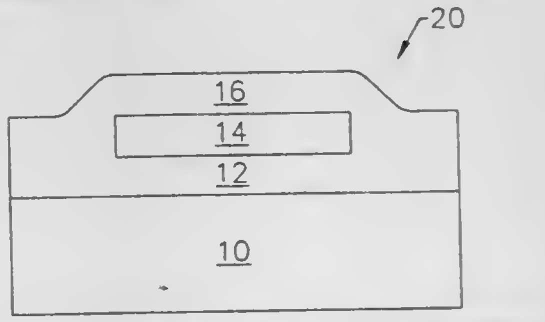
5,841,931
METHODS OF FORMING POLYCRYSTALLINE SEMICONDUCTOR WAVEGUIDES FOR OPTOELECTRONIC INTEGRATED CIRCUITS, AND DEVICES FORMED THEREBY

James S. Foresi, Brighton; Anu M. Agarwal, Weston, both of Mass.; Marcie R. Black, Austin, Tex.; Debra M. Koker, Vancouver, Wash., and Lionel C. Kimerling, Concord, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Nov. 26, 1996, Ser. No. 756,812

Int. Cl.^{6} G02B *6/10*

U.S. Cl. 385—131 **26 Claims**



1. A method of forming a semiconductor waveguide, comprising the steps of:

forming a first cladding layer on a face of a substrate;

forming a polycrystalline semiconductor layer on the first cladding layer;

polishing the polycrystalline semiconductor layer at a face thereof extending opposite the first cladding layer;

forming a second cladding layer on the polished face of the polycrystalline semiconductor layer; and

coupling a source of optical energy to an interior of the polycrystalline semiconductor layer to propagate a signal having a first wavelength therein.

5,841,932
OPTICAL FIBER COIL AND METHOD OF WINDING

Jerry L. Page, Alto; David R. Bina, Comstock Park, and Douglas Milliman, Hastings, all of Mich., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 21, 1996, Ser. No. 668,485

Int. Cl.^{6} G02B *6/02*

U.S. Cl. 385—134 **64 Claims**

1. A substantially symmetrically wound coil of optical fiber comprising:

a plurality of turns of a first segment of optical fiber wound in a clockwise direction and a plurality of turns of a second segment of optical fiber wound in the counterclockwise direction;

the turns of the first segment and of the second segment together forming a plurality of layers of turns of optical fiber; and

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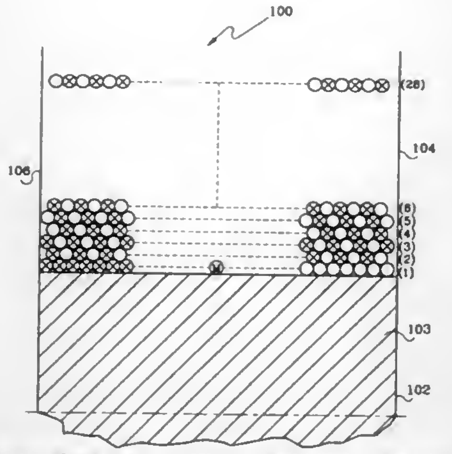


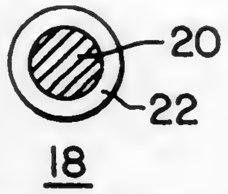
at least one of the layers comprising alternate, adjacent turns of the first and second segments of optical fiber.

5,841,933
OPTICAL WAVEGUIDE FIBER CONTAINING TITANIA AND GERMANIA

Christine L. Hoaglin, 4748 Clawson Dr., Campbell, N.Y. 14821, and Carlton M. Truesdale, R.D.#1 River Rd., Corning, N.Y. 14830

Filed Jun. 4, 1997, Ser. No. 869,272
Int. Cl.⁶ G02B *6/00*

U.S. Cl. 385—142 **14 Claims**



1. An optical waveguide fiber comprising:
a core glass region having a core refractive index profile and a maximum refractive index n_o; and,
a clad glass layer, having a minimum refractive index n_c, surrounding said core glass region, wherein $n_o>n_c$;
said core glass consisting essentially of TiO_2, Geo_2, and SiO_2, wherein the weight percent of TiO_2 is at most 7% and the weight percent ratio of TiO_2 to GeO_2 is less than 1.

5,841,934
METHOD FOR NOISE SUPPRESSION AND NOISE-SUPPRESSION CIRCUIT FOR VIDEO RECORDERS

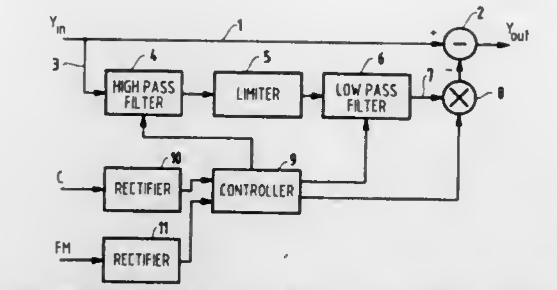
Ingo Chmielewski; Detlef Räth, and Hans-Peter Arnold, all of Peine, Germany, assignors to Matsushita Electric Industrial Company, Osaka-fu, Japan

PCT No. PCT/DE94/01456, § 371 Date Mar. 8, 1996, § 102(e) Date Mar. 8, 1996, PCT Pub. No. WO95/16326, PCT Pub. Date Jun. 15, 1995

PCT Filed Dec. 7, 1994, Ser. No. 500,946
Claims priority, application Germany, Dec. 7, 1993, 43 41 623.3
Int. Cl.⁶ H04N *9/88;9/79*

U.S. Cl. 386—2 **15 Claims**

1. A method for suppressing noise in recorded luminance signals to be reproduced from a recording medium, comprising the steps of:
generating a chroma signal from a recording medium;
detecting a level of the chroma signal;
tapping an FM signal from the recording medium;
detecting a level of the tapped signal;
generating a subtraction signal by passband filtering and limiting of a passband range of a luminance signal;



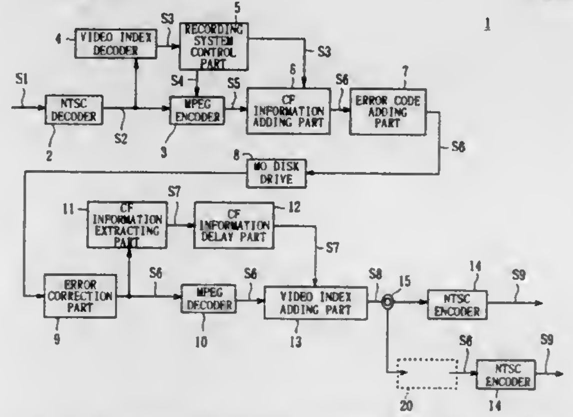
subtracting the subtraction signal from the luminance signal,
wherein the level of the subtraction signal following the limiting is varied based on the level of the corresponding chroma signal and the FM signal tapped off the recording medium,
wherein the step of generating a subtraction signal varies the passband frequency range based on at least one of the detected level of the chroma signal and the detected level of the FM signal.

5,841,935
CODING METHOD AND RECORDING AND REPRODUCING APPARATUS

Toshiya Asai, and Takato Narita, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 16, 1996, Ser. No. 720,971
Claims priority, application Japan, Oct. 20, 1995, 7-297493
Int. Cl.⁶ H04N *5/92;5/76*

U.S. Cl. 386—33 **9 Claims**



1. A recording and reproducing apparatus for compressing and coding an input video signal to record on a predetermined recording medium, and for reproducing said compressed and coded video signal from said recording medium to decode it, comprising:
extracting means for extracting color frame information from video frames of said input video signal and the compressed video signal outputted from said recording medium;
control means for storing correspondence information which shows the correspondence relation between compression information, which is needed when said video signal is compressed and coded, and said color frame information, to control the coding of the video image based on the correspondence information according to said compression information which is corresponding to said extracted color frame information; and
adding means for adding the color frame information extracted by said extracting means to the compressed and coded video signal and the decoded video signal.

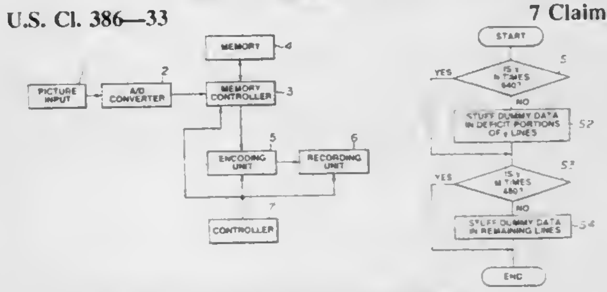
5,841,936
PICTURE DATA RECORDING/REPRODUCING APPARATUS FOR PROVIDING DIVISIONAL PICTURE MANAGEMENT WITHOUT BOUNDARY DISTORTION

Toshiharu Kobayashi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP95/02032, § 371 Date Sep. 18, 1996, § 102(e) Date Sep. 18, 1996, PCT Pub. No. WO96/11546, PCT Pub. Date Apr. 18, 1996

PCT Filed Oct. 4, 1995, Ser. No. 648,012
Claims priority, application Japan, Oct. 7, 1994, 6-243841
Int. Cl.⁶ H04N *5/76;5/92*

U.S. Cl. 386—33 **7 Claims**



1. A picture data recording device comprising:
a picture data recording medium for storing one-picture input picture data;
encoding means for dividing picture data into blocks to form resulting blocks and encoding the resulting blocks to form encoded picture data;
division means for dividing the one-picture input picture data stored in said picture data storage means into a plurality of partial picture regions forming partial picture region based picture data each sized to be an integer number times a minimum sized block unit of a plurality of minimum sized block units in said encoding means, further dividing said partial picture region based picture data into said plurality of minimum sized block units forming a plurality of resulting minimum sized blocks and supplying the plurality of resulting minimum sized blocks to said encoding unit;
recording means for recording said encoded picture data encoded by said encoding means on said recording medium on a basis of said plurality of partial picture regions; and
control means for controlling the operation of said encoding means, said division means, and said recording means,
whereby said division means operates so that when a size of a picture is indivisible by a size of one of said plurality of partial picture regions dummy pixels are used to change a shape of the picture to a picture shape divisible by one of said plurality of partial picture regions, said one-picture input picture data stored in said picture data storage means are divided into said plurality of partial picture regions each sized to be an integer number times a minimum size block in said encoding means, and whereby one of said plurality of partial picture regions based picture data is divided into minimum size block units and supplied to said encoding means.

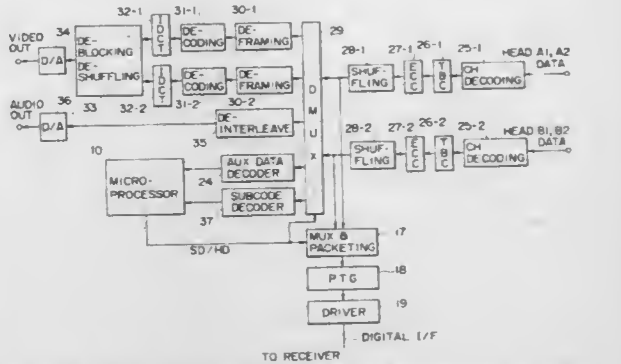
5,841,937
APPARATUS AND METHODS FOR TRANSMITTING COMPRESSED DIGITAL DATA FROM RECORDING OR REPRODUCING APPARATUS

Hisato Shima, Chiba, and Hiroyuki Ishimaru, Saitama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 14, 1995, Ser. No. 388,492
Claims priority, application Japan, Feb. 15, 1994, 6-040449
Int. Cl.⁶ H04N *5/762;5/775;9/79;5/91*

U.S. Cl. 386—40 **12 Claims**

1. An apparatus for reproducing digital image data, comprising:
means for simultaneously reproducing a first portion of the digital image data in a first track of a recording medium and a second portion of the digital image data in a second track of the recording medium, the first and second tracks each storing a predetermined amount of data therein;



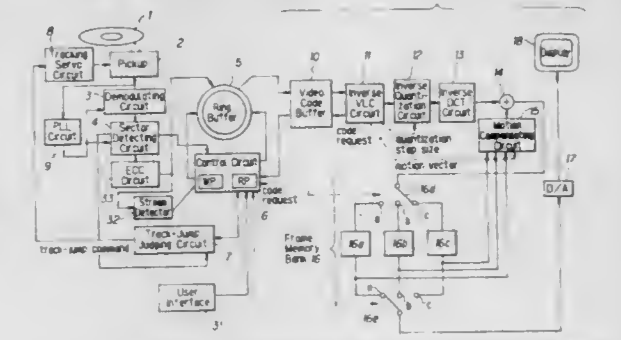
shuffling means for shuffling the first and second portions of the digital image data;
digital interface means receiving the shuffled first and second portions of the image data for forming therefrom first output image data and for providing the same to a transmission line for supply to a recording and/or reproducing apparatus, said, digital interface means including multiplexing means for multiplexing the shuffled first and second portions of the image data on a time-divisional basis in block data units to produce said first output image data, each of the block data units including an amount of data which is less than the predetermined amount of data stored in either of the first and second tracks;
deshuffling means for deshuffling the shuffled first and second portions of the image data so as to produce second output image data; and
an output terminal for outputting the second output image data.

5,841,938
DATA REPRODUCING METHOD AND DATA REPRODUCING APPARATUS

Hajime Nitta, Kanagawa, and Kiyoshi Ota, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 29, 1995, Ser. No. 520,838
Claims priority, application Japan, Sep. 5, 1994, 6-234525
Int. Cl.⁶ H04N *5/91;5/917*

U.S. Cl. 386—68 **22 Claims**



1. A data decoding method for decoding encoded video frames reproduced from a disk during a special mode, each video frame being selectively encoded as an intra- or inter-encoded frame, wherein said encoded video frames are reproduced from said disk in a sequence for decoding inter-encoded frames and stored in a buffer in said sequence in a normal mode, comprising the steps of:
storing attributes of each encoded video frame stored in said buffer during said normal mode, said attributes including whether said frame is an intra- or inter-encoded frame and a position in said buffer for each encoded video frame;
reading in a special sequence said encoded video frames from said buffer during said special mode;
determining from said attributes whether a respective encoded video frame read in said special mode is intra- or inter-encoded;
selectively reading in said special mode, according to the position in said buffer indicated by said attributes, only those

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frames of said encoded video frames from said buffer which are required for decoding said respective encoded video frame; and

decoding for display in said special mode said respective encoded video frame using said encoded video frames selectively read from said buffer.

5,841,939
PICTURE REPRODUCTION APPARATUS AND PICTURE DECODING APPARATUS

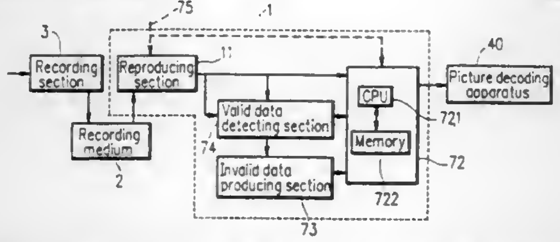
Toshiya Takahashi, Takatsuki, and Tatsushi Bannai, Sakai, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 254,037, Jun. 3, 1994, Pat. No. 5,649,047. This application Feb. 27, 1997, Ser. No. 807,640

Claims priority, application Japan, Jun. 3, 1993, 5-133132; Dec. 13, 1993, 5-342391

Int. Cl.⁶ H04N *5/783;5/92*

U.S. Cl. 386—68 **12 Claims**


3
75
1
11
40
Recording section
Reproducing section
Picture decoding apparatus
CPU
721
Valid data detecting section
Recording medium
74
Memory
72
2
Invalid data producing section
722
73

1. A picture reproduction apparatus for reproducing compressed image data from a recording medium, and for outputting the image data reproduced from the recording medium into a picture decoding apparatus, in accordance with either one of a normal playback mode or a slow playback mode, the picture reproduction apparatus comprising:

reproducing means for reproducing the compressed image data from the recording medium, and for outputting the reproduced image data including valid image data and invalid image data;

valid image data detecting means for detecting the valid image data from the reproduced image data capable of being recovered of the image data or invalid image data having no relationship with the image data, and for generating a valid data detection signal identifying the valid image data;

invalid data producing means for producing invalid data; and

trick-play control means for, in the normal playback mode, outputting the image data obtained from the reproducing means, and for, in the slow playback mode and when the valid data detection signal is input from the valid data detecting means, dividing the valid image data into variable-length encoded unit data, the unit being the minimum unit capable of being variable-length encoded, so as to alternately output the variable-length encoded unit data of one unit or more and the invalid data.

5,841,940
SINGLE DECK DUAL TAPE PATH VCR SYSTEM

Curtis D. Haines, 5643 Timber Rail, San Antonio, Tex. 78250

Continuation of Ser. No. 162,500, Dec. 3, 1993, Pat. No. 5,479,302. This application Dec. 22, 1995, Ser. No. 577,833

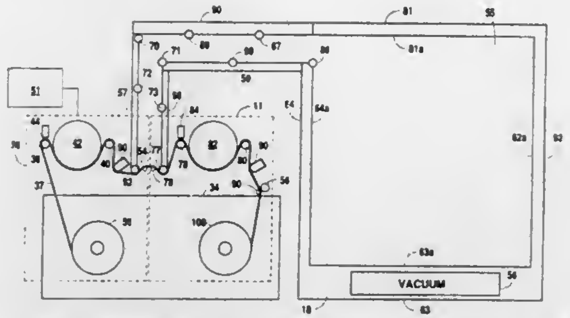
Int. Cl.⁶ H04N *5/91;* **G11B** *15/18*

U.S. Cl. 386—92 **8 Claims**

1. A VCR system for near simultaneous multifunction operations of at least one broadcast or cable communicated television signal, comprising:

(a) means for receiving a videocassette, for extracting videotape therefrom, and for returning the videotape thereto;

(b) means for receiving the at least one broadcast or cable communicated television signal;



(c) first tape path assembly for performing any of a first set of functions including recording the at least one broadcast or cable communicated television signal on a portion of the videotape extracted from the videocassette; playing back a prerecorded signal from a portion of the videotape extracted from the videocassette; and rewinding, pausing, and fast forwarding a portion of the videotape extracted from the videocassette;

(d) videotape storage compartment defined by walls forming an enclosure suitable for receiving and storing a quantity of the videotape extracted from the videocassette after performing any of the first set of functions in the first tape path;

(e) means for storing a portion of the videotape extracted from the videocassette in the videotape storage compartment;

(f) means for extracting a portion of the videotape stored in the videotape storage compartment; and

(g) second tape path assembly for performing any of a second set of functions including recording a second broadcast or cable communicated television signal on a portion of the videotape extracted from the videotape storage compartment; playing back the first or second television signal from a portion of the videotape extracted from the videotape storage compartment; and rewinding, pausing, and fast forwarding a portion of the videotape extracted from the videotape storage compartment at substantially the same time that the first tape path assembly is performing any one of the first set of functions.

5,841,941
ENCODED DATA STREAM RECORDING AND REPRODUCING APPARATUS WITH TAPE SPEED, CHANNEL NUMBER, AND CYLINDER SPEED CONTROL IN ACCORDANCE WITH BIT RATE

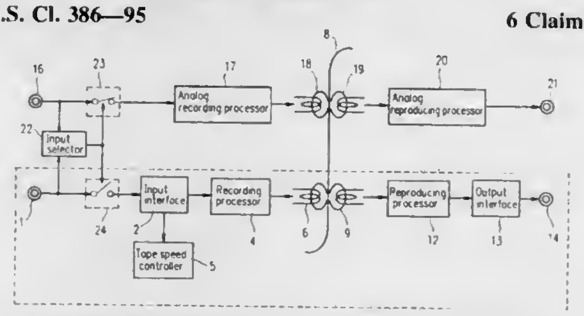
Kenji Morimoto, Neyagawa; Tadashi Kunihira, Osaka; Akihiro Takeuchi, Nara; Yasuo Hamamoto, Higashiosaka; Masazumi Yamada, Moriguchi; Mutsuyuki Okayama, Katano; Atsuo Ochi, Moriguchi; Masaaki Kobayashi, Kawanishi, and Akira Iketani, Higashiosaka, all of Japan, assignors to Matsushita Electric Indstrial Co., Ltd., Osaka, Japan

Filed Aug. 10, 1995, Ser. No. 513,485

Claims priority, application Japan, Aug. 10, 1994, 6-188397; Oct. 31, 1994, 6-267171; Dec. 14, 1994, 6-309358; Feb. 22, 1995, 7-033773; Feb. 22, 1995, 7-033779

Int. Cl.⁶ H04N *5/765*

U.S. Cl. 386—95 **6 Claims**



1. A recording and reproducing apparatus for an input encoded data stream having two different bit rates of N_1 and N_2 (where $N_1<N_2$), comprising:

an input interface having two outputs for outputting the input encoded data stream to two channels, the input interface dividing and outputting the input encoded data stream to both of the two channels when the bit rate of the input encoded data stream is N_2, while the input interface outputting the input encoded data stream to only one of the two channels when the bit rate of the input encoded data stream is N_1;

a first recording processor and a second recording processor for converting the input encoded data stream into a signal suitable for being recorded so as to supply the signal to a recording head for writing the signal onto a magnetic tape, the first recording processor and the second recording processor being connected with the two outputs of the input interface;

a tape speed controller for varying a speed for transporting the magnetic tape in accordance with the bit rates of the input encoded data stream;

a reproducing head for reading the signal from the magnetic tape;

a first reproducing processor and a second reproducing processor for performing a predetermined reproduction processing for a signal reproduced from the reproducing head; and

an output interface having two inputs for inputting the signals from two channels, the input interface integrating and outputting the signals input from the two channels when the bit rate of the reproduced encoded data stream is N_2, while the output interface outputting the signal input from only one of the two channels when the bit rate of the reproduced encoded data stream is N_1,

wherein the speed for transporting the magnetic tape and a number of the channels used for recording and reproducing operations are varied in accordance with the bit rates of the input encoded data stream.

5,841,942
CODE RECORDING APPARATUS

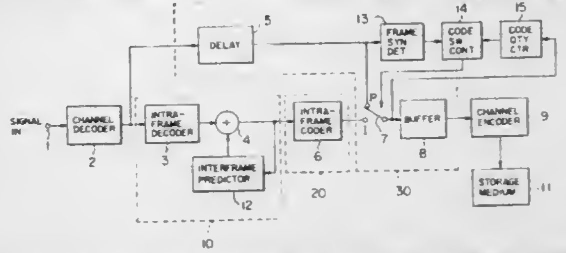
Kenji Sugiyama, Yokosuka, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Continuation of Ser. No. 285,828, Aug. 4, 1994, abandoned. This application Jul. 10, 1997, Ser. No. 889,938

Claims priority, application Japan, Aug. 4, 1993, 5-212208

Int. Cl.⁶ H04N *5/917;7/26*

U.S. Cl. 386—109 **5 Claims**



1. A code recording apparatus for recording code trains of high efficiently coded moving pictorial images, comprising:

decoding means for decoding prediction code trains prediction-coded between frames or fields, to obtain reproduced images;

coding means for coding the reproduced images independently in frame or field, to form independent code trains decodable independently; and

code replacing means for replacing a part of the prediction code train with the independent code train obtained by the coding means to form code trains to be recorded, the code trains to be recorded having the prediction code trains, the part of which is replaced with the independent code trains and is not used for forming the code trains.

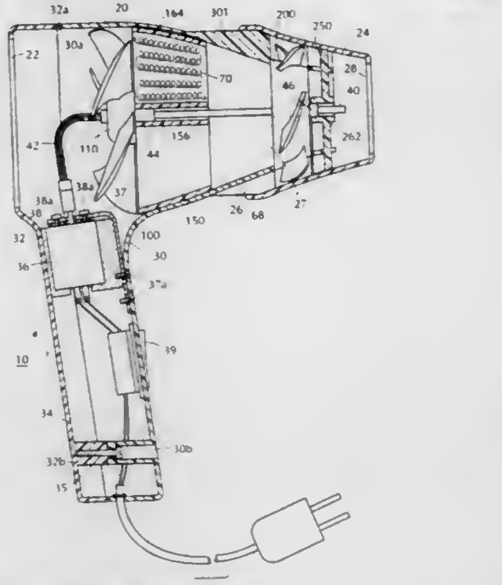
5,841,943
DUCTED FLOW HAIR DRYER WITH MULTIPLE IMPELLERS

Daniel M. Nosenchuck, Mercerville, N.J., assignor to SounDesign, LLC, Mercerville, N.J.

Filed Apr. 25, 1997, Ser. No. 845,399

Int. Cl.⁶ A45D *20/10;* **F24H** *3/00*

U.S. Cl. 392—385 **23 Claims**



1. An axial flow hair dryer comprising:

a housing forming an air flow passage between an air inlet for ambient air and an air outlet;

a first axial flow impeller disposed in said housing for generating an ambient air flow into said air flow passage through said housing air inlet;

an outer duct having an air inlet and an air outlet, said outer duct being secured to said housing with said housing air outlet disposed to introduce air flow exiting said housing air outlet into said outer duct and to form an air intake for ambient air between said housing and said outer duct;

a second axial flow impeller disposed in said outer duct for generating an ambient air flow into said outer duct through said air intake annularly of said air flow exiting said housing air outlet;

driving means for supplying motive force to said first axial flow impeller and second axial flow impeller; and

heating means for heating air flowing through said hair dryer and exiting said outer duct air outlet.

5,841,944
INFANT WARMER RADIANT HEATER HEAD

Christopher Peter Hutchinson; Richard Geoffrey Templer, and David James Keeley, all of Auckland, New Zealand, assignors to Fisher & Paykel Limited, Auckland, New Zealand

Filed Jul. 11, 1996, Ser. No. 680,241

Claims priority, application New Zealand, Jul. 14, 1995, 272577

Int. Cl.⁶ F26B *3/30*

U.S. Cl. 392—418 **8 Claims**

1. A radiant heater comprising:

curved reflector means having an inner reflecting surface, an outer surface and an open side,

an outer casing means provided adjacent said outer surface of said curved reflector means, there being an enclosed space containing stagnant gases formed between said outer casing means and said curved reflector means, said outer casing means having an internal surface facing said curved reflector means,

radiant energy source means positioned adjacent to said inner reflecting surface.

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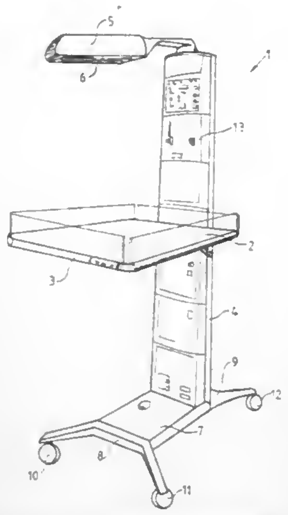


insulating means located in said enclosed space formed between said outer casing means and said curved reflector means, said insulating means being offset from said curved reflector means, dividing said enclosed space into a number of insulating pocket regions which each substantially enclose some of said stagnant gases.

5,841,945

VOICE SIGNAL COMPACTING AND EXPANDING DEVICE WITH FREQUENCY DIVISION

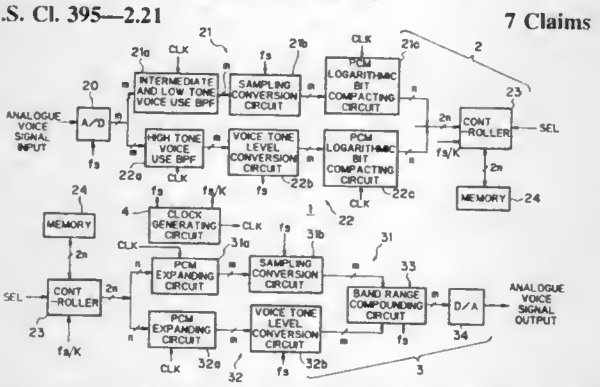
Shuji Nishitani, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Filed Dec. 22, 1994, Ser. No. 361,388

Claims priority, application Japan, Dec. 27, 1993, 5-348550

Int. Cl.^{6} G10L *3/02*

U.S. Cl. 395—2.21 **7 Claims**


21
21a
CLK
21b
fs
CLK
21c
2
20
m
INTERMEDIATE AND LOW TONE VOICE USE BPF
SAMPLING CONVERSION CIRCUIT
PCM LOGARITHMIC BIT COMPACTING CIRCUIT
23
ANALOGUE VOICE SIGNAL INPUT
A/D
HIGH TONE VOICE USE BPF
VOICE TONE LEVEL CONVERSION CIRCUIT
PCM LOGARITHMIC BIT COMPACTING CIRCUIT
2n
CONT-ROLLER
SEL
fs/K
fs
22a
CLK
22b
22c
24
fs
fs/K
MEMORY
24
4
CLOCK GENERATING CIRCUIT
CLK
1
22
MEMORY
31a
31b
31
33
SAMPLING CONVERSION CIRCUIT
PCM EXPANDING CIRCUIT
SEL
CONT-ROLLER
BAND RANGE COMPOUNDING CIRCUIT
D/A
ANALOGUE VOICE SIGNAL OUTPUT
23
PCM EXPANDING CIRCUIT
VOICE TONE LEVEL CONVERSION CIRCUIT
34
fs/K
CLK
32a
32
32b
3

1. A voice signal compacting and expanding device comprising:

an A/D conversion circuit which samples voice signals at a predetermined period of t and A/D converts the sampled voice signals;

a low pass digital filter which receives the output data from said A/D conversion circuit;

a high pass digital filter which receives the output data from said A/D conversion circuit and has a cutoff frequency at the low frequency side thereof which is connectable to a cutoff frequency characteristic at the high frequency side of said low pass digital filter;

a first data converting means which converts the output data from said low pass digital filter into thinned out data having a period of t×k, wherein k is an integer of 2 or more;

a second data converting means which converts P, wherein P is an integer of 2 or more pieces of the output data of said high pass digital filter into data having the period of t×k;

a first memory which receives the data converted by said first data converting means as first digital data values and the data converted by said second data converting means as second digital data values, and stores both the first and second digital data values at the same time;

a control circuit connected to said first memory, and connected to a second memory and a third memory which reads out the first and second digital data values at the same time from said first memory at the period of t×k, stores the first digital data values into said second memory and the second digital data values into said third memory respectively, produces k pieces of data based on the first digital data values stored in said second memory, outputs these respective data at the period of t successively and further outputs P pieces of data among the second digital data values stored in said third memory successively at the period of t; and

a D/A converting circuit which D/A converts the first and second digital data values outputted from said control circuit.

5,841,946

CHAOTIC CHARACTER EVALUATING APPARATUS AND METHOD OF THE SAME AND PROCESSING APPARATUS OF RESULTING THE CHAOTIC CHARACTER EVALUATION

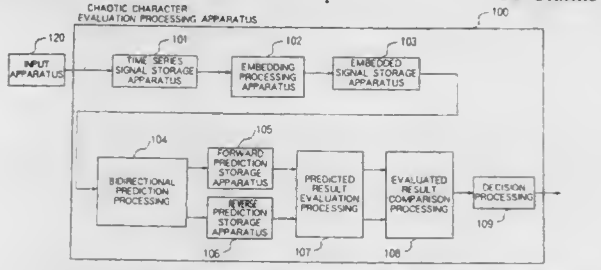
Masayoshi Naito, Kawagoe; Naoki Tanaka, Tokyo; Hiroshi Okamoto, Ome; Masahiro Kayama, and Yasuo Morooka, both of Hitachi, all of Japan, assignors to Hitachl, Ltd., Tokyo, Japan

Filed Nov. 25, 1994, Ser. No. 348,109

Claims priority, application Japan, Nov. 26, 1993, 5-296923; Aug. 26, 1994, 6-201766

Int. Cl.^{6} G06F *15/18*

U.S. Cl. 395—10 **30 Claims**


CHAOTIC CHARACTER EVALUATION PROCESSING APPARATUS
100
120
INPUT APPARATUS
101
TIME SERIES SIGNAL STORAGE APPARATUS
102
EMBEDDING PROCESSING APPARATUS
103
EMBEDDED SIGNAL STORAGE APPARATUS
104
BIDIRECTIONAL PREDICTION PROCESSING
105
FORWARD PREDICTION STORAGE APPARATUS
REVERSE PREDICTION STORAGE APPARATUS
PREDICTED RESULT EVALUATION PROCESSING
EVALUATED RESULT COMPARISON PROCESSING
DECISION PROCESSING
109
106
107
108

1. A processing apparatus incorporating a chaotic character detection function, comprising:

chaotic character evaluation means for determining whether or not sequential data obtained from an object has chaotic characteristics,

wherein the content of processing is determined on the basis of the result of the determination made by said chaotic character evaluation means;

embedding means for performing embedding processing on said sequential data;

embedded signal storage manes for storing embedded signals;

a prediction-dedicated database for storing each in a pair of outputs of said embedding means at given time points and outputs of said embedding means at succeeding time points corresponding to said given time points, respectively; and

predicting means for predicting values of the sequential data appearing after said succeeding time points on the basis of said embedded signals and the content of said prediction dedicated database,

wherein, depending on the result of the decision made by said chaotic character evaluation means on the basis of the data stored in said embedded signal storage means as to whether or not said sequential data has chaotic characteristics, the result of an arithmetic operation performed by said predicting means is reflected to the processing when said sequential data is of chaotic characteristics, while the result of the arithmetic operation performed by said predicting means is inhibited from being reflected to the processing when said sequential data has no chaotic characteristics.

5,841,947

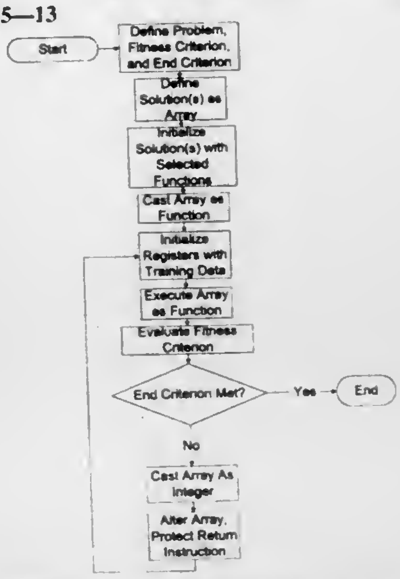
COMPUTER IMPLEMENTED MACHINE LEARNING METHOD AND SYSTEM

Peter Nordin, Decapo Ab Torggatan 8, S-411 05 Goteborg, Sweden

Filed Jul. 12, 1996, Ser. No. 674,337

Int. Cl.^{6} G06F *15/18*

U.S. Cl. 395—13 **111 Claims**


Start
Define Problem, Fitness Criterion, and End Criterion
Define Solution(s) as Array
Initialize Solution(s) with Selected Functions
Cast Array as Function
Initialize Registers with Training Data
Execute Array as Function
Evaluate Fitness Criterion
End Criterion Met?
Yes
End
No
Cast Array As Integer
Alter Array, Protect Return Instruction

1. A computer implemented learning method comprising the steps of:

(a) providing a computer with an indirectly executable program including:

a first instruction that points to and designates machine code stored in a memory as data;

a second instruction that points to and designates machine code stored in a memory as directly executable code;

a third instruction that alters machine code pointed to by the first instruction; and

a fourth instruction that executes machine code pointed to by the second instruction; and

(b) controlling the computer to execute the program which performs the steps of:

(b1) creating and storing a machine code entity including a directly executable instruction which includes run time data in a memory;

(b2) executing the second instruction to point to the entity;

(b3) executing the fourth instruction using input data to produce a result;

(b4) evaluating the result;

(b5) executing the first instruction to point to the entity;

(b6) executing the third instruction to alter the entity to include a different directly executable instruction; and

(b7) repeating steps (b3) to (b6) until an end criterion is reached.

5,841,948

DEFUZZIFYING METHOD IN FUZZY INFERENCE SYSTEM

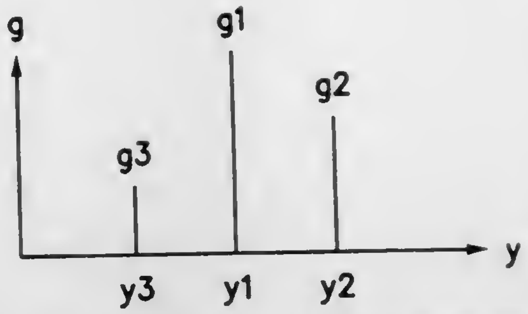
Ken Ota, Yokohama, Japan, and Willlam C. Archibald, Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 132,613, Oct. 6, 1993, abandoned. This application Apr. 18, 1995, Ser. No. 424,737

Int. Cl.^{6} G06F *9/44*

U.S. Cl. 395—61 **8 Claims**

1. In a data processing system for executing a fuzzy inference operation having a plurality of output label membership functions, wherein each of the plurality of output label membership functions is represented by a singleton having a corresponding position, yi, and a corresponding consequent grade, gi, a defuzzification method comprising the steps of:



receiving the plurality of output label membership functions via a data buffer;

communicating the plurality of output label membership functions via an information bus;

enabling an execution unit of the data processing system to select and identify a plurality of n singletons in a magnitude order corresponding to a plurality of consequent grades, the magnitude order being g1, g2, . . . , gn, where g1 is a highest value, the execution unit being coupled to the information bus; and

enabling an arithmetic logic unit of the data processing system to determine a center of gravity, y0, as a final result of the defuzzification method using an equation where n is a number of input label membership functions, said equation is:

$$y0=y1+g2(y2-y1)+\ldots+gn(yn-y1).$$

5,841,949

LEARNING/INFERENCE METHOD FOR ARTIFICIAL INTELLIGENCE AND APPARATUS THEREFOR

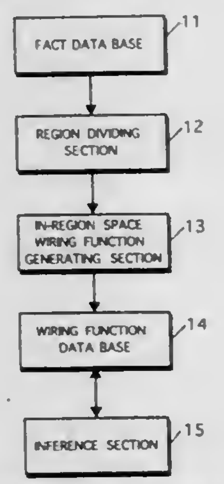
Jun Nakaya, and Takeml Chikahisa, both of Sapporo, Japan, assignors to Addin Research Inc., Sapporo, Japan

Filed Jul. 14, 1994, Ser. No. 274,802

Claims priority, application Japan, Jul. 15, 1993, 5-196734

Int. Cl.^{6} G06F *15/18*

U.S. Cl. 395—77 **10 Claims**


FACT DATA BASE
11
REGION DIVIDING SECTION
12
IN-REGION SPACE WIRING FUNCTION GENERATING SECTION
13
WIRING FUNCTION DATA BASE
14
INFERENCE SECTION
15

1. A learning/inference method for artificial intelligence implemented on a computer for analyzing physical cause and effect relation of phenomena represented by nonlinear multidimensional space, comprising:

a first step of deriving fact data which consists of a data group of input parameters of an observed event and a data group of output parameters of said observed event;

a second step of dividing a multidimensional curved surface constituted by fact data into a plurality of regions:

a third step of generating wiring functions of the respective divisional regions, and storing the wiring functions as a knowledge base; and

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- a fourth step of executing interference by conducting position prediction computation of a space interior using the stored wiring functions,
- wherein said data group of input parameters includes driving condition parameters detected by at least one sensor in an automotive internal combustion engine.

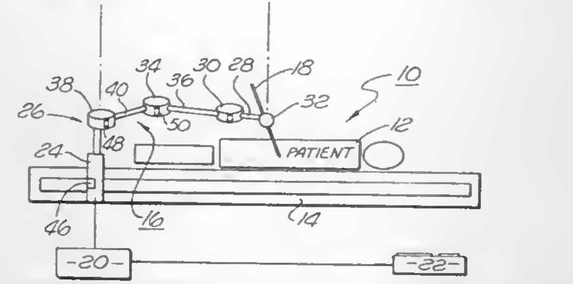
5,841,950
AUTOMATED ENDOSCOPE SYSTEM FOR OPTIMAL POSITIONING

Yulun Wang, Goleta, and Keith Phillip Laby, Santa Barbara, both of Calif., assignors to Computer Motion, Inc., Goleta, Calif.

Continuation of Ser. No. 613,866, Mar. 11, 1996, which is a continuation of Ser. No. 72,982, Jun. 3, 1993, Pat. No. 5,524,180, which is a continuation-in-part of Ser. No. 5,604, Jan. 19, 1993, abandoned, which is a continuation-in-part of Ser. No. 927,801, Aug. 10, 1992, abandoned. This application Jul. 31, 1997, Ser. No. 903,955

Int. Cl.^{6} A61B *19/00;17/36*

U.S. Cl. 395—99 **16 Claims**



1. A system that allows a surgeon to control a surgical instrument that is inserted through an incision of a patient, wherein the incision defines a pivot point, comprising:

- an articulate arm that has an end effector which holds the surgical instrument, and an active joint to move said end effector, said articulate arm further having a first passive joint which allows the surgical instrument to pivot about the pivot point, said articulate arm being located within a first coordinate system which has a first x axis, a first y axis and a first z axis, said end effector being located within a second coordinate system which has a second x axis, a second y axis and a second z axis, the surgical instrument being located within a third coordinate system which has a third x axis, a third y axis and a third z axis;
- a first input device that receives an input command from the surgeon to move the surgical instrument a moving distance in the third coordinate system; and,
- a controller that receives said input command, computes a movement of said articulate arm by computing a moving distance of the surgical instrument in the second coordinate system from the moving distance commanded in the third coordinate system, and computing a moving distance of said articulate arm in the first coordinate system from the moving distance computed in the second coordinate system, said controller provides an output command to actuate said articulate arm to move the surgical instrument the computed moving distance in the first coordinate system.

5,841,951
INK DUTY-CYCLE CONTROL

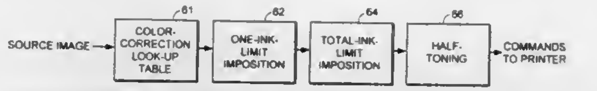
Joseph S. Shu, San Jose, and Chia-Hsin Li, Mountain View, both of Calif., assignors to Seiko Epson Corporation, Tokyo, Japan

Filed May 2, 1996, Ser. No. 641,684

Int. Cl.^{6} G06F *15/00*

U.S. Cl. 395—109 **80 Claims**

1. A method of rendering a source image comprising:



- A) generating, in response to electrical source-image signals representing a source image, electrical print-command signals by employing a sequence of at least one image-revision step, in which sequence each image-revision step receives an input image consisting of input pixels and produces therefrom an output image consisting of output pixels, the first image-revision step's input image is the source image, any subsequent image-revision step's input image is the output image of the preceding image-revision step, one said image-revision step is a total-ink-limiting step whose input image consists of input pixels whose values are represented by RGB components, the difference between the maximum and average component values of at least one of the input pixels of the total-ink-limiting step's input image exceeds a predetermined minimum, and the total-ink-limiting step comprises the steps of:
  - i) for each input pixel, computing a difference value proportional to the difference between that input pixel's maximum and average component values and thereby indicative of whether that difference exceeds the predetermined minimum; and
  - ii) obtaining an output image by determining, for each input pixel, an output pixel whose value:
    - a) equals that input pixel's value if the difference between that input pixel's maximum and average component values does not exceed the predetermined minimum, and,
    - b) if the difference between that input pixel's maximum and average component values exceeds the predetermined minimum, results from adding to that input pixel's non-maximum component values respective adjustment values that in total are a function of the difference value computed for that input pixel; and
- B) operating a printing mechanism by applying the print-command signals thereto.

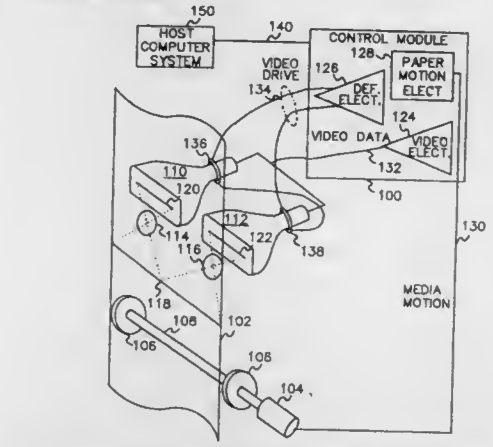
5,841,952
PARALLEL SEGMENT PRINTING IN A PHOTOGRAPHIC PROCESS PRINTER

Kerry L. Shaklee, Brighton, Colo., assignor to Sienna Imaging, Inc., Englewood, Colo.

Filed Apr. 29, 1996, Ser. No. 639,976

Int. Cl.^{6} G06F *15/00;* **H04N** *1/04;1/46*

U.S. Cl. 395—105 **18 Claims**



1. A printer for transferring image data from a host computer system to a print media to form an image thereon, said printer comprising:

- a memory for storing said image data;
- means for receiving said image data transferred from said host computer system and storing said image data into said memory means;

- a plurality of cathode ray tubes, one for displaying each of a plurality of image segments of each row of said image, wherein each of said plurality of cathode ray tubes are separated from each other;
- image transfer means for transferring an image segment displayed by each of said plurality of cathode ray tubes to said media, and for adjusting each of said image segments to recompose said image segments into image rows, wherein all image segments are transferred to a single image row before any image segments are transferred to a subsequent image row, and further wherein at least a first image segment is displayed on a first cathode ray tube during a forward scan time, and at least a second image segment is displayed on a second cathode ray tube during a retrace time of said first cathode ray tube; and
- processing means operatively engaged with said memory means and with each of said image display means for retrieving said image data from said memory means, and for transferring said plurality of image segments to said plurality of image display means thereby to transfer said image segments to said media.

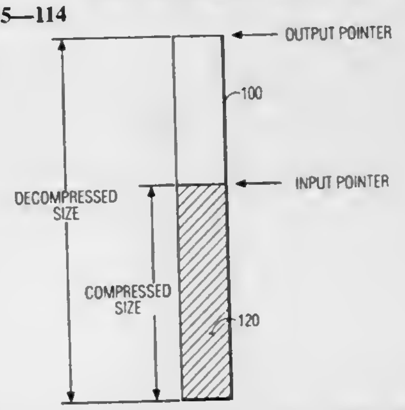
5,841,953
METHOD FOR COMPRESSING AND DECOMPRESSING DATA FILES

Pankaj Rohatgi, Los Angeles, Calif., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Continuation of Ser. No. 283,346, Aug. 1, 1994. This application Jul. 1, 1996, Ser. No. 674,302

Int. Cl.^{6} G06F *15/00*

U.S. Cl. 395—114 **6 Claims**



1. In a system for receiving a compressed data file and then decompressing the compressed data file, a method for decompressing in-place an adjusted monotone compressed file having a first contiguous portion containing compressed codewords and a second contiguous portion containing plain text representing a portion of unadjusted compressed codewords, into a decompressed file having a size and containing plain text, said compressed data file including a header including at least file size information, said method comprising the steps of:

- receiving said compressed file;
- reading the header and determining decompressed file size and identifying said first and second contiguous portions;
- allocating a memory buffer having the size of the decompressed file;
- storing the adjusted monotone compressed file in a first block of allocated said memory buffer, and setting an input pointer to a location in the memory buffer corresponding to the beginning of the adjusted monotone compressed file;
- decompressing the compressed codewords in the first contiguous portion of the adjusted compressed file to produce corresponding decompressed codewords and inserting respective decompressed codewords in a second block of allocated said memory buffer corresponding to a remaining portion of the allocated memory buffer not occupied by said monotone compressed file, and when said second block of allocated said memory buffer is filled, inserting decompressed codewords in said first block of allocated said memory buffer at memory locations previously occupied by compressed codewords that have been decompressed, and incrementing the input pointer after accessing respective compressed codewords; and
- halting decompression when said input pointer reaches the beginning of said second contiguous portion, at which time the entire compressed file will be decompressed.

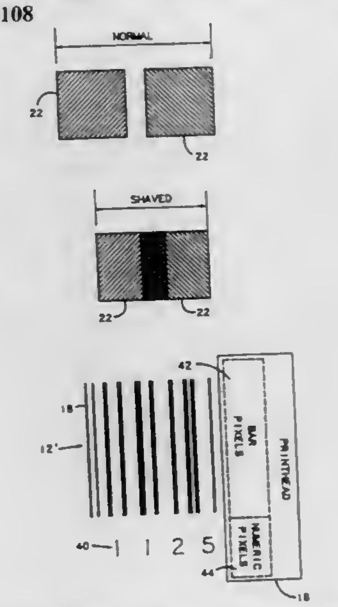
5,841,954
DOT PRINTERS WITH WIDTH COMPRESSION CAPABILITIES

H. Sprague Ackley, Seattle, Wash., assignor to Intermec Corporation, Everett, Wash.

Filed Aug. 23, 1995, Ser. No. 518,226

Int. Cl.^{6} G06F *15/00;* **B41J** *2/00;2/22;3/00*

U.S. Cl. 395—108 **16 Claims**



4. A printer for printing font and/or barcode characters comprised of a plurality of rows in a direction of printing movement perpendicular to the character bars which are in turn comprised of a plurality of close adjacent dots to improve print quality at high printing speeds which induce elongated dot smear in the direction of printing movement and improve readability of optically read barcodes comprising:

- a printhead for printing characters bars on a media surface as a series of dots,
- a drive system creating relative movement between the media and said printhead in at least two steps between printing positions of said printhead;
- a drive system creating relative movement in the direction of printing movement between said printhead and the media; and,
- a print logic for outputting character print signals to said printhead, said print logic including logic for shaving less than one dot from an end of each of the plurality of rows of a character bar when the printer is operating at high printing speeds by stepping said drive system less than a number of steps equal to the number of steps between said printing positions before said printhead prints a next dot at said end whereby a last pair of dots at said end are overlapped wherein said drive system is controlled by said print logic.

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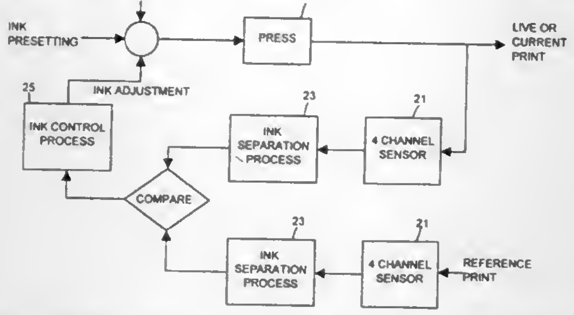
5,841,955
CONTROL SYSTEM FOR A PRINTING PRESS

Xin xin Wang, Woodridge, Ill., assignor to Goss Graphic Systems, Inc., Westmont, Ill.

Continuation-in-part of Ser. No. 265,701, Jun. 24, 1994, abandoned, and a continuation of Ser. No. 800,947, Dec. 2, 1991, abandoned. This application Aug. 16, 1995, Ser. No. 515,550

Int. Cl.^{6} G06K *15/00;* **B41F** *33/00*

U.S. Cl. 395—109 **34 Claims**



2. A control system for a four-color printing press, comprising:
- means for detecting the energy reflected from the paper surface in both the visible region and the infrared region of the electromagnetic spectrum;
- means for converting the output of the detecting means to a set of variables which represent the amount of ink present on the paper for any of the cyan, magenta, yellow and black inks; and
- means responsive to the converting means for adjusting the four-color printing press to maintain the color consistency, said adjusting means being responsive to ink volume transferred into an ink zone from two adjacent ink zones.

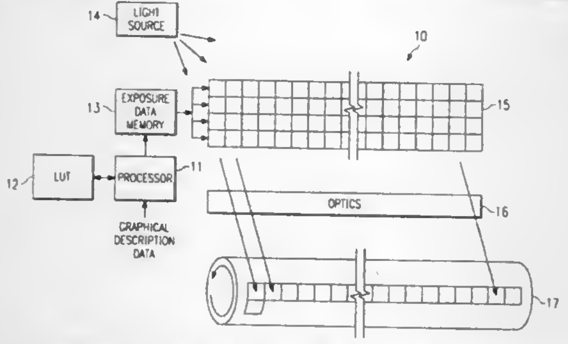
5,841,956
ANTI-ALIASING FOR DIGITAL PRINTING WITH DOT SHAPE MODULATION AND GREYSCALE

Vadlamannati Venkateswar, Plano, and Gerhard P. Deffner, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 3, 1997, Ser. No. 778,460

Int. Cl.^{6} H04N *1/23;1/405;* **G06K** *15/02*

U.S. Cl. 395—109 **13 Claims**



1. A method of reducing aliasing for printing an object as an image comprised of pixels, comprising the steps of:
- dividing each pixel to be printed into two or more phases, said phases or combinations of said phases providing different dot shapes to be printed for said pixels;
- selecting one of said dot shapes for said each pixel to be printed, each pixel's dot shape being selected by including any of said phases that is overlapped by said object by more than a predetermined amount; and
- determining a greyscale value for each said dot shape, such that the product of said greyscale value times the area of said dot shape is substantially the same as the percent of overlap of that dot shape's corresponding pixel by said object.

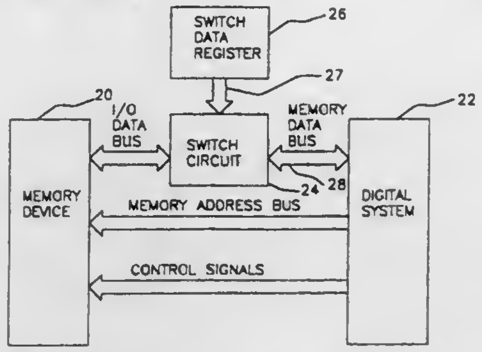
5,841,957
PROGRAMMABLE I/O REMAPPER FOR PARTIALLY DEFECTIVE MEMORY DEVICES

Jiang-Tsuen Ju, and Shih J. Chien, both of Hsin-Chu, Taiwan, assignors to Acti Technology Corp., Taipei, Taiwan

Filed May 23, 1996, Ser. No. 652,390

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—182.06 **17 Claims**



1. Apparatus for mapping a partially defective memory device to a memory data bus of an electronic system, said apparatus comprising:
- memory means responsive to a plurality of control signals and a plurality of address signals of the electronic system, said memory means having a plurality of data bits, said plurality of data bits comprising at least one defective data bit, and at least one non-defective data bit;
- switch means comprising a plurality of switches for generating a plurality of mapped data bits coupled to the memory data bus of the electronic system, said plurality of switches directly coupling said at least one non-defective data bit to the memory data bus, wherein the number of the mapped data bits is not greater than the number of the non-defective data bits of said memory means; and
- register means for storing a plurality of enable signals, the plurality of said enable signals being coupled to said switch means to control the plurality of switches of said switch means.

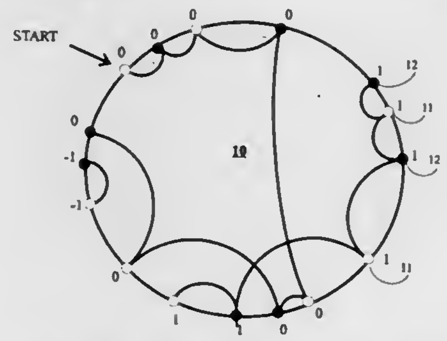
5,841,958
BIPARTITE MATCHING

Samuel R. Buss, San Diego, Calif., and Peter N. Yianilos, Princeton, N.J., assignors to NEC Research Institute, Inc., Princeton, N.J., and The Regents of the University of California, Oakland, Calif.

Filed Jan. 19, 1995, Ser. No. 377,319

Int. Cl.^{6} G06T *11/00*

U.S. Cl. 395—140 **4 Claims**



1. A process for performing bipartite matching of an object of a first subset with an object of a second subset comprising the steps of:
- preparing a graph as a tour in which the objects of the first and second subsets form the nodes and the distance between an object of the first subset and an object of the second subset is the cost of the bipartite matching of such two objects,

- decomposing the tour to form an interleaved set of quasi-convex subtours in each of which the nodes alternate between the first and second subsets, whereby the decomposition is such that a union of the minimum cost match for this set of subtours will be a minimum cost-match of the tour,
- finding the minimum cost-match of each subtour, and
- combining all the minimum cost-matches to form the desired bipartite match of the objects to be matched.

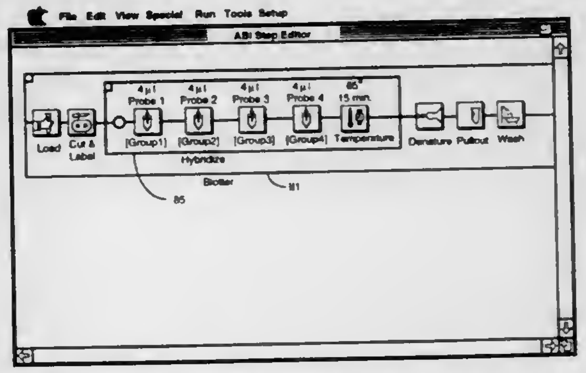
5,841,959
ROBOTIC INTERFACE

Harry A. Guiremand, Halfmoon Bay, Calif., assignor to P.E. Applied Biosystems, Inc., Foster City, Calif.

Continuation of Ser. No. 423,785, Oct. 17, 1989, abandoned. This application Dec. 6, 1994, Ser. No. 598,188

Int. Cl.^{6} G06F *15/00*

U.S. Cl. 395—140 **54 Claims**



1. A computerized control system for operating a machine, comprising:
- a general-purpose computer apparatus;
- a display monitor coupled to the computer apparatus;
- an interactive display presented on the display monitor, the interactive display comprising connected pictorial icons representing sequences of actions performable by the machine;
- input apparatus coupled to the general-purpose computer for a user to interact with the display; and
- an I/O subsystem connected to the computer and connectable to the machine for sending, in response to a user initiation input, data and commands to the machine for performing the sequences of actions in the order of connection of the pictorial icons, and for receiving signals from the machine;
  - wherein a connected sequence of icons may be collapsed in place to show a higher-level icon representing the connected sequence of icons, the higher-level icon then occupying the place of the uncollapsed connected sequence of icons, and individual higher-level icons may be expended in place to show lower-level connected sequences of icons representing individual sequences of actions making up the sequence of actions represented by the individual higher-level icon.

5,841,960
METHOD OF AND APPARARTUS FOR AUTOMATICALLY GENERATING TEST PROGRAM

Takeshi Ibusuki, and Shinji Miyahara, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

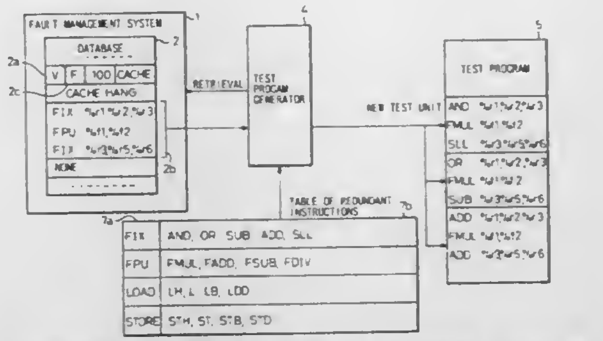
Filed Sep. 19, 1995, Ser. No. 531,205

Claims priority, application Japan, Oct. 17, 1994, 6-250325

Int. Cl.^{6} G06F *11/263*

U.S. Cl. 395—183.08 **20 Claims**

19. An apparatus generating a test program for testing a hardware fault, comprising:
- a fault management system which stores fault data, the fault data including an instruction which causes a hardware fault;



FIX	AND, OR SUB ADD, SLL
FPU	FMUL, FADD, FSUB, FDIV
LOAD	LH, L LB, LDD
STORE	STH, ST, STB, STD

- a redundant expression table storing a redundant expression corresponding to the instruction in the fault data; and
- a test program generator which
  - looks up, in the redundant expression table, the redundant expression corresponding to the instruction in the fault data, and
  - inserts a test unit having the looked up, redundant expression into the test program, to generate a test program for testing the hardware fault.

5,841,961
SEMICONDUCTOR MEMORY DEVICE INCLUDING A TAG MEMORY

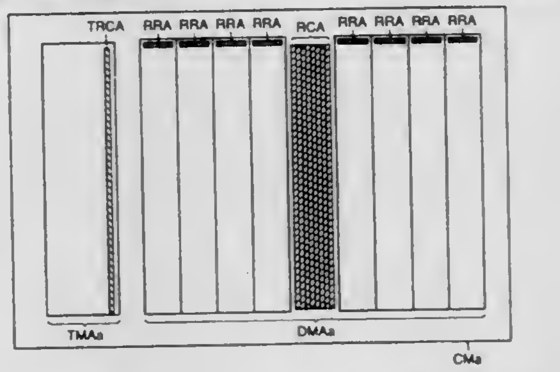
Kunihiko Kozaru; Tomohisa Wada, and Hirotoshi Sato, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 7, 1995, Ser. No. 487,214

Claims priority, application Japan, Jul. 14, 1994, 6-162267

Int. Cl.^{6} G06F *11/00;11/16*

U.S. Cl. 395—182.03 **13 Claims**



1. A semiconductor memory device including first and second memories which are integrated on a common chip and have mutually different functions, said first and second memories each having a plurality of memory cells arranged in a matrix of rows and columns, wherein,
- said first memory includes first repairing means for repairing a defective memory cell in said first memory by a first repairing method, and
- said second memory includes second repairing means for repairing a defective memory cell in said second memory by a second repairing method which is different from said first repairing method.

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5,841,962
DATA ALLOCATOR

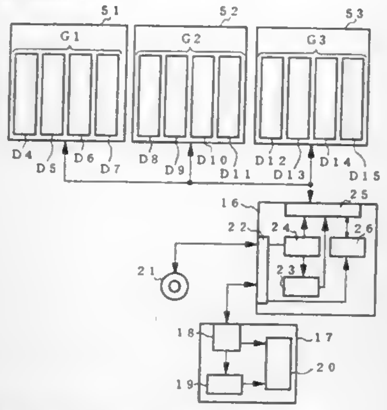
Shunichiro Nakamura, Tokyo; Hiroshi Shimizu, Shizuoka; Harumi Minemura; Tomohisa Yamaguchi, both of Tokyo; Takashi Watanabe, and Tadanori Mizuno, both of Shizuoka, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, and T. Watanabe, Shizuoka, Japan

Filed May 16, 1997, Ser. No. 857,565

Claims priority, application Japan, Aug. 28, 1996, 8-227160

Int. Cl.^{6} G06F *15/16*

U.S. Cl. 395—182.04 **9 Claims**



1. A data allocation system comprising:

k storage groups, where k is an integer greater than one, each of said storage groups including multiple memory areas arranged in a matrix for storing data block by block, said memory areas of each of said storage groups are divided into m columns, each of said m columns forming an array file, where m is an integer greater than one;

a plurality of redundant groups, each of which consists of k memory areas selected from respective storage groups, said k memory areas being located in a same row of said storage groups, and consisting of a first memory area for storing each one of redundant data, and (k-1) second memory areas for storing data, said each one of redundant data stored in said first memory area being redundant data of said data stored in said second data areas in a same redundant group; and

a data allocator allocating said redundant data to mk sets of memory areas $(D_{1j_1}, D_{2j_2}, \ldots, D_{kj_m})$ wherein each redundant group is stored in the same row of said storage groups, where j_i(i=1 to m) is a number of each one of said array files in each of said storage groups, and D_{kj_m} is a memory area belonging to k-th storage group and j_m-th array file of said k-th storage group.

5,841,963
DUAL INFORMATION PROCESSING SYSTEM HAVING A PLURALITY OF DATA TRANSFER CHANNELS

Tetsuaki Nakamikawa; Shin Kokura; Kenichi Kurosawa, all of Hitachi; Shinichiro Yamaguchi, Mito; Yoshihiro Miyazaki, Hitachi, and Hiroshi Ohguro, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 471,989, Jun. 6, 1995, abandoned.

This application May 21, 1997, Ser. No. 861,471

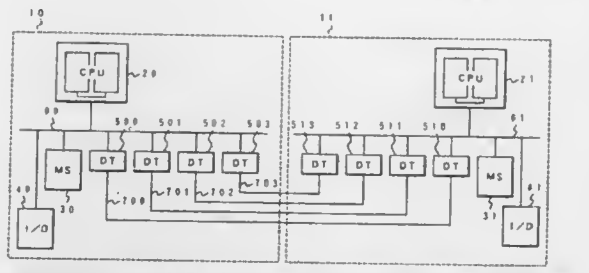
Claims priority, application Japan, Jun. 8, 1994, 6-126562

Int. Cl.^{6} G06F *11/16;15/17*

U.S. Cl. 395—182.09 **1 Claim**

1. A dual information processing system comprising:

first and second computer systems operating synchronously with each other, each of said computer systems comprising a central processing unit including means for detecting a fault occurrence in said each computer system, a data storage unit, an I/O unit, and a plurality of data transfer units for transferring data between said two computer systems, said data transfer units of said first computer system being connected to said data transfer units of said second computer system by a plurality of data transfer channels;



means for, in the event that a fault occurrence is detected in one of said computer systems but not in the transfer units thereof, assigning first address ranges said transfer units of a non-faulting computer system and transferring data stored in the data storage unit of the non-faulting computer system into the data storage unit of the computer system in which such fault has occurred;

means for, in the event that a fault occurrence is detected in the transferring units of one of said first or second computer systems, assigning second address ranges to said transferring units of a non faulting computer system and transferring data stored in the data storage unit of the non-faulting computer system into the data storage unit of the computer system in which such fault has occurred,

wherein each of said data transfer unit includes a data transfer control section for detecting a fault occurring during data transfer, a transfer state storage section for storing a fault occurrence state at said data transfer unit, assigned address storage means for storing an address range assigned to said data transfer unit, a control section for detecting an access to said storage from said central processing unit if it occurs when data is transferred and determining whether or not an accessed address is contained in the address range specified by the contents stored in said assigned address storage means, and for sending data at the accessed address to the data transfer channel if the accessed address is contained in the address range stored in said address storage means, means for checking said transfer state storage section of the data transfer units used for the data transfer to determine if a fault occurs in said data transfer units, and if a fault occurs in any of said data transfer unit, assigning the address range to another normal data transfer unit for executing data transfer.

5,841,964
OPERATING STATE MANAGEMENT SYSTEM

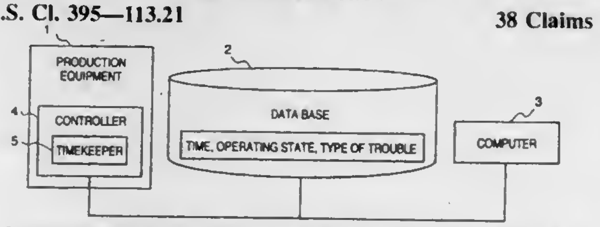
Hideki Yamaguchi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Shimomaruko, Japan

Filed Jun. 20, 1996, Ser. No. 668,250

Claims priority, application Japan, Jun. 28, 1995, 7-161798

Int. Cl.^{6} G01F *11/34*

U.S. Cl. 395—113.21 **38 Claims**



1. An operating state management system comprising database means and a computer for collecting and totalizing the operating states of production equipment and circumstances under which types of trouble occur in said production equipment, said computer including:

correlating means for storing correlation data in said database means in a time series, the correlation data being obtained by linking the type of trouble that has occurred in the production equipment, the state of the production equipment, and time of day and date at which a change in the state occurred; and

totalizing means for totalizing states of the production equipment in a designated period of time on the basis of the correlation data.

5,841,965
SYSTEM AND METHOD FOR AUTOMATICALLY DETERMINING TEST POINT FOR DC PARAMETRIC TEST

Toshihiro Takahashi, Osaka, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

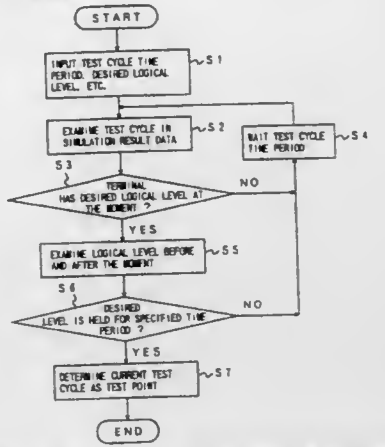
Continuation of Ser. No. 432,796, May 2, 1995, abandoned.

This application Sep. 3, 1996, Ser. No. 706,928

Claims priority, application Japan, May 16, 1994, 6-100844

Int. Cl.^{6} G06F *11/27*

U.S. Cl. 395—183.09 **9 Claims**


START
INPUT TEST CYCLE TIME PERIOD, DESIRED LOGICAL LEVEL, ETC.
S1
EXAMINE TEST CYCLE IN SIMULATION RESULT DATA
S2
WAIT TEST CYCLE TIME PERIOD
S4
S3
TERMINAL HAS DESIRED LOGICAL LEVEL AT THE MOMENT ?
NO
YES
EXAMINE LOGICAL LEVEL BEFORE AND AFTER THE MOMENT
S5
S6
DESIRED LEVEL IS HELD FOR SPECIFIED TIME PERIOD ?
NO
YES
DETERMINE CURRENT TEST CYCLE AS TEST POINT
S7
END

1. A system for automatically determining a test point for a DC parametric test, comprising:

means for supplying logical simulation result data which is obtained from performing a logical simulation operation on a logical circuit to be tested;

examining means for examining said logical simulation result data for determining specific points in the logical simulation result data which provide specific output signal characteristics, the points being used as test points for said DC parametric test in which direct-current characteristics of said logical circuit are tested.

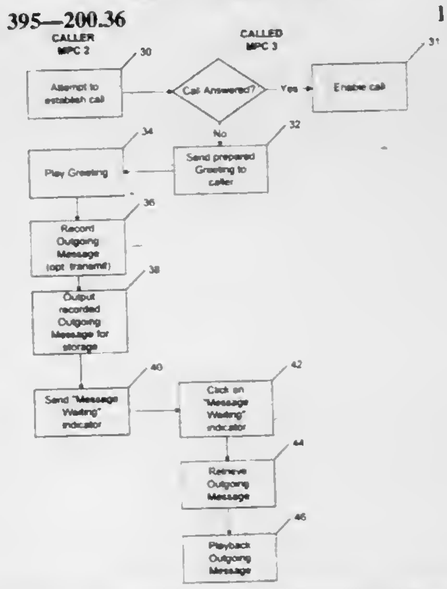
5,841,966
DISTRIBUTED MESSAGING SYSTEM

Roberto Irribarren, Fremont, Calif., assignor to Centigram Communications Corporation, San Jose, Calif.

Filed Apr. 4, 1996, Ser. No. 627,590

Int. Cl.^{6} G06F *13/14*

U.S. Cl. 395—200.36 **17 Claims**


CALLER MPC 2
CALLED MPC 3
30
31
Attempt to establish call
Call Answered?
Yes
Enable call
No
34
32
Play Greeting
Send prepared Greeting to caller
36
Record Outgoing Message (opt. transmit)
38
Output recorded Outgoing Message for storage
40
42
Send "Message Waiting" indicator
Click on "Message Waiting" indicator
44
Retrieve Outgoing Message
46
Playback Outgoing Message

1. A method for distributing messages over a local area network coupling a plurality of computer terminals, comprising the steps of:

(a) attempting to initiate a message session from a calling party using a calling computer terminal with at least one called party using at least one corresponding called computer terminal;

(b) whenever such attempt fails, then generating a greeting message associated with each called computer terminal for the calling computer terminal indicating that the corresponding called party is not responding;

(c) recording an outgoing message by the calling party to each called party, the message comprising one of an audio or audiovisual message;

(d) storing the outgoing message in an outbox associated with the calling computer terminal;

(e) generating envelope information including identification data indicating the calling party recorded the outgoing message;

(f) storing the envelope information in the outbox associated with the calling computer terminal;

(g) associating the envelope with a message waiting indicator, where the message waiting indicator indicates the presence of the envelope information and the outgoing message in the outbox and is selectable to cause the envelope information to be retrieved from the outbox and to cause the outgoing message to be retrieved from the outbox;

(h) activating the message waiting indicator at the called computer terminal when the called computer terminal is enabled to receive messages;

(i) in response to activating the message waiting indicator selected to retrieve the envelope information, retrieving the envelope information from the outbox to each called computer terminal;

(j) upon such envelope information retrieval displaying the envelope information on each called computer terminal;

(k) in response to activating the message waiting indicator selected to retrieve the outgoing message, retrieving the outgoing message from the outbox to each called computer terminal;

(l) upon such outgoing message retrieval, playing the retrieved outgoing message back on each called computer terminal.

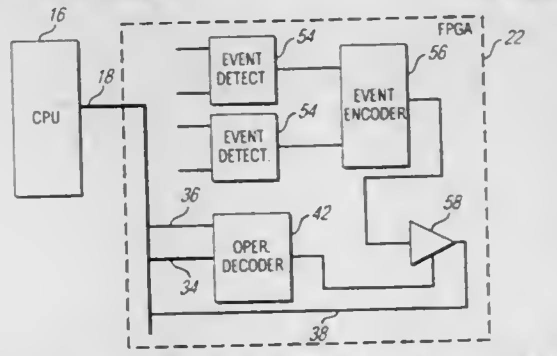
5,841,967
METHOD AND APPARATUS FOR DESIGN VERIFICATION USING EMULATION AND SIMULATION

Stephen P. Sample, Saratoga, and Mikhail Bershteyn, Campbell, both of Calif., assignors to Quickturn Design Systems, Inc., Mountain View, Calif.

Filed Oct. 17, 1996, Ser. No. 733,352

Int. Cl.^{6} G06F *11/263*

U.S. Cl. 395—183.09 **70 Claims**



1. An apparatus for design verification using emulation and simulation comprising:

at least one reconfigurable element for emulating a first portion of a design;

at least one microprocessor for simulating a second portion of said design, connected to said reconfigurable element so as to minimize time for transferring data between said first portion of said design and said second portion of said design; and

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an event detector connected to said at least one microprocessor for detecting a plurality of events during design verification, relieving said at least one microprocessor from performing event detection.

5,841,968
PROCESSOR CIRCUIT WITH TESTING DEVICE

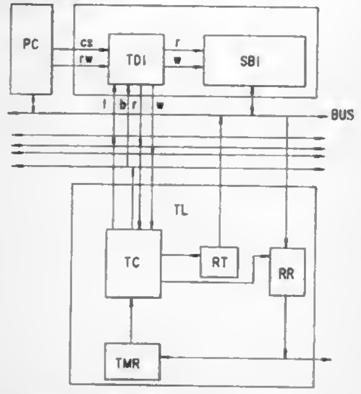
Peter Caldera, Villach, and Markus Steiner, St. Ulrich, both of Austria, assignors to Siemens Akiengesellschaft, Munich, Germany

Continuation of Ser. No. 297,984, Aug. 30, 1994, abandoned. This application Jun. 6, 1997, Ser. No. 871,677

Claims priority, application Germany, Aug. 30, 1993, 43 29 150.3

Int. Cl.⁶ G06F *11/00*

U.S. Cl. 395—183.06 **3 Claims**



1. Processor circuit configuration, comprising:
- a control processor, a bus connected to said control processor, and a plurality of circuit blocks connected to said control processor through said bus;
- a testing device connected to said control processor, to said bus and to said circuit blocks, said testing device including:
  - a plurality of test decoders each connected to a respective one of said circuit blocks; and
  - a test logic connected to each of said test decoders and to said bus;
- said test decoders receiving control signals from said test logic and from said control processor, and controlling the respective said circuit block,
- said test logic switching to a test mode operation, issuing control signals and selecting a given circuit block from said plurality of circuit blocks, said test logic deactivating all circuit blocks other than said given circuit block, transmitting test data to said selected circuit block through said bus, activating said control processor, receiving from said bus test data transmitted by said given circuit block, evaluating the test data and issuing a corresponding result signal; and
- said control processor controlling processing of the test data in said given circuit block.

5,841,969
SINGLE BUS ARCHITECTURE SUPPORTING SUBSYSTEMS OF VARIOUS CRITICALITY LEVELS

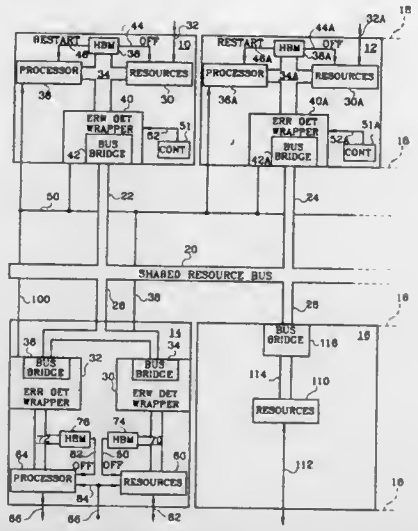
James C. Fye, Scottsdale, Ariz., assignor to Honeywell Inc.

Filed Aug. 13, 1996, Ser. No. 696,419

Int. Cl.⁶ G06F *11/14*

U.S. Cl. 395—185.09 **8 Claims**

1. An architecture for use with interconnecting a plurality of avionics subsystems of an overall system, each subsystem operating on information useful in the overall system which information may be of various levels of importance to the overall system, each subsystem having a bus bridge operable to conduct input and output information to and from its subsystem, comprising:
- a single shared resource bus connected to each of the bus bridges; and



- an error detect wrapper connected to those bus bridges associated with subsystems operating on information having at least a first predetermined level of importance to the overall system, said error detect wrapper encoding information being sent from a subsystem to the shared resource bus and checking the coding of information received from the shared resource bus to detect if there has been any transmission error between a sending subsystem and a receiving subsystem.

5,841,970
AUTHENTICATION METHOD FOR NETWORKS

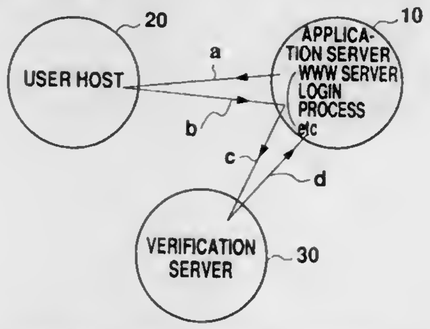
Takaaki Tabuki, Setagaya-ku, Japan, assignor to Cadix, Inc., Tokyo, Japan

Filed Jun. 27, 1996, Ser. No. 671,240

Claims priority, application Japan, Sep. 8, 1995, 7-231159

Int. Cl.⁶ G06F *11/00*

U.S. Cl. 395—187.01 **6 Claims**



1. An authentication method for use by application servers on at least one network to authenticate users of the applications, comprising:
- a receiving step in which one of the application servers receives authentication data from one of the users;
- a determining step in which the receiving application server determines a type of the authentication data received from the user and selects one of a plurality of verification servers based on the type of the authentication data received;
- a sending step in which the authentication data received in the receiving step is sent together with the identification data of the user to the selected one of the verification servers;
- a verification step in which the selected one of the verification servers verifies whether the authentication data sent in the sending step is valid authentication data of the user designated by the identification data sent in the sending step;

- a verification result reporting step in which the selected one of the verification servers notifies the receiving application server of the verification result; and
- an authentication step in which the receiving application server authenticates the user on the basis of the verification result returned in the verification result reporting step.

5,841,971
INFORMATION TRANSMISSION SYSTEM FOR TRANSMITTING VIDEO SIGNALS OVER CELLULAR TELEPHONE NETWORKS

Lucas Longginou, Hamilton, and Anthony Maeder, Greenbank, both of Australia, assignors to Voxson International Pty. Limited, Pinkenba, Australia

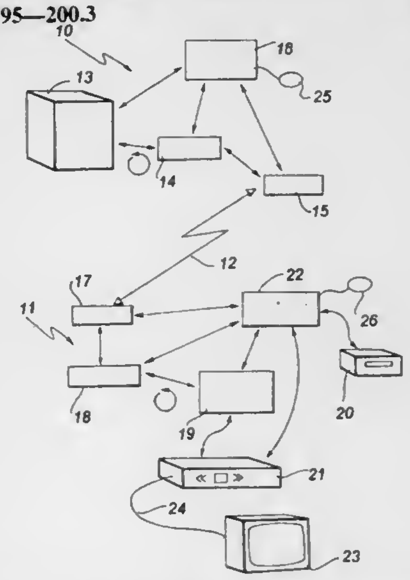
PCT No. PCT/AU93/00673, § 371 Date Oct. 31, 1995, § 102(e) Date Oct. 31, 1995, PCT Pub. No. WO94/14273, PCT Pub. Date Jun. 23, 1994

PCT Filed Dec. 17, 1993, Ser. No. 481,434

Claims priority, application Australia, Dec. 17, 1992, PL6436; Feb. 1, 1993, PL7034; Apr. 8, 1993, PL8251; May 6, 1993, PL8684

Int. Cl.⁶ G06F *13/00*

U.S. Cl. 395—200.3 **30 Claims**



1. An information transmission system for transmission of relatively wide-bandwidth information from a first location to a second location in a cellular telephone network, said system comprising:
- a receiver/transmitter base station at said first location;
- a cellular receiver at said second location;
- a communication channel in the cellular telephone network adapted to transmit the information from the first location to the second location upon a request over the communication channel initiated by a user of the cellular telephone network; and
- wherein the communication channel is implemented as a wide-bandwidth data path by the establishment of a plurality of individual channels of predetermined bandwidth acting together to connect the base station to the cellular receiver, whereby the data path has a bandwidth greater than the predetermined bandwidth of any one of said individual channels.

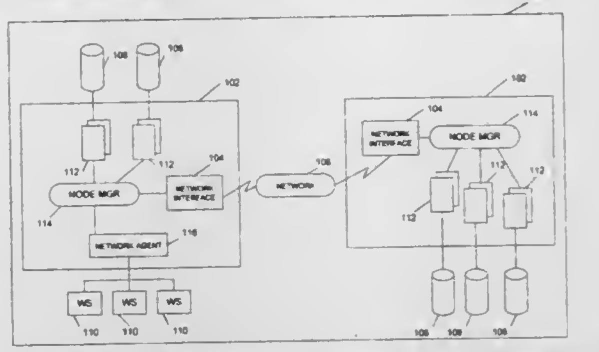
5,841,972
SYSTEM USING DISPLAYED CONFIGURATION UTILITY ON MONITOR INCLUDING LIST OF TARGET NODES, FOR ADMINISTERING INTERCONNECTED NODES OF COMPUTER NETWORK

Stephen R. Fanshier, San Diego, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Jan. 3, 1997, Ser. No. 778,495

Int. Cl.⁶ G06F *13/00*

U.S. Cl. 395—200.5 **36 Claims**



1. A method for administering a computer network of interconnected nodes, comprising the steps of:
- (a) displaying a configuration utility on a monitor attached to a computer connected to the network, wherein the displayed configuration utility includes a list of one or more target nodes in the network;
- (b) receiving data into the displayed configuration utility for selecting one or more of the target nodes in the network and for specifying one or more configurable elements on the selected target nodes; and
- (c) modifying the specified configurable elements on the selected target nodes in accordance with the received data.

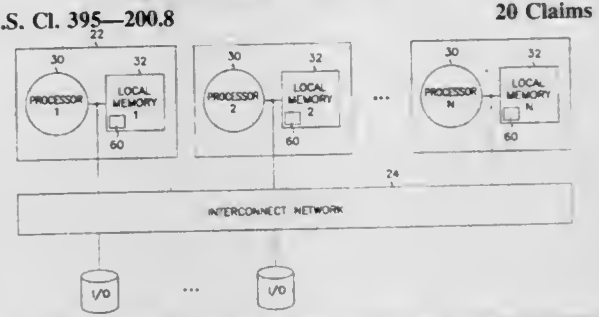
5,841,973
MESSAGING IN DISTRIBUTED MEMORY MULTIPROCESSING SYSTEM HAVING SHELL CIRCUITRY FOR ATOMIC CONTROL OF MESSAGE STORAGE QUEUE'S TAIL POINTER STRUCTURE IN LOCAL MEMORY

Richard E. Kessler, Eau Claire; Steven M. Oberiin, Chippewa Falls, and Steven L. Scott, Eau Claire, all of Wis., assignors to Cray Research, Inc., Eagan, Minn.

Filed Mar. 13, 1996, Ser. No. 615,694

Int. Cl.⁶ G06F *13/38;15/16;15/173*

U.S. Cl. 395—200.8 **20 Claims**



1. A messaging facility in a multiprocessor computer system having a plurality of processing elements interconnected by an interconnect network, each processing element including a processor and a local memory, wherein globally addressable portions of local memory of each processing element form a distributed memory, the messaging facility comprising:
- assembly means in a source processing element for assembling a message to be sent from the source processing element to a destination processing element based on information provided from the source processing element's processor;

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a network router for transmitting the assembled message from the source processing element to the destination processing element via the interconnect network;

a message queue in the local memory of the destination processing element for storing the transmitted message, wherein a control word stored in the local memory of the destination processing element includes a limit field designating a size of the message queue and a tail field designating an index into the corresponding message queue to indicate a first location in the message queue where the transmitted message is to be stored; and

shell circuitry in the destination processing element for atomically reading the tail field to determine where to store the transmitted message and updating the tail field to point to a second location in the message queue where a next transmitted message is to be stored.

5,841,974

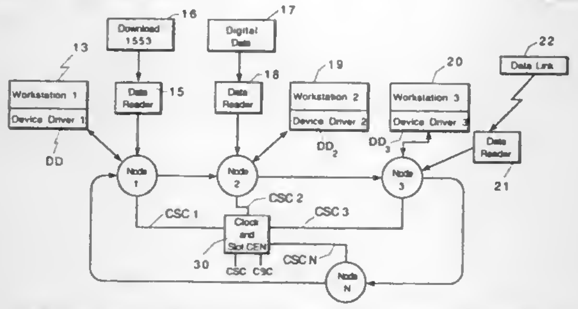
ULTRA HIGH SPEED DATA COLLECTION, PROCESSING AND DISTRIUBTION RING WITH PARALLEL DATA PATHS BETWEEN NODES

Norris Krone, Annandale; Roger Pierson, Castleton, both of Va.; Glenn Connor, Laurel, and Virgil Davis, Fulton, both of Md., assignors to University Research Foundation, Inc., Greenbelt, Md.

Division of Ser. No. 42,273, Apr. 2, 1993, Pat. No. 5,502,817. This application Mar. 18, 1996, Ser. No. 617,051

Int. Cl.^{6} G06F *13/38;* **H04J** *3/02*

U.S. Cl. 395—200.31 **4 Claims**



1. A high speed data linking system for coupling a plurality of digital data sources and data processors, comprising:

a plurality (N) of nodes, one for each of said digital data sources and digital data processors, respectively,

a plurality of parallel ring data path segments connecting said plurality of nodes in a limitless ring, said parallel ring data path segments having input and output ends,

each of said plurality of nodes including:

an input connector means connected to the output end of the one of said plurality of parallel data path segments preceding said node,

a multiplexer means having parallel input and outputs,

a plurality of node parallel data paths connected between said input connector and said multiplexer,

signal processor means connected to said parallel ring data path segments, said data processor having parallel outputs,

a second plurality of node parallel data paths connecting said parallel outputs of said signal processor to said multiplexer,

an output connector,

a third plurality of node parallel data paths connecting said multiplexer parallel outputs to said output connector,

said output connector being connected to the input end next succeeding plurality of parallel ring data paths segments succeeding said node,

a common source of clock signals having a frequency (F) commonly connected to all said plurality of nodes and means for generating a slot signal for each node which is a function of the clock frequency (F) divided by the number of nodes N.

5,841,975

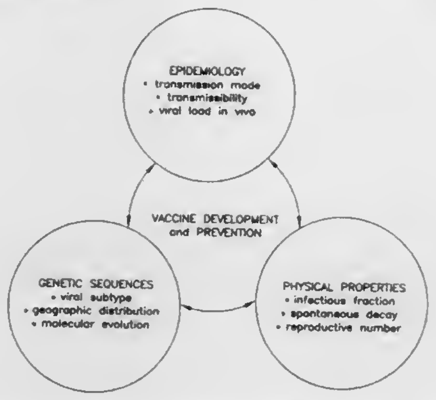
METHOD AND APPARATUS FOR GLOBALLY-ACCESSIBLE AUTOMATED TESTING

Scott P. Layne, Los Angeles, Calif., and Tony J. Beugelsdijk, Los Alamos, N. Mex., assignors to The Regents of the University of California, Oakland, Calif.

Filed Dec. 10, 1996, Ser. No. 764,719

Int. Cl.^{6} H04N *1/413*

U.S. Cl. 395—200.33 **39 Claims**



1. A method of sharing integrated testing services with at least one autonomous remote client, comprising the steps of:

receiving an access request message from the remote client in a process controller via a communications link, the process controller communicatively coupled to a sharable automated test instrument suite;

transmitting an access enabling message from the process controller to the remote client via the communications link when the remote client is authorized to access the integrated testing services, the access enabling message having a process control toolset including instructions perfomable by the remote client to generate a test command message, the test instrument suite including an operation process control toolset;

receiving a test command message from the remote client in the process controller via the communications link, the test command message comprising a process controller command;

transforming the process controller command into at least one automated test instrument suite command, and wherein the automated test instrument suite command permits for a selection, by the remote client, of different test protocols with the process control toolset;

providing the automated test instrument suite command to the automated test instrument suite to obtain remote testing data results;

compiling the remote testing data results; and

transmitting the compiled remote testing data results to the remote client.

5,841,976

METHOD AND APPARATUS FOR SUPPORTING MULTIPOINT COMMUNICATIONS IN A PROTOCOL-INDEPENDENT MANNER

Tsung-Yuan Charles Tai, Portland, and David B. Andersen, Hillsboro, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Mar. 29, 1996, Ser. No. 625,799

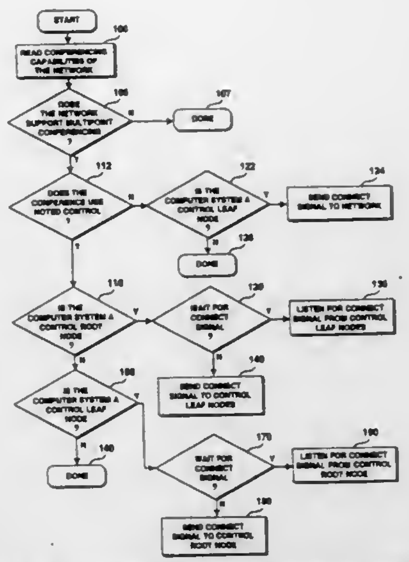
Int. Cl.^{6} G06F *11/00*

U.S. Cl. 395—200.34 **29 Claims**

1. A computer-readable medium having stored thereon a plurality of instructions which, when executed by a processor in a computer system, cause the processor to perform the steps of:

determining whether a network for a conference supports rooted control and rooted data;

if the network supports rooted control, determining whether the computer system is a control root node based on an input entry;


START
READ CONFERENCING CAPABILITIES OF THE NETWORK
DOES THE NETWORK SUPPORT MULTIPOINT CONFERENCING ?
DONE
107
DOES THE CONFERENCE USE ROOTED CONTROL ?
112
IS THE COMPUTER SYSTEM A CONTROL LEAF NODE ?
122
SEND CONNECT SIGNAL TO NETWORK
124
DONE
IS THE COMPUTER SYSTEM A CONTROL ROOT NODE ?
WAIT FOR CONNECT SIGNAL ?
LISTEN FOR CONNECT SIGNAL FROM CONTROL LEAF NODES
SEND CONNECT SIGNAL TO CONTROL LEAF NODES
IS THE COMPUTER SYSTEM A CONTROL LEAF NODE ?
DONE
WAIT FOR CONNECT SIGNAL ?
170
LISTEN FOR CONNECT SIGNAL FROM CONTROL ROOT NODE
SEND CONNECT SIGNAL TO CONTROL ROOT NODE

responding to a condition where the network supports rooted control and the computer system is a control root node by:

waiting for a connect signal requesting a connection to the conference from a control leaf node of a plurality of control leaf nodes to the control root node while the control root node is to wait for the connect signal, a receipt by the control root node of the connect signal causing the control leaf node to join the conference; and

sending the connect signal to the control leaf node when the control root node is not to wait for the connect signal, the receipt by the control leaf node of the connect signal causing the control leaf node to join the conference;

wherein the connect signal is sent from the control root node and from the control leaf node using a function for joining nodes with arguments identifying the control leaf node and the control root node.

5,841,977

COMPUTER-BASED CONFERENCING SYSTEM WITH LOCAL OPERATION FUNCTION

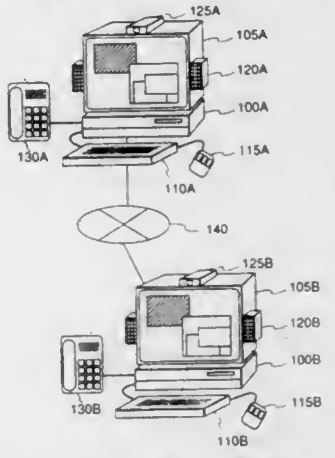
Takeshi Ishizaki; Yoshiyuki Nakayama, both of Kawasaki; Toshimitsu Hayashi, Hadano; Yoshinobu Tanigawa, Osaka; Minoru Koizumi, and Masami Kameda, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 22, 1996, Ser. No. 701,595

Claims priority, application Japan, Aug. 24, 1995, 7-216109

Int. Cl.^{6} H04L *12/26;* **H04Q** *11/04*

U.S. Cl. 395—200.34 **34 Claims**



1. A joint work support system, comprising:

a plurality of terminals mutually connected to one another through a network, each terminal including:

first data communication means for mutually communicating video data and audio data existing on the terminal with at least one of the other terminals, and

operation means, for performing operations to support joint work in both a joint work state, when the terminal is connected to another terminal through the network, and a local state, when the terminal is not connected to another terminal through the network, having a common area provided on at least a part of a screen thereof to be shared with said plurality of terminals during the joint work state and for performing operations to support, in the common area, the joint work between the terminals,

wherein, to operate in the local state, each of the terminals further includes:

recording data creating means for creating recording data containing at least operation data among the operation data, video data existing on said terminal and audio data existing on the terminal, said operation data comprising data corresponding to an operation performed by said operating means and time information representing the time when the operation is performed;

second data communication means for transmitting the created recording data to other terminals and receiving recording data which are created and transmitted by the other terminals; and

reproduction means for reproducing the recording data received by said second data communication means in accordance with the time information contained in the recording data.

5,841,978

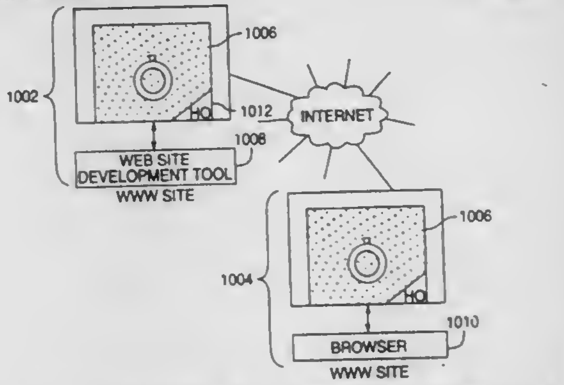
NETWORK LINKING METHOD USING STEGANOGRAPHICALLY EMBEDDED DATA OBJECTS

Geoffrey B. Rhoads, West Linn, Oreg., assignor to Digimarc Corporation, Portland, Oreg.

Continuation-in-part of Ser. No. 436,098, May 8, 1995, Pat. No. 5,636,292, and a continuation-in-part of Ser. No. 436,099, May 8, 1995, Pat. No. 5,710,834, Ser. No. 436,134, May 8, 1995, Ser. No. 438,159, May 8, 1995, Ser. No. 215,289, Mar. 17, 1994, abandoned, and Ser. No. 327,426, Oct. 21, 1994, which is a continuation-in-part of Ser. No. 154,866, Nov. 18, 1993, abandoned. This application Jul. 27, 1995, Ser. No. 508,083

Int. Cl.^{6} G06F *13/00;* **H04L** *9/00*

U.S. Cl. 395—200.47 **13 Claims**



1. A method of initiating access from a first computer to a second computer via a data communications medium; the method comprising:

creating a data object with information indicative of an address associated with the second computer;

steganographically embedding the data object in a content file comprising at least one of audio and visual data;

on the first computer, reading the content file;

decoding therefrom the steganographically embedded data object; and

initiating a link to the second computer using the address in the decoded data object.

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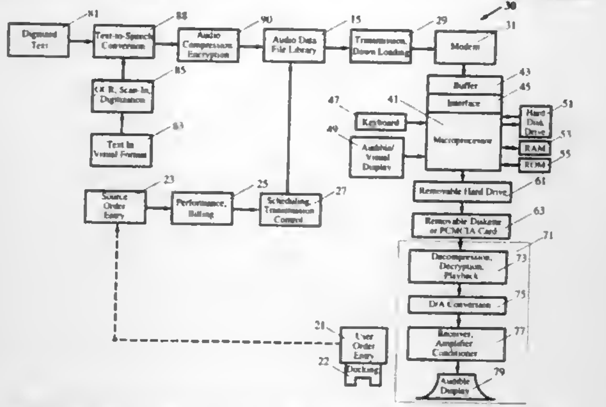
5,841,979
ENHANCED DELIVERY OF AUDIO DATA

Nathan Schulhof, Los Gatos; James M. Janky, Los Altos, and Grant Jasmin, Sunnyvale, all of Calif., assignors to Information Highway Media Corp., Cupertino, Calif.

Continuation-in-part of Ser. No. 450,818, May 25, 1995. This application May 7, 1996, Ser. No. 643,963

Int. Cl.^{6} G11B *20/10;* **H04M** *11/00*

U.S. Cl. 395—200.67 **52 Claims**



10. Audio information storage and playback apparatus comprising:

a universal data interface to receive a text data file as part of an incoming signal, in digitized and compressed format, and to provide automatic text data format recognition information for this text data file;

a microprocessor, programmed to receive and use the text data format recognition information to implement a correct communications protocol to receive and extract the text data file from the incoming signal, where the text data file is received by the microprocessor at a transfer rate that is at least two times the transfer rate for normal, audibly perceptible playback of information contained in the text data file;

diskette recording means, connected to the microprocessor, for receiving a removable diskette, for receiving the text data file extracted by the microprocessor, and for recording this text data file in a compressed format on the removable diskette;

text-to-speech conversion means for receiving the removable diskette upon which at least one text data file is recorded and for converting a text data file to an output signal that is in audio format;

playback means for receiving the text-to-speech conversion means output signal and for selecting and decompressing at least one selected data file recorded on this diskette; and

audio output and conditioning means, connected to the playback means, for selecting and retrieving a selected text data file and for reproducing the selected text data file in audibly perceptible form for playback at a real time delivery rate.

5,841,980
DISTRIBUTED SYSTEM FOR COMMUNICATION NETWORKS IN MULTI-USER APPLICATIONS

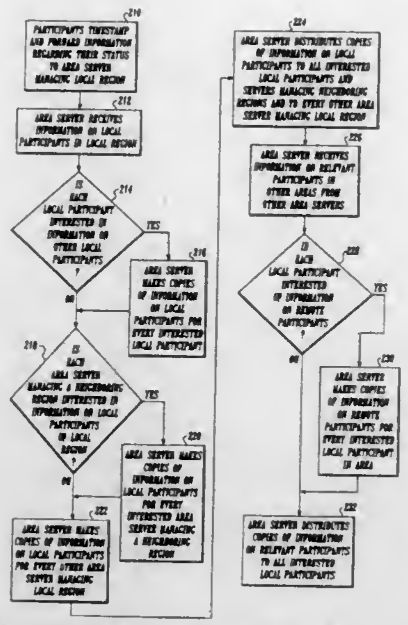
Rolland M. Waters, Seattle, and John Allred, Bellevue, both of Wash., assignors to RTime, Inc., Seattle, Wash.

Filed May 15, 1996, Ser. No. 648,839

Int. Cl.^{6} G06F *13/38;15/17*

U.S. Cl. 395—200.34 **54 Claims**

1. In a distributed system comprising a plurality of servers interconnected by a network backbone, each server hosting at least one local client, and each local client having at least one local participant, a method for allowing a plurality of participants to participate in a multi-user application, the multi-user application including a distributed global application environment comprising a plurality of local application environments, each local application environment residing on an associated server, each local application environment comprising a plurality of parameters relating to a local participant, the method for each server comprising:


210
PARTICIPANTS TIMESTAMP AND FORWARD INFORMATION REGARDING THEIR STATUS TO AREA SERVER MANAGING LOCAL REGION
212
AREA SERVER RECEIVES INFORMATION ON LOCAL PARTICIPANTS IN LOCAL REGION
214
IS EACH LOCAL PARTICIPANT INTERESTED IN INFORMATION ON OTHER LOCAL PARTICIPANTS ?
YES
NO
216
AREA SERVER MAKES COPIES OF INFORMATION ON LOCAL PARTICIPANTS FOR EVERY INTERESTED LOCAL PARTICIPANT
218
IS EACH AREA SERVER MANAGING A NEIGHBORING REGION INTERESTED IN INFORMATION ON LOCAL PARTICIPANTS IN LOCAL REGION ?
YES
NO
220
AREA SERVER MAKES COPIES OF INFORMATION ON LOCAL PARTICIPANTS FOR EVERY INTERESTED AREA SERVER MANAGING A NEIGHBORING REGION
222
AREA SERVER MAKES COPIES OF INFORMATION ON LOCAL PARTICIPANTS FOR EVERY OTHER AREA SERVER MANAGING LOCAL REGION
224
AREA SERVER DISTRIBUTES COPIES OF INFORMATION ON LOCAL PARTICIPANTS TO ALL INTERESTED LOCAL PARTICIPANTS AND SERVERS MANAGING NEIGHBORING REGIONS AND TO EVERY OTHER AREA SERVER MANAGING LOCAL REGION
226
AREA SERVER RECEIVES INFORMATION ON RELEVANT PARTICIPANTS IN OTHER AREAS FROM OTHER AREA SERVERS
228
IS EACH LOCAL PARTICIPANT INTERESTED IN INFORMATION ON REMOTE PARTICIPANTS ?
YES
NO
230
AREA SERVER MAKES COPIES OF INFORMATION ON REMOTE PARTICIPANTS FOR EVERY INTERESTED LOCAL PARTICIPANT IN AREA
232
AREA SERVER DISTRIBUTES COPIES OF INFORMATION ON RELEVANT PARTICIPANTS TO ALL INTERESTED LOCAL PARTICIPANTS

(a) receiving local participant information from a local client regarding a local participant, the local participant information comprising a change in a parameter of the local application environment;

(b) evaluating the local participant information based on relevance of the parameter to other local participants to determine the number and identity of local participants interested in the local participant information;

(c) copying the local participant information for every local participant interested in the information;

(d) copying the local participant information for every other server in the distributed system;

(e) distributing by the local server a copy of the local participant information to every local participant interested in the information; wherein distribution of the local participant information is restricted to local participants interested in the local participant information; and

(f) distributing by the local server a copy of the local participant information to every other server in the distributed system, but not distributing by the local server a copy of the local participant information to any remote participant to thereby reduce the number of copies of local participant information being distributed to participants.

5,841,981
NETWORK MANAGEMENT SYSTEM DISPLAYING STATIC DEPENDENT RELATION INFORMATION

Mariko Kondo, Yokohama, Japan, assignor to Hitachi Software Engineering Co., Ltd., Kanagawa, Japan

Filed Sep. 27, 1996, Ser. No. 722,774

Claims priority, application Japan, Sep. 28, 1995, 7-251065; Jun. 28, 1996, 8-169834

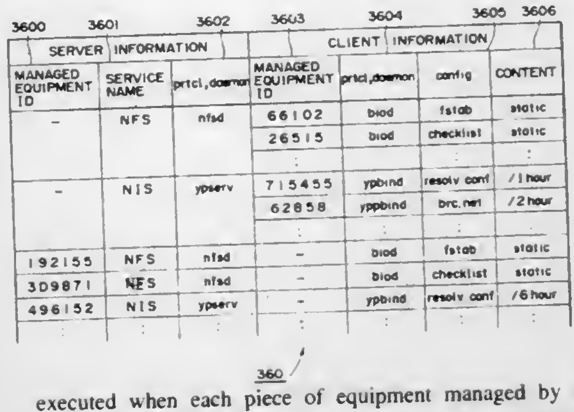
Int. Cl.^{6} G06F *15/177*

U.S. Cl. 395—200.53 **8 Claims**

1. A network management system for managing and operating a network in which a plurality of pieces of network equipment including computers are interconnected, the network management system comprising:

a first data base containing information about a physical disposition of said network equipment;

a second data base containing information about a logical and static connection relation of said network equipment, said information including a file name of a start file which is


3600
3601
3602
3603
3604
3605
3606
360

SERVER INFORMATION			CLIENT INFORMATION			
MANAGED EQUIPMENT ID	SERVICE NAME	prtcl,daemon	MANAGED EQUIPMENT ID	prtcl,daemon	config	CONTENT
–	NFS	nfsd	66102	biod	fstab	static
			26515	biod	checklist	static
			:		:	:
–	NIS	ypserv	715455	ypbind	resolv conf	/1 hour
			62858	yppbind	brc.net	/2 hour
			:	:	:	
192155	NFS	nfsd	–	biod	fstab	static
309871	NFS	nfsd	–	biod	checklist	static
496152	NIS	ypserv	–	ypbind	resolv conf	/6 hour
:	:	:	:	:	:	:

executed when each piece of equipment managed by the network management system is started, various kinds of pieces of network service start information described in the respective start files, and set information described in configuration files about each network service;

a display unit for displaying various kinds of pieces of information about the network and a network form drawing; and

first processing means for displaying, on said display unit, a static dependent relation between pieces of network equipment and strength of dependence in said computer network, together with said network form drawing, based on the information stored in said first and second data bases.

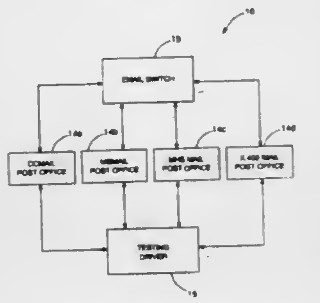
5,841,982
METHOD AND SYSTEM FOR TESTING THE OPERATION OF AN ELECTRONIC MAIL SWITCH

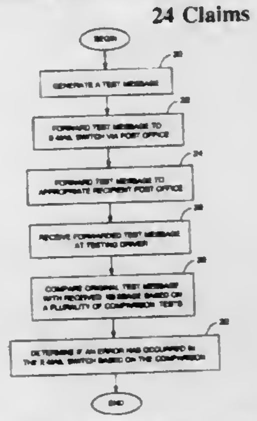
Derek J. Brouwer, 542 West Arrowhead St., Louisville, Colo. 80027-1623; Neal Gordon Staats, 1625 Larimer #1203, Denver, Colo. 80202, and David Allen Knox, 6940 Lakeview Point Dr., Longmont, Colo. 80503

Filed Jun. 17, 1996, Ser. No. 665,228

Int. Cl.^{6} H04M *1/24;3/08;* **G06F** *11/00*

U.S. Cl. 395—200.54 **24 Claims**




BEGIN
GENERATE A TEST MESSAGE
FORWARD TEST MESSAGE TO E-MAIL SWITCH VIA POST OFFICE
FORWARD TEST MESSAGE TO APPROPRIATE RECIPIENT POST OFFICE
RECEIVE FORWARDED TEST MESSAGE AT TESTING DRIVER
COMPARE ORIGINAL TEST MESSAGE WITH RECEIVED MESSAGE BASED ON A PLURALITY OF COMPARISON TESTS
DETERMINE IF AN ERROR HAS OCCURRED IN THE E-MAIL SWITCH BASED ON THE COMPARISON
END

13. A system for testing the operation of an electronic mail switch that supports interaction between different electronic mail applications each having different formats comprising:

means for generating a test message having a first format;

means for forwarding the test message to the electronic mail switch to generate a received message having a second format;

means for comparing the test message with the received message based on a plurality of comparison tests; and

means for determining if there is an error in the operation of the electronic mail switch based on the comparison.

5,841,983
COMMUNICATION SYSTEM FOR TRANSMITTING DIVISIONAL MESSAGES BACK-TO-BACK BY PRESETTING BLANK DURATION BETWEEN THE DIVISONAL MESSAGES PRIOR TO TRANSMISSION

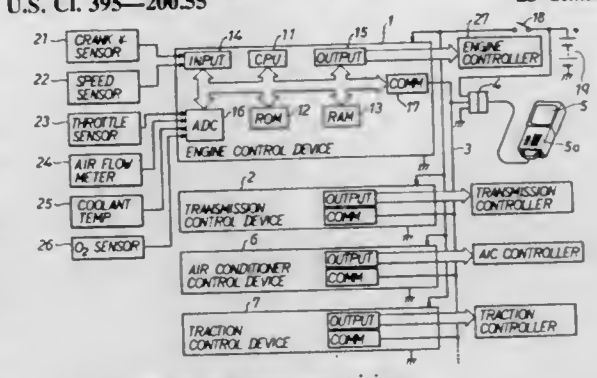
Katsumi Takaba, Obu; Masahito Hyodo, Anjou, and Takahide Abe, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 3, 1996, Ser. No. 582,429

Claims priority, application Japan, Jan. 18, 1995, 7-005416; Feb. 16, 1995, 7-028255; Oct. 12, 1995, 7-264391

Int. Cl.^{6} H04J *3/14*

U.S. Cl. 395—200.55 **23 Claims**



1. A communication system comprising:

a communication line;

a master device for transmitting via said communication line a request message to request that a predetermined processing be performed;

a plurality of slave devices, connected to said master device by said communication line, for, responsive to receipt of said request message via said communication line, transmitting via said communication line answer messages which are in an order corresponding to descending priorities of said slave devices;

wherein said slave devices transmit answer messages in such a manner that a communication blank duration on said communication line between an answer message from a given one of said slave devices and an answer message from a slave device having a priority immediately lower than a priority of said given one of said slave devices is a first predetermined length of time; and

at least one of said slave devices divides an answer message into a plurality of divisional answer messages if said answer message includes more than said predetermined amount of data, and sets said communication blank duration between said divisional answer messages before transmitting said divisional answer messages in such a manner that said communication blank duration between said divisional answer messages is a second predetermined length of time that is less than said first predetermined length of time, and then transmits said divisional answer messages.

5,841,984
METHOD OF ASSIGNING TRANSACTION IDENTIFIERS AND SYSTEM FOR IMPLEMENTING THE METHOD

Souheil Marine, Paris; Pierre Arnaud, Marcoussis; Benoit Paul-Dubois-Taine, Bourg la Reine, and Louis Bouveret, Paris, all of France, assignors to Alcatel Cit, Paris, France

Filed Jun. 24, 1996, Ser. No. 667,933

Claims priority, application France, Jun. 23, 1995, 95 07576

Int. Cl.^{6} G06F *17/00*

U.S. Cl. 395—200.56 **8 Claims**

1. Method of assigning a unique identifier to each transaction in a device including a non-volatile memory and a plurality of stations, each station executing a plurality of application processes; all the stations and the non-volatile memory being connected by a communication network assuring the integrity of communications; which method consists in:

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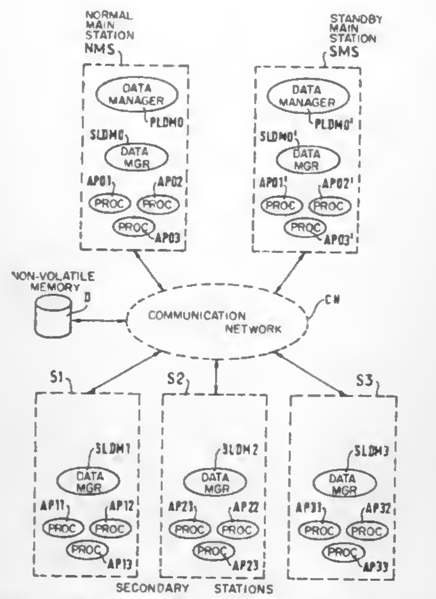
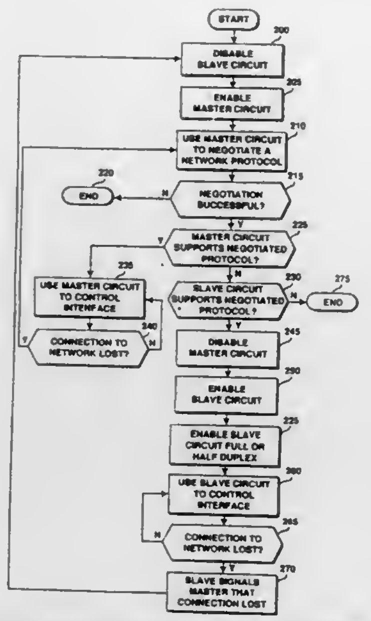


determining a first field of said identifier, having:
either a temporary value identifiable as such and unique to the set of stations, if opening of the transaction is requested during a first initialization phase;
or a value assigned by a first data manager process common to all the stations if the opening is requested after said first initialization phase; said first manager process further implementing a transaction recovery protocol known in itself;
determining a second field having:
either a temporary value identifiable as such and unique to the station executing the requesting application process that requested the opening of the transaction if the opening is requested during a second initialization phase;
or a value assigned by a second data manager process, said second data manager process being specific to the station that is executing the requesting process, if the opening of the transaction is requested after said second initialization phase;
determining a third field by incrementing by one unit a counter value specific to said requesting process;
wherein said value assigned by said first manager process is the result of incrementing by one unit a first counter value specific to said first manager process and backed up in said non-volatile memory, said counter value being restored after each failure of the station executing said first manager process;
wherein said value assigned by said second manager process is the result of incrementing by one unit a second counter value specific to said manager process;
wherein said first initialization phase is completed for a given second manager process when it has set up a link with said first manager process; and
wherein said second initialization phase is completed for a given application process when it has set up a link with said second manager process specific to the station in which said application process is executed.

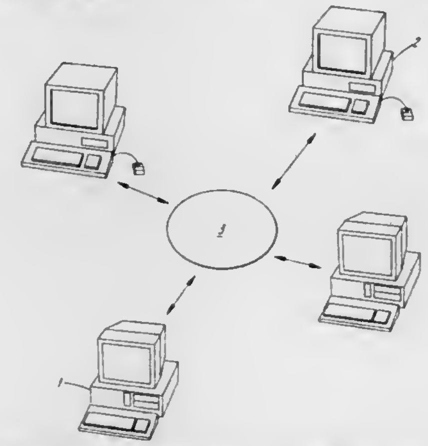
5,841,985
METHOD AND APPARATUS FOR SUPPORTING MULTIPLE PROTOCOLS ON A NETWORK
Ni Jie, Beaverton, and David Chalupsky, Banks, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.
Filed Sep. 18, 1996, Ser. No. 715,651
Int. Cl.⁶ H04J *3/22*
U.S. Cl. 395—200.57 **16 Claims**

6. A method of controlling a network interface, the method comprising the steps of:


START
200
DISABLE SLAVE CIRCUIT
205
ENABLE MASTER CIRCUIT
210
USE MASTER CIRCUIT TO NEGOTIATE A NETWORK PROTOCOL
215
END
220
N
NEGOTIATION SUCCESSFUL?
Y
MASTER CIRCUIT SUPPORTS NEGOTIATED PROTOCOL?
225
USE MASTER CIRCUIT TO CONTROL INTERFACE
235
SLAVE CIRCUIT SUPPORTS NEGOTIATED PROTOCOL?
230
END
275
CONNECTION TO NETWORK LOST?
240
DISABLE MASTER CIRCUIT
245
ENABLE SLAVE CIRCUIT
250
ENABLE SLAVE CIRCUIT FULL OR HALF DUPLEX
255
USE SLAVE CIRCUIT TO CONTROL INTERFACE
260
CONNECTION TO NETWORK LOST?
265
SLAVE SIGNALS MASTER THAT CONNECTION LOST
270

determining a negotiated network protocol from one of a plurality of supported network protocols using a first circuit, the first circuit supporting a first protocol of the plurality of supported network protocols;
using the first circuit to control the network interface, when the negotiated protocol is the first protocol;
controlling the network interface with a second circuit and disabling the first circuit when the negotiated protocol is a second protocol of the plurality of supported network protocols, the second circuit supporting the second protocol;
disabling the second circuit when the first circuit controls the network interface and while the first circuit determines the negotiated protocol; and
using the first circuit to take control of the network interface from the second circuit when the second circuit signals the first circuit that reliable communication with the network has been lost.

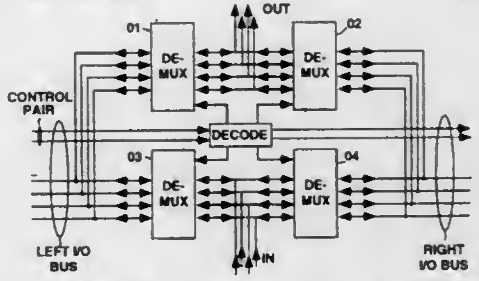
5,841,986
METHOD FOR THE TRANSMISSION OF BINARY ASYNCHRONOUS DATA VIA A SYNCHRONOUS CHANNEL
Roland Scherwey, Tentlingen, Switzerland, assignor to Asea Brown Boveri AG, Baden, Switzerland
Filed Sep. 5, 1996, Ser. No. 707,601
Claims priority, application Germany, Nov. 16, 1995, 195 42 715.7
Int. Cl.⁶ G06F *3/00*
U.S. Cl. 395—200.66 **10 Claims**



1. A method for the transmission of binary asynchronous data from a transmitter via a synchronous channel to a receiver, said binary asynchronous data comprising at least one data word with a data word length of N bits, said at least one data word being enclosed by start and stop bits, extracted from said binary asynchronous data, encoded and transmitted by the transmitter and received and decoded by the receiver, wherein said encoding and decoding are controlled by means of control words which are also transmitted between the transmitter and receiver, comprising the steps of:

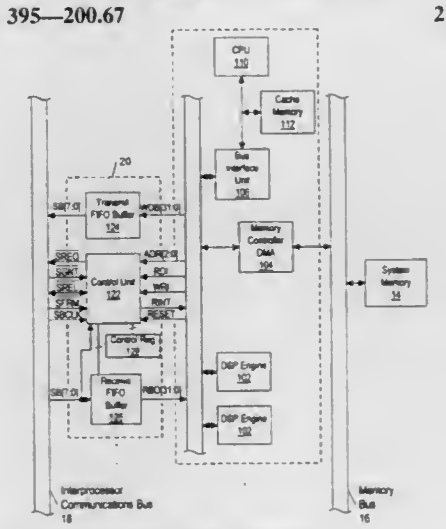
during said encoding in the transmitter, splitting said at least one data word between a plurality of frame words of a frame having a frame width of M bits and a frame length of N frame words, wherein an MSB bit of said plurality of frame words is used to distinguish the frame words from the control words;
transmitting said frame and a transmission count value, said transmission count value being determined by a transmission counter in the encoder, and corresponding to a number of transmitted frame words;
receiving in said receiver said transmitted frame and determining a reception count value which corresponds to the number of received frame words and periodically matching the reception count value to the transmission count value.

5,841,987
SIMPLE BUS AND INTERFACE SYSTEM FOR CONSUMER DIGITAL EQUIPMENT
Harold Blatter, Indianapolis; William Wesley Beyers, Jr., Greenfield, and Michael Scott Deiss, Zionsville, all of Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.
PCT No. PCT/US96/07391, § 371 Date Nov. 24, 1997, § 102(e) Date Nov. 24, 1997, PCT Pub. No. WO97/00579, PCT Pub. Date Jan. 3, 1997
Continuation-in-part of Ser. No. 292,908, Aug. 19, 1994. This PCT application May 23, 1996, Ser. No. 973,732
Claims priority, application United Kingdom, Jun. 14, 1995, 9512068
Int. Cl.⁶ G06F *16/153*
U.S. Cl. 395—200.66 **18 Claims**



1. An apparatus (**100**) for controllably coupling a source (**98**) of a packetized signal (SP) to a data bus (**501**), said apparatus comprising:
an indicia generator (**405**) controllably coupled to said source (**98**) and receiving therefrom said packetized signal (SP);
a switching matrix (**101**) controlled responsive to said indicia generator (**405**) for receiving therefrom said packetized signal (SP) for coupling to said data bus (**501**), and,
responsive to said controllable coupling from said source (**98**) said indicia generator (**405**) adds an indicia (Vs) to said packetized signal (SP) and enables said switching matrix (**101**) for coupling said packetized signal (SP) and indicia (Vs) to said data bus (**501**).

5,841,988
INTERPROCESSOR COMMUNICATIONS DATA TRANSFER AND ERROR DETECTION IN A MULTIPROCESSING ENVIRONMENT
Geeta Chennubhotla, and Ron E. Hinchley, both of San Jose, Calif., assignors to LSI Logic Corporation, Milpitas, Calif.
Filed May 23, 1996, Ser. No. 652,421
Int. Cl.⁶ G06F *13/14;13/48;13/42*
U.S. Cl. 395—200.67 **22 Claims**



1. A processing system which comprises:
a first processing subsystem configured to perform a first portion of a task;
a second processing subsystem configured to perform a second portion of the task;
an interprocessor communications subsystem coupled between the first and second processing subsystems to transport information in the form of transfer packets, wherein the transfer packets comprise a target field, a size field, and a data field, and wherein the interprocessor communications subsystem includes:
an interprocessor communications bus;
a first interface coupled between the interprocessor communications bus and the first processing subsystem;
a second interface coupled between the interprocessor communications bus and the second processing subsystem, wherein both first and second interfaces are each configured to send and receive transfer packets, wherein each interface comprises:
a transmit buffer coupled to receive transfer packets from a processing subsystem for transmission on the interprocessor communications bus;
a receive buffer coupled to receive transfer packets from the interprocessor communications bus;
a control unit coupled to a respective processing subsystem, the transmit buffer, the receive buffer, and the interprocessor communications bus, and configured to orchestrate receipt and transmission of transfer packets between the respective processing subsystem and the interprocessor communications bus;
wherein when the control unit does not have bus ownership, the control unit is configured to monitor transfer packets received on the interprocessor communications bus,
wherein the control unit is configured to determine if the target field of received transfer packets corresponds to a predetermined interface address, wherein if the target field of received transfer packets corresponds to the predetermined address, the control unit is configured to compare the size field to available receive buffer space to determine if sufficient space exists in the receive buffer for storing the received transfer packets.

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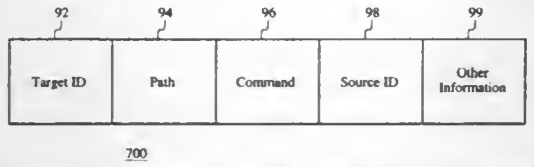
5,841,989
SYSTEM AND METHOD FOR EFFICIENTLY ROUTING DATA PACKETS IN A COMPUTER INTERCONNECT

David V. James, Palo Alto, and Glen D. Stone, San Jose, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Apr. 8, 1996, Ser. No. 631,634

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—200.69 **13 Claims**



1. A system for efficiently routing data packets, each of the data packets including data information, the system comprising:
  a plurality of nodes forming a ringlet; at least one of the plurality of nodes including an optional data path forming a faster path between a first run and a second run in the ringlet for faster transmission of the data packets within the ringlet, and at least one of the plurality of nodes having a scrubber capable of being activated for responding to the data information of the data packets passing therethrough; and
  means responsive to the data information within the one of the data packets and the location of the faster paths for reducing the length of the path traversed by the data packet within the ringlet.

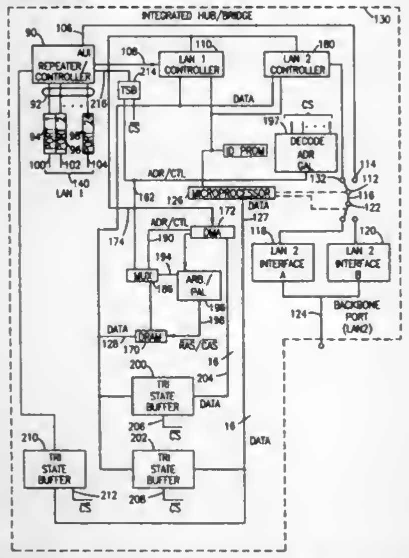
5,841,990
NETWORK CONNECTOR OPERABLE IN BRIDGE MODE AND BYPASS MODE

Jose J. Picazo, Jr., San Jose; Paul Kakul Lee, Union City, and Robert P. Zager, San Jose, all of Calif., assignors to Compaq Computer Corp., Houston, Tex.

Division of Ser. No. 498,116, Jul. 5, 1995, Pat. No. 5,742,760, which is a continuation-in-part of Ser. No. 881,931, May 12, 1992, Pat. No. 5,432,907. This application Dec. 4, 1996, Ser. No. 760,302

Int. Cl.^{6} H04J *3/02*

U.S. Cl. 395—200.79 **4 Claims**



1. A system for connecting a first network and a second network, said system comprising:
  a bridge; and
  a bridge bypass, the operation of which unifies said first network and said second network.

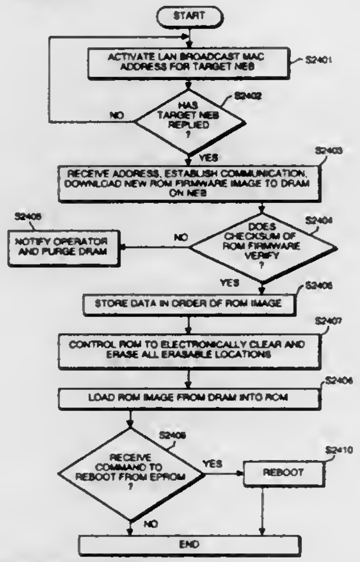
5,841,991
IN AN INTERACTIVE NETWORK BOARD, A METHOD AND APPARATUS FOR STORING A MEDIA ACCESS CONTROL ADDRESS IN A REMOTELY ALTERABLE MEMORY

William C. Russell, Laguna Hills, Calif., assignor to Canon Information Systems, Inc., Irvine, Calif.

Filed Nov. 18, 1992, Ser. No. 978,435

Int. Cl.^{6} G06F *13/16;15/177*

U.S. Cl. 395—200.51 **26 Claims**


START
ACTIVATE LAN BROADCAST MAC ADDRESS FOR TARGET NEB
S2401
HAS TARGET NEB REPLIED ?
S2402
NO
YES
RECEIVE ADDRESS, ESTABLISH COMMUNICATION, DOWNLOAD NEW ROM FIRMWARE IMAGE TO DRAM ON NEB
S2403
S2405
NOTIFY OPERATOR AND PURGE DRAM
NO
DOES CHECKSUM OF ROM FIRMWARE VERIFY ?
S2404
YES
S2406
STORE DATA IN ORDER OF ROM IMAGE
S2407
CONTROL ROM TO ELECTRONICALLY CLEAR AND ERASE ALL ERASABLE LOCATIONS
S2408
LOAD ROM IMAGE FROM DRAM INTO ROM
S2409
RECEIVE COMMAND TO REBOOT FROM EPROM ?
YES
REBOOT
S2410
NO
END

1. A networked device comprising:
  a LAN interface;
  an EPROM for storing a media access control (MAC) address for the networked device as well as operational firmware for the networked device, the operational firmware comprising executable code for operating the networked device and the MAC address comprising non-executable data defining a unique address for the networked device; and
  a processor for processing network communication over said LAN interface in accordance with the operational firmware in said EPROM;
  wherein said processor verifies that network communication is directed to said networked device in accordance with the MAC address in said EPROM.

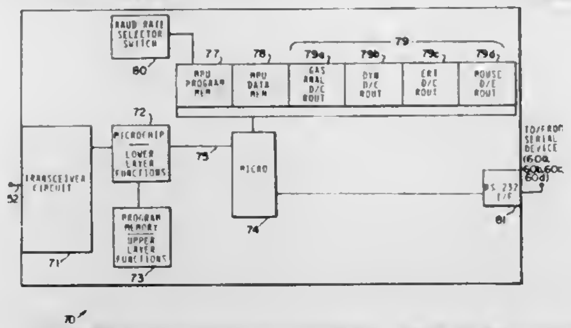
5,841,992
NETWORK-TO-SERIAL DEVICE INTELLIGENT CONVERTER

John Steven Martin, McHenry, Ill., assignor to Snap-On Tools Company, Kenosha, Wis.

Filed Mar. 25, 1996, Ser. No. 621,218

Int. Cl.^{6} C06F *13/38;15/17*

U.S. Cl. 395—200.8 **17 Claims**



1. An intelligent converter programmably adaptable for interfacing a data processing system to a selected one of plural serial devices each responsive to a serial data bit stream of a device-specific data communication format, said data processing system being adapted for coupling to a network for communication with other nodes of the network in accordance with a predefined network communication protocol of the type including user-programmable network function layers and non-programmable network function layers, said converter comprising:
  a network interface circuit for electrically coupling the converter to the data processing system to facilitate data transfer therebetween in a format prescribed by said network protocol;
  a serial device interface for electrically coupling the converter to the selected serial device to facilitate data transfer therebetween in the associated data communication format;
  first processing means coupled to said network interface circuit;
  second processing means coupled to said serial device interface circuit and responsive to signals from said first processing means to facilitate the transfer of data from said first processing means to the serial device in said associated data communication format, via the serial device interface circuit,
  said first processing means including means for ensuring the integrity of data transfers between said selected serial device and said data processing system in accordance with the non-programmable network function layers associated with said network communication protocol;
  program memory means coupled to said first processing means for facilitating the transfer of data in a predetermined user-defined format between said data processing system and said second processing means in accordance with said user-programmable network function layers; and
  a memory device coupled to said second processing means for storing appropriate data format conversion routines respectively corresponding to said plural serial devices to allow the first processing means to selectively interface with the selected serial device.

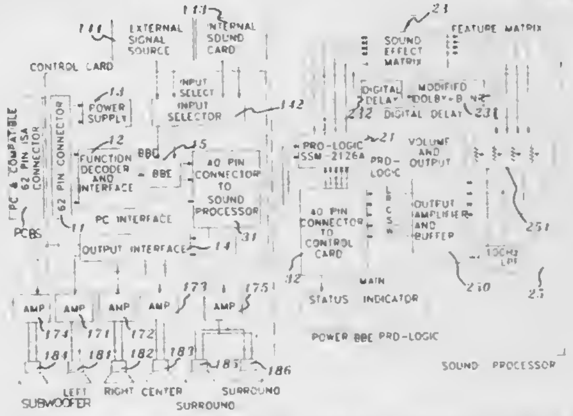
5,841,993
SURROUND SOUND SYSTEM FOR PERSONAL COMPUTER FOR INTERFACING SURROUND SOUND WITH PERSONAL COMPUTER

Lawrence Ho, 11836 Clark St., Arcadia, Calif. 91006

Filed Jan. 2, 1996, Ser. No. 582,114

Int. Cl.^{6} G11B *20/02*

U.S. Cl. 395—282 **19 Claims**



1. A surround sound system for personal computer for interfacing surround sound with personal computer, comprising
  a control card,
  a PC surround decoder for processing a stereo source signal and generating left, center, right, surround and subwoofer signals; and
  a connecting means for electrically connecting said PC surround decoder to said control card; wherein
  said control card is a PC interface card for interfacing to a personal computer and draining a 5 VDC and ±12 VDC power from said personal computer as a power source for both said control card and said PC surround decoder to operate and provide a noise immunity purpose, said control card having an ISA bus connector plugged to a compatible ISA bus slot insides said personal computer, a function decoder and interface means and a power supply means, wherein said function decoder and interface means comprises a programmable logic array for receiving control signals and address signals from said ISA bus connector of said personal computer, said power supply means comprising a predetermined number of regulator to regulate said power source from ±12 VDC into ±8 VDC for both said control card and said PC surround decoder, said control card further comprising a data buffer/driver, a predetermined number of 3-state D-type latches for receiving data signals from said ISA bus connector, an input selector for selecting said source signal, and an address setting means which comprises a quad 2-input exclusive or gate IC for serving as an address decoder, said data buffer/driver and said 3-state D-type latches functioning as a data and control interface circuit between said personal computer and said surround sound system; and
  said control card further comprising a high definition BBE Processor, said input selector comprising a predetermined number of CMOS analog switches functioning as gate to select said source signal, said source signal being fed through said BBE processor, said BBE processor working dynamically by boosting a harmonic content of music programs, as determined by said source signal input, and imparting a linear phase shift across an audio spectrum, thereby said linear phase shift allows for a separation of high, medium and low frequencies so that said frequencies do not arrive to a speaker network at precisely the same time so as to prevent said higher frequencies from being smothered, moreover, as said linear phase shift is minimal, 2 milliseconds, that is not perceived as a delay, said PC surround decoder comprising a Dolby Pro Logic decoder which is an active process designed to enhance sound localization through using of high-separation decoding techniques and is a direct descendant as using in Dolby stereo cinema processors, featuring a center channel output to complement a left, a right and a surround channel.

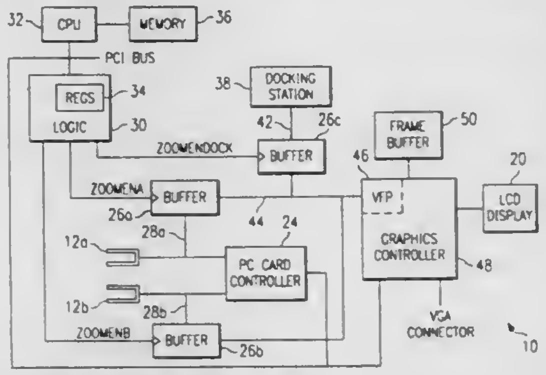
5,841,994
PORTABLE COMPUTER WITH MULTIPLE ZOOM PORT INTERFACE

Shannon C. Boesch, Georgetown, and Randall E. Juenger, Belton, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 14, 1996, Ser. No. 663,957

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—293 **6 Claims**



1. A computer system comprising:
  (a) a host system bus;
  (b) a processor coupled to said host system bus;
  (c) a frame buffer memory;
  (d) a graphics controller having a host port coupled to said host system bus, a feature port, a memory port coupled to said frame buffer memory, and an output port coupled to a display;
  (e) a control logic circuit having a host input coupled to said host system bus, a data storage register, and a plurality of enable outputs;
  (f) a plurality of external device connectors, each having a data lead;

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(g) an external connector control circuit having a device port coupled to the data lead of an external device connector, and a host port coupled to said host system bus; and

(h) a plurality of independent data buffers, each data buffer having an enable input independently coupled to a distinct enable output of said control logic circuit, a data port independently coupled to the feature port of said graphics controller, and a device port independently coupled to the data lead of a particular external device connector.

5,841,995
DATA BUS CONTROLLER HAVING A LEVEL SETTING CIRCUIT

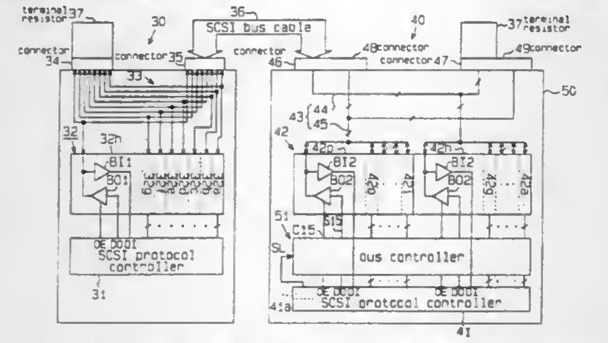
Hitoshi Ogawa, Kasugai, Japan, assignor to Fujitsu Limited, Kawasaki, and Fujitsu VLSI Limited, Kasugai, both of Japan

Continuation of Ser. No. 261,973, Jun. 17, 1994, abandoned. This application Oct. 15, 1996, Ser. No. 730,460

Claims priority, application Japan, Jul. 20, 1993, 5-179396

Int. Cl.^{6} H03K *17/16*

U.S. Cl. 395—309 8 Claims



1. A level setting circuit for setting a terminal at a predetermined voltage level, said level setting circuit comprising:

a data line coupled to said terminal;

an input buffer coupled to said data line;

an output buffer coupled to said data line, said output buffer having a data input receiving an output buffer data input signal and an enable input receiving an output buffer enable signal, the output buffer enable signal for selectively enabling and disabling an output of said output buffer; and

a controller including a first logical gate receiving a select signal and an enable signal and generating the output buffer enable signal and a second logical gate receiving the select signal and a data signal and generating the output buffer data input signal,

wherein the voltage level at said terminal is clamped at the predetermined voltage level when the select signal is active.

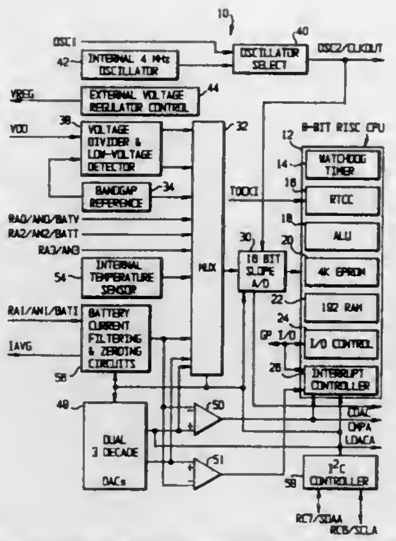
5,841,996
SERIAL COMMUNICATION INTERFACE SYSTEM HAVING PROGRAMMABLE MICROCONTROLLER FOR USE IN A BATTERY PACK

James B. Nolan, Chandler, and Brian Dellacroce, Sedona, both of Ariz., assignors to Microchip Technology Incorporated, Chandler, Ariz.

Filed Oct. 13, 1995, Ser. No. 542,679

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—309 7 Claims



1. A microcontroller for use in a battery pack for battery charging and battery monitoring applications, the battery pack including a connector having a plurality of pins for accommodating a plurality of signals the microcontroller being fabricated on a semiconductor chip to execute programs and instructions and to generate control signals in response to such execution for selectively controlling a battery charging and battery monitoring system, the microcontroller including microprocessor means for executing instructions, program memory means for storing programs to be executed by the microcontroller and data memory means for storing data, the microcontroller further including:

serial program means for normally programming the microcontroller prior to use thereof, said serial program means including

serial interface control means adapted for serial communication among said microprocessor means, said data memory means, and devices peripheral to said microcontroller, and for serially programming the microcontroller when in end-use in the battery pack,

said serial interface control means having a plurality of pins, and being adapted for such end-use programming by having at least some of its plurality of pins coupled to corresponding ones of said plurality of pins of the battery pack connector including

first and second pins for respective first and second bi-directional inputs for transmitting and receiving signals to and from the microcontroller. and further including

a third pin for energization to enable programming the microcontroller via said first and second bidirectional inputs while in said end-use, and precluding said serial communication when programming is taking place, and

wherein said serial interface control means comprises an inter-integrated circuit (I^2C) interface and wherein said first and second bidirectional inputs are used for transmitting a serial data signal and a clock signal, respectively.

5,841,997
APPARATUS FOR EFFECTING PORT SWITCHING OF FIBRE CHANNEL LOOPS

Scott Bleiweiss, Upton, and Brian Gallagher, Marlboro, both of Mass., assignors to EMC Corporation, Hopkinton, Mass.

Filed Sep. 29, 1995, Ser. No. 536,686

Int. Cl.^{6} G06F *1/32*

U.S. Cl. 395—311 7 Claims

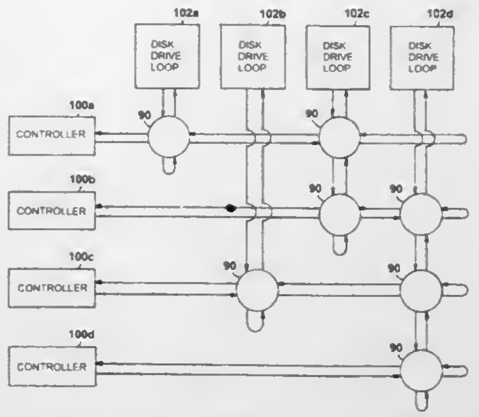
1. A fibre channel communications sub-system comprising

a plurality of channel devices arranged in a plurality of channel loops,

a plurality of channel controllers,

a software controlled switching circuit electrically connecting the channel controllers to the fibre channel loops in varying selected configurations, said circuit comprising

a plurality of switch elements arranged in a matrix-like configuration having controller loops connected to the channel controllers and drive loops connected to the channel devices, for selectively electrically connecting, under software control, each drive loop to a selected controller loop, and



each switch element, in a first mode of operation, passing electrical communication signals in one through direction, and in a second mode of operation, passing electrical communication signals in a second bypass direction,

whereby each drive loop is electrically connected to a selected one of said channel controllers.

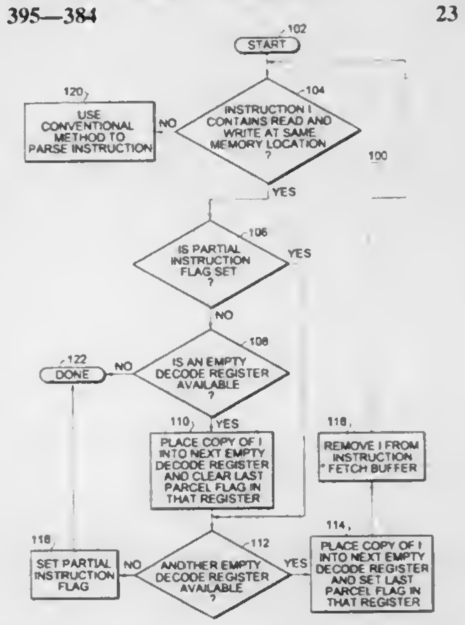
5,841,998
SYSTEM AND METHOD OF PROCESSING INSTRUCTIONS FOR A PROCESSOR

David L. Isaman, San Diego, Calif., assignor to Metaflow Technologies, Inc., La Jolla, Calif.

Continuation-in-part of Ser. No. 775,583, Dec. 31, 1996. This application May 9, 1997, Ser. No. 853,566

Int. Cl.^{6} G06F *9/30*

U.S. Cl. 395—384 23 Claims


102
START
104
120
USE CONVENTIONAL METHOD TO PARSE INSTRUCTION
NO
INSTRUCTION I CONTAINS READ AND WRITE AT SAME MEMORY LOCATION ?
100
YES
106
IS PARTIAL INSTRUCTION FLAG SET ?
YES
NO
108
122
DONE
NO
IS AN EMPTY DECODE REGISTER AVAILABLE ?
110
YES
PLACE COPY OF I INTO NEXT EMPTY DECODE REGISTER AND CLEAR LAST PARCEL FLAG IN THAT REGISTER
116
REMOVE I FROM INSTRUCTION FETCH BUFFER
118
112
114
SET PARTIAL INSTRUCTION FLAG
NO
ANOTHER EMPTY DECODE REGISTER AVAILABLE ?
YES
PLACE COPY OF I INTO NEXT EMPTY DECODE REGISTER AND SET LAST PARCEL FLAG IN THAT REGISTER

1. A data processing system comprising:

an instruction unit generating a program instruction;

a parse unit coupled to the instruction unit and receiving the program instruction, the parse unit determining whether the instruction requires both load and store operations and generating only first and second parcels for the instruction containing both load and store operations;

a decode unit coupled to the parse unit and receiving the first and second parcels, the decode unit attaching a different identification number to the first and second parcels, the identification number of the second parcel being determinable from the identification number of the first parcel; and

an issue unit coupled to the decode unit and receiving the first and second parcels and issuing the first and second parcels.

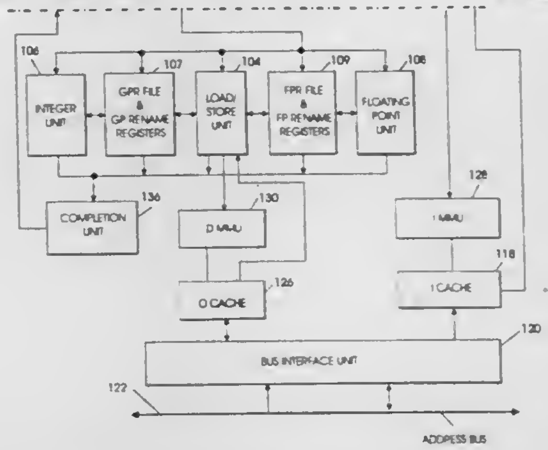
5,841,999
INFORMATION HANDLING SYSTEM HAVING A REGISTER REMAP STRUCTURE USING A CONTENT ADDRESSABLE TABLE

Hung Qui Le, Austin, Tex., and Erdem Hokenek, Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 17, 1996, Ser. No. 633,327

Int. Cl.^{6} G06F *9/30*

U.S. Cl. 395—393 8 Claims



1. An information handling system, comprising:

an instruction unit;

one or more execution units;

a memory management unit, connected to the instruction unit, and to a memory system;

one or more levels of cache memory associated with the one or more execution units;

a system bus connected to the execution units and to the memory system and to the cache memory;

one or more I/O controllers connected to the system bus for controlling I/O devices; and

a completion unit for tracking sequence of instruction dispatch and instruction completion, wherein speculatively assigned registers are released as soon as a branch instruction is found to be mispredicted.

5,842,000

Patent Not Issued For This Number

5,842,001
CLOCK SIGNAL ADJUSTING METHOD AND APPARATUS

Katsuhisa Kubota, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 23, 1995, Ser. No. 393,442

Claims priority, application Japan, Mar. 11, 1994, 6-041225

Int. Cl.^{6} G06F *1/12*

U.S. Cl. 395—551 24 Claims

1. A clock signal adjusting method applicable to an information processing system in which clock signals are distributed from a clock generating unit to a plurality of load units, each of the plurality of load units having at least a load element operated in synchronism with a clock signal input to each of said load units, said clock signal adjusting method comprising steps of:

(a) measuring delay times set in each of a plurality of delay means in accordance with setting instructions, said plurality of delay means being provided so as to correspond to said load units, each of said plurality of delay means delaying an input signal by a delay time set therein;

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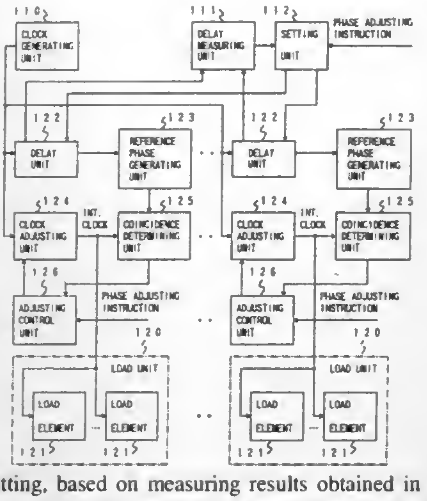


(b) inputting, based on measuring results obtained in said step (a), to said plurality of delay means setting instructions corresponding to delay times to be set in said plurality of delay means;

(c) generating reference phase signals having predetermined phase differences based on outputs of said plurality of delay means; and

(d) adjusting, based on phases of said reference phase signals generated in said step (c), a phase of the clock signal distributed for said load element in each of said load units.

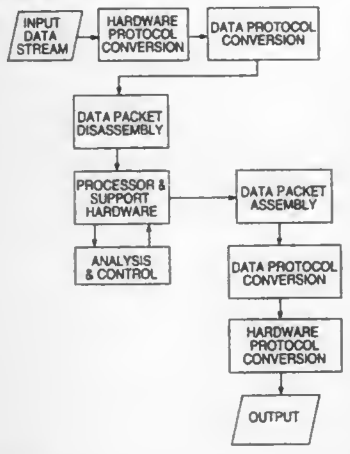
5,842,002
COMPUTER VIRUS TRAP

John Schnurer, Yellow Springs, Ohio, and Timothy J. Klemmer, Briarcliff Manor, N.Y., assignors to Quantum Leap Innovations, Inc., Briarcliff Manor, N.Y.

Continuation of Ser. No. 754,120, Nov. 20, 1996, abandoned, which is a continuation of Ser. No. 607,520, Feb. 27, 1996, abandoned, which is a continuation of Ser. No. 252,622, Jun. 1, 1994, abandoned. This application May 30, 1997, Ser. No. 865,786

Int. Cl.⁶ G06F *9/455; 11/00*

U.S. Cl. 395—500 **6 Claims**



1. A computer virus trapping device comprising:

link adapter means connected to a source of data input for converting external protocols into a data stream understood by said trapping device;

emulation means connected to said link adapter means for accepting said data stream from said link adapter means; said emulation means including means for providing an environment isolated from a protected computer system and for simulating the architecture of said protected computer system whereby a computer virus is coaxed into performing its intended activity; and

detection means responsive to said emulation means for looking for consequences of the intended viral activity upon completion of the simulation by said emulation means.

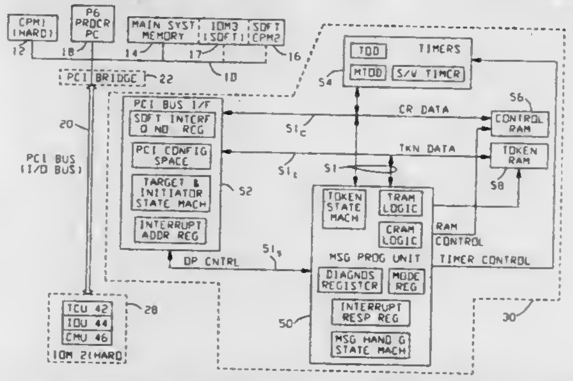
5,842,003
AUXILIARY MESSAGE ARBITRATOR FOR DIGITAL MESSAGE TRANSFER SYSTEM IN NETWORK OF HARDWARE MODULES

Richard Mike Holmes; Mark Jeffrey Tadman, and Leon Arie Krantz, all of Mission Viejo, Calif., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Mar. 26, 1997, Ser. No. 886,818

Int. Cl.⁶ G06F *9/38;* **H04J** *3/02*

U.S. Cl. 395—500 **11 Claims**



1. A message transfer control unit (AMA **30**) for managing digital message communication between sending and receiving hardware modules in a network supporting Main System Memory, a hard Central Processing Module (CPM), a hard Input/Output Module (IOM)(**28**) and a hard Personal Computer (PC) Processor wherein said Main Memory provides a message queue for each of "N" modules in said network and "M" message slots in each said message queue, said message transfer control unit comprising:

(a) bus interface means connecting said Main System Memory said hard Central Processing Module, said hard Input/Output Module and said hard PC Processor;

(b) internal bus means connecting said bus interface means to a Message Processing Unit, to a Token RAM means and to a Control RAM means;

(c) said Token RAM means including:

(c1) a free token queue for holding Token values which identify a particular message slot in each message queue in said Main System Memory;

(c2) an outstanding message Token queue for identifying Token values presently being utilized in a message transfer cycle;

(c3) an Interrupt queue means for holding pointers to be used to signal destination-receiving modules that a message is pending in their message queue in Main System Memory, said Interrupt queue means including:

(c3a) a hardware oriented Interrupt queue for initiating an Interrupt signal to a designated hardware module;

(c3b) queue means for monitoring each unfinished message transfer cycle and indicating each completed message transfer cycle;

(d) said Control RAM means including:

(d1) a bit-vector and pointer set for each module for establishing a chronological sequence of message transfers between each sending module and destination-receiving module;

(d2) an Interrupt control queue for indicating the next Interrupt to be initiated in said Token RAM means;

(e) said Message Processing Unit for enabling a Sending Module to get a Token value to place a message in said Main System Memory and to enable a Receiving Module to get a message from said Main System Memory, including:

(e1) logic means for regulating said Token RAM means and said Control RAM means;

(e2) a Token state machine means for sequencing a Get Token OP and a Return Token OP to said Token RAM;

(e3) a message handling state machine means for sequencing a Send Message OP and a Get Message OP.

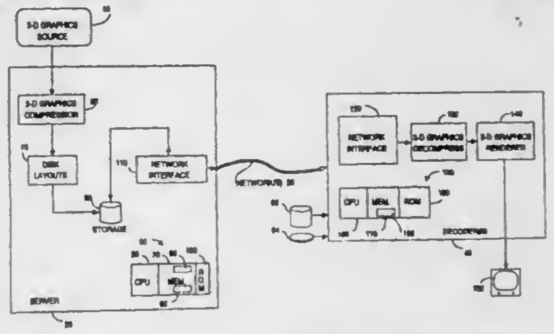
5,842,004
METHOD AND APPARATUS FOR DECOMPRESSION OF COMPRESSED GEOMETRIC THREE-DIMENSIONAL GRAPHICS DATA

Michael F. Deering, Los Altos, and Aaron S. Wynn, Palo Alto, both of Calif., assignors to Sun Microsystems, Inc., Palo Alto, Calif.

Filed Aug. 4, 1995, Ser. No. 511,326

Int. Cl.⁶ G06F *15/00*

U.S. Cl. 345—501 **20 Claims**



9. A system for decompressing a data stream whose fields include at least op code bits and tag bits and further include compressed data representing a three-dimensional object whose surface defines surface characteristics, the system including:

a computer system including a central processing unit (CPU) and memory coupled to said CPU;

a detector unit programmed to receive said data stream and to detect from a preceding field in said data stream a field length of an immediately following field;

a look-up table, coupled to receive from said detector unit at least a portion of said data stream, providing at least one piece of information selected from the group consisting of (i) tag field start position, (ii) actual tag field length, (iii) identification as to whether said field is relative, (iv) identification as to whether said field is absolute, and (v) numerical shifting offset information;

wherein bit-line fields contained in said data stream are aligned to individual bits.

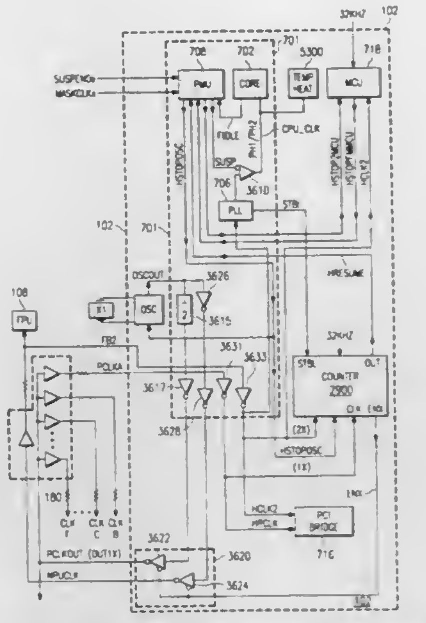
5,842,005
CLOCK CONTROL CIRCUITS, SYSTEMS AND METHODS

James J. Walsh; Joseph Joe, both of Plano; Ian Chen, Houston, all of Tex., and Yutaka Takahashi, Kanagawa, Japan, assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 363,198, Dec. 22, 1994, Pat. No. 5,754,837. This application May 8, 1997, Ser. No. 854,045

Int. Cl.⁶ G06F *1/04; 1/08*

U.S. Cl. 395—555 **23 Claims**



1. A semiconductor device comprising:

a central processing unit having a clock input;

a clock generator of clock pulses;

a logic circuit having an output to supply a clock control signal wherein said logic circuit is responsive to a mask clock signal, a suspend signal, a resume signal, and interrupt signal, and a software controllable enabling signal to generate said clock control signal based on one or more of said mask clock signal, said suspend signal, said resume signal, said interrupt signal, and said software controllable enabling signal; and

a clock gate coupled to said clock pulses and having a clock gate output coupled to said clock input of said central processing unit, said clock gate responsive to said clock control signal to prevent said clock pulses from reaching said central processing unit within one clock cycle of a change in said clock control signal.

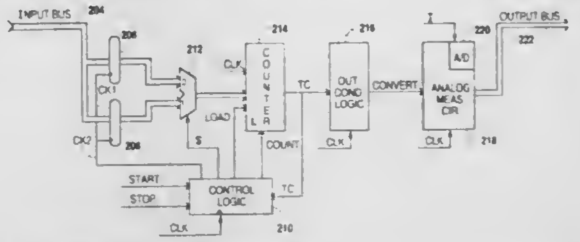
5,842,006
COUNTER CIRCUIT WITH MULTIPLE REGISTERS FOR SEAMLESS SIGNAL SWITCHING

Audrey F. Harvey; Jaffar Shah, both of Austin; Joseph Peck, Round Rock, and Kosta Ilic, Austin, all of Tex., assignors to National Instruments Corporation, Austin, Tex.

Filed Sep. 6, 1995, Ser. No. 524,068

Int. Cl.⁶ G06F *1/14*

U.S. Cl. 395—557 **22 Claims**



1. A counter circuit, comprising:

a timing device receiving a timing value and asserting a completion signal, wherein said timing value sets a timing period of said timing device;

first and second registers for storing first and second timing values, respectively, for loading into said timing device, wherein said first and second timing values are stored prior to operation of said timing device using said first and second timing values; and

logic receiving a trigger signal and said completion signal and coupled to said timing device and said first and second registers for providing a select signal to select between said first and second timing values and for asserting signals to load and initiate said timing device with one of either of said first and second timing values from said first and second registers based on said completion and said trigger signals, wherein said logic loads said timing device with said first timing value and then initiates said timing device in response to said trigger signal, wherein said logic then loads said timing device with said second timing value in response to said completion signal.

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5,842,007

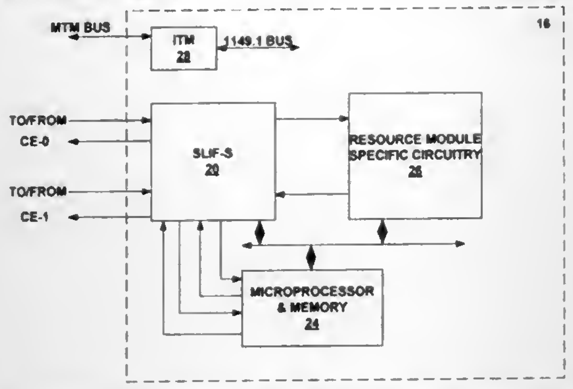
METHOD AND SYSTEM FOR TRANSFERRING HIGH LEVEL CONTROL MESSAGING FRAMING AND PAYLOAD DATA IN A SERIAL STREAM IN A COMMUNICATIONS SYSTEM

Anatoly Tarsky, and Harold J. Snow, both of Nepean, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Dec. 26, 1996, Ser. No. 773,956

Int. Cl.^{6} H04J *3/02;3/06;3/16*

U.S. Cl. 395—566 **21 Claims**



1. A method of transferring payload, control and messaging data in a communications system, in a serial data stream at a pre-set bit rate per second,

said method comprising, in sequence, the steps of,

- a) transferring a frame of data, said step further comprising
  - i) transferring one of a predetermined number of first bits consecutively at said pre-set bit rate in said serial stream, said first bits comprising payload related data, framing or messaging bits and a calculated number of second bits consecutively at said pre-set bit rate in said serial stream, said second bits comprising control or framing bits;
  - ii) transferring said other one of said predetermined number of first bits consecutively at said pre-set bit rate in said serial stream and said calculated number of second bits consecutively at said pre-set bit rate in said serial stream;
  - iii) repeating steps i) and ii) a chosen first integer number of times per frame using said predetermined number and said calculated number;
- b) repeating step a) using said predetermined number and said calculate number a chosen second integer number of times per second;

wherein said calculated number is calculated so that the sum of said predetermined number and said calculated number multiplied by said chosen first integer and said chosen second integer equals the number of bits transferred in one second at said pre-set bit rate.

5,842,008

METHOD AND APPARATUS FOR IMPLEMENTING A BRANCH TARGET BUFFER CACHE WITH MULTIPLE BTB BANKS

Simcha Gochman, Timrat, and Nicolas Kacevas, Haifa, both of Israel, assignors to Intel Corporation, Santa Clara, Calif.

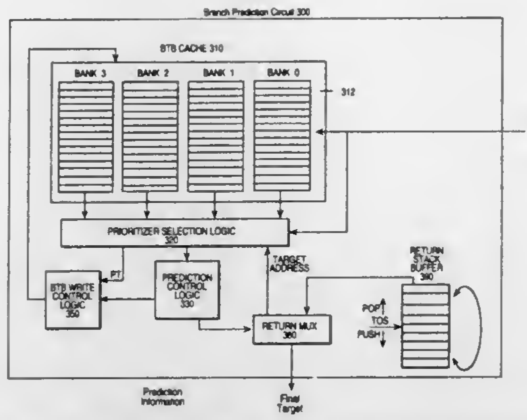
Filed Jun. 18, 1996, Ser. No. 665,516

Int. Cl.^{6} G06F *9/38*

U.S. Cl. 395—587 **14 Claims**

1. In a computer processor coupled to a memory, said memory divided into memory blocks, a branch prediction mechanism, said branch prediction mechanism predicting a block of memory to fetch based upon an instruction pointer that points to a currently executing instruction, said branch instruction prediction mechanism comprising:

- a branch target buffer cache comprising plurality of ordered branch target buffer banks, each said ordered branch target buffer bank comprising a plurality of branch entries storing information about branch instructions addressed by address bits specifying a different subblock within said memory blocks;



- a branch prediction circuit, said branch prediction circuit receiving said instruction pointer, said branch prediction circuit indexing into all of said ordered branch target buffer banks of said branch target buffer cache with said instruction pointer, said branch prediction circuit fetching at most one branch entry from each said plurality of branch target buffer banks; and
- a prioritizer circuit, said prioritizer circuit indicating the selection of one of said branch entries fetched by said branch prediction circuit from said ordered branch target buffer banks by selecting a first taken branch instruction located after said instruction pointer.

5,842,009

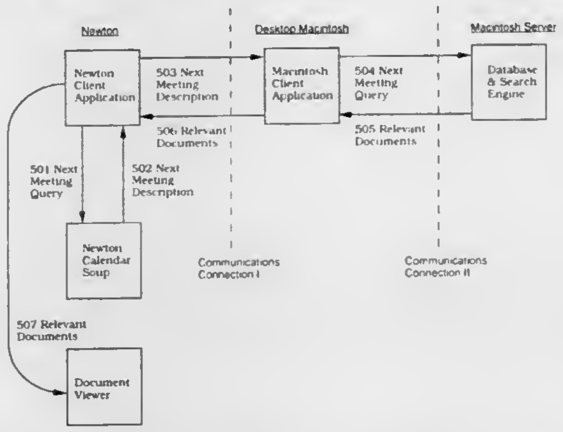
SYSTEM FOR AUTOMATICALLY RETRIEVING INFORMATION RELEVANT TO A USER'S SCHEDULED EVENT

Richard D. Borovoy, Boston, Mass.; Michael J. Graves, and Nagabhushan Rao Machiraju, both of Cupertino, Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Sep. 30, 1996, Ser. No. 723,793

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 395—601 **15 Claims**



1. A method for automatically retrieving information relevant to a scheduled event comprising:

- storing the time the scheduled event is scheduled for;
- determining that it is time to retrieve information relevant to the scheduled event based on the current time being within a predetermined time of the stored time of the scheduled event;
- automatically formulating a query comprising details about the stored scheduled event;
- searching an information source comprising information potentially relevant to the scheduled event using the automatically formulated query to identify information from the information source relevant to the query; and,
- retrieving the identified relevant information resulting from searching the information source using the automatically formulated query.

5,842,010

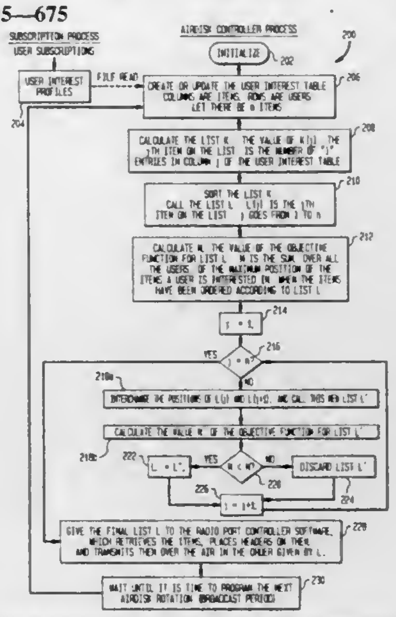
PERIODIC WIRELESS DATA BROADCAST

Ravi Kumar Jain, Hoboken, N.J., and John St. Clair Werth, Jr., Austin, Tex., assignors to Bell Communications Research, Inc., Morristown, N.J.

Filed Apr. 24, 1995, Ser. No. 427,056

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 395—675 **15 Claims**


SUBSCRIPTION PROCESS
USER SUBSCRIPTIONS
AIRDISK CONTROLLER PROCESS
200
INITIALIZE
202
USER INTEREST PROFILES
204
FILE READ
CREATE OR UPDATE THE USER INTEREST TABLE COLUMNS ARE ITEMS, ROWS ARE USERS LET THERE BE n ITEMS
206
CALCULATE THE LIST K. THE VALUE OF K(j), THE jTH ITEM ON THE LIST, IS THE NUMBER OF "1" ENTRIES IN COLUMN j OF THE USER INTEREST TABLE
208
SORT THE LIST K CALL THE LIST L. L(j) IS THE jTH ITEM ON THE LIST, j GOES FROM 1 TO n
210
CALCULATE W, THE VALUE OF THE OBJECTIVE FUNCTION FOR LIST L. W IS THE SUM, OVER ALL THE USERS, OF THE MAXIMUM POSITION OF THE ITEMS A USER IS INTERESTED IN, WHEN THE ITEMS HAVE BEEN ORDERED ACCORDING TO LIST L
212
j = 1
214
YES
j = n?
216
NO
218a
INTERCHANGE THE POSITIONS OF L(j) AND L(j+1), AND CALL THIS NEW LIST L'
CALCULATE THE VALUE W' OF THE OBJECTIVE FUNCTION FOR LIST L'
218b
222
L = L'
YES
W < W'?
NO
DISCARD LIST L'
220
226
224
j = j+1
GIVE THE FINAL LIST L TO THE RADIO PORT CONTROLLER SOFTWARE, WHICH RETRIEVES THE ITEMS, PLACES HEADERS ON THEM AND TRANSMITS THEM OVER THE AIR IN THE ORDER GIVEN BY L.
228
WAIT UNTIL IT IS TIME TO PROGRAM THE NEXT AIRDISK ROTATION BROADCAST PERIOD
230

1. A method for periodic wireless data broadcasting of data items wherein the data items are arranged to reduce the average access latency for users of the broadcast data, said method comprising the steps of

- receiving the data items to be broadcast;
- collecting user interest information with respect to the data items;
- retrieving the collected user interest information;
- generating a user interest table based upon the retrieved user interest information;
- based on the user interest table, calculating a list of data items and sorting the list according to the retrieved user interest information; and
- broadcasting the data items in the order arranged according to the sorted list.

5,842,011

GENERIC REMOTE BOOT FOR NETWORKED WORKSTATIONS BY CREATING LOCAL BOOTABLE CODE IMAGE

Tushar K. Basu, Milford, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

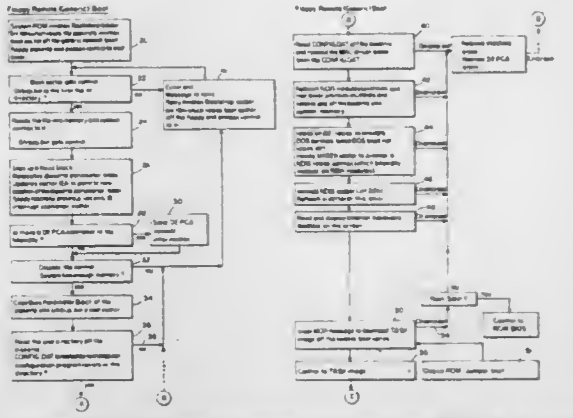
Continuation of Ser. No. 805,572, Dec. 10, 1991, Pat. No. 5,452,454. This application Sep. 12, 1995, Ser. No. 526,546

Int. Cl.^{6} G06F *13/00;15/16*

U.S. Cl. 395—652 **69 Claims**

1. A method for booting a local data processing system from a remote data processing system over a network, comprising the steps of:

- initializing the local data processing system sufficiently to establish network communications with a remote disk storing bootable code on the remote data processing system in response to powering up the local data processing system;
- copying an image of the bootable code over the network to the local data processing system to create a local bootable code image stored in the local data processing system; and



- booting the local data processing system from the local bootable code image stored in the local data processing system.

5,842,012

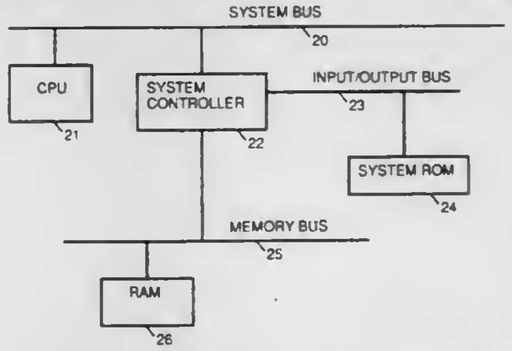
EFFICIENT SOFT RESET IN A PERSONAL COMPUTER

Gary Walker, Phoenix; David K. Cassetti, Tempe, both of Ariz., and Nicholas J. Richardson, LaJolla, Calif., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed May 15, 1996, Ser. No. 647,774

Int. Cl.^{6} G06F *12/02*

U.S. Cl. 395—652 **10 Claims**



6. A method for responding to a soft reset in a computing system comprising the following steps:

- (a) receiving, by a system controller, an access to a reset vector stored in a system read-only memory (ROM); and,
- (b) returning, by the system controller, data stored internally within the system controller.

5,842,013

ARCHITECTURE FOR MODULAR COMPUTER SYSTEM IN WHICH ONE OF THE MODULES IS DEDICATED TO USER-INTERFACE TASK

Martin Kopp, Frankenstrasse 34, D-68259, Mannheim, Germany

PCT No. PCT/DE94/00848, § 371 Date Feb. 8, 1996, § 102(e) Date Feb. 8, 1996, PCT Pub. No. WO95/04973, PCT Pub. Date Feb. 16, 1995

PCT Filed Jul. 22, 1994, Ser. No. 596,127

Claims priority, application Germany, Aug. 9, 1993, 43 26 740.8

Int. Cl.^{6} G06F *9/00*

U.S. Cl. 395—670 **23 Claims**

1. An improved computer system with a user interface containing a number of processing units using separate internal bus systems, and equipment for tranferring data and messages, and software programs for a system-wide administration of the user interface, wherein the improvement comprises:

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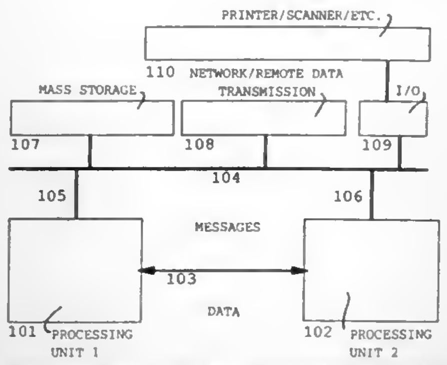


a) the hardware and software components of the computer system are divided into first, second and third modules, said first module providing the user interface a presentation and a function;

said second module operates application programs and does not contain any of the operating programs and computer components needed for the user interface;

said third module takes charge of remaining components including at least a mass storage through a connecting structure which is suitable for providing access to these components; and

said three modules are implemented as a single unit of equipment apart from any external peripheral components;

b) said modules each possess their own data paths for handling internal tasks, which data paths are separate from those of the other modules;

c) a software and hardware interface exists in the unit of equipment between said first and second modules, which interface supports exchange of messages and data without creating a direct, permanent connection affecting independent running of processes in said first and second modules; and

d) said first and second modules each has its own, direct connection path to jointly used additional components in said third module.

5,842,014

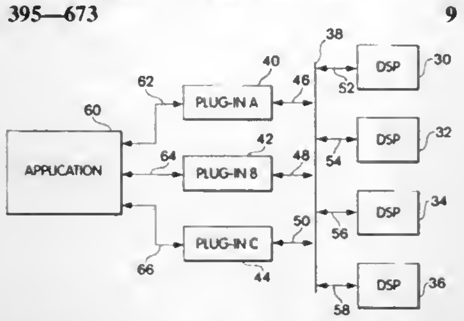
SYSTEM AND METHOD FOR DISTRIBUTING PROCESSING AMONG ONE OR MORE PROCESSORS

Evan Brooks; Thomas J. Padula, both of Palo Alto; Robert E. Currie, San Francisco, and Peter A. Richert, San Jose, all of Calif., assignors to Digidesign, Inc., Menlo Park, Calif.

Continuation of Ser. No. 490,459, Jun. 14, 1995, abandoned. This application Nov. 7, 1995, Ser. No. 553,139

Int. Cl.^{6} G06F *9/46;9/44*

U.S. Cl. 395—673 **9 Claims**



1. A computer system for performing distributed processing functions, the computer system including a host computer, the host computer having a display means, a central processing means, a storage means, an instruction and data set input means, and a bus system operatively associated with the host computer, the bus system being associated with a plurality of processors and operatively connecting the plurality of processors, the improvement comprising:

means associated with the host computer for receiving a request from the input means for processing instructions for a selected data set function;

means associated with the host computer for identifying which of the plurality of processors is preferentially suited to performing the processing of instructions for the selected data set function;

means for selecting at least one of the processors which is suited for processing the instructions;

means for sending the instructions to the selected at least one processor;

means in the processor to process the instructions and send the result of the processing the instructions to a destination chosen by the host computer: and

means for preferentially selecting at least one of the processors for performing the processing of instructions for a selected data set, wherein the means for selecting is determined by the particular set of instructions the selected processor is already executing;

wherein at least a second one of the plurality of processors is executing a second particular set of instructions, further comprising means within the computer system for preferentially selecting and sending to the second processor a selected data set for processing using the second particular set of instructions.

5,842,015

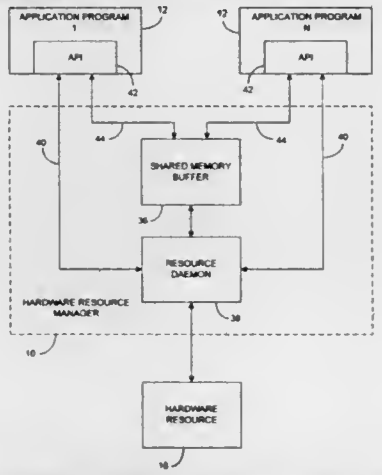
SYSTEM AND METHOD FOR REAL-TIME CONTROL OF HARDWARE IN A MULTIPROCESSING ENVIRONMENT

Ross Cunniff, and J. Norman Gee, both of Fort Collins, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 26, 1996, Ser. No. 690,425

Int. Cl.^{6} G06F *9/00*

U.S. Cl. 395—674 **18 Claims**



13. A method for providing real-time control over a limited hardware resource in a computer system capable of running multiple, asynchronous application programs, said method comprising the steps of:

receiving command and data information from said application program residing within said computer system;

storing said command and data information in a shared memory buffer residing within said computer system;

transferring said command and data information from said shared memory buffer to a resource daemon residing within said computer system;

interpreting said command information into executable instructions by said resource daemon for enabling real-time control of said limited hardware resource within said computer system; and

processing said instructions by said resource daemon, including providing said limited hardware resource with said data information as needed for operation of said limited hardware resource;

whereby each of said application programs is able to control operation of said limited hardware resource within said computer system in substantially real-time fashion.

5,842,016

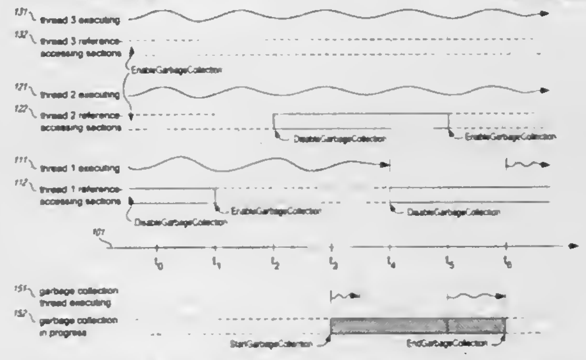
THREAD SYNCHRONIZATION IN A GARBAGE-COLLECTED SYSTEM USING EXECUTION BARRIERS

Michael Toutonghi, Seattle; Peter Kukol, Monroe; Frank Peschel-Gallee, Redmond, and Patrick Dussud, Bellevue, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed May 29, 1997, Ser. No. 864,759

Int. Cl.^{6} G06F *12/02;9/40*

U.S. Cl. 395—676 **36 Claims**



1. A method in a computer system for synchronizing the execution of each of a plurality of threads with a garbage collection process, the method comprising the steps of:

for each thread,

before the thread enters a series of instructions that interacts with references to garbage-collected objects, under the control of the thread, calling a first application programming interface (API) for disabling garbage collection if garbage collection is not already in progress, the first API returning immediately if called before garbage collection is initiated and returning only after garbage collection has completed if called after garbage collection is initiated;

before the thread enters a series of instructions that does not interact with references to garbage-collected objects, under the control of the thread, calling a second application programming interface (API) for enabling garbage collection, the second API returning immediately;

in a garbage collection thread, receiving a request to initiate garbage collection;

in response to the request, identifying threads that have enabled garbage collection more recently than they have disabled garbage collection;

after the identifying step, until all threads are identified or suspended,

identifying threads that enable garbage collection, and

suspending threads that disable garbage collection; and

when all threads are identified or suspended,

performing garbage collection, and

suspending identified threads that disable garbage collection during the performance of garbage collection.

5,842,017

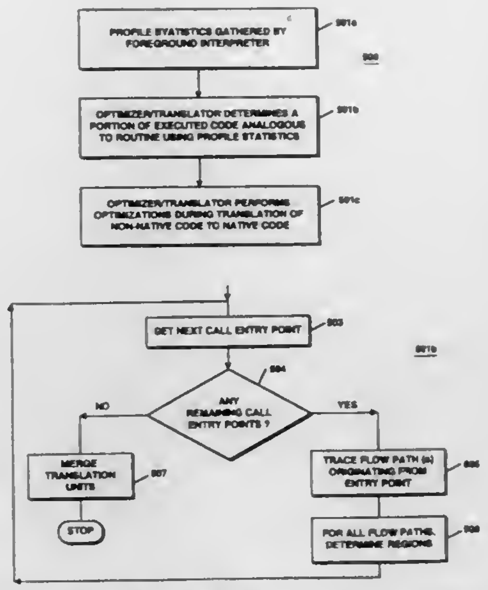
METHOD AND APPARATUS FOR FORMING A TRANSLATION UNIT

Raymond J. Hookway, West Boylston; John S. Yates, Needham, and Steven Tony Tye, Hopkinton, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jan. 29, 1996, Ser. No. 593,756

Int. Cl.^{6} G06F *5/00*

U.S. Cl. 395—707 **23 Claims**


PROFILE STATISTICS GATHERED BY FOREGROUND INTERPRETER
901a
900
OPTIMIZER/TRANSLATOR DETERMINES A PORTION OF EXECUTED CODE ANALOGOUS TO ROUTINE USING PROFILE STATISTICS
901b
OPTIMIZER/TRANSLATOR PERFORMS OPTIMIZATIONS DURING TRANSLATION OF NON-NATIVE CODE TO NATIVE CODE
901c
GET NEXT CALL ENTRY POINT
903
901b
904
ANY REMAINING CALL ENTRY POINTS ?
NO
YES
MERGE TRANSLATION UNITS
907
STOP
TRACE FLOW PATH (s) ORIGINATING FROM ENTRY POINT
906
FOR ALL FLOW PATHS, DETERMINE REGIONS
908

1. A method executed in a computer system for forming a translation unit from a binary image, the method comprising the steps of:

gathering, in response to execution of instructions included in said binary image, profile statistics including runtime information from executing said instructions using a runtime interpreter; and

determining, using said profile statistics, said translation unit comprising one or more regions, each region representing an area of contiguous instruction addresses in said binary image in which there are no breaks in the instruction addresses of the area of each region, and wherein said one or more regions in combination are substantially equivalent to a programming routine, said determining step further comprising the steps of:

tracing execution paths of code included in said binary image by using said profile statistics; and

merging a first and a second region into a third combined region when said first and second regions have overlapping or adjacent boundaries.

5,842,018

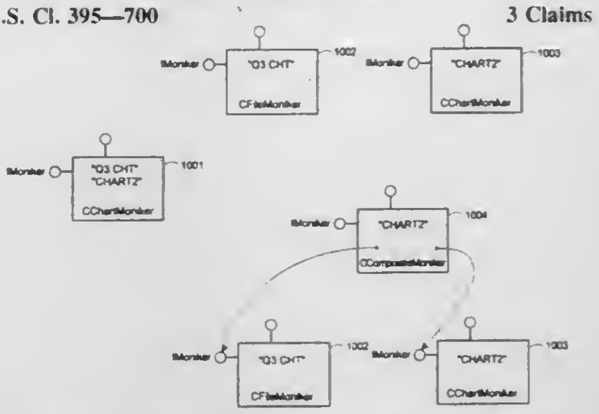
METHOD AND SYSTEM FOR REFERRING TO AND BINDING TO OBJECTS USING IDENTIFIER OBJECTS

Robert G. Atkinson, Woodinville; Antony S. Williams, Mercer Island, and Edward K. Jung, Seattle, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Division of Ser. No. 88,724, Jul. 6, 1993, Pat. No. 5,581,760, which is a continuation-in-part of Ser. No. 909,983, Jul. 6, 1992, abandoned. This application Jun. 6, 1995, Ser. No. 470,055

Int. Cl.^{6} G06F *15/00*

U.S. Cl. 395—700 **3 Claims**



1. A method in a computer system of composing a first moniker object with a second moniker object, the method comprising the computer-implemented steps of:

creating an instance of the first moniker object, the created first moniker object having a moniker class identifier that identifies a compose function member that, when executed, creates a composite moniker object that refers to the composition of the first moniker object with an indicated moniker object;

creating an instance of the second moniker object; and

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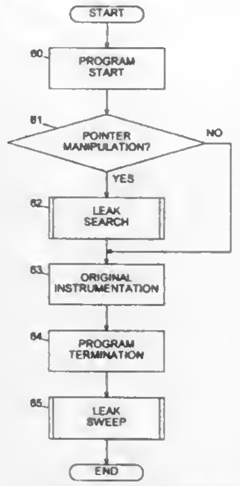
invoking the compose function member identified by the moniker class identifier of the first moniker object, using the created second moniker object as the indicated moniker object, to create an instance of a composite moniker object that refers to the composition of the first moniker object with the second moniker object.

5,842,019
METHOD AND SYSTEM FOR DYNAMICALLY DETECTING LEAKED MEMORY SPACE IN A COMPUTER PROGRAM

Adam K. Kolawa, Sierra Madre, and Wendell T. Hicken, Whittier, both of Calif., assignors to Parasoft Corporation, Monrovia, Calif.

Filed Sep. 13, 1996, Ser. No. 712,931
Int. Cl.^{6} G06F *12/00*
U.S. Cl. 395—701 20 Claims



1. A method using a computer for dynamically detecting leaked memory space in a computer program, the computer program comprising instrumentation routines for communicating runtime memory space conditions to a dynamic debugging system and having a memory space for storing dynamic data values, comprising the steps of:

performing a dynamic leak search for tracking allocated memory space using reference counting; and

performing a static leak sweep for scanning blocks of the memory space to determine whether each such block of the memory space is reachable from another such block of the memory space.

5,842,020
SYSTEM, METHOD AND ARTICLE OF MANUFACTURE FOR PROVIDING DYNAMIC USER EDITING OF OBJECT ORIENTED COMPONENTS USED IN AN OBJECT ORIENTED APPLET OR APPLICATION

Antony Azio Faustini, Palo Alto, Calif., assignor to Sun Microsystems, Inc., Palo Alto, Calif.

Filed Jan. 31, 1997, Ser. No. 792,242
Int. Cl.^{6} G06F *9/445*
U.S. Cl. 395—701 20 Claims

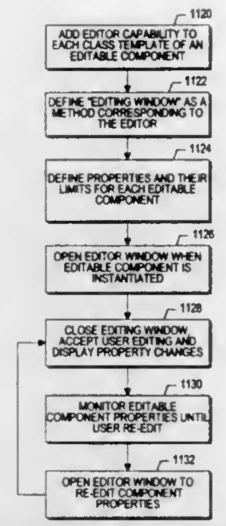
1. A method of providing user editing of predetermined object oriented components used in an object oriented applet or application, said method comprising the steps of:

a) defining an editor window as a method for the class template of each editable component;

b) defining the properties and their limits for the editor window of each component;

c) opening the editor window without user intervention when an editable component is instantiated to permit editing of a component's properties by the user;

d) closing the editor window when the user is finished editing;


1120 ADD EDITOR CAPABILITY TO EACH CLASS TEMPLATE OF AN EDITABLE COMPONENT
1122 DEFINE "EDITING WINDOW" AS A METHOD CORRESPONDING TO THE EDITOR
1124 DEFINE PROPERTIES AND THEIR LIMITS FOR EACH EDITABLE COMPONENT
1126 OPEN EDITOR WINDOW WHEN EDITABLE COMPONENT IS INSTANTIATED
1128 CLOSE EDITING WINDOW, ACCEPT USER EDITING AND DISPLAY PROPERTY CHANGES
1130 MONITOR EDITABLE COMPONENT PROPERTIES UNTIL USER RE-EDIT
1132 OPEN EDITOR WINDOW TO RE-EDIT COMPONENT PROPERTIES

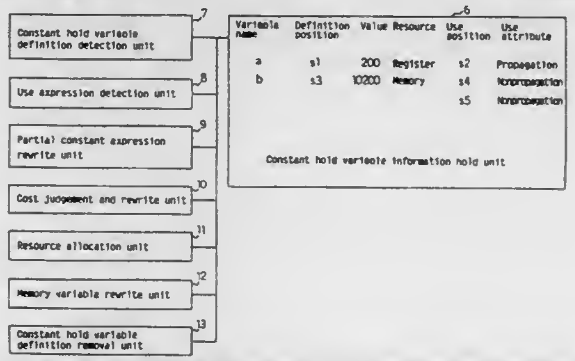
e) accepting the user's editing changes; and

f) displaying component property changes of the edited component made by the user when the editor window is closed.

5,842,021
OPTIMIZER

Kensuke Odani, Kyoto; Junko Sayama, Settsu, and Akira Tanaka, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Filed Jun. 4, 1996, Ser. No. 657,489
Claims priority, application Japan, Jun. 16, 1995, 7-150261
Int. Cl.^{6} G06F *9/45*
U.S. Cl. 395—709 8 Claims


7 Constant hold variable definition detection unit
8 Use expression detection unit
9 Partial constant expression rewrite unit
10 Cost judgement and rewrite unit
11 Resource allocation unit
12 Memory variable rewrite unit
13 Constant hold variable definition removal unit
6
Variable name
Definition position
Value
Resource
Use position
Use attribute
a
s1
200
Register
s2
Propagation
b
s3
10200
Memory
s4
Nonpropagation
s5
Nonpropagation
Constant hold variable information hold unit

1. An optimizer which is disposed in a compiler for compiling a program written in a programming language to a machine language program or assembler program, and optimizes a program written in a programming language and outputs an optimized program, comprising:

management means for managing a constant hold variable which is a variable into which a constant in the program is to be substituted, as a related expression set of the constant hold variable, by associating an expression wherein a constant is substituted into the constant hold variable with an expression wherein the constant hold variable is an operand;

first rewrite means for rewriting, among expressions in the related expression set wherein a constant hold variable is an operand, an expression wherein any other operand is a constant, and an expression of unary operation wherein the constant hold variable is an operand, to an expression wherein a constant held by the constant hold variable is an operand;

first estimation means for, after rewriting of said first rewrite means is conducted, when a constant hold variable which has not been rewritten to a constant is replaced with a constant immediate data held by the constant hold variable and set as an operand of a machine language operation, estimating an execute cycle and/or a code size of machine language instructions generated from an expression wherein the constant hold variable is an operand, in a related expression set of the constant hold variable, on the basis of a byte length of the constant;

second estimation means for, after rewriting of said first rewrite means is conducted, when a register storing a constant held by a constant hold variable which has not been rewritten to a constant is set as an operand of a machine language operation, estimating an execute cycle and/or a code size of machine language instructions generated from an expression wherein a constant is substituted into the constant hold variable and an expression wherein the constant hold variable is an operand, in a related expression set of the constant hold variable;

comparison means for comparing an estimation result of said first estimation means with an estimation result of said second estimation means, for each related expression set;

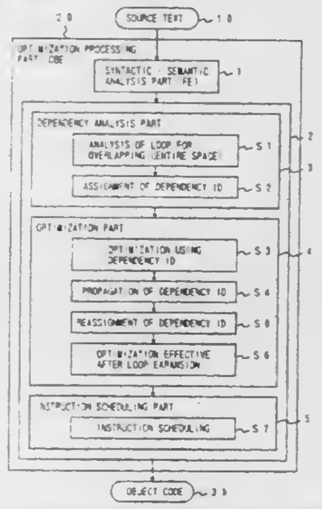
second rewrite means for, in a related expression set wherein, as a result of comparison of said comparison means, the estimation result of said first estimation means is not more than the estimation result of said second estimation means, rewriting any constant hold variable used as anoperand to a constant held by the constant hold variable; and

third rewrite means for, when any expression wherein a constant hold variable is used as an operand is rewritten to an expression wherein a constant held by a constant hold variable is used as an operand, deleting an expression wherein a constant is substituted into the constant hold variable.

5,842,022
LOOP OPTIMIZATION COMPILE PROCESSING METHOD

Tadashi Nakahira, and Masatoshi Haraguchi, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 27, 1996, Ser. No. 722,945
Claims priority, application Japan, Sep. 28, 1995, 7-250264
Int. Cl.^{6} G06F *9/45*
U.S. Cl. 395—709 13 Claims


SOURCE TEXT 10
20
OPTIMIZATION PROCESSING PART (OBE)
SYNTACTIC · SEMANTIC ANALYSIS PART (FE) 1
DEPENDENCY ANALYSIS PART 2
ANALYSIS OF LOOP FOR OVERLAPPING (ENTIRE SPACE) S1
ASSIGNMENT OF DEPENDENCY ID S2
3
OPTIMIZATION PART 4
OPTIMIZATION USING DEPENDENCY ID S3
PROPAGATION OF DEPENDENCY ID S4
REASSIGNMENT OF DEPENDENCY ID S5
OPTIMIZATION EFFECTIVE AFTER LOOP EXPANSION S6
INSTRUCTION SCHEDULING PART 5
INSTRUCTION SCHEDULING S7
OBJECT CODE 30

1. A loop optimization compile processing method for use in a compile processing apparatus adapted for a computer program and having an optimization function,

said loop optimization compile processing method comprising the steps of:

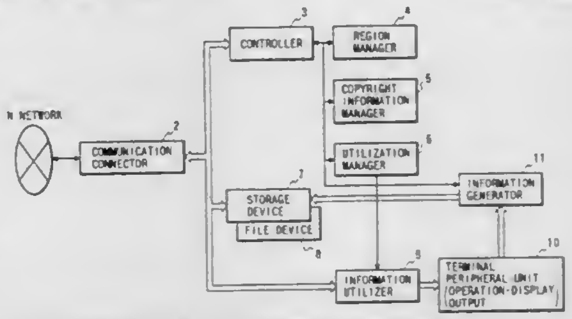
a) analyzing an entire space of a loop for dependencies between array elements and analyzing an arbitrary turn of the loop for dependencies between the array elements; and

b) assigning dependency identification information to the array elements, based on an analysis result obtained in step a).

5,842,023
INFORMATION SERVICE PROCESSOR

Tomoki Tsumura, Yokohama, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 3, 1996, Ser. No. 754,062
Claims priority, application Japan, Dec. 6, 1995, 7-318325
Int. Cl.^{6} G06F *9/00*
U.S. Cl. 395—712 36 Claims



1. An information service processor comprising:

a communication connector, connected to a network, for receiving an information service unit consisting of a main body of information and accompanying data that are provided by said broadcast communication means;

a copyright information manager for handling copyright information from said information service unit;

a utilization manager for managing utilization of said information service unit by said user;

a region manager for managing said main body of information;

a storage device for storing control data employed to control said main body of information;

a file device for storing at least said main body of information of said information service unit;

an information utilizer for exercising control while providing said main body of information to said user;

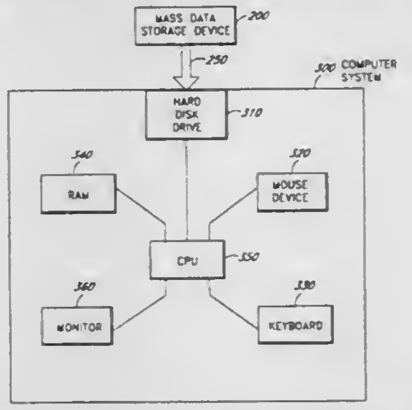
a terminal peripheral section as a specific medium for using said main body of information; and

a controller for controlling all operations of all components. Under a precise control, the information that is supplied by the information provider via the communication connector is stored in a storage device or file device belonging to a user, or permission for its employment is provided.

5,842,024
METHOD OF SOFTWARE INSTALLATION

Randy J. Choye, Mission Viejo; Yau Leung Kung, Irvine, and Henry N. Harding, Foothill Ranch, all of Calif., assignors to AST Research, Inc., Irvine, Calif.

Continuation of Ser. No. 397,652, Feb. 27, 1995, abandoned.
This application Jun. 17, 1997, Ser. No. 876,688
Int. Cl.^{6} G06F *9/445*
U.S. Cl. 395—712 1 Claim



1. A method of software installation for installing software on a computer system through the use of installation modules tailored to

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specific hardware components of the computer system, said method comprising the steps of:

storing on at least one mass data storage device a plurality of software modules for downloading onto a hard disk drive, each software module comprising a software application program and a script file associated with said application program, said script file defining at least one change to a configuration of an operating system program previously stored on said hard disk drive, wherein said script file associated with said software application programs is created according to the following steps:

installing said operating system program onto a second data storage device;

saving data stored within one or more directories of said operating system program stored on said second data storage device to one or more temporary directories;

installing said software application onto said second data storage device, and effecting one or more requisite changes to said operating system program stored on said second data storage device;

comparing post-installation data stored within said one or more directories of said operating system program stored on said second data storage device with said data stored in said one or more temporary directories; and

recording one or more changes to said operating system program resulting from said installation of said software application program within said script file;

selecting at least one software module for downloading onto the hard disk drive of a personal computer in accordance with hardware components included in said personal computer;

downloading said at least one selected software module onto the hard disk drive of said personal computer; and

modifying said operating system according to said at least one change to a configuration defined by said script file.

5,842,025

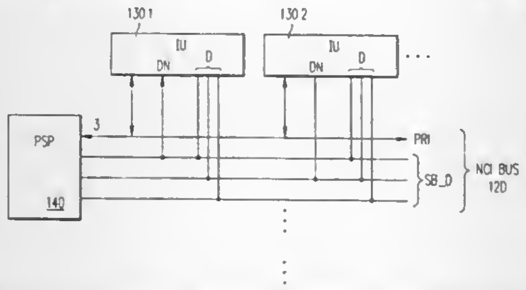
ARBITRATION METHODS AND APPARATUS

Alexander Joffe, Palo Alto, Calif., assignor to MMC Networks, Inc., Sunnyvale, Calif.

Filed Aug. 27, 1996, Ser. No. 708,140

Int. Cl.^{6} G06F *13/14*

U.S. Cl. 395—728 **34 Claims**



1. A unit U1 suitable for sharing a resource with other units, the unit U1 comprising:

means for connecting the unit U1 to a bus comprising a plurality of conductive lines; and

arbitration means for performing the following function:

in a first period of time when the unit U1 requests access to the resource, providing to the bus, simultaneously, a first multiple-bit indication of a first plurality of bits of the priority number of the unit U1, to enable the bus to indicate, at the end of the first period of time, a value B1 of the first plurality of bits of the priority number of the highest-priority unit requesting access to the resource, wherein each bit of the first indication is provided to a separate conductive line of the bus; then

in a second period of time, (a) if the first plurality of bits of the priority number of the unit U1 have the value B1, providing to the bus a second indication of at least one second bit of the priority number of the unit U1 but not of the first plurality of bits of the priority number of the unit U1, to enable the bus to indicate, at the end of the second period of time, a value B2 of the at least one second bit of the priority number of the highest-priority unit requesting access to the bus, wherein at no single moment of time an indication of all the bits of the priority number of the unit U1 is provided to the bus, and (b) if the first plurality of bits of the priority number of the unit U1 have a value different from B1, then not competing for access to the resource; and

if the unit U1 is the highest-priority unit requesting access to the bus, then setting the priority of the unit U1 to the lowest priority.

5,842,026

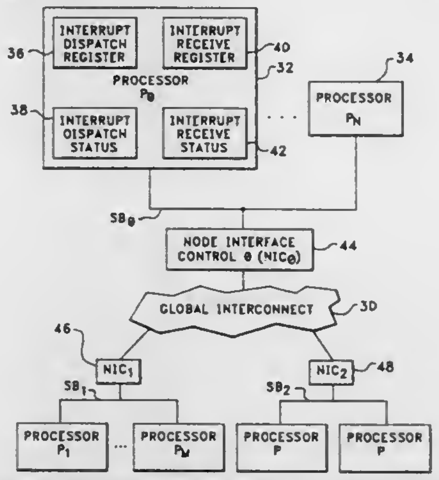
INTERRUPT TRANSFER MANAGEMENT PROCESS AND SYSTEM FOR A MULTI-PROCESSOR ENVIRONMENT

Monica C. Wong-Chan, Concord, Mass., and Erik Hagersten, Palo Alto, Calif., assignors to Sun Microsystems, Inc., Palo Alto, Calif.

Filed Jul. 1, 1996, Ser. No. 672,947

Int. Cl.^{6} G06F *13/24*

U.S. Cl. 395—733 **9 Claims**



1. A method for handling an interrupt transaction between a source processor and a target processor on separate nodes in a multi-processor system, the nodes being connected to a network through network interface controls between the node and the network, said method comprising the computer implemented steps of:

initiating the interrupt transaction at the source processor by sending an interrupt address identifying the target processor as the target of the interrupt transaction;

detecting the target processor is at a remote node on a system bus across the network;

suspending the interrupt transaction at the source processor if said detecting step detects the target processor is at a remote node, said step of suspending comprising sending an ignore signal to the source processor in response to said detecting step detecting the target processor is at a remote node, and capturing the ignore signal at the source processor and in response thereto suspending the interrupt transaction at the source processor;

forwarding an interrupt request to a target processor across the global interconnect to the remote node interface control in

performing an ACK/NACK (acknowledge/non-acknowledge) operation at the target processor and returning an ACK signal or a NACK signal to the source processor across the network;

waking up the source processor when an ACK signal or NACK signal from the target processor is received and captured by the source processor from the target processor and capturing the ACK signal or NACK signal at the source processor and in response thereto waking up the interrupt transaction at the source processor; and

sending the interrupt data from the source processor to the target processor if an ACK signal is received and aborting the interrupt transaction if a NACK signal is received.

5,842,027

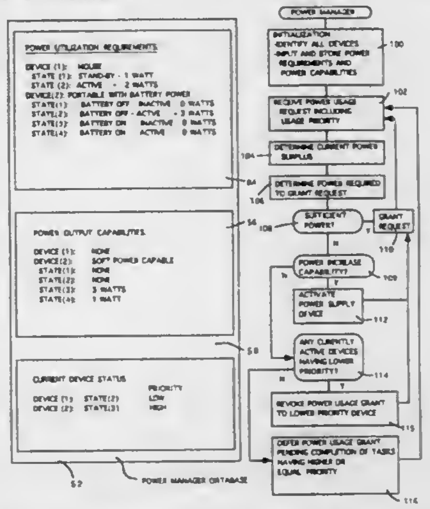
METHOD AND APPARATUS FOR SUPPLYING POWER TO DEVICES COUPLED TO A BUS

Florin Oprescu, Sunnyvale, and Michael D. Teener, Santa Cruz, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Continuation of Ser. No. 675,418, Jul. 3, 1996, abandoned, which is a continuation of Ser. No. 457,107, Jun. 1, 1995, abandoned, which is a division of Ser. No. 5,364, Jan. 14, 1993, Pat. No. 5,483,656. This application Jun. 19, 1997, Ser. No. 878,859

Int. Cl.^{6} G06F *1/26;1/32*

U.S. Cl. 395—750.01 **27 Claims**



POWER MANAGER
POWER UTILIZATION REQUIREMENTS
INITIALIZATION IDENTIFY ALL DEVICES INPUT AND STORE POWER REQUIREMENTS AND POWER CAPABILITIES
100
RECEIVE POWER USAGE REQUEST INCLUDING USAGE PRIORITY
102
DETERMINE CURRENT POWER SURPLUS
104
DETERMINE POWER REQUIRED TO GRANT REQUEST
106
SUFFICIENT POWER?
108
GRANT REQUEST
110
POWER OUTPUT CAPABILITIES
POWER INCREASE CAPABILITY?
ACTIVATE POWER SUPPLY DEVICE
112
ANY CURRENTLY ACTIVE DEVICES HAVING LOWER PRIORITY?
114
CURRENT DEVICE STATUS
PRIORITY
REVOKE POWER USAGE GRANT TO LOWER PRIORITY DEVICE
DEFER POWER USAGE GRANT PENDING COMPLETION OF TASKS HAVING HIGHER OR EQUAL PRIORITY
116
52
54
56
58
POWER MANAGER DATABASE

1. In a device interconnection bus, having a first set of devices capable of supplying power to the bus to power a second set of devices coupled to the bus, wherein said first set of devices includes at least one battery-powered device with a battery power source, an apparatus comprising:

means for controlling said battery-powered device to provide power to said bus when no AC-supply-powered devices are providing power to said bus such that said second set of devices are powered by said battery-powered device; and

means for controlling said battery-powered device to draw power from said bus when at least one AC-supply-powered device is supplying power to said bus such that said second set of devices are powered by said AC-supply-powered devices wherein at least in one mode, said battery-powered device and said at least one AC-supply-powered devices are concurrently supplying power to said bus.

5,842,028

METHOD FOR WAKING UP AN INTEGRATED CIRCUIT FROM LOW POWER MODE

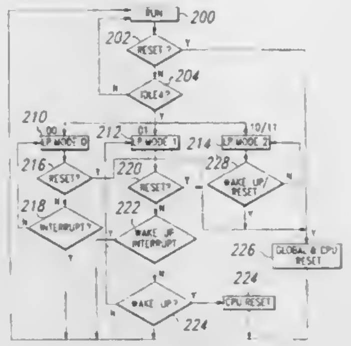
Sridhar Vajapey, Sugarland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

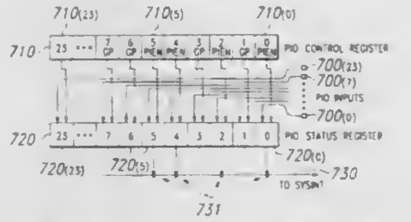
Filed Oct. 15, 1996, Ser. No. 729,936

Int. Cl.^{6} G06F *1/04*

U.S. Cl. 395—750.02 **11 Claims**

1. A method for waking up an integrated circuit from a low power mode which comprises:





providing said integrated circuit with a first pin for receiving an interrupt signal from an external source;

providing an input buffer within said integrated circuit to receive said interrupt signal which is connected to said first pin and to form a buffered interrupt signal;

treating said buffered interrupt signal as an operational interrupt when said integrated circuit is in said full power mode;

selectively masking said buffered interrupt signal so that said operational interrupt is ignored when said integrated is in full power mode and said buffered interrupt signal is masked; and

treating said buffered interrupt signal as a wake up signal when said integrated circuit is in said low power mode and returning said integrated circuit to a full power mode in response to said wake up signal whether said buffered interrupt signal is masked or unmasked, so that a second pin is not required to provide said wake up signal.

7. A method for waking up an integrated circuit from a low power mode which comprises:

providing said integrated circuit with a first pin for receiving a first signal from an external source;

providing an input buffer within said integrated circuit to receive said first signal which is connected to said first pin and to form a buffered first signal;

providing circuitry within said integrated circuit to establish and maintain a first low power mode and a second low power mode;

interpreting said buffered first signal as a wake up reset signal when said integrated circuit is in one at said first low power mode or said second low power mode and returning said integrated circuit to a full power mode in response to said wake up reset signal;

treating said buffered first signal as an operational signal for control or data when said integrated circuit is in said full power mode so that a second pin is not required to provide said wake up signals;

providing a second pin and buffer operational within said integrated circuit to send and receive a system reset signal to external components;

resetting only said integrated circuit in response to said wake up reset signal if said integrated circuit is in said first low power mode; and

resetting said integrated circuit and driving said second pin in response to said wake up reset signal if said integrated circuit is in said second low power mode.

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5,842,029

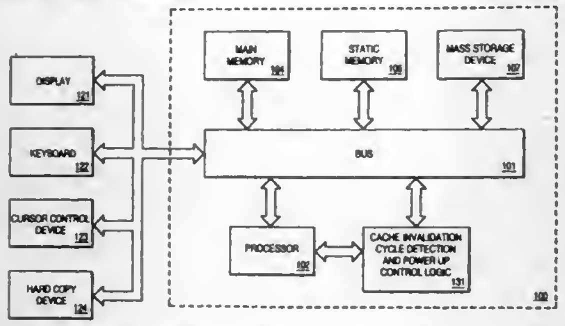
METHOD AND APPARATUS FOR POWERING DOWN AN INTEGRATED CIRCUIT TRANSPARENTLY AND ITS PHASE LOCKED LOOP

James W. Conary, Aloha, and Robert R. Beutler, Lake Oswego, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 713,734, Sep. 19, 1996, abandoned, which is a continuation of Ser. No. 36,530, Mar. 24, 1993, which is a continuation-in-part of Ser. No. 778,575, Oct. 17, 1991, abandoned. This application Jun. 19, 1997, Ser. No. 878,867

Int. Cl.^{6} G06F *1/32*

U.S. Cl. 395—750.04 **56 Claims**



1. A computer system comprising:
bus means for communicating and transferring data and instructions in the computer system;
memory means coupled to said bus for storing information;
means for generating a first clock signal;
an integrated circuit comprising
  phase locked loop (PLL) circuit means coupled to said means for generating a first clock signal, wherein said phase locked loop generates at least one bus clock signal and at least one core clock signal in response to said first clock signal,
  processing means coupled to said bus means for processing data and executing the instructions synchronous to said at least one core clock signal,
  means coupled to said processing means and said PLL circuit means and internal to said integrated circuit for placing said processing means in a reduced power consumption state in response to the execution of a power down instruction by said processing means, such that said computer system reduces power consumption, and wherein the PLL continues to receive the first clock signal and remains running and in lock while in said reduced power consumption state,
  means coupled to said processing means and said PLL circuit means and internal to said integrated circuit for generating a first signal, said first signal operable to delay said processing means from transitioning from an address generation state to a data generation state, and
  means coupled to said processing means and said PLL circuit means and internal to said integrated circuit for generating a second signal, said second signal operable to mask data inputs to said processing means.

5,842,030

MEMORY STORAGE SYSTEM HAVING SWAPPABLE POWER SUPPLIES

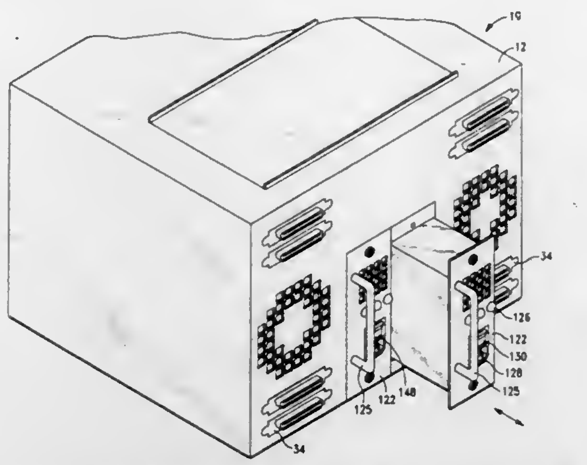
Henri Larabell, 5845 Killarney Cir., San Jose, Calif. 95138, and Dennis Read Fowler, 739 Anderson Dr., Los Altos, Calif. 94024

Filed Oct. 4, 1995, Ser. No. 542,797

Int. Cl.^{6} G06F *1/00;1/18;1/26*

U.S. Cl. 395—750.08 **18 Claims**

1. In a memory storage system connectable with memory storage devices, at least two power supplies with output voltages, and a host system, a power supply subsystem comprises:



a power supply adapter connectable with the power supply, the power supply adapter being connectable with the memory storage system for supplying power to the memory storage devices; and
voltage offset circuitry connected to the power supply adapter for inducing a voltage offset between the power supply output voltages,
wherein, when the at least two power supplies connect with the power supply adapter to provide power to an electrical device board, the voltage offset circuitry induces one of the at least two power supplies to sense a different output voltage than sensed by the remaining ones of the at least two power supplies so as to cause the one power supply to generate a different output voltage than the remaining ones of the at least two power supplies to regulate the output voltages of the remaining ones of the at least two power supplies.

5,842,031

ADVANCED PARALLEL ARRAY PROCESSOR (APAP)

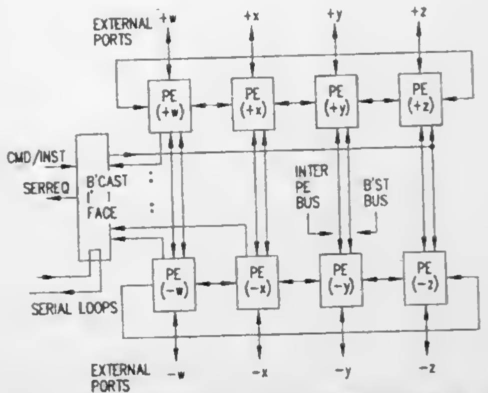
Thomas Norman Barker, Vestal; Clive Allan Collins, Poughkeepsie; Michael Charles Dapp, Endwell; James Warren Dieffenderfer, Owego; Donald George Grice, Kingston; Peter Michael Kogge, Endicott; David Christoper Kuchinski, Owego; Billy Jack Knowles, Kingston; Donald Michael Lesmeister, Vestal; Richard Ernest Miles; Richard Edward Nier, both of Apalachin, all of N.Y.; Eric Eugene Retter, Warren Center, Pa.; Robert Reist Richardson, Vestal, N.Y.; David Bruce Rolfe, West Hurley, N.Y.; Nicholas Jerome Schoonover, Tioga Center, N.Y.; Vincent John Smoral, Endwell, N.Y.; James Robert Stupp, Endwell, N.Y., and Paul Amba Wilkinson, Apalachin, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 887,630, May 22, 1992, Pat. No. 5,590,345, which is a continuation-in-part of Ser. No. 301,278, Sep. 6, 1994, Ser. No. 798,788, Nov. 27, 1991, Pat. No. 5,475,856, and Ser. No. 698,866, May 31, 1991, said Ser. No. 301,278 is a continuation of Ser. No. 611,594, Nov. 13, 1990. This application Jun. 6, 1995, Ser. No. 468,045

Int. Cl.^{6} G06F *15/80*

U.S. Cl. 395—800 **8 Claims**

1. A computer system, comprising:
a control unit, an interconnection system and a processing array for parallel processing having nodes which are interconnected with the distribution system to other processing nodes,
means for separating the physical and logical aspects of data transfer, control transfer, and diagnostic and status transfers,
means for the application or system operation software to circumvent the separating, when operating conditions warrant,
means for embedding all data routing and message passing protocols in parallel array software, and wherein
  paths and interconnection ports are multi dimensional meshes, with edges wrapped or unwrapped, or topology extensions to multi dimensional tree or hypercube structures, and



each processing element to receives data from four or more other processing elements and transmits data to one processing element all simultaneously
  wherein the control unit is programmable and has means for enabling the processing array having an array of processing elements to operate in coordination and which also enables a system control program to operate subsets of the parallel array with each subset dedicated to different applications or different phases of a single application program's processing,
  the interconnection system provides physical connections between the control unit and the elements of the parallel array of processing elements enabling data and control transfers which are completely independent of the transfer of data between elements of the processing array,
  the interconnection system distributes functions associated with data transfer between elements of the processing array and distributed functions embedded in processing node software, and
the processing array provides non-shared memory and compute services and which are partitioned and the processing array is scalable.

5,842,032

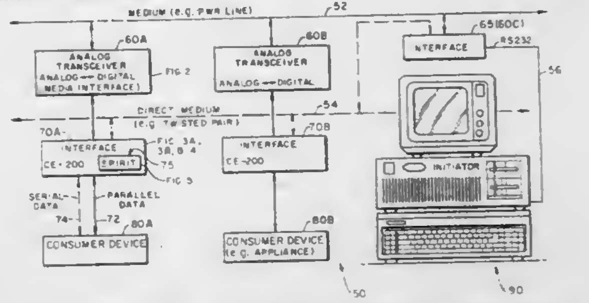
PROGRAMMABLE CONSUMER DEVICE INTERFACE

Ludo Arden Bertsch, Victoria, Canada, assignor to AISI Research Corporation, British Columbia, Canada

Continuation of Ser. No. 343,612, Nov. 22, 1994, Pat. No. 5,570,085, which is a continuation of Ser. No. 826,654, Jan. 21, 1992, abandoned, which is a continuation of Ser. No. 660,924, Feb. 27, 1991, abandoned, which is a continuation of Ser. No. 361,853, Jun. 2, 1989, abandoned. This application Oct. 28, 1996, Ser. No. 736,138

Int. Cl.^{6} G06F *13/10:13/38*

U.S. Cl. 395—800 **10 Claims**



1. A programmable consumer device interface, comprising:
media interface means for receiving first signals according to a media format and providing second signals in response thereto;
an interface control unit, including:
  a controller operable in response to said second signals and a stored program,
  a programmable memory means operable to receive, store and provide selected said second signals according to said stored program and said second signals, and
  a programmable data transceiver operable to provide third signals to said controller in response to said second signals, stored programmable memory signals and said stored program; and
transfer means providing selected fourth signals to a consumer device according to signals provided by said controller in response to said third signals and said stored program.

5,842,033

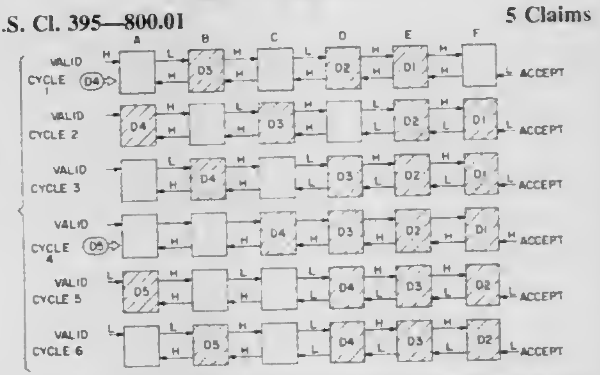
PADDING APPARATUS FOR PASSING AN ARBITRARY NUMBER OF BITS THROUGH A BUFFER IN A PIPELINE SYSTEM

Adrian P. Wise, Bracknell; Martin Sotheran, and William P. Robbins, both of Bristol, all of United Kingdom, assignors to Discovision Associates, Irvine, Calif.

Division of Ser. No. 400,397, Mar. 7, 1995, which is a continuation-in-part of Ser. No. 382,958, Feb. 2, 1995, which is a continuation of Ser. No. 82,291, Jun. 24, 1993, abandoned. This application Mar. 7, 1995, Ser. No. 400,211

Int. Cl.^{6} G06F *9/38*

U.S. Cl. 395—800.01 **5 Claims**



1. In a pipeline system, the improvement comprising: a fixed size, fixed width buffer; and means for padding said buffer to pass an arbitrary number bits through said buffer, wherein said bits comprise a stream of tokens, and a said comprises a plurality of data words, each said word including an extension indicator which indicates a presence or an absence of additional words in said token, a length of said token being determined by said extension indicators, whereby the length of said token can be unlimited;
  wherein said means for padding is pipelined with another member of said pipeline system by a two-wire link defining a sender, and a receiver, and further comprises a clock connected to said sender and said receiver, wherein data is transferred from said sender to said receiver upon a transition of said clock only when said sender is ready and said receiver is ready, wherein said two-wire link further comprises:
  electrical validation circuitry in at least one of said sender and said receiver to generate a validation signal for a first state when data stored in said stage is valid and for a second state when data stored in said stage is invalid, said validation circuitry including at least one storage device to store said validation signal;
  an acceptance signal connected between said sender and said receiver conveying an acceptance signal indicative of the ability of said receiver to load data stored in the sender; and
  enabling circuitry connected to said storage devices for generating an enabling signal to enable loading of data and validation signals into said storage device; wherein:
    said storage device includes a primary data storage device and a secondary data storage device;

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said data is loaded into said respective primary data storage devices and said validation signal is loaded into a respective secondary validation storage device at the same time;

data is loaded into said respective primary data storage device when said acceptance signal assumes an enabling state; and

said acceptance signal assumes said enabling state only when the acceptance signal associated with the data storage device of said receiver is in said enabling state or said data in said data storage device of said receiver is invalid.

5,842,034

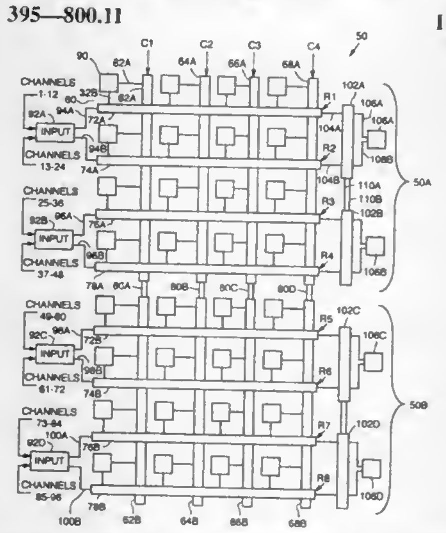
TWO DIMENSIONAL CROSSBAR MESH FOR MULTI-PROCESSOR INTERCONNECT

Gregory L. Bolstad, Orange; Christopher W. Reed, Los Angeles, and Charles J. Robie, Fullerton, all of Calif., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 20, 1996, Ser. No. 770,401

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—800.11 **16 Claims**



1. A parallel processor array, comprising a first plurality of processor elements configured as a second plurality of clusters of processing elements, and an interconnection network for interconnecting the processor clusters, the network including a two-dimensional mesh of multi-port crossbar switch elements arranged in rows and columns in a crossbar mesh network, each crossbar switch element including a third plurality of ports and controllable switching for operatively connecting one part of the crossbar switch element to another port of the crossbar switch element, and wherein each processor cluster is connected to a port of a row crossbar switch element and to a port of a column crossbar switch element, and wherein an input data set to be processed is supplied directly into the network via crossbar switch element input ports for initial partitioning of the data set among the processing elements, said input data set being characterized as a three dimensional data cube, said three dimensional data cube being characterized as sensor data, a first data dimension represents a sensor channel dimension, a second data dimension represents a Doppler dimension, and a third data dimension represents a Range cell dimension, and wherein the interconnection network is configurable in an initial state such that the data set is initially distributed among the processing elements for processing in a first data dimension during a first processing function, and subsequently is configurable to perform a data dimension transposition of the data set for processing in a second data dimension by the processing elements during a second processing function.

5,842,035

PARALLEL COMPUTER UTILIZING LESS MEMORY BY HAVING FIRST AND SECOND MEMORY AREAS

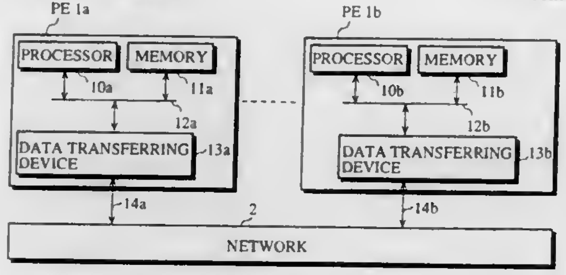
Junji Nishikawa, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 24, 1995, Ser. No. 410,077

Claims priority, application Japan, Mar. 31, 1994, 6-062215

Int. Cl.^{6} G06F *15/16*

U.S. Cl. 395—800.14 **23 Claims**



1. A parallel computer comprising a plurality of processor elements and a network interconnecting the same, wherein each of said plurality of processor elements includes:

memory means including a first area and a second area, said first area storing a program and a data portion allocated to a processor element, said second area having a smaller capacity than said first area and temporarily storing working data;

first data transferring means for performing a first data transfer, whereby data necessary for an operation are transferred to said second area from first areas of other processor elements via said network to form a new data portion therein;

a processor for performing a first operation, whereby the data portion in said first area is processed and an operation result is stored into said first area, and for performing a second operation, whereby the new data portion in said second area is processed and an operation result is stored into said second area; and

second data transferring means for performing a second data transfer, whereby the operation results stored in the second areas in the other processor elements are transferred to said first area of the processor element via said network.

5,842,036

CIRCUIT AND METHOD FOR SCHEDULING INSTRUCTIONS BY PREDICTING FUTURE AVAILABILITY OF RESOURCES REQUIRED FOR EXECUTION

Glenn J. Hinton, Portland; Robert W. Martell; Michael A. Fetterman, both of Hillsboro; David B. Papworth, Beaverton, and James L. Schwartz, Portland, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 634,692, Apr. 18, 1996, abandoned, which is a division of Ser. No. 293,388, Aug. 19, 1994, Pat. No. 5,555,432. This application Oct. 20, 1997, Ser. No. 954,444

Int. Cl.^{6} G06F *9/38*

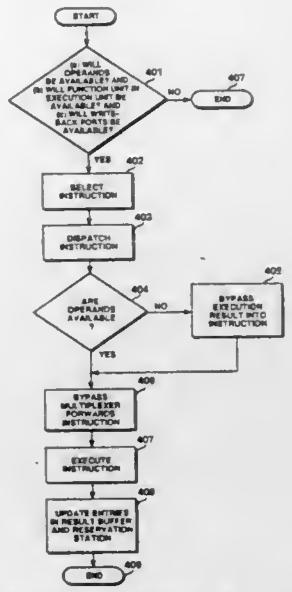
U.S. Cl. 395—800.23 **7 Claims**

1. A method of instruction execution in a processor, said method comprising the steps of:

generating an indication of availability of an execution result of a first instruction, completion of execution of said first instruction generating said execution result;

generating an n-cycle inhibit signal when completion of said first instruction will take more than n cycles;

determining whether said execution result provides an operand for a second instruction; and


START
(a) WILL OPERANDS BE AVAILABLE? AND (b) WILL FUNCTION UNIT IN EXECUTION UNIT BE AVAILABLE? AND (c) WILL WRITE-BACK PORTS BE AVAILABLE?
401
NO
407
END
YES
402
SELECT INSTRUCTION
403
DISPATCH INSTRUCTION
404
ARE OPERANDS AVAILABLE ?
NO
405
BYPASS EXECUTION RESULT INTO INSTRUCTION
YES
406
BYPASS MULTIPLEXER FORWARDS INSTRUCTION
407
EXECUTE INSTRUCTION
408
UPDATE ENTRIES IN RESULT BUFFER AND RESERVATION STATION
409
END

dispatching said second instruction to an execution unit through a bypass multiplexor prior to completion of execution of said first instruction if said execution result provides said operand for said second instruction and said n-cycle inhibit signal is not asserted, said dispatching step being performed according to said indication of availability such that said execution result is generated before said second instruction is received at said execution unit.

5,842,037

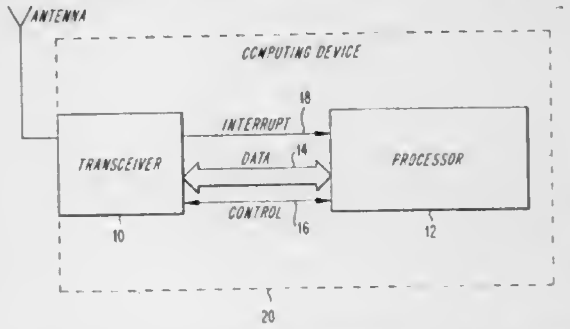
INTERFERENCE REDUCTION IN TDM-COMMUNICATION/COMPUTING DEVICES

Jacobus Haartsen, Staffanstrop, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Mar. 20, 1995, Ser. No. 406,583

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—821 **26 Claims**



1. A method for suppressing interference in an integrated communication/computing device, comprising the steps of:

sending an interrupt signal to a computing device from a transceiver when said transceiver is about to transmit or receive information over a communication channel having a defined timing;

entering an interrupt routine at the computing device in response to the interrupt signal at times that corresponds to the defined timing of the communication channel; and

releasing said computing device from the interrupt routine after the information has been transmitted or received.

5,842,038

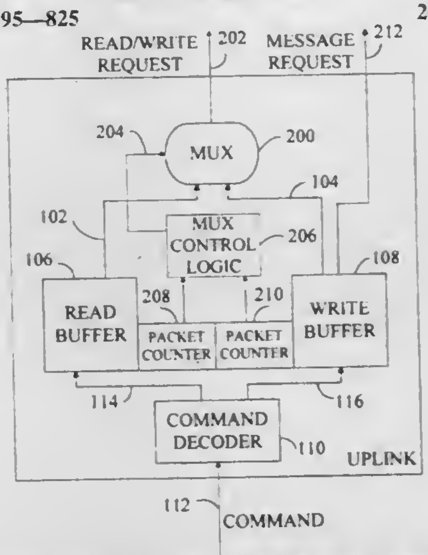
OPTIMIZED INPUT/OUTPUT MEMORY ACCESS REQUEST SYSTEM AND METHOD

David Paul Williams, Mounds View; Stephen Sutter, Maple Grove, and Robert Norman Anderson, Columbia Heights, all of Minn., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Oct. 10, 1996, Ser. No. 728,332

Int. Cl.^{6} G06F *12/06*

U.S. Cl. 395—825 **20 Claims**



1. An input/output (I/O) interface architecture for use in a data processing system, the data processing system including an I/O bus and a memory, the interface architecture comprising:

(a) an I/O bridge, coupled to the I/O bus, having bridge outputs to output commands received from the I/O bus:

(b) an uplink module, coupled to receive the commands from the I/O bridge, the uplink module comprising:

  (i) a read buffer having a first plurality of data registers to store read request commands, and having a read buffer output terminal to output the read request commands to the memory:

  (ii) a write buffer having a second plurality of data registers to store write request commands, and having a write buffer output terminal to output the write request commands to the memory: and

  (iii) command decode means, coupled to the I/O bridge, for receiving the commands and decoding command identification bits to distinguish the read request commands from the write request commands, and for routing the read request commands to the read buffer and the write request commands to the write buffer.

5,842,039

MOST RECENT FIRST DYNAMIC PROTOCOL DETECTION FOR USE WITH A PROGRAMMABLE CONTROLLER

Kelly P. Hanaway, Sussex; David J. Lillie, Pewaukee, and Paul G. Kucharski, Waukesha, all of Wis., assignors to Allen Bradley Company, LLC, Milwaukee, Wis.

Filed May 28, 1996, Ser. No. 654,468

Int. Cl.^{6} G06F *9/00;11/00*

U.S. Cl. 395—831 **14 Claims**

1. A method to be used with a programmable controller that is capable of communicating with peripheral devices according to at least first and second protocols, the protocol currently used by the controller being a current protocol and the other of the first and second protocols being a non-current protocol, the method for automatically switching controller communication from the current protocol to the non-current protocol when a peripheral device communicates in the non-current protocol, the method comprising the steps of:

(a) with the controller communicating in the first protocol so that the first protocol is the current protocol, receiving messages:

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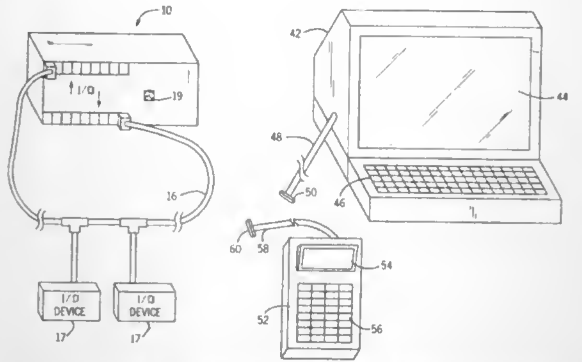


(b) determining if received messages are in the first protocol;

(c) when received messages are not in the first protocol, switching controller communication so that the second protocol is the current protocol and the first protocol is the non-current protocol; and

(d) repeating steps (a) through (c) with the current protocol as the first protocol and the non-current protocol as the second protocol.

5,842,040

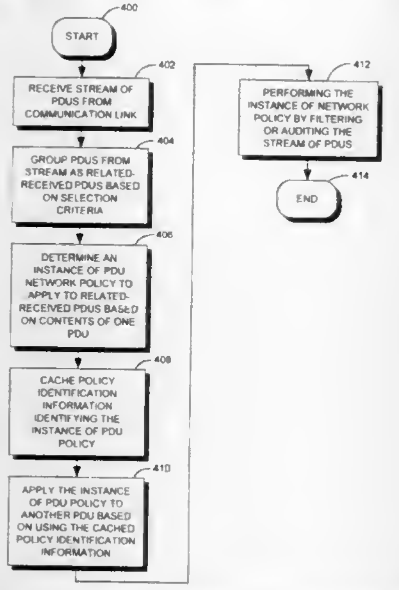
POLICY CACHING METHOD AND APPARATUS FOR USE IN A COMMUNICATION DEVICE BASED ON CONTENTS OF ONE DATA UNIT IN A SUBSET OF RELATED DATA UNITS

James P. Hughes, Lino Lakes, and Steve A. Olson, South St. Paul, both of Minn., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Jun. 18, 1996, Ser. No. 666,638

Int. Cl.^{6} G06F *13/42*

U.S. Cl. 395—831 **35 Claims**


400
START
402
RECEIVE STREAM OF PDUS FROM COMMUNICATION LINK
404
GROUP PDUS FROM STREAM AS RELATED-RECEIVED PDUS BASED ON SELECTION CRITERIA
406
DETERMINE AN INSTANCE OF PDU NETWORK POLICY TO APPLY TO RELATED-RECEIVED PDUS BASED ON CONTENTS OF ONE PDU
408
CACHE POLICY IDENTIFICATION INFORMATION IDENTIFYING THE INSTANCE OF PDU POLICY
410
APPLY THE INSTANCE OF PDU POLICY TO ANOTHER PDU BASED ON USING THE CACHED POLICY IDENTIFICATION INFORMATION
412
PERFORMING THE INSTANCE OF NETWORK POLICY BY FILTERING OR AUDITING THE STREAM OF PDUS
414
END

1. A policy caching method for use in a communication device, comprising the steps of:

determining an instance of protocol data unit (PDU) network policy from a plurality of policies to be applied to related-received PDUs based on contents of one of the related-received PDUs, wherein the related-received PDUs are a subset of a stream of PDUs and may be distributed throughout said stream of PDUs; and

caching policy identification information identifying the instance of PDU policy which is to be applied to other PDUs of the related-received PDUs.

5,842,041

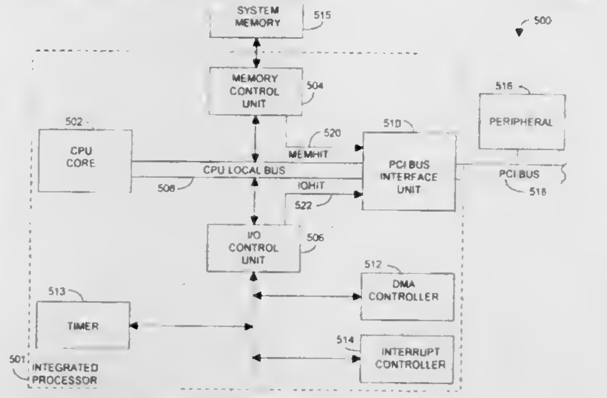
COMPUTER SYSTEM EMPLOYING A CONTROL SIGNAL INDICATIVE OF WHETHER ADDRESS IS WITHIN ADDRESS SPACE OF DEVICES ON PROCESSOR LOCAL BUS

Gerard T. McKee; Victor F. Andrade, and Kelly McCord Horton, all of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed May 20, 1994, Ser. No. 246,673

Int. Cl.^{6} G06F *13/00;13/14*

U.S. Cl. 395—843 **26 Claims**



1. A computer system comprising:

a system memory;

a memory control unit coupled to said system memory;

a bus interface unit coupled to said memory control unit via a local bus; and

a peripheral device coupled to said bus interface unit via a secondary bus, wherein said peripheral device is configured to execute a write cycle on said secondary bus, wherein said write cycle includes an associated address signal;

wherein said bus interface unit is configured to provide said associated address signal from said secondary bus to said local bus in response to said write cycle on said secondary bus without initiating a corresponding write cycle upon said local bus; and

wherein said memory control unit is configured to decode said associated address signal and generate a control signal to said bus interface unit indicative of whether said associated address signal corresponds to an address location within said system memory; and

wherein said bus interface unit is configured to initiate a cycle on said local bus which corresponds to said write cycle on said secondary bus in response to said control signal indicating that said associated address signal corresponds to said address location within said system memory.

5,842,042

DATA TRANSFER CONTROL METHOD FOR CONTROLLING TRANSFER OF DATA THROUGH A BUFFER WITHOUT CAUSING THE BUFFER TO BECOME EMPTY OR OVERFLOW

Satoshi Kodama, Yokohama; Mikito Ogata, Minamiashigara; Shigeru Kaga, Odawara, and Shinjiro Shiraki, Kanagawa-ken, all of Japan, assignors to Hitachi, Ltd., Tokyo; Hitachi Computer Engineering Co., Ltd., and Hitachi Computer Peripherals Co., Ltd., both of Kanagawa-Ken, all of Japan

Continuation of Ser. No. 314,782, Sep. 29, 1994, Pat. No. 5,623,607. This application Dec. 18, 1996, Ser. No. 769,217

Claims priority, application Japan, Oct. 5, 1993, 5-249077

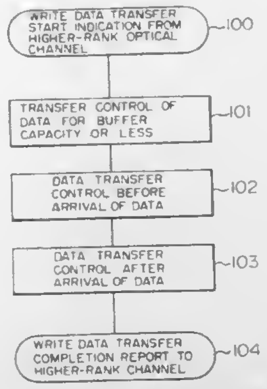
Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—849 **15 Claims**

1. A data processing system comprising:

a data transfer apparatus for controlling data transfer through a buffer;

a first data processing apparatus for transferring data with said data transfer apparatus through a first bus which transfers data at a first transfer speed; and


WRITE DATA TRANSFER START INDICATION FROM HIGHER-RANK OPTICAL CHANNEL
100
TRANSFER CONTROL OF DATA FOR BUFFER CAPACITY OR LESS
101
DATA TRANSFER CONTROL BEFORE ARRIVAL OF DATA
102
DATA TRANSFER CONTROL AFTER ARRIVAL OF DATA
103
WRITE DATA TRANSFER COMPLETION REPORT TO HIGHER-RANK CHANNEL
104

a second data processing apparatus for transferring data with said data transfer apparatus through a second bus which transfers data at a second transfer speed different from said first transfer speed.

wherein said data transfer apparatus transmits data transfer requests to said first data processing apparatus which supplies data by transfer units predetermined between said first data processing apparatus and said data transfer apparatus so as to transfer data less than data storing capacity of said buffer.

wherein said data transfer apparatus transmits data transfer requests to said first data processing apparatus at each sweep-out time for sweeping out a transfer unit of data from said buffer to said second data processing apparatus with said second data transfer speed until data transferred from said first data processing apparatus arrives at said data transfer apparatus, and

said data transfer apparatus transmits data transfer requests to said first data processing apparatus at each of said data transfer units in response to the data transfer of said transfer unit from said data transfer apparatus to said second data processing apparatus after said data from said first data processing apparatus arrived at said data transfer apparatus.

5,842,043

SYSTEM FOR DATA ACCESS MANAGEMENT OF A NETWORK OF DEDICATED PROCESSING, DATA, AND INTERFACE MACHINES COMBINATION OF WHICH PERFORMING FUNCTIONS OF A GENERAL-PURPOSE COMPUTER

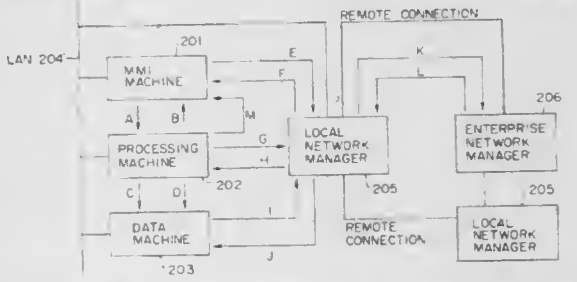
Takeshi Nishimura, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Nov. 15, 1995, Ser. No. 559,428

Claims priority, applicatinn Japan, Nov. 15, 1994, 6-280660

Int. Cl.^{6} G06F *13/14*

U.S. Cl. 395—856 **14 Claims**



1. A data access right management apparatus in a data-independent computer system including a network, said data access right management apparatus comprising:

a combination of machines separately performing functions of a general-purpose computer, including at least one of

a dedicated processing machine to receive a first electronic message including a request of a transaction process from the network, to transmit a second electronic message including results of the transaction process to the network, to transmit a third electronic message including a request of data accesses to the network, to receive a fourth electronic message including results of the data accesses from the network, and to execute transaction processes corresponding to the first through fourth electronic messages;

a dedicated data machine to receive the third electronic message including the request of the data accesses, to transmit the fourth electronic message including the results of the data accesses to the network, and to access stored data in response to the third electronic messages; and

a dedicated man-machine interface machine to transmit the first electronic message including the request of the transaction process, to receive the second electronic message including the results of the transaction process from the network, and to perform a man-machine interface processes corresponding to the first and second electronic messages; and

a first network manager to manage access rights of respective users for accessing the processing machine and the data machine through the network, where the at least one of the processing machine, the data machine and the man-machine interface machine are connected to the network.

5,842,044

INPUT BUFFER DEVICE FOR A PRINTER USING AN FIFO AND DATA INPUT METHOD

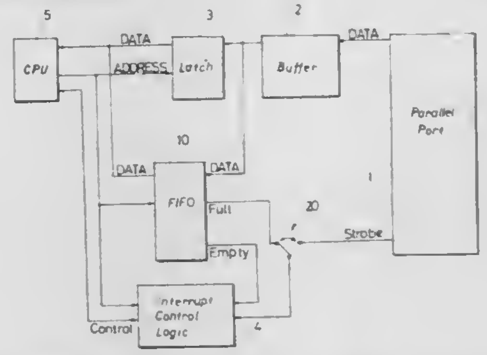
Chang Hyun No, Kyoungki-do, Rep. of Korea, assignor to Hyundai Electronics Co. Ltd., Rep. of Korea

Filed Jun. 1, 1995, Ser. No. 456,678

Claims priority, application Rep. of Korea, Jun. 29, 1994, 1994-15295

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—873 **2 Claims**



1. An input buffer device for a printer using an FIFO, having a parallel port for receiving data from a host computer, a buffer for temporarily storing the data output from said parallel port and then outputting the same, a latch for inputting the data stored in said buffer to a CPU by 1 byte, and an interrupt control logic for outputting an interrupt signal when receiving a strobe signal generated from said host computer to thereby control said CPU, said input buffer comprising:

an FIFO connected in parallel with said latch; and

a jumper for selectively receiving a strobe signal output from said host computer and an FIFO memory full signal.

5,842,045

TERMINAL UNIT HAVING A UNIVERSAL MULTI-PROTOCOL MODULAR JACK AUTOMATICALLY SETS ITS PROTOCOL TO MATCH WITH PROTOCOL OF A MODULAR PLUG CONNECTING TO THE JACK

Noriyasu Nakamura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 9, 1996, Ser. No. 694,680

Claims priority, application Japan, Aug. 14, 1995, 7-228572

Int. Cl.^{6} G06F *13/00*

U.S. Cl. 395—883 **12 Claims**

1. A terminal unit comprising:

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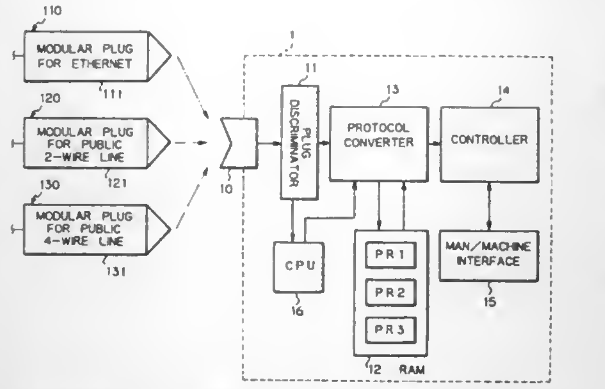


a general-purpose modular jack capable of accommodating any one of a plurality of kinds of modular plugs;

identifying means for identifying the kind of the modular plug connected to said modular jack;

storing means for storing a plurality of protocols each corresponding to a respective kind of modular plug; and

protocol converting means for reading, based on an output of said identifying means, a matching protocol that matches the kind of the modular plug connected to said modular jack, and then setting said matching protocol as a protocol of said terminal unit.

5,842,046

DISK DRIVE SYSTEM FOR STORING A PLURALITY OF I FRAMES NON-INTERLACED WITH RESPECT TO B FRAMES BY STORING B FRAMES IN A SEPARATE CYLINDER

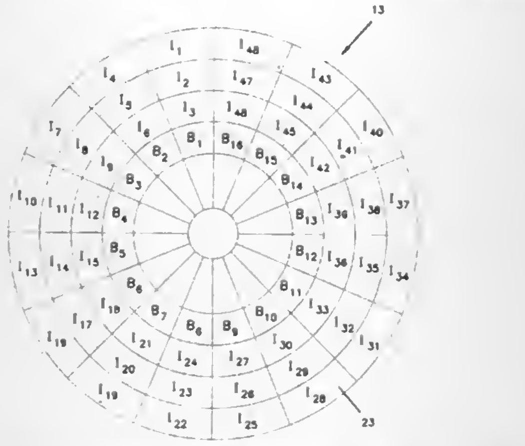
Kouichi Kajitani, Kawasaki, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 3, 1995, Ser. No. 511,006

Claims priority, application Japan, Aug. 23, 1994, 6-198785

Int. Cl.^{6} G06F *13/10;* H04N *5/76*

U.S. Cl. 395—894 **35 Claims**



1. A disk drive system for reading and storing compressed video data represented by a combination of I frames and B frames, wherein an I frame is a compressed video frame representing a sequential series of video frames having redundant data eliminated, and wherein a B frame is a frame of compressed data representing differences between video data for a frame represented by one of the I frames and video data for another frame, comprising:

a storage disk;

a head for reading and writing I and B frames to the disk; and

a controller, coupled to the head, for moving the head relative to the disk to store a plurality of I frames that are non-interlaced with respect to the B frames, wherein the I frames are stored on a first area comprising at least one cylinder and the B frames are stored in a separate second area comprising at least one cylinder.

5,842,047

STROBE LIGHT AND PHOTOGRAPHIC CAMERA INCORPORATING THE SAME

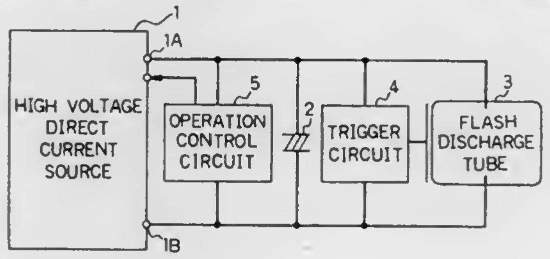
Hisashi Ogura, Ikoma-gun, and Katsumi Ogisako, Osaka, both of Japan, assignors to West Electric Company, Ltd., Osaka, Japan

Filed Jun. 20, 1997, Ser. No. 879,423

Claims priority, application Japan, Jun. 27, 1996, 8-167026

Int. Cl.^{6} G03B *15/05*

U.S. Cl. 396—6 **3 Claims**



1. A strobe light comprising:

an aluminum-electrolytic capacitor as a main capacitor for storing electric energy having a dissipation factor (tanδ) of at most 0.03; and

operation controlling means for controlling a charge completion voltage of the aluminum-electrolytic capacitor so as to be at most 300 V.

5,842,048

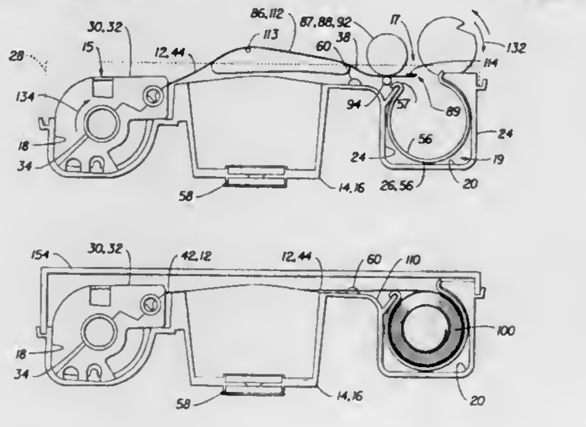
ADVANCING SHEATH FILM LOADER, METHOD OF FILM LOADING AND CAMERA FRAME ASSEMBLY

Dennis R. Zander, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 24, 1997, Ser. No. 881,169

Int. Cl.^{6} G03B *17/02*

U.S. Cl. 396—6 **23 Claims**



20. A camera comprising:

a body having a cartridge chamber, a supply chamber, and an exposure frame between said chambers, said supply chamber having first and second opposed projections defining a throat;

a flexible sheath, said sheath having opposed first and second ends attached to respective said projections, said sheath defining a substantially cylindrical film space within said supply chamber.

5,842,049

ELECTRONIC STILL VIDEO CAMERA HAVING ELECTRO-DEVELOPING RECORDING MEDIUM, AND IMAGE READER INCORPORATED THEREIN TO ELECTRONICALLY READ IMAGE SIGNALS FROM DEVELOPED IMAGE OF SUCH MEDIUM

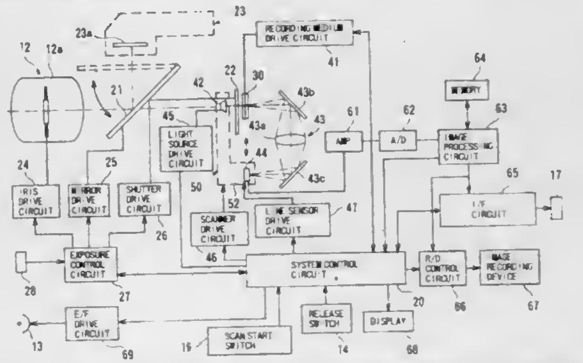
Harumi Aoki, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1996, Ser. No. 592,487

Claims priority, application Japan, Jan. 26, 1995, 7-030128

Int. Cl.^{6} G03B *17/50*

U.S. Cl. 396—30 **23 Claims**



1. An electronic still video camera having an electro-developing recording medium, comprising:

a photographing optical system that forms an optical image on an image-forming plane of said electro-developing recording medium to record and develop the optical image therein; and

an image-sensing device that optically senses said electro-developing recording medium to obtain image data from the recorded image of said electro-developing recording medium;

said image-sensing device comprising a light source having a light emitting surface arranged parallel with the image-forming plane of said electro-developing recording medium;

said image sensing device further comprising an image sensor having a light receiving surface and an immovably positioned optical system, said light receiving surface of said image sensor and said light emitting surface of said light source being oriented in the same direction;

said light source and said image sensor being associated with each other so as to be moved as a unit with respect to said electro-developing recording medium, such that light beams emitted from said light emitting surface of said light source in association with movement of said light source and said image sensor are perpendicularly directed to the image forming plane of said electro-developing recording medium and pass through the image-forming plane of said electro-developing recording medium before being directed to and focused on said light receiving surface of said image sensor, by said immovably positioned optical system.

5,842,050

ELECTRONIC STILL VIDEO CAMERA HAVING ELECTRO-DEVELOPING RECORDING MEDIUM

Harumi Aoki, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1995, Ser. No. 577,926

Claims priority, application Japan, Dec. 22, 1994, 6-335971; Dec. 22, 1994, 6-335974; Dec. 22, 1994, 6-335975; Dec. 22, 1994, 6-335977; Dec. 22, 1994, 6-335978

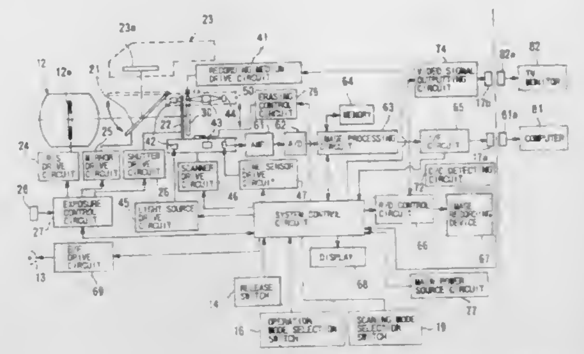
Int. Cl.^{6} G03B *17/50*

U.S. Cl. 396—30 **50 Claims**

1. An electronics still video camera having an electro-developing recording medium, comprising:

a photographing optical system that forms an optical image as a still image on said electro-developing recording medium to record and develop said optical image therein;

a first controller that controls said formation of said optical image on said electro-developing recording medium;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64
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62
61
74
82
81
DISPLAY
RELEASE SWITCH
68
66
67
MAIN POWER SOURCE CIRCUIT
77
OPERATION MODE SELECTION SWITCH
SCANNING MODE SELECTION SWITCH
COMPUTER

a manual photographing-start switch that initiates said first controller to form said optical image on said electro-developing recording medium when said manual photographing-start switch is operated;

an image-sensing device that optically senses and obtains image data from said recorded optical image of said electro-developing recording medium;

a second controller that controls said sensing of said image data from said recorded optical image of said electro-developing recording medium;

a manual image-sensing-start switch that initiates said second controller to sense said image data from said recorded optical image of said electro-developing recording medium when said manual image-sensing-start switch is operated;

a photographing-disabler that disables initiation of said first controller by an operation of said manual photographing-start switch while said second controller is initiated by an operation of said manual image-sensing-start switch; and

an image-sensing-disabler that disables initiation of said second controller by an operation of said manual image-sensing-start switch while said first controller controls said formation of said optical image on said electro-developing recording medium by an operation of said manual photographing-start switch.

5,842,051

CAMERA

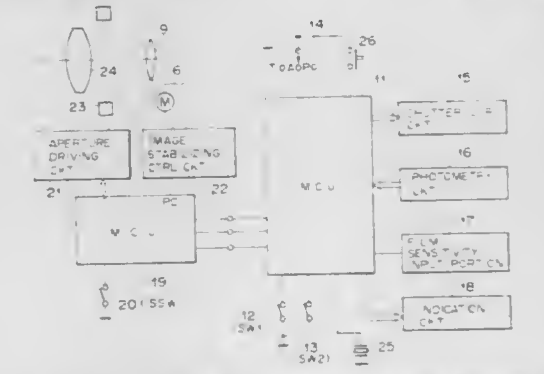
Toshiyuki Kumakura, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 430,607, Apr. 28, 1995, abandoned, which is a continuation of Ser. No. 117,659, Sep. 8, 1993, abandoned, which is a continuation of Ser. No. 692,261, Apr. 26, 1991, abandoned. This application Mar. 6, 1997, Ser. No. 812,077

Claims priority, application Japan, Apr. 27, 1990, 2-112666

Int. Cl.^{6} G03B *17/00*

U.S. Cl. 396—52 **28 Claims**



1. An image blur prevention apparatus that uses an image blur correction device which corrects image blur and an operation device which performs an operation to prevent image blur independently of the image blur correction device, said apparatus comprising:

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a determining device which determines whether the image blur correction device is performing a predetermined image blur correction operation; and

a connecting device which controls an operation state of the operation device in accordance with a determination by said determining device, said connecting device causing the operation device to perform a predetermined operation for image blur prevention when said determining device determines that the image blur correction device is not performing the predetermined image blur correction operation.

5,842,052
LOCKING MECHANISM FOR A CAMERA VIBRATION CORRECTION DEVICE

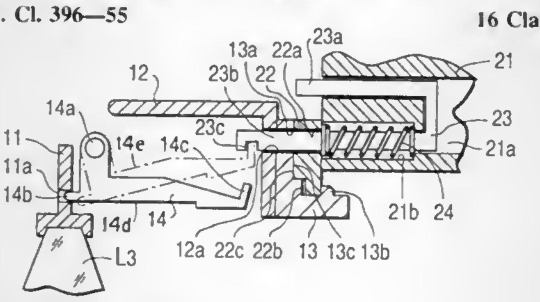
Hiroshi Okano, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 527,502, Sep. 13, 1995, abandoned, which is a continuation of Ser. No. 379,023, Jan. 27, 1995, abandoned, which is a continuation of Ser. No. 223,975, Apr. 6, 1994, abandoned. This application Jul. 31, 1996, Ser. No. 688,054

Claims priority, application Japan, Apr. 6, 1993, 5-103465

Int. Cl.⁶ G03B *17/42*

U.S. Cl. 396—55 **16 Claims**



1. A camera comprising:

a camera body;

a photographic optical system which includes a blur correction lens and is detachable from the camera body;

a blur correction mechanism which compensates for blur by moving the blur correction lens;

a locking mechanism which has a first position that restricts movement of the blur correction lens, and a second position which allows the blur correction lens to move unrestricted by the locking mechanism;

a removal regulation member which regulates the detachment of the photographic optical system from the camera body, wherein the operation of the removal regulation member is conditional upon the position of the locking mechanism; and

a lens holder which holds the blur correction lens, the lens holder having a hole, wherein

the removal regulation member includes a notched part, and

the locking mechanism comprises an arm having a first end with a protrusion and a second end with a protrusion and moves so that, when the locking mechanism is in the first position, the protrusion of the first end fits into the hole of the lens holder to restrict movement of the blur correction lens and the protrusion of the second end is not fitted into the notched part of the removal regulation member and, when the locking mechanism is in the second position, the protrusion of the first end is not fitted into the hole of the lens holder and the protrusion of the second end is fitted into the notched part of the removal regulation member to restrict the movement of the removal regulation member.

5,842,053
IMAGE SHAKE CORRECTION DEVICE FOR OPTICAL SYSTEM AND APPARATUS HAVING IMAGE SHAKE CORRECTION DEVICE OPTICAL SYSTEM

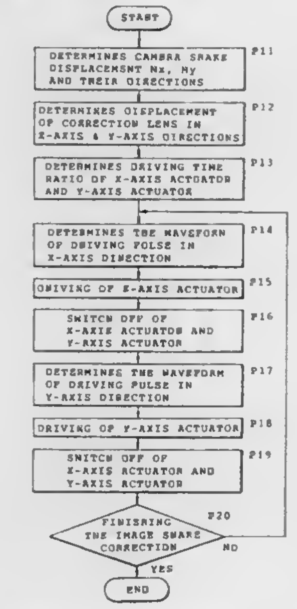
Masayuki Ueyama, Takarazuka, and Tetsuro Kanabara, Sakai, both of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Jul. 23, 1997, Ser. No. 898,961

Claims priority, application Japan, Jul. 24, 1996, 8-212180; Jul. 24, 1996, 8-212781

Int. Cl.⁶ G03B *17/00*

U.S. Cl. 396—55 **10 Claims**


START
DETERMINES CAMERA SHAKE DISPLACEMENT Nx, Ny AND THEIR DIRECTIONS
P11
DETERMINES DISPLACEMENT OF CORRECTION LENS IN X-AXIS & Y-AXIS DIRECTIONS
P12
DETERMINES DRIVING TIME RATIO OF X-AXIS ACTUATOR AND Y-AXIS ACTUATOR
P13
DETERMINES THE WAVEFORM OF DRIVING PULSE IN X-AXIS DIRECTION
P14
DRIVING OF X-AXIS ACTUATOR
P15
SWITCH OFF OF X-AXIS ACTUATOR AND Y-AXIS ACTUATOR
P16
DETERMINES THE WAVEFORM OF DRIVING PULSE IN Y-AXIS DIRECTION
P17
DRIVING OF Y-AXIS ACTUATOR
P18
SWITCH OFF OF X-AXIS ACTUATOR AND Y-AXIS ACTUATOR
P19
FINISHING THE IMAGE SHAKE CORRECTION
P20
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YES
END

1. An image shake correction device of an optical system, comprising:

a correcting lens disposed movably in a plane perpendicular to the optical axis, a plurality of correcting lens driving mechanisms for moving the correcting lens in the X-axis direction and Y-axis direction on the xy-plane perpendicular to the optical axis,

a driving pulse generation unit for generating driving pulse to move the correcting lens driving mechanism, and

a control unit for calculating driving time ratio of said plurality of lens driving mechanisms based on lens position information of the correcting lens corresponding to shake displacement of the optical axis, and for supplying driving pulse outputted from the driving pulse generating unit to said plurality of lens driving mechanisms alternately dependently on the calculated driving time ratio.

5,842,054
SHAKE DISCRIMINATION AND IMAGE STABILIZER

Koji Suzuki, and Etsuro Saito, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 19, 1997, Ser. No. 934,433

Claims priority, application Japan, Sep. 20, 1996, 8-250724

Int. Cl.⁶ G03B *17/00*

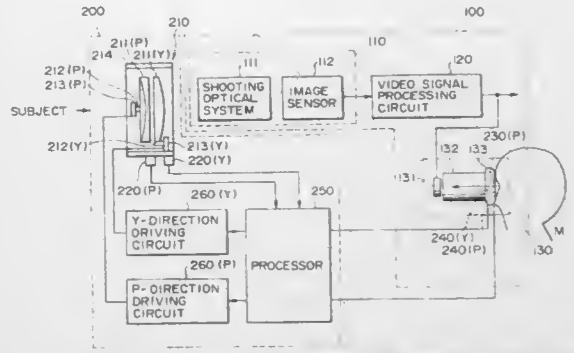
U.S. Cl. 396—55 **8 Claims**

1. A shake discriminator comprising:

a first shake detection means incorporated in a camera system to shoot a subject and serving to detect a shake of said camera system;

a second shake detection means incorporated in said camera system and serving to detect a shake of a cameraman's face with regard to said camera system; and

a shake discrimination means for making a discrimination, on the basis of the detection outputs of said first and second



shake detection means, as to whether the shake of said camera system is the one intended by the cameraman.

5,842,055
LENS BARREL AND OPTICAL APPARATUS

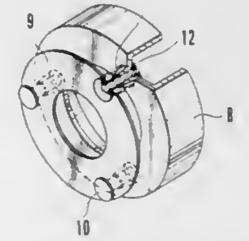
Masahisa Tamura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 20, 1997, Ser. No. 880,039

Claims priority, application Japan, Jun. 25, 1996, 8-164879

Int. Cl.⁶ G03B *9/02;* **G02B** *15/14;9/00*

U.S. Cl. 396—72 **32 Claims**



1. A lens barrel comprising:

a lens unit arranged to be movable in an optical axis direction;

a plurality of shafts which hold a stop arranged to block undesirable light and which extend in the optical axis direction; and

a support member which supports said plurality of shafts while allowing said plurality of shafts to be moved in the optical axis direction,

wherein said plurality of shafts are moved by being pushed by said lens unit, thereby moving said stop.

5,842,056
IMAGE MAGNIFICATION CONTROL DEVICE FOR A CAMERA

Noboru Suzuki; Shigeo Toji, both of Tokyo, and Masahiro Kawasaki, Saitama-ken, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

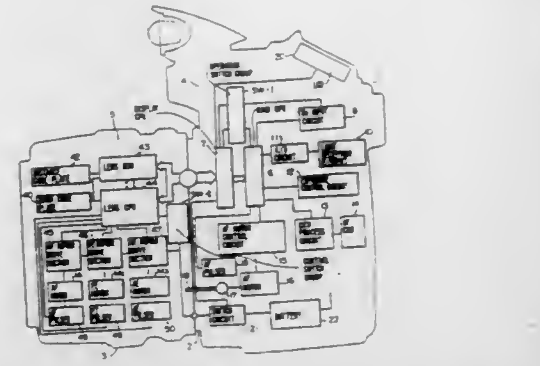
Division of Ser. No. 373,369, Jan. 7, 1995, Pat. No. 5,541,702, which is a division of Ser. No. 149,226, Nov. 2, 1993, Pat. No. 5,428,419, which is a continuation of Ser. No. 881,785, May 11, 1992, Pat. No. 5,283,607, which is a continuation of Ser. No. 652,038, Feb. 4, 1991, Pat. No. 5,159,377, which is a continuation of Ser. No. 410,880, Sep. 22, 1989, Pat. No. 5,093,680. This application May 17, 1996, Ser. No. 649,311

Claims priority, application Japan, Sep. 22, 1988, 63-237570; Sep. 22, 1988, 63-237571; Sep. 22, 1988, 63-237572; Sep. 22, 1988, 63-237573; Sep. 22, 1988, 63-237574; Sep. 22, 1988, 63-237575

Int. Cl.⁶ G03B *13/00*

U.S. Cl. 396—78 **14 Claims**

1. An image magnification control device for a camera having a photographic lens, comprising:



distance detecting means for detecting a distance "X0" between a rear focal point of said photographic lens and an image taking plane of said camera;

defocus detecting means for detecting a defocusing amount "dx" corresponding to a distance between said image taking plane and a surface on which an image is formed by said photographic lens;

first calculating means for calculating a magnification ratio γ of a control focal length "f1" required to maintain an image magnification to a present focal length "f0", based on said distance "X0" and said defocus amount "dx" in accordance with an equation:

$$\gamma = \frac{X0}{X0 + dx};$$

second calculating means for calculating a driving amount of said photographic lens to maintain said image magnification, based on said magnification ratio γ, and

means for driving said photographic lens, based on said driving amount calculated by said second calculating means, to change a focal length of said photographic lens.

5,842,057
CAMERA WITH LENS BARRIER APPARATUS

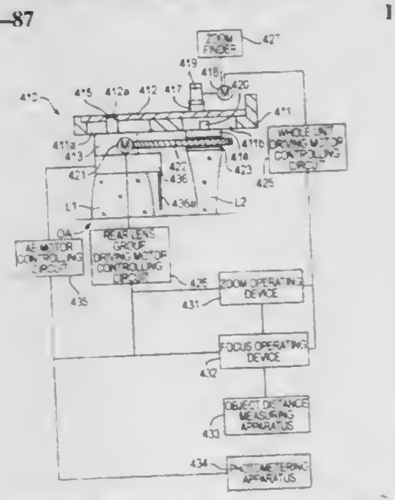
Hiroshi Nomura; Kazuyoshi Azegami; Takamitsu Sasaki; Yasushi Tabata; Nori Numako; Yoshinari Tanimura; Takuma Sato, and Masaaki Kishimoto, all of Tokyo, Japan, assignors to Asahi Kogo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 30, 1996, Ser. No. 775,239

Claims priority, application France, Jan. 26, 1996, 8-12317; Japan, Feb. 20, 1996, 8-32522; Feb. 20, 1996, 8-32523; France, Feb. 21, 1996, 8-34126; Japan, Feb. 21, 1996, 8-58335; Feb. 21, 1996, 8-58350; Feb. 22, 1996, 8-34822

Int. Cl.⁶ G03B *5/00;17/04*

U.S. Cl. 396—87 **13 Claims**


ZOOM FINDER
419
418
420
415
412a
412
417
411
411a
413
WHOLE UNIT DRIVING MOTOR CONTROLLING CIRCUIT
414
423
422
421
436
425
L1
436a
L2
OA
REAR LENS GROUP DRIVING MOTOR CONTROLLING CIRCUIT
AE MOTOR CONTROLLING CIRCUIT
ZOOM OPERATING DEVICE
435
431
FOCUS OPERATING DEVICE
432
OBJECT DISTANCE MEASURING APPARATUS
433
434
PHOTOMETERING APPARATUS

1. A zoom camera with a lens barrier apparatus, said lens barrier apparatus comprising:

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a lens barrier having an opened and a closed position;
a lens barrier opening/closing mechanism that opens and closes said lens barrier;
pulse generating means that generates pulses in association with the opening and closing movements of said lens barrier; and
determining means that determines the state of said lens barrier based on a number of pulses generated by said pulse generating means,
 wherein said lens barrier opening/closing mechanism drives said lens barrier in a first direction to open said lens barrier and in a second direction to close said lens barrier;
 wherein, when said lens barrier is being driven in said first direction, and said determining means determines that said lens barrier opening/closing mechanism has not operated normally, said lens barrier is driven in said second direction and then in said first direction again; and
 wherein, when said lens barrier is being driven in said second direction, and said determining means determines that said lens barrier opening/closing mechanism has not operated normally, said lens barrier is driven in said first direction and then in said second direction again.

5,842,058
ACCUMULATION TIME CONTROL DEVICE FOR PHOTOELECTRIC CONVERSION ELEMENT, AND FOCUS DETECTION APPARATUS USING THE SAME

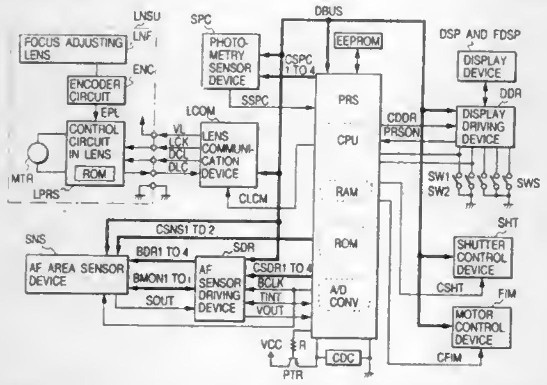
Shinichi Hagiwara, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 24, 1997, Ser. No. 936,581

Claims priority, application Japan, Sep. 27, 1996, 8-256168

Int. Cl.⁶ G03B *13/36;* H04N *3/14*

U.S. Cl. 396—96 7 Claims



1. An accumulation control device for a photoelectric conversion element, comprising:
 accumulation control means having accumulation controllers, which are fewer than the number of photoelectric conversion element arrays, and independently perform accumulation control of the photoelectric conversion element arrays respectively in accordance with accumulation monitor signals; and
 switching means for selectively switching the accumulation monitor signals to be supplied from the photoelectric conversion element arrays to the accumulation controllers.

5,842,059
AUTOMATIC FOCUS ADJUSTING DEVICE

Hirofumi Suda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

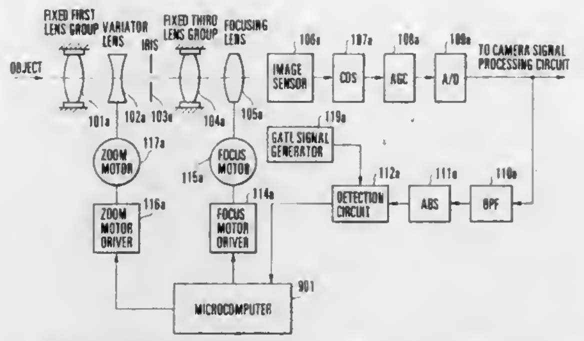
Filed Jul. 17, 1997, Ser. No. 896,551

Claims priority, application Japan, Jul. 22, 1996, 8-209366; Jul. 22, 1996, 8-209367

Int. Cl.⁶ G03B *13/36*

U.S. Cl. 396—101 25 Claims

1. An automatic focus adjusting device arranged to adjust, by driving a focusing lens, focus of an image picked up by image pickup means, said automatic focus adjusting device comprising:



extracting means for extracting, as a focus signal, a high-frequency component in a focus detecting area within an image plane of the image picked up by said image pickup means;
object frequency recognizing means for recognizing, from a frequency distribution of an object whose image is picked up by said image pickup means, a feature of the object; and
driving means for driving the focusing lens on the basis of the focus signal extracted by said extracting means and the feature of the object recognized by said object frequency recognizing means.

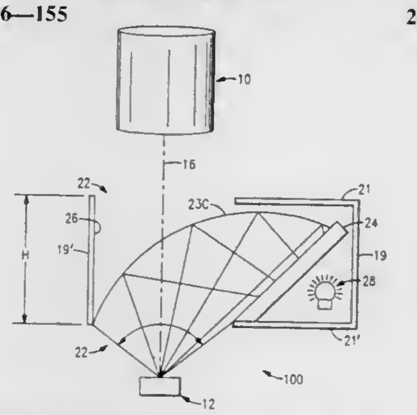
5,842,060
ILLUMINATION DEVICE WITH CURVED BEAM SPLITTER FOR ILLUMINATION AN OBJECT WITH CONTINUOUS DIFFUSE LIGHT

Timothy P. White, New Boston, N.H., and Steven M. LeBlanc, Philadelphia, Pa., assignors to Northeast Robotics LLC, Weare, N.H.

Continuation-in-part of Ser. No. 501,213, Jul. 11, 1995, Pat. No. 5,604,550, which is a continuation-in-part of Ser. No. 321,882, Oct. 31, 1994, Pat. No. 5,539,485. This application Feb. 14, 1997, Ser. No. 813,269

Int. Cl.⁶ G03B *15/06*

U.S. Cl. 396—155 20 Claims



1. An illumination device for illuminating an object to be observed by a camera along an observation axis extending from the camera to the object, said illumination device comprising:
 a housing having at least a first aperture therein alignable with an observation axis;
 a partially reflective beam splitter being supported by said housing and being positioned obliquely relative to the observation axis adjacent said at least first aperture;
 a light source being arranged to cast light on a first surface of said beam splitter;
 a diffuser being positioned between said beam splitter and said light source for diffusing light from said light source as the light passes through said diffuser to said first surface of said beam splitter;
wherein said partially reflective beam splitter is a curved member and said diffuser is sufficiently partially inclined with respect to the observation axis so as only to be able, during use, to indirectly illuminate a desired portion of the object to be observed, via said curved beam splitter, when the object is positioned along the observation axis thereby facilitating generation of a substantially uniform illumination field even when the illumination device is located adjacent the object to be observed.

5,842,061
APPARATUS USING BATTERY

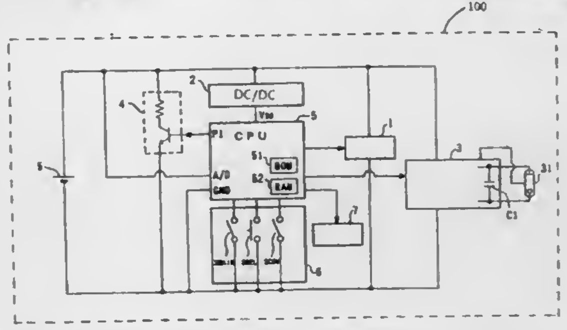
Hidekazu Nakajima, Higashiosaka, and Makoto Kato, Sakai, both of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Feb. 19, 1997, Ser. No. 803,163

Claims priority, application Japan, Feb. 21, 1996, 8-033838

Int. Cl.⁶ G03B *17/18;* G08B *21/00*

U.S. Cl. 396—203 34 Claims



1. An apparatus using a battery, comprising:
a battery checker which detects the battery voltage supplied to the apparatus and compares the detected voltage with a prescribed reference value;
an operation member;
an operation performer which performs a prescribed operation of the apparatus; and
a controller that performs control so that a battery check is performed by causing the battery checker to operate when said operation member is operated and changing said reference value and a battery check are performed if it is determined that the operation performer was performing an operation when said operation member was operated, wherein if it is determined that said operation performer was performing an operation when said operation member was operated, changing said reference value and a battery check are performed.

5,842,062

Patent Not Issued For This Number

5,842,063
CAMERA AND FILM FOR RECORDING OVERLAPPING IMAGES

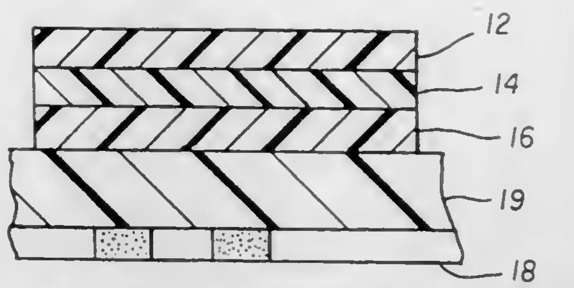
Gilbert A. Hawkins, Mendon; Annabel A. Muenter, Rochester; Philip T. Lau, Rochester, and John D. Balnga, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 30, 1996, Ser. No. 740,541

Int. Cl.⁶ G03C *7/00*

U.S. Cl. 396—315 8 Claims

1. A camera for recording overlapping visible images and non-visible digital data, the camera comprising:
 means for exposing a region of a film with visible light to record a visible image in at least one record layer sensitized to visible light; and
 means for exposing in the region of the film with non-visible light to record non-visible digital data in at least one record layer sensitized to non-visible light, whereby overlapping visible images and non visible digital data are recorded in the region.



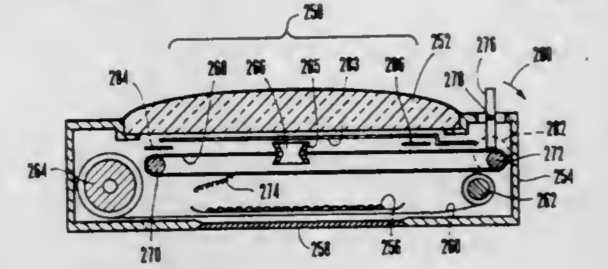
5,842,064
THREE DIMENSIONAL CAMERA

Maureen Meredith Day, Encinitas, Calif., assignor to Angraphie Dimensional Systems, LLC, Encinitas, Calif.

Continuation-in-part of Ser. No. 859,139, May 20, 1997, which is a continuation of Ser. No. 619,190, Mar. 20, 1996, Pat. No. 5,655,167. This application Nov. 5, 1997, Ser. No. 964,954

Int. Cl.⁶ G03B *35/00*

U.S. Cl. 396—330 12 Claims



1. A portable 3-D camera, comprising:
a housing;
a camera lens positioned on the housing;
a lenticular lens positioned on the housing;
a scanning aperture translationally movable in the housing, the aperture being disposed between the lenses; and
a spring coupled to the scanning aperture to cause the scanning aperture to move.

5,842,065
MIRROR OPERATING DEVICE FOR A SINGLE LENS REFLEX CAMERA WHICH MAXIMIZES AN IMAGE STABILITY TIME PERIOD

Yoshiyuki Nakano, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Jan. 27, 1997, Ser. No. 789,664

Claims priority, application Japan, Jan. 26, 1996, 8-011810

Int. Cl.⁶ G03B *19/12*

U.S. Cl. 396—358 16 Claims

1. A mirror operating device for a single lens reflex camera, comprising:
 a reflecting mirror movable between a first position blocking a photographic optical path and a second position aside from the photographic optical path;
 an electromotive drive source to drive the reflecting mirror from the second position to the first position;
 a phase detection device to detect a release operation or to detect that a mechanism which starts after the release operation has reached a specific phase state and to output a detection signal in response to the detection;
 a mirror raising mechanism to move the reflecting mirror from the first position to the second position;

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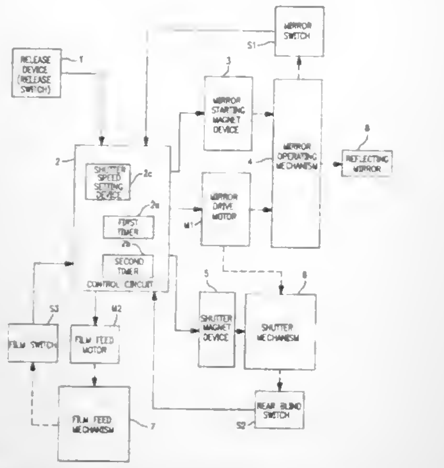


a first delay device to time a first delay time starting in response to the detection signal and to output a first signal at an end of the first delay time;

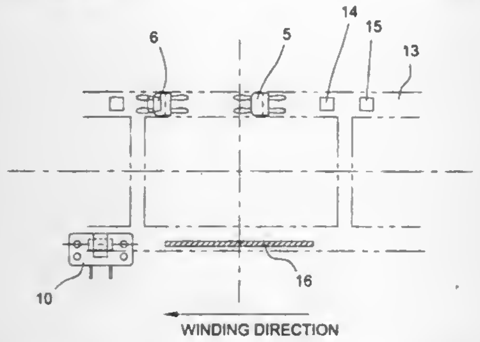
a second delay device to time a second delay time starting in response to the detection signal and to output a second signal at an end of the second delay time;

a shutter mechanism to open and close the photographic optical path in response to a release operation; and

a control device to control opening of the shutter mechanism in response to the first signal from the first delay device, and to start the electromotive drive source in response to the second signal from the second delay device,

wherein the first signal starts opening of the shutter mechanism, and the second signal starts the electromotive drive source before the shutter mechanism is finished closing, the timing of the first delay time and the second delay time being respectively set such that the reflecting mirror substantially does not obstruct the photographic optical path until the closing of the shutter mechanism finishes.

5,842,066
FILM FEED CONTROL APPARATUS
Toshiyuki Nakamura, and Youichi Yamazaki, both of Tokyo, Japan, assignors to Nikon Corporation, Tokyo, Japan
Filed Jul. 31, 1996, Ser. No. 690,080
Claims priority, application Japan, Aug. 4, 1995, 7-199479
Int. Cl.^{6} G43B *1/00*
U.S. Cl. 396—409 **24 Claims**



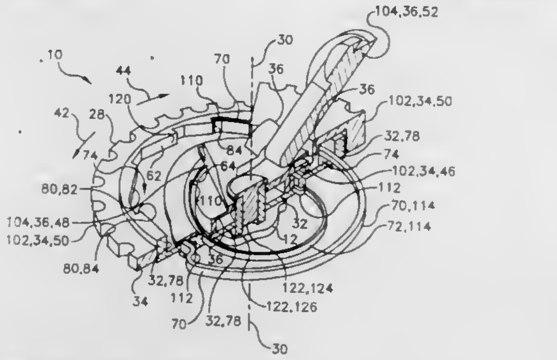
1. A film feed control apparatus for feeding film in a film feeding direction and stopping the film at predetermined stopping positions, the apparatus having an electrical feeding mechanism for feeding the film, the film including a plurality of photo frames with each photo frame associated with one stopping position and at least one perforation having a pair of facially opposing edges extending perpendicularly to the film feeding direction, the film feed control apparatus comprising:

an edge detector that detects the edges of the perforations of the film as the film is fed in the film feeding direction;

a film advancement detector that detects a first amount of film that is fed from a time when the film feeding starts to a time when a first edge of the at least one perforation is detected by the edge detector, and a second amount of film that is fed from the time when the first edge of the at least one perforation is detected to a time when a last remaining edge of the at least one perforation is detected by the edge detector; and

a controller that, subsequent to the time when film feeding starts, determines a film feeding start position based upon whether a threshold amount of time has been exceeded for the film advancement detector to detect the first amount of film and a time for the feeding mechanism to stop feeding the film at the one stopping position associated with a respective one of the plurality of photo frames based upon a total number of edges detected by the edge detector and the film feeding start position.

5,842,067
FILM WINDER UNIT AND CAMERA
Patricia L. Williams, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Jul. 21, 1997, Ser. No. 897,396
Int. Cl.^{6} G03B *1/00*
U.S. Cl. 396—411 **25 Claims**



1. An apparatus for winding film, comprising:

a film transport adapted to move the film in two opposed directions in response to rotational inputs in forward and reverse directions;

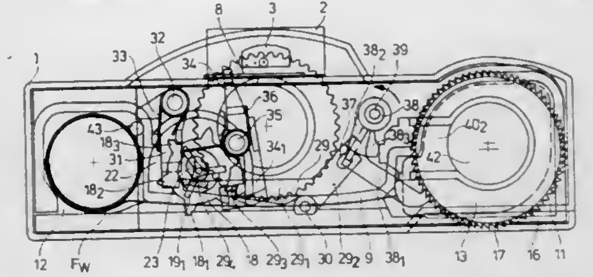
an output unit mechanically engaging said film transport for rotational movement in said forward and reverse directions, said output unit defining an axis of rotation;

an outer winder coaxial with said output unit, said outer winder being rotatable about said axis in said first and second directions of rotation relative to said body;

a inner winder nested in said outer winder, said inner winder being coaxial with said output unit, said inner winder being rotatable about said axis in said first and second directions of rotation relative to said body independent of said outer winder; and

outer and inner clutches disposed between respective said winders and said output unit, said outer clutch coupling said outer winder to said output unit during rotation of said outer winder relative to said body in said first direction of rotation, said outer clutch decoupling said outer winder from said output unit during rotation of said outer winder relative to said body in said second direction of rotation, said inner clutch coupling said inner winder to said output unit during rotation of said inner winder relative to said body in said second direction of rotation, said inner clutch decoupling said inner winder from said output unit during rotation of said inner winder relative to said body in said first direction of rotation.

5,842,068
PHOTOGRAPHIC RECORDING OR REPRODUCING DEVICE
Rolf Schröder, Zorneding, Germany, assignor to Agfa-Gevaert AG, Germany
Continuation of Ser. No. 705,216, Aug. 29, 1996, abandoned. This application Sep. 23, 1997, Ser. No. 935,580
Claims priority, application Germany, Sep. 7, 1995, 195 33 037.4
Int. Cl.^{6} G03B *1/18*
U.S. Cl. 396—411 **21 Claims**



1. A photographic recording or reproducing device adapted to be loaded with film having along an edge thereof a film perforation which includes a plurality of perforation holes, and to feed loaded film stepwise frame to frame, said device comprising

(a) film transportation means for transporting the film along a film transportation path;

(b) film metering means for determining when the film upon transportation by said film transportation means reaches a respectively given frame position, said film metering means including a film engagement member mounted in said photographic recording or reproducing device so as to be rotatable about an axis in a predetermined rotational direction, and to be movable transversely to said film transportation path;

(c) film transportation stop means controllable by said film metering means, for stopping transportation of the film by said film transporting means upon determination by said film metering means that the film has reached the respectively given frame position;

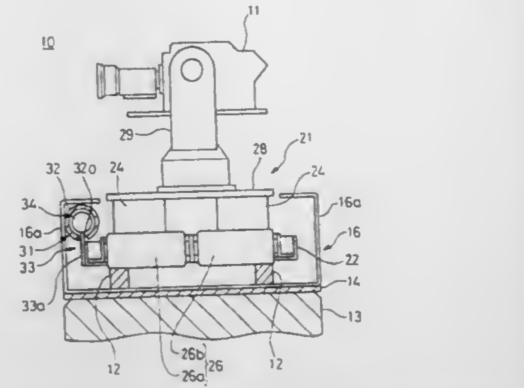
(d) wherein said film engagement member of said metering means comprises

(d1) an engagement element mounted at said engagement member and provided to enter into a perforation hole of the film and to remain in an entered position during transportation of the film by said film transportation means along said film transportation path by a partial length of a frame, and during simultaneous rotational movement of said film engagement means about said axis; and

(d2) a support element also mounted at said engagement member in a trailing position relative to said engagement element with respect to said predetermined rotational direction, and provided for engaging a support surface extending parallel to said film transportation path, so as to support said engagement member for causing movement of said engagement member transversely away from said film transportation path while said engagement element still engages said perforation hole of the film during transportation of the film along said transportation path by said partial length of a frame and simultaneous rotational movement of said engagement member.

5,842,069
MONITOR CAMERA TRANSPORTING APPARATUS BY MEANS OF COMPRESSED AIR
Kenichi Konno, c/o Kyowakogyo Co., Ltd., 22-20, Asahi-cho 1-chome, Atsugi-shi, Kanagawa, Japan
Filed Nov. 21, 1997, Ser. No. 976,287
Claims priority, application Japan, Nov. 29, 1996, 8-320111
Int. Cl.^{6} G03B *17/24*
U.S. Cl. 396—419 **3 Claims**

1. A monitor camera transporting apparatus (**10**) based on compressed air, comprising rails (**12**, **12**) laid along a transportation path of a monitor camera (**11**);



a carriage (**21**) having the monitor camera (**11**) mounted thereon and movable along the rails (**12**, **12**); and

transporting means (**31**) for moving the carriage (**21**) by means of compressed air,

Wherein the transporting means (**31**) includes:

a pipe (**32**) provided parallel to the rails (**12**, **12**) and having a slit (**32***a*) formed in its lower part along a full length of the pipe;

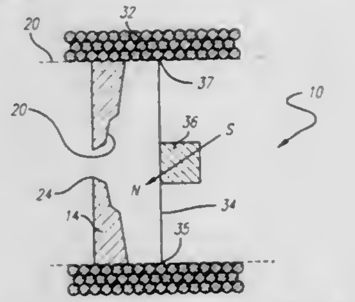
an internal moving body (**34**) inserted into said pipe (**32**) and movable within the pipe (**32**) by means of compressed air introduced into the pipe (**32**);

a connecting plate (**33**) connected at its one end to the internal moving body (**34**) within the pipe (**32**) and projected at the other end externally of the pipe (**32**) through the slit (**32***a*), said carriage (**21**) being connected to the projection (**33***a*);

a sealing wire (**36**) disposed within the pipe (**32**) along the full length of the pipe (**32**) to close the slit (**32***a*); and

a wire retracting part (**37***k*) formed in the internal moving body (**34**) or connecting plate (**33**) for retracting inwardly of the pipe (**32**) the sealing wire (**36**) located at the connecting plate (**33**).

5,842,070
ADJUSTABLE LIGHT SHUTTER FOR HAND HELD ELECTRO-OPTICAL SCANNERS
Kevork G. Arackellian, Everett, and Craig J. Cornelius, Woodinville, both of Wash., assignors to Intermec Corporation, Everett, Wash.
Division of Ser. No. 347,050, Nov. 30, 1994, abandoned. This application Jul. 30, 1997, Ser. No. 902,663
Int. Cl.^{6} G03B *17/24*
U.S. Cl. 396—463 **8 Claims**



1. A shutter for use in an optical device having an aperture and a CCD imager, comprising:

a light barrier movable between a first position blocking light that passes through said aperture and a second position enabling light to pass to said CCD imager, said light barrier having a permanent magnet portion attached to a torsional wire extending alone a chord of an outer perimeter of said aperture; and

means for electro-magnetically manipulating said light barrier between said first and second positions.

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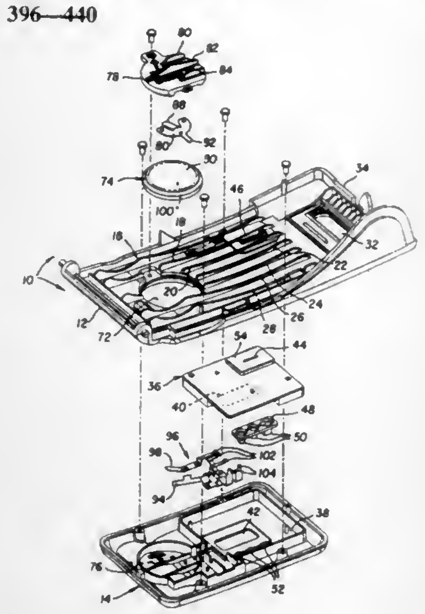
5,842,071
CAMERA BACK

Robert J. Stanchus, and William B. Salvas, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Jun. 20, 1997, Ser. No. 878,836
Int. Cl.⁶ G03B *17/00;17/02*
U.S. Cl. 396—440 **3 Claims**



1. A camera back comprising a film support for ensuring the shape of a filmstrip, is characterized in that:

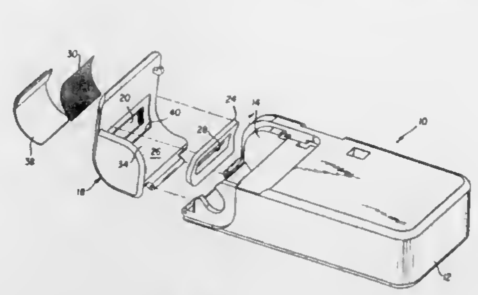
said film support has a plurality of parallel film shaping ribs integral with said camera back;

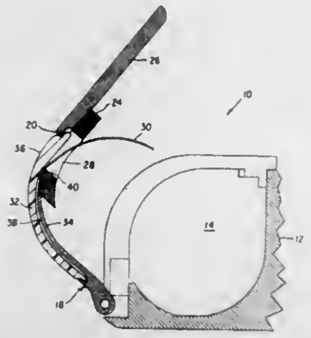
an opening for a battery is formed in said camera back to be located across at least some of said film ribs; and

a door for closing said opening has integral rib-extensions that are longitudinally aligned with said film ribs across which the opening is located, to provide respective continuations of those film ribs.

5,842,072
CAMERA WITH VIEWING OPENING EXTENDED TO HOLD LABEL

Dennis R. Zander, Penfield, and John K. Erickson, Victor, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Aug. 12, 1997, Ser. No. 910,126
Int. Cl.⁶ G03B *17/02*
U.S. Cl. 396—535 **9 Claims**





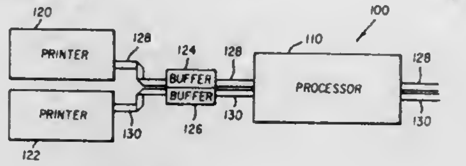
1. A camera comprising an exterior viewing opening for viewing readable information on a film cartridge when the film cartridge is in said camera, and an interior light-trapping gasket that surrounds said viewing opening to confine ambient light entering the viewing opening, is characterized in that:

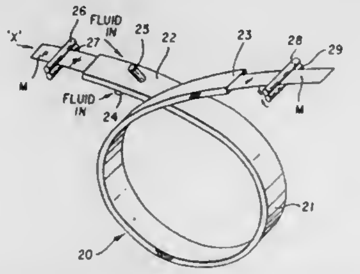
a separate label apart from the film cartridge is provided for said camera; and

said viewing opening is extended to be capable of holding said label at a particular portion of the viewing opening that does not interfere with ambient light entering the viewing opening to view the information on the film cartridge, whereby the label in addition to the information can be seen through said viewing opening.

5,842,073
PHOTOGRAPHIC PROCESSING APPARATUS

Gareth B. Evans, Potten End, and Anthony Earle, Harrow Weald, both of England, assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Feb. 14, 1997, Ser. No. 800,307
Claims priority, application United Kingdom, Feb. 21, 1996, 9603605
Int. Cl.⁶ G03D *3/08*
U.S. Cl. 396—564 **4 Claims**





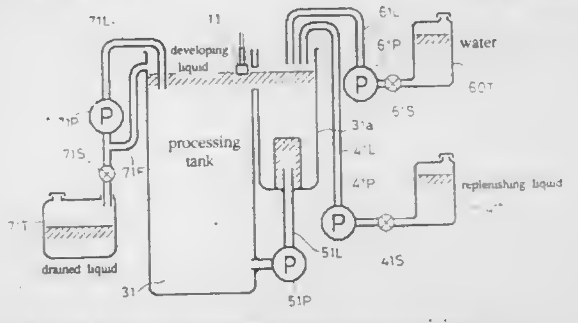
1. A photographic equipment arranged to print and to process at least one continuous web of photographic material having at least one photosensitive surface, the equipment comprising:

(a) at least one printer; and

(b) a processing apparatus comprising a plurality of processing stages and having a transport speed of at least 5 m/min, wherein each of the processing stages comprises at least one processing tank, an effective tank thickness is equal to or less than 25 mm, said processing apparatus is self-threading, and said processing apparatus is directly linked to said at least one printer.

5,842,074
PHOTOGRAPHIC DEVELOPING APPARATUS AND METHOD OF SUPPLYING WATER TO THE APPARATUS

Shigeki Nishida, and Yuji Yamamoto, both of Wakayama, Japan, assignors to Noritsu Koko Co. Ltd., Wakayama-ken, Japan
Filed May 19, 1997, Ser. No. 859,812
Claims priority, application Japan, May 20, 1996, 8-124441
Int. Cl.⁶ G03D *3/02*
U.S. Cl. 396—578 **10 Claims**



1. A photographic processing apparatus comprising:

means for supplying processing liquid to a processing tank;

means for forcibly draining processing liquid from the tank;

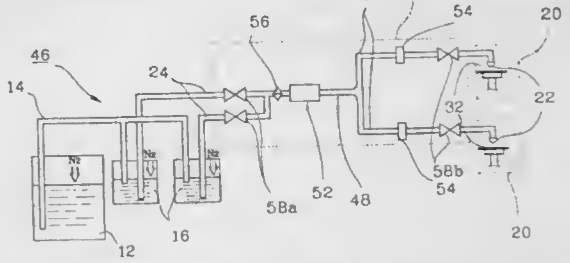
means for measuring an amount of processing liquid in the tank;

means for determining an amount of water evaporated from the liquid in the tank based on amounts of liquid coming in and out of the tank; and

means for supplying an amount of additional water to the tank based on the amount of water evaporation determined by the evaporation amount determining means.

5,842,075
DEVELOPING SOLUTION FEED SYSTEM FOR SEMICONDUCTOR PHOTOLITHOGRAPHY PROCESS HAVING A GAS REMOVAL DEVICE IN A HIGH SOLUTION FEED PRESSURE PIPE SECTION

Sung-hyeon Park, Suwon; Sung-il Kim, and Jung-kyu Lee, both of Seoul, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea
Filed Sep. 12, 1997, Ser. No. 928,529
Claims priority, application Rep. of Korea, Sep. 13, 1996, 1996 39906
Int. Cl.⁶ G03D *5/04;* **B08B** *3/04*
U.S. Cl. 396—611 **12 Claims**



1. A developing solution feed system for a semiconductor photolithography process, comprising:

a plurality of feed tanks for storing a predetermined quantity of developing solution;

a developing solution feed line having a plurality of first connecting pipes, each connected to said feed tanks, a second connecting pipe connected to the first connecting pipes to be converged into one passage, and a plurality of third connecting pipes branching off from said one passage of the second connecting pipe;

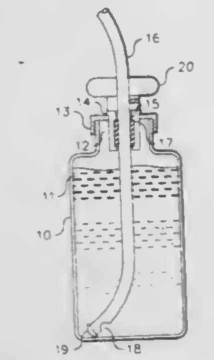
a plurality of nozzles, each connected to said third connecting pipes of the developing solution feed line to thereby sputter said developing solution onto wafers, each located in one of a plurality of process chambers;

a gas removal device installed in said one passage of said second connecting pipe of said developing solution feed line to thereby remove gas contained in said developing solution flowing through said one passage; and

a plurality of shut off valves, each installed in said third connecting pipes to thereby open and close said pipes, so that the developing solution can be selectively fed into only one process chamber through one of said plurality of third connecting pipe at a time.

5,842,076
APPARATUS FOR SUPPLYING A LIQUID FROM A CONTAINER

Edward C. Glover, London, and Anthony Earle, Harrow Weald, both of United Kingdom, assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Jul. 25, 1997, Ser. No. 897,994
Claims priority, application United Kingdom, Aug. 8, 1996, 9616691
Int. Cl.⁶ G03D *3/06;* **G01F** *11/00*
U.S. Cl. 396—626 **7 Claims**



1. An apparatus for supplying a liquid from a container which has an opening through which the liquid can be removed, said apparatus comprising:

a lid for the opening in the container;

an aperture in said lid through which a tube projects for access to an interior of the container, said tube being movable through said lid and having a distal end which is disposed at the bottom of said container;

a liquid-tight seal in said aperture through which the tube passes, said tube being movable through said seal;

at least one opening in a wall of the tube adjacent to said distal end of the tube and having access to the interior of the container;

closure means at the end of the tube preventing a passage of liquid through the distal end of the tube into the container; and

means for preventing a withdrawal of the end of the tube through the aperture in the lid when said tube is retracted;

wherein, when the tube has been withdrawn through said seal until prevented from further withdrawal, said opening in the wall of the tube is closed by said seal.

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5,842,077

DEVICE FOR THE AUTOMATIC REMOVAL OF A PHOTOGRAPHIC FILM FROM A CARTRIDGE

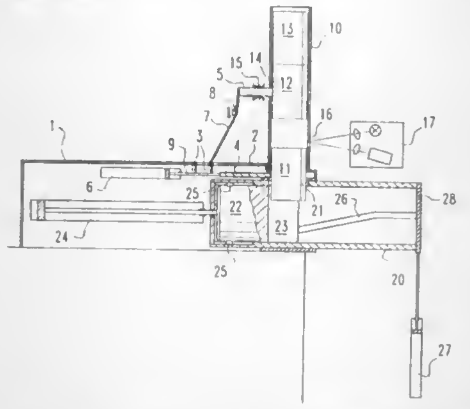
Helmut 'Zangenfeind, Puchheim; Jürgen Brunner; Reinhart Wuerfel, both of München; Günther Dömges, Oberhaching, and Raimund Kugel, Dennweiler-Frohnbach, all of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 25, 1996, Ser. No. 738,676

Claims priority, application Germany, Oct. 25, 1995, 195 39 718.5

Int. Cl.^{6} G03D *3/08;13/08*

U.S. Cl. 396—647 **17 Claims**



1. A device for the handling of a film cartridge having a spool axis, comprising:

a cartridge guide for gravitationally feeding the cartridge along its spool axis, the cartridge guide having a cross-section which corresponds to an external shape of the cartridge; and

means for turning the cartridge from a position in which the spool axis is aligned approximately vertically to a position in which the spool axis is aligned approximately horizontally, having a cartridge receptacle which is simultaneously linearly displaced and rotated.

5,842,078

APPARATUS FOR GENERATING AN INTERRUPT BY COMPARING NEWLY RECEIVED, PRECEDING STORED, AND OPTIONAL DATA WHERE DESIGNATED STORING AREAS HAVE A PLURALITY OF SWITCHING

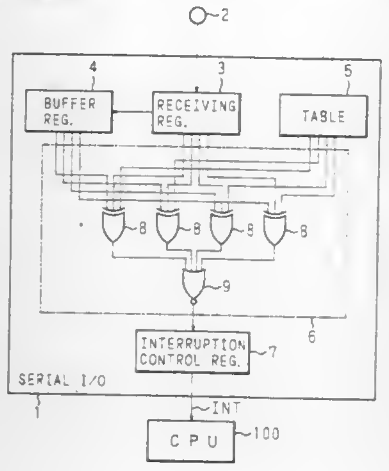
Tsuyoshi Togashi, and Kazuya Sugita, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, and Mitsubishi Electric Semiconductor Software Co., Ltd., Hyogo, both of Japan

Filed May 18, 1995, Ser. No. 444,109

Claims priority, application Japan, Jun. 10, 1994, 6-128996

Int. Cl.^{6} G06F *13/14*

U.S. Cl. 395—868 **16 Claims**



1. An interface apparatus including interruption generating means for generating an internal interruption signal when receiving data from the outside, comprising:

received data storing means for storing data received newly;

preceding data storing means for storing data received precedingly; designated data storing means for storing optional data designated beforehand; and

comparing means for comparing the data stored in said received data storing means, the data stored in said preceding data storing means and the data stored in said designated data storing means, and for making said interruption generating means generate the internal interruption signal only when the comparison result of the three data does not show coincidence; wherein

a plurality of said designated data storing means are provided, further comprising:

selective information storing means for storing an information selecting one of said plurality of designated data storing means; and

a plurality of switching means for connecting or cutting said plurality of designated data storing means and said comparing means respectively, according to the information stored in said selective information storing means.

5,842,079

FILM TYPE FIXING DEVICE

Kazuki Miyamoto; Naoyuki Ohki, both of Yokohama; Masaki Nakano, Ebina; Takahiro Ushiro; Yasuo Fukazu, both of Kawasaki; Atsushi Chaki, Yokohama; Shinichi Takata, Kawasaki, and Kazuhlro Ohyoshi, Wakoh, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

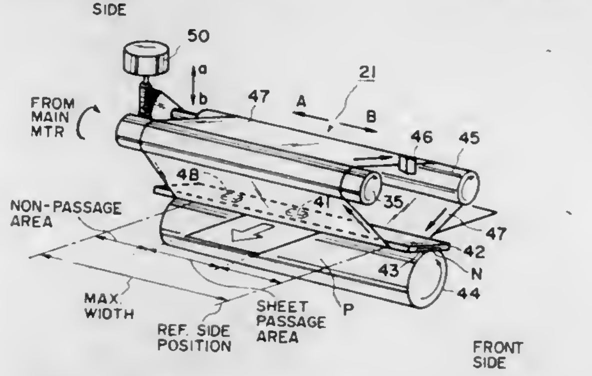
Continuation of Ser. No. 542,786, Oct. 13, 1995, abandoned.

This application Apr. 23, 1997, Ser. No. 842,052

Claims priority, application Japan, Oct. 13, 1994, 6-247761

Int. Cl.^{6} G03G *15/20*

U.S. Cl. 399—33 **9 Claims**



1. A film type fixing device, comprising:

a rotatable endless film;

film position detecting means for detecting a position, in a direction perpendicular to a movement direction, of said film;

error detecting means for detecting error of a position of said film when the output of said film position detecting means is out of a predetermined range; and

discriminating means for discriminating whether to back up error information or not on the basis of the output of said film position detecting means, when said error detecting means detects the error,

wherein the backed-up error information is not cleared by an absence of voltage supply to said device for a predetermined period, and non-backed up error information is cleared by the absence of voltage supply for the predetermined period.

5,842,080

IMAGE FORMING APPARATUS AND INTERMEDIATE TRANSFER MEMBER

Tsunenori Ashibe, Yokohama; Hiroyuki Kobayashi, Fuji; Akihiko Nakazawa, Shiroyamamachi; Atsushi Tanaka, Yokohama, and Takashi Kusaba, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

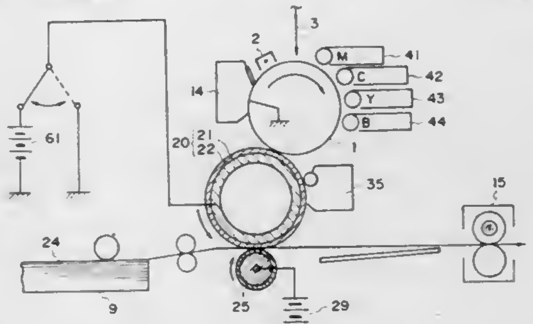
Continuation of Ser. No. 637,454, Apr. 25, 1996, abandoned.

This application Mar. 7, 1997, Ser. No. 813,678

Claims priority, application Japan, Apr. 26, 1995, 7-102378

Int. Cl.^{6} G03G *15/00;15/01;15/16*

U.S. Cl. 399—49 **16 Claims**



1. An image forming apparatus, comprising:

a first image-bearing member,

an intermediate transfer member for receiving an image formed on the first image-bearing member and transferring the image onto a second image-bearing member,

pattern-forming means for forming a prescribed pattern on the intermediate transfer member,

density detection means for detecting a density of the pattern, and

control means for controlling image forming conditions based on the detected density,

wherein the intermediate transfer member has a laminated structure including a layer containing a pigment for providing a reflectance of 10–70% for light having a wavelength in the range of 700–1500 nm at least in a region thereof for forming the prescribed pattern.

5,842,081

METHOD AND APPARATUS FOR CHARGING AN ELECTROGRAPHIC PHOTORECEPTOR

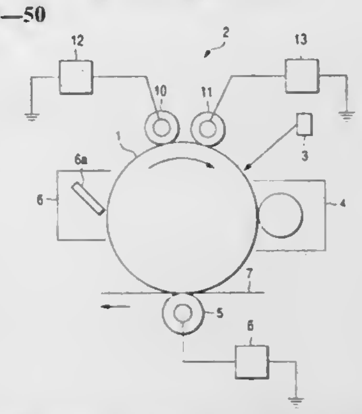
Yoichi Kaname; Akio Arai; Ryuji Katsuno; Yasutomo Ishii; Yoshitaka Kuroda, and Jin Iwasaki, all of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed May 28, 1996, Ser. No. 654,144

Claims priority, application Japan, May 31, 1995, 7-133235; Oct. 17, 1995, 7-268872; Feb. 15, 1996, 8-028175; Mar. 4, 1996, 8-045841

Int. Cl.^{6} G03G *15/02*

U.S. Cl. 399—50 **20 Claims**



1. A charging method in which the surface of an image bearing device is charged in two-steps before a latent image is formed on the surface of the image bearing device, comprising the steps of:

primarily charging the surface of said image bearing device by a contact charging device applied with a voltage that includes an AC component and a DC component superimposed on the AC component; and

secondarily charging the surface of the image bearing device by a contact charging device applied with such a DC voltage as to discharge at least part of a pattern of charge potential variation of which a pitch corresponds to a frequency pitch of the AC component, caused in the primarily charging operation,

wherein the step of primarily charging and the step of secondarily charging are performed by using two contact chargers, and

wherein the DC voltage applied to the contact charging device for secondarily charging the surface of the image bearing device is preferably such a DC voltage as to entirely discharge a pattern of charge potential variation of which the pitch corresponds to the frequency pitch of the AC component, caused in the step of primarily charging.

5,842,082

IMAGE FORMING APPARATUS HAVING INDUCED CHARGE DENSITY SUPPRESSING DEVICE FOR PREVENTING ELECTROSTATIC HYSTERISIS PHENOMENON

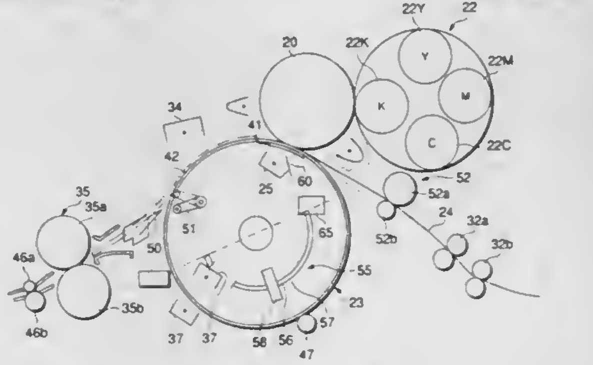
Nohuo Hyakutake; Yoshihiro Enomoto; Tetsuya Fujita, and Kazuhiro Yoshihara, all of Ebina, Japan, assignors to Fuji Xerox Co., LTD, Tokyo, Japan

Filed Sep. 19, 1996, Ser. No. 715,897

Claims priority, application Japan, Sep. 20, 1995, 7-242135

Int. Cl.^{6} G03G *15/16*

U.S. Cl. 399—66 **13 Claims**



1. An image forming apparatus, comprising:

an image forming member for forming an image;

an image holding member opposite the image forming member onto which a developed image is formed;

transfer means for transferring the developed image formed on said image holding member onto a transfer material; and

induced-charge density suppressing means for suppressing induced electric charge in an area substantially between said holding member and said transfer means, thereby preventing an electrostatic hysteresis phenomenon on said image holding member that results from the induced electric charge in said image holding member, said induced-charge density suppressing means including charge-removing means for removing electric charges from an outer surface of the transfer means by an a.c. voltage applying means applied solely to the outer surface, said a.c. voltage applying means being maintained on for a first period of time after removal of the transfer material from said transfer means.

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5,842,083

ELECTROSTATIC COPYING MACHINE

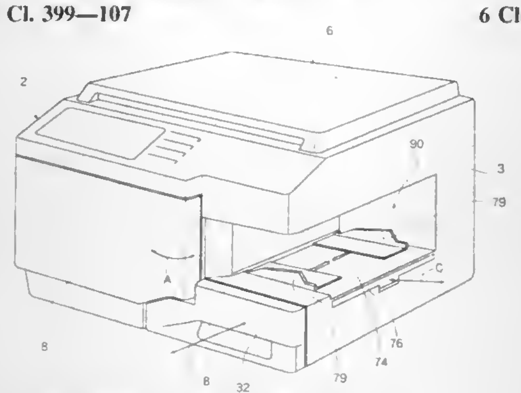
Kiyoaki Miyamoto; Kenichi Tanabe, and Tadakazu Ogiri, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed May 14, 1997, Ser. No. 856,084

Claims priority, application Japan, May 15, 1996, 8-119937

Int. Cl.^{6} G03G *15/00*

U.S. Cl. 399—107 **6 Claims**



1. An electrostatic copying machine comprising:

a copying machine body;

a transparent plate disposed on an upper surface of said copying machine body for placement thereon of a document to be copied;

image-forming means, including a rotary drum having a photosensitive surface with an exposure zone and a transfer zone defined therealong;

an optical system for projecting an image of the document onto the exposure zone, said optical system including a moving unit which moves relative to said transparent plate to execute scanning for exposure over a maximum scanning length;

copying paper-feeding means, including a paper-feeding cassette mounted in said copying machine body so as to be freely drawn out of the front surface of said copying machine body;

means defining a copying paper conveying passage for conveying a copying paper fed from said copying paper-feeding means past said transfer zone;

resist means disposed in said copying paper conveying passage at a position on the downstream side of said paper-feeding cassette, but on the upstream side of said transfer zone; and

a fixing device and a pair of paper-discharging rollers disposed in said copying paper conveying passage at a position on the downstream side of said transfer zone,

wherein said paper-feeding cassette, said resist means, said image-forming means, said fixing device, and said pair of paper-discharging rollers are successively arranged from a first side toward a second side of said copying machine body within a distance not greater than the maximum scanning length of said optical system, and said copying paper conveying passage is arranged substantially linearly.

5,842,084

DOCUMENT FEEDER WITH REMOVABLE BELT UNIT

Hiroyuki Harada; Hiroshi Kobayashi, and Masahiro Sako, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Oct. 30, 1997, Ser. No. 961,248

Claims priority, application Japan, Nov. 13, 1996, 8-318767

Int. Cl.^{6} G03L *15/04;* G03B *27/62*

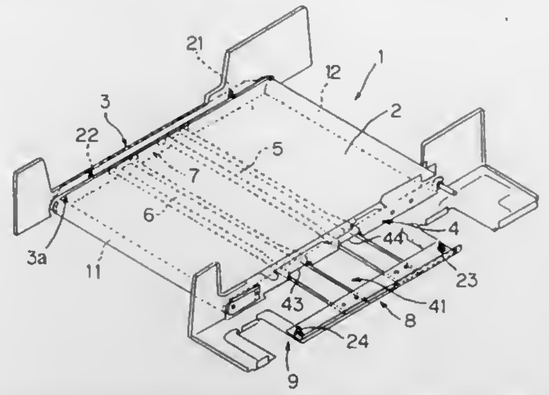
U.S. Cl. 399—110 **4 Claims**

1. A document feeder, comprising:

a transportation belt unit for transporting a document original;

a front side plate and a rear side plate respectively projecting upright at widthwise opposite edges of the transportation belt unit;

a pair of stays each extending between the front side plate and the rear side plate;



a front stay plate detachably fastened to portions of the pair of stays adjacent to the front side plate by means of a front fastening member; and

a rear stay plate fastened to portions of the pair of stays adjacent to the rear side plate by means of a rear fastening member which can be loosened;

wherein the front side plate has a recess open to an underside thereof for receiving the front stay plate for engagement therewith in a disengageable manner;

wherein the front stay plate is fastened to the front side plate in engagement with the recess by the front fastening member.

5,842,085

FIXING DEVICE IN AN IMAGE FORMING MACHINE HAVING REDUCED THERMAL FATIGUE

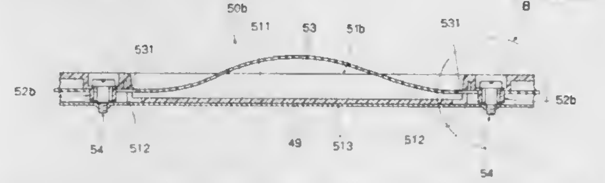
Toshiyuki Mitsuya, Osaka, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Filed Jul. 9, 1997, Ser. No. 890,449

Claims priority, application Japan, Jul. 9, 1996, 8-199654

Int. Cl.^{6} G03G *15/20*

U.S. Cl. 399—122 **6 Claims**



1. A fixing device for an image-forming machine comprising a fixing housing having a fixing roller therein; and a synthetic resin cover having a grip member and mounted on an upper surface of an upper case board of the fixing housing to cover an upper side of the fixing roller, said cover including a cover body and attaching portions formed together with the cover body as a unitary structure and being mounted on said upper case board by fastening members arranged in said attaching portions; wherein

each said attaching portion includes a cylindrical portion having a fastening member hole thereinto, and a receiving portion at a lower end of said cylindrical portion with an insertion hole therethrough, the lowest surface of said receiving portion having a position higher than the lowest surface of said cover body; and

said fastening member comprising a head portion of a diameter larger than the diameter of said insertion hole, a columnar portion connected to said head portion and having a diameter smaller than the diameter of said insertion hole but larger than the diameter of a threaded hole formed in said upper case board, and a threaded portion that is connected to said columnar portion and screwed into the threaded hole formed in said upper case board, the length of said columnar portion being greater than the thickness of the receiving portion and less than the distance from the upper surface of said receiving portion to the lower surface of said cover body, so that when the cover is fastened to the upper surface of the upper case board, the lower surface of the cover body contacts the upper surface of the upper case board, and a gap is provided between the lower surface of the attaching portion and the upper surface of the upper case board.

5,842,086

PHOTOSENSITIVE BODY DRUM UNIT

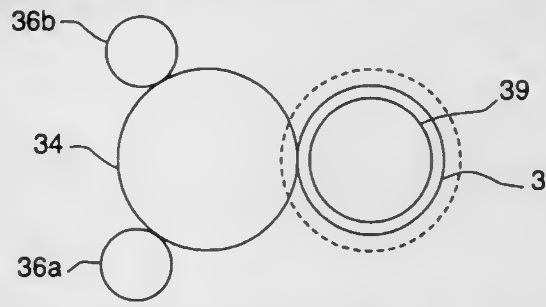
Susumu Honma; Jun'ichi Shibata, and Arimichi Fukuda, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 422,557, Apr. 14, 1995, Pat. No. 5,682,581. This application Mar. 26, 1997, Ser. No. 824,802

Claims priority, application Japan, May 26, 1995, HEI-7-134854

Int. Cl.^{6} G03G *21/00*

U.S. Cl. 399—159 **4 Claims**



1. A photosensitive drum unit comprising:

a photosensitive drum including a substrate comprising a worked electro-unite tube formed by at least one of drawing and extruding an electro-unite made from at least one of a metal strip and a metal plate cylindrically rolled up, and a photosensitive layer formed on said substrate;

one or more supporting members in contact with a photosensitive body so as to position the surface of said photosensitive body; and

a developing device having a developing roll and a disc-like member attached to an end portion of said developing roll, said disc-like member having an outer diameter larger than that of said developing roll and contacting with an outer circumference of said photosensitive body to rotate therewith, wherein said disc-like member is one of a plurality of control members for controlling a rotation position of said photosensitive body with contacting to the outer circumference of said photosensitive body.

5,842,087

CHARGING DEVICE FOR IMAGE FORMING APPARATUS

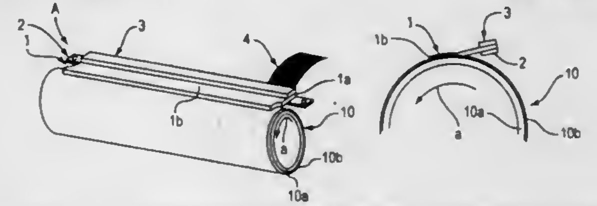
Kouji Matsushita; Yasuhiro Nakagami, and Futoshi Okazaki, all of Osaka, Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 671,879, Jun. 28, 1996. This application Jun. 20, 1997, Ser. No. 879,329

Claims priority, application Japan, Jun. 30, 1995, 7-166596; May 14, 1996, 8-119221; Aug. 12, 1996, 8-212232; Aug. 12, 1996, 8-212233

Int. Cl.^{6} G03G *15/02*

U.S. Cl. 399—174 **26 Claims**



1. A charging device for charging a surface of a charge-receiving member that moves in a direction relative to said charging device, said charging device comprising:

an intermediate member having a first surface and a second surface, said first surface being for contacting the surface of said charge-receiving member and having an end portion at a downstream side of said first surface with respect to the moving direction, said second surface being located downstream of said charge-receiving member with respect to the moving direction and being extended from the end portion of said first surface in a direction substantially normal to the surface of the charge-receiving member, wherein the charge-receiving member is charged to a first polarity by contacting with said first surface;

an electrode provided for said charge-receiving member, said electrode having a tip located at said second surface; and

a voltage source for applying electrical voltage to said electrode, the electrical voltage having a second polarity that is opposite to said first polarity.

5,842,088

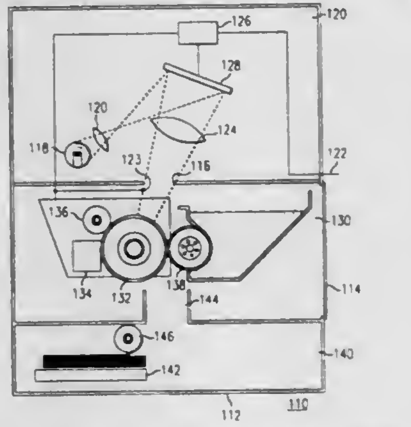
METHOD OF CALIBRATING A SPATIAL LIGHT MODULATOR PRINTING SYSTEM

E. Earle Thompson, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 474,868, Jun. 7, 1995, abandoned, which is a division of Ser. No. 261,614, Jun. 17, 1994, Pat. No. 5,673,106. This application Jan. 6, 1997, Ser. No. 781,999

Int. Cl.^{6} G03G *15/04:21/00*

U.S. Cl. 399—177 **1 Claim**



1. A method for calibrating a spatial light modulator printing system, comprising:

a. activating all of the elements of a spatial light modulator to a predetermined state, where said predetermined state is the same state for all elements, each time said printing system is turned on;

b. impinging light upon said modulator;

c. monitoring light received from said modulator at a sensor, such that elements that are defective are identified by discrepancies in the light received from individual elements that is different than what was expected from those individual elements; and

d. adjusting the operation of said modulator to correct any defects in printed image caused by said defective elements, using other elements in a same column as those defective elements.

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5,842,089
DEVELOPMENT APPARATUS FOR DEVELOPING ELECTROSTATIC LATENT IMAGE HELD BY HOLDER BY USING NONMAGNETIC ONE COMPONENT DEVELOPER

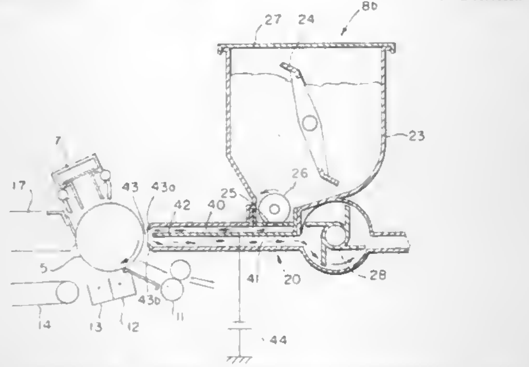
Hisashi Kunihiro; Kouji Shinkawa; Masato Asanuma; Yukihisa Imaue, all of Nara, and Itaru Kawabata, Kashiba, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 24, 1997, Ser. No. 899,481

Claims priority, application Japan, Jul. 24, 1996, 8-194220

Int. Cl.⁶ G03G *15/01;15/08*

U.S. Cl. 399—223 **7 Claims**



1. A development apparatus using a nonmagnetic one-component developer comprising:
   - a developer passage through which the nonmagnetic one-component developer passes;
   - supply means for supplying the developer into the developer passage; and
   - attracting means for attracting the developer existing in the developer passage to produce a powder stream,
   - wherein the developer passage includes an upstream passage for feeding the developer from the supply means toward an electrostatic latent image holder body, and a downstream passage for recovering the developer which was not used for development, and a developing opening which faces the electrostatic latent image holder body is formed at a junction of the upstream and downstream passages wherein the upstream and downstream passages are adjacent to each other and a partitioning member is provided for partitioning the upstream and downstream passages.

5,842,090
DEVELOPING DEVICE HAVING A MEMBER FOR RESTRICTING TRANSPORT OF DEVELOPER

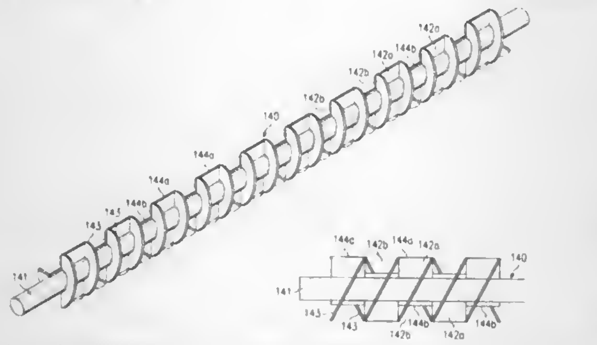
Susumu Mikawa, Takarazuka, Japan, assignor to Minolta Co., Ltd., Osaka, Japan

Filed Apr. 21, 1997, Ser. No. 843,747

Claims priority, application Japan, Apr. 22, 1996, 8-126496

Int. Cl.⁶ G03G *15/08*

U.S. Cl. 399—256 **20 Claims**



1. A developing device which mixes and transports developer, comprising:
   - a mixing and transporting member;
   - plurality of channels provided on said mixing and transporting member to transport developer; and
   - a restricting member provided within one channel of said plurality of channels to restrict developer transport.

5,842,091
TONER SUPPLYING DEVICE FOR USE IN IMAGE FORMING APPARATUS THAT MAINTAINS POSITIONAL RELATIONS BETWEEN SUPPLY ROLLER AND DEVELOPING ROLLER

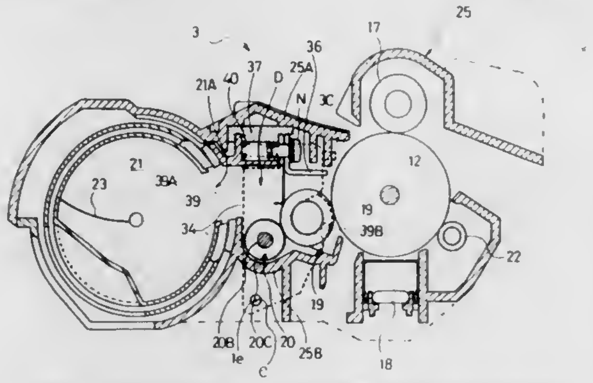
Hiroshi Nakano, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed May 27, 1997, Ser. No. 863,184

Claims priority, application Japan, May 27, 1996, 8-131477

Int. Cl.⁶ G03G *21/00*

U.S. Cl. 399—258 **16 Claims**



1. A toner supplying device for use in an image forming apparatus, for developing an electrostatic latent image formed on an outer peripheral surface of a photosensitive drum by supplying toner to the image, and then transferring the developed image onto a sheet to form a resultant image, the toner supplying device comprising:
   - a toner storing member;
   - a toner supply roller for supplying toner transported from the toner storing member;
   - a developing roller for supplying the toner supplied from the toner supply roller to the electrostatic latent image formed on the surface of the photosensitive drum to develop the image;
   - a unit case for housing therein the toner storing member, the toner supply roller, the developing roller and the photosensitive drum, the unit case being fixedly set in the image forming apparatus; and
   - a pair of supporting plates for supporting the toner supply roller and the developing roller at both sides of the rollers, the supporting plates being disposed rotatably in the unit case so that the supporting plates rotate independently from the unit case and so that the developing roller is allowed to come into contact with the photosensitive drum.

5,842,092
TONER CARTRIDGE AND TONER LEAKAGE PREVENTING TAPE

Kazuo Jyoroku, Osaka, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

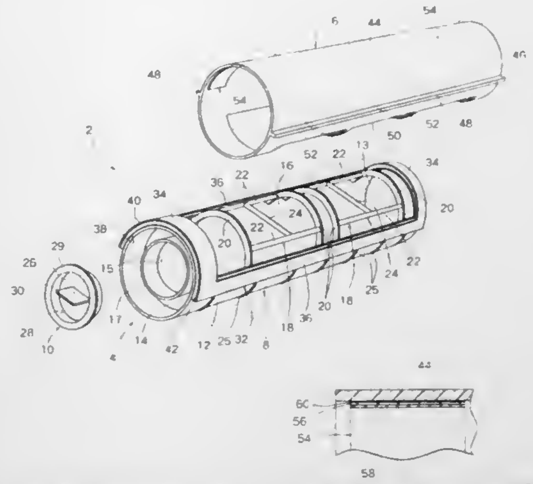
Filed Jul. 14, 1997, Ser. No. 892,099

Claims priority, application Japan, Jul. 23, 1996, 8-193016; Jul. 23, 1996, 8-193017

Int. Cl.⁶ G03G *15/08*

U.S. Cl. 399—262 **14 Claims**

6. A toner leakage preventing tape to be stuck to a surface of a required site of a member in order to prevent leakage of a toner through the required site of the member; wherein a surface of the toner leakage preventing tape is non-adherent and has a coefficient of static friction μ_0, against a surface of a glazing, of 3.5 to 4.5.



5,842,093
TONER STORAGE UNIT

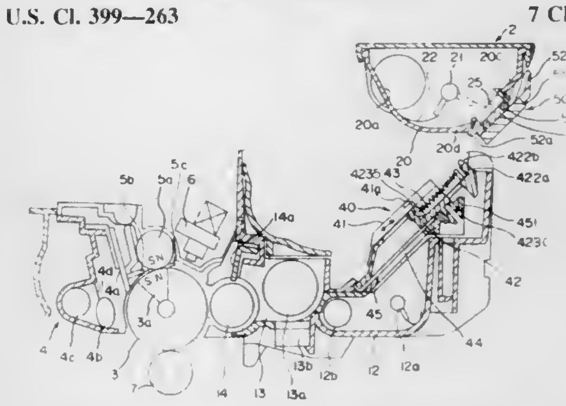
Tetuo Tanda, Tokyo, Japan, assignor to Kyocera Corporation, Kyoto, Japan

Division of Ser. No. 396,409, Feb. 28, 1995, Pat. No. 5,614,996. This application Dec. 11, 1996, Ser. No. 763,418

Claims priority, application Japan, Mar. 3, 1994, 6-58222; Dec. 29, 1994, 6-339804

Int. Cl.⁶ G03G *15/08*

U.S. Cl. 399—263 **7 Claims**



1. A toner storage unit comprising a container, a rotary shaft extending longitudinally of and mounted within the container, and an elastically deformable agitator blade attached to the rotary shaft, the agitator blade being curved with a predetermined radius of curvature and adapted to agitate toner while the agitator blade is frictionally slid on the inner surface of a toner storage section,
   - the toner storage section having a bottom, and a first side wall extending upwardly of and located downstream of the bottom in the direction of rotation of the agitator blade, the first side wall including a toner supply opening,
   - the toner storage section having a second side wall located in opposite relation to the first side wall, the second side wall being curved gradually larger toward the bottom in a transverse section, wherein the rotary shaft has an axis offset toward the toner supply opening.

5,842,094
CONVEYING DEVICE FOR MAGNETIZABLE PARTICLES

Jan Bruyndonckx, Hove, and Leo Vackier, 's Gravenwezel, both of Belgium, assignors to Agfa-Gevaert, Mortsel, Belgium

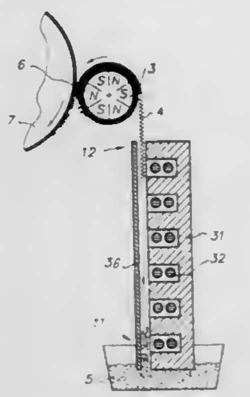
PCT No. PCT/EP95/02292, § 371 Date Dec. 13, 1996, § 102(e) Date Dec. 13, 1996, PCT Pub. No. WO95/34847, PCT Pub. Date Dec. 21, 1995

PCT Filed Jun. 14, 1995, Ser. No. 750,724

Claims priority, application Belgium, Jun. 14, 1994, 9400577

Int. Cl.⁶ G03G *15/08*

U.S. Cl. 399—289 **11 Claims**



1. An apparatus for conveying magnetically attractable particles from a first position to a second position, comprising:
   - a stator;
   - an end-plate made of magnetizable material, said stator and said end-plate defining a channel thereberween;
   - electric windings disposed within said stator; and
   - means for supplying electric current to said windings to generate a magnetic field in said channel, said magnetic field applying a force to move the particles from said first position to said second position.

5,842,095
IMAGE FORMING DEVICE WITH MULTIPLE IMAGE FORMING UNITS

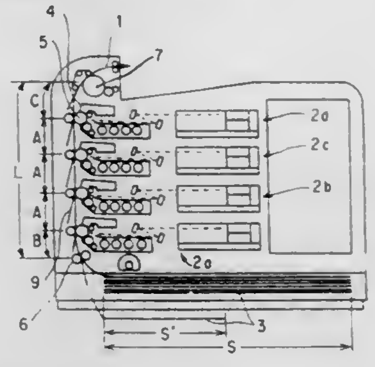
Atsuyuki Kitamura, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jun. 4, 1997, Ser. No. 868,919

Claims priority, application Japan, Jun. 6, 1996, 8-166705

Int. Cl.⁶ G03G *15/01*

U.S. Cl. 399—299 **2 Claims**



1. An image-forming device comprising:
   - a plurality of image-forming units disposed along a copy material transport path, wherein said plurality of image-forming units sequentially copies toner images onto a copy material moving along said copy material transport path;
   - transport copying means for each image-forming unit for transporting said copying material while being placed in contact

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with an image retention body and so that toner images are copied from said image retention body onto said copy material;

entry-side transporting means disposed upstream from said plurality of image-forming units along said copy material transport path; and

exit-side nip transporting means disposed downstream from said plurality of image-forming units along said copy material transport path, wherein a relationship S'>2A, A+B, A+C is fulfilled, wherein: A is the interval separating each of said plurality of image-forming units along said copy material transport path; B is the interval between one of the plurality of said image-forming units that is positioned furthest upstream, and said entry-side nip transporting means; C is the interval between one of the plurality of said image-forming units which is positioned furthest downstream and said exit-side nip transporting means; and S' is the length of a minimum-size copy material along the direction of transport, wherein when said copy material is not being nipped by either said entry-side or said exit-side nip transporting means then said copy material spans and is nipped by at least a plurality of said transport copying means of said image-forming units.

5,842,096
METHOD OF PRINTING MONOCHROME AND COLOR IMAGES ONTO A SURFACE

Robert John Mabbott, Bedford, Great Britain, assignor to ISO Developments Limited, England

PCT No. PCT/GB93/02591, § 371 Date Mar. 1, 1996, § 102(e) Date Mar. 1, 1996, PCT Pub. No. WO94/15263, PCT Pub. Date Jul. 7, 1994

PCT Filed Dec. 17, 1993, Ser. No. 454,334

Int. Cl.^{6} G03G *15/16;15/01*

U.S. Cl. 399—302 **17 Claims**

1. A method of printing monochrome and full color images onto a surface having a continuous surface, the method comprising the steps of

(a) transferring the image onto a first image carrier to provide a toner image on the first image carrier,

(b) placing the first image carrier against a second image carrier with the toner image between the first image carrier and the second image carrier, the second image carrier having a greater affinity for the toner than the first image carrier when the toner is heated and being formed from a material selected from the group consisting of a film form polyethylene ester material having a thermal shrinkage characteristic of less than 1% or a film form polyimide material;

(c) heating the first and second image carriers, with the toner image therebetween, under pressure;

(d) thereafter removing the first image carrier from the second image carrier, with the toner image wholly transferred to the second image carrier;

(e) placing the second image carrier against a surface of a substrate, onto which the toner image is to be ultimately transferred, with the toner image therebetween, the substrate having a greater affinity for the toner than the second image carrier;

(f) heating the second image carrier and the substrate, with the toner image therebetween, under pressure; and

(g) thereafter removing the second image carrier from the substrate, with the toner image transferred to the substrate.

5,842,097
IMAGE FORMING AND TRANSFERRING METHOD USING A PEELING LAYER

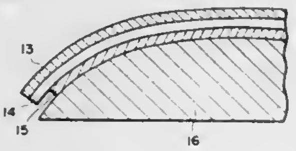
Makoto Kanbayashi, and Ryoichi Fujita, both of Kawasaki, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

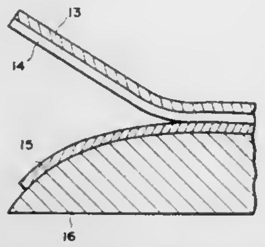
Filed Apr. 30, 1996, Ser. No. 640,107

Claims priority, application Japan, May 2, 1995, 7-131190

Int. Cl.^{6} G03G *13/16;15/16*

U.S. Cl. 399—302 **18 Claims**





1. An image forming method, comprising the steps of:

forming a toner image with a toner comprising toner particles and an external additive on a surface of a first image-carrying member comprising a support and a lamination layer disposed thereon containing a peeling layer.

fixing the toner image on the surface of the peeling layer of the first image-carrying member to form a fixed image,

peeling the peeling layer having the fixed image from the first image-carrying member, and

transferring the fixed image on the peeling layer onto a second image-carrying member while swelling the peeling layer,

wherein the lamination layer at least comprises the peeling layer and an adhesive layer, the peeling layer at least comprising a transfer layer and having an area expansion ratio of 102–106%.

5,842,098
FIXING APPARATUS AND FIXING METHOD FOR ELECTROPHOTOGRAPHIC APPARATUS

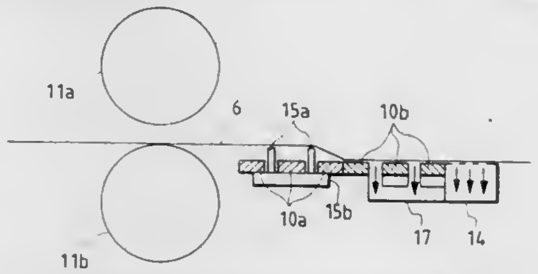
Hiroshi Ueno; Shuho Yokokawa; Kunitomo Takahashi; Sho Sawahata; Ken Onodera, and Tetsuya Ohba, all of Ibaraki, Japan, assignors to Hitachi Koki Co., Ltd., Tokyo, Japan

Filed Oct. 21, 1997, Ser. No. 954,825

Claims priority, application Japan, Oct. 25, 1996, 8-283732

Int. Cl.^{6} G03G *13/20*

U.S. Cl. 399—322 **7 Claims**



1. A fixing apparatus for an electrophotographic apparatus, comprising:

a suction unit for attracting a rear surface of a longitudinally continuous recording material on a major surface of which a toner image is held;

a preheater for preheating said recording material while adhering said recording material to said preheater by attracting force of said suction unit;

a pair of fixing rollers comprised of a heat roller and a pressure roller urged to each other, for holding and carrying said recording material therebetween while heating and pressurizing said recording material at a pressing portion therebetween to fix said toner image on said major surface of said recording material; and

a recording material lifting unit having a projection member movable relative to a surface of said preheater.

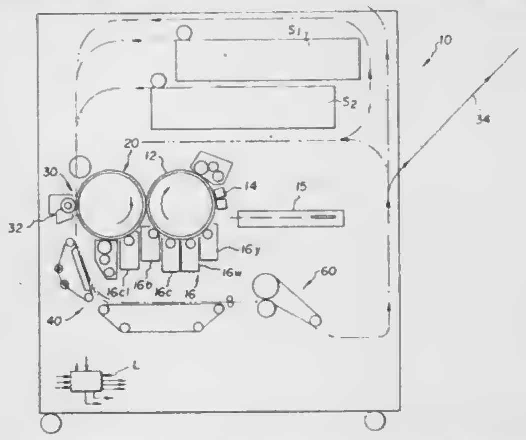
5,842,099
APPLICATION OF CLEAR MARKING PARTICLES TO IMAGES WHERE THE MARKING PARTICLE COVERAGE IS UNIFORMLY DECREASED TOWARDS THE EDGES OF THE RECEIVER MEMBER

Muhammed Aslam, Rochester; Robert D. Bobo, Ontario; Dennis R. Kamp, Churville, and Jerry E. Livadas, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 17, 1997, Ser. No. 992,746

Int. Cl.^{6} G03G *15/09;15/16*

U.S. Cl. 399—324 **19 Claims**



1. A reproduction apparatus utilizing clear marking particles in the development of an image. said clear marking particles being laid down so as to prevent offset upon fusing of an image to a receiver member, said reproduction apparatus comprising:

a dielectric member adapted to have latent images formed thereon;

a development station, including a plurality of developer units respectively containing marking particles of different colors, at least one developer unit containing black marking particles and another developer unit containing clear marking particles, said development station selectively developing latent images with marking particles from said developer units respectively;

a transfer station for transferring developed marking particle images from said dielectric member to a receiver member;

a fuser assembly for fusing a marking particle image on a receiver member; and

control means for selectively activating said developer unit for applying clear marking particles to a receiver member, said clear marking particles uniformly decreasing toward the edges of said receiver member.

5,842,100
FIXING UNIT

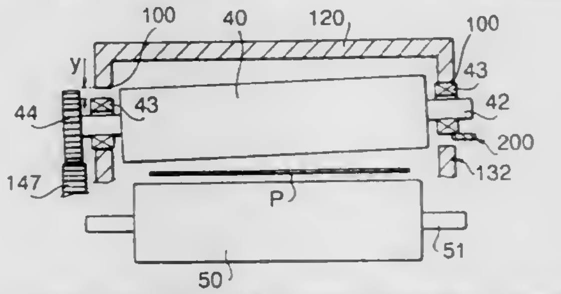
Tsukasa Yanashima; Masatoshi Takano; Tomoyuki Nishikawa; Tsutomu Sato; Kasumi Yamamoto, and Yutaka Ishikawa, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 5, 1997, Ser. No. 906,263

Claims priority, application Japan, Aug. 7, 1996, 8-224395

Int. Cl.^{6} G03G *15/20*

U.S. Cl. 399—328 **14 Claims**



1. A fixing unit for fixing images on a recording sheet, comprising:

a heat roller accommodating a heater and having a shaft member at both axial ends thereof;

two receiving members which receive both shafts of said heat roller, a clearance being provided between each shaft and respective receiving member;

a press roller movable toward and away from said heat roller;

an opening/closing mechanism which moves said press roller to open and close a gap between said press roller and said heat roller;

a rotating mechanism which rotates said heat roller, said rotating mechanism provided to the same side as said press roller with respect to said heat roller;

a driven gear provided to one shaft member of said heat roller, said driven gear being driven by said rotating mechanism; and

a biasing member which biases the other shaft of said heat roller away from said press roller within said clearance, so that said heat roller and said press roller become parallel when said one shaft member is urged away from said press roller due to the meshing engagement of said driven gear and said rotating mechanism.

5,842,101
AUTOMATIC DOCUMENT FEEDER

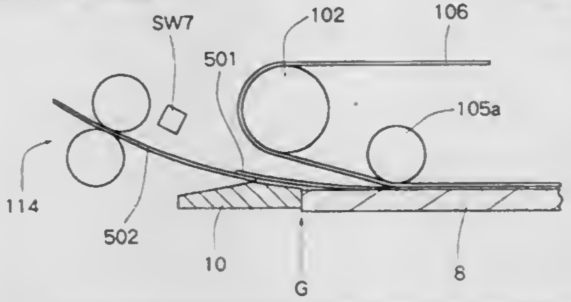
Hiroyuki Harada, Osaka, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Filed Jul. 16, 1997, Ser. No. 895,480

Claims priority, application Japan, Jul. 17, 1996, 8-187187

Int. Cl.^{6} G03G *15/00*

U.S. Cl. 399—368 **7 Claims**



4. An automatic document feeder for an image processing means having a document feed path, said automatic document feeder comprising document bearing means, for bearing documents to be fed; document sending-in means, for feeding a document borne on the document bearing means to the document feed path; a register roller pair disposed on the document feed path downstream of the document sending-in means, for temporarily stopping the document fed by the document sending-in means and carrying the

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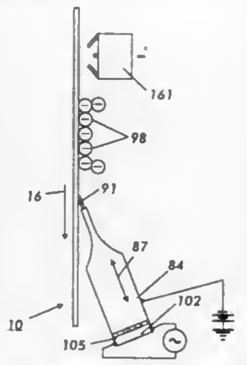
stopped document toward an exposure position for exposure of the document; document conveying means, for conveying the document carried by the register roller pair to the exposure position and for discharging the document from the exposure position after exposure of the document; two-document exposure setting means, for setting the simultaneous exposure of two documents; and control means, for controlling the document sending-in means, the register roller pair, and the document conveying means so that when the two-document exposure setting means sets the simultaneous exposure of two documents, then:
- the document sending-in means, the register roller pair and the document conveying means feed the first document borne on the document bearing means, and situate said first document at a first wait position,
- the document sending-in means and the register roller pair feed the second document borne on the document bearing means, and situate said second document at a second wait position, and
- the register roller pair and the document conveying means situate said first and second documents at the exposure position with the front end of said second document overlapping the rear end of said first document by a predetermined amount.

5,842,102
ULTRASONIC ASSIST FOR BLADE CLEANING

David B. Montfort, Webster, and Nero R. Lindblad, Ontario, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 30, 1997, Ser. No. 885,432
Int. Cl.^{6} G03G *21/00*
U.S. Cl. 399—349 **21 Claims**



1. An apparatus for cleaning particles from a surface, comprising:
- an ultrasonic horn having two ends including a first end and a second end, the second end being opposite the first end and having a horn tip, said horn tip having an integral sharp cleaning edge for cleaning the surface and;
- a piezoelectric element being adjacently attached to said ultrasonic horn on the first end of said ultrasonic horn for vibrating said horn tip and said integral sharp cleaning edge to loosen particles and clean the particles from the surface.

5,842,103
CLEANING DEVICE WITH IMPROVED DETONING EFFICIENCY

Joseph A. Swift, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

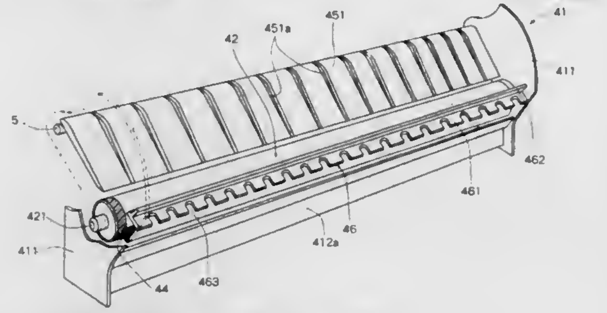
Filed Jan. 13, 1997, Ser. No. 782,160
Int. Cl.^{6} G03G *21/00*
U.S. Cl. 399—353 **20 Claims**

1. An electrostatic cleaning device for use in electrostatographic printing devices, comprising a plurality of conductive fibers having an outer coating comprising a polymer containing silane or fluoro groups which reduces a surface energy of the conductive fibers below an initial surface energy of the conductive fibers prior to coating and the surface energy of the conductive fibers following coating is below 30 dynes/cm, the plurality of conductive fibers being in attached association with the electrostatic cleaning device.

5,842,104
IMAGE-FORMING DEVICE AND A PROCESS UNIT THEREFOR HAVING A GUIDE PLATE WITH MULTIPLE OPENINGS

Hiroyuki Hazama; Nariaki Tanaka, and Takashi Terada, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Aug. 15, 1997, Ser. No. 911,729
Claims priority, application Japan, Aug. 23, 1996, 8-222048; Jun. 27, 1997, 9-172363
Int. Cl.^{6} G03G *21/18*
U.S. Cl. 399—400 **6 Claims**



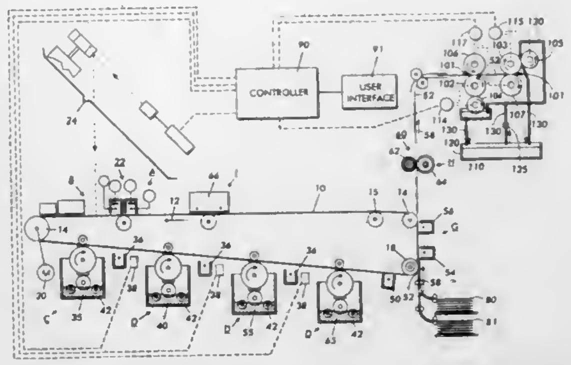
1. An image-forming machine comprising:
- a photosensitive drum rotatably disposed;
- a charger for electrically charging a peripheral surface of said photosensitive drum to a predetermined polarity;
- a developer for developing an electrostatic latent image on said peripheral surface of said photosensitive drum into a toner image;
- a transfer means for transferring the toner image formed on said peripheral surface of said photosensitive drum onto a transfer paper;
- a fixing means for heat-fixing the toner image transferred onto the transfer paper by said transfer means;
- a cooling fan for blowing cooling air to the surrounding of said fixing means; and
- a guide plate for guiding the transfer paper, onto which the toner image is transferred by said transfer means, to said fixing means, said guide plate having a length in a direction that is substantially perpendicular to a conveying direction of the transfer paper guided by said guide plate, said guide plate having a side edge, said side edge defining a plurality of openings along said length of said guide plate.

5,842,105
CONTROLLED MOISTURIZATION OF PAPER TO ELIMINATE CURL

Thomas Acquaviva, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 29, 1997, Ser. No. 940,110
Int. Cl.^{6} G03G *15/00*
U.S. Cl. 399—406 **8 Claims**

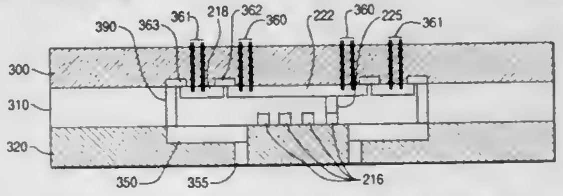
1. A system that add moisture to copy sheets while en route in a copier/printer to curl, comprising:
- a pair of back-up rolls and a pair of cylindrical transfer rolls, each having an outer cylindrical surface, said transfer rolls and said back-up rolls defining a nip between said outer cylindrical surfaces;
- a pair of metering rolls with one each of said pair of metering rolls in circumferential surface contact with one each of said cylindrical transfer rolls for wetting said outer surface of said pair of cylindrical transfer rolls;
- a pair of servo motors with one each of said servo motors being connected to one each of said transfer rolls; and
- a controller connected to said servo motors for controlling said servo motors in driving said pair of transfer rolls in a direction opposite to the direction of conveyance of the sheets at the nip area and thereby controlling the amount of fluid applied to each side of the sheets.



5,842,106
METHOD OF PRODUCING MICRO-ELECTRICAL CONDUITS

Barry Jay Thaler, Lawrenceville; Robert Leon Quinn, Trenton; Paul Leonard Braun, Highland Park; Peter J. Zanzucchi, Lawrenceville; Charlotte A. Burton, Brick; Sterling E. McBride, Lawrenceville, and Robert R. Demers, Cranbury, all of N.J., assignors to Sarnoff Corporation, Princeton, N.J.

Continuation-in-part of Ser. No. 469,238, Jun. 6, 1995, Pat. No. 5,632,876, and Ser. No. 483,331, Jun. 7, 1995, Pat. No. 5,603,351. This application Nov. 9, 1995, Ser. No. 554,887
Int. Cl.^{6} B22F *3/10;7/04*
U.S. Cl. 419—8 **22 Claims**



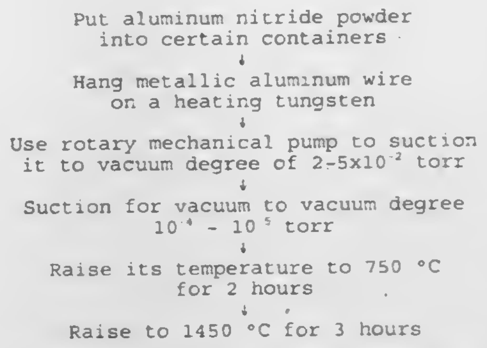
1. A method of forming, in a substrate, a fluid-tight electrical conduit through a high aspect ratio hole of at least about 3 the method comprising fusing a via ink to form the electrical conduit and to seal the hole.

5,842,107
SINTERING PROCESS FOR AlN POWDER COATED WITH AL FILM

Nan-Chung Wu; Huei-Jung Wang, and Shin-Gei Chen, all of Tainan, Taiwan, assignors to National Science Council, Taipei, Taiwan

Filed Aug. 31, 1995, Ser. No. 521,740
Int. Cl.^{6} B22F *3/12*
U.S. Cl. 419—13 **8 Claims**

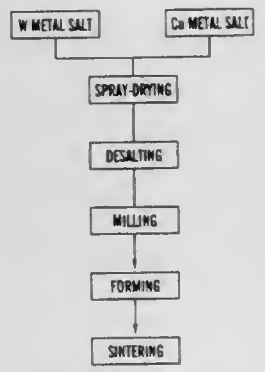
1. A process for the preparation of an aluminum nitride (AlN) sintered article comprising vacuum depositing a homogeneous layer of aluminum film onto screened aluminum nitride powder to form coated aluminum nitride powder, thereafter molding said coated aluminum nitride powder, cold pressing said coated aluminum nitride powder and sintering at 1650° C. to 1750° C. in a nitrogen atmosphere at ambient pressure to form a densely sintered aluminum nitride article.


Put aluminum nitride powder into certain containers
Hang metallic aluminum wire on a heating tungsten
Use rotary mechanical pump to suction it to vacuum degree of 2-5x10^{-2} torr
Suction for vacuum to vacuum degree 10^{-4} - 10^{-5} torr
Raise its temperature to 750 °C for 2 hours
Raise to 1450 °C for 3 hours

5,842,108
MECHANO-CHEMICAL PROCESS FOR PRODUCTION OF HIGH DENSITY AND ULTRAFINE W/CU COMPOSITE MATERIAL

Byoung-Kee Kim; Gil-Geun Lee, both of Kyungsangnam-do; Gook-Hyun Ha, Pusan, and Dong-Won Lee, Kyungsangnam-do, all of Rep. of Korea, assignors to Korea Institute of Machinery & Materials, Chungcheongnam-do, Rep. of Korea

Filed Aug. 13, 1997, Ser. No. 910,672
Claims priority, application Rep. of Korea, Mar. 4, 1997, 1997-7046
Int. Cl.^{6} B22F *3/12*
U.S. Cl. 419—33 **1 Claim**



1. A method for producing high density and ultrafine W/Cu bulk material by a mechano-chemical process, comprising the steps of:
- spray-drying an aqueous solution of tungsten (W) and copper (Cu) metal salts (object composition: W—10~30 wt % Cu) under the condition of 250° C. of container temperature, 11,000 rpm of nozzle rotation velocity and 20 ml/min of flow rate of aqueous solution thus producing W—Cu precursor powder, and desalting and dehydrating W—Cu precursor powder at 750° C. for 2 hours in the air atmosphere, thus preparing W—Cu oxide composite powder;
- milling W—Cu oxide composite powder using a rotation ball mill for 2 hours in the air atmosphere with both a weight ratio of ball to W—Cu oxide composite powder being 50: 1 and 1 wt % of paraffin as a milling additive being added to W—Cu oxide composite powder, thus mechanically pulverizing the W—Cu oxide composite powder; and
- forming the W—Cu oxide composite powder into a formed green body at a forming pressure of 1 t/cm^2, removing paraffin from the formed green body of the W—Cu oxide composite powder at 550° C. for 2 hours in the air atmosphere, primarily and secondarily reducing the formed green body under hydrogen atmosphere at 150°–250° C. for 1 hour and at 600°–800° C. for 1 hour, and sintering the green body at a temperature of higher than the melting point of copper by about 50° C. for 1 hour with temperature increasing rate of 5°

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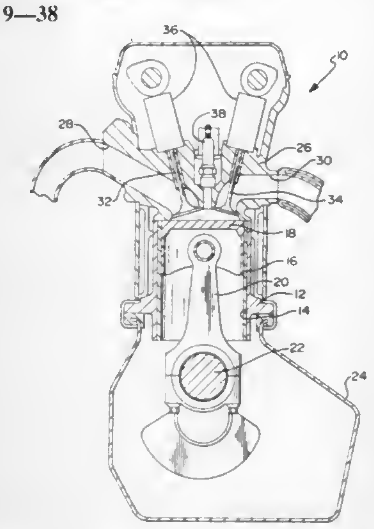
C./min, thus producing W/Cu bulk material having a composition of W—10¯30wt % Cu, an average size of tungsten particles of not higher than 1.0 μm and a density of not lower than 99.0% of a theoretical density.

5,842,109
METHOD FOR PRODUCING POWDER METAL CYLINDER BORE LINERS

Edward Akpan, Novi, and John E. Brevick, Livonia, both of Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.

Filed Jul. 11, 1996, Ser. No. 678,311
Int. Cl.^{6} B22F *3/12*

U.S. Cl. 419—38 **20 Claims**



1. A method for producing powder metal cylinder bore liners for an internal combustion engine, said method comprising the steps of:

loading a powder metal mixture into a die cavity of a die;

compacting the powder metal mixture in the die cavity using uniaxial pressure from the die and forming the powder metal cylinder bore liner; and

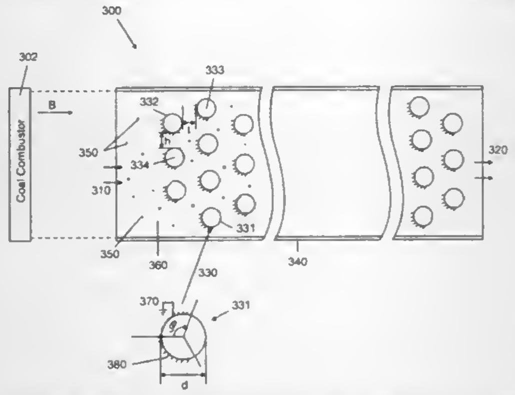
sintering the powder metal cylinder bore liner.

5,842,110
APPARATUS AND METHOD FOR PHOTOCATALYTIC CONDITIONING OF FLUE GAS FLY-ASH PARTICLES

Ali Tabatabaie-Raissi; Nazim Z. Muradov, both of Melbourne, and Peter H. Peng, Heathrow, all of Fla., assignors to University of Central Florida, Orlando, Fla.

Filed Mar. 11, 1996, Ser. No. 613,856
Int. Cl.^{6} B01J *19/08*

U.S. Cl. 422—186.3 **6 Claims**



1. An apparatus for conditioning flue gas emissions by treating the flue gas with SO_3, where the SO_3 is formed in-situ in the flue gas by photocatalytic conversion of SO_2 using selectively spaced ultraviolet (UV) light emitting lamps, comprising:

a source for allowing flue gas having fly-ash and SO_2 gases to flow into a duct; and

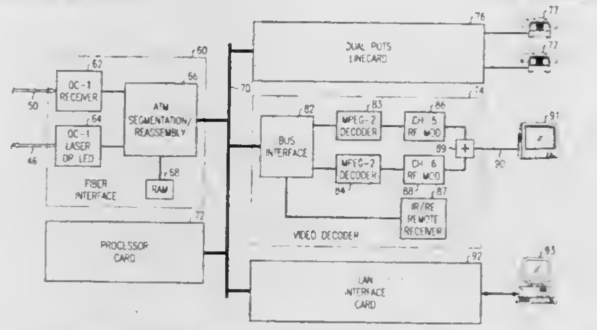
vertical and horizontal adjacent Ultra-Violet(UV) lamps arranged and positioned in a cross flow in the duct, each lamp having a diameter of approximately, d, the vertical adjacent UV lamps being spaced apart to one another at approximately d to 2d, and the horizontal adjacent UV lamps being spaced apart at approximately d to 3d, and d being equal to approximately ⅝ of an inch to approximately 2 inches, wherein SO_3 is formed in-situ in the flue gas by photocatalytic conversion of SO_2.

5,842,111
CUSTOMER PREMISE EQUIPMENT FOR USE WITH A FIBER ACCESS ARCHITECTURE IN A TELECOMMUNICATIONS NETWORK

Charles Calvin Byers, Aurora, Ill., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Aug. 23, 1996, Ser. No. 701,923
Int. Cl.^{6} H04N *7/173*

U.S. Cl. 455—6.3 **24 Claims**



1. Customer premise equipment for receiving broadband signals from a telecommunications network, comprising:

means for receiving the broadband signals;

means for segmenting said broadband signals into ATM cells;

a passive bus for receiving said ATM cells;

said passive bus directly connected to and delivering all of said ATM cells to a line card for providing telephony service, to a video decoder and to a personal computer interface card.

5,842,112
PERSONAL COMMUNICATOR SYSTEM FOR IDENTIFYING A TELEPHONE WHICH IS DISPOSED PROXIMATE A LOCATOR TRANSMITTER

Robert M. Fuller, Redmond; Frederick A. Epler, Issaquah, and Maxwell E. Manowski, Enumclaw, all of Wash., assignors to Aspect Telecommunications Corporation, San Jose, Calif.

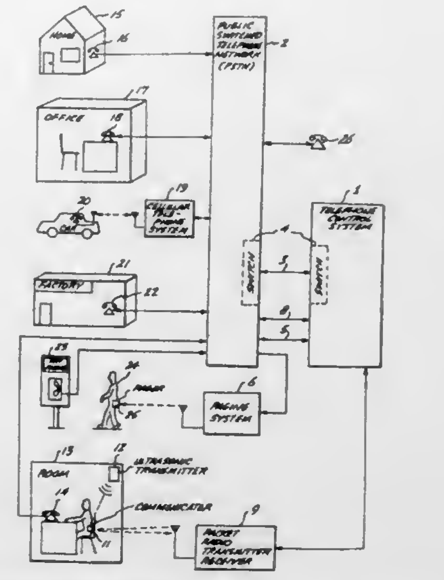
Division of Ser. No. 249,453, May 26, 1994, which is a division of Ser. No. 480,242, Feb. 15, 1990, Pat. No. 5,375,161, which is a continuation-in-part of Ser. No. 439,601, Nov. 21, 1989, abandoned, which is a continuation-in-part of Ser. No. 841,931, Mar. 20, 1986, Pat. No. 4,893,335, which is a continuation-in-part of Ser. No. 650,821, Sep. 14, 1984, abandoned. This application Jun. 2, 1995, Ser. No. 459,266
Int. Cl.^{6} H04Q *7/12;7/10;7/06*

U.S. Cl. 455—31.2 **50 Claims**

1. A communication system wherein a user carries a paging device for receiving signals broadcast from a paging system, with a unique identification code assigned to the paging device. characterized by:

a plurality of telephones wired to said communication system;

a plurality of locator transmitters, each locator transmitter being disposed proximate at least one of said plurality of telephones and transmitting an information signal identifying said at least one of said plurality of telephones; and


15
HOME
16
PUBLIC SWITCHED TELEPHONE NETWORK (PSTN)
2
OFFICE
18
17
25
20
19
21
22
13
PAGING SYSTEM
12
14
ROOM
COMMUNICATOR
PACKET RADIO TRANSMITTER RECEIVER
9
6
5
4
3

the paging device including:

a receiver for receiving the information signal from a proximate locator transmitter, and

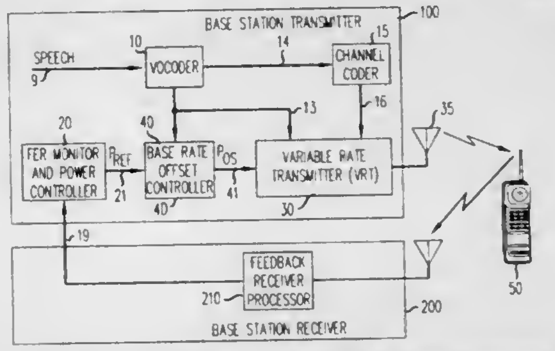
a transmitter for transmitting a signal related to the information signal received by the paging device and the paging device assigned identification code, the communication system thereby being provided with information identifying the one of said plurality of telephones which is disposed proximate the locator transmitter from which the paging device receives its information signal.

5,842,113
METHOD AND APPARATUS FOR CONTROLLING POWER IN A FORWARD LINK OF A CDMA TELECOMMUNICATIONS SYSTEM

Sanjiv Nanda, Plainsboro, and Kiran M. Rege, Marlboro, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, Del.

Filed Apr. 10, 1996, Ser. No. 631,721
Int. Cl.^{6} H04B *1/00*

U.S. Cl. 455—69 **13 Claims**



1. A method of operating a transmitter in a cellular communications system, said method comprising the steps of

generating a coded frame of signals,

generating a plurality of power offset values associated with respective frame transmission rates,

generating an indication identifying the frame transmission rate for the coded frame and selecting one of the power offset values as a function of the identified frame transmission rate,

responsive to the selection, applying the selected offset value to a reference power level to obtain an offset power level value, and

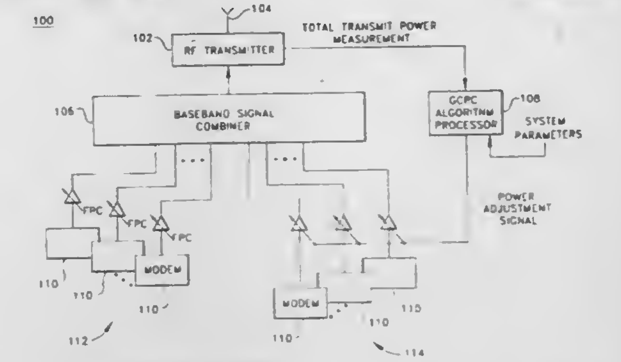
transmitting the coded frame at a power level derived as a function of at least the offset power level.

5,842,114
GLOBAL CHANNEL POWER CONTROL TO MINIMIZE SPILLOVER IN A WIRELESS COMMUNICATION ENVIRONMENT

Faith M. Ozluturk, Port Washington, N.Y., assignor to InterDigital Technology Corporation, Wilmington, Del.

Filed Feb. 12, 1997, Ser. No. 797,989
Int. Cl.^{6} H04B *7/005*

U.S. Cl. 455—69 **18 Claims**



1. A base station comprising:

means for transmitting at an output power level a plurality of assigned channels and at least one global channel;

means for monitoring said output power level;

closed-loop forward power control means for individually controlling the power level of said assigned channels; and

global channel power control means for controlling the power level of said global channel, responsive to said output power level; said global channel power control means comprising a processor, responsive to said monitoring means, which calculates a desired power level for said global channel and adjusts the power of said global channel in response thereto; wherein the power of said global channel is adjusted in response to all net changes in the total power of said assigned channels.

5,842,115
TIME-DUPLEX WIRELESS TELEPHONE WITH IMPROVED HEARING-AID COMPATIBILITY

Paul W. Dent, Pittsboro, N.C., assignor to Ericsson Inc., Research Triangle Park, N.C.

Filed Jan. 25, 1996, Ser. No. 591,061
Int. Cl.^{6} H04Q *7/32*

U.S. Cl. 455—73 **29 Claims**

24. A wireless telephone comprising:

a) a power source;

b) a radio circuit for transmitting and receiving, wherein during operation of said radio circuit a first magnetic field is generated by said radio circuit; and

c) a humbucking coil coupled to said radio circuit for passing current from said radio circuit and generating a second magnetic field directly proportional to current consumed by said radio circuit and in antiphase with said first magnetic field to at least partially cancel said first magnetic field and reduce magnetic coupling between said wireless telephone and proximate electronic apparatuses.

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5,842,116

RADIO DEVICE EQUIPPED WITH A REPLACEABLE DISPLAY SECTION

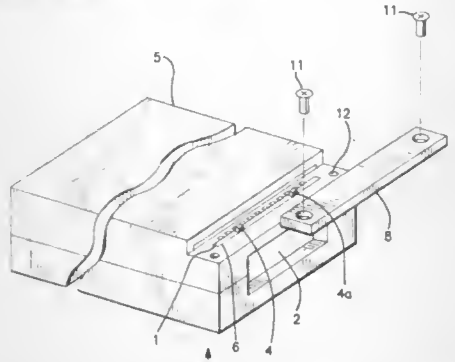
Toshiichi Nishida, and Shinichi Nakazato, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Dec. 26, 1995, Ser. No. 578,235

Claims priority, application Japan, Dec. 26, 1994, 6-322629

Int. Cl.^{6} H04B *1/38;1/06*

U.S. Cl. 455—90 **17 Claims**



1. A radio device with a replaceable display section, comprising:

a removably replaceable display section comprised of a display panel for being visible at a front surface of the device, and an electrode terminal;

a guide section in a top surface of the device for inserting and holding said display section, wherein a portion of said display section protrudes above the top surface to facilitate removal of said display section when said display section is mounted in said guide section; and

a connection terminal which is connected to the electrode terminal of said display section when said display section is mounted in said guide section.

5,842,117

MOBILE RADIO AERIAL INSTALLATION

Uwe Rosenberg, Aspach, and Dieter Cluse, Allmersbach/Tal, both of Germany, assignors to Ant Nachrichtentechnick GmbH, Backnang, Germany

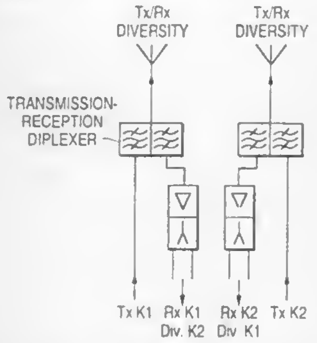
PCT No. PCT/DE94/00666, § 371 Date Apr. 9, 1996, § 102(e) Date Apr. 9, 1996, PCT Pub. No. WO95/02287, PCT Pub. Date Jan. 19, 1995

PCT Filed Jun. 15, 1994, Ser. No. 591,490

Claims priority, application Germany, Jul. 9, 1993, 43 22 863.1

Int. Cl.^{6} H03C *7/02;* **H04B** *1/02;7/02*

U.S. Cl. 455—101 **11 Claims**



1. An antenna system for a base transmitter-receiver station of a communications system for mobile radio operators, with at least two transmission channels and two associated reception channels, wherein: each base transmitter-receiver station has transmitters and receivers which operate on separate frequencies, and at least two antennas which are embodied for redundant reception; each antenna is used as a transmission antenna for at least one channel; the transmitting operation is carried out without redundancy so that each antenna is fed by a different transmission channel; and, at least one antenna is set for the redundant reception of that channel which is fed to another antenna as the transmission channel.

5,842,118

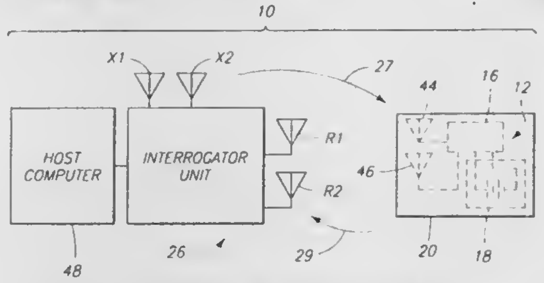
COMMUNICATION SYSTEM INCLUDING DIVERSITY ANTENNA QUEUING

Clifton W. Wood, Jr., Boise, Id., assignor to Micron Communications, Inc., Boise, Id.

Filed Dec. 18, 1996, Ser. No. 772,173

Int. Cl.^{6} H04B *7/02*

U.S. Cl. 455—101 **33 Claims**



1. A wireless communications system comprising:

a first transponder adapted to be coupled to one of a plurality of selectable antennas, and having a stack including locations holding data representing at least three antennas, the stack defining an order in which antennas will be used to attempt communication; and

a second transponder configured to communicate with the first transponder, wherein the first transponder uses an antenna defined by data in one location of the stack for communication with the second transponder, and, if successful communication with the second transponder is not established, the first transponder uses different antennas in successive communications attempts, in the defined order, and wherein the first transponder rearranges the stack after a successful communication if the successful communication did not occur using the antenna defined by data in the first mentioned location of the stack.

5,842,119

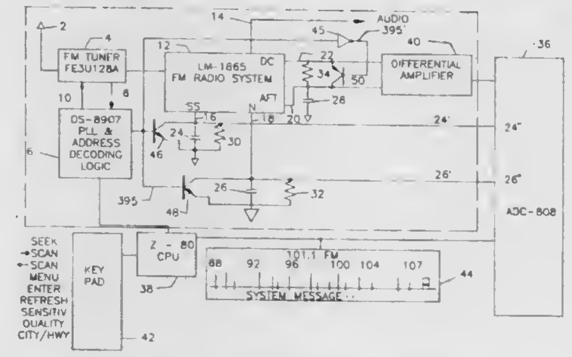
RADIO SCANNER AND DISPLAY SYSTEM

Harry Edwin Emerson, 41 Karen Pl., Budd Lake, N.J. 07828, and Harry Richard Freedman, 6461 Mandalay Dr., Parma Heights, Ohio 44130

Filed Feb. 5, 1993, Ser. No. 14,471

Int. Cl.^{6} H04B *1/16*

U.S. Cl. 455—161.3 **43 Claims**



1. A tuning system for a radio receiver comprising:

a visual display of a radio band;

means for tuning the radio receiver so that it tunes to the channels of the band in sequence;

means coupled to said radio receiver for deriving signals indicative of the received signal characteristics of stations present in channels of said radio band, the signal characteristics including at least SS (signal strength), and one of N (noise) and AFT (automatic fine tuning);

means for determining the listenable stations in response to said signals;

means for producing simultaneous displays of said listenable stations at respective channel locations in the visual display, said displays showing at least the relative magnitudes of measured values of the signal strengths of said listenable stations; and

means for tuning the radio receiver to a selected one of the displayed stations for listening.

5,842,120

RADIO RECEIVER WITH PROGRAMMABLE DIGITAL TUNER IMMUNE TO MANUFACTURING VARIATIONS IN VARACTOR CAPACITANCE

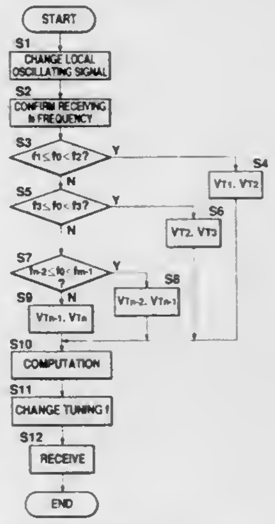
Keiji Kobayashi, and Yasunari Noguchi, both of Gunma-ken, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Sep. 24, 1996, Ser. No. 718,820

Claims priority, application Japan, Sep. 29, 1995, 7-253900

Int. Cl.^{6} H04G *1/18*

U.S. Cl. 455—179.1 **10 Claims**



1. A radio receiver comprising:

an RF tuning circuit including a tuning element having a variable frequency characteristic in order to set tuning frequencies:

a mixing circuit for converting a signal outputted from the RF tuning circuit to an IF signal by means of a local oscillating signal:

a local oscillating circuit for generating the local oscillating signal;

a frequency control circuit for controlling of the local oscillating signal in response to a select signal:

a storing circuit for storing control data corresponding to the frequency characteristic of the tuning element: and

an arithmetic unit for carrying out a computation based on the control data and data corresponding to the select signal and generating a control signal, wherein

the frequency characteristic of the tuning element is controlled by the control signal from the arithmetic unit to the tuning element, and when regulating for the radio receiver, a signal at a designated frequency is supplied to the radio receiver, while regulating control data are finely tuned, receiving field intensities in the radio receiver corresponding respectively to the regulating control data are detected, and from these are selected one regulating control data which obtains the greatest receiving field intensity, and then the selected regulating control data is stored in the storing circuit as the control data, and

data spaces between each of the control data are set at narrower interval as variation in the frequency characteristic of the tuning element becomes wider.

5,842,121

POWER SUPPLY UNIT WITH SWITCH-ON/OFF FACILITY FOR POWERING RADIO EQUIPMENT

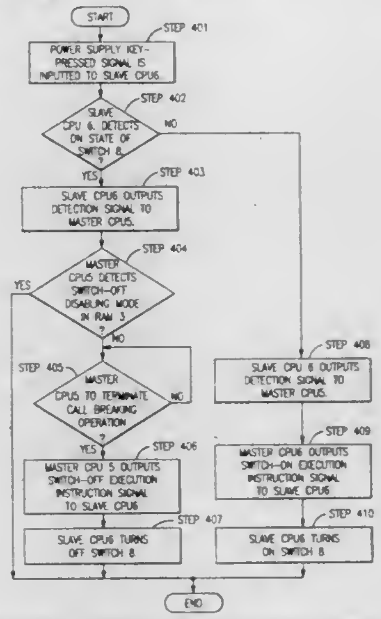
Noriko Norimatsu, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 23, 1995, Ser. No. 447,824

Claims priority, application Japan, May 24, 1994, 6-108844

Int. Cl.^{6} H04B *1/16*

U.S. Cl. 455—343 **8 Claims**


START
STEP 401
POWER SUPPLY KEY-PRESSED SIGNAL IS INPUTTED TO SLAVE CPU6
STEP 402
SLAVE CPU 6 DETECTS ON STATE OF SWITCH 8 ?
NO
YES
STEP 403
SLAVE CPU6 OUTPUTS DETECTION SIGNAL TO MASTER CPU5
STEP 404
MASTER CPU5 DETECTS SWITCH-OFF DISABLING MODE IN RAM 3 ?
YES
NO
STEP 405
MASTER CPU5 TO TERMINATE CALL BREAKING OPERATION ?
NO
YES
STEP 406
MASTER CPU 5 OUTPUTS SWITCH-OFF EXECUTION INSTRUCTION SIGNAL TO SLAVE CPU6
STEP 407
SLAVE CPU6 TURNS OFF SWITCH 8
STEP 408
SLAVE CPU 6 OUTPUTS DETECTION SIGNAL TO MASTER CPU5
STEP 409
MASTER CPU6 OUTPUTS SWITCH-ON EXECUTION INSTRUCTION SIGNAL TO SLAVE CPU6
STEP 410
SLAVE CPU6 TURNS ON SWITCH 8
END

1. A power supply unit for radio equipment comprising:

input means having a plurality of keys;

power generator means for generating power;

switching means, connected to said power generator means, for turning off said power to said radio equipment; and

disabling means for disabling the turn-off of said switching means in response to operation of a predetermined key of said input means:

wherein said disabling means comprises

- i) a RAM for storing a switch-off disabling mode which disables the turn-off of said switching means, and
- ii) control means for disabling the turn-off of said switching means while said storage means stores said switch-off disabling mode.

5,842,122

APPARATUS AND METHOD FOR ALTERNATIVE RADIOTELEPHONE SYSTEM SELECTION

Michael J. Schellinger, Bloomingdale; Robert F. D'Avello, Lake Zurich, and Robert K. Krolopp, Chicago, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 832,063, Feb. 6, 1992, Pat. No. 5,260,988. This application Jul. 30, 1993, Ser. No. 100,517

Int. Cl.^{6} H04Q *7/36*

U.S. Cl. 455—403 **2 Claims**

1. A method for alternative system selection in which a radiotelephone apparatus which transmits and receives messages on a first radiotelephone system having a first radio coverage area operating in a first frequency band and which alternatively transmits and receives messages on a second radiotelephone system having a second radio coverage area operating in a second frequency band, said first frequency band being a subset of said second frequency band, the method comprising the steps of:

detecting the first radiotelephone system from a subaudible signal transmitted on a radio channel associated with the first radiotelephone system, the step of detecting further comprising the steps of:

receiving the subaudible signal as a message word having a plurality of fields,

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decoding the message word, and

comparing identification information contained in one of the plurality of fields to prestored identification information;

monitoring for a predetermined period of time a radio channel associated with the second radiotelephone system when said subaudible signal is not detected;

initiating a telephone call via the first radiotelephone system when said subaudible signal is detected; and

terminating said telephone call when said subaudible signal ceases to be detected.

5,842,123
RADIO PAGING SYSTEM WITH VOICE TRANSFER FUNCTION AND RADIO PAGER

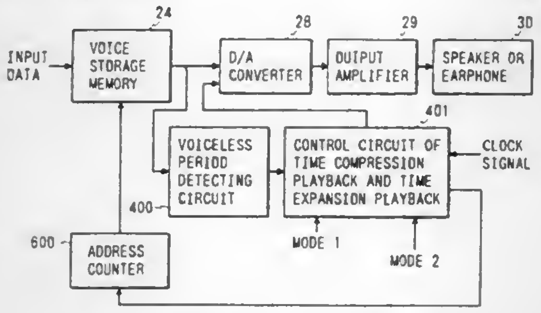
Nobuo Hamamoto, Hinode-machi; Tadashi Onishi, Hachioji; Tatsundo Suzuki, Musashimurayama; Minoru Nagata, Kodaira; Kenichi Mizuishi, Hachioji, and Yosuke Tyojamori, Hino, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 5,315, Jan. 15, 1993, Pat. No. 5,412,719. This application Apr. 20, 1995, Ser. No. 425,736

Claims priority, application Japan, Jan. 17, 1992, 4-006540; Feb. 28, 1992, 4-042863

Int. Cl.^{6} H04M *11/10*

U.S. Cl. 455—412 **14 Claims**



11. A movable terminal device, comprising:

a demodulation part for demodulating a radio signal which contains a voice information signal containing voice information;

memory means for storing said voice information;

reproducing means for reading said voice information from said memory means and for converting said voice information to an audible signal;

detecting means for detecting a voiceless period of said voice information from said memory means; and

time compression and/or expansion control means for performing compression and/or expansion of the voiceless period,

in which said time compression and/or expansion control means has a time compression part for performing compression of the voiceless period by a read cycle which is shorter than a read cycle of a voice period.

5,842,124
SYSTEM AND METHOD FOR USER-PROGRAMMABLE SERVICE PROGRAMMING OF CELLULAR TELEPHONES

Jason B. Kenagy, La Jolla, Calif., and Michael T. Coad, Overland Park, Kans., assignors to Qualcomm Incorporated, San Diego, Calif.

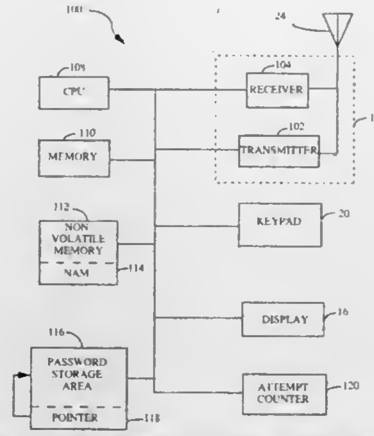
Filed Nov. 15, 1996, Ser. No. 751,191

Int. Cl.^{6} H04Q *7/32*

U.S. Cl. 455—418 **26 Claims**

1. A system for user-programming of a wireless communication device for operation with a wireless service provider, the system comprising:

a data entry device operable by a user to operate the wireless communication device and to enter a user-entered password and user-entered data;



a parameter storage area for storing system parameter values, said system parameter values controlling communications of the wireless communication device;

a password storage area for storing at least one password;

a password comparator for comparing said user-entered password with said at least one stored password, said password comparator generating an authorization signal if said user-entered password matches said at least one stored password, said authorization signal enabling said system parameter values to be changed in response to said user-entered data, and said password comparator generating an error signal if said user-entered password does not match said stored password; and

an attempt counter for storing an allowable attempt count, said attempt counter decrementing said allowable attempt count in response to said error signal, and said attempt counter setting said allowable attempt count to zero in response to said change of said system parameters.

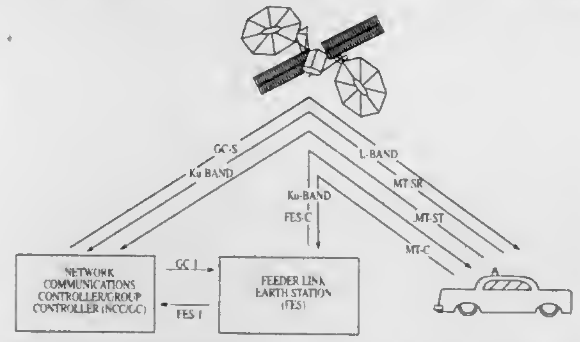
5,842,125
NETWORK CONTROL CENTER FOR SATELLITE COMMUNICATION SYSTEM

Edward J. Modzelesky, Leesburg, and William R. Tisdale, Purcellville, both of Va., assignors to AMSC Subsidiary Corporation, Reston, Va.

Filed Oct. 10, 1996, Ser. No. 728,227

Int. Cl.^{6} H04B *7/185*

U.S. Cl. 455—426 **16 Claims**


GC-S
Ku BAND
L-BAND
MT-SR
Ku-BAND
FES-C
MT-ST
MT-C
NETWORK COMMUNICATIONS CONTROLLER/GROUP CONTROLLER (NCC/GC)
GC-I
FES-I
FEEDER LINK EARTH STATION (FES)

9. In a mobile satellite system including a satellite communication switching office and network system having a satellite antenna for receiving and transmitting a satellite message via a satellite to and from a mobile earth station including a mobile communication system, a satellite interface system, a central controller receiving and transmitting the satellite message from the mobile earth station to and from the satellite communication switching office via the satellite and the satellite interface system, the mobile communication system comprising:

a user interface system providing a user interface through which a user has access to services supported by the mobile satellite system;

an antenna system providing an interface between the mobile communication system and the mobile satellite system via the satellite interface system, said antenna system receiving a first satellite message from the satellite and transmitting a second satellite message to the satellite;

said mobile satellite system being responsively connected to said mobile communication system, said mobile satellite system comprising:

a network operations center (NOC) managing and controlling the resources of the satellite network system and conducting the administrative functions associated with the management of the satellite network system, the NOC communicating with various internal and external entities via a control network;

a first network communications controller (NCC) managing the allocation of circuits between said mobile communication system and said satellite switching office for supporting communications, available circuits being held in circuit pools managed by at least one Group Controller (GC) in said NCC, said NCC communicating with said NOC via said control network;

said GC including components which control:

call setup and monitoring;

management of satellite resources during call setup and clear-down;

database management;

call record management;

congestion control;

generation of performance and traffic statistics; and

periodic performance verification testing.

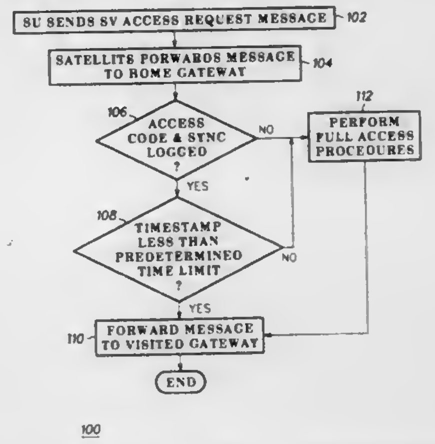
5,842,126
EXPEDITED HOME GATEWAY ACCESS METHOD AND SYSTEM

Steven Paul Sawyer, Fountain Hills, and Peter Joseph Armbruster, Chandler, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 30, 1996, Ser. No. 774,773

Int. Cl.^{6} H04B *7/185*

U.S. Cl. 455—428 **13 Claims**


SU SENDS SV ACCESS REQUEST MESSAGE
102
SATELLITE FORWARDS MESSAGE TO HOME GATEWAY
104
106
ACCESS CODE & SYNC LOGGED ?
NO
112
PERFORM FULL ACCESS PROCEDURES
YES
108
TIMESTAMP LESS THAN PREDETERMINED TIME LIMIT ?
NO
YES
110
FORWARD MESSAGE TO VISITED GATEWAY
END
100

1. A method for bypassing a home gateway access procedure, comprising the steps of:

a) receiving a first message which requests a call, the first message including an access code;

b) informing a visited gateway to set up the call if there is a record of the access code and if a time stamp of the access code is less than a predetermined time limit; and

c) performing a full access procedure if there is no record of the access code or if the time stamp of the access code is greater than the predetermined time limit.

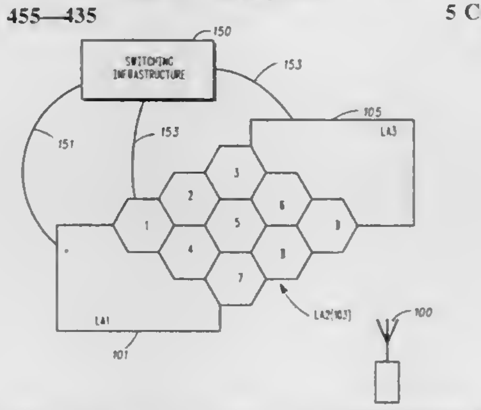
5,842,127
METHOD FOR A MOBILE TO REGISTER WITH ONE OR MORE CELL SITES AND METHOD FOR PAGING THE MOBILE

Ariel Pashtan, and Israel A. Cimet, both of Buffalo Grove, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 23, 1996, Ser. No. 685,301

Int. Cl.^{6} H04Q *7/00*

U.S. Cl. 455—435 **5 Claims**



1. A method for paging a mobile in a multiple-cell LA in a wireless communication system, the multiple-cell LA including a multiplicity of cells, the wireless communication system including switching infrastructure, and wherein the mobile includes a cell-registration feature that may be selectively enabled by the switching infrastructure, the cell-registration feature allowing the mobile to form a registration in each cell that it visits, the cell-registration feature thus allowing the mobile to be simultaneously registered in one or more cells of the multiple-cell LA which one or more cells the mobile has recently visited, the method comprising the following steps, by the switching infrastructure:

receiving a call attempt towards the mobile;

determining when the cell-registration feature is currently enabled for the mobile; and,

when it is determined that the cell-registration feature is currently enabled for the mobile, paging the mobile in only those one or more cells of the multiple-cell LA in which a registration currently exists for the mobile.

5,842,128
MOBILE COMMUNICATION SYSTEM WHEREIN A BASE STATION TRANSFERS TO ANOTHER AN IDENTIFIER FOR A CELL OF CALL ORIGINATION ONLY UPON CALL TERMINATION

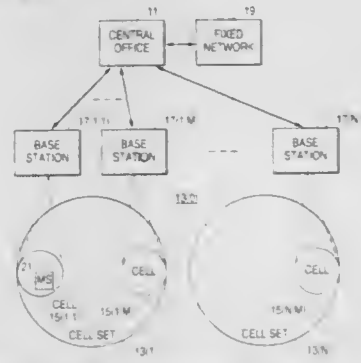
Eiji Kito, and Nobuyuki Takasawa, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 898,710, Jun. 15, 1992. This application May 9, 1995, Ser. No. 438,189

Claims priority, application Japan, Jun. 26, 1991, 3-183207; Aug. 30, 1991, 3-219500

Int. Cl.^{6} H04Q *7/22*

U.S. Cl. 455—435 **25 Claims**



1. A mobile communication system comprising:

a central office;

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a plurality of base stations connected to said central office and collectively having an overall service area divided into cell sets which are identified by respective area identifiers and each of which is subdivided into at least one cell, said cells of said cell sets being in one-to-one correspondence to said base stations; and

a mobile unit movable in said overall service area and capable of carrying out communication with one of said base stations while present in a corresponding cell of said one of said base stations, each of said central office, said base stations, and said mobile unit comprising a transmitter/receiver and a memory connected to said transmitter/receiver and wherein

the transmitter/receiver of each base station includes,

receiving means for receiving a switch request signal from said mobile unit when said mobile unit moves from a first cell controlled by a first base station to a second cell controlled by a second base station during said communication, said switch request signal including a first identifier which identifies said mobile unit and said first base station;

transferring means for transferring only said first identifier of said area identifiers from the memory of said first base station to the memory of said second base station when said mobile unit moves from said first cell to said second cell during said communication, said first cell being in the cell set identified by said first identifier and being in correspondence to said first base station, said second cell being in the cell set identified by a second identifier of said area identifiers and being in correspondence to said second base station, wherein said transferring means transfers said first identifier directly from said first base station to said second base station without using said mobile station, and

identifier transmitting means for transmitting only said second identifier to said central office as an office switch signal and to said mobile unit as a downlink signal, as part of a call termination identifier, if said second identifier is different from said first identifier upon termination of said communication, the transmitting of said second identifier only being done during said termination of said communication and not during other portions of said communication;

the transmitter/receiver of each of said central office and said mobile unit comprising updating means for updating, to said second identifier, the memory connected to the transmitter/receiver when supplied with said second identifier upon receipt of said office switch signal and said downlink signal, respectively.

5,842,129

PORTABLE RADIO TELEPHONE EQUIPMENT USED FOR CMTS/MCS IN COMMON

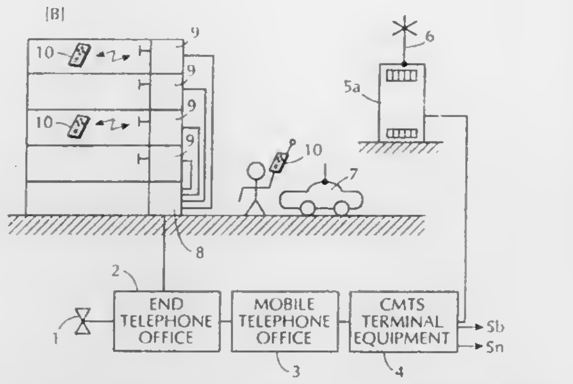
Jun Yamada; Masaki Terashima, and Kenichi Ooyama, all of Yokohama, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 956,337, Oct. 5, 1992, abandoned, and a continuation-in-part of Ser. No. 209,594, Mar. 10, 1994, which is a continuation of Ser. No. 796,808, Nov. 25, 1991. This application Feb. 16, 1995, Ser. No. 389,687

Claims priority, application Japan, Oct. 11, 1991, 3-263482

Int. Cl.^{6} H04Q *7/20*

U.S. Cl. 455—444 7 Claims



1. A method for automatically selecting the operating mode of a radio telephone capable of operating on a cellular mobile telephone system (CMTS) and on a microcellular system (MCS) which utilizes the same channels as said CMTS, comprising the steps of:

said radio telephone retrieving information stored in a memory is said radio telephone identifying at least one CMTS or MCS control channel previously accessed by said radio telephone;

said radio telephone assessing the received power to determine availability of said at least one CMTS or MCS control channel; and

said radio telephone setting itself to operate on either the CMTS or MCS in accordance with said availability,

wherein, if the received power of said at least one CMTS or MCS control channel is not adequate, said radio telephone automatically selects either a CMTS operating mode or MCS operating mode in accordance with the steps of:

scanning the CMTS channels to determine the availability of at least one CMTS or MCS control channel at the location of said radio telephone;

storing information obtained as a result of said scanning in said memory; and

selecting either a CMTS operating mode or a MCS operating mode in accordance with said information stored in said memory.

5,842,130

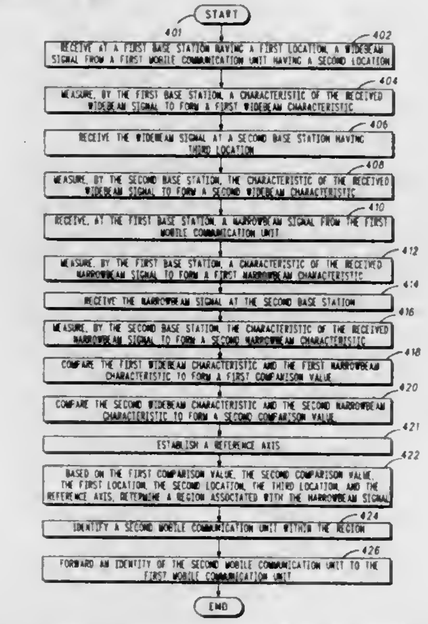
METHOD FOR IDENTIFYING A MOBILE UNIT IN A WIRELESS COMMUNICATION SYSTEM

Valentin Oprescu-Surcobe, Northbrook; Scott Thomas Droste, Crystal Lake, both of Ill., and Brian Chen, Singapore, Singapore, assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 29, 1997, Ser. No. 865,319

Int. Cl.^{6} H04Q *7/20*

U.S. Cl. 455—456 20 Claims


START
401
402
RECEIVE AT A FIRST BASE STATION HAVING A FIRST LOCATION, A WIDEBEAM SIGNAL FROM A FIRST MOBILE COMMUNICATION UNIT HAVING A SECOND LOCATION
404
MEASURE, BY THE FIRST BASE STATION, A CHARACTERISTIC OF THE RECEIVED WIDEBEAM SIGNAL TO FORM A FIRST WIDEBEAM CHARACTERISTIC
406
RECEIVE THE WIDEBEAM SIGNAL AT A SECOND BASE STATION HAVING THIRD LOCATION
408
MEASURE, BY THE SECOND BASE STATION, THE CHARACTERISTIC OF THE RECEIVED WIDEBEAM SIGNAL TO FORM A SECOND WIDEBEAM CHARACTERISTIC
410
RECEIVE, AT THE FIRST BASE STATION, A NARROWBEAM SIGNAL FROM THE FIRST MOBILE COMMUNICATION UNIT
412
MEASURE, BY THE FIRST BASE STATION, A CHARACTERISTIC OF THE RECEIVED NARROWBEAM SIGNAL TO FORM A FIRST NARROWBEAM CHARACTERISTIC
414
RECEIVE THE NARROWBEAM SIGNAL AT THE SECOND BASE STATION
416
MEASURE, BY THE SECOND BASE STATION, THE CHARACTERISTIC OF THE RECEIVED NARROWBEAM SIGNAL TO FORM A SECOND NARROWBEAM CHARACTERISTIC
418
COMPARE THE FIRST WIDEBEAM CHARACTERISTIC AND THE FIRST NARROWBEAM CHARACTERISTIC TO FORM A FIRST COMPARISON VALUE
420
COMPARE THE SECOND WIDEBEAM CHARACTERISTIC AND THE SECOND NARROWBEAM CHARACTERISTIC TO FORM A SECOND COMPARISON VALUE
421
ESTABLISH A REFERENCE AXIS
422
BASED ON THE FIRST COMPARISON VALUE, THE SECOND COMPARISON VALUE, THE FIRST LOCATION, THE SECOND LOCATION, THE THIRD LOCATION, AND THE REFERENCE AXIS, DETERMINE A REGION ASSOCIATED WITH THE NARROWBEAM SIGNAL
424
IDENTIFY A SECOND MOBILE COMMUNICATION UNIT WITHIN THE REGION
426
FORWARD AN IDENTITY OF THE SECOND MOBILE COMMUNICATION UNIT TO THE FIRST MOBILE COMMUNICATION UNIT
END

18. In a wireless communication system, a method for identifying a mobile communication unit, the method comprising the steps of:

establishing a line-of-sight between a first mobile communication unit and a second communication unit;

determining a location of the first mobile communication unit;

transmitting from the first mobile communication unit to a first base station having a first location, a widebeam signal;

transmitting from the first mobile communication unit to a second base station having a second location, the widebeam signal;

transmitting from the first mobile communication unit to the first base station, a narrowbeam signal;

transmitting from the first mobile communication unit to the second base station, the narrowbeam signal;

receiving at the first mobile communication unit from the first base station, a first comparison value, said first comparison value represents the comparison characteristics of the widebeam signal and the narrowbeam signal received at the first base station;

receiving at the first mobile communication unit from the second base station, a second comparison value, said second comparison value represents the comparison of measured characteristics of the widebeam signal and the narrowbeam signal received at the second base station;

based on the first comparison value, and the second comparison value, calculating a region associated with the narrowbeam signal; and

receiving at the first mobile communication unit, an identity of the second mobile communication unit within the region.

5,842,131

SYSTEM FOR CONFORMING POSITION OF MOVING TERMINAL

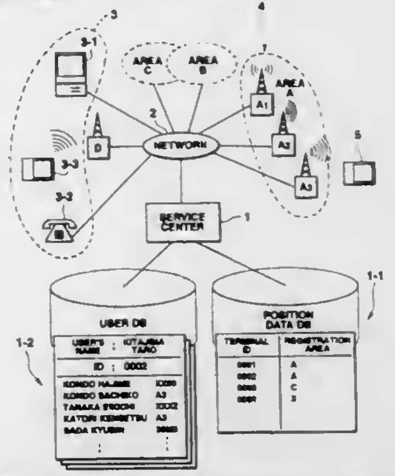
Kazuyasu Yamane, Hamura, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 459,972, Jun. 2, 1995. This application Jun. 17, 1997, Ser. No. 877,495

Claims priority, application Japan, Jun. 29, 1994, 6-147435

Int. Cl.^{6} H04M *11/00;* **G01S** *3/02*

U.S. Cl. 455—456 21 Claims



1. A system for confirming a position of a moving terminal comprising:

a radio communication network including a plurality of base stations, each of said base stations corresponding to one of a plurality of individual radio areas;

a moving terminal having a specific identification code, said moving terminal including a receiver for receiving a paging signal including said specific identification code, and a transmitter for wirelessly outputting a response signal in response to said paging signal;

a first data base for previously storing position data representing positions within said plurality of individual radio areas to which a person holding said moving terminal may visit, and base station data representing respective ones of said base stations corresponding to said positions to which the person holding said moving terminal may visit, said position data and said base station data being stored in an associated manner with respect to said identification number of said moving terminal; and

a service center means for paging one of said moving terminals by use of said radio communication network and for identifying base station data corresponding to a given one of said base stations which receives said response signal output by said moving terminal; and

position retrieving means for retrieving from said first data base corresponding position data associated with said identified base station data, and for outputting said retrieved position data as a candidate for location of the person holding said moving terminal.

5,842,132

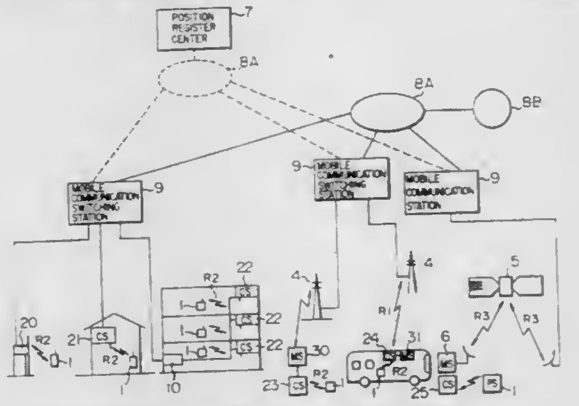
MOBILE TELECOMMUNICATION METHOD AND SYSTEM

Reljiro Fukutomi, Tokyo, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 321,835, Oct. 6, 1994, Pat. No. 5,659,882. This application Mar. 6, 1997, Ser. No. 812,699

Int. Cl.^{6} H04B *1/00*

U.S. Cl. 455—456 1 Claim



1. A personal communication system comprising:

a plurality of personal stations;

a fixed personal base station, fixed on the ground, said fixed personal base station relays a call issued from a personal station to a mobile communication switching device;

a mobile personal base station, installed on a moving object, said mobile personal base station relays the call issued from the personal station to a mobile station;

a mobile station which relays the call relayed by said mobile personal base station to a base station via a radio interface;

a base station connected to the mobile communication switching device;

a position register center which supervises positions of respective personal stations;

a mobile communication switching device which switches calls among said respective personal stations in accordance with a supervising content of said position register center;

a transmitter installed in the moving object, said transmitter transmits an identification signal with employment of very weak electromagnetic waves capable of covering the inside of the moving object; and

a register which registers a position of said personal station via only said mobile personal base station into said position register center when said PS receives said very weak electromagnetic waves.

5,842,133

Patent Not Issued For This Number

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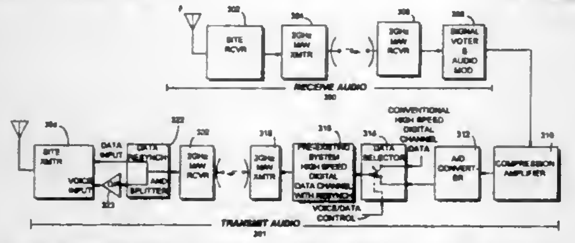
5,842,134
AUTO-ALIGNMENT OF CLEAR VOICE AND LOW SPEED DIGITAL DATA SIGNALS IN A SIMULCAST SYSTEM

Thomas A. Brown, and Robert Canada, both of Lynchburg, Va., assignors to Ericsson Inc., Research Triangle Park, N.C.

Filed Sep. 28, 1995, Ser. No. 535,932

Int. Cl.^{6} H04B *7/005;7/01*

U.S. Cl. 455—503 **4 Claims**



1. In a simulcasting radio frequency (RF) communications system of the type having a central site distributing one or more channels of high speed digital data and unencrypted analog audio information to plural RF transmitter sites, wherein signals received at each said transmitter site exhibit time ambiguities with respect to signals received at another said transmitter site, and wherein said transmitter sites include a high speed digital data resynchronization circuit means for synchronizing the high speed digital data between said transmitter sites prior to simulcast transmitting, an improved method for distribution of unencrypted analog voice signals (clear voice) and/or low speed digital data for simulcast transmissions, comprising the steps of:

- (a) converting unencrypted analog voice signals to digital voice signals at said central site;
- (b) inserting said digital voice signals and/or low speed digital data onto one or more preexisting simulcast system high speed digital data communications channel for distribution to a plurality of simulcast transmitter sites;
- (c) receiving said digital voice signals and/or low speed digital data at said plurality of simulcast transmitter sites via said high speed digital data channel; and
- (d) aligning received high speed digital data communications channel information using said high speed digital data resynchronization circuit means, said digital voice signals and/or low speed digital data received via said high speed digital data channel being automatically aligned for simulcasting by said resynchronization means.

5,842,135
SHORT WAVE TRANSMISSION METHOD AND APPARATUS THEREFOR

Iwao Ishijima, 4-20-1, Nakahara, Mitaka-shi, Tokyo, Japan, assignor to Iwao Ishijima, and Masao Tsujita, both of Tokyo, Japan

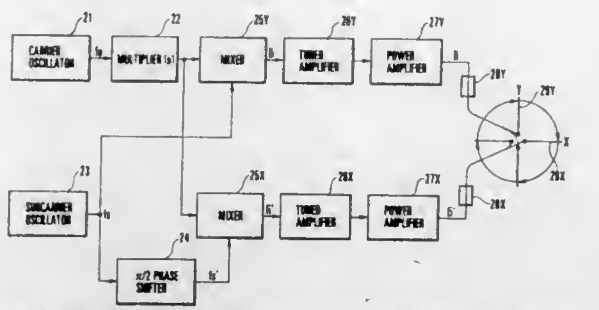
Filed May 15, 1996, Ser. No. 647,798

Claims priority, application Japan, Jun. 9, 1995, 7-168375

Int. Cl.^{6} H04B *7/005;7/01;7/015;15/00*

U.S. Cl. 455—504 **2 Claims**

1. A short wave transmission apparatus having a transmission apparatus comprising:



carrier generation means for generating a carrier in a short wave band;
amplification means for amplifying the carrier;
means for dividing the amplified carrier;
a coaxial cable; and
two orthogonal dipole antennas,
wherein said dipole antennas are connected to a coaxial cable having a length for delaying a phase to be supplied to one antenna element by $\pi/2$ with respect to that to the other antenna element.

5,842,136
ADDING AND REMOVING SUBSCRIBERS IN AN ONGOING CALL

Martti Tuulos, Tampere, Finland, assignor to Nokia Telecommunications Oy, Espoo, Finland

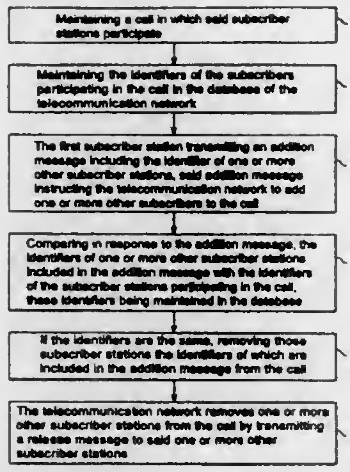
PCT No. PCT/FI95/00071, § 371 Date Dec. 27, 1995, § 102(e) Date Dec. 27, 1995, PCT Pub. No. WO95/23475, PCT Pub. Date Aug. 31, 1995

PCT Filed Feb. 15, 1995, Ser. No. 532,660

Claims priority, application Finland, Feb. 16, 1994, 940720

Int. Cl.^{6} H04Q *7/22*

U.S. Cl. 455—519 **9 Claims**


Maintaining a call in which said subscriber stations participate
601
Maintaining the identifiers of the subscribers participating in the call in the database of the telecommunication network
602
The first subscriber station transmitting an addition message including the identifier of one or more other subscriber stations, said addition message instructing the telecommunication network to add one or more other subscribers to the call
603
Comparing in response to the addition message, the identifiers of one or more other subscriber stations included in the addition message with the identifiers of the subscriber stations participating in the call, these identifiers being maintained in the database
604
If the identifiers are the same, removing those subscriber stations the identifiers of which are included in the addition message from the call
605
The telecommunication network removes one or more other subscriber stations from the call by transmitting a release message to said one or more other subscriber stations
606

1. A method for controlling a call in a telecommunication system, which comprises a telecommunication network, which includes a database and a first subscriber station provided with identifiers and one or more other subscriber stations provided with identifiers, said method comprising the steps of

maintaining a call in which said subscriber stations participate,
maintaining the identifiers of the subscribers participating in the call in the database of the telecommunication network,
the first subscriber station transmitting an addition message including the identifier of one or more other subscriber stations, said addition message instructing the telecommunication network to add one or more other subscribers to the call,
comparing in response to the addition message, the identifiers one or more other subscriber stations included in the addition message with the identifiers of the subscriber stations participating in the call, these identifiers being maintained in the database, and
if the identifiers are the same, removing those subscriber stations the identifiers of which are included in the addition message from the call.

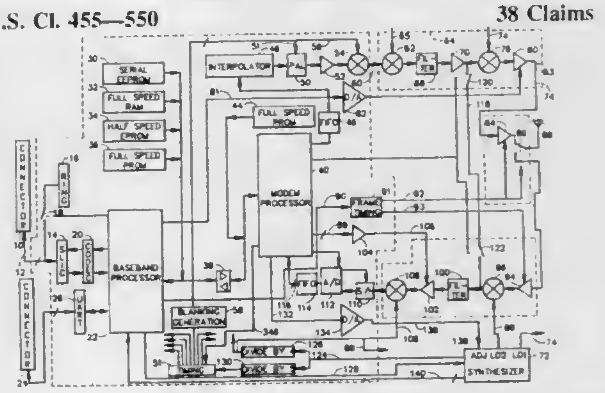
5,842,137
SUBSCRIBER UNIT FOR WIRELESS DIGITAL TELEPHONE SYSTEM

David N. Critchlow; Graham M. Avis; Sandra J. K. Earlam, all of San Diego; Karle J. Johnson, Carlsbad; Bruce A. Smetana, Escondido; Gregory L. Westling, Poway, all of Calif.; Eric Paneth, Givataiim, Israel, and Moshe Yehushua, San Diego, Calif., assignors to InterDigital Technology Corporation, Wilmington, Del.

Continuation of Ser. No. 437, Jan. 4, 1993, abandoned, which is a division of Ser. No. 256,577, Oct. 12, 1988, Pat. No. 5,177,741, which is a division of Ser. No. 893,916, Aug. 7, 1986, Pat. No. 4,825,448. This application Jun. 22, 1994, Ser. No. 264,200

Int. Cl.^{6} H04B *1/38*

U.S. Cl. 455—550 **38 Claims**



1. A subscriber unit for use in a digital multiplexed RF terrestrial communication system, the subscriber unit utilizing continuously repetitive frames in which it transmits during one portion of each frame and receives during another portion of each frame, comprising:

a first processor having an input for receiving the complex in-phase (I) and quadrature (Q) sample pairs of at least one training signal;
said first processor containing a filter for receiving a training signal in intervals between actuation of the subscriber unit during operation and filtering said training signal in accordance with a set of weighting coefficients to produce an equalized training signal;
means for comparing said equalized training signal with a desired output signal to generate said weighting coefficients; and
said first processor using said filter and generated weighting coefficients to equalize a signal received over said digital multiplexed RF communication system.

5,842,138
CONFIGURATION-INDEPENDENT METHODS AND APPARATUS FOR SOFTWARE COMMUNICATION IN A CELLULAR NETWORK

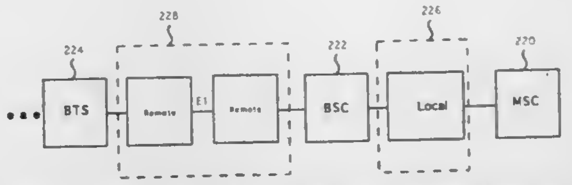
Priscilla Marilyn Lu, San Carlos, and Timothy Richard White, Palo Alto, both of Calif., assignors to interWAVE Communications International Ltd., Bermuda

Continuation-in-part of Ser. No. 435,709, May 4, 1995, Pat. No. 5,734,699. This application Oct. 11, 1996, Ser. No. 730,652

Int. Cl.^{6} H04Q *7/22*

U.S. Cl. 455—560 **23 Claims**

1. A configuration-independent software architecture for implementing a cellular communication network, said cellular communication network facilitating communication among a plurality of cellular handsets, comprising:



a first software functional block for implementing a first set of functions;
a second software functional block for implementing a second set of functions; and
a configuration-independent linkage block having an interface that appears consistent to both said first software functional block and said second software functional block irrespective of a relative position between said second software functional block, said first software functional block, and said configuration-independent linkage block in said cellular communication network, said configuration-independent linkage block facilitating communication between said first software functional block and said second software functional block via said interface utilizing configuration-independent linkage block, wherein said first software functional block, said second software functional block, and said interface remain substantially unchanged when said first software functional block changes its location in the cellular communication network relative to said second software functional block.

5,842,139
TELEPHONE COMMUNICATION TERMINAL AND COMMUNICATION METHOD

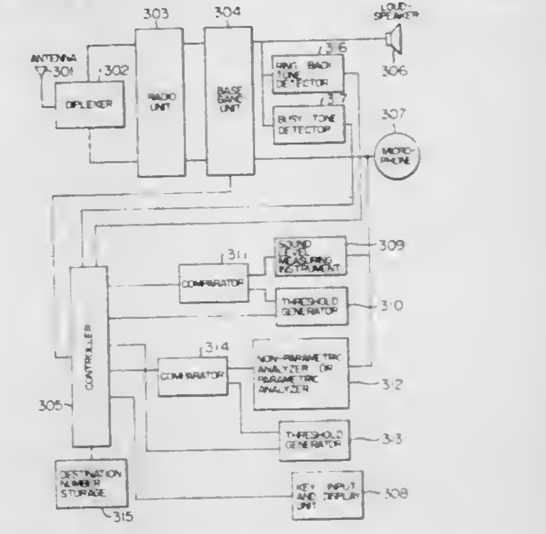
Ryujiro Muramatsu, Yokohama, and Toshiro Suzuki, Tama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 5, 1995, Ser. No. 498,126

Claims priority, application Japan, Jul. 8, 1994, 6-157248

Int. Cl.^{6} H04Q *7/20;7/32*

U.S. Cl. 455—563 **14 Claims**



1. A telephone communication terminal comprising:

means for measuring, at fixed time intervals, a sound level of a signal inputted to a telephone transmitter;
means for setting a preset threshold value for comparison with the sound level measured by said measuring means;
first comparator means for comparing a value measured by said measuring means with the preset threshold value;

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analyzer means for analyzing an input signal, and extracting spectral information from said input signal at said fixed time intervals;

means for setting a preset lower limit threshold value and a preset upper limit threshold value for comparison with the spectral information;

second comparator means for comparing a value extracted by said analyzer means with the preset lower limit threshold value and the preset upper limit threshold value; and

controller means for originating a call to a telephone number registered beforehand when an output of said first comparator means and an output of said second comparator means simultaneously indicate that said measured sound level is greater than said preset threshold value in said first comparator means and said extracted value is in a range between said preset lower limit threshold value and said preset upper limit threshold value in said second comparator means.

5,842,140

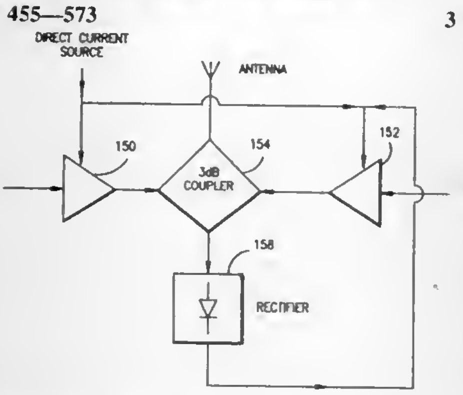
WASTE ENERGY CONTROL AND MANAGEMENT IN POWER AMPLIFIERS

Paul W. Dent, Stehag, Sweden, and Ross Warren Lampe, Raleigh, N.C., assignors to Ericsson Inc., Research Triangle Park, N.C.

Continuation of Ser. No. 472,660, Jun. 7, 1995, abandoned, which is a division of Ser. No. 179,947, Jan. 11, 1994, Pat. No. 5,574,967. This application Oct. 9, 1996, Ser. No. 728,432

Int. Cl.^{6} H04B *1/38;* **H04M** *1/00*

U.S. Cl. 455—573 **3 Claims**



1. An efficient transmitter for transmitting a plurality of signals, comprising:

a direct current power source;

at least one pair of power amplifiers for receiving power from said direct current power source, wherein a first amplifier in said pair is adapted to amplify a first signal and a second amplifier in said pair is adapted to amplify a second signal, wherein an amplification factor of said first amplifier is at least twice as great as a factor needed to amplify said first signal to a level appropriate for transmission, and wherein an amplification factor of said second amplifier is at least twice as great as a factor needed to amplify said second signal to a level appropriate for transmission;

a power combining means for combining outputs of said pair of power amplifiers to produce a desired sum signal for transmission and a waste energy signal; and

a rectifier circuit for converting the waste energy signal into a direct current which is fed back to said direct current power source in order to reduce net power consumption of said transmitter.

5,842,141

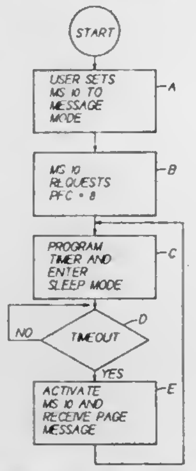
MOBILE TERMINAL HAVING USER-ACTUATED PAGER MODE

Juha Vaihoja, Tupos; Raimo Kivari, Haukipudas; Mikko Lietsalmi, Oulu; Jaakko Vanttila, Oulu; Jorma Seppanen, Oulu; Timo Kolehmainen, Oulu, and Arto Pussinen, Oulu, all of Finland, assignors to Nokia Mobile Phones Limited, Salo, Finland

Filed Jan. 1, 1996, Ser. No. 582,608

Int. Cl.^{6} H04Q *7/20*

U.S. Cl. 455—574 **23 Claims**


START
USER SETS MS 10 TO MESSAGE MODE
A
MS 10 REQUESTS PFC = 8
B
PROGRAM TIMER AND ENTER SLEEP MODE
C
TIMEOUT
D
NO
YES
ACTIVATE MS 10 AND RECEIVE PAGE MESSAGE
E

1. A method for operating a wireless terminal of a type that is bidirectionally coupled to a network by a single transceiver through a wireless interface for conducting voice and message-based communications, comprising the steps of:

in response to input from a user, disabling the wireless terminal from receiving a voice call through the single transceiver; and

after disabling wireless terminal from receiving said voice call, periodically and automatically enabling the wireless terminal, a predetermine interval of time, to receive and store at least one user message, the user message being received through the single transceiver from a network.

5,842,142

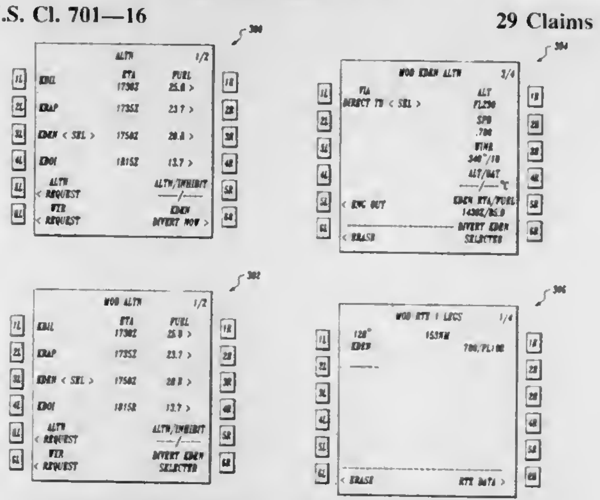
LEAST TIME ALTERNATE DESTINATION PLANNER

Daniel J. Murray, Mill Creek; John C. Griffin, III, Tacoma; Patricia S. Ness, Seattle; Clement V. Paulson, Renton; George W. Schraw, Federal Way; Bruce L. Turner, Lynnwood; Thomas E. Twiggs, Bellevue, and Henry V. VonJouanne, Renton, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed May 15, 1995, Ser. No. 440,731

Int. Cl.^{6} G06F *165/00*

U.S. Cl. 701—16 **29 Claims**



1. In a flight management computer containing a database of destinations within a region surrounding an aircraft, a method of selecting an alternate destination and implementing a diversion of the aircraft from an active flight plan to an intended destination to a diversion flight plan to the alternate destination, the diversion occurring at a diversion point the method comprising:

(a) searching said database of destinations stored in said flight management computer to identify a plurality of alternate destinations at which the aircraft may land in the region surrounding the aircraft;

(b) determining a flight time along a diversion flight plan to each of the plurality of alternate destinations;

(c) ranking the plurality of alternate destinations in the order of the flight time to each of the plurality of alternate destinations;

(d) displaying the plurality of alternate destinations to a pilot of the aircraft;

(e) enabling the pilot to initiate diversion to a selected one of the plurality of displayed alternate destinations by manipulating a single keyboard input that is linked with the flight management computer; and

(f) implementing a diversion to the selected alternate destination by replacing the active flight plan with the diversion flight plan to the selected one of the plurality of alternate destinations.

5,842,143

CIRCUIT CONFIGURATION FOR EVALUATING YAW RATE SENSOR SIGNALS

Frank Lohrenz; Frank Menten, both of Regensburg, and Gregor Probst, Landshut, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

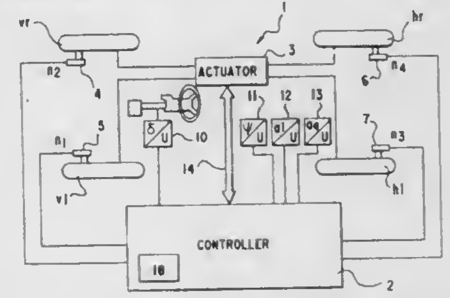
PCT No. PCT/EP95/00852, § 371 Date Mar. 24, 1995, § 102(e) Date Mar. 25, 1994, PCT Pub. No. WO95/26285, PCT Pub. Date Oct. 5, 1995

PCT Filed Mar. 8, 1995, Ser. No. 710,986

Claims priority, application Germany, Mar. 25, 1994, 94104856.3

Int. Cl.^{6} B60T *8/00*

U.S. Cl. 701—34 **6 Claims**



1. A circuit configuration for evaluating signals from a yaw rate sensor, comprising:

a controller connected to and receiving a yaw rate signal from a yaw rate sensor;

said controller being connected to and receiving signals from a plurality of further sensors sensing motion state dependent variables, and said controller calculating a reference yaw rate as a sum of a plurality of yaw rate values calculated from the signals from said plurality of further sensors, each weighted by a respective weighting factor;

said controller being programmed to calculate a difference between the reference yaw rate and the yaw rate signal received from the yaw rate sensor and to compare the difference with a predetermined threshold value; and

said controller outputting a state signal indicating a state of the yaw rate sensor depending on a result of the comparison.

5,842,144

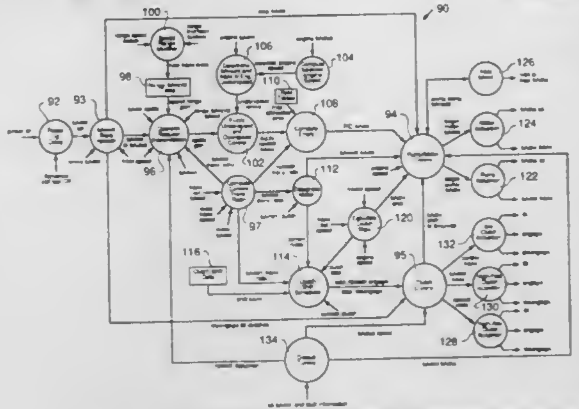
DEFAULT MODE CONTROL SYSTEM FOR A SPLIT TORQUE TRANSMISSION

Alan R. Coutant, Chillicothe; Michael G. Cronin; Kenneth P. Liesener, both of Peoria; Jerry D. Marr, Metamora, and Sanjay Rajagopalan, Peoria, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Continuation of Ser. No. 477,751, Jun. 7, 1995, abandoned. This application Sep. 29, 1997, Ser. No. 939,266

Int. Cl.^{6} B60K *41/00*

U.S. Cl. 701—62 **6 Claims**



1. A method for controlling a split torque transmission during a default mode, the split torque transmission having a hydrostatic transmission, a mechanical transmission, and a transmission control, comprising the steps of:

sensing the hydrostatic transmission, the mechanical transmission and a plurality of electrical components in the transmission control;

detecting a fault within the sensed transmission control;

detecting an event within the mechanical transmission and the hydrostatic transmission; and

controlling the split torque transmission relative to the detected fault in the transmission control or the detected event in the split torque transmission.

5,842,145

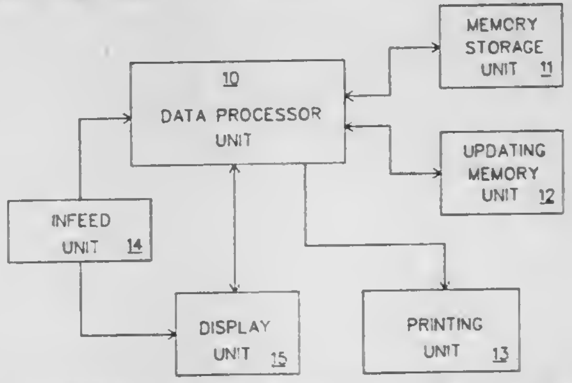
APPARATUS FOR PROVIDING INDIVIDUALIZED MAPS TO PEDESTRIANS

John S. Zimmer, 413 S. Ellison La., Waynesboro, Va. 22980

Filed Jul. 8, 1996, Ser. No. 678,580

Int. Cl.^{6} G01C *21/00*

U.S. Cl. 701—201 **8 Claims**



1. Apparatus for providing an individualized map to an airport pedestrian comprising:

a) a memory storage unit provided with a generalized detailed map of said airport indicating locations of walkways and destinations,

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b) a display unit for providing operating instructions, destination choices, and map information,

c) a user-operable infeed unit which receives selection information relative to a destination contained by said generalized map,

d) a data processor unit which determines the appropriate walking path to be taken to arrive at said selected destination,

e) an updating memory unit which supplies said data processor with transient current information concerning destinations, departure gate, flight time and flight number, and further supplies means for ascertaining departure gate based upon limited input by the user, and

f) a printing unit which prints and dispenses to the user an individualized map indicating the appropriate path determined by said data processor unit.

5,842,146

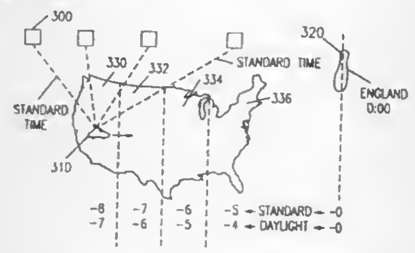
METHOD AND APPARATUS OF SETTING CLOCK TIME AND USING TIME DATA IN A VEHICLE NAVIGATION SYSTEM

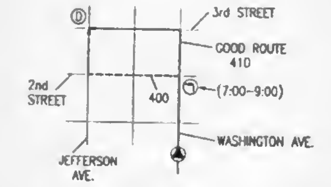
Kan Shishido, Tochigi, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 10, 1996, Ser. No. 644,869

Int. Cl.^{6} G01C *21/00*

U.S. Cl. 701—210 **15 Claims**





1. A method of navigation for a vehicle equipped with a navigation system comprising the steps of:

storing in memory road data having routes that are undesirable for travel at particular times;

storing in memory geographical data corresponding to regional time zones;

storing in memory time zone adjustment factors corresponding to the regional time zones;

determining current location of the vehicle;

displaying a plurality of nearby regional time zones in which the vehicle may be located;

determining in which of the regional time zones the vehicle is currently located;

selecting an appropriate time zone adjustment factor corresponding to the regional time zone in which the vehicle is currently located; and

adjusting the time setting of a system clock with the appropriate time zone adjustment factor.

5,842,147

NAVIGATION DISPLAY DEVICE WHICH INDICATES GOAL AND ROUTE DIRECTION INFORMATION

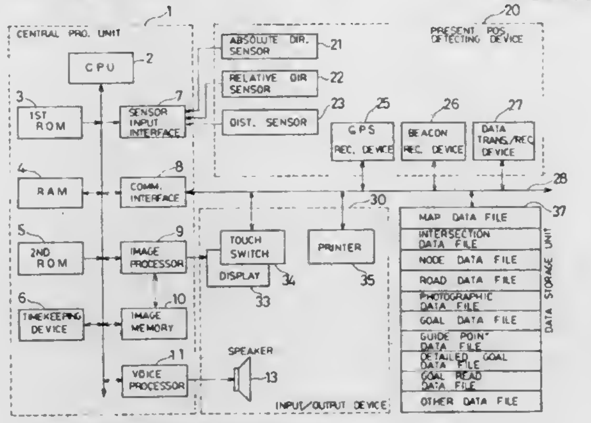
Mitsuhiro Nimura, Okazaki; Kunihiro Yamada, Anjo, and Kazuteru Maekawa, Aichi-ken, all of Japan, assignors to Aisin AW Co., Ltd., Aichi-ken, Japan

Filed Mar. 6, 1996, Ser. No. 611,884

Claims priority, application Japan, Mar. 6, 1995, 7-045323; Mar. 7, 1995, 7-047364; Jun. 30, 1995, 7-188015

Int. Cl.^{6} G01C *21/00*

U.S. Cl. 701—211 **40 Claims**



1. A navigation device comprising:

present position detection means for detecting the present position of a moving object;

goal-setting means for setting a goal;

route-setting means for setting a route to the goal that is set by said goal-setting means;

route indication means for indicating, on a map picture, the route to the goal set by said route-setting means and the present position;

goal direction calculation means for obtaining a direction from the present position to the goal;

position discrimination means for discriminating whether the present position exists on the route or not; and

goal direction informing means for informing the direction of the goal obtained by said goal direction calculation means when it is discriminated by said position discrimination means that the present position does not exist on the route.

5,842,148

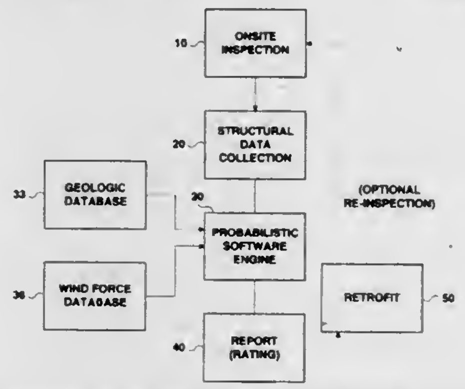
METHOD OF EVALUATING AND CLASSIFYING LIVING STRUCTURES FOR ESTIMATING POTENTIAL DAMAGE THERETO FROM PHYSICAL DISTURBANCES

James C. Prendergast, Saratoga; Leslie N. Ransbottom, Redwood City, and Walter E. Dibble, Palo Alto, all of Calif., assignors to JCP Geologists, Inc., Cupertino, Calif.

Filed Oct. 7, 1996, Ser. No. 726,693

Int. Cl.^{6} G01L *1/26*

U.S. Cl. 702—34 **54 Claims**



16. A method for estimating risk of damage likely to be sustained by a structure located at a particular site from a physical disturbance, said method including the steps of:

inspecting said structure at said site to determine its structural characteristics; and

collecting structure data pertaining to the structural characteristics of said structure; and

inputting the structure data in a format usable by a computer; and

generating an estimate of risk of damage to said structure, wherein the estimate is generated by a computer program based on a combination of the structure data and physical disturbance related information for said site;

wherein the risk estimate includes information pertaining to the likelihood of said physical disturbance occurring, potential damage likely to be caused by said disturbance, and probable financial harm resulting from such damage;

wherein the risk estimate further includes an acceptable or unacceptable rating for such structure, and such rating can be used for actuarial purposes for such structure.

5,842,149

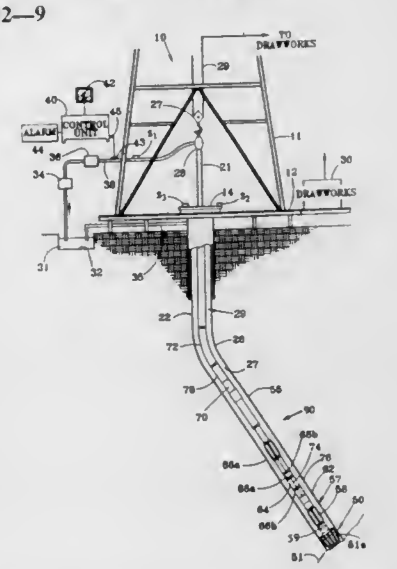
CLOSED LOOP DRILLING SYSTEM

John W. Harrell, Spring; Vladimir Dubinsky, and James V. Leggett, III, both of Houston, all of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Oct. 22, 1996, Ser. No. 734,935

Int. Cl.^{6} G06F *19/00*

U.S. Cl. 702—9 **33 Claims**



1. An automated drilling system for drilling oilfield wellbores at enhanced rates of penetration and with extended life of drilling assembly, comprising:

(a) a tubing adapted to extend from the surface into the wellbore;

(b) a drilling assembly comprising a drill bit at an end thereof and a plurality of sensors for detecting selected drilling parameters and generating data representative of said drilling parameters;

(c) a computer comprising at least one processor for receiving signals representative of said data;

(d) a force application device for applying a predetermined force on the drill bit within a range of forces;

(e) a force controller for controlling the operation of the force application device to apply the predetermined force;

(f) a source of drilling fluid under pressure at the surface for supplying a drilling fluid

(g) a fluid controller for controlling the operation of the fluid source to supply a desired predetermined pressure and flow rate of the drilling fluid;

(h) a rotator for rotating the bit at a predetermined speed of rotation within a range of rotation speeds;

(i) receivers associated with the computer for receiving agnate signals representative of the data;

(j) transmitters associated with the computer for sending control signals directing the force controller, fluid controller and rotator controller to operate the force application device, source of drilling fluid under pressure and rotator to achieve enhanced rates of penetration and extended drilling assembly life.

5,842,150

METHOD OF DETERMING THE ORGANIC CONTENT IN PULP AND PAPER MILL EFFULENTS

Lars Renberg, Västerhaninge, and Anders Sparén, Göteborg, both of Sweden, assignors to Eka Chemicals AB, Bohus, Sweden

PCT No. PCT/EP95/04030, § 371 Date Apr. 11, 1997, § 102(e) Date Apr. 11, 1997, PCT Pub. No. WO96/12183, PCT Pub. Date Apr. 25, 1996

PCT Filed Oct. 10, 1995, Ser. No. 817,359

Claims priority, application Sweden, Oct. 14, 1994, 9403520

Int. Cl.^{6} G01N *33/34*; D21C *9/10*

U.S. Cl. 702—23 **16 Claims**

1. A method for qualitative and quantitative determination of the parameters reflecting the quality of pulp or paper said method comprising:

(I) developing a calibration model by

(I.a) registering absorption, transmittance or reflectance spectral raw data of reference samples of a effluent from production of a reference pulp or paper with known properties and concentrations of organic substances to develop learning sets;

(I.b) processing the spectral raw data of reference samples to reduce noise and adjust for drift and diffuse light scatter;

(I.c) performing a data analysis by applying chemometric techniques to the processed learning sets, thus calibrating the processed spectral data with actual values for parameters reflecting the quality of the reference pulp or paper, which values are determined by means of conventional analytical methods;

(II) registering absorption, transmittance or reflectance spectra of samples of an effluent from production of the pulp or paper with unknown properties and concentration of organic substances in analog with (I.a); processing the thereby obtained spectral raw data as according to (I.b); and applying the developed calibration model to the processed data in order to determine the parameters reflecting the quality of said pulp or paper.

5,842,151

PREDICTION METHOD AND APPARATUS FOR A SECONDARY STRUCTURE OF PROTEIN

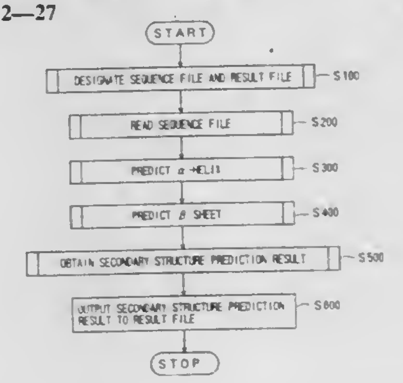
Tamotsu Noguchi, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 12, 1996, Ser. No. 679,099

Claims priority, application Japan, Dec. 8, 1995, 7-320911

Int. Cl.^{6} G06F *19/00*

U.S. Cl. 702—27 **16 Claims**


START
DESIGNATE SEQUENCE FILE AND RESULT FILE
S100
READ SEQUENCE FILE
S200
PREDICT α HELIX
S300
PREDICT β SHEET
S400
OBTAIN SECONDARY STRUCTURE PREDICTION RESULT
S500
OUTPUT SECONDARY STRUCTURE PREDICTION RESULT TO RESULT FILE
S600
STOP

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1. A method for predicting secondary structures which are characteristic structures of a protein including an α-helix and a β-sheet, comprising the steps of:

a) predicting a formation of the α-helix with respect to each amino acid residue in a sequence;

b) predicting a formation of the β-sheet with respect to all pairs of amino acid residues which are not predicted to form the α-helix by step a); and

c) combining results obtained by step a) and step b) to obtain a result of prediction of the secondary structures of the protein,

wherein the step a) comprises the steps of:

a-1) learning which types of amino acid residues have a tendency to form the α-helix;

a-2) determining the formation of the α-helix with respect to each amino acid residue in said sequence based on results obtained by step a-1); and

a-3) providing a mark to each amino acid residue which was determined to form the α-helix by step a-2), and subjecting all of the amino acid residues determined not to form the α-helix by step a-2) to the prediction of the β-sheet, and

wherein a determination of step a-2) is made based on consecutiveness of the amino acid residues having a predetermined level of formability of the α-helix.

5,842,152

Patent Not Issued For This Number

5,842,153

COORDINATES INPUT APPARATUS AND VIBRATION DETECTING APPARATUS

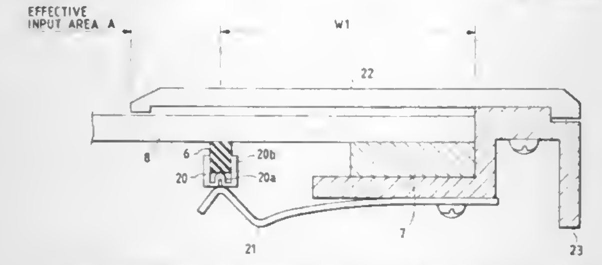
Katsuyuki Kobayashi, Yokohama; Atsushi Tanaka, Yamato; Yuichiro Yoshimura, Kamakura; Ryozo Yanagisawa, Inzai; Masaki Tokioka, Fujisawa, and Hajime Sato, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 27, 1996, Ser. No. 773,886

Claims priority, application Japan, Jan. 8, 1996, 8-000516

Int. Cl.^{6} G01B *17/00;* **C08C** *21/00*

U.S. Cl. 702—95 **38 Claims**



1. A coordinate input apparatus which has a vibration propagating plate and calculates a coordinate point on the vibration propagating plate pointed to by a vibration input pen using an elastic wave vibration applied by the vibration input pen to the vibration propagating plate, comprising:

vibration detection means, adhered to the vibration propagating plate, for detecting the vibration applied by the vibration input pen, said vibration detection means having an electrode;

electrode leading means for making an electrical connection with said electrode of said vibration detection means;

positioning means for providing a relative position of said electrode leading means to said vibration detection means based on an external shape of said vibration detection means; and

conductive pressing means for elastically pressing said electrode leading means against said electrode of said vibration detection means,

wherein an electrical signal is output from said vibration detection means through said electrode, said electrode leading means and said conductive pressing means.

5,842,154

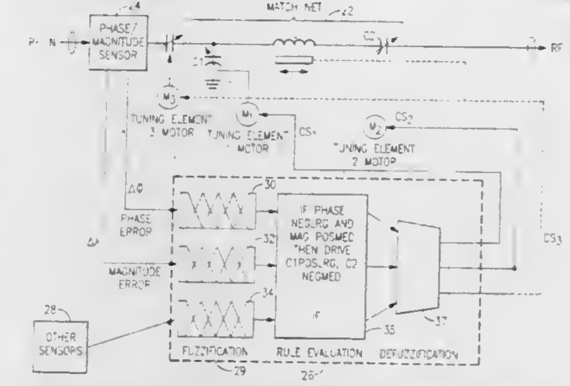
FUZZY LOGIC TUNING OF RF MATCHING NETWORK

Sean Harnett, Penfield, N.Y., assignor to ENI Technologies, Inc., Rochester, N.Y.

Filed Sep. 15, 1997, Ser. No. 929,870

Int. Cl.^{6} H01P *5/08*

U.S. Cl. 702—106 **8 Claims**



1. Fuzzy logic method of tuning an RF matching network of the type having an input at which is applied RF power at a given frequency and at a given impedance, and an output which applies said power to an RF load having a non-constant impedance, said matching network including a phase-magnitude error detector means providing a phase error signal and a magnitude error signal related respectively to impedance phase angle error and impedance magnitude error, and said matching network comprising at least a first variable impedance having a driven element for varying the impedance thereof and a second variable impedance having a driven element for varying the impedance thereof; the method comprising:

supplying said phase and said magnitude error signals to a fuzzy logic controller, wherein each said error signal has a magnitude and direction,

applying each said error signal to a fuzzy logic inference function based on a number of overlapping fuzzy sets, and where the value of error signal enjoys membership in one or more fuzzy sets;

applying fuzzy logic rules to said phase and magnitude error signals according to the fuzzy sets for which said first and second error signals enjoy membership;

obtaining drive signal values based on said fuzzy logic rules for each of said phase and magnitude error signals;

weighting said drive signal values according to the respective fuzzy inference functions for which said error signals enjoy membership; and

combining said weighted drive signal values to produce an output drive signal for said first variable impedance device driven element.

5,842,155

METHOD AND APPARATUS FOR ADJUSTING PIN DRIVER CHARGING AND DISCHARGING CURRENT

Stephen W. Bryson; Alan T. Kondo, both of Cupertino, and Don N. Lee, San Jose, all of Calif., assignors to Fairchild Semiconductor Corp., So. Portland, Me.

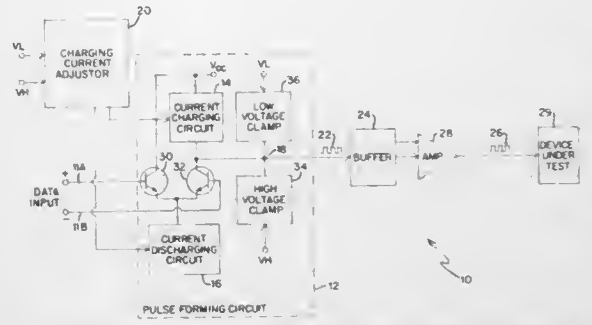
Filed May 3, 1993, Ser. No. 56,094

Int. Cl.^{6} G01R *31/02*

U.S. Cl. 702—124 **20 Claims**

1. A circuit comprising:

pulse forming means responsive to a data input signal for providing a pulsed output to an output node, said pulsed output being timed in accordance with said data input signal and having high and low voltage levels responsive to respective high and low reference voltages, said pulse forming means comprising means for providing charging currents to and discharging currents from said node; and



means responsive to said high and low reference voltages for adjusting said charging and discharging currents of said pulse forming means in accordance with the difference between said high and low reference voltages.

5,842,156

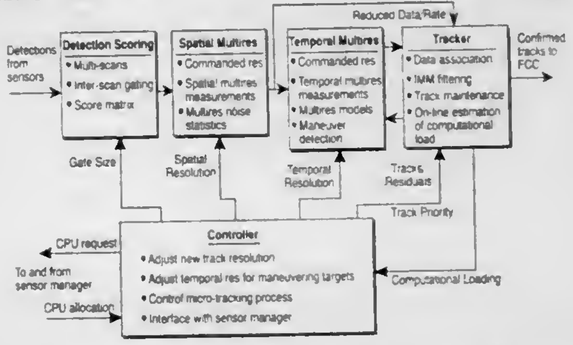
MULTIRATE MULTIRESOLUTION TARGET TRACKING

Lang Hong, Beavercreek, and Michael W. Logan, Huber Heights, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 12, 1996, Ser. No. 746,508

Int. Cl.^{6} G01S *13/00*

U.S. Cl. 702—179 **17 Claims**



1. A data reducing method for detecting and following targets comprising the steps of:

collecting raw data of fine resolution representative of target position, velocity and acceleration characteristics determined from a sequential plurality of target region scans by a group of target data sensors;

evaluating said raw data;

excluding from said raw data data representing targets displaced more than a selected distance from a previous prediction of next target position;

scoring each of n number of sequences of fine resolution raw target data according to predefined kinematics patterns, said scoring reflecting a temporal reduction of raw data points into a single value representing weights of said raw data comprising each of said sequences;

combining a selected number of scores from each of n number of sequences, said combining reflecting a spatial reduction of scored fine resolution values into a single coarse resolution value;

tracking said coarse resolution values; and

providing tracking information output signals reflecting said coarse resolution values.

5,842,157

PROCESS FOR MONITORING A MACHINE OR INSTALLATION

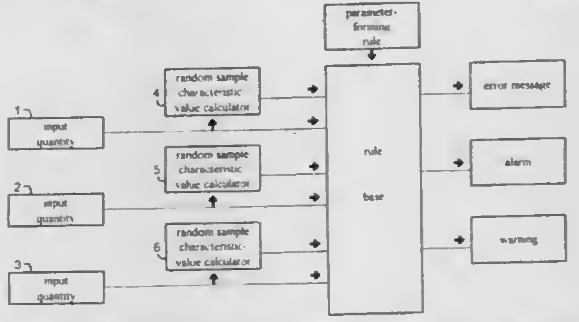
Josef Wehhofer, Darmstadt; Joachim Voegele, Riedstadt, and Harald Wolf, Darmstadt, all of Germany, assignors to Carl Schenck AG, Germany

Filed Sep. 26, 1996, Ser. No. 717,227

Claims priority, application Germany, Oct. 10, 1995, 195 37 694.3

Int. Cl.^{6} G06F *17/10*

U.S. Cl. 702—189 **3 Claims**


parameter-forming rule
random sample characteristic value calculator
4
1
input quantity
random sample characteristic value calculator
5
2
input quantity
random sample characteristic value calculator
6
3
input quantity
rule base
error message
alarm
warning

1. A process for monitoring a machine or system comprising a first step where the overall monitoring of the machine or the system is made by the linkage of monitoring subfunctions determined in compliance with the machine or system components, a second step where sensor signals to machine or system components are acquired as input variables and transmitted to a signal processing, a third step where the output variables of signal processing are processed to characteristics by means of an adaptive, control-based process, a fourth step where a control basis is generated for each machine or system component to be monitored, a fifth step where the obtained characteristics are evaluated in the monitoring subfunctions as per quantity by means of a membership function, a sixth step where the control basis is processed by means of the quantified characteristics and the output variables are obtained by defuzzification, a seventh step where the output variables of the monitoring subfunctions obtained in such a way are transmitted to the overall monitoring and an eighth step where these variables are combined in the overall monitoring by means of conventional or fuzzy logics to a monitoring information.

5,842,158

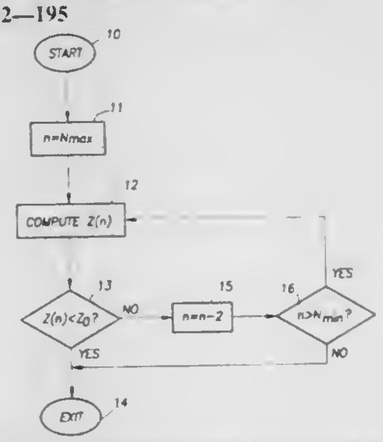
METHOD FOR ADAPTIVE FILTERING OF WELL LOGGING DATA

Ronald E. Plasek, Houston, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Mar. 5, 1997, Ser. No. 811,992

Int. Cl.^{6} G06F *17/00*

U.S. Cl. 702—195 **17 Claims**



1. A method for adaptively filtering a detected signal comprising the steps of:

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a) establishing an initial maximum number N_{max} of filter levels and a minimum number of filter levels N_{min}, wherein a filter length N is equal to N_{max};

b) adjusting a filter length N based on a goodness of fit statistic Z, wherein said filter length is adjusted by:

computing said goodness of fit statistic Z;

comparing said goodness of fit statistic Z to a predetermined Z_0;

reducing the number of N when Z is not less than Z_0;

comparing said new N to N_{min}; and

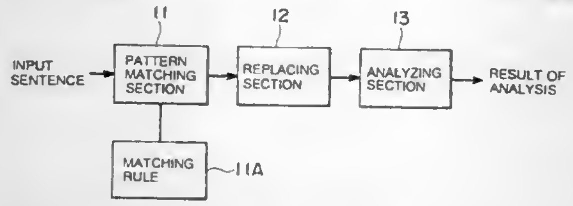
repeating said adjusting steps when N is greater than N_{min}; and

c) filtering said detected signal with said adjusted filter.

5,842,159
METHOD OF AND APPARATUS FOR ANALYZING SENTENCE

Naohito Nakamura; Ikuko Nagasawa; Satoko Segawa; Kunio Matsui; Kenji Sugiyama; Manabu Sassano, and Makoto Shiotsu, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 28, 1995, Ser. No. 412,136
Claims priority, application Japan, Apr. 6, 1994, 6-068737
Int. Cl.⁶ G06F *17/28*
U.S. Cl. 704—4 **31 Claims**



1. A sentence analyzing method comprising:

a rule preparing step for preparing a pattern matching rule for an idiom having a plurality of portions which can be separately placed;

a pattern matching step for effecting pattern matching for a sentence based on the pattern matching rule to recognize the idiom having the separately placed portions;

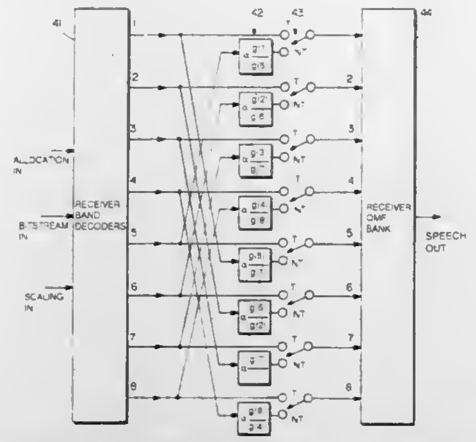
a replacing step for replacing the plurality of portions constructing the idiom recognized by the pattern matching by a series of symbolized pattern expressions; and

an analyzing step for analyzing the sentence processed in said replacing step.

5,842,160
METHOD FOR IMPROVING THE VOICE QUALITY IN LOW-RATE DYNAMIC BIT ALLOCATION SUB-BAND CODING

Richard L Zinser, Schenectady, N.Y., assignor to Ericsson Inc., Research Triangle Park, N.C.

Continuation of Ser. No. 820,733, Jan. 15, 1992, abandoned. This application Jul. 18, 1997, Ser. No. 897,022
Int. Cl.⁶ G10L *00/00*
U.S. Cl. 704—229 **9 Claims**



1. A method for improving a multi-band signal in a receiver having a sub-frequency band combining filter bank, said method comprising the steps of:

a. decoding energy levels for each transmitted band of a received signal,

b. inputting a received sub-band signal sample into the filter bank for each transmitted band;

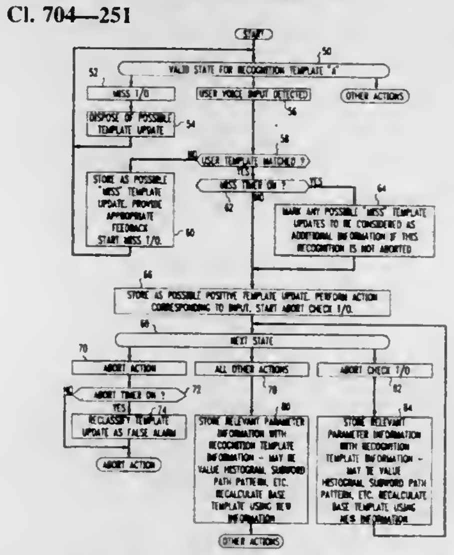
c. generating a filler sub-band signal sample for each non-transmitted band of the received signal using at least one but not all received sub-band signal samples from the transmitted bands, where the at least one of the received sub-band signals has a frequency different than does the non-transmitted band, and inputting the filler sub-band signal into the filter bank, and

d. combining the received sub- band signal samples and the filler sub-band signal sample in the filter bank to form a multi-band signal.

5,842,161
TELECOMMUNICATIONS INSTRUMENT EMPLOYING VARIABLE CRITERIA SPEECH RECOGNITION

Paul Wesley Cohrs; Mitra P. Deldar; Donald Marion Keen, and Ellen Anne Keen, all of Indianapolis, Ind., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jun. 25, 1996, Ser. No. 668,660
Int. Cl.⁶ G10L *7/08*
U.S. Cl. 704—251 **6 Claims**


START
50
VALID STATE FOR RECOGNITION TEMPLATE "X"
52
MISS T/O
USER VOICE INPUT DETECTED
OTHER ACTIONS
56
DISPOSE OF POSSIBLE TEMPLATE UPDATE
54
58
USER TEMPLATE MATCHED ?
NO
YES
MISS TIMER ON ?
YES
NO
62
64
STORE AS POSSIBLE "MISS" TEMPLATE UPDATE, PROVIDE APPROPRIATE FEEDBACK START MISS T/O.
60
MARK ANY POSSIBLE "MISS" TEMPLATE UPDATES TO BE CONSIDERED AS ADDITIONAL INFORMATION IF THIS RECOGNITION IS NOT ABORTED
66
STORE AS POSSIBLE POSITIVE TEMPLATE UPDATE. PERFORM ACTION CORRESPONDING TO INPUT. START ABORT CHECK T/O.
68
NEXT STATE
70
ABORT ACTION
ALL OTHER ACTIONS
ABORT CHECK T/O
ABORT TIMER ON ?
72
78
82
YES
74
80
84
RECLASSIFY TEMPLATE UPDATE AS FALSE ALARM
ABORT ACTION
STORE RELEVANT PARAMETER INFORMATION WITH RECOGNITION TEMPLATE INFORMATION - MAY BE VALUE HISTOGRAM, SUBWORD PATH PATTERN, ETC. RECALCULATE BASE TEMPLATE USING NEW INFORMATION
STORE RELEVANT PARAMETER INFORMATION WITH RECOGNITION TEMPLATE INFORMATION - MAY BE VALUE HISTOGRAM, SUBWORD PATH PATTERN, ETC. RECALCULATE BASE TEMPLATE USING NEW INFORMATION
OTHER ACTIONS

1. A speech recognizer apparatus for recognizing a phrase including at least one word, based upon an utterance by a user, the apparatus comprising:

means for comparing the utterance to at least one speech model to determine at least one similarity metric, wherein said at least one similarity metric corresponds to said at least one speech model;

means for selecting a particular model of speech from said at least one speech model, that most closely matches the utterance based on said at least one similarity metric;

means, responsive to the means for selecting, for determining whether the similarity metric corresponding to said most closely matching model of speech satisfies at least one recognition criterion;

means for recognizing the utterance as a phrase corresponding to said most closely matching model of speech when said at least one recognition criterion is satisfied;

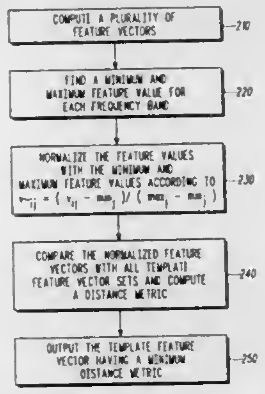
means for storing voice data representative of the utterance, when said at least one recognition criterion is satisfied; and

means for automatically adjusting said at least one recognition criterion in accordance with said stored voice data, to thereby increase a probability of recognition for the utterance upon subsequent repetition thereof.

5,842,162
METHOD AND RECOGNIZER FOR RECOGNIZING A SAMPLED SOUND SIGNAL IN NOISE

Adam B. Fineberg, Saratoga, Calif., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 613,269, Mar. 8, 1996, abandoned. This application Sep. 23, 1997, Ser. No. 935,647
Int. Cl.⁶ G10L *5/06;9/00*
U.S. Cl. 704—233 **22 Claims**


COMPUTE A PLURALITY OF FEATURE VECTORS
210
FIND A MINIMUM AND MAXIMUM FEATURE VALUE FOR EACH FREQUENCY BAND
220
NORMALIZE THE FEATURE VALUES WITH THE MINIMUM AND MAXIMUM FEATURE VALUES ACCORDING TO
230
COMPARE THE NORMALIZED FEATURE VECTORS WITH ALL TEMPLATE FEATURE VECTOR SETS AND COMPUTE A DISTANCE METRIC
240
OUTPUT THE TEMPLATE FEATURE VECTOR HAVING A MINIMUM DISTANCE METRIC
250

1. A method comprising the steps of:

computing feature values for a number of analysis frames of an acoustic signal, the feature values computed over a plurality of frequency bands;

for each of the plurality of frequency bands, determining in a logarithmic domain which of the feature values within a respective one of the plurality of frequency bands is a minimum feature value over time and which of the feature values within the respective one of the plurality of frequency bands is a maximum feature value over time;

comparing within each frequency band each of the feature values with the minimum feature value and the maximum feature value of the respective frequency band to obtain normalized feature values, normalized over time within each of the frequency bands, wherein all of the normalized feature values for a given one of the number of analysis frames define one of a plurality of normalized feature vectors;

comparing the plurality of normalized feature vectors with sets of template feature vectors to determine template feature vectors that most resemble the plurality of normalized feature vectors; and

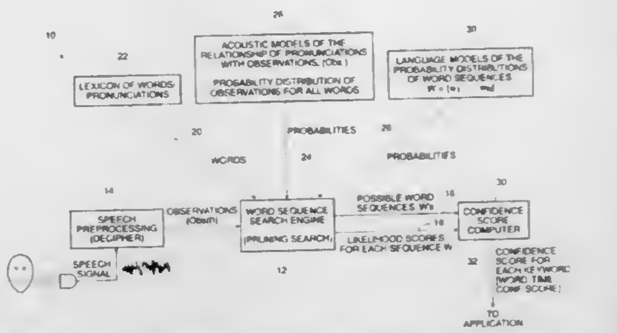
outputting the template feature vectors that most resemble the plurality of normalized feature vectors.

5,842,163
METHOD AND APPARATUS FOR COMPUTING LIKELIHOOD AND HYPOTHESIZING KEYWORD APPEARANCE IN SPEECH

Mitchel Weintraub, Fremont, Calif., assignor to SRI International, Menlo Park, Calif.

Filed Jun. 7, 1996, Ser. No. 660,144
Int. Cl.⁶ G10L *5/06*
U.S. Cl. 704—240 **14 Claims**

1. In a computerized speech recognition system, an improvement in a method for determining confidence of an occurrence of a keyword in a spoken utterance forming word sequences, the


10
22
LEXICON OF WORDS PRONUNCIATIONS
26
ACOUSTIC MODELS OF THE RELATIONSHIP OF PRONUNCIATIONS WITH OBSERVATIONS
PROBABILITY DISTRIBUTION OF OBSERVATIONS FOR ALL WORDS
30
LANGUAGE MODELS OF THE PROBABILITY DISTRIBUTIONS OF WORD SEQUENCES
20
PROBABILITIES
28
WORDS
24
PROBABILITIES
14
SPEECH PREPROCESSING (DECIPHER)
OBSERVATIONS
WORD SEQUENCE SEARCH ENGINE
(PRUNING SEARCH)
POSSIBLE WORD SEQUENCES
16
18
LIKELIHOOD SCORES FOR EACH SEQUENCE
30
CONFIDENCE SCORE COMPUTER
SPEECH SIGNAL
12
32
CONFIDENCE SCORE FOR EACH KEYWORD (WORD TIME CONF SCORE)
TO APPLICATION

method including the steps of obtaining a time series of observation feature vectors representing the spoken utterance, said time series being formed from a representation of acoustic speech input, and determining possible word sequences and corresponding likelihood scores for each of said possible word sequences for said observations the improvement comprising:

computing for an application a confidence score for said keyword from probabilities that said keyword is in a sequence of words given said observation feature vectors, wherein said confidence score is computed as a summation over the word sequences containing the keyword of the product of the likelihood of the word sequence and the likelihood of the observations given the word sequence;

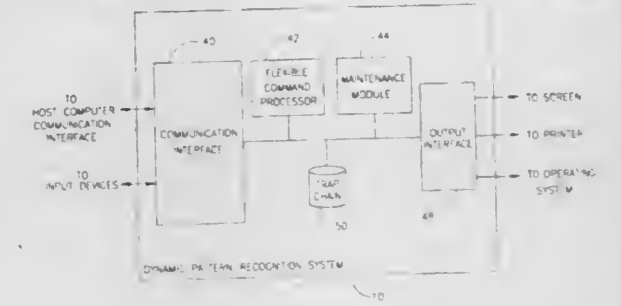
comparing said confidence score to a threshold; and

declaring detection of said keyword in said spoken utterance if said confidence score exceeds said threshold.

5,842,164
DYNAMIC PATTERN RECOGNITION SYSTEM

Amos Fine, Hadera, Israel, assignor to BATL Software Systems Ltd., Hadera, Israel

Filed Oct. 21, 1996, Ser. No. 731,870
Int. Cl.⁶ G06K *9/00*; G06F *15/38*
U.S. Cl. 704—244 **19 Claims**



1. A dynamic pattern matching system (DPRS) for use in a communication system coupled to a communication link, comprising:

a communication interface coupled to said communication link, said communication interface coupling said DPRS to said communication link;

processing means coupled to said communication interface, said processing means for processing input data received over said communication link; and

a trap chain consisting of a plurality of traps, said plurality of traps corresponding to a set of commands which define the functionality of said DPRS, each trap corresponding to a unique command.

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5,842,165

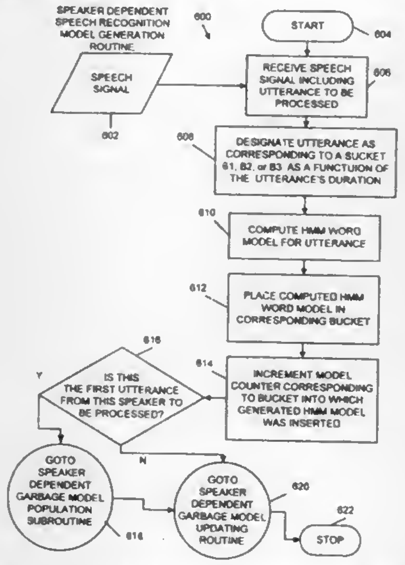
METHODS AND APPARATUS FOR GENERATING AND USING GARBAGE MODELS FOR SPEAKER DEPENDENT SPEECH RECOGNITION PURPOSES

Vijay R. Raman, Greenwich, Conn., and George J. Vysotsky, Riverdale, N.Y., assignors to Nynex Science & Technology, Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 609,029, Feb. 29, 1996, Pat. No. 5,719,921. This application Apr. 30, 1997, Ser. No. 846,617

Int. Cl.^{6} G10L *9/06*

U.S. Cl. 704—255 **20 Claims**


SPEAKER DEPENDENT SPEECH RECOGNITION MODEL GENERATION ROUTINE
600
START
604
SPEECH SIGNAL
602
RECEIVE SPEECH SIGNAL INCLUDING UTTERANCE TO BE PROCESSED
606
608
DESIGNATE UTTERANCE AS CORRESPONDING TO A SUCKET 61, 62, or 63 AS A FUNCTUION OF THE UTTERANCE'S DURATION
610
COMPUTE HMM WORD MODEL FOR UTTERANCE
612
PLACE COMPUTED HMM WORD MODEL IN CORRESPONDING BUCKET
616
614
IS THIS THE FIRST UTTERANCE FROM THIS SPEAKER TO BE PROCESSED?
INCREMENT MODEL COUNTER CORRESPONDING TO BUCKET INTO WHICH GENERATED HMM MODEL WAS INSERTED
Y
N
GOTO SPEAKER DEPENDENT GARBAGE MODEL POPULATION SUBROUTINE
618
GOTO SPEAKER DEPENDENT GARBAGE MODEL UPDATING ROUTINE
620
622
STOP

3. A method of generating a speaker dependent garbage model for use in a speaker dependent speech recognition operation, comprising the steps of:

receiving a first signal including a first utterance from a speaker for which a speaker dependent speech recognition model is to be generated;

generating a speaker dependent speech recognition model from the first utterance, the speaker dependent speech recognition model including a plurality of feature vectors; and

processing the feature vectors included in the speaker dependent speech recognition model to generate a plurality of feature vectors representing the speaker dependent garbage model, the processing including the steps of:

generating a mean feature vector; and replicating the mean feature vector

to generate the garbage model;

receiving another signal including another utterance from said speaker for which a speaker dependent speech recognition model is to be generated;

generating another speaker dependent speech recognition model from the another utterance, the speaker dependent speech recognition model including a plurality of feature vectors; and

updating the previously generated speaker dependent garbage model by combining corresponding feature vectors from the garbage model with corresponding feature vectors from the another speaker dependent speech recognition model.

5,842,166

Patent Not Issued For This Number

5,842,167

SPEECH SYNTHESIS APPARATUS WITH OUTPUT EDITING

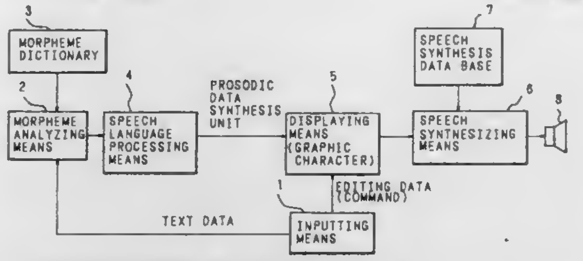
Masanori Miyatake; Hiroki Ohnishi; Takeshi Yumura, all of Osaka; Shoji Takeda, Gifu; Masashi Ochiiwa, Gifu, and Takashi Izumi, Gifu, all of Japan, assignors to Sanyo Electric Co. Ltd., Osaka, Japan

Filed May 21, 1996, Ser. No. 653,075

Claims priority, application Japan, May 29, 1995, 7-130773

Int. Cl.^{6} G10L *5/02*

U.S. Cl. 704—260 **39 Claims**


3
MORPHEME DICTIONARY
2
MORPHEME ANALYZING MEANS
4
SPEECH LANGUAGE PROCESSING MEANS
PROSODIC DATA SYNTHESIS UNIT
5
DISPLAYING MEANS (GRAPHIC CHARACTER)
7
SPEECH SYNTHESIS DATA BASE
6
SPEECH SYNTNESIZING MEANS
8
1
EDITING DATA (COMMAND)
TEXT DATA
INPUTTING MEANS

1. A speech synthesis apparatus, comprising:

means for inputting text data and data indicating editing of the appearance of the character of said text data, wherein said editing is character attribution which is expressible by the visual appearance of said editing;

means for synthesizing speech from said text data having an elocution mode corresponding to the editing of the appearance of the character of said text data;

a display screen for displaying the appearance of the character of said text data; and

means for displaying said inputted text data;

means for editing the appearance of the character of the text data displayed by said displaying means on said display screen according to the appearance data of speech, including emphasis expression or emotional expression;

means for synthesizing speech corresponding to the appearance of the character of the text data edited by the text data editing means having an output mode corresponding to the contents of the editing on the appearance of the character of said text data when synthesizing speech from the text data input by the text data inputting means.

5,842,168

CARTRIDGE-BASED, INTERACTIVE SPEECH RECOGNITION DEVICE WITH RESPONSE-CREATION CAPABILITY

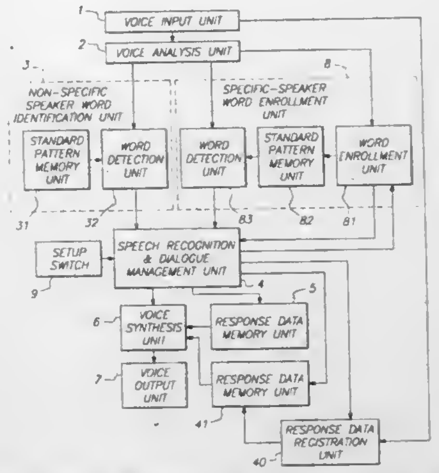
Yasunaga Miyazawa; Mitsuhiro Inazumi; Hiroshi Hasegawa; Isao Edatsune, and Osamu Urano, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 536,563, Sep. 29, 1995. This application Aug. 20, 1996, Ser. No. 700,175

Claims priority, application Japan, Aug. 21, 1995, 7-212249

Int. Cl.^{6} G10L *9/06;5/02*

U.S. Cl. 704—275 **10 Claims**


1
VOICE INPUT UNIT
2
VOICE ANALYSIS UNIT
3
NON-SPECIFIC SPEAKER WORD IDENTIFICATION UNIT
8
SPECIFIC-SPEAKER WORD ENROLLMENT UNIT
STANDARD PATTERN MEMORY UNIT
WORD DETECTION UNIT
WORD DETECTION UNIT
STANDARD PATTERN MEMORY UNIT
WORD ENROLLMENT UNIT
31
32
83
82
81
SETUP SWITCH
9
SPEECH RECOGNITION & DIALOGUE MANAGEMENT UNIT
4
5
6
VOICE SYNTHESIS UNIT
RESPONSE DATA MEMORY UNIT
7
VOICE OUTPUT UNIT
RESPONSE DATA MEMORY UNIT
41
RESPONSE DATA REGISTRATION UNIT
40

7. An interactive speech recognition apparatus, comprising:

a voice input unit to receive voice and translate the received voice into digital form;

a voice analysis unit in communication with said voice input unit to generate characteristic voice data for the received digitized voice;

a phrase identification unit in communication with said voice analysis unit to determine whether the characteristic voice data substantially matches standard characteristic voice information corresponding to pre-registered expressions and generate phrase identification data in response there to;

a speech recognition and dialogue management unit in communication with said phrase detection unit to recognize a meaning from the received voice based on the received phrase identification data and conversation content information stored in a first memory of a removable cartridge releasably communicating therewith, and to formulate an appropriate response corresponding to the recognized meaning;

a response creation function in communication with said speech recognition and dialogue management unit to enable the creation of response data based on information inputted to said speech recognition apparatus; and

a voice synthesizer in communication with said speech recognition and dialogue management unit to generate synthesized audio corresponding to the appropriate response formulated by said speech recognition and dialogue management unit.

5,842,169

READ/WRITE CONTROL METHOD AND CIRCUIT FOR A SOUND RECORDING/REPRODUCING DEVICE

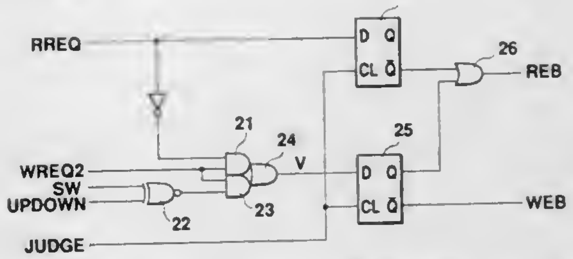
Yoshikazu Sakashita, Ora-gun, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Feb. 27, 1996, Ser. No. 607,858

Claims priority, application Japan, Feb. 28, 1995, 7-40762; Feb. 28, 1995, 7-40763

Int. Cl.^{6} G10L *9/00*

U.S. Cl. 704—278 **9 Claims**



1. A read/write control circuit for a memory storing sound data which is included in a sound recording/reproducing device comprising:

a read/write judging circuit which receives read and write request signals and a direction signal indicating whether a sequence of input sound data inputted into the memory is normal or reverse.

wherein the read/write judging circuit refers to the direction signal when both the read and write request signals simultaneously become active, gives priorty to a write operation in the memory when the sequence is normal by asserting a write enable signal, and gives priority to a read operation in the memory when the sequence is reversed by asserting a read enable signal.

5,842,170

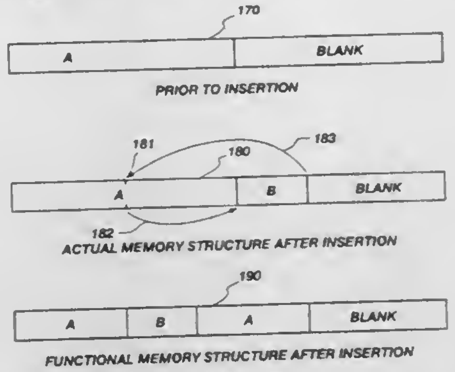
METHOD FOR EDITING IN HAND HELD RECORDER

Norbert P. Daberko, Oceanside; Richard K. Davis, and Richard D. Bridgewater, both of San Diego, all of Calif., assignors to Norris Communications Corp., San Diego, Calif.

Continuation of Ser. No. 339,139, Nov. 14, 1994. This application Dec. 23, 1996, Ser. No. 772,378

Int. Cl.^{6} G10L *9/00*

U.S. Cl. 704—278 **13 Claims**


170
A
BLANK
PRIOR TO INSERTION
181
180
183
A
B
BLANK
182
ACTUAL MEMORY STRUCTURE AFTER INSERTION
190
A
B
A
BLANK
FUNCTIONAL MEMORY STRUCTURE AFTER INSERTION

7. A method for editing messages in a recorder system, comprising:

providing a handheld recorder having flash memory for storing messages in message segments, the flash memory having a plurality of sequential memory blocks, each memory block having a plurality of memory locations, the messages being stored as message segments, wherein related message segments are logically related to each other using memory address pointers, and wherein a first message segment of each of the messages are linked to each other using the memory address pointers to thereby facilitate movement between the messages;

selecting an edit point within a message at which the message is to be edited, the edit point being at a first location within the message defining an end point of a first message segment;

generating an edited message, the edited message comprising a second message segment;

storing said second message segment in a second memory block;

altering said memory address pointers to insert the address of the second message segment;

playing said message segments in the flash memory in accordance with said ordered sequence by accessing the message segments corresponding to the addresses contained in the memory address pointers so that the message segments are played sequentially.

5,842,171

AUDIO SIGNAL PROCESSOR

Jonathan Mark Greenwood, and Michael John Ludgate, both of Basingstoke, United Kingdom, assignors to Sony Corporation, Tokyo, Japan, and Sony United Kingdom Limited, Weybridge, England

Filed Mar. 28, 1997, Ser. No. 827,527

Claims priority, application United Kingdom, Apr. 2, 1996, 9606921

Int. Cl.^{6} H04L *7/00*

U.S. Cl. 704—500 **5 Claims**

1. Apparatus for processing digital audio data comprising:

a source of digital audio data representing audio data samples at an audio data sampling rate, the audio data samples being arranged in groups spaced in time, the data in a group having a data rate much greater than the audio data sampling rate;

a first in first out store;

write control means for writing the samples of each group into the first in first out store at the said data rate as the group is produced by the source;

read control means for reading sets of a predetermined number of successive samples from the first in first out store at a rate

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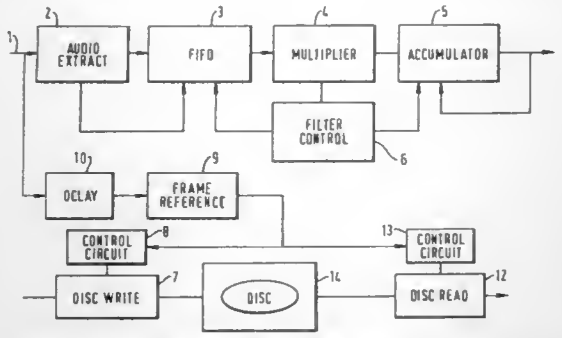


corresponding to the audio data sampling rate and means for weighting the respective samples of each set and for summing the weighted samples of the set to produce filtered audio data at the audio data sampling rate;

each set of samples read out from the first in first out store being displaced by a preset number of samples relative to the previous set to decimate the audio data.

5,842,172

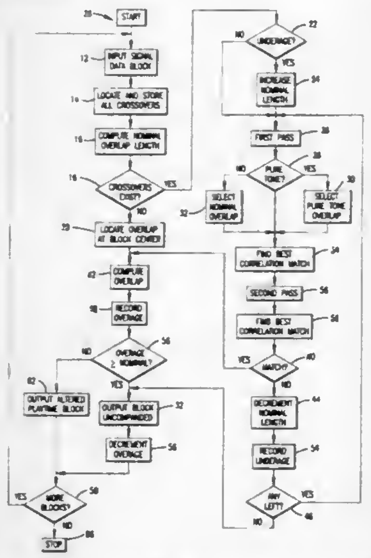
METHOD AND APPARATUS FOR MODIFYING THE PLAY TIME OF DIGITAL AUDIO TRACKS

Monti R. Wilson, Overland Park, Kans., assignor to TensorTech Corporation, Lenexa, Kans.

Filed Apr. 21, 1995, Ser. No. 426,224

Int. Cl.^{6} G10L ***9/12***

U.S. Cl. 704—503 **26 Claims**



12. A method for modifying the play time of an audio signal to a desired play time, said audio signal comprised of a stream of signal representations, said method comprising:

overlapping a block of said signal representations with a copy of at least a portion of said block, the overlapping being a function of said desired play time and including computing a normalized correlation;

determining the location of signal polarity crossovers within said block;

determining a position within said block for the overlapping, where said position is determined by the results of determining the location of signal polarity crossovers within said block;

selecting a length of an overlap to be a length equal to a summed length of full period crossover lengths within said block, wherein full period crossover lengths are defined as a length between successive said signal polarity crossovers having the same signal transition polarity,

determining if the summed length has a maximum said normalized correlation associated therewith; and

setting a nominal length to be the selected length of the overlap when said summed length has a maximum said normalized correlation associated therewith.

5,842,173

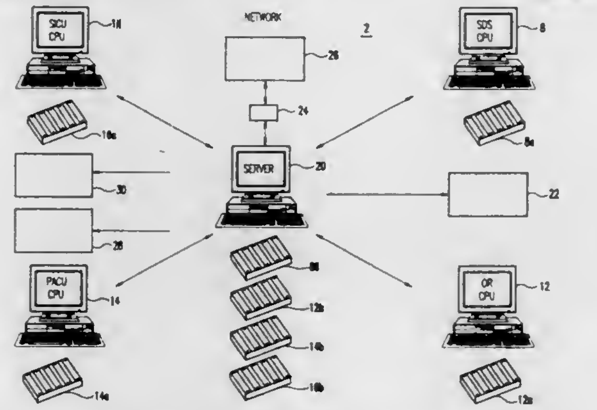
COMPUTER-BASED SURGICAL SERVICES MANAGEMENT SYSTEM

David P. Strum, 1035 S. Trenton Ave., and Luis G. Vargas, 726 E. End Ave., both of Pittsburgh, Pa. 15221

Continuation of Ser. No. 323,137, Oct. 14, 1994, abandoned. This application May 19, 1997, Ser. No. 858,327

Int. Cl.^{6} G06F ***159/00***

U.S. Cl. 705—1 **28 Claims**



1. A computer-based surgical services management system for tracking, recording, and communicating patient movement between site locations of a surgical services facility, the system comprising:

a peer-to-peer network including:

a computer workstation located at each site location; and

a coordinating server in network communication with each workstation;

a set of objects stored on the peer-to-peer network, all data relevant to an instance of an object being stored only in a distributed, non-relational database, the set of objects comprising:

data objects for tracking and recording the patient movements and for producing patient-specific audit trails, the data objects and editing rights to the patient-specific audit trails moving from site to site with the patient; and

site-specific data objects produced at each site location for storing site-specific data, the site-specific data objects being maintained at the site where the site-specific data is produced; and

an object-based application interface distributed on the peer-to-peer network for accessing, manipulating, and displaying the data objects, the data being stored only in the distributed, non-relational databases, by means of object-based methods specified by the distributed application,

wherein a copy of the set of objects is maintained in the coordinating server, data editing of objects being updated via object-based methods periodically over the peer-to-peer network.

5,842,174

TELEPHONE BILLING ANALYZER

David Patrick Yanor, 2808 W. 15th Ave., Vancouver, B.C., Canada, V6K 2Z9

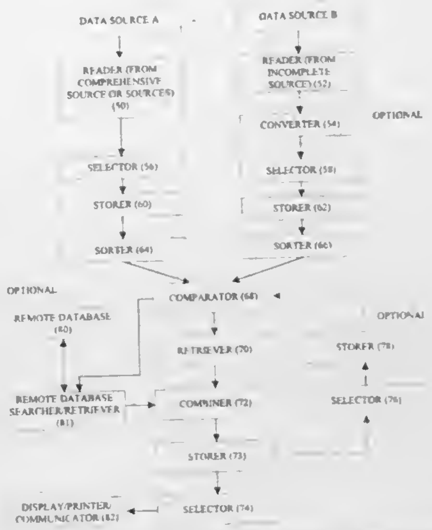
Filed Apr. 10, 1995, Ser. No. 419,182

Int. Cl.^{6} G06F ***17/30***

U.S. Cl. 705—1 **34 Claims**

1. Telephone billing processing apparatus for use with telephone directory data and billing records data comprising:

(a) directory reading means to accept and read input telephone directory data;



(b) billing reading means to accept and read input billing records data;

(c) directory entry selecting means to extract name/number data representing each telephone number and associated name from the input telephone directory data read by the directory reading means;

(d) billing line selecting means to extract billing line data representing each telephone number called and preselected associated data from the input billing records data read by the billing reading means;

(e) directory entry storing means for writing name/number data selected by the directory entry selecting means into mass storage in fields in directory entry records, one record for each directory entry read;

(f) billing line storing means for writing the billing line data selected by the billing line selecting means into mass storage in fields in billing line records, one record for each billing line read;

(g) directory entry sorting means for sorting by telephone number directory entry records stored by the directory entry storing means;

(h) billing line sorting means for sorting by telephone number billing line records stored by the billing line storing means;

(i) comparison means for comparing stored directory entry records with stored billing line records to find records with matching telephone numbers;

(j) retrieving means for retrieving each stored billing line records and each matching stored directory entry record;

(k) combining means for combining selected data from each retrieved stored billing line record with selected data from all retrieved matching stored directory entry records into a report record having fields for each item of selected retrieved data;

(l) storing means for storing each report record;

(m) selecting means for extracting selected data from each stored report record; and

(n) output means for presenting selected data from stored report records.

5,842,175

THERAPY SYSTEM

Todd Andros, Coral Gables, and Alan Redmon, Stuart, both of Fla., assignors to TherAssist Software, Inc., Coral Gables, Fla.

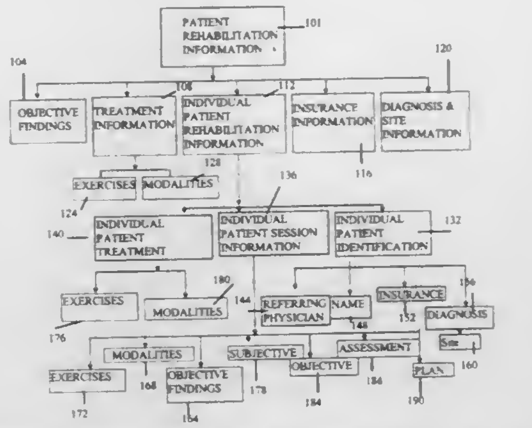
Filed Apr. 28, 1995, Ser. No. 431,121

Int. Cl.^{6} G06F ***159/00***

U.S. Cl. 705—3 **40 Claims**

1. In a computer system, a method for assisting administration and monitoring of the therapy of patients, the method comprising:

storing patient individual rehabilitation data records in a memory in the computer system;



retrieving and updating a patient individual data record in said memory of said computer system for a selected patient upon arrival of said selected patient for a therapy activity;

operating the computer system to generate at least one therapy session input screen corresponding to the selected patient, said therapy session input screen being generated for the therapy provider for use in administering therapy to said patient, said therapy session input screen showing treatments to be administered to said patient during a therapy session, and said patient individual data record including patient activity data from previous therapy sessions;

inputting subjective data into said therapy session input screen in said computer system by the therapy provider selecting choices from lists of subjective data fields; and

recording said selected data fields in said computer system by entering said data fields into said computer memory wherein said at least a portion of said patient data is displayed as a list and;

retrieving predefined phrases for said patient data, storing and combining said patient data with said phrases when said data is selected from the said list for creating a therapy report.

5,842,176

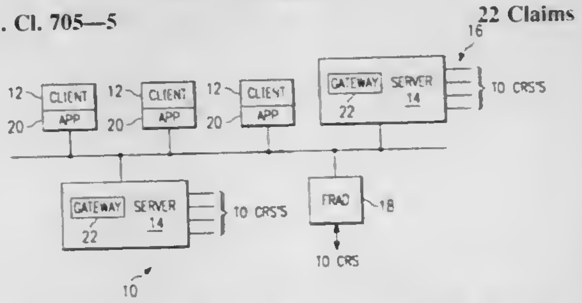
METHOD AND APPARATUS FOR INTERACTING WITH A COMPUTER RESERVATION SYSTEM

Douglas J. Hunt, Seattle, and George A. Smith, Kent, both of Wash., assignors to Electronic Data Systems Corporation, Plano, Tex.

Filed Nov. 13, 1995, Ser. No. 555,464

Int. Cl.^{6} G06F ***17/30***

U.S. Cl. 705—5 **22 Claims**



18. A method for interacting with a computer reservation system, the computer reservation system having plural addresses, the method comprising the steps of:

receiving a command from a command source, the command requiring at least a first request and a second request to a first computer reservation system, the first request for information relating to a first reservation, the second request for information relating to a second reservation;

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establishing a first session with one address and a second session with another address of the first computer reservation system;
generating the first request to the first computer reservation system using the first session;
generating the second request to the first computer reservation system using the second session;
receiving a first data set in response to the first request and a second data set in response to a second request;
returning the first and second data sets to the command source.

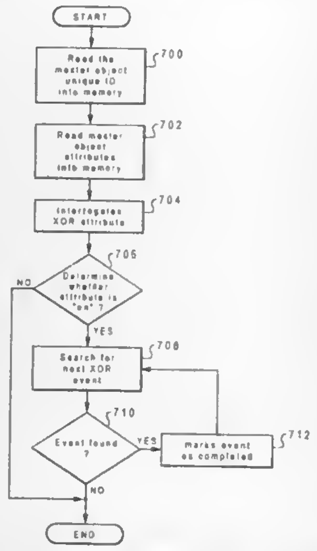
5,842,177
MANAGEMENT OF CALENDAR EVENTS IN A DATA PROCESSING SYSTEM

Thomas R. Haynes, Euless, and Gregory Peter Fitzpatrick, Keller, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1994, Ser. No. 366,158

Int. Cl.⁶ G06F ***15/16***

U.S. Cl. 705—8 **17 Claims**


START
Read the master object unique ID into memory
700
Read master object attributes into memory
702
Interrogates XOR attribute
704
Determine whether attribute is "on" ?
706
NO
YES
Search for next XOR event
708
Event found ?
710
YES
Marks event as completed
712
NO
END

1. A method in a data processing system for managing events, the data processing system having a calendar program including a plurality of events, the method comprising:
selecting a group of events within the plurality of events;
associating the group of events such that only one event within the group of events must be completed; and
performing an action on the group of events in response to a completion of an event within the group of events, wherein events within the calendar program are efficiently managed.

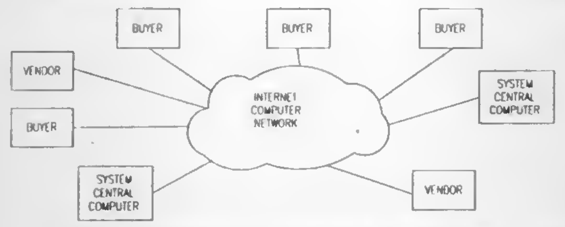
5,842,178
COMPUTERIZED QUOTATION SYSTEM AND METHOD

Joseph Giovannoli, 30 Bayberry Dr., Saddle River, N.J. 07485

Continuation of Ser. No. 603,906, Feb. 22, 1996, Pat. No. 5,758,328. This application Jan. 30, 1998, Ser. No. 15,705

Int. Cl.⁶ G06F ***17/60***

U.S. Cl. 705—26 **2 Claims**



1. A system for engaging in commercial transactions, comprising:
filter means for accepting filter conditions from buyers and sellers;
a plurality of buyers for communicating RFQs to said filter means;
a plurality of sellers for communicating quotes to said filter means in response to said RFQs, said filter means including means for determining, based upon said filter conditions, which sellers should receive RFQs from a buyer, and which quotes should be received by the buyer.

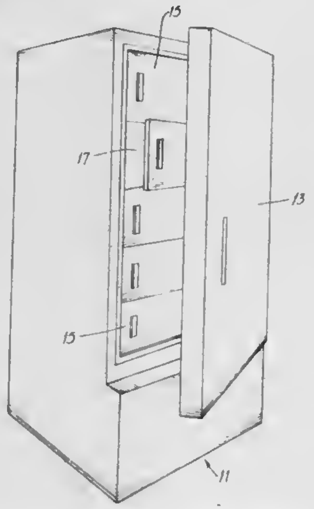
5,842,179
METHOD AND APPARATUS FOR INVENTORYING LABORATORY SPECIMENS

Steven P. Beavers, Zeeland, Mich.; Brian L. Nahey, Hartland, Wis., and Richard M. Telgenhoff, Holland, Mich., assignors to Venturedyne Limited, Milwaukee, Wis.

Filed Jan. 22, 1996, Ser. No. 589,391

Int. Cl.⁶ G06F ***17/60***

U.S. Cl. 705—28 **18 Claims**



1. A method for inventorying and later retrieving a new laboratory specimen among a group of pre-existing specimens in a rack and wherein:
the group of pre-existing specimens is in a cryogenic freezer having an interface device mounted thereon and a keypad on the interface device;
each specimen in the group is associated with an indentifier unique to that specimen;
each specimen in the group includes a vial which is substantially identical to the vials of the other specimens in the group;
each specimen in the group includes a substance comprising at least one of a plurality of substances consisting of blood, tissue, cells, and body fluid from a human patient;
each specimen in the group is unique with respect to the other specimens comprising the group; and
and wherein the method includes:
placing the new specimen within a vacant position at a primary location which includes a cryogenic freezer;
selecting a specimen identifier unique to the new specimen;
manipulating the keypad, thereby displaying a symbol representing the position of the new specimen in the primary location; and
removing the new specimen from the freezer, such removing step including again manipulating the keypad to display the primary location.

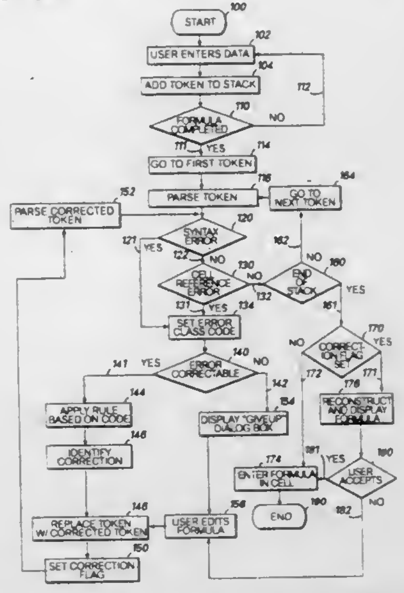
5,842,180
METHOD AND SYSTEM FOR DETECTING AND CORRECTING ERRORS IN A SPREADSHEET FORMULA

Karan Khanna, Clyde Hill, and Edward A. Martinez, Redmond, both of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Mar. 28, 1996, Ser. No. 625,535

Int. Cl.⁶ G06F ***5/00***

U.S. Cl. 705—30 **24 Claims**



1. In association with a computer system, a method for detecting and correcting an error in a formula in a cell of a spreadsheet, comprising the steps of:
creating a token for each character entered in the formula;
adding each token to a formula token stack;
for each token in the formula token stack, parsing the token to determine whether an error exists in the formula; and
if an error exists in the formula that is one of a predetermined type of error:
assigning an error class code based on the type of error; and
applying an error corrector rule to identify a correction to the error.

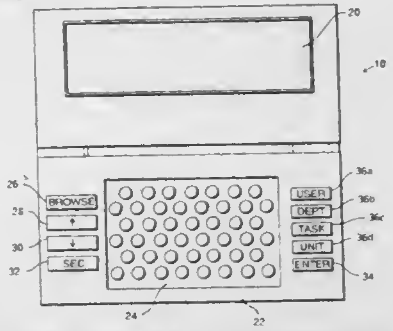
5,842,181
REMOTE HAND-HELD TIME TRACKING DEVICE AND METHOD THEREFOR

Logan M. Fanjoy, 595 W. LaDonna, Tempe, Ariz. 85282

Filed Oct. 27, 1995, Ser. No. 549,478

Int. Cl.⁶ G06F ***19/00***

U.S. Cl. 705—32 **24 Claims**



1. A method of operating a remote hand-held data collection device to associate time with accounts at the instant when and the place where work is performed, said method comprising the steps of:
obtaining, through a user interface portion of said hand-held data collection device, N descriptive codes that identify a first work assignment, wherein N is an integer greater than one;
initiating, in a time monitor portion of said hand-held data collection device, accrual of time for a first time period during which said first work assignment is performed, said initiating step being performed in response to said obtaining step;
acquiring, through said user interface, M updated descriptive codes that identify a second work assignment, wherein M is an integer greater than zero and less than N; and
beginning, in said time monitor, accrual of time for a second time period during which said second work assignment is performed, said beginning step being performed in response to said acquiring step.

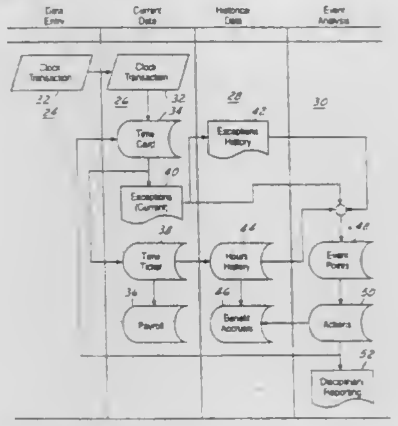
5,842,182
TIME AND ATTENDANCE EVENT ANALYSIS AND REPORTING

Michael D. Bonner, Port Huron, Mich., and William M. Hartman, Morris Plains, N.J., assignors to TimeTrak Systems, Inc., Port Huron, Mich.

Filed Feb. 12, 1996, Ser. No. 600,196

Int. Cl.⁶ G06F ***17/60***

U.S. Cl. 705—32 **17 Claims**



1. A parameter-driven time and attendance analysis system that comprises:
data entry means for entry of user time and attendance data,
means coupled to said data entry means for receiving and evaluating said time and attendance data, including means for identifying exception data indicative of non-standard time and attendance data and means for assigning event points to said exception data based upon character of said exception data,
means for accumulating said event points for each system user, and
means for automatically reporting when accumulated event points for a system user reach a preselected level,
said means for assigning event points to said exception data comprising means for specifying differing types of non-standard time and attendance data, and means for selectively assigning differing event points to such non-standard data based upon data type.

5,842,183
DYNAMICALLY UPDATED PAYMENT DUE DATE SYSTEM

Frank W. Delfer, III, Lebanon, N.J.; Lino E. Carnesecca, Lincoln, Calif.; Glenna M. Johnston, Cameron Park, Calif., and Cindy M. Spear, Rancho Murieta, Calif., assignors to International Billings Services, Inc., Rancho Cordova, Calif.

Filed Nov. 21, 1995, Ser. No. 561,356

Int. Cl.⁶ G06F ***17/60***

U.S. Cl. 705—34 **33 Claims**

1. For use with the production of billing documents, a system for updating billing information on each eligible billing document; comprising:
a) means for establishing a target mail date;

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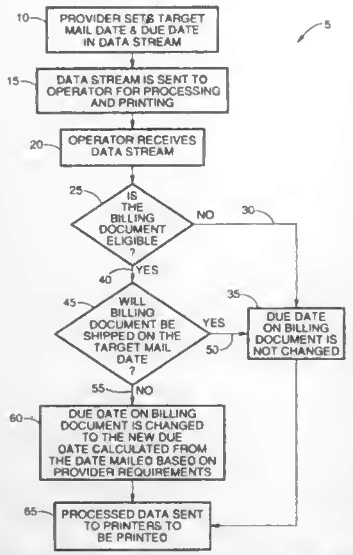

10 PROVIDER SETS TARGET MAIL DATE & DUE DATE IN DATA STREAM
5
15 DATA STREAM IS SENT TO OPERATOR FOR PROCESSING AND PRINTING
20 OPERATOR RECEIVES DATA STREAM
25 IS THE BILLING DOCUMENT ELIGIBLE ?
NO
30
YES
40
45 WILL BILLING DOCUMENT BE SHIPPED ON THE TARGET MAIL DATE ?
YES
50
35 DUE DATE ON BILLING DOCUMENT IS NOT CHANGED
55 NO
60 DUE DATE ON BILLING DOCUMENT IS CHANGED TO THE NEW DUE DATE CALCULATED FROM THE DATE MAILED BASED ON PROVIDER REQUIREMENTS
65 PROCESSED DATA SENT TO PRINTERS TO BE PRINTED

b) means for determining the eligibility of each billing document for updated billing information;

c) means for verifying that each billing document will be mailed on said target mail date; and

d) means for updating the billing information to be printed on each eligible billing document if said verification means determines that the billing document will not be mailed on said target mail date.

5,842,184

Patent Not Issued For This Number

5,842,185

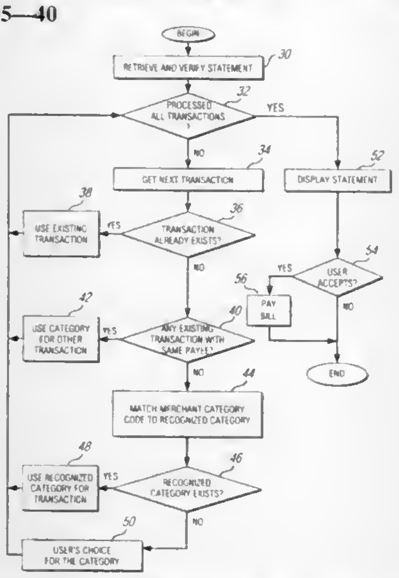
METHOD AND SYSTEM FOR ELECTRONICALLY TRACKING FINANCIAL TRANSACTIONS

Jason D. Chancey, Redwood Shores; Scott D. Cook, Woodside, and Lisa Jean Borden, Hayward, all of Calif., assignors to Intuit Inc., Menlo Park, Calif.

Continuation of Ser. No. 19,468, Feb. 18, 1993, abandoned. This application Jul. 14, 1994, Ser. No. 275,038

Int. Cl.^{6} G06F *17/60*

U.S. Cl. 705—40 **36 Claims**


BEGIN
RETRIEVE AND VERIFY STATEMENT
30
PROCESSED ALL TRANSACTIONS ?
32
YES
NO
34
GET NEXT TRANSACTION
52
DISPLAY STATEMENT
38
USE EXISTING TRANSACTION
YES
36
TRANSACTION ALREADY EXISTS?
NO
54
USER ACCEPTS?
YES
56
PAY BILL
NO
42
USE CATEGORY FOR OTHER TRANSACTION
YES
40
ANY EXISTING TRANSACTION WITH SAME PAYEE?
NO
END
44
MATCH MERCHANT CATEGORY CODE TO RECOGNIZED CATEGORY
48
USE RECOGNIZED CATEGORY FOR TRANSACTION
YES
46
RECOGNIZED CATEGORY EXISTS?
NO
50
USER'S CHOICE FOR THE CATEGORY

1. A computer-implemented process for entering transactions included in a remotely compiled electronic statement into a financial account stored in a local computer system including a processor and a storage device, comprising the steps of:

compiling with a remote processor in the remote computer system an electronic statement including at least one transaction, the transaction including a payee, the electronic statement in an electronic data format processable by the local computer system;

communicating the electronic statement to the local computer system via a communication medium;

storing the electronic statement in the storage device of the local computer system;

for at least one transaction in the electronic statement:

determining with the processor if a payee of the transaction is the payee of a previous transaction stored in the storage device;

if the payee for the transaction is the payee of a previous transaction stored in the storage device, assigning with the processor the transaction to a category associated with the previous transactions; and

storing the transaction with the assigned category in the financial account in the storage device.

5,842,186

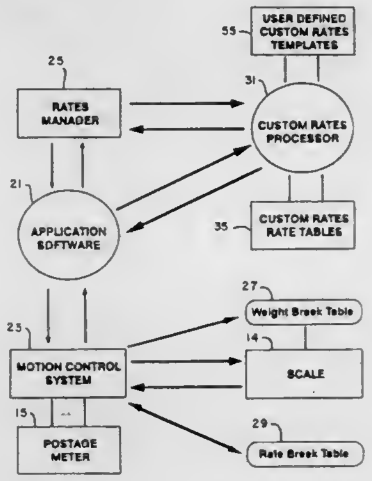
CUSTOM CLASS SELECTION IN AUTOMATED MAIL PROCESSING

George Kulik, Trumbull, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Continuation of Ser. No. 610,003, Mar. 4, 1996, Pat. No. 5,661,653. This application Mar. 31, 1997, Ser. No. 831,290

Int. Cl.^{6} G07B *17/00*

U.S. Cl. 705—410 **8 Claims**



1. A method of processing mail, the method comprising the step(s) of:

storing postage rate information for a plurality of mail classes in a postage rate table;

providing a mailpiece having an associated parameter, the associated parameter having a value;

specifying a mail class in a user defined template;

storing a threshold value corresponding to the associated parameter and the specified mail class in the user defined template;

processing the threshold values stored in the user defined template and the postage rate information from the postage rate table for the mail class specified in the template to create a custom rate table; and

processing the mailpiece using the threshold value and the value of the associated parameter to select the postage rate information from the specified mail class in the custom rate table.

5,842,187

ELECTRICITY MONITORING SYSTEM

Paul Nicholas Williams, Etwall, United Kingdom, assignor to Optimum Solutions Ltd., Derbyshire, United Kingdom

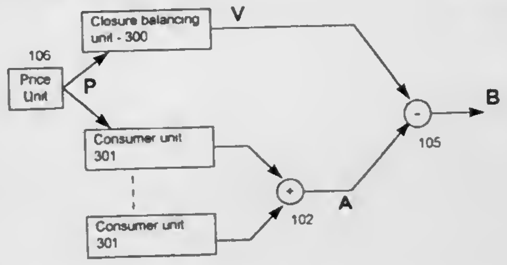
PCT No. PCT/GB95/00636, § 371 Date Jan. 6, 1997, § 102(e) Date Jan. 6, 1997, PCT Pub. No. WO95/26065, PCT Pub. Date Sep. 28, 1995

PCT Filed Mar. 22, 1995, Ser. No. 716,457

Claims priority, application United Kingdom, Mar. 22, 1994, 9405597; Oct. 25, 1994, 9421489

Int. Cl.^{6} G06F *17/60*

U.S. Cl. 705—412 **48 Claims**



1. A method of determining a charge in respect to consumption of electricity supplied from an electricity distribution network and priced in successive sub-periods,

the network incorporating a closure having one or more input supply connections all of which are metered and output connections including at least one metered output,

the method comprising:

using information derived from the metered inputs to the closure to determine a profile indicating the variation in the quantity of electricity supplied to the closure over the sub-periods;

metering each metered output to determine the quantity of electricity taken by that output over a metered period, longer than each sub-period, for that output;

determining an apportionment of metered consumption between the sub-periods in dependence on the profile; and

determining a charge for the consumption in dependence on the quantities of metered consumption and the apportionment.

5,842,188

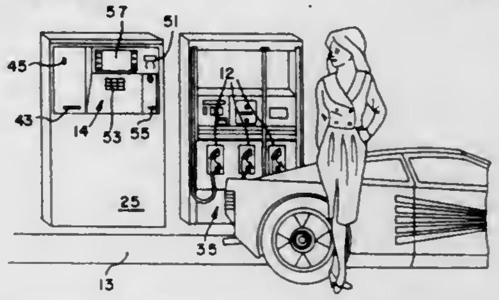
UNATTENDED AUTOMATED SYSTEM FOR SELLING AND DISPENSING WITH CHANGE DISPENSING CAPABILITY

Furman D. Ramsey, Greensboro, N.C., and James Williams, Belvedere, Ill., assignors to JTW Operations, Inc., Belvidere, Ill.

Continuation-in-part of Ser. No. 403,220, Mar. 13, 1995, abandoned. This application Jul. 23, 1996, Ser. No. 685,352

Int. Cl.^{6} G06F *17/00;* G01G *19/413*

U.S. Cl. 705—416 **20 Claims**



1. A system for operating an unattended, automated motor fuel service station for selling quantities of motor fuel to a purchaser, comprising:

at least one fuel pump for dispensing a preselected quantity of motor fuel, means for enabling operation of the fuel pump in response to a fuel pump enabling signal, said fuel pump having means for determining the amount of fuel dispensed and generating a signal indicative of the quantity of fuel dispensed from said fuel pump;

a customer console associated with said pump, means for enabling operation of the customer console in response to a customer console enabling signal, said customer console including payment acceptance means for accepting cash from the purchaser as payment for a quantity of motor fuel purchased, said customer console payment acceptance means including currency acceptance means for accepting currency as payment for said motor fuel purchase and coin acceptance means for accepting coins as payment for said motor fuel purchase, each of said currency and coin acceptance means having means for identifying the respective values of currency and coin deposited by said purchaser with said customer console payment acceptance means and means for generating respective currency and coin value identification signals in response to cash deposited with said customer console;

a controller operatively interconnected to said console payment acceptance means, the console controller having means for receiving said currency and coin value identification signals and calculating a total of cash deposited with said customer console by said purchaser, said console controller having means for generating currency and coin dispensing signals;

change dispensing means for dispensing change to said purchaser in cash as part of a purchase of said motor fuel, said cash being dispensed as change to said purchaser as currency, coins or a combination of both depending on the amount of change dispensed, the change dispensing means including a currency payout mechanism operable to pay out currency upon receipt of a currency dispensing signal from said console controller and a plurality of coin payout mechanisms each of said coin payment mechanisms being associated with a different denomination coin and each having a supply of said coins operatively associated therewith, said coin payment mechanisms being operable to payout a coin of preselected denomination from its associated coin supply upon receipt of a coin dispensing signal from said console controller; and,

system control means operatively linking said fuel pump and said customer console together, the system control means including means for generating enabling and disabling signals to said fuel pump and customer console, said system control means further including means for two-way communication with said fuel pump and said customer console.

5,842,189

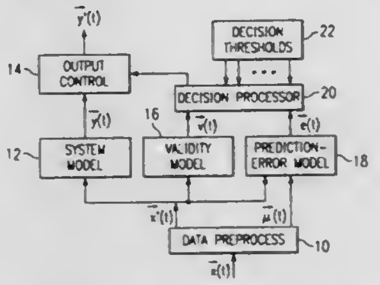
METHOD FOR OPERATING A NEURAL NETWORK WITH MISSING AND/OR INCOMPLETE DATA

James David Keeler; Eric Jon Hartman, and Ralph Bruce Ferguson, all of Austin, Tex., assignors to Pavilion Technologies, Inc., Austin, Tex.

Continuation of Ser. No. 724,377, Oct. 1, 1996, which is a continuation of Ser. No. 531,100, Sep. 20, 1995, Pat. No. 5,613,041, which is a continuation of Ser. No. 980,664, Nov. 24, 1992, abandoned. This application Sep. 27, 1997, Ser. No. 936,679

Int. Cl.^{6} G06F *15/18*

U.S. Cl. 706—16 **16 Claims**



1. A method for estimating error in a prediction output space of a predictive system model over a prediction input space as a prediction error, comprising the steps of:

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receiving an input vector comprising a plurality of input values that occupy the prediction input space;

outputting an output prediction error vector that occupies an output space corresponding to the prediction output space of the predictive system model;

mapping the prediction input space to the prediction output space through a representation of the prediction error in the predictive system model to provide the output prediction error vector in the step of outputting;

receiving an unprocessed data input vector having associated therewith unprocessed data, the unprocessed data input vector associated with substantially the same input space as the input vector, the unprocessed data input vector having errors associated with the associated unprocessed data in select portions of the prediction input space; and

processing the unprocessed data in the unprocessed data vector to minimize the errors therein to provide the input vector on an output.

5,842,190

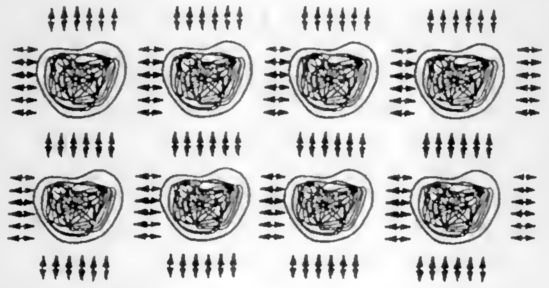
SYSTEM AND METHOD FOR HIGH SPEED COMPUTING AND FEATURE RECOGNITION CAPTURING ASPECTS OF NEOCORTICAL COMPUTATION

Jeffrey P. Sutton, Brookline, Mass., and James A. Anderson, Barrington, R.I., assignors to Brown University Research Foundation, Providence, R.I., and The General Hospital Corporation, Boston, Mass.

Filed Jul. 17, 1996, Ser. No. 682,436

Int. Cl.^{6} G06F *15/18*

U.S. Cl. 706—28 **12 Claims**



1. A NoN comprising:

a neuron having processing capabilities;

a first level module including a network of a plurality of interconnected neurons, the first level module also having processing capabilities; and

a second level module including a network of interconnected networks of interconnected neurons, the second level module also having processing capabilities;

wherein the first and second level modules are interconnected through neuron to neuron connections such that simultaneous processing can be carried out in neurons and first and second level modules.

5,842,191

NEURAL NETWORK THAT INCORPORATES DIRECT OPTICAL IMAGING

Richard G. Stearns, Los Gatos, Calif., assignor to Xerox Corporation, Stamford, Conn.

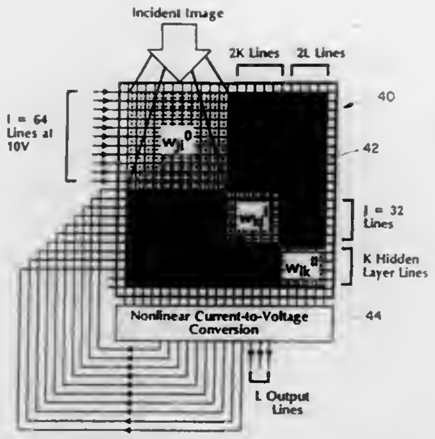
Continuation of Ser. No. 354,572, Dec. 12, 1994, abandoned. This application Sep. 3, 1997, Ser. No. 922,798

Int. Cl.^{6} G06F *15/18*

U.S. Cl. 706—40 **27 Claims**

1. An optically-addressed neural network comprising:

a two-dimensional array of photo conductors defining an array of M by N array nodes, wherein M and N are defined by positive integers and wherein the nodes of each column share a common column conductor and nodes of each row share a common row conductor;



a light mask disposed between the two-dimensional array and an associated light source such that generally collimated light therefrom is incident on a selected portion of the plurality of array nodes;

a trainable input portion of the array of photoconductors adapted to directly receive an optical image thereon, each common row conductor of the input portion having a voltage thereon fixed a preselected level;

a plurality of amplifiers, each operatively connected to one of (a) a selected one of the common column conductors of the array and (b) a selected one of the common row conductors of the array;

a first plurality of conductors for impressing selected amplified signals, received from the amplifiers, to a selected array feedback portion of the common row conductors unique to those common row conductors of the input portion; and

a second plurality of conductors, unique to the first plurality of conductors, forming a system output from selected amplified signals received from the amplifiers.

5,842,192

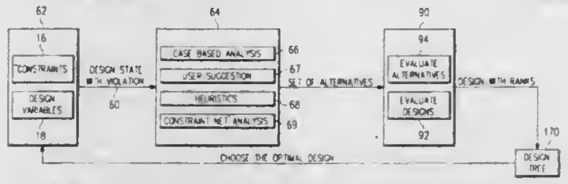
CONCURRENT DESIGN TRADEOFF ANALYSIS SYSTEM AND METHOD

Fred A. Garcia, Somerville, Mass., and Krishnan Srinivasan, Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 927,543, Jul. 31, 1992. This application Sep. 22, 1995, Ser. No. 457,251

Int. Cl.^{6} G06F *15/18*

U.S. Cl. 706—45 **19 Claims**



2. A system for concurrent tradeoff analysis, comprising:

(a) a knowledge source having information of a predetermined knowledge domain;

(b) a developer for receiving a set of constraints and receiving said information from said knowledge source to compute values for a set of variables and characteristics representing a solution state in response to said constraints and information from said knowledge source and sorting said set of constraints into hard constraints and soft constraints;

(c) an alternative generator for generating a set of at least one alternative from alternatives to said solution state in response to said computed values and characteristics being inconsistent with said constraints; and

(d) an evaluator for evaluating said set of solution states and alternatives, ranking said solution states and alternatives in response to said evaluation and selecting a most promising solution.

5,842,193

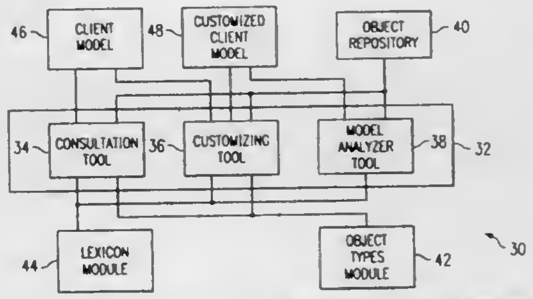
KNOWLEDGE BASED PLANNING AND ANALYSIS (KBPA)™

John P. Reilly, Dallas, Tex., assignor to Sterling Software, Inc., Dallas, Tex.

Filed Feb. 6, 1996, Ser. No. 595,888

Int. Cl.^{6} G06F *17/00*

U.S. Cl. 706—45 **2 Claims**



1. A system for developing reusable models, each of said models made up of at least one object, the system comprising:

a consultation tool coupled to an object repository, a lexicon module and an object types module for generating an initial client model in accordance with user responses to predefined consultation questions, said lexicon module being operable to store a plurality of words and at least one synonym of at least one of the words;

a customizing tool coupled to said object repository, said lexicon module and said object types module for customizing said client model to a particular business enterprise to generate a customized client model in accordance with user responses to predefined customization questions;

wherein said object repository stores a plurality of predefined objects;

wherein said lexicon module is operable to analyze said user responses and to identify parts of speech in user responses having a plurality of parts of speech, and wherein said consultation tool includes means for defining nouns in said user responses as data objects and verbs in said user responses as activity objects;

wherein said consultation tool includes means for decomposing said data objects and said activity objects in parallel until said data objects and said activity objects can no longer be decomposed or until said user terminates decomposition;

wherein said object types module associates each of said data and activity objects with an object type and said consultation tool includes means for using said object type to identify similar objects from said plurality of predefined objects in said object repository; and

further including a model analyzer tool coupled to said object repository and said lexicon module for selecting at least one candidate model from said object repository, for determining comparison criteria and termination criteria in accordance with responses by said user to predefined comparison questions, for comparing and analyzing said customized client model to said at least one candidate model in accordance with said comparison criteria; and for reinitializing said customization tool in response to said comparison and said analysis until said termination criteria is met.

5,842,194

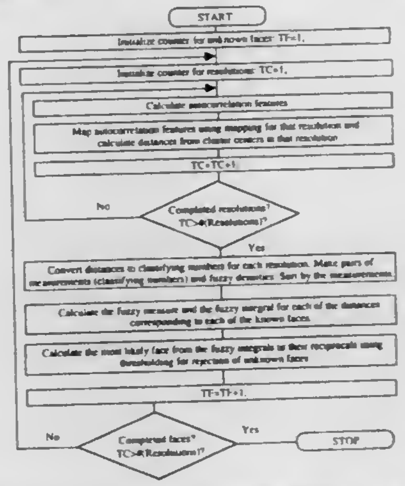
METHOD OF RECOGNIZING IMAGES OF FACES OR GENERAL IMAGES USING FUZZY COMBINATION OF MULTIPLE RESOLUTIONS

Thomas D. Arbuckle, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, and Real World Computing Partnership, both of Tokyo, Japan

Filed Jul. 28, 1995, Ser. No. 508,889

Int. Cl.^{6} G06F *15/18*

U.S. Cl. 706—52 **25 Claims**


START
Initialize counter for unknown faces: TF=1.
Initialize counter for resolutions: TC=1.
Calculate autocorrelation features
Map autocorrelation features using mapping for that resolution and calculate distances from cluster centers at that resolution
TC=TC+1
No
Completed resolutions? TC>#(Resolutions)?
Yes
Convert distances to classifying numbers for each resolution. Make pairs of measurements (classifying numbers) and fuzzy densities. Sort by the measurements.
Calculate the fuzzy measure and the fuzzy integral for each of the distances corresponding to each of the known faces.
Calculate the most likely face from the fuzzy integrals or their reciprocals using thresholding for rejection of unknown faces
TF=TF+1.
No
Compared faces? TC>#(Resolutions)?
Yes
STOP

1. A process for recognizing known images of a plurality of objects, the process comprising:

(a) obtaining a plurality of different resolutions for an unknown image;

(b) performing local autocorrelation for each resolution of the unknown image to produce a feature vector for each resolution;

(c) performing linear discriminant analysis for each feature vector, wherein each feature vector from the local autocorrelation is processed employing a transformation matrix, the transformation matrix being calculated with respect to known images required to be recognized, the linear discriminant analysis producing a plurality of outputs;

(d) performing fuzzy integration to merge the outputs from the linear discriminant analysis to produce a merged output for each of the known images, each merged output being indicative of similarity of the unknown image to each known image;

(e) analyzing each merged output to identify a known image corresponding to the unknown image.

5,842,195

METHOD AND APPARATUS FOR PREPARATION OF A DATABASE DOCUMENT IN A LOCAL PROCESSING APPARATUS AND LOADING OF THE DATABASE DOCUMENT WITH DATA FROM REMOTE SOURCES

Graham Peters, and Peter Barwell, both of St Leonards, Australia, assignors to Dolphin Software Pty Ltd, St. Leonards, Australia

PCT No. PCT/AU95/00615, § 371 Date Dec. 20, 1996, § 102(e) Date Dec. 20, 1996, PCT Pub. No. WO96/08799, PCT Pub. Date Mar. 21, 1996

PCT Filed Sep. 14, 1995, Ser. No. 765,279

Claims priority, application Australia, Sep. 14, 1994, PM8133

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 707—1 **25 Claims**

1. A processing apparatus for enabling construction of a survey questionnaire document, comprising an input means via which a survey author may input data, a survey authoring means enabling construction of a survey questionnaire document including at least one question formulated from data input by the survey author and a location address of a processing apparatus including a collator

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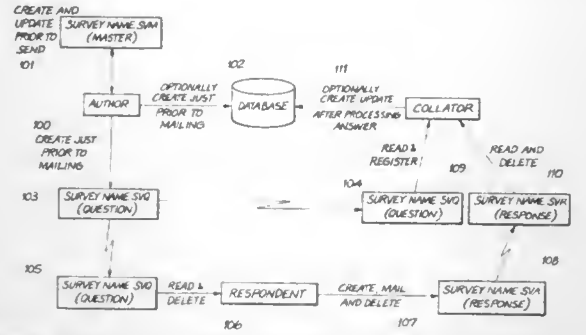

CREATE AND UPDATE PRIOR TO SEND
101
SURVEY NAME SVM (MASTER)
102
DATABASE
111
AUTHOR
OPTIONALLY CREATE JUST PRIOR TO MAILING
OPTIONALLY CREATE UPDATE AFTER PROCESSING ANSWER
COLLATOR
100
CREATE JUST PRIOR TO MAILING
READ & REGISTER
109
READ AND DELETE
110
103
SURVEY NAME SVQ (QUESTION)
104
SURVEY NAME SVQ (QUESTION)
SURVEY NAME SVR (RESPONSE)
105
108
SURVEY NAME SVQ (QUESTION)
READ & DELETE
RESPONDENT
CREATE, MAIL AND DELETE
SURVEY NAME SVA (RESPONSE)
106
107

means arranged to collate response documents produced by respondent users processing the survey questionnaire document.

5,842,196

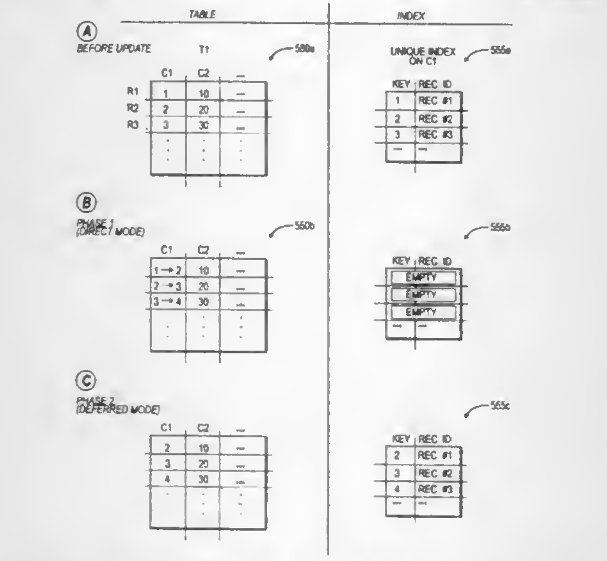
DATABASE SYSTEM WITH IMPROVED METHODS FOR UPDATING RECORDS

Sunil Agarwal, Alameda, and Vasudha Krishnaswamy, Redwood City, both of Calif., assignors to Sybase, Inc., Emeryville, Calif.

Filed Apr. 3, 1996, Ser. No. 626,093

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 707—2 **26 Claims**



1. In a database system having a database storing a database table comprising a plurality of data pages, each data page capable of storing a plurality of data records, said data records storing information organized into particular database fields, said database table having an index for logically ordering said plurality of data records, said index comprising a plurality of index entries wherein each data record is referenced by a corresponding index entry, said database system providing a direct mode, and a deferred mode for updating the database table and the index, said direct mode for performing actual updates to the database table or the index as each data record is read during a first pass, and said deferred mode for updating the database table or the index by first marking data records or index entries during the first pass for actual updating during a second pass, an improved method for updating said data records, the method comprising:

receiving a query which specifies a change in value for a database filed whose values form a unique index for the database table: and

performing said update by:

in a first pass, scanning said data pages for said data records and changing any field value which is specified to change, so that said data records are updated in the direct mode,

in conjunction with said scanning step occurring during the first pass, deleting any corresponding index entry which references a data record changed during said scanning step, so that any corresponding index entries are deleted in the direct mode,

marking any index entry so deleted in the direct mode for inserting back into the index during a second pass, and

after completing said scanning step of the first pass, inserting in the second pass all such corresponding index entries back into the index which were marked during the first pass for insertion during the second pass, so that all such corresponding index entries are inserted back into the index in the deferred mode.

5,842,197

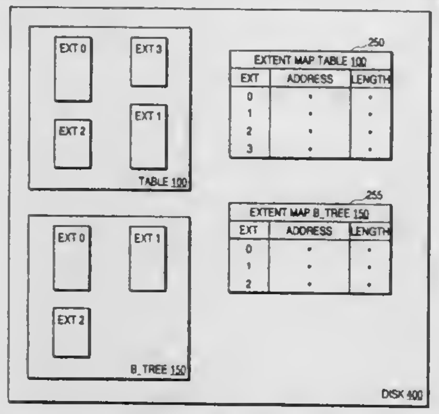
SELECTING A QUALIFIED DATA REPOSITORY TO CREATE AN INDEX

Alexander Channing Ho, Belmont, Calif., assignor to Oracle Corporation, Redwood Shores, Calif.

Filed Aug. 29, 1996, Ser. No. 705,299

Int. Cl.^{6} G06F *7/08*

U.S. Cl. 707—2 **24 Claims**



1. A computer-implemented method comprising:

identifying a plurality of data repositories each including one or more logical units of database storage that contain data necessary to create an index;

selecting a first data repository from among said plurality of data repositories based on a predetermined selection criteria: and

creating said index from said first data repository.

5,842,198

DATA MANAGEMENT SYSTEM, THAT ENABLES A USER TO CONNECT EXISTING DATA TO AN EXTERNAL FILE AND A PROGRAM TO PROCESS THAT DATA

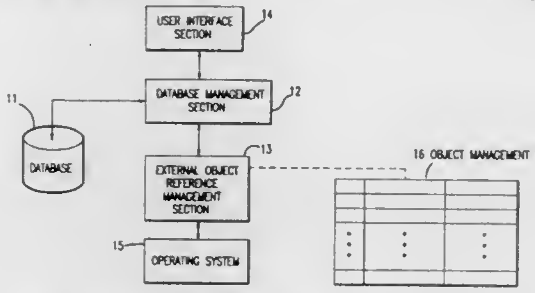
Toshikatsu Suzuki; Yoshifumi Matsunaga; Shinichiro Taniguchi, all of Nakai-machi; Eiji Ishida, Yokohama, and Hiroyuki Ishima, Nakai-machi, all of Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Apr. 10, 1996, Ser. No. 630,252

Claims priority, application Japan, Apr. 28, 1995, 7-127518

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 707—2 **12 Claims**


USER INTERFACE SECTION
14
DATABASE MANAGEMENT SECTION
12
11
DATABASE
13
EXTERNAL OBJECT REFERENCE MANAGEMENT SECTION
16 OBJECT MANAGEMENT TABLE
15
OPERATING SYSTEM

1. In a computer system that includes a first database that stores a plurality of first data units, a plurality of data files, each data file existing outside of the first database, and at least one program, each program processing at least one of the data files and existing outside of the first database, a data management system comprising:

query input means for receiving a query;

database retrieval means for retrieving at least one first data unit from the first database according to the query received by the query input means;

an external relation database, provided separately from the first database, for storing at least one second data unit each second data unit including external relation information that associates one of the plurality of first data units stored in the first database with at least one of the data files and with at least one of the at least one program;

instruction receiving means for receiving an instruction:

external relation retrieval instruction means for giving the database retrieval means a retrieval instruction to retrieve at least one of the at least one second data unit from the external relation database, said database retrieval means further retrieving from said external relation database the second data unit corresponding to the first data unit retrieved from the first database;

program invoking means for invoking, in response to the instruction received by the instruction receiving means, at least one related program of the at least one program to process at least one related data file of the plurality of data files, the at least one related program and the at least one related data file associated with the at least one first data unit by the external relation information included in the retrieved second data unit.

5,842,199

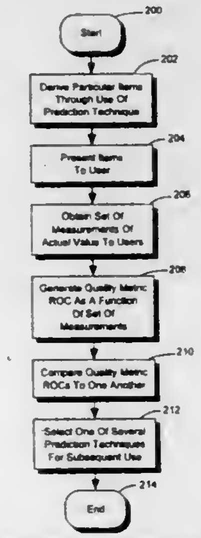
SYSTEM, METHOD AND ARTICLE OF MANUFACTURE FOR USING RECEIVER OPERATING CURVES TO EVALUATE PREDICTIVE UTILITY

Bradley N. Miller, Polymouth; John T. Riedl, Falcon Heights, and Joseph A. Konstan, St. Paul, all of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Oct. 18, 1996, Ser. No. 733,806

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 707—2 **24 Claims**


200
Start
202
Derive Particular Items Through Use Of Prediction Technique
204
Present Items To User
206
Obtain Set Of Measurements Of Actual Value To Users
208
Generate Quality Metric ROC As A Function Of Set Of Measurements
210
Compare Quality Metric ROCs To One Another
212
Select One Of Several Prediction Techniques For Subsequent Use
214
End

1. An electronic information system for determining predictive utility of recommendation techniques in ascertaining which items are preferred by a user, comprising:

(a) input means for obtaining a set of measurements of user preference of items recommended to a user, the items presented to the user being derived from a plurality of items by utilizing recommendations from an adaptive recommendation technique; and

(b) processing means, operatively coupled to the input means, generating a quality metric receiver operating curve (ROC) from the set of measurements which corresponds to a measure of effectiveness of the adaptive recommendation technique in predicting which items are preferred by the user.

5,842,200

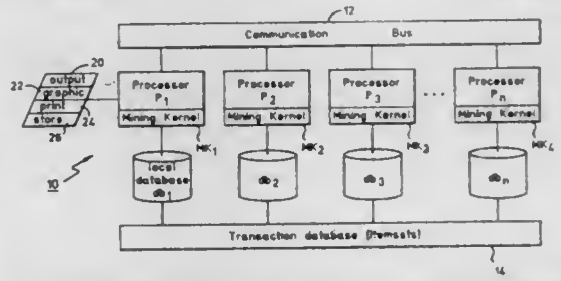
SYSTEM AND METHOD FOR PARALLEL MINING OF ASSOCIATION RULES IN DATABASES

Rakesh Agrawal, and John Christopher Shafer, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 436,794, May 8, 1995, Pat. No. 5,615,341, and Ser. No. 415,006, Mar. 31, 1995, Pat. No. 5,794,209. This application Jul. 11, 1995, Ser. No. 500,717

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 707—1 **19 Claims**



1. A digital multiprocessor comprising a plurality of processing systems, each processing system including a respective local database having distributed therein data from a transaction database of itemsets purchased in consumer transactions, each processing system including:

means for determining the number of times a candidate itemset appears in the associated local database to establish a local count for the candidate itemset;

means for using the local count to determine whether the number of times a candidate itemset appears in the transaction database exceeds a predefined minimum support value;

means for entering a candidate itemset into a set of large itemsets when the number of times exceeds a predetermined minimum support value, such that the set of large itemsets can be designated as frequently occurring itemsets in transactions;

means for determining, for at least some of the itemsets in the set of large itemsets the number of times selected subsets of the itemsets appear in the transaction database;

means for outputting an association rule when the ratio of the number of times a selected subset appears in the transaction database to the number of times the associated itemset appears in the transaction database exceeds a predetermined minimum confidence value and thereby satisfies a minimum confidence constraint; and

means for exchanging the local count with the other processing systems such that each processing system determines whether the number of times a candidate itemset appears in the transaction database exceeds the predefined minimum support value.

5,842,201

METHOD ARTICLE OF MANUFACTURE AND APPARATUS FOR USER CONTROLLED AND AUTOMATIC RETRIEVAL AND DISPLAY OF DETAILED DATA

Peter Wallack, Sunnyvale, Calif., assignor to Oracle Corporation, Redwood Shores, Calif.

Filed May 2, 1996, Ser. No. 641,785

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 707—3 **4 Claims**

1. A computer-implemented method for selectively displaying detail information associated with a selected master record, comprising the steps of:

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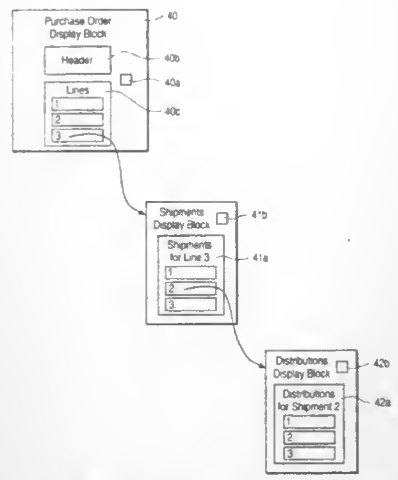


(a) determining, based on a user-controlled parameter value, whether detail information associated with said selected master record should be retrieved;

(b) retrieving at least one detail record associated with said selected master record from a database, responsive to a determination that detail information associated with said selected master record should be retrieved;

(c) displaying said at least one detail record in a detail display block associated with said selected master record;

(d) determining, prior to step (a), whether said detail display block is currently being displayed; and

(e) responsive to a determination that said detail display block is not currently being displayed, foregoing steps (a), (b) and (c) regardless of said user-controlled parameter value.

5,842,202

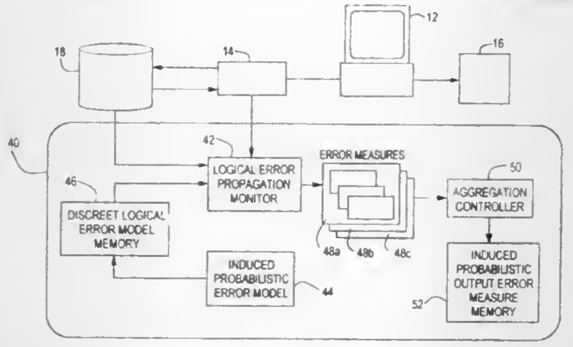
SYSTEMS AND METHODS FOR DATA QUALITY MANAGEMENT

Henry B. Kon, Somerville, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Nov. 27, 1996, Ser. No. 757,759

Int. Cl.^{6} G06F *17/00*

U.S. Cl. 707—3 **29 Claims**


12
18
14
16
40
42
LOGICAL ERROR PROPAGATION MONITOR
ERROR MEASURES
50
AGGREGATION CONTROLLER
46
DISCREET LOGICAL ERROR MODEL MEMORY
48a
48b
48c
INDUCED PROBABILISTIC ERROR MODEL
44
INDUCED PROBABILISTIC OUTPUT ERROR MEASURE MEMORY
52

1. A system for performing data processing on a structured data set, comprising

a query mechanism for providing logical operations for selectively processing said structured data set to generate a query result signal,

a memory device having storage for an error model, said error model comprising error model data representative of error in said structured data set and probability data representative of a probability distribution of said error in said structured data set, and

a propagation monitor for detecting propagation of said error from said structured data set to said query result signal and for generating in response thereto an error measure signal representative of error in said query result signal.

5,842,203

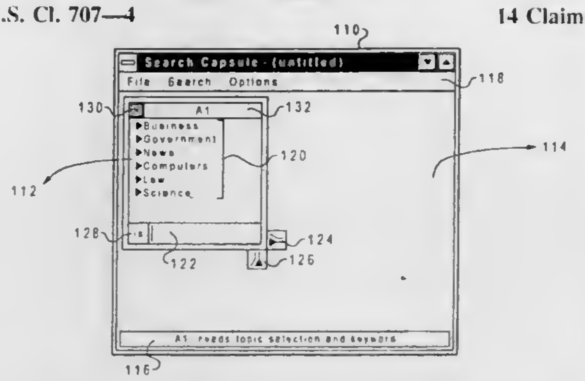
METHOD AND SYSTEM FOR PERFORMING NON-BOOLEAN SEARCH QUERIES IN A GRAPHICAL USER INTERFACE

Daniel F. D'Elena, West Milford, N.J., and Anthony E. Martinez, Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 1, 1995, Ser. No. 566,330

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 707—4 **14 Claims**



1. In a data processing system, including a data store and means for archiving files within said data store and a graphical user interface, a query system presented utilizing said graphical user interface comprising:

a graphically displayed search cell for graphically specifying a search query, said search cell capable of being utilized to permit graphical specification of a plurality of parameters of a search;

a domain scope control field graphically displayed within said search cell that allows a user to perform said hierarchical search within a plurality of topics displayable in said domain scope control field, wherein one of said plurality of topics is graphically selected utilizing said search cell as a domain scope of the search;

a graphical narrowing search control indicator that allows a user to narrow a result of said search, said narrowing search control indicator capable of being utilized to generate a second graphically displayed search cell;

a specific item search field that allows a user to identify specific key words to be searched within said one of said plurality of topics; and

a graphical broadening search control indicator that allows a user to broaden said result of said search, said broadening search control indicator capable of being utilized to generate a third graphically displayed search cell.

5,842,204

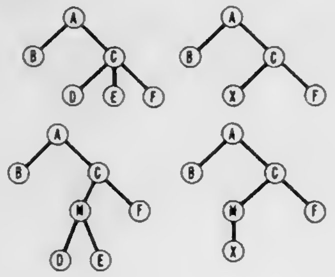
METHOD AND APPARATUS FOR TRANSLATING SOURCE CODE FROM ONE HIGH-LEVEL COMPUTER LANGUAGE TO ANOTHER

Kristy A. Andrews, Palo Alto; Paul Del Vigna, and Mark E. Molloy, both of San Jose, all of Calif., assignors to Tandem Computers, Inc., Del.

Continuation-in-part of Ser. No. 319,682, Oct. 7, 1994. This application Nov. 1, 1994, Ser. No. 332,966

Int. Cl.^{6} G06F *7/00*

U.S. Cl. 707—31 **21 Claims**



1. In a computer system, a computer-implemented method for modifying an ordered list of elements, said method comprising:

traversing a first ordered list of elements in a shallow in-order manner, producing a first ordered yield of elements, and traversing a second ordered list in a shallow in-order manner, producing a second ordered yield of elements;

comparing said first and second yields;

identifying a first element in said first yield and a second element in said second yield, said first and second elements being the respective first element where said first and second yields differ;

identifying a first sub-list of adjacent elements of said first yield beginning with said first element and a second sub-list of adjacent elements of said second yield beginning with said second element, such that removal of the first sub-list from the first yield and removal of the second sub-list from the second yield would cause the first and second removal-modified yields elements to be equivalent;

removing the first sub-list from the first list, thus creating a former position of the first sub-list;

inserting a first new element at the former position of the first sub-list, said first new element representing similarities between said first and second sub-lists and differences between the similarities and the first sub-list.

5,842,205

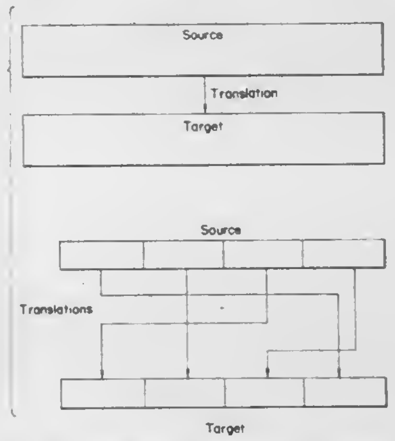
METHOD AND PROCESS OF INTER-MACHINE COMMUNICATION AND GENERALIZED METHOD FOR PROGRAM PREPARATION THEREFOR

John E. T. Brann, New York, N.Y., assignor to VIE Systems, Inc., Lyndhurst, N.J.

Filed Dec. 2, 1993, Ser. No. 161,229

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 707—4 **53 Claims**



1. A method for responding to a stimulus message, comprising the steps of:

(a) providing a computer, having a control program executing therein;

(b) providing at least two distinct and independent response generation programs for execution by the computer, each response generation program being callable by the control program to process data relating to at least a portion of a stimulus message;

(c) providing a database, associated with the computer, storing information relating to the implementation of an appropriate response to a type of stimulus message, the information identifying optional response generation programs and optional data;

(d) providing a stimulus message to the control program;

(e) accessing the database to retrieve information relating to a type of the provided stimulus message; and

(f) for each identified response generation program:

(i) calling the response generation program, optionally passing data;

(ii) generating an appropriate response to the stimulus message and optional data with the response generation program;

(iii) returning to the control program,

the application processing behavior of the computer being defined by the response generation programs, the information in the database and the stimulus message.

5,842,206

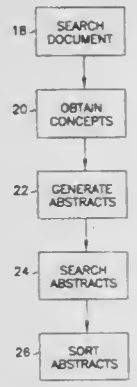
COMPUTERIZED METHOD AND SYSTEM FOR QUALIFIED SEARCHING OF ELECTRONICALLY STORED DOCUMENTS

Bernardo Sotomayor, Burnsville, Minn., assignor to Iconovex Corporation, Hopkins, Minn.

Filed Aug. 20, 1996, Ser. No. 700,148

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 707—5 **12 Claims**



1. A computerized method for searching electronically stored documents, comprising the steps of:

searching each document for a search expression;

analyzing each document containing the search expression to determine a plurality of significant concepts within the document;

generating an abstract for each concept of each document containing the search expression;

searching each abstract for the search expression; and

sorting the abstracts in one of:

a) the order of significance of their corresponding concepts; or

b) the alphabetical order of their corresponding concepts.

5,842,207

METHOD FOR STORING RECORDS OF A DISTRIBUTED DATABASE BY PLURAL PROCESSORS TO PROVIDE A HOST PROCESSOR WITH SORTED RECORDS BELONGING TO ONE OF A PLURALITY OF KEY SECTIONS

Shinji Fujiwara, Kokubunji; Yooichi Shintani, Machida; Mitsuru Nagasaka, Kodaira; Naoki Hamanaka, Tokyo, and Mikiko Suzuki, Kunitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 10, 1992, Ser. No. 911,617

Claims priority, application Japan, Jul. 10, 1991, 3-169661

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 707—7 **4 Claims**

1. A method for determining a key distribution range of records of a distributed database system, executable on a computer system comprised of a plurality of processors and a host processor connected thereto, wherein records of a database are held by said plurality of processors, said method comprising the steps of:

(a) determining by each of said plurality of processors, a local key distribution range of key values of records held by said each processor;

(b) exchanging among different ones of said plurality of processors, the local key distribution range determined thereby; . .

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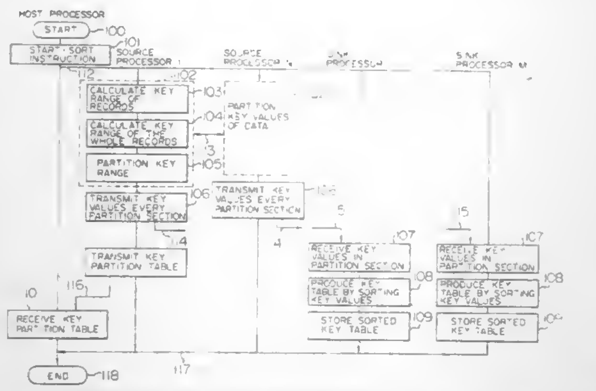

HOST PROCESSOR
START
100
START SORT INSTRUCTION
101
SOURCE PROCESSOR 1
SOURCE PROCESSOR N
SINK PROCESSOR
SINK PROCESSOR M
112
102
CALCULATE KEY RANGE OF RECORDS
103
CALCULATE KEY RANGE OF THE WHOLE RECORDS
104
PARTITION KEY VALUES OF DATA
3
PARTITION KEY RANGE
105
TRANSMIT KEY VALUES EVERY PARTITION SECTION
106
TRANSMIT KEY VALUES EVERY PARTITION SECTION
5
15
114
4
TRANSMIT KEY PARTITION TABLE
RECEIVE KEY VALUES IN PARTITION SECTION
107
PRODUCE KEY TABLE BY SORTING KEY VALUES
108
STORE SORTED KEY TABLE
109
10
116
RECEIVE KEY PARTITION TABLE
END
118
117

(c) combining in each of said plurality of processor, the local key distribution range determined thereby with at least one local key distribution range given by at least one other processor within said plurality of processors by the exchanging step, to generate a combined key distribution range of a key distribution range for key values of records held in said each processor and a key distribution range for key values of records held in said at least one other processor; and

(d) repeating the steps (b) and (c) until each of said plurality of processors generates a global key distribution range of key values of records held in said plurality of processors, wherein at each repetition of the step (b) each of the plurality of processors exchanges one combined key distribution range generated thereby by preceding execution of the steps (b) and (c) with another of said plurality of processors which has generated another combined distribution range which includes information which has not yet been reflected to the one key distribution range.

5,842,208

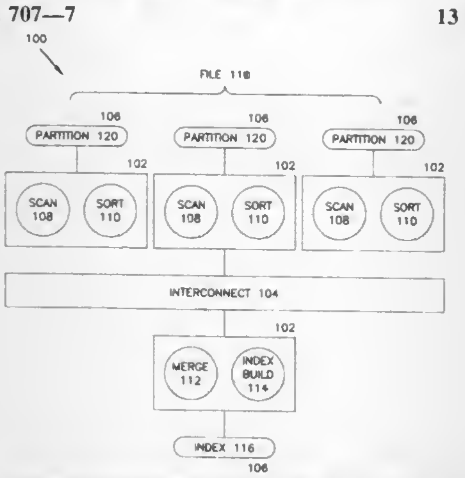
HIGH PERFORMANCE RECOVER/BUILD INDEX SYSTEM BY UNLOADING DATABASE FILES IN PARALLEL

Ted E. Blank, San Jose; John Marland Garth; James Alan Ruddy, both of Gilroy, and Bryan Frederick Smith, Morgan Hill, all of Calif., assignors to International Business Machines Corpaoration, Armonk, N.Y.

Filed Apr. 9, 1997, Ser. No. 838,647

Int. Cl.^{6} G06F *7/00*

U.S. Cl. 707—7 **13 Claims**



1. A computer-implemented method for building an index for a database file, the index and file being stored in a data storage device coupled to a computer, the method comprising the steps of:

performing, in the computer, multiple scans in parallel against the file, wherein each of the multiple scans extracts a desired key value and a record identifier for each of the scanned records to create a scan stream;

performing, in the computer, multiple sorts in parallel against the scan streams to create multiple sort streams of extracted key values and record identifiers;

performing, in the computer, one or more merges in parallel of the multiple sort streams to create a single merge stream of extracted key values and record identifiers; and

building, in the computer, the index for the file from the single merge stream of extracted key values and record identifiers.

5,842,209

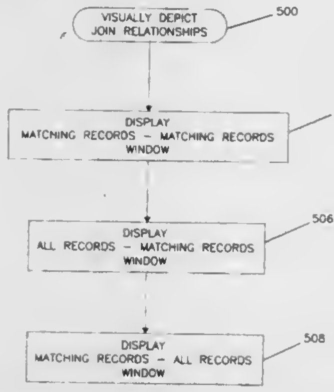
USER INTERFACE FOR VISUALLY DEPICTING INNER/OUTER/LEFT/RIGHT JOINS IN A DATABASE SYSTEM

Darryl Jon Mocek, San Jose; Kester Li, and Jonathan Michael Levine, both of San Francisco, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 3, 1996, Ser. No. 707,140

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 707—4 **21 Claims**


VISUALLY DEPICT JOIN RELATIONSHIPS
500
DISPLAY MATCHING RECORDS – MATCHING RECORDS WINDOW
504
DISPLAY ALL RECORDS – MATCHING RECORDS WINDOW
506
DISPLAY MATCHING RECORDS – ALL RECORDS WINDOW
508

8. A computerized apparatus for controlling a database management system, comprising:

a computer;

means, performed by the computer, for visually depicting at least two tables, fields in the tables, and one or more join relationships between fields in the tables on a display device coupled to a computer, wherein the join relationships illustrate join operations performed between two or more tables in the database management system; and

means, performed by the computer, for accepting a user command from a user input device into the computer, wherein the user command selectively chooses among the join relationships visually depicted on the display device.

5,842,210

METHOD AND APPARATUS FOR SELECTIVELY RETRIEVING DATA FROM A DATABASE IN A DATA COMMUNICATION SYSTEM

Xuming Chen, North Richland Hills; W. Garland Phillips, Arlington; Alain C. Briancon, McKinney, and Terence Edward Sumner, Azle, all of Tex., assignors to Motorola, Inc.

Filed Oct. 30, 1996, Ser. No. 741,482

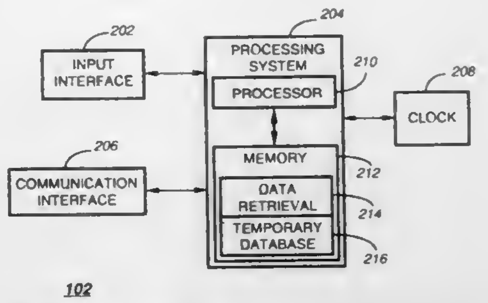
Int. Cl.^{6} G06F *17/30*

U.S. Cl. 707—10 **19 Claims**

1. A method in a data communication system having an input controller for receiving a message from a message originator, the input controller coupled to a home controller through a network, the method for selectively retrieving, by the input controller, data from a database in the home controller, the method comprising the steps of:

programming the data corresponding to a plurality of subscribers into the database, the data comprising a plurality of parameters for each of the plurality of subscribers;

selectively defining ones of the plurality of parameters to belong to parameter groups identified by parameter group identifiers;



generating, by the input controller in response to receiving the message, a request for the data corresponding to one of the plurality of subscribers from the database, the request further indicating a desired one of the parameter groups;

returning, from the home controller, the desired one of the parameter groups corresponding to the one of the plurality of subscribers, in response to the request; and

storing the data retrieved in a memory of the input controller for a predetermined time, thereby creating a temporary database.

5,842,211

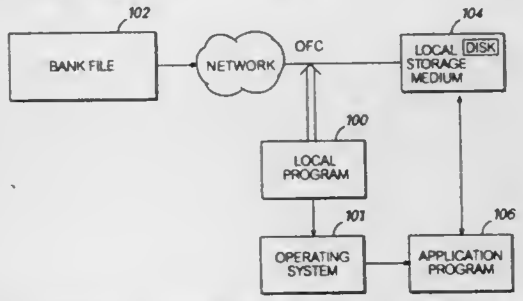
METHOD AND SYSTEM FOR TRANSFERRING A BANK FILE TO AN APPLICATION PROGRAM

Peter H. Horadan, Kirland; Richard A. Vaughan, Seattle, and Matthew L. Cone, Bellevue, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Mar. 14, 1997, Ser. No. 818,202

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 707—10 **19 Claims**



1. A method for transferring a bank file stored on a server associated with a financial institution to an application program running on a client computer, comprising:

creating a second file based on the bank file, said step of creating being performed by the server associated with the financial institution;

writing the second file to a local storage medium;

calling the operating system; and

the operating system causing the application program to transfer the second file from the local storage medium to the application program without user intervention.

5,842,212

DATA MODELING AND COMPUTER ACCESS RECORD MEMORY

Keith B. Ballurio, Mansassas; Matthew R. Edelstein, Arlington, and Brian B. Puckett, Oakton, all of Va., assignors to Information Project Group Inc., Herndon, Va.

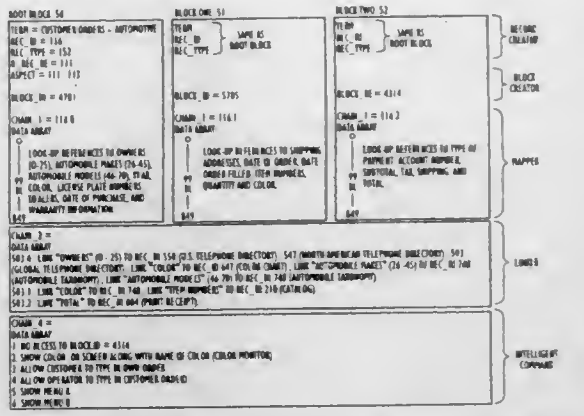
Filed Mar. 5, 1996, Ser. No. 610,945

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 707—100 **6 Claims**

1. A computer storage device for storing a data modeling record comprising:

a root block stored in the computer storage device, wherein the root block has a Chain-1 data array for containing data look-up references; and



a Chain-2 data array stored in the computer storage device for containing two-way network linkages.

5,842,213

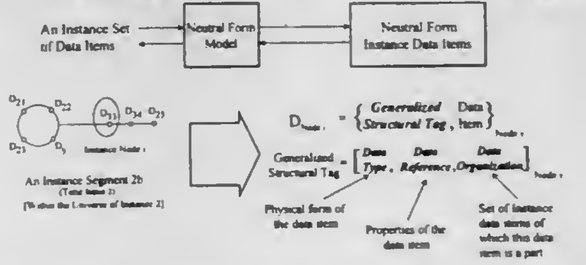
METHOD FOR MODELING, STORING, AND TRANSFERRING DATA IN NEUTRAL FORM

Paul S. Odom, 17023 Evergreen Elm Way, Houston, Tex. 77059, and Michael J. Massey, 3315 Plumb St., Houston, Tex. 77005

Filed Jan. 28, 1997, Ser. No. 789,860

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 707—100 **18 Claims**


An Instance Set of Data Items
Neutral Form Model
Neutral Form Instance Data Items
An Instance Segment 2b
Generalized Data
Structural Tag, Item
Generalized Structural Tag
Data Type,
Data Reference,
Data Organization
Physical form of the data item
Properties of the data item
Set of instance data items of which this data item is a part

1. A method of organizing and storing a set of information in neutral form in a computer based environment comprising the steps of:

a) organizing the set of information into instance data sets;

b) defining a time basis for the collection of instance data sets;

c) organizing each instance data set into an instance cluster comprised of data instance nodes;

d) assigning to each data instance node in an instance cluster a distinguishing structural tag comprising the following three components:

a data reference;

a data type;

a data organization;

e) defining the components of the structural tag for each data value in each instance cluster;

f) assigning properties of the data value to each structural tag;

g) storing the names of all of the structural tag elements together with their respective definitions and properties in a suitable format;

h) combining each data value and its respective structural tag to form a neutral form expression of the data; and

i) storing the resultant neutral form expression of the data value.

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5,842,214

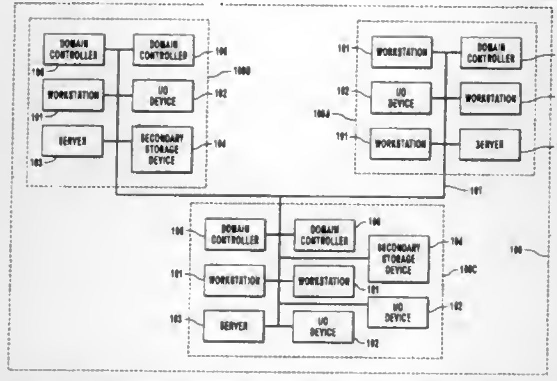
DISTRIBUTED FILE SYSTEM PROVIDING A UNIFIED NAME SPACE WITH EFFICIENT NAME RESOLUTION

Alan Whitney; Yuval Neeman, both of Bellevue; Sudheer Koneru, Redmond; Milan Shah, Redmond; Peter J. Cook, Redmond, and Arnold S. Miller, Bellevue, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Continuation of Ser. No. 174,910, Dec. 29, 1993, Pat. No. 5,701,462. This application Sep. 24, 1997, Ser. No. 936,852

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 707—10 **7 Claims**



1. In a distributed system having a first storage media partition and a second storage media partition, a method comprising the steps of:

running a first file system on the first storage media partition of the distributed system for storing and managing files;

running a second file system on the second storage media partition for storing and managing files, wherein the second file system differs from the first file system; and

providing a distributed file system that furnishes a single distributed name space with files in the first storage media partition and files in the second storage media partition and that furnishes name resolution services to the first file system and the second file system for the distributed name space, wherein the distributed file system is transparent to the first file system and the second file system.

5,842,215

Patent Not Issued For This Number

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storing said identification header and a representation of said original information in at least one key file; and

maintaining said at least one key file separate from said locked file for later retrieval of said original information.

5,842,216

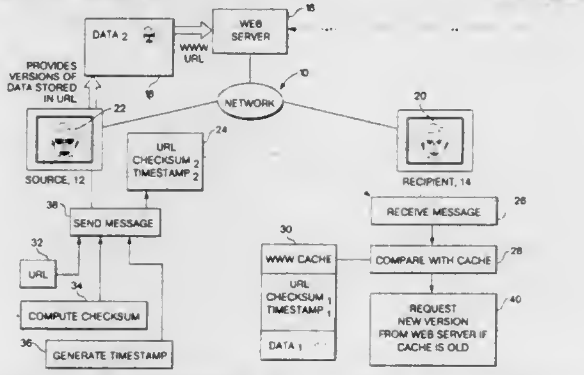
SYSTEM FOR SENDING SMALL POSITIVE DATA NOTIFICATION MESSAGES OVER A NETWORK TO INDICATE THAT A RECIPIENT NODE SHOULD OBTAIN A PARTICULAR VERSION OF A PARTICULAR DATA ITEM

David Anderson, Belmont, and Richard C. Waters, Concord, both of Mass., assignors to Mitsubishi Electric Information Technology Center America, Inc., Cambridge, Mass.

Filed May 3, 1996, Ser. No. 642,345

Int. Cl.^{6} G06F *15/163*

U.S. Cl. 707—203 **9 Claims**



1. A system for eliminating time consuming unnecessary transfers of data over a network, while at the same time guaranteeing timeliness of data used by a recipient node of said network, comprising:

a source of data coupled to said network, means at said source for sending a command in the form of a small positive data-notification message over said network for each version of said data to indicate that a recipient node should obtain a particular version of a particular data item;

means at said recipient node and responsive to said small data-notification message for determining whether the data corresponding to said small data-notification message is already present; and, means at said recipient node for fetching the data specified by said small data positive notification message if not already present at said recipient node, whereby said source commands via said small positive data-notification message that appropriate new data be fetched and available at said recipient node if not already there.

5,842,217

METHOD FOR RECOGNIZING COMPOUND TERMS IN A DOCUMENT

John Light, Hillsboro, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Dec. 30, 1996, Ser. No. 773,194

Int. Cl.^{6} G06F *17/30*

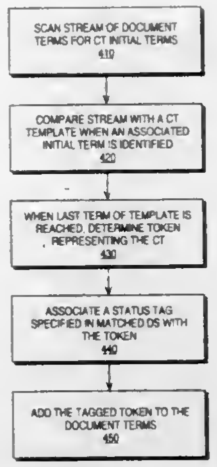
U.S. Cl. 707—101 **12 Claims**

1. A method for identifying a compound term in a document that is represented as a stream of document terms, the method comprising the steps of:

scanning the stream of document terms for an initial term associated with the compound term;

when the initial term is identified, accessing a compound term template that includes content, retention, and token specifications for the compound term;

comparing the stream, beginning with the initial term, to the compound term template; and


SCAN STREAM OF DOCUMENT TERMS FOR CT INITIAL TERMS
410
COMPARE STREAM WITH A CT TEMPLATE WHEN AN ASSOCIATED INITIAL TERM IS IDENTIFIED
420
WHEN LAST TERM OF TEMPLATE IS REACHED, DETERMINE TOKEN REPRESENTING THE CT
430
ASSOCIATE A STATUS TAG SPECIFIED IN MATCHED DS WITH THE TOKEN
440
ADD THE TAGGED TOKEN TO THE DOCUMENT TERMS
450

adding to the document stream a tagged token indicated by the token and retention specifications of the template, when the stream matches the content specification of the template.

5,842,218

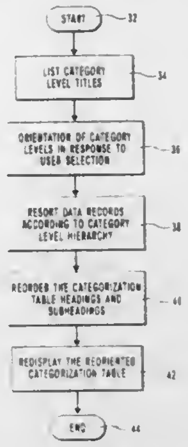
METHOD, COMPUTER PROGRAM PRODUCT, AND SYSTEM FOR A REORIENTING CATEGORIZATION TABLE

Marke James Robinson, Belmont, Mass., assignor to Media Plan, Inc., Sandy, Utah

Filed Dec. 6, 1996, Ser. No. 761,592

Int. Cl.^{6} G06F *17/00;17/30*

U.S. Cl. 707—102 **12 Claims**


START
32
LIST CATEGORY LEVEL TITLES
34
ORIENTATION OF CATEGORY LEVELS IN RESPONSE TO USER SELECTION
36
RESORT DATA RECORDS ACCORDING TO CATEGORY LEVEL HIERARCHY
38
REORDER THE CATEGORIZATION TABLE HEADINGS AND SUBHEADINGS
40
REDISPLAY THE REORIENTED CATEGORIZATION TABLE
42
END
44

1. A method for reorienting and displaying a categorization table having N different categorization levels, the categorization table categorizing a quantity of data records having data record fields, using values of each of the N categorization levels to form category headings for that particular level, and capable of being expanded or collapsed for each respective heading at each respective level, the method comprising the steps of:

displaying N categorization levels, each categorization level corresponding to a data record field;

forming a hierarchal order of the N categorization levels in response to a user selection, the user having created the hierarchal order from amongst potential hierarchal orderings;

displaying a reoriented categorization table into the quantity of data records wherein the N different categorization levels are arranged in the hierarchal order previously chosen and the category headings for each different level are made up of each of the different possible field values for the field corresponding to that particular level thereby reorienting the categorization table using the N categorization levels in response to the user selection of the hierarchal order of the N categorization levels.

5,842,219

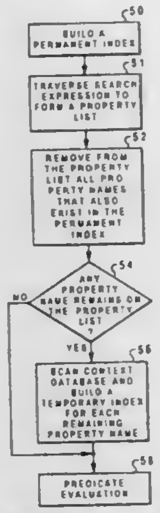
METHOD AND SYSTEM FOR PROVIDING A MULTIPLE PROPERTY SEARCHING CAPABILITY WITHIN AN OBJECT-ORIENTED DISTRIBUTED COMPUTING NETWORK

Robert Howard High, Jr., Round Rock, and Vinoj Narayan Kumar, Austin, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 14, 1996, Ser. No. 616,115

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 707—103 **19 Claims**


50
BUILD A PERMANENT INDEX
51
TRAVERSE SEARCH EXPRESSION TO FORM A PROPERTY LIST
52
REMOVE FROM THE PROPERTY LIST ALL PROPERTY NAMES THAT ALSO EXIST IN THE PERMANENT INDEX
54
ANY PROPERTY NAME REMAINS ON THE PROPERTY LIST ?
NO
YES
56
SCAN CONTEXT DATABASE AND BUILD A TEMPORARY INDEX FOR EACH REMAINING PROPERTY NAME
58
PREDICATE EVALUATION

1. A method for providing a multiple property searching capability within an object-oriented distributed computing network, said method comprising the steps of:

building a permanent index, wherein said permanent index includes a plurality of property names;

traversing a search expression having at least one property name to form a property name list, wherein said property name list includes all property names specified within said search expression;

removing from said property name list any of said specified property names that also exists in said permanent index;

determining whether or not there is any property name remaining on said property name list; and

in response to a determination that there is at least one property name remaining on said property list, building a temporary index for each remaining property name such that subsequent searches for frequently searched properties can be performed more efficiently.

5,842,220

METHODS AND APPARATUS FOR EXPOSING MEMBERS OF AN OBJECT CLASS THROUGH CLASS SIGNATURE INTERFACES

Michael De Groot, Cupertino, and Christopher Brumme, Half Moon Bay, both of Calif., assignors to Oracle Corporation, Redwood Shores, Calif.

Filed May 2, 1997, Ser. No. 850,688

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 707—103 **43 Claims**

1. A method of exposing object class information of an object in an object oriented software system, said method comprising the steps of:

providing, in said object oriented system, a class signature interface for an object class, wherein said object class, defined by an object model, includes at least one member; and

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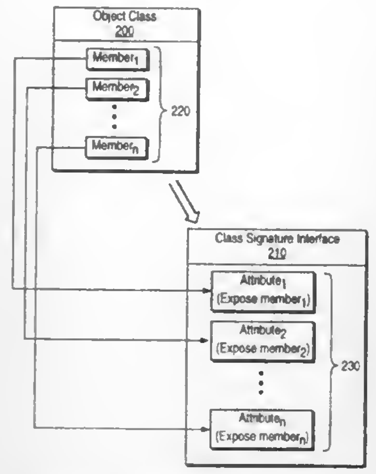

Object Class
200
Member1
Member2
Membern
220
Class Signature Interface
210
Attribute1 (Expose member1)
Attribute2 (Expose member2)
Attributen (Expose membern)
230

exposing, in said object oriented software system, said member of said object class by exposing access information to said member in said class signature interface.

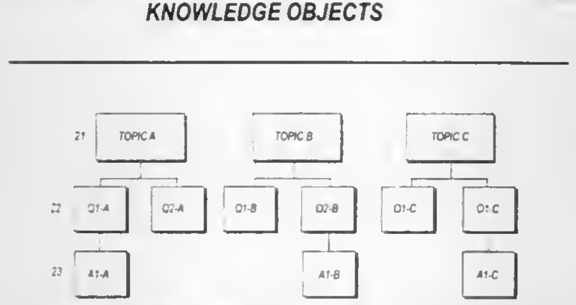
5,842,221
DYNAMIC FREQUENTLY ASKED QUESTIONS (FAQ) SYSTEM

Robert J. Schmonsees, Potomac, Md., assignor to Wisdom-Ware, Inc., Falls Church, Va.

Filed Feb. 19, 1997, Ser. No. 802,634

Int. Cl.^{6} G06F *17/00*

U.S. Cl. 707—104 **10 Claims**



1. A network user interface system for organizing frequently asked questions, comprising:

a database of topics, frequently asked questions, answers and links, wherein:

the topics are arranged in the database in a one to many relationship with corresponding ones of the frequently asked questions,

the questions are arranged in the database in a one to one relationship with corresponding ones of the answers, and

the answers are arranged in the database in a one to many relationship with corresponding ones of the links, and an interface having:

a first scrolling screen area of said topics from the database for selecting one of said topics;

a second scrolling screen area of questions from the database corresponding to the selected topic, for selecting one of said questions;

a third screen area of an answer corresponding to the selected question; and

a fourth scrolling screen area of links from the database corresponding to the selected question.

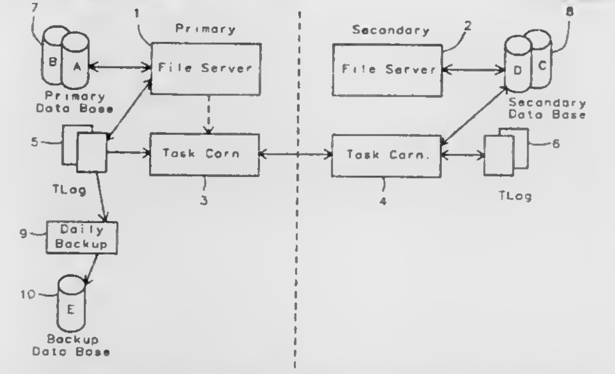
5,842,222
PRODUCTION INFORMATION SYSTEM ENHANCED FOR AVAILABILITY

Chun-Ching Lin, I-Lan; Yi-Hsin Chan, Chu-Pei; Hung-Chieh Hsu, Miaoly, and Shih-Yung Lo, Hsin-Chu, all of Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Ltd., Hsin-Chu, Taiwan

Filed Oct. 4, 1996, Ser. No. 725,803

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 707—202 **12 Claims**



1. A database and production information system adapted for high availability, and comprising:

a) a dual machine architecture having a primary and a secondary side,

b) each side having a fileserver, a database, a transaction log and a task communicator,

c) said database on the primary side being a primary database and said database on the secondary side being a secondary database,

d) said fileserver on the primary side being connected to the primary database, a transaction log, and a task communicator,

e) the task communicator on the primary side connected to the task communicator on the secondary side,

f) the primary system communicating with the secondary database through the task communicator on the primary side connected to the task communicator on the secondary side,

g) the task communicator on the primary side connected to the transaction log,

h) said transaction log on the primary side connected to a backup database through a daily backup process,

i) said backup database used for database maintenance thereby increasing the availability of the primary system.

5,842,223
METHOD AND APPARATUS FOR INFORMATION STATE MANAGEMENT

David M. Bristor, Menlo Park, Calif., assignor to Sun Microsystems Inc., Palo Alto, Calif.

Filed Jul. 3, 1995, Ser. No. 497,526

Int. Cl.^{6} G06F *17/30*

U.S. Cl. 707—204 **71 Claims**

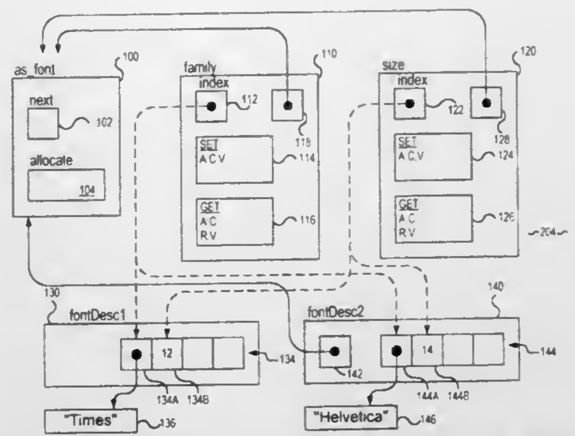
1. A method for accessing a data element in a memory of a computer system, the method comprising:

forming in the memory an attribute which defines the data element;

including the attribute in an attribute set structure which includes zero or more other attributes and to which additional attributes can subsequently be added;

forming in the memory one or more contexts, each of which can include a value of the data element;

including in the attribute an access procedure, execution of which accesses the value of the data element within a selected one of the one or more contexts; and



executing the access procedure while specifying the selected context to thereby access the value of the selected context.

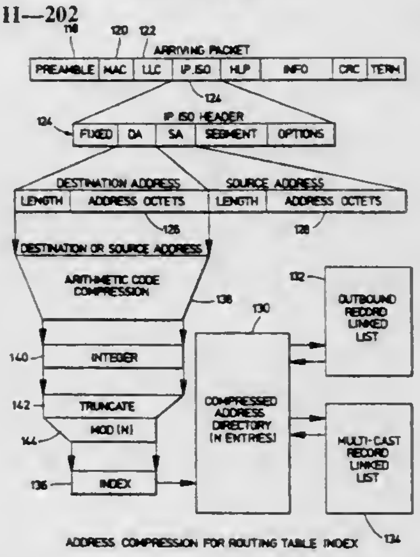
5,842,224
METHOD AND APPARATUS FOR SOURCE FILTERING DATA PACKETS BETWEEN NETWORKS OF DIFFERING MEDIA

Peter R. Fenner, 600 Goodwin, Richardson, Tex. 75081

Continuation of Ser. No. 737,147, Jul. 29, 1991, abandoned, which is a continuation-in-part of Ser. No. 367,012, Jun. 16, 1989, Pat. No. 5,095,480. This application Jun. 30, 1994, Ser. No. 269,951

Int. Cl.^{6} G06F *12/06*

U.S. Cl. 711—202 **13 Claims**



ADDRESS COMPRESSION FOR ROUTING TABLE INDEX

1. In a communication system having a plurality of data networks interconnected for communicating packets of data, each packet containing a source address of a sender, a data packet and a destination address of a receiver for the data packet, a method comprising:

at a media access controller for interconnecting one data network of a plurality of data networks to at least a second data network of the plurality of data networks receiving a data packet from the second data network;

examining the data packet for a source address contained in the data packet;

looking up, in a directory table stored at the controller, the source address for obtaining source filtering information relating to the source the step of looking up comprising the steps of,

arithmetically coding, according to a predetermined model, the source address as a numerical value uniquely identifying a record of data containing source filtering information for the source address, and

accessing the record of data identified by the numerical value for retrieving the source filtering information associated with the source address; and

determining whether or not any nodes of the first data network which are connected to the controller are protected from receiving the data packet from the source.

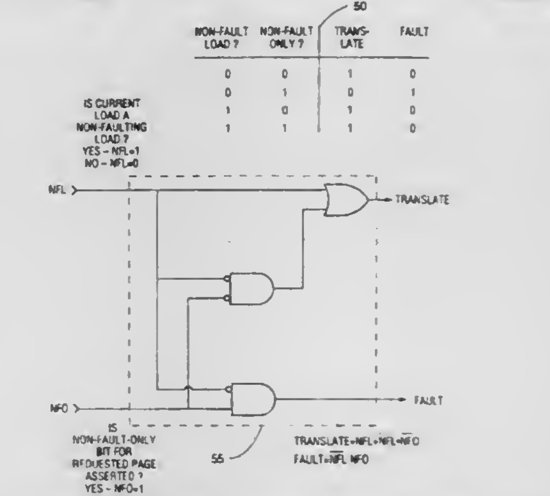
5,842,225
METHOD AND APPARATUS FOR IMPLEMENTING NON-FAULTING LOAD INSTRUCTION

Leslie Kohn, Fremont, Calif., assignor to Sun Microsystems, Inc., Palo Alto, Calif.

Filed Feb. 27, 1995, Ser. No. 395,579

Int. Cl.^{6} G06F *12/10*

U.S. Cl. 711—202 **22 Claims**


50
NON-FAULT LOAD ?
NON-FAULT ONLY ?
TRANS-LATE
FAULT
0 0 1 0
0 1 0 1
1 0 1 0
1 1 1 0
IS CURRENT LOAD A NON-FAULTING LOAD ? YES - NFL=1 NO - NFL=0
NFL
TRANSLATE
NFO
FAULT
IS NON-FAULT-ONLY BIT FOR REQUESTED PAGE ASSERTED ? YES - NFO=1 NO - NFO=0
55
TRANSLATE=NFL+NFL+NFO
FAULT=NFL NFO

1. A translation table entry within a memory, for use by a processor, the translation table entry comprising:

a virtual address portion that specifies a virtual address space to which the translation table entry applies;

a physical address portion that specifies a physical address space to which the virtual address space corresponds; and

a non-fault-only bit, wherein the non-fault-only bit indicates whether or not a non-fault instruction or a normal fault load instruction has access to the virtual address space.

5,842,226
VIRTUAL MEMORY MANAGEMENT FOR A MICROKERNEL SYSTEM WITH MULTIPLE OPERATING SYSTEMS

Gary Lee Barton; Ching-Yun Chao; Charles Chuldoo Jung; Freeman Leigh Rawson, III; Hardeep Singh, all of Boca Raton, and Guy Gil Sotomayor, Jr., West Palm Beach, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 9, 1994, Ser. No. 303,851

Int. Cl.^{6} G06F *12/08*

U.S. Cl. 711—203 **15 Claims**

1. In a data processing system a memory management apparatus, comprising:

an auxiliary data source means in the data processing system, for storing data in original format;

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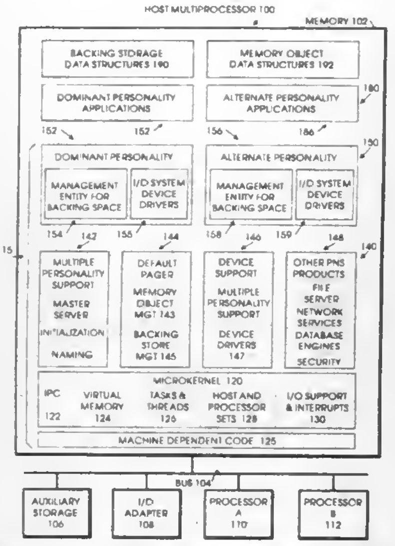

a bus means coupled to said auxiliary data source means;

a memory means in the data processing system coupled to said auxiliary data source device over said bus means, for storing data structures and program instructions;

a processor means coupled to the memory means and to the auxiliary data source device over the bus means, for executing said program instructions stored in said memory means;

a personality server in said memory means, coupled to said auxiliary data source means, for using a unique operating system personality accessing method to access said data in said auxiliary data source means having said original format, and loading it into said memory means;

a personality neutral pager means in said memory, coupled to said personality server, for reformatting said data into a backing storage format, for operating system personality neutral backing storage in said memory means;

said personality neutral pager means forming said backing storage format for data in said memory by organizing said data into pages contained in frames, said frames being contained in paging spaces in said memory means;

said original format for data in said auxiliary data source means including data units of contiguous data;

said personality neutral pager means organizing said data units of contiguous data into a single frame of said pages.

PATENTS

GRANTED November 24, 1998

ERRATA

Designs

For CLASS	See PATENT NO.
D23—286	D401,693

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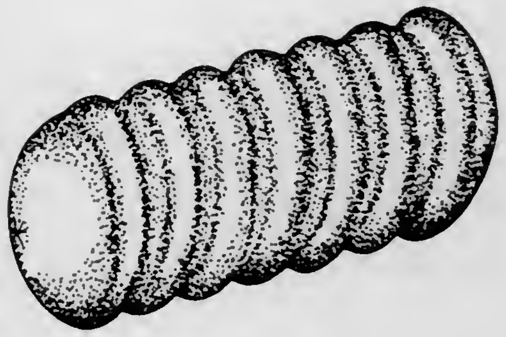
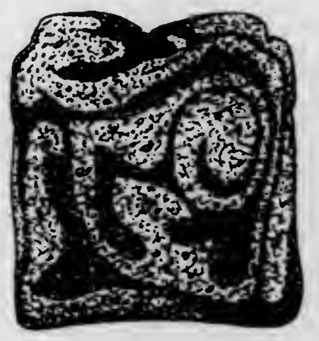
DESIGNS

NOVEMBER 24, 1998

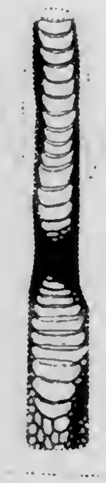
401,385
CASING MEAT PRODUCT WITH A HELICAL SURFACE
Neil Mintz, 7129 Rockrose Terr., Carlsbad, Calif. 92009
Filed Aug. 29, 1997, Ser. No. 80,128
Term of patent 14 years
LOC (6) Cl. 01 - *01*
U.S. Cl. D1—125



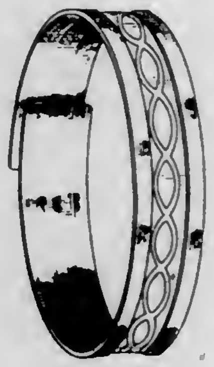
401,386
FRONT AND REAR FACES OF A TOASTED BREAD SLICE
Tiziano Boselli, Parma, Italy, assignor to Barilla Alimentare S.p.A., Italy
Filed Oct. 6, 1997, Ser. No. 77,578
Claims priority, application Italy, Apr. 7, 1997, Mi 97 00193
Term of patent 14 years
LOC (6) Cl. 01 - *01*
U.S. Cl. D1—129



401,387
GLOVE
Roy Chamberlain, 821 Shun Pike, Cottontown, Tenn. 37048
Filed Aug. 21, 1997, Ser. No. 75,745
Term of patent 14 years
LOC (6) Cl. 02 - *06*
U.S. Cl. D2—623



401,388
ILLUMINATED BELT
Michael Knight, Bloomington, Minn., and Richard Harolde, Woodacre, Calif., assignors to Lumitech, Inc., Wayzata, Minn.
Filed Oct. 31, 1996, Ser. No. 61,808
Term of patent 14 years
LOC (6) Cl. 02 - *07*
U.S. Cl. D2—638



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401,389
ZIPPER AND BUTTON PULLER

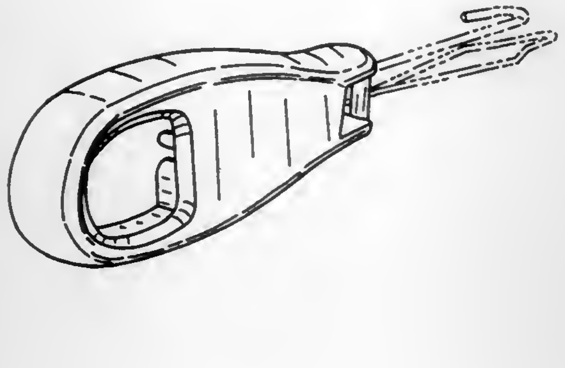
Curtis Taylor, Chagrin Falls; Jeffrey S. Plantz, Seven Hills, and Nicholas E. Stanca, Westlake, all of Ohio, assignors to Magic American Corporation, Cleveland, Ohio

Filed Aug. 11, 1997, Ser. No. 75,126

Term of patent 14 years

LOC (6) Cl. 07 - *99*

U.S. Cl. D2—641



401,390
SHIRT IN A SIMULATIVE ARRANGEMENT FOR PRESENTATION

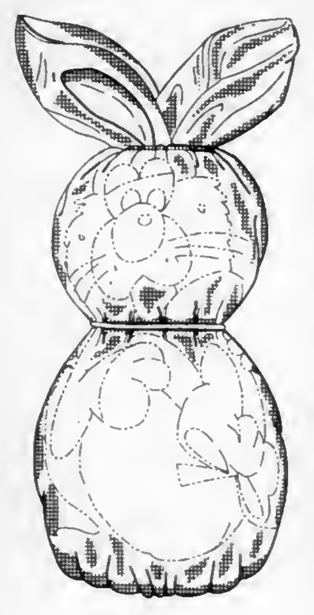
Walter Both, Tarper St 2, 24997 Wanderup, Germany

Filed Apr. 4, 1996, Ser. No. 52,590

Term of patent 14 years

LOC (6) Cl. 02 - *02*

U.S. Cl. D2—840



401,391
GOLF SHOE

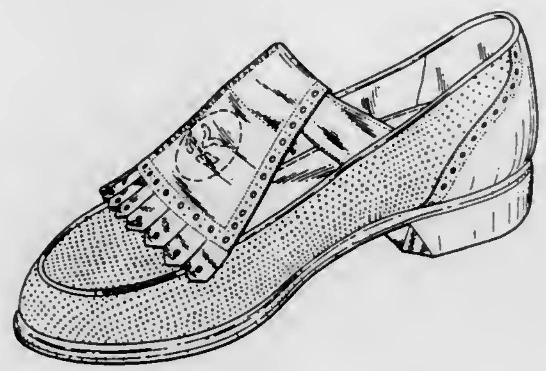
Alessandro Genuin, Munich, Germany, assignor to Genuin Golf & Dress of America, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 50,568, Jan. 25, 1996, Pat. No. Des. 382,388. This application Sep. 6, 1996, Ser. No. 59,323

Term of patent 14 years

LOC (6) Cl. 02 - *04*

U.S. Cl. D2—906



401,392
CAP WITH VISOR

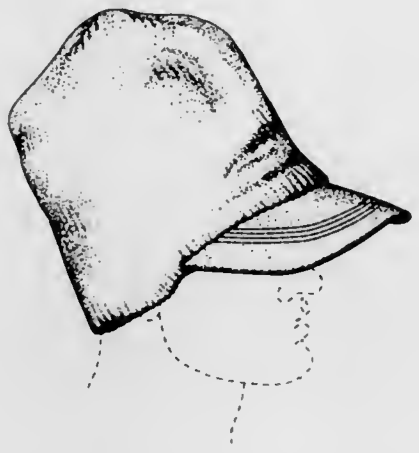
John W. DiGiglia, Lake Charles, La., assignor to Dubber-Bugger Industries, Newport Beach, Calif.

Filed Oct. 27, 1997, Ser. No. 78,484

Term of patent 14 years

LOC (6) Cl. 02 - *03*

U.S. Cl. D2—879



401,393
COMBINED NECK AND EAR SHADE

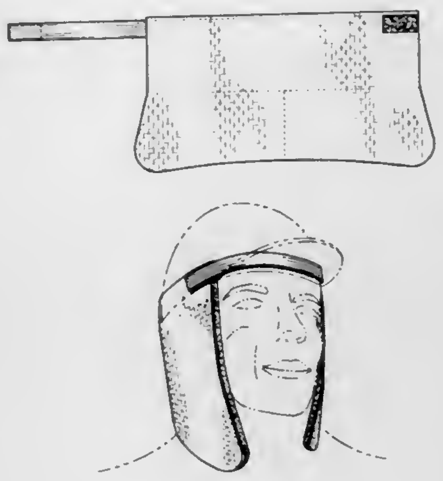
Gene Johanson; Betty Johanson, and Wesley Johanson, all of Rte. 1, Box 665V, Aransas Pass, Tex. 78336

Filed Mar. 4, 1997, Ser. No. 66,987

Term of patent 14 years

LOC (6) Cl. 29 - *02*

U.S. Cl. D2—891



401,394
DENIM BOOT UPPER WITH SIDE POCKET AN BUTTON FLY

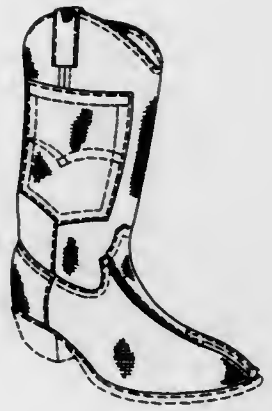
Albert Dale Herndon, 11872 Turquoise St., Garden Grove, Calif. 92645

Filed Mar. 26, 1997, Ser. No. 68,518

Term of patent 14 years

LOC (6) Cl. 02 - *04*

U.S. Cl. D2—910



401,395
BOTTOM SURFACE PORTION OF A SHOE OUTSOLE

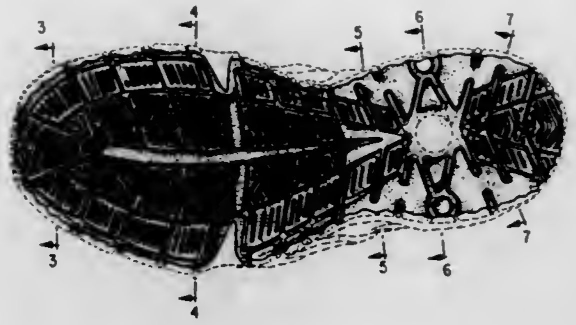
Richard D. Clarke, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.

Filed Jan. 30, 1998, Ser. No. 82,790

Term of patent 14 years

LOC (6) Cl. 02 - *04*

U.S. Cl. D2—953



401,396
SHOE SOLE

Toshikazu Kayano, Kobe, Japan, assignor to Asics Corporation, Japan

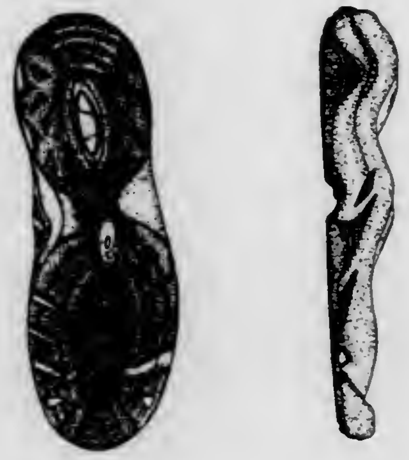
Filed Oct. 29, 1997, Ser. No. 78,668

Claims priority, application Japan, May 9, 1997, 9-53841

Term of patent 14 years

LOC (6) Cl. 02 - *04*

U.S. Cl. D2—954



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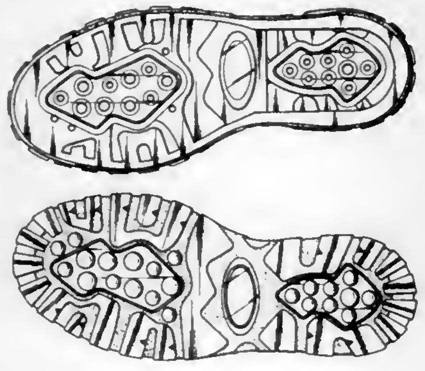
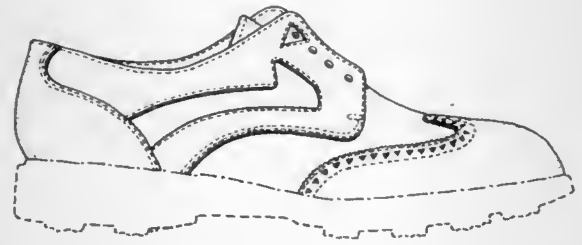
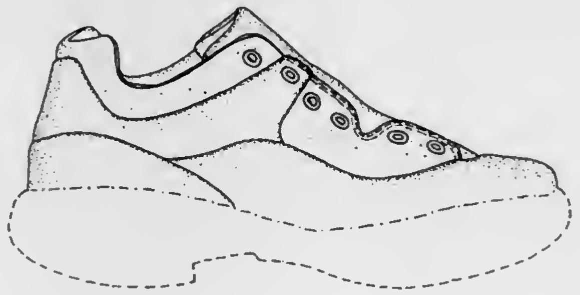
401,397
SHOE SOLE
Eddie Chen, 4F-3, No. 255, Sec. 1, Taichung-Kang Rd., Taichung City, Taiwan
Filed Oct. 1, 1997, Ser. No. 77,437
Term of patent 14 years
LOC (6) Cl. 02 - *04*
U.S. Cl. D2—957



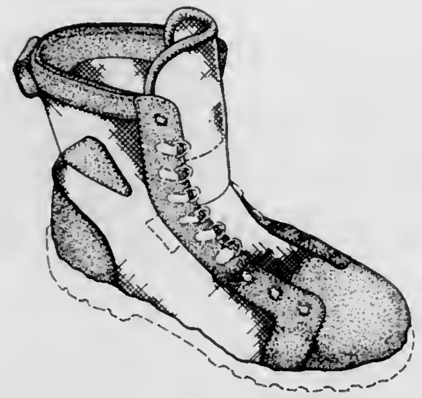
401,398
SHOE UPPER
Ragnar Carlson, S. Yarmouth, Mass., assignor to The Rockport Company, Inc., Marlboro, Mass.
Filed Oct. 28, 1997, Ser. No. 78,591
Term of patent 14 years
LOC (6) Cl. 02 - *04*
U.S. Cl. D2—969



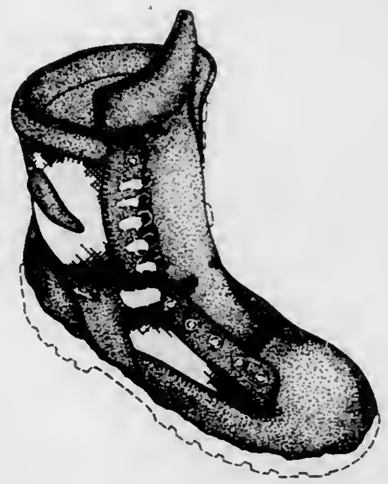
401,399
SHOE UPPER
Peter von Conta, Putnam, Conn., and Gary P. Duclos, Newbury Port, Mass., assignors to The Rockport Company, Inc., Marlboro, Mass.
Filed Mar. 3, 1997, Ser. No. 67,296
Term of patent 14 years
LOC (6) Cl. 02 - *04*
U.S. Cl. D2—969



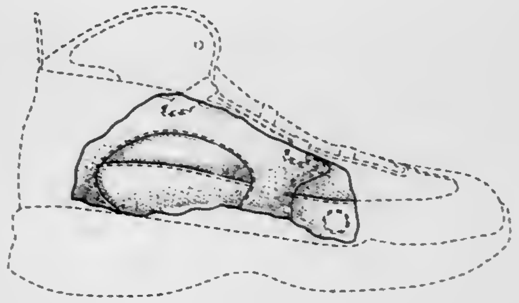
401,400
SHOE UPPER
Mike Brooks, Nelsonville; Edgar H. Simpson, Lancaster, both of Ohio; Theodore A. Kastner, Raymond, Me., and Diana A. Wurfbain, Athens, Ohio, assignors to Rocky Shoes & Boots, Inc., Nelsonville, Ohio
Filed Sep. 29, 1997, Ser. No. 77,187
Term of patent 14 years
LOC (6) Cl. 02 - *04*
U.S. Cl. D2—970



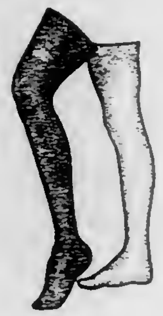
401,401
SHOE UPPER
Mike Brooks, Nelsonville; Edgar H. Simpson, Lancaster, both of Ohio; Theodore A. Kastner, Raymond, Me., and Diana A. Wurfbain, Athens, Ohio, assignors to Rocky Shoes & Boots, Inc., Nelsonville, Ohio
Filed Sep. 29, 1997, Ser. No. 77,641
Term of patent 14 years
LOC (6) Cl. 02 - *04*
U.S. Cl. D2—970



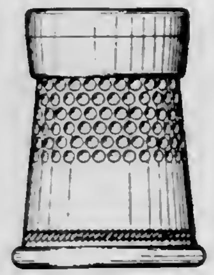
401,402
SIDE ELEMENT OF A SHOE UPPER
Richard D. Clarke, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Oct. 21, 1997, Ser. No. 78,192
Term of patent 14 years
LOC (6) Cl. 02 - *99*
U.S. Cl. D2—972



401,403
CONTRAST COLORED HOSIERY
Reinhard Schreiber, D 26524 Halbemond, Nadörsterstr. 13, Germany
Filed Dec. 16, 1993, Ser. No. 16,407
Claims priority, application Germany, Jun. 22, 1993, M 930 5382.7
Term of patent 14 years
LOC (6) Cl. 02 - *04*
U.S. Cl. D2—980



401,404
THIMBLE
Paul A. Raterink, 2500 McIntosh Ave. NE., Grand Rapids, Mich. 49505
Filed Aug. 26, 1996, Ser. No. 58,860
Term of patent 14 years
LOC (6) Cl. 02 - *07*
U.S. Cl. D3—29



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401,405

TOILETRY CONTAINER

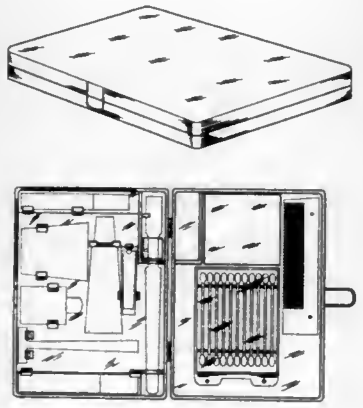
Dong Jin Kim, 12700 Yukon Ave., Hawthorne, Calif. 90250, and Sung Jin Kang, 13100 Alondra Blvd., Suite 106, Cerritos, Calif. 90703

Filed Mar. 4, 1997, Ser. No. 67,499

Term of patent 14 years

LOC (6) Cl. 03 - *01*

U.S. Cl. D3—205



401,406

PERSONAL ITEMS TRANSPORT CASE

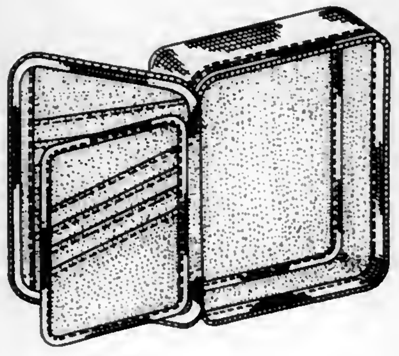
Roger J. Alves, Simi Valley, and Kasidy W. Alves, Oxnard, both of Calif., assignors to Scosche Industries, Inc., Oxnard, Calif.

Filed Apr. 22, 1997, Ser. No. 69,513

Term of patent 14 years

LOC (6) Cl. 03 - *01*

U.S. Cl. D3—215



401,407

MOBILE STORAGE APPARATUS

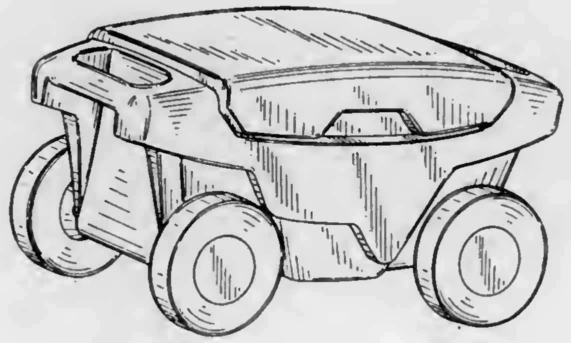
Jay M. Bro, Plano, and David Bradshaw, Garland, both of Tex., assignors to Today's Kids, Inc., Booneville, Ark.

Filed Nov. 21, 1997, Ser. No. 79,659

Term of patent 14 years

LOC (6) Cl. 03 - *01*

U.S. Cl. D3—271



401,408

BRIEFCASE

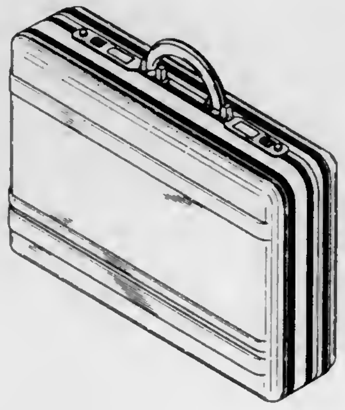
Li Hsin Sun; Feng Ching O, both of 2801 Waterman Blvd., Suite 270, Fairfield, Calif. 94533, and Mau Shing Jan, 1213F, Lane 67, Lin-Sun N. Rd., Taipei, Taiwan

Filed Aug. 14, 1997, Ser. No. 75,595

Term of patent 14 years

LOC (6) Cl. 03 - *01*

U.S. Cl. D3—276



401,409

TOOL BOX

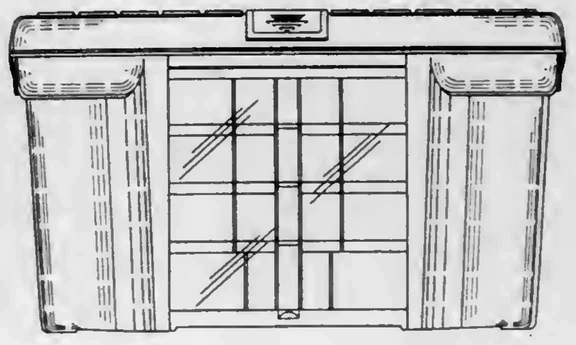
Zvi Yemini, Tel Aviv, Israel, assignor to ZAG Industries LTD., Rosh Haayin, Israel

Filed May 12, 1997, Ser. No. 70,618

Term of patent 14 years

LOC (6) Cl. 03 - *01*

U.S. Cl. D3—281



401,410

FACING FOR A BINDER OR PORTFOLIO AND CLOSURE ELEMENT

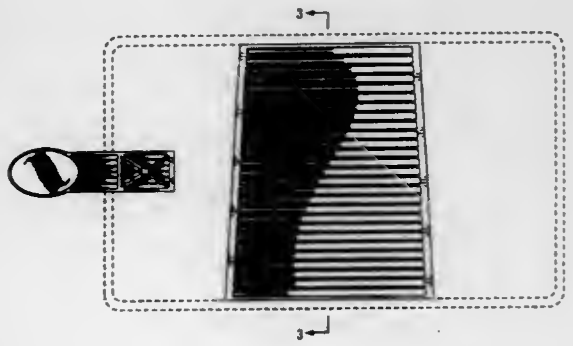
Jon R. Wyant, Spring Valley, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Nov. 13, 1996, Ser. No. 62,319

Term of patent 14 years

LOC (6) Cl. 03 - *01*

U.S. Cl. D3—303



401,411

GIFT BASKET ADORNED WITH TRIM AND RIBBONS

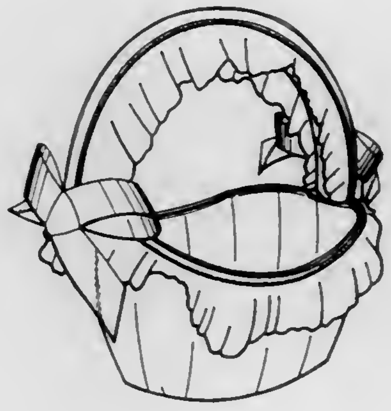
W. Ann Chirillo, 1505 Manor Dr., Daytona Beach, Fla. 32114

Filed Jul. 15, 1996, Ser. No. 57,036

Term of patent 14 years

LOC (6) Cl. 03 - *01*

U.S. Cl. D3—307



401,412

BIN

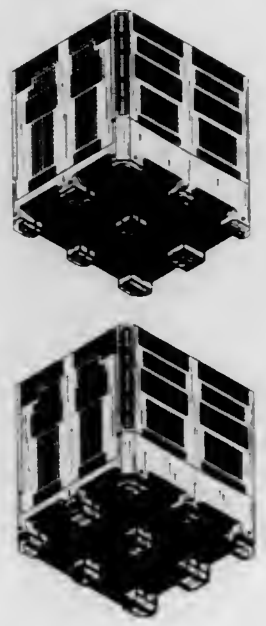
Stephane F. LeTrudet, St. Peters, Mo., assignor to Allibert-Contico, L.L.C., Bridgeton, Mo.

Filed Oct. 9, 1997, Ser. No. 77,717

Term of patent 14 years

LOC (6) Cl. 03 - *01*

U.S. Cl. D3—314



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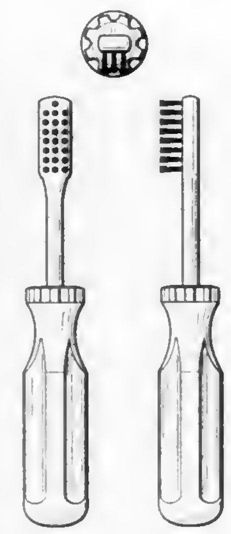
401,413
TOOTHBRUSH WITH HANDLE

Timothy R. Porter, P.O. Box 8007, Tulsa, Okla. 74101-8007
Division of Ser. No. 56,935, Jul. 11, 1996, Pat. No. Des. 389,312, which is a division of Ser. No. 35,092, Feb. 21, 1995, Pat. No. Des. 373,474. This application Jul. 2, 1997, Ser. No. 73,172
Term of patent 14 years
LOC (6) Cl. 04 - *02*

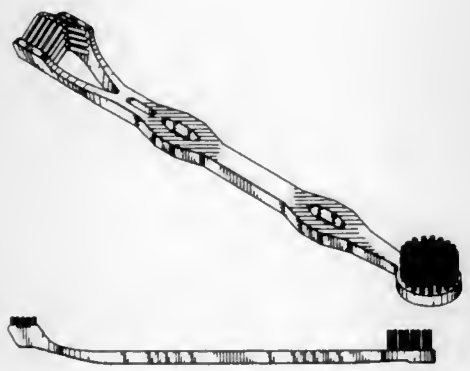
U.S. Cl. D4—104



401,414
MULTIPLE HEAD TOOTH BRUSH

Jean Louis Vrignaud, 13802 N. Scottsdale Rd., Ste. 104-22, Scottsdale, Ariz. 85254
Filed Nov. 7, 1996, Ser. No. 62,132
Term of patent 14 years
LOC (6) Cl. 04 - *02*

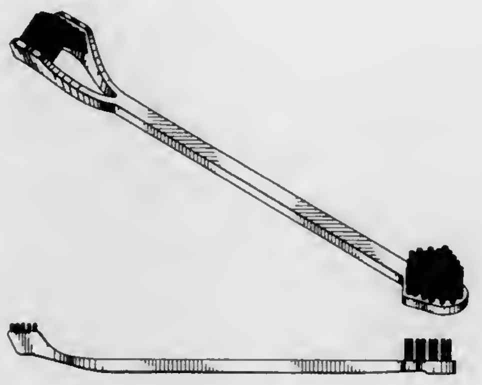
U.S. Cl. D4—106



401,415
MULTIPLE HEAD TOOTH BRUSH

Jean Louis Vrignaud, 13802 N. Scottsdale Rd. Ste 104-22, Scottsdale, Ariz. 85254
Filed Nov. 7, 1996, Ser. No. 62,133
Term of patent 14 years
LOC (6) Cl. 04 - *02*

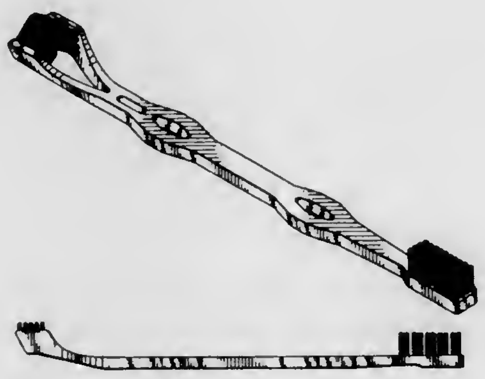
U.S. Cl. D4—106



401,416
MULTIPLE HEAD TOOTH BRUSH

Jean Louis Vrignaud, 13802 N. Scottsdale Rd., Ste. 104-22, Scottsdale, Ariz. 85254
Filed Nov. 7, 1996, Ser. No. 62,134
Term of patent 14 years
LOC (6) Cl. 04 - *02*

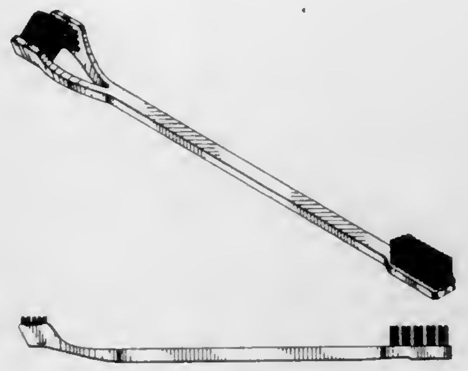
U.S. Cl. D4—106



401,417
MULTIPLE HEAD TOOTH BRUSH

Jean Louis Vrignaud, 13802 N. Scottsdale Rd., Ste. 104-22, Scottsdale, Ariz. 85254
Filed Nov. 7, 1996, Ser. No. 62,367
Term of patent 14 years
LOC (6) Cl. 04 - *02*

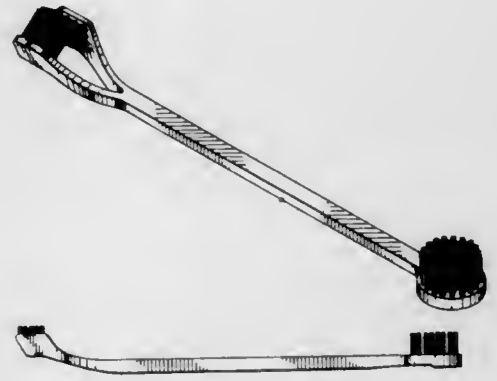
U.S. Cl. D4—106



401,418
MULTIPLE HEAD TOOTH BRUSH

Jean Louis Vrignaud, 13802 N. Scottsdale Rd., Ste. 104-22, Scottsdale, Ariz. 85254
Filed Nov. 7, 1996, Ser. No. 62,368
Term of patent 14 years
LOC (6) Cl. 04 - *02*

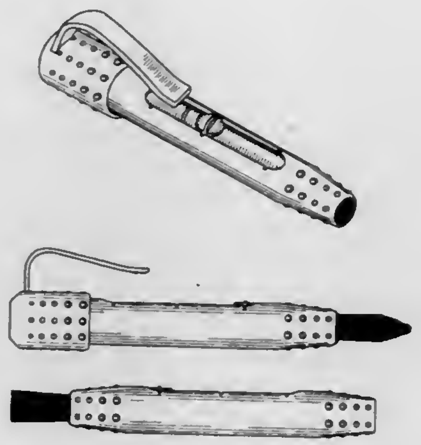
U.S. Cl. D4—106



401,419
RETRACTABLE DETAIL BRUSH WITH CAP

Jerome J. Hartmann, Carlisle, and Thomas R. Steinhagen, West Des Moines, both of Iowa, assignors to Cobbs Manufacturing Company, Des Moines, Iowa
Filed Oct. 27, 1997, Ser. No. 78,569
Term of patent 14 years
LOC (6) Cl. 04 - *04*

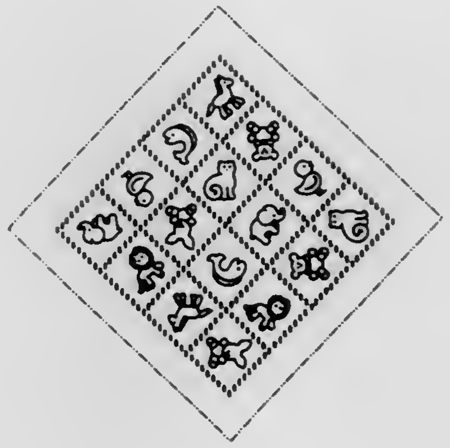
U.S. Cl. D4—135



401,420
PATTERN FOR A NONWOVEN WIPE

Lester Charles Sporing, Loveland, and Patricia Lynn Neiheisel, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Feb. 5, 1997, Ser. No. 66,038
Term of patent 14 years
LOC (6) Cl. 05 - *06*

U.S. Cl. D5—26



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401,421
BATHROOM TISSUE

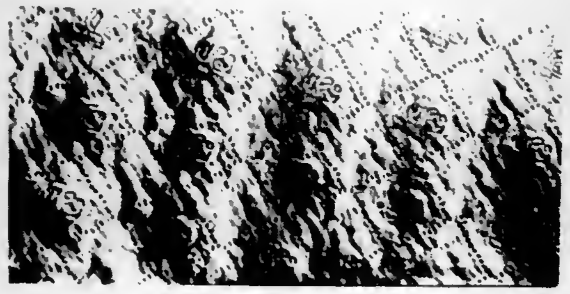
Gaylyn A. Schulz, Appleton, Wis., assignor to Fort James Corporation, Richmond, Va.

Continuation of Ser. No. 35,510, Feb. 28, 1995, abandoned, which is a continuation of Ser. No. 13,607, Sep. 28, 1993, abandoned, which is a continuation of Ser. No. 921,705, Jul. 30, 1992, abandoned. This application Apr. 1, 1996, Ser. No. 52,485

Term of patent 14 years

LOC (6) Cl. 05 - *06*

U.S. Cl. D5—53



401,422
FABRIC

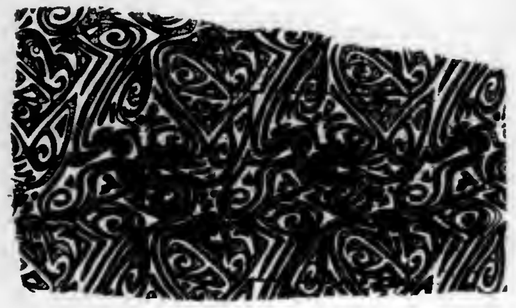
Amy S. Minkin, Canton, Mass., assignor to SRL, Inc., Wilmington, Del.

Filed Feb. 10, 1997, Ser. No. 66,265

Term of patent 14 years

LOC (6) Cl. 05 - *06*

U.S. Cl. D5—62



401,423
TRI-VIEW MIRROR

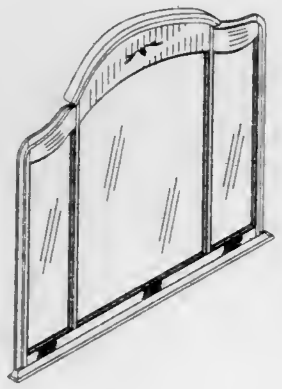
Paul Zaidman, Winnipeg, Canada, assignor to Palliser Furniture, Ltd., Winnipeg, Canada

Filed Feb. 28, 1997, Ser. No. 66,719

Term of patent 14 years

LOC (6) Cl. 06 - *07*

U.S. Cl. D6—302



401,424
MODULAR FURNITURE UNIT

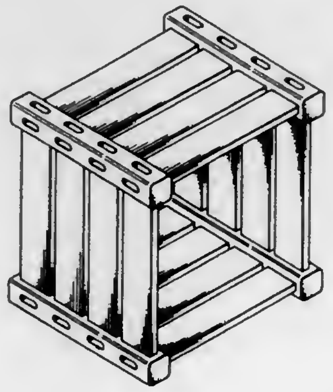
Tatsujiro Ogo, 3-232 Monuryonan-Cho, Sanai-shi, and Kiyoshi Suzuki, 1-215, Sengen-Cho, Ohmiya-City, Saitama, both of Japan

Filed Mar. 21, 1997, Ser. No. 68,477

Term of patent 14 years

LOC (6) Cl. 06 - *06*

U.S. Cl. D6—329



401,425
ROCKING CHAIR

Charles Desnoyers, St. Pie, Canada, assignor to Dutailier International Inc., Canada

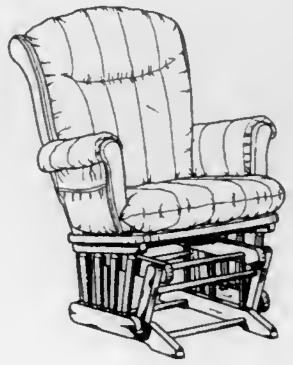
Filed Sep. 24, 1997, Ser. No. 77,037

Claims priority, application Canada, Aug. 25, 1997, 2216

Term of patent 14 years

LOC (6) Cl. 06 - *01*

U.S. Cl. D6—344



401,426
SKATE AND FOOTWEAR FITTING STATION

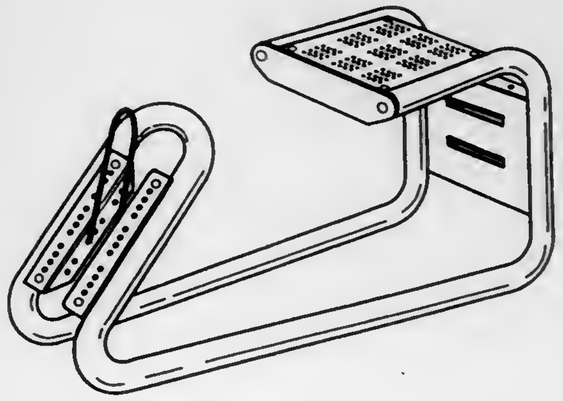
Antonio Hu, Menlo Park, and Louis Hsiao, Palo Alto, both of Calif., assignors to Concept Designs Inc, Mt View, Calif.

Filed Nov. 19, 1996, Ser. No. 62,592

Term of patent 14 years

LOC (6) Cl. 06 - *01*

U.S. Cl. D6—349



401,427
CHAIR SADDLE

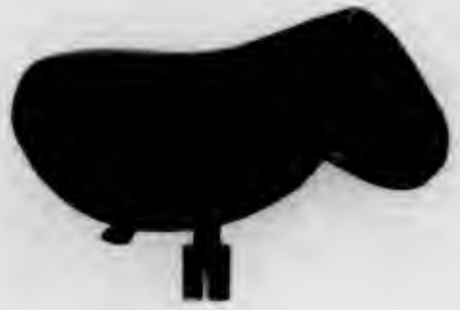
Veli-Jussi Jalkanen, Rautalampi, Finland, assignor to Easydoing Ky, Rautalampi, Finland

Filed Mar. 11, 1996, Ser. No. 51,487

Term of patent 14 years

LOC (6) Cl. 06 - *01*

U.S. Cl. D6—354



401,428
CHAIR

Peter Kaczmarek, Downview, Canada, assignor to Global Upholstery Company, Toronto, Canada

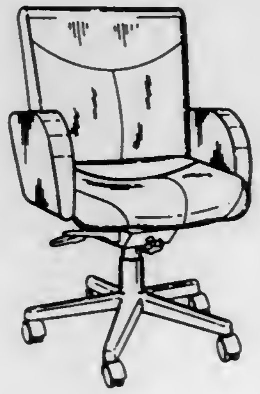
Filed Jun. 19, 1996, Ser. No. 55,979

Claims priority, application Canada, Jun. 4, 1996, 1996-1315

Term of patent 14 years

LOC (6) Cl. 06 - *01*

U.S. Cl. D6—366



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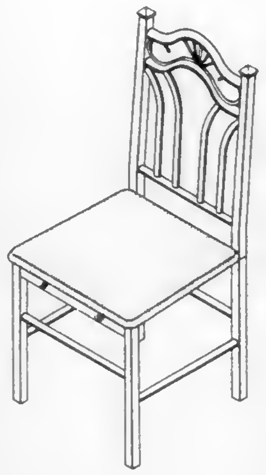
401,429
CHAIR

Chuen-Jong Tseng, Chiayi Hsien, Taiwan, assignor to Shin Yen Enterprise Co., Ltd., Chiayi Hsien, Taiwan
Filed Nov. 17, 1997, Ser. No. 79,599
Term of patent 14 years
LOC (6) Cl. 06 - *01*

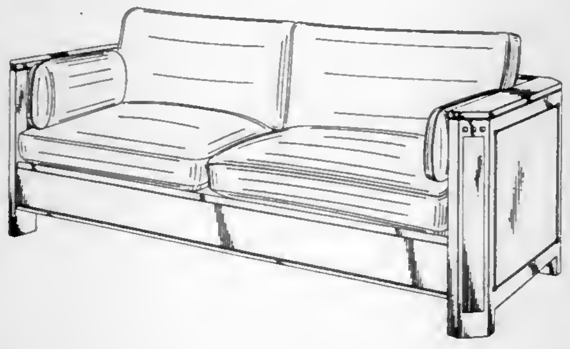
U.S. Cl. D6—380



401,430
SOFA

William E. De Blaay, Manlius, N.Y., assignor to L & J. G. Stickley, Inc., Manlius, N.Y.
Filed Sep. 8, 1997, Ser. No. 76,207
Term of patent 14 years
LOC (6) Cl. 06 - *01*

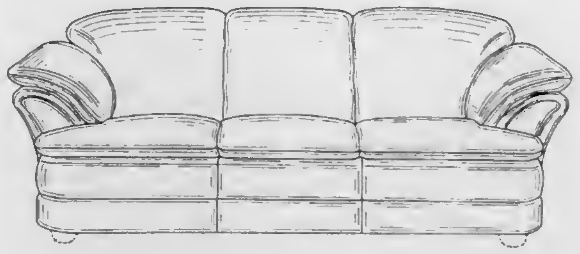
U.S. Cl. D6—381



401,431
SEAT

Pasquale Natuzzi, and Arcangelo Scarati, both of Bari, Italy, assignors to Industrie Natuzzi, Spa, Santeramo, Italy
Filed Sep. 15, 1997, Ser. No. 77,022
Term of patent 14 years
LOC (6) Cl. 06 - *01*

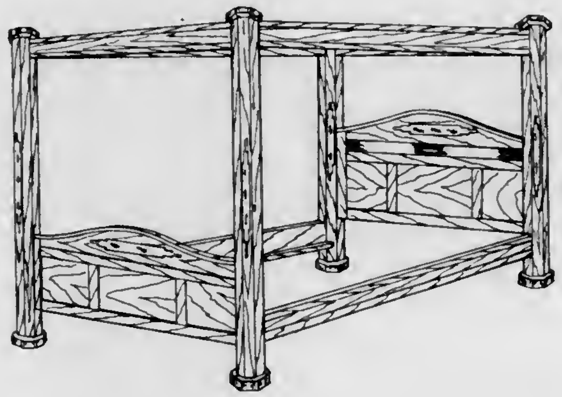
U.S. Cl. D6—381



401,432
SOUTHWESTERN BED

Ronald A. Lowery, 12540 E. Calle Tatita, Tucson, Ariz. 85749
Division of Ser. No. 51,124, Mar. 4, 1996, Pat. No. Des. 387,214. This application Dec. 5, 1997, Ser. No. 80,254
Term of patent 14 years
LOC (6) Cl. 06 - *01*

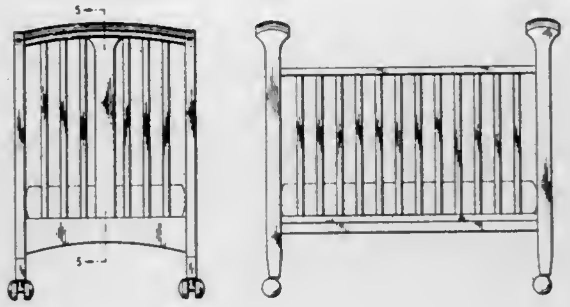
U.S. Cl. D6—389



401,433
CRIB

Lawrence E. Tabbia, 102 E. Pleasant Grove Rd., Jackson, N.J. 08527, assignor to Lawrence E. Tabbia, Jackson, N.J.
Filed Feb. 14, 1997, Ser. No. 66,502
Term of patent 14 years
LOC (6) Cl. 06 - *01*

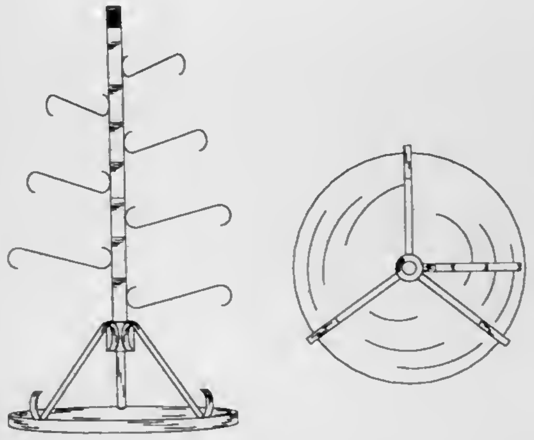
U.S. Cl. D6—390



401,434
HALL TREE FLOOR LAMP AND COAT RACK

Wade Meteer, R.R. #1, Box 221, Athens, Ill. 62613
Filed Dec. 2, 1996, Ser. No. 63,228
Term of patent 14 years
LOC (6) Cl. 06 - *04*

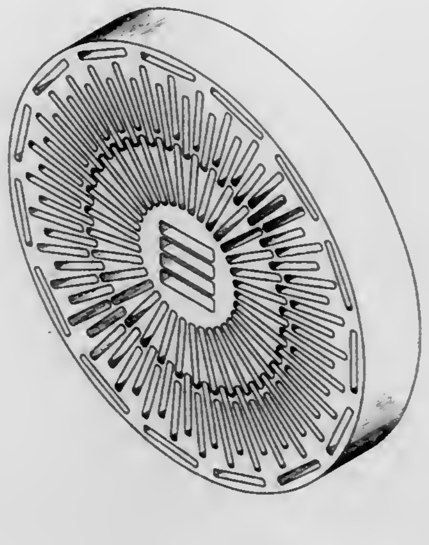
U.S. Cl. D6—399



401,435
COMPACT DISC DISPLAY/STORAGE CAROUSEL

Richard W. Memmer, 1801 Paces River Ave. #202, Rock Hill, S.C. 29732
Filed Mar. 20, 1997, Ser. No. 68,716
Term of patent 14 years
LOC (6) Cl. 06 - *04*

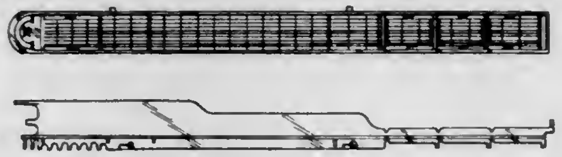
U.S. Cl. D6—407



401,436
DISPLAY RACK

Richard Jay, Westport, Conn., assignor to Display Technologies, Inc., Whitestone, N.Y.
Filed Aug. 8, 1996, Ser. No. 58,137
Term of patent 14 years
LOC (6) Cl. 06 - *04*

U.S. Cl. D6—408



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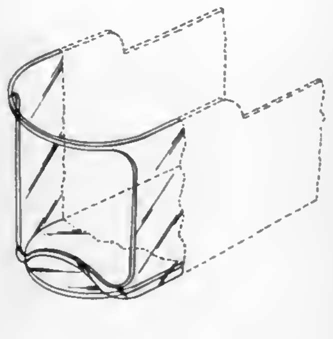
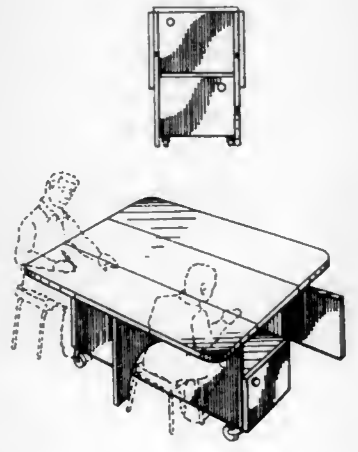
401,437
MERCHANDISING DISPLAY CHANNEL FRONT

Bernard Primiano, Smyrna, and Dennis E. Parham, Kennesaw, both of Ga., assignors to The Mead Corporation, Dayton, Ohio
Filed Nov. 4, 1997, Ser. No. 78,867
Term of patent 14 years
LOC (6) Cl. 06 - 04
U.S. Cl. D6—408



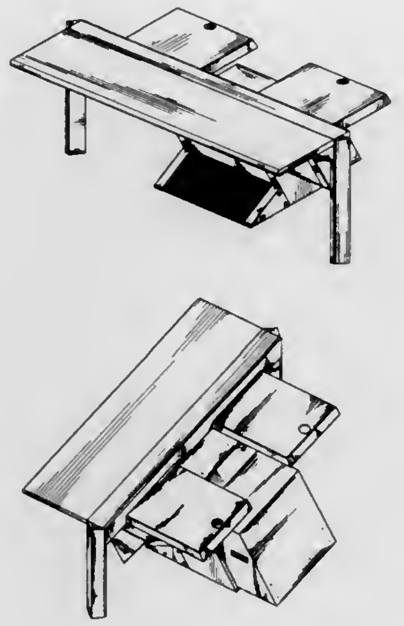
401,438
STUDENT DESK

Elizabeth Acinapura, and Maria C. Juliano, both of 14 High Popples Rd., Gloucester, Mass. 01930
Filed Jul. 11, 1997, Ser. No. 73,624
Term of patent 14 years
LOC (6) Cl. 06 - 04
U.S. Cl. D6—425



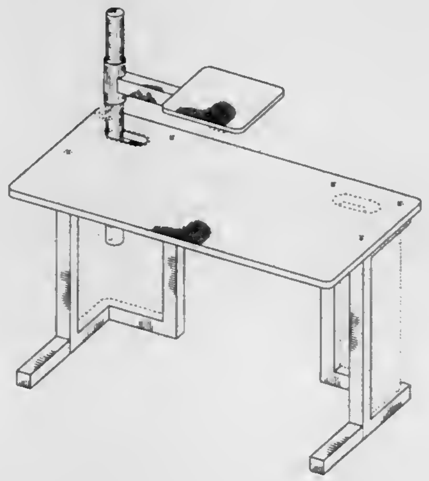
401,439
WORKSTATION TABLE

Justin M. Maguire, Jr., Barrington, R.I.; Anthony J. Rus, Concord, Ohio; George R. Hall, II, Geneva, Ohio, and Robert F. Sapita, Mentor, Ohio, assignors to Elsag International N.V., Amsterdam, Netherlands
Filed Sep. 23, 1996, Ser. No. 60,092
Term of patent 14 years
LOC (6) Cl. 06 - 03
U.S. Cl. D6—426



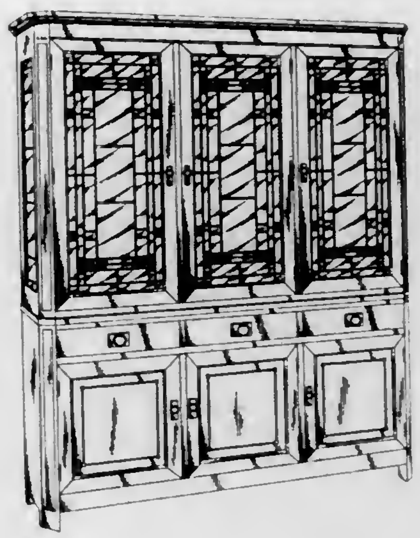
401,440
MODULAR DESK

Carl Brook Brandenberg, FM 3450, Box 188, Cresson, Tex. 76035
Filed Oct. 8, 1997, Ser. No. 77,653
Term of patent 14 years
LOC (6) Cl. 06 - 04
U.S. Cl. D6—426



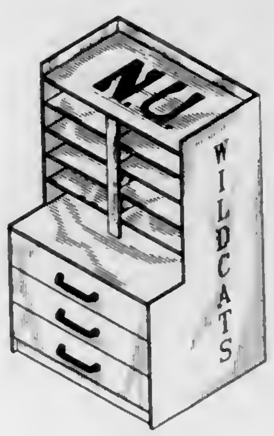
401,441
BUFFET AND CHINA CABINET

William E. De Blaay, Manlius, N.Y., assignor to L & J. G. Stickley, Inc., Manlius, N.Y.
Filed Jan. 21, 1997, Ser. No. 65,126
Term of patent 14 years
LOC (6) Cl. 06 - 04
U.S. Cl. D6—438



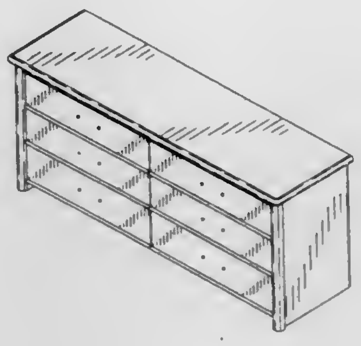
401,442
SWEATER SHELVING UNIT

Stephen P. Zwolenik, 789 E. Ross St., Lancaster, Pa. 17602
Filed Aug. 21, 1997, Ser. No. 75,556
Term of patent 14 years
LOC (6) Cl. 06 - 04
U.S. Cl. D6—438



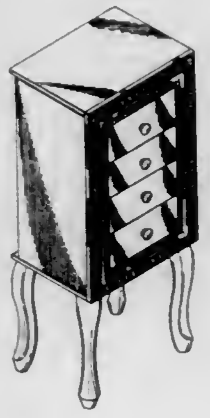
401,443
DOUBLE DRESSER

Paul Zaidman, Winnipeg, Canada, assignor to Palliser Furniture, Ltd., Winnipeg, Canada
Filed May 10, 1996, Ser. No. 54,266
Term of patent 14 years
LOC (6) Cl. 06 - 04
U.S. Cl. D6—446



401,444
JEWELRY CABINET

Jui-Lin Lin, Taichung, Taiwan, assignor to Hong-Yi Wooden Article Co., Ltd., Taichung, Taiwan
Filed Jan. 21, 1997, Ser. No. 65,340
Term of patent 14 years
LOC (6) Cl. 06 - 04
U.S. Cl. D6—446



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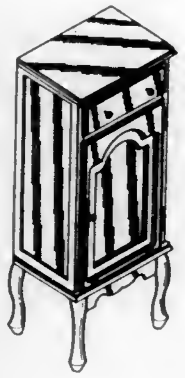
401,445
JEWELRY CASE
Jui-Lin Lin, No. 186-3, Sec. 1, Tung-Shan Rd., Pei-Tun Dist., Taichung City, Taiwan

Filed Apr. 22, 1997, Ser. No. 69,622
Term of patent 14 years
LOC (6) Cl. 06 - *04*

U.S. Cl. D6—446



401,446
MAGNA CHEST
Larry D. Hazen, and Gary A. Huffstetler, both of Lenoir, N.C., assignors to Broyhill Furnitures Industries, Inc., Lenoir, N.C.

Filed Aug. 28, 1997, Ser. No. 75,995
Term of patent 14 years
LOC (6) Cl. 06 - *04*

U.S. Cl. D6—446

401,447
NIGHT STAND
Larry D. Hazen, and Gary A. Huffstetler, both of Lenoir, N.C., assignors to Broyhill Furniture Industries, Inc., Lenoir, N.C.

Filed Aug. 28, 1997, Ser. No. 75,942
Term of patent 14 years
LOC (6) Cl. 06 - *04*

U.S. Cl. D6—446

401,448
DOOR DRESSER
Larry D. Hazen, and Gary A. Huffstetler, both of Lenoir, N.C., assignors to Broyhill Furniture Industries, Inc., Lenoir, N.C.

Filed Aug. 28, 1997, Ser. No. 75,996
Term of patent 14 years
LOC (6) Cl. 06 - *04*

U.S. Cl. D6—446

401,449
DRAWER CHEST
Larry D. Hazen, and Gary A. Huffstetler, both of Lenoir, N.C., assignors to Broyhill Furniture Industries, Inc., Lenoir, N.C.

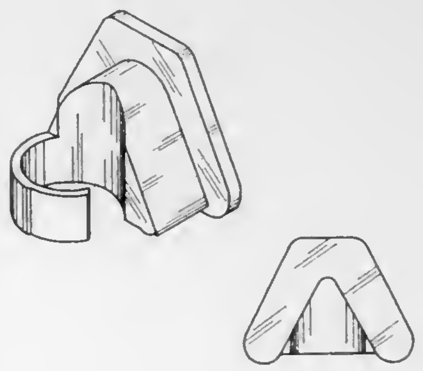
Filed Aug. 28, 1997, Ser. No. 76,044
Term of patent 14 years
LOC (6) Cl. 06 - *04*

U.S. Cl. D6—446

401,450
SPECTACLE DISPLAY HOLDER
Jan S. Ennis, 16709 NE. 41st St., Redmond, Wash. 98052

Division of Ser. No. 23,869, Jun. 2, 1994, Pat. No. Des. 367,571, which is a continuation-in-part of Ser. No. 5,674, Mar. 8, 1993, Pat. No. Des. 351,955. This application Dec. 11, 1995, Ser. No. 47,688
Term of patent 14 years
LOC (6) Cl. 06 - *04*

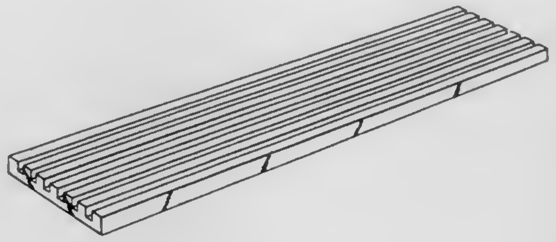
U.S. Cl. D6—466



401,451
PHARMACEUTICAL ORDER DISPLAY STAND
Stanley Sherman, 4608 Westridge Pl., Camp Springs, Md. 20348

Filed Oct. 20, 1995, Ser. No. 45,478
Term of patent 14 years
LOC (6) Cl. 06 - *04*

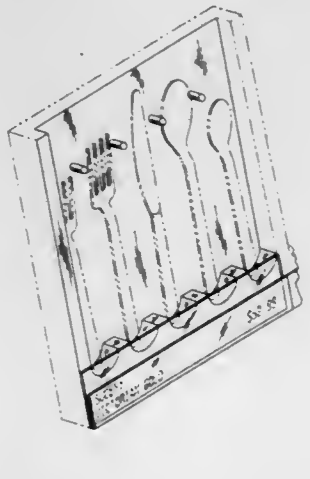
U.S. Cl. D6—467



401,452
FLATWARE DISPLAY FIXTURE
Phillip Kornbluh, Freehold Township, N.J., assignor to BBBL, Inc., Downers Grove, Ill.

Filed Mar. 7, 1997, Ser. No. 67,440
Term of patent 14 years
LOC (6) Cl. 06 - *04*

U.S. Cl. D6—467



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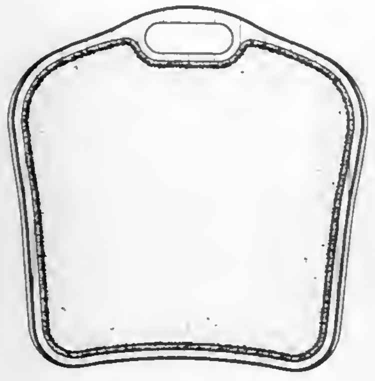
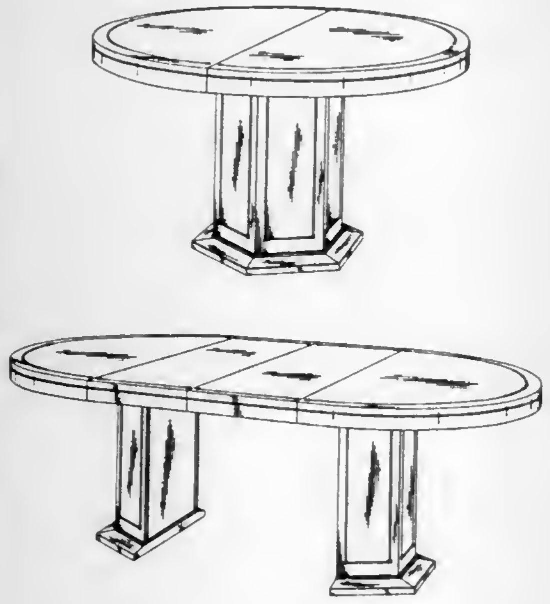
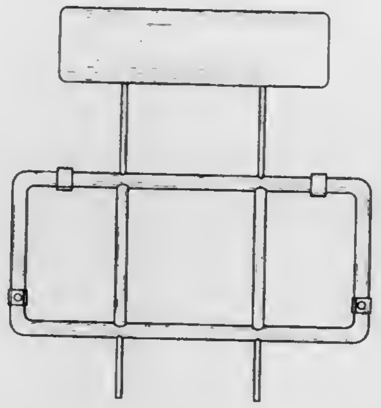
401,453
CHAIR BACK
Sanford L. Holt, Morristown, Tenn., assignor to Shelby Williams Industries, Inc., Morristown, Tenn.
Filed Sep. 3, 1997, Ser. No. 75,610
Term of patent 14 years
LOC (6) Cl. 06 - *06*
U.S. Cl. D6—502



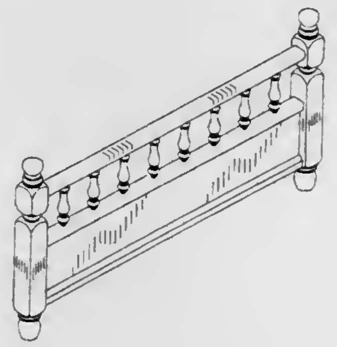
401,454
PEDESTAL EXTENSION DINING TABLE
William E. De Blaay, Manlius, N.Y., assignor to L & J. G. Stickley, Inc., Manlius, N.Y.
Filed Sep. 8, 1997, Ser. No. 76,209
Term of patent 14 years
LOC (6) Cl. 06 - *03*
U.S. Cl. D6—486



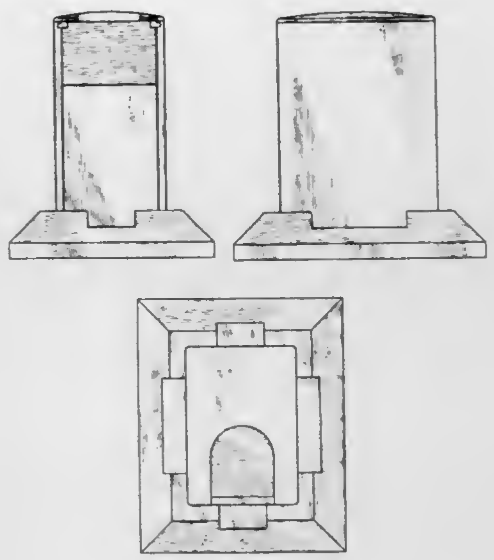
401,455
HEADREST
Richard G. Pate, 140 Wright Cir., Niceville, Fla. 32578
Continuation of Ser. No. 924,237, Aug. 3, 1992, abandoned.
This application Apr. 11, 1994, Ser. No. 21,158
Term of patent 14 years
LOC (6) Cl. 06 - *06*
U.S. Cl. D6—501



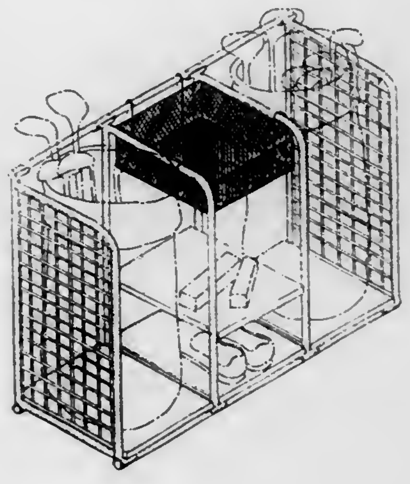
401,456
FOOTBOARD
Paul Zaidman, Winnipeg, Canada, assignor to Palliser Furniture Ltd., Winnipeg, Canada
Filed Feb. 28, 1997, Ser. No. 67,404
Term of patent 14 years
LOC (6) Cl. 06 - *01*
U.S. Cl. D6—508



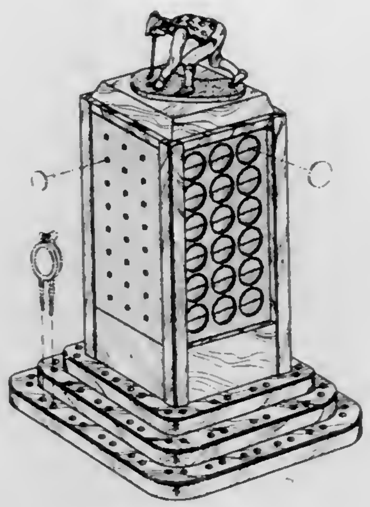
401,457
PACKET DISPENSER
Clay T. Wright, P.O. Box 526, Carthage, Miss. 39051
Continuation of Ser. No. 10,008, Jun. 28, 1993, abandoned.
This application Jun. 6, 1994, Ser. No. 24,012
Term of patent 14 years
LOC (6) Cl. 08 - *08*
U.S. Cl. D6—517



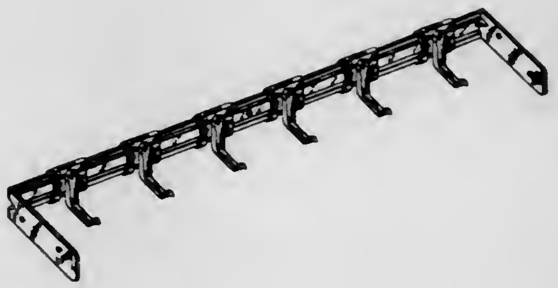
401,458
GOLF ACCESSORY STAND
Ben M. Hsia, 27756 Ave. Mentry, Santa Clarita, Calif. 91355
Filed Aug. 20, 1997, Ser. No. 75,408
Term of patent 14 years
LOC (6) Cl. 08 - *08*
U.S. Cl. D6—552



401,459
GOLF DIVOT TOOL CAROUSEL
John R. Tate, 11621 Markon Dr., Gardon Grove, Calif. 92841
Filed Nov. 24, 1997, Ser. No. 79,873
Term of patent 14 years
LOC (6) Cl. 08 - *08*
U.S. Cl. D6—552



401,460
TOOL RACK
Kenneth Laga, Franklin, Mass., assignor to American Manufacturing Company, Inc., Allentown, Pa.
Filed Mar. 6, 1996, Ser. No. 51,237
Term of patent 14 years
LOC (6) Cl. 23 - *06*
U.S. Cl. D6—566



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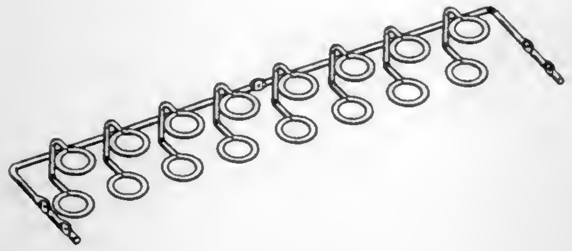
401,461
TOOL RACK

Kenneth Laga, Franklin, Mass., assignor to American Manufacturing Company, Inc., Allentown, Pa.
Filed Mar. 25, 1996, Ser. No. 52,176
Term of patent 14 years
LOC (6) Cl. 06 - *10*

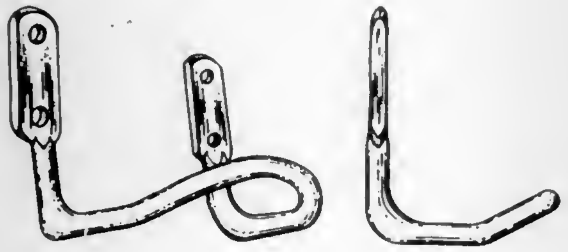
U.S. Cl. D6—566



401,462
HAMMER HOLDER

George P. Paikos, 27795 Avenue Hopkins, Valencia, Calif. 91355, and Michael C. F. Chen, No. 17 Kung 6 Road, Lin-Kou 2nd Industrial Park, Taipai, Hsien, Taiwan
Continuation-in-part of Ser. No. 60,251, Sep. 25, 1996, Pat. No. Des. 392,826. This application Oct. 7, 1997, Ser. No. 77,625
Term of patent 14 years
LOC (6) Cl. 08 - *08*

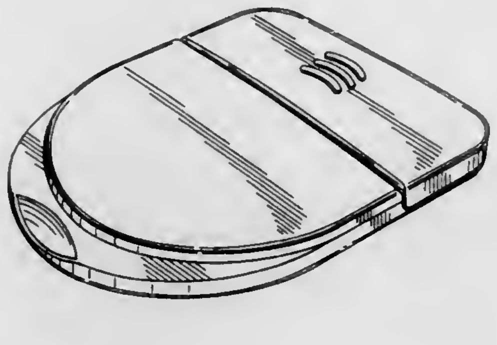
U.S. Cl. D6—566



401,463
COMPACT DISC STORAGE CASE

Albert B. Cheris, Highland Park, Ill.; Robert B. Staubitz, Collinsville, and Timothy Repp, New Hartford, both of Conn., assignors to Tenex Corporation, Elk Grove Village, Ill.
Filed Jan. 29, 1997, Ser. No. 65,551
Term of patent 14 years
LOC (6) Cl. 06 - *04*

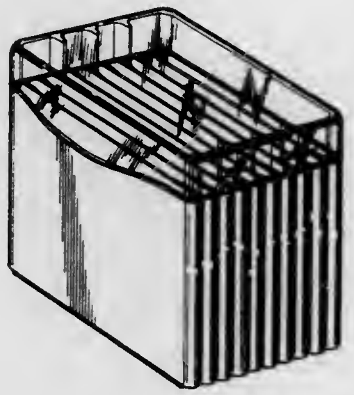
U.S. Cl. D6—634



401,464
EXPANDABLE DISKETTE HOLDER WITH REMOVABLE LID

Albert B. Cheris, Highland Park, and Mark Dziersk, Chicago, both of Ill., assignors to Tenex Corporation, Elk Grove Village, Ill.
Filed Nov. 10, 1997, Ser. No. 79,118
Term of patent 14 years
LOC (6) Cl. 06 - *04*

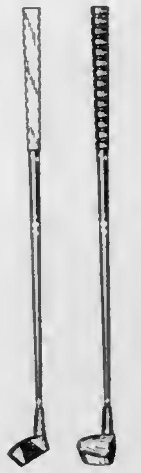
U.S. Cl. D6—634



401,465
DRINK MIXER

Sixto Naranjo, 75 Washington Ave., Little Ferry, N.J. 07643
Filed Jul. 15, 1997, Ser. No. 73,672
Term of patent 14 years
LOC (6) Cl. 07 - *06*

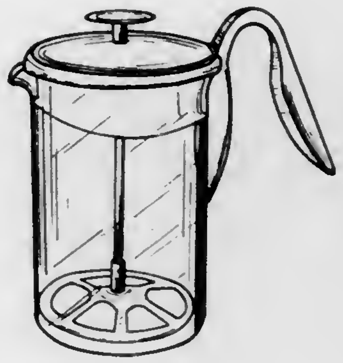
U.S. Cl. D7—300.2



401,466
CAPPUCCINO MAKER

Carsten Joergensen, Kriens, Sweden, assignor to PI-Design AG, Triengen, Sweden
Filed Apr. 22, 1997, Ser. No. 69,040
Claims priority, application Denmark, Oct. 23, 1996, 1010/96
Term of patent 14 years
LOC (6) Cl. 07 - *01*

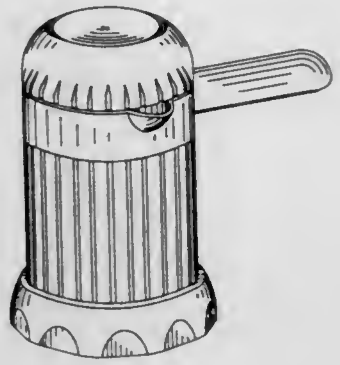
U.S. Cl. D7—318



401,467
COFFEEMAKER

Stuart Naft, Fairfield, and Patrick B Nolan, Danbury, both of Conn., assignors to Black & Decker Inc., Newark, Del.
Filed Dec. 21, 1997, Ser. No. 75,411
Term of patent 14 years
LOC (6) Cl. 07 - *01*

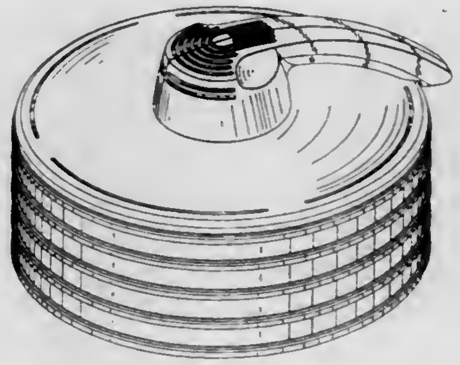
U.S. Cl. D7—318



401,468
FOOD DEHYDRATOR

John L. Knoll, Minneapolis; Neal P. Barnes, Maple Grove; Terry L. Van Valkenburg, Elk River, and Michael W. Horvath, Woodbury, all of Minn., assignors to American Harvest, Inc., Chaska, Minn.
Filed Jan. 10, 1997, Ser. No. 64,769
Term of patent 14 years
LOC (6) Cl. 07 - *02*

U.S. Cl. D7—323



401,469
DRINKING GLASS STEM

Vladimir Klein, Novy Bor, Czech Rep., assignor to Crystalex a.s., Novy Bor, Czech Rep.

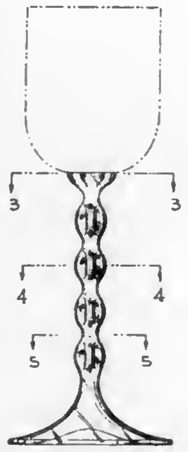
Filed Feb. 12, 1998, Ser. No. 83,549

Claims priority, application Czech Rep., Aug. 18, 1997, 30331-97

Term of patent 14 years

LOC (6) Cl. 07 - *99*

U.S. Cl. D7—396.6



401,470
MICROWAVE OVEN

Kensaku Noda; Masatoshi Okuda, and Yasunori Kusachi, all of Shiga-Ken, Japan, assignors to Sanyo Electric Co., Ltd., Osaka-fu, Japan

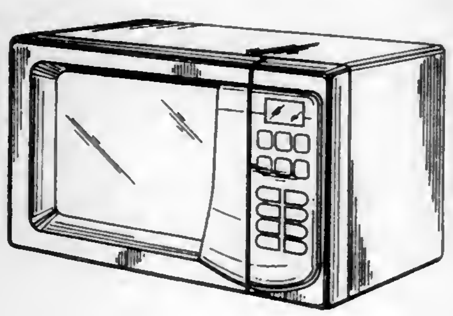
Filed Jul. 10, 1997, Ser. No. 73,456

Claims priority, application Japan, Jan. 14, 1997, 9-812

Term of patent 14 years

LOC (6) Cl. 07 - *02*

U.S. Cl. D7—351



401,471
TOASTER

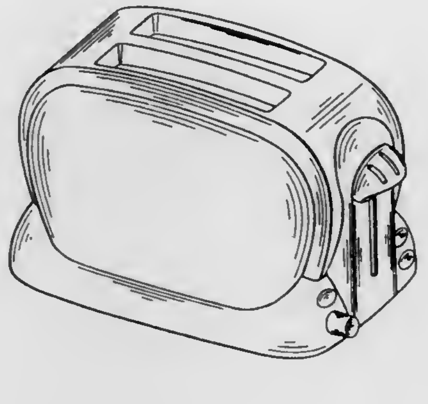
Mario John Barker, Sydney, Australia, assignor to Breville PTY Ltd., Botany, Australia

Filed Oct. 2, 1997, Ser. No. 80,669

Term of patent 14 years

LOC (6) Cl. 07 - *02*

U.S. Cl. D7—330



401,472
TOASTER

Neil M. Gould, London, England, assignor to Townport Limited, Middlesex, England

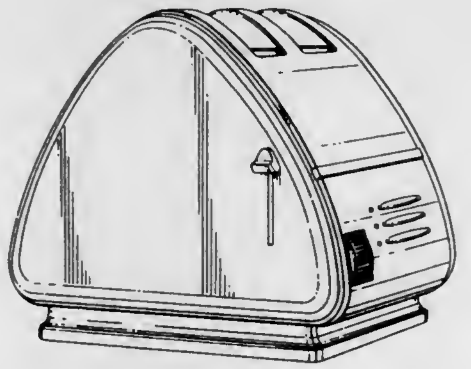
Filed Aug. 18, 1997, Ser. No. 75,414

Claims priority, application Germany, Feb. 17, 1997, M 97 01 570.9

Term of patent 14 years

LOC (6) Cl. 07 - *02*

U.S. Cl. D7—330



401,473
KITCHEN UTENSIL HANDLE

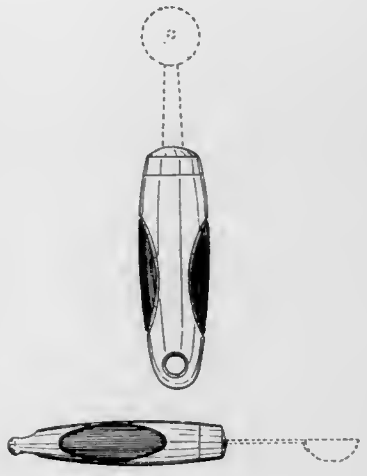
Karen Swinford, Schaumburg, Ill.; Heng Kah Hee, Singapore, Singapore; Chau Pok Man, PokFuLam, Hong Kong; Lee Suet Mui, Tusen Wan, Hong Kong, and Fung Ka Ming, Tuen Mun, Hong Kong, assignors to Ekco Housewares, Inc., Franklin Park, Ill.

Filed Sep. 25, 1997, Ser. No. 77,048

Term of patent 14 years

LOC (6) Cl. 07 - *06*

U.S. Cl. D7—395



401,474
ADJUSTABLE AND COLLAPSIBLE DRIP COLLECTING DEVICE

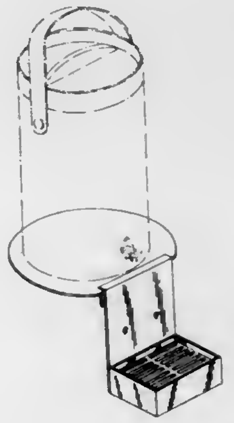
Sandra Ann Leatherman; Franklin Leatherman, both of 16206 Skye Ct.; Sheri Lynne Selzer, and Wayne David Selzer, both of 1118B W. Washington St., all of Hagerstown, Md. 21740

Filed Nov. 4, 1997, Ser. No. 78,735

Term of patent 14 years

LOC (6) Cl. 07 - *99*

U.S. Cl. D7—397



401,475
BOWL

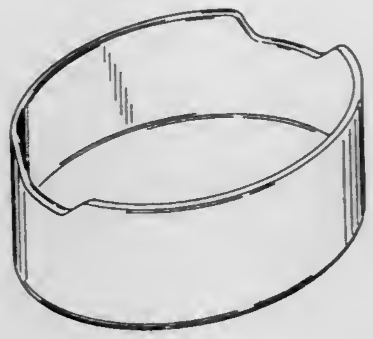
Sharon Ritchey, Phoenix, Ariz., assignor to Cats with an Attitude, Inc., Phoenix, Ariz.

Filed Jul. 9, 1997, Ser. No. 78,796

Term of patent 14 years

LOC (6) Cl. 07 - *01*

U.S. Cl. D7—543



401,476
BULK BIN ASSEMBLY

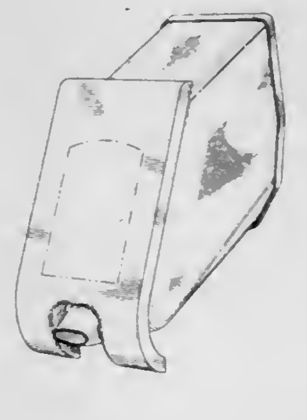
Eric Francis Henry, Rutherford, and Tatsuo Rushing, Ringwood, both of N.J., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sep. 29, 1997, Ser. No. 77,223

Term of patent 14 years

LOC (6) Cl. 07 - *01*

U.S. Cl. D7—589



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401,477
GOOSENECK TOWER CONDIMENT DISPENSER

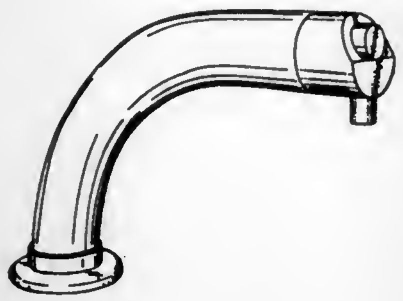
Richard A. Martindale, Vacaville, Calif., assignor to Automatic Bar Controls, Inc., Vacaville, Calif.

Continuation-in-part of Ser. No. 54,857, May 23, 1996, Pat. No. Des. 395,509. This application Apr. 28, 1997, Ser. No. 69,624

Term of patent 14 years

LOC (6) Cl. 07 - *06*

U.S. Cl. D7—590



401,478
CONTAINER FOR USE PRIMARILY AS A PICNIC HAMPER

Brian Martin Greenway, and Gillian Mary Greenway, both of Westfield House, Langley Lane, Goosnargh, Preston, Lancashire PR3 2JS, England

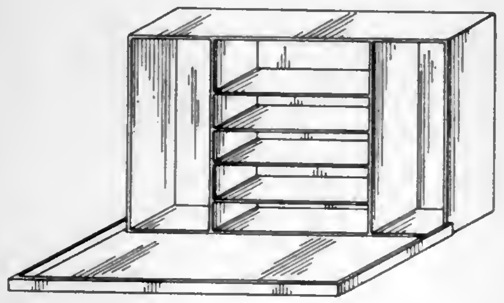
Filed Oct. 27, 1997, Ser. No. 78,500

Claims priority, application United Kingdom, Apr. 25, 1997, 2065192

Term of patent 14 years

LOC (6) Cl. 07 - *06*

U.S. Cl. D7—601



401,479
COLLAPSIBLE COOLER

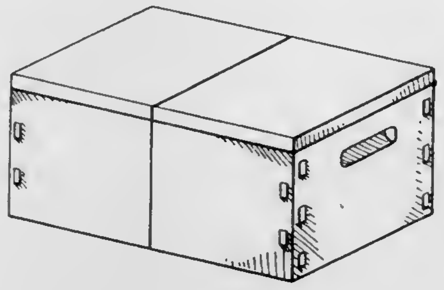
Larsen B. Norman, 18 A Dreyer Ave., Staten Island, N.Y. 10314, and Laura Norton, 107 Bard Ave., Staten Island, N.Y. 10301

Filed Nov. 17, 1997, Ser. No. 79,444

Term of patent 14 years

LOC (6) Cl. 07 - *06*

U.S. Cl. D7—605



401,480
COASTER

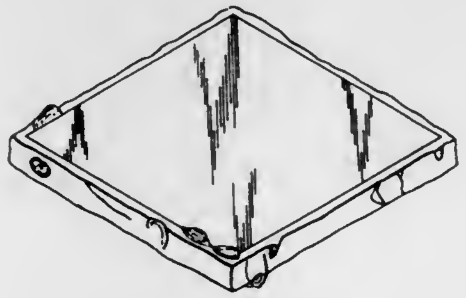
Tanya J. Hoggard, 2730 Cox Lain, Cincinnati, Ohio 45209

Filed Oct. 3, 1997, Ser. No. 77,109

Term of patent 14 years

LOC (6) Cl. 07 - *06*

U.S. Cl. D7—624



401,481
UTENSILS

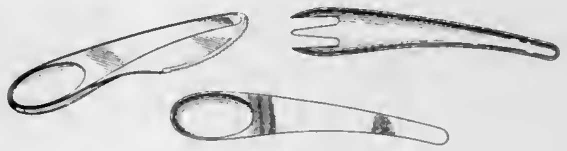
Michel Boilard, Sherbrooke; André Côté, Montréal, and Patrick Allen, Lasalle, all of Canada, assignors to Air Transat, Mirabel, Canada

Filed Nov. 25, 1997, Ser. No. 79,774

Term of patent 14 years

LOC (6) Cl. 07 - *03*

U.S. Cl. D7—643



401,482
COOKIE STAMP

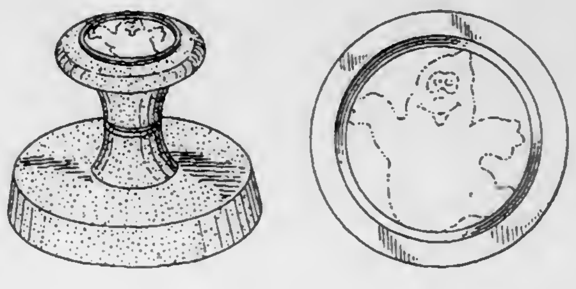
David W. De Are, Glen Ellyn, Ill., assignor to Wilton Industries, Inc., Woodridge, Ill.

Filed Mar. 7, 1997, Ser. No. 67,674

Term of patent 14 years

LOC (6) Cl. 07 - *04*

U.S. Cl. D7—677



401,483
SPICE RACK

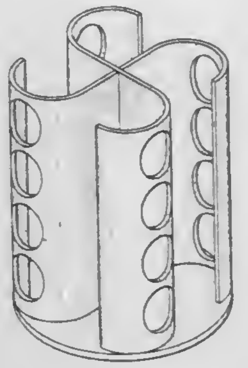
V. Lorenzo Porcelli, Ossining, N.Y., assignor to M. Kamenstein, Inc., Elmsford, N.Y.

Filed Oct. 24, 1997, Ser. No. 78,298

Term of patent 14 years

LOC (6) Cl. 07 - *06*

U.S. Cl. D7—707



401,484
SUPPORT FOR LAWN AND GARDEN ORNAMENTS

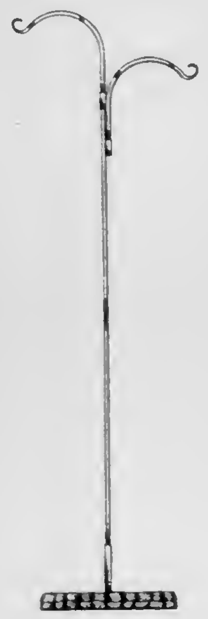
Stewart Hardison, P.O. Box 333, Bainbridge, N.Y. 13733

Filed May 28, 1997, Ser. No. 71,349

Term of patent 14 years

LOC (6) Cl. 08 - *99*

U.S. Cl. D8—1



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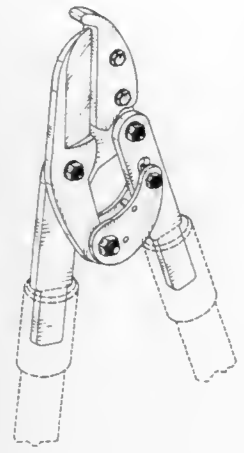
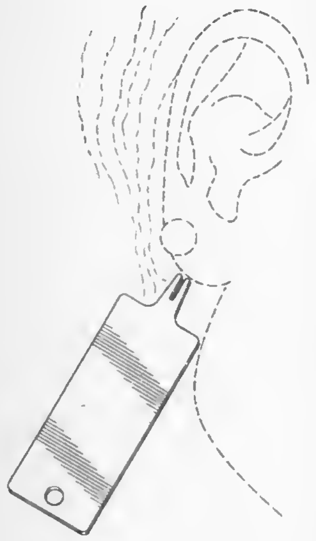
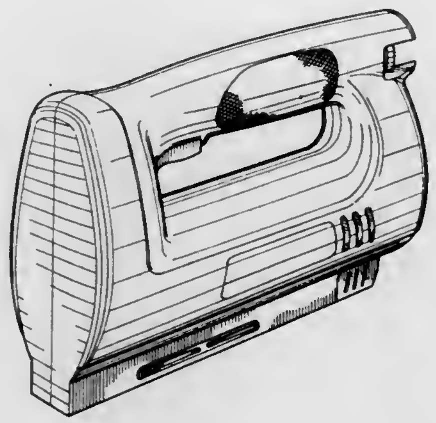
401,485
RATCHET LOPPER
Dick Liao, Bridgewater, Mass., assignor to Greenlife, Inc., Bridgewater, Mass.
Filed Jan. 2, 1998, Ser. No. 81,426
Term of patent 14 years
LOC (6) Cl. 08 - *01*
U.S. Cl. D8—5



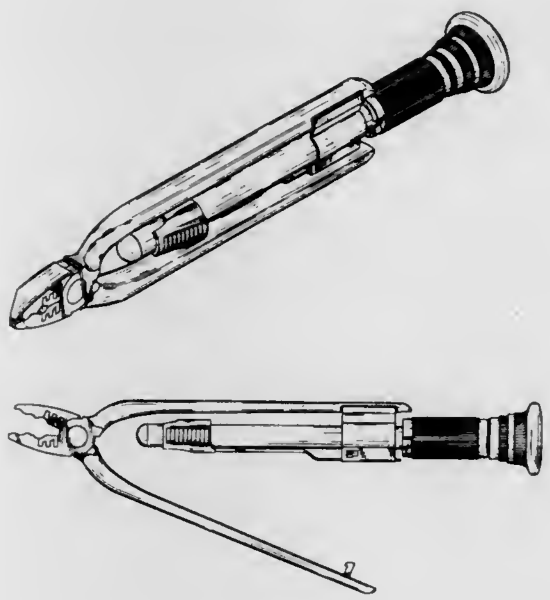
401,486
EARRING TOOL
Linda L. Becker, 920 Parks Ave., #284, Winona, Minn. 55987
Filed Sep. 24, 1997, Ser. No. 76,551
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—19



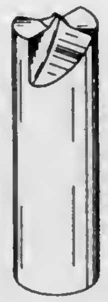
401,487
STAPLER
Scott D. Price, Singapore, Singapore, assignor to Black & Decker Inc., Newark, Del.
Filed May 23, 1997, Ser. No. 71,231
Term of patent 14 years
LOC (6) Cl. 19 - *02*
U.S. Cl. D8—49



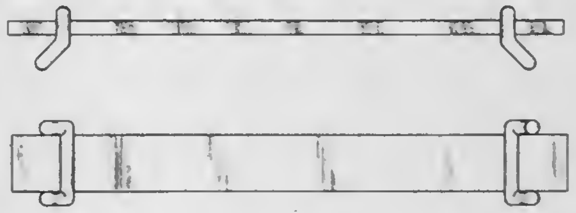
401,488
PLIER DEVICE
Darryle Eugene Bates, Cuyahoga Falls, Ohio, and Vincent J. Kiernan, Marco Island, Fla., assignors to Stride Tool, Inc., Ellicottville, N.Y.
Filed Feb. 21, 1997, Ser. No. 67,063
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—52



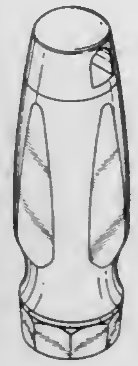
401,489
SPOT WELD REMOVAL TOOL
Mark Ambrose, Aurora, Ohio, assignor to S & H Industries, Inc., Bedford Heights, Ohio
Filed May 9, 1997, Ser. No. 70,566
Term of patent 14 years
LOC (6) Cl. 08 - *01*
U.S. Cl. D8—70



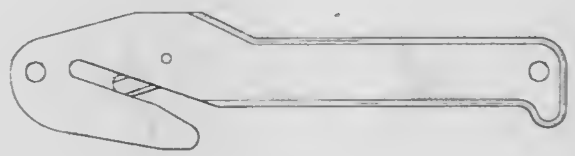
401,490
AUTOMOBILE MOUNTED MECHANICS TOOL TRAY
Manuel C. Teixeira, 1031 Carmel Ave., Manteca, Calif. 95336
Filed Jan. 22, 1998, Ser. No. 82,447
Term of patent 14 years
LOC (6) Cl. 08 - *05*
U.S. Cl. D8—71



401,491
TOOL HANDLE
Hsuan-Sen Shiao, No. 15-1, Lane 369, Min-Chuan Rd., Taichung City, Taiwan
Filed Oct. 31, 1997, Ser. No. 78,704
Term of patent 14 years
LOC (6) Cl. 08 - *04*
U.S. Cl. D8—83



401,492
SAFTEY CUTTER FOR PLASTIC AND CARDBOARD PRODUCTS
Jack Joseph, Jr., 718 Turkey Ridge Rd., Mt. Bethel, Pa. 18343
Filed Jul. 31, 1997, Ser. No. 77,005
Term of patent 14 years
LOC (6) Cl. 08 - *03*
U.S. Cl. D8—98



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401,493
TOOL HANDLE

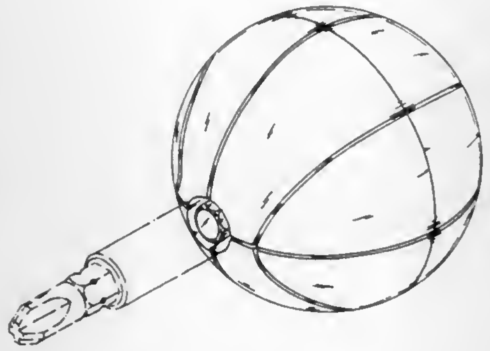
Ching Chou Lin, No. 150, Sec. 3, Chung San Road, Wu Zh Hsiang, Taichung Hsien, Taiwan

Filed Sep. 25, 1997, Ser. No. 80,136

Term of patent 14 years

LOC (6) Cl. 08 - *04*

U.S. Cl. D8—107



401,494
SECURITY ANCHOR

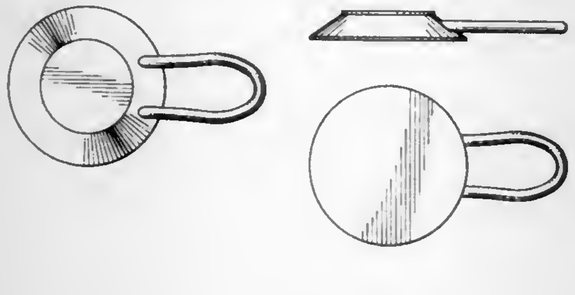
Robert C. Perry, 5755 SW. Willow La., Lake Oswego, Oreg. 97035-5340

Filed Sep. 29, 1997, Ser. No. 77,192

Term of patent 14 years

LOC (6) Cl. 08 - *07*

U.S. Cl. D8—332



401,495
ARM FOR BRACKET ASSEMBLY

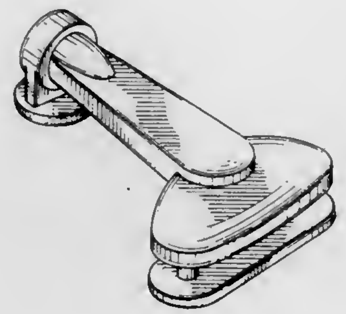
Roy Fischer, 7641 E. Gray Rd., Scottsdale, Ariz. 85260

Filed Jan. 19, 1998, Ser. No. 82,238

Term of patent 14 years

LOC (6) Cl. 08 - *05*

U.S. Cl. D8—349



401,496
POT LID HOLDER

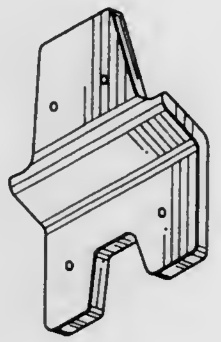
Jerry D. Lambert, and Irene B. Lambert, both of 759 Kenowood Dr., Port Orange, Fla. 32119

Filed Nov. 13, 1997, Ser. No. 79,473

Term of patent 14 years

LOC (6) Cl. 08 - *05*

U.S. Cl. D8—354



401,497
SPEED RUN CONDUIT SUPPORT

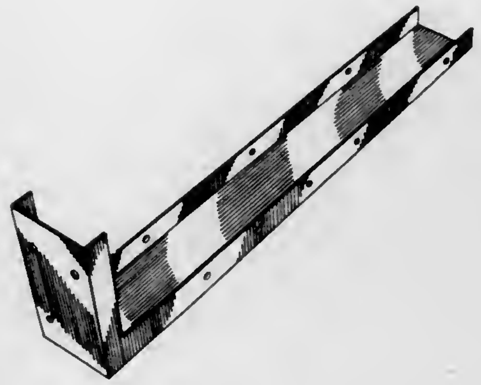
Dennis Terrell, 7122 Acre Estates, Toccoa, Ga. 30577

Filed Jul. 12, 1997, Ser. No. 73,641

Term of patent 14 years

LOC (6) Cl. 08 - *05*

U.S. Cl. D8—356



401,498
RIBLESS MOUNT

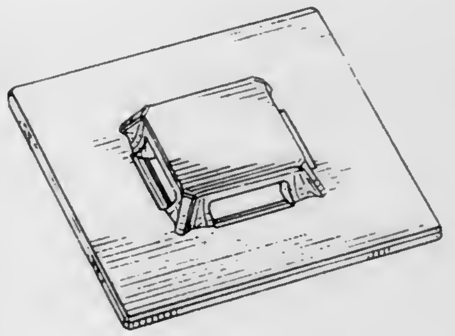
Jack E. Caveney, Hinsdale, Ill., assignor to Panduit Corp., Tinley Park, Ill.

Filed Nov. 20, 1997, Ser. No. 79,678

Term of patent 14 years

LOC (6) Cl. 08 - *05*

U.S. Cl. D8—356



401,499
SUCTION CUP

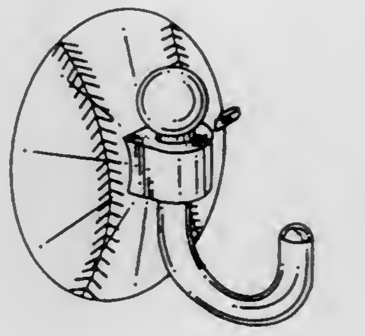
Arthur J. Barry, Greenpoint, N.Y., assignor to Presto Galaxy Suction Cups, Inc., Greenpoint, N.Y.

Filed Jan. 21, 1997, Ser. No. 65,108

Term of patent 14 years

LOC (6) Cl. 08 - *05*

U.S. Cl. D8—367



401,500
MULTI-PURPOSE HANGER

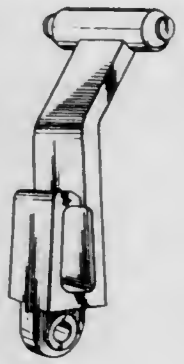
James Perry, R.R. #2, Renfrew, ON, Canada, K7V 3Z5, and Bill Chatzigiannis, 1493 Walkley Road, Ottawa, ON, Canada, K1V 0H3

Filed Nov. 5, 1997, Ser. No. 78,855

Term of patent 14 years

LOC (6) Cl. 08 - *05*

U.S. Cl. D8—373



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401,501
COMBINED DISPENSER AND CAP

Mitsuji Nagayoshi, São Paulo, Brazil, assignor to Lancamentos Criacoes Em Couro Ltda., Diadema, Brazil

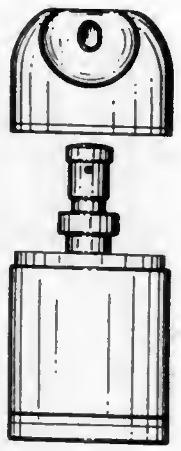
Filed Aug. 26, 1996, Ser. No. 58,845

Claims priority, application Brazil, Feb. 27, 1996, 5600378-1

Term of patent 14 years

LOC (6) Cl. 09 - *01*

U.S. Cl. D9—300



401,502
PORTION OF A CONFECTIONARY PACKAGE

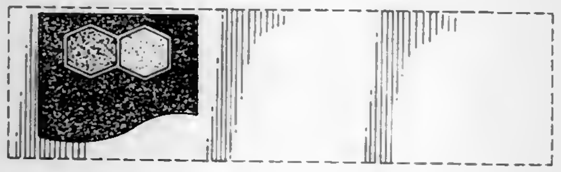
Hae Geun Yoon, Seoul, Rep. of Korea, assignor to Lotte Confectionery Company, Rep. of Korea

Filed Oct. 8, 1996, Ser. No. 60,816

Term of patent 14 years

LOC (6) Cl. 09 - *05*

U.S. Cl. D9—305



401,503
RECIPIENT FOR VETERINARY PRODUCTS TO TREAT FELINE PARASITES

Herve Domenget, Marcy L'Etoile, France, assignor to Merial, Lyons, France

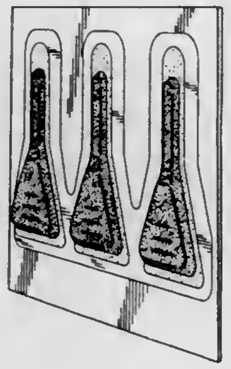
Filed Nov. 27, 1996, Ser. No. 62,834

Claims priority, application Hague Agreement, May 28, 1996, DM036513

Term of patent 14 years

LOC (6) Cl. 09 - *03*

U.S. Cl. D9—345



401,504
BOTTLE

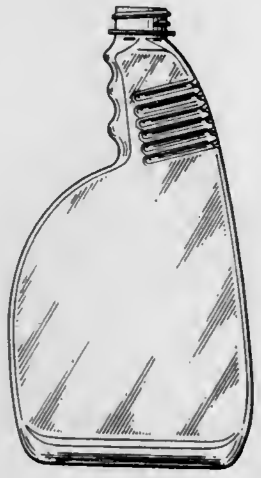
James D. Bolliger, Crown Point, Ind.; William W. Campbell, Benecia; Leslie E. Finn, Pleasanton, both of Calif.; M. A. Lateef Khan, Warrenville, Ill.; Barry G. Levenson, Piedmont, and Frederick G. Doolittle, Danville, both of Calif., assignors to The Clorox Company, Oakland, Calif.

Filed Mar. 21, 1997, Ser. No. 68,257

Term of patent 14 years

LOC (6) Cl. 09 - *01*

U.S. Cl. D9—523



401,505
AUXILIARY HANDLE GRIP

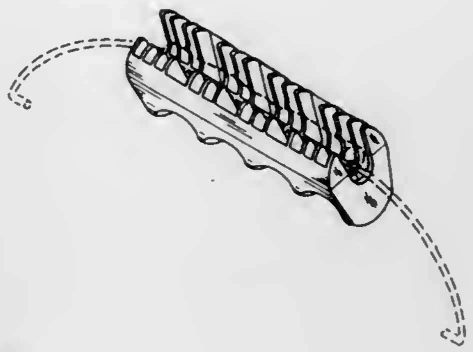
Richard A. Michael, 216 Gordon St., Piqua, Ohio 45356, and Mark A. Shively, 5490 Behms Rd., Celina, Ohio 45822

Filed Sep. 23, 1996, Ser. No. 60,090

Term of patent 14 years

LOC (6) Cl. 09 - *07*

U.S. Cl. D9—434



401,506
COMBINED BOTTLE AND CAP

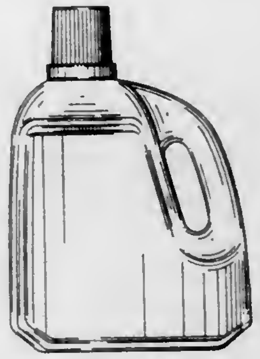
Robert C. Collins, II, Scottsdale, Ariz.; Daniel E. Ostrowski, North Brunswick, N.J., and Christopher J. Wolpert, Scottsdale, Ariz., assignors to The Dial Corporation, Scottsdale, Ariz.

Filed Dec. 8, 1997, Ser. No. 79,626

Term of patent 14 years

LOC (6) Cl. 09 - *01*

U.S. Cl. D9—528



401,507
BOTTLE

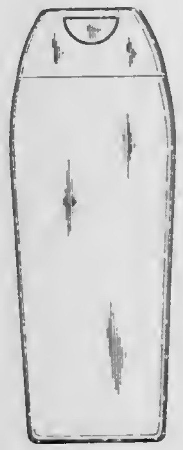
Frank Gonda, Fairfield, Conn.; David Scott Laubach, New York, N.Y.; Gregory Alan Lathrop, Manchester, and Joyce Lynn Kruse, Baltimore, both of Md., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed Apr. 17, 1997, Ser. No. 69,743

Term of patent 14 years

LOC (6) Cl. 09 - *01*

U.S. Cl. D9—529



401,508
CAN

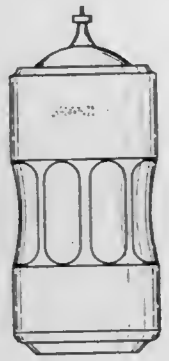
Abner Brown, III, 461 N. Popular St., Apt. 7, Greenville, Miss. 38701

Filed Sep. 23, 1996, Ser. No. 64,255

Term of patent 14 years

LOC (6) Cl. 09 - *01*

U.S. Cl. D9—538



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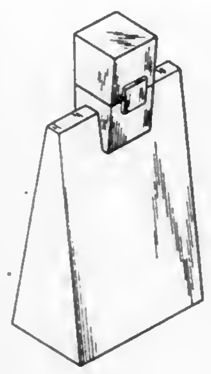
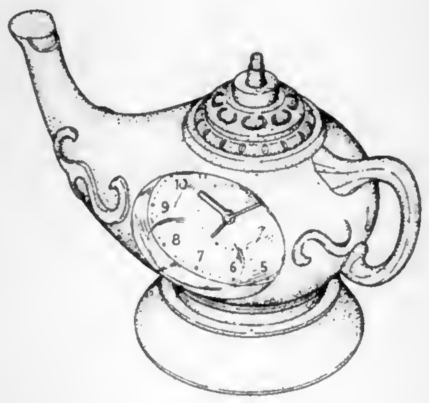
401,509
COMBINED BOTTLE AND CAP

Catherine Krunas, Ramsey, N.J., assignor to Fendi Profumi, S.p.A., Parma, Italy
Filed Oct. 29, 1997, Ser. No. 78,518
Claims priority, application WIPO, Jun. 5, 1997, DM/040393
Term of patent 14 years
LOC (6) Cl. 09 - *01*
U.S. Cl. D9—573



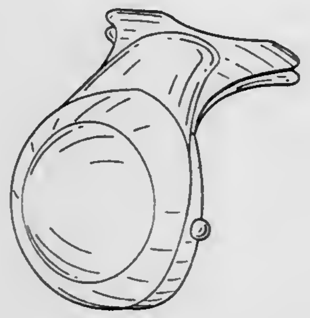
401,510
ALARM CLOCK

Kuei Liang Chung Liao, No. 17, Chung Hsing E. Rd., Tai Ping City, Taichung Hsien, Taiwan
Filed Nov. 26, 1997, Ser. No. 79,742
Term of patent 14 years
LOC (6) Cl. 10 - *01*
U.S. Cl. D10—6



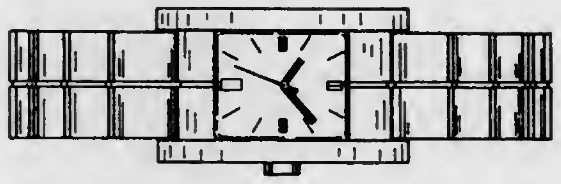
401,511
WRIST WATCH

Andre Le Marquand, 60 rue Condemine, 1630 Bulle, Switzerland
Filed Oct. 22, 1997, Ser. No. 78,164
Claims priority, application Hague Agreement, Apr. 24, 1997, DM/039961
Term of patent 14 years
LOC (6) Cl. 10 - *02*
U.S. Cl. D10—30



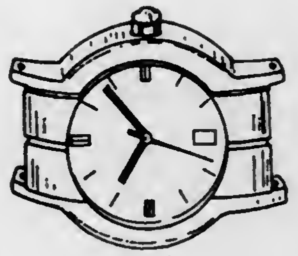
401,512
WRISTWATCH

Olivier C Coquerel, Paris, France, assignor to S. T. Dupont S.A., Paris, France
Filed Sep. 29, 1997, Ser. No. 77,430
Claims priority, application France, Apr. 3, 1997, 971971
Term of patent 14 years
LOC (6) Cl. 10 - *02*
U.S. Cl. D10—32



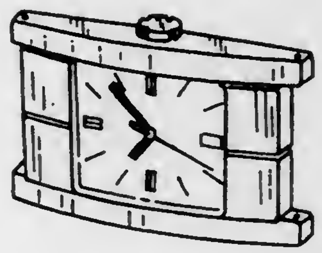
401,513
WATCHCASE

Olivier C Coquerel, Paris, France, assignor to S. T. Dupont S.A., Paris, France
Filed Sep. 29, 1997, Ser. No. 77,432
Claims priority, application France, Apr. 3, 1997, 971971
Term of patent 14 years
LOC (6) Cl. 10 - *02*
U.S. Cl. D10—39



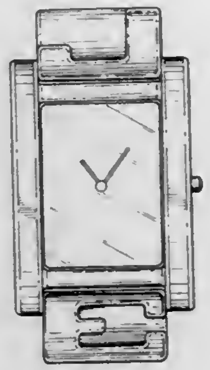
401,514
WATCHCASE

Olivier C. Coquerel, Paris, France, assignor to S. T. Dupont S.A., Paris, France
Filed Sep. 29, 1997, Ser. No. 77,434
Claims priority, application France, Apr. 3, 1997, 971971
Term of patent 14 years
LOC (6) Cl. 10 - *02*
U.S. Cl. D10—39



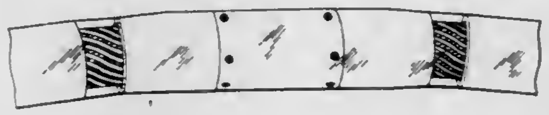
401,515
WATCH

Yacov Yida, 11700 Valley Crest Rd., Studio City, Calif. 91604
Filed Jan. 23, 1998, Ser. No. 82,530
Term of patent 14 years
LOC (6) Cl. 10 - *02*
U.S. Cl. D10—39



401,516
CABLE PORTION WITH HYDROPHONE MODULE

Robert Douglas Dowle, Ryde, and Frank Weiss, Maroubra, both of Australia, assignors to Thomson Marconi Sonar Pty Limited, Rydalmere, Australia
Filed Sep. 25, 1996, Ser. No. 60,250
Claims priority, application Australia, Mar. 26, 1996, 924/96
Term of patent 14 years
LOC (6) Cl. 10 - *04*
U.S. Cl. D10—46



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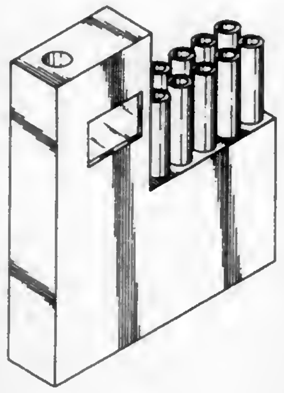
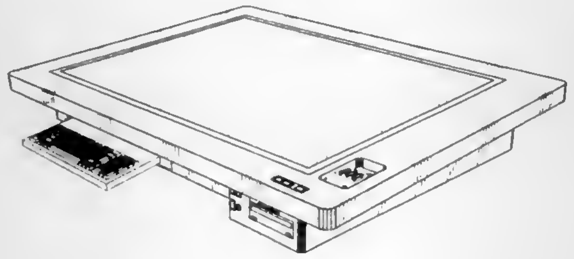
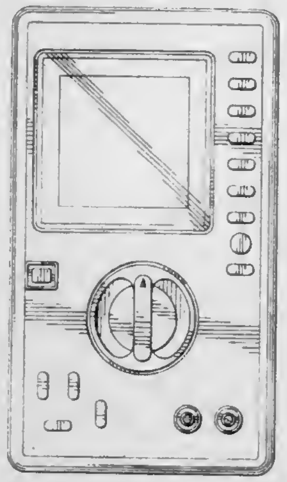
401,517
ELECTRONIC THERMOMETER UTILIZING FLAVORED THERMOMETER COVERS
Robert D. Smith, and Sunday Lee Smith, both of 303 Davis St., Anchorage, Ak. 99503
Filed Sep. 30, 1996, Ser. No. 60,491
Term of patent 14 years
LOC (6) Cl. 10 - *04*
U.S. Cl. D10—57



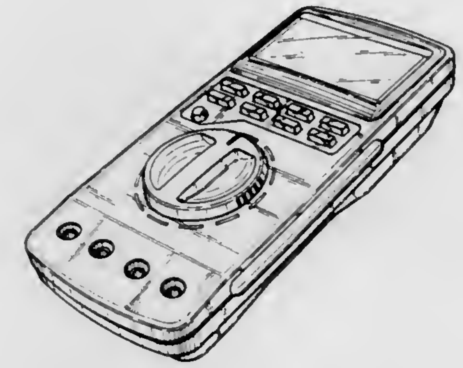
401,518
COMPUTERIZED DRAFTING BOARD
Orlando Rosario, 1480 Springside Dr., Weston, Fla. 33326
Filed Jan. 29, 1998, Ser. No. 82,735
Term of patent 14 years
LOC (6) Cl. 10 - *04*
U.S. Cl. D10—63



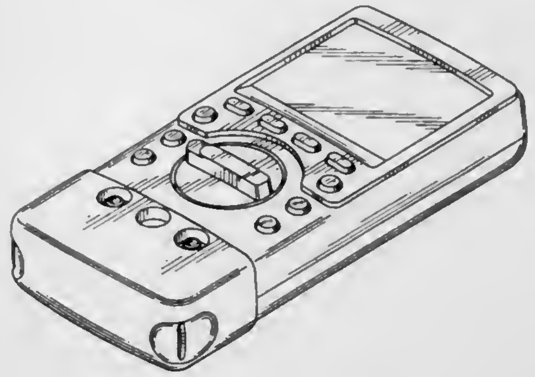
401,519
DIGITAL TESTING INSTRUMENT
Ed Frankovitch, Jr., Coatesville, Pa., and Robert J. Wieners, Wrentham, Mass., assignors to Universal Enterprises, Inc., Beaverton, Oreg.
Filed Sep. 19, 1996, Ser. No. 60,049
Term of patent 14 years
LOC (6) Cl. 10 - *04*
U.S. Cl. D10—78



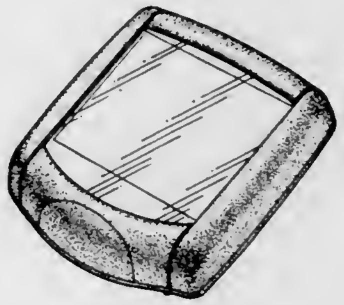
401,520
DIGITAL MULTI METER
Christian Beha, Glottertal, Germany, assignor to Ch-BEHA GmbH Technische Neuentwicklungen, Germany
Filed Oct. 10, 1997, Ser. No. 77,847
Term of patent 14 years
LOC (6) Cl. 10 - *04*
U.S. Cl. D10—78



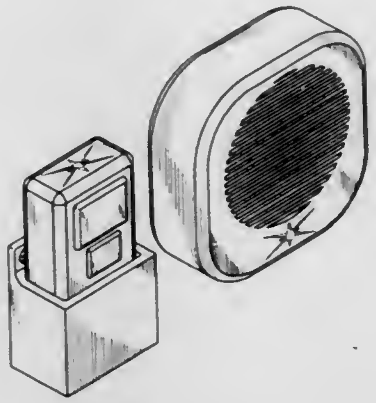
401,521
HAND HELD ELECTRONIC MEASUREMENT INSTRUMENT
Jerry L. Wrisley, Beaverton, and J. Steve Lyford, Portland, both of Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.
Filed Jan. 22, 1998, Ser. No. 82,581
Term of patent 14 years
LOC (6) Cl. 10 - *04*
U.S. Cl. D10—78



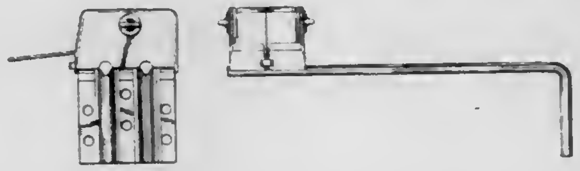
401,522
BICYCLE METER
Takashi Ueda, Izumi, and Youji Okuda, Kawachinagano, both of Japan, assignors to Cat Eye Co., Ltd., Osaka, Japan
Filed Feb. 19, 1998, Ser. No. 83,828
Claims priority, application Japan, Sep. 2, 1997, 9-66567
Term of patent 14 years
LOC (6) Cl. 10 - *04*
U.S. Cl. D10—98



401,523
COMBINED REMOTE CONTROL TRANSMITTER AND FIRE DETECTOR
Don C. Baker, 2813 SW. Prairie, #20, Topeka, Kans. 66614
Filed Dec. 24, 1997, Ser. No. 81,234
Term of patent 14 years
LOC (6) Cl. 10 - *05*
U.S. Cl. D10—106



401,524
ELECTRONIC BARRIER AND PHOTO-ELECTRIC SENSOR EYE
Michael Hörmann, Halle in Westfalen, Germany, assignor to Marantec Antriebs-und Steuerungstechnik GmbH & Co. Produktions KG, Marienfeld, Germany
Filed Aug. 15, 1997, Ser. No. 75,489
Term of patent 14 years
LOC (6) Cl. 10 - *05*
U.S. Cl. D10—113



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401,525
ELECTRONIC SOUNDER

Takahiro Sone; Yoshio Imahori; Katsuyuki Sano, and Tomonari Suzuki, all of Shizuoka, Japan, assignors to Star Micronics Co., Ltd., Shizuoka-ken, Japan

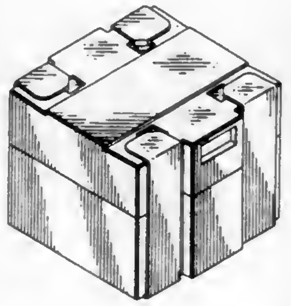
Filed Feb. 3, 1998, Ser. No. 82,995

Claims priority, application Japan, Aug. 8, 1997, 9-64363

Term of patent 14 years

LOC (6) Cl. 10 - *05*

U.S. Cl. D10—116



401,526
ADHESIVE-BACKED FOOD FRESHNESS INDICATOR DISK

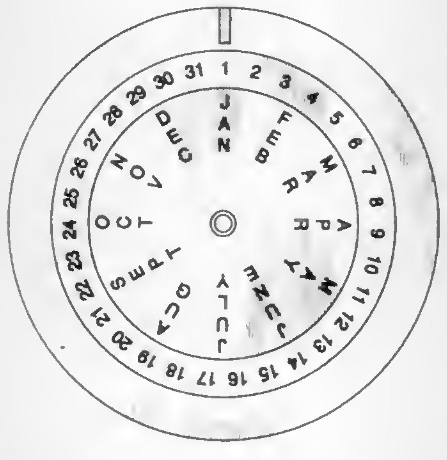
Bernadette Stunder, 15126 Ina Dr., Philadelphia, Pa. 19116

Filed Oct. 15, 1996, Ser. No. 61,056

Term of patent 14 years

LOC (6) Cl. 10 - *07*

U.S. Cl. D10—126



401,527
MULTIPLE ELEMENT BANGLE BRACELET

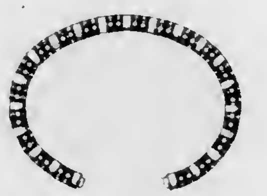
Pepi Kelman, Los Angeles, Calif., assignor to Pepi Kelman, Inc., Los Angeles, Calif.

Filed Aug. 25, 1997, Ser. No. 75,685

Term of patent 14 years

LOC (6) Cl. 11 - *01*

U.S. Cl. D11—4



401,528
LAPEL PIN

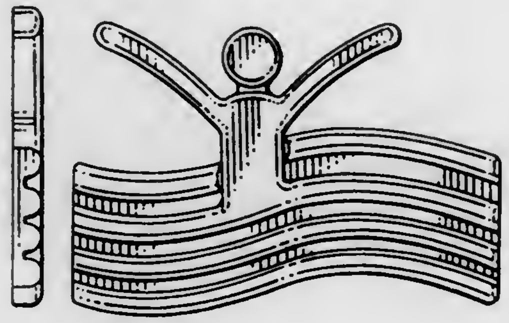
Cheryl M. Genovese, 59 Oak Tree Ct., West Middlesex, Pa. 16159

Filed Oct. 6, 1997, Ser. No. 77,579

Term of patent 14 years

LOC (6) Cl. 11 - *01*

U.S. Cl. D11—48



401,529
SLEIGH RUNNERS CONTAINER BASE

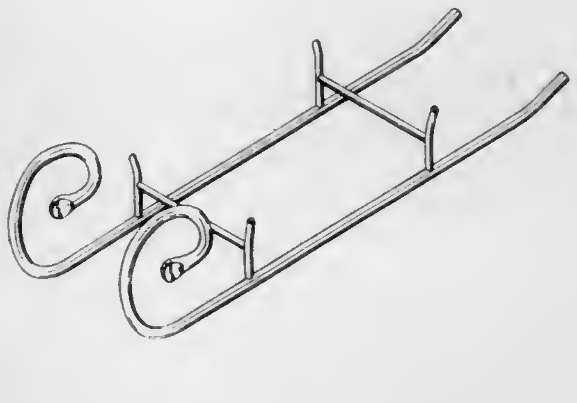
Lynn Lippert, Newark, Ohio, and Durward L. Staten, Mountain View, Ark., assignors to The Longaberger Company, Newark, Ohio

Filed Oct. 21, 1997, Ser. No. 78,204

Term of patent 14 years

LOC (6) Cl. 11 - *05*

U.S. Cl. D11—125



401,530
TRAY FOR THE GROWING OF SEEDLINGS

Altti Keskilohko, Säkylä, Finland, assignor to Lännen Tehtaat Oy, Iso-Vimma, Finland

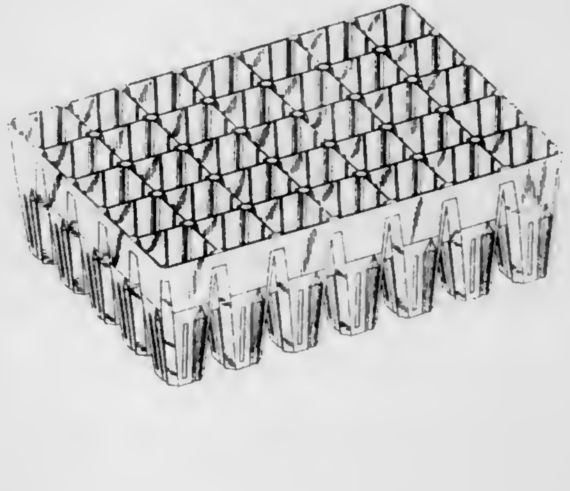
Filed Aug. 14, 1997, Ser. No. 74,954

Claims priority, application Finland, Feb. 28, 1997, 168/97

Term of patent 14 years

LOC (6) Cl. 11 - *02*

U.S. Cl. D11—155



401,531
FLOWER POT COVER

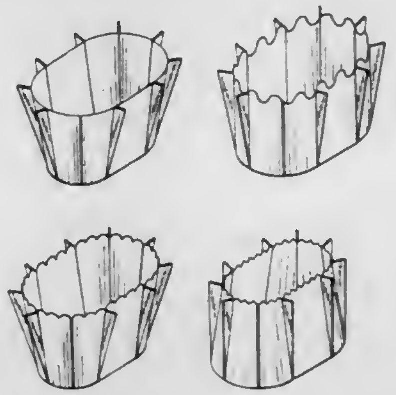
Donald E. Weder, Highland, Ill., and Jon S. Shryock, Bethany, Okla., assignors to Southpac Trust International, Inc.

Division of Ser. No. 46,123, Nov. 7, 1995, Pat. No. Des. 381,291, which is a division of Ser. No. 9,447, Jun. 11, 1993, Pat. No. Des. 364,587, which is a continuation-in-part of Ser. No. 781,453, Oct. 21, 1991, Pat. No. Des. 348,634, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, Ser. No. 411,249, Sep. 22, 1989, Pat. No. Des. 358,113, Ser. No. 411,247, Sep. 22, 1989, abandoned, and Ser. No. 411,245, Sep. 22, 1989, abandoned. This application Jan. 21, 1997, Ser. No. 64,876

Term of patent 14 years

LOC (6) Cl. 11 - *02*

U.S. Cl. D11—164



401,532
FLOWER POT COVER

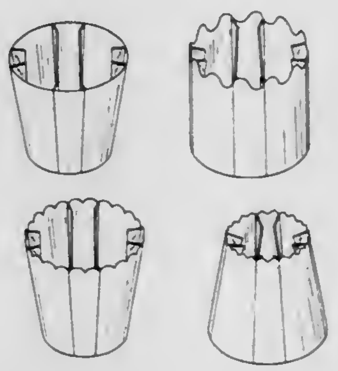
Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Southpac Trust international, Inc.

Division of Ser. No. 49,318, Jan. 22, 1996, Pat. No. Des. 385,217, which is a division of Ser. No. 7,868, Apr. 30, 1993, Pat. No. Des. 368,877, which is a continuation-in-part of Ser. No. 782,237, Oct. 18, 1991, Pat. No. Des. 349,076, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, Ser. No. 411,249, Sep. 22, 1989, Pat. No. Des. 358,113, Ser. No. 411,247, Sep. 22, 1989, abandoned, and Ser. No. 411,245, Sep. 22, 1989, abandoned. This application Apr. 23, 1997, Ser. No. 69,774

Term of patent 14 years

LOC (6) Cl. 11 - *02*

U.S. Cl. D11—164



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401,533

BUCKLE

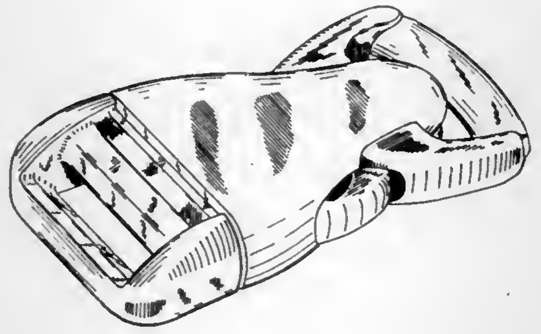
Joseph Anscher, Muttontown, N.Y., assignor to National Molding Corp., Farmingdale, N.Y.

Filed Oct. 30, 1997, Ser. No. 78,745

Term of patent 14 years

LOC (6) Cl. 02 - *07*

U.S. Cl. D11—218



401,534

MOTOR-ASSISTED BICYCLE

Seiji Higashihara, and Katsuyuki Nagano, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

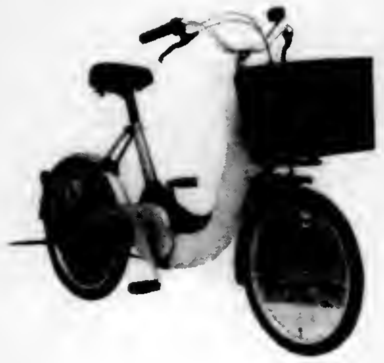
Filed Dec. 10, 1996, Ser. No. 63,549

Claims priority, application Japan, Jun. 10, 1996, 8-17189

Term of patent 14 years

LOC (6) Cl. 12 - *11*

U.S. Cl. D12—110



401,535

FOOT PEG FOR MOTORCYCLES AND DIRT BIKES

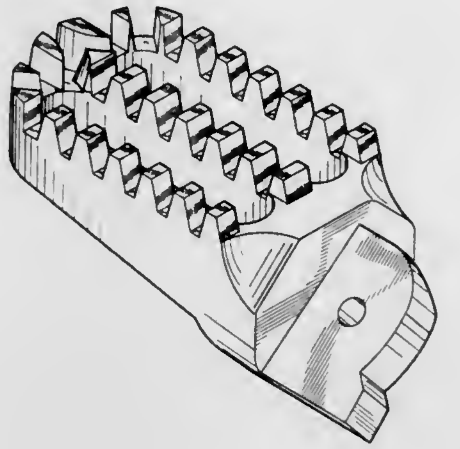
Timothy D. Joseph, Jr., 6320 87th St. NW., Gig Harbor, Wash. 98332

Filed May 5, 1997, Ser. No. 69,591

Term of patent 14 years

LOC (6) Cl. 12 - *11*

U.S. Cl. D12—114



401,536

DAMPER FOR SPRINGER FORK FOR MOTORCYCLES

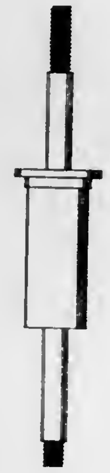
Richard L. Clements, 120 E. Wyoming, Redwood Falls, Minn. 56283

Filed Feb. 22, 1996, Ser. No. 50,787

Term of patent 14 years

LOC (6) Cl. 12 - *11*

U.S. Cl. D12—118



401,537

BICYCLE FRONT FORK LOWER TUBE ASSEMBLY

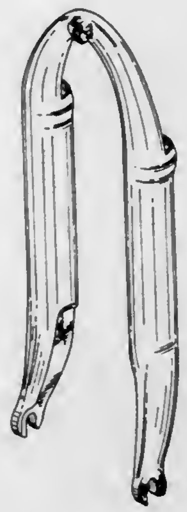
Paul H. Turner, Boulder, Colo., assignor to RockShox, Inc., San Jose, Calif.

Filed Jul. 15, 1996, Ser. No. 57,000

Term of patent 14 years

LOC (6) Cl. 12 - *11*

U.S. Cl. D12—118



401,538

CHAINLESS TRANSMISSION UNIT OF A BICYCLE

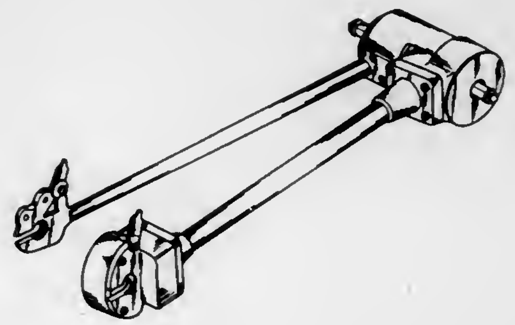
Chen-Ching Chang, 3/F., No. 37, Jih-Hsin St., Shu-Lin Town, Taipei County, Taiwan

Filed Mar. 25, 1997, Ser. No. 68,599

Term of patent 14 years

LOC (6) Cl. 12 - *11*

U.S. Cl. D12—122



401,539

CRANKARM FOR A BICYCLE

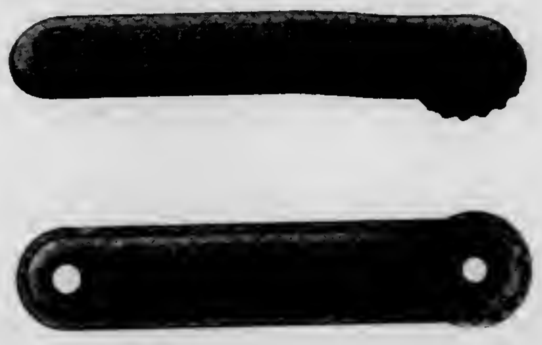
Robert H. Humphries, Jr., Danbury, and Thomas C. Patterson, Westport, both of Conn., assignors to Cannondale Corporation, Bethel, Conn.

Continuation-in-part of Ser. No. 651,581, May 22, 1996. This application Sep. 18, 1996, Ser. No. 59,965

Term of patent 14 years

LOC (6) Cl. 12 - *11*

U.S. Cl. D12—123



401,540

MOTOR-ASSISTED WHEELCHAIR

Shoji Yamamoto, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

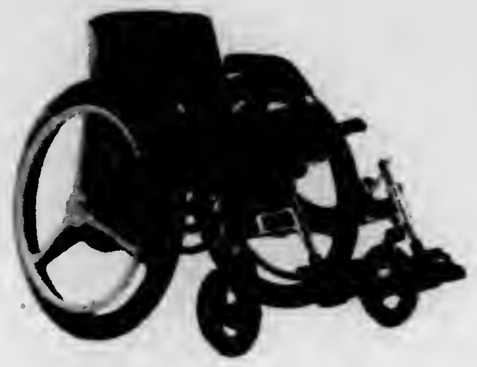
Filed Mar. 12, 1997, Ser. No. 67,759

Claims priority, application Japan, Sep. 12, 1996, 8-27297

Term of patent 14 years

LOC (6) Cl. 12 - *12*

U.S. Cl. D12—131



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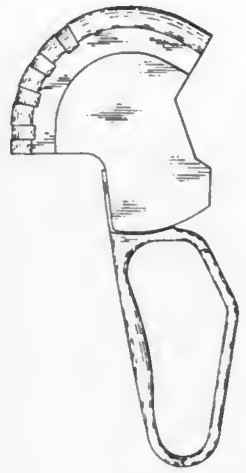
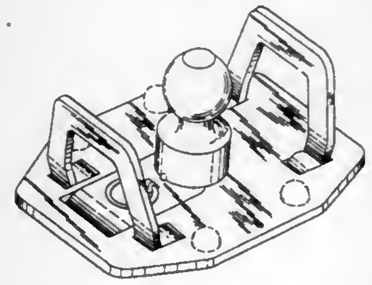
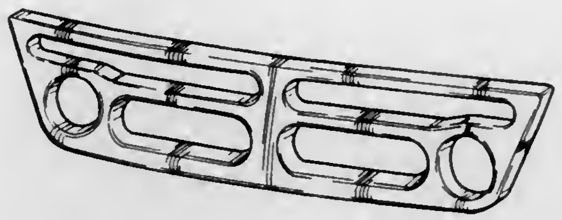
401,541
BRAKE HANDLE FOR A WALKER
Anders Gustav Ahlbertz, Gothenburg, Sweden, assignor to Dolomite Svenska AB, Anderstorp, Sweden
Filed Oct. 22, 1996, Ser. No. 61,347
Claims priority, application Sweden, Apr. 24, 1996, 96-0935
Term of patent 14 years
LOC (6) Cl. 12 - *12*
U.S. Cl. D12—133



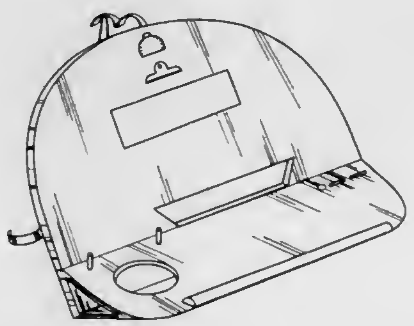
401,542
GOOSENECK HITCH ASSEMBLY
Thomas W. Lindenman, South Bend, and Richard W. McCoy, Granger, both of Ind., assignors to Reese Products, Inc., Elkhart, Ind.
Filed Apr. 30, 1997, Ser. No. 70,122
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—162



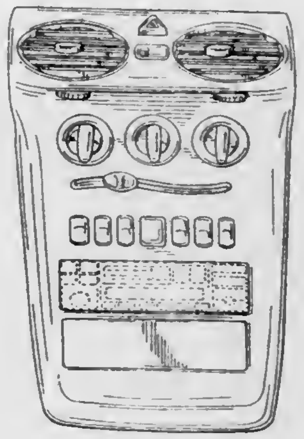
401,543
DESIGN FOR A VEHICLE GRILLE
Gary C. Mobley, Whitelake, Mich., assignor to Gregory A. Lesnau, White Lake, Mich., a part interest
Filed Feb. 18, 1997, Ser. No. 66,604
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—163



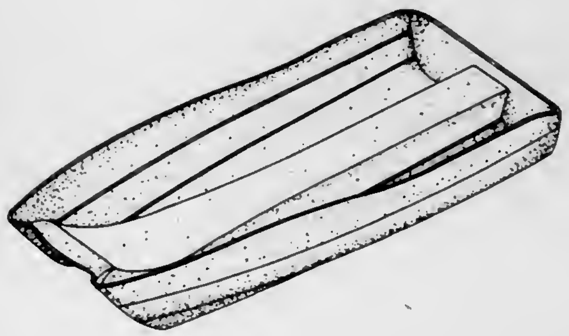
401,544
COMBINED COVER AND STRAP FOR THE STEERING WHEEL OF A VEHICLE
Colin Chandler Corsetti, 833 Southwest Bayshore Blvd., Port St. Lucie, Fla. 34983
Filed Aug. 18, 1994, Ser. No. 27,402
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—177



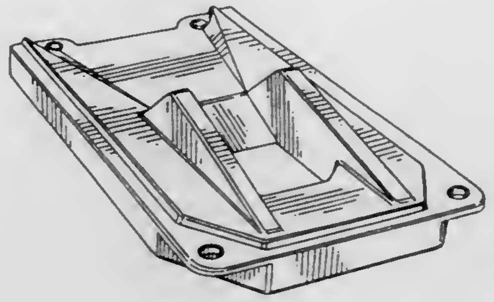
401,545
CENTER PORTION OF A VEHICLE INSTRUMENT PANEL
Bruno Sacco, Sindelfingen; Peter Pfeiffer, Böblingen, and Romuald Juraschek, Calw, all of Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany
Filed Jan. 30, 1997, Ser. No. 65,269
Claims priority, application Germany, Jul. 30, 1996, M96 06 391.2
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—192



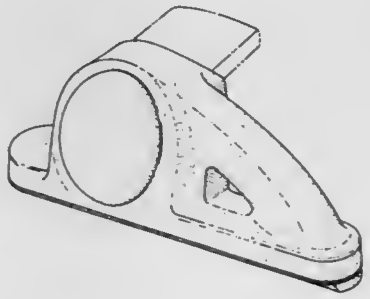
401,546
CATAMARAN BOAT HULL
Mark A. Boris, Merritt Island, and Forrest B. Munden, Englewood, both of Fla., assignors to WWW Group, Inc.
Filed Sep. 12, 1997, Ser. No. 76,677
Term of patent 14 years
LOC (6) Cl. 12 - *06*
U.S. Cl. D12—304



401,547
AERATOR FLOAT
Rudolf R. Karliner, Minnetonka, Minn., assignor to Aeration Industries International, Inc., Chaska, Minn.
Filed Aug. 1, 1997, Ser. No. 74,780
Term of patent 14 years
LOC (6) Cl. 12 - *06*
U.S. Cl. D12—316



401,548
VEHICLE ARTICLE CARRIER BRACKET
David D. Egly, Detroit, Mich., assignor to JAC Products, Inc., Ann Arbor, Mich.
Filed Feb. 10, 1998, Ser. No. 83,450
Term of patent 14 years
LOC (6) Cl. 12 - *16*
U.S. Cl. D12—414



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Patent Not Issued For This Number

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BATTERY HOUSING FOR A PORTABLE RADIO TELEPHONE

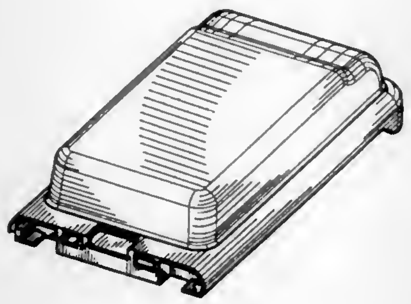
Randall P. Chambers; William C. Phelps, both of Lawrenceville, and Barbara A. Ruth, Cumming, all of Ga., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 3, 1996, Ser. No. 63,274

Term of patent 14 years

LOC (6) Cl. 13 - *02*

U.S. Cl. D13—103



401,551

BATTERY FOR A VEHICLE

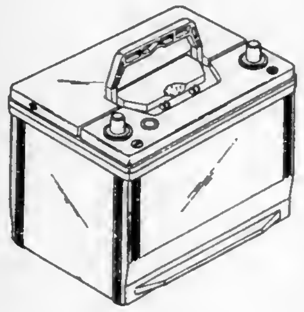
Sung Choong Kim, Seoul, Rep. of Korea, assignor to Delkor Corporation, Kyungbuk, Rep. of Korea

Filed Sep. 29, 1997, Ser. No. 77,221

Term of patent 14 years

LOC (6) Cl. 13 - *02*

U.S. Cl. D13—106



401,552

BATTERY CHARGER

Yosuke Tanaka, Hyogo, and Kazuo Takaka, Nara, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

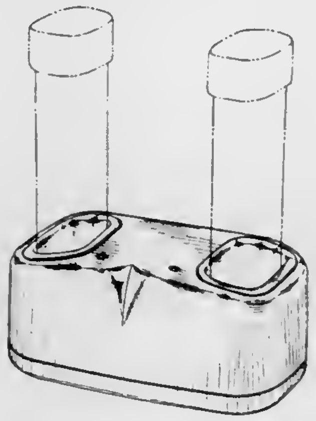
Filed Jul. 9, 1996, Ser. No. 56,777

Claims priority, application Japan, Jan. 16, 1996, 8-801

Term of patent 14 years

LOC (6) Cl. 13 - *02*

U.S. Cl. D13—107



401,553

ELECTRIC MOTOR HOUSING

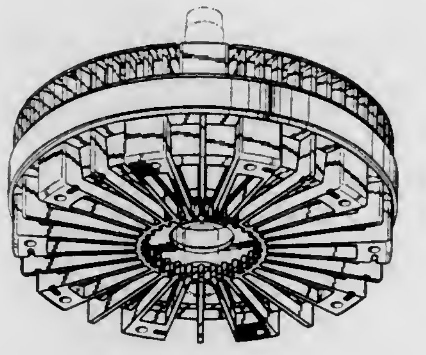
Richard A. Pearce, and Jack W. Gee, II, both of Memphis, Tenn., assignors to Hunter Fan Company, Memphis, Tenn.

Flied Aug. 7, 1996, Ser. No. 58,047

Term of patent 14 years

LOC (6) Cl. 13 - *02*

U.S. Cl. D13—112



401,554

BATTERY COVER FOR A WIRELESS COMMUNICATION DEVICE

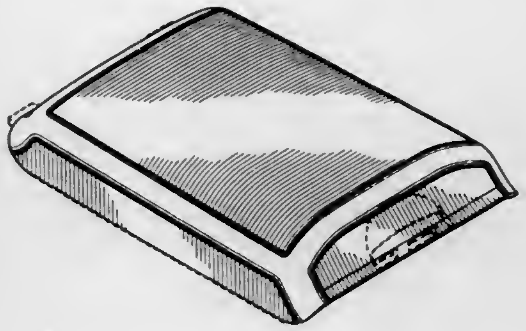
Albert Leo Nagele, Wilmette, and Mark Daniel Janninck, Elmhurst, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 23, 1998, Ser. No. 84,025

Term of patent 14 years

LOC (6) Cl. 13 - *02*

U.S. Cl. D13—119



401,555

SOCKET ADAPTOR WITH CIRCUIT BREAKER

Clement Pui-Yin Tam, G.P.O. Box 3262, Hong Kong, Hong Kong

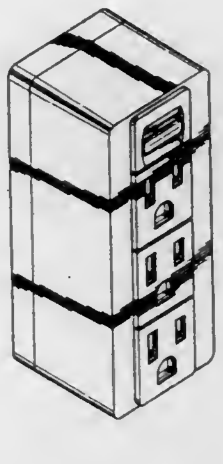
Filed Nov. 20, 1996, Ser. No. 62,626

Claims priority, application Canada, May 21, 1996, 1996-1172

Term of patent 14 years

LOC (6) Cl. 13 - *03*

U.S. Cl. D13—137.3



401,556

ELECTRIC PLUG WITH SURGE PROTECTION

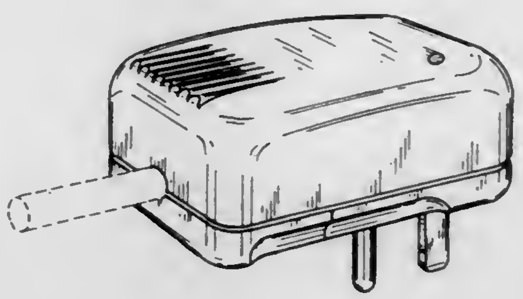
Albert Stekeienburg, Taipei, Taiwan, assignor to All-Line Inc., Taipei, Taiwan

Filed Sep. 30, 1997, Ser. No. 77,669

Term of patent 14 years

LOC (6) Cl. 13 - *03*

U.S. Cl. D13—138.2



401,557

ELECTRICAL OUTLET

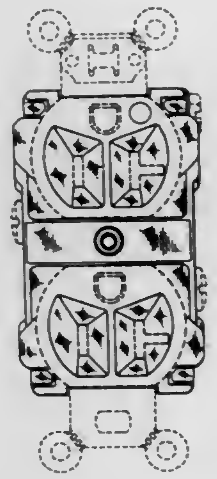
James A. Osterbrock, Central Square, and Michael R. Bryndzia, Baldwinsville, both of N.Y., assignors to Pass & Seymour, Inc., Syracuse, N.Y.

Filed Nov. 1, 1996, Ser. No. 61,879

Term of patent 14 years

LOC (6) Cl. 13 - *03*

U.S. Cl. D13—139.3



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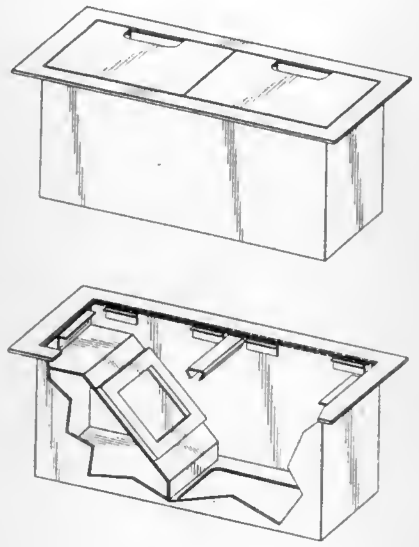
401,558
WIRE ACCESS BOX

Gordon S. Almond, Kelowna, Canada, assignor to R123 Enterprises Ltd., Kelowna, Canada
Filed May 30, 1997, Ser. No. 71,540
Term of patent 14 years
LOC (6) Cl. 13 - *03*

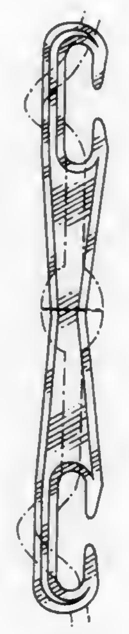
U.S. Cl. D13—152



401,559
RETAINER FOR COUPLED ELECTRICAL CORDS

Josh Angell, Occidental, Calif., assignor to Josef Valuch, Petaluma, Calif.
Filed Dec. 5, 1996, Ser. No. 63,338
Term of patent 14 years
LOC (6) Cl. 13 - *03*

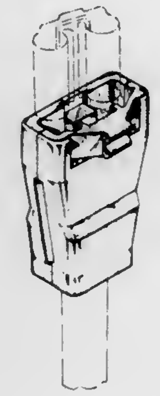
U.S. Cl. D13—154



401,560
INSULATING COVER FOR A TERMINAL

Toshinobu Nakamura, Tokyo, Japan, assignor to Shinagawa Shoko Co., Ltd., Tokyo, Japan
Filed Sep. 29, 1997, Ser. No. 77,130
Term of patent 14 years
LOC (6) Cl. 13 - *03*

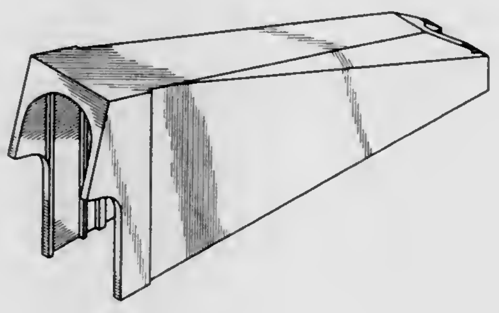
U.S. Cl. D13—156



401,561
HOOD FOR AN ELECTRICAL CONNECTOR

Kenneth W. Brownell, Marion, and John G. Shram, Weaverville, both of N.C., assignors to Superior Modular Products, Incorporater, Savannah, N.C.
Filed Nov. 25, 1997, Ser. No. 79,778
Term of patent 14 years
LOC (6) Cl. 13 - *03*

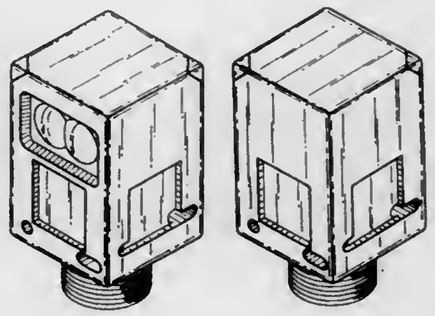
U.S. Cl. D13—156



401,562
HOUSING FOR PHOTOELECTRIC LIMIT SWITCH CONTROL

Dwight S. Brass, Freeport, Ill., and George D. La Police, Somerville, N.J., assignors to Sycon Corporation, Lancaster, Pa.
Filed Mar. 7, 1997, Ser. No. 67,455
Term of patent 14 years
LOC (6) Cl. 13 - *03*

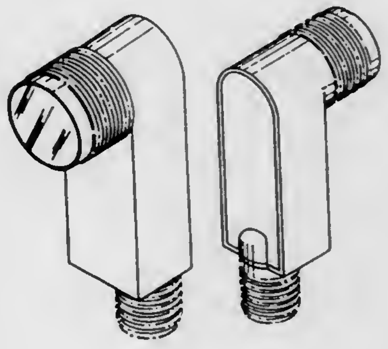
U.S. Cl. D13—165



401,563
HOUSING FOR A PHOTOELECTRIC CONTROL

George D. La Police, Somerville, N.J., assignor to Sycon Corporation, Lancaster, Pa.
Filed Oct. 9, 1997, Ser. No. 77,705
Term of patent 14 years
LOC (6) Cl. 13 - *03*

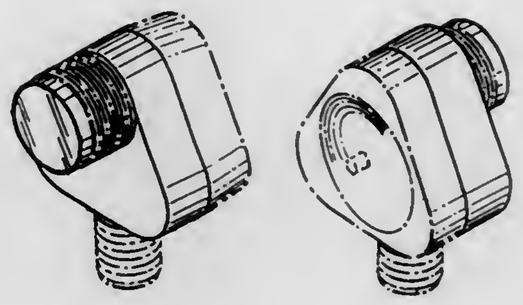
U.S. Cl. D13—165



401,564
HOUSING FOR PHOTOELECTRIC CONTROL

George D. La Police, Somerville, N.J., assignor to Sycon Corporation, Lancaster, Pa.
Filed Oct. 9, 1997, Ser. No. 77,706
Term of patent 14 years
LOC (6) Cl. 13 - *03*

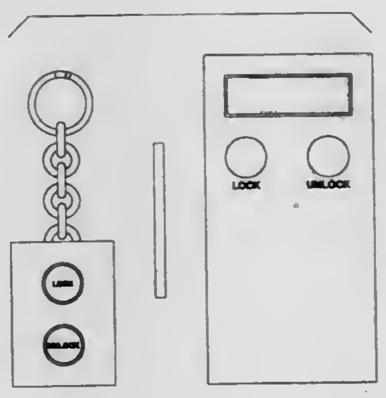
U.S. Cl. D13—165



401,565
DEADBOLT LOCK ASSEMBLY WITH REMOTE CONTROL

Terri Wray Smith, and Edward Gene Smith, Jr., both of 4724 Cadillac Blvd., Arlington, Tex. 76016
Filed May 8, 1997, Ser. No. 70,412
Term of patent 14 years
LOC (6) Cl. 13 - *03*

U.S. Cl. D13—168



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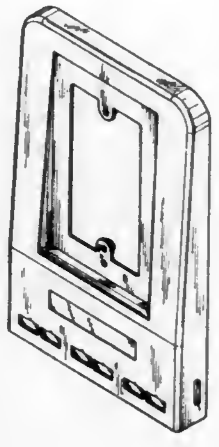
401,566
CABLE MANAGEMENT ENCLOSURE

Michael J. Gesmondi, Thomaston; John A. Siemon, Woodbury; Robert C. Carlson, Jr., Torrington, all of Conn., and Conrad L. Ott, Port Jefferson Station, N.Y., assignors to The Siemon Company, Watertown, Conn.

Filed May 23, 1996, Ser. No. 54,878
Term of patent 14 years
LOC (6) Cl. 13 - *03*

U.S. Cl. D13—177

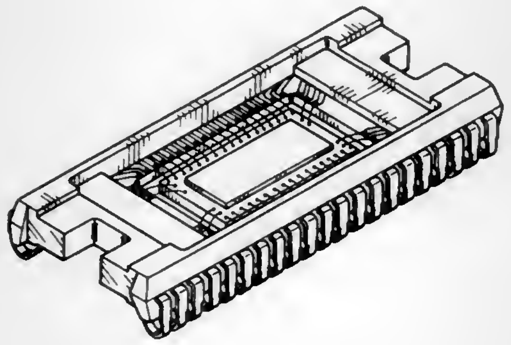


401,567
TEMPORARY PACKAGE FOR SEMICONDUCTOR DICE

Warren M. Farnworth, Nampa; Alan G. Wood, Boise; David R. Hembree, Boise, and Salman Akram, Boise, all of Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Apr. 25, 1997, Ser. No. 70,005
Term of patent 14 years
LOC (6) Cl. 23 - *06*

U.S. Cl. D13—182

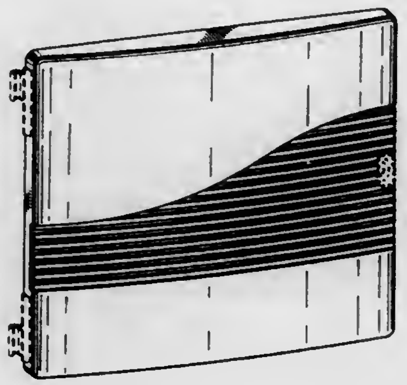


401,568
COVER FOR AN ELECTRONIC AND/OR OPTICAL EQUIPMENT ENCLOSURE

Tor Andrew Alden, Somerset County; Bassel Hage Daoud, Morris County, and Kevin Luke Massaro, Morris County, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Sep. 13, 1996, Ser. No. 60,292
Term of patent 14 years
LOC (6) Cl. 13 - *99*

U.S. Cl. D13—184

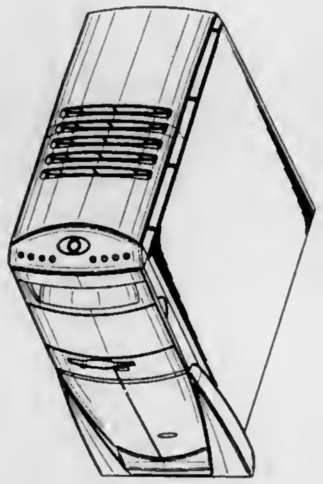


401,569
COMPUTER TOWER

Kevin L. Massaro, Houston, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Filed Jun. 12, 1997, Ser. No. 72,175
Term of patent 14 years
LOC (6) Cl. 14 - *02*

U.S. Cl. D14—100

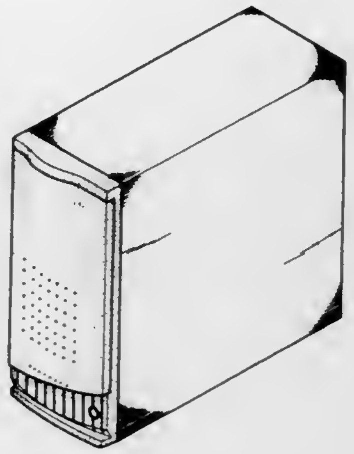


401,570
COMPUTER CASE

Chi Hsiu Lee, P.O. Box 82-144, Taipei, Taiwan

Filed Nov. 22, 1996, Ser. No. 62,759
Term of patent 14 years
LOC (6) Cl. 14 - *02*

U.S. Cl. D14—102

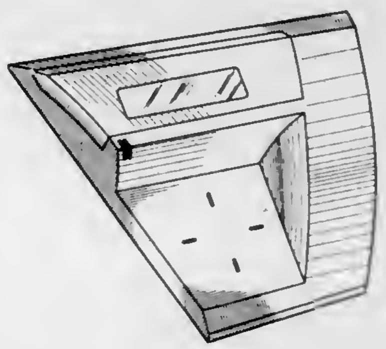


401,571
TRANSIT GATE CARD READER

Bradford F. Butts, Oak Park; Arnold Crater, Hoffman Estates; Michael D. Prince, and Paul F. O'Connor, both of Chicago, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 15, 1997, Ser. No. 77,946
Term of patent 14 years
LOC (6) Cl. 14 - *02*

U.S. Cl. D14—105

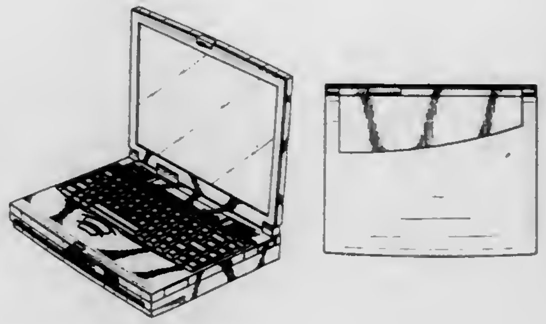


401,572
ELECTRONIC COMPUTER

Keita Tanaka, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 28, 1997, Ser. No. 78,532
Claims priority, application Japan, Jun. 16, 1997, 9-57812
Term of patent 14 years
LOC (6) Cl. 14 - *02*

U.S. Cl. D14—106

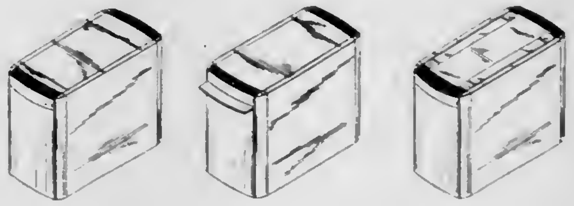


401,573
DATA RECORDER AND READER

Teiyu Goto, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 13, 1996, Ser. No. 63,589
Claims priority, application Japan, Jun. 14, 1996, 8-17765; Jun. 14, 1996, 8-17766; Jun. 14, 1996, 8-17767
Term of patent 14 years
LOC (6) Cl. 14 - *02*

U.S. Cl. D14—107



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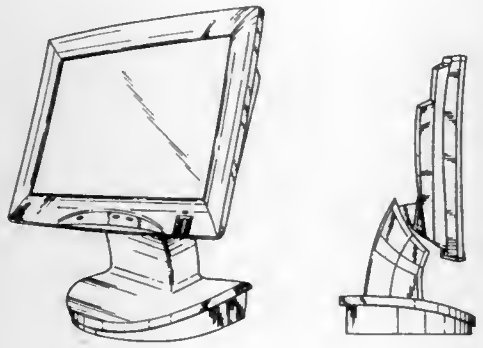
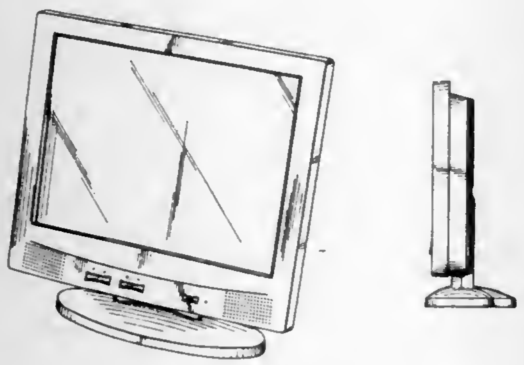
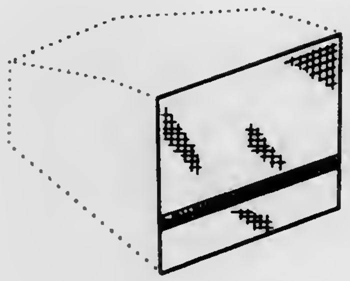
401,574
FLAT PANEL MONITOR
Michael Leman, Eagle, Id., and Randall W. Martin, The Woodlands, Tex., assignors to Compaq Computer Corporation, Houston, Tex.
Filed Jun. 2, 1997, Ser. No. 71,569
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—113



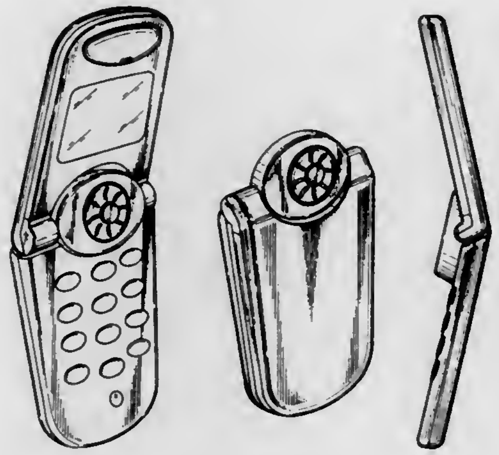
401,575
COMPUTER DISPLAY
Yu-Hsin Chuo, Taipei, Taiwan, assignor to Compal Electronics, Inc., Taipei, Taiwan
Filed Nov. 7, 1997, Ser. No. 79,086
Claims priority, application Taiwan, Oct. 24, 1997, 86309221
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—113



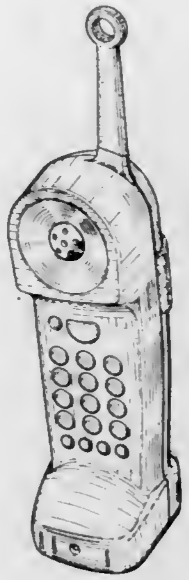
401,576
FRONT OF A COMPUTER MONITOR COVER WITH ZIPPER ACCENT
Wainwright S. Watkins, P.O. Box 251696, Glendale, Calif. 91225
Filed Sep. 12, 1997, Ser. No. 76,670
Term of patent 14 years
LOC (6) Cl. 14 - *02*
U.S. Cl. D14—114



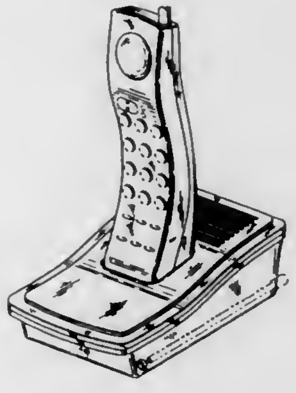
401,577
PORTABLE RADIOTELEPHONE
Katsuhiro Yamaguchi, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Nov. 26, 1997, Ser. No. 80,545
Claims priority, application Japan, Jul. 23, 1997, 9-62262
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—138



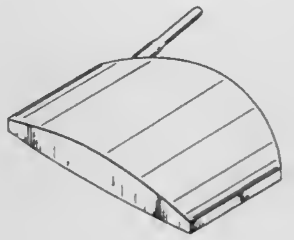
401,578
TELEPHONE HANDSET
Ronald L. Lytel, Indianapolis, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.
Filed Aug. 20, 1997, Ser. No. 75,441
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—147



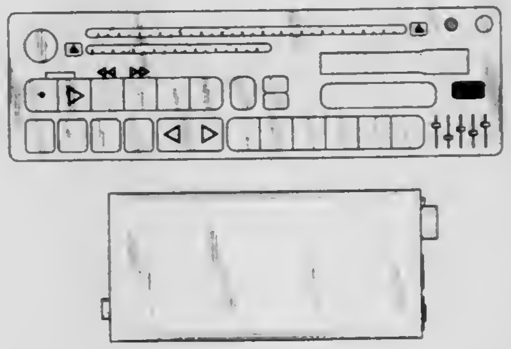
401,579
TELEPHONE SET
O'Connell Julien Benjamin, Marlboro, N.J.; Sze Lee Chua, Singapore, Singapore; Chi Man Chui, Kowloon, Hong Kong; King Hoe Goh; Lee Wah Tan, both of Singapore, Singapore; Steven Mitchell Wheatley, Morristown, N.J., and Terry A. Whitlock, Yardley, Pa., assignors to Lucent Technologies Inc., Murray Hill, N.J.
Filed Dec. 29, 1995, Ser. No. 48,447
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—149



401,580
TRANSMITTER
Teiyu Goto, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Dec. 13, 1996, Ser. No. 63,590
Claims priority, application Japan, Jun. 14, 1996, 8-17768
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—155



401,581
CAR AUDIO RECORDING SYSTEM
John M Palmiro, and Susan M Palmiro, both of 1315 Bradford Ave., Bronx, N.Y. 10461
Filed Feb. 5, 1998, Ser. No. 83,134
Term of patent 14 years
LOC (6) Cl. 14 - *01*
U.S. Cl. D14—167



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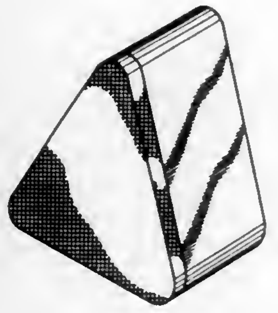
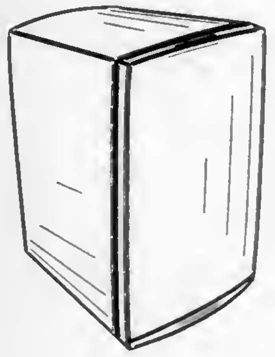
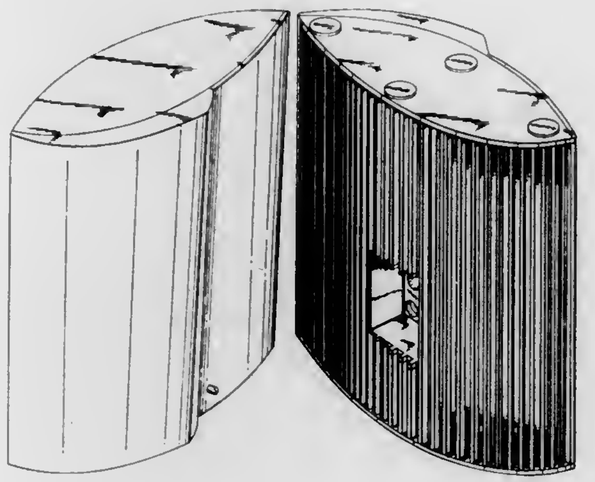
401,582
TRIANGULAR SPEAKER
Alan Gremchuck, 2455 Vista Wood Cir., No. 22, Thousand Oaks, Calif. 91362
Filed Jan. 5, 1996, Ser. No. 51,316
Term of patent 14 years
LOC (6) Cl. 14 - *01*
U.S. Cl. D14—210



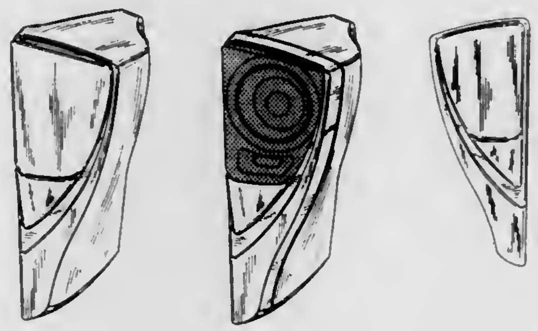
401,583
LOUDSPEAKER HOUSING
Jay Shin, Brooklyn, and Charles Rozier, New York, both of N.Y., assignors to Boston Acoustics, Inc., Peabody, Mass.
Filed Sep. 3, 1996, Ser. No. 59,100
Term of patent 14 years
LOC (6) Cl. 14 - *01*
U.S. Cl. D14—214



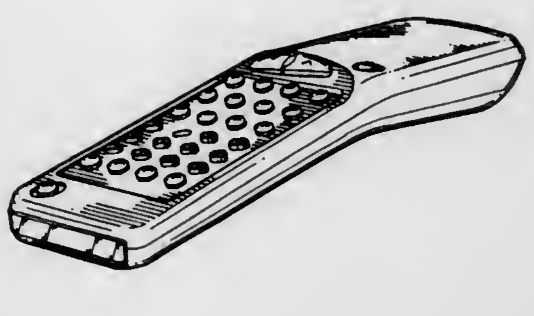
401,584
LOUDSPEAKER
David Lewis, København, Denmark, assignor to Bang & Olufsen Holding A/S, Struer, Denmark
Filed Dec. 11, 1996, Ser. No. 63,601
Claims priority, application Denmark, Jun. 13, 1996, MA 0582 1996
Term of patent 14 years
LOC (6) Cl. 14 - *01*
U.S. Cl. D14—214



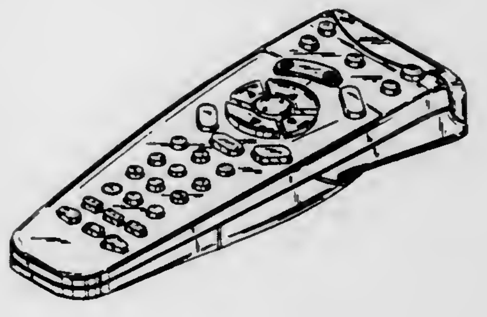
401,585
SPEAKER BOX
Edward L. Boyd, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Apr. 8, 1997, Ser. No. 68,367
Term of patent 14 years
LOC (6) Cl. 14 - *01*
U.S. Cl. D14—214



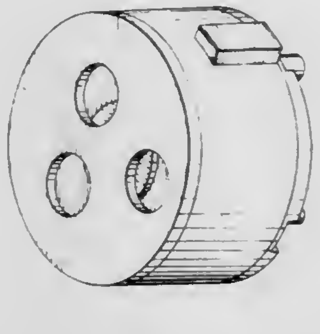
401,586
AUDIO REMOTE CONTROLLER
Masafumi Ito; Minoru Sube; Haruki Takita, and Hiroyuki Watanabe, all of Musashino, Japan, assignors to Teac Corporation, Tokyo, Japan
Filed Feb. 9, 1996, Ser. No. 50,139
Claims priority, application Japan, Aug. 10, 1995, 7-23471
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—218



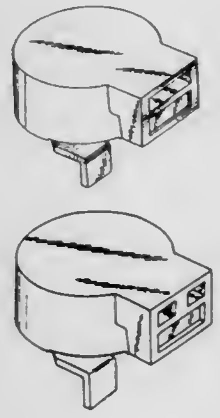
401,587
SATELLITE RECEIVER REMOTE CONTROL
Daniel L. Rudolph, Denver, Colo., assignor to Echostar Communications Corporation, Engelwood, Colo.
Filed Apr. 1, 1996, Ser. No. 58,386
Term of patent 14 years
LOC (6) Cl. 14 - *03*
U.S. Cl. D14—218



401,588
ELECTROACOUSTIC TRANSDUCER
Isao Fushimi, Shizuoka, Japan, assignor to Star Micronics Co., Ltd., Shizuoka, Japan
Filed Mar. 7, 1996, Ser. No. 51,263
Claims priority, application Japan, Sep. 8, 1995, 7-26529
Term of patent 14 years
LOC (6) Cl. 14 - *01*
U.S. Cl. D14—222



401,589
ELECTROACOUSTIC TRANSDUCER
Takahiro Sone, and Yoshio Imahori, both of Shizuoka, Japan, assignors to Star Micronics Co., Ltd., Shizuoka, Japan
Filed Dec. 5, 1996, Ser. No. 62,766
Claims priority, application Japan, Jun. 5, 1996, 8-16587; Jun. 5, 1996, 8-16588
Term of patent 14 years
LOC (6) Cl. 14 - *01*
U.S. Cl. D14—222



401,590
ELECTROACOUSTIC TRANSDUCER

Kazushige Tajima, and Yoshio Imahori, both of Shizuoka, Japan, assignors to Star Micronics Co., Ltd., Shizuoka, Japan

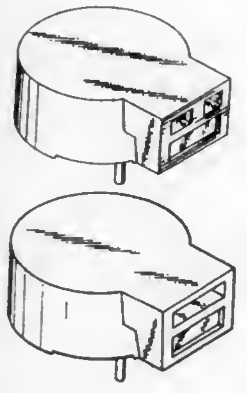
Filed Dec. 5, 1996, Ser. No. 62,937

Claims priority, application Japan, Jun. 5, 1996, 8-16589; Jun. 5, 1996, 8-16590

Term of patent 14 years

LOC (6) Cl. 14 - *01*

U.S. Cl. D14—222



401,591
AUTOSOUND INSTALLATION MOUNTING DEVICE

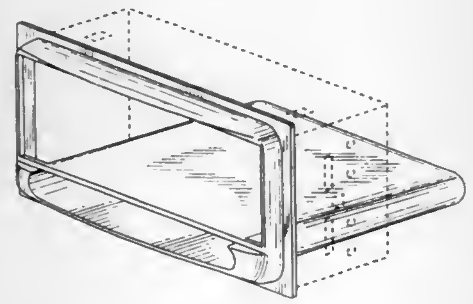
William H. Jones, Jr., Ormond Beach, and R. Spencer Quilling, II, Glenwood, both of Fla., assignors to Metra Electronics Corporation, Holly Hill, Fla.

Filed Jan. 9, 1997, Ser. No. 64,737

Term of patent 14 years

LOC (6) Cl. 14 - *01*

U.S. Cl. D14—224



401,592
ANTENNA RADOME

Shinichiro Nishimura; Hideyuki Tsutsui, both of Tokyo; Hiroyuki Kobayashi, Yokohama, and Kazuyuki Oguri, Higashikurume, all of Japan, assignors to Japan Radio Co., Ltd., Tokyo, Japan

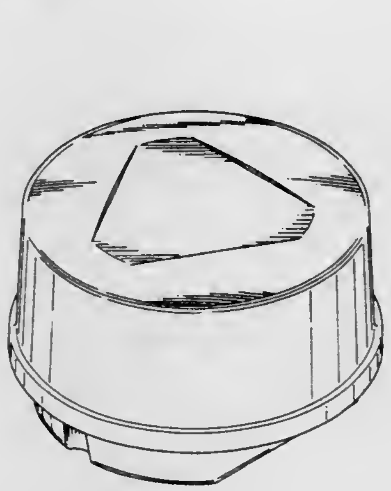
Filed Mar. 14, 1997, Ser. No. 68,016

Claims priority, application Japan, Sep. 25, 1996, 8-28516

Term of patent 14 years

LOC (6) Cl. 14 - *03*

U.S. Cl. D14—230



401,593
NAVIGATION ANTENNA

Shinichiro Nishimura; Hideyuki Tsutsui, both of Tokyo, and Miyoshi Nishio, Mitaka, all of Japan, assignors to Japan Radio Co., Ltd., Tokyo, Japan

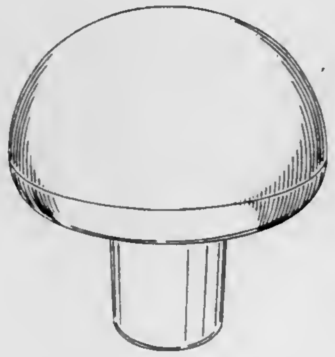
Filed Mar. 14, 1997, Ser. No. 68,017

Claims priority, application Japan, Sep. 25, 1996, 8-28517

Term of patent 14 years

LOC (6) Cl. 14 - *03*

U.S. Cl. D14—230



401,594
NAVIGATION ANTENNA

Shinichiro Nishimura; Hideyuki Tsutsui, both of Tokyo, and Miyoshi Nishio, Mitaka, all of Japan, assignors to Japan Radio Co., Ltd., Tokyo, Japan

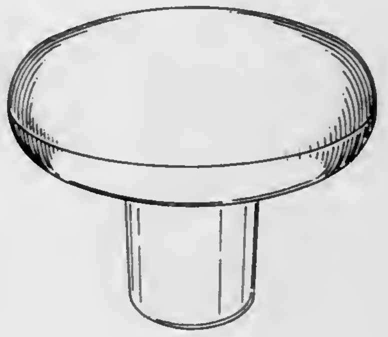
Filed Mar. 14, 1997, Ser. No. 68,018

Claims priority, application Japan, Sep. 25, 1996, 8-28518

Term of patent 14 years

LOC (6) Cl. 14 - *03*

U.S. Cl. D14—230



401,595
ANTENNA COVER

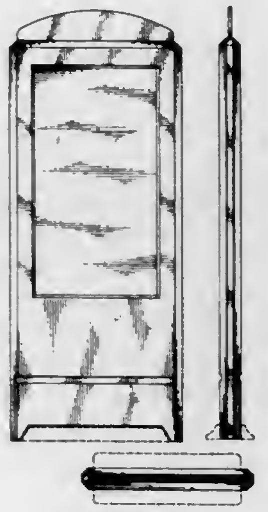
David A. Guttadauro, 365 Salem St., Wakefield, Mass. 01880

Filed Apr. 7, 1997, Ser. No. 68,356

Term of patent 14 years

LOC (6) Cl. 14 - *03*

U.S. Cl. D14—230



401,596
ENGINE FOR A MODEL

Yoshihiro Yukami, Osaka, Japan, assignor to O.S. Engines Mfg. Co., Ltd., Osaka, Japan

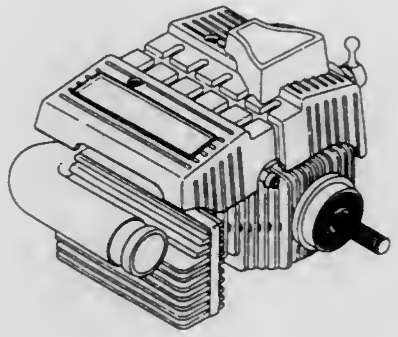
Filed Sep. 30, 1997, Ser. No. 78,957

Claims priority, application Japan, Sep. 9, 1997, 9-67295

Term of patent 14 years

LOC (6) Cl. 02 - *01*

U.S. Cl. D15—1



401,597
SHALLOW CYLINDRICAL AIR FILTER WITH TOP AND SIDE FILTERING AREAS

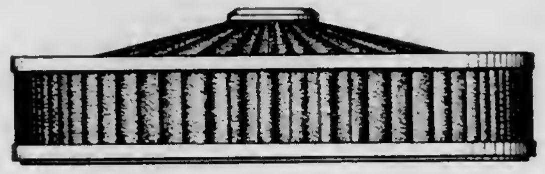
Nathan E. Shelton, Riverside, Calif., and Duncan Bickerton, Warrington, England, assignors to K & N Engineering, Inc., Riverside, Calif.

Filed Nov. 10, 1997, Ser. No. 79,257

Term of patent 14 years

LOC (6) Cl. 15 - *01*

U.S. Cl. D15—5



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401,598

WIRE ELECTROEROSION MACHINE

Marco Mariotta, Losone, and Herbert Wiss, Locarno, both of Switzerland, assignors to AGIE SA, Losone, Switzerland

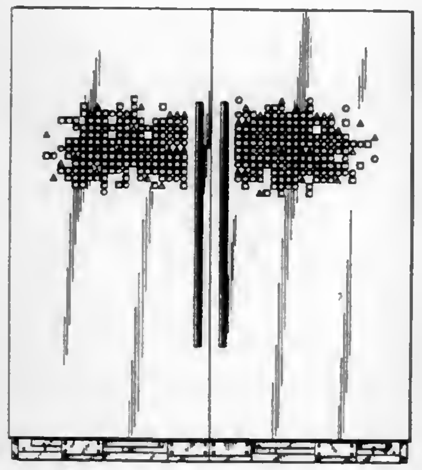
Filed Jul. 28, 1997, Ser. No. 74,100

Claims priority, application Switzerland, Jan. 28, 1997, DM/038950

Term of patent 14 years

LOC (6) Cl. 15 - *09*

U.S. Cl. D15—122



401,599

SUPPORT ARM FOR A SLIDING COMPOUND MITER SAW

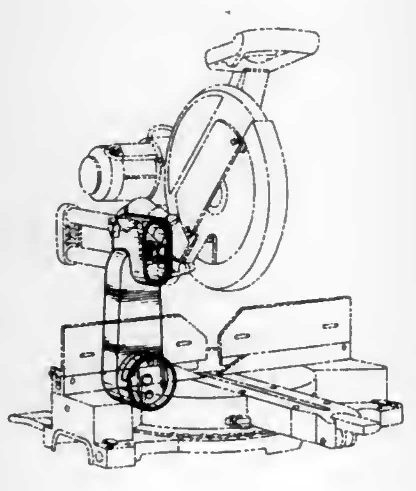
William R. Stumpf, Kingsville, Md., and Scott Price, Singapore, Singapore, assignors to Black & Decker Inc., Newark, Del.

Filed Jun. 19, 1997, Ser. No. 72,687

Term of patent 14 years

LOC (6) Cl. 15 - *09*

U.S. Cl. D15—133



401,600

LIQUID DISPENSING DEVICE

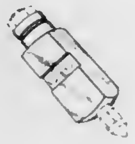
David J. Byerly, Lawrenceville; Charles P. Ganzer, Cumming, both of Ga., and Thomas C. Jenkins, Amherst, Ohio, assignors to Nordson Corporation, Westlake, Ohio

Filed Nov. 3, 1997, Ser. No. 78,994

Term of patent 14 years

LOC (6) Cl. 15 - *09*

U.S. Cl. D15—144.2



401,601

FOLDABLE OIL CHANGE PLATFORM FOR A LAWNMOWER

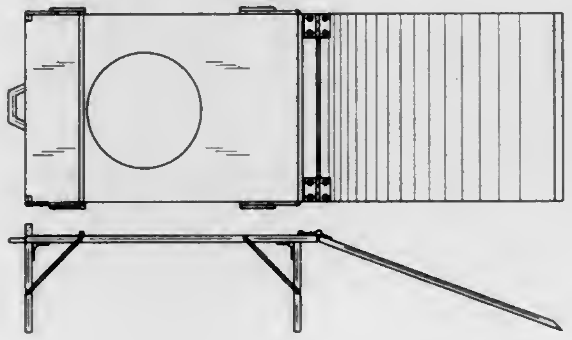
Harry S. Kalpagian, 610 Meade Dr., Greensboro, N.C. 27410

Filed Feb. 2, 1998, Ser. No. 83,202

Term of patent 14 years

LOC (6) Cl. 15 - *09*

U.S. Cl. D15—150



401,602

MODULE FOR DISPENSING SUBSTANCES AT A VEHICLE SERVICE STATION

Stein Alvern, Oslo, and Øyvind Alvern, Hjellestad, both of Norway, assignors to Alvern Norway AS, Norway

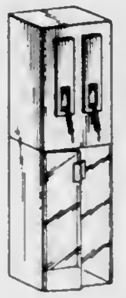
Filed Oct. 16, 1996, Ser. No. 61,104

Claims priority, application Norway, Apr. 24, 1996, 960272

Term of patent 14 years

LOC (6) Cl. 10 - *04*

U.S. Cl. D15—151



401,603

TV CAMERA

Fumio Hasegawa, Nishio, Japan, assignor to Elmo Co., Ltd., Nagoya, Japan

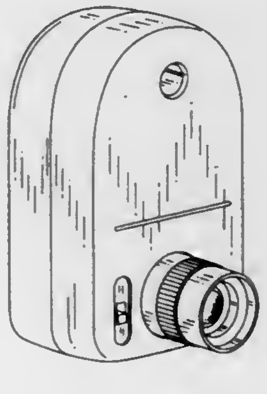
Division of Ser. No. 56,405, Jun. 28, 1996. This application Mar. 31, 1997, Ser. No. 68,769

Claims priority, application Japan, Dec. 28, 1995, 7-39441

Term of patent 14 years

LOC (6) Cl. 16 - *01*

U.S. Cl. D16—202



401,604

CAMERA

Hideki Ito, Kawagoe, and Yoshimasa Hyodo, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

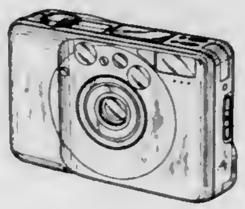
Filed Dec. 15, 1997, Ser. No. 80,730

Claims priority, application Japan, Jun. 23, 1997, 9-059095

Term of patent 14 years

LOC (6) Cl. 16 - *01*

U.S. Cl. D16—218



401,605

BASEBALL SHAPED TRANSPARENCY VIEWER

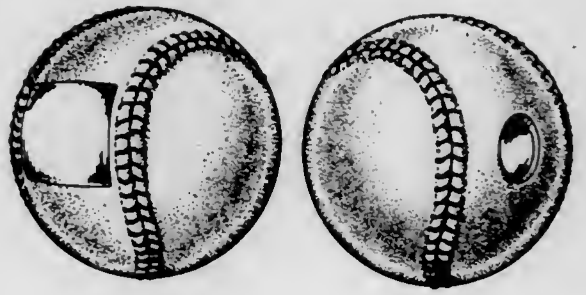
Brian Shirley, 4850 E. Desert Cove, #210, Scottsdale, Ariz. 85254

Filed Nov. 24, 1997, Ser. No. 81,936

Term of patent 14 years

LOC (6) Cl. 16 - *02*

U.S. Cl. D16—227



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401,606
EYEGLASSES FOR SHOTGUN SHOOTERS

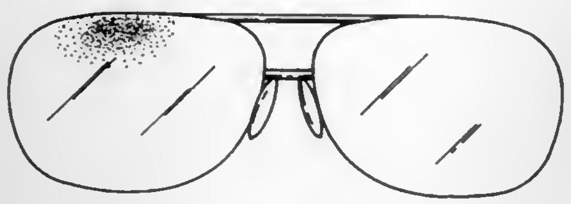
Martin K. Kasprzyk, 2648 Ransomville Rd., Ransomville, N.Y. 14131

Filed Jan. 29, 1997, Ser. No. 65,572

Term of patent 14 years

LOC (6) Cl. 16 - *06*

U.S. Cl. D16—300



401,607
SAFETY GLASSES

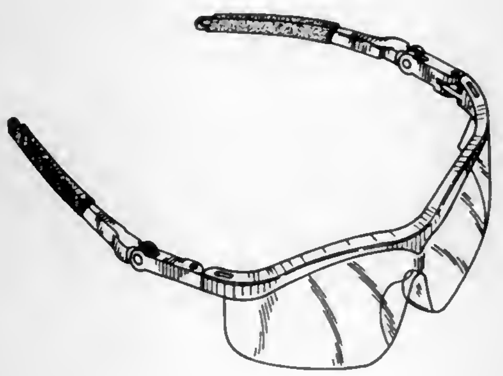
Robert L. Miniutti, Jamestown, R.I., assignor to Crews, Inc., Memphis, Tenn.

Filed May 14, 1997, Ser. No. 70,694

Term of patent 14 years

LOC (6) Cl. 16 - *06*

U.S. Cl. D16—314



401,608
SAFETY SPECTACLES

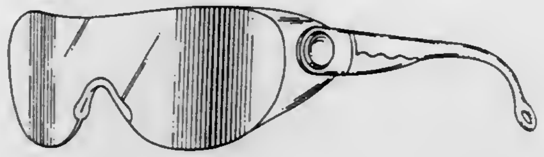
John David Eberle, Amherst, and Devin Glenn Cooper, Fairport, both of N.Y., assignors to American Allsafe Company, Tonawanda, N.Y.

Filed Oct. 20, 1997, Ser. No. 78,248

Term of patent 14 years

LOC (6) Cl. 16 - *06*

U.S. Cl. D16—314



401,609
PAIR OF EYEGLASSES

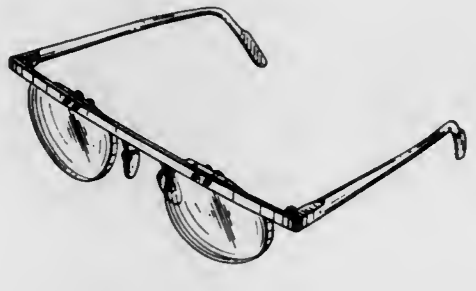
Charlotte Kjoelbye Jorst, 867 Donna Dr., Incline Village, Nev. 89451

Filed Dec. 16, 1997, Ser. No. 80,791

Term of patent 14 years

LOC (6) Cl. 16 - *06*

U.S. Cl. D16—316



401,610
EYEWEAR

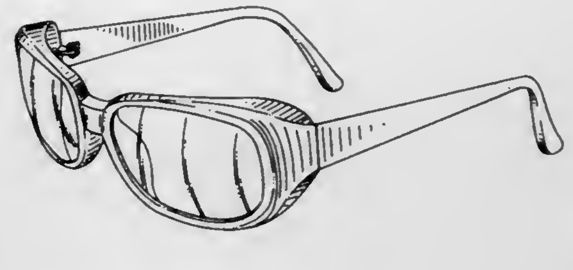
Mark J. Flanagan, Rochester, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed May 1, 1997, Ser. No. 70,152

Term of patent 14 years

LOC (6) Cl. 16 - *06*

U.S. Cl. D16—327



401,611
ELECTRONIC KEYBOARD MUSICAL INSTRUMENT

Daizo Sato, Hamamatsu, Japan, assignor to Yamaha Corporation, Shizuoka-ken, Japan

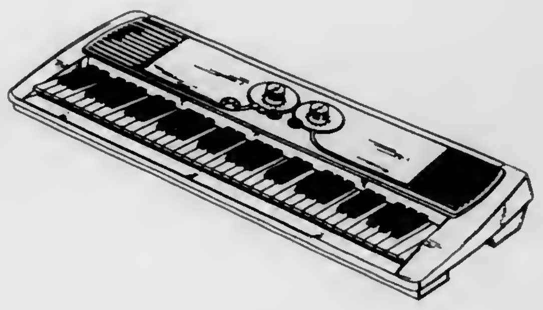
Filed Oct. 21, 1997, Ser. No. 78,337

Claims priority, application Japan, Apr. 23, 1997, 9-52290

Term of patent 14 years

LOC (6) Cl. 17 - *01*

U.S. Cl. D17—1



401,612
ELECTRONIC PERCUSSION INSTRUMENT

Kunihiro Takei, Shizuoka-ken, Japan, assignor to Yamaha Corporation, Shizuoka-ken, Japan

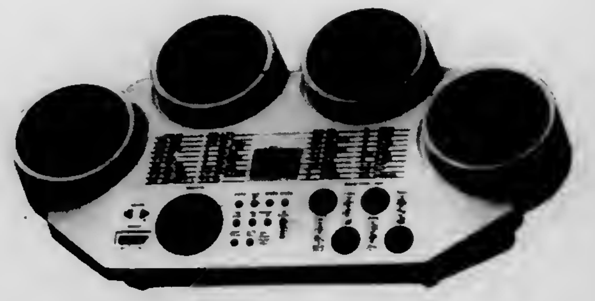
Continuation of Ser. No. 33,477, Jan. 13, 1995, abandoned. This application Aug. 26, 1996, Ser. No. 58,832

Claims priority, application Japan, Jul. 15, 1994, 6-21241

Term of patent 14 years

LOC (6) Cl. 17 - *04*

U.S. Cl. D17—22



401,613
DIET AID CALCULATOR

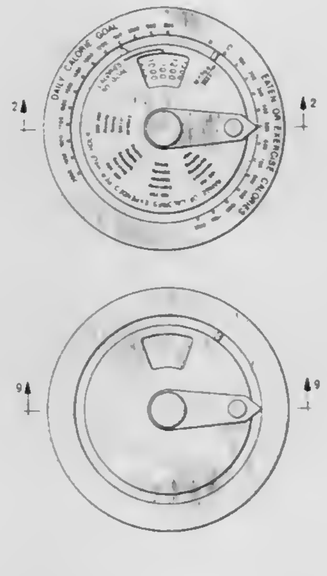
Millicent F. Goldman, 538 Croton Heights Rd., Yorktown Heights, N.Y. 10598

Filed Sep. 20, 1996, Ser. No. 60,074

Term of patent 14 years

LOC (6) Cl. 18 - *01*

U.S. Cl. D18—10



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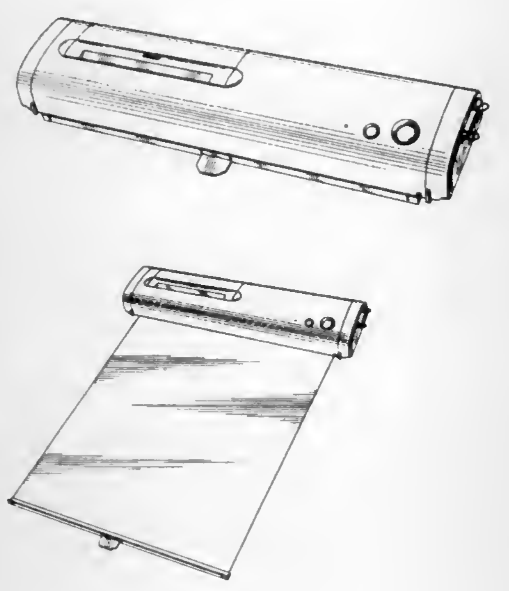
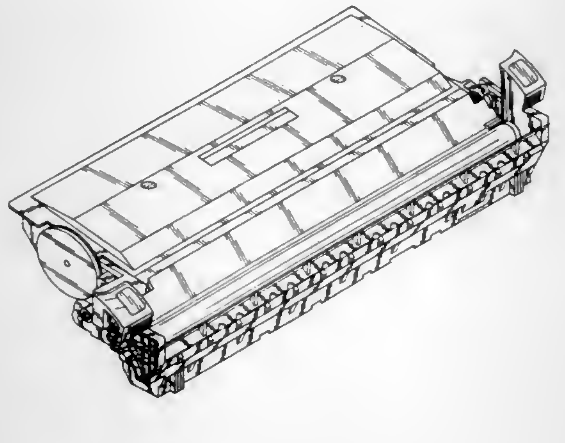
401,614
BLACKBOARD HAVING THE FUNCTION OF SCANNER AND PRINTER

Toshiya Moriyama, Fukuoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan
Filed Nov. 20, 1997, Ser. No. 79,674
Claims priority, application Japan, Jun. 5, 1997, 9-57140
Term of patent 14 years
LOC (6) Cl. 16 - *03*
U.S. Cl. D18—36



401,615
DEVELOPING UNIT FOR FORMING AN IMAGE

Masaru Goto; Masanobu Maeshima, and Hiroyuki Hazama, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan
Filed May 2, 1997, Ser. No. 70,242
Claims priority, application Japan, Nov. 15, 1996, 8-34811
Term of patent 14 years
LOC (6) Cl. 16 - *03*
U.S. Cl. D18—40

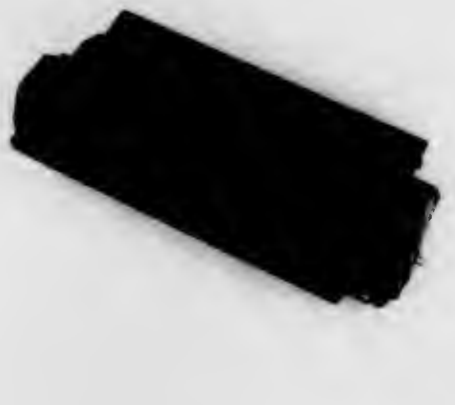


401,616
IMAGE FORMING APPARATUS

Yoshihiro Miyazawa, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 14, 1997, Ser. No. 79,214
Claims priority, application Japan, May 22, 1997, 9-55186
Term of patent 14 years
LOC (6) Cl. 16 - *03*
U.S. Cl. D18—40

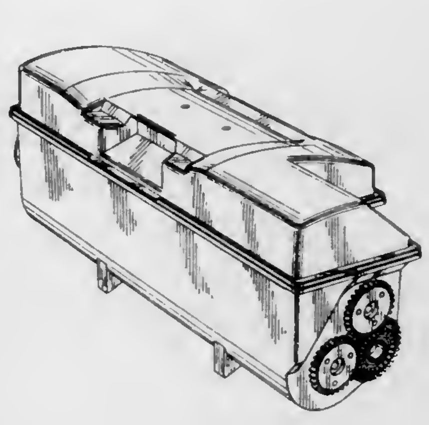
401,617
IMAGE FORMING APPARATUS

Yoshihiro Miyazawa, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 14, 1997, Ser. No. 79,215
Claims priority, application Japan, May 22, 1997, 9-055185
Term of patent 14 years
LOC (6) Cl. 16 - *03*
U.S. Cl. D18—40



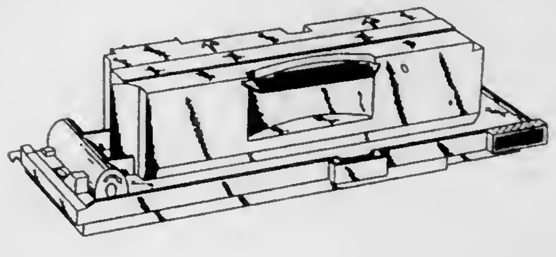
401,618
TONER CARTRIDGE

Yoshiaki Ikebata, Mie, Japan, assignor to Kyocera Corporation, Kyoto, Japan
Filed Feb. 14, 1997, Ser. No. 66,530
Claims priority, application Japan, Aug. 19, 1996, 8-24763
Term of patent 14 years
LOC (6) Cl. 16 - *03*
U.S. Cl. D18—43



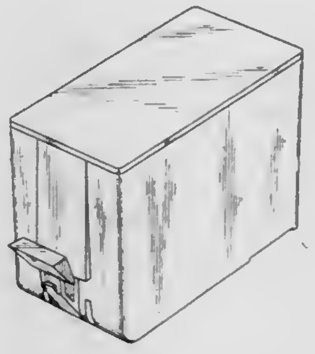
401,619
TONER SUPPLYING CARTRIDGE FOR AN IMAGE FORMING APPARATUS

Kazuo Joroku, and Toshihiko Watanabe, both of Osaka, Japan, assignors to Mita Industrial Co., Ltd, Osaka, Japan
Filed May 5, 1997, Ser. No. 70,298
Claims priority, application Japan, Nov. 15, 1996, 8-34810
Term of patent 14 years
LOC (6) Cl. 16 - *03*
U.S. Cl. D18—43



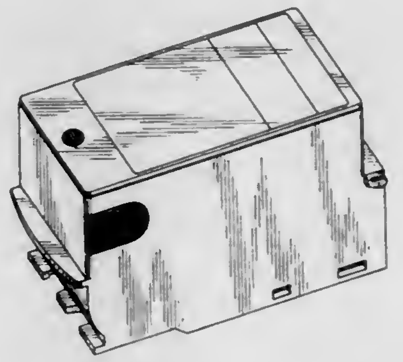
401,620
INK TANK FOR PRINTER

Minoru Nozawa, Yokohama; Keiichiro Tsukuda, Kawasaki, and Hisakazu Shimizu, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 24, 1997, Ser. No. 76,550
Claims priority, application Japan, Mar. 31, 1997, 9-9095
Term of patent 14 years
LOC (6) Cl. 18 - *02*
U.S. Cl. D18—56



401,621
INK TANK FOR PRINTER

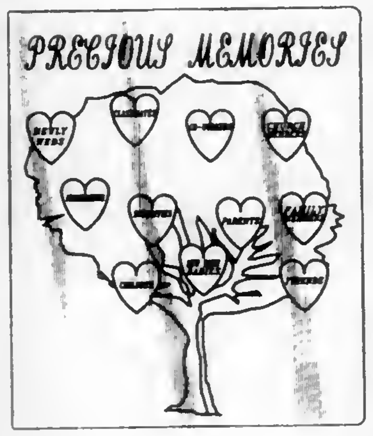
Hisakazu Shimizu; Minoru Nozawa, both of Yokohama, and Keiichiro Tsukuda, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 24, 1997, Ser. No. 76,545
Claims priority, application Japan, Mar. 31, 1997, 9-009096
Term of patent 14 years
LOC (6) Cl. 18 - *02*
U.S. Cl. D18—56



401,622
PRECIOUS MEMORIES KEEPSAKE ALBUM

Dorothy F. Ford, P.O. Box 240, Pine Forge, Pa. 19548
Filed Jul. 28, 1997, Ser. No. 74,687
Term of patent 14 years
LOC (6) Cl. 19 - *04*

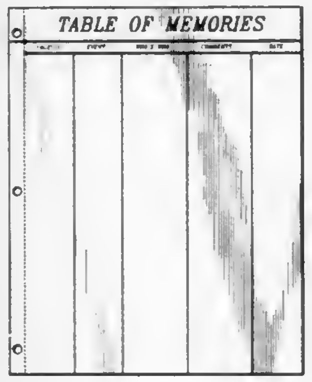
U.S. Cl. D19—26



401,623
PHOTO ALBUM TABLE OF CONTENTS DIVIDER PAGE

Christine Savage, 227 Santa Barbara #A, San Clemente, Calif. 92672
Filed Nov. 17, 1997, Ser. No. 79,482
Term of patent 14 years
LOC (6) Cl. 19 - *04*

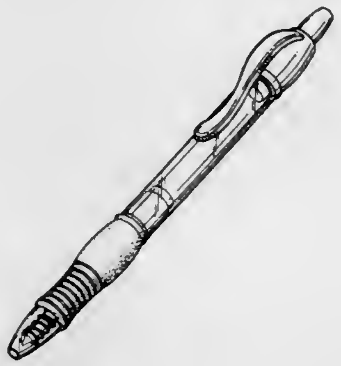
U.S. Cl. D19—33



401,624
BALLPOINT PEN

Makoto Sakuno, Tokyo, Japan, assignor to Kabushiki Kaisha Pilot, Tokyo, Japan
Filed Jun. 16, 1997, Ser. No. 74,672
Claims priority, application Japan, Jan. 24, 1997, 9-1806
Term of patent 14 years
LOC (6) Cl. 19 - *06*

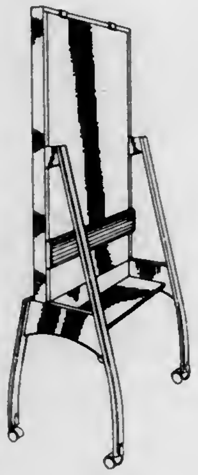
U.S. Cl. D19—51



401,625
WHITEBOARD

Steve Verbeek, Aurora, Canada, assignor to Teknion Furnture Systems (A Partnership of Teknion Holdings Inc.), Downsview, Canada
Filed Oct. 7, 1997, Ser. No. 77,738
Term of patent 14 years
LOC (6) Cl. 19 - *06*

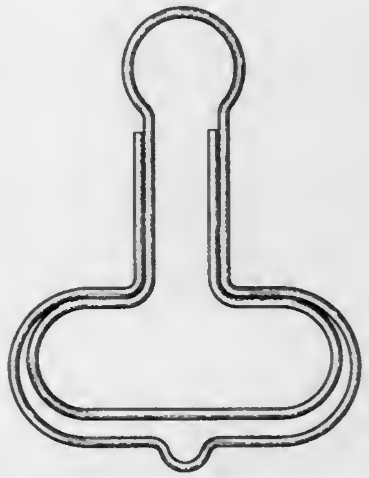
U.S. Cl. D19—52



401,626
PAPER CLIP WITH WIDE END

Jenq-Pyng Shyu, 26231 Carmel St., Laguna Hills, Calif. 92656
Filed Jul. 5, 1996, Ser. No. 56,670
Term of patent 14 years
LOC (6) Cl. 19 - *02*

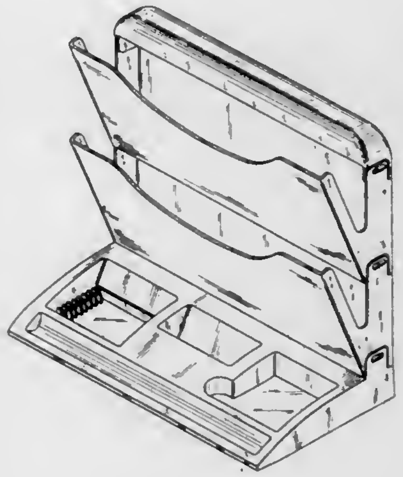
U.S. Cl. D19—65



401,627
DESKTOP VERTICAL FILE

Aimee J. Markelz, Chicago, and Charles E. Bain, West Dundee, both of Ill., assignors to Sterling Plastics Co., Madison, Wis.
Division of Ser. No. 58,906, Aug. 27, 1996, Pat. No. Des. 388,465. This application Dec. 24, 1997, Ser. No. 82,344
Term of patent 14 years
LOC (6) Cl. 19 - *02*

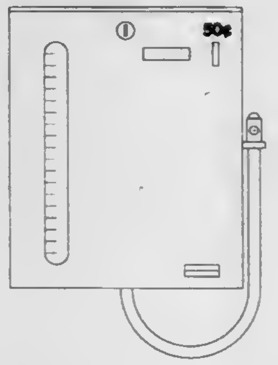
U.S. Cl. D19—78



401,628
WALL-MOUNTED HAIRSPRAY DISPENSER

Elizabeth J. Zurwick, Box 38, Robson, British Columbia, Canada, V0G 1X0
Filed Aug. 18, 1997, Ser. No. 75,154
Term of patent 14 years
LOC (6) Cl. 20 - *01*

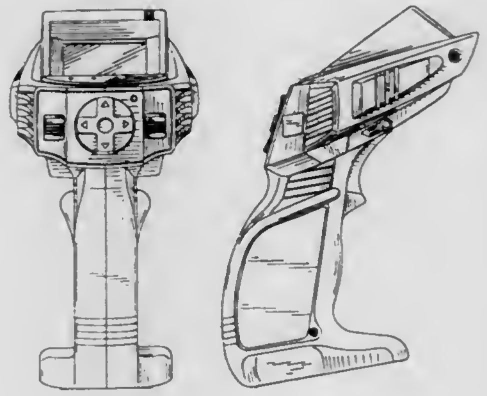
U.S. Cl. D20—1



401,629
POWER GRIP GAME

Yu Wah Wing, Tsuen Wan, Hong Kong, assignor to Tiger Electronics, Inc., Vernon Hills, Ill.
Filed Jan. 16, 1996, Ser. No. 49,037
Term of patent 14 years
LOC (6) Cl. 21 - *01*

U.S. Cl. D21—13



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401,630

TICKET SCRATCHER

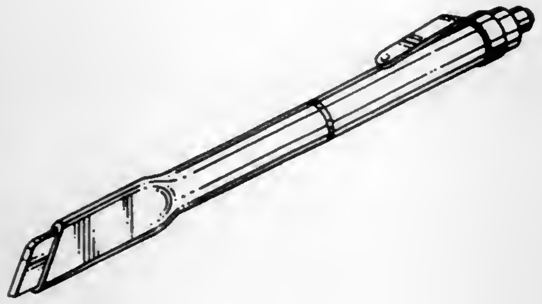
André Pilon, and Jean Pilon, both of RR. #1, Martintown, Ontario, Canada, K0C 1S0

Filed Nov. 13, 1995, Ser. No. 46,324

Claims priority, application Canada, May 29, 1995, 1995-1143

Term of patent 14 years

U.S. Cl. D21—37



401,631

COMBINED SET OF CONTROL PANEL AND JOY STICKS FOR A VIDEO GAME MACHINE

Yutaka Okumura, Tokyo, Japan, assignor to Sega Enterprises, Ltd., Tokyo, Japan

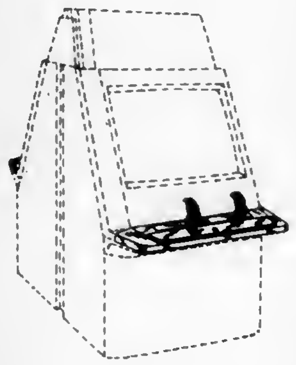
Filed Oct. 17, 1996, Ser. No. 61,207

Claims priority, application Japan, Apr. 18, 1996, 8-11293

Term of patent 14 years

LOC (6) Cl. 21 - *01*

U.S. Cl. D21—48



401,632

Patent Not Issued For This Number

401,633

PUZZLE ROCKING CHAIR

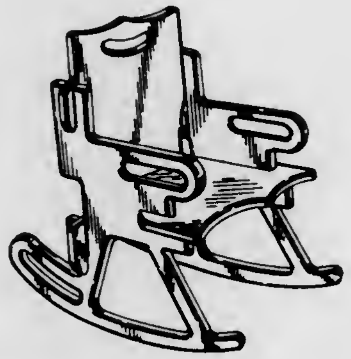
Floyd Balough, P.O. Box 723, Sunset Beach, Calif. 90742

Filed Sep. 23, 1997, Ser. No. 76,955

Term of patent 14 years

LOC (6) Cl. 21 - *01*

U.S. Cl. D21—104



401,634

TOY PINHOLE CAMERA

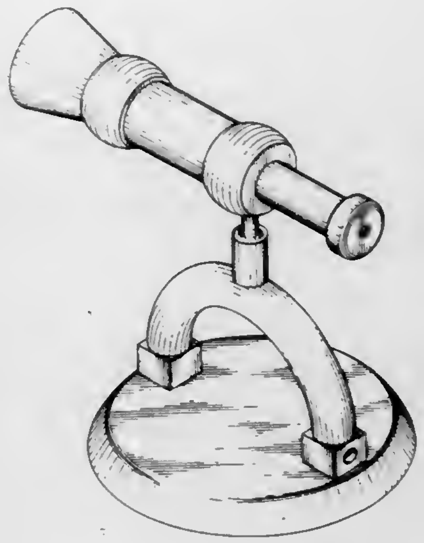
Chi-Man Wong, Kwai Chung, Hong Kong, assignor to Edu-Science (H.K.) Limited, Hong Kong, Hong Kong

Filed Sep. 17, 1997, Ser. No. 77,009

Term of patent 14 years

LOC (6) Cl. 21 - *01*

U.S. Cl. D21—110



401,635

FACE OF A TENNIS RACQUET

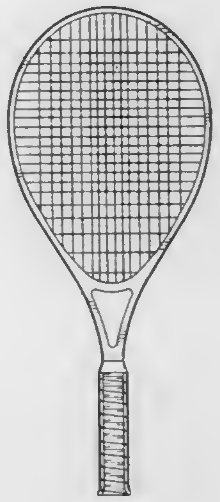
Stephen J. Davis, Washington Crossing, Pa., and André Terzaghi, San Diego, Calif., assignors to Prince Sports Group, Inc., Bordentown, N.J.

Division of Ser. No. 480,026, Jun. 7, 1995, abandoned, which is a continuation of Ser. No. 290,673, Aug. 15, 1994, abandoned, which is a continuation of Ser. No. 922,930, Jul. 31, 1992, abandoned. This application Aug. 30, 1996, Ser. No. 59,718

Term of patent 14 years

LOC (6) Cl. 21 - *02*

U.S. Cl. D21—212



401,636

GOLF PUTTER HEAD

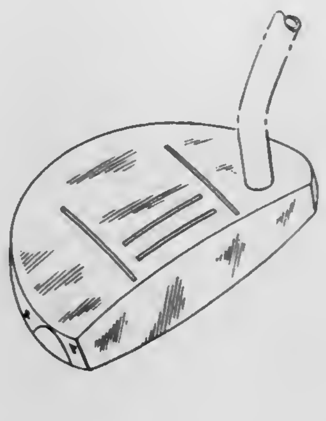
Clovis R. Duclos, 3622 Rebel Cir., Huntington Beach, Calif. 92649

Filed Aug. 15, 1997, Ser. No. 75,494

Term of patent 14 years

LOC (6) Cl. 21 - *02*

U.S. Cl. D21—219



401,637

GOLF CLUB HEAD

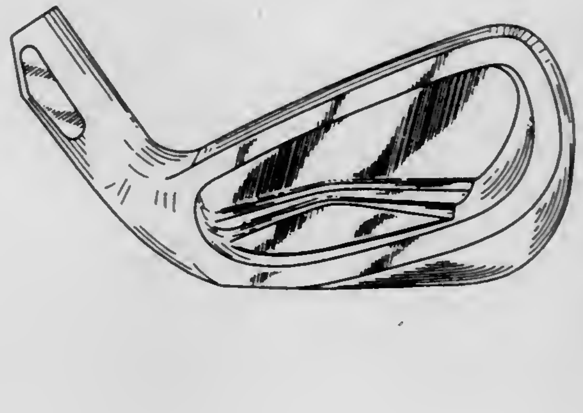
Christopher Brian Best, Encinitas; Philamon W. Rodgers, San Diego, and Robert D. Hirsch, Oceanside, all of Calif., assignors to Cobra Golf, Inc., Carlsbad, Calif.

Continuation-in-part of Ser. No. 62,404, Nov. 22, 1996, abandoned. This application Jan. 23, 1997, Ser. No. 65,178

Term of patent 14 years

LOC (6) Cl. 21 - *02*

U.S. Cl. D21—220



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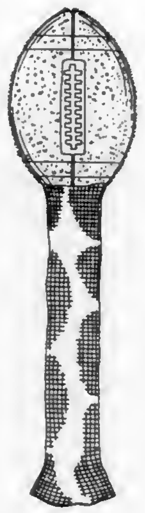
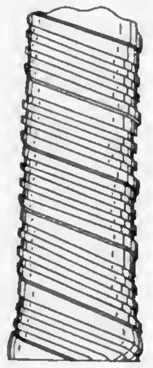
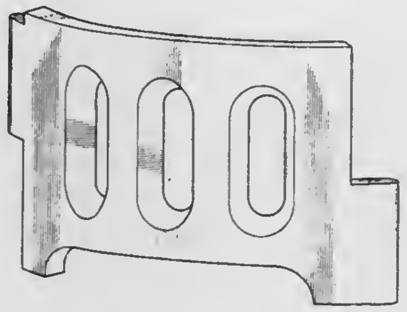
401,638
GOLF CLUB COVER CONFIGURED AS A SPORTS ITEM
Owen Craig Pollard, 2370 Brookhaven Pass, Vista, Calif. 92083
Filed Aug. 2, 1995, Ser. No. 42,173
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—221



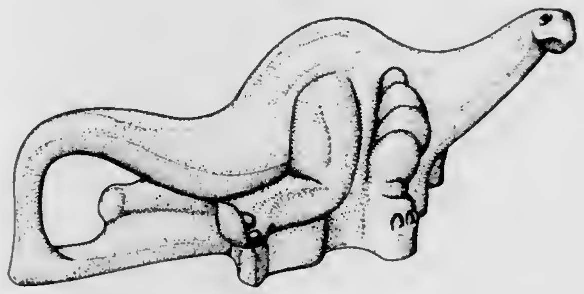
401,639
PORTION OF A GRIP FOR SPORTS RACQUETS
Kent L. Yeh, Plainsboro, N.J., assignor to Prince Sports Group, Inc., Bordentown, N.J.
Filed Oct. 23, 1995, Ser. No. 45,504
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—222



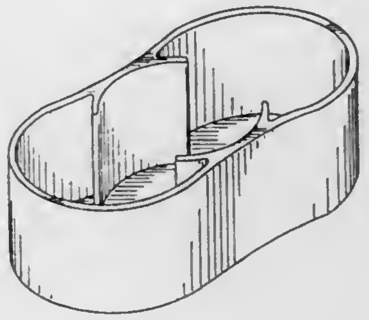
401,640
PANEL FOR PLAGROUND STRUCTURE
Gary B. Van Wagenen, San Marino, Calif., assignor to Little Tikes Commercial Play Systems (Omni) Inc., Industry, Calif.
Filed Feb. 3, 1997, Ser. No. 66,055
Term of patent 14 years
LOC (6) Cl. 21 - *03*
U.S. Cl. D21—240



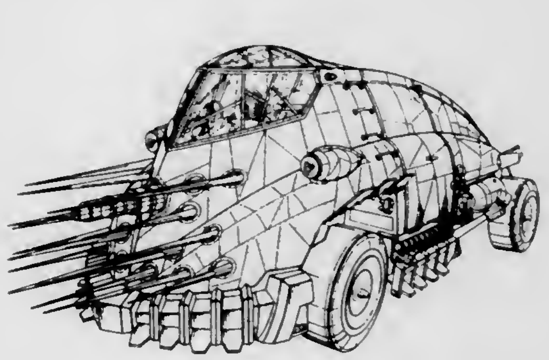
401,641
DINOSAUR PLAYGROUND CLIMBER
James E. Miller, Birmingham, Mich., assignor to Wausau Tile, Inc., Wausau, Wis.
Filed Aug. 11, 1997, Ser. No. 75,017
Term of patent 14 years
LOC (6) Cl. 21 - *03*
U.S. Cl. D21—245



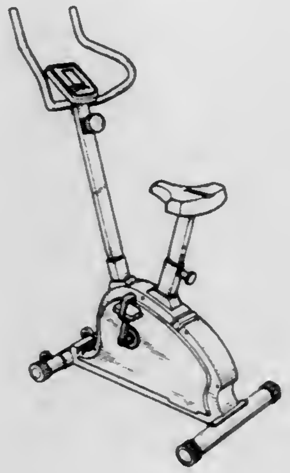
401,642
ORNAMENT
Helle Kleist Nielsen, Frederiksberg, Denmark, assignor to Interlego AG, Baar, Switzerland
Filed Sep. 18, 1997, Ser. No. 76,793
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—503



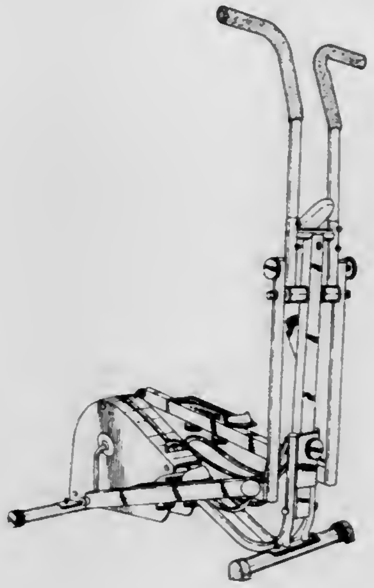
401,643
VEHICLE
Jaques Rey, Studio City; Barbara Ling, Echo Park, and Joel Schumacher, Burbank, all of Calif., assignors to Warner Bros. (div. of Time-Warner Entertainment Company, L.P.), Burbank, Calif.
Filed Apr. 25, 1997, Ser. No. 69,922
Term of patent 14 years
LOC (6) Cl. 21 - *01*
U.S. Cl. D21—533



401,644
PEDALING EXERCISER
Tsai-Lie Chen, No. 58, Chung Hsing N. St., San Chung City, Taipei Hsien, Taiwan
Filed Oct. 31, 1997, Ser. No. 78,884
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—663



401,645
EXERCISER
Johnson Kuo, 6F., No. 6, Lane 12, Sec. 6, Hsin I Rd., Taipei, Taiwan
Filed Nov. 19, 1997, Ser. No. 79,527
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—668



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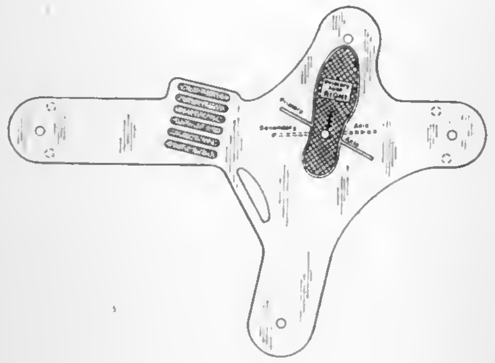
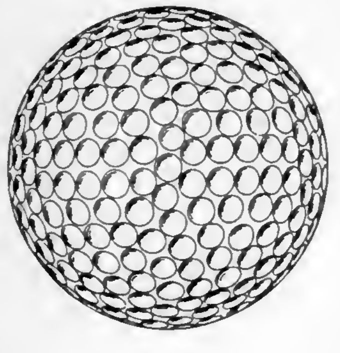
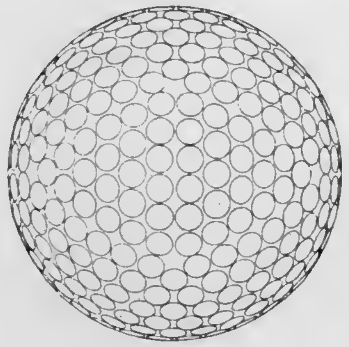
401,646
EXERCISE PLATFORM
Randall Scot Seelye, 5405 Old Greensboro Rd., Chapel Hill, N.C. 27516
Filed Jun. 24, 1997, Ser. No. 72,761
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—671



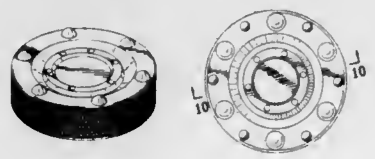
401,647
GOLF BALL
Atuki Kasasima, Chichibu, Japan, assignor to Bridgestone Sports Co., Ltd., Tokyo, Japan
Filed Dec. 5, 1996, Ser. No. 63,329
Claims priority, application Japan, Jun. 7, 1996, 8-16826
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—709



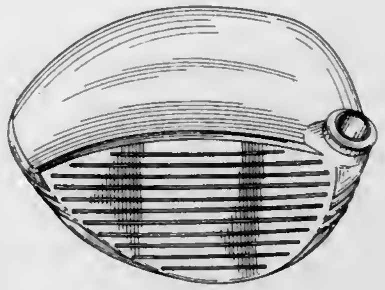
401,648
GOLF BALL
Atuki Kasasima, and Keisuke Ihara, both of Chichibu, Japan, assignors to Bridgestone Sports Co., Ltd., Tokyo, Japan
Filed Dec. 5, 1996, Ser. No. 63,330
Claims priority, application Japan, Jun. 7, 1996, 8-16825
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—709



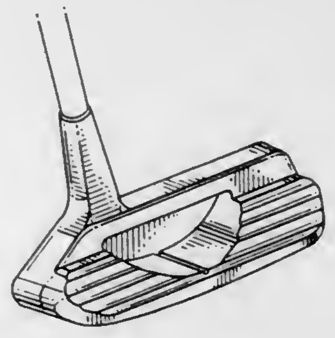
401,649
NON-ICE HOCKEY PUCK
Alex R. Bellehumeur, 6242 Napoli Ct., Long Beach, Calif. 90802
Filed Jan. 20, 1998, Ser. No. 82,296
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—710



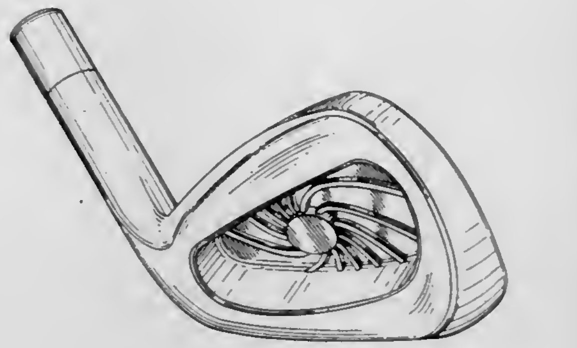
401,650
WOOD-TYPE HEAD FOR A GOLF CLUB
Bruce D. Burrows, 25555 W. Ave. Stanford, Valencia, Calif. 91353-1101
Filed Oct. 9, 1997, Ser. No. 77,693
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—733



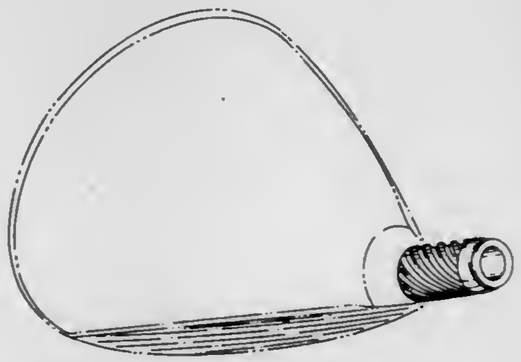
401,651
GOLF PUTTER HEAD AND ANGLED HOSEL
Roger C. Cleveland, Los Angeles; Augustin W. Rollinson, San Diego; Wayne H. Byrne, Diamond Bar, and Garth Smith, Vista, all of Calif., assignors to Callaway Golf Company, Carlsbad, Calif.
Continuation-in-part of Ser. No. 47,831, Jan. 16, 1996, Pat. No. Des. 385,933. This application Oct. 31, 1997, Ser. No. 78,675
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—736



401,652
IRON-TYPE HEAD FOR A GOLF CLUB
Bruce D. Burrows, 25555 W. Avenue Stanford, Valencia, Calif. 91352-1101
Filed Oct. 9, 1997, Ser. No. 77,714
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—748



401,653
SPIRAL HOSEL FOR A GOLF CLUB
Bruce D. Burrows, 25555 W. Avenue Stanford, Valencia, Calif. 91353-1101
Filed Oct. 9, 1997, Ser. No. 77,696
Term of patent 14 years
LOC (6) Cl. 21 - *02*
U.S. Cl. D21—753



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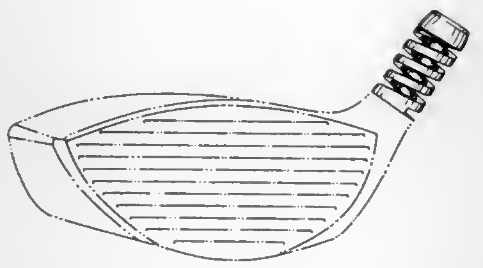
401,654
SPRING HOSEL FOR A GOLF CLUB

Bruce D. Burrows, 25555 W. Avenue Stanford, Valencia, Calif. 91353-1101

Filed Oct. 9, 1997, Ser. No. 77,697
Term of patent 14 years
LOC (6) Cl. 21 - *02*

U.S. Cl. D21—753

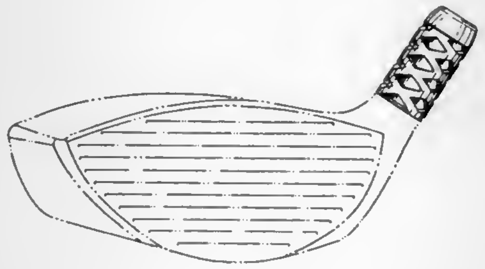


401,655
DIAMOND PATTERN HOSEL FOR A GOLF CLUB

Bruce D. Burrows, 25555 W. Avenue Stanford, Valencia, Calif. 91352-1101

Filed Oct. 9, 1997, Ser. No. 77,836
Term of patent 14 years
LOC (6) Cl. 21 - *02*

U.S. Cl. D21—753

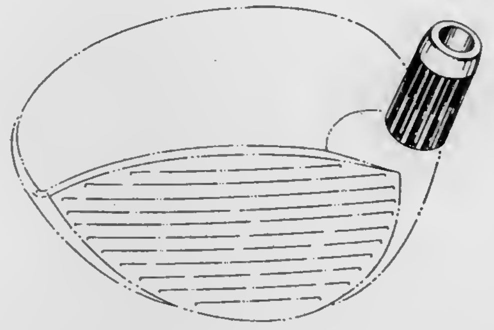


401,656
FLUTED HOSEL FOR A GOLF CLUB

Bruce D. Burrows, 25555 W. Avenue Stanford, Valencia, Calif. 91353-1101

Filed Oct. 10, 1997, Ser. No. 77,880
Term of patent 14 years
LOC (6) Cl. 21 - *02*

U.S. Cl. D21—753

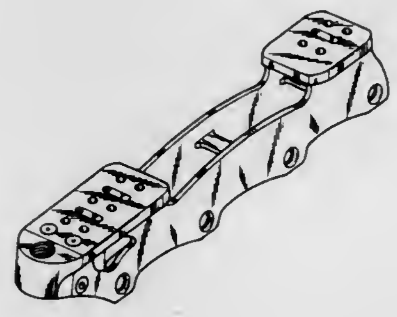


401,657
SOLE PLATE FOR IN-LINE ROLLER SKATE

Chen-Chun Ou, 22F., No. 21, Section 1, Ming-Sheng Road, Pan-Chiao City, Taipei County, Taiwan

Filed Sep. 22, 1997, Ser. No. 77,367
Term of patent 14 years
LOC (6) Cl. 21 - *02*

U.S. Cl. D21—771

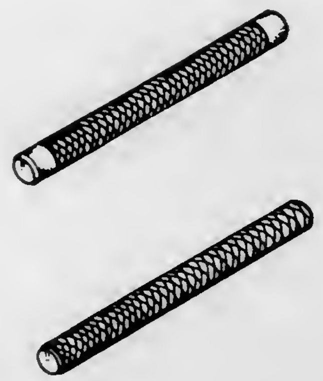


401,658
10-22 RECOIL BUFFER

Larry Alan Bullock, P.O. Box 104903, Jefferson City, Mo. 65110

Filed Jun. 19, 1996, Ser. No. 55,976
Term of patent 14 years
LOC (6) Cl. 22 - *01*

U.S. Cl. D22—108

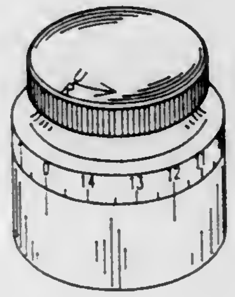


401,659
KNOB FOR WEAPON TELESCOPES

Dean Roberson, 9500 Cedar Island Rd., Omaha, Nebr. 68123

Filed Aug. 13, 1997, Ser. No. 75,043
Term of patent 14 years
LOC (6) Cl. 22 - *01*

U.S. Cl. D22—108

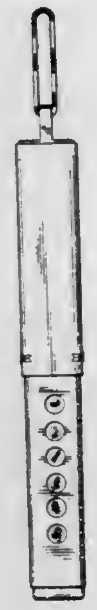


401,660
SCANT DISPENSER

Robert J. Timm, 1120 S. Monroe, Bay City, Mich. 48708, and Richard D. George, 3424 Shane Ct., Freeland, Mich. 48623

Filed Oct. 7, 1996, Ser. No. 60,775
Term of patent 14 years
LOC (6) Cl. 22 - *06*

U.S. Cl. D22—125

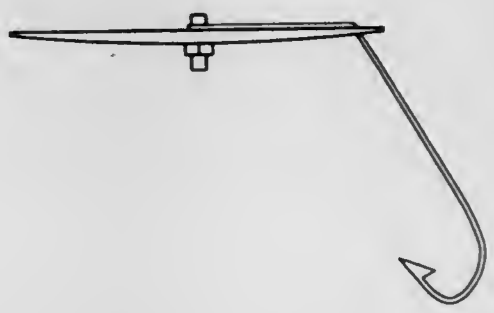


401,661
FISHING LURE

D. Blake Cox, 5385 Valleydale Rd., Kernersville, N.C. 27284

Filed Sep. 9, 1996, Ser. No. 59,387
Term of patent 14 years
LOC (6) Cl. 22 - *05*

U.S. Cl. D22—129



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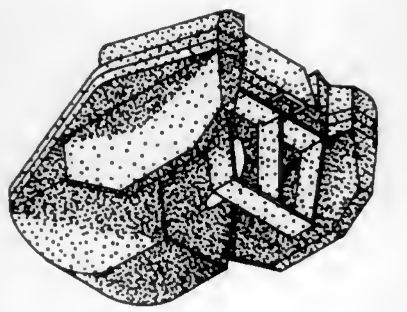
401,662

TROLL POD—OFFSHORE TROLLER

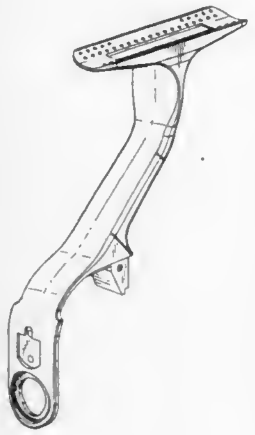
Thomas Henry Harmon, 24397 University Ave., LomaLinda, Calif. 92354
Filed Sep. 11, 1996, Ser. No. 59,469
Term of patent 14 years
LOC (6) Cl. 22 - *05*
U.S. Cl. D22—134



401,663

FISHING REEL FOOT

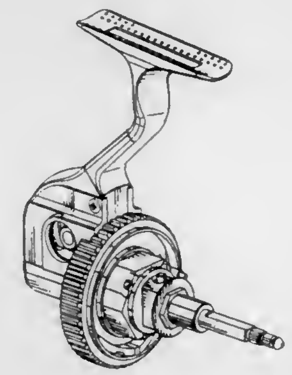
Bengt-Åke Henriksson, Svängsta, and Lars-Olof Carlsson, Asarum, both of Sweden, assignors to Berkley Inc., Spirit Lake, Iowa
Filed May 9, 1997, Ser. No. 70,556
Term of patent 14 years
LOC (6) Cl. 22 - *05*
U.S. Cl. D22—141



401,664

FISHING REEL FRAME

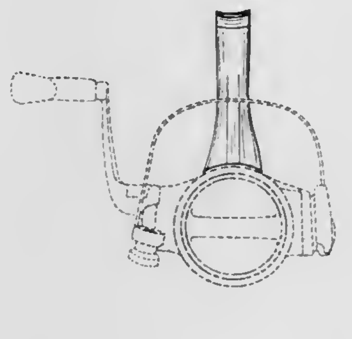
Bengt-Ake Henriksson, Svängsta, and Lars-Olof Carlsson, Asarum, both of Sweden, assignors to Berkley Inc., Spirit Lake, Iowa
Filed May 9, 1997, Ser. No. 70,557
Term of patent 14 years
LOC (6) Cl. 22 - *05*
U.S. Cl. D22—141



401,665

FISHING REEL BODY

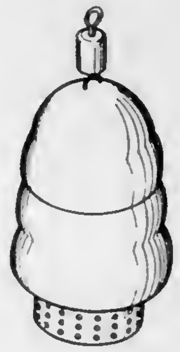
Takashi Kondoh, Musashino; Yukio Itoh, and Shigeo Mimura, both of Higashikurme, all of Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan
Filed Sep. 22, 1997, Ser. No. 76,979
Claims priority, application Japan, Mar. 25, 1997, 9-8398
Term of patent 14 years
LOC (6) Cl. 22 - *05*
U.S. Cl. D22—141



401,666

FISHING WEIGHT

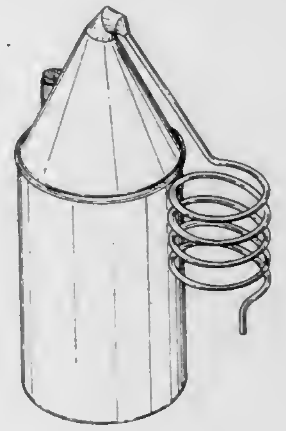
Byung Hoon Lee, #7-402, Jinhung Apt., Cheongdam-dong, Kangnam-ku, Seoul, Rep. of Korea
Filed Aug. 5, 1997, Ser. No. 74,718
Term of patent 14 years
LOC (6) Cl. 22 - *05*
U.S. Cl. D22—145



401,667

SIMULATIVE STILL

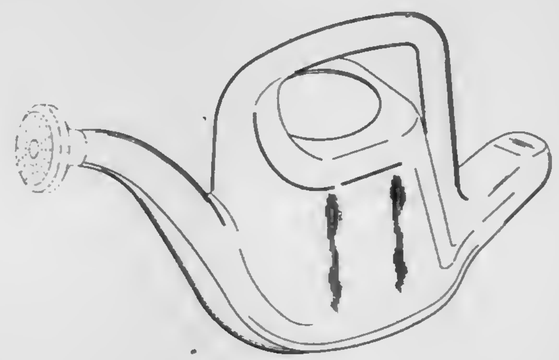
Angela D. Tadlock, 4208 Powell St., Parkersburg, W. Va. 26101
Filed Nov. 21, 1997, Ser. No. 79,720
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—207



401,668

WATERING CAN

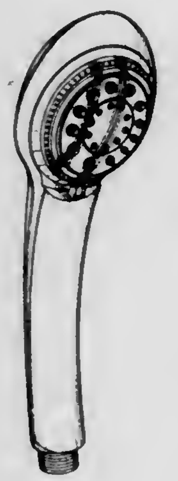
James Kreizel, Hewlett, N.Y., assignor to Dynamic Design, Inc., East Elmhurst, N.Y.
Continuation-in-part of Ser. No. 858,276, May 19, 1997. This application Nov. 19, 1997, Ser. No. 79,813
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—212



401,669

HAND HELD SHOWERHEAD

Jorg Ratzlaff, Nagold, Germany, assignor to Alsons Corporation, Hillsdale, Mich.
Filed Nov. 17, 1997, Ser. No. 79,494
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—223



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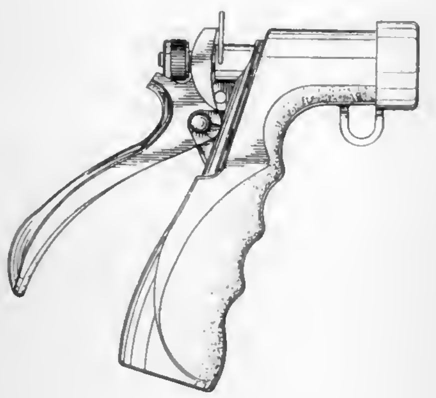
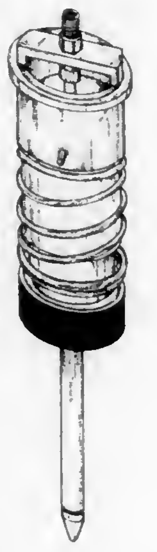
401,670
PISTOL HOSE NOZZLE

John W. Goodin, Coto De Caza, Calif., assignor to L. R. Nelson, Peoria, Ill.
Division of Ser. No. 47,945, Dec. 15, 1995. This application Feb. 12, 1998, Ser. No. 83,672
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—226



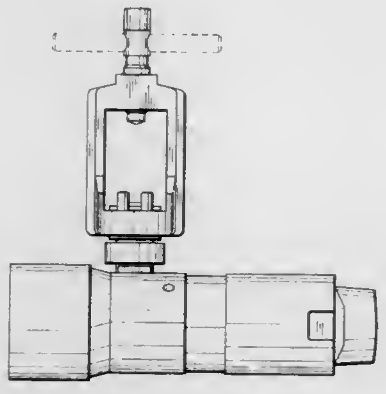
401,671
FILLING VALVE

David Lewis, and Donald Walden, both of 4335 Bodega Ave., Petaluma, Calif. 94952
Filed Oct. 17, 1997, Ser. No. 78,055
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—233



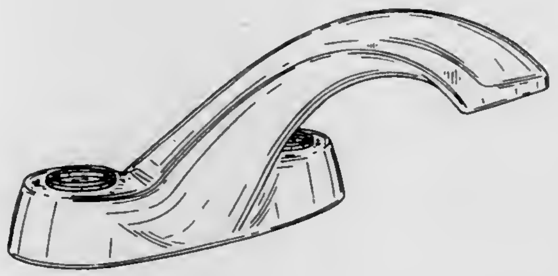
401,672
GAS PRESSURE REGULATOR

Richard C. Klopstad, Indianapolis, Ind., assignor to ReGin Manufacturing, Inc., Indianapolis, Ind.
Filed Oct. 10, 1996, Ser. No. 60,929
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—235



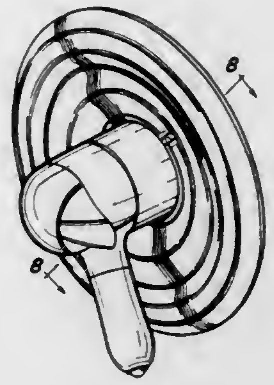
401,673
FAUCET BODY

Rudolf Steffes, Mueckeln, Germany, assignor to American Standard Inc., Piscataway, N.J.
Filed Apr. 29, 1996, Ser. No. 53,737
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—241



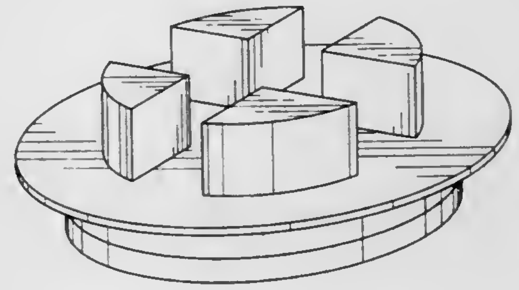
401,674
SHOWER ESCUTCHEON AND HANDLE

Judd A. Lord, Carmel, Ind., assignor to Masco Corporation of Indiana, Indianapolis, Ind.
Filed Nov. 10, 1997, Ser. No. 79,261
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—254



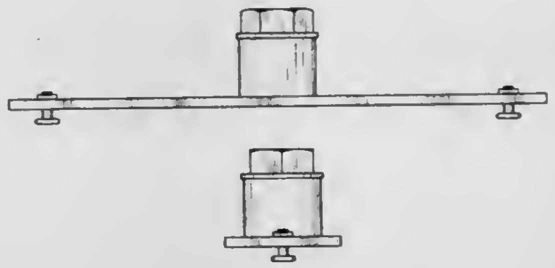
401,675
COMBINED DRAIN CAP AND FINISHING TOOL

Michael R. Stute, 22633 Criswell, Canoga Park, Calif. 91307
Filed Aug. 21, 1996, Ser. No. 58,730
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—260



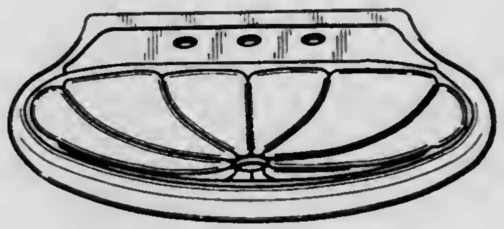
401,676
PLUG RETENTION RETAINER

Anthony D. Galaviz, 34552 Calle Portola, Capo Beach, Calif. 92624
Filed Oct. 11, 1996, Ser. No. 62,955
Term of patent 14 years
LOC (6) Cl. 23 - *01*
U.S. Cl. D23—260



401,677
LAVATORY

Marcelo Garza Laguera Garza, Acambaro No. 459, Col. CD. Industrial, 36541, Irapuato, Guanajuato, Mexico
Filed Apr. 30, 1997, Ser. No. 70,104
Claims priority, application Mexico, Oct. 31, 1996, 961100
Term of patent 14 years
LOC (6) Cl. 23 - *02*
U.S. Cl. D23—284



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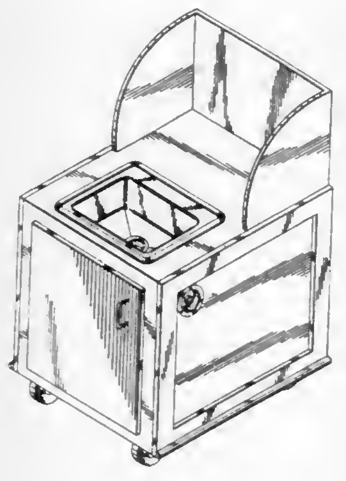
401,678
MOBILE CONCESSION HANDWASH STATION

Grayam Scheel, Deland, and Lebby J. Fore, Longwood, both of Fla., assignors to Concession & Restaurant Supply, Inc., Longwood, Fla.

Filed Dec. 5, 1997, Ser. No. 80,259
Term of patent 14 years
LOC (6) Cl. 23 - *01*

U.S. Cl. D23—286

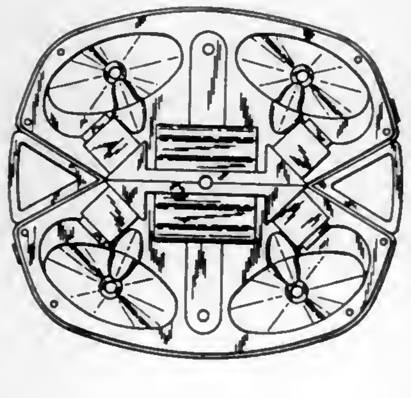


401,679
PORTABLE SINK

Richard Leach Tagg, Sandhutton, England, assignor to Polyjohn Enterprise Corporation, Whiting, Ind.

Continuation of Ser. No. 51,979, Mar. 20, 1996, Pat. No. Des. 391,343. This application Oct. 15, 1997, Ser. No. 82,035
Term of patent 14 years
LOC (6) Cl. 23 - *02*

U.S. Cl. D23—286

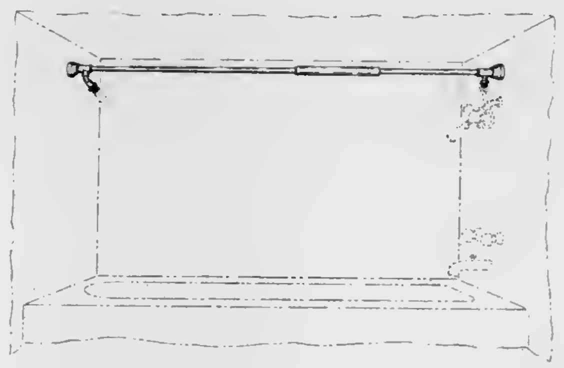


401,680
AUXILIARY SHOWER HEAD FIXTURE FOR BATHTUB ENCLOSURES

Mark R. Tiernan, 6970 Jackson Ct., Merrillville, Ind. 46410

Filed Jan. 30, 1997, Ser. No. 65,595
Term of patent 14 years
LOC (6) Cl. 23 - *02*

U.S. Cl. D23—304

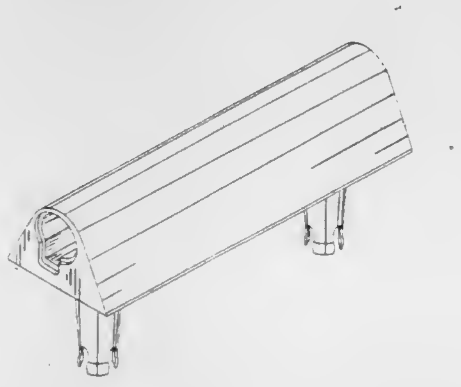


401,681
HOLDER OF OPENING AND CLOSING DEVICE FOR THE SEAT OR THE SEAT LID OF A TOILET BOWL

Akira Sorimachi, Kanagawa, Japan, assignor to Katoh Electrical Machinery Co., Ltd., Kanagawa, Japan

Filed Feb. 13, 1997, Ser. No. 66,586
Claims priority, application Japan, Aug. 30, 1996, 8-25934
Term of patent 14 years
LOC (6) Cl. 23 - *02*

U.S. Cl. D23—311

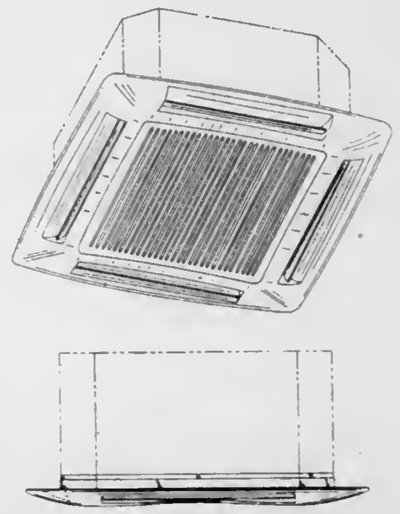


401,682
CEILING MOUNTED AIR CONDITIONING APPARATUS

Giuliano Galeazzi, Velate; Roberto Aliprandi, Villasanta; Giorgio Rusignuolo, Vedano Al Lambro, and Gianluca Vecchi, Monza, all of Italy, assignors to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 31, 1997, Ser. No. 78,781
Term of patent 14 years
LOC (6) Cl. 23 - *04*

U.S. Cl. D23—351

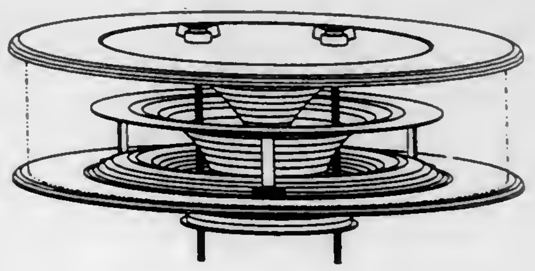


401,683
AIR CLEANER

Jerry M. Alcone, 1423 Los Tomases Dr. Northwest, Albuquerque, N. Mex. 87102

Filed Dec. 17, 1997, Ser. No. 80,889
Term of patent 14 years
LOC (6) Cl. 23 - *04*

U.S. Cl. D23—364

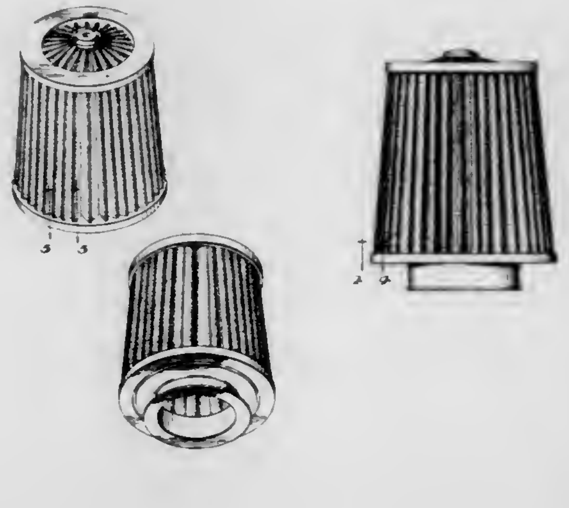


401,684
AIR FILTER

Nathan E. Shelton, Riverside, Calif., and Duncan Bickerton, Warrington, England, assignors to K&N Engineering, Inc., Riverside, Calif.

Filed Nov. 12, 1997, Ser. No. 79,284
Term of patent 14 years
LOC (6) Cl. 23 - *04*

U.S. Cl. D23—365

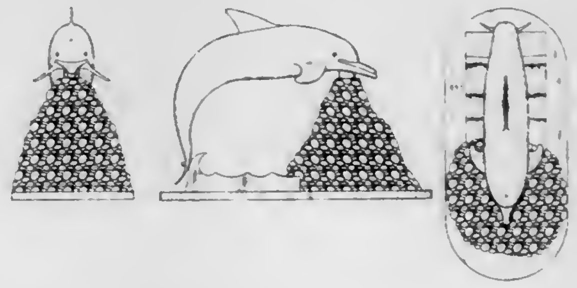


401,685
DOLPHIN AIR FRESHENER DISPENSER

Kenneth R. Wilson, 1481 Extension Rd., Nanaimo, British Columbia, Canada, B9R 5K1

Filed Nov. 30, 1995, Ser. No. 47,261
Term of patent 14 years
LOC (6) Cl. 23 - *04*

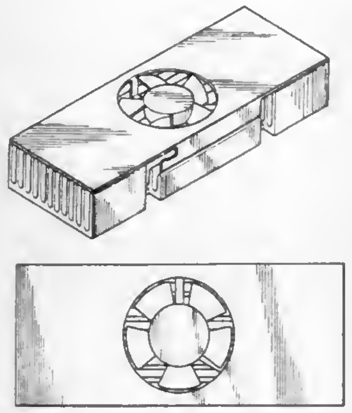
U.S. Cl. D23—367



401,686

HEAT DISIPITATION FAN

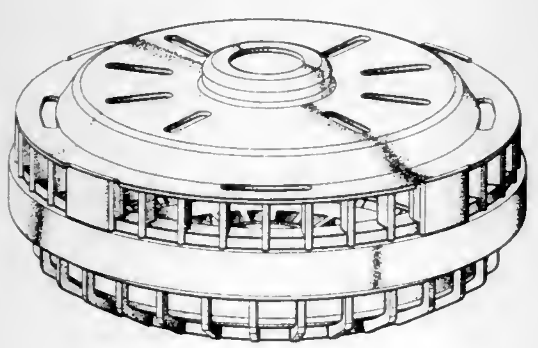
Alex Horng, Kaohsiung, Taiwan, assignor to Sunonwealth Electric Machine Industry Co., Ltd., Taiwan
Filed Oct. 7, 1997, Ser. No. 77,608
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—370



401,687

ELECTRIC MOTOR HOUSING

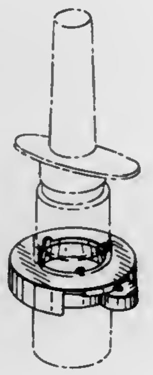
Richard A. Pearce, Memphis, and Masao Tsuji, Germantown, both of Tenn., assignors to Hunter Fan Company, Memphis, Tenn.
Filed Dec. 16, 1997, Ser. No. 80,775
Term of patent 14 years
LOC (6) Cl. 23 - *04*
U.S. Cl. D23—411



401,688

COMPLIANCE RING

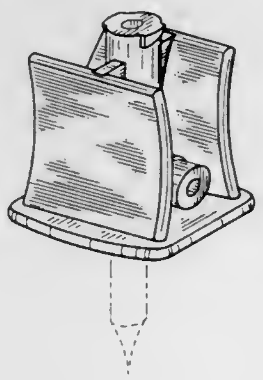
Matthew Coe, Asbury, N.J., assignor to PharmaDesign, Inc., Warren, N.J.
Filed Aug. 5, 1997, Ser. No. 74,611
Term of patent 14 years
LOC (6) Cl. 24 - *02*
U.S. Cl. D24—127



401,689

GRIP FOR A PIN

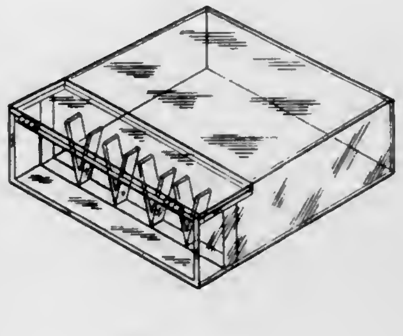
James J. Sullivan, P.O. Box 1799, Ojai, Calif. 93023
Filed Sep. 13, 1996, Ser. No. 59,580
Term of patent 14 years
LOC (6) Cl. 24 - *99*
U.S. Cl. D24—130



401,690

MULTIPLE HYPODERMIC NEEDLE DISPENSER

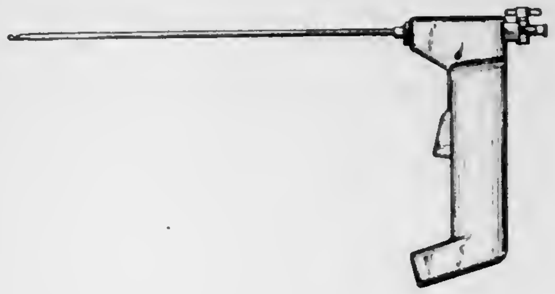
Kendall A. Simm, 8832 Sapphire St., Westminister, Calif. 92683
Continuation-in-part of Ser. No. 6,980, Apr. 12, 1993, abandoned. This application Jun. 21, 1996, Ser. No. 56,102
Term of patent 14 years
LOC (6) Cl. 24 - *02*
U.S. Cl. D24—131



401,691

SURGICAL INSTRUMENT USED IN BACK SURGERY

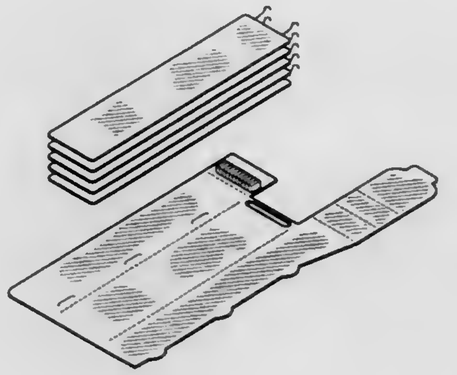
Tibor Koros, and Gabriel Koros, both of 610 Flinn Ave., Moorpark, Calif. 93021
Filed May 9, 1997, Ser. No. 70,518
Term of patent 14 years
LOC (6) Cl. 24 - *02*
U.S. Cl. D24—144



401,692

SUTURE PACKAGE

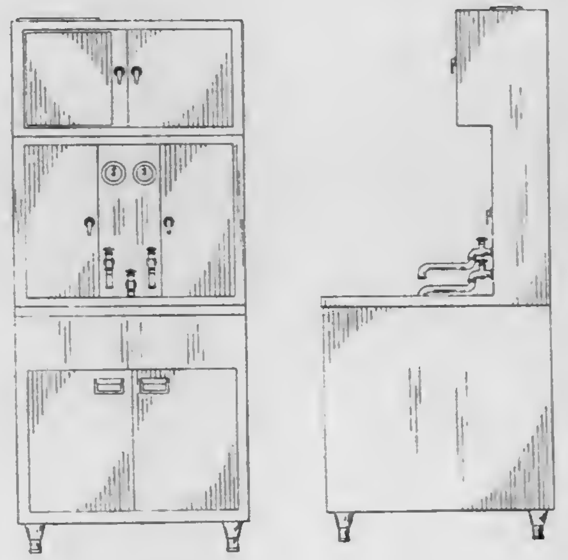
Elizabeth A. Chambers, Danbury, Conn., assignor to Tyco Group S.A.R.L., Luxembourg
Division of Ser. No. 30,424, Oct. 28, 1994, Pat. No. 8,382,960. This application Mar. 25, 1997, Ser. No. 68,706
Term of patent 14 years
LOC (6) Cl. 24 - *02*
U.S. Cl. D24—145



401,693

SINK UNIT

Lai John Nai Kit, Tokyo, Japan, assignor to K.K. Water Doc, Tokyo, Japan
Filed Nov. 22, 1996, Ser. No. 63,042
Claims priority, application Japan, May 22, 1996, 8-14837
Term of patent 14 years
LOC (6) Cl. 23 - *02*
U.S. Cl. D23—286



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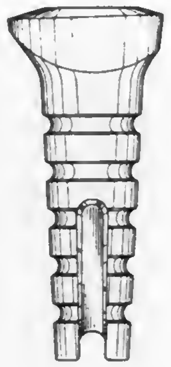
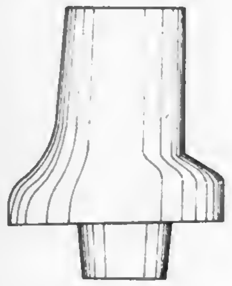
401,694
ANATOMIC IMPLANT

Fereidoun Daftary, 9001 Wilshire Blvd., No. 205, Beverly Hills, Calif. 90211
Filed Dec. 2, 1996, Ser. No. 63,182
Term of patent 14 years
LOC (6) Cl. 24 - *03*
U.S. Cl. D24—155



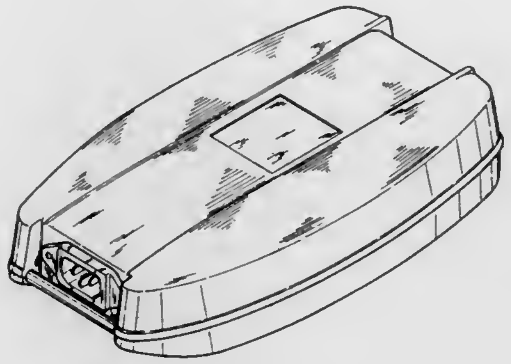
401,695
ABUTMENT FOR ANATOMIC IMPLANTS

Fereidoun Daftary, 9001 Wilshire Blvd., No. 205, Beverly Hills, Calif. 90211
Filed Dec. 2, 1996, Ser. No. 63,227
Term of patent 14 years
LOC (6) Cl. 24 - *03*
U.S. Cl. D24—155



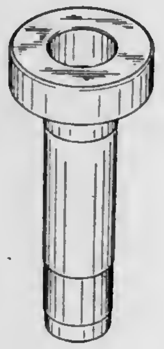
401,696
ELECTROMAGNETIC WAVE GENERATOR

Su Jong Kuo, P.O. Box 63-99, Taichung, Taiwan
Filed Jan. 21, 1997, Ser. No. 65,107
Term of patent 14 years
LOC (6) Cl. 24 - *01*
U.S. Cl. D24—200



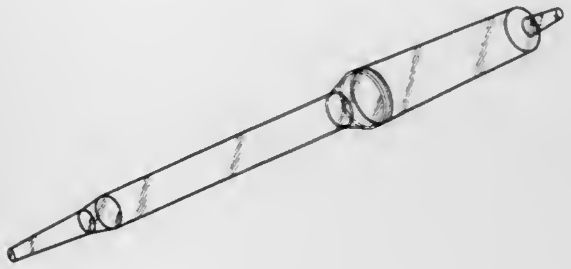
401,697
CONTAINER

Kevin M. Cloonan, Round Lake; Ted J. Hanagan, Libertyville; Kirk M. Kimler, Grayslake, all of Ill., and Scott G. Safar, Pleasant Prairie, Wis., assignors to Abbott Laboratories, Abbott Park, Ill.
Filed May 21, 1997, Ser. No. 71,135
Term of patent 14 years
LOC (6) Cl. 24 - *01*
U.S. Cl. D24—224



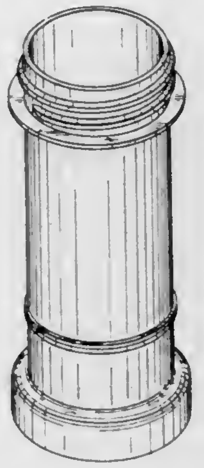
401,698
MULTISTAGE PIPET

Michael Daniels, Denville, N.J., assignor to Becton Dickinson and Company, Franklin Lakes, N.J.
Filed Jan. 31, 1997, Ser. No. 68,101
Term of patent 14 years
LOC (6) Cl. 24 - *02*
U.S. Cl. D24—222



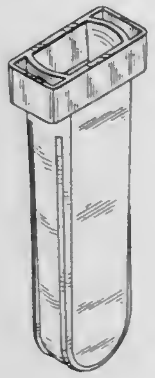
401,699
CONTAINER FOR USE WITH AN AUTOMATIC ANALYZER

Steve Herchenbach, Grayslake; Linas P. Laurusonis; Michael W. McGowan, both of Gurnee, all of Ill., and Scott G. Safar, Pleasant Prairie, Wis., assignors to Abbott Laboratories, Abbott Park, Ill.
Filed May 22, 1997, Ser. No. 71,141
Term of patent 14 years
LOC (6) Cl. 24 - *02*
U.S. Cl. D24—224



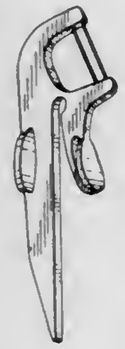
401,700
CONTAINER FOR USE WITH AN AUTOMATIC ANALYZER

Robert C. Gray; Linas P. Laurusonis, both of Gurnee; Matthew L. Mittino, Evanston; Jack F. Ramsey, Grayslake, and Tahua Yang, Darien, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.
Filed May 22, 1997, Ser. No. 71,157
Term of patent 14 years
LOC (6) Cl. 24 - *02*
U.S. Cl. D24—224



401,701
DUAL STRAND DENTAL FLOSSER

Ingram S. Chodorow, Upper Saddle River, N.J., assignor to Placontrol Corporation, Montvale, N.J.
Continuation of Ser. No. 324,479, Oct. 17, 1994, which is a continuation-in-part of Ser. No. 114,424, Aug. 30, 1993, Pat. No. 5,538,023. This application May 24, 1996, Ser. No. 54,960
Term of patent 14 years
LOC (6) Cl. 28 - *03*
U.S. Cl. D28—64



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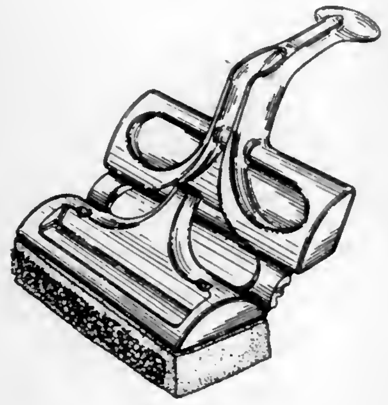
401,702
WRINGER SPONGE MOP HEAD

Enzo Berti, Dolo/Venice, Italy, assignor to The Libman Company, Arcola, Ill.

Filed Jun. 17, 1997, Ser. No. 72,437
Term of patent 14 years
LOC (6) Cl. 08 - *05*

U.S. Cl. D32—44

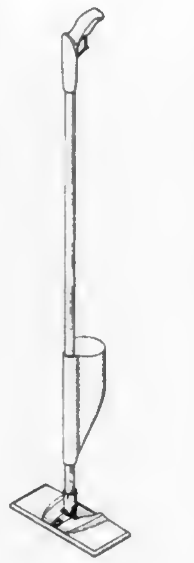


401,703
CLEANING IMPLEMENT

Timothy J. Beechuk; Aram J. Irwin, both of Cincinnati; Christopher M. Miller, Milford; Vernon S. Ping, III, Cincinnati; Steven M. Schennum, West Chester; Jonathan J. Schwartz, Cincinnati, and James W. Settelmayer, Jr., Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 26, 1996, Ser. No. 62,810
Term of patent 14 years
LOC (6) Cl. 08 - *05*

U.S. Cl. D32—45

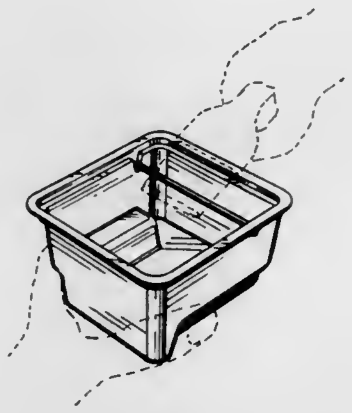


401,704
PAINT DISPENSER WITH BRUSH WIPE AND REST

Henry R. Clark, 228 Timber La., Stockbridge, Ga. 30281

Filed Nov. 17, 1997, Ser. No. 79,496
Term of patent 14 years
LOC (6) Cl. 07 - *07*

U.S. Cl. D32—53.1

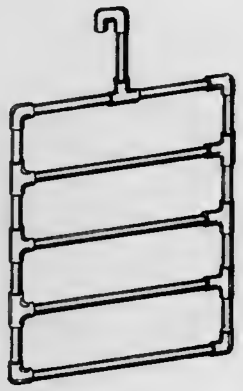


401,705
CUSHION DRYING RACK

Richard M. Jones, 3231 Walden Way, Racine, Wis. 53405

Filed Sep. 25, 1997, Ser. No. 77,040
Term of patent 14 years
LOC (6) Cl. 07 - *05*

U.S. Cl. D32—58

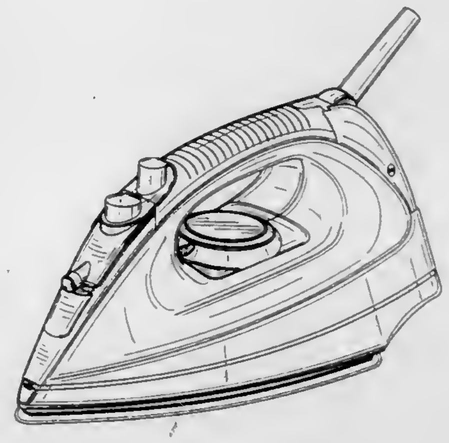


401,706
IRON

Jacques Gudefin, St. Priest, France, assignor to Calor S.A., Lyons, France

Filed Dec. 3, 1997, Ser. No. 80,211
Claims priority, application WIPO, Jun. 3, 1997, DM003736
Term of patent 14 years
LOC (6) Cl. 07 - *05*

U.S. Cl. D32—70

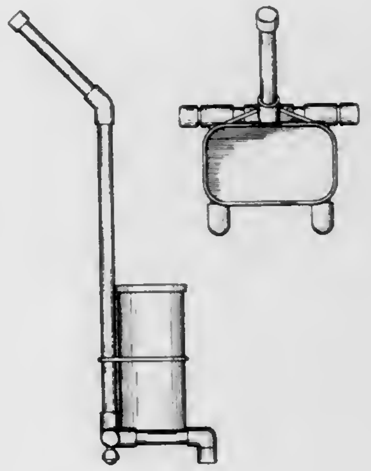


401,707
WASTE CONTAINER

Gordon F. Warner, deceased, late of Eloy, Ariz., by Peggy S. Warner, administrator, 505 Hopi Cir. P.O. Box 965, Eloy, Ariz. 85231

Filed Oct. 22, 1997, Ser. No. 78,148
Term of patent 14 years
LOC (6) Cl. 09 - *09*

U.S. Cl. D34—5

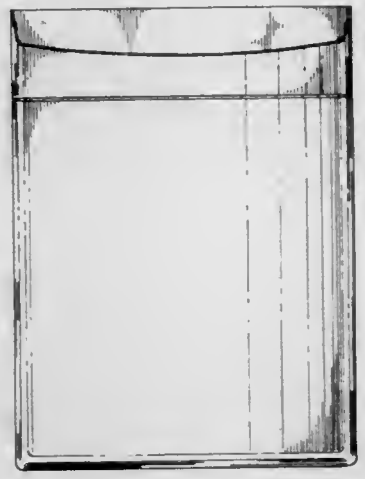


401,708
WASTE RECEPTACLE

John Richard Arbak, Ventura, and Allan Cameron, Santa Monica, both of Calif., assignors to Bobrick Washroom Equipment, Inc., North Hollywood, Calif.

Filed Jul. 7, 1997, Ser. No. 73,369
Term of patent 14 years
LOC (6) Cl. 09 - *09*

U.S. Cl. D34—1

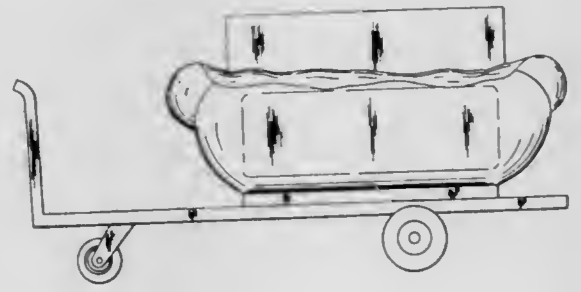


401,709
VENDING CART

Alan A. Genovese, 702 Spirit 40 Park, Suite 110, Ellisville, Mo. 63005

Continuation-in-part of Ser. No. 53,592, Apr. 25, 1996, Pat. No. Des. 383,280. This application Aug. 26, 1997, Ser. No. 76,146
Term of patent 14 years
LOC (6) Cl. 12 - *02*

U.S. Cl. D34—13



401,710
VENDING CART

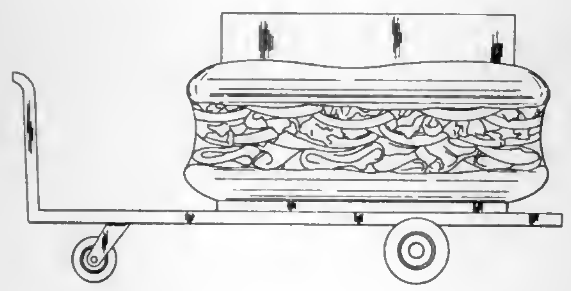
Alan A. Genovese, 702 Spirit 40 Ct., Suite 110, Clarkson Valley, Mo. 63005

Continuation-in-part of Ser. No. 52,420, Mar. 29, 1996, Pat. No. Des. 388,023. This application Dec. 19, 1997, Ser. No. 81,090

Term of patent 14 years

LOC (6) Cl. 12 - *02*

U.S. Cl. D34—13



401,711
VENDING CART

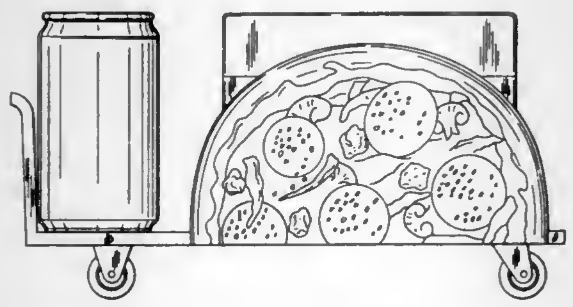
Alan A. Genovese, 702 Spirit 40 Ct., Suite 110, Clarkson Valley, Mich. 63005

Filed Jan. 8, 1998, Ser. No. 81,733

Term of patent 14 years

LOC (6) Cl. 12 - *02*

U.S. Cl. D34—13



401,712
HOUSEHOLD CLEANING CART

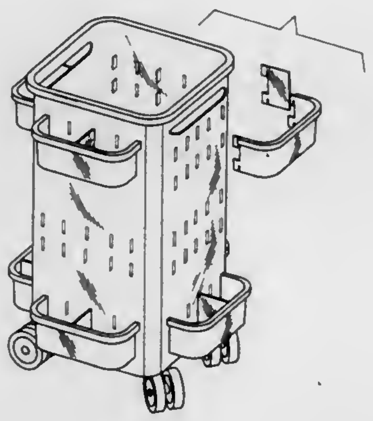
Juanita M. Daniels, 6025 Overbrook Ave., Philadelphia, Pa. 19131

Filed Aug. 27, 1997, Ser. No. 75,736

Term of patent 14 years

LOC (6) Cl. 12 - *02*

U.S. Cl. D34—20



401,713
BOAT BOW WHEEL ACCESSORY FOR SINGLE HANDED TRANSPORT TO A LAUNCHING SITE

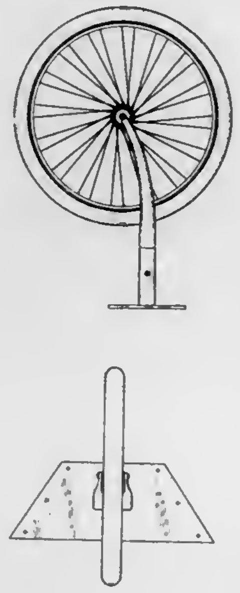
Roy O. P. Simon, RR 2, Site 11-47, 681 Silverlane SW., Cranbrook, British Columbia, Canada, ViC 4H3

Filed Dec. 30, 1996, Ser. No. 64,340

Term of patent 14 years

LOC (6) Cl. 12 - *02*

U.S. Cl. D34—23



401,714
CREEPER

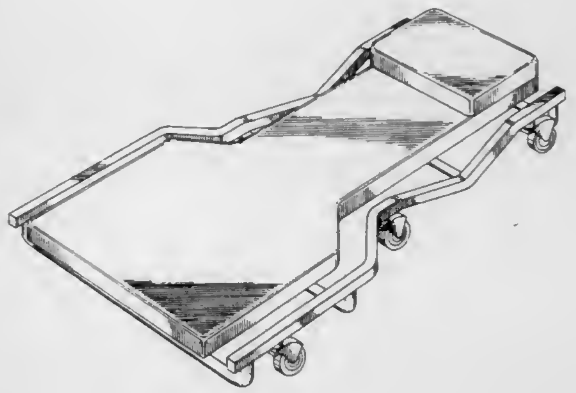
Kirt E. Whiteside, Marion, and Terry L. Whiteside, Delaware, both of Ohio, assignors to Whiteside Mfg. Co., Delaware, Ohio

Filed Nov. 21, 1997, Ser. No. 79,713

Term of patent 14 years

LOC (6) Cl. 12 - *02*

U.S. Cl. D34—23



401,715
CREEPER

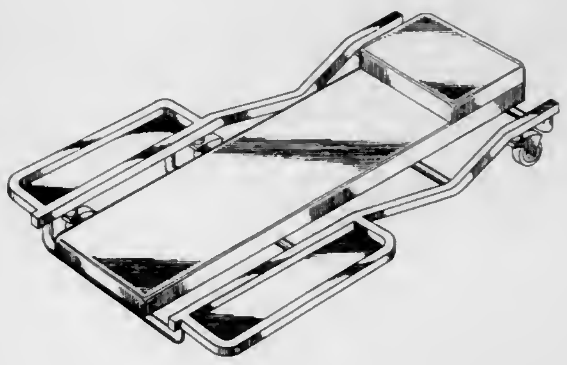
Kirt E. Whiteside, Marion; Terry L. Whiteside, Delaware; Robert E. Studer, New Washington, and Keith R. Studer, Shelby, all of Ohio, assignors to Whiteside Mfg. Co., Delaware, Ohio

Filed Jan. 26, 1998, Ser. No. 82,543

Term of patent 14 years

LOC (6) Cl. 12 - *02*

U.S. Cl. D34—23



401,716
HANDPOWERED PALLET TRUCK

Luthy André Marcel, Ulm, Germany, assignor to Mecanique Industrie Chimie-Mic, Rungis, France

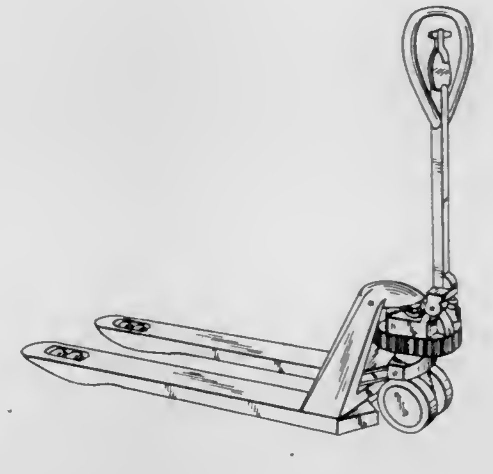
Filed Dec. 20, 1996, Ser. No. 63,985

Claims priority, application France, Jun. 21, 1996, 963673

Term of patent 14 years

LOC (6) Cl. 12 - *05*

U.S. Cl. D34—34



401,717
CARGO ROLLER

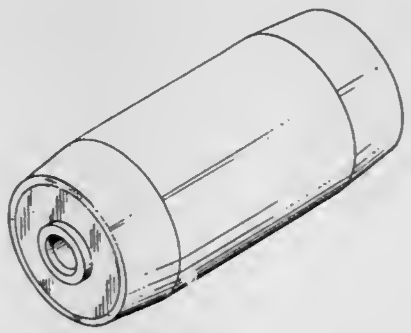
Randall A. Grueber, 2831 Walker Lee Dr., Los Alamitos, Calif. 90720, and John A. Cookson, 2412 Cliff Dr., Newport Beach, Calif. 92663

Filed Apr. 16, 1997, Ser. No. 70,399

Term of patent 14 years

LOC (6) Cl. 12 - *05*

U.S. Cl. D34—29



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401,718
STEERING TILLER FOR A MATERIALS HANDLING VEHICLE

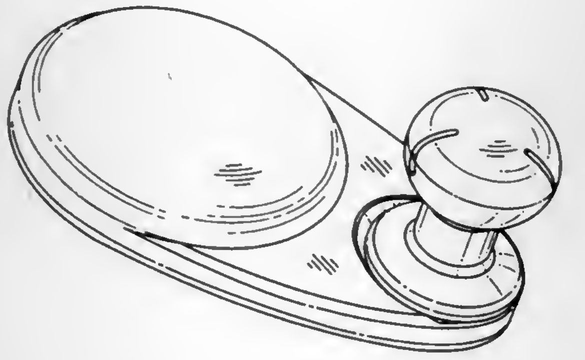
Robert J. Henshaw, New Bremen, and Philip D. Palermo, Sidney, both of Ohio, assignors to Crown Equipment Corporation, New Bremen, Ohio

Filed Sep. 20, 1996, Ser. No. 60,042

Term of patent 14 years

LOC (6) Cl. 12 - *05*

U.S. Cl. D34—35



401,719
TRASH RECEPTACLE WITH BAG LINER RETAINING HANDLES

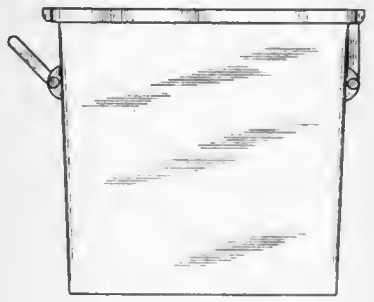
Raymond Van Leeuwen, and Neil Van Leeuwen, both of 114 Simpson Rd., Ardmore, Pa. 19003

Filed Jan. 17, 1997, Ser. No. 65,033

Term of patent 14 years

LOC (6) Cl. 09 - *09*

U.S. Cl. D34—1



401,720
COMPOST CONTAINER

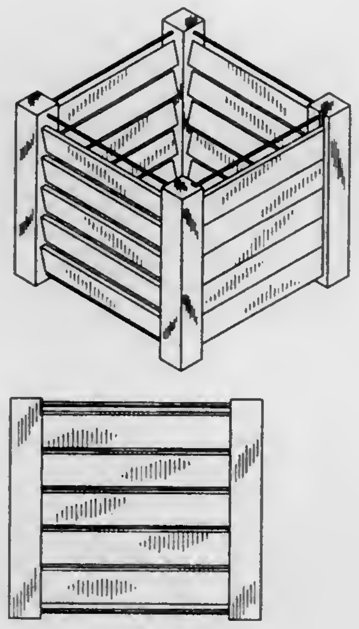
Gary Newquist, Albany, Oreg., assignor to Stanco Mfg., Inc., Salem, Oreg.

Filed Oct. 23, 1997, Ser. No. 81,083

Term of patent 14 years

LOC (6) Cl. 09 - *09*

U.S. Cl. D34—1



401,721
CONTAINER FOR TRASH OR REFUSE

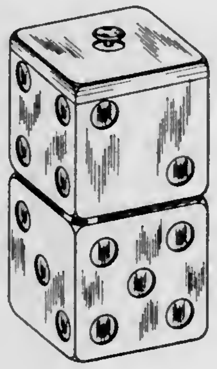
Louis Dionisio, 916 S. 5th St., Lindenhurst, N.Y. 11757

Continuation-in-part of Ser. No. 47,229, Nov. 29, 1995, Pat. No. Des. 377,295. This application Jan. 6, 1997, Ser. No. 64,543

Term of patent 14 years

LOC (6) Cl. 15 - *05*

U.S. Cl. D34—4



401,722
FRAME FOR SUPPORTING AND FILLING A SAND BAG

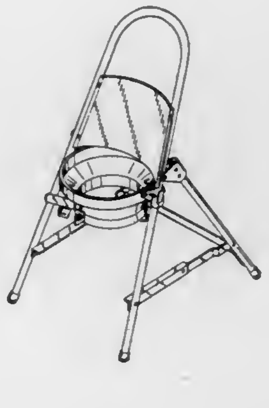
Robert J. Eichenberg, 1 Collins Island, Newport Beach, Calif. 92662

Filed Jan. 26, 1998, Ser. No. 82,576

Term of patent 14 years

LOC (6) Cl. 09 - *09*

U.S. Cl. D34—6



401,723
PULL GOLF CART WITH SEAT

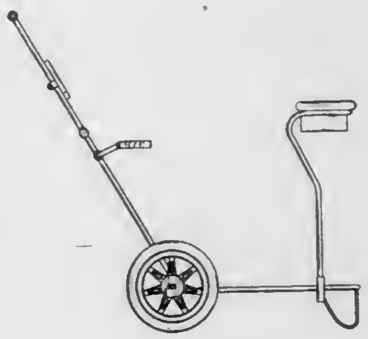
Victor Mauro, and Vera M Mauro, both of 39-11551 Kingfisher Drive Richmond, British Columbia, Canada, V7E 3N5

Filed Apr. 2, 1998, Ser. No. 86,004

Term of patent 14 years

LOC (6) Cl. 12 - *02*

U.S. Cl. D34—15



401,724
CREEPER

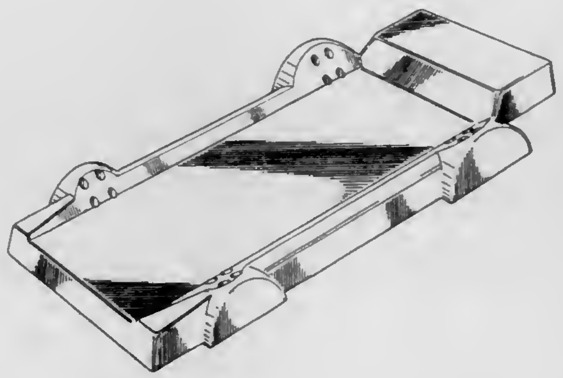
Kirt E. Whiteside, Marion, and Terry L. Whiteside, Delaware, both of Ohio, assignors to Whiteside Mfg. Co., Delaware, Ohio

Filed Jan. 22, 1998, Ser. No. 82,459

Term of patent 14 years

LOC (6) Cl. 12 - *02*

U.S. Cl. D34—23



401,725
LINE TRIMMER CADDY

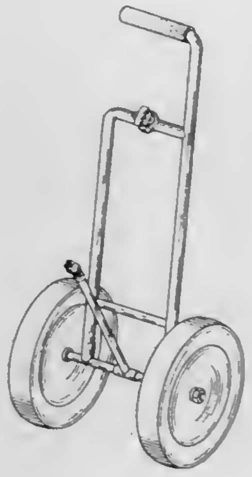
Edward J. Szumal, HC 62 Box 33206, Pinetop, Ariz. 85935

Filed Sep. 23, 1997, Ser. No. 76,873

Term of patent 14 years

LOC (6) Cl. 12 - *02*

U.S. Cl. D34—24



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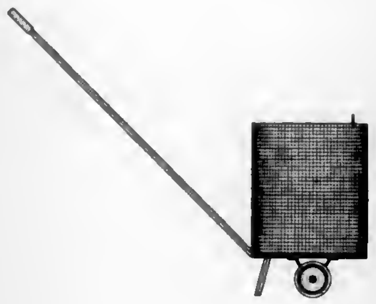
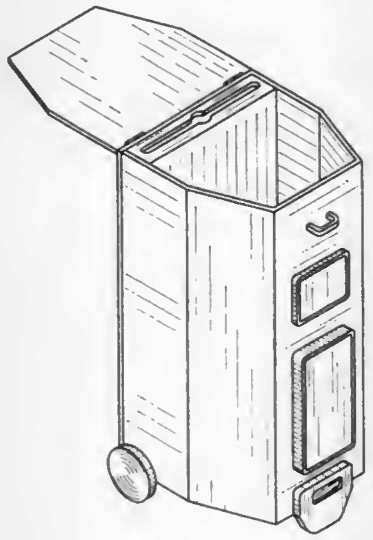
401,726
ANIMAL TRANSPORTER
Clifford A Leasure, and Dixie L Sonnier, both of 4200 SW. 107th #802, Beaverton, Oreg. 97005
Filed Sep. 25, 1997, Ser. No. 77,043
Term of patent 14 years
LOC (6) Cl. 12 - *02*

U.S. Cl. D34—25



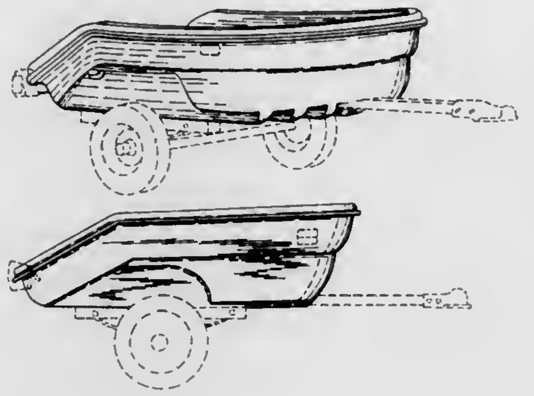
401,727
CART FOR SPORTS EQUIPMENT
James R. Weideman, 3408 Lamont Ct., Eau Claire, Wis. 54701, and Richard D. Henrie, 3631 NE. Fern Valley Dr., Claremore, Okla. 74015
Filed Nov. 21, 1997, Ser. No. 79,689
Term of patent 14 years
LOC (6) Cl. 12 - *02*

U.S. Cl. D34—25



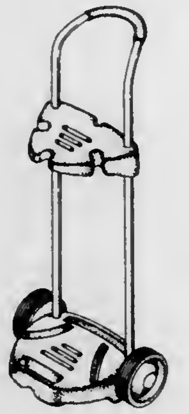
401,728
TRAILER
John J. Kass, and Richard McCoy, both of Granger, Ind., assignors to Reese Products, Inc., Elkhart, Ind.
Filed Oct. 18, 1996, Ser. No. 61,267
Term of patent 14 years
LOC (6) Cl. 12 - *02*

U.S. Cl. D34—26



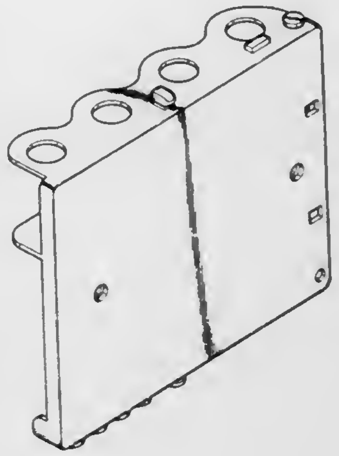
401,729
TOOL CART
Meng-Jung Wu, Tainan Hsien, Taiwan, assignor to Yuann Tay Enterprise Co., Ltd., Tainan Hsien, Taiwan
Filed Mar. 18, 1998, Ser. No. 85,224
Term of patent 14 years
LOC (6) Cl. 12 - *02*

U.S. Cl. D34—26



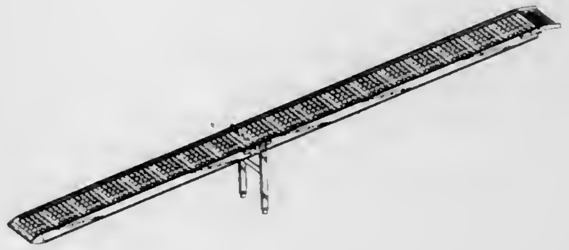
401,730
UTILITY TRAY FOR GOLF CLUB CARTS
Gordon Liao, Yung Kang, Taiwan, assignor to Unique Product & Design Co., Ltd., Tainan Hsien, Taiwan
Filed Aug. 20, 1997, Ser. No. 75,523
Term of patent 14 years
LOC (6) Cl. 12 - *02*

U.S. Cl. D34—27



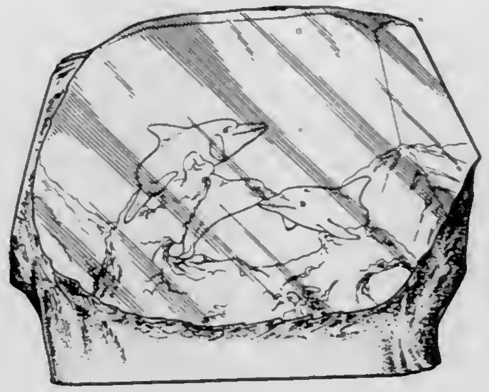
401,731
RAMP FOR LOADING AND UNLOADING TRUCKS
Paul L. Jeruss, 2626 Lucile Ave., Stockton, Calif. 95209
Filed Feb. 25, 1997, Ser. No. 67,120
Term of patent 14 years
LOC (6) Cl. 12 - *05*

U.S. Cl. D34—32



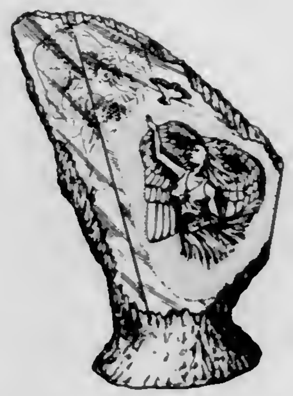
401,732
CREMATION URN
Daniel J. Parker, Connersville, Ind., assignor to Batesville Casket Company, Inc., Batesville, Ind.
Filed Oct. 16, 1997, Ser. No. 78,073
Term of patent 14 years
LOC (6) Cl. 99 - *00*

U.S. Cl. D99—5



401,733
CREMATION URN
Mark H. Thesken, Cincionati, Ohio, assignor to Batesville Casket Company, Inc., Batesville, Ind.
Filed Oct. 3, 1997, Ser. No. 77,523
Term of patent 14 years
LOC (6) Cl. 99 - *00*

U.S. Cl. D99—5



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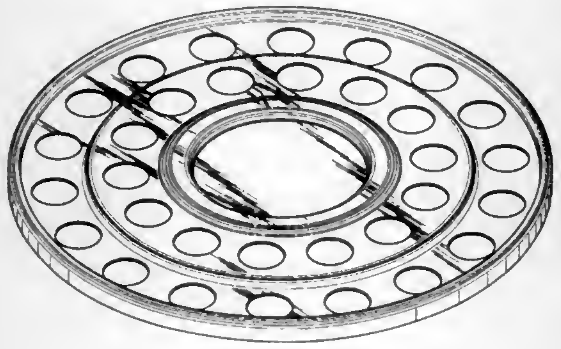
401,734
COMMUNION TRAY
Ellis E. Monk, Altoona, Iowa, assignor to Artistic Manufacturing Corporation, Altoona, Iowa
Filed Jun. 13, 1997, Ser. No. 72,339
Term of patent 14 years
LOC (6) Cl. 07 - *01*

U.S. Cl. D99—25



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 24th DAY OF NOVEMBER, 1998

NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A & D Company, Limited: *See—*
  - Tochikubo, Osamu; and Ishizuka, Shigehiro, 5,840,037, Cl. 600-499.000.
- AAON, Inc.: *See—*
  - Ludwig, Richard M.; and Davis, Richard J., 5,839,505, Cl. 165-109.100.
- AB Volvo: *See—*
  - Johansson, Lars, 5,839,863, Cl. 410-66.000.
- Abajian, Henry Baxter: *See—*
  - Hlavka, Joseph J.; Pincus, Matthew R.; Noble, John Fowler; Abajian, Henry Baxter; and Kende, Andrew S., 5,840,683, Cl. 514-9.000.
- ABB Flexible Automation, Inc.: *See—*
  - Svensson, Tommy, 5,841,104, Cl. 219-125.100.
- ABB Research Ltd: *See—*
  - Börner, Gunter; Nienburg, Hans-Christoph; Böhme, Helmut; Sopka, Jörg; and Kleber, Wolfgang, 5,839,669, Cl. 239-704.000.
  - Döbbeling, Klaus, 5,839,283, Cl. 60-737.000.
- Abbott Laboratories: *See—*
  - Brooks, Clint D. W.; Kolasa, Teodozyj; Lee, Wendy; and Stewart, Andrew O., 5,840,758, Cl. 514-564.000.
  - Goldhardt, Donald J.; Hall, John D.; Hirsch, William H.; and Ross, Jeffrey R., 5,840,065, Cl. 604-96.000.
- Abbott, Ronald E.; and Willgrubs, Theodore M., to GPX Corp. Dipper door actuated lube pumping system. 5,839,213, Cl. 37-443.000.
- Abbruscato, C. Richard, to American TeleCare, Inc. Digital telephonic system for stethoscope signal processing. 5,841,846, Cl. 379-106.020.
- ABC-Team Spielplatzgeräte GmbH: *See—*
  - Zingel, Hans-Walter; and Plugge, Manfred, 5,839,963, Cl. 472-104.000.
- Abe, Hidenori: *See—*
  - Takatani, Muneo; Ikeda, Hitoshi; Iida, Kyoko; and Abe, Hidenori, 5,840,732, Cl. 514-300.000.
- Abe, Hidetoshi, to Furukawa Denchi Kabushiki Kaisha. Method for activating an alkaline rechargeable battery. 5,840,442, Cl. 429-206.000.
- Abe, Hiroyuki, to Sony Corporation. Motor capable of generating an electric signal having a particular and precise frequency and a rotary magnetic head apparatus using the same. 5,841,208, Cl. 310-67.00R.
- Abe, Nobutaka: *See—*
  - Tsubouchi, Yuzo; Abe, Nobutaka; and Nakamura, Yuji, 5,840,594, Cl. 438-15.000.
- Abe, Shuji: *See—*
  - Kurihara, Kouichi; and Abe, Shuji, 5,841,475, Cl. 348-409.000.
- Abe, Takahide: *See—*
  - Takaba, Katsumi; Hyodo, Masahito; and Abe, Takahide, 5,841,983, Cl. 395-200.550.
- Abe, Tomohiko: *See—*
  - Satoh, Takamasa; Oae, Yoshihisa; Arai, Soichiro; Miyazawa, Kenichi; Yasuda, Hiroshi; Ohno, Manabu; Watanabe, Hitoshi; Kai, Junichi; Abe, Tomohiko; Yamada, Akio; and Takahashi, Yasushi, 5,841,145, Cl. 250-492.220.
- Abou-Samra, Abdul-Badi: *See—*
  - Segre, Gino V.; Kronenberg, Henry M.; Abou-Samra, Abdul-Badi; Juppner, Harald; Potts, John T., Jr.; and Schipani, Ernestina, 5,840,853, Cl. 530-387.100.
- Abraham, Joseph N. Micro word-pad with tactile multifunctional keys. 5,841,374, Cl. 341-34.000.
- Abraham, Norbert, Sr.: *See—*
  - Ribeiro, Carmo; Clemente, Marcos; Brown, Alan S.; Abraham, Norbert, Sr.; and Bare, Kristopher R., 5,839,352, Cl. 92-186.000.
- Abramovitz, Mark; Grygorczyk, Richard; Metters, Kathleen; Nguyen, Truyen; Rushmore, Thomas H.; and Slipetz, Deborah, to Merck Frosst Canada, Inc. Purified prostaglandin receptor FP. 5,840,847, Cl. 530-350.000.
- Abrams, Andrew L.: *See—*
  - Gumaste, Anand V.; Abrams, Andrew L.; and Fleming, Scott, 5,840,062, Cl. 604-68.000.
- Acampora, Salvatore, Jr., to Torrington Company, The. Bearing and bearing seal. 5,839,834, Cl. 384-484.000.
- Accudyne Corporation: *See—*
  - Varney, John C.; Costas, Judson P.; Nemeth, Paul R.; and Olmstead, Ty R., 5,839,668, Cl. 239-690.000.
- Acessline Technologies, Inc.: *See—*
  - Fuller, Robert M.; Epler, Frederick A.; and Manowski, Maxwell E., 5,841,837, Cl. 379-57.000.
- Ackley, Donald E.: *See—*
  - Shieh, Chan-Long; Ackley, Donald E.; Maracas, George N.; and Harvey, Thomas B., III, 5,841,914, Cl. 385-12.000.
- Ackley, H. Sprague, to Intermec Corporation. Dot printers with width compression capabilities. 5,841,954, Cl. 395-108.000.
- Acquaviva, Thomas, to Xerox Corporation. Controlled moisturization of paper to eliminate curl. 5,842,105, Cl. 399-406.000.
- ACS Wireless, Inc.: *See—*
  - Birnbaum, Thomas J., 5,841,407, Cl. 343-895.000.
- Acti Technology Corp.: *See—*
  - Ju, Jiang-Tsuen; and Chien, Shih J., 5,841,957, Cl. 395-182.060.
- Activated Cell Therapy, Inc.: *See—*
  - Van Vlasselaer, Peter, 5,840,502, Cl. 435-7.210.
- Acushnet Company: *See—*
  - Lutz, Mitchell E.; Hatch, William Ellis; and Zanotti, Brian Louis, 5,840,788, Cl. 524-95.000.
- Adachi, Chihaya: *See—*
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Weinkauf, Frank, 5,839,743, Cl. 280-154.000.
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Fenton, Garry; Morley, Andrew David; Palfreyman, Malcolm Norman; Ratcliffe, Andrew James; Sharp, Brian William; Stuttle, Keith Alfred James; Thurairatnam, Sukanthini; and Vacher, Bernard Yvon Jack, to Rhone-Poulenc Rorer Limited. Compounds containing phenyl linked to aryl or heteroaryl by an aliphatic- or heteroatom-containing linking group. 5,840,724, Cl. 514-252.000.
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Vance, Ronald D.; and Johnson, H. Clayton, 5,839,136, Cl. 5-623.000.
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Fichtel & Sachs AG: *See—*
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Fine, Amos, to BATL Software Systems Ltd. Dynamic pattern recognition system. 5,842,164, Cl. 704-244.000.
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Bieck, Torsten; Ziegler, Christiane; Widulle, Rüdiger; and Lange, Carsten, 5,839,711, Cl. 248-313.000.
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Jensen, Michael Hamish, 5,839,507, Cl. 165-263.000.
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Kloian, Harvey V. Tearable retainer. 5,839,868, Cl. 411-533.000.

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Klouda, Mark A. Golf swing training device. 5,839,969, Cl. 473-220.000.

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Knape, Ronnie D. Lawn chair rocker base system. 5,839,781, Cl. 297-258.100.

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Knoepke, Eckhard: *See*—

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Knorr Bremse Systeme Fur Nutzfahrzeuge GmbH: *See*—

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Knotts, Thomas A.; Stout, Cheryl; and Walker, Richard C., to Hewlett-Packard Company. Fully-integrated high-speed interleaved voltage-controlled ring oscillator. 5,841,325, Cl. 331-57.000.

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Wood, Michael C., 5,839,902, Cl. 434-130.000.

Knowles, Billy Jack: *See*—

Barker, Thomas Norman; Collins, Clive Allan; Dapp, Michael Charles; Dieffenderfer, James Warren; Grice, Donald George; Kogge, Peter Michael; Kuchinski, David Christoper; Knowles, Billy Jack; Lesmeister, Donald Michael; Miles, Richard Ernest; Nier, Richard Edward; Retter, Eric Eugene; Richardson, Robert Reist; Rolfe, David Bruce; Schoonover, Nicholas Jerome; Smoral, Vincent John; Stupp, James Robert; and Wilkinson, Paul Amba, 5,842,031, Cl. 395-800.000.

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Knüttel, Werner, to Fredenhagen GmbH & Co. KG. Mono- or twin-rail overhead chain conveyor. 5,839,371, Cl. 104-172.400.

Kobayashi, Hideki; Kushibiki, Nobuo; Masatomi, Tohru; and Takeuchi, Kikuko, to Dow Corning Toray Silicone Co., Ltd.; and Dow Corning Asia, Ltd. Method of manufacturing a polysiloxane charge transporting material. 5,840,816, Cl. 528-4.000.

Kobayashi, Hiroshi: *See*—

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Kobayashi, Hiroyuki: *See*—

Ashibe, Tsunenori; Kobayashi, Hiroyuki; Nakazawa, Akihiko; Tanaka, Atsushi; and Kusaba, Takashi, 5,842,080, Cl. 399-49.000.

Kobayashi, Isao; and Kaifu, Noriyuki, to Canon Kabushiki Kaisha. Photoelectric conversion device, method of driving photoelectric conversion device, and system having the device. 5,841,180, Cl. 257-448.000.

Kobayashi, Katsuyoshi, to Fujitsu Limited. Calibration of semiconductor pattern inspection device and a fabrication process of a semiconductor device using such an inspection device. 5,840,595, Cl. 438-16.000.

Kobayashi, Katsuyuki; Tanaka, Atsushi; Yoshimura, Yuichiro; Yanagisawa, Ryozo; Tokioka, Masaki; and Sato, Hajime, to Canon Kabushiki Kaisha. Coordinates input apparatus and vibration detecting apparatus. 5,842,153, Cl. 702-95.000.

Kobayashi, Kazuo: *See*—

Hamachi, Tadashi; Kobayashi, Kazuo; Morita, Yoshitsugu; Sawa, Kiyotaka; and Tachibana, Ryuji, 5,840,831, Cl. 528-488.000.

Kobayashi, Keiji; and Noguchi, Yasunari, to Sanyo Electric Co., Ltd. Radio receiver with programmable digital tuner immune to manufacturing variations in varactor capacitance. 5,842,120, Cl. 455-179.100.

Kobayashi, Keiko: *See*—

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Kobayashi, Ken: *See*—

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Kobayashi, Masaaki, to Narakawa Industry Co., Ltd. Movable workbench and an assembly line device using the workbench. 5,839,721, Cl. 269-57.000.

Kobayashi, Masaaki: *See*—

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Kobayashi, Motohiro: *See*—

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Kobayashi, Noriya; and Malik, Sharad, to NEC Corporation. System and method for processing graphic delay data of logic circuit to reduce topological redundancy. 5,841,673, Cl. 364-489.000.

Kobayashi, Seiichiroh: *See*—

Schlüter, Klaus; Schwarz, Wolfgang; Kuscher, Gerd; Feuerstake, Eugen; Klöber, Martin; Schneider, Karl-Heinz; Honda, Kiyoshi; Kobayashi, Seiichiroh; and Kishimoto, Junichi, 5,839,754, Cl. 280-736.000.

Kobayashi, Shinichi; Koike, Eiji; Miyagawa, Kazunori; and Matubara, Kazuo, to Atom Medical Corporation. Incubator. 5,840,010, Cl. 600-22.000.

Kobayashi, Susumu; Miyazaki, Masaya; and Horiuchi, Masaki, to Matsushita Electric Industrial Co., Ltd. Optical disk changer system and method of managing optical disk changer. 5,841,743, Cl. 369-34.000.

Kobayashi, Tohru: *See*—

Hori, Yoji; Kobayashi, Tohru; Hongo, Hideyuki; Yamaguchi, Akio; Takahashi, Yoko; Imai, Takashi; and Hagiwara, Toshimitsu, 5,840,811, Cl. 525-411.000.

Kobayashi, Tomoo; Torikoshi, Kaoru; and Ezure, Tadakazu, to Fuji Xerox Co., Ltd. Image recording medium capable of reuse. 5,840,421, Cl. 428-332.000.

Kobayashi, Toshiharu, to Sony Corporation. Picture data recording/reproducing apparatus for providing divisional picture management without boundary distortion. 5,841,936, Cl. 386-33.000.

Kobayashi, Yuji: *See*—

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Kobilansky, Alex: *See*—

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Kochi, Tetsunobu, to Canon Kabushiki Kaisha. Semiconductor device, and operating device, signal converter, and signal processing system using the semiconductor device. 5,841,685, Cl. 364-807.000.

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Koday, Yohai. Rotatable water bottle holder. 5,839,632, Cl. 224-414.000.

Koenck, Steven E., to Norand Technology Corporation. Hand-held optically readable character set reader having automatic focus control for operation over a range of distances. 5,841,121, Cl. 235-472.000.

Koenig & Bauer-Albert Aktiengesellschaft: *See—*
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Koga, Hisamitsu; Kumagai, Naotake; Owada, Tomiji; Furukawa, Nobuya; Kato, Masaaki; and Kawamura, Nobuyuki, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Braking control system for electric automobile. 5,839,800, Cl. 303-152.000.

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Koike, Hideharu, to Kabushiki Kaisha Toshiba. Voltage subtracter circuit, voltage amplifier circuit, voltage divider circuit and semiconductor integrated circuit device. 5,841,311, Cl. 327-361.000.

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Koizumi, Nobukazu; and Awata, Yutaka, to Fujitsu Limimited. Access line termination unit. 5,841,809, Cl. 375-233.000.

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Kojima, Hirofumi; and Kamakura, Yutaka, to Mitsubishi Electric Semiconductor Software Co., Ltd.; and Mitsubishi Denji Kabushiki Kaisha. Semiconductor integrated circuit including a high density cell. 5,841,157, Cl. 257-202.000.

Kojima, Hiroshi, to Bridgestone Corporation. Vibration isolating apparatus. 5,839,720, Cl. 267-140.140.

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Kolivoski, Christopher James; Schaeffer, Richard Lloyd, Jr.; and Morris, Michael, to Whitaker Corporation, The. Hand-held crimping tool. 5,839,316, Cl. 72-453.160.

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Komatsu, Hiroyuki; Komatsu, Kuniyuki; and Ono, Shigeru, to Dental Aid Co. Ltd. Deglutition assisting instrument. 5,839,444, Cl. 128-859.000.

Komatsu, Keiro; Hayashi, Masako; Hamamoto, Kiichi; Sasaki, Tatsuya; and Takeuchi, Takeshi, to NEC Corporation. Light wavelength filtering circuit and manufacturing method thereof. 5,841,929, Cl. 385-129.000.

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Komazaki, Takahiro; and Tsutsui, Keiichi, to Sony Corporation. Recording-medium driving apparatus and recording-medium driving method with playback signal defect detector. 5,841,751, Cl. 369-59.000.

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Komiya, Kyosuke; Fukuoka, Shinsuke; and Kawamura, Mamoru, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for preparing aromatic polycarbonate. 5,840,826, Cl. 528-196.000.

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Komoto, Satoshi; Tanaka, Toshiaki; and Fujimura, Norio, to Kabushiki Kaisha Toshiba. Multicolor light emitting device. 5,841,177, Cl. 257-431.000.

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Kondo, Tetsujiro; Fujimori, Yasuhiro; Takahashi, Kenji; and Kawaguchi, Kunio, to Sony Corporation. Information signal encoding apparatus, encoding method thereof, information signal decoding method, and information signal medium thereof. 5,841,375, Cl. 341-50.000.

Kondo, Tetsuya; and Nagano, Hirofumi, to Victor Company of Japan, Ltd. Optical recording medium and reproducing apparatus for optical recording medium. 5,841,861, Cl. 380-4.000.

Kondo, Toshiyuki, to Kabushiki Kaisha Toshiba. Method of manufacturing semiconductor device using an amorphous material. 5,840,618, Cl. 438-533.000.

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Konica Corporation: *See—*
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  Haneda, Satoshi; Nagase, Hisayoshi; Tokimatsu, Hiroyuki; Onodera, Masahiro; Hamada, Shuta; Miura, Toshihide; and Mochizuki, Fumitaka, 5,840,461, Cl. 430-133.000.

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Beatty, Gerald F.: *See—*
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Brooks, Mike; Simpson, Edgar H.; Kastner, Theodore A.; and Wurfbain, Diana A., to Rocky Shoes & Boots, Inc. Shoe upper. 401,401, Cl. D2-970.000.
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Brownell, Kenneth W.; and Shram, John G., to Superior Modular Products, Incorporater. Hood for an electrical connector. 401,561, Cl. D13-156.000.
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Broyhill Furnitures Industries, Inc.: *See—*
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Bullock, Larry Alan. 10-22 recoil buffer. 401,658, Cl. D22-108.000.
Burrows, Bruce D. Wood-type head for a golf club. 401,650, Cl. D21-733.000.
Burrows, Bruce D. Iron-type head for a golf club. 401,652, Cl. D21-748.000.
Burrows, Bruce D. Spiral hosel for a golf club. 401,653, Cl. D21-753.000.
Burrows, Bruce D. Spring hosel for a golf club. 401,654, Cl. D21-753.000.
Burrows, Bruce D. Diamond pattern hosel for a golf club. 401,655, Cl. D21-753.000.
Burrows, Bruce D. Fluted hosel for a golf club. 401,656, Cl. D21-753.000.
Butts, Bradford F.; Crater, Arnold; Prince, Michael D.; and O'Connor, Paul F., to Motorola, Inc. Transit gate card reader. 401,571, Cl. D14-105.000.
Byerly, David J.; Ganzer, Charles P.; and Jenkins, Thomas C., to Nordson Corporation. Liquid dispensing device. 401,600, Cl. D15-144.200.
Byrne, Wayne H.: *See—*
Cleveland, Roger C.; Rollinson, Augustin W.; Byrne, Wayne H.; and Smith, Garth, 401,651, Cl. D21-736.000.
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Miyazawa, Yoshihiro, 401,617, Cl. D18-40.000.
Nozawa, Minoru; Tsukuda, Keiichiro; and Shimizu, Hisakazu, 401,620, Cl. D18-56.000.
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Carlson, Ragnar, to Rockport Company, Inc., The. Shoe upper. 401,398, Cl. D2-969.000.
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- Carrier Corporation: *See—*
  - Galeazzi, Giuliano; Aliprandi, Roberto; Rusignuolo, Giorgio; and Vecchi, Gianluca, 401,682, Cl. D23-351.000.
- Cat Eye Co., Ltd.: *See—*
  - Ueda, Takashi; and Okuda, Youji, 401,522, Cl. D10-98.000.
- Cats with an Attitude, Inc.: *See—*
  - Ritchey, Sharon, 401,475, Cl. D7-543.000.
- Caveney, Jack E., to Panduit Corp. Ribless mount. 401,498, Cl. D8-356.000.
- Ch-BEHA GmbH Technische Neuentwicklungen: *See—*
  - Beha, Christian, 401,520, Cl. D10-78.000.
- Chamberlain, Roy. Glove. 401,387, Cl. D2-623.000.
- Chambers, Elizabeth A., to Tyco Group S.A.R.L. Suture package. 401,692, Cl. D24-145.000.
- Chambers, Randall P.; Phelps, William C.; and Ruth, Barbara A., to Motorola, Inc. Battery housing for a portable radio telephone. 401,550, Cl. D13-103.000.
- Chang, Chen-Ching. Chainless transmission unit of a bicycle. 401,538, Cl. D12-122.000.
- Chatzigiannis, Bill: *See—*
  - Perry, James; and Chatzigiannis, Bill, 401,500, Cl. D8-373.000.
- Chen, Eddie. Shoe sole. 401,397, Cl. D2-957.000.
- Chen, Michael C. F.: *See—*
  - Paikos, George P.; and Chen, Michael C. F., 401,462, Cl. D6-566.000.
- Chen, Tsai-Lie. Pedaling exerciser. 401,644, Cl. D21-663.000.
- Cheris, Albert B.; Staubitz, Robert B.; and Repp, Timothy, to Tenex Corporation. Compact disc storage case. 401,463, Cl. D6-634.000.
- Cheris, Albert B.; and Dziersk, Mark, to Tenex Corporation. Expandable diskette holder with removable lid. 401,464, Cl. D6-634.000.
- Chirillo, W. Ann. Gift basket adorned with trim and ribbons. 401,411, Cl. D3-307.000.
- Chodorow, Ingram S., to Placontrol Corporation. Dual strand dental flosser. 401,701, Cl. D28-64.000.
- Chua, Sze Lee: *See—*
  - Benjamin, O'Connell Julien; Chua, Sze Lee; Chui, Chi Man; Goh, King Hoe; Tan, Lee Wah; Wheatley, Steven Mitchell; and Whitlock, Terry A., 401,579, Cl. D14-149.000.
- Chui, Chi Man: *See—*
  - Benjamin, O'Connell Julien; Chua, Sze Lee; Chui, Chi Man; Goh, King Hoe; Tan, Lee Wah; Wheatley, Steven Mitchell; and Whitlock, Terry A., 401,579, Cl. D14-149.000.
- Chung Liao, Kuei Liang. Alarm clock. 401,510, Cl. D10-6.000.
- Chuo, Yu-Hsin, to Compal Electronics, Inc. Computer display. 401,575, Cl. D14-113.000.
- Clark, Henry R. Paint dispenser with brush wipe and rest. 401,704, Cl. D32-53.100.
- Clarke, Richard D., to Nike, Inc. Bottom surface portion of a shoe outsole. 401,395, Cl. D2-953.000.
- Clarke, Richard D., to Nike, Inc. Side element of a shoe upper. 401,402, Cl. D2-972.000.
- Clements, Richard L. Damper for springer fork for motorcycles. 401,536, Cl. D12-118.000.
- Cleveland, Roger C.; Rollinson, Augustin W.; Byrne, Wayne H.; and Smith, Garth, to Callaway Golf Company. Golf putter head and angled hosel. 401,651, Cl. D21-736.000.
- Cloonan, Kevin M.; Hanagan, Ted J.; Kimler, Kirk M.; and Safar, Scott G., to Abbott Laboratories. Container. 401,697, Cl. D24-224.000.
- Clorox Company, The: *See—*
  - Bolliger, James D.; Campbell, William W.; Finn, Leslie E.; Khan, M. A. Lateef; Levenson, Barry G.; and Doolittle, Frederick G., 401,504, Cl. D9-523.000.
- Cobbs Manufacturing Company: *See—*
  - Hartmann, Jerome J.; and Steinhagen, Thomas R., 401,419, Cl. D4-135.000.
- Cobra Golf, Inc.: *See—*
  - Best, Christopher Brian; Rodgers, Philamon W.; and Hirsch, Robert D., 401,637, Cl. D21-220.000.
- Coe, Matthew, to PharmaDesign, Inc. Compliance ring. 401,688, Cl. D24-127.000.
- Collins, Robert C., II; Ostrowski, Daniel E.; and Wolpert, Christopher J., to Dial Corporation, The. Combined bottle and cap. 401,506, Cl. D9-528.000.
- Compal Electronics, Inc.: *See—*
  - Chuo, Yu-Hsin, 401,575, Cl. D14-113.000.
- Compaq Computer Corporation: *See—*
  - Leman, Michael; and Martin, Randall W., 401,574, Cl. D14-113.000.
  - Massaro, Kevin L., 401,569, Cl. D14-100.000.
- Concept Designs Inc: *See—*
  - Hu, Antonio; and Hsiao, Louis, 401,426, Cl. D6-349.000.
- Concession & Restaurant Supply, Inc.: *See—*
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- Cookson, John A.: *See—*
  - Grueber, Randall A.; and Cookson, John A., 401,717, Cl. D34-29.000.
- Cooper, Devin Glenn: *See—*
  - Eberle, John David; and Cooper, Devin Glenn, 401,608, Cl. D16-314.000.
- Coquerel, Olivier C, to S. T. Dupont S.A. Wristwatch. 401,512, Cl. D10-32.000.
- Coquerel, Olivier C, to S. T. Dupont S.A. Watchcase. 401,513, Cl. D10-39.000.
- Coquerel, Olivier C., to S. T. Dupont S.A. Watchcase. 401,514, Cl. D10-39.000.
- Corsetti, Colin Chandler. Combined cover and strap for the steering wheel of a vehicle. 401,544, Cl. D12-177.000.
- Côté , André: *See—*
  - Boilard, Michel; Côté , André; and Allen, Patrick, 401,481, Cl. D7-643.000.
- Cox, D. Blake. Fishing lure. 401,661, Cl. D22-129.000.
- Crater, Arnold: *See—*
  - Butts, Bradford F.; Crater, Arnold; Prince, Michael D.; and O'Connor, Paul F., 401,571, Cl. D14-105.000.
- Crews, Inc.: *See—*
  - Miniutti, Robert L., 401,607, Cl. D16-314.000.
- Crown Equipment Corporation: *See—*
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- Crystalex a.s.: *See—*
  - Klein, Vladimir, 401,469, Cl. D7-396.600.
- Daftary, Fereidoun. Anatomic implant. 401,694, Cl. D24-155.000.
- Daftary, Fereidoun. Abutment for anatomic implants. 401,695, Cl. D24-155.000.
- Daiwa Seiko, Inc.: *See—*
  - Kondoh, Takashi; Itoh, Yukio; and Mimura, Shigeo, 401,665, Cl. D22-141.000.
- Daniels, Juanita M. Household cleaning cart. 401,712, Cl. D34-20.000.
- Daniels, Michael, to Becton Dickinson and Company. Multistage pipet. 401,698, Cl. D24-222.000.
- Daoud, Bassel Hage: *See—*
  - Alden, Tor Andrew; Daoud, Bassel Hage; and Massaro, Kevin Luke, 401,568, Cl. D13-184.000.
- Davis, Stephen J.; and Terzaghi, André, to Prince Sports Group, Inc. Face of a tennis racquet. 401,635, Cl. D21-212.000.
- De Are, David W., to Wilton Industries, Inc. Cookie stamp. 401,482, Cl. D7-677.000.
- De Blaay, William E., to L & J. G. Stickley, Inc. Sofa. 401,430, Cl. D6-381.000.
- De Blaay, William E., to L & J. G. Stickley, Inc. Buffet and china cabinet. 401,441, Cl. D6-438.000.
- De Blaay, William E., to L & J. G. Stickley, Inc. Pedestal extension dining table. 401,454, Cl. D6-486.000.
- Delkor Corporation: *See—*
  - Kim, Sung Choong, 401,551, Cl. D13-106.000.
- Desnoyers, Charles, to Dutailier International Inc. Rocking chair. 401,425, Cl. D6-344.000.
- Dial Corporation, The: *See—*
  - Collins, Robert C., II; Ostrowski, Daniel E.; and Wolpert, Christopher J., 401,506, Cl. D9-528.000.
- DiGiglia, John W., to Dubber-Bugger Industries. Cap with visor. 401,392, Cl. D2-879.000.
- Dionisio, Louis. Container for trash or refuse. 401,721, Cl. D34-4.000.
- Display Technologies, Inc.: *See—*
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- Dolomite Svenska AB: *See—*
  - Ahlbertz, Anders Gustav, 401,541, Cl. D12-133.000.
- Domenget, Herve, to Merial. Recipient for veterinary products to treat feline parasites. 401,503, Cl. D9-345.000.
- Doolittle, Frederick G.: *See—*
  - Bolliger, James D.; Campbell, William W.; Finn, Leslie E.; Khan, M. A. Lateef; Levenson, Barry G.; and Doolittle, Frederick G., 401,504, Cl. D9-523.000.
- Dowle, Robert Douglas; and Weiss, Frank, to Thomson Marconi Sonar Pty Limited. Cable portion with hydrophone module. 401,516, Cl. D10-46.000.
- Dubber-Bugger Industries: *See—*
  - DiGiglia, John W., 401,392, Cl. D2-879.000.
- Duclos, Clovis R. Golf putter head. 401,636, Cl. D21-219.000.
- Duclos, Gary P.: *See—*
  - von Conta, Peter; and Duclos, Gary P., 401,399, Cl. D2-969.000.
- Dutailier International Inc.: *See—*
  - Desnoyers, Charles, 401,425, Cl. D6-344.000.
- Dynamic Design, Inc.: *See—*
  - Kreizel, James, 401,668, Cl. D23-212.000.
- Dziersk, Mark: *See—*
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- Eberle, John David; and Cooper, Devin Glenn, to American Allsafe Company. Safety spectacles. 401,608, Cl. D16-314.000.
- Echostar Communications Corporation: *See—*
  - Rudolph, Daniel L., 401,587, Cl. D14-218.000.
- Edu-Science (H.K.) Limited: *See—*
  - Wong, Chi-Man, 401,634, Cl. D21-110.000.
- Egly, David D., to JAC Products, Inc. Vehicle article carrier bracket. 401,548, Cl. D12-414.000.
- Eichenberg, Robert J. Frame for supporting and filling a sand bag. 401,722, Cl. D34-6.000.
- Ekco Housewares, Inc.: *See—*
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- Elmo Co., Ltd.: *See—*
  - Hasegawa, Fumio, 401,603, Cl. D16-202.000.
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  - Maguire, Justin M., Jr.; Rus, Anthony J.; Hall, George R., II; and Sapita, Robert F., 401,439, Cl. D6-426.000.
- Ennis, Jan S. Spectacle display holder. 401,450, Cl. D6-466.000.

- Farnworth, Warren M.; Wood, Alan G.; Hembree, David R.; and Akram, Salman, to Micron Technology, Inc. Temporary package for semiconductor dice. 401,567, Cl. D13-182.000.
- Fendi Profumi, S.p.A.: *See—*
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  - Bolliger, James D.; Campbell, William W.; Finn, Leslie E.; Khan, M. A. Lateef; Levenson, Barry G.; and Doolittle, Frederick G., 401,504, Cl. D9-523.000.
- Fischer, Roy. Arm for bracket assembly. 401,495, Cl. D8-349.000.
- Flanagan, Mark J., to Bausch & Lomb Incorporated. Eyewear. 401,610, Cl. D16-327.000.
- Ford, Dorothy F. Precious memories keepsake album. 401,622, Cl. D19-26.000.
- Fore, Lebby J.: *See—*
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- Fort James Corporation: *See—*
  - Schulz, Gaylyn A., 401,421, Cl. D5-53.000.
- Frankovitch, Ed, Jr.; and Wieners, Robert J., to Universal Enterprises, Inc. Digital testing instrument. 401,519, Cl. D10-78.000.
- Fushimi, Isao, to Star Micronics Co., Ltd. Electroacoustic transducer. 401,588, Cl. D14-222.000.
- Galaviz, Anthony D. Plug retention retainer. 401,676, Cl. D23-260.000.
- Galeazzi, Giuliano; Aliprandi, Roberto; Rusignuolo, Giorgio; and Vecchi, Gianluca, to Carrier Corporation. Ceiling mounted air conditioning apparatus. 401,682, Cl. D23-351.000.
- Ganzer, Charles P.: *See—*
  - Byerly, David J.; Ganzer, Charles P.; and Jenkins, Thomas C., 401,600, Cl. D15-144.200.
- Garza, Marcelo Garza Laguera. Lavatory. 401,677, Cl. D23-284.000.
- Gee, Jack W., II: *See—*
  - Pearce, Richard A.; and Gee, Jack W., II, 401,553, Cl. D13-112.000.
- Genovese, Alan A. Vending cart. 401,709, Cl. D34-13.000.
- Genovese, Alan A. Vending cart. 401,710, Cl. D34-13.000.
- Genovese, Alan A. Vending cart. 401,711, Cl. D34-13.000.
- Genovese, Cheryl M. Lapel pin. 401,528, Cl. D11-48.000.
- Genuin, Alessandro, to Genuin Golf & Dress of America, Inc. Golf shoe. 401,391, Cl. D2-906.000.
- Genuin Golf & Dress of America, Inc.: *See—*
  - Genuin, Alessandro, 401,391, Cl. D2-906.000.
- George, Richard D.: *See—*
  - Timm, Robert J.; and George, Richard D., 401,660, Cl. D22-125.000.
- Gesmondi, Michael J.; Siemon, John A.; Carlson, Robert C., Jr.; and Ott, Conrad L., to Siemon Company, The. Cable management enclosure. 401,566, Cl. D13-177.000.
- Global Upholstery Company: *See—*
  - Kaczmarek, Peter, 401,428, Cl. D6-366.000.
- Goh, King Hoe: *See—*
  - Benjamin, O'Connell Julien; Chua, Sze Lee; Chui, Chi Man; Goh, King Hoe; Tan, Lee Wah; Wheatley, Steven Mitchell; and Whitlock, Terry A., 401,579, Cl. D14-149.000.
- Goldman, Millicent F. Diet aid calculator. 401,613, Cl. D18-10.000.
- Gonda, Frank; Laubach, David Scott; Lathrop, Gregory Alan; and Kruse, Joyce Lynn, to Lever Brothers Company, Division of Conopco, Inc. Bottle. 401,507, Cl. D9-529.000.
- Goodin, John W., to Nelson, L. R. Pistol hose nozzle. 401,670, Cl. D23-226.000.
- Goto, Masaru; Maeshima, Masanobu; and Hazama, Hiroyuki, to Mita Industrial Co., Ltd. Developing unit for forming an image. 401,615, Cl. D18-40.000.
- Goto, Teiyu, to Sony Corporation. Data recorder and reader. 401,573, Cl. D14-107.000.
- Goto, Teiyu, to Sony Corporation. Transmitter. 401,580, Cl. D14-155.000.
- Gould, Neil M., to Townport Limited. Toaster. 401,472, Cl. D7-330.000.
- Gray, Robert C.; Laurusonis, Linas P.; Mittino, Matthew L.; Ramsey, Jack F.; and Yang, Tahua, to Abbott Laboraties. Container for use with an automatic analyzer. 401,700, Cl. D24-224.000.
- Greenlife, Inc.: *See—*
  - Liao, Dick, 401,485, Cl. D8-5.000.
- Greenway, Brian Martin; and Greenway, Gillian Mary. Container for use primarily as a picnic hamper. 401,478, Cl. D7-601.000.
- Greenway, Gillian Mary: *See—*
  - Greenway, Brian Martin; and Greenway, Gillian Mary, 401,478, Cl. D7-601.000.
- Gremchuck, Alan. Triangular speaker. 401,582, Cl. D14-210.000.
- Grueber, Randall A.; and Cookson, John A. Cargo roller. 401,717, Cl. D34-29.000.
- Gudefin, Jacques, to Calor S.A. Iron. 401,706, Cl. D32-70.000.
- Guttadauro, David A. Antenna cover. 401,595, Cl. D14-230.000.
- Hall, George R., II: *See—*
  - Maguire, Justin M., Jr.; Rus, Anthony J.; Hall, George R., II; and Sapita, Robert F., 401,439, Cl. D6-426.000.
- Hanagan, Ted J.: *See—*
  - Cloonan, Kevin M.; Hanagan, Ted J.; Kimler, Kirk M.; and Safar, Scott G., 401,697, Cl. D24-224.000.
- Hardison, Stewart. Support for lawn and garden ornaments. 401,484, Cl. D8-1.000.
- Harmon, Thomas Henry. Troll pod—offshore troller. 401,662, Cl. D22-134.000.
- Harolde, Richard: *See—*
  - Knight, Michael; and Harolde, Richard, 401,388, Cl. D2-638.000.
- Hartmann, Jerome J.; and Steinhagen, Thomas R., to Cobbs Manufacturing Company. Retractable detail brush with cap. 401,419, Cl. D4-135.000.
- Hasegawa, Fumio, to Elmo Co., Ltd. TV camera. 401,603, Cl. D16-202.000.
- Hazama, Hiroyuki: *See—*
  - Goto, Masaru; Maeshima, Masanobu; and Hazama, Hiroyuki, 401,615, Cl. D18-40.000.
- Hazen, Larry D.; and Huffstetler, Gary A., to Broyhill Furnitures Industries, Inc. Magna chest. 401,446, Cl. D6-446.000.
- Hazen, Larry D.; and Huffstetler, Gary A., to Broyhill Furniture Industries, Inc. Night stand. 401,447, Cl. D6-446.000.
- Hazen, Larry D.; and Huffstetler, Gary A., to Broyhill Furniture Industries, Inc. Door dresser. 401,448, Cl. D6-446.000.
- Hazen, Larry D.; and Huffstetler, Gary A., to Broyhill Furniture Industries, Inc. Drawer chest. 401,449, Cl. D6-446.000.
- Hee, Heng Kah: *See—*
  - Swinford, Karen; Hee, Heng Kah; Man, Chau Pok; Mui, Lee Suet; and Ming, Fung Ka, 401,473, Cl. D7-395.000.
- Hembree, David R.: *See—*
  - Farnworth, Warren M.; Wood, Alan G.; Hembree, David R.; and Akram, Salman, 401,567, Cl. D13-182.000.
- Henrie, Richard D.: *See—*
  - Weideman, James R.; and Henrie, Richard D., 401,727, Cl. D34-25.000.
- Henriksson, Bengt-Åke; and Carlsson, Lars-Olof, to Berkley Inc. Fishing reel foot. 401,663, Cl. D22-141.000.
- Henriksson, Bengt-Åke; and Carlsson, Lars-Olof, to Berkley Inc. Fishing reel frame. 401,664, Cl. D22-141.000.
- Henry, Eric Francis; and Rushing, Tatsuo, to Procter & Gamble Company, The. Bulk bin assembly. 401,476, Cl. D7-589.000.
- Henshaw, Robert J.; and Palermo, Philip D., to Crown Equipment Corporation. Steering tiller for a materials handling vehicle. 401,718, Cl. D34-35.000.
- Herchenbach, Steve; Laurusonis, Linas P.; McGowan, Michael W.; and Safar, Scott G., to Abbott Laboratories. Container for use with an automatic analyzer. 401,699, Cl. D24-224.000.
- Herndon, Albert Dale. Denim boot upper with side pocket an button fly. 401,394, Cl. D2-910.000.
- Higashihara, Seiji; and Nagano, Katsuyuki, to Honda Giken Kogyo Kabushiki Kaisha. Motor-assisted bicycle. 401,534, Cl. D12-110.000.
- Hirsch, Robert D.: *See—*
  - Best, Christopher Brian; Rodgers, Philamon W.; and Hirsch, Robert D., 401,637, Cl. D21-220.000.
- Hoggard, Tanya J. Coaster. 401,480, Cl. D7-624.000.
- Holt, Sanford L., to Shelby Williams Industries, Inc. Chair back. 401,453, Cl. D6-502.000.
- Honda Giken Kogyo Kabushiki Kaisha: *See—*
  - Higashihara, Seiji; and Nagano, Katsuyuki, 401,534, Cl. D12-110.000.
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- Hong-Yi Wooden Article Co., Ltd.: *See—*
  - Lin, Jui-Lin, 401,444, Cl. D6-446.000.
- Hörmann, Michael, to Marantec Antriebs-und Steuerungstechnik GmbH & Co. Produktions KG. Electronic barrier and photo-electric sensor eye. 401,524, Cl. D10-113.000.
- Horng, Alex, to Sunonwealth Electric Machine Industry Co., Ltd. Heat dissipitation fan. 401,686, Cl. D23-370.000.
- Horvath, Michael W.: *See—*
  - Knoll, John L.; Barnes, Neal P.; Van Valkenburg, Terry L.; and Horvath, Michael W., 401,468, Cl. D7-323.000.
- Hsia, Ben M. Golf accessory stand. 401,458, Cl. D6-552.000.
- Hsiao, Louis: *See—*
  - Hu, Antonio; and Hsiao, Louis, 401,426, Cl. D6-349.000.
- Hu, Antonio; and Hsiao, Louis, to Concept Designs Inc. Skate and footwear fitting station. 401,426, Cl. D6-349.000.
- Huffstetler, Gary A.: *See—*
  - Hazen, Larry D.; and Huffstetler, Gary A., 401,446, Cl. D6-446.000.
  - Hazen, Larry D.; and Huffstetler, Gary A., 401,447, Cl. D6-446.000.
  - Hazen, Larry D.; and Huffstetler, Gary A., 401,448, Cl. D6-446.000.
  - Hazen, Larry D.; and Huffstetler, Gary A., 401,449, Cl. D6-446.000.
- Humphries, Robert H., Jr.; and Patterson, Thomas C., to Cannondale Corporation. Crankarm for a bicycle. 401,539, Cl. D12-123.000.
- Hunter Fan Company: *See—*
  - Pearce, Richard A.; and Gee, Jack W., II, 401,553, Cl. D13-112.000.
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442	5,840,112
487	5,840,113
802	5,840,114

CLASS 108

140	5,839,373

CLASS 110

162	5,839,374
235	5,839,375
270	5,839,376

CLASS 111

185	5,839,378

CLASS 112

10	5,839,379
102.5	5,839,380
221	5,839,381
470.04	5,839,382

CLASS 114

67 A	5,839,384
72	5,839,383
102	5,839,385
121	5,839,386
218	RE. 35,965
230	5,839,387
361	5,839,388

CLASS 117

18	5,840,115
20	5,840,116
62	5,840,117
103	5,840,118
208	5,840,120

CLASS 118

13	5,840,119
	5,840,121
505	5,840,122
603	5,840,123
726	5,840,124
730	5,840,125

CLASS 119

53	5,839,389
174	5,839,390
212	5,839,391
498	5,839,392
712	5,839,393
795	5,839,394
850	5,839,395

CLASS 122

406.5	5,839,396

CLASS 123

41.01	5,839,397
41.33	5,839,398
80 BB	5,839,399
90.16	5,839,400
90.31	5,839,401
90.51	5,839,402
169 R	5,839,403
184.34	5,839,404
184.57	5,839,405
192.2	5,839,406
193.6	5,839,407
322	5,839,453
323	5,839,408
326	5,839,409
339.12	5,839,410
398	5,839,419
446	5,839,411
	5,839,412
447	5,839,413
467	5,839,414
478	5,839,420
491	5,839,415
559.2	5,839,416
568	5,839,417
585	5,839,418
698	5,839,421

CLASS 124

53.5	5,839,422

CLASS 125

15	5,839,423
16.02	5,839,424
	5,839,425

CLASS 126

39 N	5,839,426
512	5,839,427
	5,839,428

CLASS 128

200.14	5,839,429
	5,839,430
201.25	5,839,432
204 21	5,839,433
204.23	5,839,434
205 12	5,839,435
205.24	5,839,436
207.17	5,839,437
630	5,839,438
633	5,839,439
654	5,839,440
660.04	5,839,441
661.01	5,839,442
859	5,839,444
876	B1 396,906
898	5,839,443
	5,839,445
	5,839,446

CLASS 131

331	5,839,447
	5,839,448
342	5,839,449

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CLASS 132

252	5,839,450
271	5,839,451
275	5,839,452

CLASS 134

1	5,840,126
2	5,840,127
	5,840,129
8	5,840,128
22.15	5,840,130
57 D	5,839,454
57 R	5,839,455
104.1	5,839,456
110	5,839,457
113	5,839,458
138	5,839,459
147	5,839,460

CLASS 135

72	5,839,461
128	5,839,462

CLASS 136

203	5,841,064

CLASS 137

1	5,839,463
218	5,839,464
413	5,839,465
414	5,839,466
454.4	5,839,468
501	5,839,467
550	5,839,469
599	5,839,470
625.18	5,839,471
856	5,839,472
888	5,839,473
889	5,839,474

CLASS 138

98	5,839,475
120	5,839,476
121	5,839,477
141	5,839,478

CLASS 139

383 A	5,839,479
383 AA	RE. 35,966
452	5,839,480
455	5,839,481
456	5,839,482

CLASS 141

1	5,839,483
65	5,839,484
129	5,839,485
177	5,839,486
326	5,839,487
347	5,839,488
382	5,839,489

CLASS 144

208.9	5,839,490

CLASS 148

111	RE. 35,967
122	5,840,131
280	5,840,132
301	5,840,133
302	5,840,134
405	5,840,135
664	5,840,136

CLASS 149

37	5,841,065
246	5,839,229

CLASS 152

157	5,840,274
209 R	5,840,137
524	5,840,138

CLASS 156

79	5,840,139
89.28	5,840,140
153	5,840,141
237	5,840,142
256	5,840,143
267	5,840,144
272.2	5,840,147
272.4	5,840,145
	5,840,146
275.5	5,840,148
285	5,840,149
324	5,840,150
380.2	5,840,151
498	5,840,152
542	5,840,153
580.2	5,840,154
584	5,840,155

CLASS 160

22	5,839,491
107	5,839,492
133	5,839,493
167 R	5,839,494

CLASS 162

4	5,840,156
5	5,840,157
164.3	5,840,158

CLASS 164

95	5,839,495
97	5,839,496
113	5,839,497
137	5,839,498
244	5,839,499
414	5,839,500
428	5,839,501
476	5,839,502
484	5,839,503
516	5,839,504

CLASS 165

109.1	5,839,505
203	5,839,506
263	5,839,507

CLASS 166

65 1	5,839,508
264	5,839,509
276	5,839,510
312	5,839,511
348	5,839,512
370	5,839,513
384	5,839,514
387	5,839,515

CLASS 172

456	5,839,516

CLASS 173

162.2	5,839,517
176	5,839,518

CLASS 174

2	5,841,066
35 MS	5,841,067
58	5,841,068
69	5,841,069
72 A	5,841,070
94 R	5,841,071
110 F	5,841,072
113 R	5,841,073
250	5,841,074
	5,841,075

CLASS 175

57	5,839,519
61	5,839,520
66	5,839,521
209	5,839,522
228	5,839,523
320	5,839,524
375	5,839,525
431	5,839,526

CLASS 177

25.13	5,841,076
210 R	5,841,077

CLASS 178

18.06	5,841,078

CLASS 180

16	5,839,528
24.01	5,839,527
65.1	5,839,529
65.4	5,839,530
69 1	5,839,531
164	5,839,532
165	5,839,533
169	5,839,534
197	5,839,535
227	5,839,536
443	5,839,537

CLASS 181

214	5,841,079
225	5,841,080
286	5,841,081

CLASS 182

20	5,839,538
150	5,839,539
153	5,839,540
192	5,839,541

CLASS 187

222	5,839,542
316	5,841,082
	5,841,083
324	5,839,543
382	5,841,084

CLASS 188

1.11 L	5,839,545
24.9	5,839,544
69	5,839,546
73.31	5,839,547
82.1	5,839,548
243	5,839,549
250 D	5,839,550
321.11	5,839,552
322.17	5,839,551

CLASS 190

109	5,839,553

CLASS 191

10	5,839,554

CLASS 192

8 R	5,839,555
48.91	5,839,556
56.32	5,839,557
58.62	5,839,558
70.25	5,839,559
70.27	5,839,560
90	5,839,561
143	5,839,562

CLASS 194

328	5,839,563

CLASS 198

303	5,839,564
364	5,839,565
370.04	5,839,566
683	5,839,567
750.5	5,839,568
817	5,839,569
831	5,839,570
844.2	5,839,571

CLASS 200

16 R	5,841,085
61.89	5,841,086

CLASS 203

10	5,840,159
57	5,840,160

CLASS 204

192.14	5,840,161
192.38	5,840,163
196	5,840,164
198	5,840,165
293	5,840,166
298.05	5,840,167
416	5,840,168
462	5,840,169

CLASS 205

101	5,840,170
335	5,840,171
639	5,840,172
705	5,840,173
763	5,840,174

CLASS 206

204	5,839,572
216	5,839,574
221	5,839,573
232	5,839,575
308.1	5,839,576
315.1	5,839,577
362.2	5,839,578
378	5,839,579
379	5,839,580
459.1	5,839,581
524.8	5,839,582
577	5,839,590
704	5,839,583

CLASS 208

87	5,840,175
152	5,840,176
208 R	5,840,177
251 R	5,840,178

CLASS 209

166	5,840,179

CLASS 210

162	5,840,180
198.2	5,840,181
202	5,840,182
221.2	5,840,183
222	5,840,184
232	5,840,185
321.79	5,840,186
400	5,840,187
448	5,840,188
474	5,840,189
500.24	5,840,190
601	5,840,191
638	5,840,192
	5,840,193
710	5,840,194
713	5,840,195
748	5,840,196
780	5,840,197
802	5,840,198

CLASS 211

41.17	5,839,584
49.1	5,839,585
59.2	5,839,587
59.3	5,839,588
70.6	5,839,589
163	5,839,586

CLASS 215

230	5,839,592
349	5,839,593

CLASS 216

2	5,840,199
6	5,840,200
24	5,840,201
52	5,840,202
66	5,840,203
95	5,840,204
109	5,840,205
188	5,839,776

CLASS 218

45	5,841,087
158	5,841,088

CLASS 219

60 A	5,841,089
64	5,841,090
69.12	5,841,091
69.17	5,841,093
81	5,841,094
121.48	5,841,095
121.62	5,841,096
121 63	5,841,097
	5,841,098
121.69	5,841,099
	5,841,100
121.71	5,841,101
	5,841,102
125.1	5,841,104
137.31	5,841,105
202	5,841,106
243	5,841,107
441	5,841,108
464	5,841,109
497	5,841,110
504	5,841,111
506	5,841,112
739	5,841,113
761	5,841,114

CLASS 220

3.7	5,839,594
4.21	5,839,595
256	5,839,596
264	5,839,597
321	5,839,598
410	5,839,599
560.04	5,839,600
712	5,839,601
737	5,839,602
782	5,839,603
789	5,839,604

CLASS 221

59	5,839,605
212	5,839,606
231	5,839,607

CLASS 222

1	5,839,608
107	5,839,609
129.3	5,839,610
153.14	5,839,611
185	5,839,614
321.8	5,839,616
321.9	5,839,617
333	5,839,612
361	5,839,618
368	5,839,619
382	5,839,620
383.1	5,839,621
390	5,839,622
402.1	5,839,623
402.19	5,839,624
464.1	5,839,625
494	5,839,626
541.9	5,839,627
594	5,840,206

CLASS 223

37	5,839,628
85	5,839,629

CLASS 224

197	5,839,630
251	5,839,631
321	5,839,615
414	5,839,632
675	5,839,633

CLASS 225

39	5,839,634
96.5	5,839,635

CLASS 226

4	5,839,636
128	5,839,637
176	5,839,613

CLASS 227

8	5,839,638
175.1	5,839,639

CLASS 228

4.5	5,839,640
41	5,839,641
	5,839,642
119	5,839,643
168	5,839,644
180.22	5,839,645
183	5,839,646
212	5,839,647

CLASS 229

87.05	5,839,648
114	5,839,649
120.11	5,839,650
125.32	5,839,651
240	5,839,652
403	5,839,653

CLASS 235

375	5,841,115
	5,841,116
	5,841,117
379	5,841,118
380	5,841,119
382	5,841,120
472	5,841,121
492	5,841,122
	5,841,123

CLASS 236

47	5,839,654

CLASS 237

8 A	5,839,655
12.3 B	5,839,656

CLASS 238

10 E	5,839,657

CLASS 239

1	5,839,658
	5,839,659
63	5,839,660
88	5,839,661
208	5,839,662
265.35	5,839,663
271	5,839,664
310	5,839,665
439	5,839,666
498	5,839,667
690	5,839,668
704	5,839,669

CLASS 241

5	5,839,670
24.1	5,839,671
30	5,839,672
48	5,839,673
73	5,839,674
100	5,839,675
101.76	5,839,676
291	5,839,677

CLASS 242

18 R	5,839,678
21	5,839,679
160.1	5,839,680
231	5,839,681
314	5,839,682
334.2	5,839,683
361	5,839,684
366	5,839,685
374	5,839,686
404.3	5,839,687
523.1	5,839,688
542	5,839,689

CLASS 244

6	5,839,690
7 R	5,839,691
102 SL	5,839,692
114 R	5,839,693
118 1	5,839,694
145	5,839,695
159	5,839,696
195	5,839,697
214	5,839,699
217	5,839,698
219	5,839,700

CLASS 248

49	5,839,702
65	5,839,703
165	5,839,705
178.1	5,839,704
188	5,839,706
214	5,839,707
309.1	5,839,708
311.2	5,839,709
	5,839,710
313	5,839,711
316.2	5,839,712
346.01	5,839,713
519	5,839,714

CLASS 250

201.3	5,841,124
201.9	5,841,125
208.1	5,841,126
	5,841,127
	5,841,128
216	5,841,129
227.14	5,841,130
227.17	5,841,131
231.13	5,841,132
	5,841,133
237 G	5,841,134
269.3	5,841,135
288	5,841,136
338.5	5,841,137
339.12	5,841,139
341.1	5,841,138
363.03	5,841,140
363.04	5,841,141
395	5,841,142
458.1	5,841,143
491.1	5,841,144
492.22	5,841,145
493.1	5,841,146
507.1	5,841,147
559.29	5,841,149
584	5,841,148

CLASS 251

149.1	5,839,715
149.6	5,839,716
305	5,839,717

CLASS 252

70	5,840,207
299.63	5,840,208
299.67	5,840,209
301.4 F	5,839,718
307	5,840,210
312	5,840,211
350	5,840,212
399	5,840,213
500	5,840,214
	5,840,215
514	5,840,216
521.5	5,840,218
583	5,840,217

CLASS 257

3	5,841,150
14	5,841,151
	5,841,152
69	5,841,153
99	5,841,154
138	5,841,155
183	5,841,156
202	5,841,157
233	5,841,158
291	5,841,159
295	5,841,160
315	5,841,161
	5,841,162
316	5,841,163
	5,841,164
318	5,841,165
335	5,841,166
341	5,841,167
344	5,841,168
345	5,841,170
347	5,841,171
355	5,841,169
	5,841,172
384	5,841,173
392	5,841,174
	5,841,175
431	5,841,177
433	5,841,178
437	5,841,179
446	5,841,176
448	5,841,180
487	5,841,181

532	5,841,182
536	5,841,183
580	5,841,184
630	5,841,185
635	5,841,186
666	5,841,187
668	5,841,188
678	5,841,189
	5,841,190
691	5,841,191
701	5,841,192
723	5,841,193
729	5,841,194
774	5,841,195
	5,841,196
777	5,841,197
780	5,841,198
903	5,841,199

CLASS 264

0.5	5,841,200
2.7	5,840,219
15	5,840,220
29.7	5,840,221
39	5,840,222
40.1	5,840,223
46.4	5,840,224
46.6	5,840,225
71	5,840,226
112	5,840,227
132	5,840,228
142	5,840,229
145	5,840,230
154	5,840,231
171.26	5,840,232
176.1	5,840,233
205	5,840,234
288.8	5,840,235
302	5,840,236
326	5,840,237
331.17	5,840,238
401	5,840,239
425	5,840,240
437	5,840,241
470	5,840,242
509	5,840,243
565	5,840,244

CLASS 267

64.12	5,839,719
140.14	5,839,720

CLASS 269

57	5,839,721

CLASS 271

265.02	5,839,722

CLASS 273

109	5,839,723
127 R	5,839,724
244	5,839,725
246	5,839,726
271	5,839,727
274	5,839,728
276	5,839,729
292	RE. 35,968
	5,839,730
	5,839,731
	5,839,732
400	5,839,733

CLASS 280

7.13	5,839,734
11.115	5,839,737
11 22	5,839,735
	5,839,736
30	5,839,738
47.35	5,839,739
87.021	5,839,740
124 106	5,839,741
124 134	5,839,742
154	5,839,743
416.4	5,839,744
434	5,839,745
605	5,839,746
611	5,839,747
648	5,839,748
661	5,839,749
683	5,839,750
728.2	5,839,751
728.3	5,839,752
733	5,839,753
736	5,839,754
739	5,839,755
743.1	5,839,756
749	5,839,757
756	5,839,758
762	5,839,759
768	5,839,760
851	5,839,761

CLASS 281

38	5,839,762

CLASS 283

109	5,839,763

CLASS 285

276	5,839,764
334 2	5,839,765

CLASS 290

40 C	5,841,201

CLASS 292

144	5,839,766
336.3	5,839,767

CLASS 294

74	5,839,768
87.1	5,839,769
88	5,839,770
146	5,839,771

CLASS 296

32	5,839,772
65.09	5,839,773
91	5,839,774
183	5,839,775
205	5,839,777
224	5,839,778

CLASS 297

135	5,839,780
258.1	5,839,781
337	5,839,782
380	5,839,783
383	5,839,784
411.2	5,839,785
411.35	5,839,786
452.2	5,839,787
452.41	5,839,788
476	5,839,789
478	5,839,790
483	5,839,792
484	5,839,793

CLASS 300

7	5,839,794

CLASS 301

5.1	5,839,795
37.31	5,839,796

CLASS 303

36	RE. 35,969
146	5,839,798
	5,839,799
152	5,839,800
191	5,839,801

CLASS 305

52	5,839,802

CLASS 307

10.1	5,841,202
10 8	5,841,203
117	5,841,204
130	5,841,205
147	5,841,206

CLASS 310

12	5,841,207
67 R	5,841,208
89	5,841,209
90	5,841,210
	5,841,211
156	5,841,212
313 D	5,841,214
316	5,841,215
328	5,841,216
348	5,841,217

CLASS 312

107.5	5,839,803
223 2	5,839,804
257.1	5,839,806

CLASS 313

46	5,841,218
293	5,841,219
326	5,841,221
345	5,841,222
412	5,841,224
440	5,841,225
	5,841,226
479	5,841,227
481	5,841,228
490	5,841,229
506	5,841,230
532	5,841,231
565	5,841,220
585	5,841,232

CLASS 315

39	5,841,233
85	5,841,234
111.21	5,841,235
111 41	5,841,236
111.81	5,841,237
119	5,841,238
219	5,841,239
	5,841,240
244	5,841,241
248	5,841,242
	5,841,243
	5,841,244
289	5,841,245
307	5,841,246
370	5,841,247
371	5,841,248

CLASS 318

10	5,841,249
135	5,841,250
254	5,841,252
280	5,841,253
430	5,841,254
490	5,841,255
562	5,841,256
568.11	5,841,257
568 12	5,841,258
587	5,841,259
638	5,841,260
696	5,841,261
701	5,841,262
727	5,841,264
807	5,841,263

CLASS 320

134	5,841,265

CLASS 322

8	5,841,266

CLASS 323

215	5,841,267
222	5,841,268
276	5,841,269
314	5,841,270
316	5,841,271

CLASS 324

117 H	5,841,272
207.17	5,841,273
	5,841,274
207.21	5,841,276
240	5,841,277
267.21	5,841,275
318	5,841,278
	5,841,279
323	5,841,280
339	5,841,281
347	5,841,282
399	5,841,283
428	5,841,284
435	5,841,285
511	5,841,286
537	5,841,287
639	5,841,288
	5,841,289
714	5,841,290
755	5,841,291
761	5,841,292
765	5,841,293
	5,841,294

CLASS 326

39	5,841,295
49	5,841,296
83	5,841,297
97	5,841,298
98	5,841,299
	5,841,300

CLASS 327

100	5,841,301
117	5,841,302
156	5,841,303
161	5,841,304
175	5,841,305
228	5,841,306
265	5,841,307
307	5,841,308
333	5,841,309
337	5,841,310
361	5,841,311
378	5,841,312
393	5,841,313
536	5,841,314
552	5,841,315
560	5,841,316
563	5,841,317

CLASS 330

9	5,841,318
129	5,841,319
133	5,841,320
255	5,841,321

CLASS 331

1 R	5,841,322
11	5,841,323
17	5,841,324
57	5,841,325
117 R	5,841,326

CLASS 333

101	5,841,327
116	5,841,328
175	5,841,329
202	5,841,330
	5,841,331
207	5,841,332
238	5,841,333

CLASS 334

55	5,841,334

CLASS 336

170	5,841,335
212	5,841,336

CLASS 337

198	5,841,337
293	5,841,338

CLASS 338

51	5,841,340
321	5,841,341
325	5,841,342

CLASS 340

390.1	5,841,343
426	5,841,344
440	5,841,345
540	5,841,346
542	5,841,347
551	5,841,348
572	5,841,349
	5,841,350
	5,841,351
573	5,841,352
575	5,841,354
635	5,841,355
	5,841,356
636	5,841,357
648	5,841,358
688	5,841,359
689	5,841,353
825.03	5,841,362
825 07	5,841,360
825.31	5,841,361
	5,841,363
825.35	5,841,365
825.54	5,841,364
901	5,841,366
903	5,841,367
932.2	5,841,368
975	5,841,370

CLASS 341

13	5,841,371
20	5,841,372
21	5,841,373
34	5,841,374
50	5,841,375
51	5,841,376
	5,841,377
61	5,841,378
63	5,841,379
67	5,841,380
	5,841,381
120	5,841,382
122	5,841,383
138	5,841,384
139	5,841,385
143	5,841,386
155	5,841,387
	5,841,388
159	5,841,389
173	5,841,390

CLASS 342

34	5,841,391
125	5,841,392
165	5,841,393
174	5,841,394
196	5,841,395
357	5,841,396
	5,841,398
	5,841,399
359	5,841,397
382	5,841,400

CLASS 343

700 MS	5,841,401
702	5,841,402
	5,841,403
786	5,841,404
795	5,841,405
815	5,841,406
895	5,841,407

CLASS 345

3	5,841,418
7	5,841,408
8	5,841,409
58	5,841,410
	5,841,411
	5,841,412
63	5,841,413
87	5,841,414
90	5,841,415
94	5,841,416
96	5,841,417
97	5,841,419
118	5,841,420
150	5,841,421
154	5,841,422
163	5,841,425
	5,841,426
168	5,841,423
	5,841,424
173	5,841,427
184	5,841,428
192	5,841,429
211	5,841,431
213	5,841,430
302	5,841,432
327	5,841,433
335	5,841,434
339	5,841,435
342	5,841,436
346	5,841,437
348	5,841,438
418	5,841,439
419	5,841,440
430	5,841,441
	5,841,442
	5,841,443
501	5,842,004
506	5,841,444
508	5,841,445
516	5,841,446
523	5,841,447

CLASS 347

19	5,841,448
32	5,841,450
41	5,841,451
47	5,841,452
55	5,841,449
86	5,841,453
87	5,841,454
	5,841,455
103	5,841,456
120	5,841,457
131	5,841,458
176	5,841,459
	5,841,460
195	5,841,461
213	5,841,462
242	5,841,463
253	5,841,464
258	5,841,465

CLASS 348

5.5	5,841,466
6	5,841,467
	5,841,468
15	5,841,469
65	5,841,491
181	5,841,251
231	5,841,471
390	5,841,472
	5,841,473
397	5,841,470
402	5,841,474
409	5,841,475
416	5,841,476
420	5,841,477
426	5,841,478
432	5,841,479
459	5,841,480
500	5,841,481
537	5,841,482
565	5,841,483
607	5,841,484
663	5,841,485
673	5,841,486
674	5,841,487
694	5,841,488

CLASS 349

17	5,841,489
40	5,841,490
74	5,841,492
86	5,841,493
98	5,841,494
113	5,841,496
128	5,841,497
141	5,841,498
	5,841,499
	5,841,500
150	5,841,501
158	5,841,503
172	5,841,504

CLASS 351

44	5,841,505
47	5,841,506
49	5,841,507
113	5,841,508
209	5,841,502
212	5,841,511
218	5,841,510
221	5,841,509

CLASS 352

27	5,841,513
56	5,841,512
184	5,841,514

CLASS 353

38	5,839,807
97	5,839,808

CLASS 355

27	5,841,515
30	5,841,516
40	5,841,517
	5,841,518
	5,841,519
53	5,841,520
67	5,841,521

CLASS 356

5.1	5,841,522
72	5,841,523
73	5,841,524
124 5	5,841,525
139 1	5,841,527
237	5,841,528
	5,841,530
316	5,841,531
318	5,841,532
326	5,841,533
336	5,841,534
345	5,841,529
	5,841,535
346	5,841,536
350	5,841,537
369	5,841,538
376	5,841,539
381	5,841,540
383	5,841,541
384	5,841,542
394	5,841,543
399	5,841,544
436	5,841,545
445	5,841,546

CLASS 358

296	5,841,547
	5,841,548
	5,841,549
402	5,841,550
426	5,841,551
447	5,841,552
494	5,841,553
514	5,841,554

CLASS 359

2	5,841,555
117	5,841,556
122	5,841,557
124	5,841,558
138	5,841,560
152	5,841,562
158	5,841,563
161	5,841,564
189	5,841,565
204	5,841,566
212	5,841,567
245	5,841,568
291	5,841,569
330	5,841,570
341	5,841,571
	5,841,573
351	5,841,574
365	5,841,575
383	5,841,576
386	5,841,577
434	5,841,578
456	5,841,572
489	5,841,581
572	5,841,579
577	5,841,583
586	5,841,584
616	5,841,585
654	5,841,586
662	5,841,587
683	5,841,588
688	5,841,582
726	5,841,589

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763	5,841,590
819	5,841,591
	5,841,592
823	5,841,593
841	5,841,594
847	5,841,595
859	5,841,596

CLASS 360

15	5,841,597
31	5,841,598
39	5,841,599
48	5,841,600
	5,841,601
51	5,841,602
68	5,841,603
73.03	5,841,604
97.01	5,841,605
99.01	5,841,606
99.08	5,841,607
103	5,841,608
104	5,841,609
106	5,841,610
113	5,841,611
114	5,841,612
128	5,841,613

CLASS 361

14	5,841,614
42	5,841,615
102	5,841,616
106	5,841,617
110	5,841,618
111	5,841,619
119	5,841,620
185	5,841,621
232	5,841,622
234	5,841,623
	5,841,624
321.4	5,841,625
321.5	5,841,626
502	5,841,627
600	5,841,628
603	5,841,629
683	5,841,630
684	5,841,631
686	5,841,632
695	5,841,633
699	5,841,634
749	5,841,635
752	5,841,636
753	5,841,637
790	5,841,638
796	5,841,639
820	5,841,640

CLASS 362

23	5,839,809
29	5,839,810
30	5,839,811
31	5,839,812
32	5,839,813
78	5,839,814
80	5,839,815
153.1	5,839,816
192	5,839,817
226	5,839,818
252	5,839,819
	5,839,820
253	5,839,821
264	5,839,822
327	5,839,823

CLASS 363

21	5,841,641
	5,841,642
	5,841,643
37	5,841,644
43	5,841,645
56	5,841,646
	5,841,647
59	5,841,648
98	5,841,649
131	5,841,650

CLASS 364

148	5,841,651
164	5,841,652
167.02	5,841,653
188	5,841,654
	5,841,655
191	5,841,656
464.16	5,841,658
468	5,841,659
468.1	5,841,657
468.22	5,841,660
468.28	5,841,661
471.01	5,841,671
474.37	5,841,662
488	5,841,672
489	5,841,673
	5,841,674
490	5,841,663
	5,841,664
507	5,841,675
551.01	5,841,666
	5,841,667
	5,841,668
552	5,841,676
554	5,841,669
569	5,841,677
578	5,841,670
	5,841,678
715.06	5,841,679
717.03	5,841,680
724.011	5,841,681
725.03	5,841,682
748.03	5,841,683
757	5,841,684
807	5,841,685

CLASS 365

51	5,841,686
63	5,841,687
	5,841,688
145	5,841,689
149	5,841,690
	5,841,691
173	5,841,692
185.01	5,841,693
185.05	5,841,694
185.08	5,841,695
185.11	5,841,696
185.14	5,841,697
185.18	5,841,700
185.21	5,841,698
185.28	5,841,701
185.33	5,841,699
189.05	5,841,702
189.09	5,841,703
	5,841,704
	5,841,705
189.11	5,841,706
194	5,841,580
	5,841,707
200	5,841,708
	5,841,709
	5,841,710
	5,841,711
	5,841,712
201	5,841,713
	5,841,714
203	5,841,715
	5,841,716
205	5,841,717
208	5,841,718
210	5,841,719
	5,841,720
218	5,841,721
221	5,841,722
225.7	5,841,723
226	5,841,724
	5,841,725
230.03	5,841,726
	5,841,727
230.06	5,841,728
230.08	5,841,729
233	5,841,730
	5,841,731
	5,841,732

CLASS 366

59	5,839,824
247	5,839,825
315	5,839,826
325.94	5,839,827
340	5,839,828

CLASS 367

15	5,841,733
35	5,841,734
124	5,841,735
140	5,841,736
147	5,841,737

CLASS 368

205	5,841,738

CLASS 369

32	5,841,739
	5,841,740
33	5,841,741
	5,841,742
34	5,841,743
36	5,841,744
44.23	5,841,745
44.35	5,841,746
54	5,841,747
58	5,841,748
59	5,841,749
	5,841,750
	5,841,751
75.2	5,841,752
94	5,841,753
109	5,841,754
118	5,841,755
192	5,841,756
275.3	5,841,757

CLASS 370

221	5,841,759
238	5,841,758
242	5,841,760
248	5,841,761
252	5,841,762
260	5,841,763
310	5,841,764
319	5,841,765
321	5,841,766
329	5,841,767
335	5,841,768
338	5,841,769
346	5,841,770
360	5,841,771
395	5,841,772
	5,841,773
399	5,841,774
422	5,841,775
441	5,841,776
443	5,841,777
447	5,841,778
514	5,841,779
524	5,841,780

CLASS 371

2.1	5,841,781
5.1	5,841,782
	5,841,783
21.1	5,841,784
	5,841,785
	5,841,786
	5,841,787
22.1	5,841,789
	5,841,790
22.3	5,841,788
	5,841,791
22.5	5,841,792
37.01	5,841,793
37.4	5,841,794
40.13	5,841,795
43.6	5,841,796

CLASS 372

6	5,841,797
11	5,841,798
19	5,841,799
22	5,841,800
23	5,841,801
45	5,841,802
59	5,841,804
69	5,841,805

CLASS 374

121	5,839,829
161	5,839,830

CLASS 375

206	5,841,806
	5,841,807
208	5,841,808
232	5,841,810
233	5,841,809
235	5,841,811
279	5,841,813
321	5,841,814
326	5,841,815
331	5,841,816
340	5,841,817
341	5,841,812
	5,841,818
	5,841,819
345	5,841,820
350	5,841,821
	5,841,822
373	5,841,823

CLASS 376

258	5,841,824
272	5,841,825
316	5,841,826

CLASS 377

20	5,841,827

CLASS 378

4	5,841,828
	5,841,829
15	5,841,830
19	5,841,831
56	5,841,832
98.9	5,841,833
156	5,841,834
207	5,841,835

CLASS 379

29	5,841,836
57	5,841,837
67	5,841,838
88	5,841,839
93.01	5,841,840
93.08	5,841,841
93.32	5,841,842
100.09	5,841,843
100.14	5,841,844
106.01	5,841,845
106.02	5,841,846
114	5,841,847
128	5,841,848
142	5,841,849
	5,841,850
156	5,841,851
201	5,841,852
215	5,841,853
265	5,841,854
387	5,841,855
406	5,841,856
428	5,841,857
430	5,841,858
433	5,841,859

CLASS 380

4	5,841,861
9	5,841,862
11	5,841,863
21	5,841,864
	5,841,865
23	5,841,866
25	5,841,867
	5,841,868
	5,841,869
	5,841,870
	5,841,871
28	5,841,872
49	5,841,873
50	5,841,874

CLASS 381

61	5,841,875
71.14	5,841,876
86	5,841,877
124	5,841,878
309	5,841,879
401	5,841,880

CLASS 382

101	5,841,881
109	5,841,882
110	5,841,883
	5,841,884
112	5,841,885
115	5,841,886
118	5,841,887
124	5,841,888
128	5,841,889
131	5,841,890
	5,841,891
141	5,841,892
145	5,841,893
154	5,841,894
155	5,841,895
162	5,841,896
163	5,841,897
164	5,841,898
168	5,841,899
176	5,841,900
187	5,841,901
	5,841,902
203	5,841,903
	5,841,905
	5,841,906
210	5,841,907
233	5,841,904
243	5,841,909
254	5,841,911
258	5,841,910

CLASS 383

65	5,839,831
101	5,839,832

CLASS 384

107	5,839,833
484	5,839,834
497	5,839,835

CLASS 385

7	5,841,912
	5,841,913
12	5,841,914
13	5,841,915
16	5,841,916
17	5,841,917
24	5,841,918
37	5,841,919
	5,841,920
46	5,841,921
76	5,841,922
93	5,841,923
	5,841,924
123	5,841,926
129	5,841,927
	5,841,928
	5,841,929
131	5,841,930
	5,841,931
134	5,841,932
142	5,841,933

CLASS 386

2	5,841,934
33	5,841,935
	5,841,936
40	5,841,937
68	5,841,938
	5,841,939
92	5,841,940
95	5,841,941
109	5,841,942

CLASS 392

385	5,841,943
418	5,841,944

CLASS 395

2.21	5,841,945
10	5,841,946
13	5,841,947
61	5,841,948
77	5,841,949
99	5,841,950
105	5,841,952
108	5,841,954
109	5,841,951
	5,841,955
	5,841,956
113.21	5,841,964
114	5,841,953
140	5,841,958
	5,841,959
182.03	5,841,961
182.04	5,841,962
182.06	5,841,957
182.09	5,841,963
183.06	5,841,968
183.08	5,841,960
183.09	5,841,965
	5,841,967
185.09	5,841,969
187.01	5,841,970
200.3	5,841,971
200.31	5,841,974
200.33	5,841,975
200.34	5,841,976
	5,841,977
	5,841,980
200.36	5,841,966
200.47	5,841,978
200.5	5,841,972
200.51	5,841,991
200.53	5,841,981
200.54	5,841,982
200.55	5,841,983
200.56	5,841,984
200.57	5,841,985
200.66	5,841,986
	5,841,987
200.67	5,841,979
	5,841,988
200.69	5,841,989
200.79	5,841,990
200.8	5,841,973
	5,841,992
282	5,841,993
293	5,841,994
309	5,841,995
	5,841,996
311	5,841,997
384	5,841,998
393	5,841,999
500	5,842,002
	5,842,003
551	5,842,001
555	5,842,005
557	5,842,006
566	5,842,007
587	5,842,008
601	5,842,009
652	5,842,011
	5,842,012
670	5,842,013
673	5,842,014
674	5,842,015
675	5,842,010
676	5,842,016
700	5,842,018
701	5,842,019
	5,842,020
707	5,842,017
709	5,842,021
	5,842,022
712	5,842,023
	5,842,024
728	5,842,025
733	5,842,026
750.01	5,842,027
750.02	5,842,028
750.04	5,842,029
750.08	5,842,030
800	5,842,031
	5,842,032
800.01	5,842,033
800.11	5,842,034
800.14	5,842,035
800 23	5,842,036
821	5,842,037
825	5,842,038
831	5,842,039
	5,842,040
843	5,842,041
849	5,842,042
856	5,842,043
868	5,842,078
873	5,842,044
883	5,842,045
894	5,842,046

CLASS 396

6	5,842,047
	5,842,048
30	5,842,049
	5,842,050
52	5,842,051
55	5,842,052
	5,842,053
	5,842,054
72	5,842,055
78	5,842,056
87	5,842,057
96	5,842,058
101	5,842,059
155	5,842,060
203	5,842,061
315	5,842,063
330	5,842,064
358	5,842,065
409	5,842,066
411	5,842,067
	5,842,068
419	5,842,069
440	5,842,071
463	5,842,070
535	5,842,072
564	5,842,073
578	5,842,074
611	5,842,075
626	5,842,076
647	5,842,077

CLASS 399

33	5,842,079
49	5,842,080
50	5,842,081
66	5,842,082
107	5,842,083
110	5,842,084
122	5,842,085
159	5,842,086
174	5,842,087
177	5,842,088
223	5,842,089
256	5,842,090
258	5,842,091
262	5,842,092
263	5,842,093
289	5,842,094
299	5,842,095
302	5,842,096
	5,842,097
322	5,842,098
324	5,842,099
328	5,842,100
349	5,842,102
353	5,842,103
368	5,842,101
400	5,842,104
406	5,842,105

CLASS 400

62	5,839,836
76	5,839,837
185	5,839,838
242	5,839,839
621	5,839,840
708	5,839,841

CLASS 401

201	5,839,842

CLASS 402

4	5,839,843

CLASS 403

135	5,839,845
164	5,839,846
269	5,839,847
282	5,839,848

CLASS 404

6	5,839,849
9	5,839,850

CLASS 405

3	5,839,851
43	5,839,844
60	5,839,853
215	5,839,854
262	5,839,855

CLASS 407

114	5,839,856
	5,839,857
115	5,839,858

CLASS 408

158	5,839,859
180	5,839,860

CLASS 409

2	5,839,861
201	5,839,862

CLASS 410

66	5,839,863
69	5,839,864
127	5,839,865

CLASS 411

5	5,839,866
337	5,839,867
533	5,839,868

CLASS 413

31	5,839,869

CLASS 414

150	5,839,870
228	5,839,871
280	5,839,872
	5,839,873
459	5,839,874
462	5,839,875
590	5,839,876
797	5,839,877

CLASS 415

206	5,839,879
209.2	5,839,878
229	5,839,880

CLASS 416

5	5,839,881
229 A	5,839,882

CLASS 417

63	5,839,883
196	5,839,884
213	5,839,885
250	5,839,886
364	5,839,887
521	5,839,888

CLASS 418

31	5,839,889

CLASS 419

8	5,842,106
13	5,842,107
33	5,842,108
38	5,842,109

CLASS 422

4	5,840,245
	5,840,246
7	5,840,247
26	5,840,248
28	5,840,249
	5,840,250
36	5,840,251
40	5,840,252
63	5,840,253
68.1	5,840,254
90	5,840,255
102	5,840,256
125	5,840,257
142	5,840,258
186.3	5,842,110
191	5,840,259
219	5,840,260
300	5,840,261

CLASS 423

92	5,840,262
243.01	5,840,263
277	5,840,264
447 2	5,840,265
483	5,840,266
592	5,840,267
	5,840,268
	5,840,269
658	5,840,270
700	5,840,271

CLASS 424

1.49	5,840,272
1.65	5,840,273
9.52	5,840,275
	5,840,276
45	5,840,277
	5,840,278
46	5,840,279
47	5,840,280
49	5,840,281
59	5,840,282
61	5,840,283
64	5,840,285
65	5,840,286
	5,840,287
	5,840,288
68	5,840,289
70.12	5,840,291
70.16	5,840,292
78.02	5,840,293
78.31	5,840,294
94.5	5,840,295
94.6	5,840,296
131.1	5,840,297
133.1	5,840,298
	5,840,299
135.1	5,840,300
143.1	5,840,301
150.1	5,840,302
152.1	5,840,305
153.1	5,840,344
186.1	5,840,306
189.1	5,840,303
192.1	5,840,304
193.1	5,840,307
195.1	5,840,308
	5,840,309
	5,840,310
198.1	5,840,311
200.1	5,840,312
208.1	5,840,313
244.1	5,840,314
	5,840,315
257.1	5,840,316
277.1	5,840,317
282.1	5,840,318
400	5,840,319
401	5,840,320
402	5,840,321
405	5,840,322
	5,840,323
418	5,840,324
420	5,840,325
423	5,840,290
448	5,840,327
450	5,840,328
458	5,840,329
464	5,840,330
	5,840,331
	5,840,332
	5,840,333
	5,840,334
473	5,840,335
484	5,840,336
486	5,840,337
488	5,840,338
489	5,840,339
499	5,840,340
	5,840,341
553	5,840,342
616	5,840,343

CLASS 425

311	5,840,345
382 R	5,840,346
393	5,840,347
407	5,840,348
532	5,840,349
533	5,840,350
556	5,840,351
	5,840,352

CLASS 426

15	5,840,353
74	5,840,354
104	5,840,355
262	5,840,356
467	5,840,358
516	5,840,359
594	5,840,360
615	5,840,361
650	5,840,362

CLASS 427

97	5,840,363
160	5,840,364
240	5,840,365
250	5,840,366
255.1	5,840,367
255 4	5,840,368
282	5,840,369
372.2	5,840,370
377	5,840,371
407.1	5,840,372
446	5,840,373
579	5,840,374
600	5,840,375

CLASS 428

1	5,840,376
31	RE. 35,970
33	5,840,377
34.1	5,840,379
34 4	5,840,380
	5,840,381
35.8	5,840,383
	5,840,384
36.7	5,840,385
36.9	5,840,386
36.91	5,840,387
	5,840,388
	5,840,389
37	5,840,390
38	5,840,391
40.1	5,840,392
49	5,840,393
57	5,840,378
64.1	5,840,395
65.3	5,840,394
67	5,840,396
	5,840,418
73	5,840,397
100	RE. 35,971
	5,840,398
102	5,840,399
116	5,840,400
122	5,840,401
131	5,840,402
154	5,840,403
	5,840,404
156	5,840,405
	5,840,406
167	5,840,407
190	5,840,408
209	5,840,382
212	5,840,410
229	5,840,411
284	5,840,412
292.1	5,840,413
307.7	5,840,414
323	5,840,415
	5,840,416
	5,840,417
327	5,840,419
332	5,840,420
	5,840,421
355 EN	5,840,422
364	RE. 35,972
367	5,840,424
372	5,840,425
408	5,840,426
	5,840,427
412	5,840,428
	5,840,429
516	5,840,430
542.2	5,840,431
570	5,840,432
598	5,840,619
632	5,840,434
689	5,840,433
698	5,840,435
	5,840,436

CLASS 429

14	5,840,437
30	5,840,438
60	5,840,440
84	5,840,439
176	5,840,441
206	5,840,442
212	5,840,443
223	5,840,444

CLASS 430

5	5,840,445
	5,840,446
	5,840,447
	5,840,448
7	5,840,449
25	5,840,450
30	5,840,451
31	5,840,452
42	5,840,453
45	5,840,457
59	5,840,454
67	5,840,455
106	5,840,456
110	5,840,458
	5,840,459
	5,840,460
133	5,840,461
137	5,840,462
201	5,840,463
257	5,840,464
270.1	5,840,465
270.13	5,840,466
302	5,840,467
350	5,840,469
359	5,840,470
399	5,840,471
488	5,840,472
509	5,840,473
569	5,840,474
619	5,840,475

CLASS 431

7	5,839,891
8	5,839,890
153	5,839,892

CLASS 432

75	5,839,893
181	5,839,894

CLASS 433

118	5,839,895
159	5,839,896
165	5,839,897
173	5,839,898
215	5,839,899
218	5,839,900

CLASS 434

127	5,839,901
130	5,839,902
247	5,839,903
268	5,839,904
307 R	5,839,905

CLASS 435

4	5,840,477
5	5,840,478
	5,840,479
	5,840,480
	5,840,481
6	5,840,482
	5,840,483
	5,840,484
	5,840,485
	5,840,486
	5,840,487
	5,840,488
	5,840,489
	5,840,490
	5,840,491
	5,840,492
	5,840,493
	5,840,494
	5,840,497
7.1	5,840,495
	5,840,496
	5,840,498
	5,840,499
	5,840,500
7.21	5,840,502
	5,840,503
	5,840,504
7.23	5,840,506
	5,840,507
7.32	5,840,508
7.35	5,840,513
18	5,840,505
	5,840,512
19	5,840,511
23	5,840,509
	5,840,510
29	5,840,514
	5,840,515
	5,840,516
68.1	5,840,517
69 1	5,840,518
	5,840,520
	5,840,521
	5,840,522
	5,840,523
	5,840,524
	5,840,525
	5,840,526
	5,840,527
	5,840,528
	5,840,529
	5,840,530
	5,840,531
	5,840,532
	5,840,533
	5,840,534
	5,840,535
	5,840,536
	5,840,537
	5,840,538
	5,840,540
69 2	5,840,539
69 3	5,840,541
69 4	5,840,542
69.5	5,840,543
	5,840,544
71.1	5,840,546
71.2	5,840,547
74	5,840,501
91.2	5,840,549
97	5,840,550
106	5,840,551
118	5,840,552
134	5,840,548
147	5,840,553
172.3	5,840,554
	5,840,555
	5,840,556
	5,840,557
192	5,840,558
193	5,840,559
194	5,840,560
195	5,840,561
212	5,840,562
226	5,840,564
235.1	5,840,563
	5,840,565
240.2	5,840,566
240.49	5,840,567
252.3	5,840,568
	5,840,569
254.3	5,840,570
262.5	5,840,571
286.7	5,840,572
287.2	5,840,573
320.1	5,840,574
	5,840,575
325	5,840,576
	5,840,577
	5,840,578
	5,840,579
372	5,840,580
430.1	5,840,581
696	5,840,545

CLASS 436

55	5,840,582
	5,840,583
66	5,840,584
161	5,840,585
510	5,840,586
513	5,840,587
518	5,840,588

CLASS 437

11	5,840,590
52	5,840,591
128	5,840,589
173	5,840,592

CLASS 438

6	5,840,593
15	5,840,594
16	5,840,595
47	5,840,596
52	5,840,597
118	5,840,598
123	5,840,599
151	5,840,600
	5,840,601
153	5,840,602
202	5,840,603
230	5,840,604
253	5,840,605
255	5,840,606
257	5,840,607
275	5,840,608
299	5,840,609
301	5,840,610
307	5,840,611
312	5,840,612
320	5,840,613
364	5,840,423
396	5,840,615
459	5,840,616
464	5,840,614
533	5,840,618
609	5,840,620
618	5,840,621
622	5,840,622
624	5,840,623
	5,840,624
626	5,840,625
649	5,840,626
669	5,840,627
680	5,840,628
692	5,840,629
712	5,840,630
789	5,840,631

CLASS 439

61	5,839,906
76.1	5,839,907
107	5,839,908
137	5,839,909
157	5,839,912
188	5,839,910
326	5,839,913
470	5,839,911
488	5,839,914
489	5,839,915
495	5,839,916
	5,839,917
526	5,839,918
529	5,839,919
587	5,839,920
595	5,839,921
717	5,839,922
752	5,839,923
757	5,839,924
852	5,839,925

CLASS 440

37	5,839,926
43	5,839,927
75	5,839,928
76	5,839,929
88	5,839,930

CLASS 441

6	5,839,931
80	5,839,932
94	5,839,933

CLASS 442

62	5,840,632
200	5,840,637
203	5,840,636
270	5,840,635
361	5,840,633
	5,840,634

CLASS 445

24	5,839,934
47	5,839,935

CLASS 446

16	5,839,936
75	5,839,937
120	5,839,938
175	5,839,939
212	5,839,940
442	5,839,941

CLASS 450

58	5,839,942

CLASS 451

8	5,839,943
	5,839,944
82	5,839,945
90	5,839,946
288	5,839,947
353	5,839,948
356	5,839,949
359	5,839,950
446	5,839,951

CLASS 452

8	5,839,952

CLASS 454

313	5,839,953

CLASS 455

6.3	5,842,111
31.2	5,842,112
69	5,842,113
	5,842,114
73	5,842,115
90	5,842,116
101	5,842,117
	5,842,118
161.3	5,842,119
179 1	5,842,120
343	5,842,121
403	5,842,122
412	5,842,123
418	5,842,124
426	5,842,125
428	5,842,126
435	5,842,127
	5,842,128
444	5,842,129
456	5,842,130
	5,842,131
	5,842,132
458	5,842,133
503	5,842,134
504	5,842,135
519	5,842,136
550	5,842,137
560	5,842,138
563	5,842,139
573	5,842,140
574	5,842,141

CLASS 460

45	5,839,954

CLASS 463

16	5,839,955
20	5,839,957

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25	5,839,956
35	5,839,958
36	5,839,959
41	5,839,960

CLASS 464

52	5,839,961
68	5,839,962

CLASS 472

104	5,839,963
117	5,839,964
118	5,839,965

CLASS 473

29	5,839,966
47.2	5,839,967
219	5,839,968
220	5,839,969
252	5,839,970
263	5,839,971
286	5,839,972
305	5,839,973
337	5,839,974
346	5,839,975
414	5,839,976
446	5,839,977
458	5,839,978
464	5,839,979
478	5,839,980
480	5,839,981
481	5,839,982
568	5,839,983

CLASS 475

83	5,839,984
90	5,839,985
230	5,839,986

CLASS 477

107	5,839,987
130	5,839,988
143	5,839,989

CLASS 482

8	5,839,990
23	5,839,991
49	5,839,992
54	5,839,993
91	5,839,994
92	5,839,995
106	5,839,996
107	5,839,997
140	5,839,998
142	5,840,001
146	5,839,999

CLASS 493

352	5,840,004
399	5,840,002
405	5,840,003

CLASS 494

16	5,840,005
53	5,840,006
	5,840,007

CLASS 501

48	5,840,638
88	5,840,639
103	5,840,641
136	5,840,642

CLASS 502

25	5,840,643
117	5,840,644
	5,840,645
152	5,840,646
213	5,840,647
306	5,840,648
324	5,840,649
350	5,840,650
434	5,840,651

CLASS 503

204	5,840,657
216	5,840,652

CLASS 504

115	5,840,656
251	5,840,654
280	5,840,653
348	5,840,661

CLASS 505

470	5,840,660
501	5,840,659

CLASS 507

236	5,840,658

CLASS 508

107	5,840,666
279	5,840,665
283	5,840,664
291	5,840,662
	5,840,663
334	5,840,672

CLASS 510

112	5,840,671
152	5,840,670
344	5,840,669
349	5,840,668
376	5,840,667
392	5,840,677
	5,840,678
417	5,840,676
439	5,840,675

CLASS 513

402	5,841,223

CLASS 514

2	5,840,673
	5,840,674
	5,840,681
3	5,840,680
8	5,840,679
9	5,840,682
	5,840,683
11	5,840,684
12	5,840,685
	5,840,686
	5,840,687
	5,840,688
	5,840,689
	5,840,690
	5,840,692
	5,840,693
	5,840,695
13	5,840,696
17	5,840,697
18	5,840,698
	5,840,699
21	5,840,700
	5,840,701
23	5,840,702
	5,840,703
30	5,840,704
43	5,840,705
44	5,840,707
	5,840,708
	5,840,710
45	5,840,711
52	5,840,712
58	5,840,713
	5,840,714
62	5,840,715
75	5,840,716
159	5,840,717
167	5,840,718
180	5,840,719
182	5,840,740
232.2	5,840,721
241	5,840,722
249	5,840,723
252	5,840,724
	5,840,725
253	5,840,726
254	5,840,727
261	5,840,728
262	5,840,763
263	5,840,729
275	5,840,730
289	5,840,731
300	5,840,732
311	5,840,733
315	5,840,734
320	5,840,735
332	5,840,736
338	5,840,737
359	5,840,738
365	5,840,739
381	5,840,741
383	5,840,742
395	5,840,743
398	5,840,744
414	5,840,745
438	5,840,746
443	5,840,747
449	5,840,748
450	5,840,749
459	5,840,750
460	5,840,751
	5,840,752
464	5,840,753
493	5,840,760
534	5,840,754
535	5,840,755
538	5,840,756
560	5,840,757
564	5,840,758
610	5,840,759
617	5,840,761
627	5,840,762
646	5,840,764
731	5,840,765
742	5,840,766
759	5,840,767
779	5,840,768
781	5,840,769
885	5,840,770
931	5,840,771

CLASS 521

41	5,840,772
49	5,840,773
61	5,840,774
64	5,840,775
82	5,840,777
99	5,840,778
118	5,840,779
137	5,840,780
167	5,840,781
174	5,840,782

CLASS 522

412	5,840,783

CLASS 523

130	5,840,784
145	5,840,785
201	5,840,786

CLASS 524

35	5,840,787
95	5,840,788
156	5,840,789
186	5,840,790
405	5,840,791
417	5,840,792
423	5,840,793
	5,840,798
425	5,840,794
447	5,840,795
449	5,840,796
495	5,840,797
507	5,840,799
555	5,840,804
731	5,840,805
806	5,840,800

CLASS 525

54.44	5,840,801
63	5,840,802
85	5,840,803
101	5,840,806
178	5,840,807
268	5,840,808
316	5,840,809
333.3	5,840,810
411	5,840,811
458	5,840,812
479	5,840,813
502	5,840,814

CLASS 526

127	5,840,815
169	5,840,820
210	5,840,819
284	5,840,817

CLASS 528

4	5,840,816
10	5,840,821
44	5,840,822
73	5,840,823
97	5,840,824
183	5,840,825
196	5,840,826
272	5,840,827
353	5,840,828
363	5,840,829
388	5,840,830
488	5,840,831

CLASS 530

300	5,840,832
	5,840,833
323	5,840,834
	5,840,835
324	5,840,836
	5,840,837
	5,840,838
325	5,840,839
338	5,840,841
350	5,840,840
	5,840,842
	5,840,843
	5,840,844
	5,840,845
	5,840,846
	5,840,847
356	5,840,848
	5,840,849
374	5,840,850
385	5,840,851
	5,840,852
387.1	5,840,853
387.7	5,840,854
388.22	5,840,856
388.4	5,840,855
413	5,840,857
	5,840,858

CLASS 534

10	5,840,859

CLASS 536

1.11	5,840,860
16.8	5,840,861
22.1	5,840,862
23.1	5,840,864
	5,840,867
	5,840,868
23.2	5,840,865
	5,840,866
23.5	5,840,869
	5,840,870
	5,840,871
24.3	5,840,873
24.5	5,840,874
	5,840,875
25.3	5,840,876
25.32	5,840,879
25.4	5,840,877
	5,840,878
26.4	5,840,880
46	5,840,881
91	5,840,882
103	5,840,883
127	5,840,884

CLASS 540

222	5,840,885

CLASS 544

162	5,840,886
230	5,840,888
230.5	5,840,720
264	5,840,889
276	5,840,890
	5,840,891
302	5,840,892
329	5,840,893
350	5,840,894
366	5,840,895
390	5,840,896

CLASS 546

2	5,840,897
41	5,840,898
48	5,840,899
	5,840,900
49	5,840,901
79	5,840,902
99	5,840,903
116	5,840,904
184	5,840,905
193	5,840,906
256	5,840,907
273.7	5,840,910

CLASS 548

164	5,840,908
253	5,840,909
326.5	5,840,911
365.4	5,840,912
373.1	5,840,913
406	5,840,914
486	5,840,915
557	5,840,916

CLASS 549

6	5,840,917
77	5,840,918
220	5,840,919
266	5,840,920
282	5,840,921
285	5,840,922
311	5,840,923
323	5,840,924
349	5,840,925
384	5,840,926
458	5,840,927
483	5,840,928
510	5,840,929
	5,840,930
	5,840,931
512	5,840,932
529	5,840,933
	5,840,934

CLASS 552

301	5,840,935
521	5,840,936
653	5,840,938

CLASS 554

37	5,840,939
61	5,840,940
92	5,840,941
162	5,840,942
166	5,840,943
175	5,840,944
192	5,840,945
224	5,840,946

CLASS 556

8	5,840,947
11	5,840,948
	5,840,949
	5,840,950
425	5,840,951
429	5,840,952
483	5,840,953

CLASS 558

71	5,840,954
324	5,840,955
441	5,840,956

CLASS 560

92	5,840,957
124	5,840,958
169	5,840,960
172	5,840,961
190	5,840,959
239	5,840,962

CLASS 562

23	5,840,963
401	5,840,964
412	5,840,965
453	5,840,966
455	5,840,967
486	5,840,968
487	5,840,970
519	5,840,969
538	5,840,971
560	5,840,972
583	5,840,973
623	5,840,974
859	5,840,975

CLASS 564

4	5,840,976
57	5,840,977
159	5,840,978
308	5,840,980
395	5,840,981
409	5,840,979
423	5,840,982
	5,840,983
440	5,840,984
471	5,840,986
479	5,840,987
485	5,840,988
488	5,840,985
490	5,840,989
507	5,840,990

CLASS 568

32	5,840,991
392	5,840,992
545	5,840,993
580	5,840,994
618	5,840,995
634	5,840,996
648	5,840,997
655	5,840,998
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867	5,841,003

CLASS 570

127	5,841,004
144	5,841,005
163	5,841,006
169	5,841,007
176	5,841,008
245	5,841,009

CLASS 585

3	5,841,010
241	5,841,011
260	5,841,012
269	5,841,013
313	5,841,014

CLASS 600

3	5,840,008
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22	5,840,010
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102	5,840,012
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125	5,840,014
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564	5,840,043
567	5,840,044
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585	5,840,046
587	5,840,047

CLASS 601

18	5,840,048
149	5,840,049

CLASS 602

19	5,840,050
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54	5,840,052
66	5,840,053

CLASS 604

8	5,840,054
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CLASS 606

7	5,840,075
34	5,840,076
112	5,840,077
151	5,840,078

CLASS 607

4	5,840,079
114	5,840,080

CLASS 623

2	5,840,081
11	5,840,083

CLASS 701

16	5,842,142
34	5,842,143
62	5,842,144
201	5,842,145
210	5,842,146
211	5,842,147

CLASS 702

9	5,842,149
23	5,842,150
27	5,842,151
34	5,842,148
95	5,842,153
106	5,842,154
124	5,842,155
179	5,842,156
189	5,842,157
195	5,842,158

CLASS 704

4	5,842,159
229	5,842,160
233	5,842,162
240	5,842,163
244	5,842,164

251	5,842,161
255	5,842,165
260	5,842,167
275	5,842,168
278	5,842,169
	5,842,170
500	5,842,171
503	5,842,172

CLASS 705

1	5,842,173
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3	5,842,175
5	5,842,176
8	5,842,177
26	5,842,178
28	5,842,179
30	5,842,180
32	5,842,181
	5,842,182
34	5,842,183
40	5,842,185
410	5,842,186
412	5,842,187
416	5,842,188

CLASS 706

16	5,842,189
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40	5,842,191
45	5,842,192
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52	5,842,194

CLASS 707

1	5,842,195
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2	5,842,196
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3	5,842,201
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4	5,842,203
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7	5,842,207
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8	5,842,215
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	5,842,214
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101	5,842,217
102	5,842,218
103	5,842,219
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104	5,842,221
202	5,842,222
203	5,842,216
204	5,842,223

CLASS 711

202	5,842,224
	5,842,225
203	5,842,226

CLASS 800

200	5,841,015

CLASS 814

12	5,840,691

CLASSIFICATION OF DESIGNS

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	910	401,394
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	969	401,398
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	972	401,402
	980	401,403
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D6—	302	401,423
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D11—	4	401,527
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D12—	110	401,534
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	316	401,547
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D14—	100	401,569
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	222	401,588
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D15—	1	401,596
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	144.2	401,600
	150	401,601
	151	401,602
D16—	202	401,603
	218	401,604
	227	401,605
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	316	401,609
	327	401,610
D17—	1	401,611
	22	401,612
D18—	10	401,613
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	43	401,618
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D19—	26	401,622
	33	401,623
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D20—	1	401,628
D21—	13	401,629
	37	401,630
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	771	401,657
D22—	108	401,658
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	141	401,663
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D23—	207	401,667
	212	401,668
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	233	401,671
	235	401,672
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	411	401,687
D24—	127	401,688
	130	401,689
	131	401,690
	144	401,691
	145	401,692
	155	401,694
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	200	401,696
	222	401,698
	224	401,697
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D28—	64	401,701
D32—	44	401,702
	45	401,703
	53.1	401,704
	58	401,705
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D34—	1	401,708
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	29	401,717
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	35	401,718
D99—	5	401,732
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	25	401,734

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	27	10,701
	55	10,702
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		10,704
	87	10,705
	88.1	10,706

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PATENTS

01 : 5,839,399
5,839,463
5,839,572
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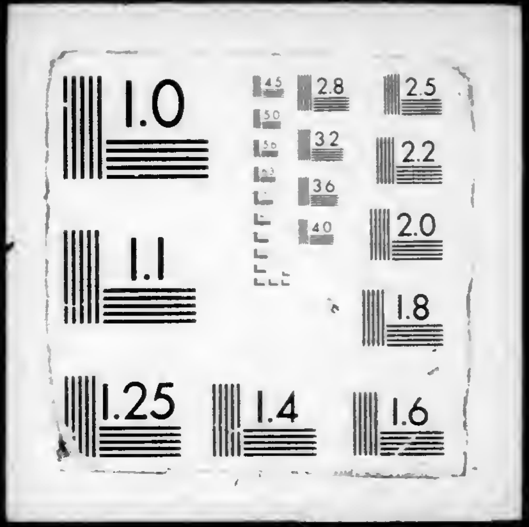

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